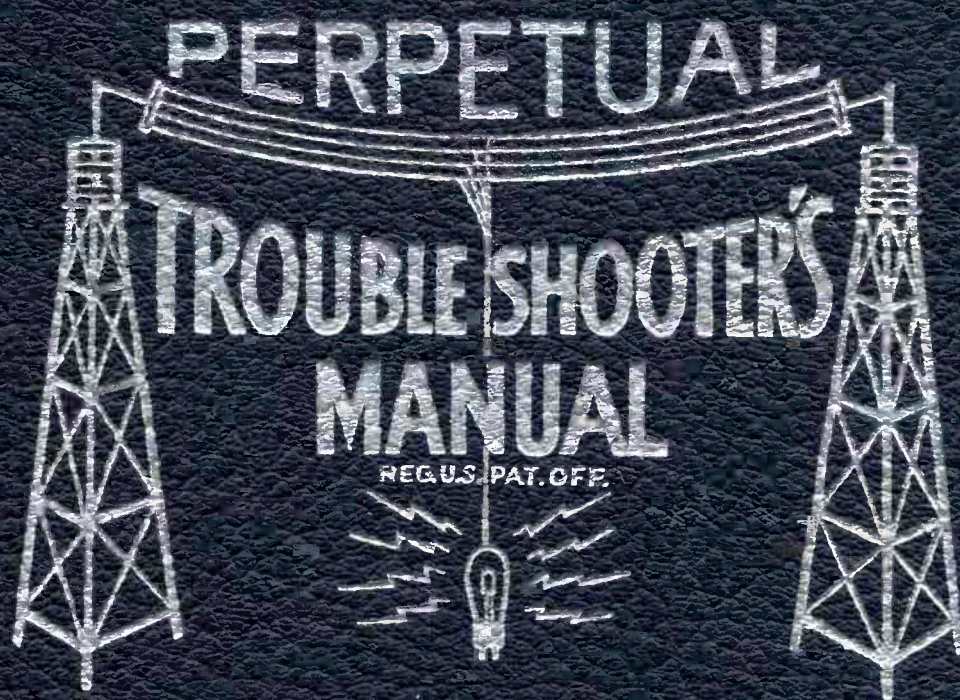


VOLUME X

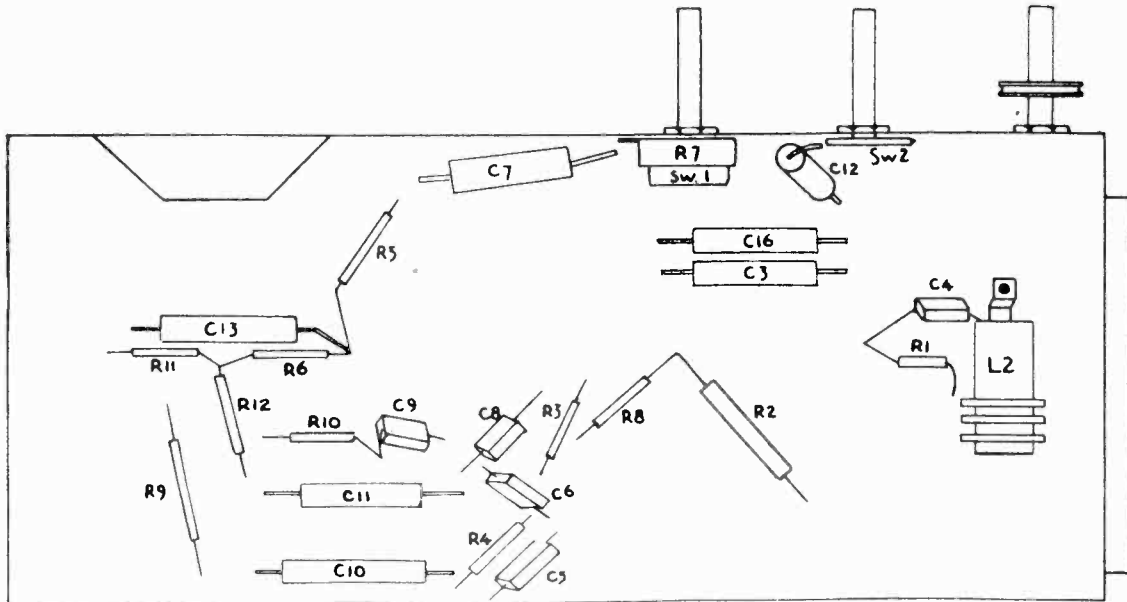


JOHN F. RIDER

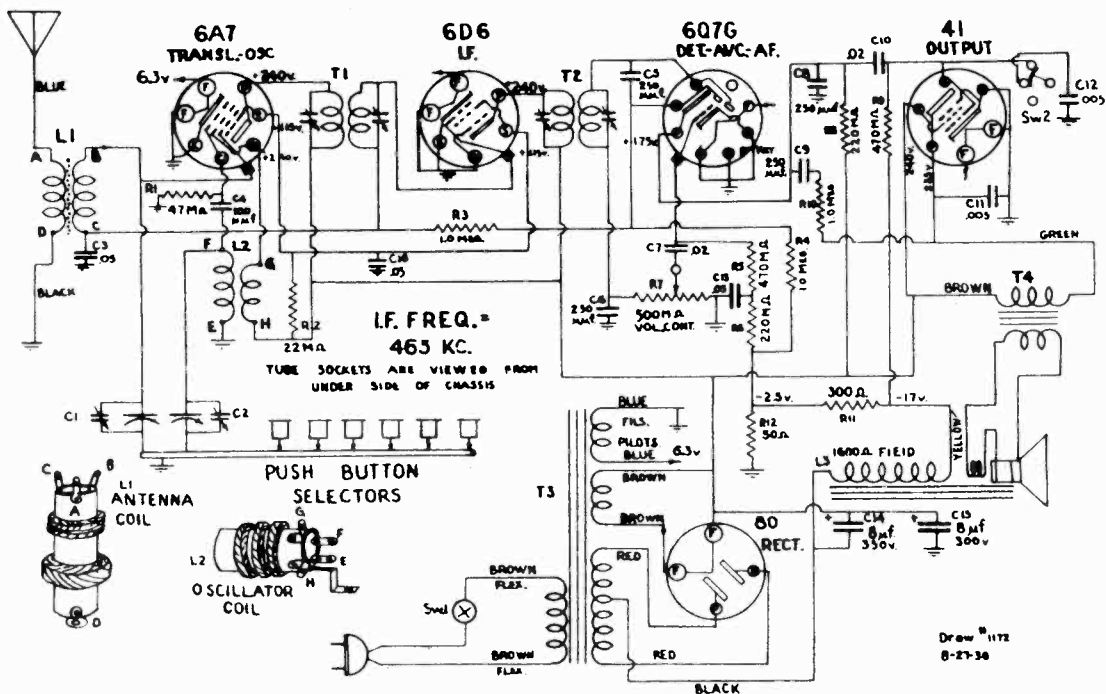
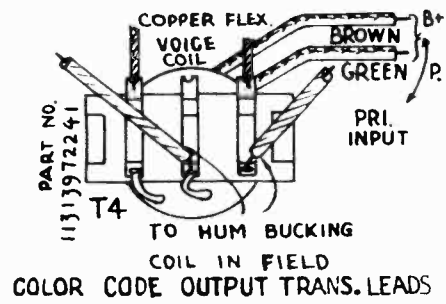
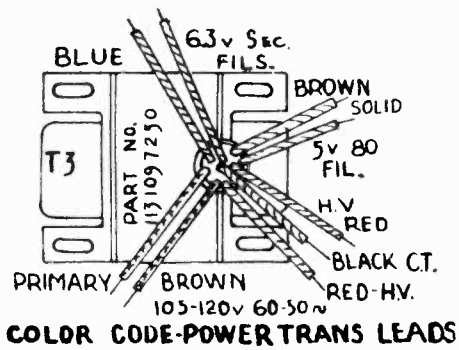
Schematic, Voltage
Chassis, Color Code

SEARS-ROEBUCK & CO.

MODEL 3972
Chassis 113.972



LOCATION OF PARTS UNDER CHASSIS



Draw 1172
8-27-38

MODEL 3972

Ch. 113.972

Alignment, Socket
Trimmers

SEARS-ROEBUCK & CO.

GENERAL INFORMATION & SERVICE HINTS

Should it be necessary to remove the chassis from the cabinet it is important when reassembling the receiver that the selector knob not be pushed on the shaft so far that it will exert pressure on the front of the cabinet, as any friction at this point will cause difficulty in operating the push buttons.

Should there be instances where it is difficult to set the push buttons accurately on a station it is very possible that the trouble is caused by a slight burr on the end of the screw insert in the push button knob; remove the push button in question and remove the burr that might be on the end of the screw.

ELECTRICAL SPECIFICATIONS

TUBES AND FUNCTIONS:
 6A7 Translator-Oscillator 41 Output
 6D6 I.F. 80 Rectifier
 6Q7G AVC, detector, 1st audio

POWER SUPPLY:
 105 - 120 Volts, 50-60 Cycle A.C. 47 Watts

FREQUENCY RANGE:
 Broadcast 540-1750 KC

ALIGNMENT FREQUENCIES:
 Oscil. Ant.-Transl.
 Trimmer Trimmer
 Broadcast 1400 KC 1400 KC

INTERMEDIATE FREQUENCY 465 KC

POWER OUTPUT:
 Type Single Pentode
 Undistorted 2.25 Watts
 Maximum 3.2 Watts

LOUD SPEAKER:
 Type Dynamic
 Size 5 inch
 Field resistance 1600 ohms

MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:
 1. Left knob. "On-Off" switch and Volume
 2. Center knob. Tone Control
 3. Right knob Station Selector

CONTROL OPERATION:
 Turning right: Power on: Volume increase
 Turning right: Bass, Treble
 Tuning ratio: 1:1

57 RL 132
SEPT. 8, 1938

SILVERTONE
5 TUBE BROADCAST BAND SUPERHETERODYNE
MODEL 3972
FACTORY IDENTIFICATION NUMBER - 113.972

AUTOMATIC TUNING CONTROL ADJUSTMENT

Tune the receiver dial to any desired station, choose the push button which you wish to control this station. Unscrew the push button one full turn, then depress the button as far as it will go, with the button in this position turn it until tight. The chosen station may always be received by depressing this button.

Remove call letter disc of station from list supplied and insert in button.

Insert celluloid disc.

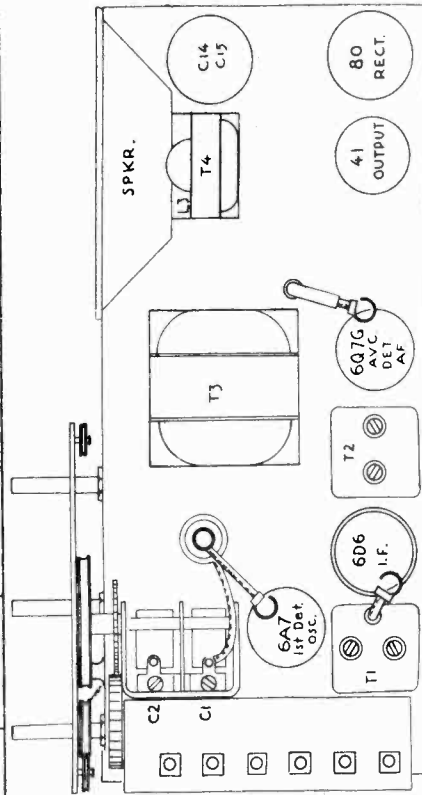
In a like manner select a station for each of the other buttons and make necessary adjustments for each station.

ALIGNMENT PROCEDURE

- Output meter connection Across loud speaker voice coil
- Output meter reading to indicate 500 milliwatts 1.1 volts
- Generator ground lead connection Receiver chassis
- Dummy antenna value in series with generator output See chart below
- Connection of generator output lead See chart below
- Generator modulation 50%, 400 cycles
- Position of volume control Fully clockwise
- Position of tone control Clockwise
- Position of Dial Pointer with variable fully closed Over first heavy line below 550 kc

PRELIMINARY:

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROX. MICROVOLTS
Open	465 kc.	.1 mfd.	6A7 Grid	T2, T1	I.F. Output I.F. Input	100
1400 kc.	1400 kc.	.0082 mfd.	Ant. Lead	CG, C1	Oscillator Translator	50



LOCATION OF PARTS TOP OF CHASSIS

SEARS-ROEBUCK & CO.

JULY 5, 1938

MODELS 4608A, 4609A, 4628A
 4629A, 4638A, 4639A, 4648A
 4649A, 4728A, 4748A
 Chassis 101.472X
 Schematic, Voltage, Socket
 Trimmers, Chassis

POWER SUPPLY:

"A" Battery (4½ volt dry) . . . 1 - #5032P
 "A" Battery (4 volt storage). . . 1 - #5049
 "B" Batteries 2 - #5131P

"A" Drain 0.3 amperes
 "B" Drain 14 ma

FREQUENCY RANGES:

Band "A" 540-1780 kc
 Band "P" 1760-8200 kc
 Band "F" 5975-18500 kc

ALIGNMENT FREQUENCIES:

	Oscil.	Ant.-Transl.
Band "A"	1400 kc	1400 kc
Band "P"	5 mc	5 mc
Band "F"	--	15 mc
		Trimmer
		Padder
		600 kc
		Fixed
		Fixed

INTERMEDIATE FREQUENCY 485 kc

POWER OUTPUT:

Type Class "B"
 Undistorted 0.45 watts
 Maximum 0.9 watts

LOUD SPEAKER:

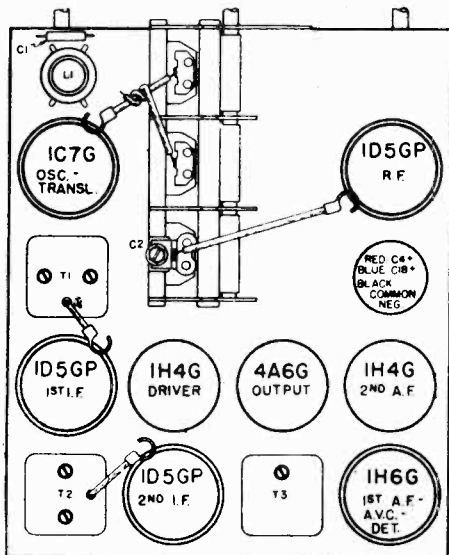
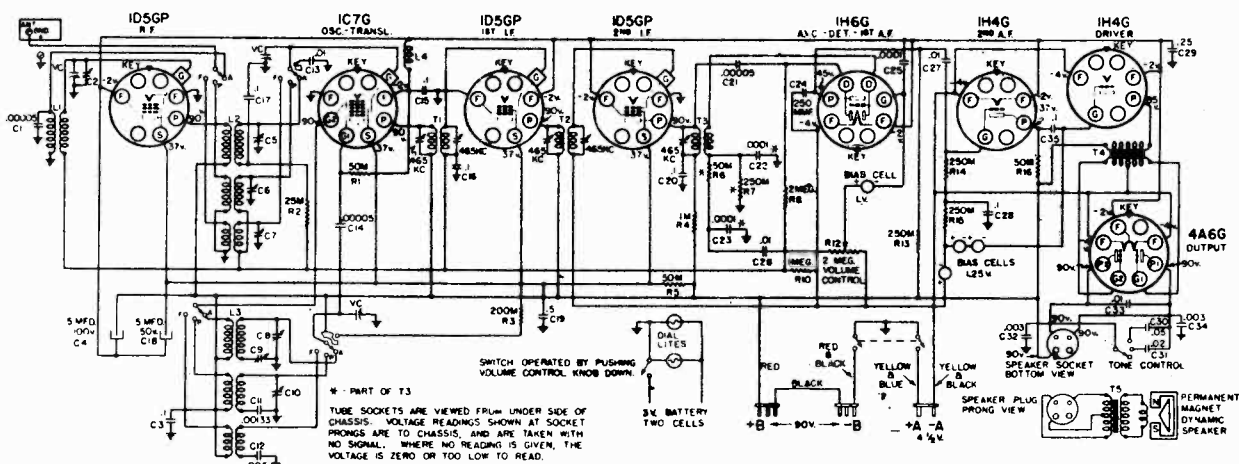
Type Permanent Magnet Dynamic
 Size 5 and 8 inch

OPERATING FEATURES:

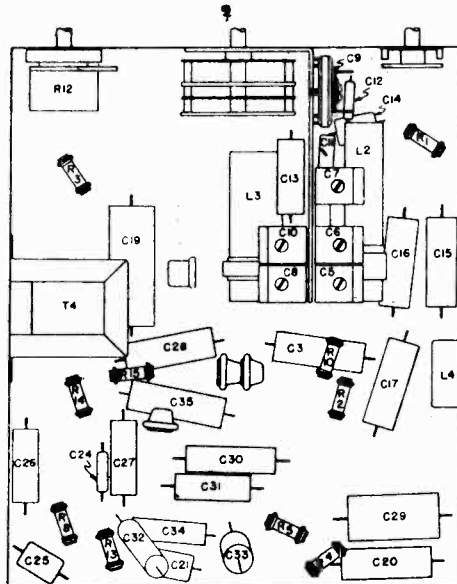
Three position Tone Control
 Automatic Volume Control
 "On-Off" Indicator
 Flash-O-Light Illumination
 Short Wave Stations marked on dial
 Wave Band Indicator

CHASSIS FEATURES:

Number RF stages . . . One on Broadcast Band
 Number IF stages Two
 Number condensers in gang Three
 Antenna Conventional
 Plugs attached to battery cable



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

MODELS 4608A, 4609A, 4628A, 4629A, 4638A, 4639A, 4648A, 4649A, 4728A, 4748A
Chassis 101.472X

SEARS-ROEBUCK & CO.

MODEL 4700
Chassis 104.235
Alignment Notes

MODEL 4700. CHASSIS 104.235. ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections Across loud speaker voice coil
Output meter sensitivity microvolts for 1 watt output 1.9 volts
Generator ground lead connection See chart below
Dummy antenna value to be put in series with generator output Receiver Chassis
Generator modulation See chart below
Position of volume control See chart below
Cover must be on case when making R. F. adjustments.

Table with columns: Position of Dial Pointer, Generator Frequency, Dummy Antenna Connections, Adjustment Symbol, Circuit Adjusted, Approx. Microvolts

IMPORTANT ALIGNMENT NOTES

*Make the generator connection to the receiver through a shielded lead having not more than 50 MMF. (0.0005) capacity. If a series condenser has been employed as outlined in the first paragraph under "General Information and Service Hints" the dummy antenna should be the same as the antenna itself.

**Readjust C-2 after installation as outlined under "Antenna Matching in Service Hints". Each step of the Alignment Procedure should be repeated in order to afford greater accuracy. Always keep the output from the signal generator at its lowest possible value to prevent any possible AVC action.

Alignment Adjustment screws are shown in Figures 3 and 4.
Only the dummy antenna indicated in the chart for any particular frequency should be used. Grid cap leads should remain in place during alignment.

Oscillator circuit alignment can be made only at high frequencies. A fixed padder is used in series with the return of the oscillator coil secondary. Oscillator coil inductance is preadjusted at factory.

Values shown under "Microvolts" are only approximate.

Dial Adjustments:

Rotate dial completely to the right. Then rotate dial completely to the left. Now dial will be set to compensate properly.

CAUSES AND REMEDIES FOR UNUSUAL NOISE CONDITIONS

If controls operate with too much difficulty it indicates that the control cables are bent too sharply. This should be avoided.

If after making proper installation of receiver, you encounter noises you cannot eliminate refer to RL's Nos. 2, 6, 40, 41, 76, 73, 117, for suggestions and remedies.

ELIMINATING WHISTLE AT 900 TO 920 KC:

In locations where a strong 90 KC station is in operation, a whistle may be experienced at 900 to 920 KC. This whistle is due to a beat between the second harmonic (910 KC) of the 456 KC I. F. and the 910 KC station. Such a condition can be corrected by changing the I. F. frequency to a higher or lower value until the whistle disappears. However, the I. F. amplifier should not be shifted to a frequency higher than 485 KC nor lower than 445 KC but should be as close to 456 KC as possible.

If the I. F. frequency is changed, it will be necessary to realign the rest of the receiver as described under "Alignment Procedure".

Antenna Matching:

An antenna padder condenser is used to match antenna capacities up to 500 MMF. If, in the installation this padder is not effective, it is because the capacity of the antenna is over 500 MMF. In that case a fixed capacity of .0005 MFD. or less should be connected in series with the antenna. The location of the antenna adjustment is found on Fig. 3.

ALIGNMENT PROCEDURE

Output meter connection Across speaker voice coil
Output meter reading to indicate 50 milliwatts 0.4 volts
Average sensitivity in microvolts for 50 milliwatts output See chart below
Dummy antenna value to be in series with generator output See chart below
Connection of generator output lead See chart below
Connection of generator ground lead Receiver chassis
Generator modulation 30%, 400 cycles
Position of Volume Control Fully on
Position of Tone Control Fully clockwise
Position of Dial Pointer To fall on end line of scale (low frequency end). Loosen AVC control knob, rotate and rotate drum if necessary. Tighten set screws after pointer is properly set.

Table with columns: WAVE BAND SWITCH POSITION, POSITION OF DIAL POINTER, GENERATOR FREQUENCY, DUMMY ANTENNA CONNECTION, GENERATOR CONNECTION, TRIMMERS ADJUSTED (IN ORDER SHOWN), TRIGGER FUNCTION, APPROXIMATE MICROVOLTS

IMPORTANT ALIGNMENT NOTES

Note that the IF must be adjusted with the Wave Band Switch in the "F" position. Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

Always keep the output from the signal generator at its lowest possible value to prevent AVC action of the receiver from interfering with the alignment. As the variable is increased through alignment, the output from the generator should be decreased to compensate.

MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:

- 1. Left knob On-Off Switch; Volume; Flash-O-Light.
2. Center lower knob Wave Band Switch
3. Center upper knob Selector
4. Right knob Tone Control

CONTROL OPERATION:

- Turning right: Power on; Volume increase; Pushing down: Flash-O-Light.
Turning right: "A", "F", "P"
Tuning Ratio: 30:1
Turning right: "LO", "MED", "HI"

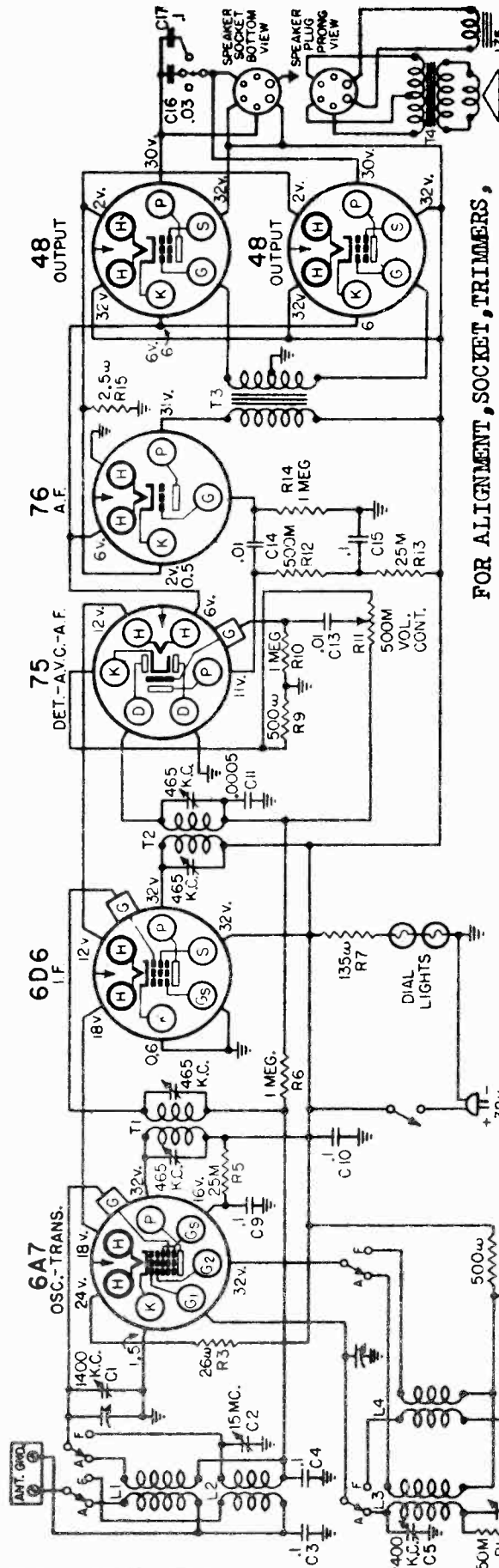
SUBJECT: CIRCUIT REVISIONS TO REDUCE BATTERY DRAIN

Later production of chassis number 101.472 (described in RL 4515 identified as 101.472X) as will be seen from the Wiring Diagram in this supplement, the circuit has been revised and tube changes made. The two 1B6 output tubes have been replaced by a single 1B6 and a 450 output tube. The 5B battery drain from the 5A battery drain from .3 ampere to .3 ampere, and reduce the 5B drain from 85 ma. to 15 ma.

The Parts List, Locations of Parts Diagrams, and Wiring Diagram follow. Be sure to mention chassis identification number 101.472X when ordering parts for this chassis.

SEARS-ROEBUCK & CO.

MODELS 4612A, 6162
Chassis 101.533
Schematic, Voltage



FOR ALIGNMENT, SOCKET, TRIMMERS,
CHASSIS, SEE NEXT PAGE

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
READINGS TO BE MADE WITH NO SIGNAL, WHERE NO VOLTAGE READING
IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY
LOW READING.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE
TRIMMER CONDENSERS.
FIGURES AT CATHODE ARE CATHODE CURRENT IN MILLIAMPERES.

CONTROL OPERATIONS:
Turning right: Volume Increase
Turning left: "AM", "FOR"
Tuning ratio: 17:1
Turning right: ON, HI, MED, LO

OPERATING CONTROLS:
1. Left knob Volume Band
2. Next to left knob Wave Switch
3. Next to right knob Station Selector
4. Right knob Tone Control
CABINET SOURCES: D, J

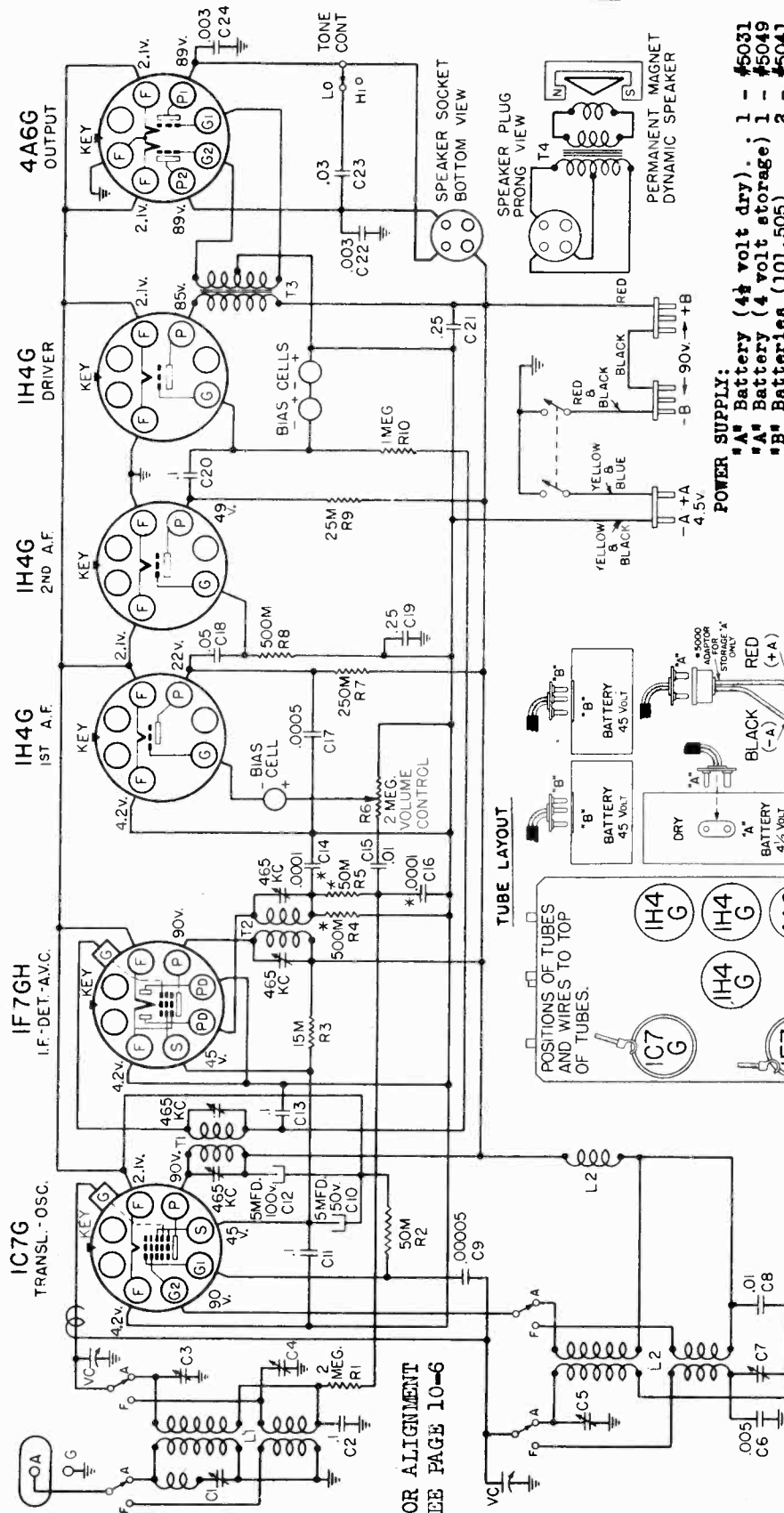
POWER SUPPLY: All models available	38 volts, DG; 45 Watts
FREQUENCY RANGES: Band "AM"	540-1750 kc
Band "FOR"	5.5-16.5 mc
INTERMEDIATE FREQUENCY	
POWER OUTPUT: Type	Push-Pull
Undistorted	0.15 watts
Maximum	0.33 watts
LOUD SPEAKER: Type	Dynamic
Size	6" and 8"
Field coil resistance	175 ohms
Field coil voltage drop	38 volts
CHASSIS FEATURES: Tone Control	3 Position
Automatic Volume Control	
ALIGNMENT FREQUENCIES: Ant-Transl. Oscill.	Oscill. Padder
Trimmer	500 kc
Band "AM"	1400 kc
Band "FOR"	Fixed
LOUD SPEAKER: Type	495 kc
Size	
Field coil resistance	
Field coil voltage drop	
CHASSIS FEATURES: Number IF stages	One
Antenna	Conventional
Push-Pull Output	

57 RL 135
SEPT. 14, 1938

SEARS-ROEBUCK & CO.

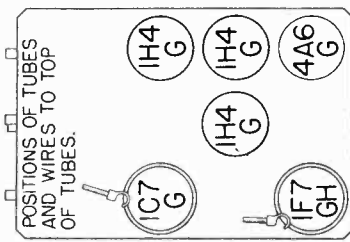
MODELS 4632A, 4633A, 6014, 6015
6044, 6045, 6064, 6144, 6164
Chassis 101.505, 101.505X
Schematic, Voltage, Socket

APRIL 15, 1938



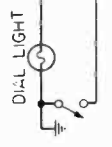
FOR ALIGNMENT
SEE PAGE 10-6

TUBE LAYOUT



* - IN ITEM T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.



SWITCH OPERATED BY PUSHING VOLUME CONTROL KNOB IN. (MODELS 4632A & 4633A ONLY)

POWER SUPPLY:
"A" Battery (4½ volt dry) . . . 1 - #5031
"A" Battery (4 volt storage) 1 - #5049
"B" Batteries (101.505) . . . 2 - #5041

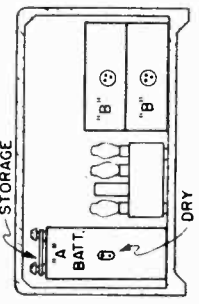
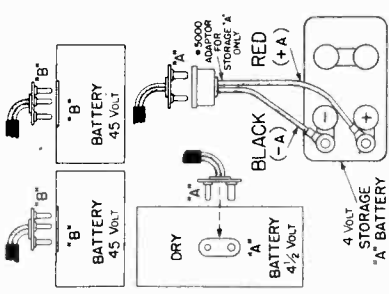
FREQUENCY RANGE:
Broadcast 540-1750 kc
Short Wave 5.9-18 mc

INTERMEDIATE FREQUENCY 465 kc

"B" Batteries (101.505X) . . . 2 - #5131
"A" Drain 0.34 amperes
"B" Drain 1½ ma

ALIGNMENT FREQUENCIES:
Oscillator Antenna-Transl. Padder
Trimmer 1400 kc 600 kc
16 mc -

ARRANGEMENT OF BATTERIES



MODELS 4632A, 4633A, 6014
6015, 6044, 6045, 6144, 6164
6064 Ch. 101.505, 101.505X
Socket, Chassis, Notes

SEARS-ROEBUCK & CO.

MODELS 4667, 4767, 4777,
4798. Chassis 101.498
Tuner Condensers, Drive

MODELS 4667, 4767, 4777, 4798, CHASSIS 101.498.

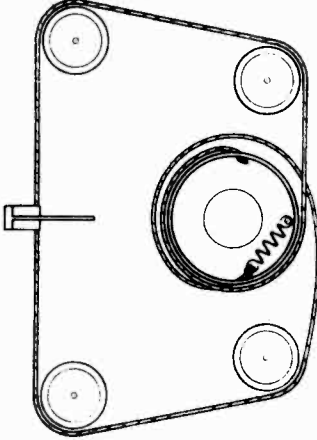
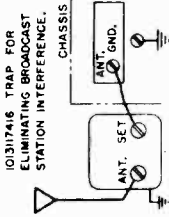
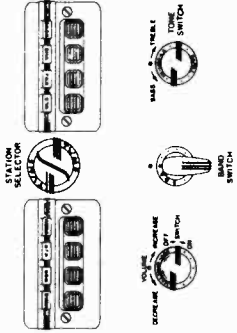
OPERATING CONTROLS:

1. Left knob . . . "On-Off" switch and Volume
2. Lower center knob . . . Wave Band Switch
3. Upper center knob . . . Station Selector
4. Right knob Tone Control

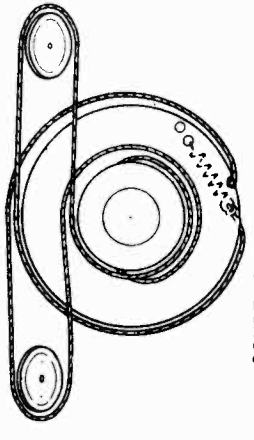
CONTROL OPERATION:

- Turning right: Power on; volume increase
- Turning right: Push Button Tuning, "A" "B", "C", "D"
- Tuning ratio: 50:1
- Turning right: "LOW", "MEDIUM", "HIGH"

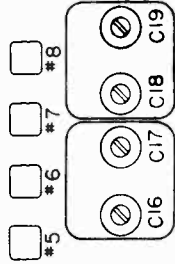
DIAL & KNOB FUNCTIONS:



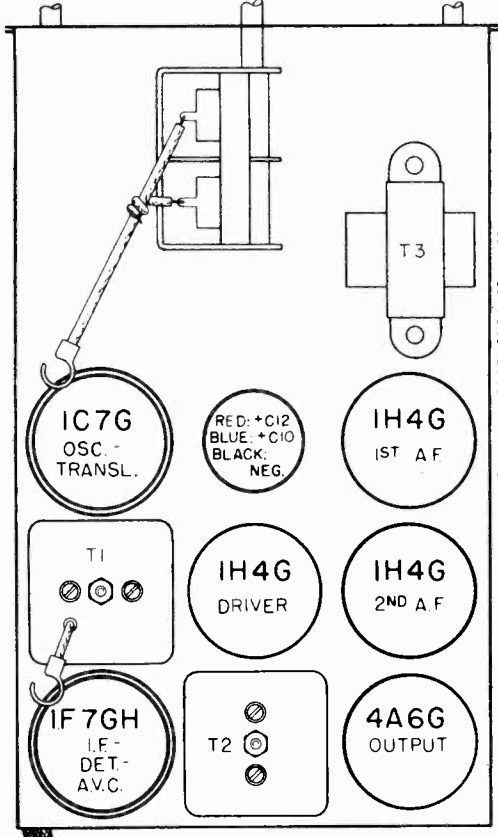
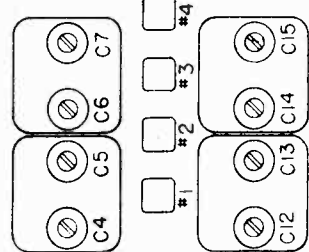
POINTER DRIVE HOOKUP



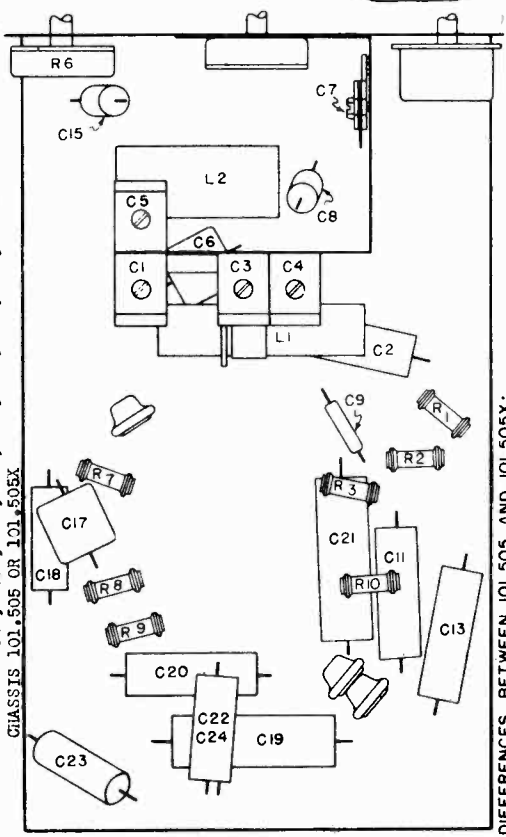
CONDENSER DRIVE HOOKUP



PUSH BUTTON CONDENSER POSITIONS



LOCATIONS OF PARTS ON TOP OF CHASSIS.



LOCATIONS OF PARTS UNDER CHASSIS.

MODELS 4632A, 4633A, 6014, 6015, 6044, 6045, 6084, 6144, 6164.
CHASSIS 101.505 OR 101.505X

DIFFERENCES BETWEEN 101.505 AND 101.505X:

The Model 101.505X incorporates the Dial FLASH-O-LITE feature. Pushing the Volume Control knob in will cause the dial to become illuminated. Two flash-light cells provide the battery for the dial lamp.

POWER OUTPUT:

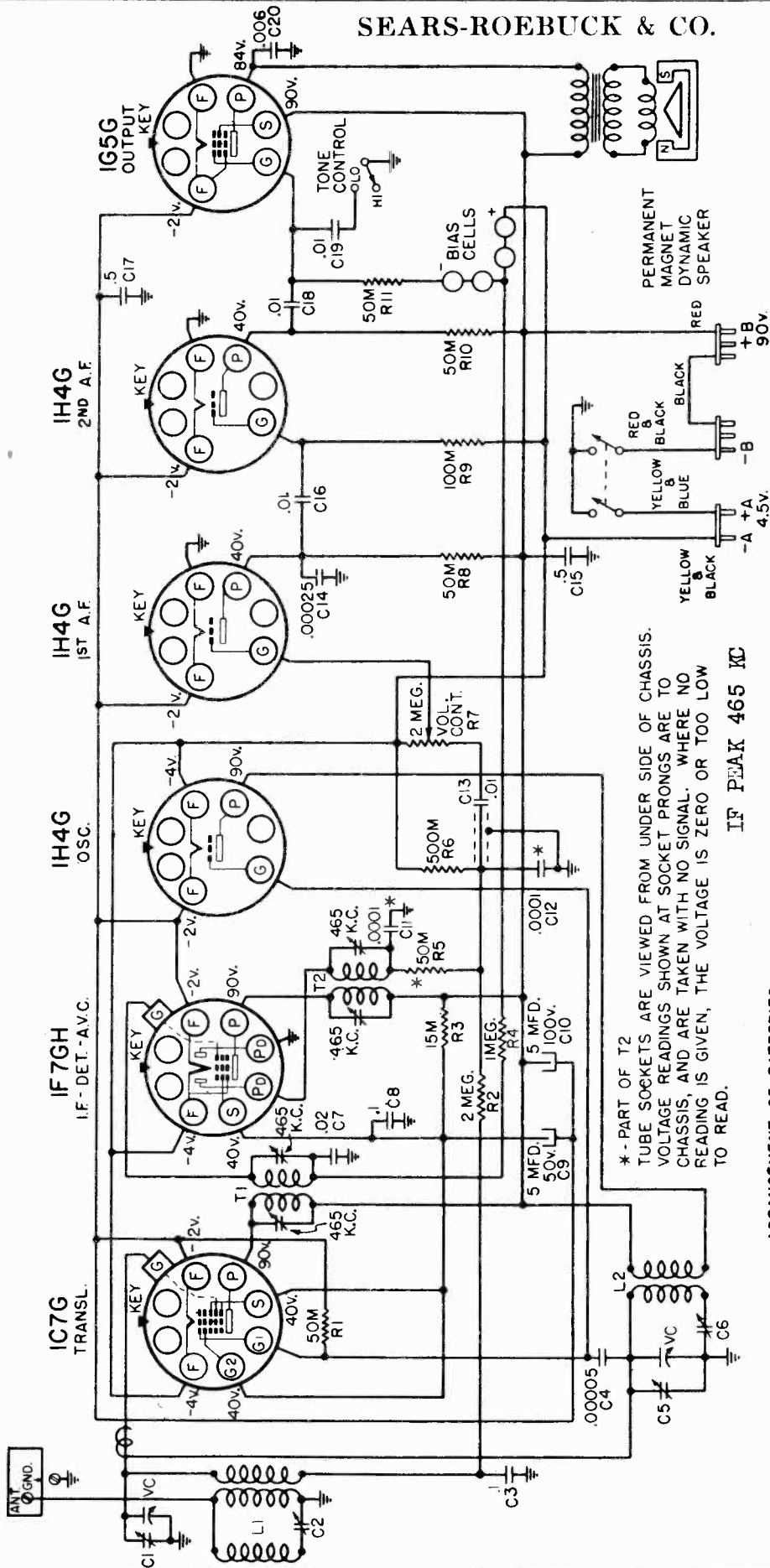
Type Class AB
Undistorted 0.4 watts
Maximum 0.8 watts

LOUD SPEAKER:

Type FM Dynamic
Size 6 and 8 inch

SEARS-ROEBUCK & CO.

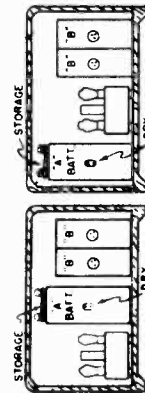
MODELS 4644A, 4645A
 Chassis 101.504
 Schematic, Voltage
 Socket



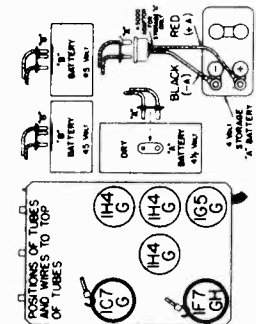
* - PART OF T2
 TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
 VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO
 CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO
 READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW
 TO READ.

IF PEAK 465 KC

ARRANGEMENT OF BATTERIES



TUBE LAYOUT



POWER OUTPUT:

Type	Single Pentode
Undistorted	0.25 watts
Maximum	0.4 watts

LOUD SPEAKER:

Type	P. M. Dynamic
Size	6 inch

57 RL 90

MARCH 9, 1938

FREQUENCY RANGE:
 Broadcast 540-1750 kc

ALIGNMENT FREQUENCIES:
 Oscillator Antenna-Transl.
 Trimmer 1400 kc
 Trimmer 1400 kc

Fadder 600 kc
 465 kc

MODELS 4644A, 4645A
Socket, Chassis
Alignment

SEARS ROEBUCK & CO.

MODELS 6010, 6040
MODELS 6052, 6053
MODELS 6054, 6055
Alignment

MODELS 4644A, 4645A CHASSIS 101.504; 6010, 6040 CHASSIS 101.519; 6052, 6053 CHASSIS 101.525; 6054-5 CHASSIS 101.532.
USE OF TABLE: ONLY ONE MODEL FOR EACH CHASSIS IS SHOWN IN TABLE BELOW, FOR EXAMPLE 4644A INDICATES CHASSIS 101.504 AND MODEL 4644A.

- Output meter connections, Models 4644A, 6010, 6052 ----- Across loud speaker voice coil.
- Model 6054-5 ----- 4000 ohm Weston meter, across speaker terminals.
- Output reading to indicate 50 milliwatts, Models 4644A, 6010, 6052 ----- 0.37 volts.
- Model 6054-5 ----- 9.40 volts.
- Generator Ground lead connection ----- Receiver chassis.
- Dummy antenna value to be in series with generator output ----- See chart below.
- Connection of generator output lead ----- See chart below.
- Generator modulation ----- 30%, 400 cycles.
- Approximate average sensitivity in microvolts for 50 milliwatts output ----- See chart below.
- Position of volume control ----- Fully On.
- Position of Tone control, Models 4644A, 6010, 6052 ----- "HI".

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)				TRIMMER FUNCTION	APPROXIMATE MICROVOLTS			
				M O D E L S					M O D E L S			
				4644A	6010	6052	6054-5		4644A	6010	6052	6054-5
Closed	465 kc	.1 mfd.	1079 Transl. Grid	T ₂ , T ₁	T ₂ , T ₁	T ₂ , T ₁	T ₂ , T ₁	IF	160	185	225	---
600 kc	465 kc *	.0002 mfd.	Antenna Term.	C ₂ *	C ₁₆ *	C ₂ *	C ₁₆ *	IF Wave Trap	---	---	---	---
Fully open	1730 kc	.0002 mfd.	Ant. Clip		C ₄			Oscillator	90			
1400 kc **	1400 Kc	.0002 mfd.	Antenna Term	C ₅ , C ₁	C ₁	C ₅ , C ₁	C ₁ , C ₄	Oscillator Translater	66	70	115	110
800 kc (rock)	800 kc	.0002 mfd.	Antenna Term	C ₆	C ₅	C ₆	C ₅	Padder	33	70	80	80

*The generator should be adjusted to give high output. The trimmer should be adjusted for minimum output meter reading instead of usual maximum output meter reading. If the frequency of an interfering code station near 465 kc is known, the generator should be adjusted to that frequency instead of 465 kc.

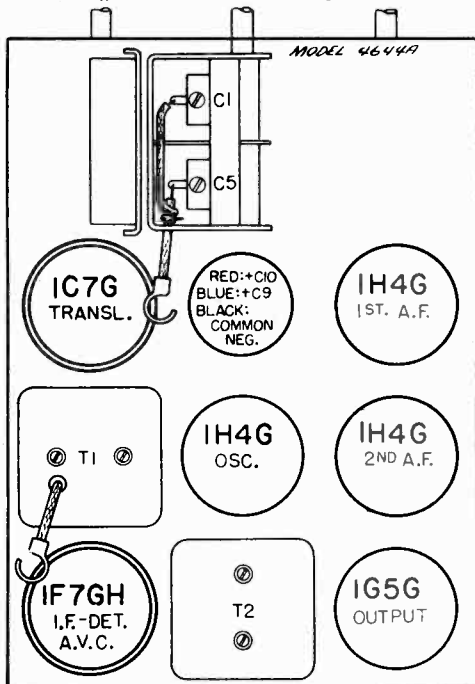
**Using the dial as a template make a dummy dial of cardboard with only the 1400 kc calibration on it. Slip this dummy dial over the shaft, hold it horizontal so the 1400 mark will come at the same position as the 1400 mark of the actual dial and turn the dial pointer to the 1400 kc mark. (The dial pointer should be horizontal when the condenser is fully open or fully meshed.)

The variable should be rocked back and forth a degree or two while making the 600 kc adjustment. The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy.

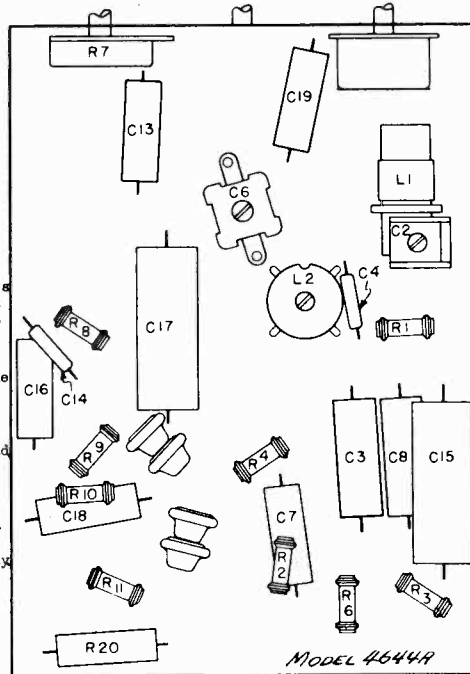
Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment. Values shown under "Microvolts" are only approximate.

ELIMINATING WHISTLE AT 930 KC: MODELS 4644A, 6052, 6054-5, 6010.

A whistle, due to a beat between the second harmonic (930 kc) of the 465 kc IF, and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver. Determine at what point between 900 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at 915/2 or 457.5 kc. Try to select the new IF frequency as near to 465 kc as possible. Align the IF at the new frequency and then realign the rest of the receiver as described.



LOCATIONS OF PARTS ON TOP OF CHASSIS.



LOCATIONS OF PARTS UNDER CHASSIS

MODELS 4644A, 4645A; Chassis 101.504

The dry "A" battery should be replaced when its voltage drops to 3.4 volts, under load. "B" batteries should be replaced when the voltage of each battery has dropped to 34 volts, under load. The life rating of the various size batteries, given are for an average use of three hours a day.

Schematic, Voltage Changes for Jacks

SEARS-ROEBUCK & CO.

MODELS 4667, 4677, 4767, 4777
4798 Chassis 101.498

POWER SUPPLY:

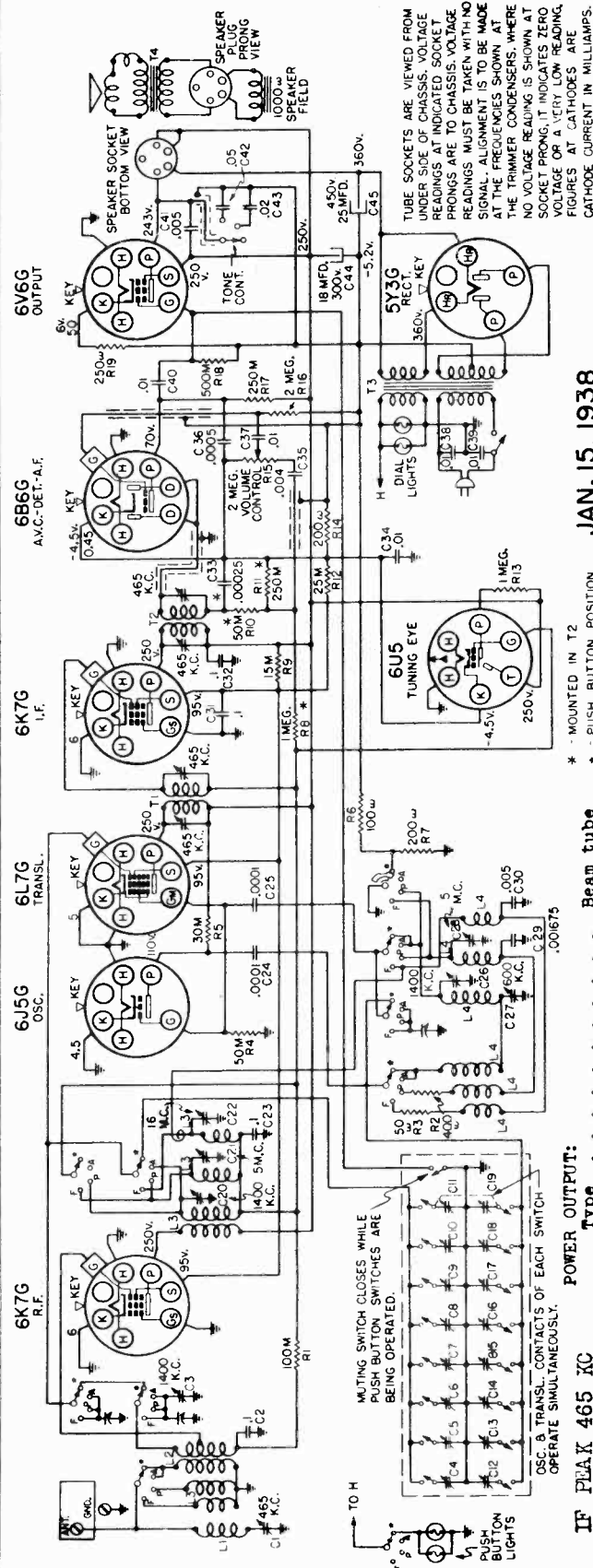
All Models available 105-125 volts, 50-60 cycle, 75 watts
All Models available 125-135 volts, 35 cycle, 75 watts

FREQUENCY RANGES:

Band "A" 540-1750 kc
Band "P" 3150-5300 kc
Band "F" 6-18.2 mc

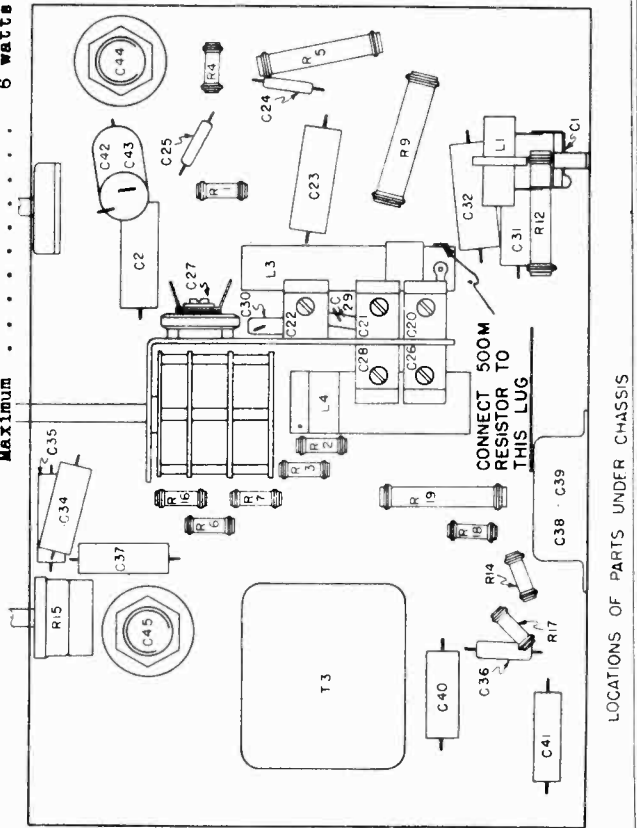
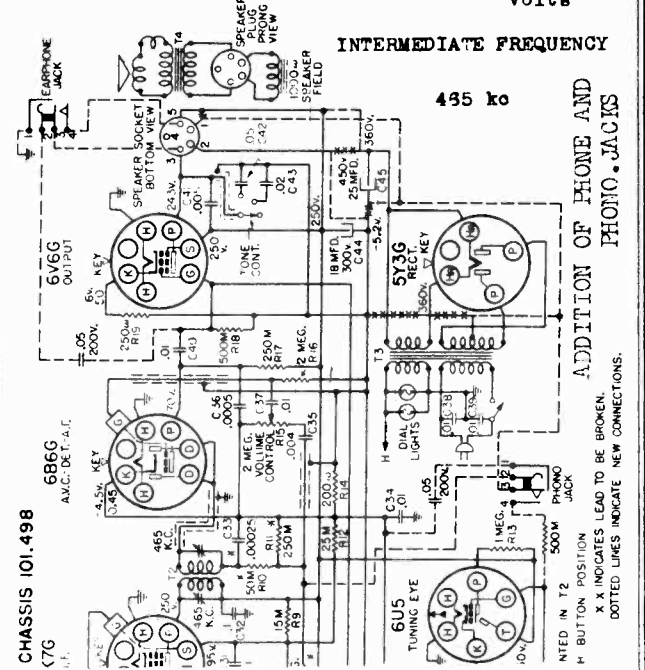
LOUD SPEAKER:

Type Dynamic
Size 6", 8", 12"
App. field coil resistance . . . 1000 ohms
App. field coil voltage drop . . . 110 volts



JAN. 15, 1938

* - MOUNTED IN T2
* - PUSH BUTTON POSITION



MODELS 4667, 4677, 4767

4777, 4798. Ch. 101. 498

Socket, Trimmers, Chassis

Alignment, Transformer

SEARS-ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY.

- Output meter connection Across voice coil leads
- Output meter reading to indicate .5 watts output 1.04 volts
- Approximate microvolts input for .5 watts output See chart below
- Dummy antenna value to be in series with Generator output See chart below
- Connection of generator output lead See chart below
- Connection of generator ground lead To chassis
- Generator modulation 30%, 400 cycles
- Position of Volume Control Fully clockwise
- Position of Tone Control Fully clockwise
- Position of Dial Pointer when variable is fully meshed Fully clockwise
- Position of Dial Pointer when variable is fully meshed square block at 550 kc end of dial.

WAVE BAND SWITCH POSITION	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
P	Closed	465 kc	.1 mfd.	T3, T1	IF Output IF Input	105
A	Closed	485 kc	.0003 mfd. Ant. Term.	C1 *	IF Trap	-
A	1500 kc	.0003 mfd. Ant. Term.	C28, C30, C3	C28, C30, C3	Oscillator Transl., RF	11
A	600 kc (rock)	500 kc .0003 mfd. Ant. Term.	C37	C37	Padder	18
P	6 mc	8 mc 400 ohms Ant. Term.	C38	C38	Oscillator	70
P	5 mc (rock)	5 mc 400 ohms Ant. Term.	C31	C31	Translator	70
P	16 mc (rock)	16 mc 400 ohms Ant. Term.	C32	C32	Translator	50

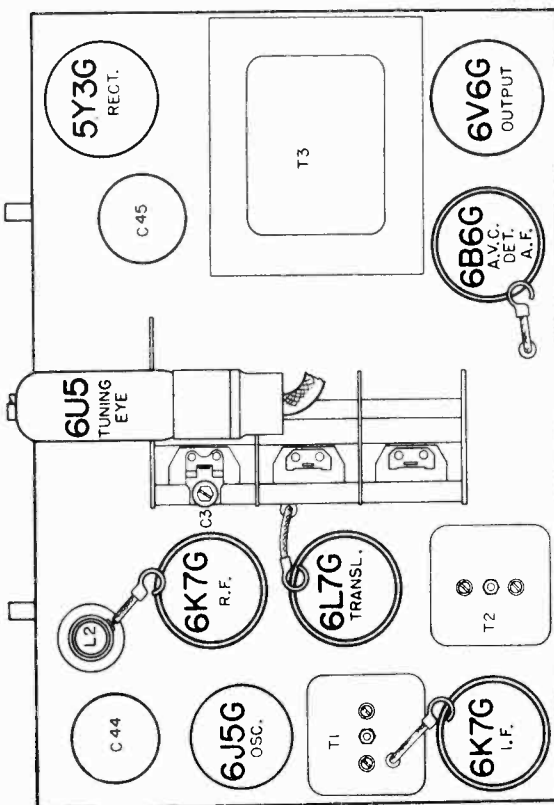
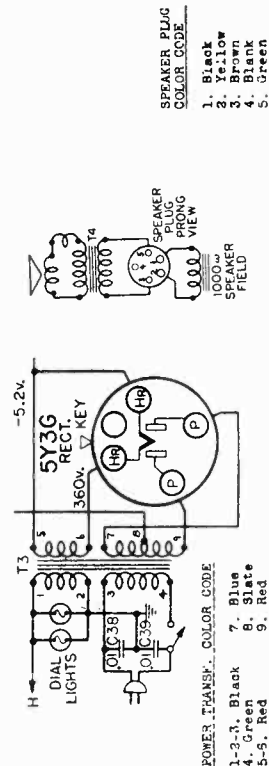
IMPORTANT ALIGNMENT NOTES

• If the frequency of an interfering code station is known, the generator should be adjusted to that frequency instead of to 465 kc. The trap should be adjusted to give minimum output meter deflection instead of the usual maximum reading.

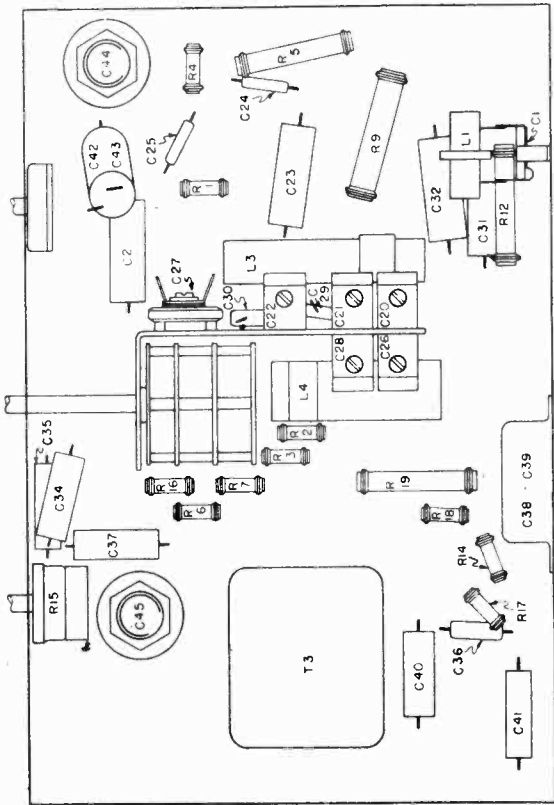
Where indicated by the word, "Rock" the variable should be rocked back and forth a degree or two while making the adjustment.

It is necessary to repeat the entire alignment procedure step by step in the original order to secure proper alignment. Perfect alignment is not possible with one adjustment of the trimmers.

Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly. Values shown under, "Microvolts", are only approximate.



LOCATIONS OF PARTS TOP OF CHASSIS.



LOCATIONS OF PARTS UNDER CHASSIS

MODELS 4681, 4781
Chassis 101.499
Tuner Data

SEARS-ROEBUCK & CO.

MODELS 4667, 4677, 4767
4777, 4798. Ch. 101.498
Tuner Data
Jack Installation

The trap has two terminals marked, "ANT" and "SET". Disconnect the antenna lead-in from the receiver and connect it to the "ANT" terminal of the trap. Connect a wire from the "SET" terminal of the trap to the "ANT" terminal of the chassis. The ground connection to the chassis remains as it was. The trap then is in series between the antenna and the receiver. The trap should be tuned to eliminate the interfering station. The sensitivity of the receiver will be reduced in the region of the frequency to which the trap is tuned.

INSTALLATION OF A PHONOGRAPH PICKUP JACK OR AN EARPHONE JACK: FOR CHASSIS 101.498 ONLY

A kit, part #1013117199, can be ordered from Colonial Radio Corporation, 854 West Street, Buffalo, N. Y. The retail selling price is \$1.11. This kit contains the earphone socket, installing either a phonograph pick-up jack or an earphone jack. If the customer desires both a phonograph pick-up jack and an earphone jack, it will be necessary to use two kits and to drill an additional hole in the back of the chassis for the additional jack.

PHONOGRAPH PICK-UP JACK: A hole, covered with a brass insert, is provided in the back of the chassis. Remove the brass insert and mount the jack in this hole. Insulate the jack from the chassis by insulating washers supplied in the kit. The Schematic Section shows the connections to the kit. In addition, the wiring in the Schematic Section shows the speaker socket and the electrolytic condenser. As the Schematic Section shows, these wiring changes and the connections to the jack are as follows:

Disconnect the jumper between prongs 1 and 5 of the speaker socket.

Disconnect the lead from prong 2 of the speaker socket and connect it to prong 5.

Disconnect the leads from prong 1 of the speaker socket and connect them to prong 5.

There is a hole in the front apron of the chassis, between the Tone Control and the right side of the chassis. Mount one of the terminal boards, supplied in the kit, in this hole.

There is an electrolytic condenser just above the terminal board mentioned in the preceding paragraph. Remove the three leads that connect to the mounting nut of this condenser and connect them to the terminal board mentioned in the preceding paragraph.

Solder a lead from the mounting nut of the electrolytic, mentioned in the preceding paragraph, to prong #1 of the speaker socket.

The slate colored lead of the power transformer is connected to the mounting nut of the electrolytic condenser mentioned next to the volume control. Remove this lead from the condenser mounting nut and then the lead by splicing, and run it to prong #1 of the speaker socket.

Solder a lead from the mounting nut of the electrolytic, mentioned in the preceding paragraph, to prong #2 of the speaker socket.

There is a terminal board mounted under one of the nuts that mount the transformer. Mount the terminal board supplied in the kit under this nut. Do not connect the .05 condenser in the kit, between this new terminal board and terminal #1 of the jack.

Run a lead from the new terminal board to the cathode prong of the 6B8G tube.

There is a two-terminal board mounted on the front of the Wave Switch assembly bracket. Run a lead from the terminal of this board that is nearest the Volume Control to lug #8 of the jack.

Run a lead from lug #3 of the jack to prong #1 of the speaker socket.

Connect the 500M ohm resistor between lug #4 of the jack and the coil terminal shown in the illustration.

The radio Volume Control and Tone Control will operate for the phonograph pick-up.

EARPHONE JACK: Mount the jack in the hole in the back of the chassis. The jack frame must be grounded to the chassis. Therefore, do not use the insulating washers.

Connect the .05 condenser from terminal #8 of the jack to the grid prong of the 6B8G output tube.

Connect terminal #3 of the jack to terminal #3 of the speaker socket.

Connect terminal #4 of the jack to terminal #5 of the speaker socket.

This is the only wiring necessary. The wiring changes mentioned above for connection of the phonograph pick-up jack are not to be done if only an earphone jack is used.

With the connections as described, the loud speaker will not operate when the earphones are plugged in. If it is desired to have the loud speaker operate at the same time the earphones are plugged in, the connections to terminals 3 and 4 of the jack should be omitted.

GENERAL INFORMATION & SERVICE HINTS

INSTRUCTIONS FOR SETTING UP PUSH BUTTON STATIONS:

- Remove the two eusouthcons that enclose the push buttons. Remove the celluloid call letter holders. A label, telling what frequency (kilocycles) stations can be set up on each button. Each button can be used for only one station in its frequency range.
- Turn the wave switch knob to the "American" position and use the tuning knob to tune in the station chosen for #1 button. Then turn the wave band switch to the Push Button position, and push button #1 all the way in.
- It will be seen that there are two adjusting screws for each button, an upper one and a lower one. Using a screw driver, turn the lower screw until the call letter holder on the station is lined up as accurately as possible, as indicated by the Tuning Eye. When the adjustment is made, obtain a strong Tuning Eye indication, but do not turn your station knob the upper adjusting screw one or two turns to the right and then proceed with the lower screw adjustment. To check whether you are adjusting to the correct station, turn the Wave Switch knob back to the "American" position momentarily.
- After the best possible setting of the lower screw has been made, adjust the #1 upper screw right or left to make the slit of the Tuning Eye still narrower.
- Proceed in the same manner for each button. Be sure the Wave Switch knob is in the "Push Button" position and that you have pushed in the proper button before starting the screw adjustments for that button. The lower screw for each button MUST be adjusted before the upper screw is adjusted. The Wave Switch knob can be turned back to the "American" position momentarily at any time, to check whether you are adjusting to the correct station.
- Place the call letters for the chosen stations in the celluloid call letter holders. Be sure to insert the call letters in the proper order so that they will be over the push button for their respective stations. Then replace the celluloid call letter holders and the eusouthcons.

THE A.V.C. CIRCUIT:

The diode current of the 6B8G tube, flowing through the 250M ohm resistor, R11, creates a voltage drop across it. This voltage is applied to the control grids of the RF, Translator, and IF tubes to provide AVC.

OSCILLATION:

Be sure the tube shields are making good contact to their base clips. Poor contact may cause oscillation.

ELIMINATING WHISTLE AT 930 KC:

A whistle, due to a beat between the second harmonic (930 kc) of the 465 kc IF and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 900 kc and 960 kc the whistle will be least objectionable. Dividing this frequency by 11 will determine the IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at 915/3 or 457.5 kc. Try to choose the new IF frequency as near to 465 kc as possible.

Align the IF at the new frequency and then realign the rest of the receiver as described under "ALIGNMENT PROCEDURE". It will also be necessary to readjust any stations set up on the Push Button Tuning Mechanism.

WAVE TRAPS:

A wave-trap, designed to eliminate code interference from ship transmitters, airports or air beacon stations in locations where the receiver is near such transmitters, is built into the receiver. As explained in the alignment procedure, this trap should be tuned to the interfering station in the vicinity of 465 kc.

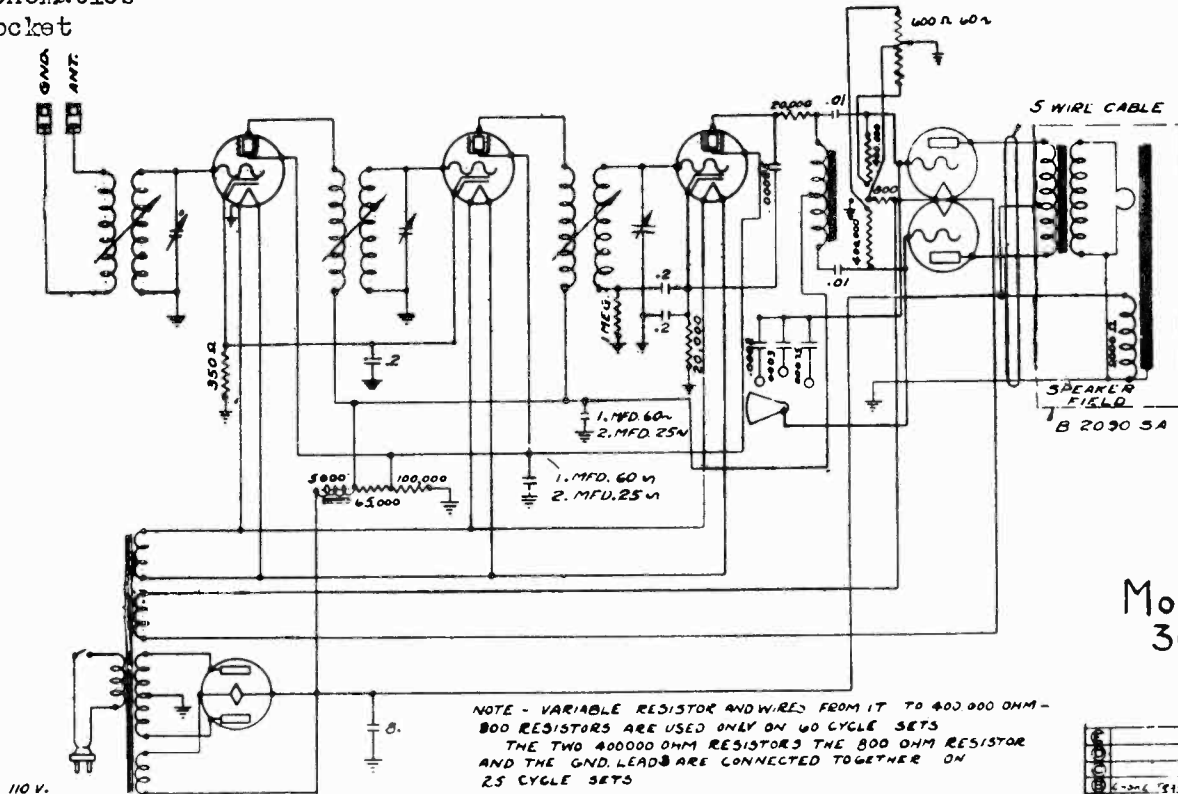
A wave-trap, designed to eliminate whistles and cross modulation troubles on the broadcast band when the receiver is located comparatively near some powerful broadcast station, is available.

This trap can be ordered under part #1013117416 directly from Sears, Roebuck and Co. Retail Store or Mail Order branch, using Purchase Order Blank Form F6384. The retail selling price is \$1.30.

Mount the trap to the chassis mounting shelf on the inside of the cabinet by means of wood screws. Tighten the screws on the trap. It is important to connect a wire from under the head of one of the wood screws to the chassis so that the wave-trap shield becomes grounded to the chassis.

MODEL 36
 MODEL 36-P
 Schematics
 Socket

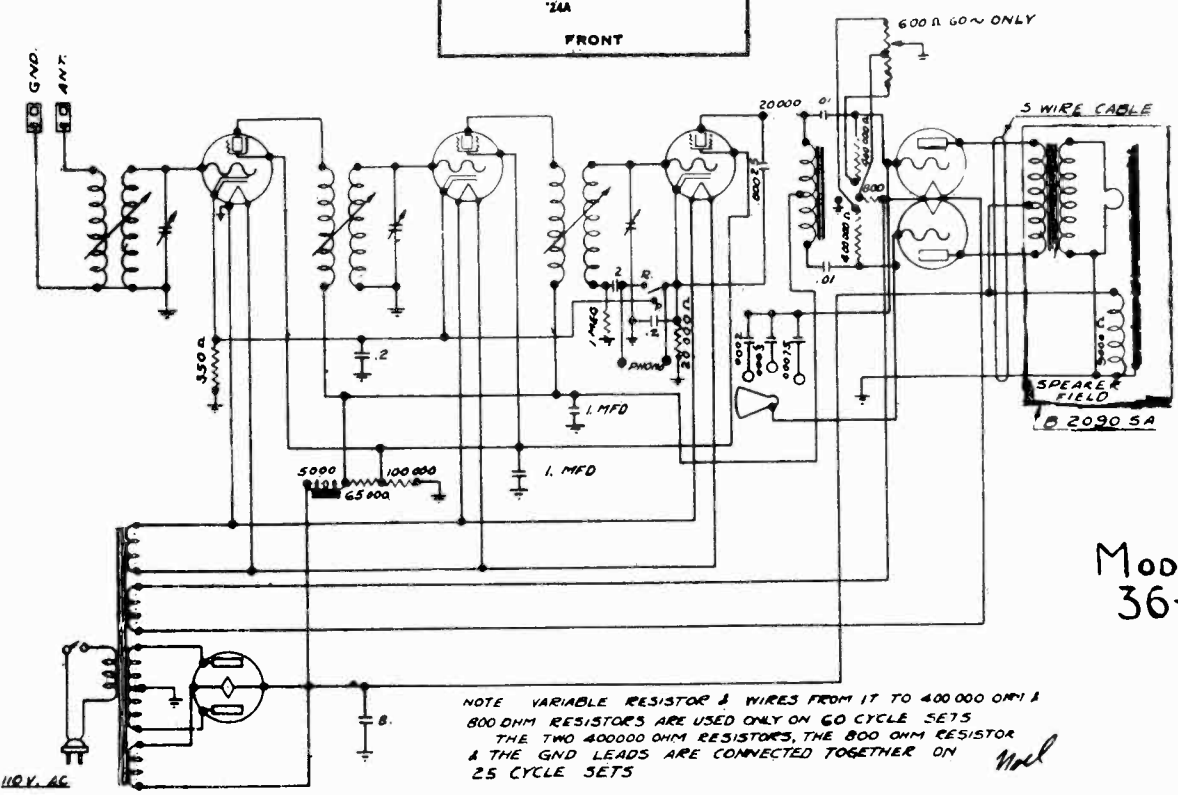
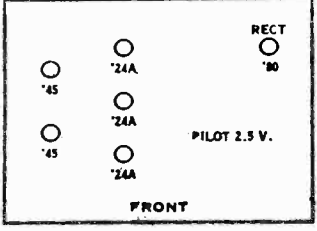
SEARS-ROEBUCK & CO.



MODEL 36

NOTE - VARIABLE RESISTOR AND WIRES FROM IT TO 400,000 OHM - 800 OHM RESISTORS ARE USED ONLY ON 60 CYCLE SETS
 THE TWO 400,000 OHM RESISTORS, THE 800 OHM RESISTOR AND THE GND. LEAD ARE CONNECTED TOGETHER ON 25 CYCLE SETS

1	2	3	4
5	6	7	8
9	10	11	12

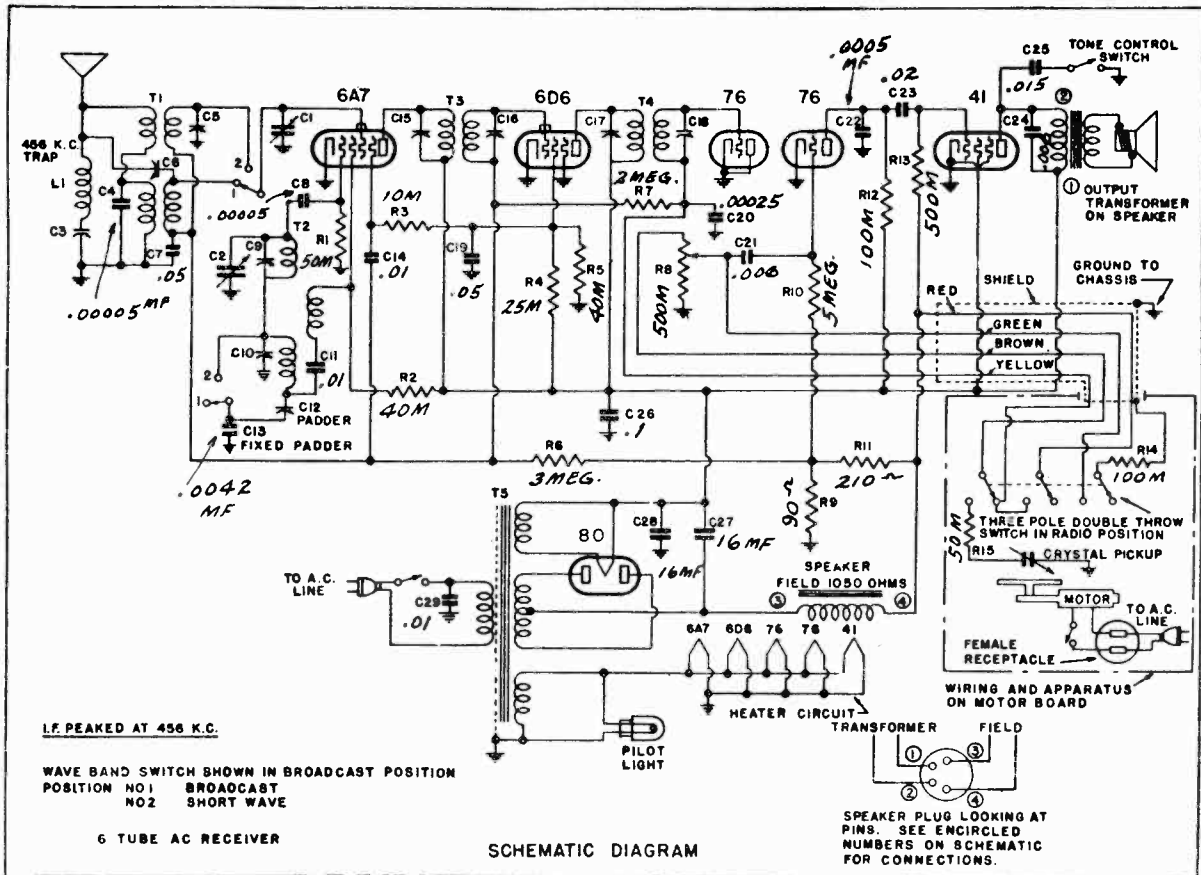


MODEL 36-P

NOTE VARIABLE RESISTOR & WIRES FROM IT TO 400,000 OHM 1 800 OHM RESISTORS ARE USED ONLY ON 60 CYCLE SETS
 THE TWO 400,000 OHM RESISTORS, THE 800 OHM RESISTOR & THE GND. LEADS ARE CONNECTED TOGETHER ON 25 CYCLE SETS

SEARS-ROEBUCK & CO.

MODEL 4668, Ch. 103, AR166
Schematic, Voltage



TUBES AND FUNCTIONS:

6A7	Translator-Oscillator	76	A. F. Amplifier
6D6	IF	41	Output
76	AVC - Detector	80	Rectifier

POWER SUPPLY:

All models available 105-125 volts, 60 cycle, 53 watts

FREQUENCY RANGES:

American Band 540-1730 KC
Foreign Band 5.7-18.3 MC

ALIGNMENT FREQUENCIES:

	Oscil.	Oscil.
	Trimmer	Padder
Band "AM"	1600 kc	600 kc
Band "FOR"	16 mc	Fixed

INTERMEDIATE FREQUENCY 456 kc

POWER OUTPUT:

Type	Pentode
Undistorted	2.6 watts
Maximum	3.9 watts

LOUD SPEAKER:

Type	Dynamic
Size	6"
Field Coil Resistance	1050 Ohms

OPERATING FEATURES:

Tone Control Two Point
Automatic Volume Control
Crystal Phonograph Pickup

6A7	244	82	0	118	6.3 a.c.
6D6	244	85	0	—	6.3 a.c.
76	0	—	0	—	6.3 a.c.
76 a-f	86	—	0	—	6.3 a.c.
41	226	244	0	—	6.3 a.c.

Voltage Table

Voltage across speaker field—65.
Voltage at 80 filament to B minus (center-tap of high-voltage winding on power transformer)—325.
The grid bias for all the tubes is developed across the resistors R9 and R11 (see schematic No. 1). The total voltage measured across R9 and R11 should be 15 volts, and is the bias for the 41 tube. The voltage measured across R9 should be 5 volts. To check the bias on the 6A7 and 6D6 tubes, measure the values of resistors R6, R7 and R8 (see schematic).

MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:

1. Left Knob Wave Change
2. Next to Left Knob Tone Control
3. Next to Right Knob Tuning
4. Right Knob Power Switch

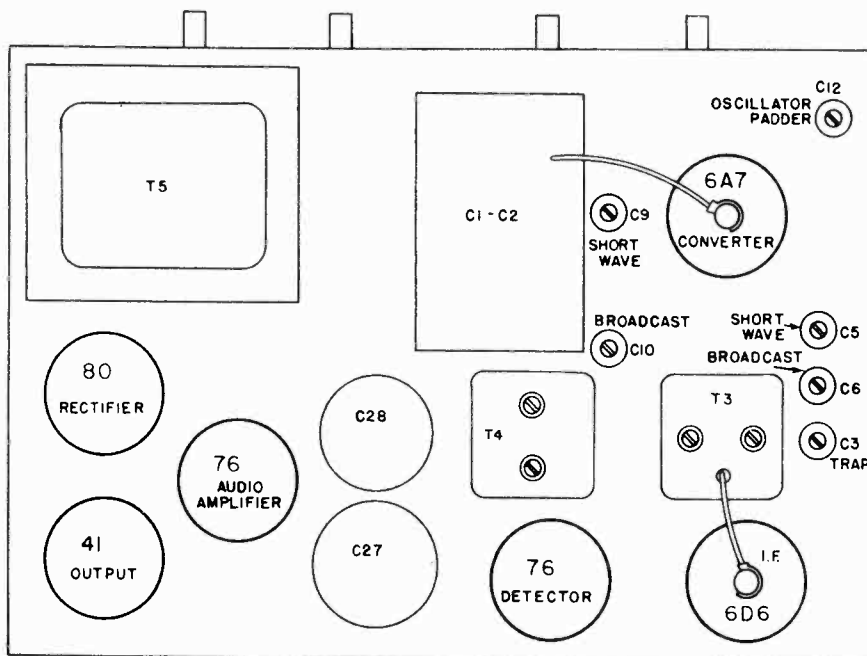
CONTROL OPERATION:

Clockwise "AM" Anti-Clockwise "FOR"
Ratio 12:1
Turn Right: Power On; Volume Increase

MODEL 46 68, Ch. 103, AR166

Socket, Trimmers
Alignment

SEARS-ROEBUCK & CO.



LOCATION OF PARTS TOP OF CHASSIS

57 RL 75
FEB. 16, 1938

ALIGNMENT PROCEDURE

PRELIMINARY:

- Output meter connections Across speaker voice coil
- Output meter reading to indicate .050 watt.
(Meter on 50 V. scale or higher) 19.7 volts
- Average sensitivity in microvolts for .050 watts output See chart below
- Dummy antenna value to be in series with generator output See chart below
- Connection of generator output lead See chart below
- Connection of generator ground lead To chassis
- Generator modulation App. 30% - 400 cycles
- Position of volume control Fully clockwise
- Position of tone control Fully clockwise
- Position of dial pointer with variable fully meshed Horizontal

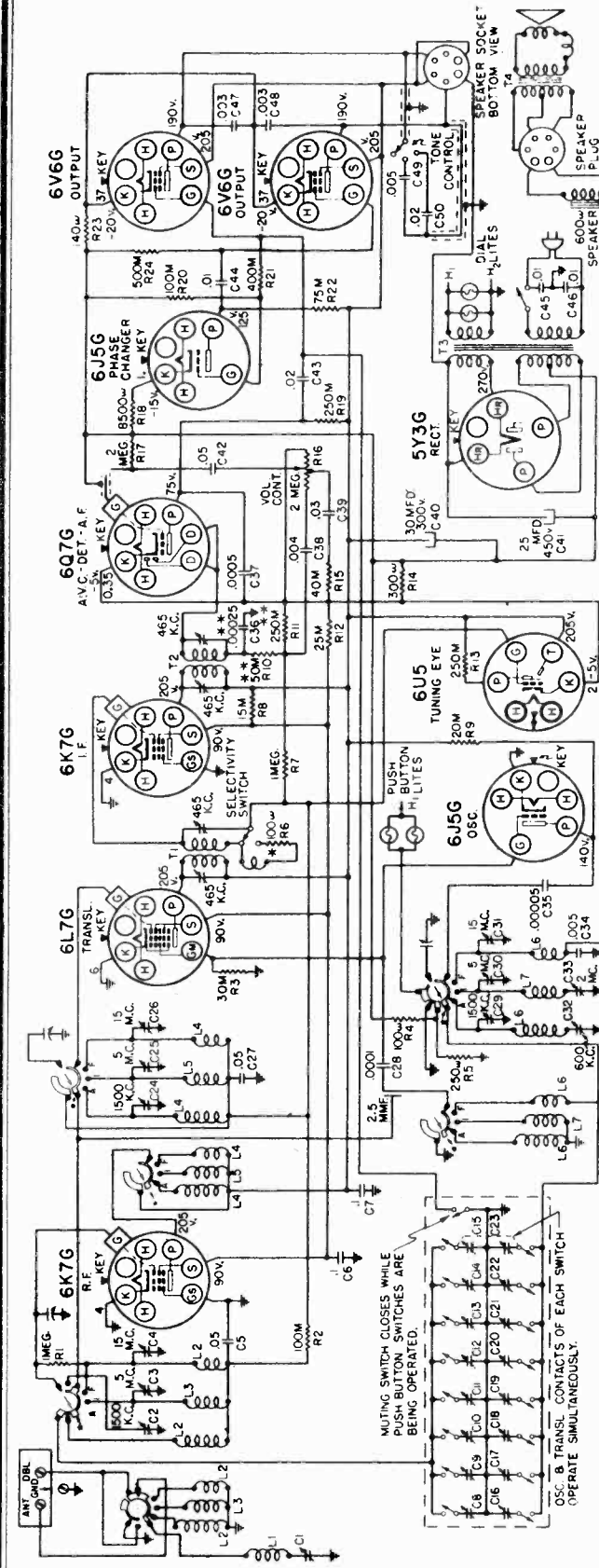
WAVE BAND SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	DUMMY ANTENNA CONNECTION	GENERATOR ANTENNA CONNECTION	TRIMMERS ADJUSTED IN ORDER SHOWN	TRIMMER APPROXIMATE FUNCTION MICROVOLTS
B.C.	160	456	.02 mfd.	6A7 Grid	C15, C16 C17, C18	I. F. 50
B.C.	160	456	.0002 mfd.	Ant. Lead	C3	Wave trap Trim. for minimum response
S.W.	16	16 mc.	400 ohm	Ant. Lead	C9, C5	Osc., R. F. 17
B.C.	60 (rook)	800 kc.	.0002 mfd.	Ant. Lead	C12	Osc. 10
B.C.	160	1600	.0002 mfd.	Ant. Lead	C10, C6	Osc., R.F. 12

IMPORTANT ALIGNMENT NOTES

Where indicated by the word "Rook", the variable should be rooked back and forth a degree or two while making the adjustment.
It is advisable to repeat the entire alignment procedure band by band and in the original order to insure greater accuracy.
Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.
Values shown under "Microvolts" are only approximate.

SEARS-ROEBUCK & CO.

MODELS 4681, 4781
Chassis 101.499
Schematic, Voltage
Color Code



IF PEAK 465 KC

FREQUENCY RANGES:
American Band 540-1800 kc
Intermediate Band 1780-8050 kc
Foreign Band 5.9-18.1 mc

INTERMEDIATE FREQUENCY 485 kc

POWER OUTPUT:
Type Push-Pull (Beam Tubes)
Undistorted 6 watts
Maximum 10 watts

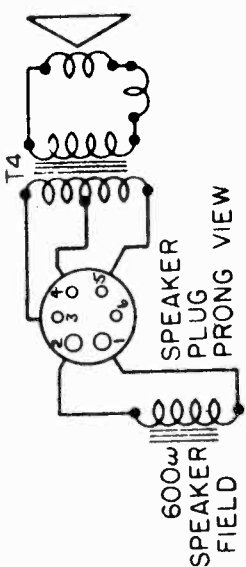
LOUD SPEAKER:
Type Dynamic
Size 10" and 12"
App. field coil resistance . . 800 ohms
App. field coil voltage drop . . volts

ALIGNMENT FREQUENCIES:
Oscill. Ant-Transl. Oscill.
Trimmer 1500 kc
Band #AN# 5 mc
Band #INT# 5 mc
Band #FOR# 15 mc

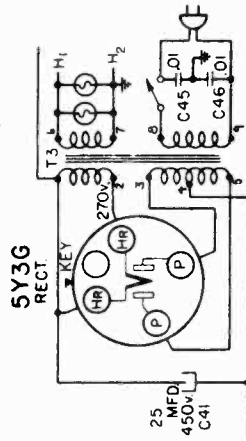
POWER SUPPLY:
All models available 105-125 volts, 50-60 cycle, 95 watts
All models available 105-125 volts, 25 cycle, 100 watts

JAN. 19, 1938

FOR TUNER DATA SEE PAGE 10-13



SPEAKER PLUG COLOR CODE
1. Black 4. Red
2. Yellow 5. Green
3. Brown 6. Blank



POWER TRANSF. COLOR CODE
1. 3-Red 5-Blue
4-Slate 6, 7, 8-Black
9-Green

MODELS 4681,4781
Chassis 101.499

SEARS-ROEBUCK & CO.

Phone, Phono, Jacks
Installation, Schematic

INSTALLATION OF A PHONOGRAPH PICKUP JACK OR AN EARPHONE JACK:

A kit, part #1018117189, can be ordered from Colonial Radio Corporation, 354 Rano Street, Buffalo, N. Y. The retail selling price is \$1.11. This kit contains the necessary parts for installing either a phonograph pick-up jack or an earphone jack. If the customer desires both a phonograph pick-up jack and an earphone jack, it will be necessary to use two kits and to drill an additional hole in the back of the chassis for the additional jack.

PHONOGRAPH PICK-UP JACK: A hole, covered with a brass insert, is provided in the back of the chassis. Remove the brass insert and mount the jack in this hole. Insulate the jack from the chassis by means of the two insulating washers supplied in the kit. The Schematic Section shows the connections to the jack.

Disconnect the jumper that is between prongs #1 and #4 of the speaker socket and move the lead on prong #1 to prong #4.

Locate the electrolytic condenser mounted alongside of the power transformer. A green lead runs from the anode (center terminal) of this electrolytic to prong #3 of the speaker socket. Transfer the connections of this lead from the anode to the cathode (mounting nut) of the electrolytic and from prong #2 to prong #1 of the speaker socket.

There is a jumper between the cathodes of the two electrolytics. Disconnect this jumper. Run a jumper between the anodes of the two electrolytics.

There is a four-terminal board mounted under the nut that holds the IF output transformer. Run a lead from the terminal nearest the speaker socket on this board to prong #3 of the speaker socket.

Run a lead from lug #1 of the jack to the cathode of the 6Q7G tube.

Connect the .05 mfd. condenser from lug #2 of the jack to the blank prong (3rd one clockwise from the locating pin when viewed from the underside) of the 6K7G tube socket.

Run a lead from lug #3 of the jack to the coil terminal shown in the illustration.

Connect the 500M ohm resistor, supplied in the kit, between lug #4 of the jack and prong #1 of the speaker socket.

The radio Volume Control and Tone Control will operate for the phonograph pick-up.

EARPHONE JACK: Mount the jack in the hole in the back of the chassis. The jack frame must be grounded to the chassis. Therefore, do not use the insulating washers.

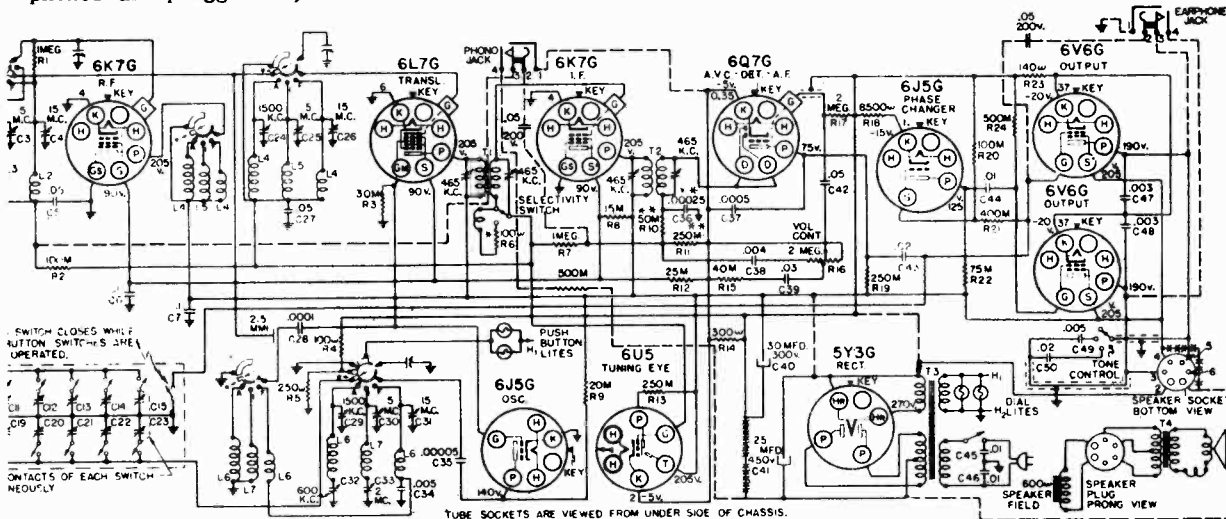
Connect the .05 condenser from terminal #2 of the jack to the grid prong of the 6V6G output tube.

Connect terminal #3 of the jack to terminal #5 of the speaker socket.

Connect terminal #4 of the jack to terminal #3 of the speaker socket.

This is the only wiring necessary. The wiring changes mentioned above for connection of the phonograph pick-up jack are not to be done if only an earphone jack is used.

With the connections as described, the loud speaker will not operate when the earphones are plugged in. If it is desired to have the loud speaker operate at the same time the earphones are plugged in, the connections to terminals 3 and 4 of the jack should be omitted.

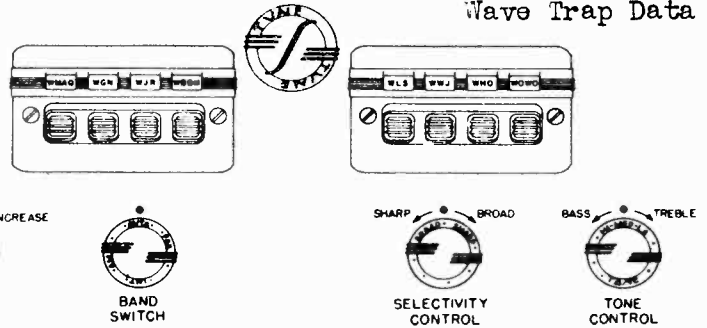


XX - INDICATES LEAD TO BE BROKEN.
DOTTED LINES INDICATE NEW CONNECTION

SEARS-ROEBUCK & CO.

MODELS 4681, 4781
Chassis 101.499
Chassis, Antenna
Wave Trap Data

1. Left knob . . "On-Off" switch and Volume
2. Next to left knob . . . Wave Band switch and Push Button Tuning
3. Center knob Tuning
4. Next to right knob . . . Selectivity
5. Right knob Tone Control

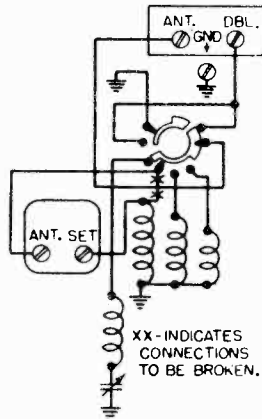
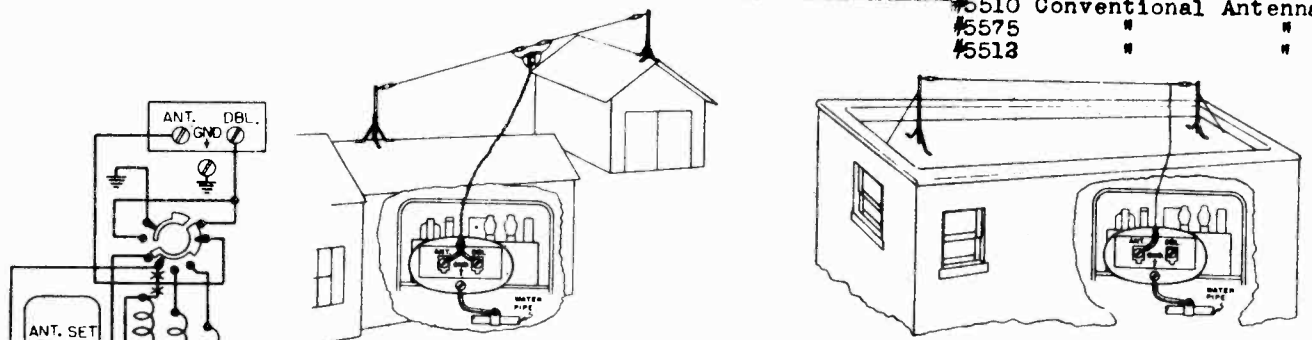


DIAL & KNOB FUNCTIONS

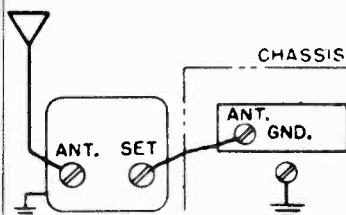
The trap has two terminals marked, "ANT" and "SET". If a conventional antenna is being used (not a doublet), the trap will be connected as follows. Disconnect the antenna leadin from the receiver and connect it to the "ANT" terminal of the trap. Connect a wire from the "SET" terminal of the trap to the "ANT" terminal of the chassis. The ground connection to the chassis remains as it was. The trap then is in series between the antenna and the receiver. The trap should be tuned to eliminate the interfering station. The sensitivity of the receiver will be reduced in the region of the frequency to which the trap is tuned.

If a doublet antenna is installed with the receiver, the trap must be connected between the antenna lug of the broadcast antenna coil primary and the Wave Switch. Remove the lead between the antenna lug of the primary and the wave switch. Connect the "ANT" terminal of the trap to the wave switch lug. Connect the "SET" terminal of the trap to the antenna coil lug. See Illustration below.

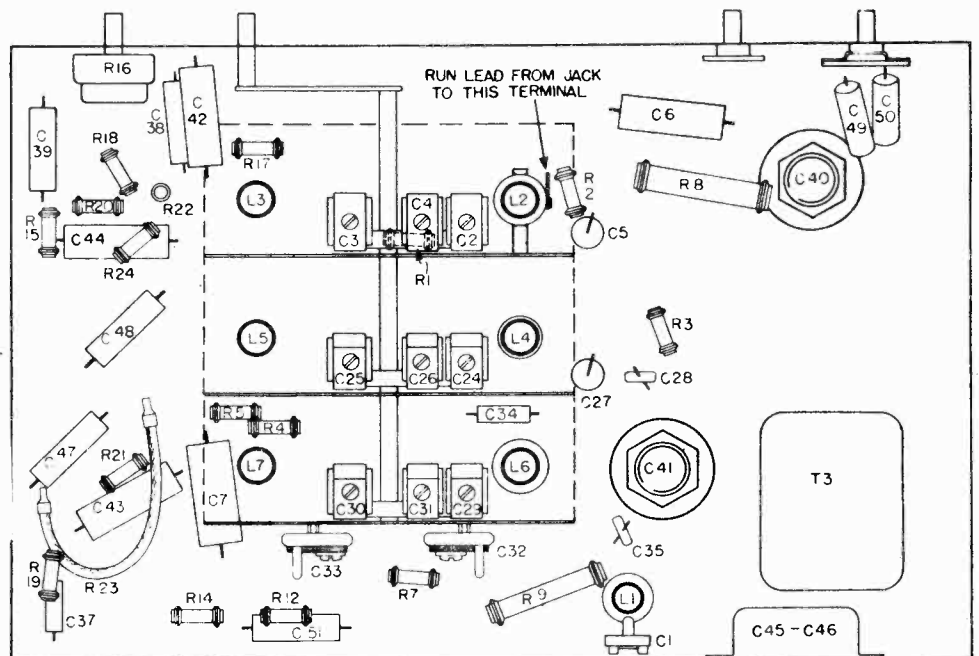
- ANTENNA CONNECTIONS
- #5587 Doublet Antenna
 - #5510 Conventional Antenna
 - #5575 " "
 - #5513 " "



WAVE TRAP CONNECTIONS WHEN DOUBLET ANTENNA IS BEING USED.



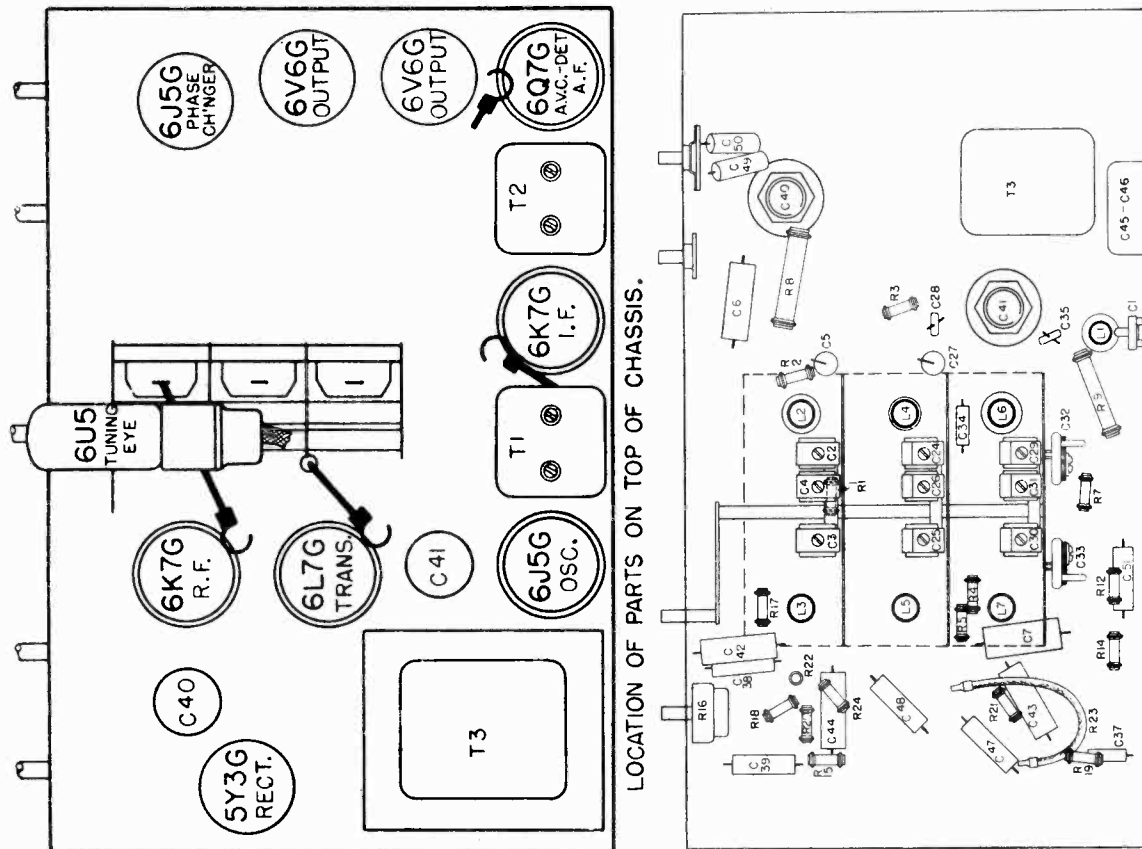
1013117416 TRAP FOR ELIMINATING BROADCAST STATION INTERFERENCE.



LOCATIONS OF PARTS UNDER CHASSIS

MODELS 4681, 4781
 Chassis 101.499
 Socket, Trimmers
 Alignment, Chassis

SEARS-ROEBUCK & CO.



LOCATION OF PARTS ON TOP OF CHASSIS.

LOCATIONS OF PARTS UNDER CHASSIS

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections Across speaker voice coil
 Output meter reading to indicate .5 watts output 1.81 volts
 Approximate average sensitivity in microvolts for .5 watts output See chart below
 Dummy antenna value to be in series with generator output See chart below
 Connection of generator output lead See chart below
 Connection of generator ground lead To chassis
 Generator modulation 30%, 400 cycles
 Position of volume control Fully clockwise
 Position of tone control Fully clockwise
 Position of selectivity control Sharp
 Position of dial pointer with variable fully closed To fall on last calibration mark at 550 kc end of AMERICAN band.

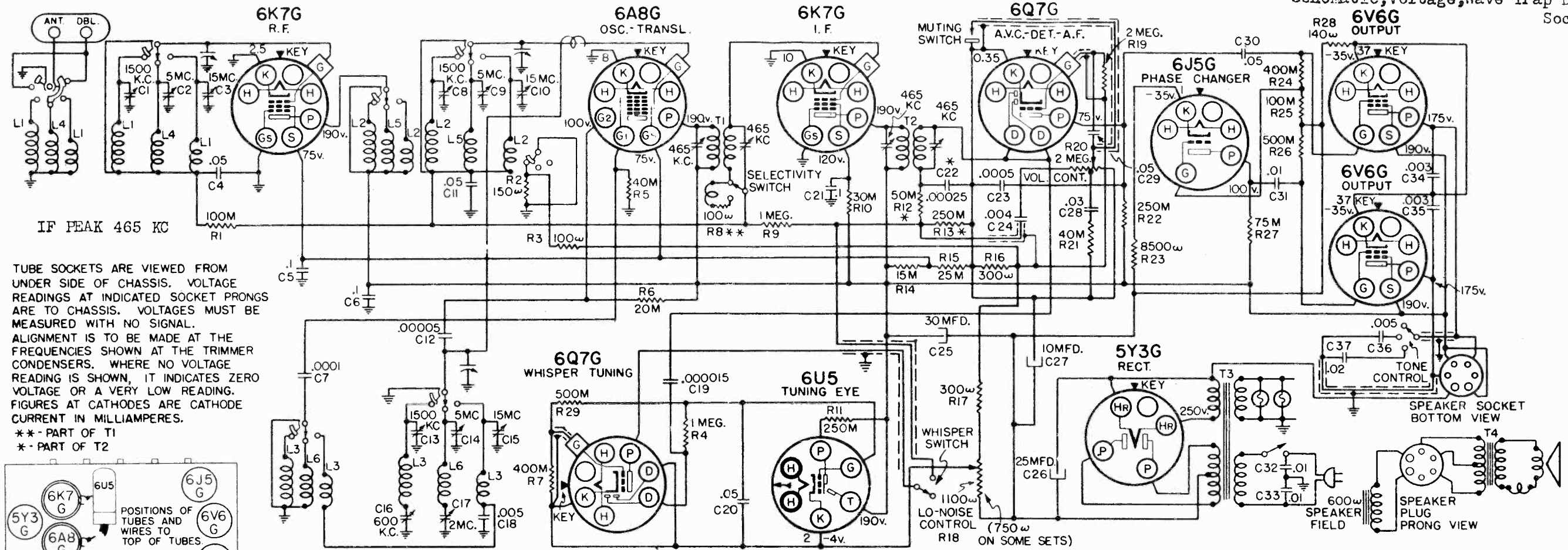
WAVE BAND POSITION OF VARIABLE POSITION	GENERATOR FREQUENCY	DUMMY ANTENNA CONNECTION	GENERATOR CONNECTION	ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"INT"	1.8 mc	.1 mfd.	6L7G Grid	T2, T1	IF	70
"AM"	Closed	.0002 mfd.	Ant. Term.	C1 *	IF trap	-
"AM"	1500 kc	.0002 mfd.	Ant. Term.	C39, C34, C2	Oscillator, Transal., RF	30
"AM"	500 kc (rock)	.0002 mfd.	Ant. Term.	C32	Padder	18
"INT"	5 mc	5 mc	400 ohms Ant. Term.	C30	Oscillator	-
"INT"	5 mc (rock)	5 mc	400 ohms Ant. Term.	C35, C3	Translator, RF	5
"INT"	2 mc (rock)	2 mc	400 ohms Ant. Term.	C33	Padder	15
"FOR"	15 mc	15 mc	400 ohms Ant. Term.	C31	Oscillator	-
"FOR"	15 mc (rock)	15 mc	400 ohms Ant. Term.	C38, C4	Transal., RF	5

IMPORTANT ALIGNMENT NOTES

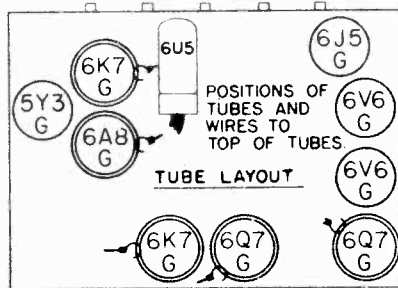
* If the frequency of an interfering code station is known, the generator should be adjusted to that frequency instead of to 485 kc. The trap should be adjusted to give maximum output meter deflection instead of the usual maximum reading.
 Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.
 It is necessary to repeat the entire alignment procedure step by step in the original order to secure proper alignment. Perfect alignment is not possible with one adjustment of the trimmers.
 Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.
 The shield plate that covers the coil assembly should be left in place while making the alignment adjustments. The trimmer screws are accessible through the holes in the shield.
 Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy antenna used for alignment of any other band.
 No connection should be made to the doublet terminal on the antenna connection block.

SEARS-ROEBUCK & CO.

MODEL 4786, Chassis 100.196
Schematic, Voltage, Wave Trap Data
Socket



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. VOLTAGES MUST BE MEASURED WITH NO SIGNAL. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
** - PART OF T1
* - PART OF T2



POWER SUPPLY:
All models available 105-125 volts, 50-60 cycle, 85 watts
All models available 105-125 volts, 35 cycle, 90 watts

ALIGNMENT FREQUENCIES:

	Oscil. Trimmer	Ant-Transl. Trimmer	Oscil. Padder
Band "AM"	1500 kc	1500 kc	800 kc
Band "INT"	5 mc	5 mc	2 mc
Band "FOR"	15 mc	15 mc	Fixed

FREQUENCY RANGES:

American Band	540-1800 kc
Intermediate Band	1780-8100 kc
Foreign Band	5.9-18.2 mc

INTERMEDIATE FREQUENCY 465 kc

POWER OUTPUT:

Type	Push-Pull (Beam Tubes)
Undistorted	6 watts
Maximum	10 watts

LOUD SPEAKER:

Type	Dynamic
Size	6", 8", 10", 12"
Field coil resistance	600 ohms
App. field coil voltage drop	80 volts

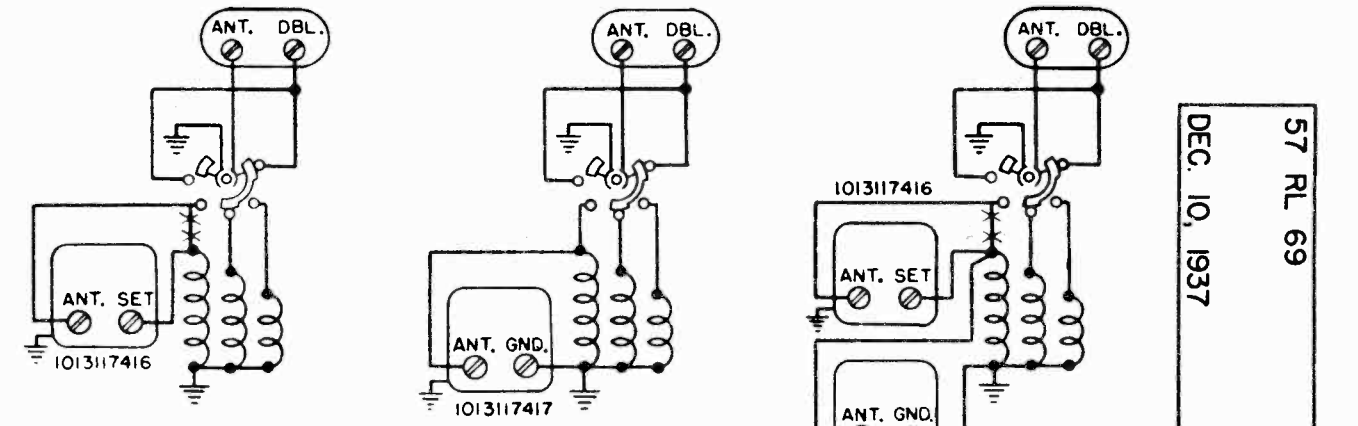
OPERATING FEATURES:
Tone Control Three point
Selectivity Control Two point
Lo-Noise Control
Automatic Volume Control
Roll Over dial with only one scale visible at a time.
Automatic Tuning Dial

CHASSIS FEATURES:
Number RF stages One
Number IF stages One
Antenna Doublet or Conventional
Line Noise Filter Condensers
Tuning Eye
Dual Tuning Ratio
Provision for Phonograph Pick-Up Connections

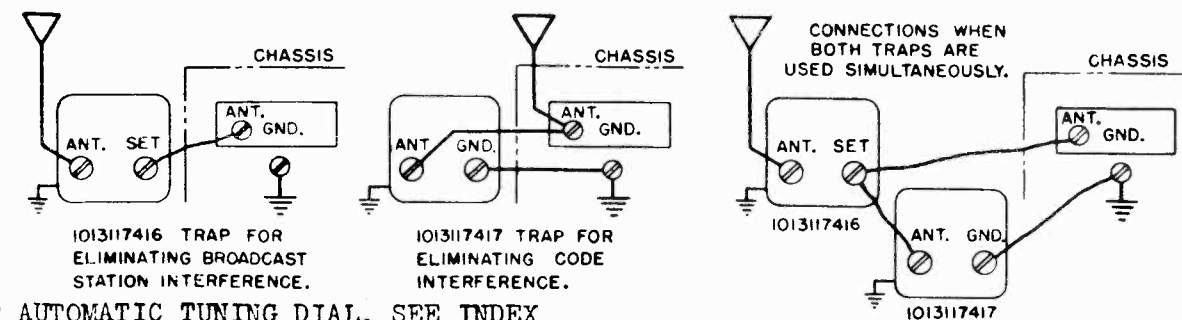
MECHANICAL SPECIFICATIONS

- OPERATING CONTROLS:
1. Left knob . . . "On-Off" switch and Volume
 2. Next to left knob . . . Wave Band Switch
 3. Center knob . . . Tuning
 4. Next to right knob. Inner: Selectivity. Outer: Lo-Noise.
 5. Right knob . . . Tone Control

- CONTROL OPERATION:
- Turning right: Power on; volume increase
- Turning right: American, Intermediate, Foreign
- Tuning ratio: 6:1; 30:1
- Turning right, inner: Sharp, Broad.
- Turning right, outer: Normal, Lo-Noise.
- Turning right: "LO", "MEDIUM", "HI"



XX - INDICATES CONNECTION TO BE BROKEN.
WAVE TRAP CONNECTIONS WHEN DOUBLET ANTENNA IS BEING USED



FOR AUTOMATIC TUNING DIAL, SEE INDEX

57 RL 69
DEC. 10, 1937

SEARS-ROEBUCK & CO.

MODEL 4786
Chassis 100.196
Socket, Trimmers
Alignment, Chassis

ALIGNMENT PROCEDURE

- PRELIMINARY:**
- Output meter connections Across speaker voice coil
 - Output meter reading to indicate .5 watts output 1.31 volts
 - Approximate average sensitivity in microvolts for .5 watts output See chart below
 - Dummy antenna value to be in series with generator output See chart below
 - Connection of generator output lead See chart below
 - Connection of generator ground lead To chassis
 - Generator modulation 30%, 400 cycles
 - Position of volume control Fully clockwise
 - Position of tone control Fully clockwise
 - Position of selectivity control Sharp
 - Position of Lo-noise control Normal
 - Position of dial pointer with variable fully closed mark at 550 kc end of AMERICAN band.

WAVE BAND SWITCH POSITION	GENERATOR FREQUENCY	DUMMY ANTENNA CONNECTION	GENERATOR CONNECTION	TRIMMER (IN ORDER SHOWN)	FUNCTION	APPROXIMATE MICROVOLTS
INT	1.8 mc	.1 mfd.	6A9G Grid	T2, T1	IF	5200
AM	1500 kc	.0003 mfd.	Ant. Term.	C13, C8, C1	Oscillator, Transl., RF	35
AM	800 kc (rock)	.0002 mfd.	Ant. Term.	C16	Padder	20
INT	5 mc	400 ohms	Ant. Term.	C14	Oscillator	-
INT	5 mc (rock)	400 ohms	Ant. Term.	C9, C3	Translator, RF	3
INT	2 mc (rock)	400 ohms	Ant. Term.	C17	Padder	8
FOR	15 mc	400 ohms	Ant. Term.	C15	Oscillator	-
FOR	15 mc (rock)	400 ohms	Ant. Term.	C10, C3	Translator, RF	10

IMPORTANT ALIGNMENT NOTES

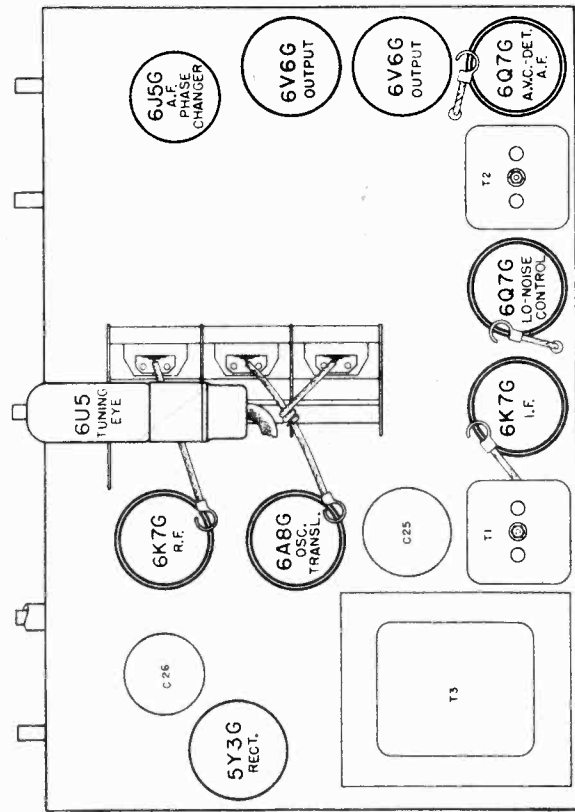
Where indicated by the word "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value, to prevent the AVC action of the set from interfering with accurate alignment.

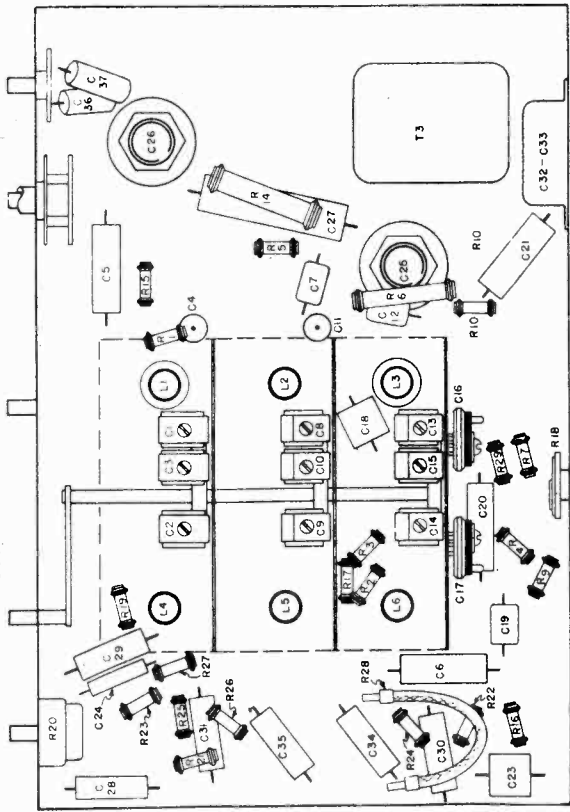
The shield plate that covers the coil assembly should be left in place while making the alignment adjustments. The trimmer screws are accessible through the holes in the shield.

Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy antenna used for alignment of any other band.

No connection should be made to the doublet terminal on the antenna connection block.

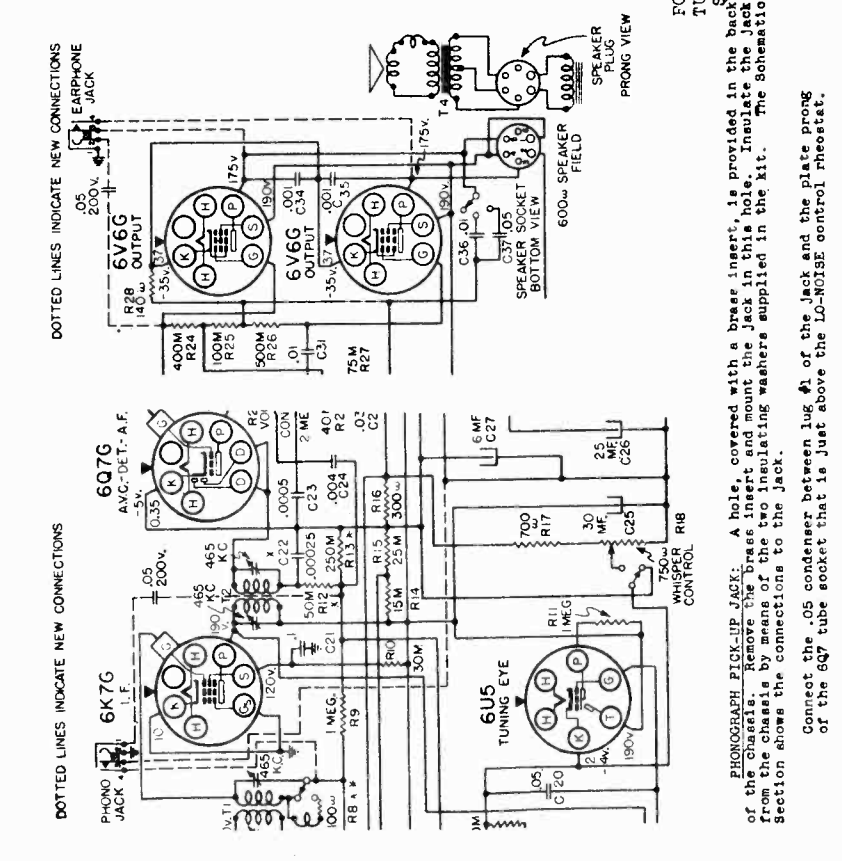
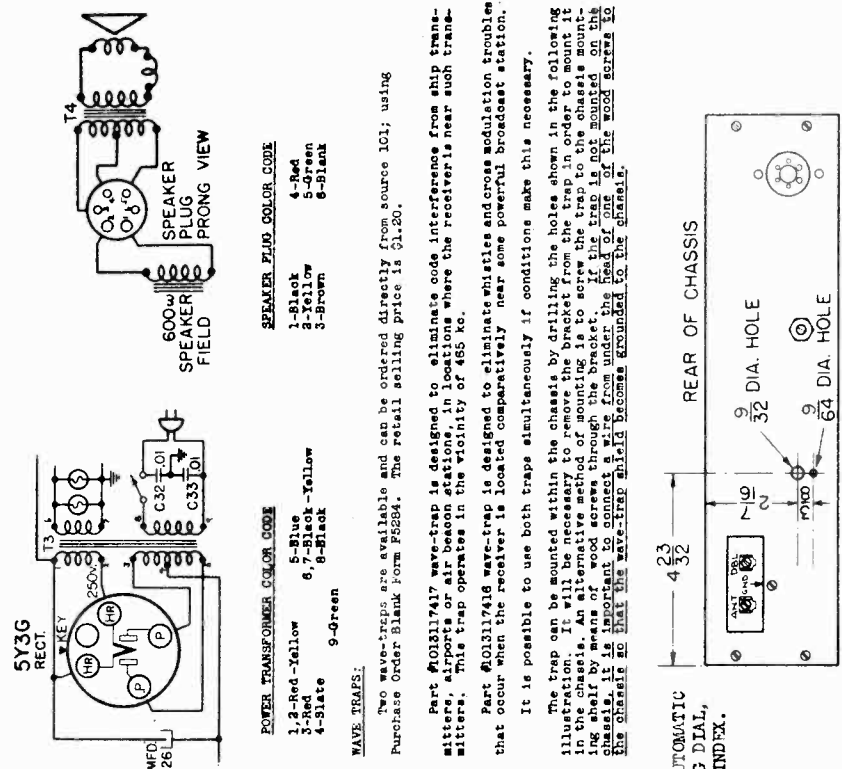


LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

MODEL 4786
Chassis 100.196
Jacks Installation
Wave Trap, Color Code



Two wave-traps are available and can be ordered directly from source 101; using Purchase Order Blank Form P5284. The retail selling price is \$1.20.

Part #101317417 wave-trap is designed to eliminate code interference from ship transmitters, airports or air beacon stations, in locations where the receiver is near such transmitters. This trap operates in the vicinity of 465 kc.

Part #101317418 wave-trap is designed to eliminate whistles and cross modulation troubles that occur when the receiver is located comparatively near some powerful broadcast station.

It is possible to use both traps simultaneously if conditions make this necessary.

The trap can be mounted within the chassis by drilling the holes shown in the following illustration. An alternative method of mounting is to screw the trap to the chassis mounting shelf by means of wood screws through the bracket. If the trap is not mounted on the chassis, it is important to connect a wire from under the head of one of the wood screws to the chassis so that the wave-trap shield becomes grounded to the chassis.

FOR AUTOMATIC TUNING DIAL, SEE INDEX.

If a conventional antenna is being used with the receiver, the traps are to be connected as described in the next two paragraphs and the illustration that follows them.

The part #101317417 trap, for code interference elimination, has two terminals marked "AW" and "GP". Connect a wire between the "AW" terminal of the trap and the "AW" terminal of the chassis. Connect a wire between the "GP" terminal of the trap and the "GP" terminal of the chassis. The ground connection to the receiver remains as they were, the trap being connected across them. The trap should be adjusted to minimum response from the interfering station.

Part #101317418 trap, for broadcast station interference elimination, has two terminals marked "AW" and "S". Connect a wire from the "AW" terminal of the trap to the "AW" terminal of the chassis. Connect a wire from the "S" terminal of the trap to the "AW" terminal of the chassis. The ground connection to the chassis remains as it was. The trap then is in series between the antenna and the receiver. The trap should be tuned to eliminate the interfering station. The sensitivity of the receiver will be reduced in the region of the frequency to which the trap is tuned.

If a doublet antenna is installed with the receiver, the antenna terminal of the 101317417 trap must be connected to the antenna lug of the broadcast band antenna coil primary inside the chassis. The 101317418 trap must be connected to the antenna terminal of the antenna coil primary and the wave switch. Connect the antenna terminal of the trap to the wave switch lug. Connect the set terminal of the trap to the antenna coil lug. See next illustration.

PHONOGRAPH PICK-UP JACK. A hole, covered with a brass insert, is provided in the back of the chassis. Remove the brass insert and mount the Jack in this hole. Insulate the Jack from the chassis by means of the two insulating washers supplied in the kit. The Schematic Section shows the connections to the Jack.

Connect the .05 condenser between lug #1 of the Jack and the plate prong of the 6Q7 tube socket that is just above the LO-NOISE control rheostat.

Connect lug #8 of the Jack to ground.

There is a terminal board mounted under the IF input transformer. Connect the terminal on this board nearest the back of the chassis to lug #3 of the Jack.

Connect lug #4 of the Jack to the LO-NOISE control rheostat.

The radio Volume Control and Tone Control will operate for the phonograph pick-up.

EARPHONE JACK. Mount the Jack in the hole in the back of the chassis. The Jack frame must be grounded to the chassis. Therefore, do not use the insulating washers.

Connect the .05 condenser from terminal #2 of the Jack to the grid prong of the 6V6 output tube.

Connect terminal #3 of the Jack to terminal #5 of the speaker socket.

Connect terminal #4 of the Jack to terminal #3 of the speaker socket.

This is the only wiring necessary. The wiring changes mentioned above for connection of the phonograph pick-up Jack are not to be done if only an earphone Jack is used.

With the connections as described, the loud speaker will not operate when the earphones are plugged in. If it is desired to have the loud speaker operate at the same time the earphones are plugged in, the connections to terminals 3 and 4 of the Jack should be omitted.

MODELS 4610, 4669, 4769
4789. Chassis 101.482
Automatic Tuner Data

SEARS-ROEBUCK & CO.

MODEL 4786
Chassis 100.196

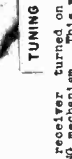
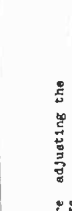
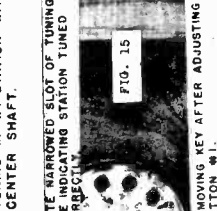
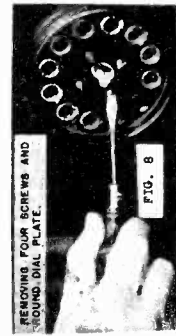
Carefully pull out the key allowing the button to snap back into position. If the button sticks when you try to pull the key out, shake it slightly and it should snap out. Be sure it must not be pushed in again until the mechanism has been looked as described in the following paragraph.

Lock the mechanism by moving the stud to the right as indicated by the forefinger and arrow in Fig. 16. Note that one hand is holding the mechanism at the outer edge of the button so that they are not pushed in accidentally.

You can check the accuracy of your setting of the button by turning the round AUTOMATIC TUNING mechanism about an inch or so, so that your station is no longer in the notch. Then push the button toward the bottom point of the AUTOMATIC TUNING dial until it reaches its stop. Then remove your finger from the button and your station will be tuned in. Now see if it can be tuned any more exactly by rotating the center shaft as illustrated in Fig. 11. Use the Tuning Eye to determine exactness of tuning. If you find that your station is not so exactly in the notch as you desire, adjust the button so that you have not adjusted the button carefully enough and the procedure should be repeated more accurately.



LO-NOISE AND PULLING KNOB STRAIGHT OFF OF TUNING SHAFT.



THE AUTOMATIC TUNING DIAL:
The method of setting up the Automatic Tuning Dial follows in detail in some cases frequency drift due to aging of the mechanism. It is necessary to sweep the Automatic Tuning Dial button particularly the ones for the high frequency end of the broadcast band. If after they have been reset once it is seldom necessary to reset them again although in some cases further aging and drifting does occur, making a second resetting necessary.

THE FIXED BUTTON, IDENTIFIED BY A RED CAP, CANNOT BE ADJUSTED TO ANY STATION. DO NOT TAMPER WITH THE ADJUSTMENT OF THIS BUTTON.

Approx. Broadcast Band	Approx. Broadcast Band	Approx. Broadcast Band	Approx. Broadcast Band	Approx. Broadcast Band	Approx. Broadcast Band	Approx. Broadcast Band	Approx. Broadcast Band	Approx. Broadcast Band	Approx. Broadcast Band
Wave Length	Wave Length	Wave Length	Wave Length	Wave Length	Wave Length	Wave Length	Wave Length	Wave Length	Wave Length
Short	Long	Short	Long	Short	Long	Short	Long	Short	Long
10	11	12	13	14	15	16	17	18	19
11	12	13	14	15	16	17	18	19	20
12	13	14	15	16	17	18	19	20	21
13	14	15	16	17	18	19	20	21	22
14	15	16	17	18	19	20	21	22	23
15	16	17	18	19	20	21	22	23	24
16	17	18	19	20	21	22	23	24	25
17	18	19	20	21	22	23	24	25	26
18	19	20	21	22	23	24	25	26	27
19	20	21	22	23	24	25	26	27	28
20	21	22	23	24	25	26	27	28	29
21	22	23	24	25	26	27	28	29	30
22	23	24	25	26	27	28	29	30	31
23	24	25	26	27	28	29	30	31	32
24	25	26	27	28	29	30	31	32	33
25	26	27	28	29	30	31	32	33	34
26	27	28	29	30	31	32	33	34	35
27	28	29	30	31	32	33	34	35	36
28	29	30	31	32	33	34	35	36	37
29	30	31	32	33	34	35	36	37	38
30	31	32	33	34	35	36	37	38	39
31	32	33	34	35	36	37	38	39	40
32	33	34	35	36	37	38	39	40	41
33	34	35	36	37	38	39	40	41	42
34	35	36	37	38	39	40	41	42	43
35	36	37	38	39	40	41	42	43	44
36	37	38	39	40	41	42	43	44	45
37	38	39	40	41	42	43	44	45	46
38	39	40	41	42	43	44	45	46	47
39	40	41	42	43	44	45	46	47	48
40	41	42	43	44	45	46	47	48	49
41	42	43	44	45	46	47	48	49	50
42	43	44	45	46	47	48	49	50	51
43	44	45	46	47	48	49	50	51	52
44	45	46	47	48	49	50	51	52	53
45	46	47	48	49	50	51	52	53	54
46	47	48	49	50	51	52	53	54	55
47	48	49	50	51	52	53	54	55	56
48	49	50	51	52	53	54	55	56	57
49	50	51	52	53	54	55	56	57	58
50	51	52	53	54	55	56	57	58	59
51	52	53	54	55	56	57	58	59	60
52	53	54	55	56	57	58	59	60	61
53	54	55	56	57	58	59	60	61	62
54	55	56	57	58	59	60	61	62	63
55	56	57	58	59	60	61	62	63	64
56	57	58	59	60	61	62	63	64	65
57	58	59	60	61	62	63	64	65	66
58	59	60	61	62	63	64	65	66	67
59	60	61	62	63	64	65	66	67	68
60	61	62	63	64	65	66	67	68	69
61	62	63	64	65	66	67	68	69	70
62	63	64	65	66	67	68	69	70	71
63	64	65	66	67	68	69	70	71	72
64	65	66	67	68	69	70	71	72	73
65	66	67	68	69	70	71	72	73	74
66	67	68	69	70	71	72	73	74	75
67	68	69	70	71	72	73	74	75	76
68	69	70	71	72	73	74	75	76	77
69	70	71	72	73	74	75	76	77	78
70	71	72	73	74	75	76	77	78	79
71	72	73	74	75	76	77	78	79	80
72	73	74	75	76	77	78	79	80	81
73	74	75	76	77	78	79	80	81	82
74	75	76	77	78	79	80	81	82	83
75	76	77	78	79	80	81	82	83	84
76	77	78	79	80	81	82	83	84	85
77	78	79	80	81	82	83	84	85	86
78	79	80	81	82	83	84	85	86	87
79	80	81	82	83	84	85	86	87	88
80	81	82	83	84	85	86	87	88	89
81	82	83	84	85	86	87	88	89	90
82	83	84	85	86	87	88	89	90	91
83	84	85	86	87	88	89	90	91	92
84	85	86	87	88	89	90	91	92	93
85	86	87	88	89	90	91	92	93	94
86	87	88	89	90	91	92	93	94	95
87	88	89	90	91	92	93	94	95	96
88	89	90	91	92	93	94	95	96	97
89	90	91	92	93	94	95	96	97	98
90	91	92	93	94	95	96	97	98	99
91	92	93	94	95	96	97	98	99	100

Make a list of the stations you want to set up on the AUTOMATIC TUNING dial. Mark down the frequency of the stations as well as their call letters. Arrange the stations in the order of their frequency. That is, the one of lowest frequency first; next higher frequency second, etc.

IN TWO OR MORE OF YOUR SELECTED STATIONS FALL WITHIN ONE BUTTON ADJUSTMENT, YOU MUST REVISE YOUR LIST OF STATIONS SO THAT ONLY ONE STATION WILL BE ASSIGNED TO A BUTTON.

To proceed with the setting up, turn the selectivity control knob to the SHARP position. See Fig. 7. (This knob must be turned to the SHARP position only for setting up the stations on the AUTOMATIC TUNING dial. After stations have been set up they may be tuned in with the knob in either the BROAD or SHARP positions.)

If you select fewer than eleven stations so that there is no station in one or more of the frequency slots but eleven stations so that there is no station left unadjusted, (54) the frequency slots, marked TUNES, off of its shaft. See Fig. 7A.

Unscrew the four screws and remove the round AUTOMATIC TUNING plate. See Fig. 6. The mechanism will then appear as in Fig. 9. Note the numbering of the buttons.

Unlock the AUTOMATIC TUNING mechanism by pushing the stud to the left as shown by the forefinger in Fig. 10. Turn the AUTOMATIC TUNING dial clockwise until the key is about 3/16" to the edge of the slot. (You will find that the stud can also be pushed in. This is normal.) It takes quite a bit of pressure to move the stud so that it is necessary to hold the mechanism firmly with one hand, as shown.

Tune in the first station on your selected list. (The first station is the one of lowest frequency.) This can be done by rotating the center tuning shaft as shown in Fig. 11. (Be sure the Wave Band Switch is turned to the AMERICAN position.) You will find that the pointer in the Tuning Eye is turned to the station you have selected. Note that the dial points to approximately 550 kc on the Roll Over dial, the Tuning Eye shows the station as being tuned and that button #1 is in position to be adjusted. Your station for button #1 may be any station between 540 kc and approximately 550 kc since this is the frequency range of this button.

The key (see Fig. 12), has the handle, insert the other end of the key into button #1. Push the button all the way in by means of the key and turn the button. You will find that the button cannot be turned in either direction but that it cannot be turned for more than one-half a circle. See Fig. 13.

If button #1 cannot be pushed in far enough to allow it to turn it will be necessary to remove the half button from button #1. Then proceed to adjust button #1 as described in the following paragraph, being very careful not to turn the red button. The red button will go in slightly when adjusting button #1 but will return to its original position when #1 button is released after completing its adjustment. Replace the hairpin clip on the red button. This removal of the hairpin clip from the red button may be necessary only when adjusting button #1 or button #11. It will NOT be necessary when adjusting any of the other buttons.

There is a notch in the outer edge of the button that will tell you in what direction to turn the button. The button should be turned so that the notch would fall on an imaginary line drawn straight down from the center of the AUTOMATIC TUNING dial. When the notch reaches this point you will find that further rotation of the button will cause the Tuning Eye dial to advance. Carefully turn the key so that your #1 station will be tuned in exactly. The station cannot be heard while the button is pushed in by means of the key, so that the Tuning Eye must be used for precise tuning as described in paragraph 18. When the dark portion at the bottom of the Tuning Eye is narrowest, the station is tuned in exactly even though the Roll Over dial pointer may not be exactly at 550 kc. See Fig. 14.

Find the station when button #1 is turned as far as possible. Note that you may find the imaginary center line of the dial and that the station cannot be tuned in with button #1. You must then choose a different station for button #1 and the station you chose originally will be set up on button #6. If you have no other station for button #6, turn the button so that its notch is about midway in its range as shown by button #6 in Fig. 13. This will keep the station in the notch. Note that there are two station numbers listed in the following for all those stations that have two button numbers listed in the following.

FIG. 8 REMOVING FOUR SCREWS AND ROUND DIAL PLATE.

FIG. 9 APPEARANCE OF MECHANISM AFTER REMOVAL OF ROUND DIAL PLATE. NOTE ELEVEN NUMBERED BUTTONS AND ONE FIXED BUTTON THAT IS NOT NUMBERED.

FIG. 10 UNLOCKING DIAL MECHANISM.

FIG. 11 NOTE NARROWED SLOT OF TUNING EYE INDICATING STATION TUNED CORRECTLY.

FIG. 12 KEY FOR ADJUSTING BUTTONS.

FIG. 13 TUNING IN #1 STATION WITH CENTER SHAFT.

FIG. 14 NOTE NARROWED SLOT OF TUNING EYE INDICATING STATION TUNED CORRECTLY.

FIG. 15 REMOVING KEY AFTER ADJUSTING BUTTON #1.

FIG. 16 TUNING IN #1 STATION WITH KEY.

FIG. 17 CAP WITH CALL LETTERS IN PLACE ON BUTTON #1.

FIG. 18 LOCKING MECHANISM AFTER ADJUSTING BUTTON #1.

FIG. 19 MECHANISM HELD FROM TURNING. BE CAREFUL NOT TO PUSH IN BUTTONS WHILE HOLDING.

MODEL 4786, Ch. 100.196
MODELS 4610, 4669, 4769
4789, Ch. 101.482

SEARS-ROEBUCK & CO.

Automatic Tuner Data
Part 2

When all of the buttons have been adjusted and the caps put on them, the mechanism will appear as in Fig. 28. If you have selected fewer than 11 stations, the call letters on the buttons will be adjusted. A cap with printed station call letters use one of the discs that has a printed station call letters.

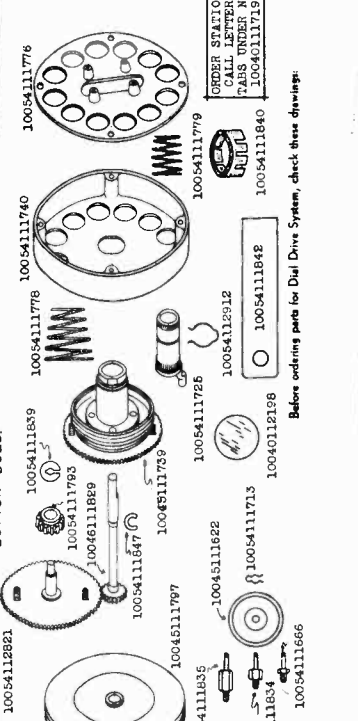
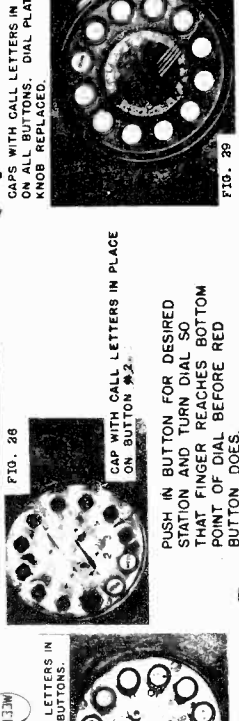
Replace the round AUTOMATIC TUNING dial plate, using the four screws. If there was a paper washer behind the plate, put it back in place before screwing on the plate. Then push the knob back onto its shaft. Notice that the shaft has a flat end that fits into a hole in the cap. The cap is held in place by the spring. The cap should be pushed onto the shaft. See Fig. 29.

OPERATION:

To tune in any of the stations that have been set up on the AUTOMATIC TUNING dial, merely push in the station with the station's call letters and turn the dial. The pointer will turn into the station with your finger on it will reach the bottom point of the dial before the red button does. In other words, when you place your finger on a button for a desired station, turn the dial so that the red index button follows your finger rather than having your finger follow the red index button. The radio will be reduced in volume and alternating noise between stations while tuning with the AUTOMATIC TUNING dial.

UNLOCKING MECHANISM BEFORE TUNING IN #2 STATION. NOTE LEFT HAND HOLDING MECHANISM FROM TURNING.

To tune in any of the stations that have been set up on the AUTOMATIC TUNING dial, merely push in the station with the station's call letters and turn the dial. The pointer will turn into the station with your finger on it will reach the bottom point of the dial before the red button does. In other words, when you place your finger on a button for a desired station, turn the dial so that the red index button follows your finger rather than having your finger follow the red index button. The radio will be reduced in volume and alternating noise between stations while tuning with the AUTOMATIC TUNING dial.



After the AUTOMATIC TUNING dial button has been adjusted properly and the mechanism locked as described, you are ready to insert the cap with the station's call letters. If you purchased your radio from a Sears' Retail Store proceed as follows:

RETAIL STORE MODELS:

Push out the disc containing the call letters of your selected station. Place one of the clear celluloid discs into one of the metal caps and then place the disc with your station call letters in the cap. Be sure to put the disc in so that the call letters are readable from the front of the cap. See Fig. 17.

Push the cap into place on the button for your station. See Fig. 18. Be sure the cap is put on so that the letters are upright and can be read easily.

Again unlock the dial mechanism by moving the stud to the left as shown by the forefinger and arrow in Fig. 20. After the mechanism is unlocked, push in the station call letters being ordered models.

MAIL ORDER MODELS:

Push the cap into place on the button for your station. See Fig. 18. Be sure the cap is put on so that the letters are upright and can be read easily.

Again unlock the dial mechanism by moving the stud to the left as shown by the forefinger and arrow in Fig. 20. After the mechanism is unlocked, push in the station call letters being ordered models.

MAIL ORDER MODELS:

Push the cap into place on the button for your station. See Fig. 18. Be sure the cap is put on so that the letters are upright and can be read easily.

Again unlock the dial mechanism by moving the stud to the left as shown by the forefinger and arrow in Fig. 20. After the mechanism is unlocked, push in the station call letters being ordered models.

Push out the disc containing the call letters of your selected station. Place one of the clear celluloid discs into one of the metal caps and then place the disc with your station call letters in the cap. Be sure to put the disc in so that the call letters are readable from the front of the cap. See Fig. 17.

Push the cap into place on the button for your station. See Fig. 18. Be sure the cap is put on so that the letters are upright and can be read easily.

Again unlock the dial mechanism by moving the stud to the left as shown by the forefinger and arrow in Fig. 20. After the mechanism is unlocked, push in the station call letters being ordered models.

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Push the cap into place on the button for your station. See Fig. 18. Be sure the cap is put on so that the letters are upright and can be read easily.

Again unlock the dial mechanism by moving the stud to the left as shown by the forefinger and arrow in Fig. 20. After the mechanism is unlocked, push in the station call letters being ordered models.

Push out the disc containing the call letters of your selected station. Place one of the clear celluloid discs into one of the metal caps and then place the disc with your station call letters in the cap. Be sure to put the disc in so that the call letters are readable from the front of the cap. See Fig. 17.

Push the cap into place on the button for your station. See Fig. 18. Be sure the cap is put on so that the letters are upright and can be read easily.

Again unlock the dial mechanism by moving the stud to the left as shown by the forefinger and arrow in Fig. 20. After the mechanism is unlocked, push in the station call letters being ordered models.

Push out the disc containing the call letters of your selected station. Place one of the clear celluloid discs into one of the metal caps and then place the disc with your station call letters in the cap. Be sure to put the disc in so that the call letters are readable from the front of the cap. See Fig. 17.

Push the cap into place on the button for your station. See Fig. 18. Be sure the cap is put on so that the letters are upright and can be read easily.

Again unlock the dial mechanism by moving the stud to the left as shown by the forefinger and arrow in Fig. 20. After the mechanism is unlocked, push in the station call letters being ordered models.

Automatic Tuner Data
Part 3

SEARS-ROEBUCK & CO.

MODEL 4786, Ch. 100.196
MODELS 4610, 4669, 4769
4789, Ch. 101.482

JULY 15, 1937

SUBJECT: READJUSTING THE AUTOMATIC TUNING DIAL STOP BUTTON TO MAKE IT POSSIBLE TO SET UP DESIRED STATIONS, THAT ARE CLOSE IN FREQUENCY, ON ADJACENT BUTTONS.

By referring to ranges it will be seen that WMAQ, 870 kc, would be set up on button #4. WGN, 720 kc, would be set up on button #4 or #5. WBBM, 770 kc, would be set up on button #5. Since these three stations come within the frequency range of only two of the buttons, the customer would ordinarily have to give up one of the three stations for AUTOMATIC TUNING.

It is possible, however, to change the setting of the "fixed" button and make it possible to set up three such stations, close together in frequency, on three separate buttons.

The method of doing this is as follows:

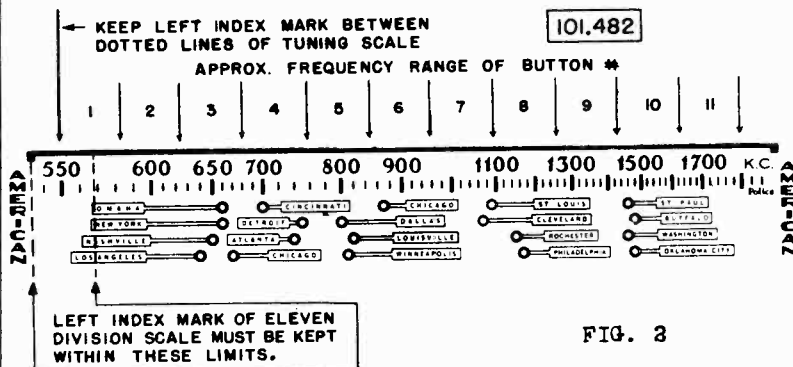


FIG. 2

FIRST:-

Make a full size reproduction of button frequency ranges on a suitable paper or cardboard, - an eleven division scale, one division for each button range as illustrated.

SECOND:-

Likewise make a full size reproduction of the AMERICAN band on suitable paper or cardboard.

Make a light pencil mark on the reproduction of the tuning scale at the frequency of each of the eleven desired stations. Then lay the eleven division scale against the reproduction of the tuning scale and move the eleven division scale to such a position that each of the pencil marked positions for the eleven desired stations will fall within the range of a different button. However, the eleven division scale can only be moved so that its left index mark comes between the dotted lines of the reproduction of the tuning scale, as shown in Fig. 2. In Fig. 2 it will be seen that by moving the eleven division scale to the point shown, WMAQ will be within the range of button #3; WGN will be within the range of button #4; and WBBM will be within the range of button #5.

When a position of the eleven division scale is found that will allow the eleven desired stations to fall within the range of separate buttons, carefully note at what point on the reproduction of the dial scale the left index mark of the eleven division scale comes. In the illustration for stations WMAQ, WGN, and WBBM, the index mark is just about opposite 550 kc on the dial scale. (Fig. 2).

Remove the chassis from its cabinet. Leave the AUTOMATIC TUNING dial escutcheon off.

Turn the AUTOMATIC TUNING dial to its stop so that the variable is fully meshed. Now move the pointer along its drive cable to the point on the dial that corresponds exactly to the position of the left index mark of the eleven division scale, as described in the preceding paragraph. As can be seen by inspection, the pointer is pinched onto the drive cable and it will be necessary to pry this pinching open slightly so that the pointer can be moved along the cable. The AUTOMATIC TUNING dial must be kept turned all the way to the left to its stop during the operation of moving the pointer. After the pointer has been moved to its new position it should be pinched onto the cable again so that it cannot slip.

Loosen the set screw that holds the variable condenser drive drum to the variable condenser shaft.

Unlock the AUTOMATIC TUNING dial mechanism by moving the studs counter-clockwise. Pull out the "hair pin" clip that will be found on the unnumbered stop button. This button can then be pushed in and turned the same as the other eleven numbered buttons. Push in the unnumbered button and turn it to such position that when the AUTOMATIC TUNING dial mechanism is turned to its limit the pointer will be at its original stop at the left end of the dial. Then lock the mechanism by rotating the studs clockwise. (Be careful not to push in button #1 while the unnumbered button is pushed in as this may jam the mechanism. If this should happen the mechanism can be freed by pushing in the stop latch, as will be seen by inspection.) Replace the "hair pin" clip on the unnumbered button.

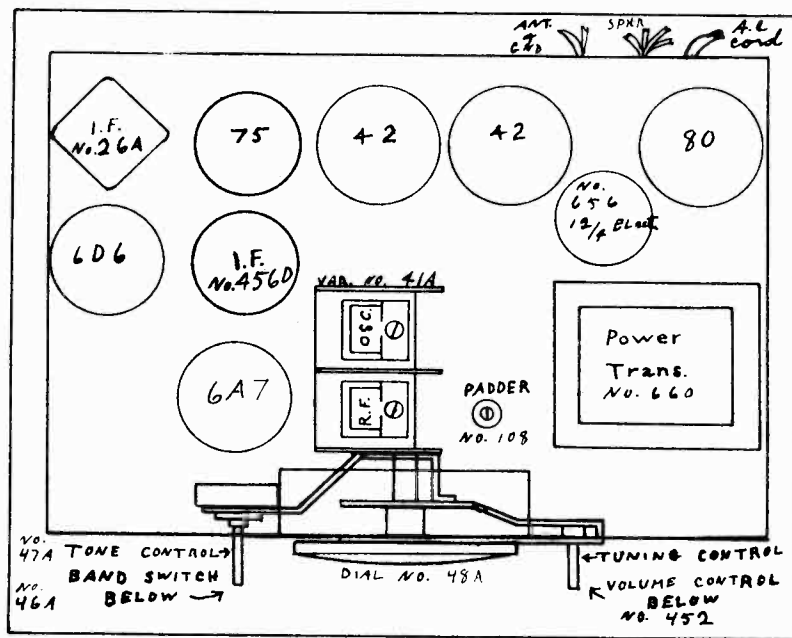
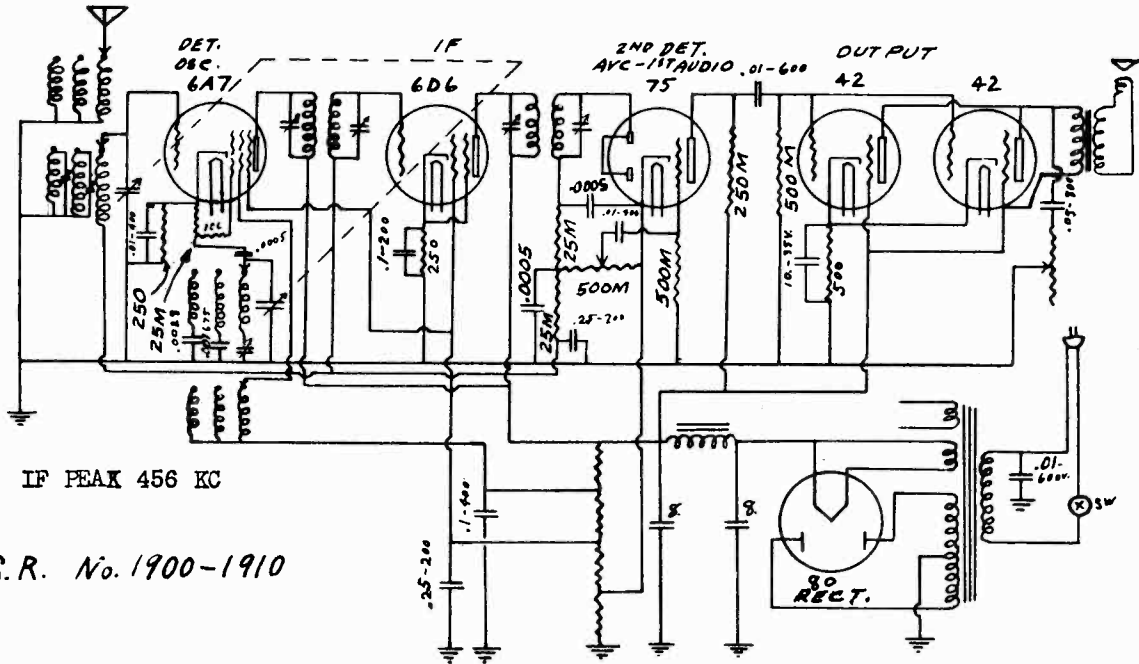
With the mechanism turned all the way to the left to its stop and with the dial pointer at its left limit on the dial, fully mesh the variable condenser by turning the movable plates with the fingers. Then re-tighten the set screw that holds the condenser drive drum to the variable condenser shaft.

The eleven desired stations can then be set up on the eleven adjustable buttons in accordance with the instructions. (SEE PRECEDING PAGES). The new frequency ranges for the buttons will be determined by holding the eleven division scale against the reproduction of the tuning scale, with the left index mark of the eleven division scale at the proper point between the dotted lines on the reproduction of the tuning dial scale.

MODELS 1900, 1910
Schematic, Socket

SEARS-ROEBUCK & CO.

Trimmers, Alignment



ALIGNMENT

- 1- Apply 456 KC note to control grid of 6A7 and peak IF trans. for max. gain.
- 2- Apply 4000 KC note to antenna wire; set band switch to 2nd band and align trimmer on oscillator section of variable condenser to track with 4000 KC on dial.
- 3- Turn Band switch to Broadcast band; apply 1500 KC note to antenna wire, adjust trimmer on RF section of variable condenser for maximum gain.
- 4- Apply 600 KC note to antenna, adjust padder condenser for maximum gain, swinging condenser back and forth across 600 KC signal.
- 5- Check 1400 KC signal for alignment.
- 6-Turn band switch to 2nd band; check 4000 KC signal for alignment and adjust trimmer on antenna coil for greatest gain at 4000 KC.
- 7-Turn band switch to last band and adjust trimmer on antenna coil for greatest noise on 12 megacycles.

RECEIVER RANGE - THREE WAVE BANDS

540 - 1720 kilocycles; 1720 - 5000 kilocycles; 5.5 - 16 megacycles

SEARS-ROEBUCK & CO.

MODEL 4796, Ch. 126.201
Schematic, Voltage

OPERATING FEATURES:
 Phonograph-Radio operation
 Automatic Phonograph Mechanism with self-starting, governor-type motor
 Two-point Tone Control
 Automatic Volume Control

PHONOGRAPH:
 Type Automatic-Manual
 Record Capacity Eight 10-inch
 Turntable Speed 78 R.P.M.
 Type of Pickup Crystal
 Pickup Impedance 75,000 ohms at 1,000 cycles

POWER SUPPLY RATING 105-125 volts, 60 cycles Total 105 watts
Radio Only 75 watts 105 watts

FREQUENCY RANGES:
 American Band 540-1720 kc
 Foreign Band 5.8-18 mc

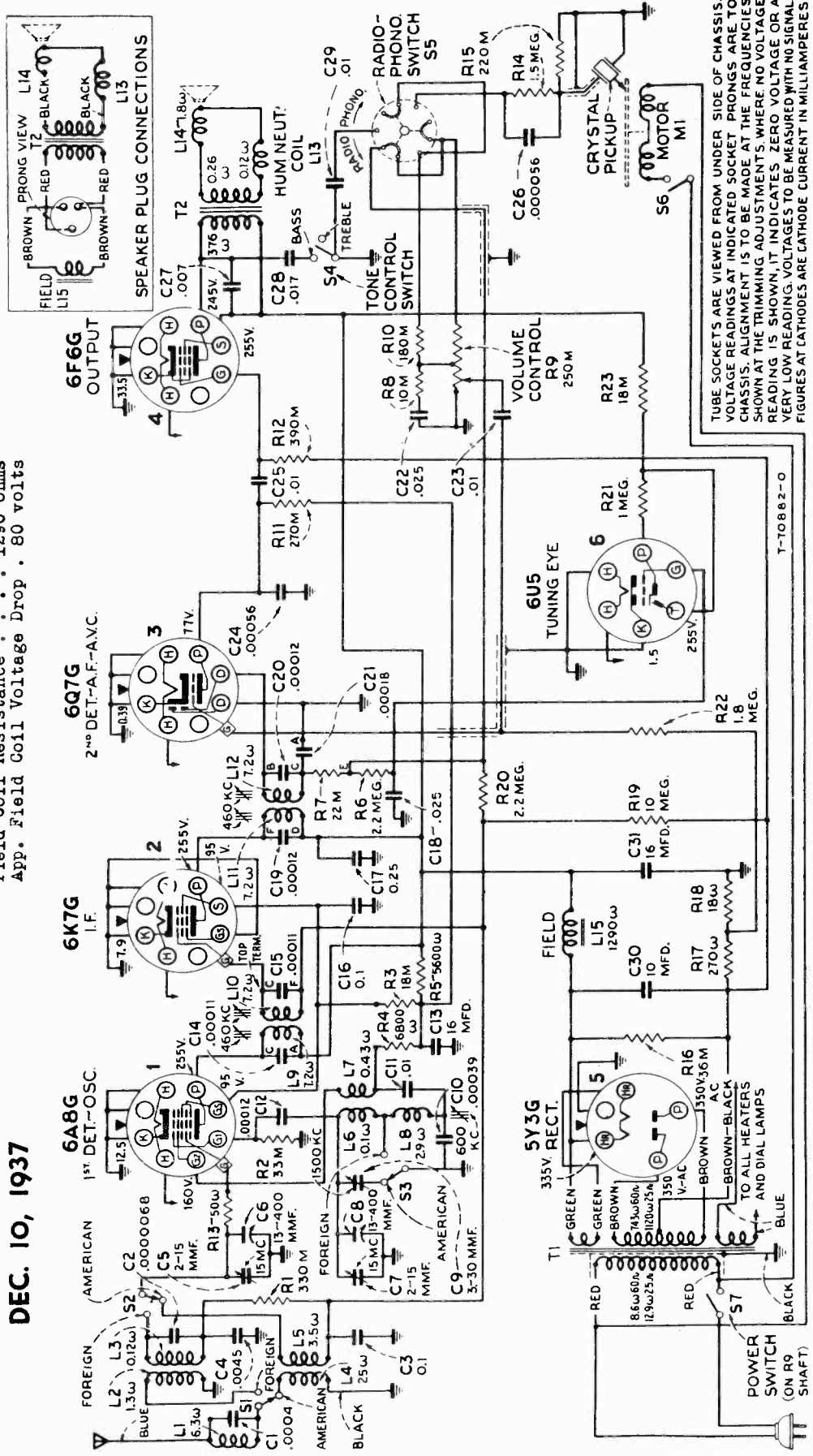
ALIGNMENT FREQUENCIES:
 Band "F" 15 mc(osc., det.)
 Band "A" 600 kc(osc.), 1500 kc(osc.)

INTERMEDIATE FREQUENCY 460 kc

POWER OUTPUT:
 Type Pentode
 Undistorted 2.5 watts
 Maximum 4.5 watts

LOUDSPEAKER:
 Type Electrodynamic
 Size 12 inches
 V.C. Impedance 2.25 ohms at 400 cycles
 Field Coil Resistance 1290 ohms
 App. Field Coil Voltage Drop 80 volts

DEC. 10, 1937



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS, WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES TO BE MEASURED WITH NO SIGNAL. FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

GENERAL INFORMATION AND SERVICE HINTS

ELIMINATING WHISTLE AT 920 KC.

A whistle due to a beat between the second harmonic (920 kc) of the 460 kc I.F. and a 920 kc signal may be experienced. In localities where the 920 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the I-F frequency of the receiver.

Determine at what point between 890 kc and 950 kc the whistle will be least objectionable. Dividing this frequency by two will give the new I-F frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 905 kc would not be objectionable, the I-F should be re-aligned at 905/2 or 452.5 kc. Try to select the new I-F frequency as close as possible to 460 kc.

An interfering whistle may also be caused by two stations having a frequency difference equal to the I-F frequency (460 kc) of the receiver and will be evidenced by a whistling sound when the receiver is tuned to either of the stations. It may be further localized by tuning the receiver to each of these stations and then stopping the oscillator in each case, by grounding the oscillator station of the variable tuning condenser C8 to chassis. If the whistle, in each case, still persists, it is being caused by the beat between these two stations and may be corrected by shifting the I-F frequency, of the receiver, to a frequency other than the difference frequency of the two local or strong signals (stations).

The I-F amplifier should not be shifted to a frequency higher than 475 kc, nor lower than 445 kc, but should be as close to 460 kc as possible.

Align the I.F. at the new frequency and then re-align the rest of the receiver as described under "ALIGNMENT PROCEDURE."

AUTOMATIC RECORD MECHANISM.

The record changing mechanism is designed to be simple and fool-proof. Certain adjustments may be required occasionally. The adjustments are illustrated in this booklet.

It is important, when servicing the automatic mechanism, to have it placed on a level support. It is also important to refer to the instructions on the motor governor disc to bind or lean, since bent levers and broken parts may result. Application of oil to the felt pad which rubs against the motor governor disc will insure smooth operation.

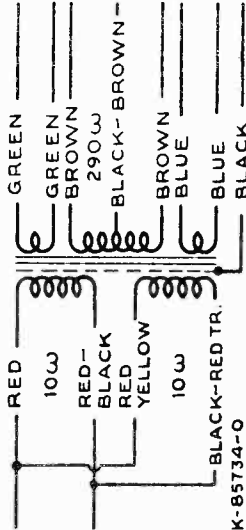
CAUTION.--Do not leave records stacked on record-holder posts, when not in use, as they are liable to warp, particularly so in warm climates.

LOUDSPEAKER.

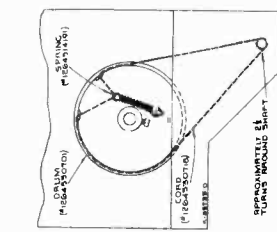
Centering of the loudspeaker is made in the usual manner with three, narrow-paper feelers. After finishing the front dust cover, this may be removed by softening its cement with light fluid. The dust cover should be cemented in place with ambroid upon completion of adjustment.

DIAL POINTER AND CONDENSER DRIVE HOOK-UP.

The drive hook-up for the dial pointer and the variable condenser is illustrated.



CONNECTIONS FOR 110 VOLT, 60 CYCLE REPLACEMENT POWER TRANSFORMER (1201030607)



DIAL DRIVE HOOKUP

ALIGNMENT PROCEDURE

- Output meter connections Across speaker voice coil
- Output meter reading to indicate 1.0 watt output 1.5 volts
- Approximate average sensitivity in microvolts for 1.0 watt output See chart below
- Dummy antenna value to be inserted in series with generator output See chart below
- Connection of generator output lead See chart below
- Connection of generator ground lead To chassis
- Generator modulation 30%, 400 cycles
- Position of Radio-Phono. switch Counter-clockwise
- Position of Volume Control Fully clockwise
- Position of Tone Control Fully clockwise
- Position of Dial Pointer with variable tuning condenser fully closed To fall on last calibration mark at 540 kc end of "American" band.

WAVE-BAND SWITCH POSITION	GENERATOR FREQUENCY	IMPEDANCE ANTENNA	GENERATOR CONNECTION	TRIMMER (IN ORDER SHOWN)	APPROXIMATE MICROVOLTS
"AM"	No signal	.001 mfd.	6K7-G Gr-14	L11, L12	15, 000
"AM"	550-750 kc	.001 mfd.	6A5-G Gr-14	L9, L10	200
"FOR"	15 mc	300 ohms	Ant. Lead (blue)	"FOR" C7**	-
"FOR"	15 mc	300 ohms	Ant. Lead (blue)	"FOR" C8*	50
"AM"	1500 kc (rock)	.0002 mfd.	Ant. Lead (blue)	C9	-
"AM"	600 kc (rock)	.0002 mfd.	Ant. Lead (blue)	L8	29
"AM"	1500 kc (rock)	.0002 mfd.	Ant. Lead (blue)	C9	97

IMPORTANT ALIGNMENT NOTES

- **Use maximum capacity peak if two peaks can be obtained.
- *Use minimum capacity peak if two peaks can be obtained.
- Where indicated by the word "hook," the variable tuning condenser should be hooked back and forth a degree or two while making this adjustment.
- Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value, to prevent the a-v-o action of the set from interfering with accurate alignment.
- Adjustment locations are shown on the top and bottom parts location views of chassis.
- Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy antenna used for alignment in any other band. Grid cap leads should remain in place during alignment.
- Values shown under, "Microvolts," are only approximate.

- CHASSIS FEATURES:
- No. I-F stages One
 - Antenna Doublet or Conventional
 - Tuning Eye Magnetically Adjusted I-F Transformers
 - Line Noise Electrostatic Transformer Shield "American" Band Low-Frequency Oscillator Tracking

SEARS-ROEBUCK & CO.

MODEL 4796, Ch. 126.201
 Socket, Trimmers
 Chassis

OPERATING CONTROLS:

RADIO PANEL:

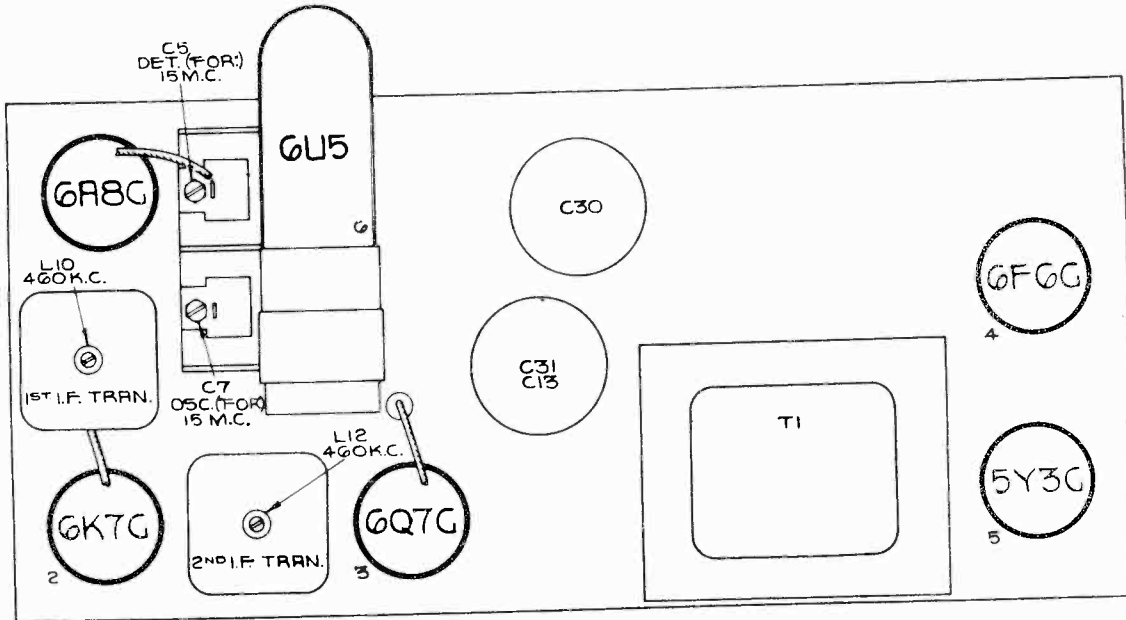
1. Left knob . . . "Radio-Phono." Switch
2. Next to left knob . "On-Off" Switch and Volume
3. Center knob . . . Wave-Band Switch
4. Next to right knob . . . Tuning
5. Right knob Tone Control

PHONO. COMPARTMENT:

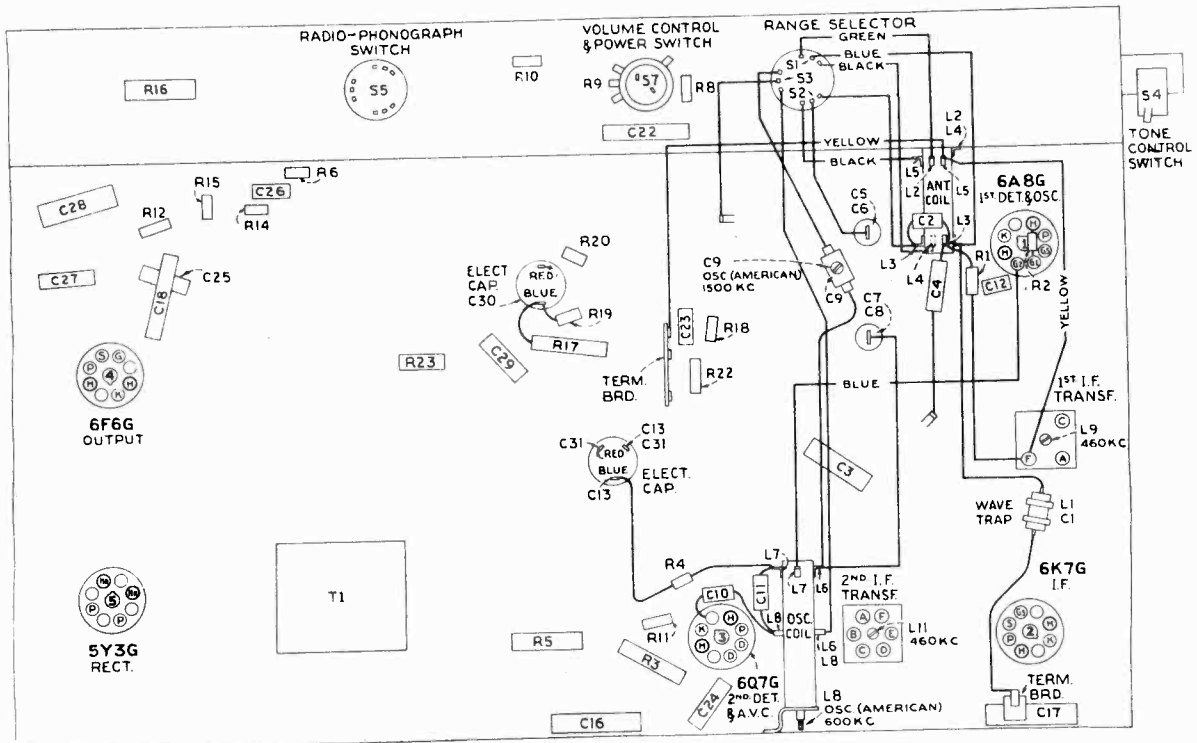
6. Turntable Switch
7. Index Lever
8. Record Ejector

CONTROL OPERATION:

- Turning right: Radio; Phonograph
 Turning right: Power on; Volume Increase
 Turning right: "American," "Foreign" 10 to 1
 Tuning ratio: 10 to 1
 Turning right: Bass, Treble
- Toggle: Phono. Motor "On-Off"
 Front 10" Automatic or Manual Operation
 Rear 12" Manual Operation
 Pushing to Left Rejects When "Index Lever" is in 10" Position



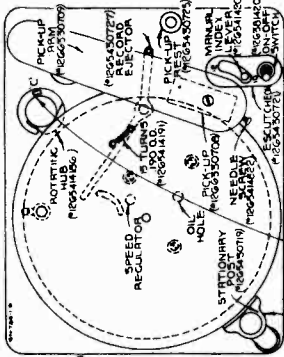
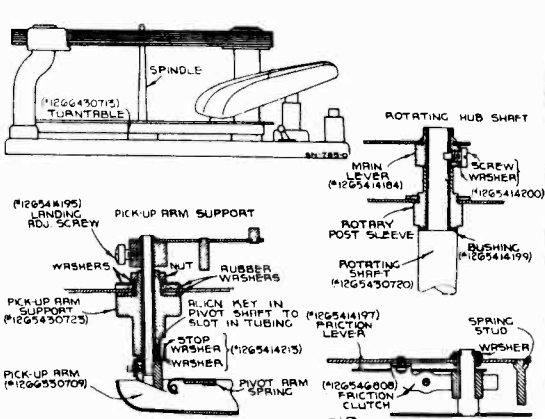
LOCATION OF PARTS AND ALIGNMENT ADJUSTMENTS TOP OF CHASSIS



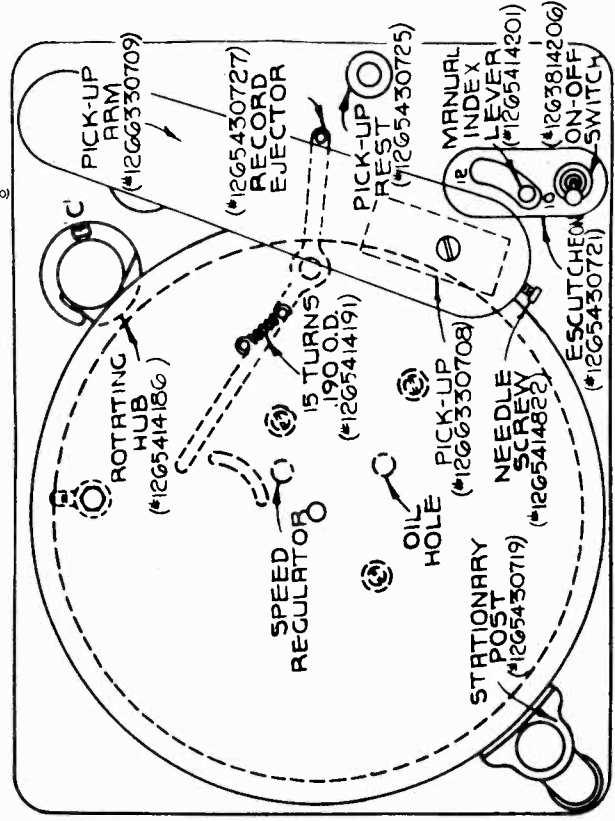
LOCATION OF PARTS AND ALIGNMENT ADJUSTMENTS BOTTOM OF CHASSIS

MODEL 4796, Ch. 126.201
Phono. Wiring, Details

SEARS-ROEBUCK & CO.

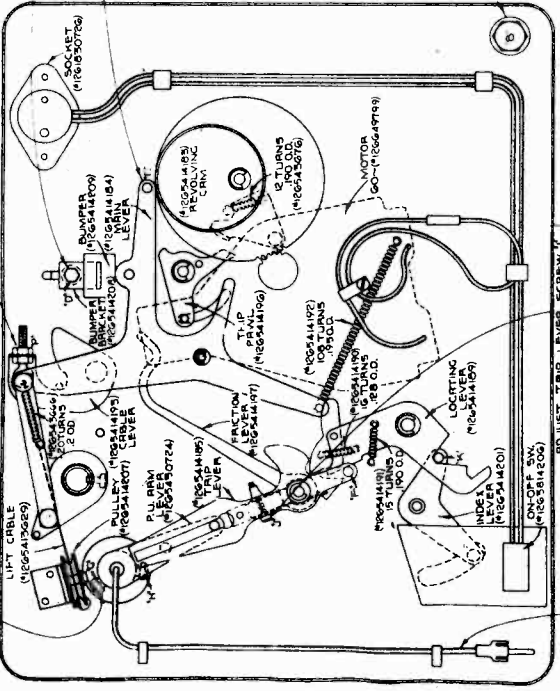


TO ADJUST RECORD POSTS, MOVE SPINDLE SO THAT IT RECORDS ON THE LOWER CHORD OF THE ROT. HUB. MOVE STATIONARY RECORD POST TO THE POSITION OF THE TONE ARM. THE RECORD POSTS SHOULD BE ADJUSTED TO THE POSITION OF THE TONE ARM. THE RECORD POSTS SHOULD BE ADJUSTED TO THE POSITION OF THE TONE ARM. THE RECORD POSTS SHOULD BE ADJUSTED TO THE POSITION OF THE TONE ARM.

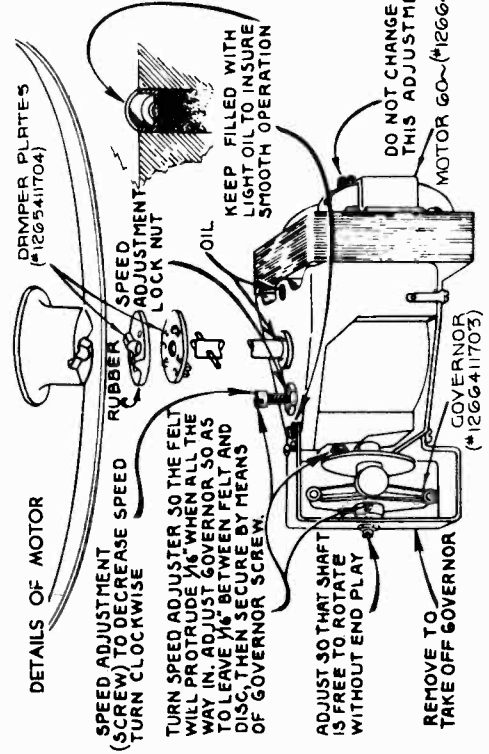


DETAILS OF MOTORBOARD

ADJUST THE ARE OF THE TONE ARM SO THAT THE TOP OF THE TONING BARNS COULD BE IN THE CENTER OF THE RECORD. THIS ADJUSTMENT IS MADE BY MEANS OF THE SCREW LEVER.



TO ADJUST THE POSITION OF THE NEEDLE, TURN THE SPINDLE WITH THE TONING BARNS. THE SPINDLE SHOULD BE IN THE CENTER OF THE RECORD. THE SPINDLE SHOULD BE IN THE CENTER OF THE RECORD. THE SPINDLE SHOULD BE IN THE CENTER OF THE RECORD.



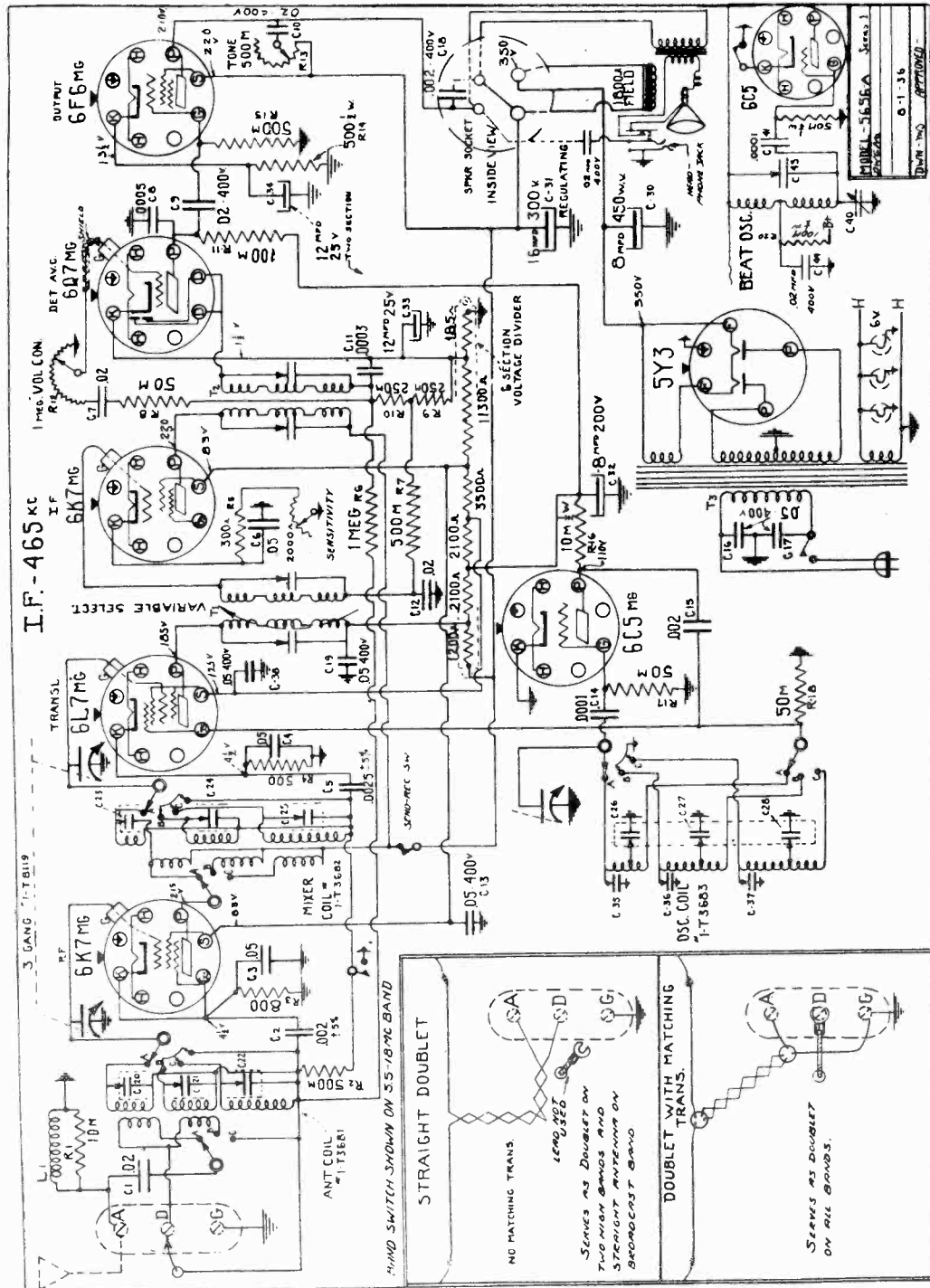
DETAILS OF MOTOR

TURN SPEED ADJUSTER SO THE FELT WILL PROTRUDE 1/16 WHEN ALL THE WAY IN. ADJUST GOVERNOR SO AS TO LEAVE 1/16 BETWEEN FELT AND DISC, THEN SECURE BY MEANS OF GOVERNOR SCREW.

ADJUST SO THAT SHAFT IS FREE TO ROTATE WITHOUT END PLAY. REMOVE TO TAKE OFF GOVERNOR.

DO NOT CHANGE THIS ADJUSTMENT. MOTOR GO.

SEARS-ROEBUCK & CO.

MODEL 5656A
Schematic, VoltageUSE ONLY WITH ALTERNATING CURRENT

UNLESS OTHERWISE SPECIFIED ON BACK OF CHASSIS, THIS RECEIVER IS FOR USE WITH 105 TO 120 VOLT ALTERNATING CURRENT, ONLY.

MODEL 5731
Moto-Matic Tuner
 Part 128,15600

SEARS-ROEBUCK & CO.

For MODELS 6000,6001
 Ch.101.495X,101.496X
 MODELS 6100,6101
 Ch.101.495,101.496
 Details,Schematics,Data

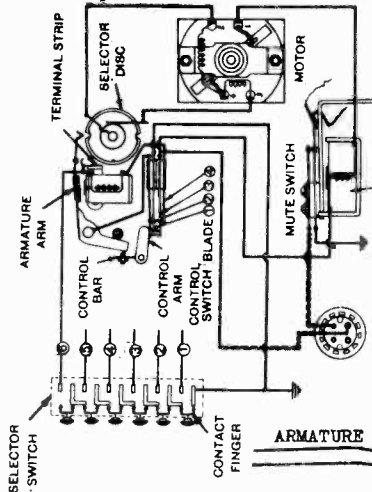


FIG. 1

ANGULAR ADJUSTMENT
OF THE ARMATURE ARM "V":

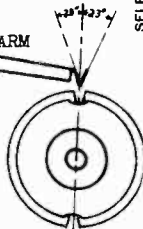


FIG. 2

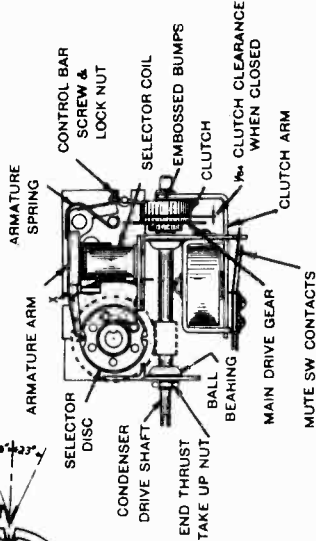


FIG. 3

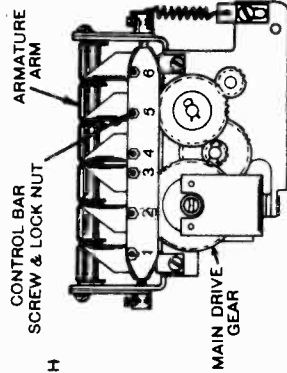


FIG. 4

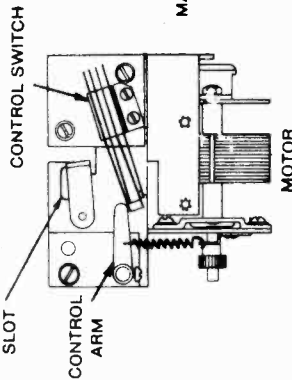


FIG. 5

ELECTRICAL SPECIFICATIONS

Power Supply 5 to 8 volts D.C. Starting current . . . 6 amps. for 1 second
 No current used while at rest Returning current . . . 5 amps. for 2 seconds

GENERAL INFORMATION AND SERVICE HINTS

MOUNTING MOTO-MATIC TUNER:

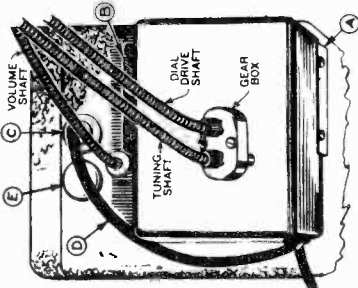


FIG. 1

Fasten mounting brackets A and B to receiver with four #8-32 machine screws and lockwashers.

Determine the angular position of key in variable condenser drive fitting that is located directly under the tuning cable opening in the radio case. Lower Moto-matic tuner into place between mounting brackets and rotate shaft on Moto-matic tuner so that slot has the same angular position as the key on variable condenser drive fitting. When lowered all the way into place no play should exist between key on variable condenser drive fitting, and the slot on Moto-matic shaft. This is very important, and if there is play it should be corrected by lightly pinching together the slot on Moto-matic shaft.

Fasten tuner with four #8-32 machine screws and lockwashers. Remove plug button C as shown in Fig. 1 and plug in power lead.

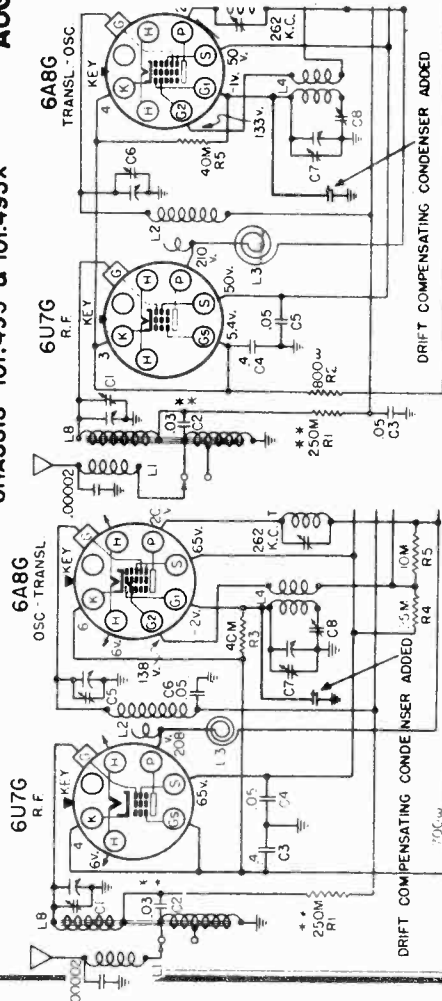
NOTE: Check worm gear on the gang condenser for slippage of the clutch which is provided, as this will cause the tuner to tune inaccurately. This gear should not slip except when the condenser plates are all the way open or all the way closed when the worm is rotated in the direction to open or close the plates.

SUBJECT: ADDITION OF A DRIFT COMPENSATING CONDENSER TO MAINTAIN ACCURACY OF STATION TUNING.

A drift compensating condenser, to eliminate frequency drift of the receiver as it warms up, is available from source 101. This condenser is connected across the oscillator trimmer as shown by the Schematic sections in this Supplement.

CHASSIS 101.496 & 101.495X CHASSIS 101.495 & 101.495X

AUGUST 25, 1938



SEARS-ROEBUCK & CO.

MODEL 5731
Moto-Matic Tuner
Part 128.15600
Adjustments, Part 1

ACCURACY ADJUSTMENT OF CONTROL BAR ADJUSTING SCREWS FULLY MOUNTED IN CAR OR ON BENCH

Improvement of accuracy is sometimes necessary after installation due to additional springy torque added by the control bench cables, which are sometimes laid in an "S" bend to make a satisfactory mounting in the car. These complicated cable bends must be avoided as much as possible for the following reason: A complete kit of adjusting coils is provided for this work and consists of the following:

- 1 - Double end socket wrench in combination with screw driver.
- 1 - Dummy cover with opening for access to accuracy adjusting screws and bushing for holding same in place.
- 1 - .004 x 3/8 x 6 shim for adjusting armature and selector material.

It is suggested that a complete assembly and accuracy check be made on the bench approximating the cable bends as they would be in the car. The check should not be made until the set has warmed up for about 20 to 30 minutes.

- (1) Remove cover of Moto-Matic unit, the side which is away from the radio. Two small screws at each end are to be removed and the cover will pop off easily.
- (2) Replace with dummy cover and connect control lead to bushing and lay cables as they would be in the car installation.

Before making any accuracy adjustments determine by trial whether or not the inaccuracy is being caused by the cable bends. Bend the cables under the bench in the same way as they will be in actual amount of spring that will tend to detune the station after an automatic selection has been made. Make sure that the complete installation is made with a few bends in the control cables as possible. If necessary shorten the tuning cables rather than having them kinked or pushed into small clearances.

After you have eliminated the possibility of inaccuracy due to the above, the following procedure should be followed closely:

- (3) Set up a station at 1000 KC or higher, using one distantly located, or use your oscillator with low input. Hold down the station button which is set up and use the double-ended adjusting wrench with screw driver insert. Place over adjusting screw and locknut on the control bar. (The proper screw can be found by pressing the selector switch button several times and noting when the armature arm moves down to the edge of selector disc. This is the correct position.) Turn the adjusting screw slowly 1/4 turn or more, while holding down the button. (A rubber band around the selector switch will serve to hold down the button to which the adjustment is being made) until the clutch pulls up with a click. (See Fig. 1.) Now turn back or to the right until clutch drops back or open. Turn further to the right about 1/8 turn.

Lock up locknut; holding screw steady to prevent further turning. Remove rubber band. Make tuning adjustments by turning the knob until short distance from resonance on both sides of the signal. In each case push the button setup for adjustment and check for accuracy by listening to quality of signal received, or use an output meter if signal generator is used.

Repeat for the rest of the buttons, using the same frequency setting.

If unit rocks back and forth while making the above adjustments it is due to one or two reasons. First it may be that the control switch operates as outlined in the paragraphs under "Adjustment of Control Switch". Second - the armature arm must not strike the pole piece of the control magnet before it falls entirely into the "W" of the selector disc. The correction for this difficulty is also outlined in the paragraphs under "Adjustment of Control Switch".

Inaccuracy in station selection or inability to make accuracy adjustments due to rocking while making the adjustments will exist if the armature arm will not allow the "W" end to seat properly in the selector disc slot. This is caused by the armature pad striking against the coil core. For the correction of this use the following method:

You will find a small rectangular slot directly in line with the selector coil pole tops at the end of the frame. (See Fig. 5.) This opening is used for seeking air gap clearance to the armature pad and pole face. The minimum distance is .0035", maximum .0075", and must be checked by using a .004" thick which can be cut from a sheet of brass or bronze in a shim. If the gap is less than .0035" will cause setting up troubles at a low voltage of 5 volts at the battery.

If the armature does not fall entirely into the "W" slot of the selector disc when the .004 shim is inserted, the shim will be held between the bands marked "W" and the point marked "R" (Fig. 4) until armature "W" seats properly all the way into "W" slot of selector disc.

The 5 volt check for setting up stations checks the ability of the armature arm to hold into the slot. To make this test connect a constant test battery terminal and allow charger to raise the voltage to 5 volts. Connect a volt meter across battery terminals and make this test when voltage is at 5 volts. The selector button is held down. The armature arm should not slip out during this test when setting up a station. This also checks that you have the proper gap between armature pad and face of selector coil.

ALIGNING MOTO-MATIC WITH RECEIVER:

Car box and flexible drive shaft and dial drive shaft can be placed into the tuner temporarily so that the receiver and tuner can be aligned on the bench. Turn the free end of the flexible drive shaft clockwise until a stop is felt. Rotate in opposite direction until a stop is felt. Turn clockwise again so that the stop is felt in left hand. This will align the motor gear on the ring condenser shaft. It is best to have the top cover off the receiver while doing this to ascertain that the condenser goes through 180 degrees when the shaft is rotated eight complete turns.

HOW TO SET UP STATIONS:

To set button for a certain station, have the receiver in operation and hold down button until station comes in clearly. Now turn in the desired station until the station comes in clearly. The station comes in accurately. Release button and this station is set to this particular button. After station is once set up it is not necessary to hold button down to tune automatically; only a momentary push is required. Mechanism will go through the complete operating cycle when once started. To set the other five buttons repeat for each button as outlined above.

HOW THE TUNER OPERATES:

The Moto-Matic tuner is a mechanical electro device actuated by an electric motor to steadily and accurately tune an automobile radio receiver. This device functions in the following manner:

ADJUSTMENT OF CONTROL SWITCH:

CAUTION: Do not adjust control switch unless accuracy adjustment of control bar (see instructions above) has failed to produce correct operation of the unit.

The purpose of the control switch is to open the circuit to the motor magnetic clutch and selector coils when the armature arm falls down into the slot of the selector disc. Opening of this circuit is used when setting up a station by the fact that the armature arm is down in the "W" slot. This holds the selector disc stationary while the shaft slips when tuning manually for a station setting.

The timing of the control switch is adjusted individually for each armature arm by screwing in or out the control bar adjustment screw as outlined under "Accuracy Adjustment of Control Bar". With the unit connected to 6 volts depress the selector switch button and hold down until motor stops at the station you wish to set up. The selector arm (Fig. 2) should be in the "W" slot of the selector disc. If the control arm (Fig. 2) is not in the "W" slot, the selector arm will not open when the armature arm falls in slot it will be necessary to screw in the control bar adjustment screw. When adjusted properly the control switch will open when armature arm falls in slot and will not open when armature arm comes down on the edge of selector disc. If this adjustment is made improperly so that the control switch opens when the armature arm is down on the edge of selector disc, it operates adversely due to the fact that the armature arm will not hold down long enough. It is important that the armature arm falls practically all the way into the "W" slot of the selector disc before the control switch opens in order to obtain maximum accuracy.

To check switch operation disconnect power source. By hand press down the armature arm against the edge of the selector disc. (Be sure you have rotated each selector disc to a position away from the slot). Check each armature arm. The switch should not open nor should the fibre control arm move, when this decrease contact pressure. If the control arm moves or the switch opens, the control switch is out of adjustment. When the control switch is out of adjustment, the armature arm is riding on the edge of the selector disc. Now rotate selector disc until armature arm drops into the slot without play in the selector disc slot when rotated slightly. Now both switch contacts should open with about .020" clearance between points.

If you are troubled with rocking or bucking when making the initial accuracy adjustment, check for the parallel movement or opening of the control switch. By moving the fibre control arm (see Fig. 5) by hand so the control switch contacts open, make certain that they open and close simultaneously.

By referring to Fig. 2 it may be seen that the #2 blade controls the selector coil, the #4 blade the motor and magnetic clutch. It is desirable to give the #2 blade a very slight lead in opening over the #4 blade. Adjustment can be made with a pair of long nose pliers, being sure to bend only the #2 or #4 blade. Never adjust the #1 or #3 blade, as these must always be parallel to each other.

Let a selector switch button is depressed the contact finger opens the common circuit to the other buttons and closes the circuit to the selector coil, which pulls down the armature arm and closes the contact to the terminal strip. (See Fig. 2). The contact holds the selector coil circuit closed so that when pressure on the button of the selector switch is released the coils will complete their self, the armature being held down on the selector disc which completes the circuit to one of the fields of the motor and through the clutch coil. The half of selector disc that is common to the other half of the selector disc will give counter clockwise rotation. Through the reduction gearing the selector disc shaft is driven in the direction of whichever half of the selector disc the armature arm came contact with. The selector shaft rotates until the formed end of armature arm falls into the "W" groove on the selector disc. This moves the control bar and control arm which opens the control switch. The control switch opens the motor and clutch coil circuits, and immediately resets for the next selection. The Moto-Matic drive is a new method of station selection. The selector disc is rotated in the direction of the armature arm as held down into the "W" slot of the selector disc. The selector disc is formed and the armature arm is held down in the "W" slot of the selector disc by holding a selector switch button down, which holds the armature down from running and the clutch from closing while manually tuning to set up a station on any button.

MODEL 5731
Moto-Matic Tuner
Part 128.15600

SEARS-ROEBUCK & CO.

Adjustments, Part 2
Parts List

HOW TO ORDER PARTS FOR THIS MOTO-MATIC TUNER - IDENTIFICATION NUMBER 128.15600

- Use Purchase Order Form 5264.
- On the Purchase Order always give the following information:
(1) PART NUMBER and DESCRIPTION for each part ordered, as given in this parts list, regardless of number printed on part itself. When no part number is assigned, order by description and rating. Also give PRICE of part (indicate if no selling).
(2) IDENTIFICATION NUMBER, which is 128.15600. This number is found inside the top cover of the unit.

Authorized Replacement Parts for this model may be obtained from any Sears, Roebuck and Co. Retail Store or Mail Order branch. Always give part numbers and the chassis identification number.

PARTS LIST-SOURCE NO. 128

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE
A	12815292	Armature Shaft	.10
A1	12815427	Armature Shaft Bearing	.05
A2	12815643	Armature Stop Shaft	.05
A2	12815549	Armature Arm R.H.	.25
	12815695	Armature Arm L.H.	.25
	12815660	Armature Spring	.05
	12815428	Case Mounting Bracket (Large)	.20
	12815428	Clutch Collar	.18
	12815234	Clutch Collar	.05
C2	12815812	Clutch Pivot Bracket	.43
	12815412	Clutch Sleeve and Pin Assembly	.43
	12815250	Clutch Throwout Spring	.02
C3	12815333	Control Switch	.61
	12815940	Control Bar Screw	.05
	12815799	Control Bar Nut	.05
C1	12815420	Control Bar Collar	.07
	12815497	Control Arm Tension Spring Adjusting Bracket	.11
C	12815590	Control Arm and Bushing Assembly	.06
	12815544	Control Arm Tension Spring	.05
	12815283	Cover (Set Side)	.41
	12815292	Cover and Bushing Assembly (Tuning Side)	.47
	12815355	Intermediate Gear Assembly	.50
	12815646	Intermediate Idler Gear Retainer Spring (2 required)	.06
	12815282	Motor and Fanion Assembly	6.25
	12815282	Motor and Fanion Assembly	.23
	12815376	Making Switch	.40
	12815377	Mounting Bracket, Worm Shaft, Worm and Idler Assembly	4.00
	12815471	Power Lead and Plug Assembly	.87
	12815592	Selector Switch and Lead Assembly	4.00
	12815602	Selector Switch Back Cover	.06
	12815839	Selector Switch Steering Column Strap (2 required)	.10
	12815306	Selector Switch Mounting Bracket (2 Required)	.09
	12815306	Selector Switch Stud Head Mounting Screw (2 Required)	.15
	12815308	Selector Switch Push Button	.17
	12815308	Selector Switch Push Button	.94
	12815255	Selector Switch Lead	.04
	12815260	Selector Switch Plunger Spring	3 for .75
	12815264	Selector Coil Assembly	.05
	12815495	Selector Coil Assembly (6)	2.50
	12815303	Selector Coil Assembly	.18
	12815303	Selector Disc and Shaft Assembly	.00
	12815303	Station Call Letter Tab Retaining Plate	.00
	12815315	Station Call Letter Tab Retaining Plate Screw (3 required)	.23
	12815616	Selector Coil Terminal Strip Assembly	.36
	12815796	Selector Coil Terminal Strip	.05
	12815797	Terminal Strip Stud	.07
	12815797	Terminal Strip Stud	.38
	12815797	Moto-Matic Tuner Adjusting Kit (Owner into stock at retail selling prices prepaid, no selling) - 85¢ each Cost.	.10

RETAIL SELLING PRICES PREPAID, NO SELLING - 85¢ each Cost. PRICES SUBJECT TO CHANGE WITHOUT NOTICE

TENSION ADJUSTMENT OF SELECTOR DISCS:

On one end of the selector disc one shaft will be found two 3/8" nuts that determine the tension of the selector discs. These are permanently adjusted at the factory and should not require attention. If readjustment is necessary, loosen the locknut. Tighten or loosen, whichever is necessary, the armature arm will hold and turn the selector disc when the selector coils are energized by 5 volts. Tighten the lock nut. The purpose of this adjustment is to adjust the tension of the selector disc so that the armature arm will not be forced out of the arm slot when setting up a station.

Angular Adjustment of the Armature Arm:

The angular position of the sides of the armature arm is correct when the angle of each side is the same with respect to the radius of the selector disc. (See Fig. 6.) No work angle will cause a slipping out of the armature arm when setting up a station. Under conditions not enough angle will cause the armature arm to stick. Any adjustments to the angles of the armature arm should be made carefully with a pair of long nose pliers. Sticking armature arm will cause the armature arm to be out of the groove of the selector disc. The metal by the edge of the groove of the selector disc slot. This burr may be removed by carefully filing this surface with a fine file.

IMPROPER ALIGNMENT OF CONDENSER DRIVE SHAFT WITH WORM DRIVE FITTING ON VARIABLE CONDENSER:

On earlier production the mounting bracket holes were too small to allow for production variations. If trouble is experienced with the mounting of the unit to the receiver, production variations found necessary to center the condenser drive shaft with a 3/16" drill.

Remove the cover of the receiver and mount the Motomatic tuner making sure the condenser drive shaft is centered in the worm drive fitting on the variable condenser.

MAGNETIC CLUTCH ARM ADJUSTMENT:

There may be an occasional complaint or observation of a chattering or skipping of the Motomatic clutch when under full load. This is caused by the engaging pins not being engaged deep enough into the clutch arm. This may be corrected by the use of the file and note if the clearance of 1/64" exists from clutch flange to clutch face proper. (See Fig. 11) If the clearance is not 1/64" remove clutch arm and bend angle closer to clutch outside face. This arm is made of treated steel and bends easily. Replace and check; several trials may be necessary.

After making magnetic clutch adjustments it may be necessary to readjust the stop located above clutch so that clutch motion from the engaged position to the disengaged position can be held at a minimum. Note: When clutch is disengaged it is important that the clutch pins do not drag when tuning manually.

Sticking open of clutch when a button is depressed may be caused by many misadjustments. First - the clutch arm may be warped during the process of bending so that the embossed bumps do not ride on the outside edge of the clutch face. Correct this by rebending clutch arm. Second - it is important that the embossed bumps on the clutch arm be in the same plane as the embossed bumps on the clutch face while engaging clutch on back of the receiver. Third - the embossed bumps on the clutch face may be out of alignment with the .004" shim supplied with kit. In other words compare the spacing of the embossed bumps from the clutch face. Correct any differences by bending slightly the forked section of the clutch arm.

SELECTOR SWITCH:

Failure of tuner to operate may lie in the selector switch. Remove back plate and place jumper wire from the first terminal on the end where lead enters switch case to the red wire terminal. This should cause tuner to operate on #1 button. Now repeat, going to the red to blue, blue to brown, etc. to whether the contact ring of these should operate an armature arm. Doing this will give a check as to whether the contact ring of these should operate an armature arm. When button is out. See schematic wiring diagram. If tuner operates in this manner the individual contact fingers are not making contact when button is depressed. Remedies for the above are as follows:

First - it may be necessary to bend contact fingers so that good connection is made. Second - The selector switch case may be bulged in the center. This can be corrected by placing a strap across both sides.

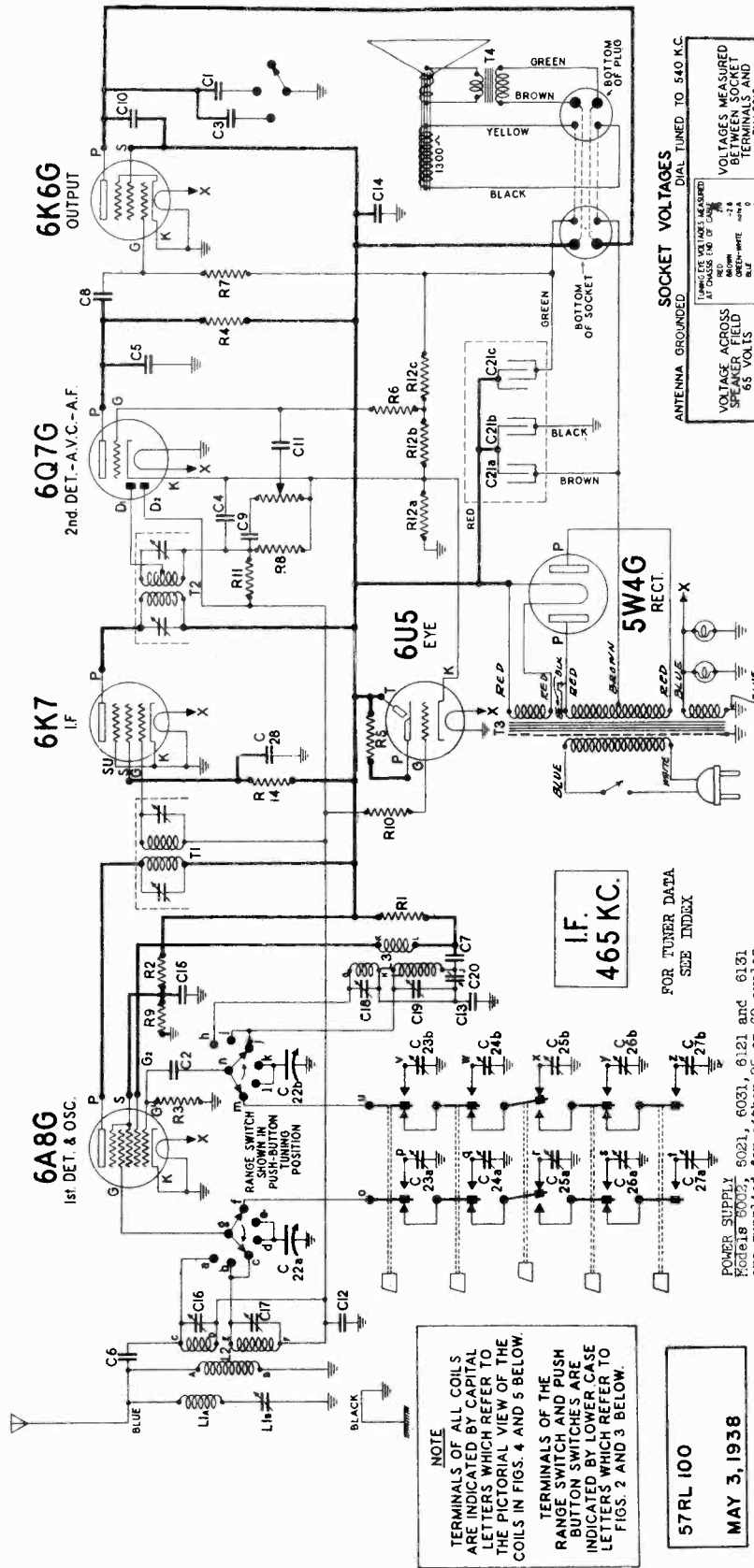
The selector switch plunger back-up plate may become loosened, in which case it will be necessary to push back in place and put a wood wedge between this plate and switch case.

CONDENSER DRIVE SHAFT END PLATE:

The condenser drive shaft (Fig. 4) should not have any lateral or axial play. If some does exist, it can be taken out by bending back the end play adjusting nut. Lock the tabs and taking up on the nut until no play is felt and no additional torque required to turn shaft.

SEARS-ROEBUCK & CO.

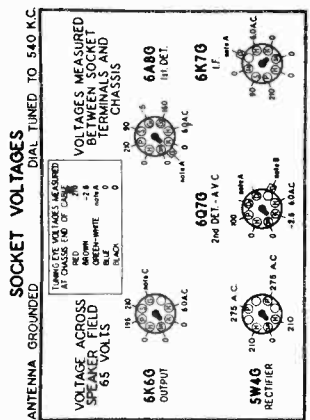
MODELS 6002, 6021, 6031
6121, 6131, Ch. 100, 195
Schematic, Voltage



NOTE
TERMINALS OF ALL COILS
ARE INDICATED BY CAPITAL
LETTERS WHICH REFER TO
THE PICTORIAL VIEW OF THE
COILS IN FIGS. 4 AND 5 BELOW.

TERMINALS OF THE
RANGE SWITCH AND PUSH
BUTTON SWITCHES ARE
INDICATED BY LOWER CASE
LETTERS WHICH REFER TO
FIGS. 2 AND 3 BELOW.

57RL 100
MAY 3, 1938



Use a high resistance voltmeter of 1000 ohms per volt.

NOTE A: The bias for the control grids of the 6U5, 6Q7G, 6U5 and the diode plates of the 6Q7-G tubes is furnished across resistor R12a.

NOTE B: The bias for the control grids of the 6Q7-G is -4.5 volts measured across resistors R12a and R12b.

NOTE C: The bias for the control grid of the 6K6-G output tube is 0 volts measured across resistors R12a, R12b and R12c.

ANTENNA COIL

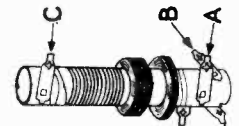


FIG. 5

OSCILLATOR COIL

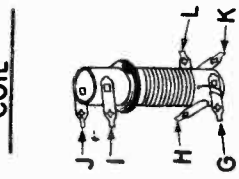


FIG. 4

PUSH-BUTTON TUNER SWITCH

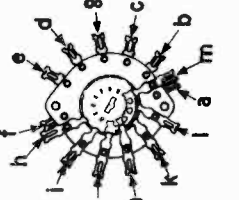


FIG. 3

SWITCH RANGE

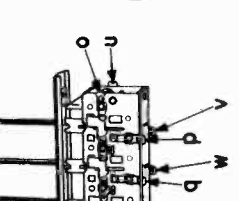


FIG. 2

POWER SUPPLY
Models 6002, 6021, 6031, 6121 and 6131
are supplied for either 25 or 60 cycles
power.

105-125 Volt - 25 cycles - 53 watts
105-125 Volt - 60 cycles - 53 watts

FORM NO. 9691
PRINTED IN THE UNITED STATES OF AMERICA

MODELS 6002, 6021, 6031
6121, 6131, Ch. 100, 195

SEARS-ROEBUCK & CO.

Socket, Trimmers, Chassis
Alignment

POWER OUTPUT

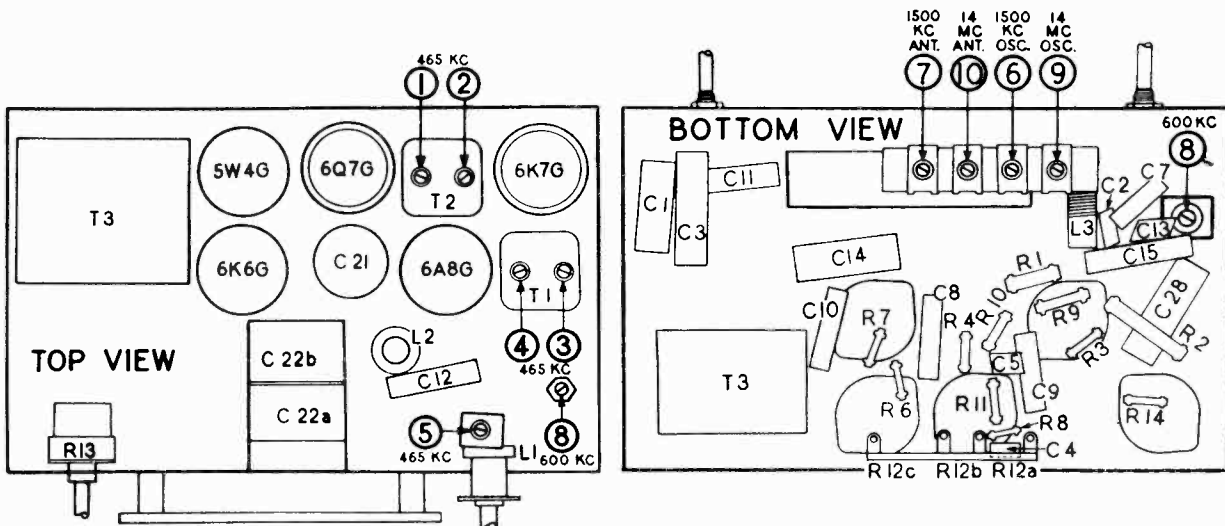
Type.....Pentode
Undistorted.....1.8 watts
Maximum.....3.5 watts

ALIGNMENT PROCEDURE

Before attempting to align the receiver check to see that the dial pointer is in a horizontal position when the gang condenser is in full mesh. If the pointer is incorrectly set, it is merely necessary to move the pointer to the correct position by hand, while holding the gang condenser in the full mesh position.

Output meter connections-----Across voice coil leads
Output meter reading to indicate 0.2 watt output-----0.835 volts
Average sensitivity in microvolts for 0.2 watt output-----See chart below
Connection of Generator Ground-----Receiver chassis
Dummy Antenna in series with Generator Output Lead-----See chart below
Connection of Generator Output Lead-----See chart below
Generator modulation-----30%, 400 cycles
Position of volume control-----Maximum clockwise

DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RANGE SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	SENSITIVITY MICROVOLTS	TYPE OF ADJUSTMENT
.1 MFD CONDENSER	CONTROL GRID OF 6A8-G TUBE	465 KC	AMERICAN "AM" (Center)	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	2nd I.F.	85	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
					3-4	1st I.F.		
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	465 KC	AMERICAN "AM" (Center)	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	-	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	1500 KC	AMERICAN "AM" (Center)	1500 KC	6	"AMERICAN" OSCILLATOR (Shunt)	-	ADJUST TRIMMER TO BRING IN SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	1500 KC	AMERICAN "AM" (Center)	TUNE TO 1500 KC GENERATOR SIGNAL	7	"AMERICAN" ANTENNA	40	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	600 KC	AMERICAN "AM" (Center)	TUNE TO 600 KC GENERATOR SIGNAL	8	"AMERICAN" OSCILLATOR (Series Pad)	30	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	14 MC	FOREIGN "FOR" (Counter-clockwise)	14 MC	9	"FOREIGN" OSCILLATOR (Shunt)	-	ADJUST TO BRING IN SIGNAL. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 13.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 14 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	14 MC	FOREIGN "FOR" (Counter-clockwise)	14 MC	10	"FOREIGN" ANTENNA	30	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.



SEARS-ROEBUCK & CO.

MODELS 6002, 6021, 6031
6121, 6131. Ch. 100.195
MODEL 6157 Ch. 100.198
Parts Lists

Model 6157 Chassis 100.198
PARTS LIST-SOURCE NO. 100
RETAIL SELLING PRICES PREPAID
PRICES SUBJECT TO CHANGE WITHOUT NOTICE
ELECTRICAL PARTS

Part Number	Schematic Location	Description	Selling Price Each
1003112796	L1	Coil - Wave trap (with trimmer)	\$.50
10028113295	L2	Coil - Antenna (broadcast)	1.20
10028113296	L3	Coil - R.F. (broadcast)	1.30
10028113297	L4	Coil - Oscillator (broadcast)	.48
10028113298	L5	Coil - Antenna (police)	.50
10028113301	L6	Coil - Antenna (short wave)	.52
10028113412	L7	Coil - Oscillator (police)	1.20
10028113607	L8	Coil - Oscillator (short wave)	.52
1001983539	C1-C2	Condenser - mica 250 mmfd.	.20
1001983783	C3-C4-C5	Condenser - mica, 110 mmf. (10%)	.20
1001985061	C6	Condenser - mica 5 mmfd.	.15
	C7	Condenser - paper .02 mfd. 400 volt	.25
	C8	Condenser - paper .004 mfd. 400 volt	.25
	C9-C10	Condenser - paper .01 mfd. 400 volt	.25
	C11-C12	Condenser - paper .05 mfd. 200 volt	.25
	C13	Condenser - paper .1 mfd. 300 volt	.25
	C14	Condenser - paper .1 mfd. 400 volt	.25
	C15-C16	Condenser - paper .004 mfd. 400 volt	.24
	C17	Condenser - elect. 30 mfd. 450 volt	1.80
1002089937	C18	Condenser - elect. 10 mfd. 35 volt	.80
10020110377	C19	Condenser - paper .05 mfd. 400 volt	.13
	C20-C21	Condenser - mica 1650 mmfd. (3%)	.30
	C22	Condenser - mica 4050 mmfd. (3%)	.40
10019112428	C23	Condenser - elect. 30 mfd. 450 volt	1.40
10020113261	C24	Condenser - trimmer - 3 section	.54
10017113319	C25-C27	Condenser - trimmer - 3 section	.54
10017113320	C28	Condenser - padding	.38
10017113320	C29-C30	Condenser - variable gang	5.95
10017113346	C31	Trimmer condenser strip - for push buttons	2.98
1005485321	C32	Connector - Ground	.01
10049110629	C33-C34	Lamp - 6.3 volt - .25 amps	.15
	C35	Resistor - carb. 47,000 ohms ± W.	.12
	R1-R2	Resistor - carb. 220,000 ohms ± W.	.12
	R3-R4	Resistor - carb. 1 meg. 1/4 watt	.12
	R5-R6-R7	Resistor - carb. 4700 ohm 1/4 watt	.12
	R8-R9-R10	Resistor - carb. 470,000 ohms ± W.	.12
	R11-R12	Resistor - carb. 470,000 ohms ± W.	.12
	R13	Resistor - carb. 100,000 ohms ± W.	.12
	R14	Resistor - carb. 15,000 ohms 1 watt	.15
	R15	Resistor - carb. 4700 ohms ± W. (10%)	.12
	R16	Resistor - carb. 2200 ohms 1/4 watt	.12
	R17	Resistor - carb. 15000 ohms 3 watts	.25
	R18	Resistor - carb. 10,000 ohms 1 watt	.25
10023110596	R19	Resistor - carb. 220000 ohm ± W. (10%)	.12
10023112956	R20	Resistor - carb. 39000 ohm ± W. (10%)	.12
10023112992	R21	Resistor - Bias Strip	.46
1002114662	R22-R24	Section R23 - 240 ohms	.46
		Section R24 - 35 ohms	
10024114651	R25	Volume control & off-on switch (1 megohm)	1.10
R-10058115037		Speaker - dynamic 10 inch	9.95
R-10057114733		Cone and voice coil for R-10058115037 speaker)	2.76
10038114652		Switch - for push buttons	3.70
10038114141		Switch - radio phono (D.P.D.T.)	.44
10037114649		Range switch	2.10
1005411531		Terminal strip - phone	.13
10033114665	T1	Transformer - 1st I.F.	1.44
10034114667	T2	Transformer - 2nd I.F.	1.44
10013114663	T3	Transformer - output	1.96
10010114668	T4	Transformer - power 117 V. 60 C.	6.72
1001114758	T4	Transformer - power 117 V. 25 C.	9.98

DIAL & MISCELLANEOUS PARTS

Part Number	Description	Selling Price Each
10054114728	Band Indicator Slide and strip	\$.30
10045114032	Bracket & Pulley Assembly - right hand	.34
10045114034	Bracket & Pulley Assembly - left hand	.34
10054113442	Bracket - for tuning eye	.16
10054113149	Button - for push button tuner	.08
10055114088	Cable & Plug - for tuning eye	.60
10053114360	Cap - for tube shield	.08
10045114042	Clamp - for dial scale	.10
10054112745	Clip - coil mounting (osc. & ant.)	.01
10054112758	Clip - for mtg. wave trap coil	.01
10054114031	Collar - for band switch shaft	.10
1005485321	Connector - ground	.01
10045113178	Cord - band indicator (28" required)(supplied in 4 ft. lengths)	.30
10054111302	Cord - dial drive 6 or 50 ft. lgths. Per Ft.	.05
10054111973	Cushion rubber rest for back of chassis	.06
10045114036	Dial mtg. plate	.45
10045114048	Dial pointer & slide	.20
10042114800	Dial Scale - glass	.64
10045113338	Drum - dial drive	.54
10044114823	Escutcheon - for dial	2.40
10044113155	Escutcheon - for eye	.25
10044114824	Escutcheon - around push buttons	1.28
10054113207	Gear - pinion on auxiliary range sw. shaft	.25
10054113347	Gear - on range switch shaft	.20
10039114727	Knob - for range switch	.19
10040114726	Knob - for tuning	.19
10040114725	Knob - for volume control	.19

Models 6002, 6021, 6031, 6121, 6131, Chassis 100.195
PARTS LIST-SOURCE NO. 100
RETAIL SELLING PRICES PREPAID
PRICES SUBJECT TO CHANGE WITHOUT NOTICE
ELECTRICAL PARTS

Part Number	Schematic Location	Description	Selling Price Each
10031112796	L1a-L1b	Coil - Wave Trap (with trimmer)	\$.50
10028113011	L2	Coil - Ant. - broadcast & short-wave	1.20
10013113015	L3	Coil Assembly - oscillator	1.00
	C1	Condenser - paper .02 mfd. 600 volt	.35
1001985061	C2	Condenser - mica 51 mmfd.	.15
	C3	Condenser - paper .04 mfd. 600 volt	.35
1001983539	C4-C5	Condenser - mica 250 mmfd.	.20
1001985454	C6	Condenser - mica 11 mmfd.	.15
	C7-C8-C9	Condenser - paper .01 mfd. 400 volt	.25
	C10	Condenser - Ceramic tube .006 mfd. 600 volt	.25
	C11-C12	Condenser - paper .05 mfd. 200 volt	.25
1001982857	C13	Condenser - mica .0042 mfd.	.35
	C14	Condenser - paper .1 mfd. 400 volt	.25
	C15	Condenser - paper .1 mfd. 200 volt	.25
10017112893	C16-C17	Condenser - trimmer (4 section)	.60
	C18-C19	Condenser - trimmer (4 section)	.60
10017112799	C20	Condenser - padder (530 to 630 mmfd)	.36
		Condenser - electrolytic (dry)	
		(Section A - 8 mfd. - 400 volt)	
		(Section B - 4 mfd. - 400 volt)	1.80
		(Section C - 4 mfd. - 400 volt)	
10020112883	C21a-C21b	Condenser - variable gang	2.90
	C21c	Condenser - dual push button trimmer (1100 KC to 1700 KC)	.38
10016112888	C22a-C22b	Condenser - dual push button trimmer (770 KC to 1350 KC)	.45
10017112890	C23a-C23b	Condenser - dual push button trimmer (550 KC to 1000 KC)	.50
10017112891	C24a-C24b	Condenser - paper .1 mfd. 400 volt	.25
10017112892	C25a-C25b	Condenser - paper .1 mfd. 400 volt	.25
10017112892	C26a-C26b	Condenser - paper .1 mfd. 400 volt	.25
	C27a-C27b	Condenser - paper .1 mfd. 400 volt	.25
10057113409-U	C28	Cone - voice coil assem. (10057-115019-U Speaker)	1.80
10057113410-U		Cone - voice coil assem. (10057-115020-U Speaker)	1.85
10049110629		Lamp - 6.3 volt - .25 amps	.15
	R1	Resistor - carb. 10,000 ohms ± watt	.15
	R2	Resistor - carb. 15,000 ohms 1 watt	.15
	R3	Resistor - carb. 47,000 ohms ± watt	.12
	R4	Resistor - carb. 220,000 ohms ± watt	.12
	R5-R6	Resistor - carb. 1 megohm 1/4 watt	.12
	R7	Resistor - carb. 470,000 ohms ± watt	.12
	R8	Resistor - carb. 220,000 ohms ± watt	.12
	R9	Resistor - carb. 22,000 ohms ± watt	.12
	R10	Resistor - carb. 2.2 meg. 1/4 watt	.15
	R11	Resistor - carb. 3.3 meg. 1/4 watt	.12
		Resistor - (Section A - 55 ohms)	
10021112789	R12a-R12b	Resistor - (Section B - 30 ohms)	.40
	R12c	Resistor - (Section C - 240 ohms)	.40
	R14	Resistor - carb. 68,000 ohms ± watt	.12
10055115019-U		Speaker - dynamic 6"	5.30
10055115020-U		Speaker - dynamic 8"	7.70
10037112868		Switch - range	.96
10038112869		Switch Assembly - for push buttons	2.90
10038112870		Switch - Tone Control	.40
10033112684	T1	Transformer - 1st I.F.	1.20
10035113496	T2	Transformer - 2nd I.F.	1.25
10010112687	T3	Transformer - power 117 V. -60 cycle	3.50
10010113473	T3	Transformer - power 117 V. -25 cycle	5.00
10013113408-U	T4	Transformer - output for 100131150-20-U or 10013115019-U speaker	1.20
10024112889	R13	Volume Control - 500,000 ohms with off-on switch	.90

DIAL DRIVE & MISCELLANEOUS PARTS

Part Number	Description	Selling Price Each
10054113149	Button - for push button tuner	\$.08
10018113130	Cable & Plug - for tuning eye	.55
10054112745	Clip - coil mounting (osc. & ant.)	.01
10054112796	Clip - wave trap coil mtg.	.01
10054113019	Clip - dial scale retaining	.01
10054111302	Cord - dial drive 6 or 50 ft. lgths. Per Ft.	.05
10054112233	Drum & Bushing - for dial drive	.35
10044113146	Escutcheon - for dial	.84
10044113147	Escutcheon - for push buttons	.48
10044113148	Escutcheon - for tuning eye	.20
10059113378	Instruction Book - Model 100.195	.10
10039113131	Knob - Tone Control	.12
10039113132	Knob - Range switch	.12
10039113133	Knob - Volume control	.14
10039113134	Knob - Tuning	.14
10054113138	Mtg. Plate & Bracket - for dial	.42
10054110496	Plug - Speaker (4 prong)	.12
10041113183	Pointer - dial	.12
1005481145	Retaining Ring - for drive shaft	Per C .50

MODELS 6003, 6004, 6024
6034, 6124, 6134
Chassis 101.510

SEARS-ROEBUCK & CO.

Jacks Installation
Schematic
Alignment

SUBJECT: CONNECTION OF EARPHONE AND PHONOGRAPH PICKUP JACKS:

Part number 101S119531 Jack, for connection of earphones or phonograph pick-up, can be ordered directly from source 101. Retail selling price is 79¢.

The schematic section on the back of this sheet shows the connections.

If a crystal pick-up is used, a filter composed of a .01 mfd. condenser and a 100M ohm resistor connected in series, should be connected across the pick-up to prevent excessive bass response. This filter will also act as a partial scratch filter.

- Output meter connection Across loud speaker voice coil 0.85 volts
- Output meter reading to indicate 500 milliwatts See chart below
- Average sensitivity in microvolts for 500 milliwatts output Receiver chassis
- Generator ground lead connection See chart below
- Dummy antenna value to be in series with generator output See chart below
- Connection of generator output lead 30%, 400 cycles
- Generator modulation Fully clockwise
- Position of Volume Control HI
- Position of Tone Control Center of block to left of 550 kc calibration mark.

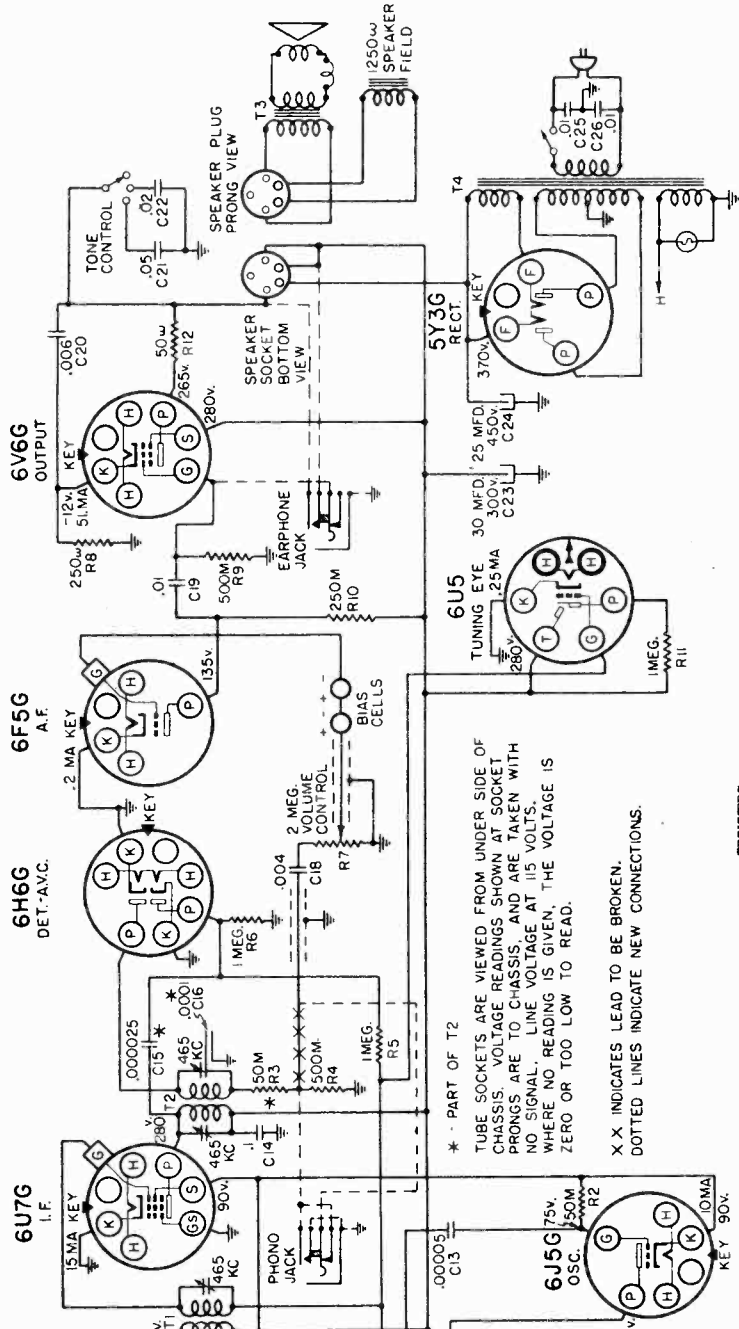
ALIGNMENT PROCEDURE

PRELIMINARY:

RAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ORDER (SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	485 kc	.1 mfd.	6480 Grid	T3, T1	IF Output IF Input	90
"SW"	15 mc (rock)	15 mc	400 ohms	Ant. Term.	C5	Translator	50
"9POR"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C7*	Oscillator Translator	80
"AM"	Fully open	1730 kc	.0003 mfd.	Ant. Term.	C8	Oscillator	90
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C3, C2	Transl., Ant.	75
"AM"	900 kc(rock)	800 kc	.0003 mfd.	Ant. Term.	C9	Padder	80

IMPORTANT ALIGNMENT NOTES

The alignment must be done in the order given.
Two peaks can be had, one with the trimmer screwed further out than the other. The correct adjustment is with the trimmer screwed further out. The other peak is the image.
Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.
The alignment procedure should be repeated stage by stage. In the original order, for greatest accuracy, always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.



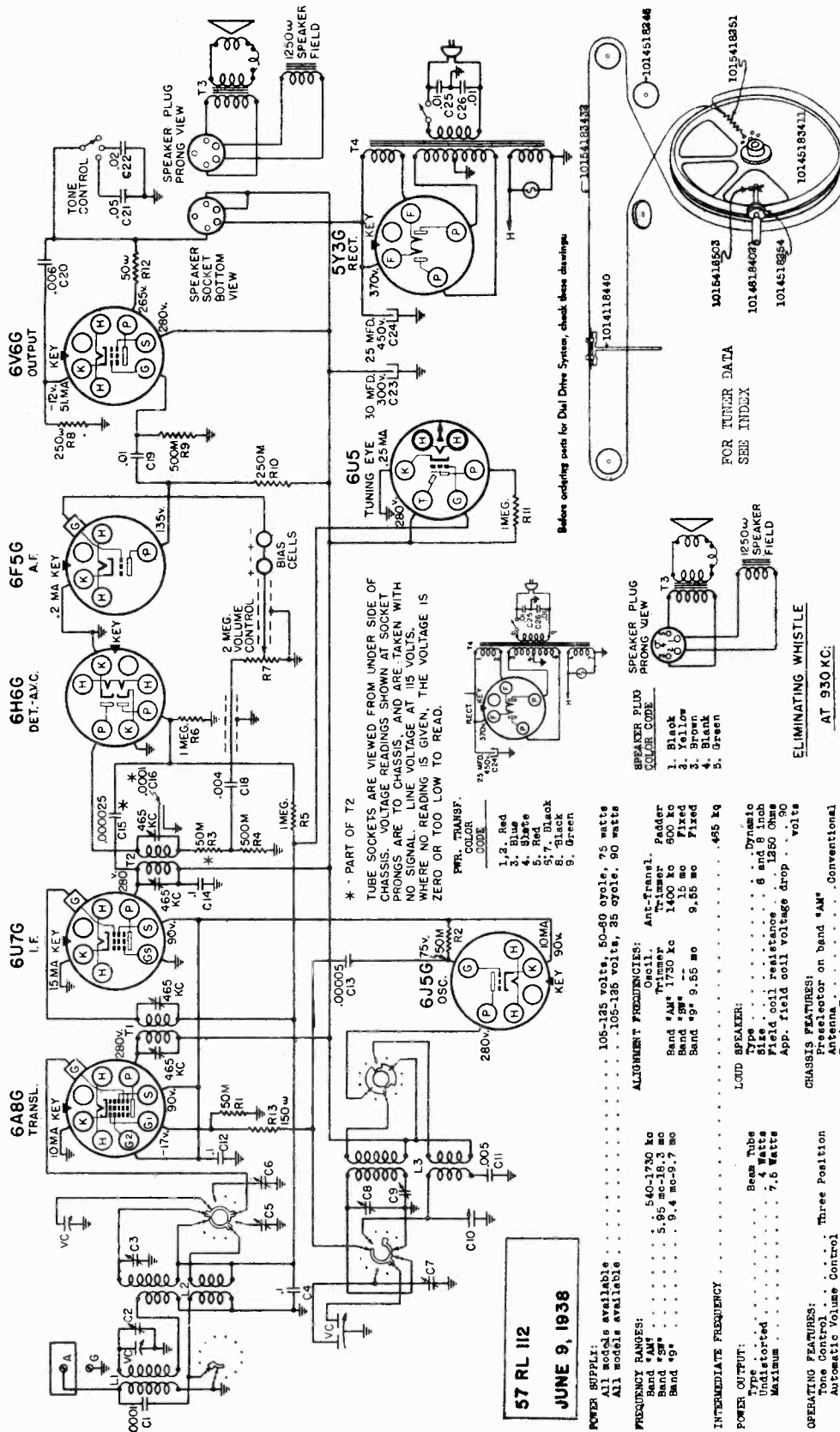
* PART OF T2
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

X X INDICATES LEAD TO BE BROKEN.
DOTTED LINES INDICATE NEW CONNECTIONS.

Schematic, Voltage Drive Data

SEARS-ROEBUCK & CO.

MODELS 6003, 6004, 6024
6034, 6124, 6134
Chassis 101.510



* - PART OF T2
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT ITS VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

PRG. TRANSF. COLOR CODE

1.	Red
2.	Black
3.	Blue
5.	Red
5.	Black
7.	Black
8.	Black
9.	Green

57 RL 112
JUNE 9, 1938

POWER SUPPLY:
All models available 105-125 volts, 50-60 cycle, 75 watts
All models available 105-125 volts, 25 cycle, 90 watts

FREQUENCY RANGES:
Band *5W* 540-1730 kc
Band *9* 5.85 mc-16.3 mc
Band *9* 9.4 mc-9.7 mc

INTERMEDIATE FREQUENCY 465 kc

POWER OUTPUT:
Type Beam Tube
Undistorted 4 Watts
Maximum 7.5 Watts

ALIGNMENT FREQUENCIES:
Oscillator 1730 kc
Ant.-Transf. 1400 kc
Tri-Transf. 600 kc
Band *5W* 15 mc
Band *9* 9.55 mc

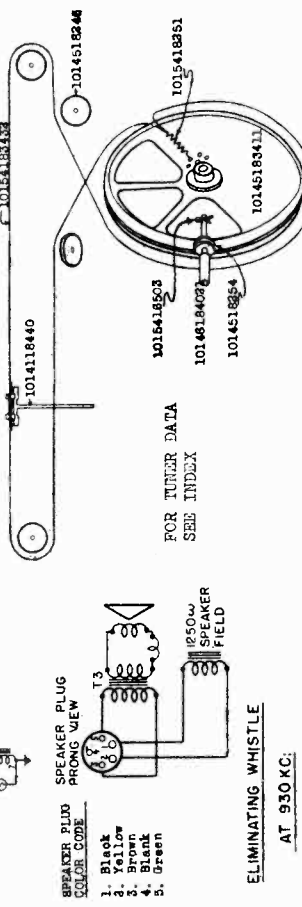
LOUD SPEAKER:
Type Dynamic
Size 8 in. x 5 in.
Max. coil resistance 1250 ohms
App. field coil voltage drop volts

CHASSIS FEATURES:
Presselector on band *AM* Conventional
Antenna
Tuning Eye

MECHANICAL SPECIFICATIONS
Tone Control Three Position
Automatic Volume Control
Spread Band Tuning
Push Button Tuning (8 buttons)

CONTROL OPERATION:
Turning right: Volume increase
Turning right: HI, MED, LO
Turning right: AM, SW, 9
Turning ratio: 13:1

OPERATING CONTROLS:
1. Upper left knob Volume
2. Lower left knob On-off switch
3. Lower right knob Band switch
4. Upper right knob Station Selector



FOR TUNER DATA SEE INDEX

ELIMINATING WHISTLE AT 930 KC.

A whistle, due to a beat between the second harmonic (930 kc) of the 465 kc IF and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

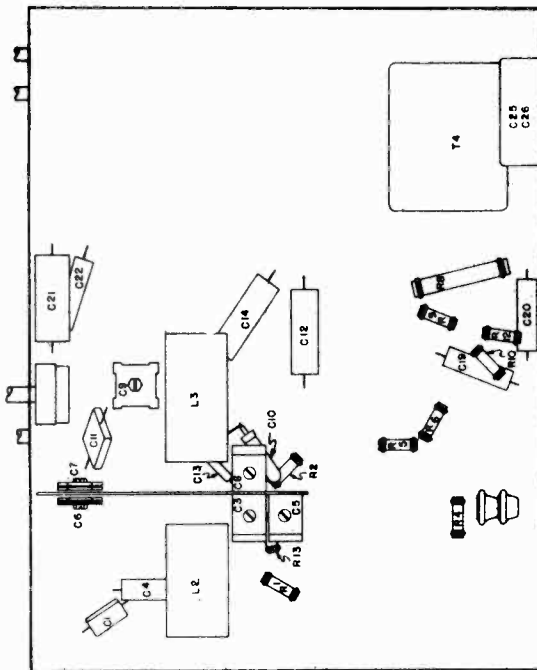
Determining at what point between 900 kc and 960 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at 915/2 or 457.5 kc. Try to select the new IF frequency as close as possible to 465 kc.

Align the IF at the new frequency and then realign the rest of the receiver as described under "ALIGNMENT FREQUENCIES".

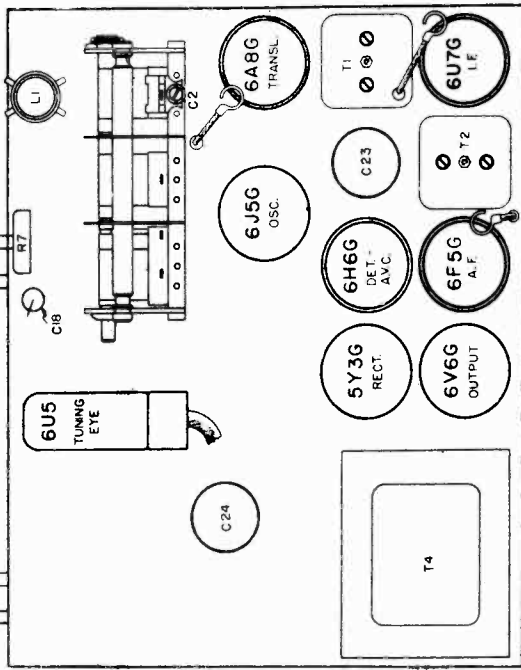
MODELS 6003, 6004, 6024
6034, 6124, 6134
Chassis 101.510

SEARS-ROEBUCK & CO.

MODELS 6005, 6071, 6076
6171, 6176. Ch. 101.507
Socket, Trimmers, Chassis



LOCATIONS OF PARTS UNDER CHASSIS.
MODELS 6003, 6004, 6024, 6034, 6124, 6134
CHASSIS 101.510



LOCATIONS OF PARTS ON TOP OF CHASSIS.

SILVERTONE BATTERY CHARGERS AVAILABLE:

The customer should be told about the SILVERTONE GAS-O-POWER and the SILVERTONE SUPER AIR-CHARGER. Either of these units provides an economical means of keeping the storage battery charged. The customer should be informed of the advisability of frequent hydrometer testing of the storage battery to prevent it from becoming too low in charge. A battery that is allowed to run too low before re-charging will not have as long a life as one that is re-charged more frequently.

LOUD SPEAKER:

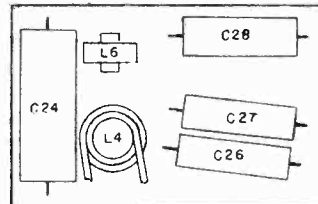
Type PM Dynamic
Size 8"

POWER OUTPUT:

Type Pentode
Undistorted35 watts
Maximum5 watts

CHASSIS FEATURES:

Number of IF stages One
Number condenser in gang Two
Antenna Conventional
Tuning Eye
Built-in IF Wave Trap
Synchronous Vibrator-Rectifier



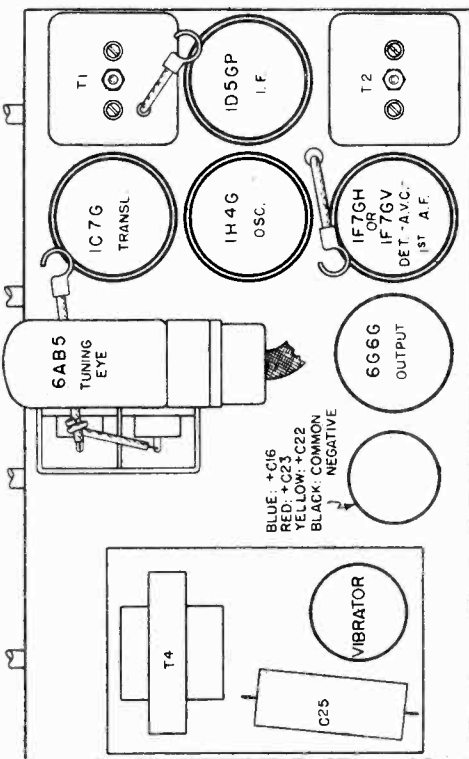
LOCATIONS OF PARTS UNDER POWER SUPPLY

MODELS 6005, 6071, 6076
6171, 6176 CHASSIS 101.507

CONTROL OPERATION:
Turning right: "A",
Turning right: "A",
Turning ratio: 13:1
Turning right: On, "HI"; "LO"

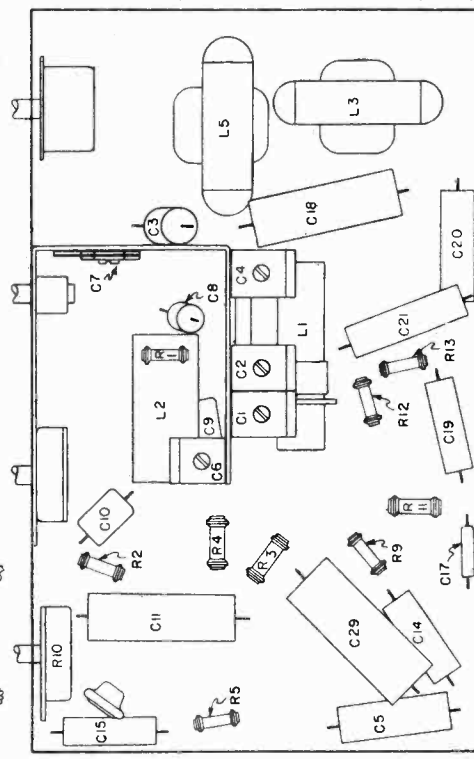
OPERATING FEATURES:
Tone Control Two position
Automatic Volume Control

OPERATING CONTROLS:
1. Left knob Volume Control
2. Next to left knob Wave Switch
3. Next to right knob Station Selector
4. Right knob On-Off Switch and Tone Control



BLUE: +C16
RED: +C23
YELLOW: +C22
BLACK: COMMON
NEGATIVE

LOCATIONS OF PARTS ON TOP OF CHASSIS.

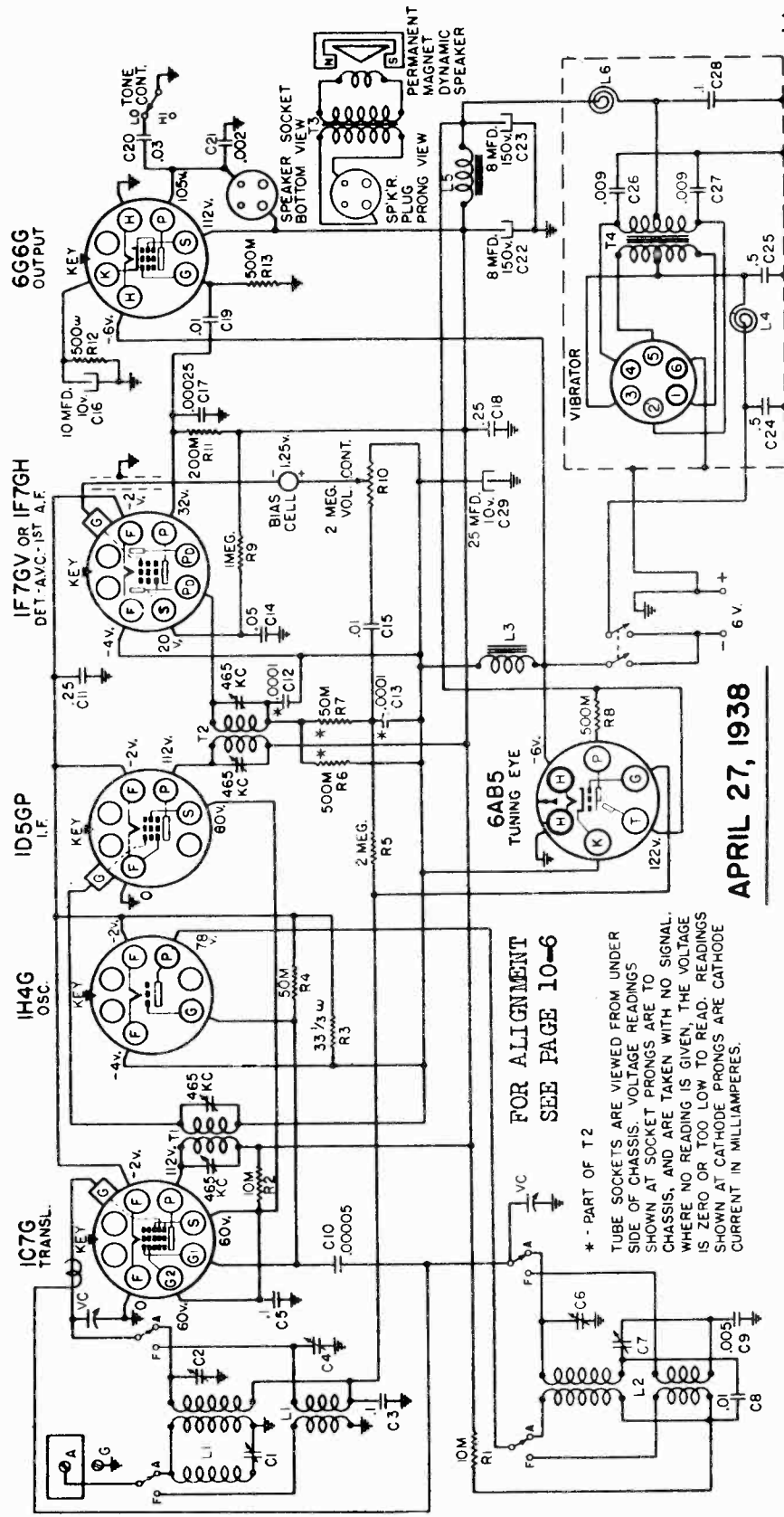


LOCATIONS OF PARTS UNDER CHASSIS.

SEARS-ROEBUCK & CO.

MODELS 6005, 6071, 6076
6171, 6176. Ch. 101. 507
Schematic, Voltage
Socket

FOR ALIGNMENT, SEE INDEX.



APRIL 27, 1938

FOR ALIGNMENT
SEE PAGE 10-6

* - PART OF T2
TUBE SOCKETS ARE VIEWED FROM UNDER
SIDE OF CHASSIS. VOLTAGE READINGS
SHOWN AT SOCKET PRONGS ARE TO
CHASSIS, AND ARE TAKEN WITH NO SIGNAL.
WHERE NO READING IS GIVEN, THE VOLTAGE
IS ZERO OR TOO LOW TO READ. READINGS
SHOWN AT CATHODE PRONGS ARE CATHODE
CURRENT IN MILLIAMPERES.

POWER SUPPLY:
Six volt storage battery

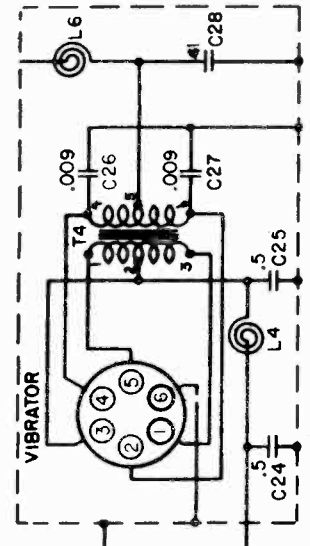
FREQUENCY RANGES:
Band "A" 540-1750 kc
Band "F" 5.9-18.2 mc

Battery drain 1.5 amperes

ALIGNMENT FREQUENCIES:
Oscil. Ant.-Transl. 465 kc
Trimmer 1400 kc
Band "A" 1400 kc
Band "F" 15 mc

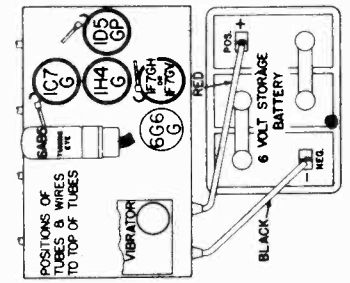
POWER TRANSF. COLOR CODE

- 1, 2, 3 - Enamel
- 4 - Red
- 5 - Slate
- 6 - Blue



INTERMEDIATE FREQUENCY 465 kc

TUBE LAYOUT



CHASSIS 101.511, 101.515
101.517, 101.524, 101.534

SEARS-ROEBUCK & CO.

Alignment

MODEL 6036

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	465 kc	.1 mfd.	8480 0r14	T3, T1	IF Output IF Input	--
"5W"	15 mc (rook)	15 mc	400 ohms	Ant. Term.	C5	Translator	25
"9"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C11*, C8	Oscillator Translator	40
"11"	11.8 mc	14.8 mc	400 ohms	Ant. Term.	C7	Oscillator Translator	35
"15"	15 mc	15 mc	400 ohms	Ant. Term.	C9*	Oscillator Translator	35
"AM"	1400 kc	1400 kc	.0003 mfd.	Ant. Term.	C15, C4, C1	Osc. Transal., RF	35
"AM"	800 kc (rook)	800 kc	.0002 mfd.	Ant. Term.	C15	Padder	40

MODEL 6038

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	465 kc	.1 mfd.	8480 0r14	T3, T2, T1	IF Output, IF Interstage, IF Input	--

MODELS INDICATED AS 6008 INCLUDES MODELS, 6009, 6018, 6019, 6048, 6068, 6069, 6148, 6168, CHASSIS 101.524, 6079, CHASSIS 101.516, 6136, CHASSIS 101.511, 6138, CHASSIS 101.517, 6140, CHASSIS 101.534.

FOR LOCATION OF TRIMMERS SEE INDEX.

Output meter connection Across loud speaker voice coil.
Output meter reading to indicate 50 milliwatts, MODEL 6008, 6074, 0.37 volts, to indicate 500 milliwatts, MODELS 6036, 6140, 0.196 volts; for MODEL 6038, 1.08 volts.

Approximate microwatts input for 50 milliwatts output:-
For Models, 6008, 6074 see chart below.
For 500 milliwatts output, for Models 6036, 6038, 6140, -- see chart below.

Generator ground lead connection..... receiver chassis.
Dummy antenna value to be in series with generator output see chart below.
Connection of generator output lead 30% 400 cycles.
Generator modulation Fully lockwise.
Position of volume control HI.
Position of tone control Center of block to left
Position of dial pointer with variable fully closed Center of block to left of 550 kc calibration mark.

MODEL 6038

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	465 kc	.1 mfd.	8480 0r14	T3, T2, T1	IF Output, IF Interstage, IF Input	--
"5W"	18 mc	18 mc	400 ohms	Ant. Term.	C39*	Oscillator	--
"9"	15 mc(rook)	15 mc	400 ohms	Ant. Term.	C11, C4	Translator, RF	10
"9"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C38*	Oscillator	20
"11"	11.7 mc	11.7 mc	400 ohms	Ant. Term.	C12, C3	Translator RF	13
"15"	14.9 mc	14.9 mc	400 ohms	Ant. Term.	C29*	Oscillator Translator	10
"AM"	1400 kc	1400 kc	.0003 mfd.	Ant. Term.	C30	Oscillator Translator	15
"AM"	800 kc(rook)	800 kc	.0002 mfd.	Ant. Term.	C31	Padder	40

MODEL 6036, 6038, 6140. IMPORTANT ALIGNMENT NOTES

The alignment must be done in the order given.
Two peaks can be had, one with the trimmer screwed further out than the other. The correct adjustment is with the trimmer screwed further out. The other peak is the image, where indicated by the word "Rook". The variable should be rooked back and forth a degree or two while making the adjustment.
The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

MODEL 6140

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	465 kc	.1 mfd.	8480 0r14	T2, T1	IF Output IF Input	90
"5W"	15 mc (rook)	15 mc	400 ohms	Ant. Term.	C5	Translator	50
"9PDR"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C8	Oscillator Translator	80
"AM"	1400 kc	1400 kc	.0003 mfd.	Ant. Term.	C8, C3, C2	Osc. Transal., Ant.	75
"AM"	800 kc (rook)	800 kc	.0002 mfd.	Ant. Term.	C9	Padder	80

MODEL 6074

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	465 kc	.1 mfd.	8080 0r14	T3, T1	IF Output IF Input	75
"AM"	800 kc	800 kc	.0003 mfd.	Ant. Term.	C1*	Wave Trap	--
"5W"	15 mc(rook)	15 mc	400 ohms	Ant. Term.	C4	Translator	50
"9PDR"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C7*	Oscillator Translator	65
"AM"	1780 kc	1780 kc	.0003 mfd.	Ant. Term.	C10	Oscillator	75
"AM"	1400 kc	1400 kc	.0003 mfd.	Ant. Term.	C3	Translator	45
"AM"	800 kc(rook)	800 kc	.0002 mfd.	Ant. Term.	C11	Padder	35

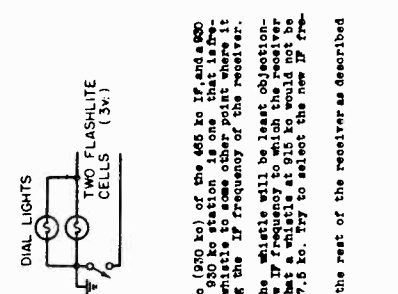
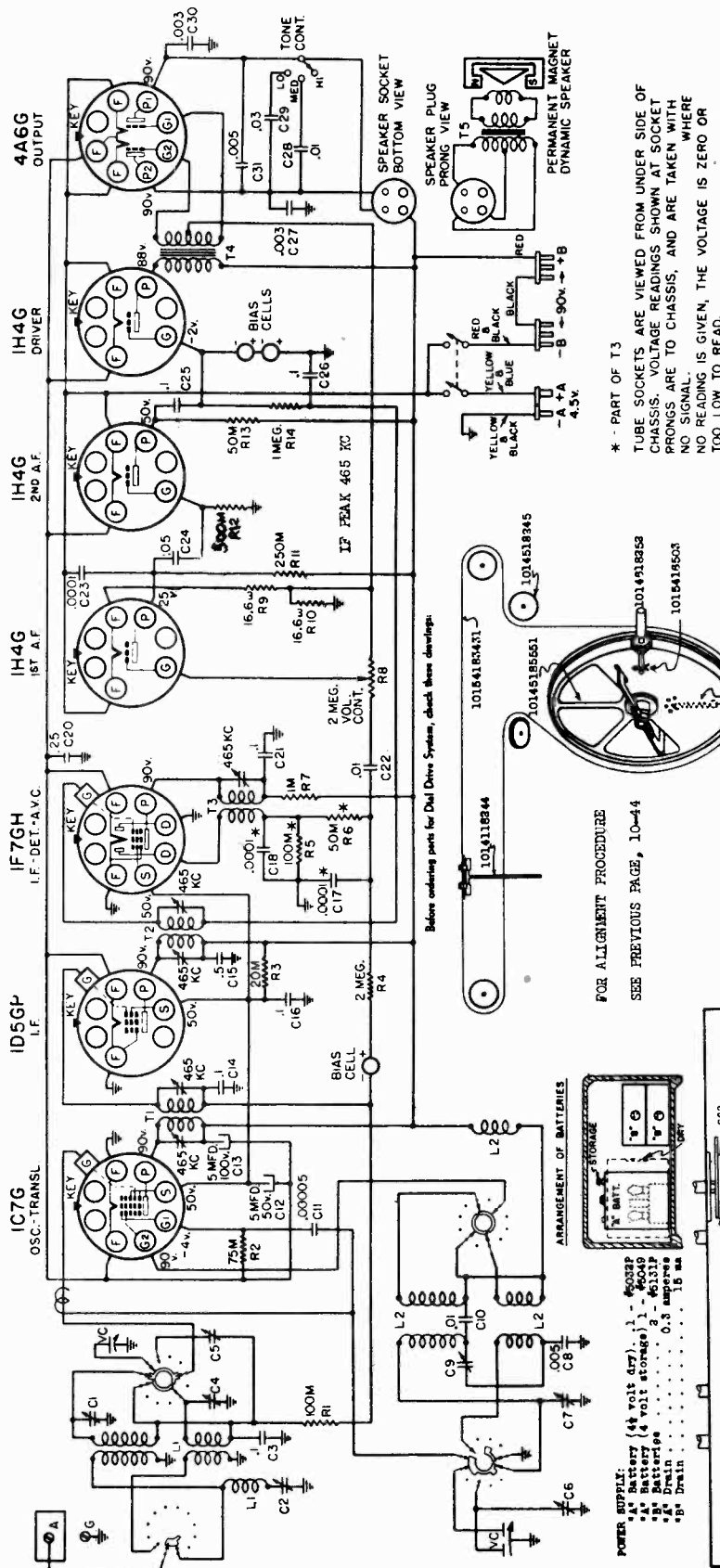
MODELS 6008, 6074. IMPORTANT ALIGNMENT NOTES

The alignment must be done in the sequence given.
The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 465 kc is known, the generator should be adjusted to the frequency of that station instead of to 465 kc.
Where indicated by the word "Rook", the variable should be rooked back and forth a degree or two while making the adjustment.
The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

Schematic, Socket, Trimmers
Drive Data, Notes

SEARS ROEBUCK & CO.

MODELS 6008, 6009, 6018
6019, 6048, 6049, 6068, 6069
6148, 6168 Chassis 101.524



SWITCH OPERATED BY PUSHING VOLUME CONTROL KNOB IN.
 USE NO. 6000 ADAPTOR WITH 4-VOLT STORAGE "A" BATTERY ONLY
 ELIMINATING WHIMSY AT 930 KC.

A whistle, due to a beat between the second harmonic (930 kc) of the 465 kc IF and a 800 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other station. This will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 900 kc and 960 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be aligned at 915/2 or 457.5 kc. Try to adjust the new IF frequency as near as possible to 465 kc.

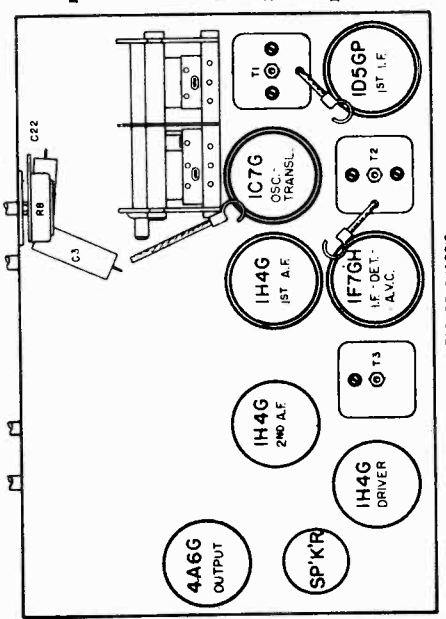
Align the IF at the new frequency and then realign the rest of the receiver as described under, "ALIGNMENT PROCEDURE".

FREQUENCY RANGES:
 Broadcast 540-1730 kc
 Short Wave 1.6-30 mc
 Spread Band 9.4 mc-9.7 mc

ALIGNMENT FREQUENCIES:
 Oscillator 1014518551
 Ant.-Transl. Padler 1015418651
 Trimmer 101418244
 Band "A" 1400 kc
 Band "B" 15 mc
 Band "C" 9.35 mc
 Band "D" 9.55 mc
 Intermediate Frequency 465 kc

POWER OUTPUT:
 Type Glass 5"
 Undistorted 0.5 watts
 Maximum 0.8 watts

LOAD SPEAKER:
 Type PM Dynamic
 Size 6 and 8 inch



57RL 108
 JUNE 16, 1938

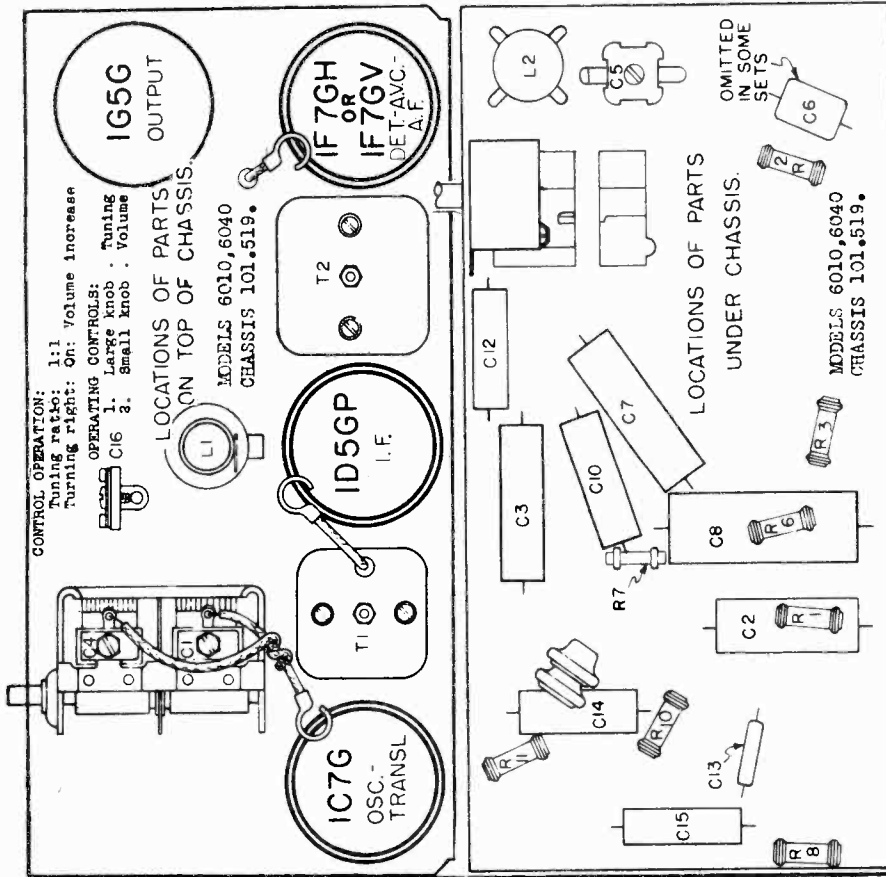
MODELS 6008, 6009, 6018
6019, 6048, 6049, 6068, 6069
6148, 6168. Ch. 101.524
Chassis Layout, Data

SEARS-ROEBUCK & CO. Socket, Trimmers, Chassis
Notes

MODELS 6010, 6040, Ch. 101.519

BATTERY REPLACEMENT:

The dry 4 1/2 volt "A" battery should be replaced when its voltage drops to 3.4 volts, under load. The 6 1/2 volt "B" battery should be replaced when the voltage of the battery has dropped to 4.5 volts, under load. The life rating of the various size batteries, given on the next page, are for an average use of three hours a day.



THE "A" SUPPLY:

These models may be used with either a 4 1/2 volt dry "A" battery or a 4 volt storage "A" battery. Catalog #5000 adaptor is necessary to make the connection between the "A" plug and the terminals of the storage battery.

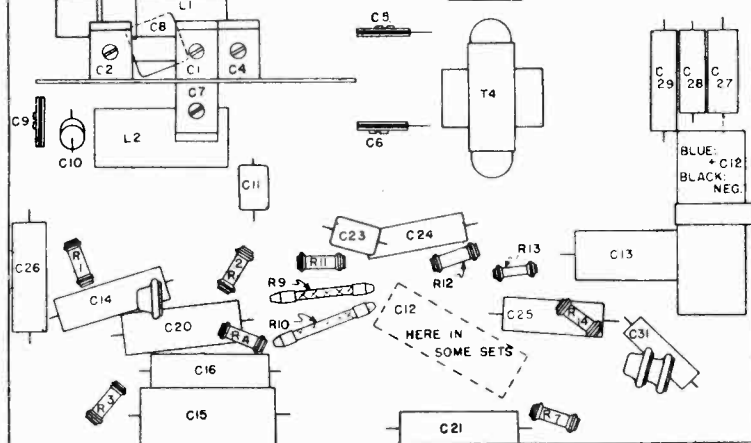
THE FILAMENT CIRCUIT:

Since the tubes have two volt filaments and the "A" supply is four volts, a series parallel arrangement is used for the filament circuit. Accordingly, if any tube burns out, its companion tube will not light either. The full "A" voltage will appear across the filament terminals of the burnt out tube.

THE AVC CIRCUIT:

Diode current of the 1F7GH tube, flowing through the 500M ohm resistor, R5, creates a voltage drop across it. This voltage is applied to the control grid of the 1C7G tube to provide AVC.

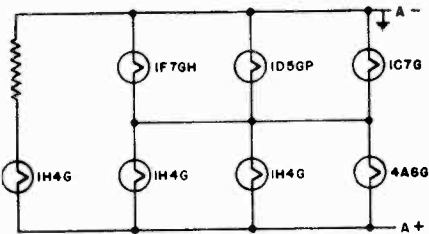
LOCATIONS OF PARTS UNDER CHASSIS. MODELS 6008, 6009, 6018, 6019, 6048, 6049, 6068, 6069, 6148, 6168. CHASSIS 101.524.



THE FILAMENT CIRCUIT:

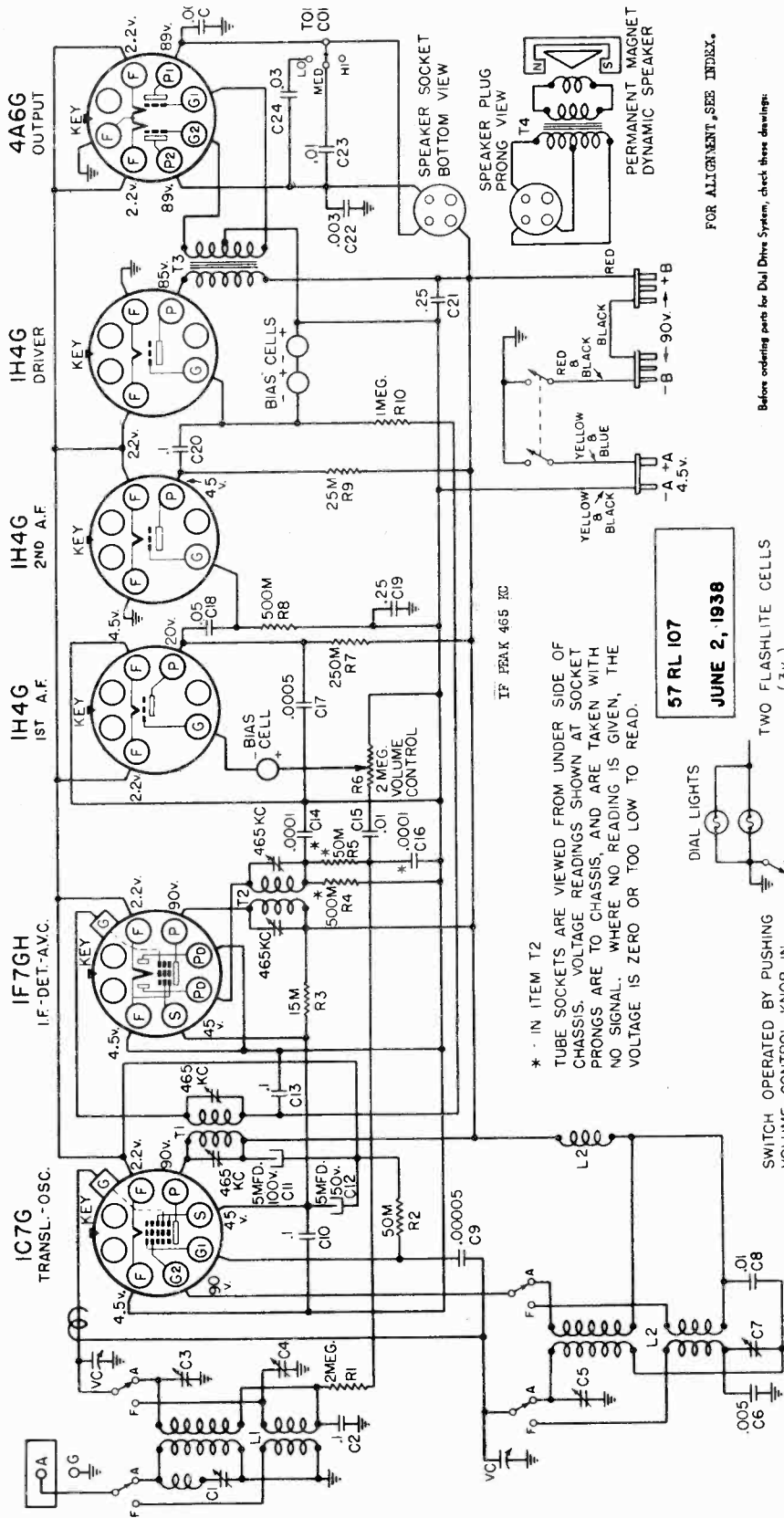
Since the "A" supply is four volts and the tube filaments are rated at two volts, a series parallel arrangement is used for the filament circuit. A simplified diagram is shown below. If any one tube burns out (except the 1H4G first AP), the filament voltage and current of the other tubes will be affected.

A Catalog #5000 adaptor must be used on the "A" cable plug when a storage "A" battery is used. The owner should be warned not to attempt the use of a six volt automobile storage battery. Only a four volt storage "A" battery should be used.



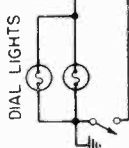
SEARS-ROEBUCK & CO.

MODELS 6016, 6017, 6046
6047, 6146. Ch. 101.512
Schematic, Voltage
Drive Data



* IN ITEM T2
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

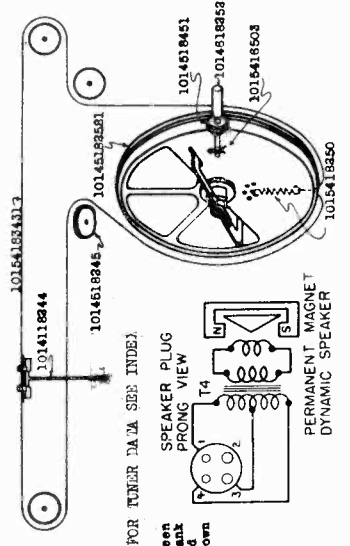
57 RL 107
JUNE 2, 1938



SWITCH OPERATED BY PUSHING VOLUME CONTROL KNOB IN.

FOR ALIGNMENT, SEE INDEX.

Before ordering parts for Dial Drive System, check these drawings:



COLOR CODE

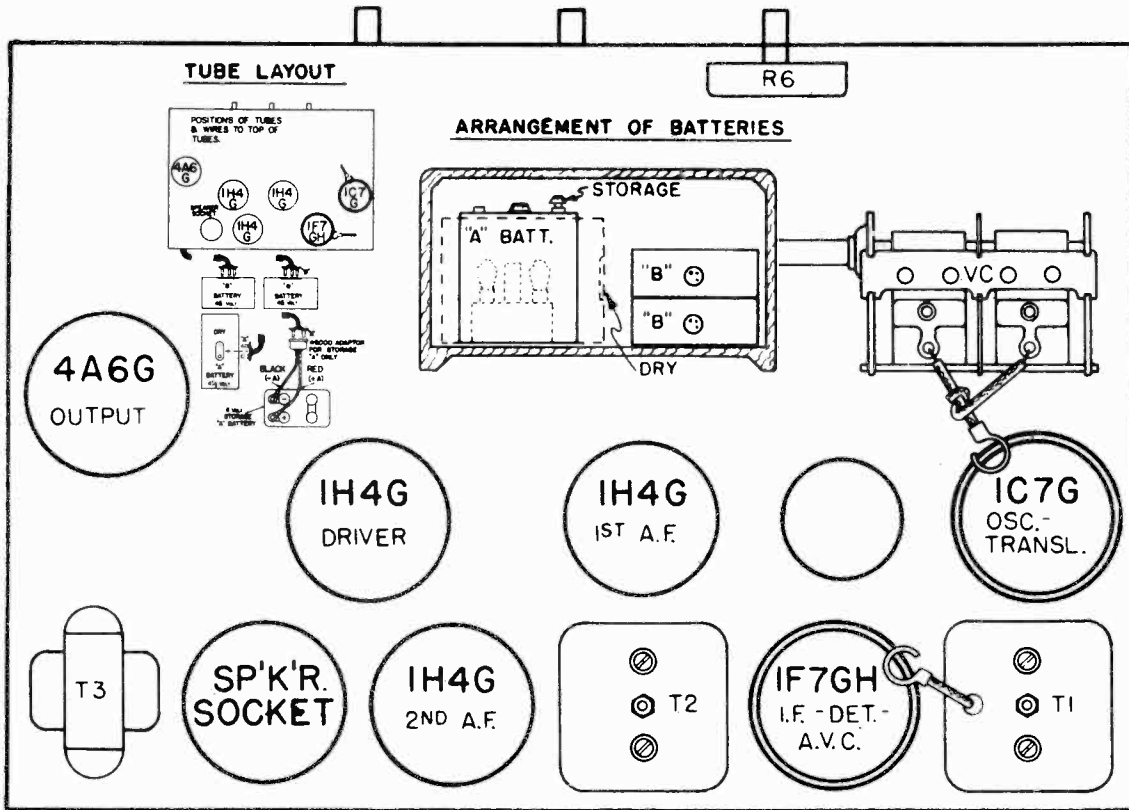
- 1. Blue
- 2. Red
- 3. Green
- 4. Black
- 5. Yellow

ELECTRICAL SPECIFICATIONS

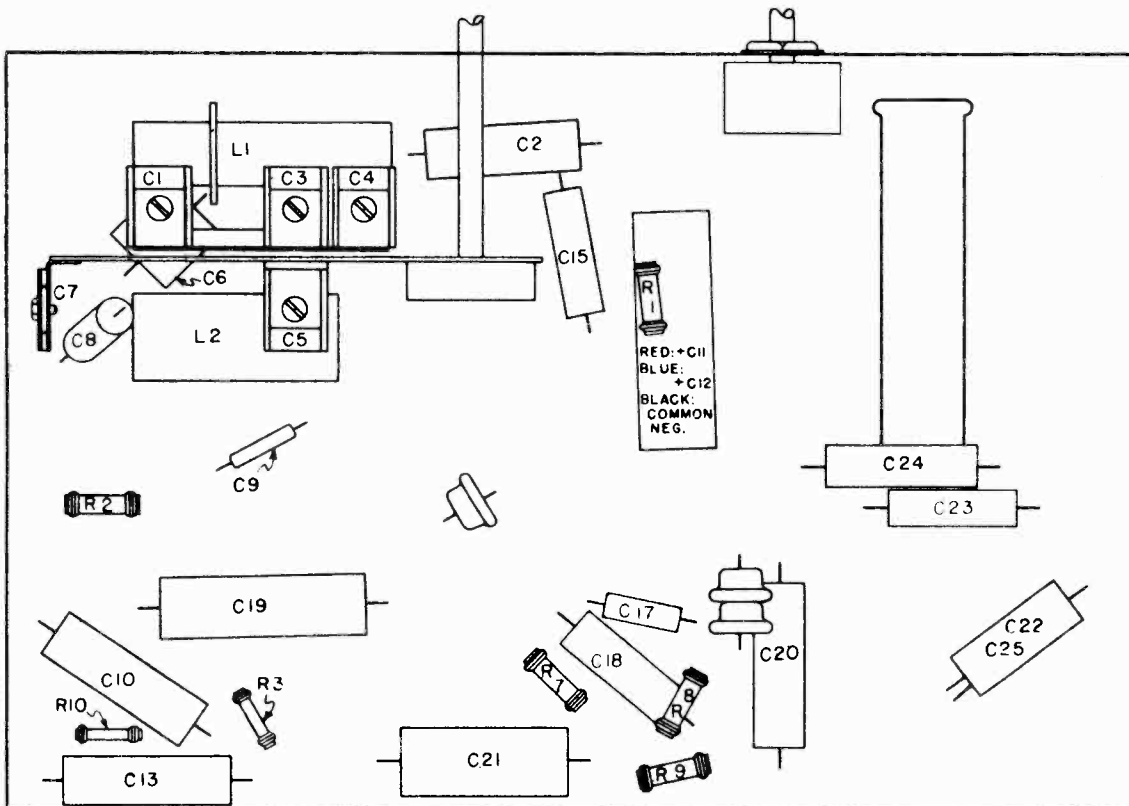
TUBES AND FUNCTIONS:	1C7G	Oscillator-Translator	Second AF
	1F7GH	IF-Detector-AVC	Driver
	1H4G	4A6G	Output
POWER SUPPLY:	4A Battery (4 volt dry)	1 - 4031	
	4A Battery (4 volt storage)	1 - 4049	
	4B Batteries	3 - 4041	
FREQUENCY RANGES:	Broadcast	540-1750 kc	
	Short wave	5.9-18.5 mc	
INTERMEDIATE FREQUENCY:		465 kc	
ALIGNMENT FREQUENCIES:	Grid Dip	1400 kc	
	Antenna Trimmer	1400 kc	
	Padder	600 kc	
	Trimmer	1400 kc	

MODELS 6016, 6017, 6046
6047, 6146 Ch. 101.512
Socket, Trimmers, Chassis

SEARS-ROEBUCK & CO.



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS.

OPERATING FEATURES:

- Tone control Three position
- Automatic Volume Control
- "On-Off" indicator
- Dial FLASH-O-LITE
- Push Button Tuning

POWER OUTPUT:

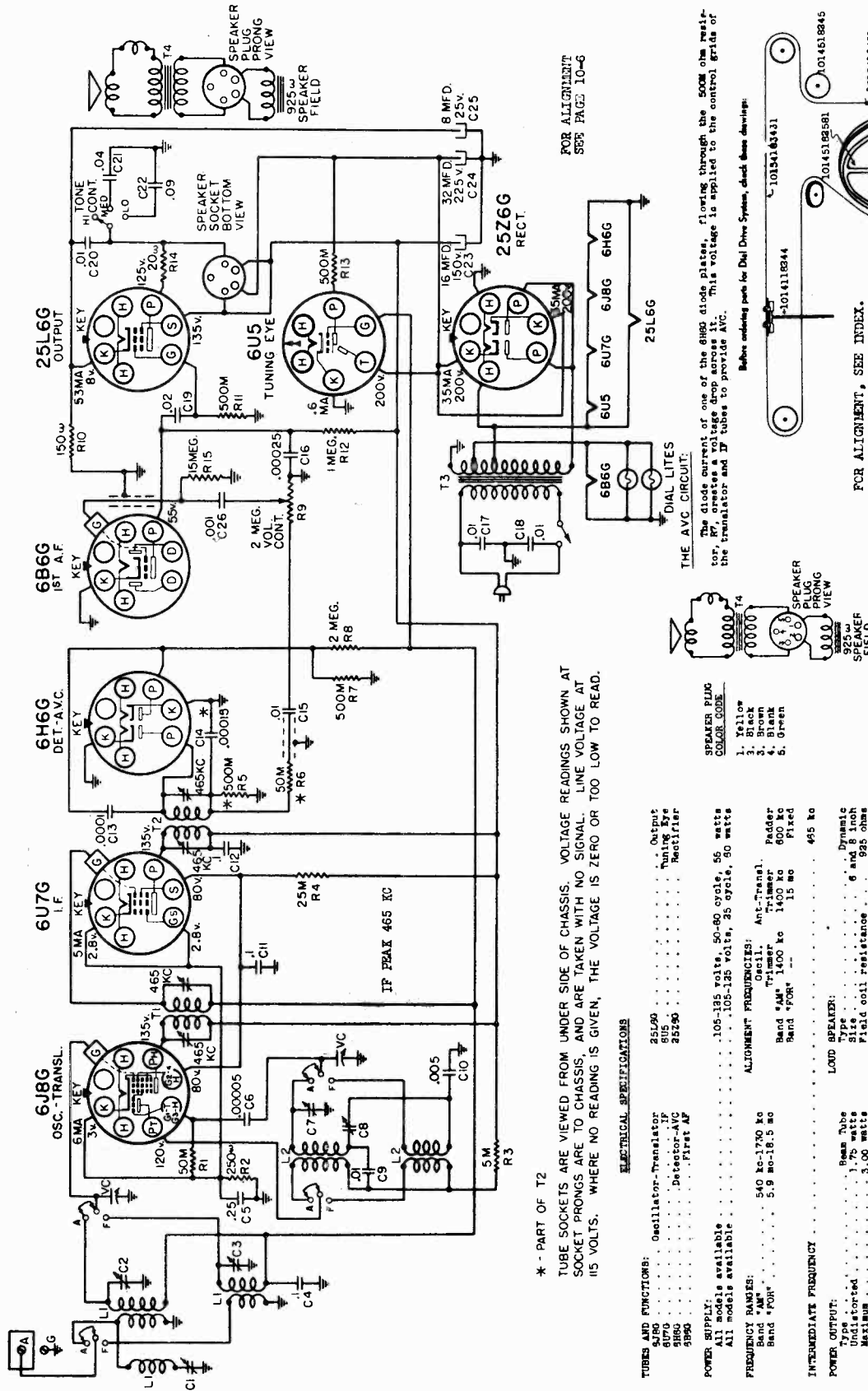
- Type Class "B"
- Undistorted 0.4 watts
- Maximum 0.8 watts

LOUD SPEAKER:

- Type FM Dynamic
- Size 6"

SEARS-ROEBUCK & CO.

MODELS 6022, 6122, 6132
 Chassis 101.509
 Schematic, Voltage
 Drive Data



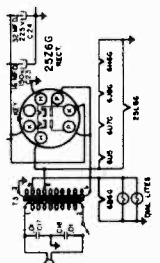
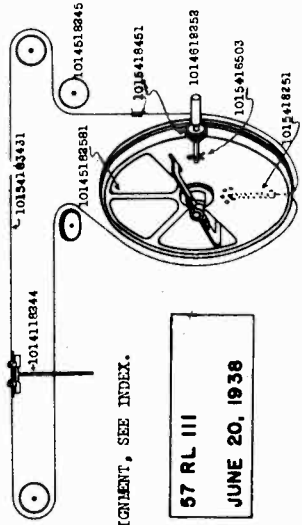
* - PART OF T2
 TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

ELECTRICAL SPECIFICATIONS

TUBES AND FUNCTIONS:	6J8G	Oscillator-Transmitter	25L6G	Output
	6U7G	I.F.	6U5	Tuning Eye
	6H6G	Detector-A.V.C.	25Z6G	Rectifier
	6B6G	First AF		
POWER SUPPLY:	All models available 105-125 volts, 50-60 cycle, 56 watts			
	All models available 105-125 volts, 25 cycle, 80 watts			
FREQUENCY BANDS:	ALIGNMENT FREQUENCIES:			
Band "AM"	540 kc-1730 kc	Oscil.	Ant.-Transit.	Paeder
Band "PH"	5.9 mc-16.5 mc	Trimmer	Trimmer	600 kc
		15 mc	Fixed	15 mc
INTERMEDIATE FREQUENCY	. . . . . 495 kc			
POWER OUTPUT:	LOAD SPEAKER:			
Type connected	Beam Tube			
Maximum	1.75 watts	Dynamic		
	3.00 watts	Field coil resistance	. . . . . 6 and 8 inch	
OPERATING FEATURES:	CHASSIS FEATURES:			
One Control Volume Control	Wave Trap			
Push Button Tuning (8 button)	Number of IF Stages One			
	Antenna Conventional			
	Tuning Eye			
OPERATING CONTROLS:	MECHANICAL SPECIFICATIONS			
1. Upper left knob Volume	CONTROL OPERATION:			
2. Lower left knob Band Switch	Turning right: Volume Increase			
3. Lower right knob On-Off and Tone	Turning right: Ant. Trim			
4. Upper right knob Station Selector	Turning right: 1st AF			
	Tuning Ratio: 10:1			

FOR ALIGNMENT
 SEE PAGE 10-6

FOR ALIGNMENT, SEE INDEX.



SPEAKER PLUG COLOR CODE

1. Yellow
2. Red
3. Brown
4. Blank
5. Green

PFR. TRANS. COLOR CODE

1. Black
2. Green
3. Slate
4. Blue
5. Red

57 RL III
 JUNE 20, 1938

MODELS 6022,6122,6132

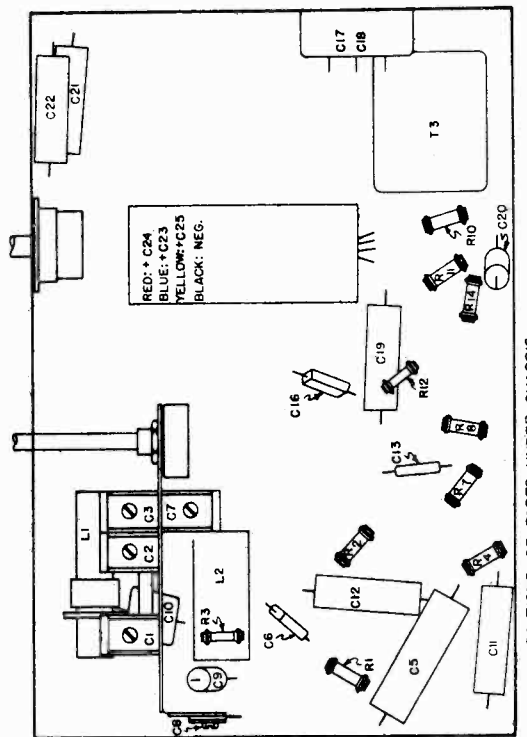
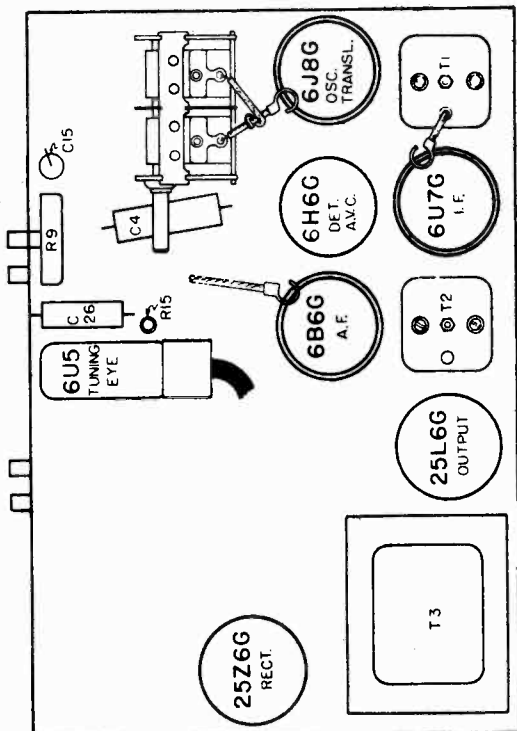
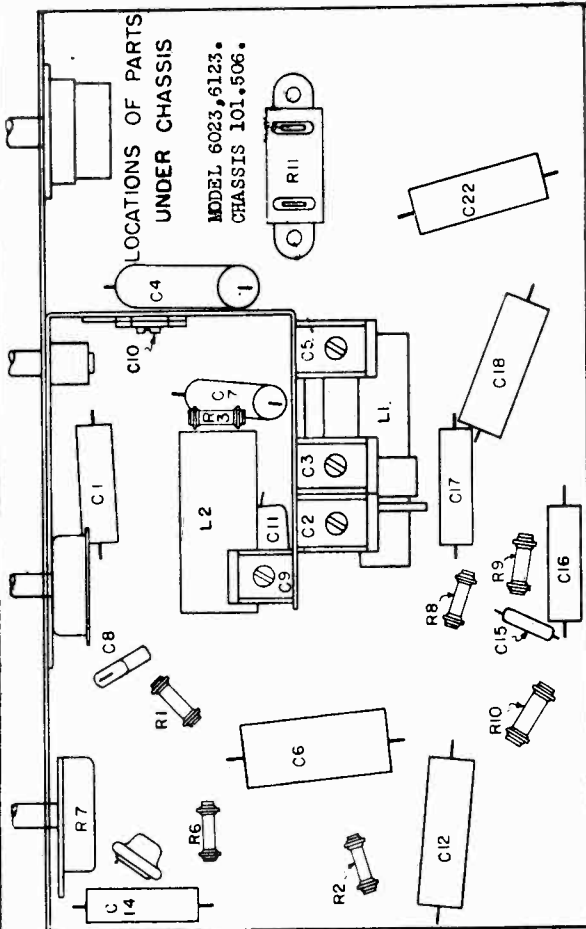
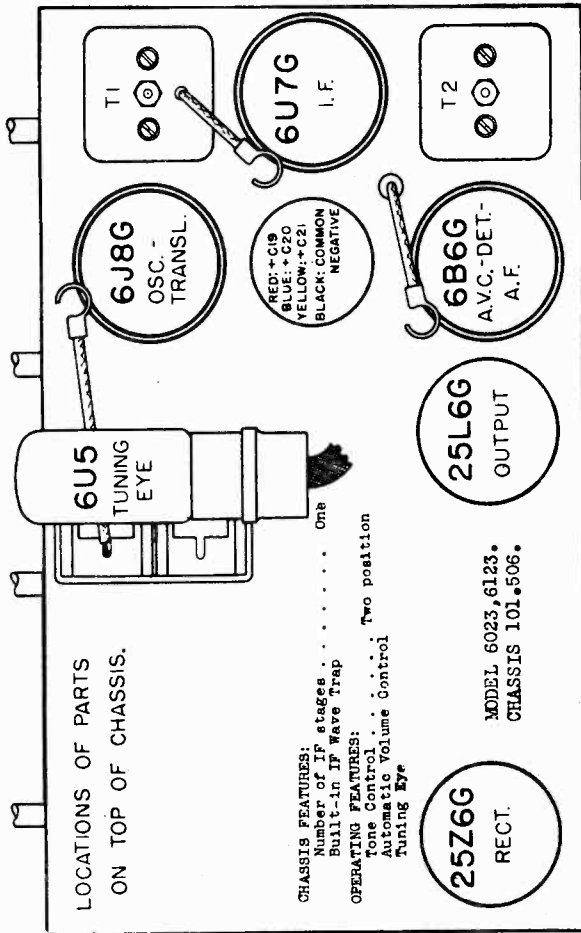
Chassis 101.509

SEARS-ROEBUCK & CO.

MODELS 6023,6123

Chassis 101.506

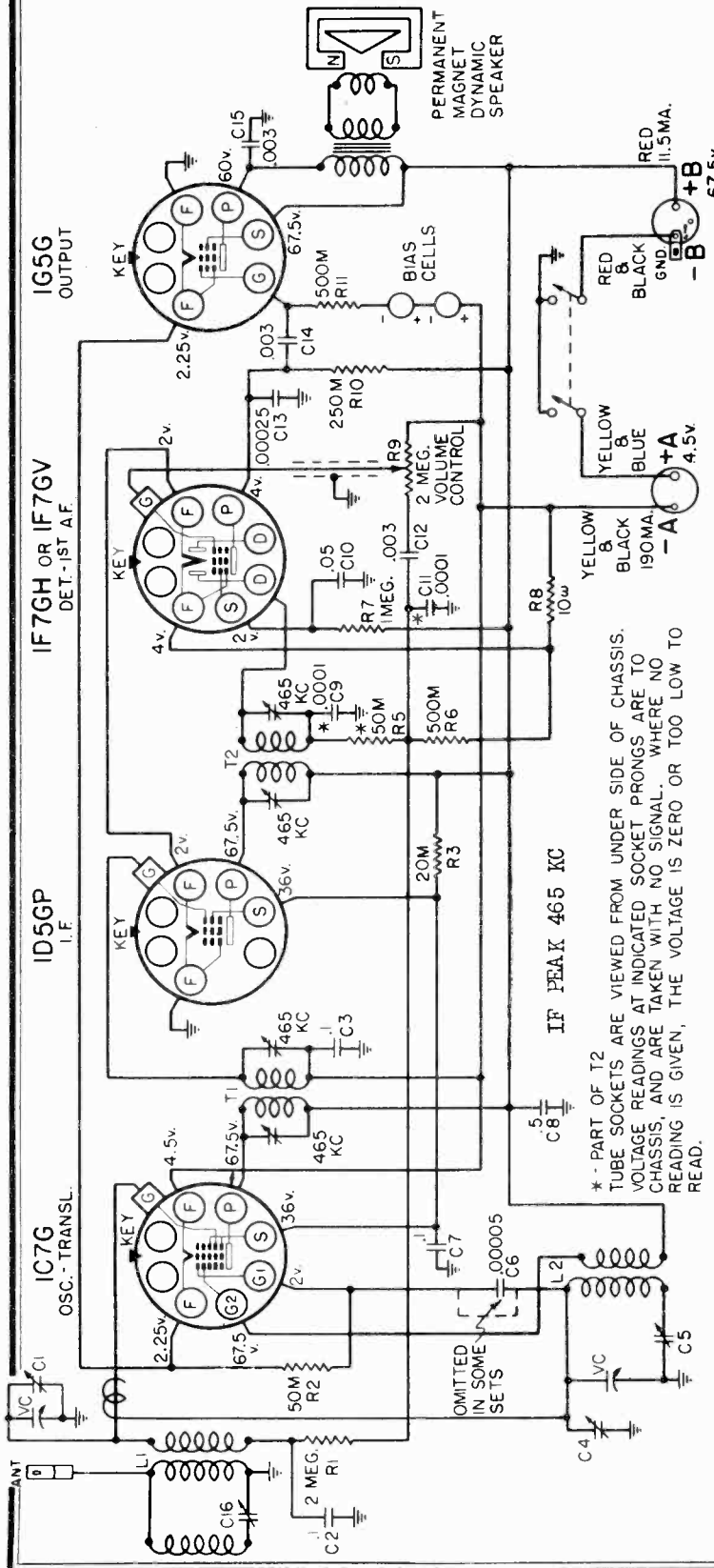
Socket, Trimmers, Chassis



SEARS-ROEBUCK & CO.

MODELS 6010, 6040, Ch. 101, 519
Schematic, Voltage, Socket
Trimmers, Change

57 RL 105
MAY 18, 1938



POWER SUPPLY:
 "A" Battery (4 1/2 volt dry) . . . 1 - #5030
 "B" Battery (67 volt storage) . . . 1 - #5049

FREQUENCY RANGE:
 Broadcast 540-1730 kc

INTERMEDIATE FREQUENCY 465 kc

POWER OUTPUT:
 Type Single Pentode
 Undistorted 125 watts
 Maximum 25 watts

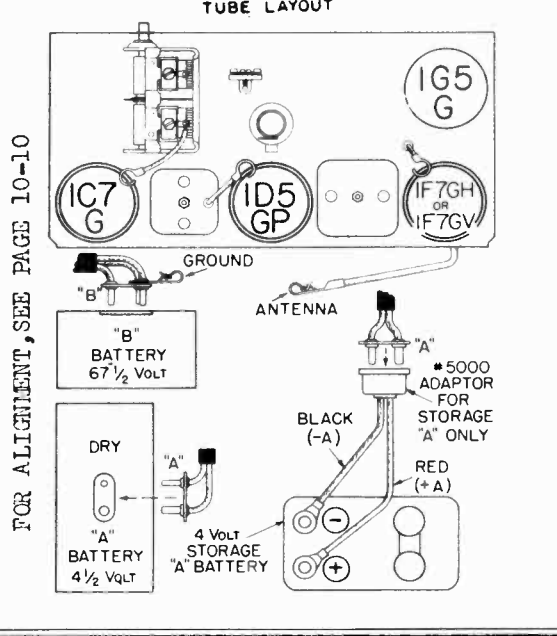
OPERATING FEATURES:
 Calibrated tuning knob
 Automatic Volume Control

ALIGNMENT FREQUENCIES:
 Oscillator 1730 kc
 Antenna-Tranasl. Trimmer 1400 kc
 Padder 600 kc
 465 kc

LOUD SPEAKER:
 Type P.M. Dynamic
 Size 5 inch

CHASSIS FEATURES:
 Number IF stages One
 Built-in Wave Trap
 Plugs attached to battery cable

OMISSION OF C6:
 It has been found that C5 is not necessary; that a direct connection from the oscillator coil to the IC7G tube is permissible. Accordingly, C5 was omitted from later production.

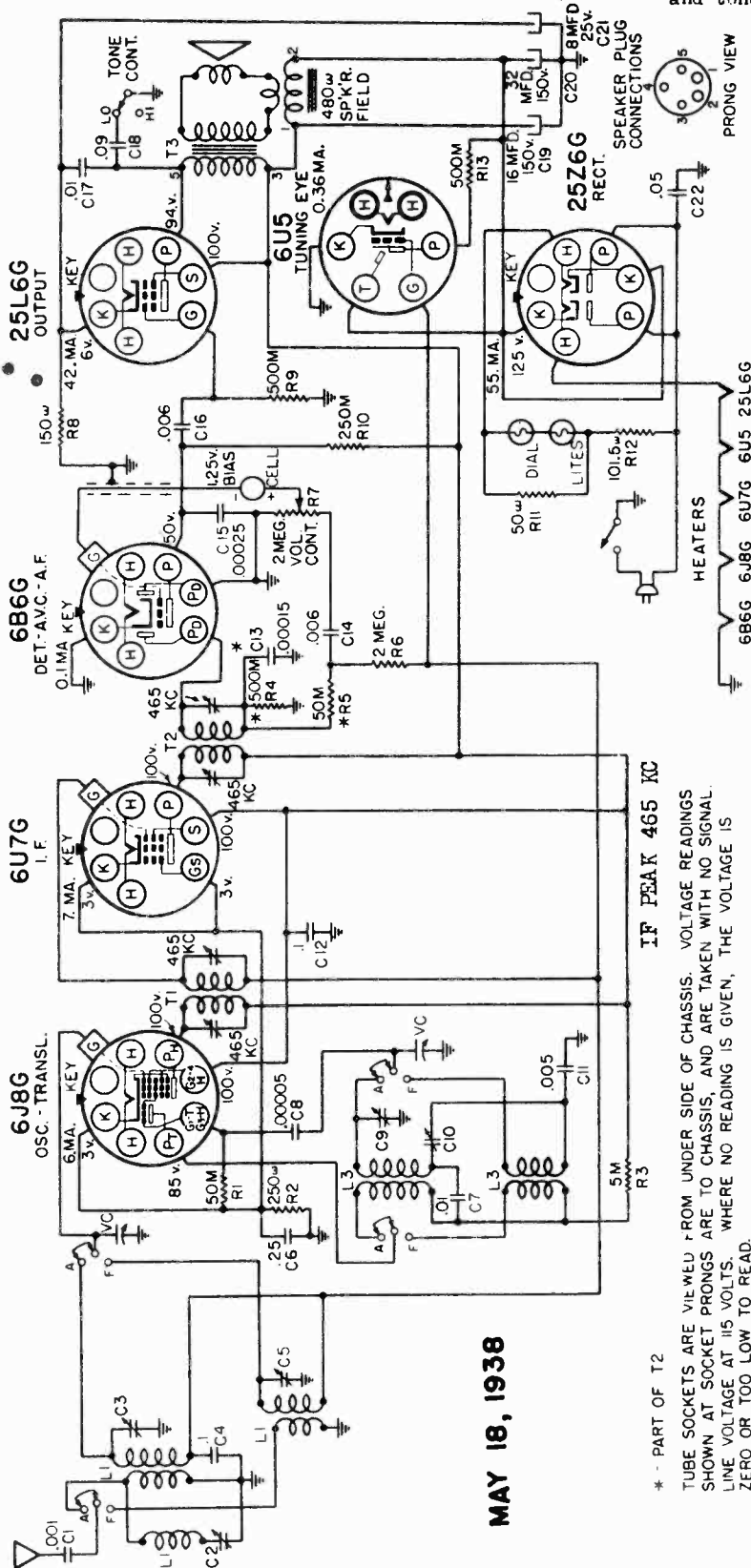


MODELS 6023, 6123, Ch. 101.506
Schematic, Voltage, Notes

SEARS ROEBUCK & CO.

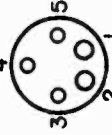
OPERATING CONTROLS:

1. Left knob Volume
2. Next to left knob Wave Band Switch
3. Next to right knob Station Selector
4. Right knob "On-off" switch and tone



FOR ALIGNMENT, SEE INDEX.

SPEAKER PLUG CONNECTIONS



1. Yellow
2. Black
3. Brown
4. Blank
5. Green

PRONG VIEW

CONTROL OPERATION:

- Turning right: Volume Increase
- Turning right: "A", "F"
- Tuning ratio: 13:1
- Turning right: "ON", "HI", "LO".

MAY 18, 1938

* - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

POWER SUPPLY:

All models available 105-125 volts, 50-50 cycle, or DC, 50 watt

FREQUENCY RANGES:

Band "A" 540-1750 kc
Band "F" 5.9-18.2 mc

ALIGNMENT FREQUENCIES:

Oscill. Ant.-Transl. Padler
Trimmer Trimmer 500 kc
Band "A" 1400 kc
Band "F" 15 mc
Fixed
465 kc

INTERMEDIATE FREQUENCY 465 kc

POWER OUTPUT:

Type Beam
Undistorted 1.4 watt
Maximum 2 watt

LOUD SPEAKER:

Type Dynamic
Size 5" g.
Field coil resistance 480 ohms
App. field coil voltage drop 25 volts

POWER SUPPLY AND HEATER CIRCUIT:

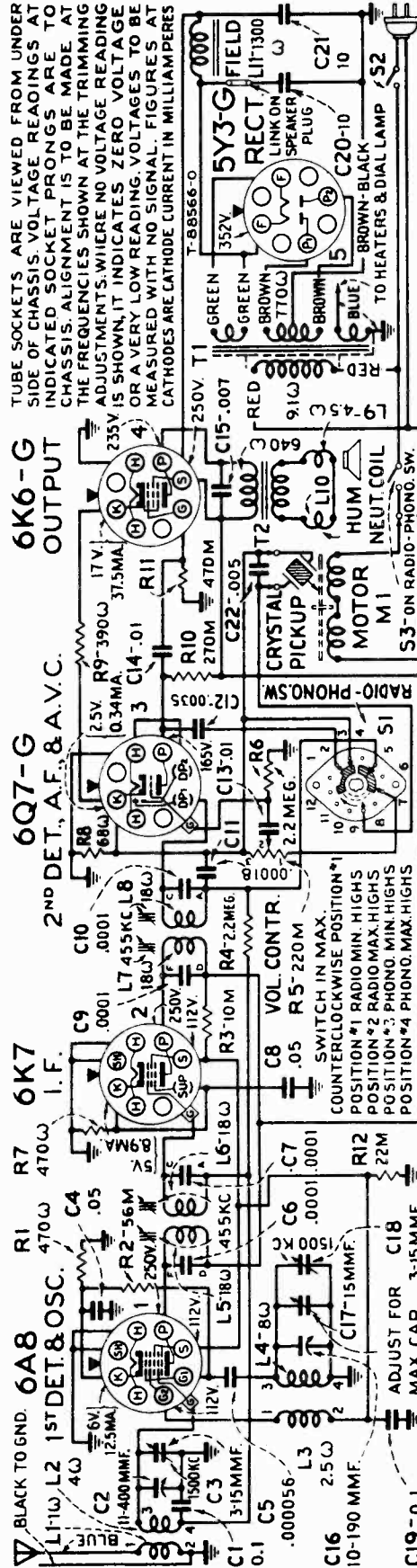
All of the tube heaters are connected in series. Accordingly, if any one tube burns out the others will not light. The full line voltage will appear across the heater terminals of the burnt out tube. Under certain conditions, the chassis may be above ground potential by an amount equal to the line voltage. Accordingly, appropriate precaution should be taken when working on the chassis.

Motor, Pick-up Wiring Alignment

SEARS-ROEBUCK & CO.

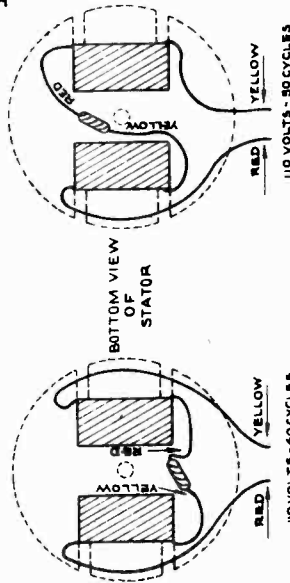
MODEL 6028
Chassis 126.204
Schematic, Voltage
Speaker Wiring

JULY 20, 1938



CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION, VOL. VIII

IF PEAK 455 KC



MOTOR COIL WIRING

POWER SUPPLY RATINGS AVAILABLE..... 540-1,720 kc

FREQUENCY RANGE:
Broadcast..... 1,500 kc (osc., ant.)

ALIGNMENT FREQUENCY:
Broadcast..... 1,500 kc (osc., ant.)

INTERMEDIATE FREQUENCY..... 455 kc

Loudspeaker:

Centering of the loudspeaker voice-coil is made in the usual manner with three, narrow-paper feelers, after first removing the front dust-cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. The dust cover should be cemented back in place with ambroid after adjustment has been completed.

LOUDSPEAKER WIRING

PICKUP CONNECTIONS

Dial lamp..... 6.3 volts, 0.25 ampere

..... 105-125 volts, 60 cycles, 80 watts

..... 105-125 volts, 50 cycles, 80 watts

POWER OUTPUT:

Type..... Pentode

Undistorted..... 2.0 watts

Maximum..... 3.5 watts

LOUDSPEAKER:

Type..... 5-inch electrodynamic

V.C. Impedance..... 5 ohms at 400 cycles

Field Coil Resistance..... 1,300 ohms

App. Field Coil Voltage Drop..... 100 volts

PHONOGRAPH:

Type..... Manual

Turntable Speed..... 78 R.P.M.

Type of Pickup..... Crystal

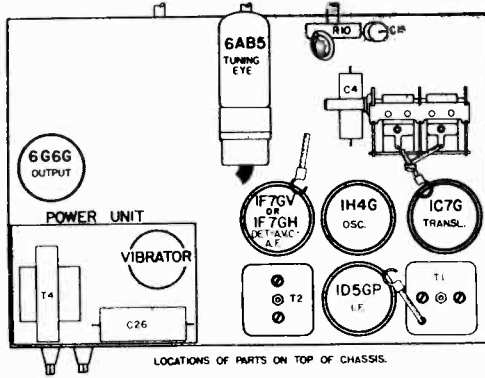
Pickup Impedance..... 80,000 ohms at 1,000 cycles

MODEL 6028, Ch. 126.204
 Motor Details, Trimmers
 Chassis Wiring, Socket

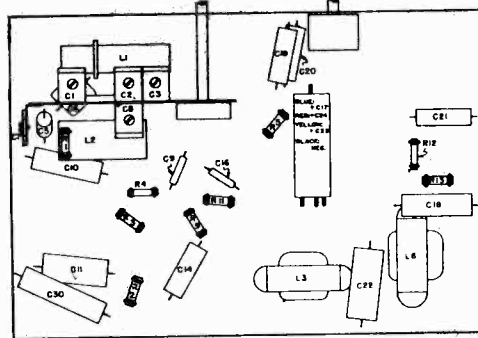
SEARS-ROEBUCK & CO.

MODELS 6072, 6077, 6172
 Chassis 101.513
 Socket, Trimmers, Chassis

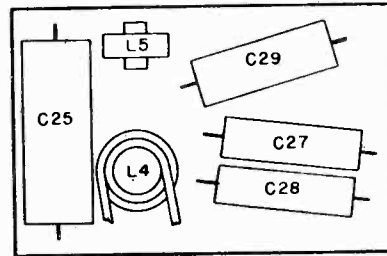
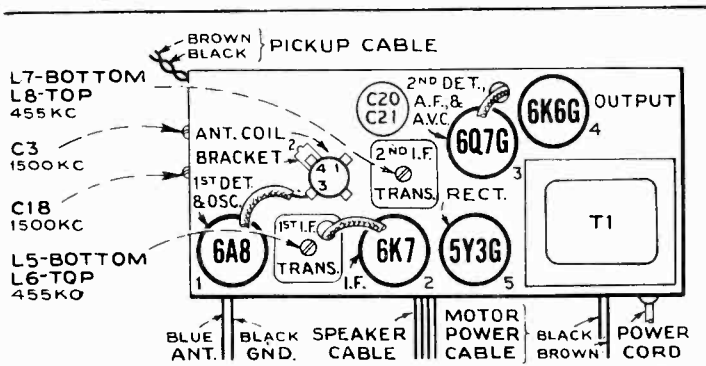
MODELS 6072, 6077, 6172. CHASSIS 101.513.



LOCATIONS OF PARTS ON TOP OF CHASSIS.

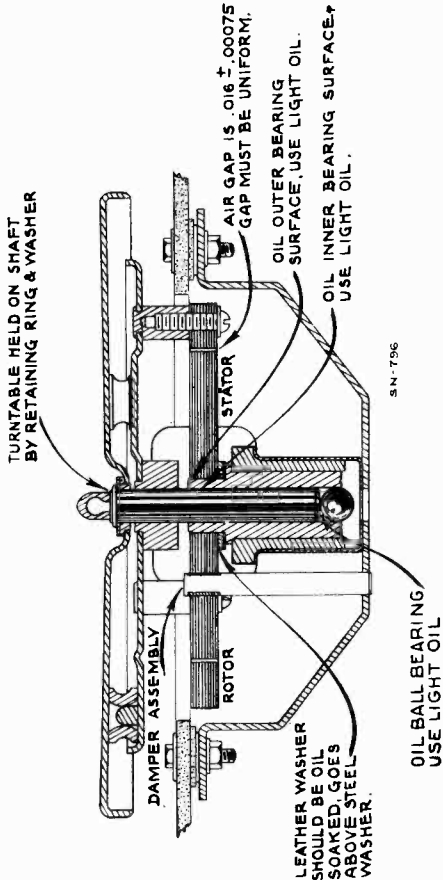


LOCATIONS OF PARTS UNDER CHASSIS.

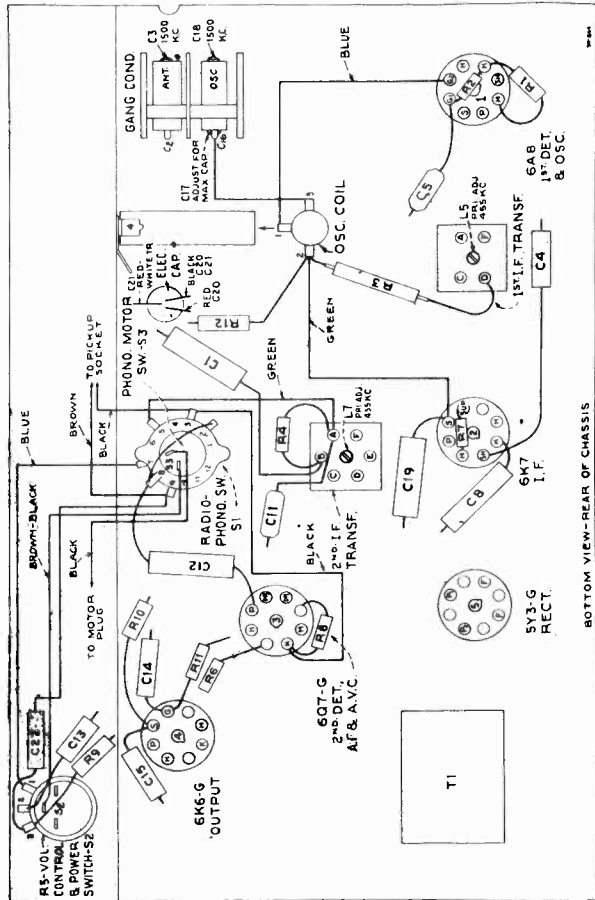


LOCATIONS OF PARTS UNDER POWER PACK.

MODEL 6028, CHASSIS 126.204.



MOTOR DETAILS

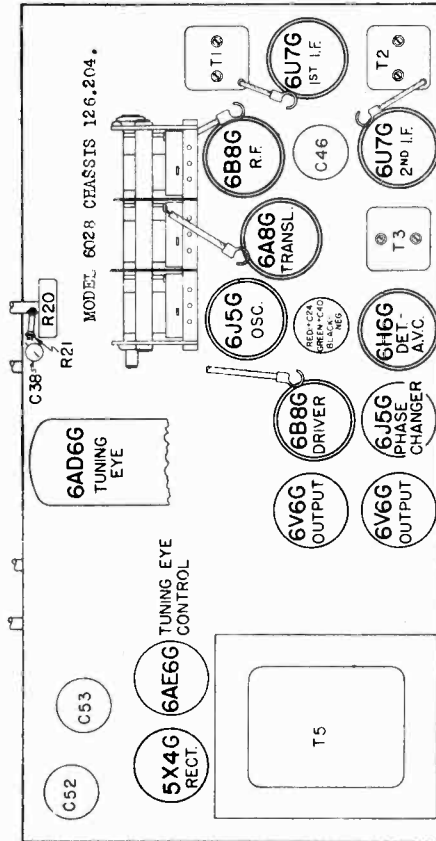


BOTTOM VIEW-REAR OF CHASSIS

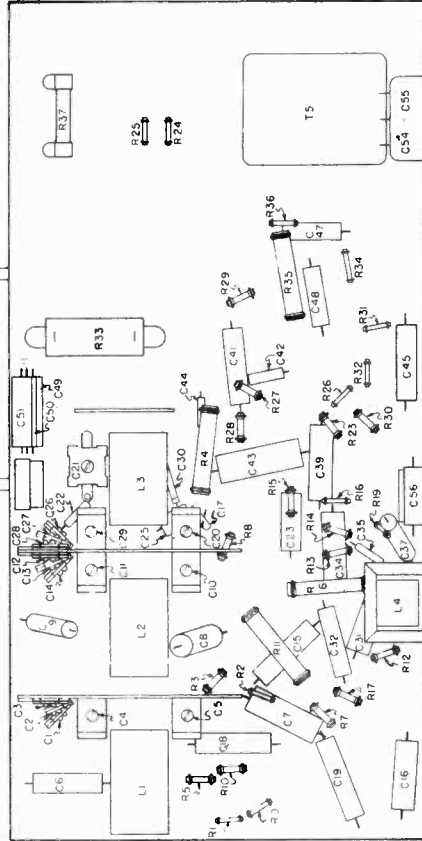
MODELS 6038, 6138
Chassis 101.517
Alignment, Motor Data

SEARS-ROEBUCK & CO.

MODEL 6028, Ch. 126.204
Socket, Trimmers, Chassis



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS

ELIMINATING WHISTLE AT 930 KC:

A whistle, due to a beat between the second harmonic (930 kc) of the 455 kc I.F. and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the I.F. frequency of the receiver. Determine at what point between 900 kc and 970 kc the whistle will be least objectionable. Dividing this frequency by two will give the new I.F. frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the I.F. should be realigned at 915/2 or 457.5 kc. Try to select the new I.F. frequency as close to 455 kc as possible.

Align the I.F. at the new frequency and then realign the rest of the receiver as described under "ALIGNMENT PROCEDURE".

ALIGNMENT PROCEDURE

MODEL 6038, 6138 CHASSIS 101.517.

- PRELIMINARY:**
Output meter connections..... Arrow speaker voice coil
Output meter reading to indicate 1.0 watt output..... 2.25 volts
Approximate average sensitivity in microvolts for 1.0 watt output..... See chart below
Dummy antenna value to be inserted in series with generator output..... See chart below
Connection of generator output lead..... See chart below
Connection of generator ground lead..... To chassis
Generator modulation..... 30%, 400 cycles
Position of Volume Control..... Fully clockwise
Position of Radio-Phono Switch..... Second position from left
Position of Dial Pointer with variable tuning condenser fully closed..... To coincide with horizontal line on dial

Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmer Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
Low End	455 kc	.001 mfd.	6K7 Grid	L7, L8	2nd I.F. Trans.	15,000
Low End	455 kc	.001 mfd.	6A8 Grid	L5, L6	1st I.F. Trans.	270
1,500 kc	1,500 kc	.0002 mfd.	Ant. Lead (Blue)	C18*, C3	Osc., Ant.	25

IMPORTANT ALIGNMENT NOTES

* Trimmer C17, on opposite side of gang condenser from C18, should be screwed clockwise for maximum capacity before adjusting C18.
Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value to prevent the a.v.c. action of the set from interfering with accurate alignment.
Adjustment locations are shown on the top and bottom parts location views of chassis.
Only the dummy antenna indicated in the chart for any particular frequency should be used. Remove the dummy antenna used for alignment at any other frequency. Grid cap leads should remain in place during alignment.
Values shown under "Microvolts" are only approximate.

Eliminating Whistle at 910 KC:

A whistle, due to a beat between the second harmonic (910 kc) of the 455 kc I.F. and a 910 kc signal may be experienced. In localities where the 910 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the I.F. frequency of the receiver. Determine at what point between 880 kc and 940 kc the whistle will be least objectionable. Dividing this frequency by two will give the new I.F. frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the I.F. should be realigned at 915/2 or 457.5 kc. Try to select the new I.F. frequency as near to 455 kc as possible.

Align the I.F. at the new frequency and then realign the rest of the receiver as described under "ALIGNMENT PROCEDURE".

Phonograph Motor:

- Starting**—The phonograph motor switch (S1) is turned "on" in the two phonograph positions of the Radio-Phono switch, and it is turned "off" in the two radio positions. To start the phonograph motor, turn the Radio-Phono switch to one of the two phonograph positions, which applies power to the motor, and then give the motor a clockwise twist with the hand.
Hum and Vibration—A small amount of hum when starting, decreasing to a negligible amount when running, is normal. If excessive vibration occurs it may be due to:
1. Insufficient lubrication, or any failure that will cause binding.
2. Leather washer not oiled. (Check to make certain that the leather washer is above the steel washer.)
3. Motor not properly supported from motor board.
4. Burrs on poles of rotor or stator. Remove with fine emery cloth.

Removing Rotor—The rotor and turntable assembly simply rests on the ball bearing at bottom of vertical bearing. Remove by lifting up.

Rotor Adjustment—Loosen the three screws that hold the rotor to the turntable, insert three 16-mil shims at equal distances around the gap between the rotor and stator, and then carefully tighten the three screws. The top of the rotor must be flush with the top of the stator. Add additional steel washers beneath the stator if necessary.
Lubrication—Oiling points are indicated on "Details of Motor".

OPERATING FEATURES:

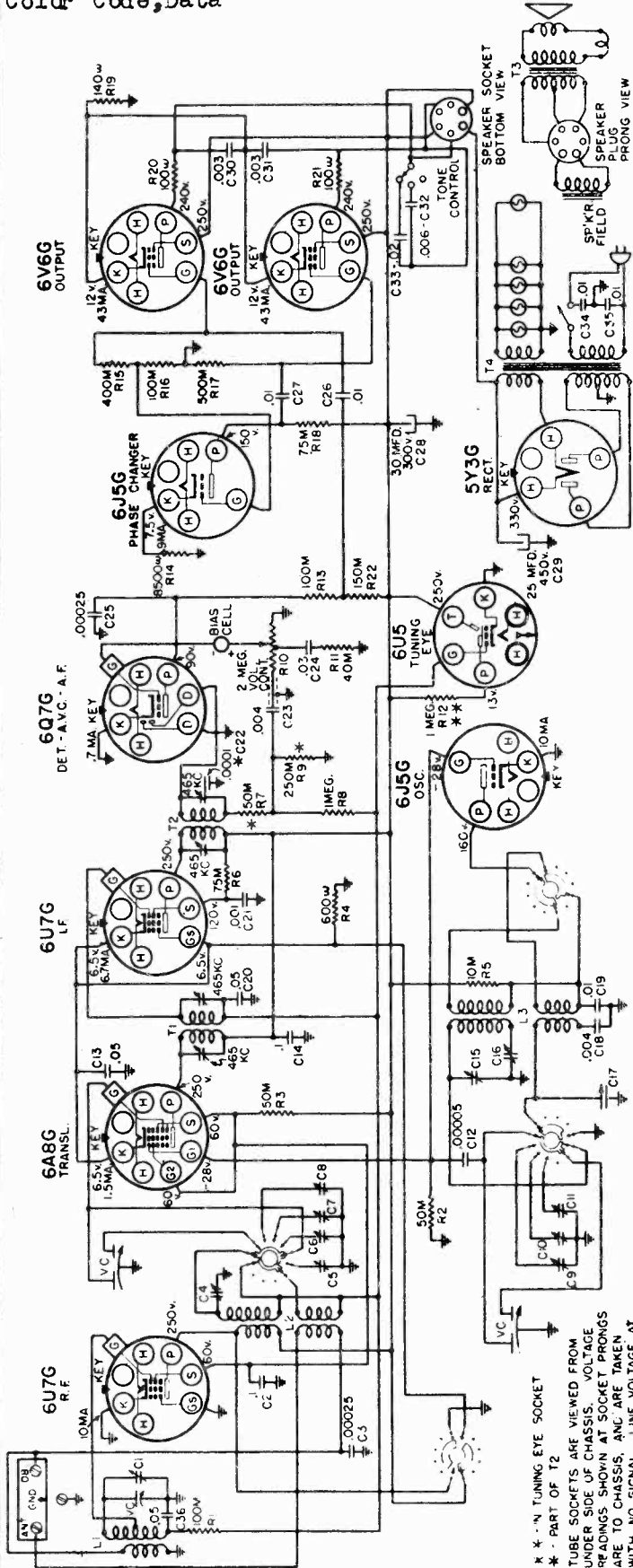
- Phonograph-Radio operation
- Manual-starting, synchronous-type motor
- Auto-point-one Control
- Automatic Volume Control

CHASSIS FEATURES:

- No. I.F. Stages..... One
- Antenna..... Doubler or Conventional
- Line Noise..... Transformer, Shield
- Magnet Core Adjusted I.F. Transformers

MODELS 6036, 6136
Chassis 101.511
Schematic, Voltage
Color Code, Data

SEARS-ROEBUCK & CO.



K * - IN TUNING EYE SOCKET
* - PART OF T2
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 115 VOLTS. WHEN NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. READINGS TAKEN WITH WAVE SWITCH IN BROADCAST POSITION.

JULY 1, 1938

IF PEAK 465 KC

POWER SUPPLY:

All models available 105-125 volts, 50-60 cycle, 103 watts
All models available 105-135 volts, 25 cycle, 115 watts

FREQUENCY RANGES:

Band "AM" 540-1750 kc
Band "SW" 5.95-18.3 mc
Band "9" 9.4-9.7 mc
Band "11" 11.5-13.1 mc
Band "15" 14.3-15.4 mc

ALIGNMENT FREQUENCIES:

Oscil.	Ant-Transl.
Trimmer	Padder
Band "AM" 1400 kc	900 kc
Band "SW" 15 mc	Fixed
Band "9" 9.55 mc	Fixed
Band "11" 11.7 mc	Fixed
Band "15" 15 mc	Fixed

INTERMEDIATE FREQUENCY 455 kc

POWER OUTPUT:

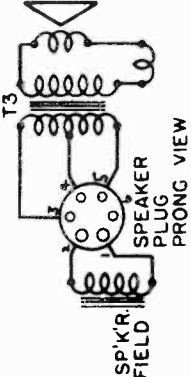
Distorted 5 watts
Type Push pull beam tubes
Maximum 10 watts

LOUD SPEAKER:

Type Dynamic
Size 10 and 12 inch
Field coil resistance 600 ohms
App. field coil voltage drop 95 V.

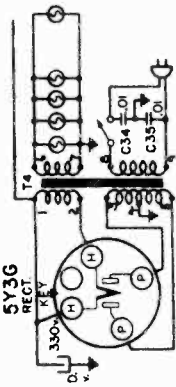
SPEAKER PLUG COLOR CODE

1. Black
2. Yellow
3. Brown
4. Red
5. Green
6. Blank



FOR ALIGNMENT
SEE PAGE 10-44

PWR. TRANSF. COLOR CODE



- 1, 3. Red
2. Red
4. Slate
5. Blue
- 6, 7. Black
8. Green
9. Black

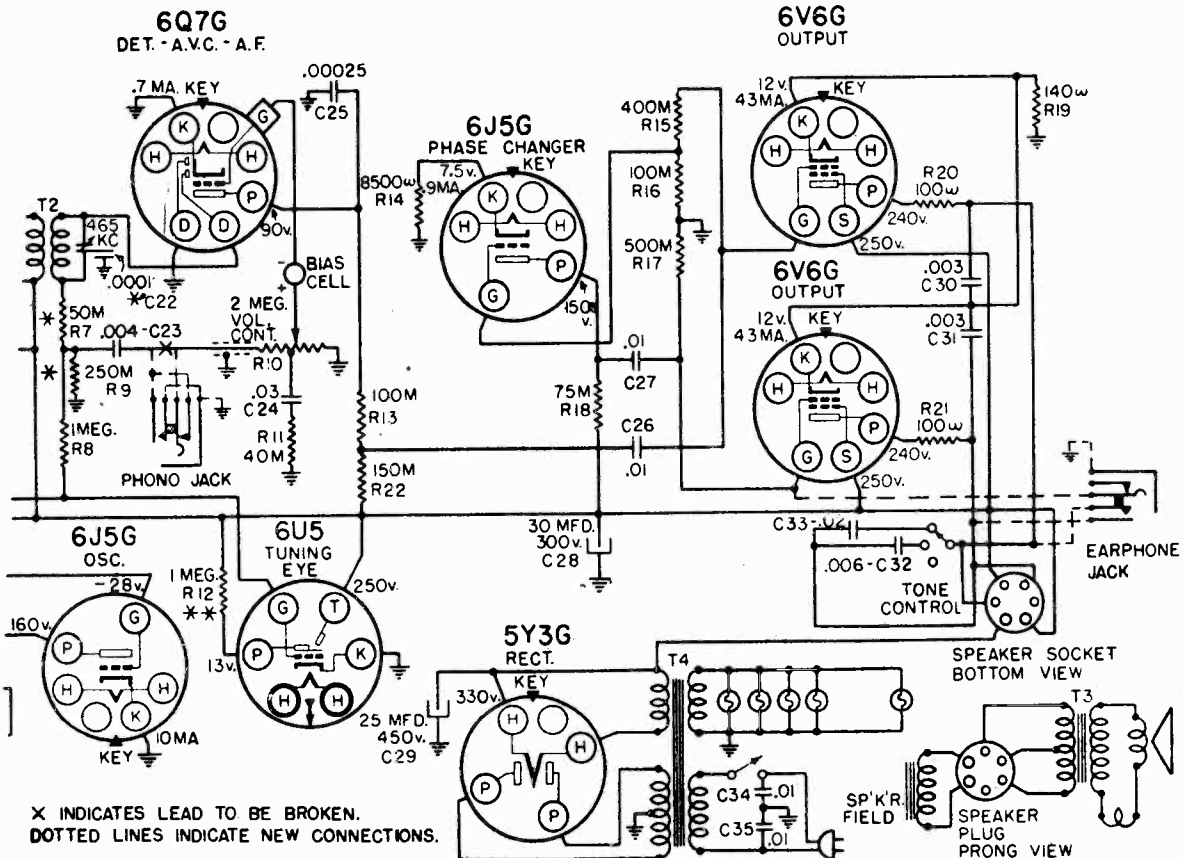
SEARS-ROEBUCK & CO.

MODELS 6036, 6136
 Chassis 101.511
 Phone, Phono. Jacks
 Drive Data, Notes

SUBJECT: CONNECTION OF EARPHONE AND PHONOGRAPH PICKUP JACKS:

Part number 1015119531 Jack, for connection of earphones or phonograph pick-up, can be ordered directly from source 101.

If a crystal pick-up is used, a filter composed of a .01 mfd. condenser and a 100M ohm resistor connected in series, should be connected across the pick-up to prevent excessive bass response. This filter will also act as a partial scratch filter.



X INDICATES LEAD TO BE BROKEN.
 DOTTED LINES INDICATE NEW CONNECTIONS.

OPERATING FEATURES:

- Tone Control Three position
- Automatic Volume Control
- Three Spread Bands
- Push Button Tuning (8 button)
- Band Indicator

OPERATING CONTROLS:

1. Upper left knob Volume
2. Lower left knob . . . "On-Off" Switch and Tone
3. Lower right knob . . . Wave Band Switch
4. Upper right knob . . . Station Selector

THE AVC CIRCUIT:

The diode current of one of the 6Q7G diode plates, flowing through the 250M ohm resistor, R9, creates a voltage drop across it. This voltage is applied to the control grids of the RF, translator, and IF tubes, to provide AVC.

ELIMINATING WHISTLE AT 930 KC:

A whistle, due to a beat between the second harmonic (930 kc) of the 465 kc IF, and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the IF frequency of the receiver.

Determine at what point between 900 kc and 980 kc the whistle will be least objectionable. Dividing this frequency by two will give the new IF frequency to which the receiver should be aligned. For example, if it is determined that a whistle at 915 kc would not be objectionable, the IF should be realigned at 915/2 or 457.5 kc. Try to select the new IF frequency as near as possible to 465 kc.

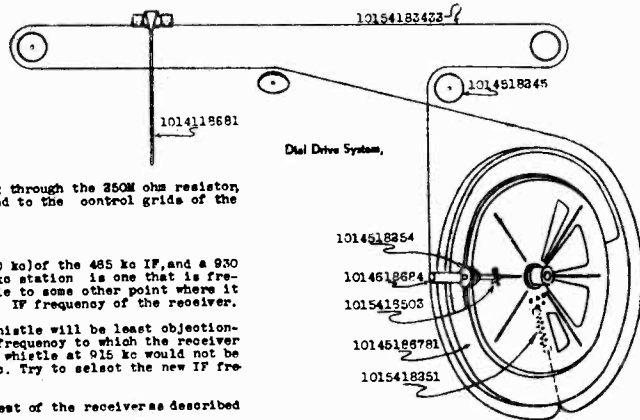
Align the IF at the new frequency and then realign the rest of the receiver as described under, "ALIGNMENT PROCEDURE".

CHASSIS FEATURES:

- Number RF stages . . . One (on Band "AM")
- Number IF stages One
- Tuning Eye
- Number condensers in gang . . . Three
- Antenna Doublet

CONTROL OPERATION:

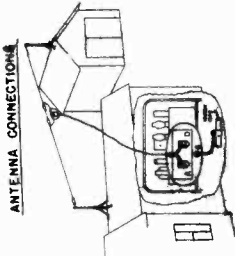
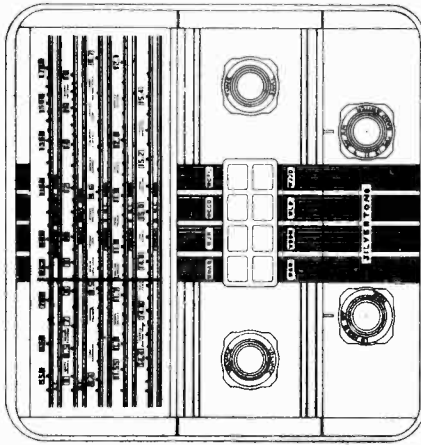
- Turning right: Volume increase
- Turning right: . . "ON", "HI", "MED", "LO"
- Turning right: "AM", "SW", "9", "11", "15"
- Tuning ratio: 13:1



MODELS 6036, 6136
Chassis 101.511
Socket, Trimmers
Chassis, Tuner Data

SEARS-ROEBUCK & CO.

CHASSIS 101.509, 101.510,
101.512, 101.513,
101.515, 101.517,
101.524, 101.534
Tuner Data



TUNER DATA FOR CHASSIS:-
101.509, 101.510, 101.512,
101.513, 101.515, 101.517,
101.524, and 101.534.

PUSH BUTTON TUNING
SETTING UP:

Leave the radio turned on for about 15 minutes before adjusting the push buttons. This "warming up" period will insure permanent and accurate settings.

1. Make a list of the stations that you want to set up for push button tuning. It is advisable, but not necessary, to arrange the stations in the order of their frequency (kilocycles per second). The top left push button can be used for station #1, the next to the left for station #2, etc. The next upper, middle, or right push buttons can be set up for push button tuning. The stations selected must give strong and reliable reception. The Band Switch knob must be turned to the proper position for the stations selected.

2. Pull the volume control and tuning knobs off of their shafts. Remove the snap-in buttons that were covered by the knobs. The escutcheon (the plate through which the push buttons protrude) can then be removed. Be careful not to lose the snap-in buttons.

3. Replace the tuning knob on its shaft. Push the knob in and turn it so that the dial pointer comes to the left end of the dial. A key will be found in the Instruction Leaflet envelope. Engage this key with the slotted shaft that is between the tuning knob and the push buttons. Unlock the mechanism by pushing the shaft in and unscrewing it (turn counterclockwise as far as it will go. Do not force it. About 8 turns is sufficient to loosen it completely. (A screw driver can be used for unlocking the mechanism instead of the key supplied.) Then remove the key.

4. Push the button that you wish to use for your #1 station, all the way in and hold it in firmly. Push the tuning knob in and turn it until your #1 station is tuned in exactly as indicated by the tuning eye. Be as exact as possible in tuning your station since this will determine how accurately your station will be tuned whenever you use the push button. Then let go of the push button, making sure not to turn the tuning knob until you have let go of the button. (Turning the knob while the button is pushed in would spoil the accuracy of the adjustment.)

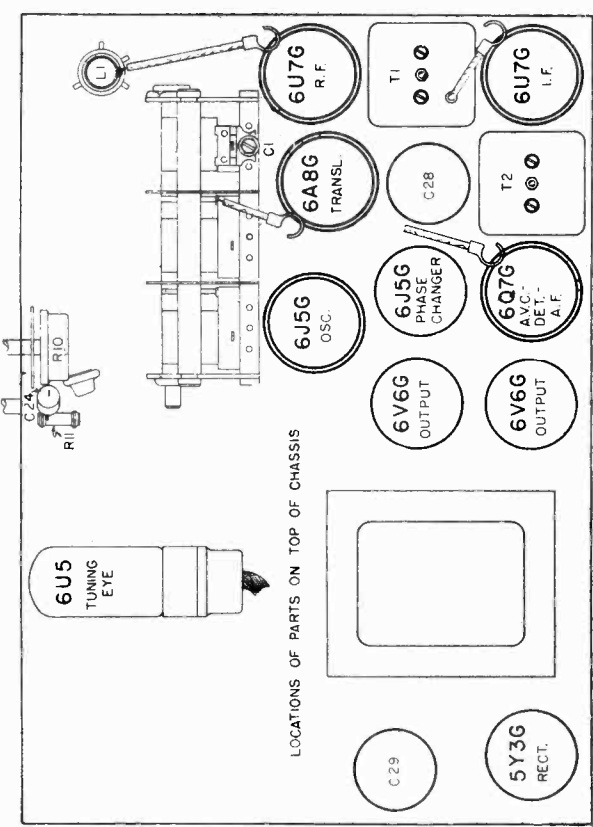
5. Push in your #2 button. Hold it in firmly and tune in your #2 station accurately. Then let go of the push button and then the tuning knob. Proceed in the same manner for the other stations on your list.

6. When all of the stations have been set up, push the tuning knob in and turn it so that the dial pointer comes to the right end of the dial. Then lock the mechanism by securely tightening (turning clockwise) the slotted shaft, using the key supplied or a screw driver.

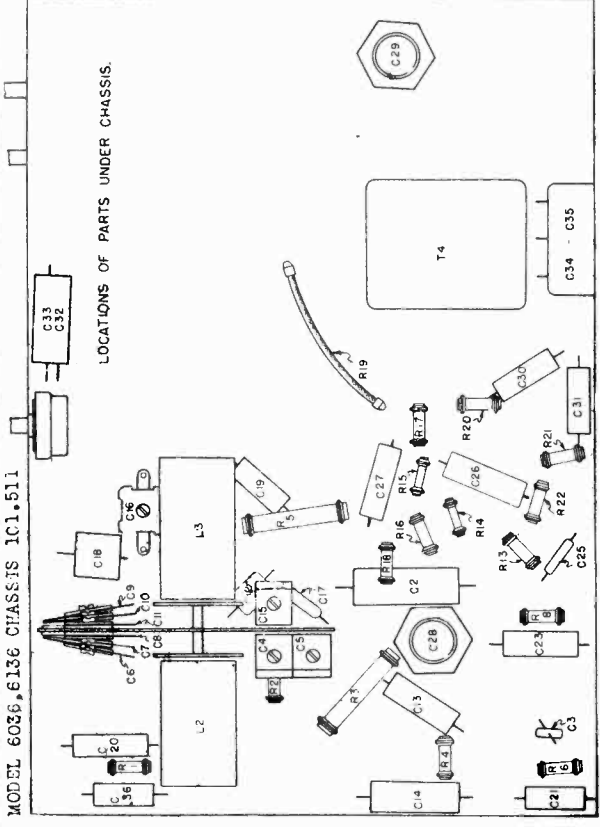
7. Punch out the call letters of your desired stations from the call letter sheets supplied. Insert the call letters in the celluloid holders at the back of the escutcheon. Be sure to insert the call letters so that they are opposite their respective push buttons. Then replace the escutcheon.

8. You may change your choice of stations at any time by unlocking the mechanism as described in Step 3 and adjusting the tuning knob to the station desired. Then replace the escutcheon as described in Step 7. The call letters of the new station should be inserted in the call letter holder in their proper position.

Push the button, indicated for your desired station, all the way in. Your station then will be tuned in. If you have selected short wave stations for push button tuning, be sure the band switch is turned to the proper band. The button will remain part way in, indicating that station is tuned in, until you push another button or the tuning knob.



LOCATIONS OF PARTS ON TOP OF CHASSIS



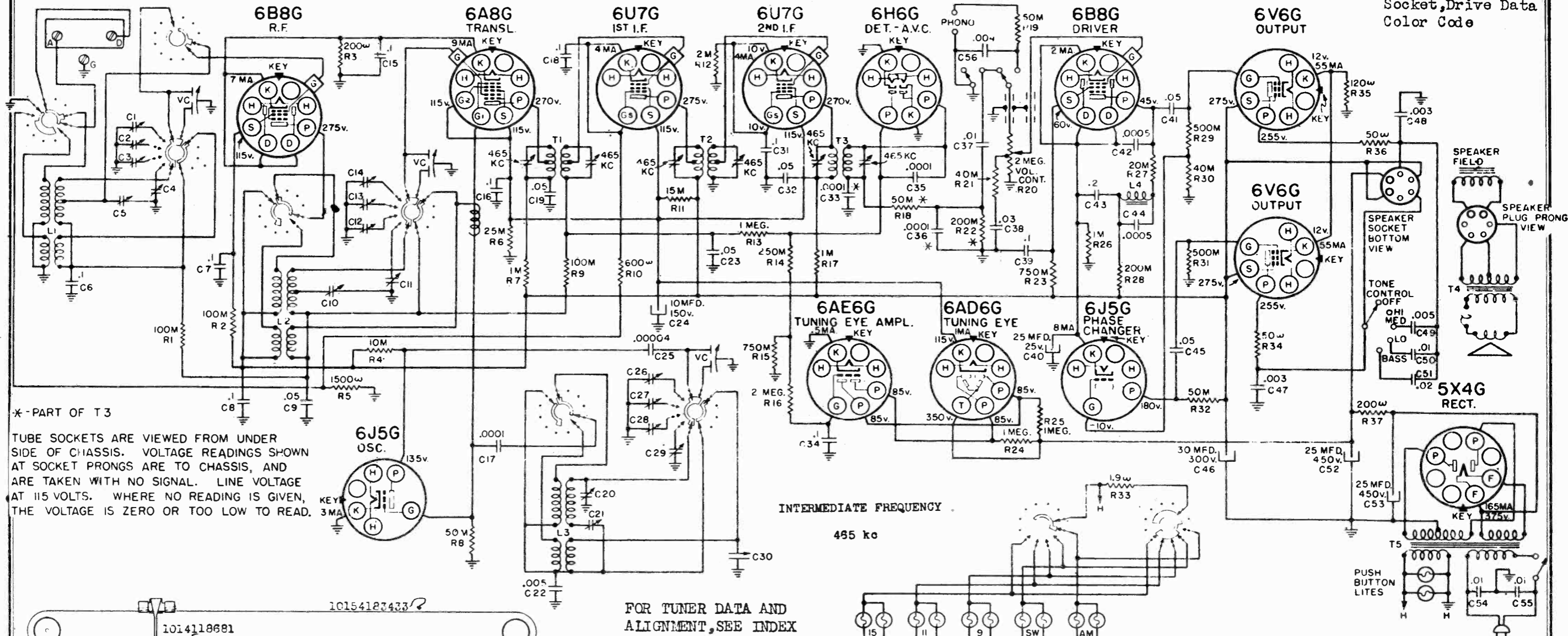
LOCATIONS OF PARTS UNDER CHASSIS.

MODEL 6036, 6136 CHASSIS 101.511

SEARS-ROEBUCK & CO.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.517

MODELS 6038, 6138
Chassis 101.517
Schematic, Voltage
Socket, Drive Data
Color Code



*-PART OF T3
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

FOR TUNER DATA AND ALIGNMENT, SEE INDEX

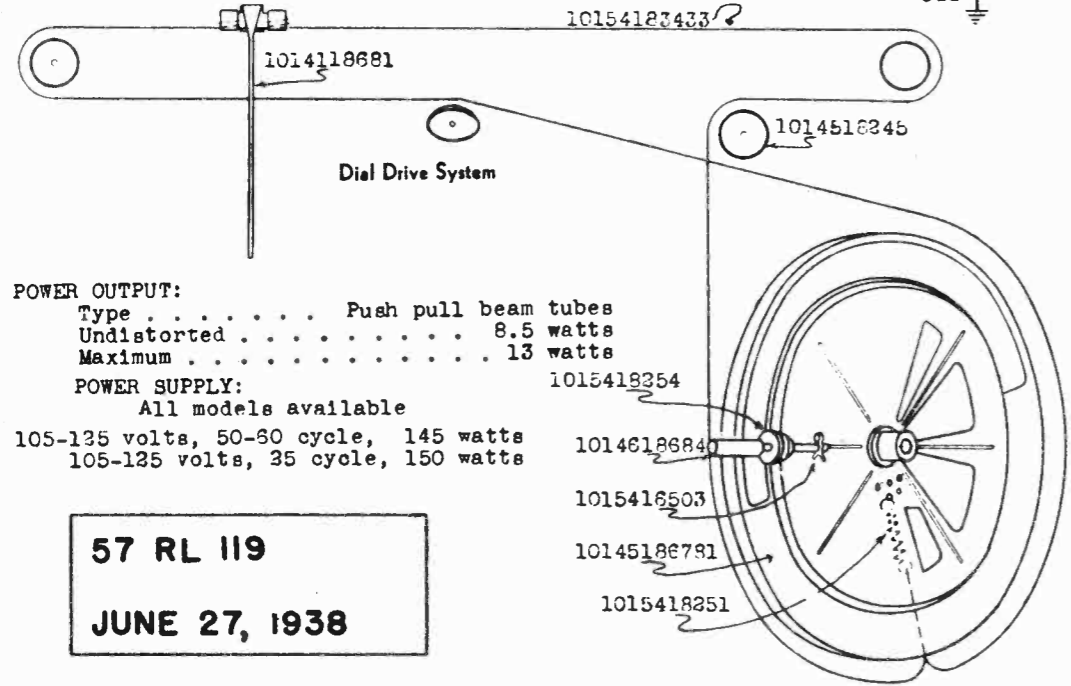
FREQUENCY RANGES:

Band "AM"	543-1750 kc
Band "SW"	5.9 mc-18.1 mc
Band "9"	9.4 mc-9.7 mc
Band "11"	11.5 mc-12.1 mc
Band "15"	14.6 mc-15.8 mc

LOUD SPEAKER:
Type Dynamic
Size 13 inch
Field coil resistance 480 ohms
App. field coil voltage drop 65 V.

ALIGNMENT FREQUENCIES:

	Oscill. Trimmer	Ant-Transl. Trimmer	Padder
Band "AM"	1400 kc	1400 kc	600 kc
Band "SW"	18 mc	15 mc	Fixed
Band "9"	9.55 mc	9.55 mc	Fixed
Band "11"	11.7 mc	11.7 mc	Fixed
Band "15"	14.9 mc	14.9 mc	Fixed

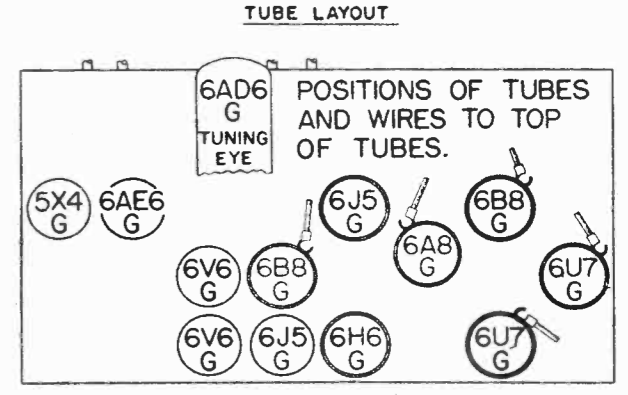


SPEAKER PLUG COLOR CODE

1. Black
2. Yellow
3. Brown
4. Red
5. Green
6. Blank

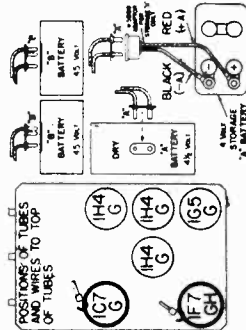
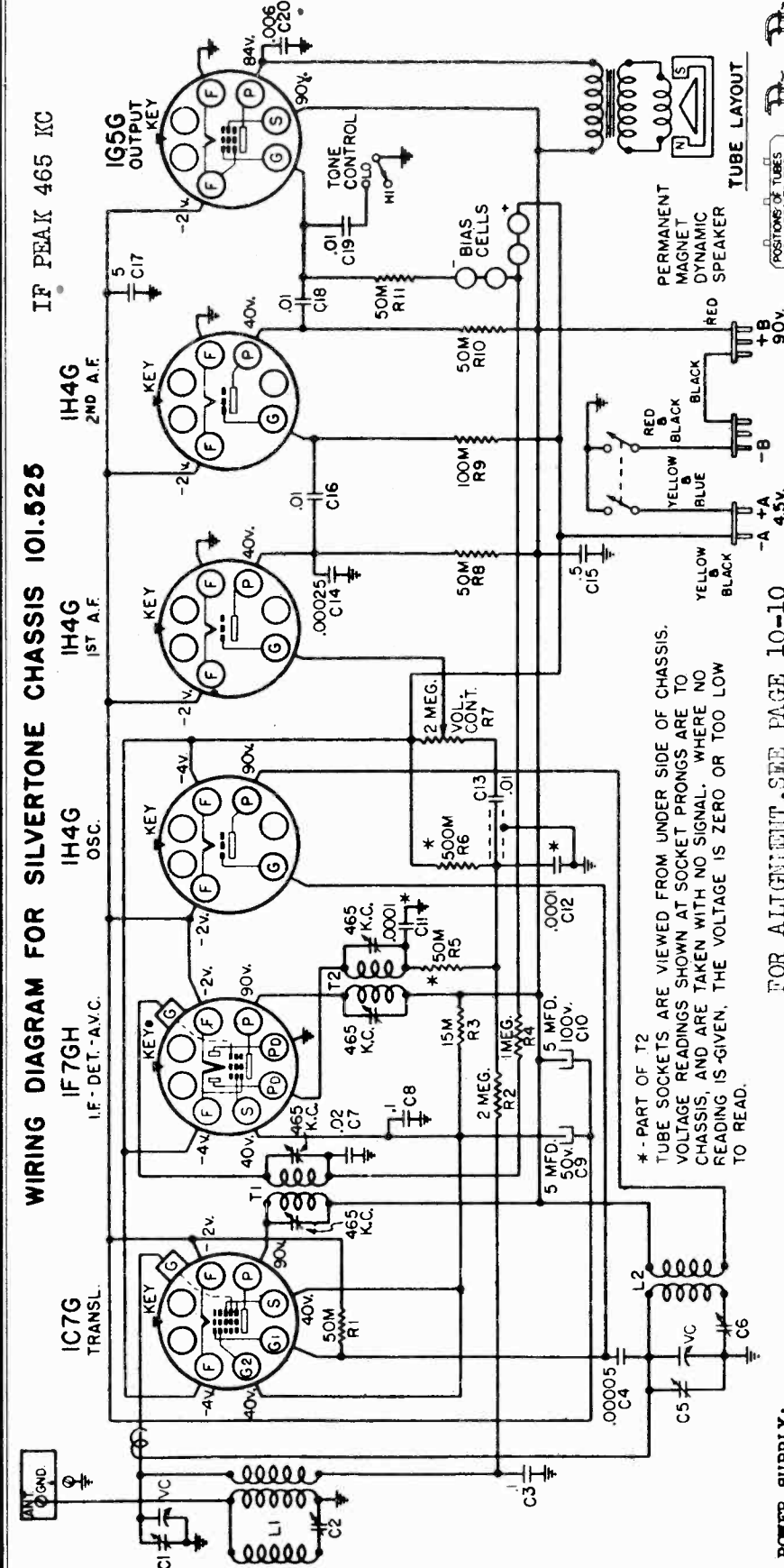
PWR. TRANSF. COLOR CODE

1. Red
2. Slate
3. Blue
- 4, 5. Red
- 6, 7. Black
8. Black
9. Green



POWER OUTPUT:
Type Push pull beam tubes
Undistorted 8.5 watts
Maximum 13 watts
POWER SUPPLY:
All models available
105-135 volts, 50-60 cycle, 145 watts
105-135 volts, 35 cycle, 150 watts

57 RL 119
JUNE 27, 1938



JUNE 13, 1938

FOR TUNER DATA SEE INDEX

FOR ALIGNMENT, SEE PAGE 10-10

POWER SUPPLY:
"A" Battery (4 volt dry) 1 - #5030 POWER OUTPUT:
"A" Battery (4 volt storage) 1 - #5049

FREQUENCY RANGE:
Broadcast 540-1750 kc CHASSIS FEATURES:
Number IF stages One
Built-in Wave Trap
Plugs attached to battery cable

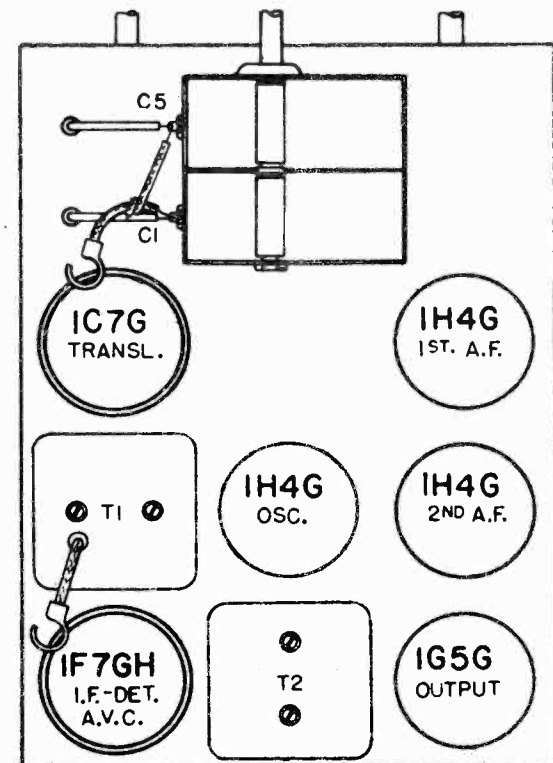
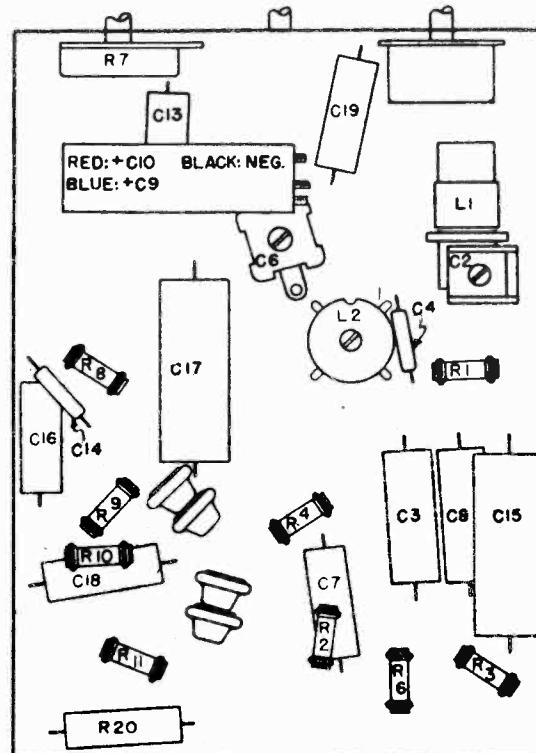
INTERMEDIATE FREQUENCY 465 kc

OPERATING FEATURES:
Tone Control Two position.
Automatic Volume Control
"On-Off" Indicator
Push Button Tuning (4 button)

LOUD SPEAKER:
Type PM Dynamic
Size 6 inch

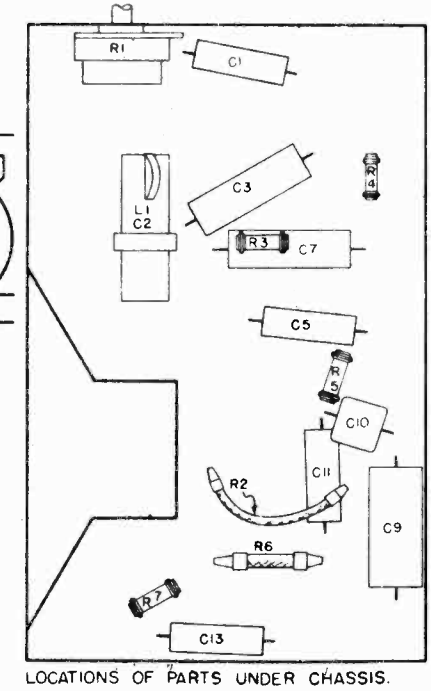
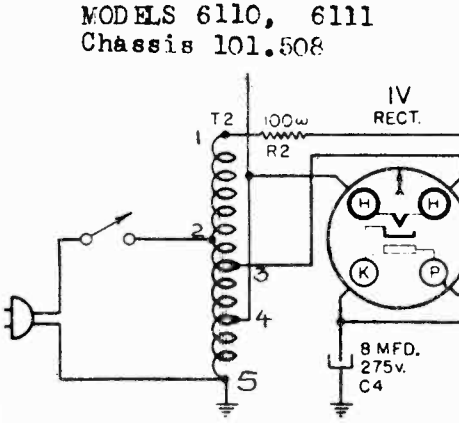
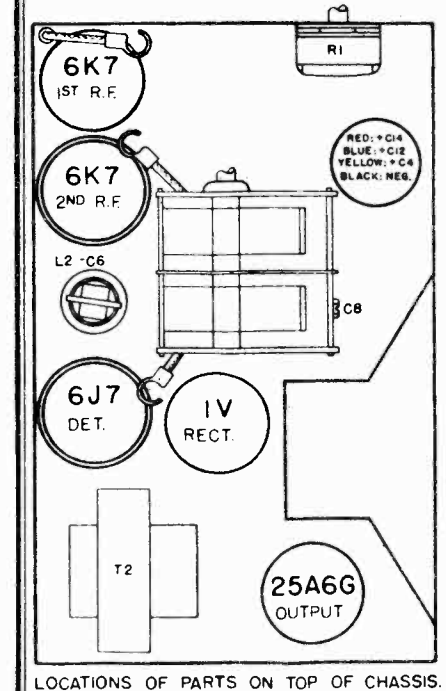
* - PART OF T2
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

ALIGNMENT FREQUENCIES:
Oscillator Antenna-Transl. Padder
Trimmer 1400 kc 600 kc
1400 kc



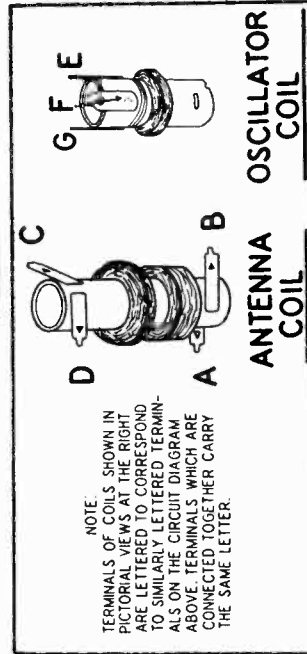
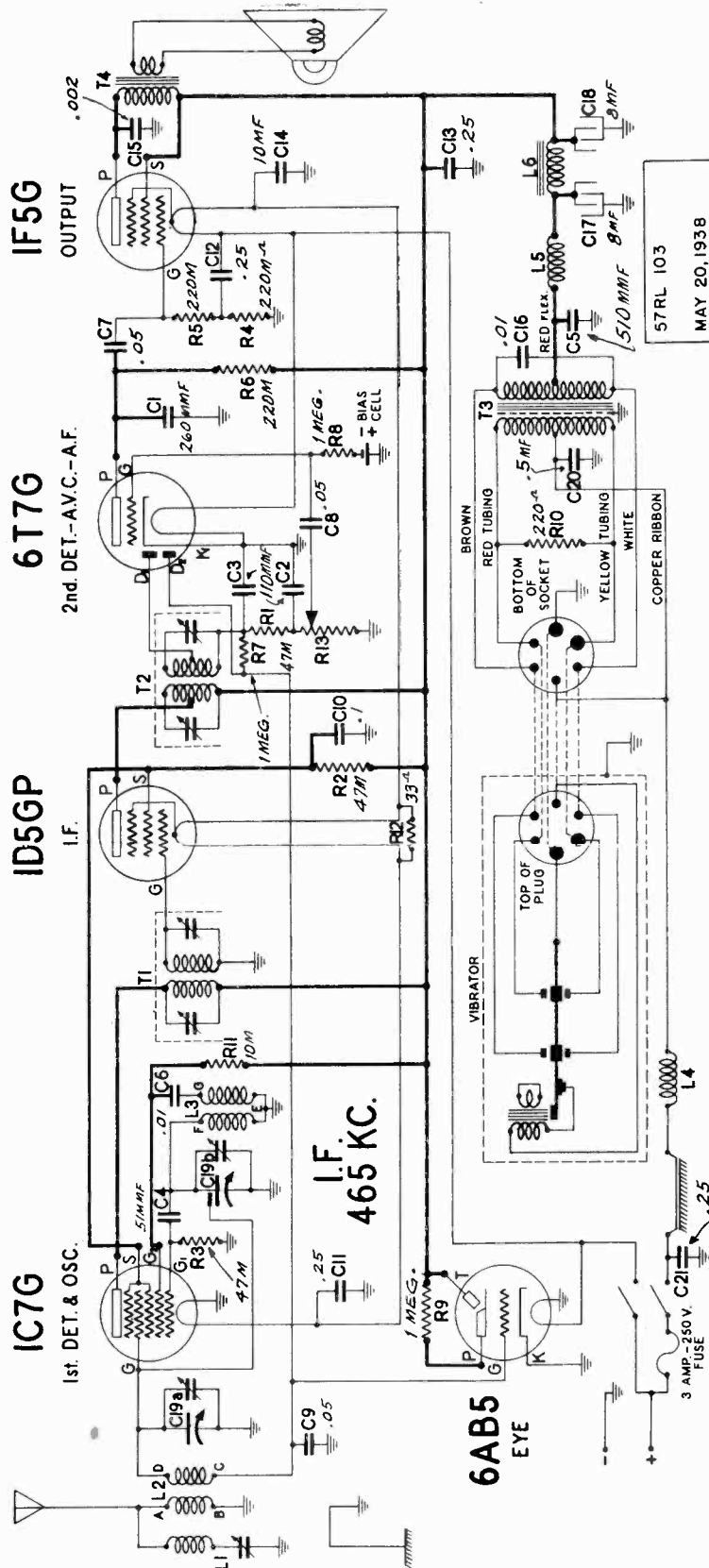
ALIGNMENT PROCEDURE: FOR CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION VOL. VIII INDEX

Either a broadcast station of about 1400 kc or a signal generator can be used for alignment. The chassis must be taken out of the cabinet for alignment of the trimmer, C8. The volume control setting should be reduced so that the signal is just audible in order to facilitate accuracy of adjustment. This set has no AVC so that a strong input signal may be used.



SEARS-ROEBUCK & CO.

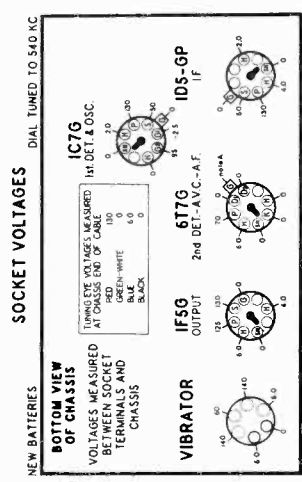
MODELS 6070, 6170
Chassis 100.189
Schematic, Voltage
Coils



Use a high resistance voltmeter of 1,000 ohms per volt.

NOTE A: The bias for the control grid of the 6T7-G tube is -1.0 volt supplied by a bias cell. Due to the high resistance of the cell the voltmeter will indicate only a fraction of a volt.

IMPORTANT: The bias for the control grid of the ID5-GP tube is -2.0 volts measured across the filament of the 1C7-G tube. The bias for the control grid of the IF5-G tube is -4.0 volts measured from the low side of the IF5-G tube filament to ground.



NEW BATTERIES		FORM NO. 8725 PRINTED IN U.S.A.	
POWER SUPPLY	Available	POWER OUTPUT	6 volt - 1.3 AMP.
"A" supply vibrator	.....	Type	.....Synchronous; plug-in type
"B" supply vibrator	.....	Maximum	.....0.55 WATTS
FREQUENCY RANGE	537 to 1785 KC.	OPERATING FEATURES	
INTERMEDIATE FREQUENCY	.....	Stability Range	.....50-5000 Cycles
		Volume Stabilizer	.....A.V.C. System
		Number of I.F. Stages	.....One
		Antenna	.....Conventional
		Number of Cond. in Oeag.	.....Two
		485 KC. Wave Tray	.....
		LOUD SPEAKER	
		Type	.....Perm. Magnet Dynamic
		Watts	.....5
		Size	.....5486

MODELS 6070, 6170
Chassis 100.189
Socket, Trimmers
Chassis Alignment

SEARS-ROEBUCK & CO.

MODEL 7225, Ch. 110.255
Alignment

Model 6070, 6170 Chassis 100.189

ALIGNMENT PROCEDURE

Before attempting to align the receiver check to see that the dial pointer is opposite the last scale division on the low frequency end of the dial scale when the gang condenser is in full mesh. If the pointer is incorrectly set, it is merely necessary to move the pointer to the correct position by hand, while holding the gang condenser in the full-mesh position.

Output meter connections-----Across voice coil leads
Output meter reading to indicate 0.05 watt output-----See chart below
Output meter reading to indicate 0.05 watt output-----See chart below
Connection of generator ground-----Receiver chassis
Dummy Antenna in series with Generator Output Lead-----See chart below
Connection of Generator Output Lead-----See chart below
Position of volume control-----Maximum clockwise

POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR OUTPUT	TRIMMERS ADJUSTED	TRIMMER FUNCTION	APPROXIMATE MICROFARADS
**	465 KC	0r14 6D6	T7, T6, T8 T7, T6, T8 T4, T5	I.F.	4500
**	466 KC	0r14 6A7	I.F.	I.F.	60
600 KC (Rock)	600 KC	Ant.	P	Osc.	16
1500 KC	1500 KC	Ant.	T3, T2	Osc., A.F.	20
600 KC	466 KC	Ant.	T1	wave trap	**

ALIGNMENT PROCEDURE

Model 7225 Chassis 110.255

Output Meter Connections Across Primary Output Transformer
Output Meter reading to indicate 0.050 watt
For Weston type 571 Output Meter on 15 volt scale 9 volts
Average sensitivity in MV for .06 watt output see chart below
Dummy antenna value in series with generator output 100 MFPS
Connection of generator ground lead To Chassis
Generator modulation App. 50% at 400 cycles
Position of volume control Fully clockwise

It is advisable to repeat the entire alignment procedure band by band and in the original order to insure greater accuracy.

Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.

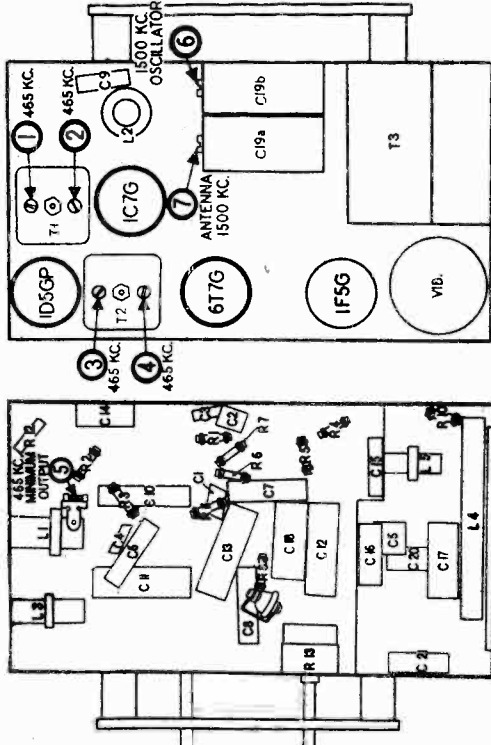
Values shown under "Microfarads" are only approximate.

**Short oscillator section of variable condenser.

Second i.f. alignment must be done twice to secure flat top tuning.

***Adjust trimmer for minimum signal response with maximum signal input.

*First time T7 is misaligned about one turn by loosening center screw.



TOP VIEW

BOTTOM VIEW

IMPORTANT ALIGNMENT NOTES

As indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

It is advisable to repeat the entire alignment procedure band by band and in the original order to insure greater accuracy.

Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.

Values shown under "Microfarads" are only approximate.

**Short oscillator section of variable condenser.

Second i.f. alignment must be done twice to secure flat top tuning.

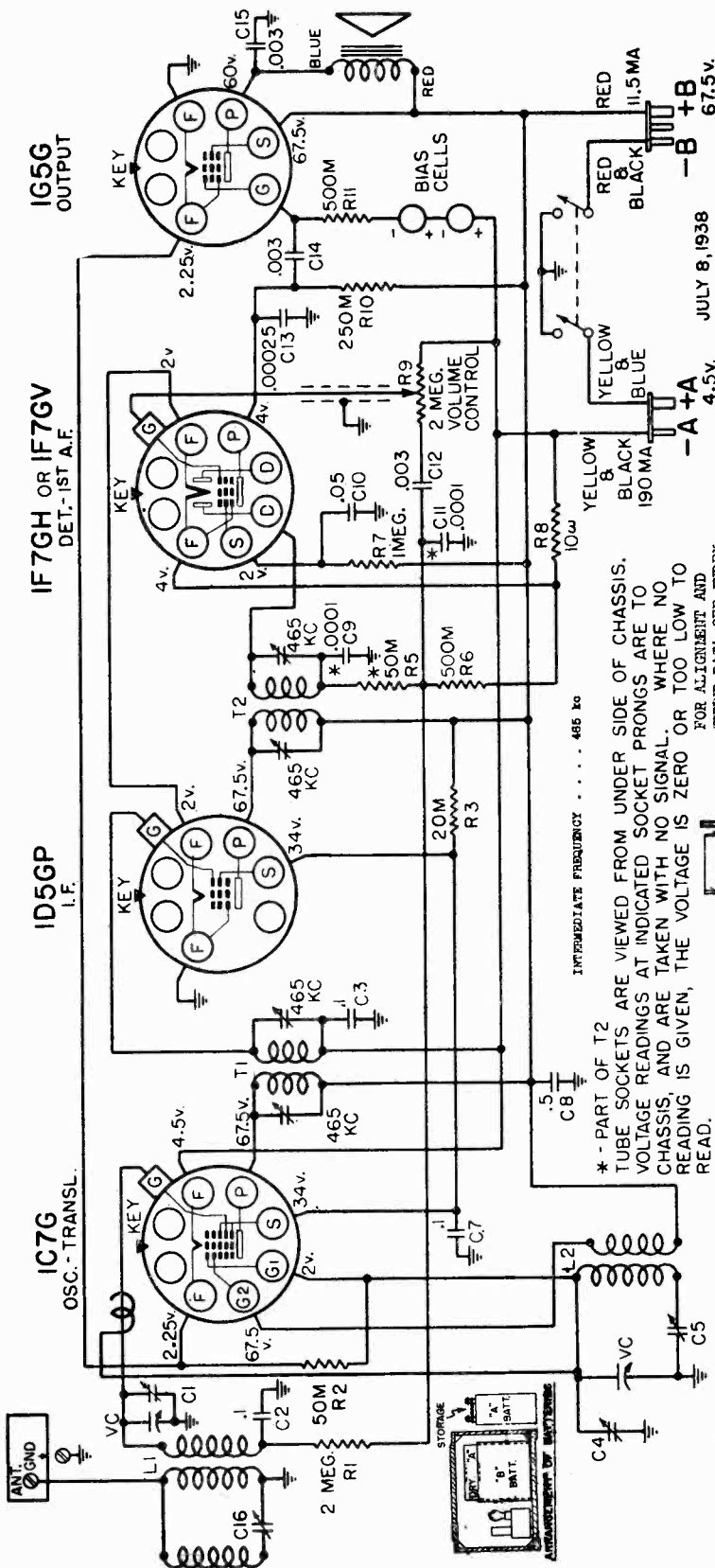
***Adjust trimmer for minimum signal response with maximum signal input.

*First time T7 is misaligned about one turn by loosening center screw.

Socket, Trimmers
Chassis

SEARS-ROEBUCK & CO.

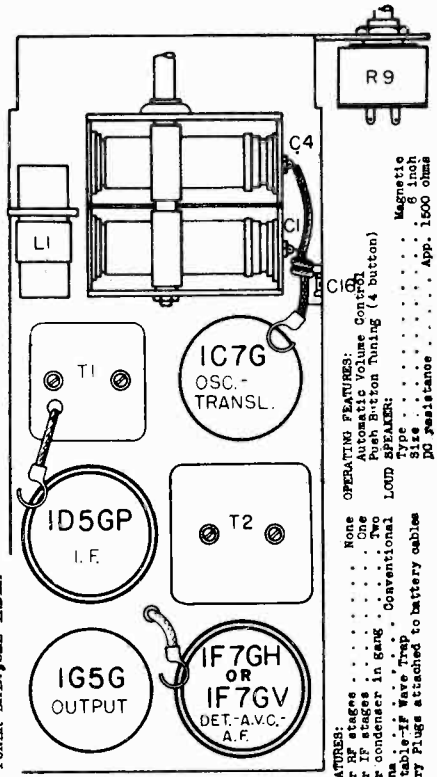
MODELS 6054, 6055
Chassis 101.532
Schematic, Voltage



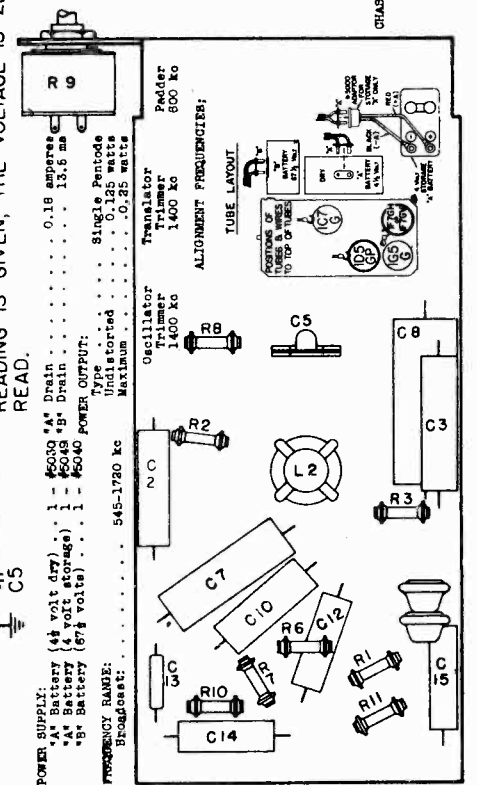
INTERMEDIATE FREQUENCY 465 kc

* - PART OF T2 TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

FOR ALIGNMENT AND TUNER DATA, SEE INDEX



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER CHASSIS.

POWER SUPPLY:
 *A Battery (48 volt dry) 600 mA
 *B Battery (60 volt storage) 1.5 A
 *C Battery (60 volt) 600 mA

POWER OUTPUT:
 Unmodulated Single Pentode
 Modulated 0.125 watts
 Maximum 0.35 watts

FREQUENCY RANGE:
 Broadcast 545-1720 kc

ALIGNMENT FREQUENCIES:
 Oscillator 1400 kc
 Translator 1400 kc
 Padder 600 kc

TUBE LAYOUT:
 TUBES & WIRING TO TOP OF CHASSIS

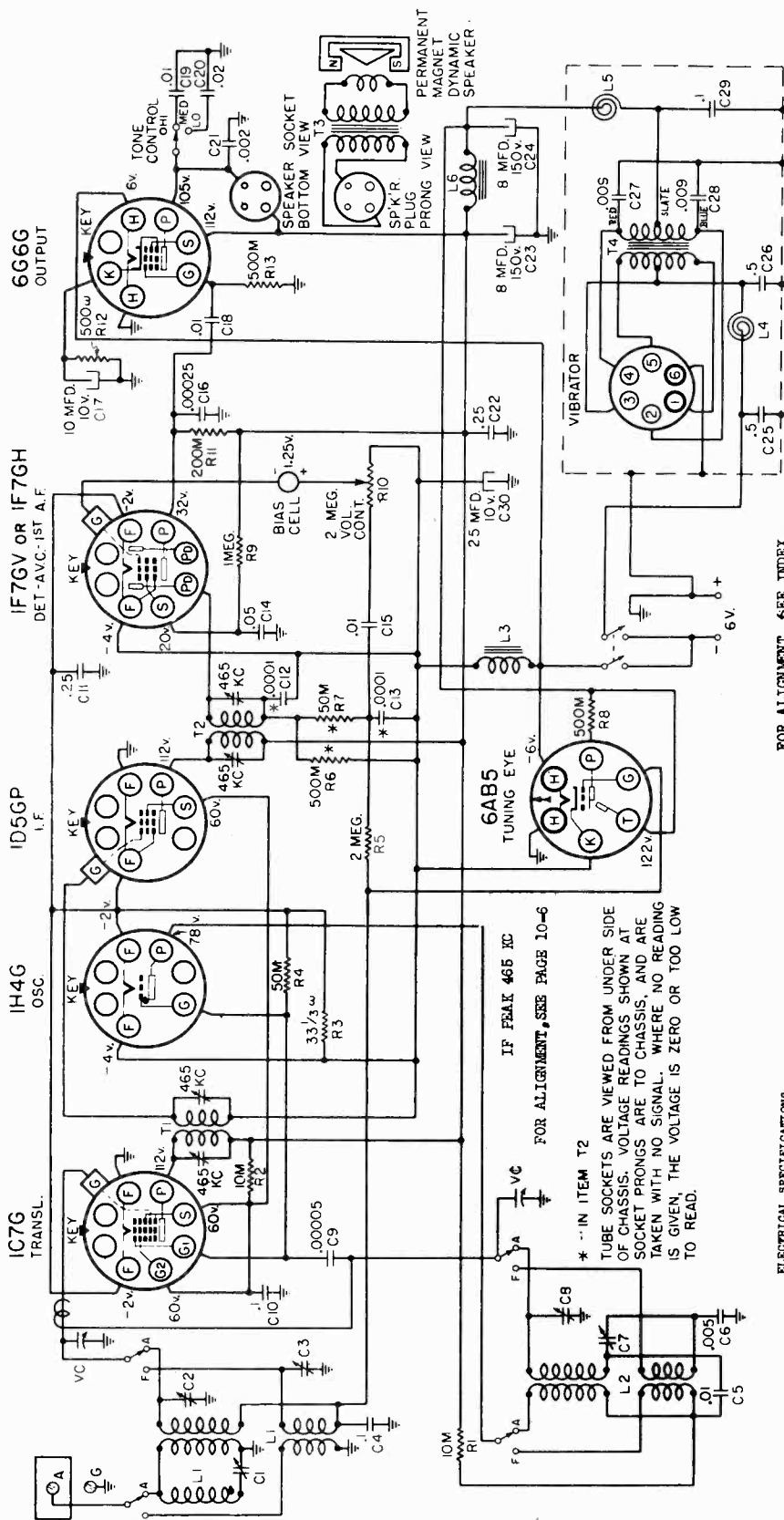
OPERATING FEATURES:
 Automatic Volume Control
 Automatic Tuning (4 buttons)
 Loud Speaker
 Type Magneto
 Size 6 inch
 DC Resistance App. 1500 ohms

MODELS 6072, 6077, 6172

Chassis 101.5L3

Schematic, Voltage

SEARS-ROEBUCK & CO.



57 RL 116
JUNE 15, 1938

FOR ALIGNMENT, SEE INDEX.

ELECTRICAL SPECIFICATIONS

TUBES AND FUNCTIONS:	
1C7G	Translator
1H4G	Oscillator
1D5GP	Oscillator
1F7GV or 1F7GH	Detector-AVC-1st A.F.
6G6G	Output
6AB5	Tuning Eye
POWER SUPPLY:	
Six volt storage battery	
FREQUENCY RANGES:	
Band "AM"	540-1730 kc
Band "FM"	5.9-18.2 mc
INTERMEDIATE FREQUENCY:	
Type	Penode
Undistorted	0.2 Mc
Maximum	0.5 Watts
LOAD SPEAKER:	
Type	PW Dynamic
Size	6 and 8 inch
ALIGNMENT FREQUENCIES:	
Oscill.	Ant.-Transal.
Trimmer	600 kc
Band "AM"	1730 kc
Band "FM"	16 mc
Fixed	485 kc
BATTERY DRAIN: 1.5 ampere	
OPERATING FEATURES:	
Tone Control	
Automatic Volume Control	
Push Button Tuning (5 button)	
CHASSIS FEATURES:	
Number IF stages	
Number condensers in gang	
Antenna	
Tuning Eye	
Synchronous Vibrator-Rectifier	
Built-in IF Wave Trap	
MECHANICAL SPECIFICATIONS:	
CONTROL OPERATION:	
Turning right: Volume increase	
Turning left: Band Switch	
Turning right: "ON", "HI", "MED", "LO"	
Turning ratio: 10:1	

IF PEAK 465 KC
FOR ALIGNMENT, SEE PAGE 10-6

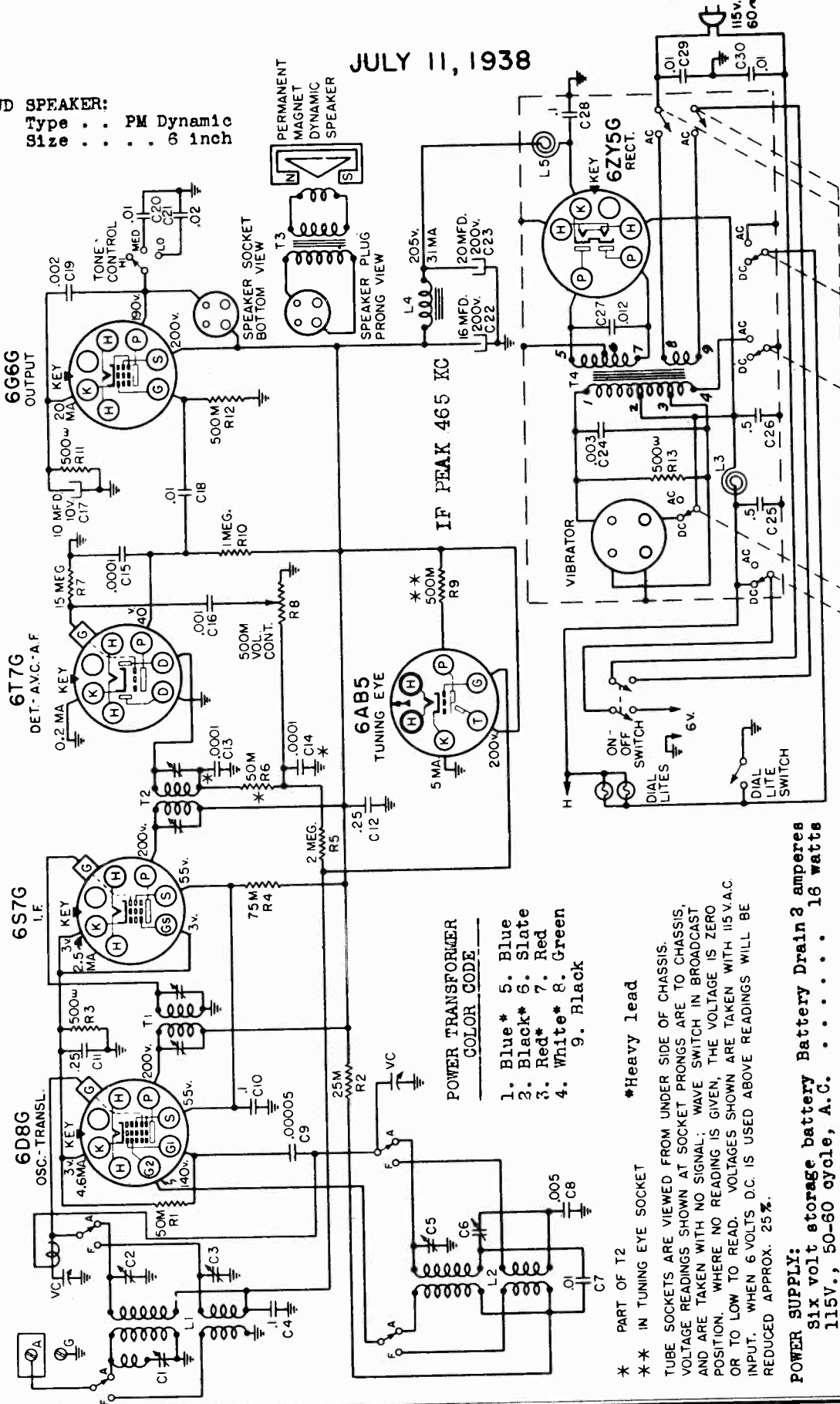
* IN ITEM T2
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

SEARS-ROEBUCK & CO. MODELS 6073, 6173, Ch. 101.528
Schematic Voltage

JULY 11, 1938

LOUD SPEAKER:
Type . . . PM Dynamic
Size 6 inch

FOR ALIGNMENT, SEE INDEX.



POWER OUTPUT:
Type Pentode
Undistorted 0.35 watts on A.C.;
0.25 watts on D.C.
Maximum 0.5 watts on A.C.;
0.4 watts on D.C.

Ant-Transl.
Trimmer 1500 kc
Fixed 15 mc
Padder 600 kc
Fixed 15 mc
465 kc

ALIGNMENT FREQUENCIES:
Oscil.
Trimmer 1500 kc
Band "AM"
Band "FOR"

FREQUENCY RANGES:
Band "AM" 545-1730 kc
Band "FOR" 6-18 mc
INTERMEDIATE FREQUENCY

- POWER TRANSFORMER
COLOR CODE
- 1. Blue* 5. Blue
 - 2. Black* 6. Slate
 - 3. Red* 7. Red
 - 4. White* 8. Green
 - 9. Black

* Heavy lead
** IN TUNING EYE SOCKET
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS,
AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST
POSITION. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO
OR TO LOW TO READ. VOLTAGES SHOWN ARE TAKEN WITH 115 V.A.C.
INPUT. WHEN 6 VOLTS D.C. IS USED ABOVE READINGS WILL BE
REDUCED APPROX. 25%.

POWER SUPPLY:
Six volt storage battery Battery Drain 3 amperes
115V., 50-60 cycle, A.C. 16 watts

MODELS 6073, 6173

Chassis 101.528

Socket, Trimmers, Chassis

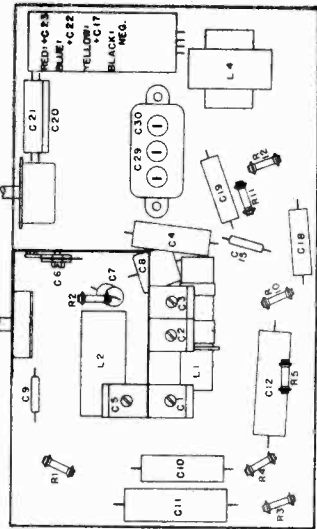
SEARS-ROEBUCK & CO.

MODEL 6101, Ch. 101.496

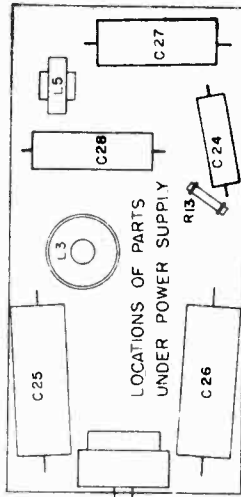
Socket, Trimmers, Chassis

Antenna Coil, Trimmers

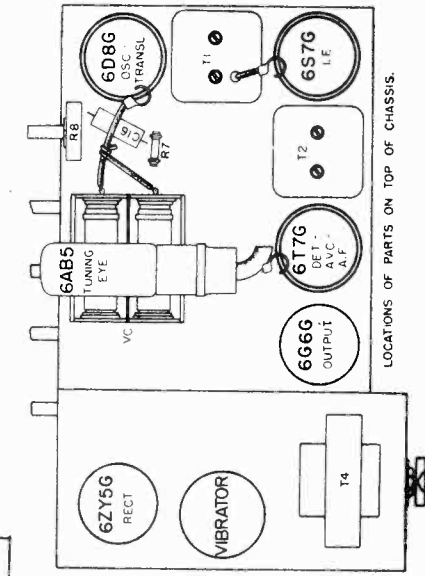
MODELS 6073, 6173. CHASSIS 101.528.



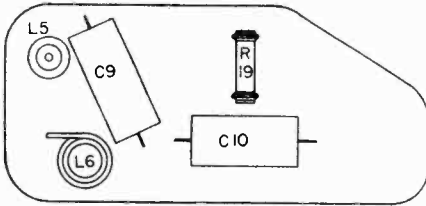
LOCATION OF PARTS UNDER CHASSIS



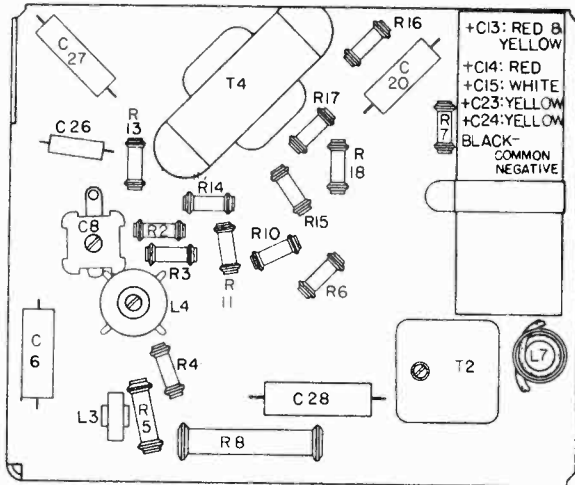
LOCATIONS OF PARTS UNDER POWER SUPPLY



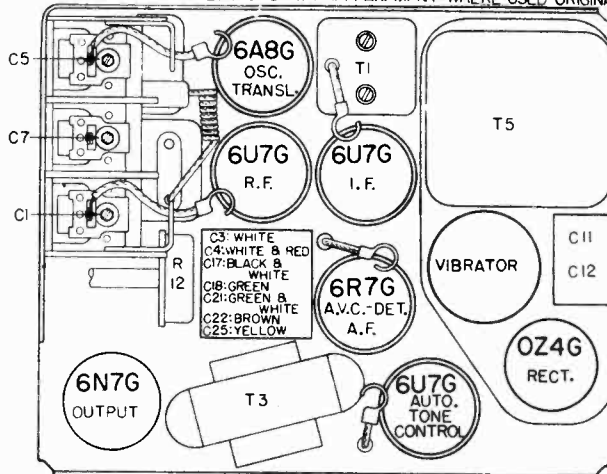
LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATIONS OF PARTS UNDER POWER SUPPLY
USE INSULATED TYPE RESISTORS FOR REPLACEMENT
WHERE USED ORIGINALLY



LOCATIONS OF PARTS UNDER CHASSIS
USE INSULATED TYPE RESISTORS FOR REPLACEMENT WHERE USED ORIGINALLY



LOCATIONS OF PARTS ON TOP OF CHASSIS

MODEL 6101, CHASSIS 101.496.

ANTENNA MATCHING:

Two separate adjustments are provided for matching the receiver to the particular ear antenna. One adjustment consists of two taps on the antenna coil. The second adjustment is a trimmer, C1, on the variable condenser. It is accessible through a hole in the bottom cover of the receiver case. These adjustments are to be made as follows:

THE TAPPED ANTENNA COIL:

The adjustment of the tapped antenna coil should be made before installing the receiver on the car. Removal of the bottom cover of the receiver will reveal a terminal board mounted in the rear of the chassis. The variable condenser plates must be closed for it to be seen. This terminal board has four jacks holes, only two of which are used. These two are marked with the numerals "1" and "2". The sets are shipped with the plug in hole #1.

THE ANTENNA TRIMMER ADJUSTMENT:

With the set tuned to a weak station at about 1500 kilocycles, turn the adjusting screw (accessible through the hole in the bottom cover) to the point affording maximum volume. A weak station must be used to prevent overloading of the receiver from interfering with accurate peaking. If a peak cannot be reached with the trimmer, the capacity of the car's antenna may be such that the other antenna tap adjustment should be used.

The plug position should be changed to hole #2 if a whip type aerial, such as Catalog #5582, or any other aerial of less than 125 mmf. capacity is used.

CHASSIS FEATURES:

- Automatic Tone Control One
- Number RF stages One
- Number IF stages One
- Number condensers in gang Three
- Antenna filter
- Tapped antenna coil for matching antenna capacity.

Variable antenna trimmer

Non-synchronous vibrator

Provision for push button automatic

Provision for Push Button Automatic

Motor Tuner Accessory.

Provision for Auxiliary Speaker.

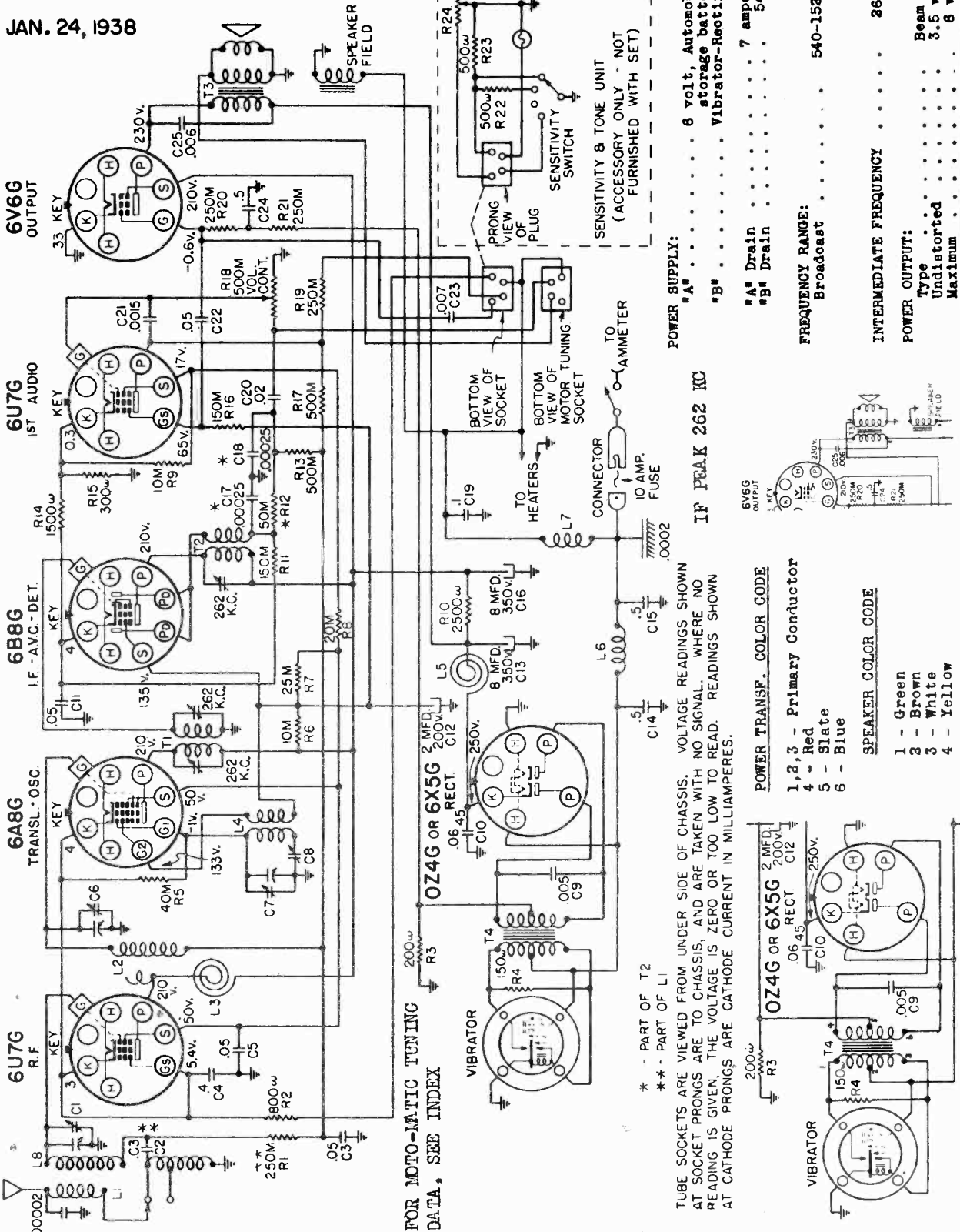
SEARS-ROEBUCK & CO.

MODEL 6100, Ch. 101.495
Schematic, Voltage
Color Codes

ALIGNMENT FREQUENCIES:
Oscillator Trimmer 1580 kc
Ant.-Translator Trimmer 1400 kc
Padder 800 kc

LOUD SPEAKER:
Type Dynamic
Size 8"
Approximate field resistance 4 ohms

JAN. 24, 1938



POWER SUPPLY:

- "A" 6 volt, Automobile storage battery.
- "B" Vibrator-Rectifier
- "A" Drain 7 amperes
- "B" Drain 54 ma

IF PEAK 262 KC

FREQUENCY RANGE:

- Broadcast 540-1530 kc
- INTERMEDIATE FREQUENCY 268 kc

POWER OUTPUT:

- Type Beam Tube
- Undistorted 3.5 watts
- Maximum 6 watts

POWER TRANSF. COLOR CODE

- 1, 2, 3 - Primary Conductor
- 4 - Red
- 5 - Slate
- 6 - Blue

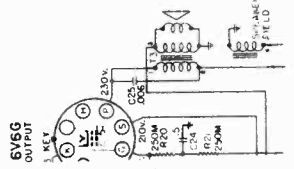
SPEAKER COLOR CODE

- 1 - Green
- 2 - Brown
- 3 - White
- 4 - Yellow

FOR AUTO-TUNING DATA, SEE INDEX

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. READINGS SHOWN AT CATHODE PRONGS ARE CATHODE CURRENT IN MILLIAMPERES.

* - PART OF T2
** - PART OF L1



MODEL 6100, Ch. 101.495
 Socket, Trimmers, Chassis
 Alignment

SEARS-ROEBUCK & CO.

MODEL 6101, Ch. 101.496
 Alignment

ALIGNMENT PROCEDURE

PRELIMINARY:

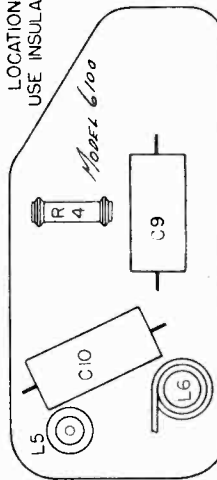
Output meter connections Across loud speaker voice coil
 Output meter reading to indicate 1 watt Model 6101 - 1.05 volts, Model 6100 - .85 volts
 Average sensitivity microvolts for 1 watt output See chart below
 Generator ground lead connection Receiver chassis
 Dummy antenna value to be in series with generator output See chart below
 Connection of generator output lead See chart below
 Generator modulation 30%, 400 cycles
 Position of Volume Control Fully on
 Position of Antenna Tap #3 hole
 The chassis must be in its case although the covers may be removed during the alignment procedure.

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	388 kc	.1 mfd.	6A9D Grid	T2, T1	IF	600 600
Fully Open	1530 kc	.0003 mfd.	Antenna Conn.	C7	Oscillator, Trimmer	1.5 1.0
1400 kc	1400 kc	.0003 mfd.	Antenna Conn.	*C1, C5	Antenna, Translator	1.5 1.0
800 kc (rock)	800 kc	.0003 mfd.	Antenna Conn.	C8	Padder	3.8 2.0

IMPORTANT ALIGNMENT NOTES

The variable should be rocked back and forth a degree or two while making the 800 kc adjustment.
 The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy.
 Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.

LOCATIONS OF PARTS UNDER POWER SUPPLY
 USE INSULATED TYPE RESISTORS FOR REPLACEMENT
 WHERE USED ORIGINALLY

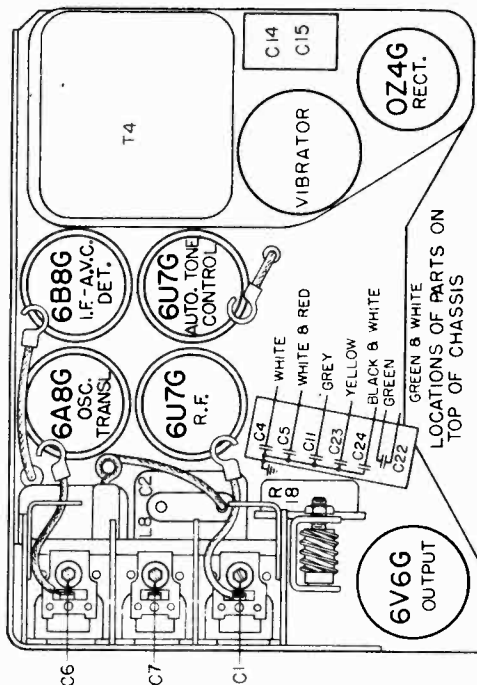


CHASSIS FEATURES:

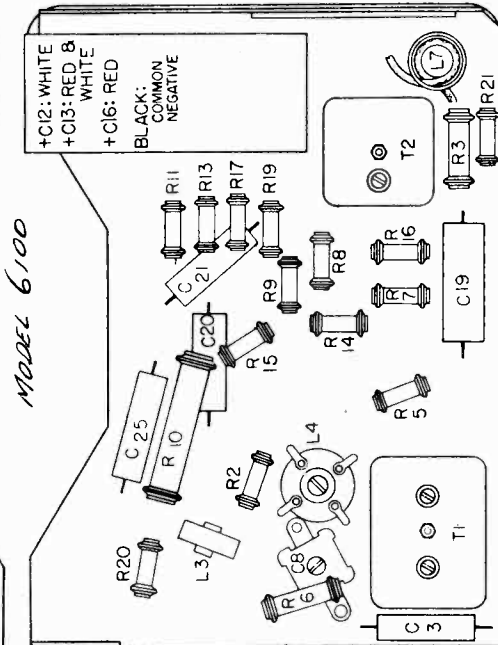
- Automatic Tone Control One
- Number RF stages One
- Number IF stages One
- Number condensers in gang Three
- Antenna filter
- Tapped antenna coil for matching antenna capacity.
- Variable antenna trimmer
- Non-synchronous vibrator
- Provision for combined Tone and Sensitivity control unit accessory.
- Provision for Push Button Automatic Motor Tuner Accessory
- Provision for Auxiliary Speaker.

OPERATING FEATURES:

- Automatic Volume Control



LOCATIONS OF PARTS ON TOP OF CHASSIS



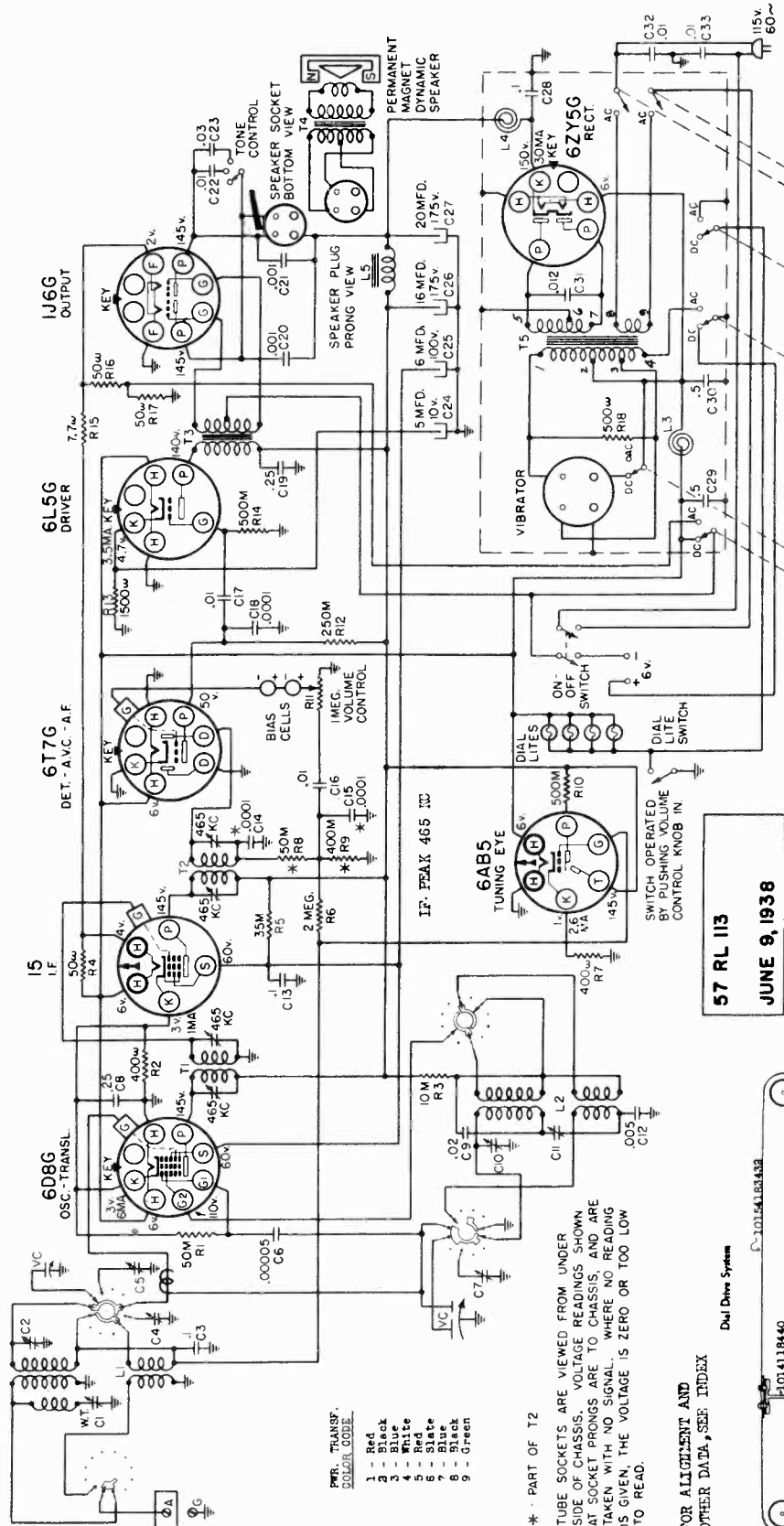
LOCATIONS OF PARTS UNDER CHASSIS

USE INSULATED TYPE RESISTORS FOR REPLACEMENT WHERE USED ORIGINALLY
 THE ANTENNA TRIMMER ADJUSTMENT:

With the set tuned to a weak station at about 1500 kilocycles, turn the adjusting screw (accessible through the hole in the bottom cover) to the point affording maximum volume. A weak station must be used to prevent the AVC action of the receiver from interfering with accurate peaking. If a peak cannot be reached with the trimmer, the capacity of the car's antenna may be such that the other antenna tap adjustment should be used.

SEARS-ROEBUCK & CO.

MODELS 6074, 6079
Chassis 101.515
Schematic, Voltage
Drive Data



POWER SUPPLY:
Six volt storage battery
115 volt, 50-60 cycle, A.C.

BATTERY DRAIN: 2.1 amperes
. 30 watts

FREQUENCY RANGES:
Band "AM" 540-1730 kc
Band "SW" 5.8-18.2 mc
Band "9" 9.4-9.7 mc

INTERMEDIATE FREQUENCY: 495 kc

POWER OUTPUT:
Type Class "B"
Undistorted 1.5 watts on A.C.
Maximum 2.5 watts on D.C.
. 1.5 watts on D.C.

LOUD SPEAKER:
Type PM Dynamic
Size 5 and 8 inch

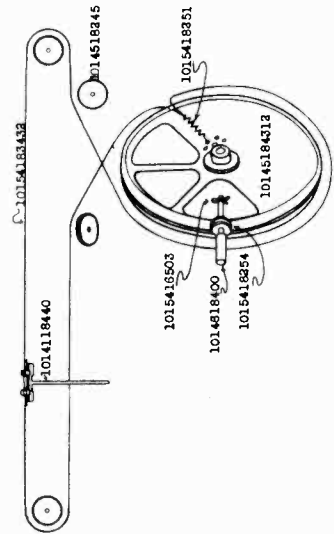
ALIGNMENT FREQUENCIES:
Oscill. Ant-Transl.
Trimmer 1730 kc
Band "AM" 1400 kc
Band "9" 9.55 mc
Band "S" 9.55 mc

57 RL 113
JUNE 9, 1938

- FOR TRANSF. COLOR CODE:**
- 1 - Red
 - 2 - Black
 - 3 - Blue
 - 4 - Green
 - 5 - Red
 - 6 - Slate
 - 7 - Blue
 - 8 - Black
 - 9 - Green

* PART OF T2
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

FOR ALIGNMENT AND OTHER DATA, SEE INDEX



MODEL 6101, Ch. 101.496
Schematic, Voltage
Color Code

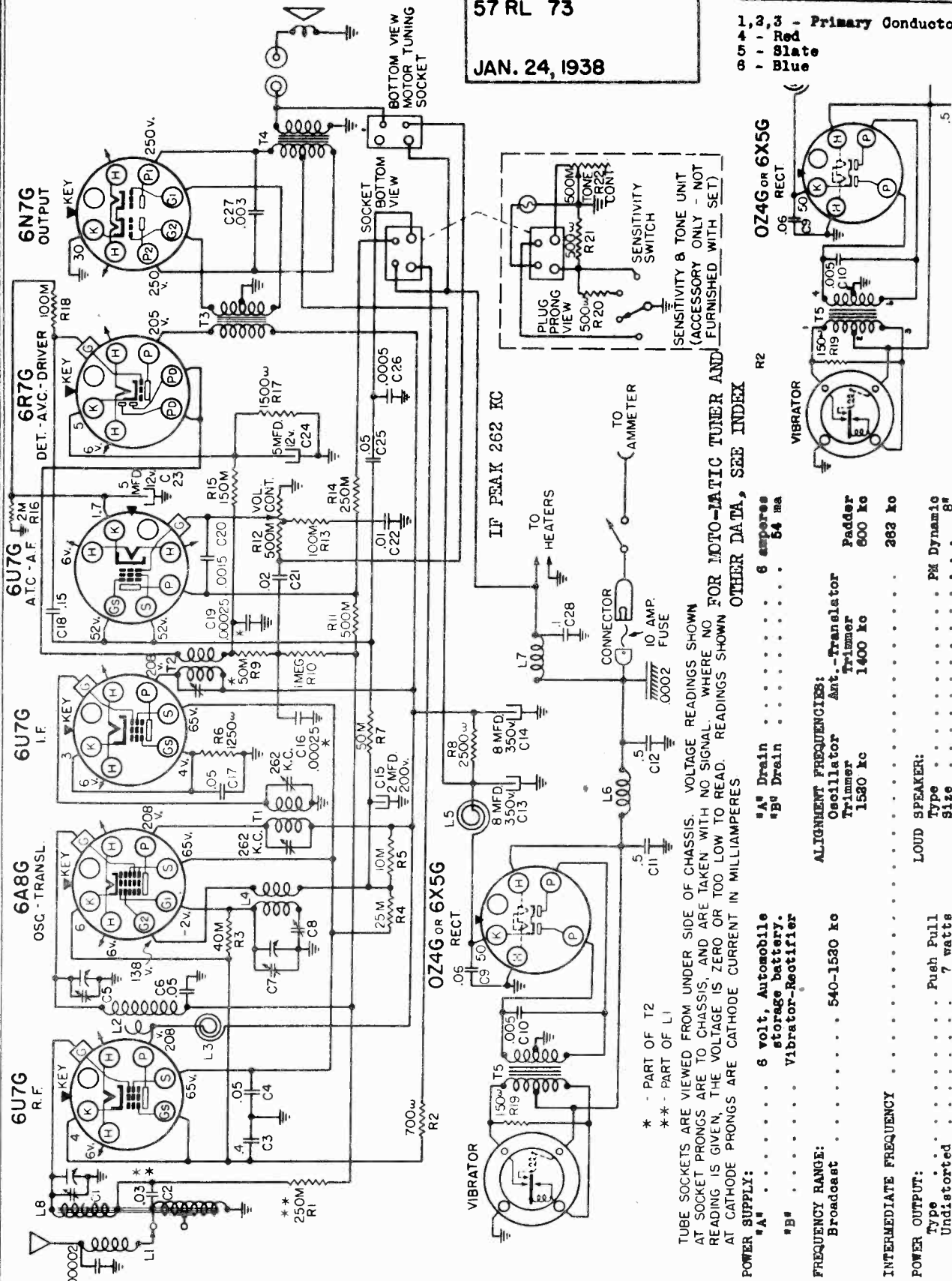
SEARS-ROEBUCK & CO.

57 RL 73

JAN. 24, 1938

POWER TRANSF. COLOR CODE

- 1, 3, 3 - Primary Conductor
- 4 - Red
- 5 - Slate
- 6 - Blue



* - PART OF T2
** - PART OF L1

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. READINGS SHOWN FOR MOTO-MATIC TUNER AND OTHER DATA, SEE INDEX.

POWER SUPPLY:
#A 6 volt, Automobile storage battery.
#B Vibrator-Rectifier

FREQUENCY RANGE:
Broadcast 540-1530 kc

INTERMEDIATE FREQUENCY
LOUD SPEAKER:
Type Push Pull
Undistorted 7 watts
Maximum 10 watts

ALIGNMENT FREQUENCIES:
Oscillator Ant.-Translator
Trimmer 1400 kc
Padder 800 kc
263 kc

#A Drain 6 amperes
#B Drain 54 ma

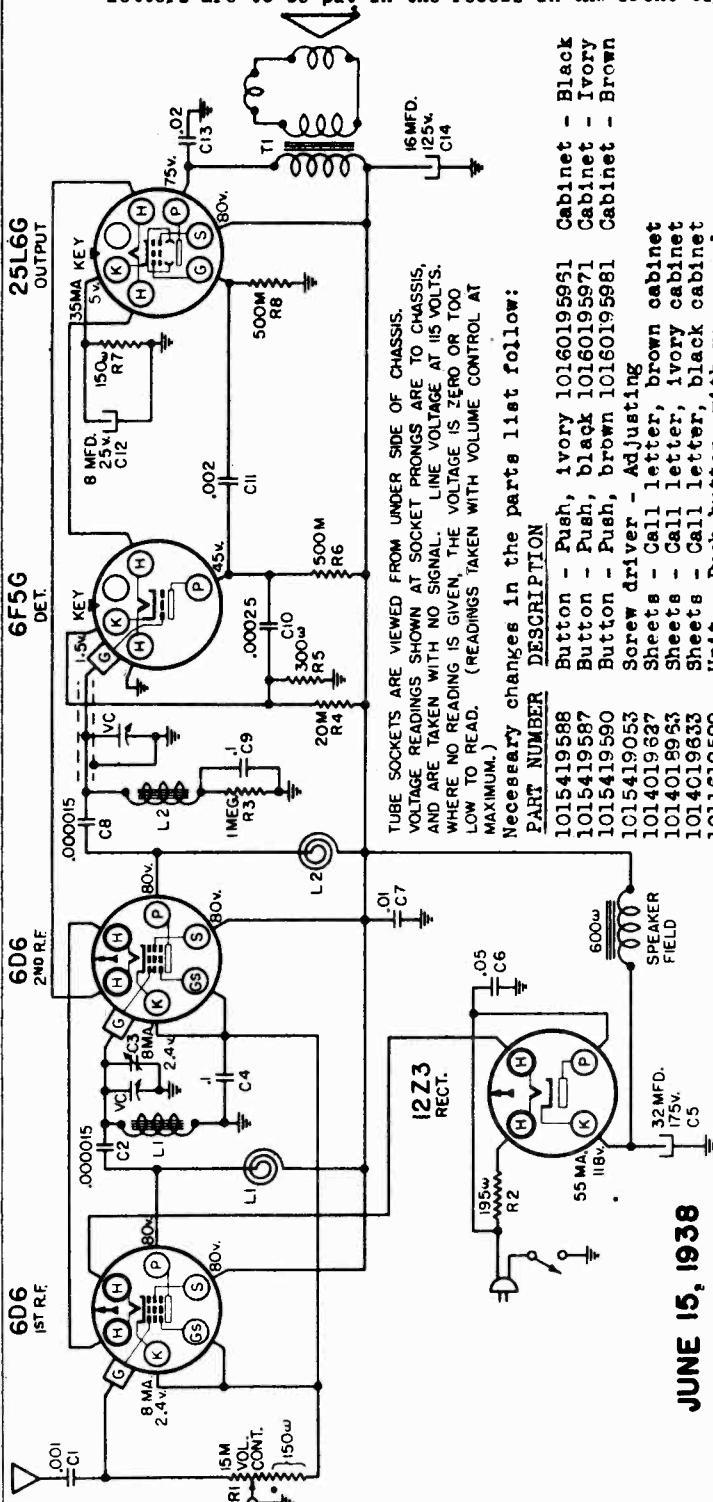
Schematic, Voltage, Alignment
Tuner Changes

SEARS-ROEBUCK & CO.

MODELS 6102, 6102A, 6103, 6103A
6105, 6105A. Chassis 101.526,
101.526-1

PUSH BUTTON TUNING:

Push buttons are set up in the following manner: Unlock the button by turning it counter-clockwise. Push the button all the way in. While holding it in, tune in the desired station. Then, with the button still pushed in, look it by turning it clockwise. The station's call letters are to be put in the recess in the front of the button.



ALIGNMENT FREQUENCY:
1500 kc

LOUD SPEAKER:
Type Dynamic
Size 5 inch
Field coil resistance 600 ohms
App. field coil voltage drop 40 volts

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. (READINGS TAKEN WITH VOLUME CONTROL AT MAXIMUM.)

Necessary changes in the parts list follow:

PART NUMBER	DESCRIPTION
1015419588	Button - Push, ivory 10160195951 Cabinet - Black
1015419587	Button - Push, black 10160195971 Cabinet - Ivory
1015419590	Button - Push, brown 10160195981 Cabinet - Brown
1015419053	Screw driver - Adjusting
1014019637	Sheets - Call letter, brown cabinet
1014019633	Sheets - Call letter, ivory cabinet
101619589	Unit - Push button, with var. cond.
1013919508	Knob - Volume, brown
1013919609	Knob - Tuning, brown

JUNE 15, 1938

ALIGNMENT PROCEDURE

The receiver need not be taken out of the cabinet for alignment.

Either a broadcast signal of about 1500 kc should be tuned in or else a signal generator, connected through a .0003 mfd. condenser to the set's antenna, should be used.

Tune in the signal and adjust the trimmer (accessible through the hole in the bottom of the cabinet) for maximum loud speaker response. This can be done most accurately, if the volume control setting is reduced to give low volume level. (This set has no AVC.) The variable should be rocked a degree or two during the adjustment. An insulated screw driver should be used, since the chassis may be above ground potential as explained previously.

SUBJECT: CHANGES IN PUSH BUTTON MECHANISM.

Chassis embodying these changes have the identification number 101.526-1. The suffix letter "A" also has been added to the catalog number.

The design of the push button tuning mechanism has been changed somewhat. Stations are set up as follows:

Full the push buttons off of their levers. Using the small screw driver supplied, unscrew the push button screw two or three turns. With screw and lever pushed in firmly, tune in the desired station. Then securely tighten the screw. Check the accuracy of the setting by pushing the lever to get the station and then seeing if the station can be still more accurately tuned with the tuning knob. If necessary, repeat the adjustment to obtain a more accurate setting. Punch out the station's call letters from the sheet, insert them in the recess in the front of the button, cover them with the clear celluloid disc, and replace the button. Proceed in the same manner for the remaining buttons.

FREQUENCY RANGE:
Broadcast 540-1730 kc

POWER OUTPUT:

Type Beam Tube
Undistorted 0.85 watts
Maximum 1.5 watts

OPERATING CONTROLS:

1. Small knob: "On-Off" Switch and Volume

2. Large knob: Station Selector

CONTROL OPERATION:

Turning right: Volume increase

Tuning ratio: Direct

CHASSIS FEATURES:

Attached antenna

OPERATING FEATURES:

Push Button Tuning (4 button)

MODELS 6102, 6102A, 6103
6103A, 6105, 6105A
Chassis 101.526, 101.526-1
Socket, Chassis

SEARS-ROEBUCK & CO.

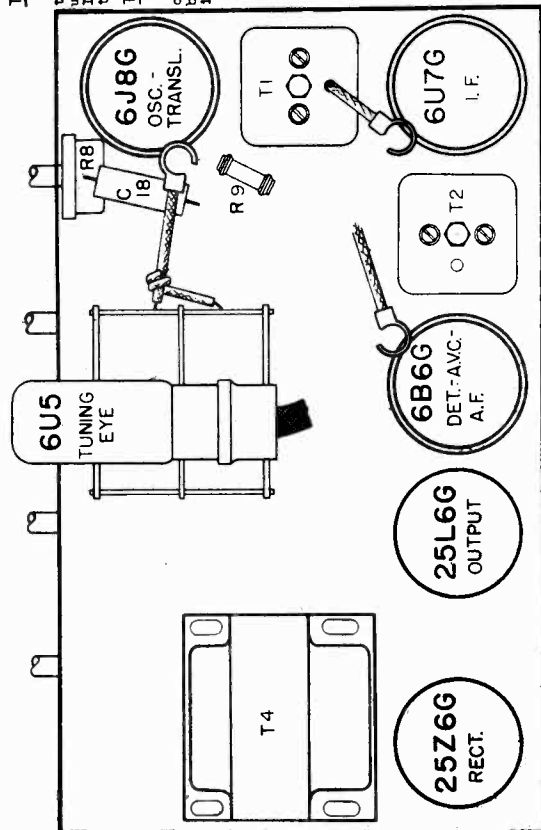
MODEL 6125, Ch. 101.527
Socket, Trimmers, Chassis
Notes

THE ANTENNA: MODEL 6125, CHASSIS 101.527.

An attached antenna wire is supplied with the receiver. It should be uncoiled and extended as far from the radio as possible. If interference between stations is encountered, uncoil the antenna only far enough to obtain satisfactory reception, free of interference. In locations remote from broadcasting stations additional pick-up can be had by connecting the end of the antenna to a conventional outdoor antenna lead.

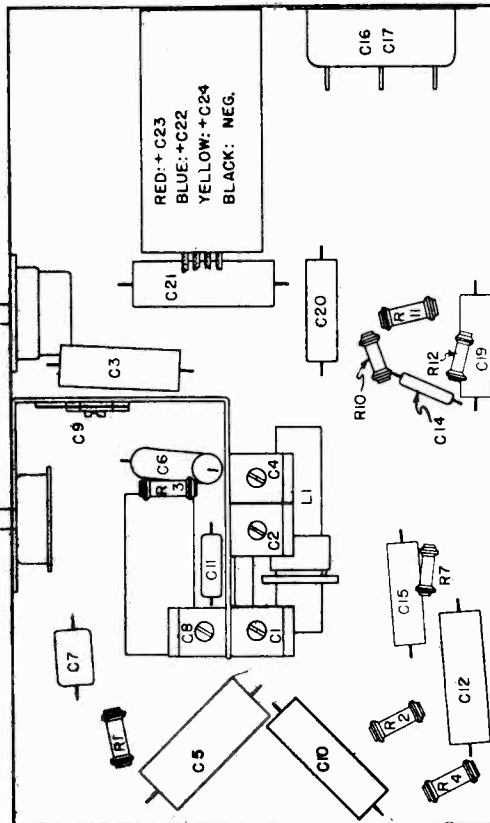
THE FILAMENT CIRCUIT:

All of the tubes are connected in series. Accordingly, if any one tube burns out, the others will not light. The full line voltage will appear across the heater prongs of the burnt out tube. The power transformer is connected in series with the tube heaters, and it is normal for the cord to become warm during operation.

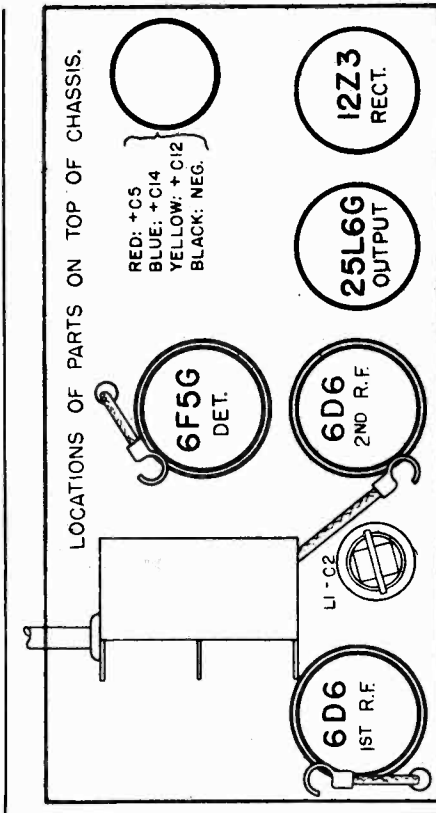


LOCATIONS OF PARTS ON TOP OF CHASSIS.

MODEL 6125, CHASSIS 101.527.

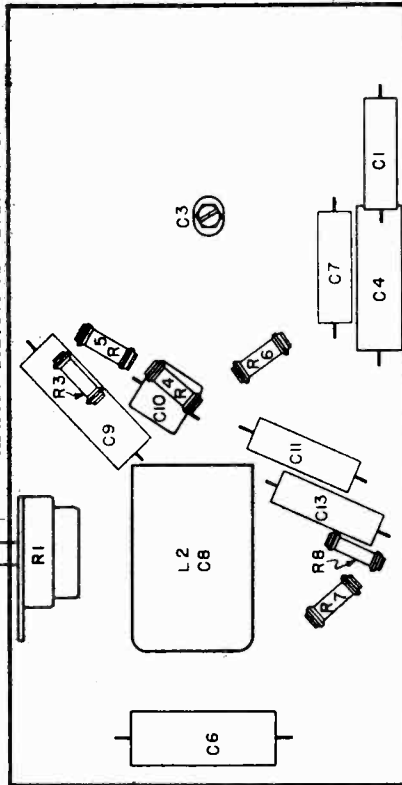


LOCATIONS OF PARTS UNDER CHASSIS.



LOCATIONS OF PARTS ON TOP OF CHASSIS.

MODELS 6102, 6102A, 6103, 6103A, 6105, 6105A.
CHASSIS 101.526 AND 101.526-1.



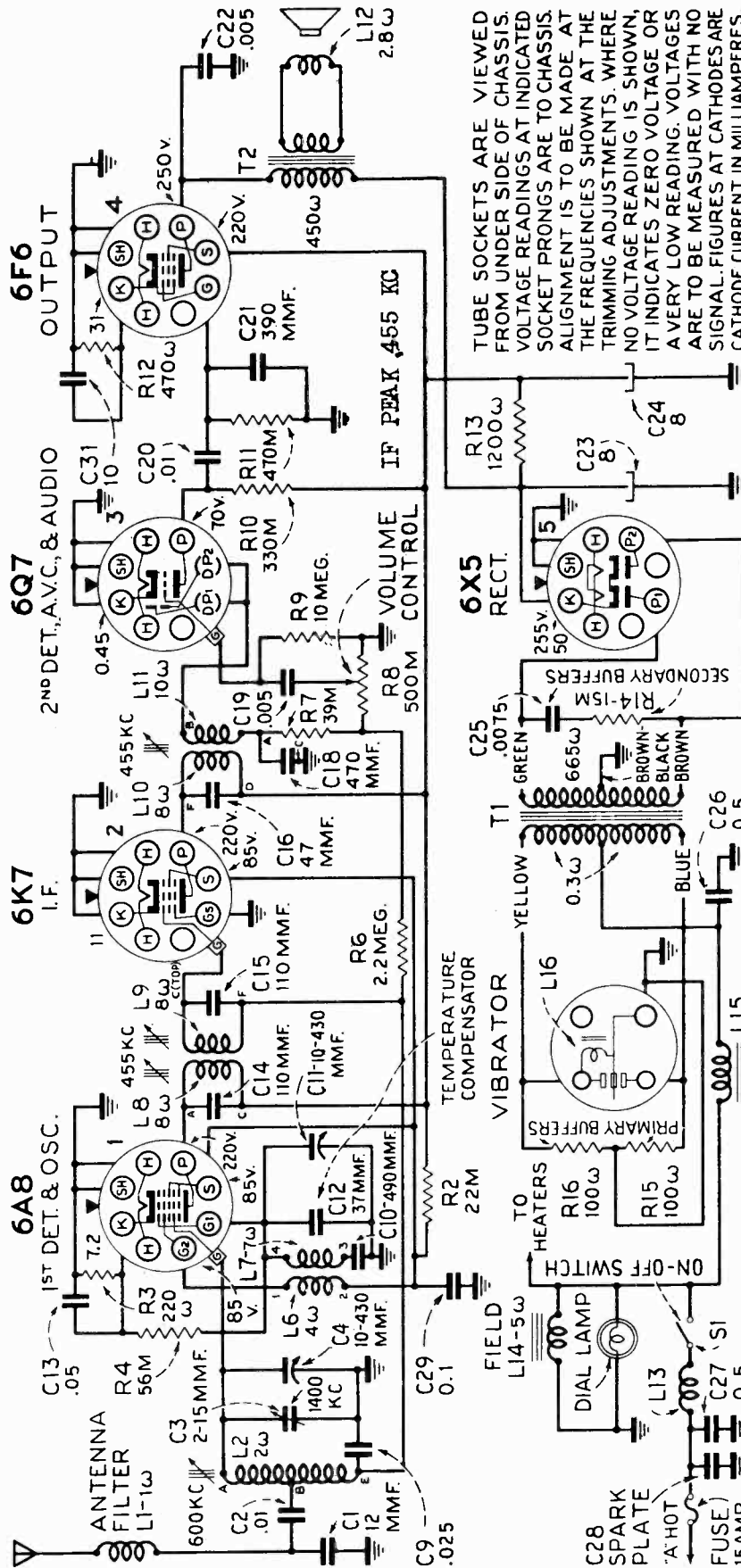
LOCATIONS OF PARTS UNDER CHASSIS.

SEARS-ROEBUCK & CO.

MODEL 6104, Ch. 126, 203

Schematic, Voltage

Data



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES ARE TO BE MEASURED WITH NO SIGNAL. FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

JUNE 30, 1938

ALIGNMENT FREQUENCIES:

- I.F. 455 kc
- Ant. 600 and 1,400 kc
- Osc. No Adjustment

LOUDSPEAKER:

- Type. Electrodynamic
- Size. 5 inches
- V.C. Impedance. 3.2 ohms at 400 cycles
- Field Coil Resistance. 5 ohms
- App. Field Coil Voltage Drop. 6 volts

FREQUENCY RANGE 550-1,550 kc

POWER OUTPUT:

- Type. Pentode
- Undistorted. 2.1 watts
- Maximum. 4.1 watts

POWER SUPPLY:

- "A". 6.3 volt Auto Storage Battery
- "B". Non-Synchronous Vibrator
- Current Drain. 6.75 amps.

MODEL 6104, Ch. 126, 203
Tuner Assembly, Data

SEARS-ROEBUCK & CO.

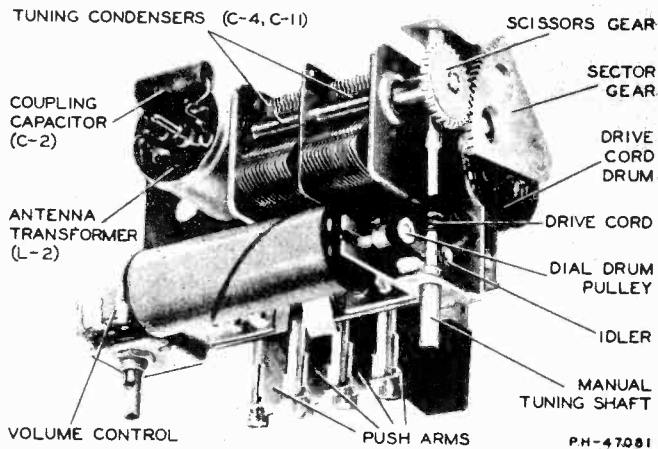
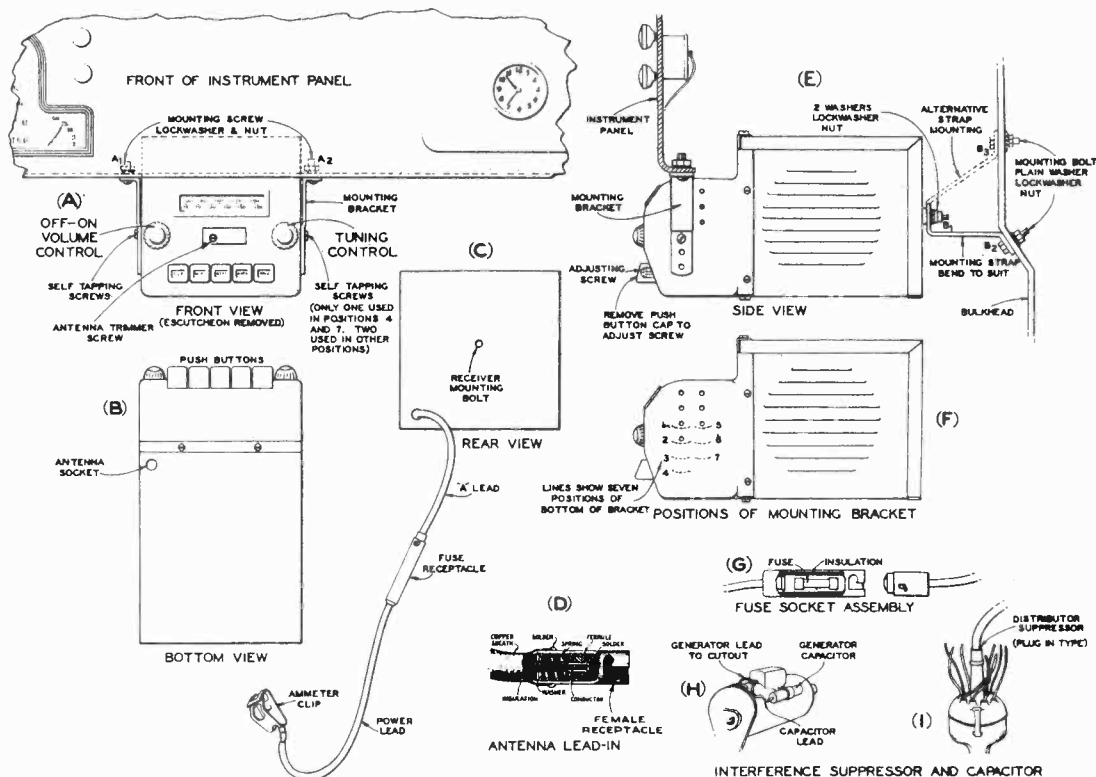


FIGURE 1—PUSH BUTTON AND MANUAL TUNING ASSEMBLY

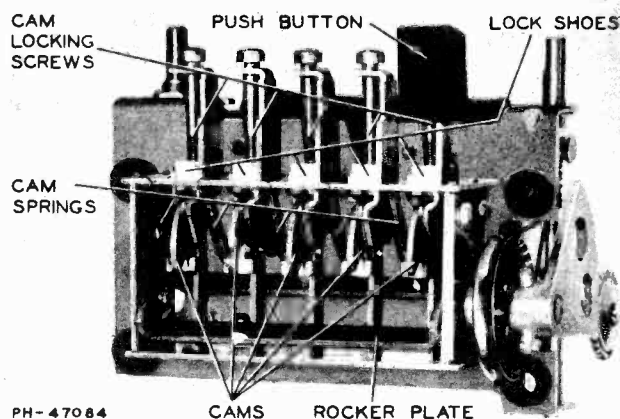


FIGURE 2—BOTTOM VIEW OF PUSH BUTTON MECHANISM

Push Button Tuning Mechanism:

The push button tuning mechanism used in this receiver is of the mechanical type, wherein the movement of the button actually turns the tuning condenser to any pre-determined setting. The movement is actuated thru a Push-Arm, Cam, Rocker Plate and Sector Gear, which meshes with a Scissors Gear directly fastened to the tuning condenser shaft—(See Figures 1 and 2.) The scissors gear prevents backlash between the sector gear and the tuning condenser. Since the sector gear is mounted directly on the rocker plate shaft, the position of the rocker plate will accurately determine the position of the tuning condenser.

The cams (Figure 2) which determine the stop points for each button are mounted on the push arms and are locked in place by the locking screws and lock-shoes, which press firmly against the cams when the locking screws are tightened. Care should be used when locking screws are tightened not to use excessive force as the threads may become damaged or stripped.

Adjustments for Push Button Tuning are very easily made. To adjust a push button for any station proceed as follows:

- (1) Pull the push button off the push arm.
- (2) Loosen the cam locking screw one-half turn.
- (3) Using the Dial Tuning Control tune in the station.
- (4) Press the push arm in as far as it will go and accurately retune station.
- (5) With the push button still held down, tighten cam locking screw.
- (6) Replace the push button.

With the locking screw tight, the cam is locked in position and when the button is pushed in, the cam pressure causes the rocker plate to assume the position that tunes in the desired station (See Figure 2.)

Manual Tuning Dial:

A manual tuning knob is provided so that additional stations may be tuned in as desired. The manual tuning shaft is connected thru a cord drive to a drum on the rocker plate shaft. This same cord drives the dial drum by passing over a pulley on the drum shaft. Figure 6 shows the complete cord drive assembly and the correct number of turns which the cord should be wrapped around the drive shaft and dial drum pulley. Stops are provided on the dial drum so that dial scale adjustment is made by tuning the set to the extreme ends of the band.

SEARS-ROEBUCK & CO.

MODEL 6104, Ch. 126.203
 Chassis Wiring, Socket
 Trimmers, Alignment, Data

ALIGNMENT PROCEDURE

PRELIMINARY:	Generator Frequency	Dummy Antenna	Generator Connections	Adjustment Symbol	Circuit Adjusted	Approx. Microvolts
Output meter connections.....	455 kc	.001 mfd.	6K7 Grid	L-10	2nd I.F. Trans.	3,500
Output meter readings to indicate 1 watt.....	455 kc	.001 mfd.	6A8 Grid	L-8, L-9	1st I.F. Trans.	35
Generator ground lead connections.....	1,400 kc	.0001 mfd. †	Ant. Lead	C-3	Ant.	3
Dummy antenna value to be in series with generator output.....	600 kc	.0001 mfd. †	Ant. Lead	L-2	Ant.	9
Connection of generator output lead.....	1,400 kc	.0001 mfd. †	Ant. Lead	C-3*	Ant.	3
Generator modulation.....						
Position of Volume Control.....						
Chassis must be in its case with front end removed, when aligning R.F. circuit.						

NOTE: No oscillator alignment adjustments are required in this receiver.

IMPORTANT ALIGNMENT NOTES

† Make the generator connection to the receiver thru a shielded lead-in having not more than 30 mmf. (.00003) capacity with a male connector attached for connection to antenna socket. If C-3 has been changed, as outlined under "Antenna Circuit," for reason of a high capacity antenna, the Dummy Antenna should be the same value as the antenna itself.

* Readjust C-3 after installation as outlined under "Antenna Circuit" in "Service Hints."

Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value, to prevent the A.V.C. action of the receiver from interfering with accurate alignment.

Alignment adjustment locations are shown on the top and bottom parts location views of chassis.

Only the dummy antenna indicated in the chart for any particular frequency should be used. Grid cap leads should remain in the factory.

Oscillator circuit alignment is not required in this receiver at either end of the band; the oscillator coil is pre-adjusted for inductance in the factory.

Since the oscillator coil is unshielded, the case has some effect on its inductance. Therefore alignment must be done either with the chassis in the case or with a steel plate (covering the bottom of chassis), substituting for the case.

Values shown under "Microvolts" are only approximate.

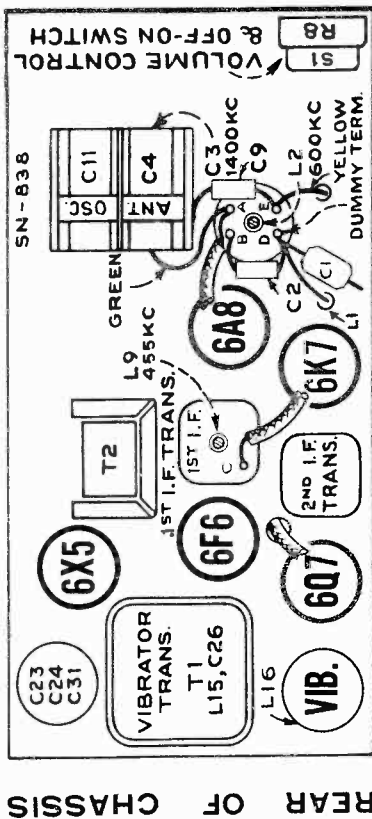


FIGURE 3—LOCATION OF PARTS AND ALIGNMENT ADJUSTMENTS ON TOP OF CHASSIS

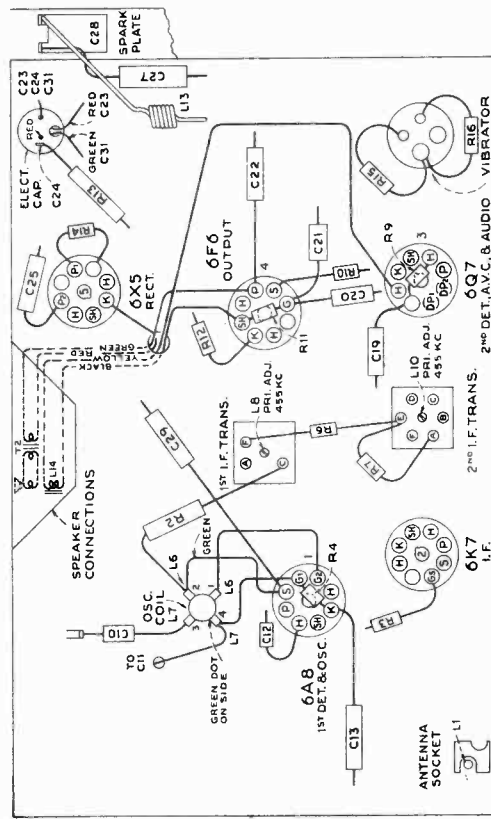


FIGURE 4—LOCATION OF PARTS AND ALIGNMENT ADJUSTMENTS ON BOTTOM OF CHASSIS

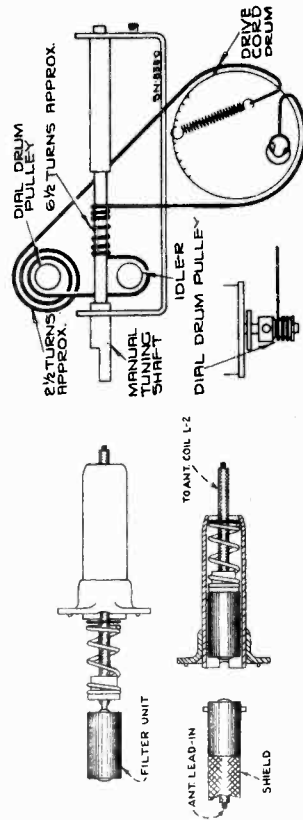


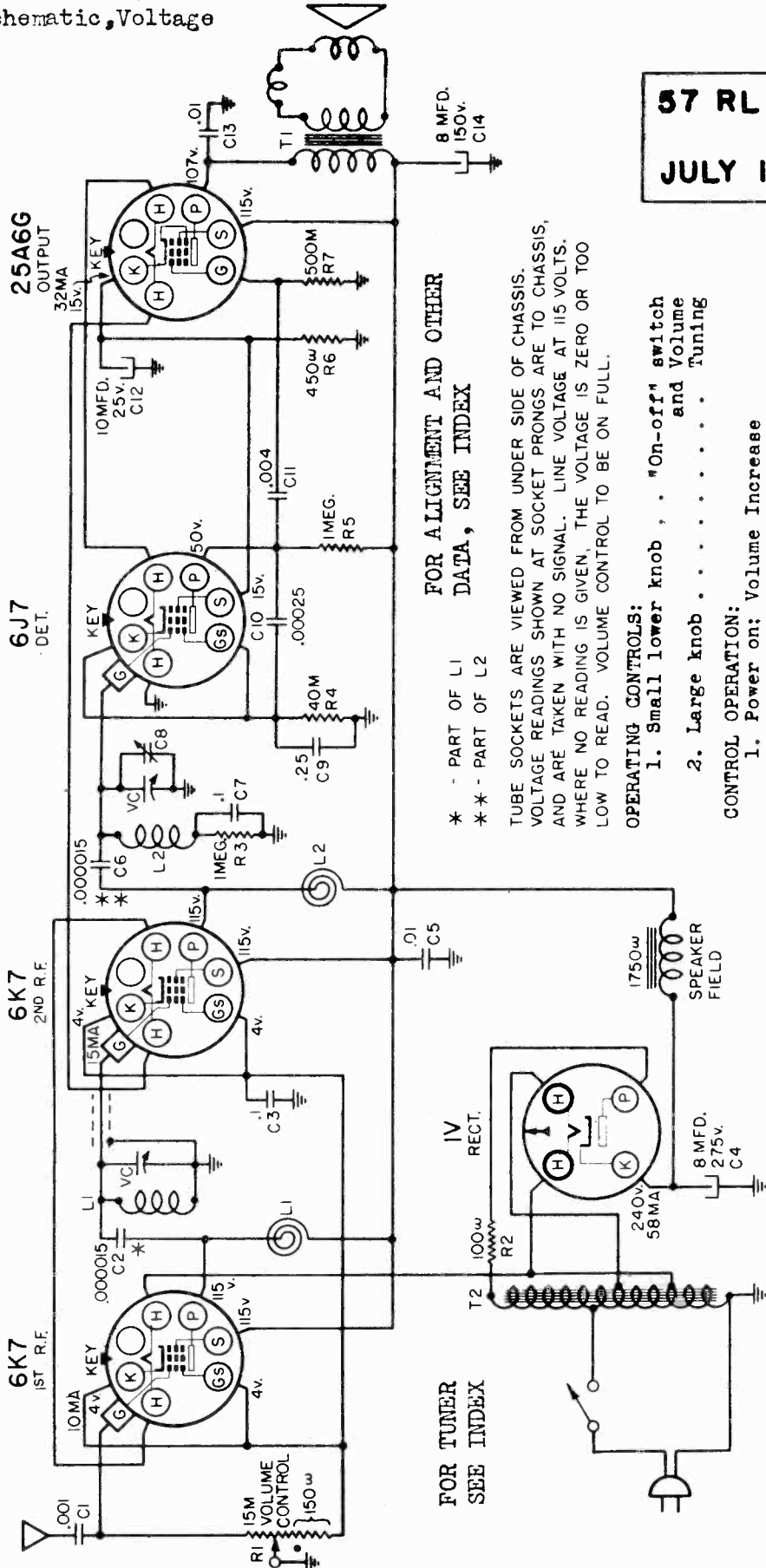
FIGURE 5—ANTENNA FILTER

FIGURE 6—DRIVE CORD HOOKUP

MODELS 6110, 6111
Chassis 101,508
Schematic, Voltage

SEARS-ROEBUCK & CO.

57 RL 122
JULY 1, 1938



FOR ALIGNMENT AND OTHER DATA, SEE INDEX

* - PART OF L1
** - PART OF L2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. VOLUME CONTROL TO BE ON FULL.

OPERATING CONTROLS:

1. Small lower knob, "On-off" switch and Volume and Tuning
2. Large knob
3. Tuning ratio: Direct

CONTROL OPERATION:

1. Power on; Volume Increase
2. Tuning ratio: Direct
3. Tuning ratio: Direct

POWER SUPPLY:
All models available 545-1730 kc

FREQUENCY RANGE:
All models available 545-1730 kc

OPERATING FEATURES:
Push button tuning (6 button)
Frequency calibrated tuning knob

POWER OUTPUT:
Type Pentode
Undistorted 0.85 watts
Maximum 1.8 watts

LOUD SPEAKER:
Type Dynamic
Size 5"
Field coil resistance 1750 ohms

FOR TUNER SEE INDEX

SEARS ROEBUCK & CO.

MODELS 6112, 6113, 6118
 Chassis 101.521
 Schematic, Voltage, Tuner
 Socket, Chassis

ALIGNMENT PROCEDURE:

Either a broadcast station of about 1400 kc or a signal generator can be used for alignment. The chassis must be taken out of the cabinet for alignment of the trimmer, C8. The volume control setting should be reduced so that the signal is just audible in order to facilitate accuracy of adjustment. This set has no AVC so that a strong input signal may be used.

ADJUSTING THE PUSH BUTTONS:

Unlock the mechanism by loosening the screw at the center of the tuning knob, for a few turns. Push the button all the way in and tune in the desired station while the button is held in firmly. Then release the button before tuning in the next station. Proceed in the same manner for the remaining buttons. Lock the mechanism by tightening the screw in the tuning knob. Punch out the station call letters from the sheet supplied and insert them in the recess in each button. Cover the call letters with the clear celluloid discs, supplied. Be careful not to drop the call letter tabs inside the receiver when inserting them in the push buttons.

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
 VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS,
 AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 115 VOLTS.
 WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO
 LOW TO READ. VOLUME CONTROL TO BE ON FULL.

* - PART OF L1
 ** - PART OF L2

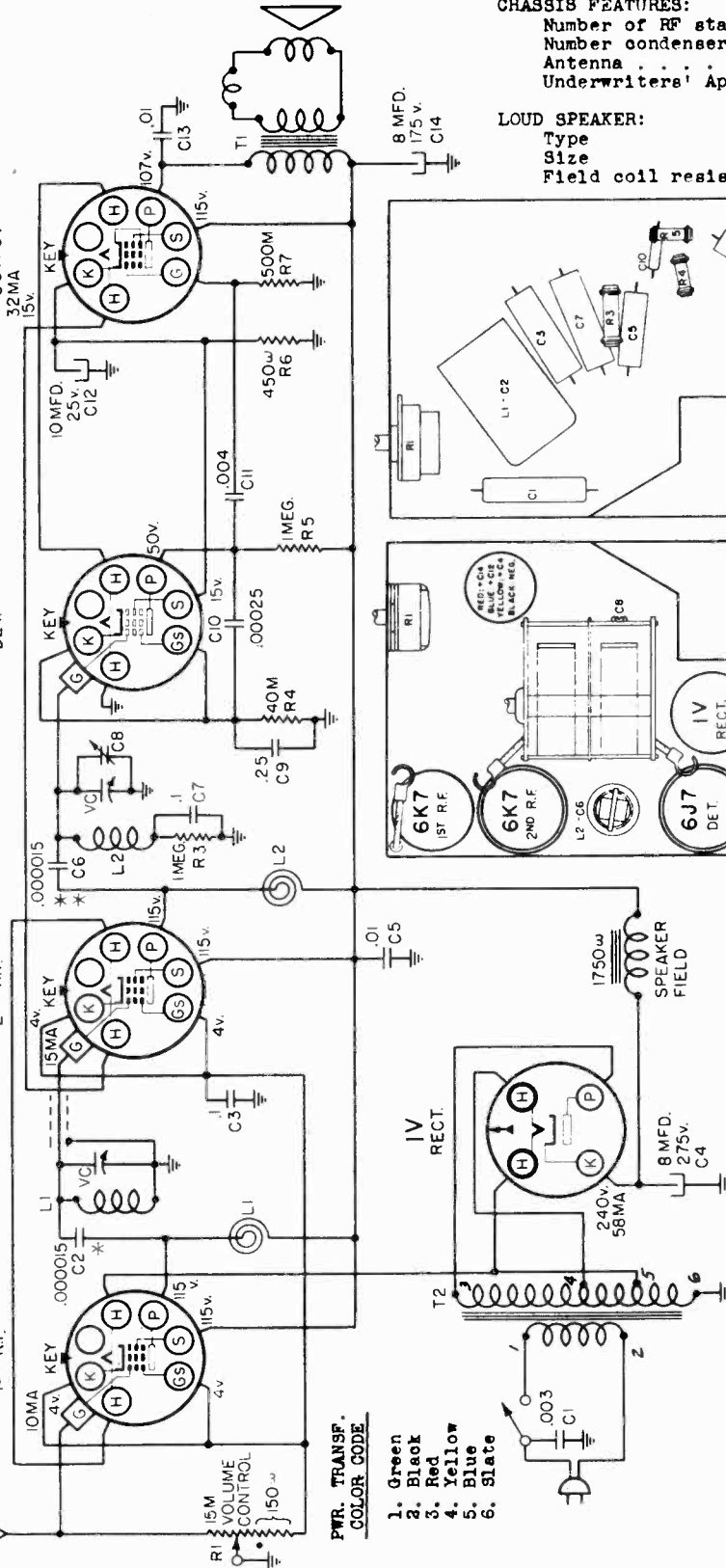
OCT. 6, 1938

25A6G
 32MA
 15V.
 OUTPUT

6J7
 DET.

6K7
 2ND R.F.

6K7
 1ST R.F.



PWR. TRANSF. COLOR CODE

- 1. Green
- 2. Black
- 3. Red
- 4. Yellow
- 5. Blue
- 6. Slate

OPERATING FEATURES:

- Push button tuning (6 button)
- Frequency calibrated tuning knob

POWER OUTPUT:

- Type Pentode
- Undistorted 0.85 watts
- Maximum 1.6 watts

POWER SUPPLY:

All models available 105-125 volts, 50-60 cycles, 40 watts

FREQUENCY RANGE: 545-1720 kc

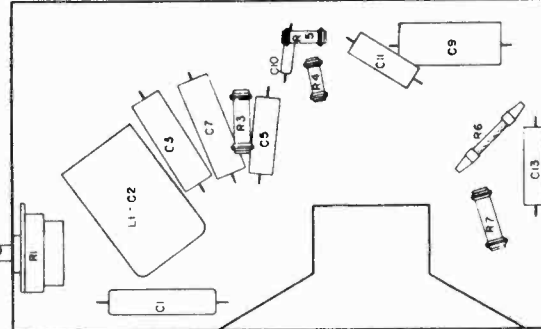
ALIGNMENT: 1400 kc

CHASSIS FEATURES:

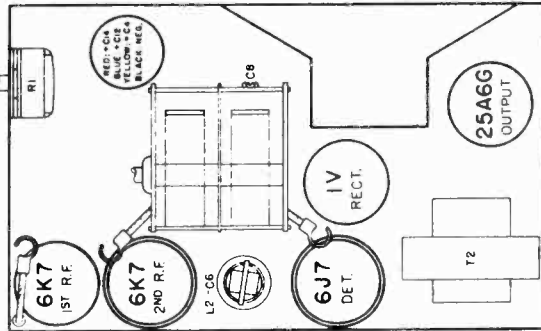
- Number of RF stages Two
- Number condensers in gang Two
- Antenna Attached
- Underwriters' Approval

LOUD SPEAKER:

- Type Dynamic
- Size 5"
- Field coil resistance 1750 ohms



LOCATIONS OF PARTS UNDER CHASSIS.



LOCATIONS OF PARTS ON TOP OF CHASSIS.

MODELS 6114, 6115, Ch. 101, 522

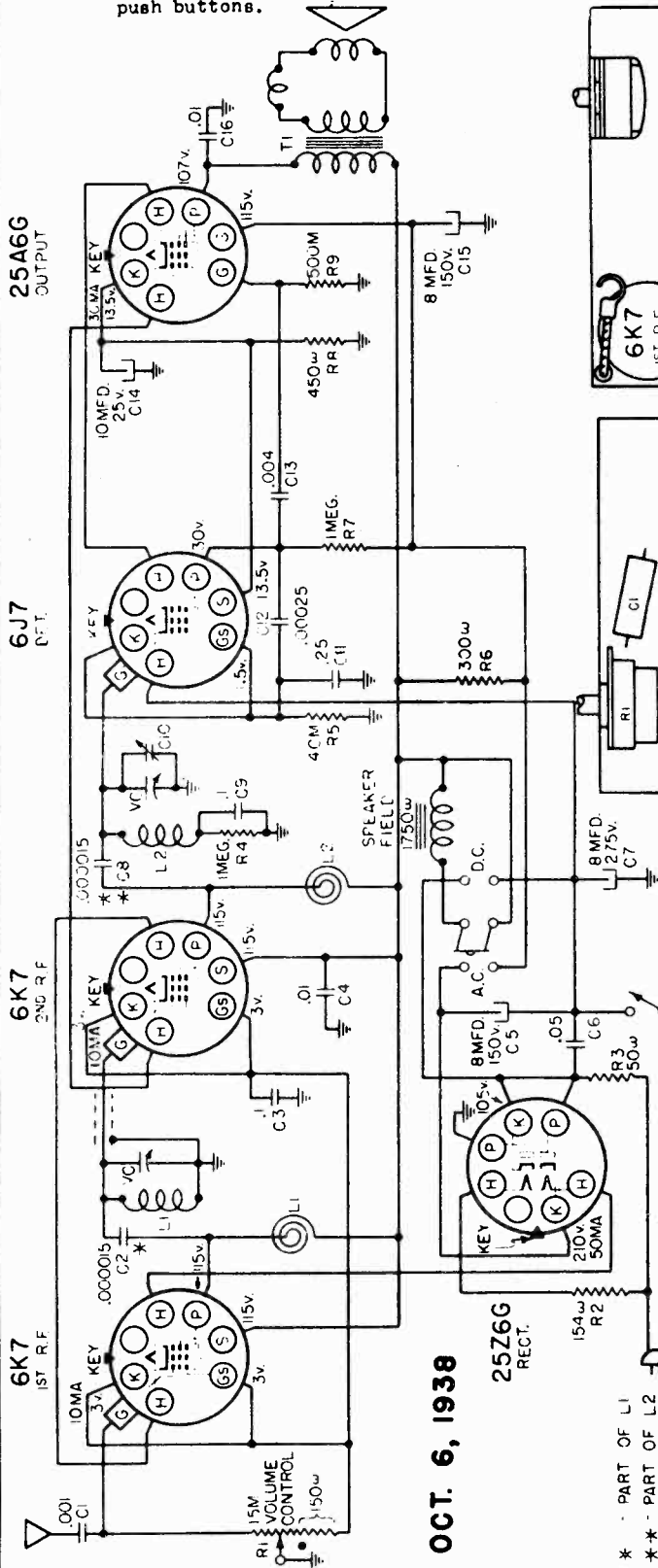
Schematic, Voltage, Chassis

Socket, Alignment, Tuner

SEARS-ROEBUCK & CO.

ADJUSTING THE PUSH BUTTONS:

Unlock the mechanism by loosening the screw at the center of the tuning knob, for a few turns. Push the button all the way in and tune in the desired station while the button is held in firmly. Then release the button before tuning in the next station. Proceed in the same manner for the remaining buttons. Lock the mechanism by tightening the screw in the tuning knob. Punch out the station call letters from the sheet supplied and insert them in the recess in each button. Cover the call letters with the clear celluloid discs, supplied. Be careful not to drop the call letter tabs inside the receiver when inserting them in the push buttons.



OCT. 6, 1938

* PART OF L1
** PART OF L2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. VOLUME CONTROL TO BE ON FULL.

LOUD SPEAKER:

Type Dynamic
Size 5"
Field coil resistance 1750 ohms

POWER SUPPLY:

All models available 105-135 volts, DC or 25-80 cycle AC, 50 watts.

ALIGNMENT:

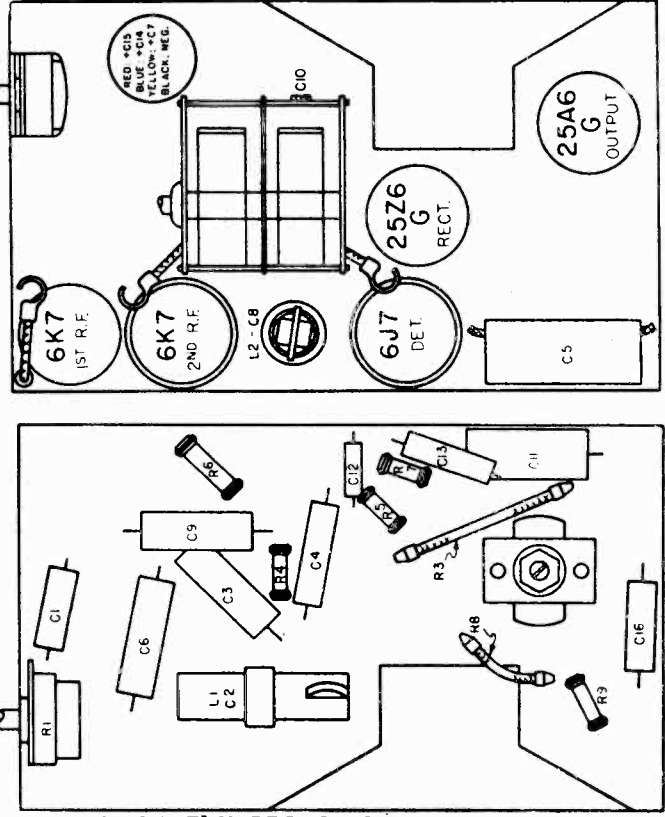
Frequency range 545-1730 kc

OPERATING FEATURES:

Push button tuning (3 button)
Frequency calibrated tuning knob

POWER OUTPUT:

Type Pentode
Undistorted 0.85 watts on AC
Maximum 1.1 watts on DC



LOCATIONS OF PARTS ON TOP OF CHASSIS.
LOCATIONS OF PARTS UNDER CHASSIS.

ALIGNMENT PROCEDURE:

Either a BC Station of about 1400KC or a sig. gen. can be used for align. Chassis to be removed for C8 trimmer align. - Volume Cont. setting be reduced so signal is just audible to facilitate accurate adj.

This set has no AVC so that a strong input signal may be used.

MODELS 6054, 6055

MODEL 7225

Tuner Data

SEARS-ROEBUCK & CO.

MODEL 6125, Chassis 101.527
Schematic, Voltage, Tuner

POWER SUPPLY: 105-125 volts. 50-60 cycle, 50 watts

OPERATING CONTROLS:

1. Upper left knob Volume
2. Lower left knob Wave Band Switch
3. Lower right knob "On-Off" Switch and Tone
4. Upper right knob Station Selector

CONTROL OPERATION:

- Turning right: Volume increase
Turning right: "AM", "SW"
Turning right: "ON", "HI", "LO"

Tuning ratio: 4:1

FOR ALIGNMENT, SEE INDEX.

ALIGNMENT FREQUENCIES:

	Oscil. Trimmer	Ant-Transl. Trimmer	Padder
Band "AM"	1400 kc	1400 kc	600 kc
Band "SW"	--	15 mc	Fixed

FREQUENCY RANGES:

Band "AM"	540-1730 kc
Band "SW"	5.9 mc-18.2 mc

POWER OUTPUT:

Type	Beam Tube
Undistorted	1.75 watts
Maximum	3 watts

LOUD SPEAKER:

Type	Dynamic
Size	6 and 8 inch
Field coil resistance	480 ohms

CHASSIS FEATURES:

Number IF stages	One
Number condensers in gang	Two
Antenna	Conventional
Built-in IF Wave Trap	

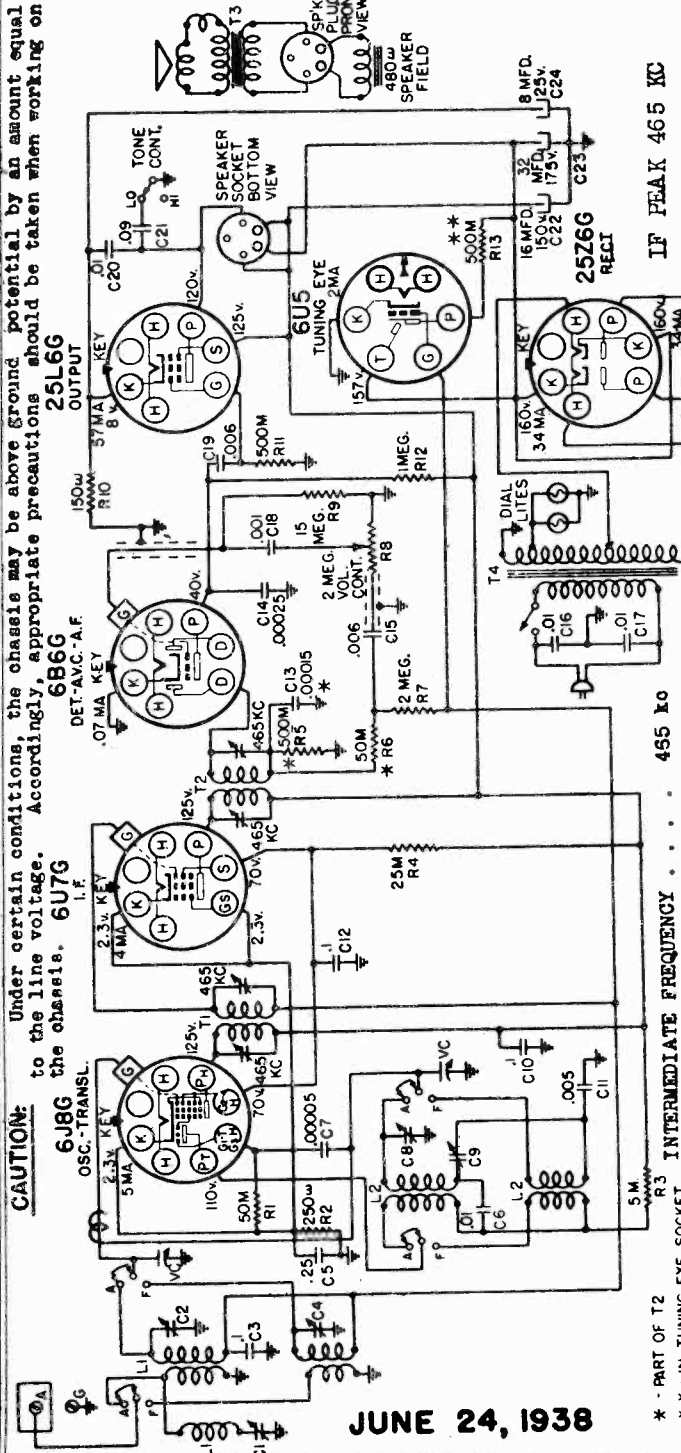
OPERATING FEATURES:

- Tone Control Two position
- Automatic Volume Control
- Push Button Tuning (5 button)
- Tuning Eye

CAUTION: Under certain conditions, the chassis may be above ground potential by an amount equal to the line voltage. Accordingly, appropriate precautions should be taken when working on the chassis.

CAUTION:

Under certain conditions, the chassis may be above ground potential by an amount equal to the line voltage. Accordingly, appropriate precautions should be taken when working on the chassis.



IF PEAK 465 KC

455 KC

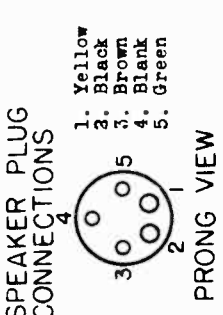
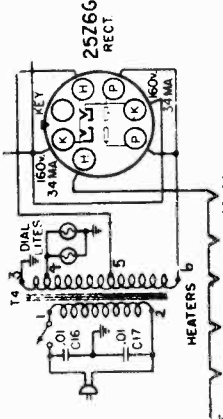
INTERMEDIATE FREQUENCY

* - PART OF T2

** - IN TUNING EYE SOCKET
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 115 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

PWR. TRANSF. COLOR CODE

1. Green
2. Black
3. Slave
4. Yellow
5. Blue
6. Red



SPEAKER PLUG CONNECTIONS

1. Yellow
2. Black
3. Brown
4. Blank
5. Green

PUSH BUTTON TUNING

SETTING UP:

Unscrew (turn counter-clockwise) the push button two or three turns. (Use a penny in the button slot to unscrew it, if necessary.) Push the button all the way in. Hold it in firmly and at the same time tune in your desired station. With your station tuned in, lock the adjustment by tightening the push button knob (turn clockwise). Hold the button in while tightening it. Punch out the station's call letters from the sheet supplied and insert the call letters in the recess in the button. Then cover the call letters with one of the clear celluloid discs supplied.

Proceed in the same manner for the remaining buttons. If a change in selection of stations is desired, the old call letters can be removed with a pin inserted in the slot under the call letters.

JUNE 24, 1938

MODEL 6140, Ch. 101.534

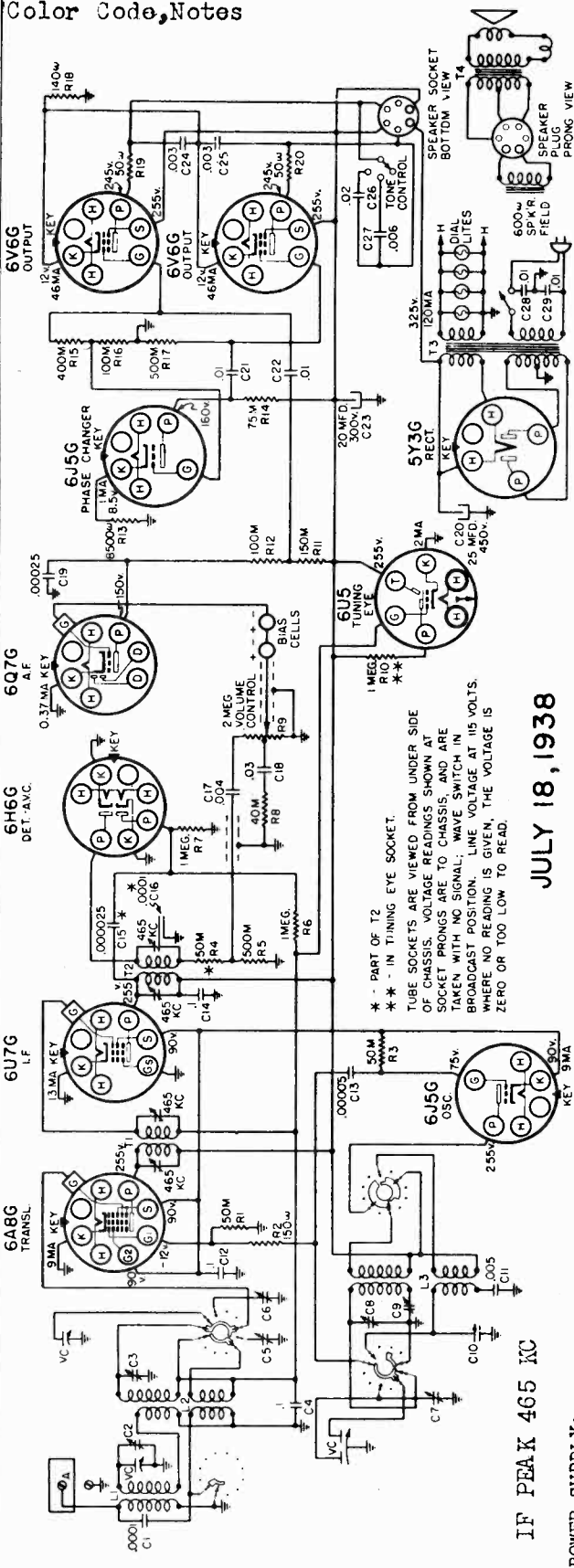
MODELS 6152, 6153

Chassis 101.537

Schematic, Voltage

Color Code, Notes

SEARS-ROEBUCK & CO.



JULY 18, 1938

IF PEAK 465 KC

POWER SUPPLY:

- All models available 105-125 volts, 50-60 cycle, 105 watts
- All models available 105-125 volts, 35 cycle, 120 watts

FREQUENCY RANGES:

- Band "AM" 540-1730 kc
- Band "SW" 5.95 mc-18.3 mc
- Band "9" 9.4 mc-9.7 mc

INTERMEDIATE FREQUENCY

- Type Push pull beam tubes
- Undistorted 6 watts
- Maximum 10 watts

OPERATING FEATURES:

- Tone Control Three position
- Automatic Volume Control
- Spread Band Tuning
- Push Button Tuning (A button)

OPERATING CONTROLS:

- Upper left knob Volume
- Lower left knob . . . "On-off" switch & Tone
- Lower right knob Band switch
- Upper right knob Station Selector

ALIGNMENT FREQUENCIES:

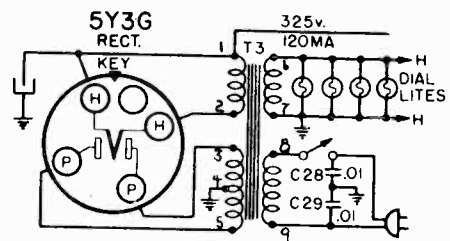
- Oscil. Ant.-Transal. 455 kc
- Trimmer Padder Dynamic
- Band "AM" 1400 kc 13 inch
- Band "SW" 15 mc 10 inch
- Band "9" 9.55 mc 500 ohms

LOUD SPEAKER:

- Type Dynamic
- Size 13 inch
- Size 10 inch
- Field coil resistance 500 ohms
- App. field coil voltage drop 70 volts
- CHASSIS FEATURES: Presetector on band "AM"
- Antenna Conventional
- Tuning Eye

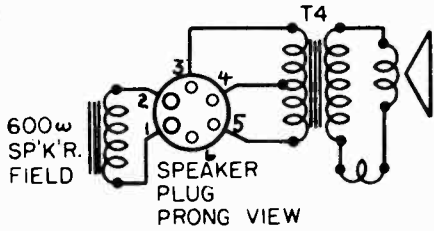
CONTROL OPERATION:

- Turning right: Volume increase
- Turning right: . . . "HI", "MED", "LO"
- Turning right: "AM", "SW", "9"
- Tuning ratio: 13:1



SPEAKER PLUG COLOR CODE

- Black
- Yellow
- Brown
- Red
- Green
- Blank

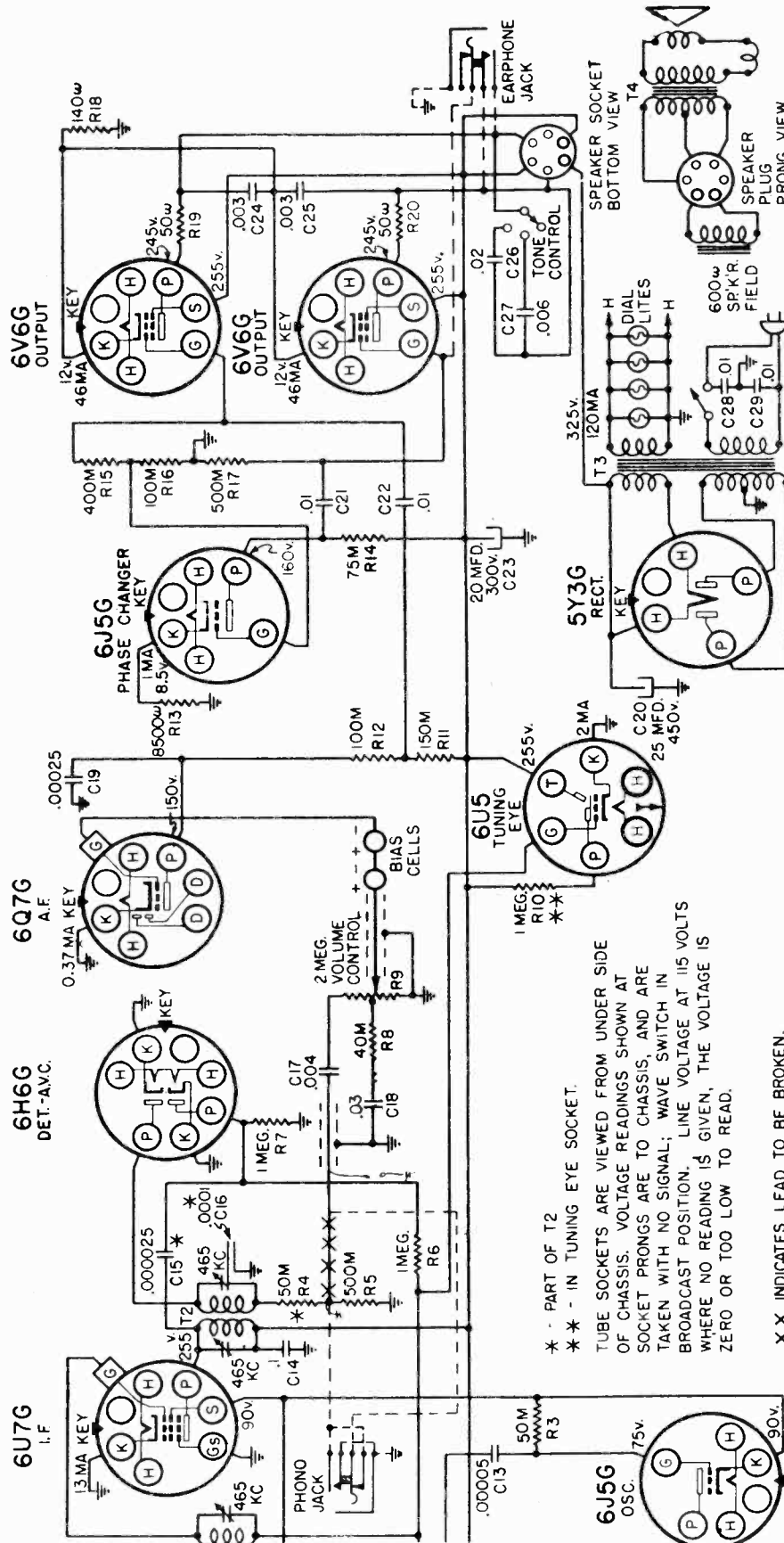


PWR. TRANSF. COLOR CODE

- Red
- Blue
- Slate
- Red
- Black
- Black
- Green

SEARS-ROEBUCK & CO.

MODEL 6140, Ch. 101.534
MODELS 6152, 6153
Chassis 101.537
Phone, Phono, Jacks Data



SUBJECT: CONNECTION OF EARPHONE AND PHONOGRAPH PICKUP JACKS:

Part number 1016119531 jack, for connection of earphones or phonograph pick-up, can be ordered directly from source 101.

If a crystal pick-up is used, a filter composed of a .01 mfd. condenser and a 100M ohm resistor connected in series, should be connected across the pick-up to prevent excessive bass response. This filter will also act as a partial scratch filter.

DIAL LIGHT REPLACEMENT:

The lamps that illuminate the push button call letters are made accessible for replacement by removing the push button escutcheon.

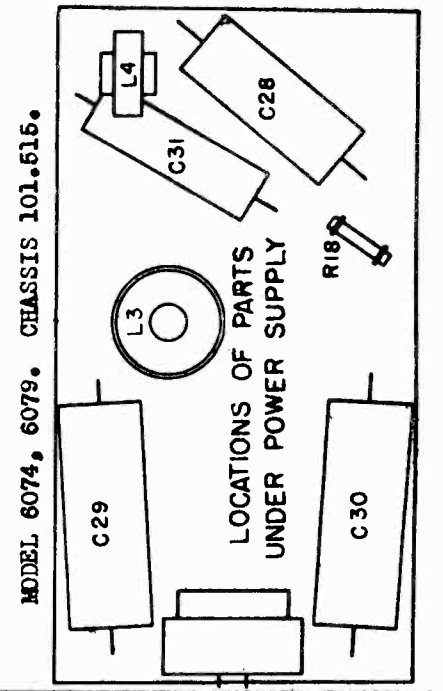
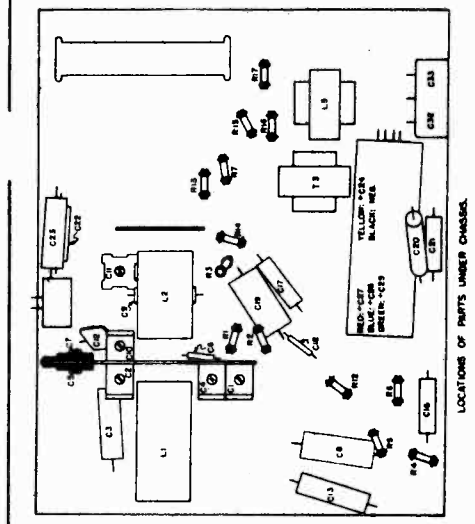
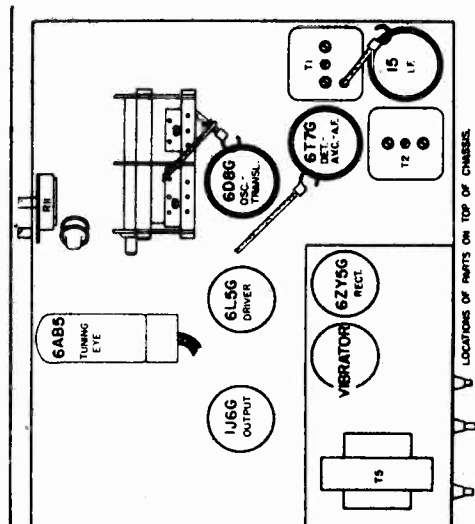
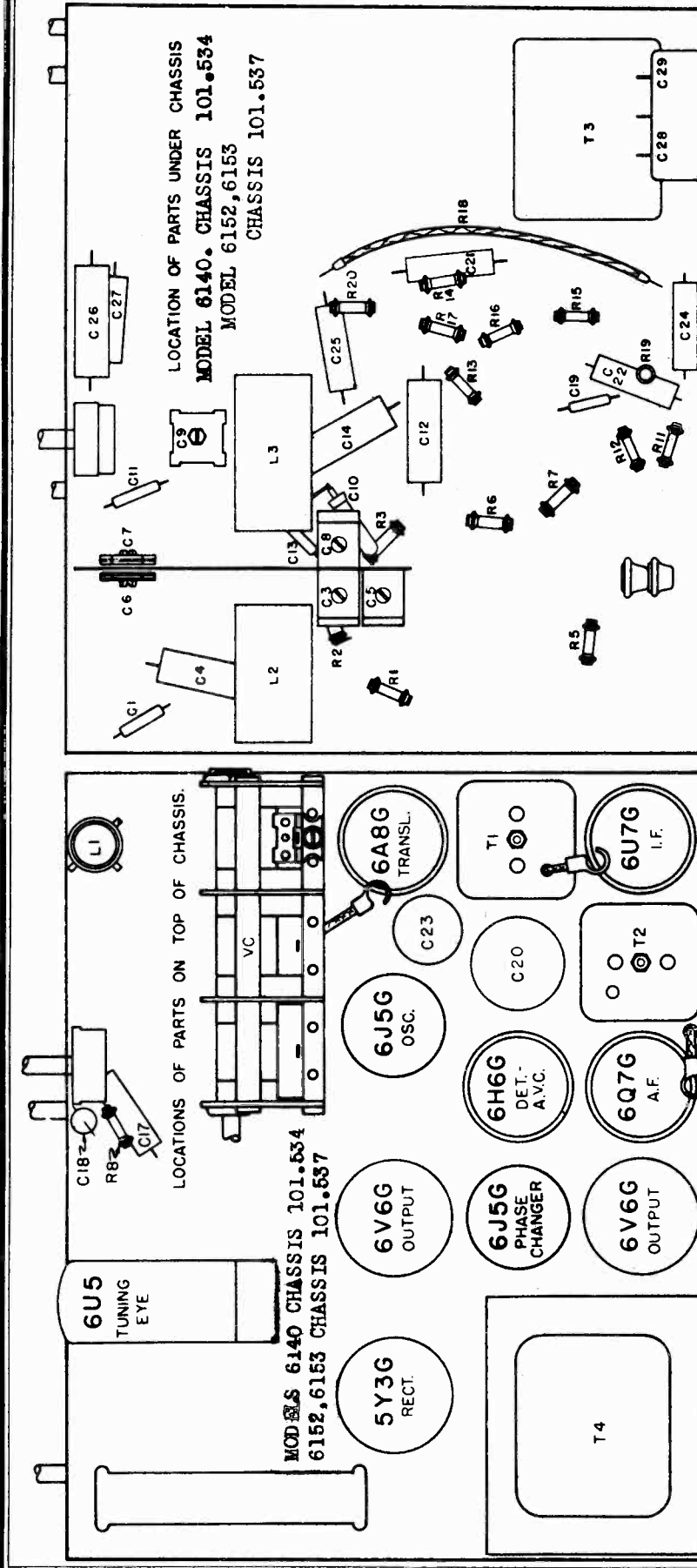
* - PART OF T2
* * - IN TUNING EYE SOCKET.
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 115 VOLTS WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

X X INDICATES LEAD TO BE BROKEN.
DOTTED LINES INDICATE NEW CONNECTIONS.

MODELS 6074, 6079, Ch. 101.515
 MODEL 6140, Chassis 101.534

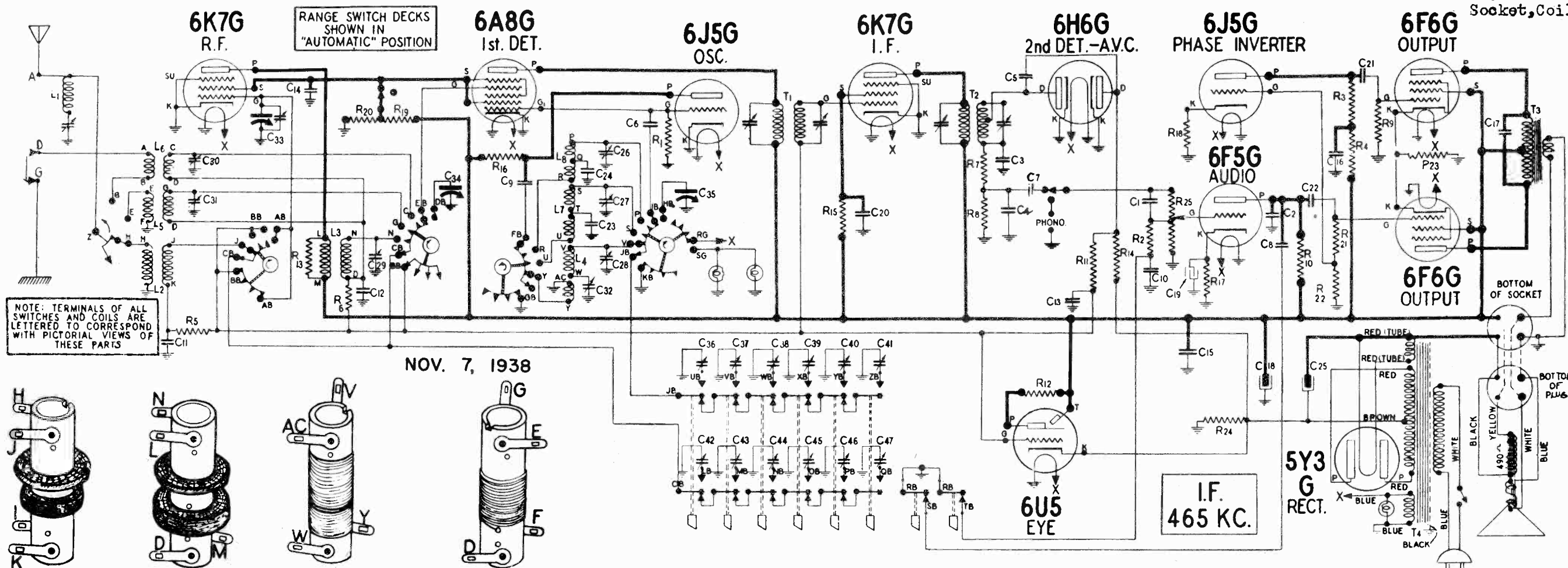
SEARS-ROEBUCK & CO.

MODELS 6152, 6153, Ch. 101.537
 Socket, Trimmers, Chassis



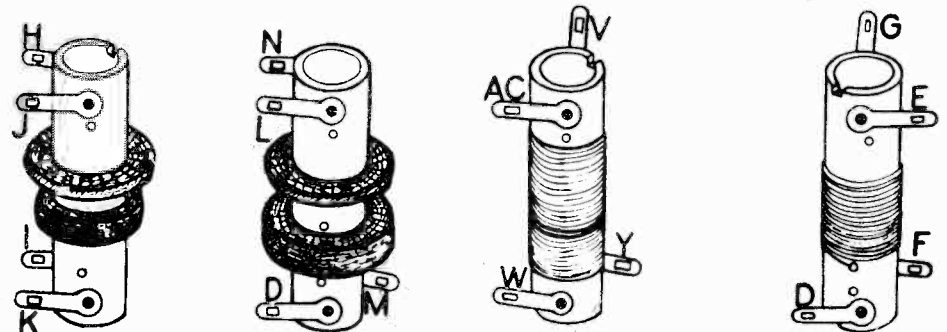
SEARS-ROEBUCK & CO.

MODEL 6157, Chassis 100.198
Schematic, Voltage, Switches
Socket, Coils

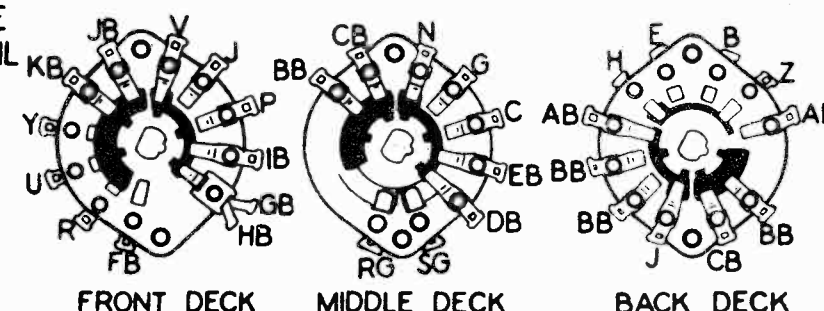


NOTE: TERMINALS OF ALL SWITCHES AND COILS ARE LETTERED TO CORRESPOND WITH PICTORIAL VIEWS OF THESE PARTS

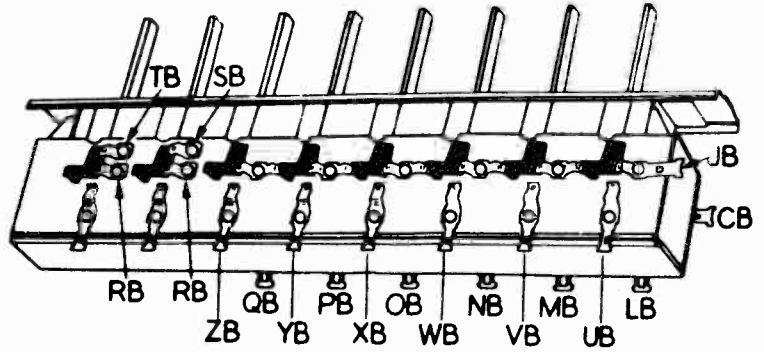
NOV. 7, 1938



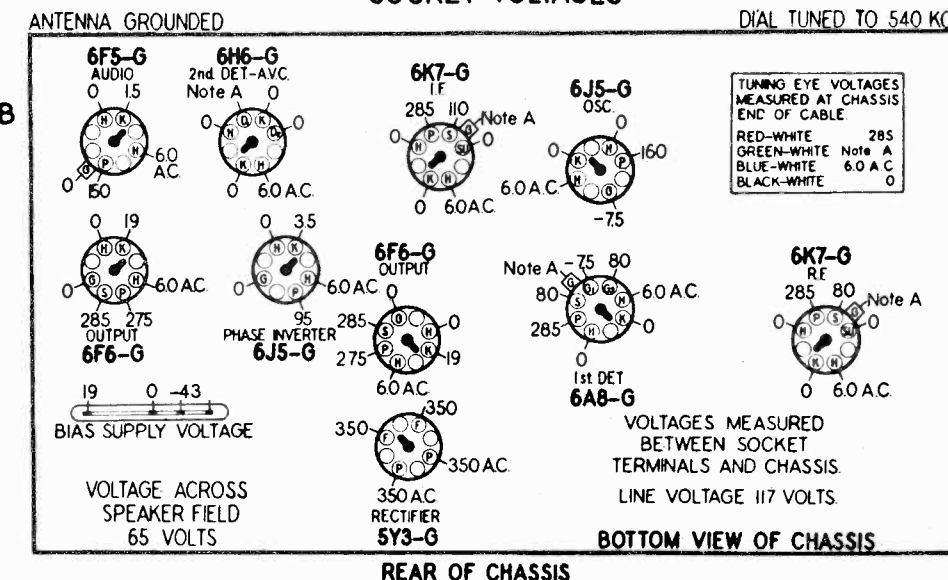
FRONT VIEW OF RANGE SWITCH DECKS.



PUSH-BUTTON TUNER SWITCH



SOCKET VOLTAGES



REAR OF CHASSIS

INTERMEDIATE FREQUENCY.....465 KC.
POWER OUTPUT
Type.....Push-Pull Pentodes
Undistorted.....6 watts
Maximum.....10 watts

Use high resistance voltmeter of at least 1000 ohms per volt. The bias on the control grids of the 6A8-G, 6U5 and 6K7-G and the delay voltage on the diode plate (D1) of the 6H6-G is -4.3 volts, measured across resistor R24.

SEARS-ROEBUCK & CO.

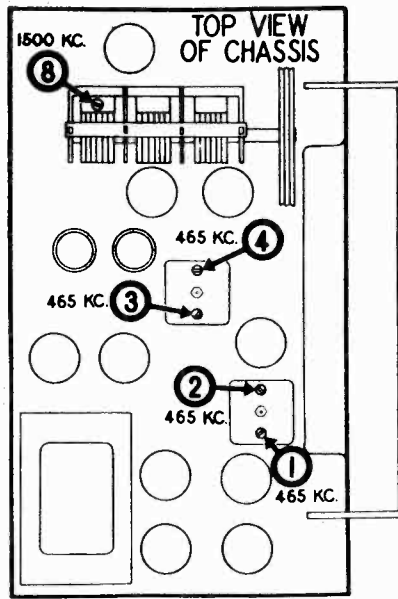
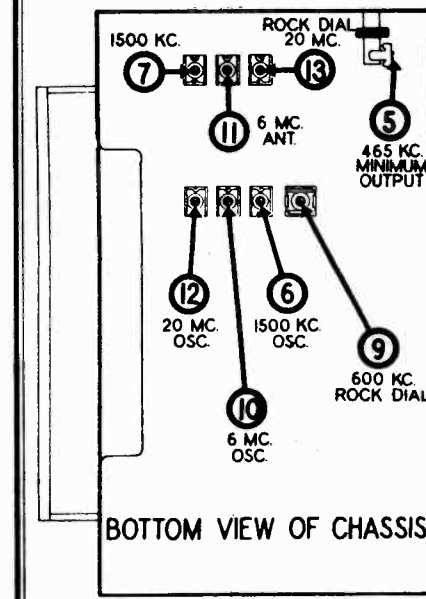
MODEL 6157, Ch. 100.198
Alignment, Trimmers

ALIGNMENT PROCEDURE

Before attempting to align the receiver, see that the dial pointer is correctly set. With the gang condenser in full mesh, set the pointer to the last mark on the left end of the dial scale. If the pointer is incorrectly set, it is only necessary to loosen the set screw on the dial cord drive drum and push the gang condenser in full mesh with the pointer properly set, then retighten the set screw.

Output meter connections-----	Across voice coil leads	1.325 volts
Output meter reading to indicate 0.5 watt output-----		1.325 volts
Average sensitivity in micovolts for 0.5 watt output-----	See chart below	
Connection of Generator Ground-----	Receiver chassis	
Dummy antenna in series with Generator Output Lead-----	See chart below	
Connection of Generator Output Lead-----	See chart below	
Generator modulation-----	30%, 400 cycles	
Position of volume control-----	Maximum clockwise	

DUMMY ANT IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	SENSITIVITY MICROVOLTS	TYPE OF ADJUSTMENT
.1 MFD CONDENSER	CONTROL GRID OF 6AG5 TUBE	465 KC	BROADCAST	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	2ND I.F.	7000	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
					3-4	1ST I.F.	150	
200 MMFD. CONDENSER	ANTENNA TERMINAL	465 KC	BROADCAST	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP		ADJUST FOR MINIMUM OUTPUT. USING A STRONG GENERATOR SIGNAL.
200 MMFD. CONDENSER	ANTENNA TERMINAL	1500 KC	BROADCAST	1500 KC	6	BROADCAST OSCILLATOR (SHUNT)		ADJUST FOR MAXIMUM OUTPUT.
200 MMFD. CONDENSER	ANTENNA TERMINAL	1500 KC	BROADCAST	TUNE TO 1500 KC GENERATOR SIGNAL	7	BROADCAST DETECTOR	30	ADJUST FOR MAXIMUM OUTPUT.
					8	BROADCAST ANTENNA	6	
200 MMFD. CONDENSER	ANTENNA TERMINAL	600 KC	BROADCAST	TUNE TO 600 KC GENERATOR SIGNAL	9	BROADCAST OSCILLATOR (SERIES)	5	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	6 MC	INTERMEDIATE	6 MC	10	INTERMEDIATE OSCILLATOR		ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 5.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 6 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	6 MC	INTERMEDIATE	TUNE TO 6 MC GENERATOR SIGNAL	11	INTERMEDIATE ANTENNA	30	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	20 MC	FOREIGN	20 MC	12	FOREIGN OSCILLATOR		ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 19.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 20 MC WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	20 MC	FOREIGN	TUNE TO 20 MC GENERATOR SIGNAL	13	FOREIGN ANTENNA	65	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.



POWER SUPPLY
Model 6157 can be supplied for operation from either 25 or 60 cycle power supplies.

105-125 volt - 25 cycles - 110 watts
105-125 volt - 50 - 60 cycles - 110 watts

ALIGNMENT FREQUENCIES
20 MC.; 6 MC.;
1500 KC.; 600 KC.

FREQUENCY RANGES
Broadcast Band.....540 to 1730 KC.
Intermediate Band.....2.2 to 7.0 MC.
Foreign Band.....6.8 to 22.5 MC.

MODEL 6157, Ch. 100.198
Tuner Data, Drive Data

SEARS-ROEBUCK & CO.

MODELS 6002, 6021, 6031
6121, 6131, Ch. 100.195
Tuner Data

HOW TO SET UP AND USE YOUR PUSH BUTTON TUNER.

- SET-UP PRELIMINARY**
- Be sure that your set is connected to a good antenna system.
 - Turn on the set and allow it to operate at least one quarter hour before setting-up the push buttons.
 - Make a list of station call letters for six nearby powerful broadcast stations for which you wish to set up the buttons. Arrange the stations in your list in the order of their frequency. That is, the station of lowest frequency will be first; the next higher second, and etc. Refer to the radio log furnished with this receiver and you will be able to determine the correct frequency of the desired stations. After you have marked down the frequencies on your chart alongside of the station call letters and arranged them in their proper order, number them 1, 2, 3, 4, 5, 6, 7 and 8 respectively. Check each frequency using Figs. 1 & 2. If each frequency falls within the range of its button, proceed as outlined in the following paragraphs.

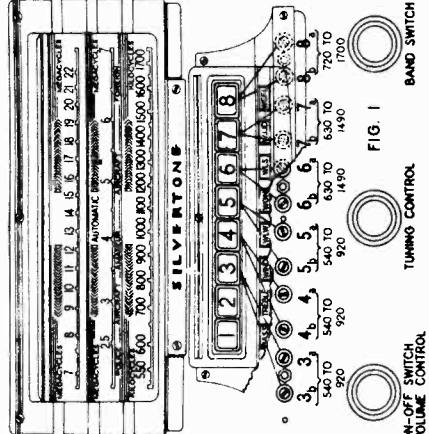
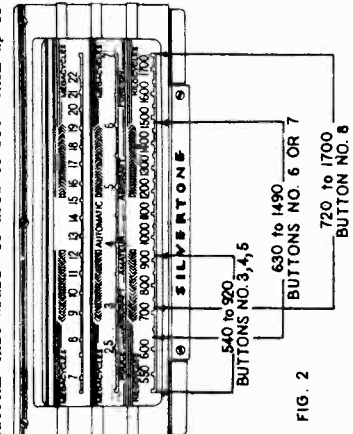
A typical list of stations and the buttons that would be used to set them up is shown below:-

Station Call Letters	Frequency	Button No.
WMAQ	670 KC.	3
WJW	720 KC.	4
WENR	770 KC.	5
WENR-WLS	1600 KC.	7
Police (State)	1640 KC.	8

- Notice in Fig. 1 that buttons 1 and 2 are for use as tone control buttons. Buttons 3 to 8 inclusive are to be set-up for automatic station selection. Also notice that stations with a frequency between 540 KC and 920 can be set-up on buttons 3, 4 and 5. Stations with a frequency assignment between 630 and 1490 KC may be up on button 6 and 7. Button No. 8 may be used for setting up a station between 720 KC and 1700 KC. There can be only one station on your list that has a frequency rating between 1490 KC and 1700 KC and it must be set-up on button No. 8. However, on the same button it is possible to set-up a station whose frequency is as low as 720 KC.

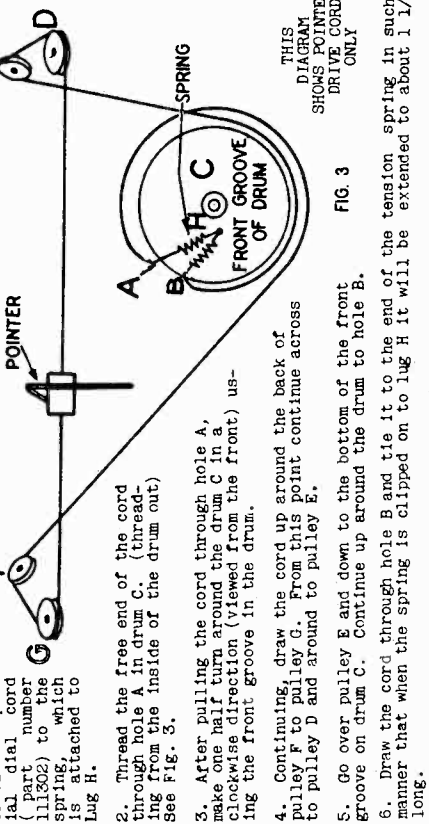
Remove the escutcheon around the push buttons by taking out the six screws holding it to the cabinet. This will bring into view the six pairs of adjustment screws, each pair of which is used to tune in a station that you wish to set-up on a particular button.

- SET-UP PROCEDURE**
- Turn the band switch (right hand knob) to the right (clockwise) until the word "BROADCAST" appears in the lower opening in the dial scale. Then using the tuning knob (center) tune in the station.



- Now turn the band switch to the extreme clockwise position until the word "AUTO-MATIC" appears in the dial opening.
- Push in the button to which you wish to set up the station (See Fig. 1).
- Use a small screw driver and insert it in the "a" screw for that button (see Fig. 1).
- Rotate the screw back and forth slowly until the program previously heard is heard again. If trouble is experienced in getting the station, turn the volume control to the right. **NOTE:** Be sure that you adjust this particular screw until the sides of the tuning eye "shadow" are closest together. If you are not successful in tuning in the station by turning the "a" screw back and forth, carefully re-read paragraphs "C" and "D", and repeat procedure 1, 2, 3, 4 and 5.
- Check to see if you have the proper station by changing the band switch from "Automatic" to "Broadcast" and vice versa.
- Now insert the screw driver in the "b" screw for that button (see Fig. 1) and turn it to the left or right until the program is received with maximum volume. The correct setting for this screw is when the sides of the tuning eye "shadow" are closest together.
- Re-adjust the "a" and "b" screws slightly while the band switch is in the "Automatic" position until the sides of the tuning eye "shadow" are closest together.
- Set-up buttons 4, 5, 6, 7 and 8 following steps 1 to 7 inclusive.
- Call letter tabs and celluloid windows are supplied with your receiver. The tabs are used to label the six push buttons set-up for stations. The celluloid tabs are supplied as a perforated sheet which is to be broken into eight sections. Select the proper call letter tabs from station call letter sheets supplied.
- Place the call letter tabs in back of the celluloid window and insert them in their respective slots in the push button escutcheon.
- Replace the escutcheon with its six retaining screws.

REPLACING THE POINTER DRIVE CORD

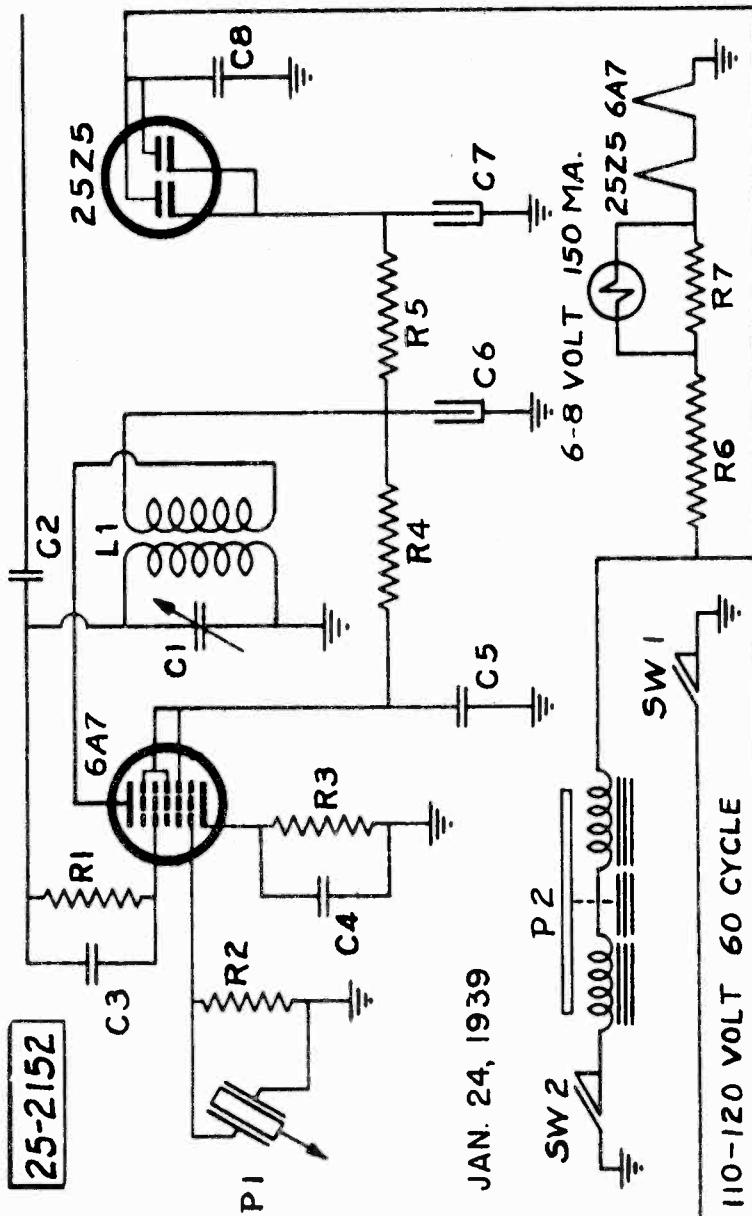


- Tie one end of 51" of special dial cord (part number 111302) to the spring, to which is attached to Lug H.
- Thread the free end of the cord through hole A in drum C (threading from the inside of the drum out) See Fig. 3.
- After pulling the cord through hole A, make one half turn around the drum C in a clockwise direction (viewed from the front) using the front groove in the drum.
- Continuing, draw the cord up around the back of pulley F to pulley G. From this point continue across to pulley D and around to pulley E.
- Go over pulley E and down to the bottom of the front groove on drum C. Continue up around the drum to hole B.
- Draw the cord through hole B and tie it to the end of the tension spring in such a manner that when the spring is clipped on to lug H it will be extended to about 1 1/8" long.

SEARS-ROEBUCK & CO.

MODEL 6226, Chassis 134.802
 Wireless Record Player
 Schematic, Notes
 Chassis 134.802-1
 Schematic Changes, Notes
 BOTTOM VIEW OF CHASSIS

SCHEMATIC DIAGRAM FOR CHASSIS NO. 134.802

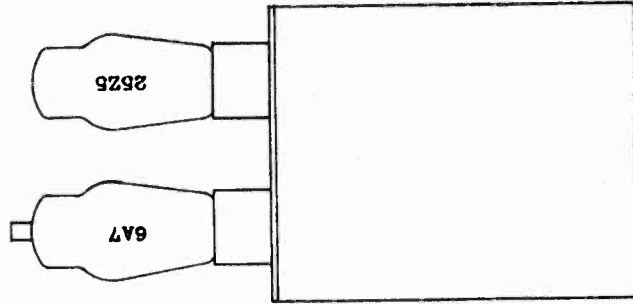
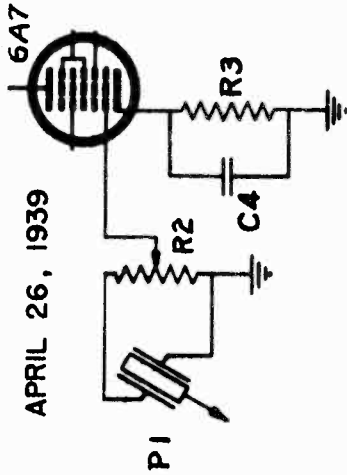


JAN. 24, 1939

25-2152

CHASSIS 134.802-1

APRIL 26, 1939



CHASSIS TUBE LAYOUT

FRONT

SUBJECT: ADDITION OF VOLUME CONTROL WITH A "MASTER" SWITCH.

There has been effected a change to further promote the satisfaction to be derived from this equipment by the incorporation of a volume control with the "Master" switch control.

To place the volume control in a position for easier operation, the "Master" switch has been placed on the right hand side of the equipment, the "Motor" switch taking up its position on the left hand side of the equipment.

To place the equipment in operation, the right hand switch marked "Master" should be turned on and advanced to the limit of its clockwise turn, which will place the volume control "Full-on". Slightly to the left of the right hand control will be noticed a small metal cap. This should be prised up with the screw driver furnished to gain entrance to the tuning control, instead of making this adjustment from the bottom as directed -- then the usual procedure should be gone through as indicated under "Set Up Procedure".

The volume control can now be set at a level indicated by the satisfaction of the user. Turning the control to the right increases volume, turning it to the left decreases volume.

MODEL 6226, Ch. 134.802

Operating, Set-up Data

Parts Lists

SEARS-ROEBUCK & CO.

In changing records, operate only the right hand control. The pilot light will illuminate the record sufficiently so that no other light is required for replacing records or changing needles, and the motor can be stopped or started by the use of this one control. Good results will not be obtained unless needles are changed regularly.

The quality of the tone response will be in proportion to the goodness of the radio receiver, and for full tone response a good console set should be used. It is essential that the wave channel selected for operation of the record player should be practically free from radio signal.

If difficulty is experienced in finding a cleared channel, or if severe atmospheric static is present these faults can be overcome by moving the record player closer to the radio set or its antenna, and to the extent of attaching a wire to the end of the antenna which provides the same attachment cord and direct connection, however.

A few types of phonograph records, including some symphonic reproductions, give a very heavy signal when used with medium or loud needles, and better results can be secured with these records by the use of soft tone needles.

In the case of old phonograph records made prior to the use of electrical recording, a low signal volume is sometimes available and this can be corrected by the use of loud or extra loud needles.

Authorized Replacement Parts for this model may be obtained from any Sears, Roebuck and Co. Retail Store or Mail Order branch. Always give part numbers and the chassis identification number.

ELECTRICAL SPECIFICATIONS

FREQUENCY RANGE: 750 to 540 kilocycles

POWER OUTPUT: 20 to 30 feet from the receiver.

Fidelity ranges . . . 50 to 6,000 cycles.

MECHANICAL SPECIFICATIONS

CONTROL OPERATION: turning #1 control to right connects power to transmitting unit and available power supply to the motor.

turning #2 switch to right connects power supply to motor. #1 switch should not be turned off during operation or changing records, and the table should be stopped to the left.

The Model No. 6226, carrying identification No. 134.802, is so designed that it has a tuning range of 750 to 540 kilocycles. This range is selected on the lower part of the broadcast band and is ample in latitude because in any geographical location there will be found a space somewhere in this latitude of frequency where a powerful carrier does not exist and satisfactory operation may be had. This section of the broadcast band is chosen because there are more cleared channels in this part of the frequency band than in the higher part of the band.

This wireless remote record player is designed to be connected to any additional antenna and during times when there is high atmospheric interference or where entire freedom from heterodyne sounds is desired, the receiver may be disconnected from the antenna. It is so designed that it is closely connected with the receiver, which is being operated, so that it is not possible for it to be seen to protrude from the 110 plug and wrapping of these turns around the antenna lead to the receiver. This will not in any way interfere with the operation of the radio receiver.

The circuit network used in the wireless remote record player is of conventional design insofar as the circuit before the modulator circuit is concerned. The modulator circuit is unique in that it contains a variable capacitor in the feedback circuit. This prevents, among other things, frequency modulation which gives rise to distortion if its extent be great. The percentage modulation is chosen so that, using a moderate tone needle, it will vary from approximately 20% on low amplitude records to as high as 80% on very high amplitude recordings. In the general sense it is impossible for the oscillator to become more than 100% modulated. Distortion arising from high amplitude passages is associated with the arm and should be remedied by using a soft, long needle.

There are two switch controls on the equipment so that the "Master" switch may be turned on and left in this position, and the power supply will continue to be connected to the oscillator unit. This results in the carrier created by the oscillator always maintaining quiet operation in the receiver due to the fact that the AVC of the receiver is operating to maintain a low sensitivity of that device and hence occasional atmospheric disturbances will not be heard. If the carrier were interrupted during severe atmospheric conditions, the modulator circuit would not be operated, thereby bringing up very high background noise which would not promote the satisfaction of the user.

When distortion is apparent in the output of this device, it will probably be caused by a defective tube, a defective arm, or a worn-out needle. First of all, the quality of the needle should be investigated, then a tube, known to give distortionless operation in the wireless remote record player, should be inserted and last of all, the crystal cartridge in the arm should be replaced.

SET UP PROCEDURE

A. Set up the equipment not more than 20 feet from some point of the antenna system of the radio set with which it is going to be operated.

B. Turn on the radio receiver and allow time for the tubes to come to operating temperature. Tune through the frequency spectrum between 750 and 540 kilocycles and locate a channel which is quiet and on which you do not hear broadcasting.

C. The "Master" switch of your wireless remote record player to the right hand position, insert a record and place it on the table and place the record on its normal position. Pull the "Motor" switch on and starting table, insert the screw driver provided through this hole and adjust the trimming condenser located directly above until the carrier is heard to be received by the radio receiver. This adjustment should be made very carefully and the record player should be tuned back and forth across the channel to which the radio receiver is tuned until it is a balance between the carrier and the radio receiver. The quality of the tone should be satisfactory. Final tuning of the receiver a small amount will result in more nearly correct tuning.

D. After the above adjustment has been made, all subsequent operation is taken care of at the radio receiver, such as adjusting tone control, volume control, and when it is again desired to operate the record player, it will be heard in the same place on the scale of the receiver to which it has now become adjusted.

Table with columns: PART NO., SCHEMATIC LOCATION, DESCRIPTION, SELLING PRICE. Lists various components like buttons, clamps, clips, condensers, capacitors, coils, and resistors with their respective part numbers and prices.

PLEASE SUBJECT TO CHANGE WITHOUT NOTICE

SEARS ROEBUCK & CO.

MODELS 6195, 6196, 6197
 Chassis 109.216
 Schematic, Voltage
 Socket, Trimmers
 Alignment

ALIGNMENT PROCEDURE

Either a broadcast signal between 1400 and 1500 KC may be used.

The antenna of the receiver should be extended as in normal use. Tune in a station between 1400 and 1500 KC. and adjust the trimmers on top of the variable condenser for maximum signal.

If a signal generator is used, extend the antenna as described above, run a wire from the generator parallel to, but insulated from the antenna. Set the generator at 1720 KC. Turn the variable condenser all the way to the right (minimum capacity). Tune in the signal from the generator with the trimmer on the front section of the variable condenser. Set the generator at about 1400 KC. Tune in the signal and adjust the trimmer on the rear section of the variable condenser for maximum signal.

The signal generator method is most satisfactory and should always be used when available.

CAUTION:

Under no condition should a ground be attached to this receiver, also no grounded object should be allowed to come in contact with the chassis.

POWER SUPPLY:

105-125 volts, 50-60 cycle or D. C. 43 Watts on 117 volt line.

FREQUENCY RANGE:

Broadcast and other services 540 to 1720 KC.

ALIGNMENT FREQUENCIES:

1720 and 1500 KC.

POWER OUTPUT:

Type.....Beam Power
 Undistorted.....1 Watt
 Maximum.....2.0 Watts

LOUD SPEAKER:

Type.....Dynamic
 Size.....3 1/2"
 Field Resistance.....450 Ohms

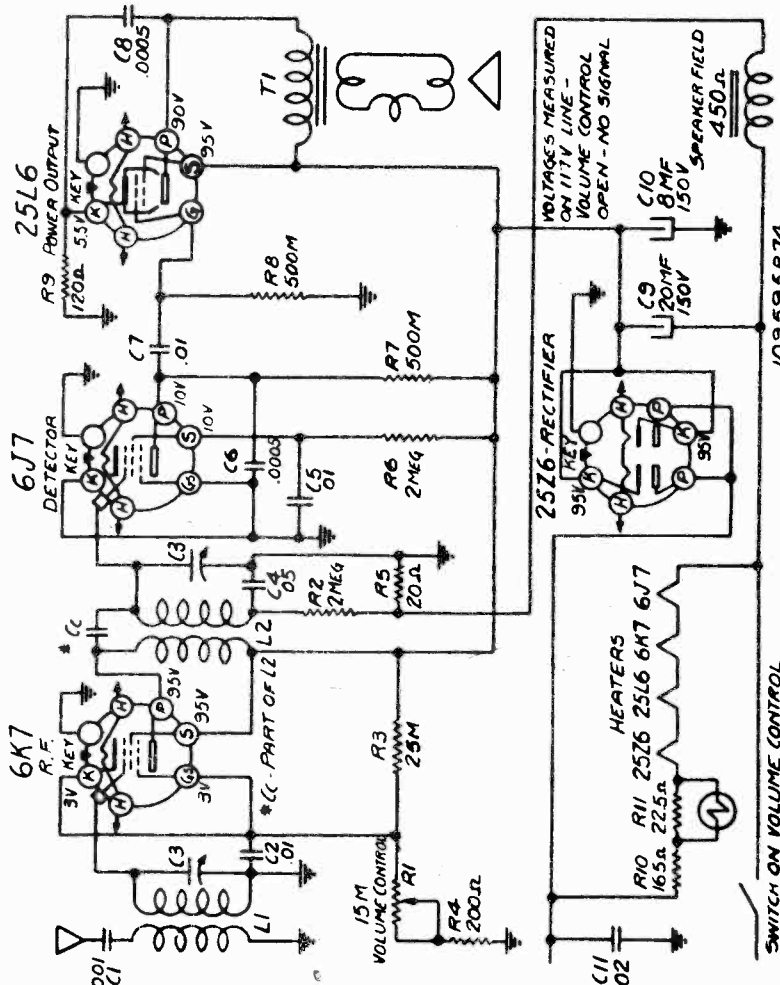
MECHANICAL SPECIFICATIONS

CONTROLS:

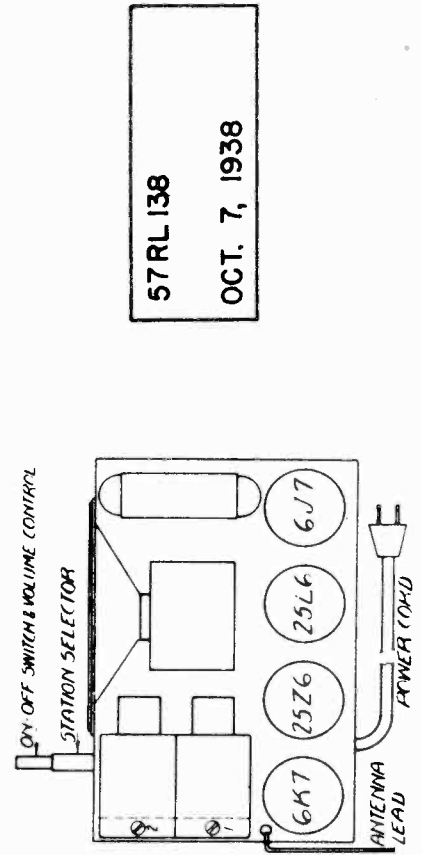
Upper Knob.....Tuning
 Lower Knob.....Volume control, On-Off Switch

CONTROL OPERATION:

Direct Drive
 Turn right to turn power on and to increase volume.



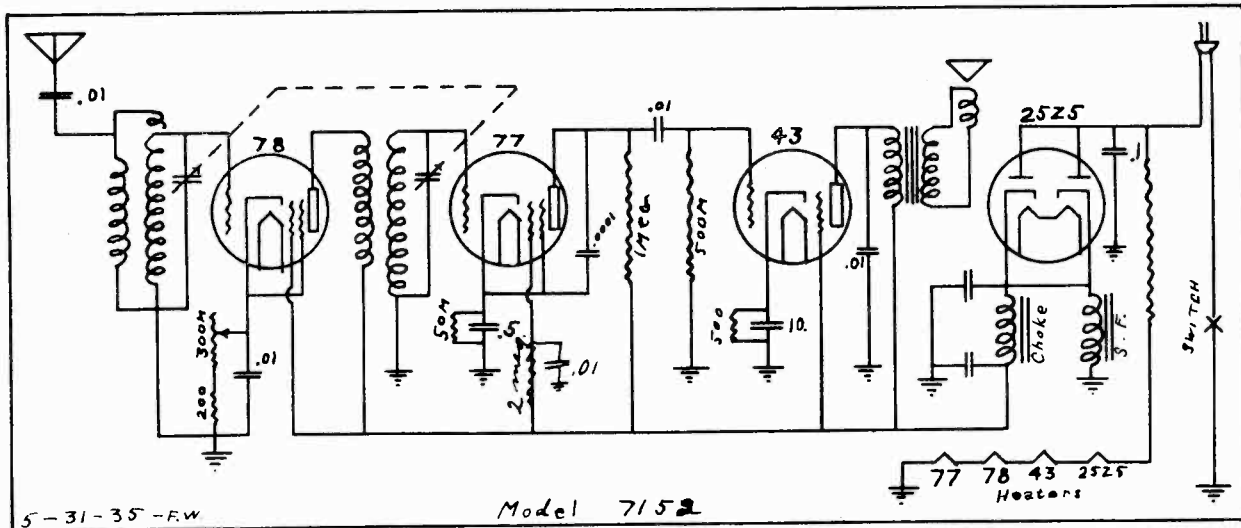
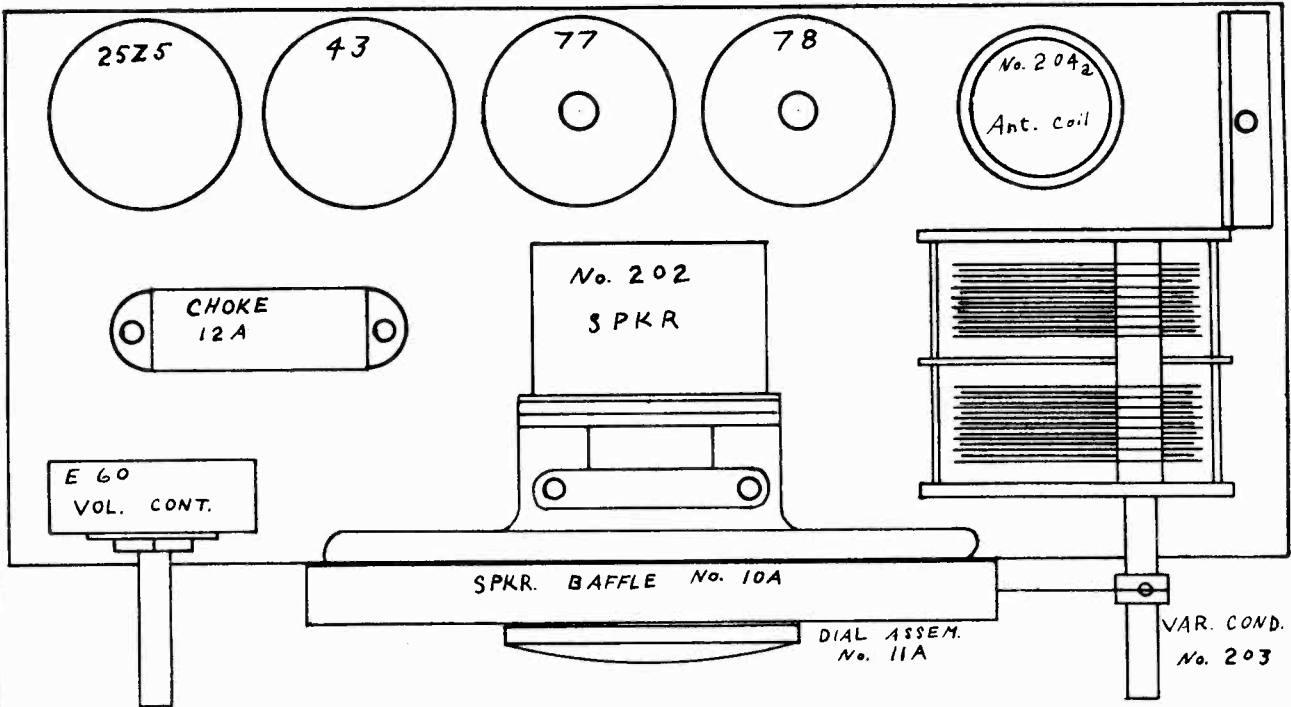
WIRING DIAGRAM FOR SILVERTONE CHASSIS 109.216



MODEL 7152
Schematic, Socket
Voltage

SEARS-ROEBUCK & CO.

FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



SOCKET VOLTAGES

TUBE	POSITION	EF	EK	EG2	EG3	BP
78	RF	6.3	2.1	110	2.1	108
77	Det.	6.3	1.4	14	1.4	18
43	PR. OUTPUT	25	16	110	-	100

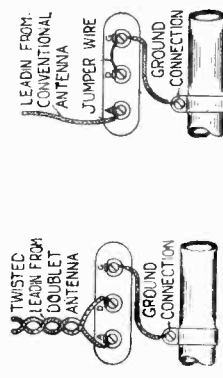
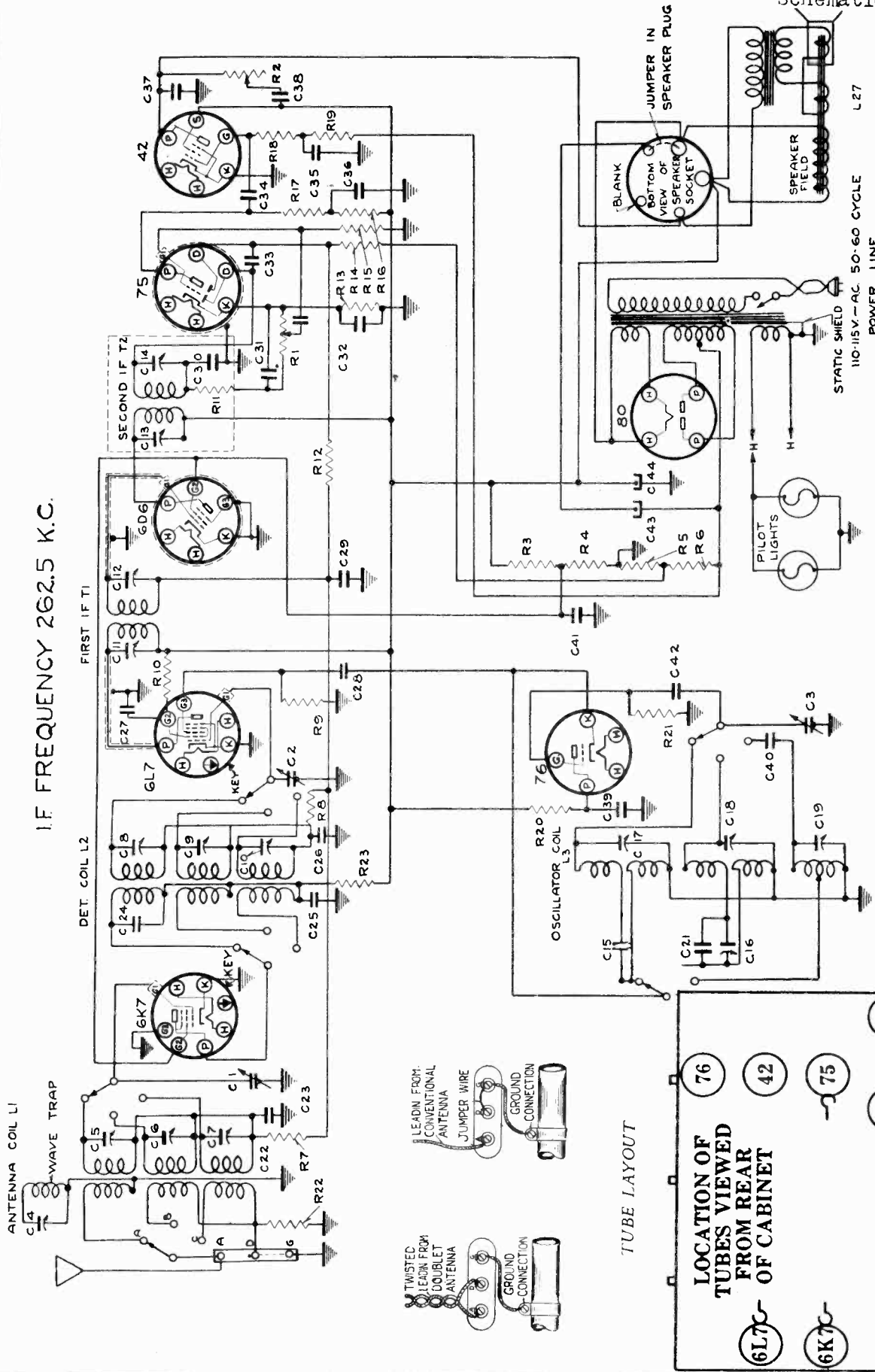
Line voltage 115 Volts - Voltage control all the way up
All voltages taken with 1000 ohms per volt D.C. meter except
heaters. from points indicated to ground.

r - filament k - Cathode G2 - Screen Grid
G3 - Suppressor grid P - Plate

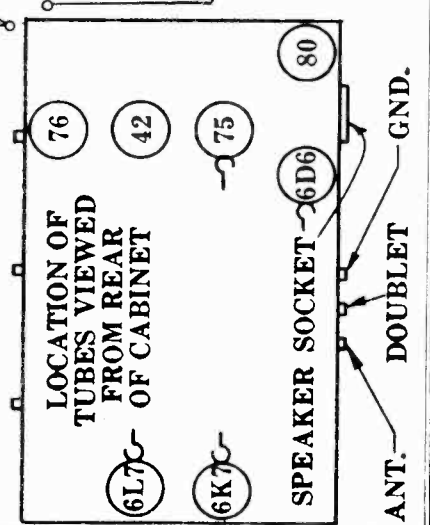
SEARS ROEBUCK & CO.

MODELS 7170, 7170A
Schematic, Socket

I.F. FREQUENCY 262.5 K.C.

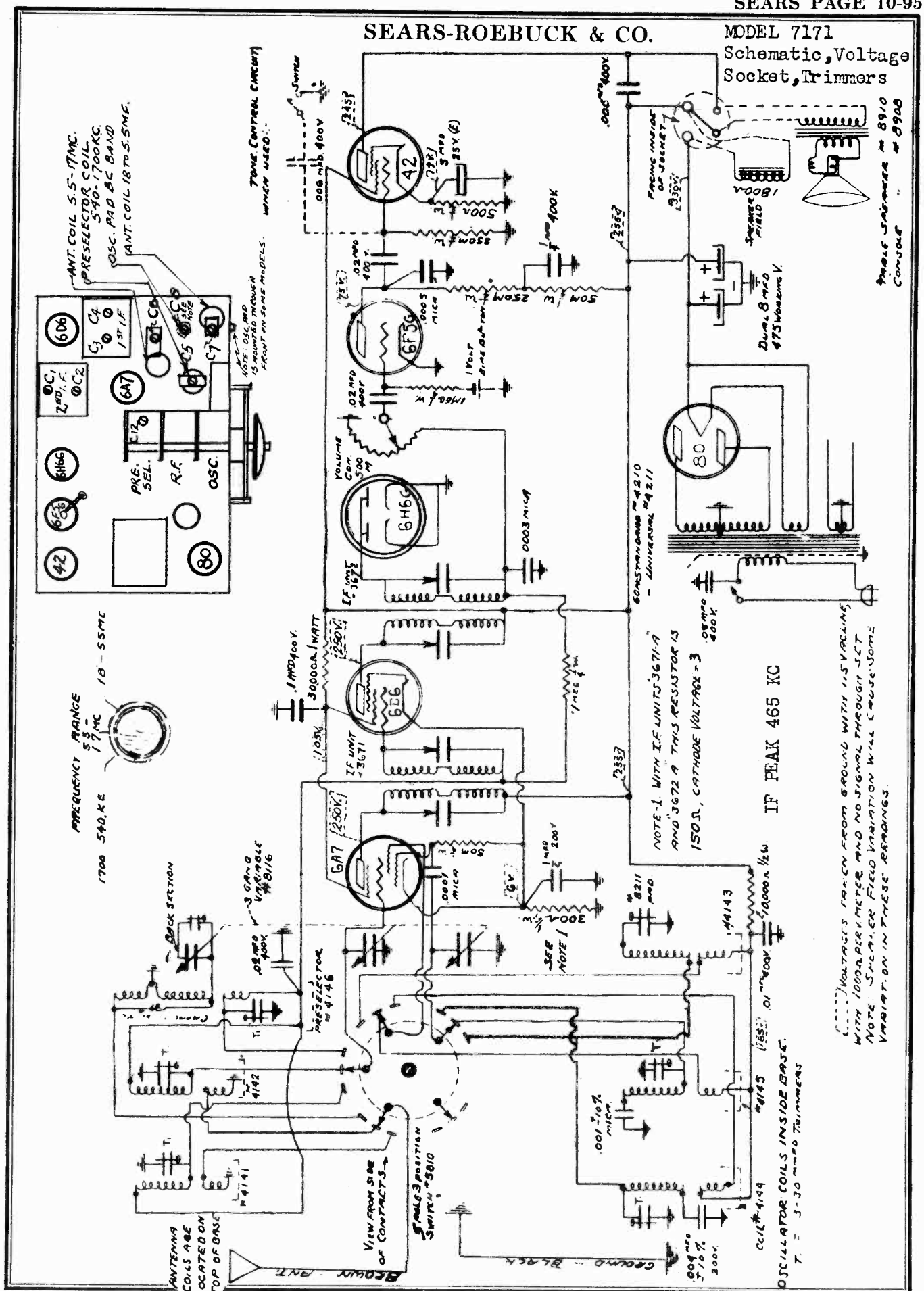


TUBE LAYOUT



SEARS-ROEBUCK & CO.

MODEL 7171
Schematic, Voltage
Socket, Trimmers



MODEL 7171

Alignment

SEARS-ROEBUCK & CO.

Peak oscillator trimmer C-10 to 5 M.C. from test oscillator. And Ant. coil trimmer C-6 to same frequency.

NOTE: After adjusting the two high bands at 17 megacycles and 5 megacycles the test oscillator input to antenna should be increased and receiver dial advanced to .9 megacycle lower and note if test oscillator signal is heard.

In case there is no response the oscillator trimmers have been pulled down too tightly. The trimmers should be released until this condition exists then go back to original point of alignment - reduce antenna input voltage and correct the trimmer adjustment.

EXAMPLE: The receiver has been adjusted to 17 megacycles. Tune receiver to approximately 16.9 M.C.

Increase oscillator signal by "opening up" the alternator. Move the dial back and forth at 16.9 M.C.

If no signal is heard, let oscillator trimmer off until it is heard at 16.9 M.C.

Reduce signal voltage from generator, go back to 17 M.C. and slightly correct this last trimmer adjustment.

The same thing applies to the 5 M.C. adjustment.

IV THE BROADCAST BAND

1. Turn wave band switch all the way to left and dial hand set to 1400 KC (the top scale).

2. Peak oscillator trimmer C-9 to 1400 KC., the Antenna preselector C-12 (variable condenser trimmer) to 1400 KC, and trimmer C-5 to 1400 KC.

3. Set dial hand to 550 KC and adjust oscillator padding condenser C-8 to 550 KC.

4. Recheck dial at 1400 KC as in number (1) and (2).

5. Points in the middle of the dial may be checked and if necessary the plates of the front section of variable condenser may be bent for alignment.

V NOTES.

1. Seal all trimmers after their final adjustment.
2. Be sure that the settings are being made to the true fundamental signal from the oscillator and not on a harmonic or image frequency.
3. Refer to the schematic for the voltages at the tube sockets.

THE ALIGNMENT PROCEDURE

The following alignment instructions are given with the assumption that the service station has an oscillator capable of accurately covering the range of the receiver.

The only other apparatus necessary is a meter connected in the output stage to indicate resonance. This can be 0 to 3 volt AC meter connected across the voice coil of the speaker or preferably an output meter connected in the plate circuit of the 42 power tube in series with an 8 MFD paper condenser.

I THE I.F. STAGES

The I.F.'s are aligned by the usual system of feeding the intermediate frequency of 465KC into the grid of the 6A7 tube.

The two trimmers in each of the I.F. cans should be very carefully peaked to resonance as they are very critical and will greatly affect the performance of the set. These are trimmers number C1, C2, C3, C4. (See pictorial diagram).

The sensitivity of the I.F. stages will be 40 microvolts or better.

Always use as low an output as possible from the test oscillator in making the various adjustments.

II ALIGNMENT OF SHORTWAVE BAND 5.5 TO 18 M.C.

First check the position of the dial hand by rotating the condenser shaft to the left to full capacity. At this point the dial hand should be straight across in line with the lines dividing the scale in half. If the hand is off position it can be easily lined up by loosening the set screw behind the dial card in the drive hub.

1. Set the test oscillator to 17 megacycles.

2. Turn wave band switch all the way to right for highest S.W. band, and set dial hand to 17 M.C.

3. Peak trimmer condenser C-11 of the oscillator coil (See pictorial 6-2) to resonance with 17 M.C. fed into antenna.

4. Peak Ant. coil trimmer C-7 at same setting to 17 M.C.

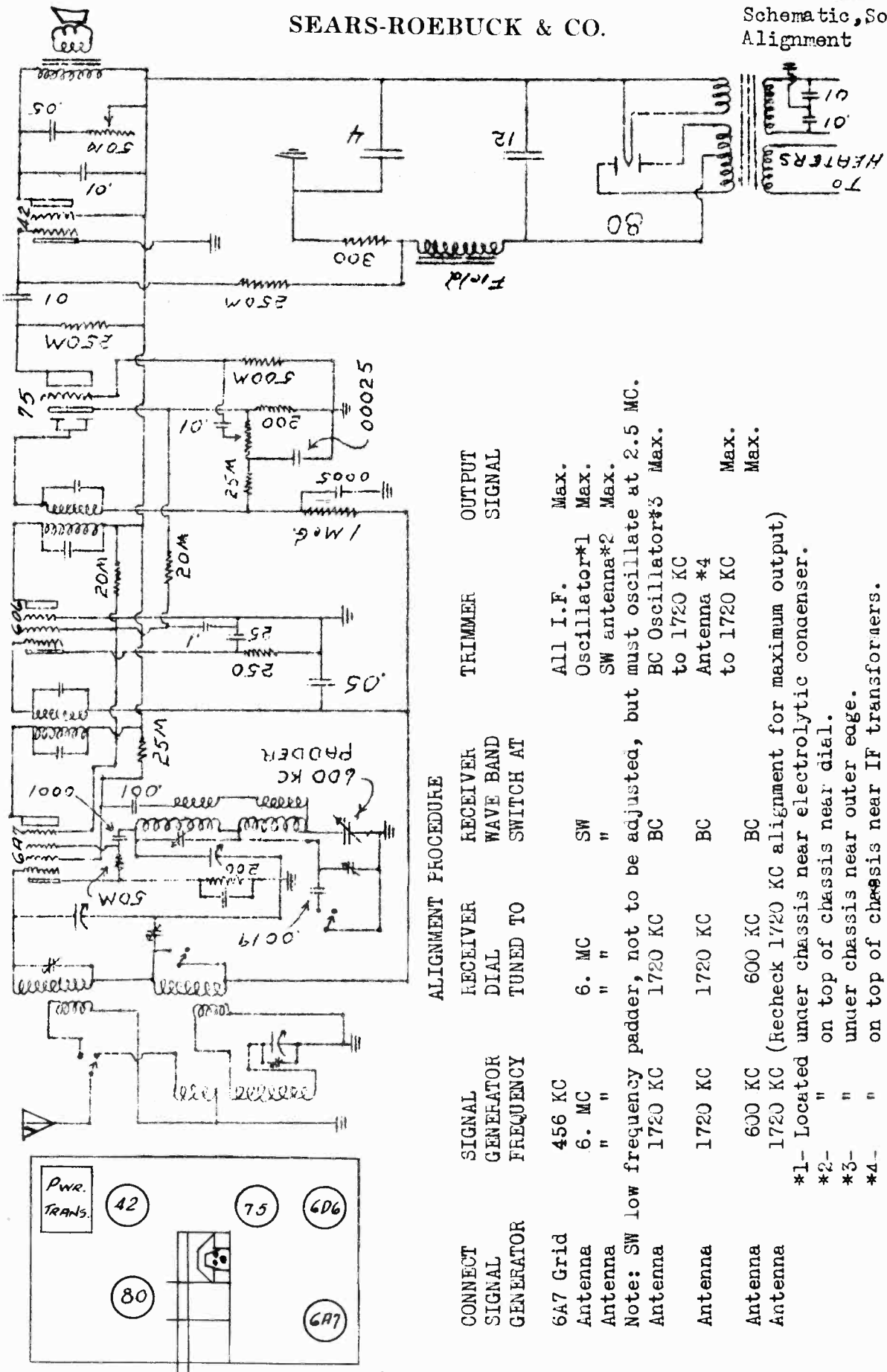
III SHORT WAVE BAND 1.7 TO 5.5 M.C.

1. Turn wave switch to middle position.

2. Set dial hand to 5 megacycles on the 1.7 to 5.5 M.C. inner scale.

SEARS-ROEBUCK & CO.

MODEL 7172
Schematic, Socket
Alignment



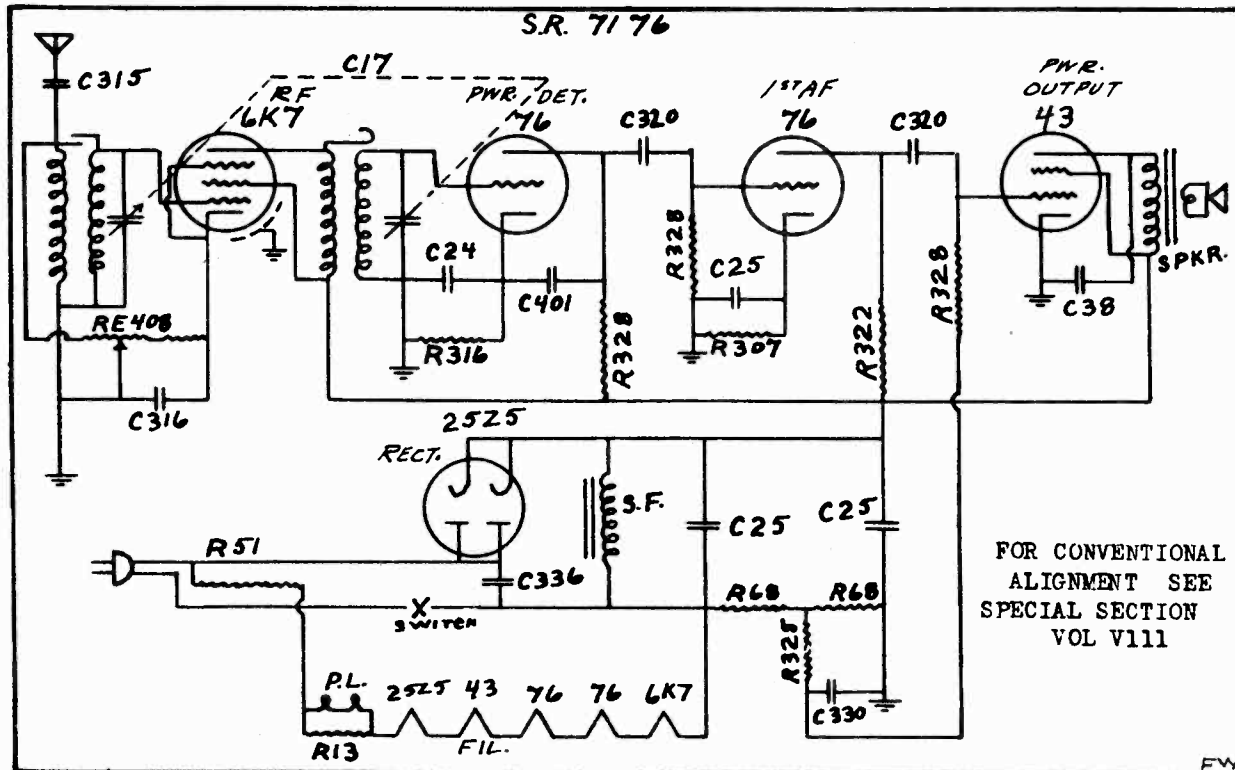
ALIGNMENT PROCEDURE

CONNECT SIGNAL GENERATOR	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL TUNED TO	RECEIVER WAVE BAND SWITCH AT	TRIMMER	OUTPUT SIGNAL
6A7 Grid	456 KC				Max.
Antenna	6. MC	6. MC	SW		Oscillator*1 Max.
Antenna	" "	" "	"		SW antenna*2 Max.
Note: SW low frequency padder, not to be adjusted, but must oscillate at 2.5 MC.					
Antenna	1720 KC	1720 KC	BC		BC Oscillator*3 Max.
Antenna	1720 KC	1720 KC	BC		to 1720 KC
Antenna	600 KC	600 KC	BC		Antenna *4 Max.
Antenna	1720 KC (Recheck 1720 KC alignment for maximum output)				Max.

- *1- Located under chassis near electrolytic condenser.
- *2- on top of chassis near dial.
- *3- under chassis near outer edge.
- *4- on top of chassis near IF transformers.

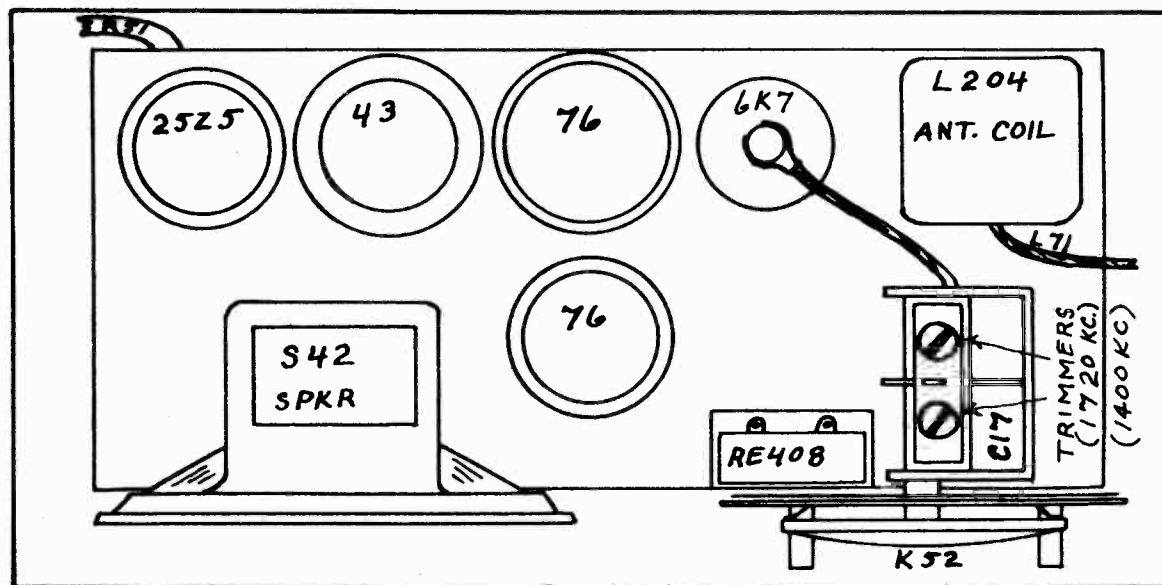
MODEL 7176
Schematic, Socket, Trimmers
Alignment

SEARS-ROEBUCK & CO



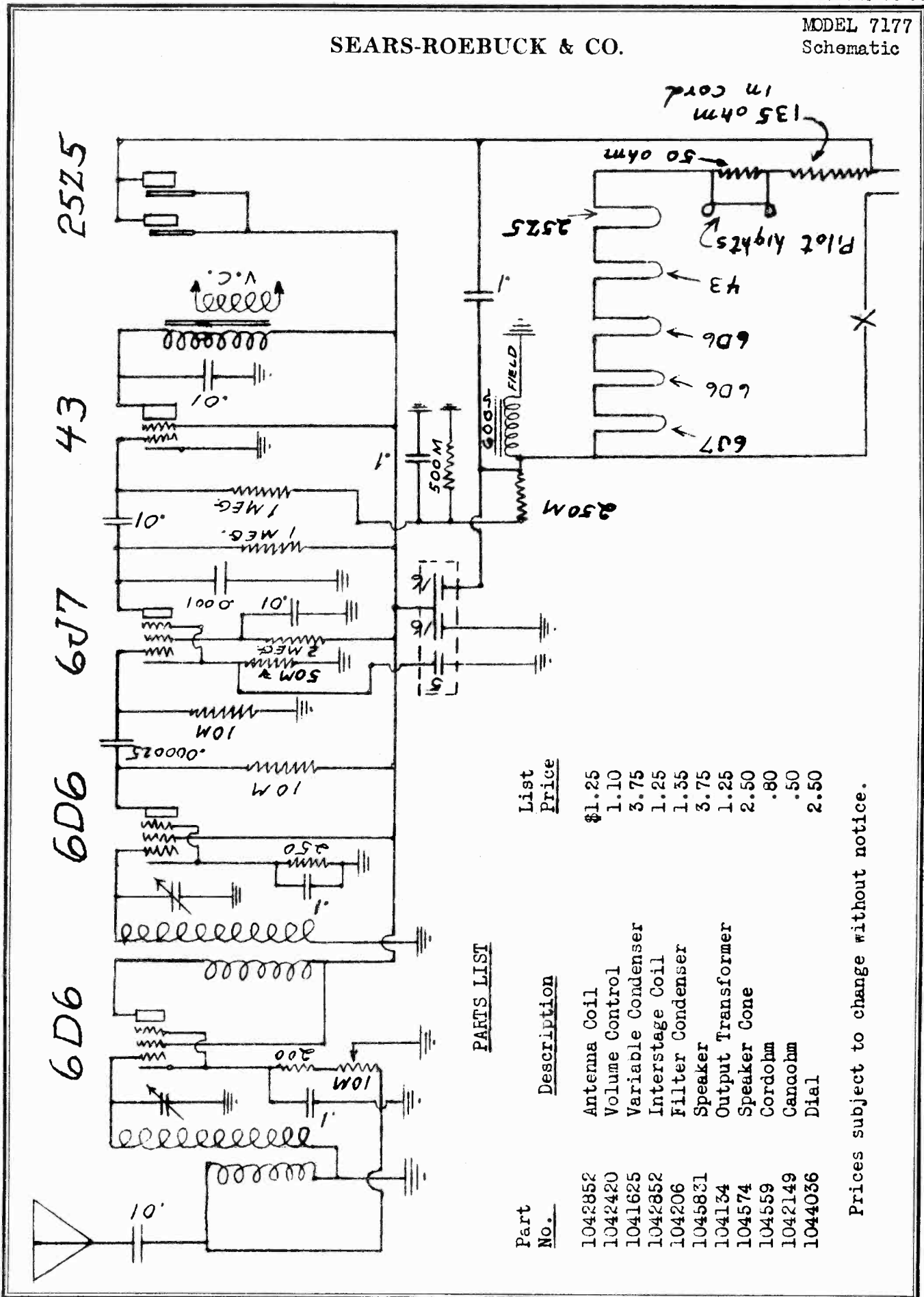
LEGEND

- | | |
|---------------------------|--------------------------------|
| C17 - 360 MMF. Var. Cond. | R13 - 50 OHMS. |
| C24 - 5 MFD. 35V. Elect. | R51 - 135 OHM. Cordohm |
| C25 - 16-8-5 MFD | R68 - 400 OHMS |
| C38 - .003 MFD. 800V. | R307 - 2,500 OHMS |
| C315 - .01 MFD. 200V | R316 - 15,000 OHMS |
| C316 - .01 MFD. 400V | R322 - 50,000 OHMS |
| C320 - .02 MFD. 200V | R328 - 1 MEG. |
| C330 - .05 MFD. 200V | RE408 - 300,000 OHM Vol. Cont. |
| C336 - .1 MFD. 400V | P.L. - Pilot Lights |
| C401 - .0001 Mica | S.L. - Speaker Field |



SEARS-ROEBUCK & CO.

MODEL 7177
Schematic



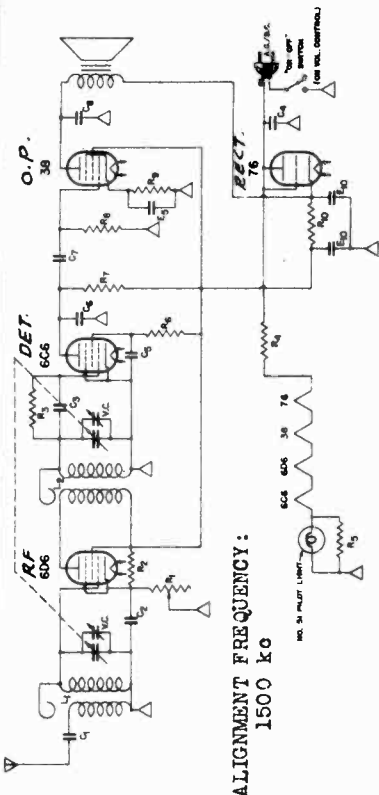
PARTS LIST

Part No.	Description	List Price
1042852	Antenna Coil	\$1.25
1042420	Volume Control	1.10
1041625	Variable Condenser	3.75
1042852	Interstage Coil	1.25
104206	Filter Condenser	1.35
1045831	Speaker	3.75
104134	Output Transformer	1.25
104574	Speaker Cone	2.50
104559	Cordoban	.80
1042149	Canaobm	.50
1044036	Dial	2.50

Prices subject to change without notice.

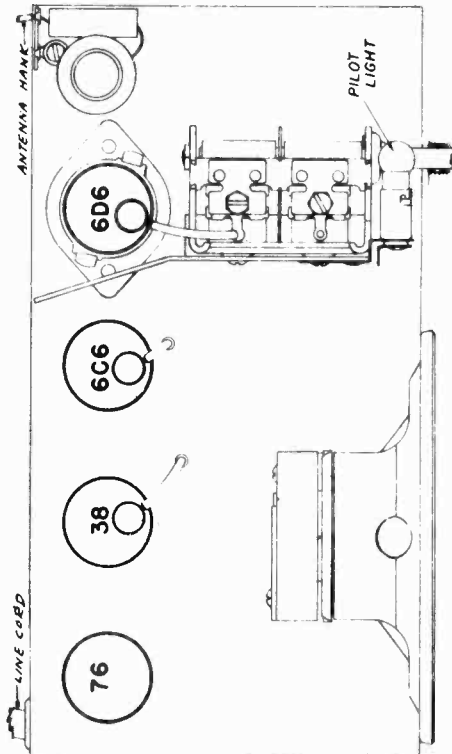
MODEL 7211, Ch. 110.7211
 MODELS 7212, 7212A
 Chassis 110.7212
 Schematics, Socket, Trimmers
 Alignment

SEARS-ROEBUCK & CO.



ALIGNMENT FREQUENCY:
1500 kc

- Model 7211
- | | | | |
|-------------------|-------------------------|------------------|-------------|
| R ₁ - | 25,000 OHM VOL. CONTROL | C ₁ - | .005 400 V. |
| R ₂ - | 35,000 " | C ₂ - | .02 200 V. |
| R ₃ - | 3,000,000 " | C ₃ - | .005 400 V. |
| R ₄ - | 250 " | C ₄ - | .05 " |
| R ₅ - | 31 " | C ₅ - | .02 200 V. |
| R ₆ - | 6,000,000 " | C ₆ - | .00025 MCA |
| R ₇ - | 1,000,000 " | C ₇ - | .02 200 V. |
| R ₈ - | 750,000 " | C ₈ - | .005 400 V. |
| R ₉ - | 1,000 " | | |
| R ₁₀ - | 2,700 " | | |
- | | |
|------------------|---------------|
| L ₁ - | ANTENNA COIL |
| L ₂ - | R.F. COIL |
| S ₁ - | 5 MFD 25 W.V. |
| S ₂ - | 10 " 50 " |

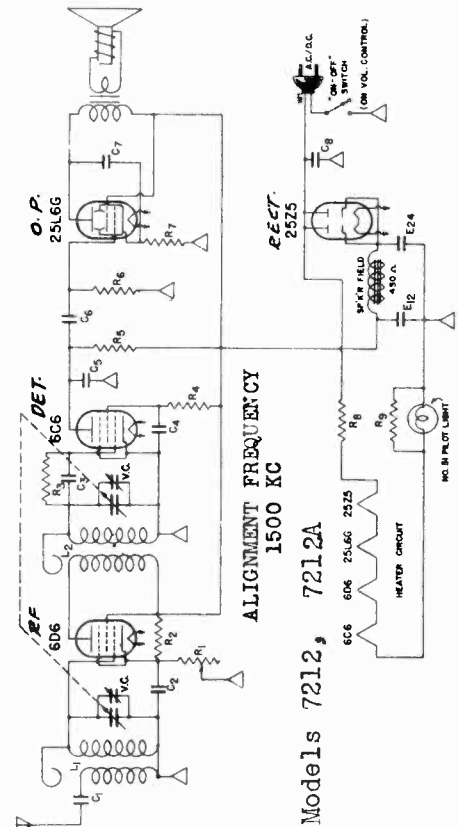


POWER SUPPLY:
All models 105-125 volts, 25-60 cycle or DC, 35 watts

FREQUENCY RANGE:
Broadcast 540-1700 kc

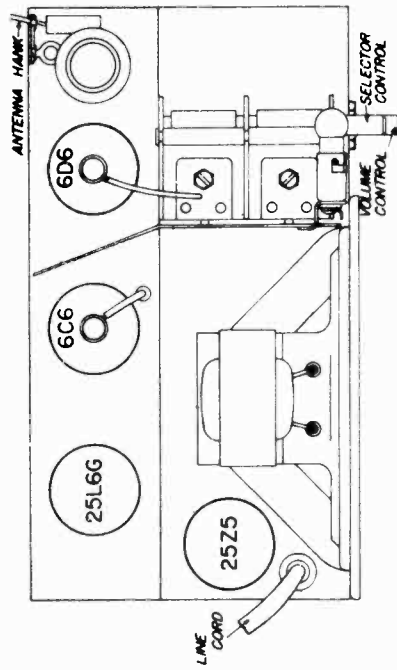
POWER OUTPUT:
Type Single Pentode
Undistorted3 watts
Maximum6 watts

APRIL 7, 1938



ALIGNMENT FREQUENCY:
1500 KC

- Models 7212, 7212A
- | | | | |
|------------------|-------------------------|------------------|-------------|
| R ₁ - | 25,000 OHM VOL. CONTROL | C ₁ - | .005 400 V. |
| R ₂ - | 35,000 " | C ₂ - | .02 200 V. |
| R ₃ - | 6,000,000 " | C ₃ - | .005 400 V. |
| R ₄ - | 6,000,000 " | C ₄ - | .02 200 V. |
| R ₅ - | 1,000,000 " | C ₅ - | .00025 MCA |
| R ₆ - | 500,000 " | C ₆ - | .02 200 V. |
| R ₇ - | 150 " | C ₇ - | .01 400 V. |
| R ₈ - | 165 " | C ₈ - | .1 " |
| R ₉ - | 31 OHM 3 WATT | | |
- | | |
|------------------|-----------------|
| L ₁ - | ANTENNA COIL |
| L ₂ - | R.F. COIL |
| S ₁ - | 12 MFD 150 V.W. |
| S ₂ - | 24 " " |
- V.C. - 40 MMF MAX. VARIABLE COND.



POWER SUPPLY:
All models 105-125 volts, 50-60 cycle or DC, 40 watts

FREQUENCY RANGE:
Broadcast 540-1470 KC

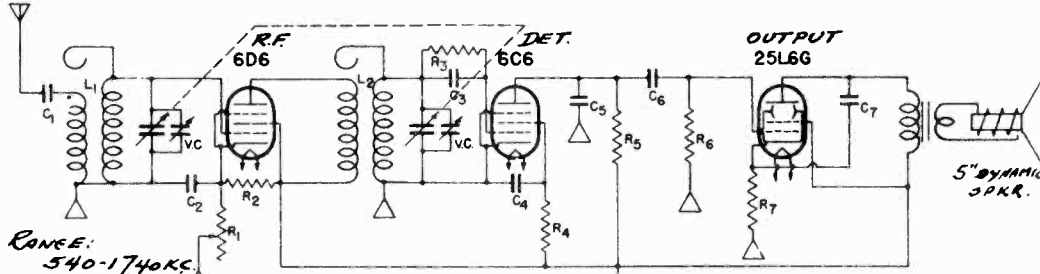
POWER OUTPUT:
Type Beam Power
Undistorted1 watt
Maximum 1.5 watts

APRIL 7, 1938

CONVENTIONAL
ALIGNMENT
SEE
SPECIAL
SECTION
VOL. VIII

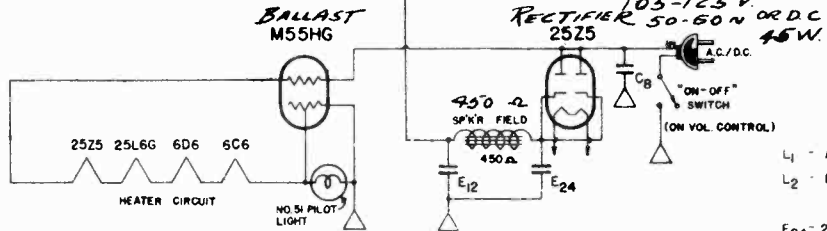
SEARS ROEBUCK & CO.

MODEL 7213, Ch. 110.7213
Schematic, Socket, Trimmers
MODEL 7214, Ch. 110.7214
Schematic

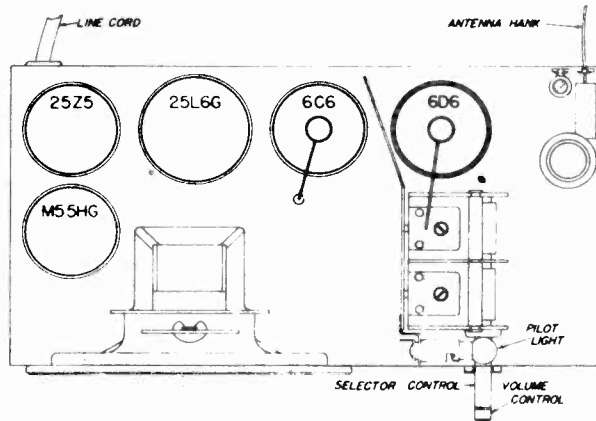


RANGE: 540-1740 KC.

ALIGN AT 1500 KC



APRIL 7, 1938



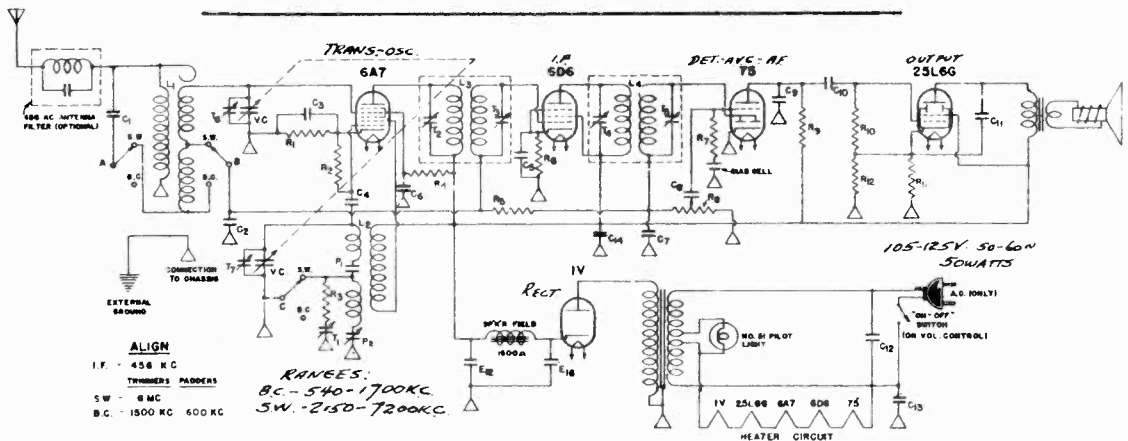
MODEL 7213
CHASSIS 110.7213

- C1 - .005 - 400 V.
- C2 - .02 - 200 V.
- C3 - .005 - 400 V.
- C4 - .02 - 200 V.
- C5 - .0001 - MICA
- C6 - .02 - 200 V.
- C7 - .01 - 400 V.
- C8 - .1 - 400 V.

- L1 - ANTENNA COIL
- L2 - R.F. COIL
- E24 - 24 MFD 150 V.W.
- E12 - 12 " " "
- VC - 410 MMF. MAX. VARIABLE COND.

- R1 - 25,000 OHM VOLUME CONTROL
- R2 - 35,000 " 1/4 WATT
- R3 - 6,000,000 " " "
- R4 - 6,000,000 " " "
- R5 - 1,000,000 " " "
- R6 - 500,000 " " "
- R7 - 150 " 1/2 "

POWER OUTPUT:
Type Beam Power
Undistorted 1.2 watts
Maximum 1.6 watts



ALIGN
I.F. - 456 KC
TRIMMERS PADDERS
S.W. - 6 MC
B.C. - 1500 KC 600 KC

RANGES:
B.C. - 540-1700 KC.
S.W. - 2150-7200 KC

- R1 - 400 OHM 1/4 WATT
- R2 - 50,000 " " "
- R3 - 85 " " "
- R4 - 35,000 " " "
- R5 - 3,000,000 " " "
- R6 - 400 " " "
- R7 - 780,000 " " "
- R8 - 500,000 VOL. CONTROL
- R9 - 500,000 1/4 WATT
- R10 - 500,000 " " "
- R11 - 300 1/2 "
- R12 - 600 TO 800 1/4 "

- L - COMBINATION ANTENNA COIL
- L2 - COMBINATION OSCILLATOR COIL
- L3 - 456 KC. INPUT I.F.
- L4 - 456 KC. OUTPUT I.F.
- P1 - 1360 MMF. MICA PADDER
- P2 - 700 MMF. MAX. PADDER

- C1 - .005 - 400 V.
- C2 - .05 - 200 V.
- C3 - .05 - " "
- C4 - .0001 - MICA
- C5 - .05 - 200 V.
- C6 - .02 - 200 V.
- C7 - .00025 - MICA
- C8 - .02 - 400 V.
- C9 - .00025 - MICA
- C10 - .02 - 200 V.
- C11 - .01 - 800 V.
- C12 - .1 - 400 V.
- C13 - .05 - " "
- C14 - .02 - 200 V.

MODEL 7214
CHASSIS 110.7214

APRIL 7, 1938

POWER OUTPUT:
Type Beam Power
Undistorted 1.75 watts
Maximum 2.5 watts

LOUD SPEAKER:
Type Dynamic
Size 5"
Field Resistance 1500 ohms

MODEL 7214, Ch. 110.7214
 Socket, Trimmers, Alignment SEARS-ROEBUCK & CO.
 MODEL 7215, Ch. 110.7215
 Tuner, Alignment

MODEL 7214
 FACTORY IDENTIFICATION NO. 110.7214
ALIGNMENT PROCEDURE

PRELIMINARY:
 Output meter connections Across output transformer
 Output meter reading indicates 0.050 watt 9 volts
 Average sensitivity in MV for .05 watt output See chart below
 Dummy antenna value in series with generator output 100 MFDPS
 Connection of generator ground lead To chassis
 Generator modulation App. 30% at 400 cycles
 Position of volume control Fully clockwise

WAVE BAND SWITCH POSITION OF DIAL POSITION	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"5A"	456 KC	6A7 Grid	T2, T3, T4, T5, T7, T8	I.F.	140
"5B"	6 MC	Ant. lead	PE	Osc., R.F.	30
"5C"	600 KC	Ant. lead	T1	Osc.	30
"5C"	1500 KC	Ant. lead	T1	Osc.	45

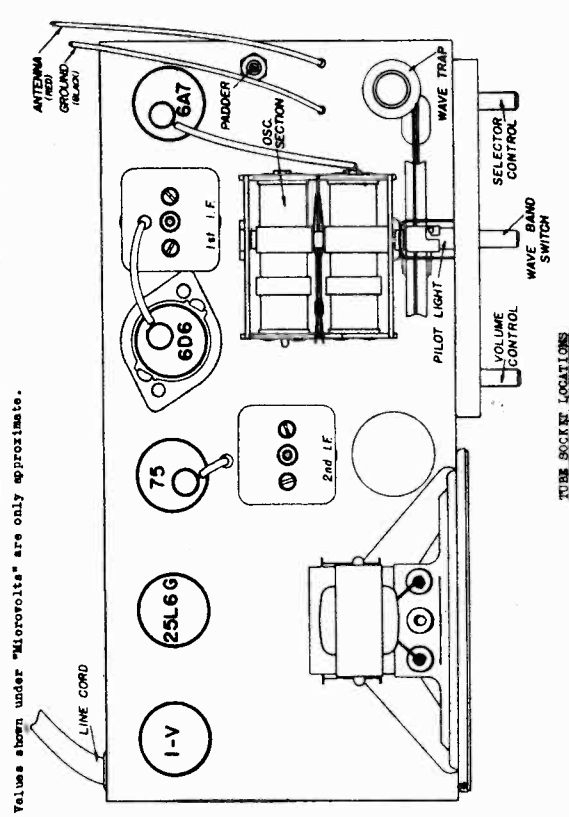
IMPORTANT ALIGNMENT NOTES
 Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.
 It is advisable to repeat the entire alignment procedure band by band and in the original order to insure greater accuracy.
 Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.
 Values shown under "Microvolts" are only approximate.

MODEL 7215
 FACTORY IDENTIFICATION NO. 110.7215
AUTOMATIC TUNING CONTROL ADJUSTMENT

This radio leaves the factory with the push button unset, and the user will have to make the necessary adjustments for setting the buttons.
 The following is the procedure to be followed in making the adjustments for each station.
 Note: Before attempting to set buttons read through the ENTIRE PROCEDURE VERY CAREFULLY.
 1. Decide on station you wish to receive.
 2. From the radio section of your daily newspaper find the transmitting frequency in kilocycles of the stations.
 3. Refer to the diagram underneath cabinet and see which set of adjustment screws will have a tuning range that includes the frequency of the station desired. This is the pair of screws to be adjusted for this particular station. The ranges are listed under each pair of adjustment screws.
 4. From the same diagram, after finding where the proper pair of adjustment screws are located, trace a dotted line connecting these screws to one of the push buttons. This is the button which, after the adjustments are completed, will tune in the station.
 5. Push button located by paragraph 4 "IN".
 6. Turn volume control knob on full (to the extreme right) and adjust screw marked "0" until desired station is heard. If when making this adjustment, a number of stations can be brought in as the screw is turned and it is doubtful which station is the correct one, press button No. 6 (Manual Tuning) "IF" and move dial pointer by turning station selector knob to the number on the dial that corresponds to the frequency of the station desired. The station number is indicated by a dot to the left of the frequency in kilocycles. Listening to the program being broadcast will identify the station when adjusting screw "0".
 7. Adjust screw marked "A" for maximum volume, retarding the volume control and readjusting if necessary. This completes the adjustments for this particular station.
 8. Cut out name of station from list supplied and insert in button.
 9. Insert celluloid disc.
 10. In a like manner select a station for each of the other buttons and make necessary adjustments for each station.

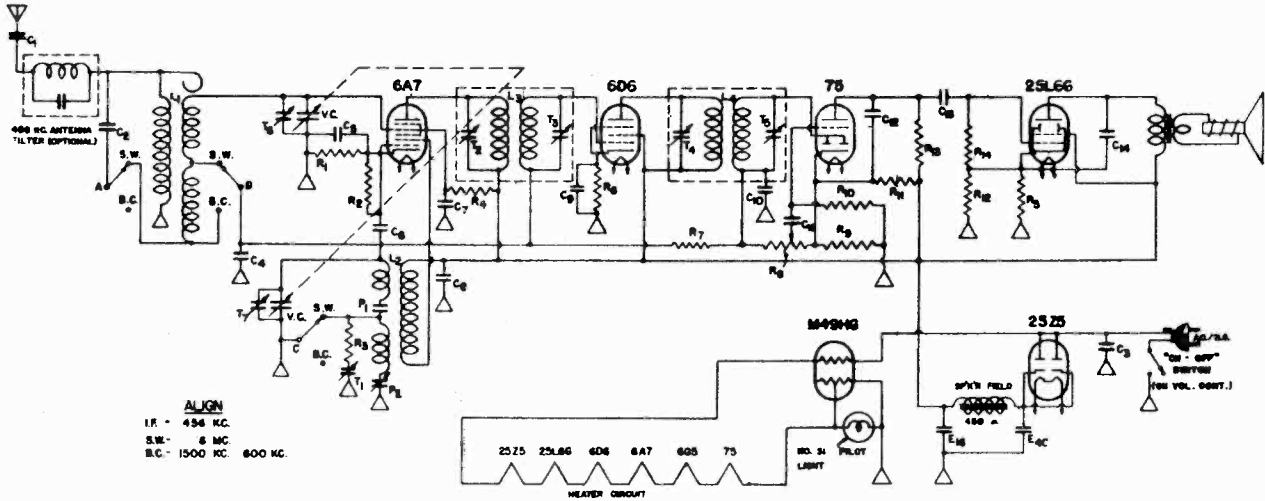
ALIGNMENT PROCEDURE
 Output Meter Connections Across Primary Output Transformer
 Output Meter Reading to Indicate 0.050 watt 9 Volts
 For Station Type 571 Output Meter on 15 Volt scale See Chart below
 Dummy Antenna Value in Series with Generator Output 100 MFDPS
 Connection of generator ground lead To chassis
 Generator Modulation App. 30% at 400 cycles
 Position of volume control Fully clockwise

IMPORTANT ALIGNMENT NOTES
 Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.
 It is advisable to repeat the entire alignment procedure band by band and in the original order to insure greater accuracy.
 Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.
 Values shown under "Microvolts" are only approximate.



SEARS-ROEBUCK & CO.

MODEL 7220, Ch. 110.7220
Schematic Notes



ALIGN
I.F. - 456 KC.
S.W. - 6 MC
B.C. - 1500 KC. 600 KC.

R ₁	400 OHM	1/4 WATT
R ₂	50,000	" "
R ₃	85	" "
R ₄	35,000	" "
R ₅	150	1/2 "
R ₆	400	1/4 "
R ₇	3,000,000	" "
R ₈	500,000	" VOL. CONTROL
R ₉	200	1/2 WATT
R ₁₀	750,000	" "
R ₁₁	25,000	" "
R ₁₂	600 to 800	" "
R ₁₃	500,000	" "
R ₁₄	500,000	" "

L ₁	COMBINATION ANTENNA COIL
L ₂	COMBINATION OSCILLATOR COIL
L ₃	456 K.C. INPUT I.F.
L ₄	456 K.C. OUTPUT I.F.
P ₁	1380 MMF. MICA PADDER
P ₂	700 MMF. MAX. PADDER
E ₁₅	16 MFD. 150 V.W.
E ₄₀	40 " " "
V.C.	410 MMF. MAX. VARIABLE COND.
T ₁	3-35 MMF. TRIMMER

C ₁	.005	400 V.
C ₂	.005	" "
C ₃	.1	400 V.
C ₄	.05	200 V.
C ₅	.05	" "
C ₆	.0001	MICA
C ₇	.02	200 V.
C ₈	.02	200 V.
C ₉	.05	" "
C ₁₀	.00025	MICA
C ₁₁	.02	200 V.
C ₁₂	.00025	MICA
C ₁₃	.02	200 V.
C ₁₄	.01	400 V.

SWITCHES A,B,C - 3 POLE DOUBLE
THROW WAVE BAND SWITCH

ELECTRICAL SPECIFICATIONS

APRIL 7, 1938

TUBES AND FUNCTIONS:

6A7	Translator-Oscillator
6D6	IF
75	AVC, detector, 1st audio

25L6G	Output
25Z5	Rectifier
M49EG	Ballast tube

POWER SUPPLY:

All models available 105-125 volts, 25-60 cycle or DC, 45 watts

FREQUENCY RANGES:

Broadcast	540-1700 KC
Short Wave	2150-7200 KC

ALIGNMENT FREQUENCIES:

Broadcast	Oscil.	Oscil.
Short Wave	Trimmer	Padder
	1500 KC	600 KC
	6 MC	Fixed

POWER OUTPUT:

Type	Beam Power
Undistorted	.8 watts
Maximum	1.5 watts

LOUD SPEAKER:

Type	Dynamic
Size	5"
Field resistance	450 ohms

MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:

Left Knob	"On-Off" switch, volume control
Center Knob	Wave change switch
Right Knob	Tuning

CONTROL OPERATION:

Turning right; power on; volume increase
Left Foreign; right Broadcast.

Under certain conditions, the chassis may be above ground potential. Do not allow any grounded object to come into contact with the chassis while the line cord is plugged in. Also, be careful when working on the chassis out of its cabinet, to avoid shocks.

If the power supply is DC, the power cord plug must be in its receptacle in the proper way. If the receiver does not operate after being turned on for a minute, reverse the polarity by removing the power cord plug from its receptacle and turning it half way around before re-inserting it in the receptacle.

MODEL 7220, Ch. 110.7220
 MODEL 7226, Ch. 110.880
 Socket, Trimmers
 Alignment

SEARS-ROEBUCK & CO.

MODEL 7226 CHASSIS 110.880

ALIGNMENT PROCEDURE

Output Meter Connections Across primary of output transformer
 Output meter reading to indicate 0.05 watt
 For Weston type 571 output meter on 15 volt scale
 Average sensitivity in series with generator output
 Dummy antenna value in series with generator output
 Connection of generator ground lead
 Position of volume control Fully clockwise

WAVE BAND SWITCH POSITION	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
SW	6 MC	6A7 Grid	T2, T3, T4, T5	I. F.	70
SW	6 MC	Ant. lead	T7, T8	Osc. R. F.	45
BC	600 (Rock)	Ant. lead	F2	Osc.	12
BC	1500	Ant. lead	T1	Osc.	16

IMPORTANT ALIGNMENT NOTES

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.
 It is advisable to repeat the entire alignment procedure band by band and in the original order to insure greater accuracy.
 Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.
 Values shown under "Microvolts" are only approximate.

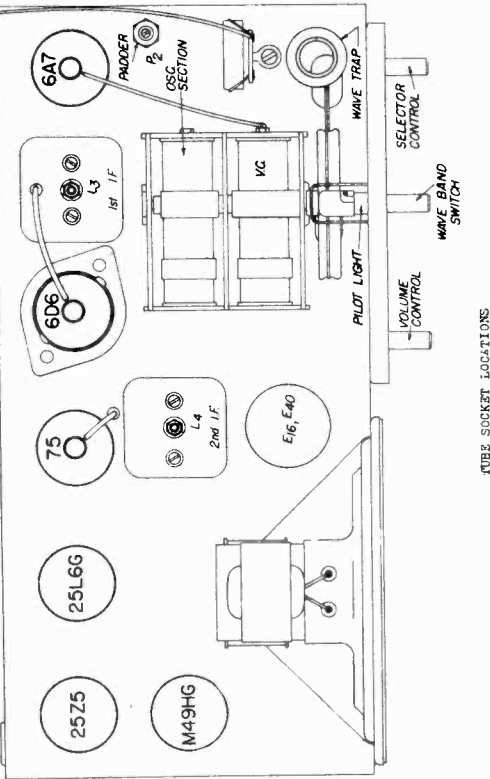
ALIGNMENT PROCEDURE

Output Meter Connections Across Primary Output Transformer
 Output meter reading to indicate 0.05 watt
 For Weston Type 571 Output meter on 15 volt scale
 Average sensitivity in series with generator output
 Dummy antenna value in series with generator output
 Connection of generator ground lead
 Position of volume control Fully clockwise

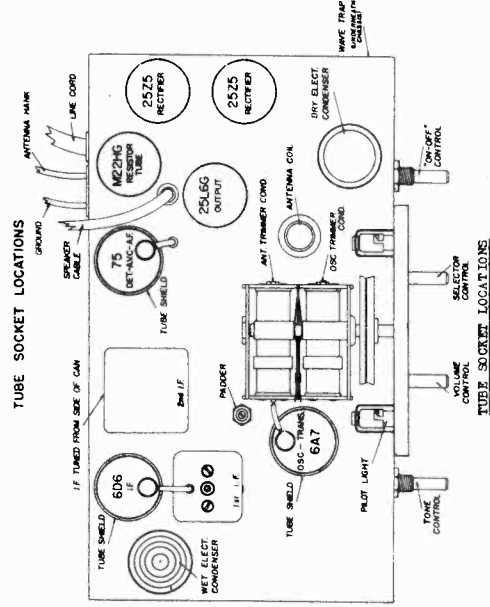
POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
**	456 KC	Grid 6D6	T7, T8, T9	I. F.	2600
**	456 KC	Grid 6A7	T4, T5	I. F.	37
**	400 KC (Rock)	Ant.	F	Osc.	20
**	1500 KC	Ant.	T2, T3	Osc., R. F.	16
**	600 KC	Ant.	T1	Wave Trap	***

IMPORTANT ALIGNMENT NOTES

Where indicated by the word "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.
 Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.
 Values shown under "Microvolts" are only approximate.
 *First time T7 is aligned about one turn by loosening center screw.
 **Short oscillator section of variable condenser.
 ***Wave trap is aligned to secure minimum output with maximum signal input.



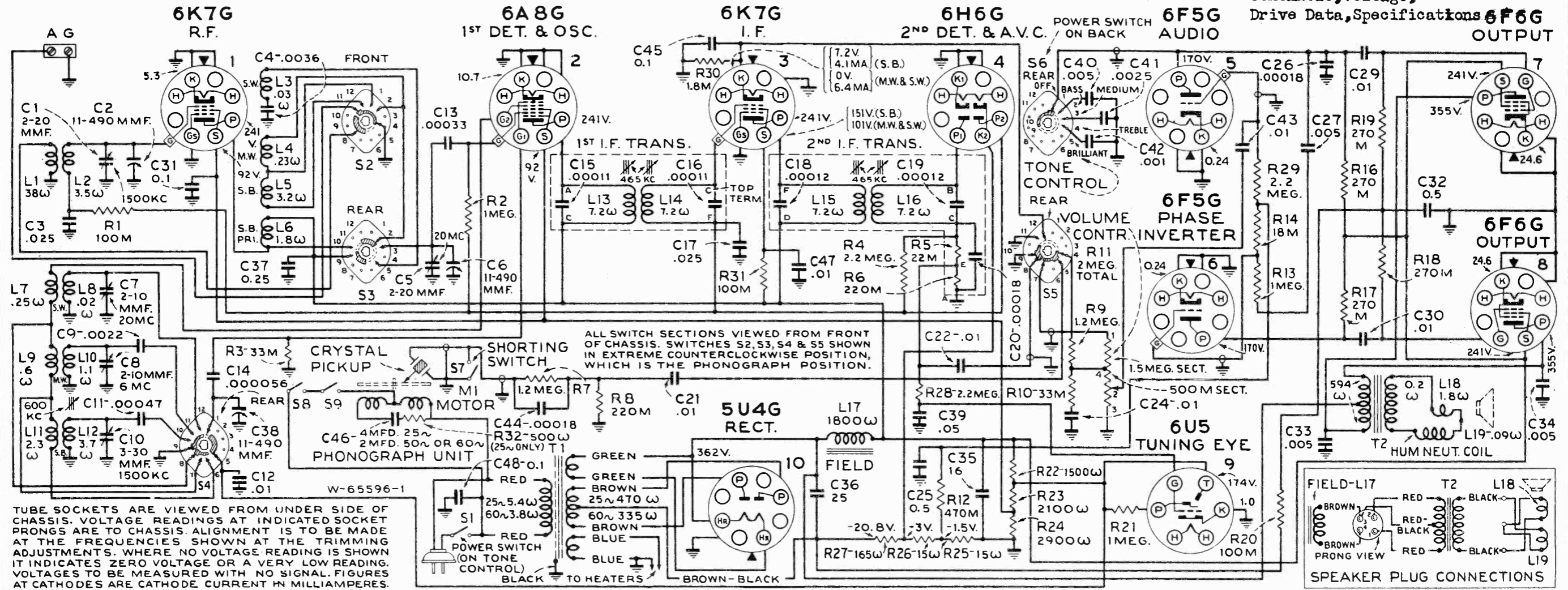
TUBE SOCKET LOCATIONS



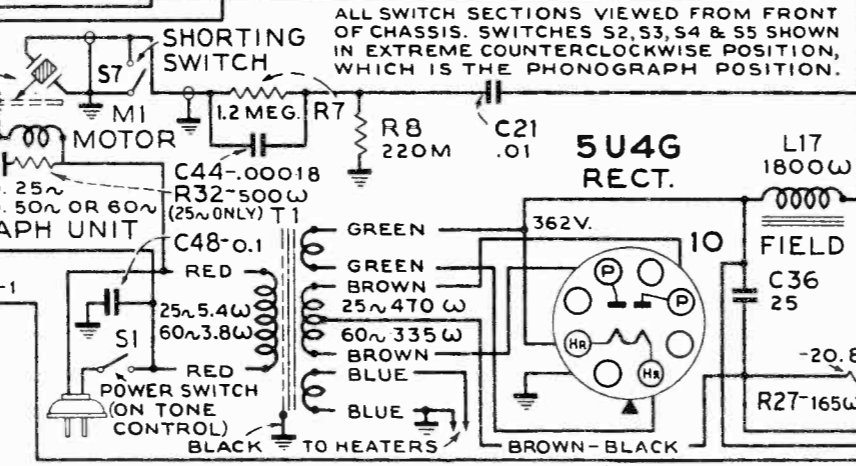
TUBE SOCKET LOCATIONS

SEARS-ROEBUCK & CO.

MODEL 7221, Chassis 126.202
Schematic, Voltage,
Drive Data, Specifications **6F6G**
OUTPUT



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS. WHERE NO VOLTAGE READING IS SHOWN IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES TO BE MEASURED WITH NO SIGNAL. FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.



In cases where the customer objects to "boominess," the following circuit change may be made to minimize low-frequency response.

Change condenser C43 to .001 mfd., or in the most stubborn cases to .0001 mfd. Add a 2 megohm resistor across the crystal pickup circuit connecting it from junction of pickup cable, C44, and R7 to chassis. This will reduce low-frequency response.

Mount the speaker away from the baffle by about 1/4" to 3/8".
POWER SUPPLY RATINGS AVAILABLE.....

	Radio Only	Total
105-125 volts, 60 cycles	120 watts	150 watts
105-125 volts, 50 cycles	120 watts	155 watts
105-125 volts, 25 cycles	120 watts	150 watts

FREQUENCY RANGES:
Standard Broadcast (S.B.)..... 540-1,720 kc
Medium Wave (M.W.)..... 2.3-7.5 mc
Short Wave (S.W.)..... 7.5-22 mc

INTERMEDIATE FREQUENCY..... 465 kc

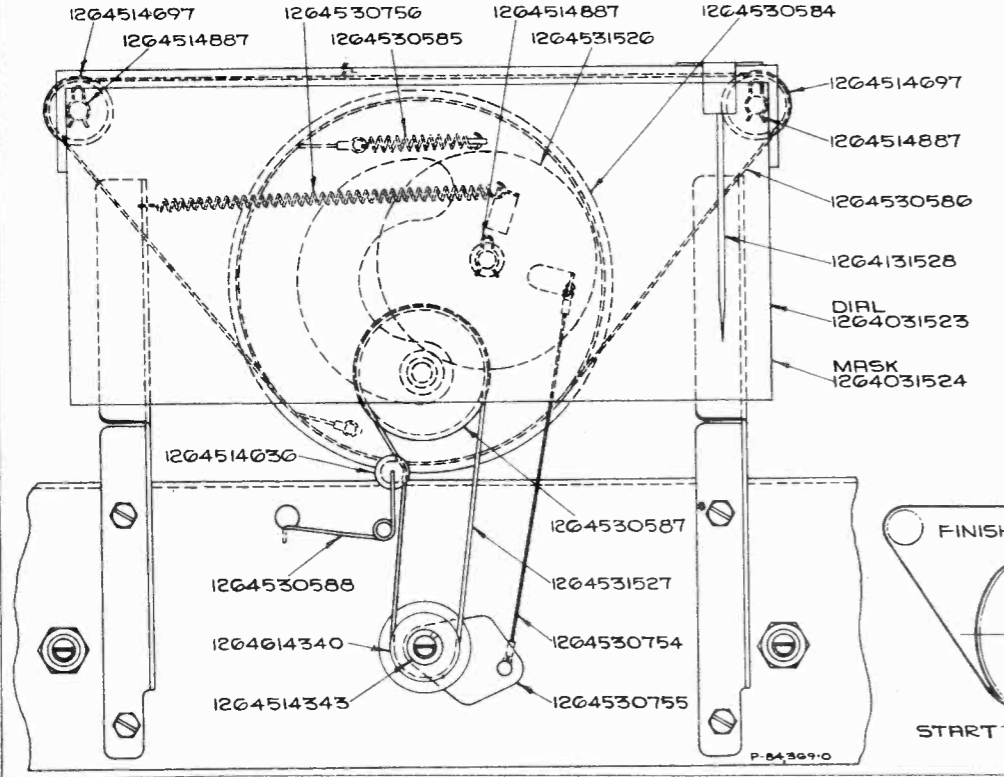
POWER OUTPUT:
Type..... Push-Pull Pentode
Undistorted..... 10 watts
Maximum..... 12 watts

OPERATING FEATURES:
Phonograph-Radio operation
Automatic Phonograph Mechanism with self-starting, synchronous-type motor
Four-point Tone Control
Automatic Volume Control

PHONOGRAPH:
Type..... Automatic-Manual
Record Capacity.... Eight 10-inch or Seven 12-inch
Turntable Speed..... 78 R.P.M.
Type of Pickup..... Crystal
Pickup Impedance..... 80,000 ohms at 1,000 cycles

LOUDSPEAKER:
Type..... Electrodynamic
Size..... 12 inches
V.C. Impedance..... 2.25 ohms at 400 cycles
Field Coil Resistance..... 1,800 ohms
App. Field Coil Voltage Drop..... 115 volts

CHASSIS FEATURES:
No. R-F stages (Band "S.B.")..... One
No. I-F stages..... One
Antenna..... Doublet or Conventional
Tuning Eye
Line Noise Electrostatic Transformer Shield
Aural-Compensated Volume Control
Magnetite-Core Adjusted I-F Transformers and Band "S.B." Low-Frequency Oscillator Tracking



SEARS-ROEBUCK & CO.

MODEL 7221, Ch. 126.202
Socket, Trimmers
Alignment, Phono. Data

Automatic Record Changer Mechanism

- 1.-Ejector Arm goes through normal cycle but does not eject records. Adjust "F" and "G". See that "Spindle" slides freely.
2.-Ejector Arm does not return to rest position. Adjust "H".
3.-Ejector Arm does not start after needle reaches eccentric groove. Adjust "J" (turn screw clockwise).

- 4.-Ejector Arm does not start after needle reaches eccentric groove. Adjust "J" (turn screw clockwise).
5.-Eject cycle starts before eccentric record groove is reached. Adjust "J" (turn screw counter-clockwise).
6.-Ejector Arm does not return to rest position. Adjust "H".
7.-Ejector Arm does not return to rest position. Adjust "H".
8.-Pickup strikes record during eject cycle. Adjust "K" and "L".
9.-Starts playing record several grooves in from beginning or needle misses record entirely. Adjust "L".
10.-Needle falls on smooth portion at start of record but does not move into pickup groove. Adjust "M".
11.-Automatic stop does not operate after needle reaches eccentric groove. Adjust "B" and "C".
12.-Motor does not restart when "Pickup" is returned to rest position. Adjust "C". See that switch mechanism parts move freely and springs are functioning.
13.-Starts eject cycle although set for "Manual" operation. Adjust "D".
14.-Noise in loudspeaker while changing needles. Clean "Shorting Contact" and adjust "Q".
15.-"Wow" in record reproduction.—Instrument should be warmed to about 65° F. Ejector tip should be centered and free to rotate (adjustments "F" and "G"). There should be no solid particles on gear teeth or on "Spindle" and "Spindle" should be straight. Proper lubrication is important.

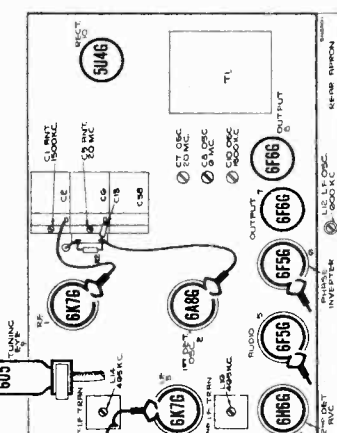
Lubrication.—The motor gear-box should be regreased periodically from one to two years depending on use. The spindle should be regreased. Apply about a level table-spoonful of good, clean, gear grease having uniform viscosity over wide temperature ranges and good clinging quality. This should be placed on the worm and drive gears only. Approximately every six months, put medium motor oil (S.A.E. No. 30) in the motor and spindle bearings. Do not over-cover the main gear and cam of the automatic mechanism with a light grease. Any good household oil, such as Cross Country General Purpose oil, is suitable for the ejector-tip "F" bearing.

Loudspeaker: Centering of the loudspeaker voice-coil is made in the usual manner with three, narrow-paper feelers, after first removing the front dust-cover. This may be removed by loosening its cement with a light application of acetone, using a brush. The acetone should be allowed to evaporate. The dust cover should be put back in place with a screwdriver upon completion of adjustment.

Under normal operating conditions, service requirements on this mechanism should be negligible. Occasionally, however, certain adjustments may be necessary. It is important to refrain from forcing the mechanism if there is a tendency to bind or jam, when operating or adjusting, since bent levers and possibly broken parts may result.

Record Changer Adjustments.—Mount motor-board on a level support. Remove turntable and cover at right of turntable. Adjustment locations are designated on motor-board illustrations as A, B, etc. The adjustments are explained under corresponding symbols below. Perform adjustments in the following order:

- A.—Trip rod "A" should be engaged in "Switch Lever" slot. Adjust trip rod "A" to obtain about 1/8 of an inch clearance from motor-board.
B.—Adjust "B" to the position shown.
C.—With "Index Lever" in "Manual" position, "Pickup Arm" raised to extreme left, and switch tipped to open contact "C", adjust contact points "C" by bending the soft contact arm until points are opened 10 to 30 thousandths of an inch.
D.—With "Index Lever" in "Manual" position, release set screw "D" and force "Manual Index Finger" as far as it will go towards "Trip Pawl Stop Pin." Tighten set screw.
E.—Adjust "E" to provide approximately 1/32 of an inch between outer end of "Lunk Slot" and screw when rubber "Bumper" is in contact with stop bracket.
F and G.—Remove rubber silencer at "F" and adjust "F" and "G" to center "F" in line with "Spindle." Longitudinal movement, with respect to "Ejector Arm," may be effected by loosening hex. head at "F." Lateral movement of "Ejector Arm" may be effected by adjustment "G."
H.—Adjust "H" so under side of pickup head can be raised 3/8 inch above motor-board.
I.—Adjust screw "I" until friction will just force "Trip Finger" to move "Trip Pawl" when "Index Lever" is in "12" inch position.
N.—Adjust needle pressure by turning screw under center of "Pickup Arm" so that a force of 72 grams (2.5 ounces) of weight, such as a 12-inch record, is applied to the needle screw to measure force.
K.—Adjustment "N" must be performed prior to this adjustment. Such as a 12-inch record, on "N" with adjustment "K" so that "Cable" tension will allow needle to lower slowly on start of record at completion of eject cycle. Turn "Motor Switch" off after eject cycle is completed and check to see that "Cable" is slightly loose when "Pickup Arm" is moved against "Spindle." Replace turntable and put a needle in "Pickup."
L.—Adjust "L" so needle will drop into center of smooth portion at the start of a 12-inch record when "Index Lever" is in "12" inch position and "Pickup Arm" is at extreme right.
M.—Loosen three screws "M" and rotate "Spacer" until Pointer on "Spacer" is in line with screw to right of "Pickup Arm."
P.—Adjust turntable height by insertion or removal of thrust washers at "P" so ejector tip "P" will not eject bottom 12-inch record but will eject second from bottom record.
Q.—Adjust position of shorting switch at "Q" so switch closes when needle is just outside a 12-inch record.
R.—Adjust screw "R" upward just enough so that with one record on turntable and ejector tip "P" resting on record surface, there is 1/32 of an inch clearance between screw "R" and "Ejector Arm."



The I.F. amplifier should not be shifted to a frequency higher than 455 kc, nor lower than 450 kc, but should be aligned on the I.F. at the new frequency and then realigned the rest of the receiver as described under "ALIGNMENT PROCEDURE."

IMPORTANT ALIGNMENT NOTES

** Use maximum capacity peak if two peaks can be obtained.
* Use minimum capacity peak if two peaks can be obtained.
Where indicated by the word "Rock," the variable tuning condenser should be rocked back and forth a degree or two while making this adjustment.

Eliminating Whistle at 930 KC. A whistle due to a beat between the second harmonic (930 kc) of the 465 kc I.F. and a 930 kc signal may be experienced. In localities where the 930 kc station is one that is frequently listened to, it will be desirable to shift the whistle to some other point where it will not be objectionable. This can be done by shifting the I.F. frequency of the receiver.

Interfering whistle may also be caused by two stations having a frequency difference equal to the I.F. frequency (465 kc) of the receiver and will be evidenced by a whistle appearing when the receiver is tuned to either station. To eliminate this whistle, tune the receiver to one of these stations and then stop the oscillator, in each case, by grounding the oscillator motor section of the variable tuning condenser C38 (rear section) to chassis. If the whistle, in each case, still persists, it is being caused by the beat between these two stations and may be corrected by shifting the I.F. frequency of the receiver to a frequency other than the difference frequency of the two local or strong signals (stations).

MODEL 7221, Ch. 126.202
Chassis Wiring

SEARS-ROEBUCK & CO.
MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:

RADIO PANEL:

- 1. Rear Knob..... Radio or Phonograph Volume
2. Center Knob (large)..... Tuning
Center Knob (small) Phonograph and Wave-Band Switch
3. Front Knob..... "On-Off" Switch and Tone
PHONOGRAPH COMPARTMENT:
4. Turntable Switch.....
5. Index Lever.....

CONTROL OPERATION:

- Turning right..... Volume Increase
Tuning ratio..... 20 to 1
Turning right..... "Phonograph"; "Standard Broadcast"; "Medium Wave"; "Short Wave"
Turning right..... Power on—Bass; Medium; Treble; Brilliant
Toggle..... Phonograph Motor "On-Off"
Front, Manual; Center, 12-inch Automatic; Rear, 10-inch Automatic

ALIGNMENT PROCEDURE

Table with columns: Preliminary, Wave-Band Switch Position, Generator Frequency, Dummy Antenna, Generator Connection, Trimmer Function, Approximate Microvolts.

Trimmers

Table with columns: Wave-Band Switch Position, Generator Frequency, Dummy Antenna, Generator Connection, Trimmer Function, Approximate Microvolts.

IMPORTANT ALIGNMENT NOTES

** Use maximum capacity peak if two peaks can be obtained.
* Use minimum capacity peak if two peaks can be obtained.
Where indicated by the word "Rock," the variable tuning condenser should be rocked back and forth a degree or two while making this adjustment.

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MODEL 7221, Ch. 126.202
Chassis Wiring

SEARS-ROEBUCK & CO.
MECHANICAL SPECIFICATIONS

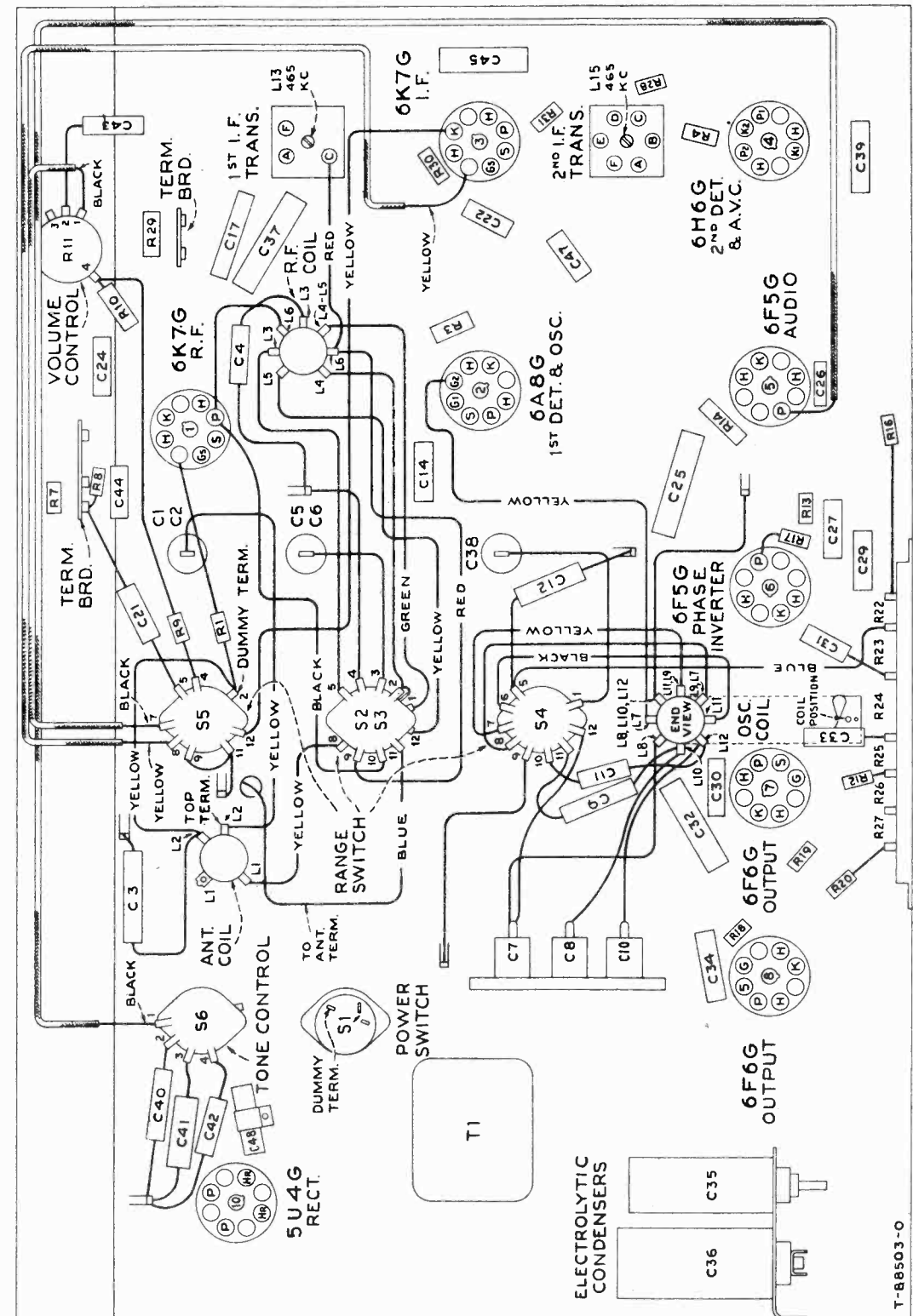
OPERATING CONTROLS:

RADIO PANEL:

- 1. Rear Knob..... Radio or Phonograph Volume
2. Center Knob (large)..... Tuning
Center Knob (small) Phonograph and Wave-Band Switch
3. Front Knob..... "On-Off" Switch and Tone
PHONOGRAPH COMPARTMENT:
4. Turntable Switch.....
5. Index Lever.....

CONTROL OPERATION:

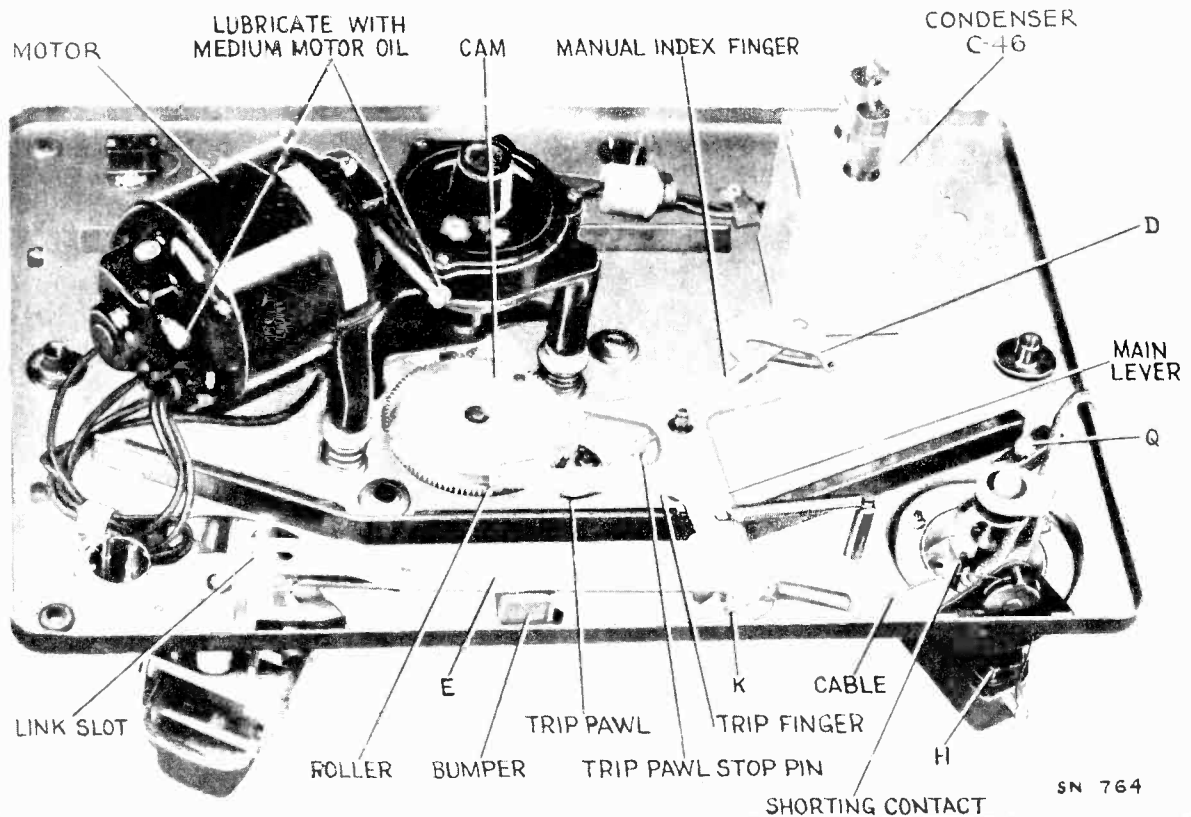
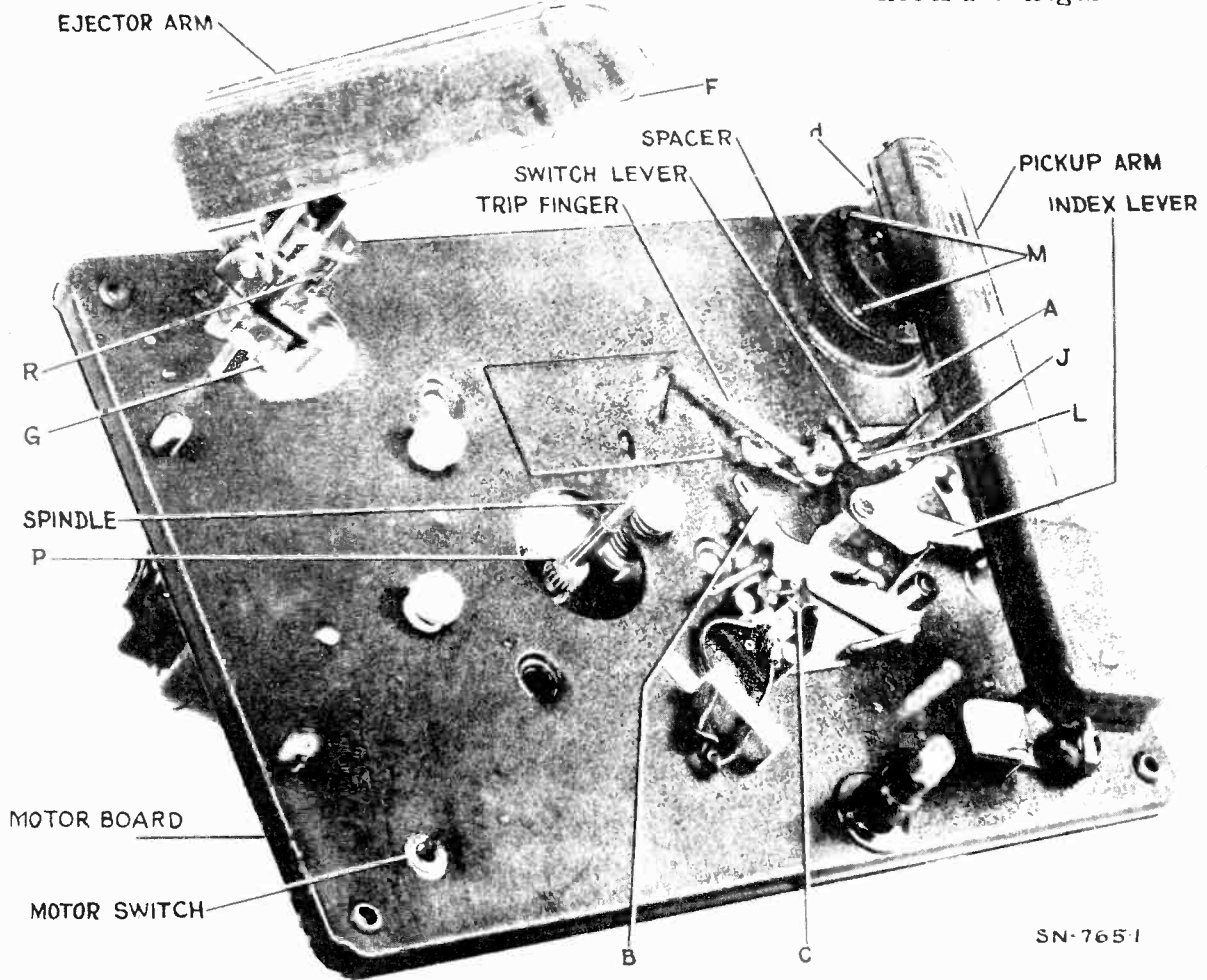
- Turning right..... Volume Increase
Tuning ratio..... 20 to 1
Turning right..... "Phonograph"; "Standard Broadcast"; "Medium Wave"; "Short Wave"
Turning right..... Power on—Bass; Medium; Treble; Brilliant
Toggle..... Phonograph Motor "On-Off"
Front, Manual; Center, 12-inch Automatic; Rear, 10-inch Automatic



LOCATION OF PARTS AND ALIGNMENT ADJUSTMENTS ON BOTTOM OF CHASSIS INCLUDING RANGE SWITCH AND COIL CONNECTIONS

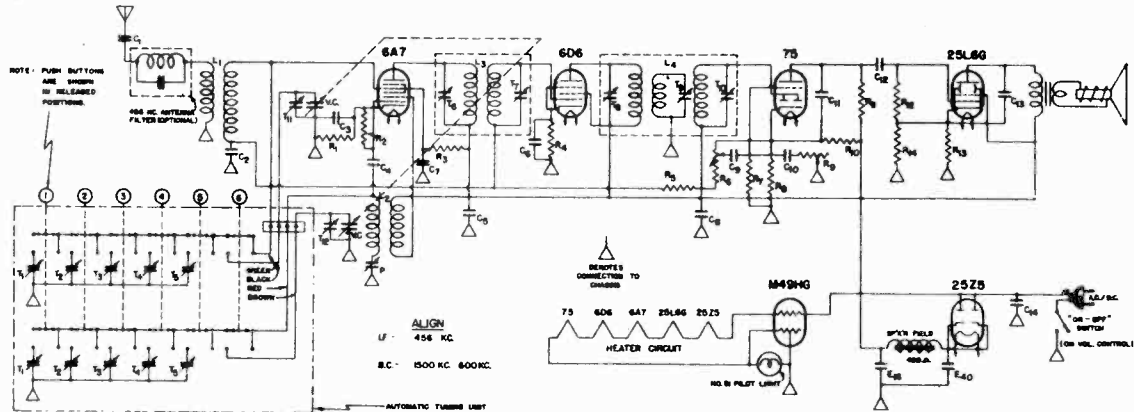
SEARS-ROEBUCK & CO.

MODEL 7221, Ch. 126.202
Record Changer Assembly



MODEL 7215, Ch. 110.7215
Schematic, Socket, Tuner
Trimmers

SEARS-ROEBUCK & CO.



R ₁ - 400 OHM	1/4 WATT	L ₁ - ANTENNA COIL	C ₁ - .008 - 400 V.
R ₂ - 30,000 "	"	L ₂ - OSCILLATOR COIL	C ₂ - .05 - 200 V.
R ₃ - 35,000 "	"	L ₃ - 456 KC. INPUT IF	C ₃ - .06 - 200 V.
R ₄ - 400 "	"	L ₄ - 456 KC. TRIPLE TUNED OUTPUT IF	C ₄ - .0001 - 500 V.
R ₅ - 3,000,000 "	"	P - 700 MMF. MAX. PADDER	C ₅ - .02 - 200 V.
R ₆ - 500,000 "	VOL. CONTROL	E ₁₆ - 16 MFD 150 V.W.	C ₆ - .05 - "
R ₇ - 750,000 "	1/4 WATT	E ₄₀ 40 "	C ₇ - .02 - "
R ₈ - 200 "	1/2 "	V.C. - 410 MMF. MAX. VARIABLE COND.	C ₈ - .00025 - 500 V.
R ₉ - 500,000 "	1/4 WATT	T ₁ - 150 - 420 MMF.	C ₉ - .02 - 200 V.
R ₁₀ - 25,000 "	"	T _{2, T₃} - 100 - 300 MMF.	C ₁₀ - .008 - 400 V.
R ₁₁ - 500,000 "	"	T ₄ - 60 - 200 MMF.	C ₁₁ - .00025 - 500 V.
R ₁₂ - 500,000 "	"	T ₅ - 20 - 140 MMF.	C ₁₂ - .02 - 200 V.
R ₁₃ - 150 "	"		C ₁₃ - .01 - 400 V.
R ₁₄ - 400 TO 800 "	"		C ₁₄ - .1 - "

POWER SUPPLY:

All models available 105-125 volts, 25-60 cycle or DC, 45 watts

FREQUENCY RANGE:

Broadcast 540-1700 KC

ALIGNMENT FREQUENCIES:

Broadcast 1500 KC
Oscil. Trimmer 600 KC
Oscil. Padder 600 KC

POWER OUTPUT:

Type Beam Power
Undistorted 1.2
Maximum 1.6

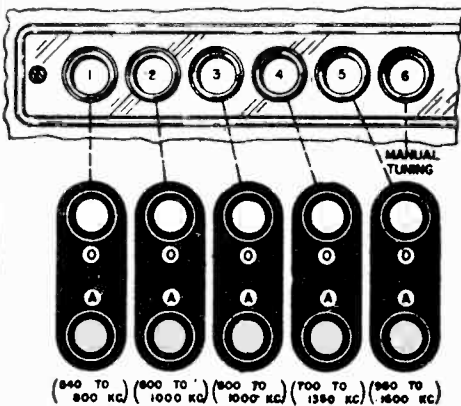
LOUD SPEAKER:

Type Dynamic
Size 5"
Field resistance 450 ohms

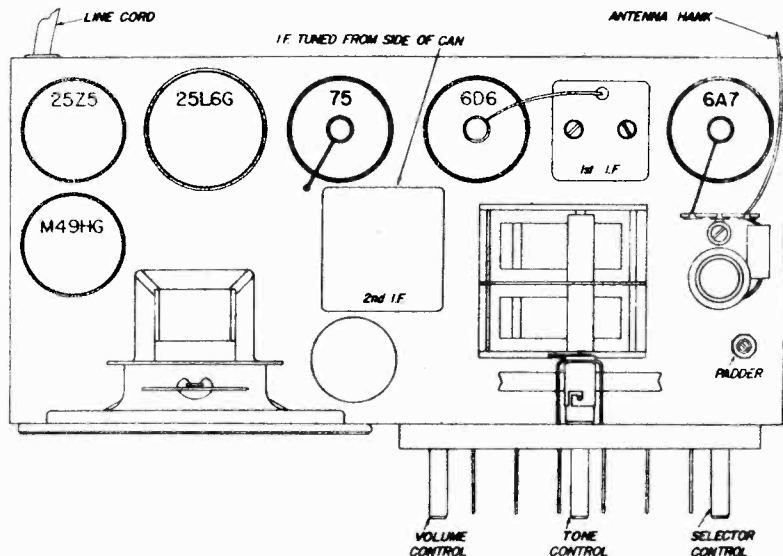
AUTOMATIC TUNING CONTROL:

There are six buttons on the front panel. Five of them can be set so that by simply pushing the button marked with the station's call letters, any of five different broadcast stations can be received.

The sixth button is used to cut out the automatic tuning and convert the set for use with the regular dial and manual tuning.

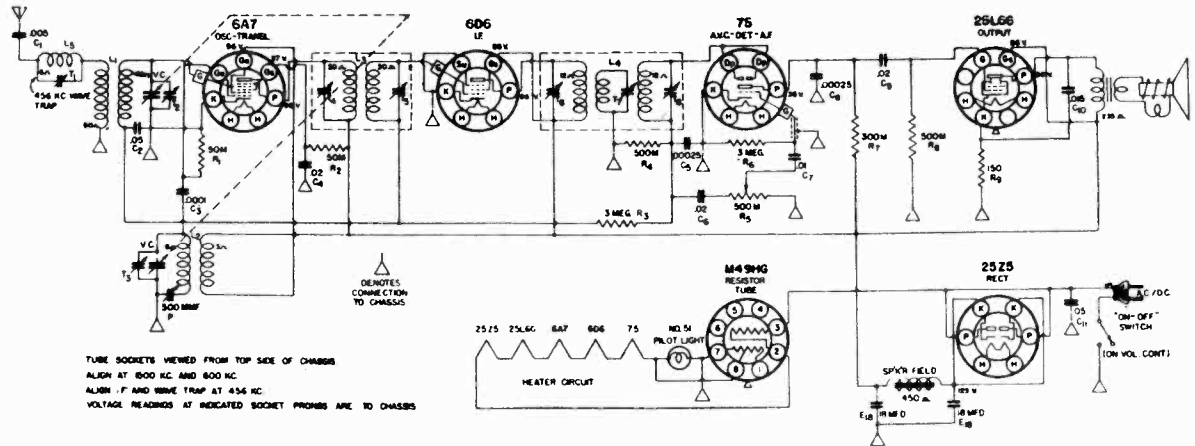


AUTOMATIC TUNING ADJUSTMENTS



APRIL 7, 1938

MODEL 7225, Ch. 110.255
SEARS-ROEBUCK & CO. Schematic, Socket
 Trimmers, Voltage, Alignment



FOR TUNER, SEE INDEX

POWER SUPPLY:

All models available 105-125 volts, 25-60 cycle or DC, 45 watts

FREQUENCY RANGE:

Broadcast 540-1740 KC

ALIGNMENT FREQUENCIES:

Broadcast	Oscil. Trimmer 1600 KC	Oscil. Padder 600 KC
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POWER OUTPUT:

Type	Beam Power
Undistorted	1.
Maximum	1.6

LOUD SPEAKER:

Type	Dynamic
Size	5"
Field resistance	450 ohms

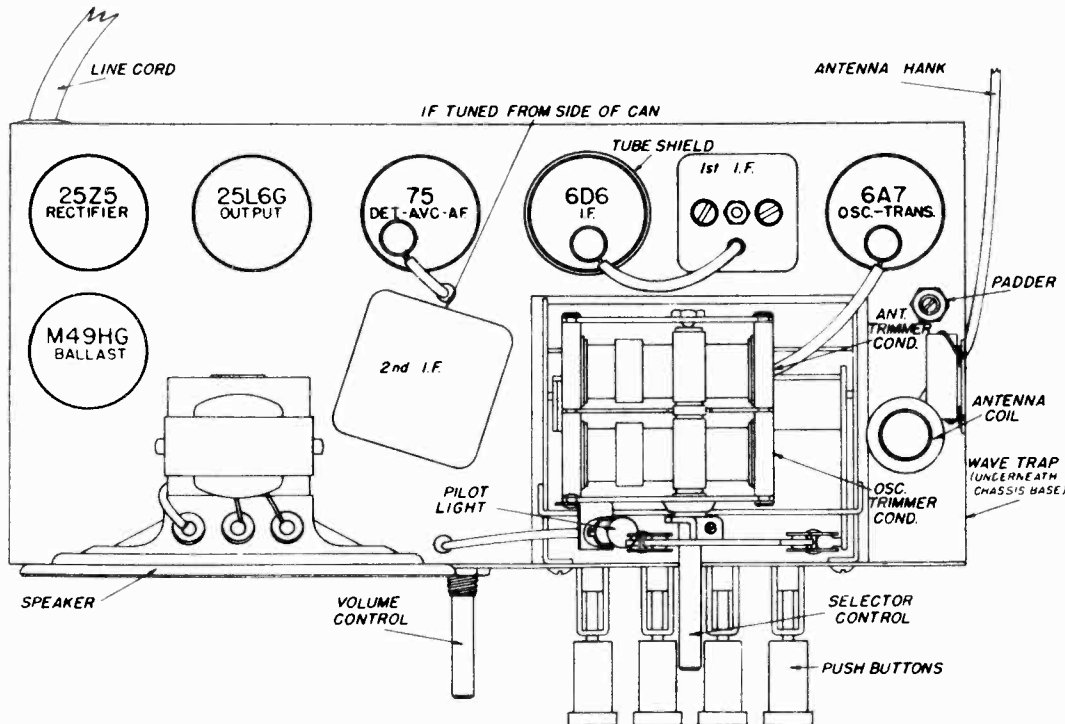
MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:

Left knob, "On-Off" switch, volume control
 Upper Right Knob tuning

CONTROL OPERATION:

Turning right; power on; vol. increase

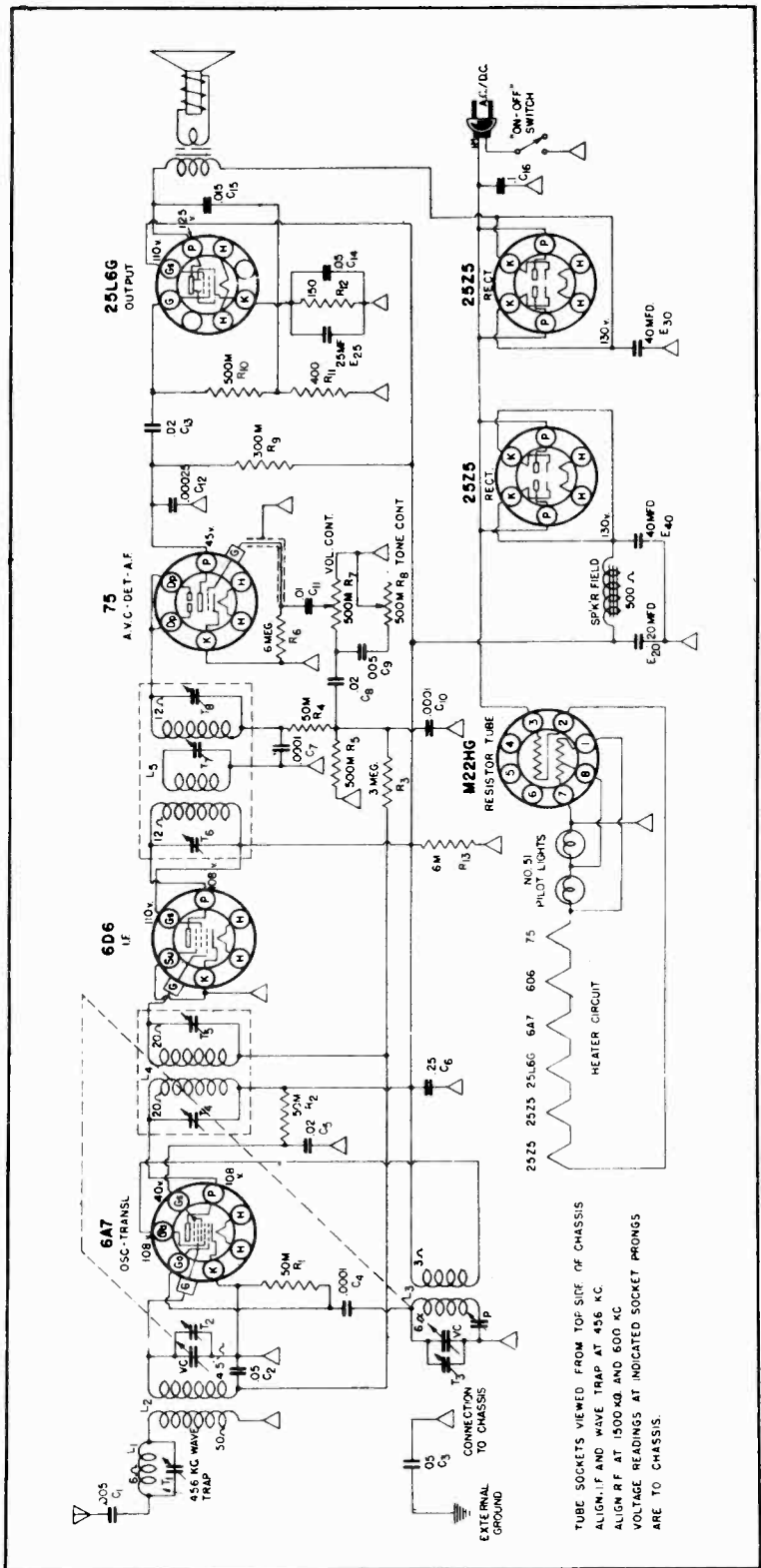


57RL109
 JUNE 16, 1938

MODEL 7226, Ch. 110.880
Schematic, Voltage
Alignment

SEARS-ROEBUCK & CO.

57RL 121
JULY 11, 1938



TUBE SOCKETS VIEWED FROM TOP SIDE OF CHASSIS
ALIGN I.F. AND WAVE TRAP AT 456 KC
ALIGN RF AT 1500 KC AND 600 KC
VOLTAGE READINGS AT INDICATED SOCKET PRONGS
ARE TO CHASSIS.

POWER SUPPLY:
All models available 105-125 volts, 25-60 cycle or DC, 45 watts

FREQUENCY RANGE:
Broadcast 540-1740 KC

ALIGNMENT FREQUENCIES:
Oscill.
Trimmer
Padder
1500 KC 600 KC

POWER OUTPUT:
Type Beam Power
Undistorted 1.7 Watts
Maximum 2.7 Watts

Broadcast
LOUD SPEAKER:
Type Dynamic
Size 8"
Field Resistance 500 ohms

MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:
Left Knob Tone control
Left Center Volume control
Right Center Selector control
Right Knob "On-Off" switch

CONTROL OPERATION:
Turning right; mellow to brilliant
Turning right; volume increase
Turning right; power on

THE GROUND:

In noisy locations, it may be desirable to connect the black lead in rear of chassis to a water pipe or radiator. This may eliminate much of the interference.

CAUTION: Do not connect a ground wire directly to the chassis; otherwise harm will result.

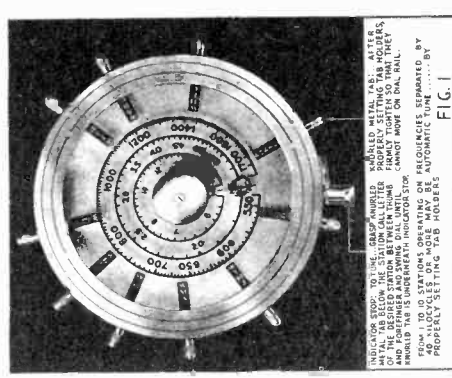
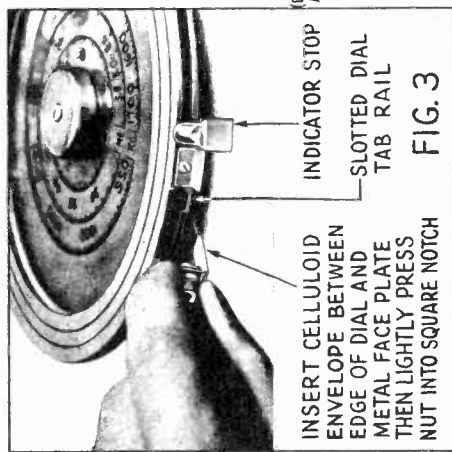
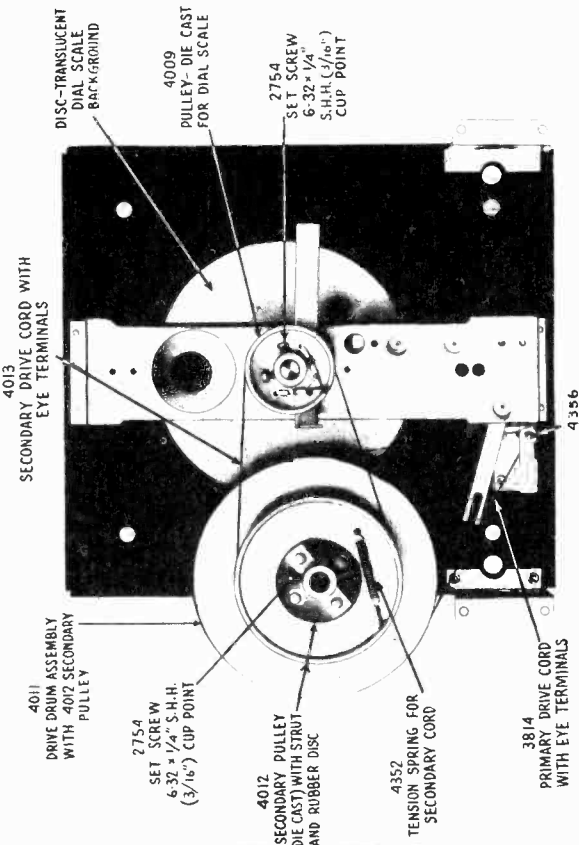
SENTINEL RADIO CORP.

MODEL "Automatic Tune"
Wheel Dial
Assembly, Details, Notes
For MODELS 78B, 78BE, 82A
82AE, 86AE, 91B, 95B

SERVICE NOTES for "AUTOMATIC-TUNE" WHEEL DIAL

USED WITH MODELS 78B, 78BE, 82A, 82AE, 86AE, 91B AND 95B

DIAL MECHANISM



- While an "AUTOMATIC-TUNE" tab may be set for distant weak stations, better results will be obtained if the stations selected for "AUTOMATIC-TUNE" are strong nearby or local stations. AFTER THE "AUTOMATIC-TUNE" OPERATION, OBTAIN THE FREQUENCIES USED AND CALL LETTERS OF THESE STATIONS AND SET STATION TABS BY:
 - Lay station call letter tab sheet on flat surface.
 - Slide the metal tab holder over the station tab by cutting around black edges of each desired tab.
 - To illustrate the proper setting of station paper strip and metal tab holder, the tab holder is shown for Station WGN 720 kilocycles.
 - Carefully note that the station call letter tab appears directly below the 720 kilocycle calibration on the face of the metal dial and slotted dial rail.
 - If Station WGN is not one of the selected stations or if a tab is to be set for a station which operates on a frequency less than 720 kilocycles, remove WGN celluloid envelope and station call letter tab.
 - Loosen tab holder by grasping knurled end of metal tab with finger tips and turn one or two turns to the left.
 - Slide the metal tab holder over the station tab until it is pulled free from tab holder rail.
 - Slide the celluloid envelope out of the metal dial.
- PLACE EACH SELECTED STATION CALL LETTER PAPER STRIP INSIDE OF CELLULOID ENVELOPE BY:**
 - Hold celluloid envelope with curved end up.
 - Place station call letter paper strip inside of celluloid envelope with printed call letters upward.
- REPLACING No. 4000 DIAL GLASS SCALE ASSEMBLY**

As it requires special tools to properly set part No. 4005 shaft assembly on part No. 4000 glass scale—we will ship all orders for No. 4000 glass scales with the No. 4005 shaft assembled on the glass scale.

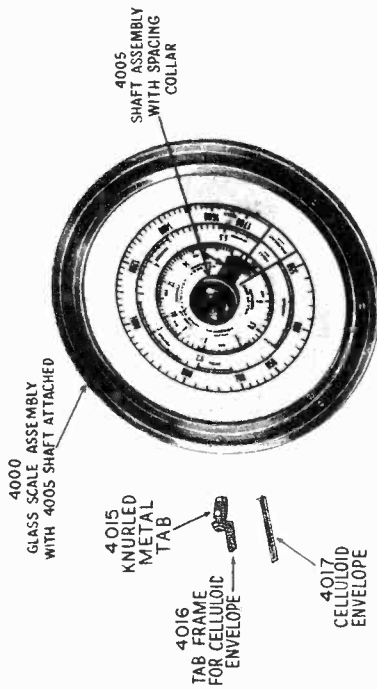
- INSERT CELLULOID ENVELOPE INTO A METAL TAB FRAME BY:**
 - Hold curved end of celluloid envelope towards metal knurled tab holder and insert celluloid into metal frame.
 - Gently push celluloid inward until curved end of envelope touches edge of celluloid tab frame.
 - Arrange tabs in numerical order according to station frequency.
- SET THE METAL TAB HOLDERS ON DIAL BY:** (See Fig. 3)
 - Set the metal tab holder for the station that broadcasts on the lowest frequency—least number of kilocycles—and then set the next station tab for the selected station operating on the next lowest frequency, continuing on in this way until a tab has been set for all of the selected stations.
 - Carefully tune in the station which broadcasts on the lowest frequency—least number of kilocycles.
 - Insert celluloid envelope between edge of dial and metal face plate—lightly press nut on end of knurled tab into square notch in slotted dial rail—then slide tab holder along rail until the knurled tab is underneath the indicator stop on the dial at which point station call letter strip will be visible.
 - Loosen the indicator line on the face of the dial.
 - Tighten tab holders as much as possible without moving dial by turning knurled tab to the right—then swing dial so knurled tab is away from indicator stop on the dial and firmly tighten so that it cannot move on the dial rail. DO NOT USE PLIERS TO TIGHTEN.

- When installing part No. 4000 glass assembly follow procedure in order given:
 - Insert No. 4005 shaft into main bushing attached to the cadmium plated bracket on back of dial face.
 - Place steel spacer washer and brass tension spring in order named over end of No. 4005 shaft.
 - Place the small die cast primary pulley No. 4009 on shaft—do not tighten No. 2754 set screws.
 - Loosen the two set screws in brass spacer collar on the No. 4005 shaft.
 - Adjust brass spacer collar—by sliding collar on shaft—so that there will be approximately 1/8" clearance between the bottom of metal tab holder and the face plate. Firmly retighten brass collar and No. 2754 die cast pulley set screws. Failure to provide proper clearance will result in scratches on dial face and the dial mechanism will not operate freely.
- TO INSTALL No. 3814 PRIMARY DRIVE CORD:**
 - Looking at back of dial, wrap dial cord twice around No. 4355 drive shaft in CLOCKWISE direction.
 - Hook No. 3462 tension spring into loops at end of dial cord.

NEVER LOOSEN THE FOUR SCREWS THAT HOLD THE CADMIUM PLATED BRACKET TO DIAL FACE—OTHERWISE THE MAIN BUSHING WILL BE THROWN OUT OF CENTER.

MODEL "Automatic Tune"
Wheel Dial
Installation, Details, Parts

SENTINEL RADIO CORP.



COMPLETE WHEEL DIAL ASSEMBLY LESS ESCUTCHEON

Part No.	Part Name	Description	Last Price
205	Dial Assembly	Used With Model 78B Complete Assembly Less Escutcheon.	12.75
206	Dial Assembly	Used With Model 78BE Complete Assembly Less Escutcheon.	12.75
207	Dial Assembly	Used With Model 82A Complete Assembly Less Escutcheon.	12.75
201	Dial Assembly	Used With Model 82AE & 86AE Complete Assembly Less Escutcheon.	12.75
204	Dial Assembly	Used With Model 91B & 95B Complete Assembly Less Escutcheon.	12.25

MISCELLANEOUS PARTS USED IN ABOVE ASSEMBLIES

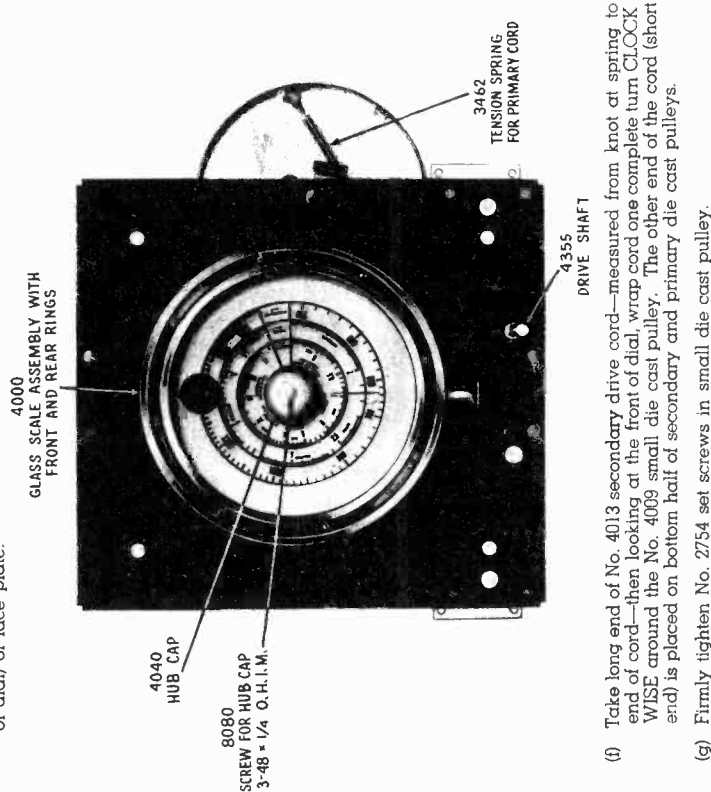
Part No.	Part Name	Description	Last Price
4016	Celluloid Envelope	Station Call Letter Cover.	.05
3814	Cord	Primary Drive Cord	.15
4013	Cord	Secondary Drive Cord	.15
3985	Band Indicator Assem.	For Model 78BE-78B-91B-95B	.75
3982	Band Indicator Assem.	For Model 82AE-82A-86AE	.75
4011	Drive Drum Assem.	with 4012 Secondary Pulley and Rubber Disc Coupler	1.25
4355	Drive Shaft		.12
4027	Disc	Translucent Dial Scale Background for Model 78BE.	.50
3984	Disc	Translucent Dial Scale Background for Model 82AE & 86AE.	.55
4024	Disc	Translucent Dial Scale Background for Model 82A	.55
4023	Disc	Translucent Dial Scale Background for Model 91B, 95B & 78B.	.50
3771	Escutcheon	For Cabinet—All Models	1.00
4017	Frame	Metal Holder for Celluloid Envelope	.05
4040	Hub Cap		.15
4015	Knurled Tab		.05
4009	Pulley	Dial Scale Drive (Die Cast)	.45
4000	Scale	Calibrated Glass Scale With 4005 Shaft Assem.	2.75
8071	Screw	For Hub Cap 3-48 x 1/4" O.H.I.M.	.005
2754	Screw	For Pulley 6-32 x 1/4" S.H.H. Cup Point	.01
4356	Spring Lock	For Drive Shaft	.01 net
4352	Spring Tension	For Secondary Cord	.07
3462	Spring Tension	For Primary Cord	.07

Prices are subject to change without notice.

TO INSTALL No. 4013 SECONDARY DRIVE CORD:

The dial mechanism picture shows and refers to eye terminals on drive cord—these were used in early production. Loops made by knots in the cords are now used to attach cord to lugs in the No. 4009 die cast pulley and to the No. 4352 & 3462 tension springs.

- (a) Looking at the front of the dial rotate dial scale COUNTER-CLOCKWISE until dial stop is reached.
- (b) Loosen the two No. 2754 set screws in small die cast pulley No. 4009.
- (c) Looking at front of dial turn the small die cast pulley so that the cut out in pulley will be towards the left and approximately in line with the upper edge of the dial light bracket. This bracket which is only used in six volt battery and 110 volt AC models is shown mounted on the cadmium plated dial face plate bracket in dial mechanism picture.
- (d) Hook No. 4352 tension spring in dial cord loop.
- (e) Turn No. 4011 drum so that the hole in the No. 4012 large die cast pulley—through which the secondary drive cord is pulled—is towards the top of face plate. This will bring the hole approximately in line with the left hand edge (looking at back of dial) of face plate.



- (f) Take long end of No. 4013 secondary drive cord—measured from knot at spring to end of cord—then looking at the front of dial, wrap cord one complete turn CLOCKWISE around the No. 4009 small die cast pulley. The other end of the cord (short end) is placed on bottom half of secondary and primary die cast pulleys.
- (g) Firmly tighten No. 2754 set screws in small die cast pulley.

MODEL 56U
 MODEL 67L
 MODELS 68B, 68BE
 Alignment

SENTINEL RADIO CORP.

Model 56U Eight Tube AC-DC Superheterodyne Receiver

ALIGNING I. F. STAGE AT 645 METERS:

- (a) Connect the high side of the test oscillator output to the control grid of the 6A8 modulator tube through a .02 Mfd. condenser. Leave the grid cap connected to the grid terminal of the tube, and connect the ground side of the test oscillator to the receiver base through a 2 Mfd. condenser.
 - (b) Set test oscillator frequency to 645 meters (this must be accurate).
 - (c) Peak each of the second I. F. transformer trimmers.
 - (d) Peak each of the first I. F. transformer trimmers.
- To assure most accurate trimmer setting repeat above adjustment several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING 16.5-51.7 METER BAND:

- (a) Connect the high output side of the test oscillator through a 400 ohm resistor to receiver antenna lead and the low side to the set ground through a .02 Mfd. condenser.
- (b) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop. (complete in mesh), at which point the dial needle must be exactly even with the last line at the high wave length end of the dial calibration. If the dial needle does not point exactly to the last line, move needle to correct position.
- (c) Place the band selector switch for operation on the 16.5-51.7 meter band, tune receiver dial and set test oscillator frequency to EXACTLY 16.5 meters. Then tune in the 16.5 METER SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING THE 16.5 METER OSCILLATOR TRIMMER.

NOTE:

- When adjusting this trimmer two peaks, the fundamental and the image peak will be noticed. CARE MUST BE TAKEN THAT THE RIGHT PEAK IS USED FOR ALIGNING THE RECEIVER AT 16.5 METERS. Always back off the trimmer to minimum capacity, then screw down the trimmer (add capacity) until the SECOND PEAK which is the proper one to use is tuned in. If the trimmer is screwed down only to the point where the first peak is received, the incorrect peak will be tuned in.
- (d) Tune the receiver dial and set test oscillator frequency to EXACTLY 20 METERS. Adjust 20 meter antenna trimmer for maximum 20 meter test signal sensitivity.

ALIGNING 175-555 METER BAND:

- (a) Replace the 400 ohm resistor in series with test oscillator lead with a 200 Mfd. condenser, place the band selector switch for operation on the 175-555 meter band, tune receiver dial and set test oscillator frequency to EXACTLY 175 METERS. BRING IN THE 175 METER TEST OSCILLATOR SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING 175 METER OSCILLATOR TRIMMER.
- (b) Set test oscillator frequency and receiver dial to EXACTLY 215 METERS. Adjust 215 meter pre-selector and antenna trimmers for maximum 215 test oscillator signal sensitivity.
- (c) Tune receiver dial and set test oscillator frequency to approximately 500 meters. While rocking gang condenser slightly to right and left adjust 500 meter oscillator padder for maximum sensitivity.

ALIGNING 770-2140 METER BAND:

- (a) Place band selector switch for operation on the 770 to 2140 meter band, and set test oscillator frequency and receiver dial to EXACTLY 770 METERS. BRING IN 770 METER TEST SIGNAL TO MAXIMUM OUTPUT WITH 770 METER OSCILLATOR TRIMMER.
- (b) Tune receiver dial and set test oscillator frequency to EXACTLY 880 METERS. Adjust 880 meter antenna and preselector trimmers for maximum 880 meter test signal response.
- (c) Set receiver dial and test oscillator frequency to approximately 1875 meters. Then while rocking gang condenser slightly to right and left adjust 1875 meter padding condenser for maximum sensitivity.

Model 67L
 Six Tube Superheterodyne Receiver

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

- (a) Connect the ground lead of the test oscillator to the chassis or set ground lead. Connect the other lead to the grid cap of the 6A7 tube through a .02 Mfd. condenser DO NOT REMOVE GRID CLIP.
- (b) Set test oscillator to EXACTLY 465 kilocycles and turn receiver volume control on full.
- (c) Peak each of the second I.F. transformer trimmers.
- (d) Peak each of the first I.F. transformer trimmers.

ADJUSTING 465 KILOCYCLE WAVE TRAP:

- (a) Connect the high output side of the test oscillator through a .00025 Mfd. condenser to the receiver antenna lead and the low side to the set ground.
- (b) Set test oscillator frequency to EXACTLY 465 kilocycles and adjust the 465 K.C. wave trap trimmer condenser mounted on and accessible through hole in rear of chassis for MINIMUM 465 kilocycle signal response.

ALIGNING 1720-540 KILOCYCLE BAND:

- (a) Adjust band selector switch for operation on 1720-540 kilocycle band and leave test oscillator lead connected to receiver antenna lead through the .00025 Mfd. series condenser.
- (b) Set test oscillator frequency and receiver dial to EXACTLY 1720 kilocycles.
- (c) Adjust 1720 K. C. oscillator trimmer to bring in 1720 kilocycle test oscillator signal to maximum output.
- (d) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles.
- (e) Adjust 1400 K.C. antenna trimmer for maximum sensitivity.
- (f) Set receiver dial and test oscillator frequency to approximately 600 kilocycles.
- (g) While rocking gang condenser slightly to right and left adjust 600 K.C. padder for maximum sensitivity.

ALIGNING 2.3-6.3 MEGACYCLE BAND:

- (a) Replace .00025 Mfd. test oscillator lead series condenser with a 400 ohm resistor. Adjust band selector switch for operation on 6.3 to 2.3 megacycle band, and tune receiver dial and set test oscillator frequency to EXACTLY 6.3 megacycles.
- (b) Adjust 6.3 M.C. oscillator trimmer to bring in 6.3 megacycle test oscillator signal to maximum output.
- (c) Tune receiver dial and set test oscillator frequency to 5.8 megacycles, and while rocking gang condenser slightly to right and left adjust 5.8 M.C. antenna trimmer for maximum sensitivity.
- (d) No adjustment is required at low frequency end of this band as a fixed oscillator pad is used. To assure more accurate trimmer setting repeat all above adjustments several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

Model 68B-68BE—Three Band Superheterodyne Receiver

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

- (a) Attach the ground lead of the test oscillator to the chassis. Connect the other lead to the grid cap of the 6A7 tube through a .02 Mfd. series condenser. DO NOT REMOVE GRID CLIP.
- (b) Set test oscillator to EXACTLY 465 kilocycles and turn receiver volume control on full.
- (c) Peak each of the second I.F. transformer trimmers.
- (d) Peak each of the first I.F. transformer trimmers.

ALIGNING 1720-535 KILOCYCLE BAND:

- (a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line move needle to correct position.
- (b) Remove test oscillator lead from grid of 6A7 tube and connect to receiver antenna lead through a .00025 Mfd. series condenser.
- (c) Adjust band selector switch for operation on the 1720-535 kilocycle band.
- (d) Set test oscillator frequency and receiver dial to EXACTLY 1720 kilocycles, and BRING IN 1720 KILOCYCLE TEST OSCILLATOR SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING 1720 KILOCYCLE OSCILLATOR TRIMMER.
- (e) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles. Adjust 1400 K.C. pre-selector and antenna trimmers for maximum sensitivity.
- (f) Set test oscillator frequency and receiver dial to approximately 600 kilocycles. Then while rocking gang condenser slightly to right and left, adjust 600 K.C. oscillator padder for maximum signal response.

ALIGNING 18-5.8 MEGACYCLE BAND:

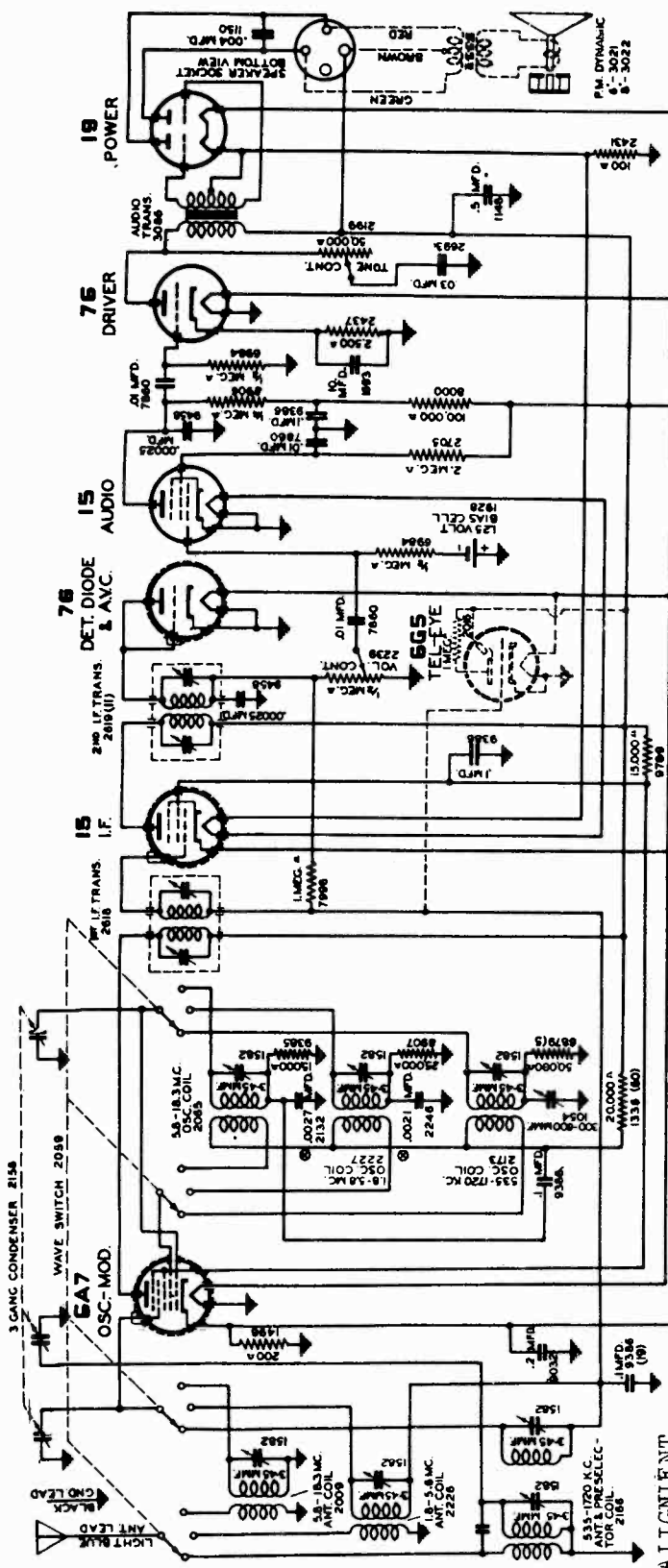
- (a) Replace .00025 Mfd. test oscillator antenna lead series condenser with a 400 ohm resistor.
- (b) Adjust band selector switch to 1.8-5.8 megacycles, tune receiver dial and set test oscillator frequency to EXACTLY 5.8 megacycles. Bring in 5.8 megacycle test signal to maximum output by adjusting 5.8 M.C. oscillator trimmer.
- (c) Tune receiver dial and test oscillator frequency to EXACTLY 5 megacycles, and adjust 5 M.C. antenna trimmer for maximum sensitivity.

ALIGNING 5.8-18.3 MEGACYCLE BAND:

- (a) Leave 400 ohm resistor in series with test oscillator lead and place band selector switch for operation on 5.8-18.3 megacycle band, tune receiver dial and set test oscillator frequency to EXACTLY 18 megacycles.
- (b) Adjust 18 M.C. oscillator trimmer to bring in 18 megacycle test signal to maximum output. CARE MUST BE TAKEN THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 18 MEGACYCLES. Always back off the trimmer to minimum capacity, then screw down the trimmer (add capacity) until the FIRST PEAK which is the fundamental and the proper one to use is tuned in. If the trimmer is screwed down beyond the point where the first peak is received, the incorrect image peak will be tuned in. After completing adjustment of the oscillator trimmer at 18 megacycles, increase the output of the test oscillator and tune receiver dial to approximately 17 megacycles. Then vary the receiver dial slightly to the right and left of 17 megacycles, and if the fundamental peak was used in aligning at 18 megacycles the test oscillator signal will be heard at approximately 17 megacycles on the receiver dial.
- (c) Tune receiver dial and set test oscillator frequency to EXACTLY 15 megacycles.
- (d) Rock gang condenser slightly to right and left and adjust 15 M.C. antenna trimmer for maximum 15 megacycle test signal response.

MODELS 68B, 68BE
Schematic, Voltage
Socket, Trimmers

SENTINEL RADIO CORP.

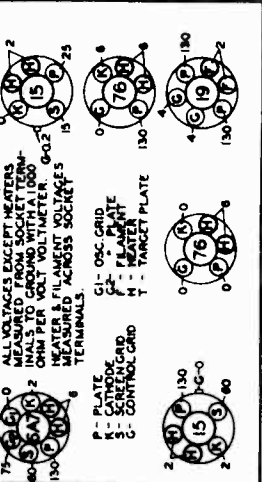


I.F. - 465 K.C.

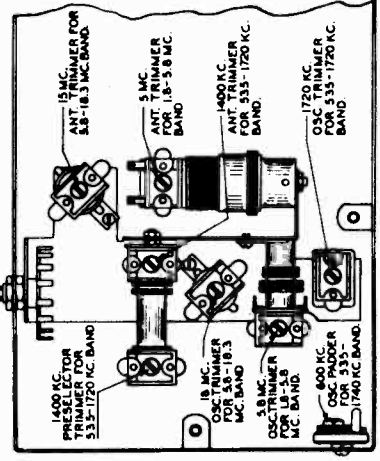
NOTES - 1. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
2. INDICATES CAPACITY TOLERANCE, ± 5%
3. UNIT - P.F. 16



NOTE - ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS PER VOLTMETER COIL HEATER & FILAMENT VOLTAGES MEASURED ACROSS SOCKET TERMINALS.



VOLTAGE TABLE (BOTTOM VIEW)

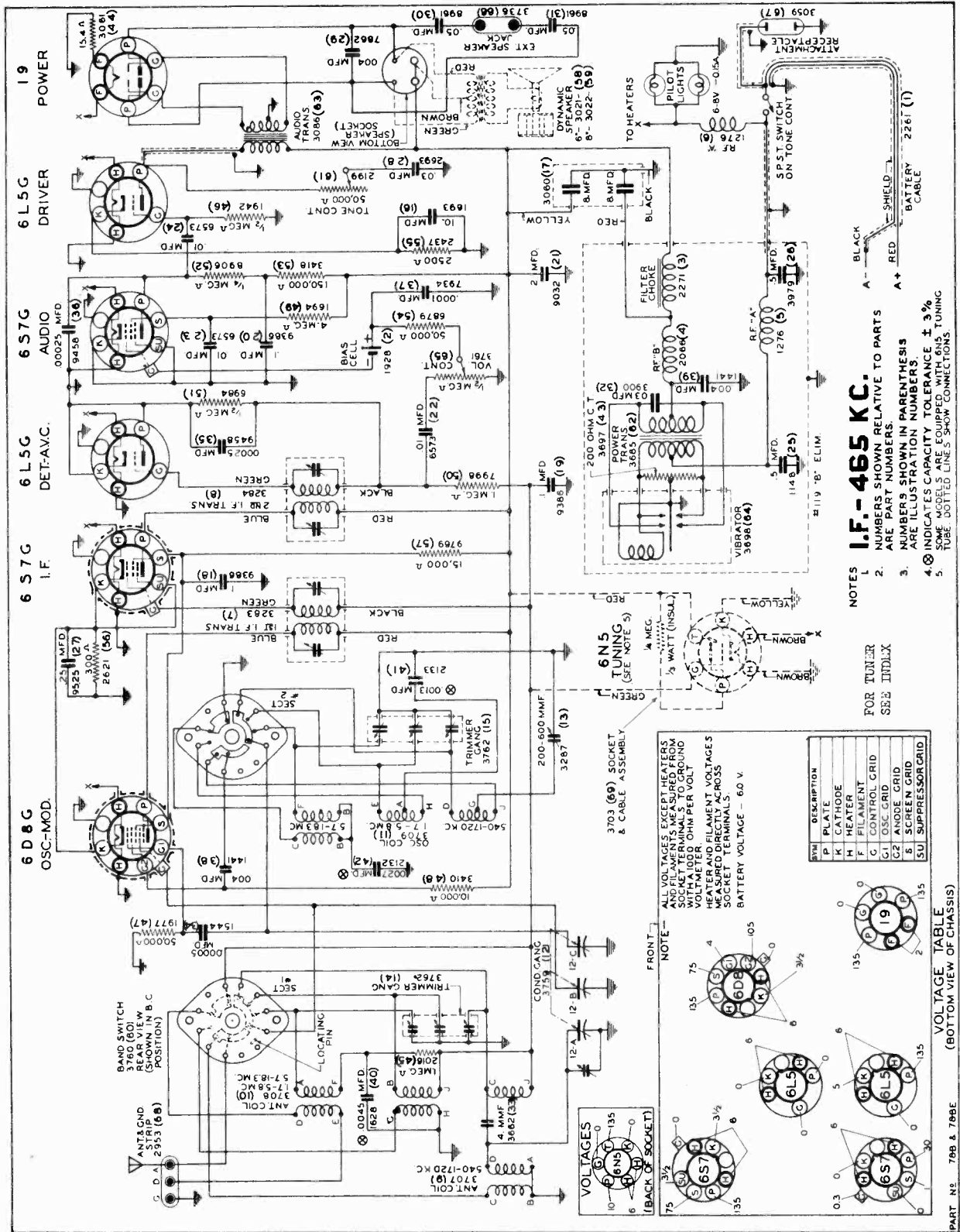


BOTTOM VIEW OF CHASSIS SHOWING LOCATION OF TRIMMERS & PADDERS.

FOR ALIGNMENT SEE INDEX

SENTINEL RADIO CORP.

MODELS 78B, 78BE
Schematic, Voltage
Socket

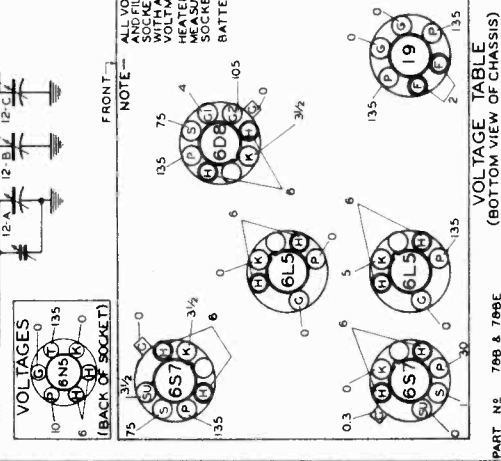


- NOTES**
1. NUMBERS SHOWN RELATIVE TO PARTS
 2. ARE PART NUMBERS.
 3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
 4. ⊗ INDICATES CAPACITY TOLERANCE ± 3%
 5. TUBE DOTTED LINE SHOWS CONNECTIONS.

FOR TUNER
SEE INDEX

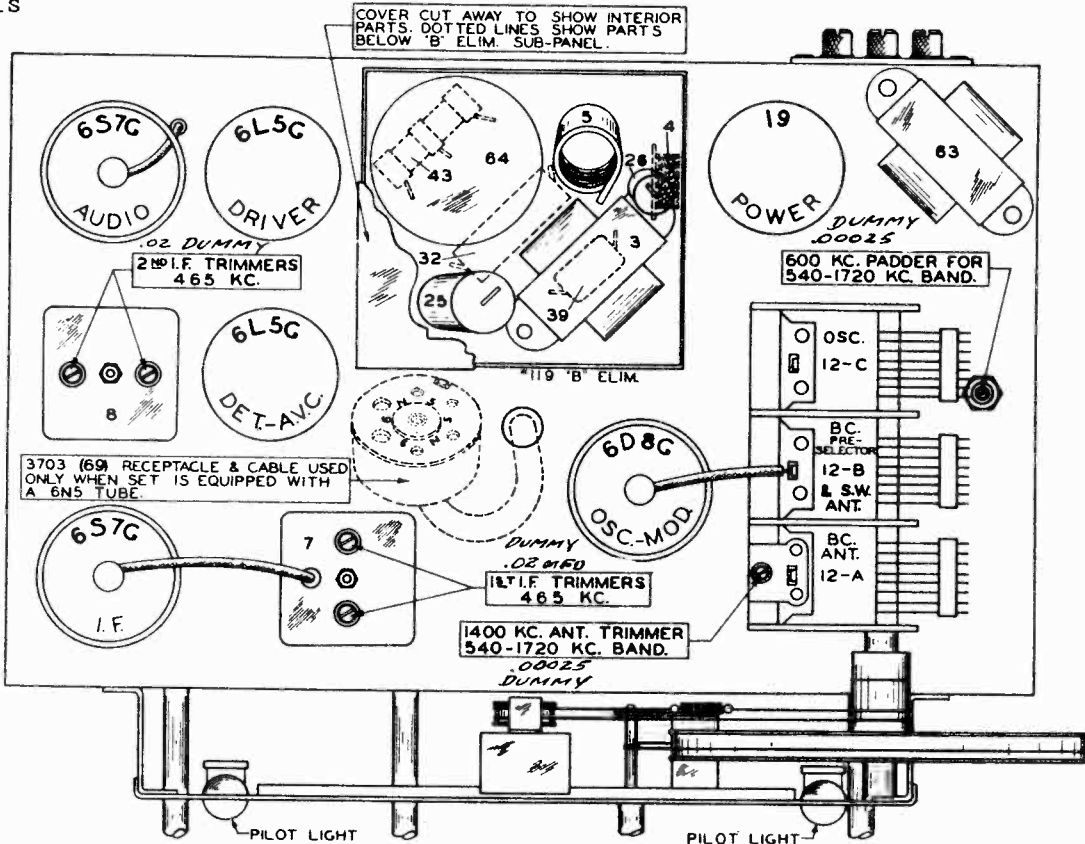
SYM	DESCRIPTION
P	PLATE
K	CATHODE
H	HEATER
F	FILAMENT
C	CONTROL GRID
G1	OSC. GRID
G2	ANODE GRID
S	SCREEN GRID
SU	SUPPRESSOR GRID

NOTE -
ALL VOLTAGES EXCEPT HEATERS AND FILAMENTS MEASURED FROM WICKS TO GROUND WITH A LOG OHM PER VOLT VOLT-METER.
HEATER AND FILAMENT VOLTAGES SOCKET TERMINALS.
BATTERY VOLTAGE - 60 V.

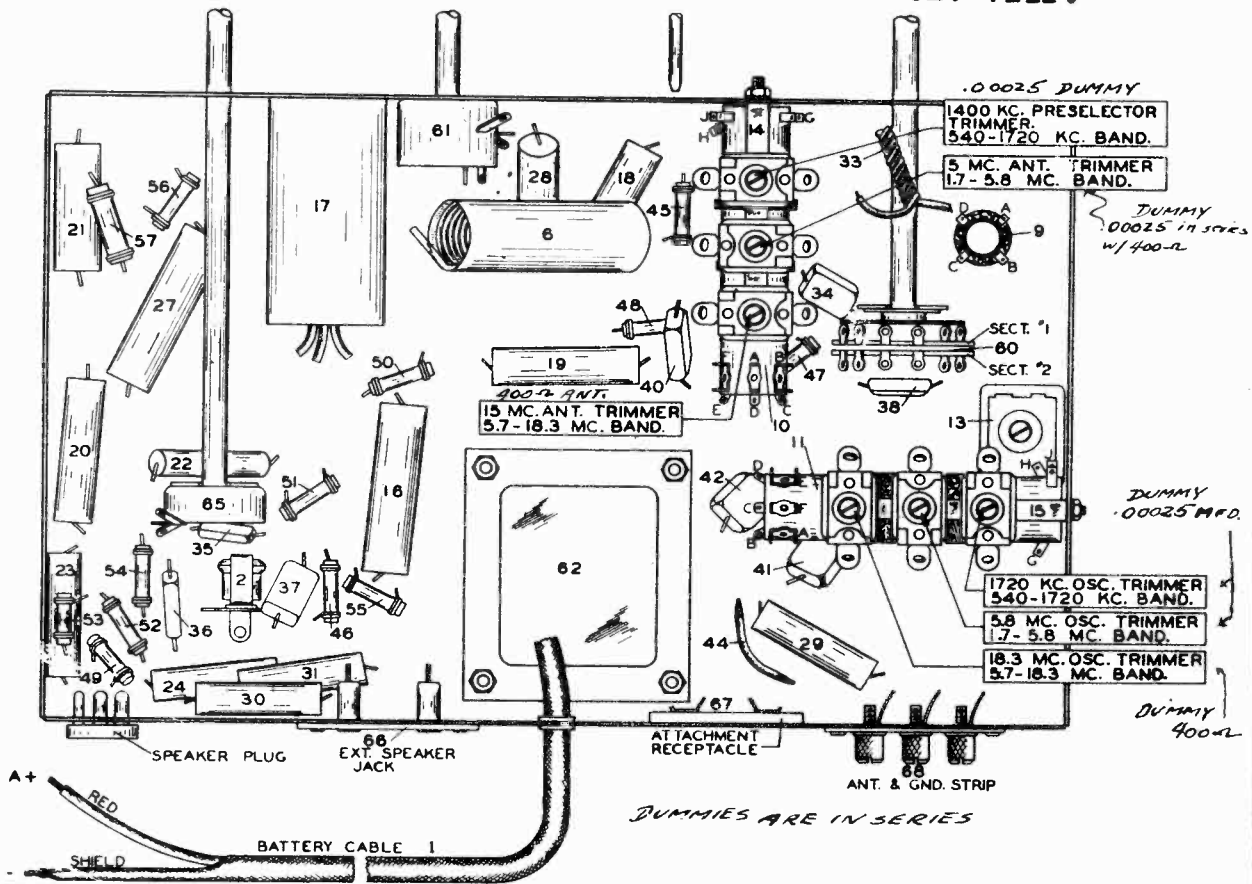


MODELS 78B, 78BE
Alignment, Trimmers
Chassis

SENTINEL RADIO CORP.



CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII.



MODEL Push Button Dial
Assembly, Instructions
Parts List

SENTINEL RADIO CORP.

For MODELS 78B, 78BE
82A, 82AE, 86AE, 91B, 95B

FOR OTHER ASSEMBLIES SEE "AUTOMATIC TUNE" MODEL DIAL ASSEMBLIES.

PARTS LIST

COMPLETE PUSH BUTTON DIAL ASSEMBLY LESS ESCUTCHEON

Part No.	Part Name	Description	List Price
211	Dial Assembly	Used With Model 78B Complete Assembly Less Escutcheon.	\$12.75
212	Dial Assembly	Used With Model 78BE Complete Assembly Less Escutcheon.	12.75
208	Dial Assembly	Used With Model 82A Complete Assembly Less Escutcheon.	12.75
209	Dial Assembly	Used With Model 82AE & 86AE Complete Assembly Less Escutcheon.	12.75
210	Dial Assembly	Used With Model 91B & 95B Complete Assembly Less Escutcheon.	12.25

MISCELLANEOUS PARTS USED IN ABOVE ASSEMBLIES

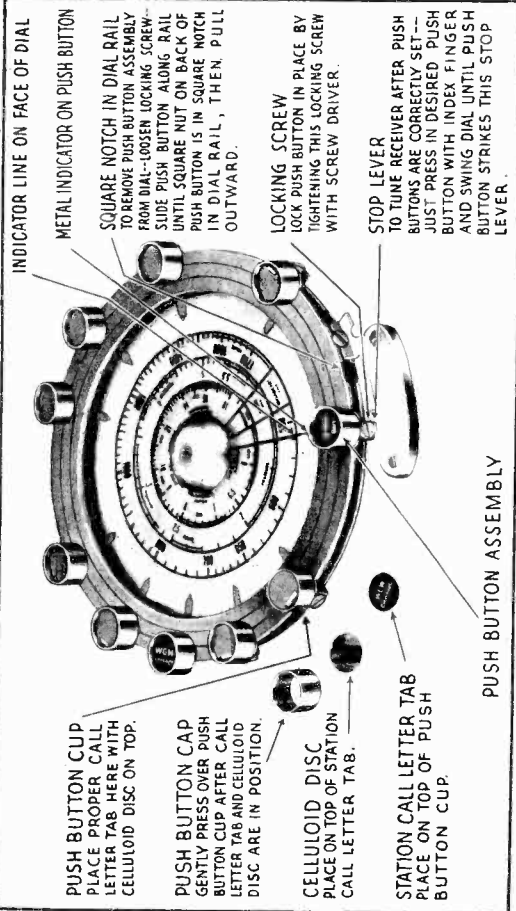
4047	Cap	Push Button	.15
4046	Celluloid Disc	Station Call Letter Cover.	.05
3814	Cord	Primary Drive Cord	.15
4013	Cord	Secondary Drive Cord	.15
4041	Cup Assembly	Push Button—With Clip and Compression Spring	.15
3995	Band Indicator Assem.	For Model 78BE-78B-91B-95B	.75
3992	Band Indicator Assem.	For Model 82AE-82A-86AE	.75
4011	Drive Drum Assem.	with 4012 Secondary Pulley and Rubber Disc Coupler.	1.25
4355	Drive Shaft		.12
4027	Disc	Translucent Dial Scale Background for Model 78BE	.50
3984	Disc	Translucent Dial Scale Background for Model 82AE & 86AE	.55
4024	Disc	Translucent Dial Scale Background for Model 82A	.55
4029	Disc	Translucent Dial Scale Background for Model 91B, 95B & 78B	.50
3771	Escutcheon	For Cabinet—All Models	1.00
4040	Hub Cap		.15
4009	Pulley	Dial Scale Drive (Die Cast)	.45
4039	Plate	Slide Stop	.10
4000	Scale	Calibrated Glass Scale With 4005 Shaft Assem.	2.75
8071	Screw	For Hub Cap 3-48 x 1/4" O.H.L.M.	.005
2754	Screw	For Pulley 6-32 x 1/4" S.H.H. Cup Point	.01
4037	Slide Stop	Push Button Stop	.10
4356	Spring Lock	For Drive Shaft	.01 net
4352	Spring Tension	For Secondary Cord	.07
3462	Spring Tension	For Primary Cord	.07

Prices are subject to change without notice.

When ordering parts be sure to mention part number and order all parts from:

Printed in U.S.A.

SERVICE NOTES for PUSH BUTTON DIAL



FROM ONE TO TEN STATIONS OPERATING ON FREQUENCIES SEPARATED BY FORTY KILOCYCLES OR MORE MAY BE AUTOMATICALLY TUNED BY PROPERLY SETTING PUSH BUTTONS.

IT IS A SIMPLE MATTER TO "AUTOMATIC TUNE" WEAK STATIONS. BETTER RESULTS WILL BE OBTAINED WHEN STATIONS SEPARATED BY AUTOMATIC PUSH BUTTON TUNING ARE STRONG NEARBY OR LOCAL STATIONS.

AFTER IT IS DETERMINED WHAT STATIONS YOU WISH TO "AUTOMATIC PUSH BUTTON TUNE", OBTAIN THE FREQUENCY USED AND CALL LETTERS OF THESE STATIONS AND SET PUSH BUTTONS BY:

To illustrate the proper installation and setting of the Push Button, the receiver is shipped from the factory with a Push Button properly set for station WGN, Chicago, 720 kilocycles. If WGN is not one of the selected stations, remove call letters by:

- Gently cap section of Push Button between fingers and cap.
- Carefully remove the station call letter tab and celluloid disc.

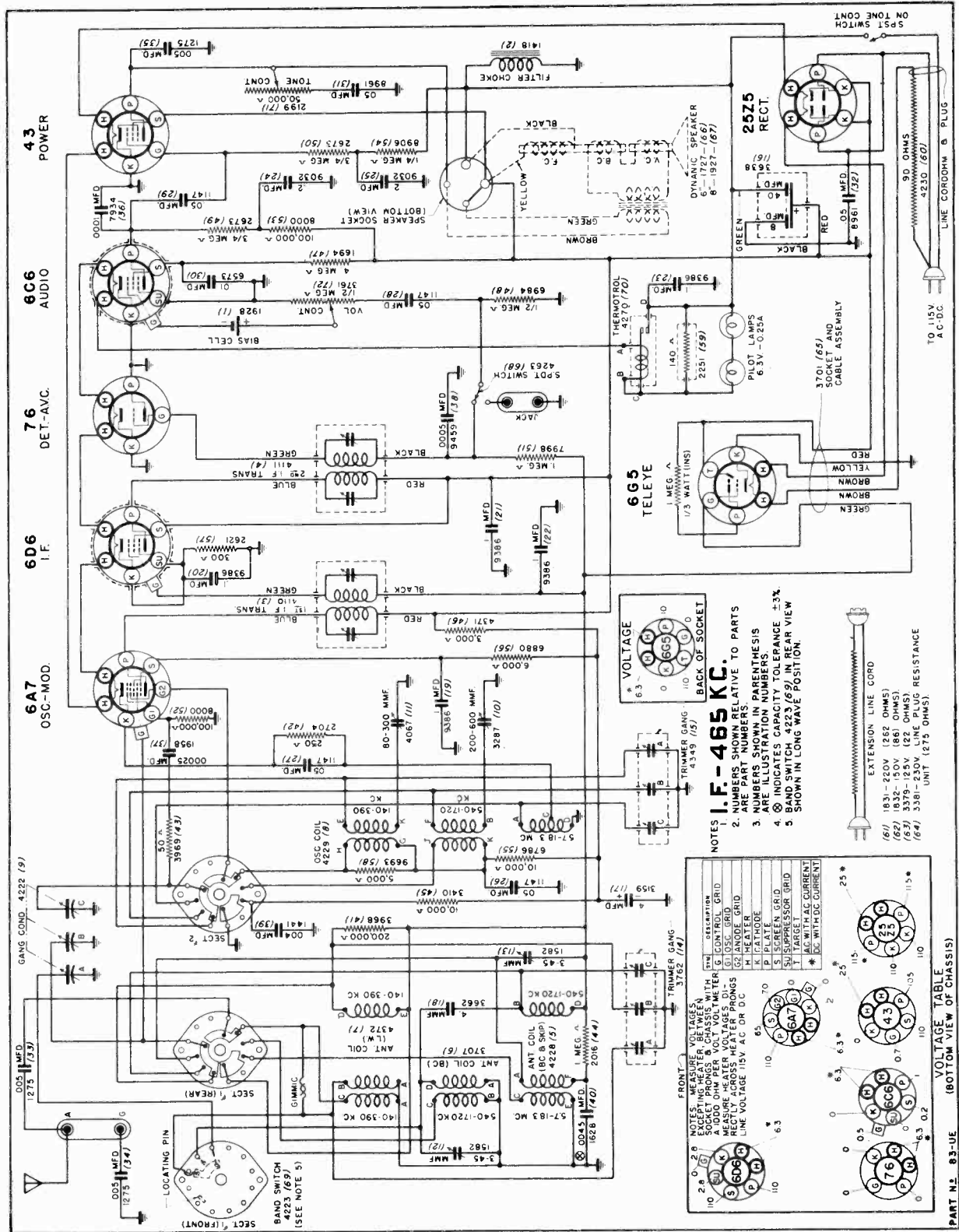
AFTER THE TEN PUSH BUTTONS HAVE BEEN PROPERLY SET THEY WILL NOT REQUIRE FURTHER ATTENTION EXCEPT WHEN MOVED FROM THEIR POSITION OR WHEN AN ADDITIONAL TAB IS INCLUDED WHICH WOULD DISTURB THE POSITION OF THE OTHER TABS.

SET STATION PUSH BUTTON BY:

- Gently press desired round paper station call letter tabs out of station tab sets.
- Always set the first push button for the desired station that broadcasts on the lowest frequency—the least number of kilocycles. The next push button for the selected station operating on the next higher frequency continuing on in this manner until a Push Button has been set for all of the desired stations.
- Loosen Push Button locking screw and remove caps on all Push Buttons by grasping cap between fingers and gently pulling outward—then remove celluloid discs.
- Carefully tune in the station which broadcasts on the lowest frequency—least number of kilocycles.
- Slide the Push Button nearest to the low frequency end of dial scale—without moving dial—until metal indicator attached to Push Button is exactly even with the indicator driver firmly lock Push Button in place by tightening Push Button locking screw.
- Place printed paper station call letter tab, having call letters of station, tuned in—on top of Push Button cup, then—place celluloid protective disc on top of this and Push Button cup.
- Next set a Push Button for the desired station operating on the next lowest frequency in the same manner as above and continue on in this way until all the Push Buttons have been properly set.

SENTINEL RADIO CORP.

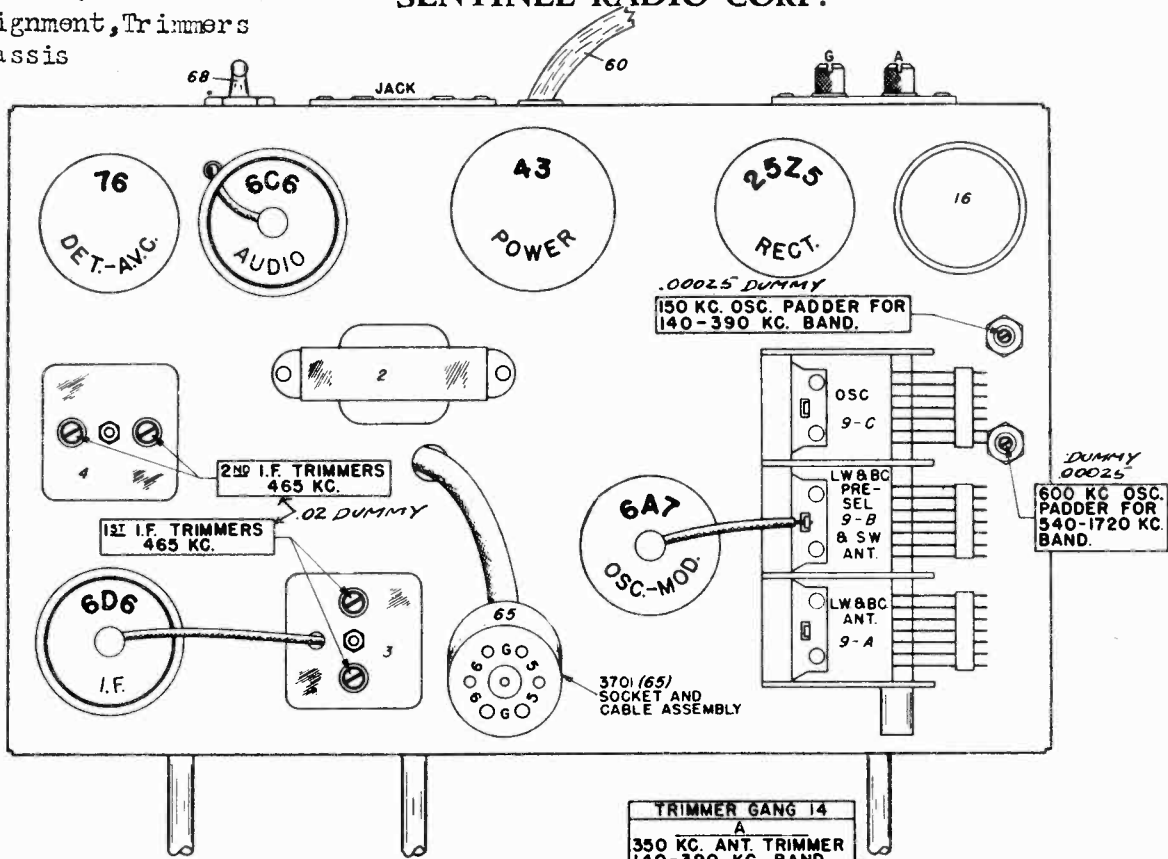
MODEL 83UE
Schematic, Voltage
Socket



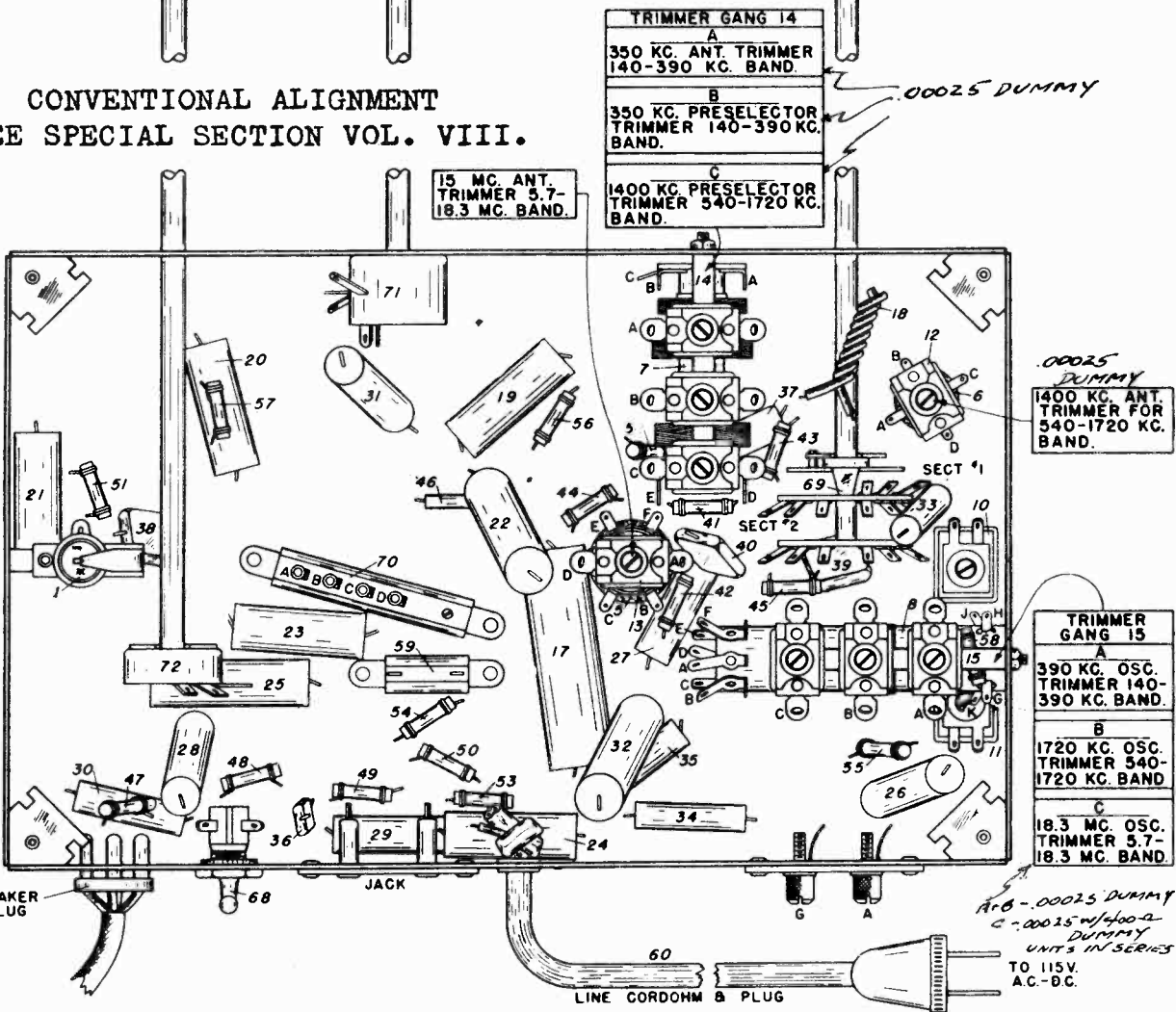
MODEL 83UE

Alignment, Trimmers
Chassis

SENTINEL RADIO CORP.

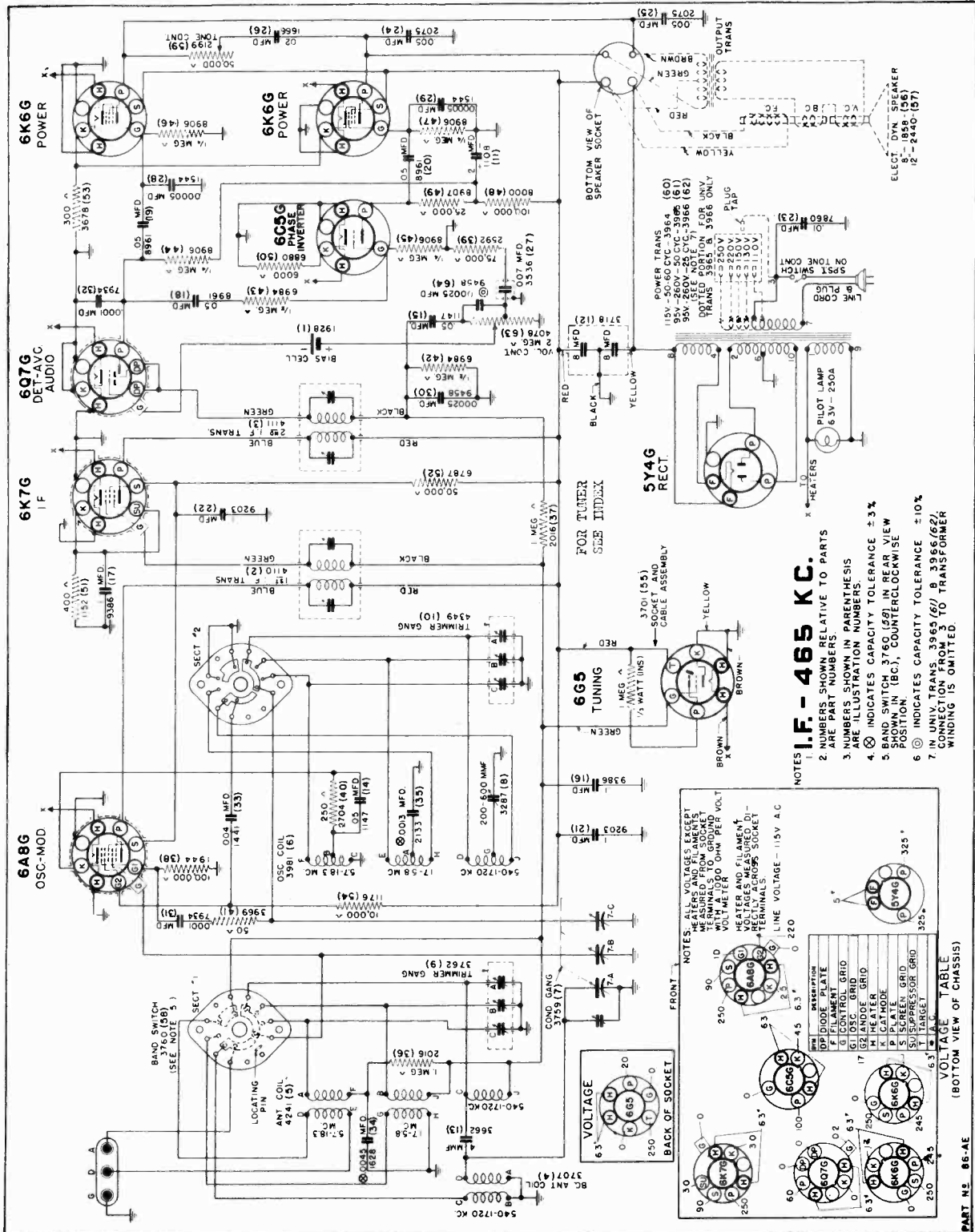


CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.



SENTINEL RADIO CORP.

MODEL 86AE
Schematic, Voltage
Socket



- NOTES**
1. I.F. - 465 KC.
 2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
 3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
 4. ⊗ INDICATES CAPACITY TOLERANCE ± 3%
 5. BAND SWITCH 3760 (59) IN REAR VIEW SHOWN IN (I.C.), COUNTERCLOCKWISE POSITION.
 6. ⊕ INDICATES CAPACITY TOLERANCE ± 10%
 7. IN UNIV. TRANS. 3965 (67) B 3966 (62), WINDING IS OMITTED.

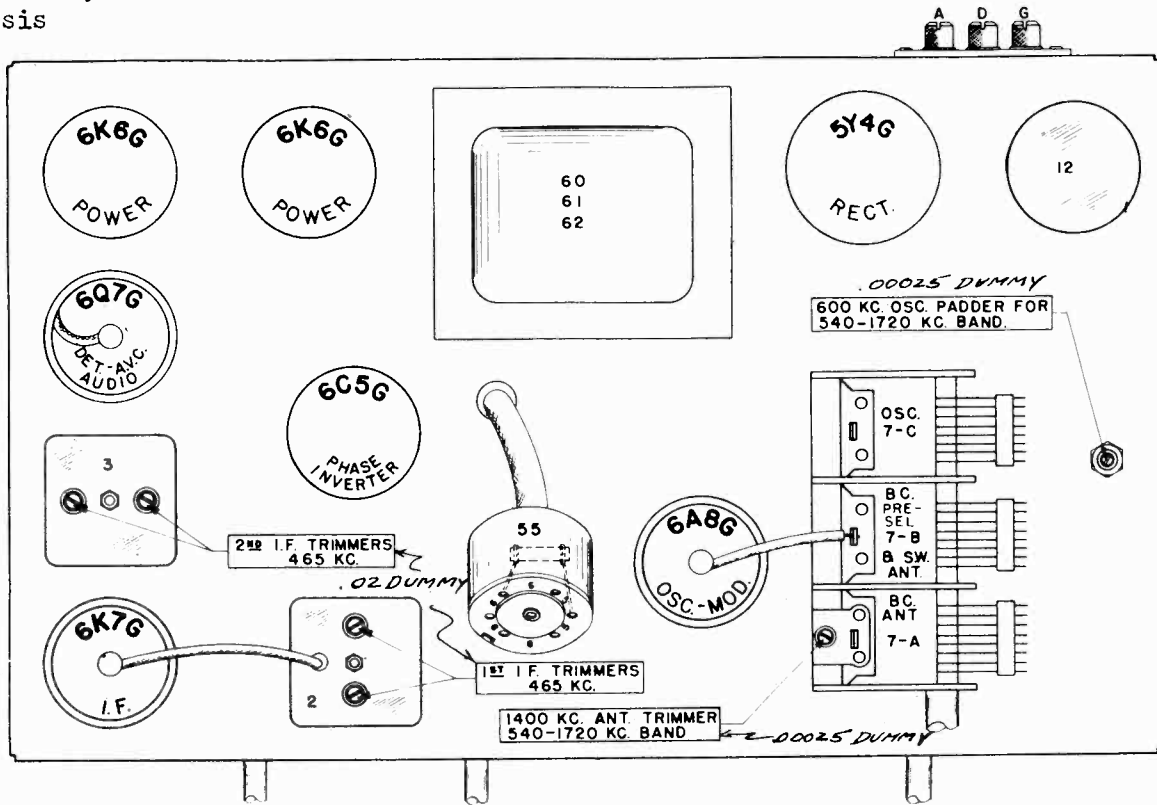
VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

INTRODUCTION	LINE VOLTAGE - 115V A.C.
DP DIODE PLATE	0 220
F FILAMENT	0 250
G CONTROL GRID	0 250
H DIODE GRID	0 250
I HEATER GRID	0 250
K CATHODE	0 250
L PLATE	0 250
M SUPPRESSOR GRID	0 250
N TARGET	0 325

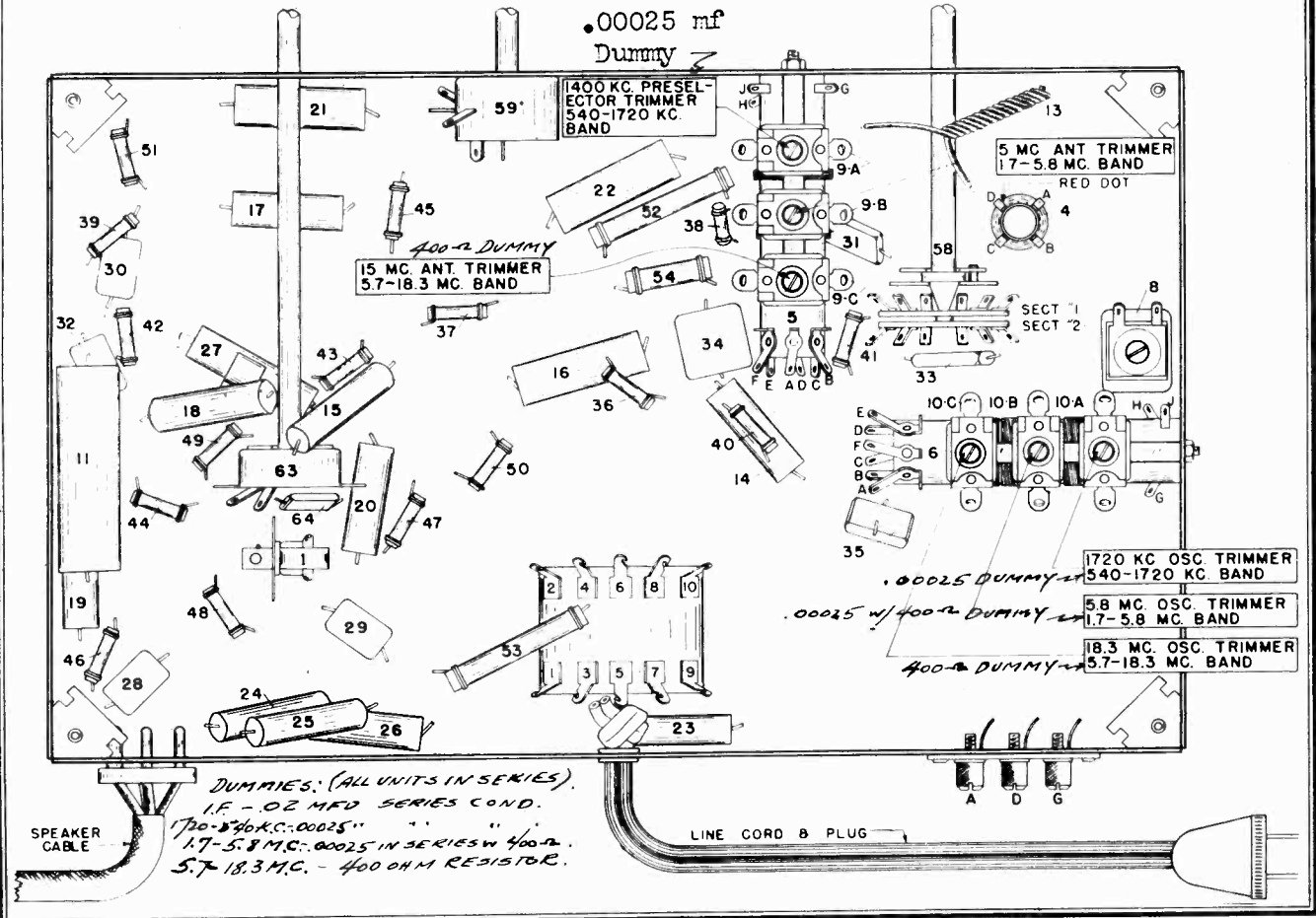
FRONT - NOTES: ALL VOLTAGES EXCEPT HEATERS AND FILAMENTS MEASURED FROM SOCKET WITH A 1000 OHM PER VOLT VOLTMETER. FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

MODEL 86A
Alignment, Trimmers
Chassis

SENTINEL RADIO CORP.

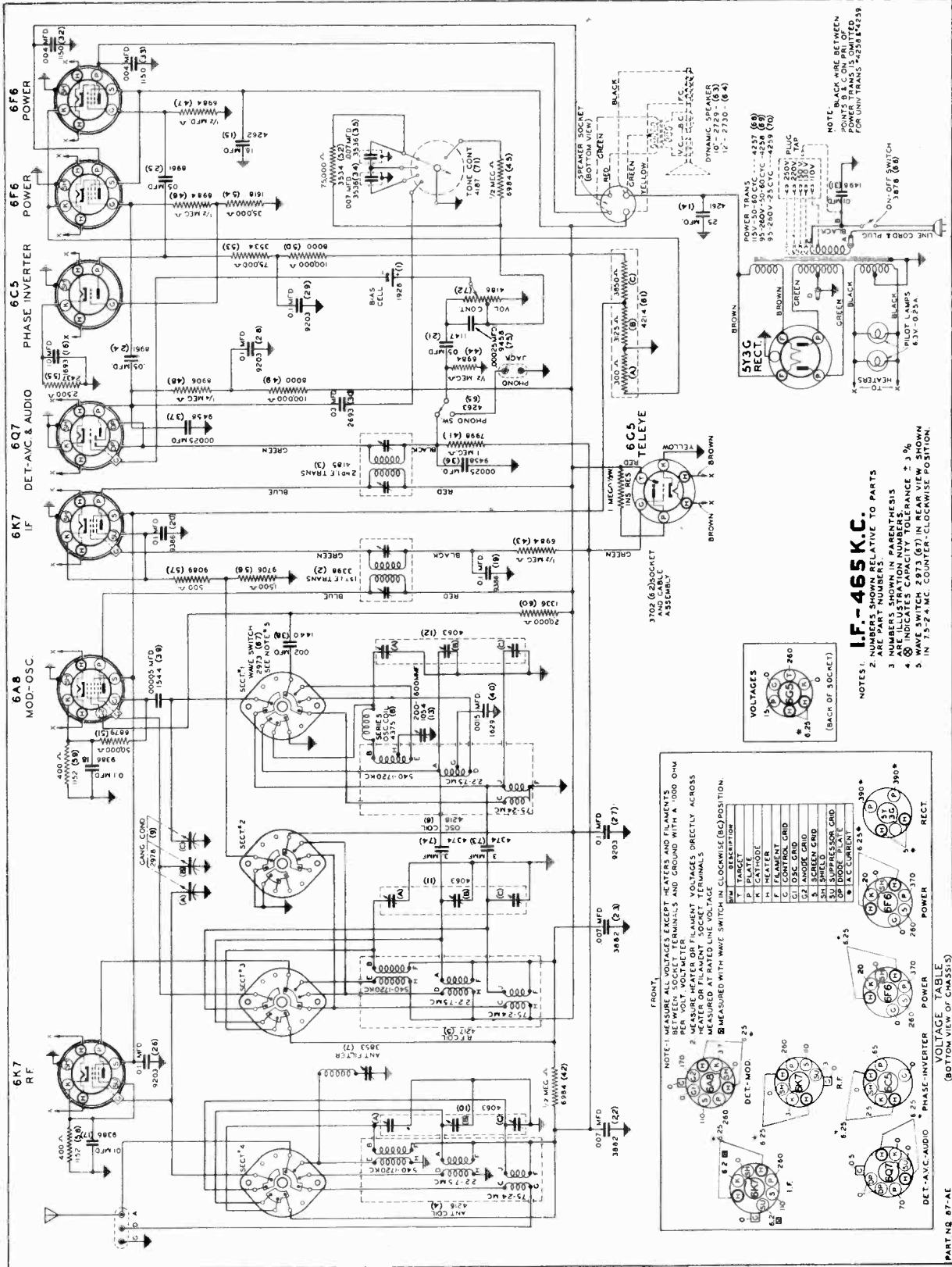


CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII.



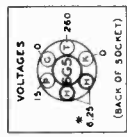
SENTINEL RADIO CORP.

MODEL 87AE
Schematic, Voltage
Socket



IF-465 KC.

- 1. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
- 2. NUMBERS SHOWN IN PARENTHESES ARE PART NUMBERS.
- 3. NUMBERS SHOWN IN PARENTHESES INDICATE CAPACITY TOLERANCE ± 3%.
- 4. WAVE SWITCH 2873 (67) IN REAR VIEW SHOWN IN 75-2.4 MC. COUNTER-CLOCKWISE POSITION.



FRONT, (BOTTOM VIEW OF CHASSIS)

POINT	DESCRIPTION	VOLTS
1	HEATER	260
2	CATHODE	0
3	CONTROL GRID	260
4	OSC. GRID	260
5	ANODE GRID	260
6	SHIELD GRID	260
7	DIODE PLATE	260
8	SUPPRESSOR GRID	260
9	TAPE	260
10	TAPE	260

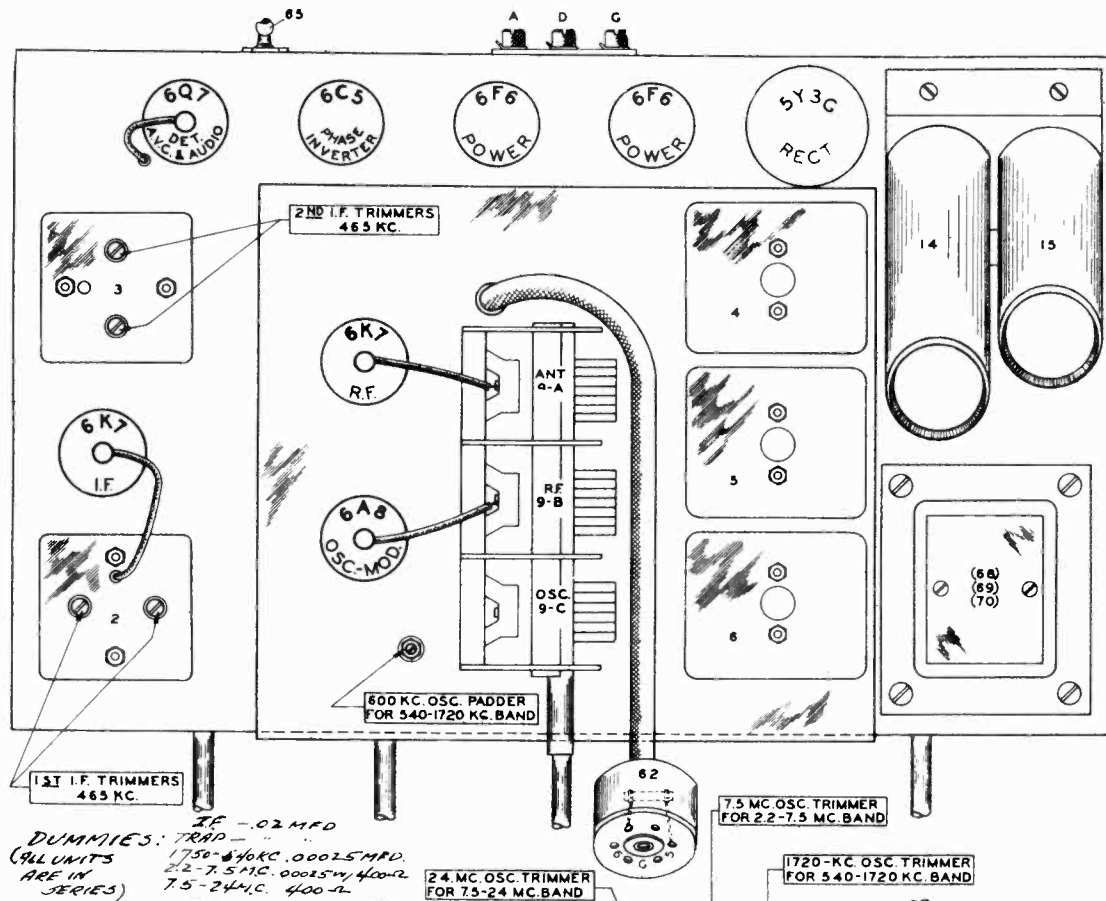
NOTE 1: MEASURE ALL VOLTAGES EXCEPT HEATERS AND FILAMENTS PER VOLT-VOLTMETER TERMINALS AND GROUND WITH A 1000 OHM RESISTOR.
NOTE 2: MEASURE HEATER OR FILAMENT VOLTAGES DIRECTLY ACROSS HEATER OR FILAMENT.
NOTE 3: MEASURE VOLTAGES AT RATED LINE VOLTAGE.
NOTE 4: MEASURED WITH WAVE SWITCH IN CLOCKWISE (B) POSITION.

PART NO. 87-AE VOLTAGE TABLE (BOTTOM VIEW OF CHASSIS)

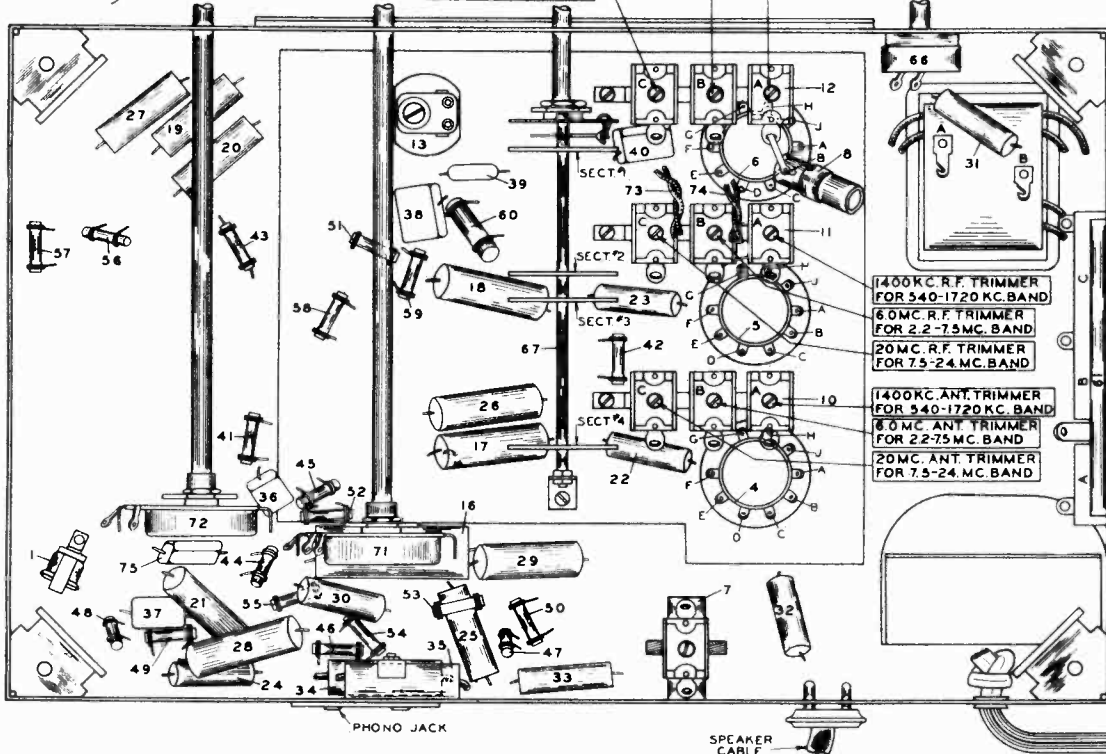
MODEL 87AE

Alignment, Trimmers
Chassis

SENTINEL RADIO CORP.



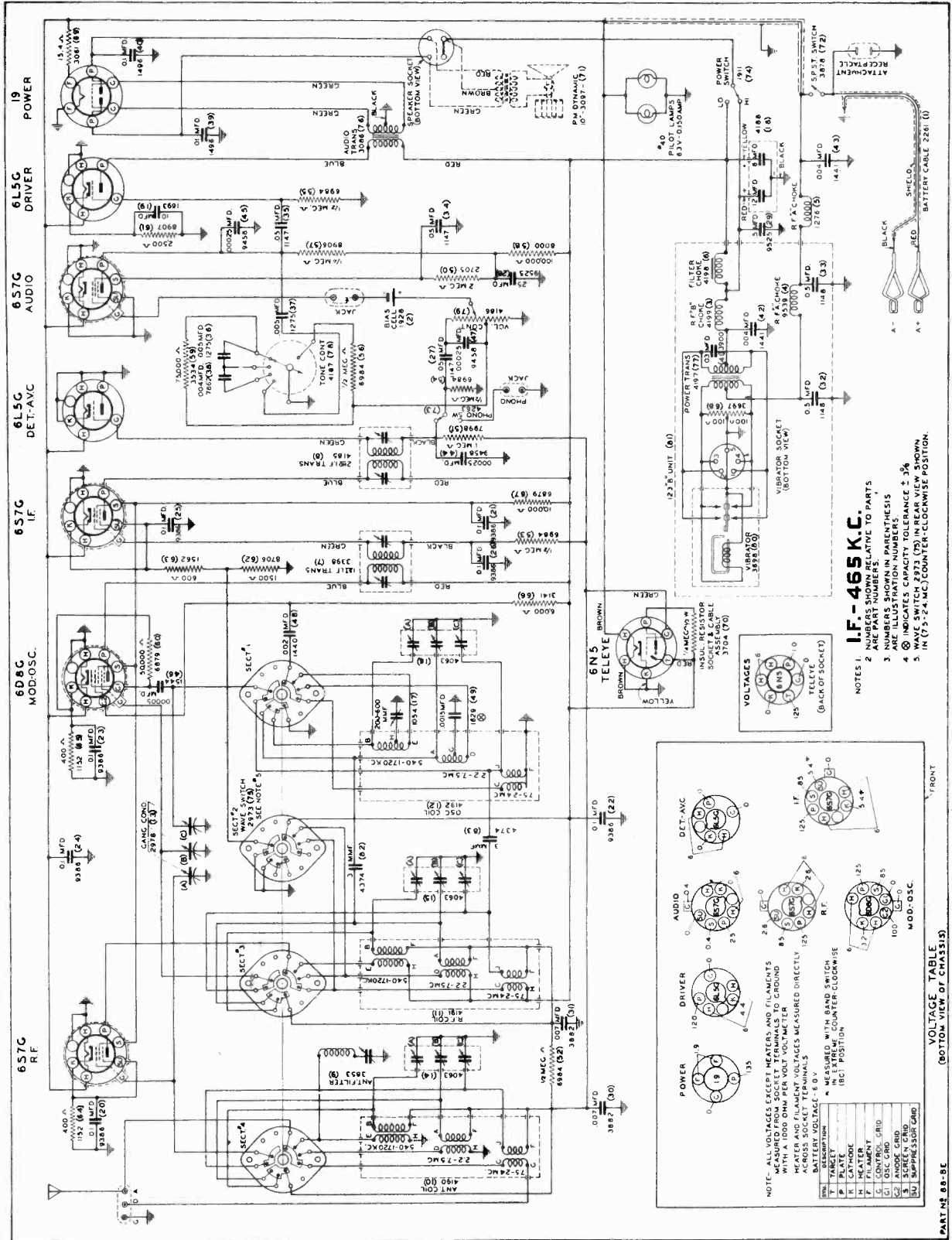
*IF - .02 MFD
DUMMIES: TRAP -
(ALL UNITS
ARE IN
SERIES)
1750-840 KC. 0.0025 MFD.
2.2-7.5 MC. 0.0015 MFD. 400 P.F.
7.5-24 MC. 400 P.F.*



CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII.

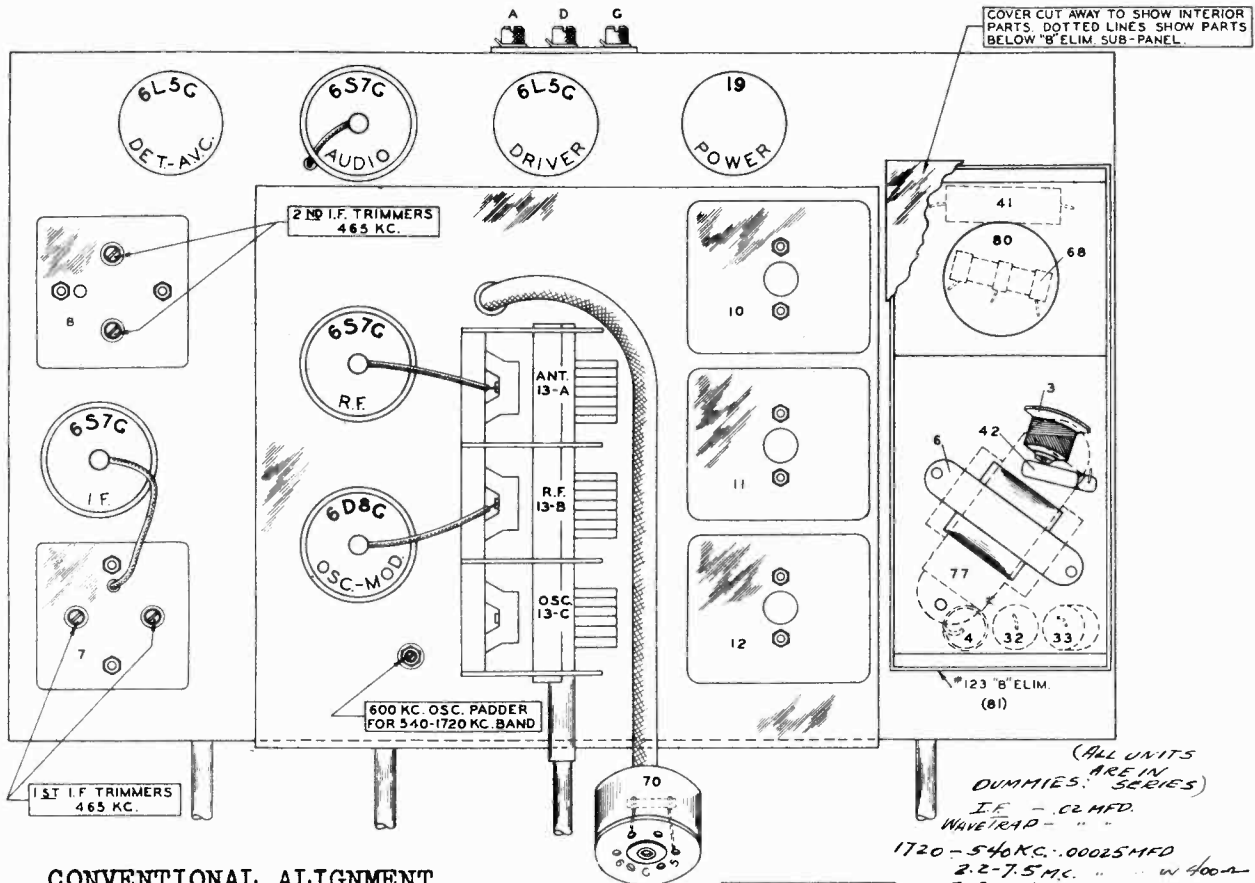
SENTINEL RADIO CORP.

MODEL 88BE
Schematic, Voltage
Socket

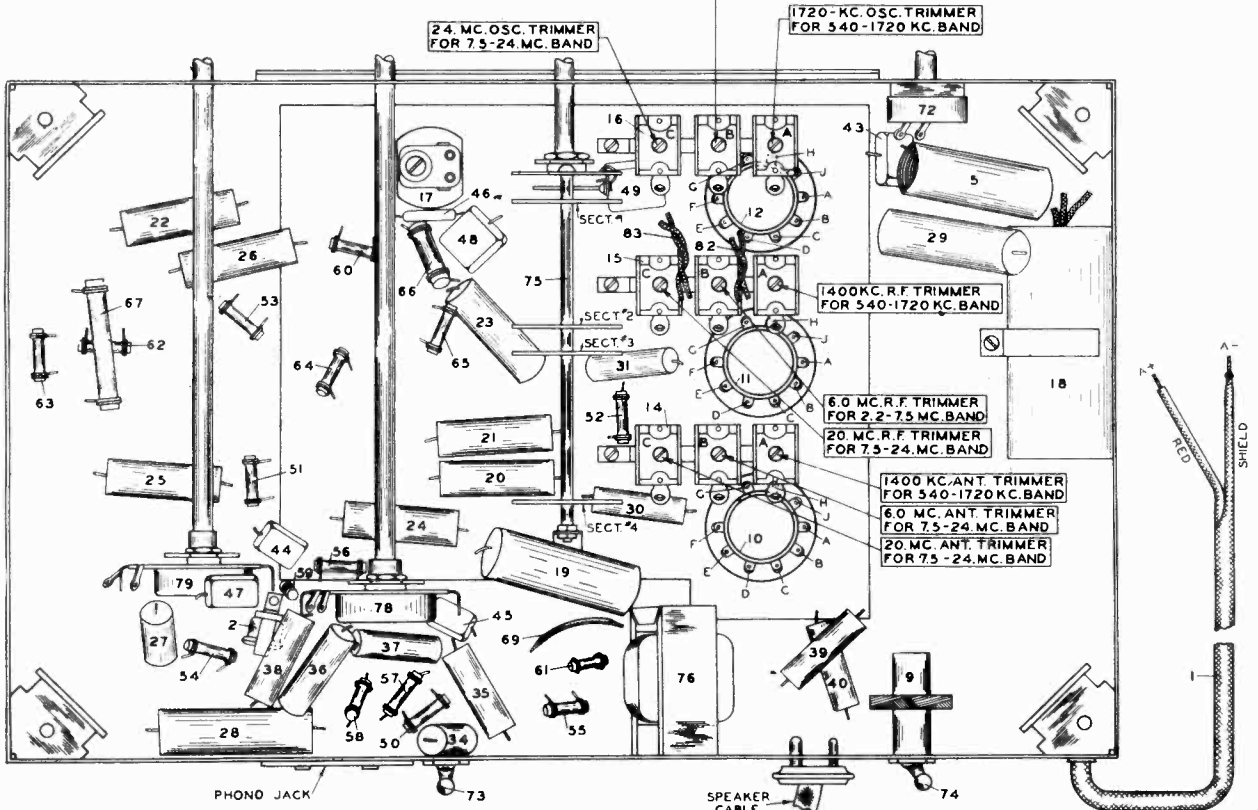


MODEL 88BE
Alignment, Trimmers
Chassis

SENTINEL RADIO CORP.

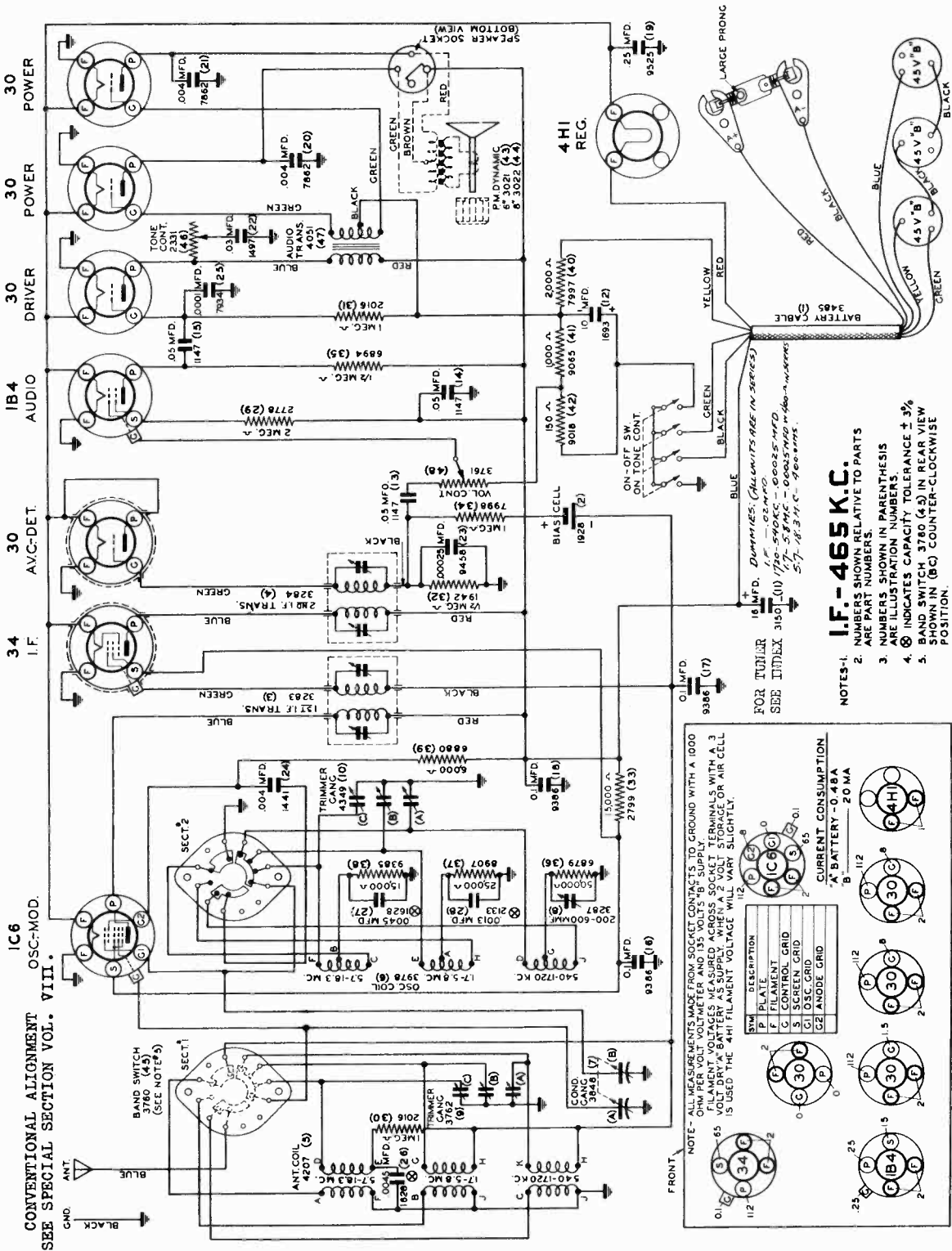


CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.



SENTINEL RADIO CORP.

MODEL 91B Schematic, Voltage Socket, Alignment



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.

OSC.-MOD.
IC 6

I.F.
34

A.V.C.-DET.
30

AUDIO
IB 4

DRIVER
30

POWER
30

POWER
30

POWER
30

- I.F.-465 K.C.**
- 1. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
 - 2. NUMBERS SHOWN IN PARENTHESES ARE TOLERANCE ± 3%.
 - 3. NUMBERS SHOWN IN SQUARES INDICATE CAPACITY.
 - 4. BAND SWITCH 3780 (45) IN REAR VIEW POSITION.
 - 5. BAND SWITCH 3780 (45) IN REAR VIEW POSITION.

FOR TUNER
SEE INDEX 3150 (1)

DUMMIES: (ALLOTTED IN SERIES)
 5405 (2)
 5405 MFD
 58 MFC - 00005 MFD
 57 - 48.2 M.C. - 900000
 57 - 48.2 M.C. - 900000

NOTE - ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1000 OHM OHMMETER AND 150 VOLTS B+ SUPPLY. TERMINALS WITH A 3 VOLT DRY A BATTERY AS SUPPLY. WHEN A 2 VOLT STORAGE OR AIR CELL IS USED THE 4H1 FILAMENT VOLTAGE WILL VARY SLIGHTLY.

SOCKET	DESCRIPTION
65	PLATE
65	FILAMENT
65	CONTROL GRID
65	SCREEN GRID
65	OSC. GRID
65	GRID ANODE GRID

CURRENT CONSUMPTION
 A BATTERY - 0.48 A
 B - 20 MA

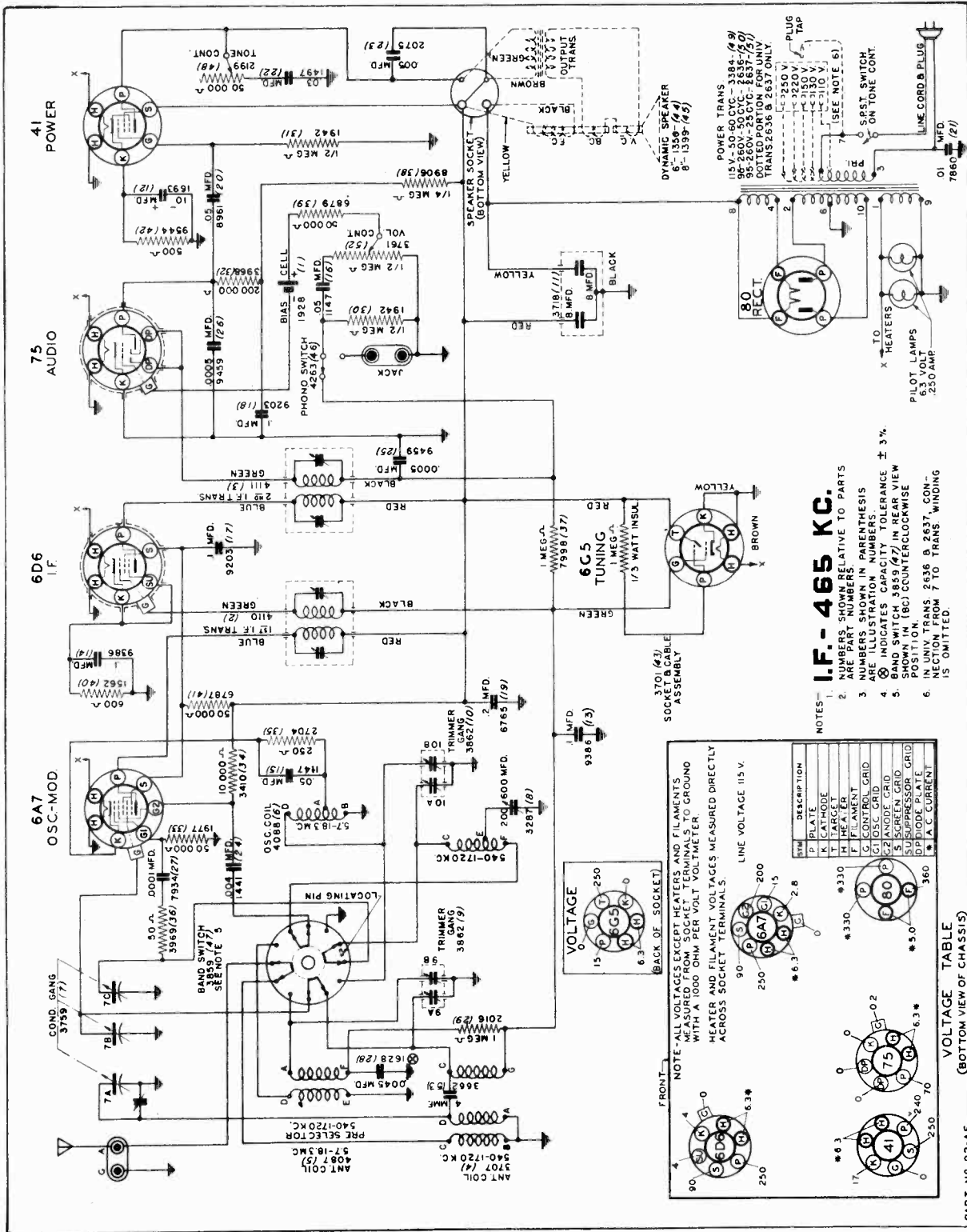
NOTE: Three oscillator trimmers on the coil mounted on side of chassis, reading from bottom of chassis, the three antenna trimmers on coil attached to front of chassis, reading from front to rear are: 1400 KC, 5 MC & 15 MC.

The three oscillator trimmers on the coil mounted on side of chassis, reading from bottom of chassis, the three antenna trimmers on coil attached to front of chassis, reading from front to rear are: 1400 KC, 5 MC & 15 MC.

PART NO 91-B
VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

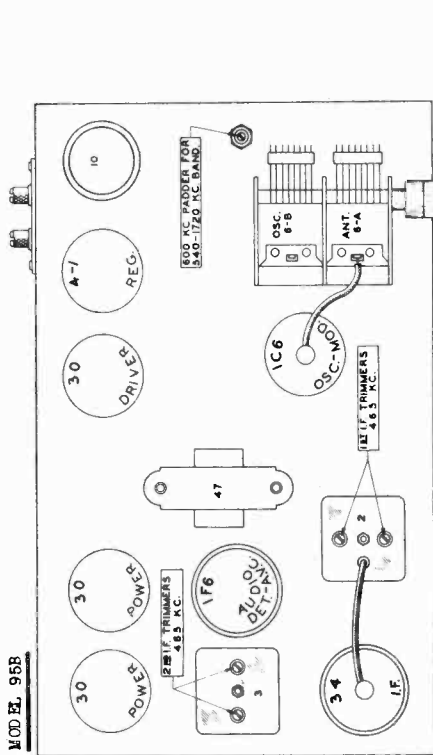
MODEL 92AE
Schematic, Voltage
Socket

SENTINEL RADIO CORP.



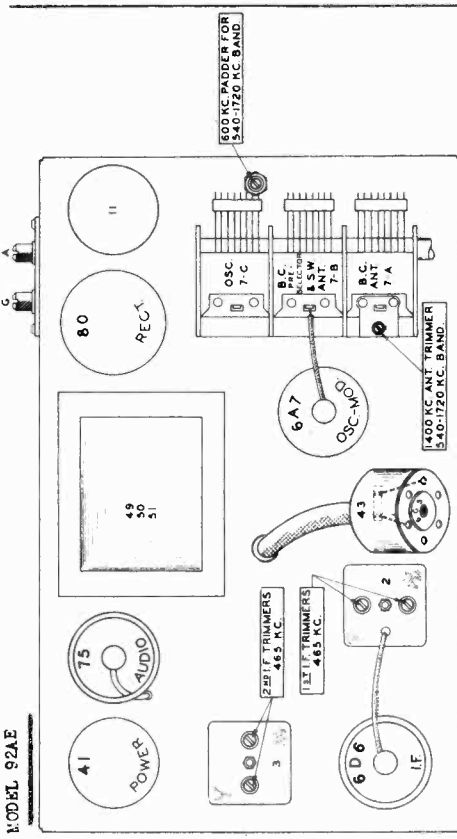
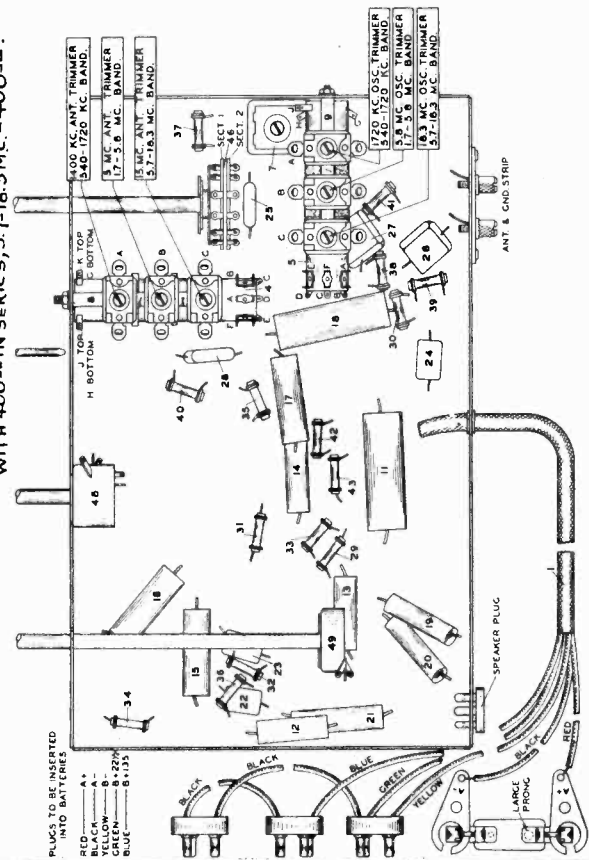
SENTINEL RADIO CORP.

MODEL 92AE
MODEL 95B
Alignment, Trimmers
Chassis



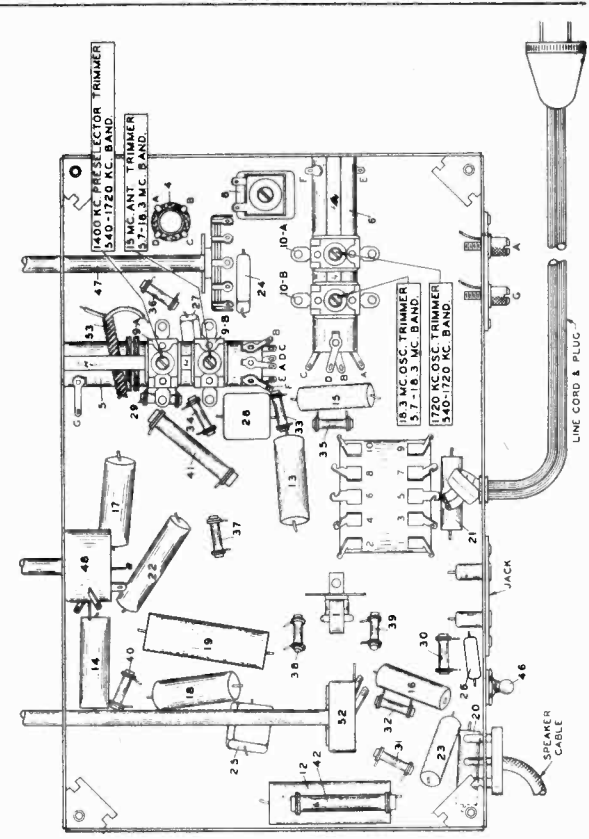
DUMMY ANTENNAS: - I.F. 0.2 MFD, 1720-1720.540KC.-00025 MFD, 17-58 M.C.-00025 MFD. WITH 400- Ω IN SERIES, 5.7-18.3 M.C.-400- Ω .

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.



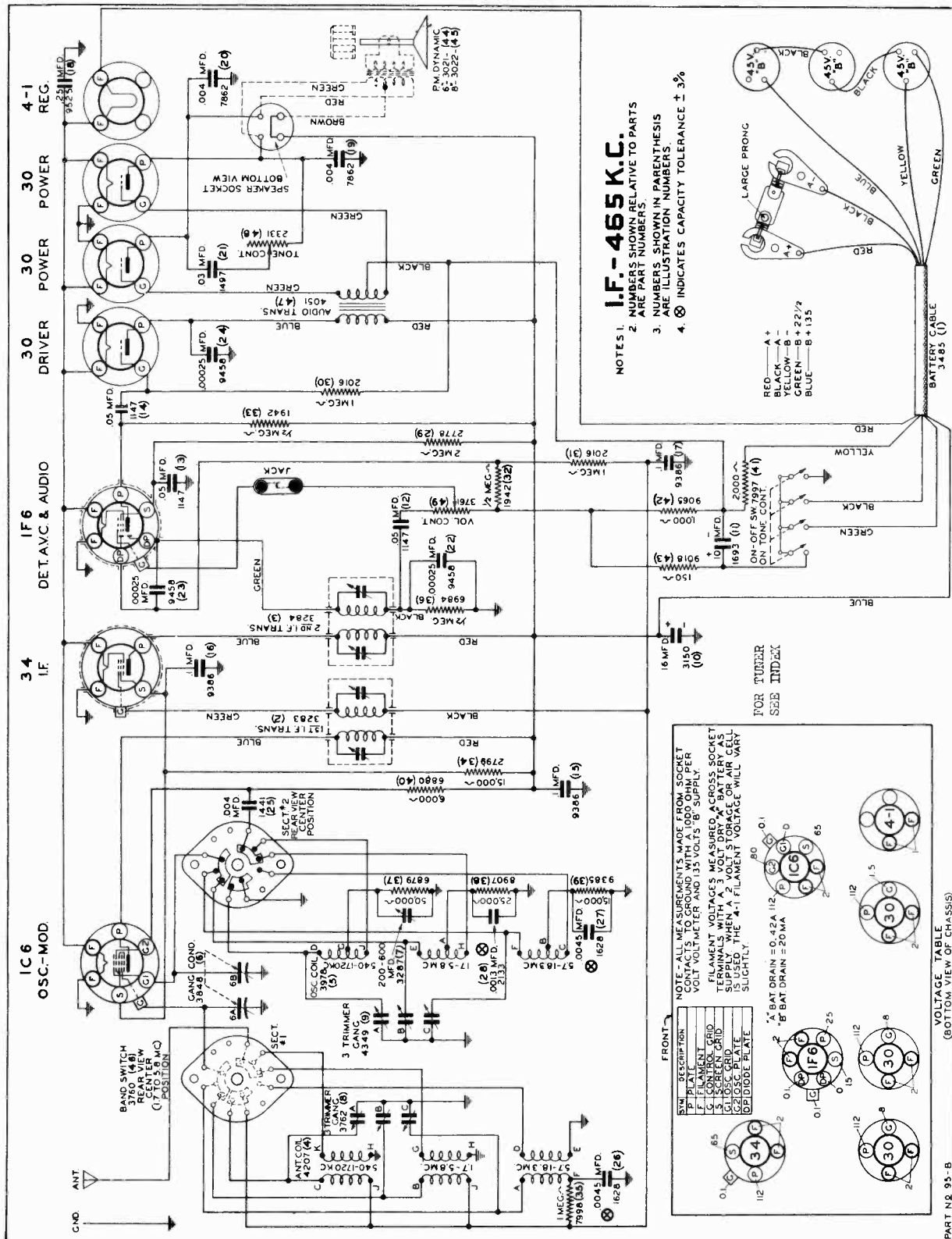
DUMMY ANTENNAS: - I.F. 0.2 MFD, 1720-1720.540KC.-00025 MFD, 17-58 M.C.-00025 MFD. WITH 400- Ω SERIES RESISTOR.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII

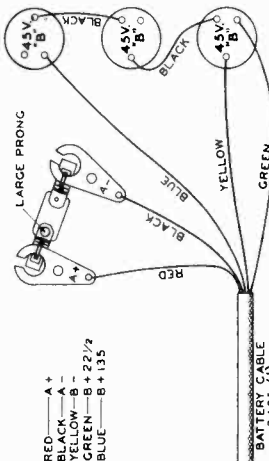


MODEL 95B
Schematic, Voltage
Socket

SENTINEL RADIO CORP.



NOTES 1. I.F. - 465 K.C.
2. PART NUMBER RELATIVE TO PARTS ARE SHOWN IN PARENTHESIS
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS
4. ⊗ INDICATES CAPACITY TOLERANCE ± 3%



FOR TUNER SEE INDEX

NOTE - ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER AND 135 VOLTS 'B' SUPPLY

FILAMENT VOLTAGES MEASURED, A CROSS SOCKET TERMINALS WITH 3 VOLTS DRY 'A' BATTERY IS USED. THE 'A-1' FILAMENT VOLTAGE WILL VARY SLIGHTLY.

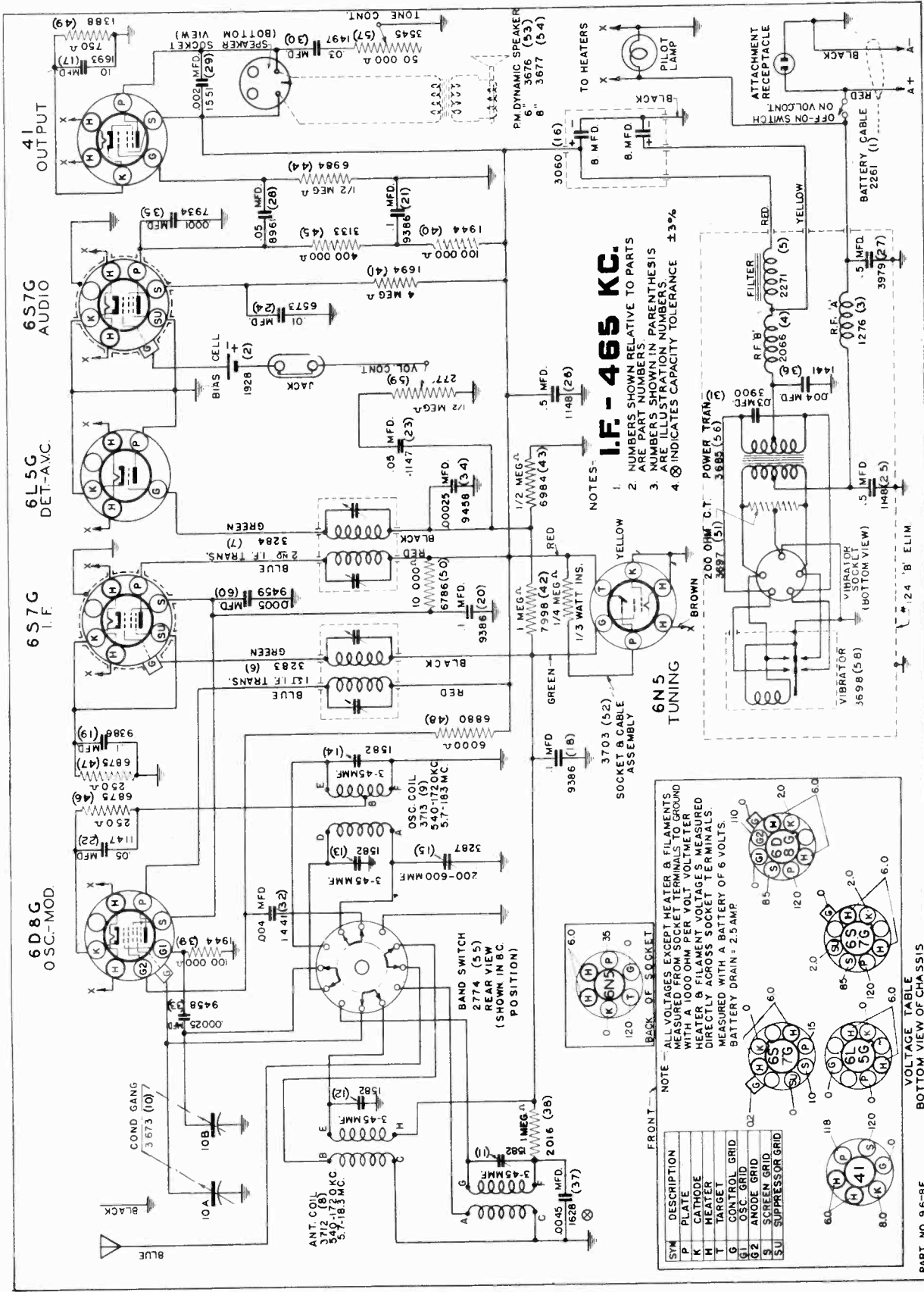
* 'A' BAT DRAIN = 0.42A 112
* 'B' BAT DRAIN = 20 MA

VOLTAGE TABLE (BOTTOM VIEW OF CHASSIS)

SOCKET	1	2	3	4	5	6	7	8	9	10	11	12
IC 6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
IF 6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
30	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
4-1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

SENTINEL RADIO CORP.

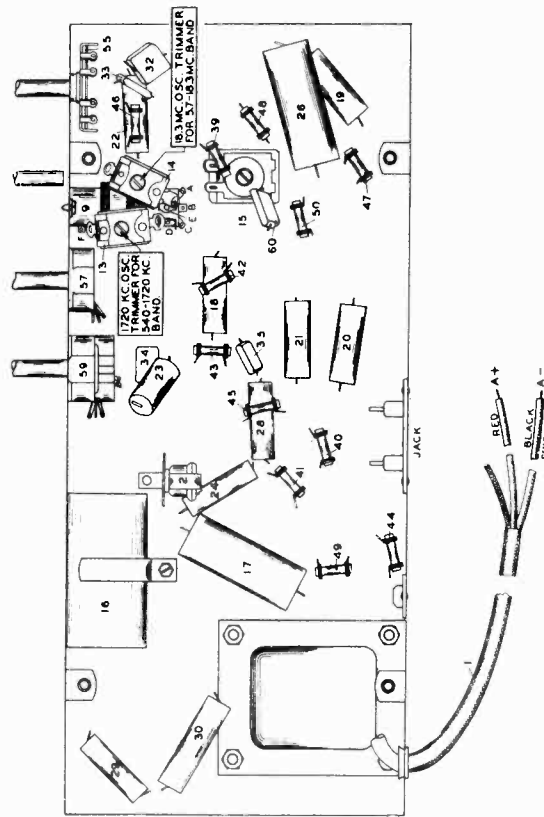
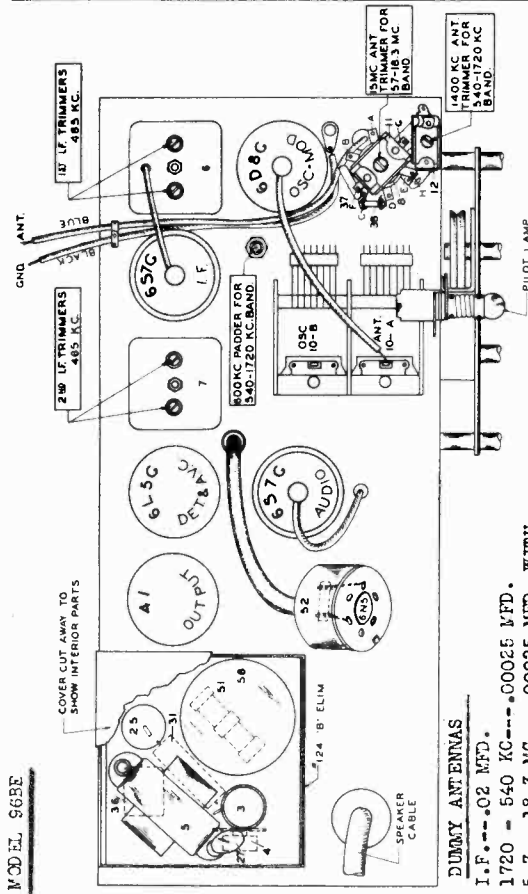
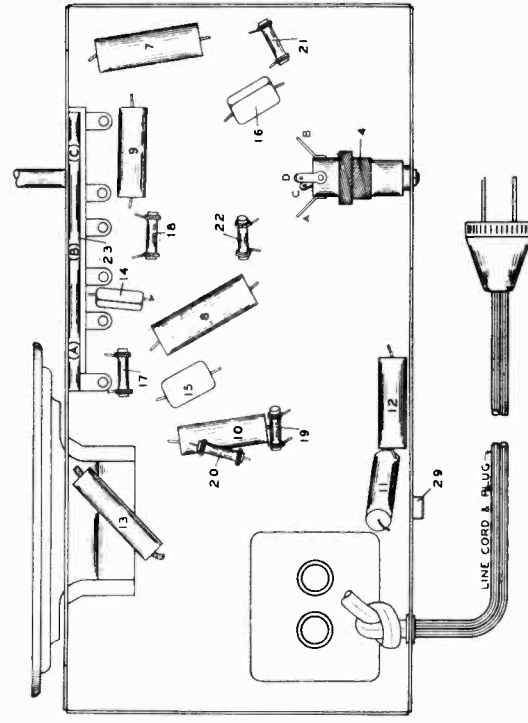
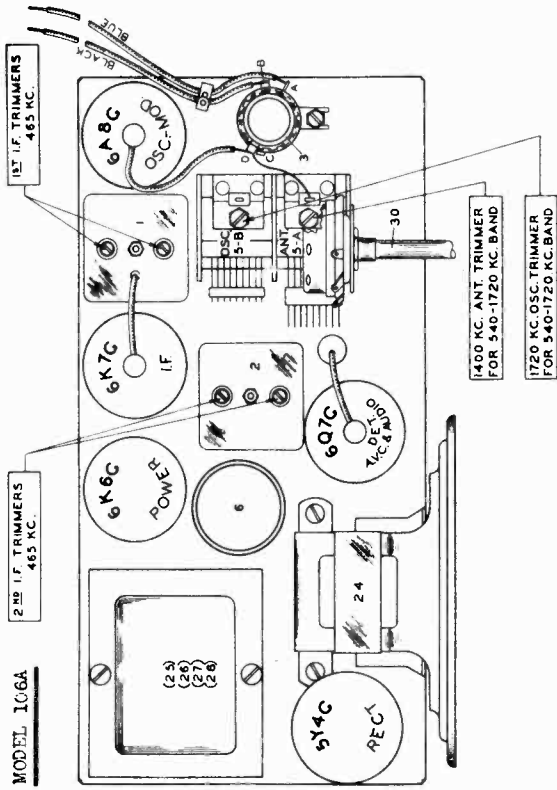
MODEL 96BE
Schematic, Voltage
Socket



MODEL 96BE
Alignment, Trimmers
Chassis

SENTINEL RADIO CORP.

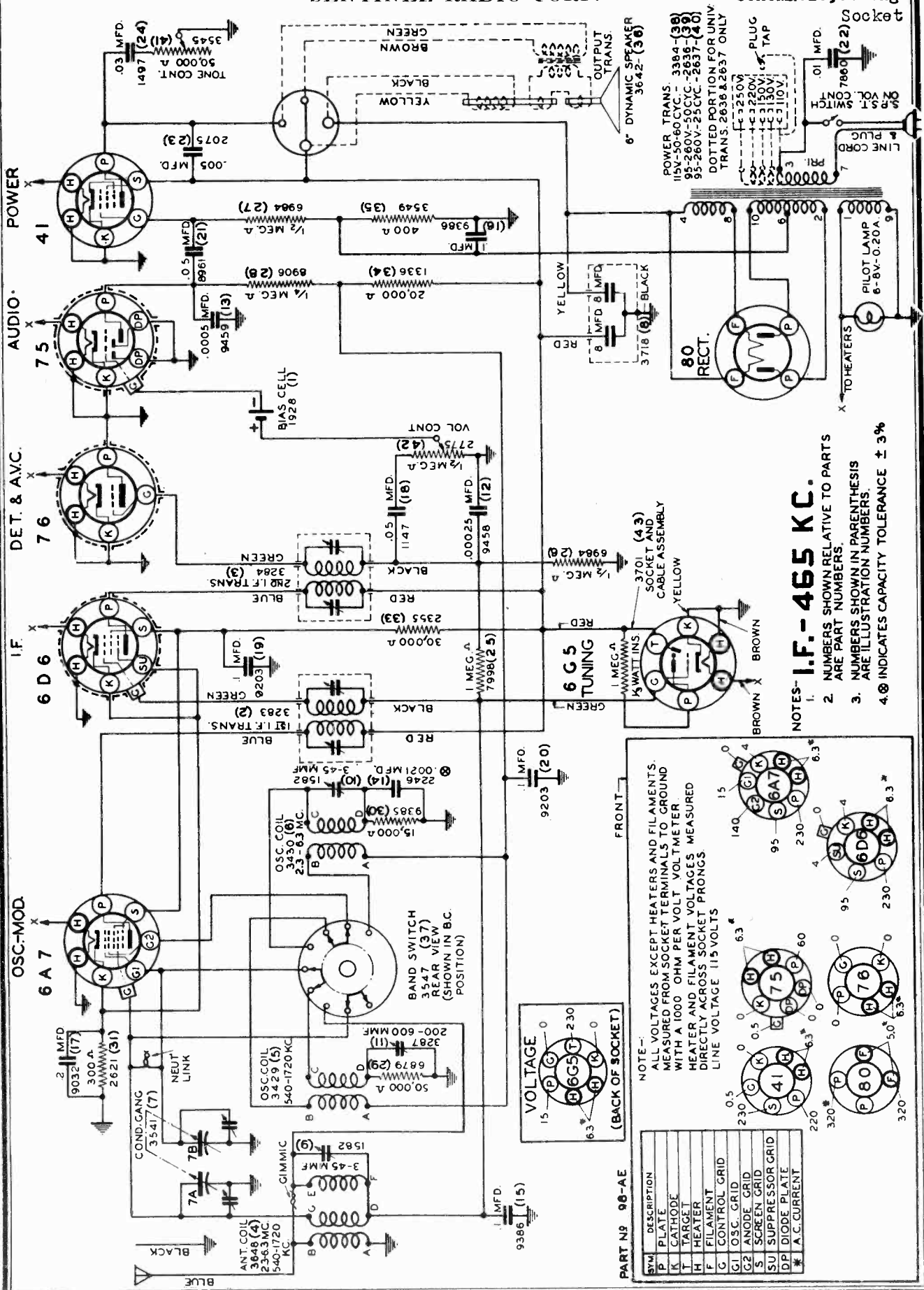
MODEL 106A
Trimmers, Chassis



SENTINEL RADIO CORP.

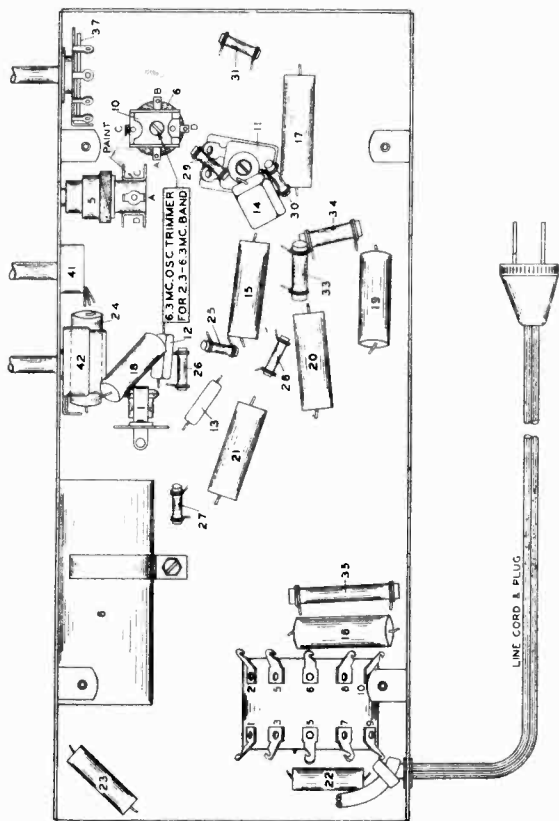
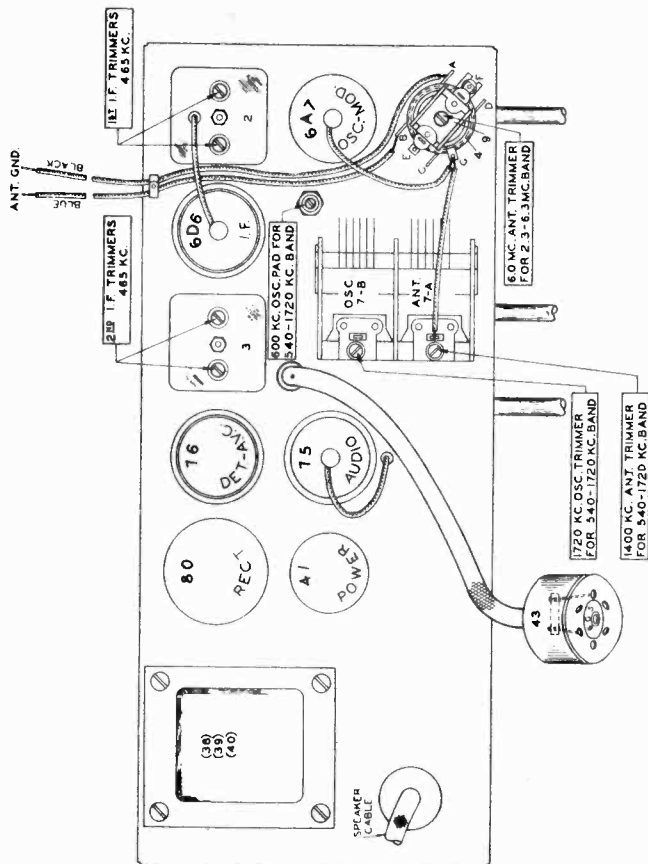
MODEL 98AE

Schematic, Voltage Socket



MODEL 98AE
Trimmers, Chassis
Alignment

SENTINEL RADIO CORP.



ALIGNMENT PROCEDURE:

Lack of sensitivity, selectivity or poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, inadequate or excessively long antenna, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proven not to be the cause.

NOTE: BE SURE TO FOLLOW PROCEDURE CAREFULLY WHEN ALIGNING. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT.

IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER.

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

- Connect the ground lead of the test oscillator to the chassis or set ground lead. Connect the other lead of the test oscillator to the grid cap of the 6A7 tube through a .02 Mfd. series condenser. **DO NOT REMOVE GRID CLIP.**
- Set test oscillator to **EXACTLY 465 kilocycles** and turn receiver volume control on full.
- Peak each of the second I.F. transformer trimmers.
- Peak each of the first I.F. transformer trimmers.
To assure most accurate trimmer setting repeat above adjustment several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING 1720-540 KILOCYCLE BAND:

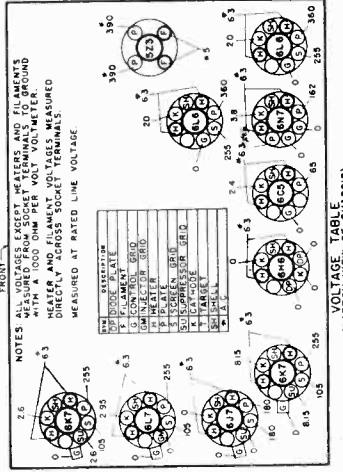
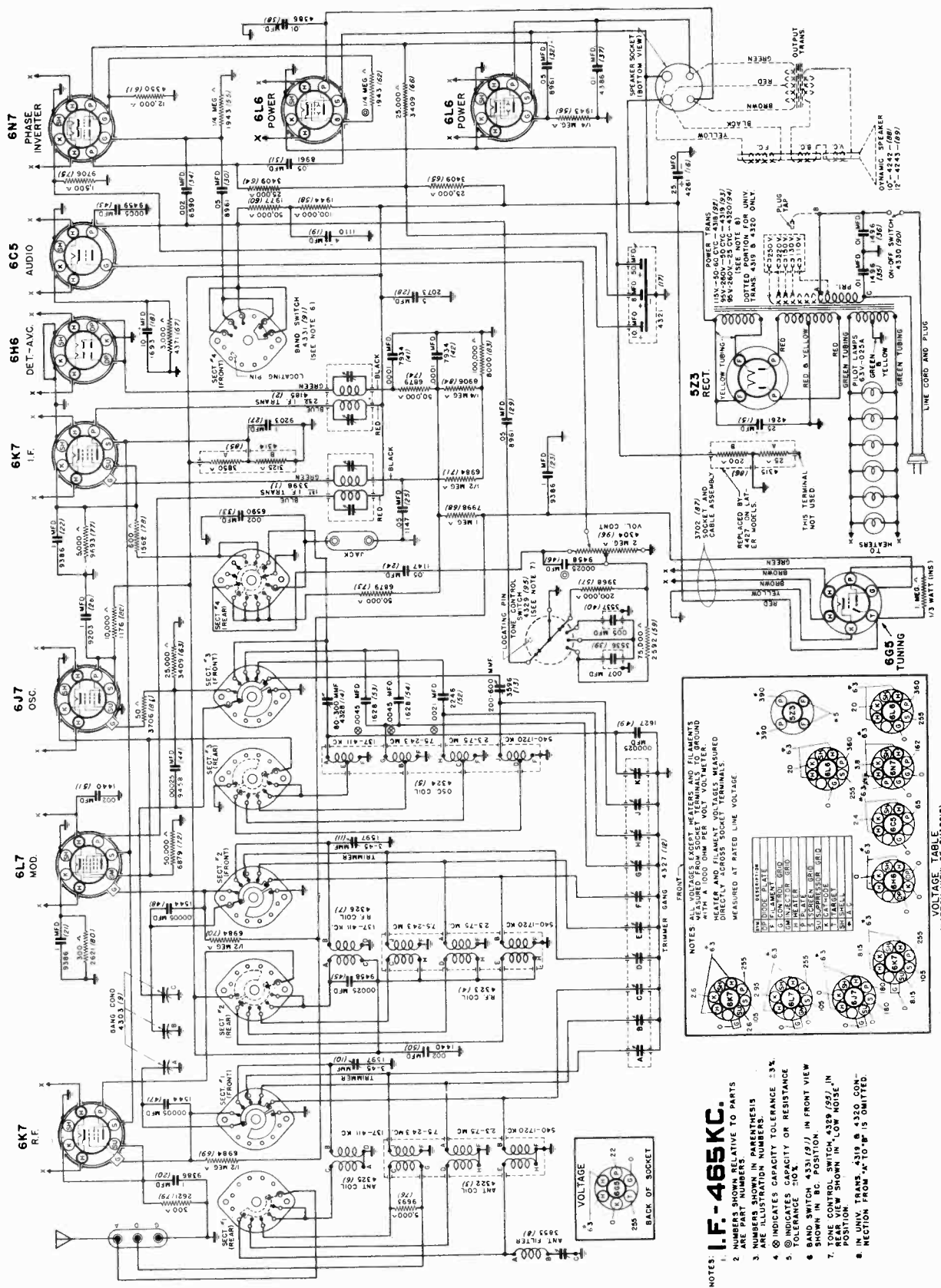
- Remove test oscillator lead from grid of the 6A7 tube and attach it to the receiver antenna lead through a .00025 Mfd. series condenser.
- Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line move needle to correct position.
- Set receiver dial and test oscillator frequency to **EXACTLY 1720 kilocycles.**
- Bring in 1720 KC test oscillator signal to maximum output by adjusting the trimmer condenser mounted on top of the oscillator section of the gang condenser. Looking at the front of the receiver the rear section of the gang condenser is the oscillator section.
- Tune receiver dial and set test oscillator frequency to **EXACTLY 1400 kilocycles:**
- Adjust trimmer on top of the front section gang condenser (antenna section) for maximum 1400 kilocycle test signal response.
- Tune receiver dial and set test oscillator frequency to approximately 600 kilocycles.
- While rocking the tuning condenser back and forth adjust 600 KC oscillator padder condenser which is accessible through the hole in the top of the chassis adjacent to the gang condenser for maximum 600 kilocycle signal response.

ALIGNING 2.3-6.3 MEGACYCLE BAND:

- Replace .00025 Mfd. Test oscillator antenna lead series condenser with a 400 ohm resistor.
- Adjust band selector switch for 2.3-6.3 megacycles band operation, tune receiver dial and set test oscillator frequency to **EXACTLY 6.3 megacycles.**
- Bring in 6.3 megacycle test oscillator signal to maximum output by adjusting 6.3 M.C. oscillator trimmer on top of coil located underneath chassis.
- Tune receiver dial and test oscillator frequency to **EXACTLY 6 megacycles,** and adjust 6 M.C. antenna trimmer which is mounted on coil located on top of chassis for maximum sensitivity.

SENTINEL RADIO CORP.

MODEL 99AE
Schematic, Voltage
Socket



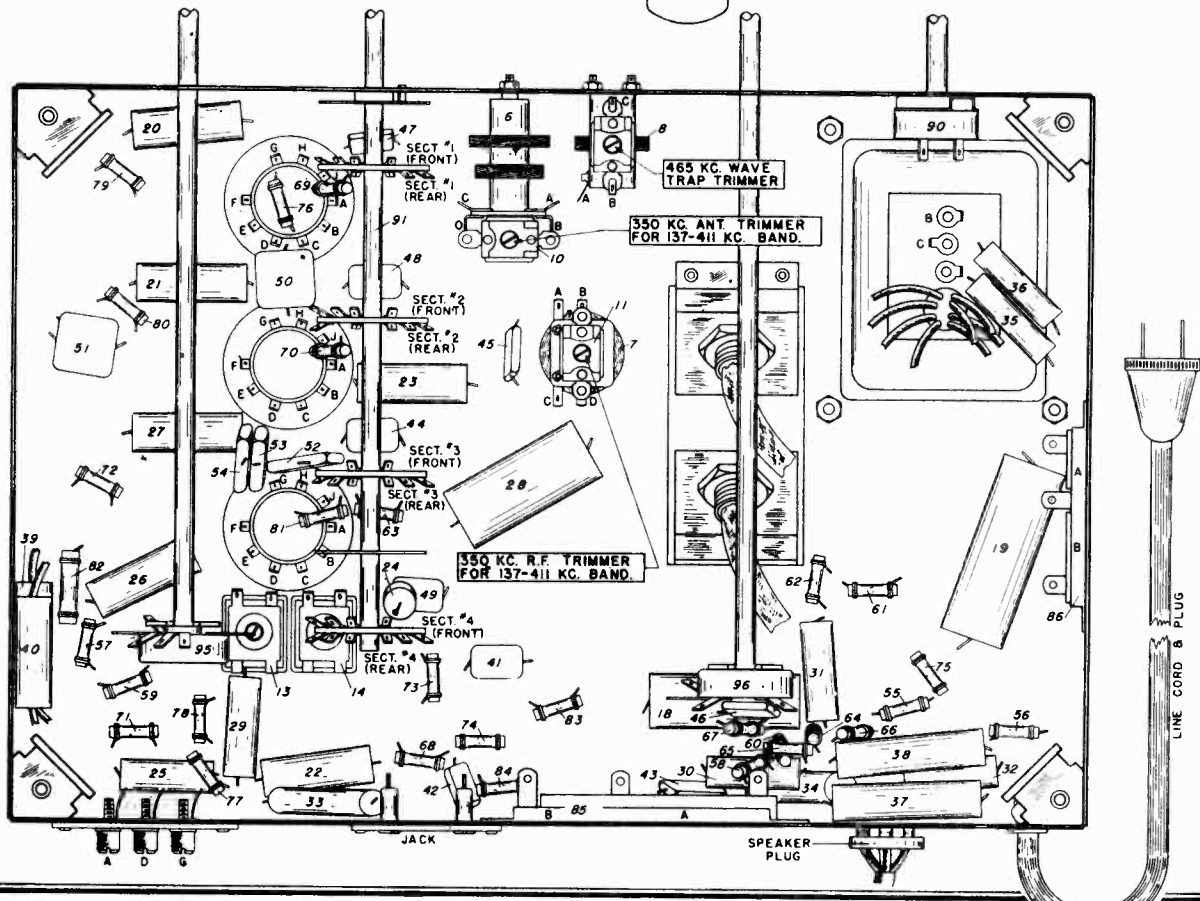
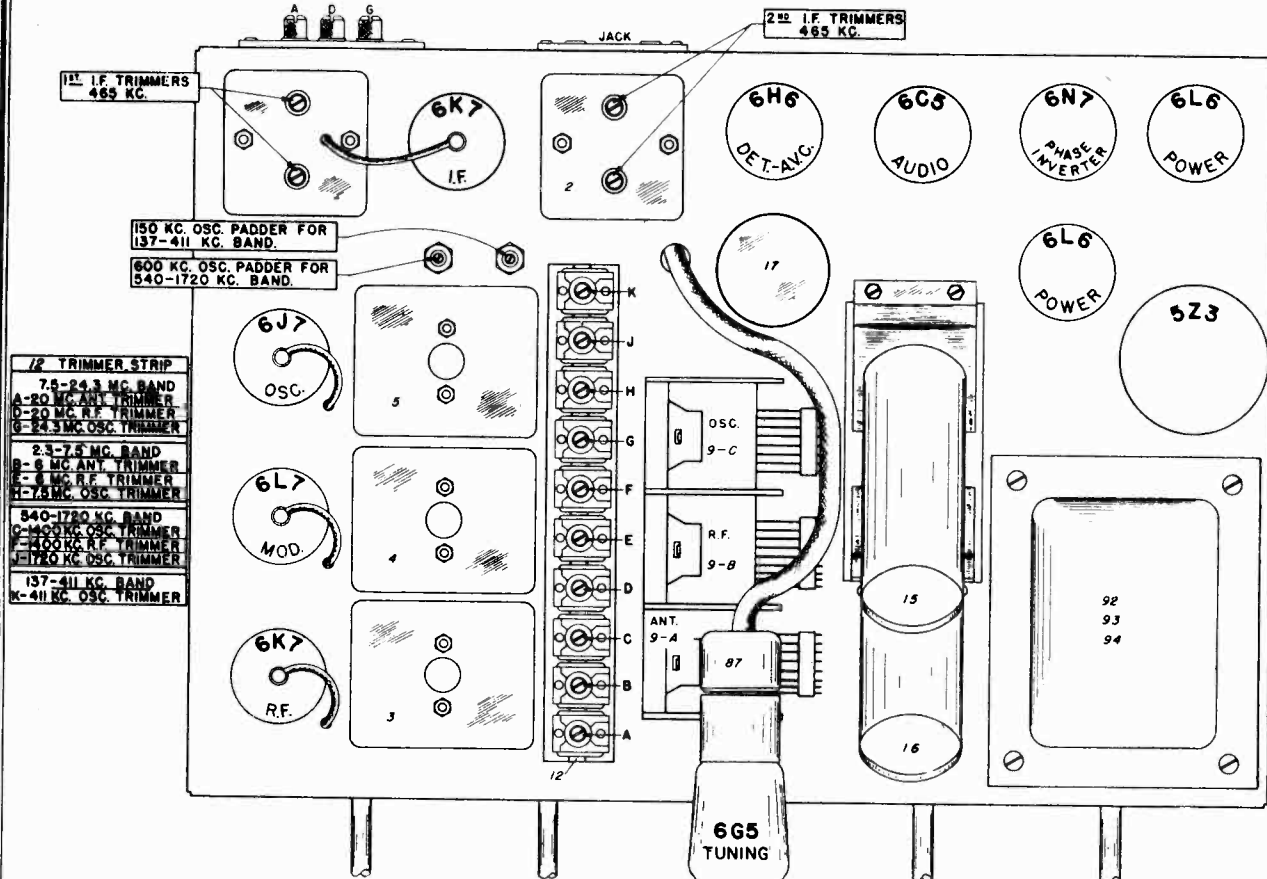
NOTES:

1. I.F. - 465 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS IN PARENTHESES INDICATE TOLERANCE.
4. INDICATES CAPACITY TOLERANCE.
5. INDICATES CAPACITY OR RESISTANCE TOLERANCE.
6. BAND SWITCH 4331 (9) IN FRONT VIEW SHOWN IN B.C. POSITION.
7. TONE CONTROL SWITCH 4329 (9) IN FRONT VIEW SHOWN IN LOW NOISE POSITION.
8. IN UNIV. TRANS. 4319 & 4320 CONNECTION FROM "A" TO "B" IS OMITTED.

MODEL 99AE

Trimmers
Chassis

SENTINEL RADIO CORP.



SENTINEL RADIO CORP.

MODEL 99AE
 MODELS 144X, 144XE
 MODELS 149A, 149AE, 159AE
 Alignment

SENTINEL-ERLA MODEL 99AE

ALIGNMENT PROCEDURE:

Lack of sensitivity, selectivity or poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, inadequate or excessively long antenna, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proven not to be the cause.

NOTE: BE SURE TO FOLLOW PROCEDURE CAREFULLY WHEN ALIGNING. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMER AND PADDING CONDENSERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON PARTS DIAGRAM.

IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER.

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

- (a) Connect the ground lead of the test oscillator to the chassis or set ground post. Connect the other lead of the test oscillator to the grid cap of the 6L7 tube through a .02 Mid. series condenser. **DO NOT REMOVE GRID CLIP.**
- (b) Set test oscillator to EXACTLY 465 kilocycles and turn receiver volume control on full.
- (c) Peak each of the second I.F. transformer trimmers.
- (d) Peak each of the first I.F. transformer trimmers.
- (e) To assure most accurate trimmer setting repeat above adjustment several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

ADJUSTING 465 KILOCYCLE WAVE TRAP:

- (a) Connect the high output side of the test oscillator through a .00025 Mid. condenser to the receiver antenna "A" post and the low side to the set ground.
- (b) Set test oscillator frequency to EXACTLY 465 kilocycles and adjust 465 kilocycle wave trap trimmer condenser for MINIMUM 465 kilocycle signal response.

ALIGNING 137-411 KILOCYCLE BAND:

- (a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line move needle to correct position.
- (b) Leave test oscillator lead connected to receiver antenna "A" post through a .00025 Mid series condenser.

- (c) Adjust band selector switch for operation on 137-411 kilocycle band, tune receiver dial and set test oscillator frequency to EXACTLY 411 kilocycles.
- (d) Bring in 411 kilocycle test signal to maximum output by adjusting 411 K.C. (K) oscillator trimmer.
- (e) Tune receiver dial and set test oscillator frequency to EXACTLY 350 kilocycles. Adjust 350 K.C. antenna and R.F. trimmers for maximum sensitivity.
- (f) Tune receiver dial and set test oscillator frequency to approximately 150 kilocycles—then while rocking gang condenser slightly to right and left adjust 150 kilocycle oscillator paddler for maximum sensitivity.

ALIGNING 1720-540 KILOCYCLE BAND:

- (a) Leave .00025 Mid. condenser in series with test oscillator lead. Adjust band selector switch for operation on the 1720-540 kilocycle band.
- (b) Set test oscillator frequency and receiver dial to EXACTLY 1720 kilocycles. ADJUST 1720 KILOCYCLE OSCILLATOR TRIMMER (J) TO BRING IN 1720 KILOCYCLE TEST OSCILLATOR SIGNAL TO MAXIMUM OUTPUT.
- (c) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles. Adjust 1400 K.C. antenna (C) and R.F. (F) trimmers for maximum sensitivity.
- (d) Set test oscillator frequency and receiver dial to approximately 600 kilocycles. Then while rocking gang condenser slightly to right and left, adjust 600 K.C. oscillator paddler for maximum signal response.

ALIGNING 2.3-7.5 MEGACYCLE BAND:

- (a) Replace .00025 Mid. test oscillator lead series condenser with a 400 ohm carbon resistor.

- (b) Adjust band selector switch to 2.3-7.5 megacycle band, tune receiver dial and set test oscillator frequency to EXACTLY 7.5 megacycles—then adjust 7.5 megacycle oscillator (H) trimmer for maximum 7.5 megacycle test signal output.
- (c) Tune receiver dial and test oscillator frequency to EXACTLY 6 megacycles—adjust 6 M.C. antenna (B) and R.F. (E) trimmers for maximum sensitivity.

ALIGNING 7.5-24.3 MEGACYCLE BAND:

- (a) Leave 400 ohm resistor in series with test oscillator lead and place band selector switch for operation on 7.5-24.3 megacycle band, tune receiver dial and set test oscillator frequency to EXACTLY 24.3 megacycles.
- (b) Adjust 24.3 M.C. oscillator trimmer. (G) to bring in 24.3 megacycle test signal to maximum output. **NOTE:** When adjusting this trimmer two peaks, the fundamental and the image peak will be noticed. **CARE MUST BE TAKEN THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 24.3 MEGACYCLES.** Always back off the trimmer to minimum capacity, then screw down the trimmer (add capacity) until the **FIRST PEAK** which is the fundamental and the proper one to use is tuned in. If the trimmer is screwed down beyond the point where the first peak is received the incorrect image peak will be tuned in. After completing adjustment of the oscillator trimmer at 24.3 megacycles, always check to see if the proper peak has been used. To do this leave test oscillator frequency at 24.3 megacycles, increase the output of the test oscillator and tune receiver dial to approximately 23.3 megacycles. Then vary the receiver dial slightly to the right and left of 23.3 megacycles and if the fundamental peak was used in aligning at 24.3 megacycles the test oscillator signal will be heard at approximately 23.3 megacycles on the receiver dial.

- (c) Tune receiver dial and set test oscillator frequency to EXACTLY 20 megacycles.
 - (d) Adjust 20 M.C. antenna (A) and R.F. (D) trimmers for maximum 20 megacycle test signal response.
- To assure most accurate trimmer setting, repeat all above adjustments several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

MODELS 144X, 144XE, 149A, 149AE, and 159AE.

ALIGNMENT PROCEDURE IN TABULATED FORM

The user is to follow the above steps in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read instructions from left to right. If the dial calibration is required on any one band, make the adjustment marked (b) first, (2) next, (3) third. If the dial calibration is required on two bands, make the adjustment marked (b) first, (2) next, (3) third. At which point the dial indicator must be exactly even with the last line at the low frequency end of the dial calibration. If the needle does not point exactly to that line move needle to correct position. To assure most accurate trimmer setting repeat above adjustment several times always using lowest possible test oscillator output consistent with some type of output measuring device. Have ground lead of test oscillator attached to chassis.

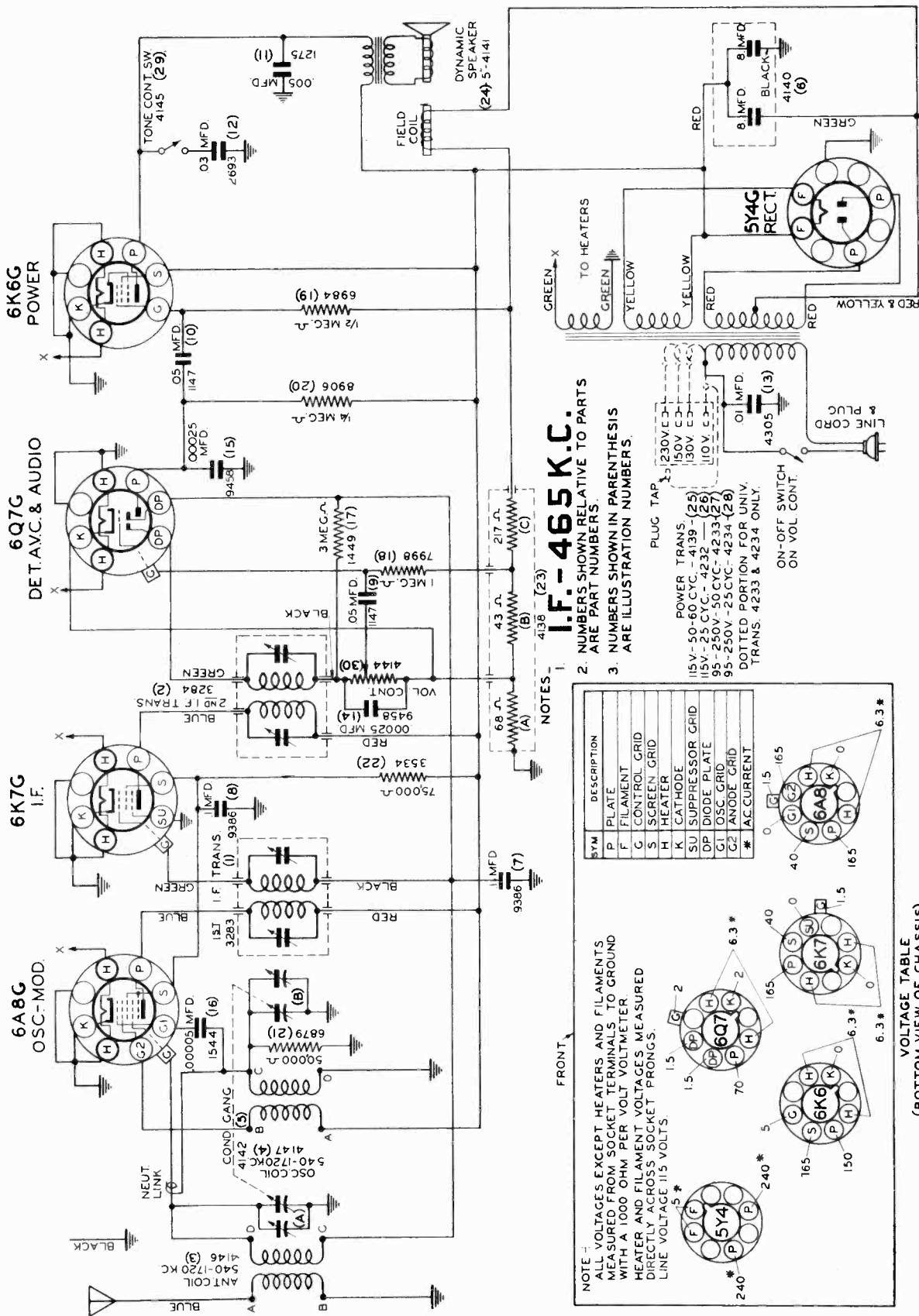
Place band selector switch for operation on.	Set receiver dial to:	Adjust test oscillator frequency to:	Use trimmer potentiometer with test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below and:
1 IF alignment use any band position	Any point where interfering signal is received	Exactly 465 K.C.	.02 Mid. condenser	High side to antenna lead. 6D6G tube. Do not remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output.
1730 to 540 K.C.	Exactly 1730 K.C. Exactly 1400 K.C. Approximately 600 K.C.	Exactly 465 K.C.	.00025 Mid. condenser .00025 Mid. condenser .00025 Mid. condenser	Receiver blue antenna lead Receiver blue antenna lead Receiver blue antenna lead	Adjust 1730 K.C. oscillator trimmer for maximum output. Adjust 1400 K.C. antenna trimmer for maximum output. While rocking gang condenser adjust 600 K.C. oscillator paddler for maximum output.
5.8 to 15.1 M.C. BAND	Exactly 18.7 M.C. Exactly 13 M.C.	Exactly 18.7 M.C. Exactly 13 M.C.	400 Ohm resistor r-400 Ohm carbon resistor	Receiver blue antenna lead Receiver blue antenna lead	Adjust 18.7 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, back off trimmer (add capacity) until the second peak—which is the proper one to use is tuned in.
2	Exactly 13 M.C.	Exactly 13 M.C.		Receiver blue antenna lead	Adjust 13 M.C. antenna trimmer for maximum output.

* Grid cap of 6A7 tube
MODELS 149A, 149AE, and 159AE

MODEL 106A

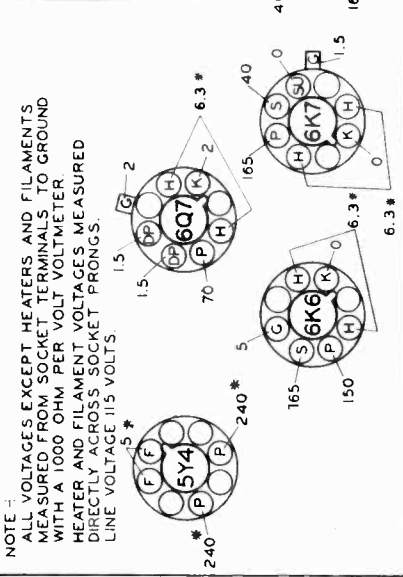
Schematic, Voltage
Socket

SENTINEL RADIO CORP.



I.F. - 465 K.C.
 1. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
 2. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

SYM	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
H	HEATER
K	CATHODE
SU	SUPPRESSOR GRID
DP	DIODE PLATE
G1	OSC GRID
G2	ANODE GRID
*	ACCURRENT



SENTINEL RADIO CORP.

MODEL 106A
MODEL 107AE
Alignment

- (b) Carefully tune in the selected station that broadcasts on the lowest frequency—the least number of kilocycles.
- (c) Place a little mucilage or celluloid on back of paper tab. Press the paper call letter tab—so that the printed call letters of the station tuned in are at the same angle as the printing on the dial—into the round depression on the cabinet front that is nearest to the dial pointer. By placing call letter tab on angle the call letter can easily be read with cabinet in either a horizontal or upright position.

- (d) Tune in the next selected station having the next lowest station frequency, pressing the call letter for this station into the round cabinet depression nearest to the dial pointer needle—continuing on in this way until station call letters have been placed into all nine cabinet depressions.

After the station call letters are set it will be a simple matter to determine the approximate dial position of any of these stations—just rotate tuning knob until dial pointer needle points to station call letter of desired station. It must be remembered that only the approximate tuning location will be indicated by the dial pointer needle—each station must be correctly tuned in by **ROTATING THE TUNING CONTROL KNOB UNTIL A STATION IS TUNED IN WITH GREATEST CLARITY.**

ALIGNMENT PROCEDURE:

Lack of sensitivity, selectivity, or poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, inadequate or excessively long antenna, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proven not to be the cause.

NOTE: BE SURE TO FOLLOW PROCEDURE CAREFULLY WHEN ALIGNING. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS AND PADDING CONDENSERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER.

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

- (a) Connect the ground lead of the test oscillator to the chassis or set ground lead. Connect the other lead of the test oscillator to the grid cap of the 6A8G tube through a .02 Mfd. series condenser. **DO NOT REMOVE GRID CLIP.**
- (b) Set test oscillator to EXACTLY 465 kilocycles and turn receiver volume control on full.
- (c) Peak each of the second I.F. transformer trimmers.
- (d) Peak each of the first I.F. transformer trimmers.

To assure most accurate trimmer setting repeat above adjustment several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING 1720-540 KILOCYCLE BAND:

- (a) Remove test oscillator lead from grid of 6A8G tube and attach it to the receiver antenna lead through a .00025 Mfd. series condenser.
- (b) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line move needle to correct position.
- (c) Set receiver dial and test oscillator frequency to EXACTLY 1720 kilocycles.
- (d) Bring in 1720 KC test oscillator signal to maximum output by adjusting the trimmer condenser mounted on top of the oscillator section of the gang condenser. Looking at the front of the receiver the rear section of the gang condenser is the oscillator section.
- (e) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles.
- (f) Adjust trimmer on top of the front section gang condenser (antenna section) for maximum 1400 kilocycle test signal response.

SENTINEL-ERLA MODEL 107AE**ALIGNMENT PROCEDURE:**

Lack of sensitivity, selectivity, or poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, inadequate or excessively long antenna, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proven not to be the cause.

NOTE: BE SURE TO FOLLOW PROCEDURE CAREFULLY WHEN ALIGNING. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS AND PADDING CONDENSERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM. IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER.

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

- (a) Connect the ground lead of the test oscillator to the chassis or set ground lead. Connect the other lead of the test oscillator to the grid cap of the 6A7 tube through a .02 Mfd. series condenser. **DO NOT REMOVE GRID CLIP.**
- (b) Set test oscillator to EXACTLY 465 kilocycles and turn receiver volume control on full.
- (c) Peak each of the second I.F. transformer trimmers.
- (d) Peak each of the first I.F. transformer trimmers.
- To assure most accurate trimmer setting repeat above adjustment several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING 1720-540 KILOCYCLE BAND:

- (a) Remove test oscillator lead from grid of the 6A7 tube and attach it to the receiver antenna lead through a .00025 Mfd. series condenser.
- (b) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line move needle to correct position.
- (c) **PLACE BAND SELECTOR SWITCH FOR 1720-540 K.C. OPERATION. PRESS IN MANUAL PUSH-BUTTON AND SET RECEIVER DIAL AND TEST OSCILLATOR FREQUENCY TO EXACTLY 1720 KILOCYCLES.** Bring in 1720 KC test oscillator signal to maximum output by adjusting the trimmer condenser mounted on top of the oscillator section of the gang condenser. Looking at the front of the receiver the rear section of the gang condenser is the oscillator section.
- (d) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles.
- (e) Adjust trimmer on top of the front section gang condenser (antenna section) for maximum 1400 kilocycle test signal response.
- (f) Tune receiver dial and set test oscillator frequency to approximately 600 kilocycles.
- (g) While rocking the tuning condenser back and forth adjust 600 KC oscillator padding condenser which is accessible through the hole in the top of chassis adjacent to the gang condenser for maximum 600 kilocycle signal response.

ALIGNING 2.3-6.3 MEGACYCLE BAND:

- (a) Replace .00025 Mfd. test oscillator antenna lead series condenser with a 400 ohm resistor.
- (b) Adjust band selector switch for 2.3-6.3 megacycle band operation, tune receiver dial and set test oscillator frequency to EXACTLY 6.3 megacycles.
- (c) Bring in 6.3 megacycle test oscillator signal to maximum output by adjusting 6.3 M.C. oscillator trimmer.
- (d) Tune receiver dial and test oscillator frequency to EXACTLY 6 megacycles, and adjust 6 M.C. antenna trimmer for maximum sensitivity.

MODEL 106A

FOR TRIMMER LOCATIONS
AND CHASSIS, SEE INDEX

THIS RADIO IS DESIGNED SO THAT IT MAY BE PLACED IN A HORIZONTAL OR UPRIGHT POSITION. AS THE OPERATION AND PERFORMANCE OF THE RECEIVER IS THE SAME IN EITHER POSITION, IT IS A MATTER OF PERSONAL PREFERENCE AS TO WHICH POSITION TO USE.

The approximate position on the dial that any nine stations will be tuned in may be quickly determined—by pressing a paper tab having the station call letters into the round depressions on the front of the cabinet.

THE STATIONS SELECTED MUST OPERATE ON A FREQUENCY 40 KILOCYCLES OR MORE APART. OTHERWISE IT WILL BE IMPOSSIBLE TO PLACE THE CALL LETTER TABS IN THEIR PROPER POSITION IN CABINET DEPRESSIONS.

While it will be found that only the approximate location will be indicated, the station call tabs properly located will be an extremely helpful tuning aid.

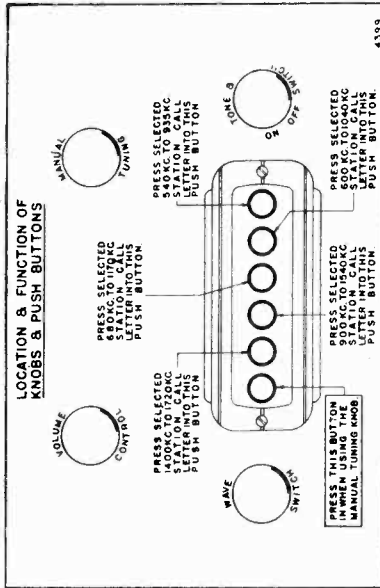
To set the proper station call letter tabs into the cabinet depressions proceed as follows:

- (a) Determine which nine stations call letters you wish to have on the cabinet—press call letter tabs out of the call letter sheets provided.

SENTINEL RADIO CORP.

MODEL 107AE
MODEL 145AE
Tuner Data

Sentinel Model 107AE



- (i) With a small screw driver carefully tune in the selected 540-600 kilocycle broadcast band by slowly adjusting trimmer 1B. Be sure to adjust trimmer 1B. BE SURE TO WATCH TUNING EYE AND ADJUST TRIMMERS SO THAT THE TWO OPEN ENDS OF THE GREEN INVERTED "V" ON THE TUNING EYE ARE CLOSEST TOGETHER. GREATEST VOLUME AND CLEAREST TONE.
- (j) Moisture gummed back of selected 540-600 KC stations paper tab and press into round depression in 540-835 KC push button.
- (k) After trimmers 1A and 1B have been properly set for the station operating between 540-600 kilocycles, adjust other trimmers in the same manner and in the following order:
 - (l) Set trimmers 2A and 2B for selected station operating between 600-1040 kilocycle.
 - (m) Adjust trimmers 3A and 3B for selected station operating between 900-1540 kilocycles.
 - (n) Set trimmers 4A and 4B for selected station operating between 1040-1720 kilocycles.
 - (o) Adjust trimmers 5A and 5B for selected station operating between 1400-1720 kilocycles.

INSTRUCTIONS FOR INSTALLING AND OPERATING "AUTOMATIC PUSH BUTTON"

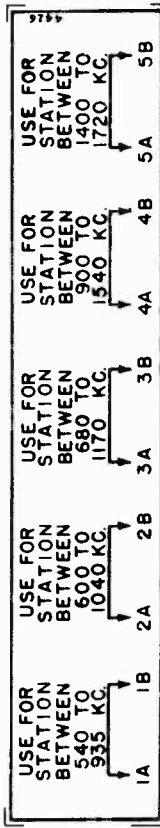
Five stations operating in the 1720-540 kilocycle broadcast band may be "AUTOMATIC PUSH-BUTTON" tuned by properly setting the ten trimmer screws, accessible through holes in the back of the chassis.

AS THE PUSH-BUTTONS ARE NOT PRE-SET AT THE FACTORY FOR ANY TRIMMER, IT IS IMPORTANT TO SET THEM AS FOLLOWS:

- (a) It is important to have the serial, which will be used with the set, attached to the radio when adjusting the trimmers. OPERATE THE SET AT LEAST ONE-HALF HOUR BEFORE ADJUSTING TRIMMERS. Thoroughly warmed up when trimmers are adjusted, the trimmers may shift position after they become warm resulting in poor tone, weak signal, and excessive background noise.
- (b) OPERATE THE SET AT LEAST ONE HOUR BEFORE ADJUSTING TRIMMERS. Obtain the transmitter frequency number of kilocycles and call letters of the stations you wish to "Push-Button" tune.
- (c) Place band selector switch for operation on 1720-540 kilocycle band.
- (d) Turn "MANUAL" tuning button—see diagram.
- (e) It is desirable to set the transmitter frequency in somewhere between 540-835 kilocycles that the two trimmers marked "540-835 K.C." on paper label attached to back of chassis be adjusted first.
- (f) Using "MANUAL" tuning knob carefully tune in selected station whose transmitter frequency is between 540-835 kilocycles.
- (g) Press in push-button marked "540-835 K.C."—see diagram. STATION SIGNAL WILL DISAPPEAR, OR MAY BE DISTORTED, AND IN SOME INSTANCES THE STATION WILL BE HEARD.

AS THE TRIMMERS BE USED TO LOOSELY OR TOO TIGHTLY ADJUSTED IT IS IMPORTANT THAT THE PROPER TRIMMERS BE USED.

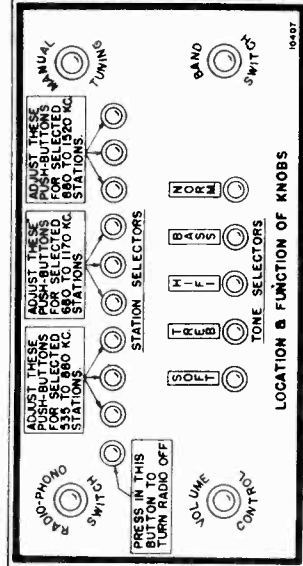
It may be noticed that the transmitter frequency—number of kilocycles—of a selected station falls within the range of more than one group of trimmers. Generally the transmitter frequency of the selected station will fall well within the minimum and maximum range of one set of trimmers—this is the right group of trimmers to use. For example, if a selected station transmitter frequency is 600 kilocycles it would be possible to use trimmers 2A and 2B or trimmers 3A and 3B. In some instances it may be necessary after the set is operated for a period of time to reset the trimmers as they may drift due to heat, humidity, etc.



This diagram, which is similar to the one attached to the back of chassis over trimmer holes, shows the minimum-maximum range of the five groups of trimmers.

IMPORTANT: WHEN LISTENING TO STATIONS ON BROADCAST BAND, THE "MANUAL PUSH BUTTON" OR ONE OF THE OTHER "PUSH BUTTONS" MUST BE PUSHED IN—OTHERWISE NO STATION WILL BE HEARD. DO NOT PRESS IN MORE THAN ONE "PUSH BUTTON" AT ONE TIME—IF MORE THAN ONE "PUSH BUTTON" IS PRESSED INWARD ONLY THE HIGHEST FREQUENCY STATION WILL BE HEARD.

Sentinel Model 145AE



PUSH-BUTTON ADJUSTMENT

Nine stations operating in the 1500-540 kilocycle band may be automatically push button tuned by properly setting each station selector push button. AS THE PUSH BUTTONS ARE NOT PRE-SET AT THE FACTORY FOR ANY DEFINITE STATIONS BE SURE TO SET EACH ONE.

Before Attempting to Set Push Buttons Be Sure to:

- (a) Have aerial which will be used with the radio attached to the receiver when setting push buttons.
- (b) Operate radio at least 15 minutes before adjusting push buttons.
- (c) Obtain transmitter frequency—number of kilocycles—and call letters of the nine stations you wish to push button tune from radio log or newspaper radio station list.

Adjust Push Buttons for Selected Stations by:

- (a) Rotate band switch to the NEXT TO MAXIMUM RIGHT HAND POSITION—540-1730 KILOCYCLE BAND MANUAL TUNING POSITION.
- (b) Using regular manual tuning knob carefully tune in one of the selected stations whose transmitter frequency is somewhere between 535-880 kilocycles. Make a mental note of the kind of program on this station, so that when push button is adjusted for this particular station (as instructed in paragraph (e)) it will be easy to recognize the station by the type of program being transmitted.
- (c) Rotate band switch knob to maximum right hand position.
- (d) Press in one of the three push buttons marked 535-880 kilocycles on diagram. NOTE: STATION MAY DISAPPEAR, BE DISTORTED OR IN SOME INSTANCES ANOTHER STATION MAY BE HEARD.
- (e) GRASP END OF PUSH BUTTON JUST PRESSED IN AND BY SLOWLY TURNING THIS BUTTON CAREFULLY TUNE IN THE SELECTED 535-880 KILOCYCLE STATION THAT WAS PREVIOUSLY TUNED IN WITH MANUAL CONTROL. Slowly—turn first in one direction, then if the wanted station is not heard turn in opposite direction. WATCH TUNING EYE AND ADJUST SO THAT THE TWO OPEN ENDS OF THE GREEN INVERTED "V" ON THE TUNING EYE ARE CLOSEST TOGETHER, AT WHICH POINT THE SIGNAL WILL BE HEARD WITH GREATEST VOLUME AND CLEAREST TONE.
- (f) Press station call letter of the station just tuned in out of call letter sheet supplied and insert into depression adjacent to push button just adjusted.
- (g) After the first 535-880 kilocycle push button has been properly set, the other eight push buttons should be adjusted in the same manner preferably in the following order:
 1. Set remaining two push buttons marked 535-880 kilocycles on diagram for any two stations operating between 535-880 kilocycles.
 2. The three push buttons marked 680-1170 kilocycles on diagram should be adjusted for any three selected stations operating between 680 and 1170 kilocycles.
 3. Adjust the three push buttons marked 880-1520 kilocycles on diagram for any three selected stations operating between 880 and 1520 kilocycles.

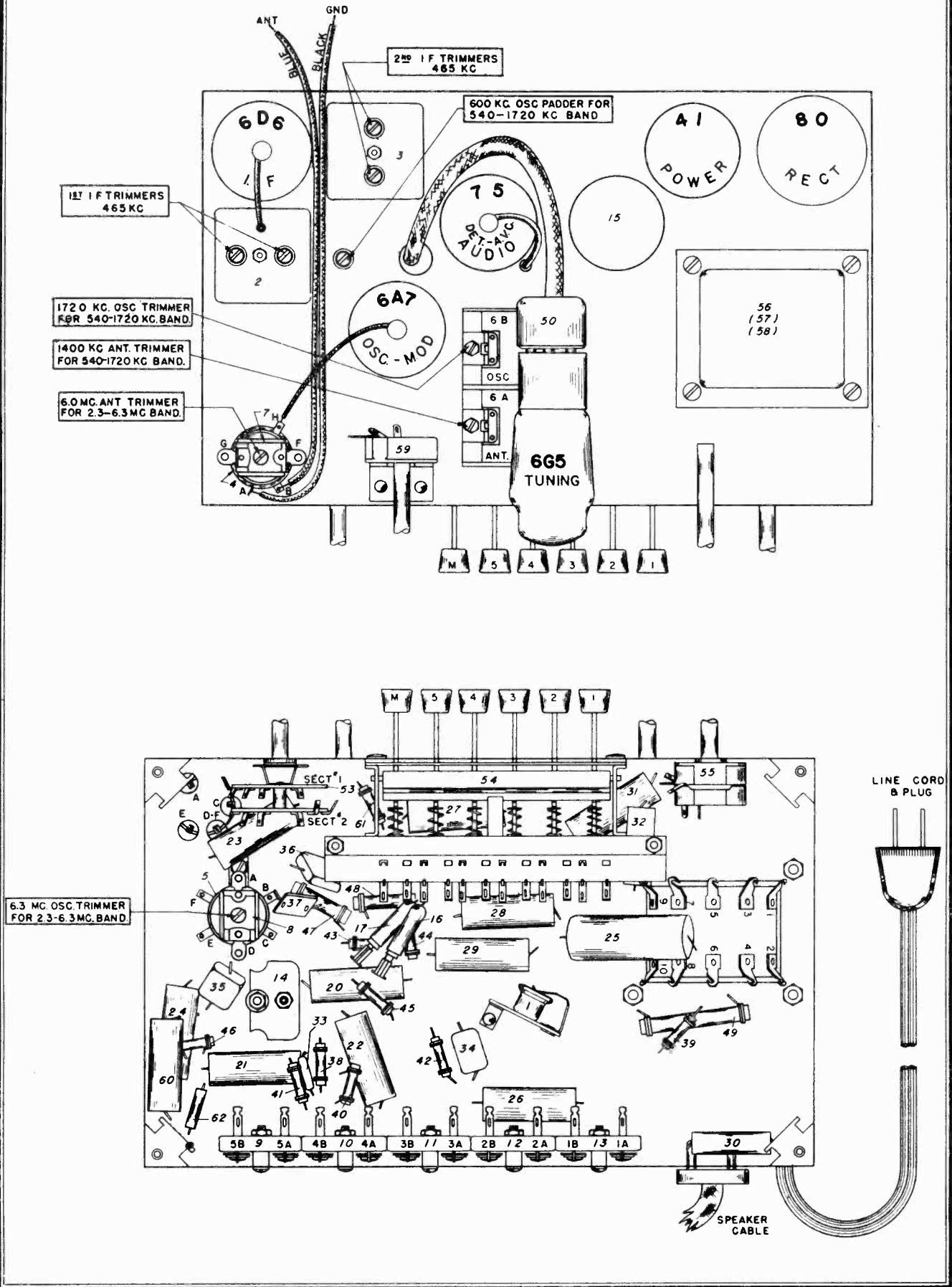
IMPORTANT

For Manual Tuning the Band Switch must be in next to maximum right hand position. When adjusting Push Buttons or when Push Button tuning after Push Buttons have been set, Band Switch must be in maximum right hand position.

MODEL 107AE

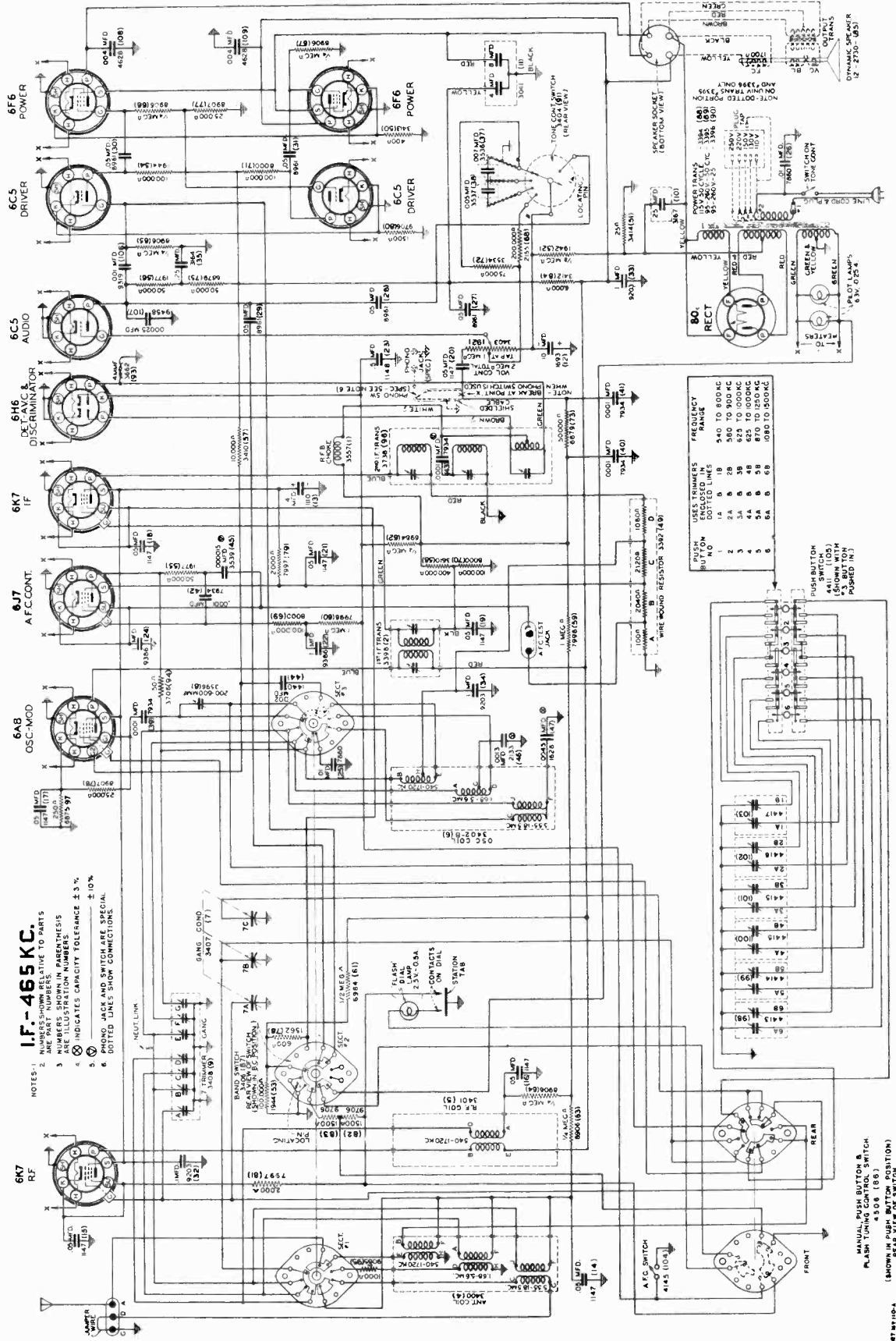
Trimmers, Chassis

SENTINEL RADIO CORP.



SENTINEL RADIO CORP.

MODEL 110A Schematic



IF - 465 KC.

NOTES - 1. PART NUMBERS SHOWN IN PARENTHESES ARE PART NUMBERS SUBSTITUTIVE TO PARTS.
 2. NUMBERS SHOWN IN PARENTHESES ARE TOLERANCE INDICATORS.
 3. NUMBERS SHOWN IN PARENTHESES ARE TOLERANCE INDICATORS.
 4. INDICATES CAPACITY TOLERANCE ± 3%.
 5. INDICATES CAPACITY TOLERANCE ± 10%.
 6. DOTTED LINES AND SWITCH ARE SPECIAL.
 7. DOTTED LINES SHOW CONNECTIONS.

PUSH BUTTON	USES TRIMMERS ENCLOSED IN	FREQUENCY RANGE
1	A	940 TO 800 KC
2	2A	360 TO 800 KC
3	3A	825 TO 800 KC
4	4A	870 TO 800 KC
5	5A	870 TO 800 KC
6	6A	870 TO 800 KC

MANUAL PUSH BUTTON 4413 (105)
 FLASH (JUNGLE CONTROL) SWITCH 4308 (88)
 (SHOWN IN PUSH BUTTON POSITION) RELAY VIEW SWITCH

MODEL 110A

Socket, Voltage Alignment

SENTINEL RADIO CORP.

(e) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles. Adjust 1400 K.C. R.F. and antenna trimmers for maximum sensitivity.

(f) Set test oscillator frequency and receiver dial to approximately 600 kilocycles. Then while rocking gang condenser slightly to right and left, adjust 600 K.C. oscillator paddler for maximum signal response.

ALIGNING 1.68-5.6 MEGACYCLE BAND:

(a) Replace .00025 Mfd. test oscillator antenna lead series condenser with a 400 ohm resistor.

(b) Adjust band selector switch to 1.68-5.6 megacycles, tune receiver dial and set test oscillator frequency to EXACTLY 5.6 megacycles. Bring in 5.6 megacycle test signal to maximum output by adjusting 5.6 M. C. oscillator trimmer.

(c) Tune receiver dial and test oscillator frequency to EXACTLY 6 megacycles and adjust 5 M.C. antenna trimmer for maximum sensitivity.

ALIGNING 5.55-18.5 MEGACYCLE BAND:

(a) Leave 400 ohm resistor in series with test oscillator lead and place band selector switch for operation on 5.55-18.5 megacycle band, tune receiver dial and set test oscillator frequency to EXACTLY 18.5 megacycles.

(b) Adjust 18.5 M.C. oscillator trimmer to bring in 18.5 megacycle test signal to maximum output.

NOTE: When adjusting this trimmer two peaks, the fundamental and the image peak will be noticed. CARE MUST BE TAKEN THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 18.5 MEGACYCLES. Always back off the trimmer to minimum capacity, then screw down the trimmer (add capacity) until the FIRST peak which is the fundamental and the proper one to use is tuned in. If the trimmer is screwed down beyond the point where the first peak is received the incorrect image peak will be tuned in. After completing adjustment of the oscillator trimmer at 18.5 megacycles, always check to see if the proper peak has been used. To do this leave test oscillator frequency at 18.5 megacycles, increase the output of the test oscillator and tune receiver dial to approximately 17.5 megacycles. Then vary the receiver dial slightly to the right and left of 17.5 megacycles, and if the fundamental peak was used in aligning at 18.5 megacycles the test oscillator signal will be heard at approximately 17.5 megacycles on the receiver dial.

(c) Tune receiver dial and set test oscillator frequency to EXACTLY 15 megacycles. Rock gang condenser slightly to right and left and adjust 15 M.C. antenna trimmer for maximum 15 megacycle test signal response.

To assure more accurate trimmer setting, repeat all above adjustments several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

(c) Turn receiver on, place A.F.C. switch knob in left position and if meter needle jumps off scale adjust output of test oscillator until an approximate 2 M.A. deflection is obtained on the 0 to 5 milliammeter scale.

(d) Place band selector switch for operation on 1720-540 K.C. broadcast band—and set receiver dial somewhere near 1000 kilocycles at a point where no station is heard.

(e) Rotate A.F.C. switch knob from maximum left hand to middle position and note whether the milliammeter reading changes as the position of the A.F.C. switch is changed. No change in reading indicates probable proper discriminator trimmer adjustment, while a noticeable change indicates improper discriminator trimmer adjustment.

(f) IMPORTANT: DO NOT ADJUST DISCRIMINATOR TRIMMER UNLESS IT IS ABSOLUTELY NECESSARY. Place A.F.C. switch in middle position and note milliammeter reading, then place A.F.C. switch in maximum left hand position. With A.F.C. switch in maximum left hand position, CAREFULLY ADJUST DISCRIMINATOR TRIMMER UNTIL MILLIAMMETER READING IS EXACTLY THE SAME IN BOTH POSITIONS.

NOTE: As the discriminator trimmer screw is screwed in (increasing capacity) the milliammeter reading should decrease and as the discriminator trimmer is unscrewed (decreasing capacity) the milliammeter reading should increase. IF WHEN ADJUSTING THE DISCRIMINATOR TRIMMER THE MILLIAMMETER READING DOES NOT SHARPLY INCREASE OR DECREASE AS THE TRIMMER IS ADJUSTED EVEN AFTER SEVERAL TURNS OF THE TRIMMER SCREW, THIS DOES NOT INDICATE PROPER BALANCING BUT DOES INDICATE INCORRECT ADJUSTMENT AND THE DISCRIMINATOR TRIMMER SHOULD BE SET TO ABOUT 1/2 CAPACITY AND THE ADJUSTMENT OF THE DISCRIMINATOR TRIMMER MADE ALL OVER AGAIN.

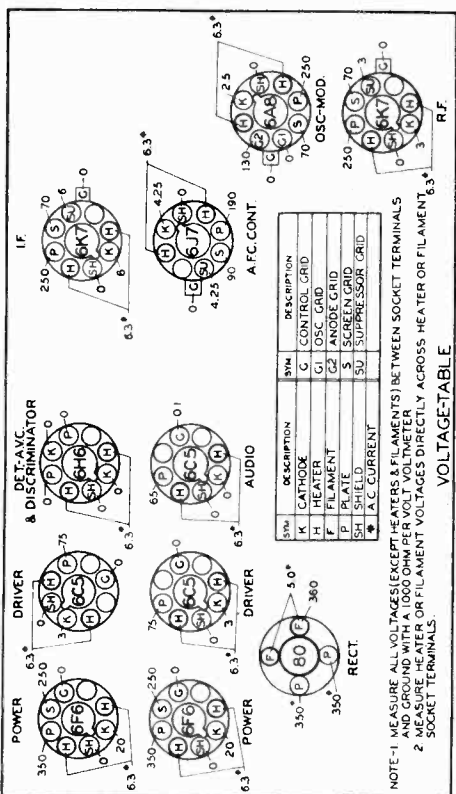
ALIGNING 1720-540 KILOCYCLE BAND:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line, move needle to correct position.

(b) Remove test oscillator lead from grid of 6A8 tube and connect to receiver "A" antenna post through a .00025 Mfd. condenser.

(c) Place A.F.C. control knob in middle A.F.C. "off" position. Adjust band selector switch for operation on the 1720-540 kilocycle band.

(d) Set test oscillator frequency and receiver dial to EXACTLY 1720 kilocycles, and BRING IN 1720 KILOCYCLE TEST OSCILLATOR SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING 1720 KILOCYCLE OSCILLATOR TRIMMER.



ALIGNMENT PROCEDURE:

1. Do not align set until it has reached normal operating temperature. Place the receiver in operation at least 15 minutes before attempting to realign the set.
2. The importance of using the proper type of test equipment and FOLLOWING THE ALIGNMENT PROCEDURE EXACTLY AS GIVEN CANNOT BE TOO STRONGLY EMPHASIZED—failure to do so will result in low sensitivity, poor selectivity, incorrect dial calibration, distortion and unsatisfactory operation of the automatic frequency control.
3. It is absolutely necessary that an accurately calibrated test oscillator with some type of output measuring device and a double scale milliammeter—0 to 1 M. A. and 0 to 5 M.A. be used.

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

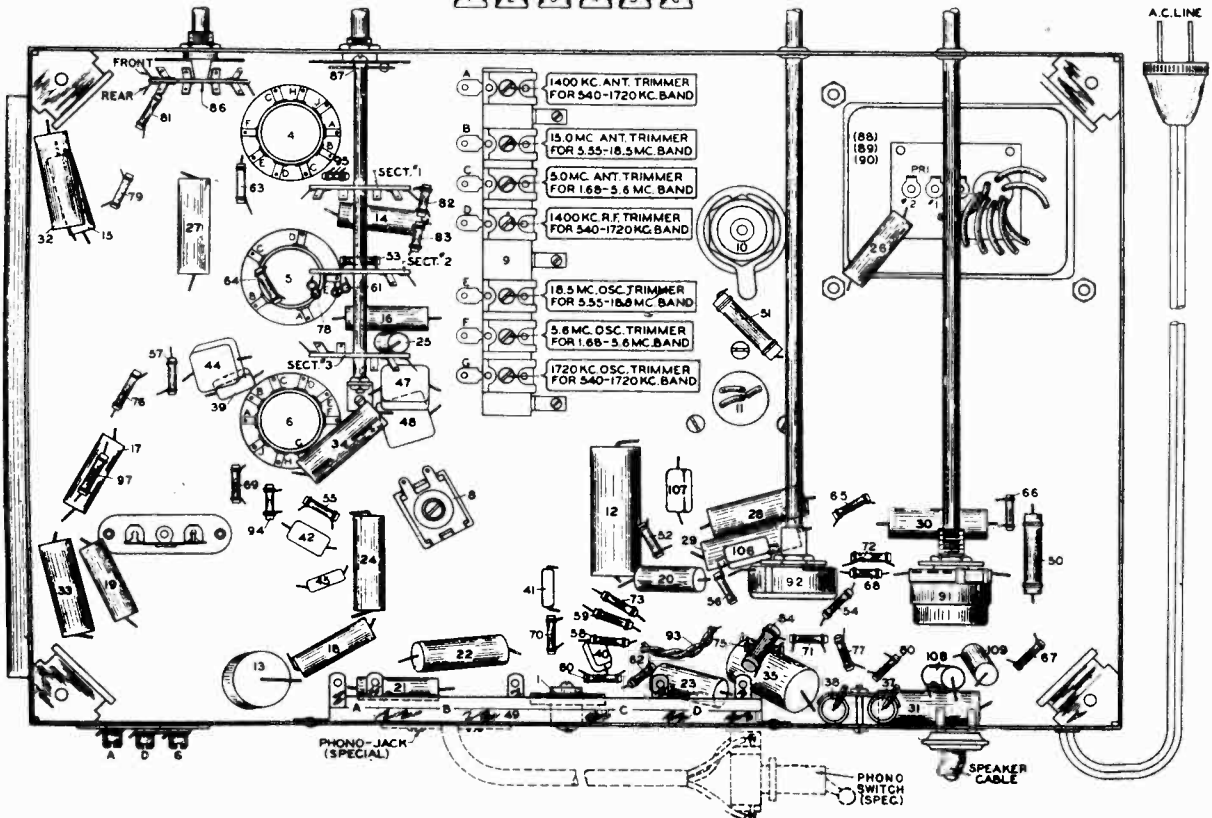
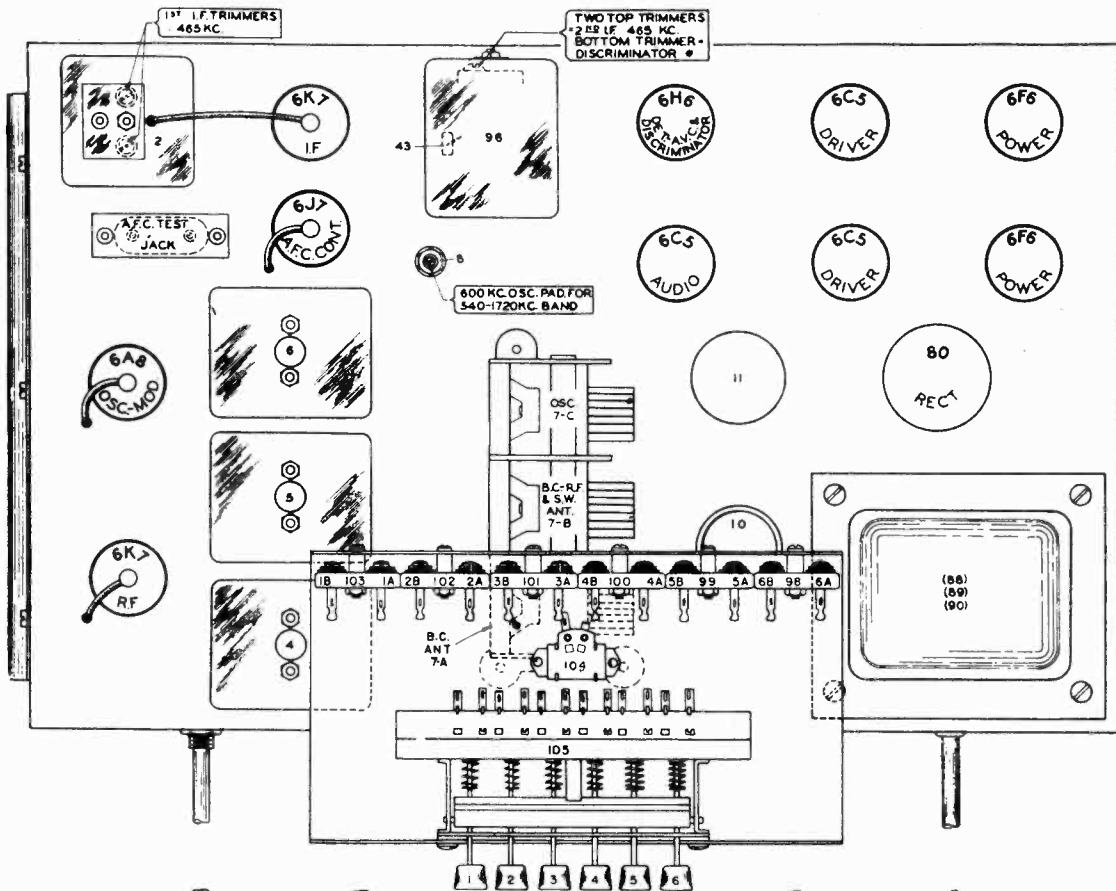
- (a) Place automatic frequency control knob in the middle A.F.C. "off" position.
- (b) Attach the ground lead of the test oscillator to the chassis. Connect the other lead to the grid cap of the 6A8 tube through a .02 Mfd. series condenser. DO NOT REMOVE GRID CLIP.
- (c) Set test oscillator to EXACTLY 465 kilocycles and turn volume control on full.

ALIGNING DISCRIMINATOR CIRCUIT:

- (a) Place switch underneath push button plate assembly (above gang condenser) in A.F.C. "on" position. Leave test oscillator set to EXACTLY 465 KILOCYCLES and connect to grid of 6A8 tube through a .02 Mfd. Condenser—insert lead of double scale 0 to 1 and 0 to 5 milliammeter into A.F.C. test jack located on top of chassis adjacent to the 6A7 tube. To avoid possibility of damaging the meter should one of the milliammeter leads short to the metal chassis, ALWAYS TURN OFF RECEIVER WHEN INSERTING OR REMOVING MILLIAMMETER LEADS FROM A.F.C. TEST JACK.
- (b) Short out A.F.C. mute switch by grounding the second from the left (looking at the front of the chassis) of the four lugs mounted on top of the dial assembly. The proper lug to ground is indicated in the "Note X" on chassis top parts view.

SENTINEL RADIO CORP.

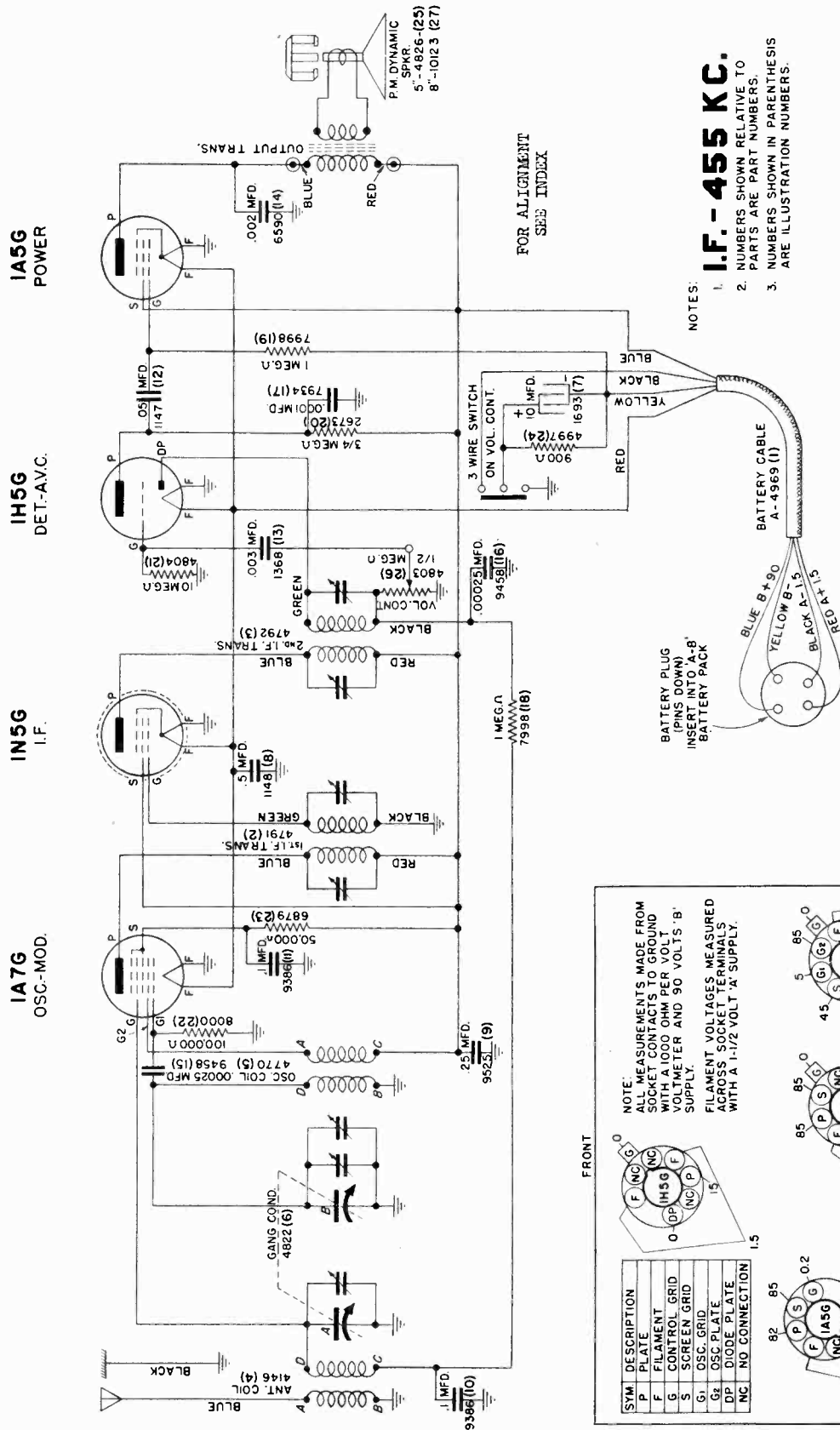
MODEL 110A
Trimmers
Chassis



MODEL 118B

Schematic, Voltage
Socket

SENTINEL RADIO CORP.



FOR ALIGNMENT
SEE INDEX

I.F. - 455 KC.
 1. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
 2. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

BATTERY PLUG
(PINS DOWN)
INSERT INTO 'A-B'
BATTERY PACK

NOTE: ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1000 OHM PER VOLT VOLTMEETER AND 90 VOLTS 'B' SUPPLY. FILAMENT VOLTAGES MEASURED ACROSS SOCKET TERMINALS WITH A 1-1/2 VOLT 'A' SUPPLY.

FRONT

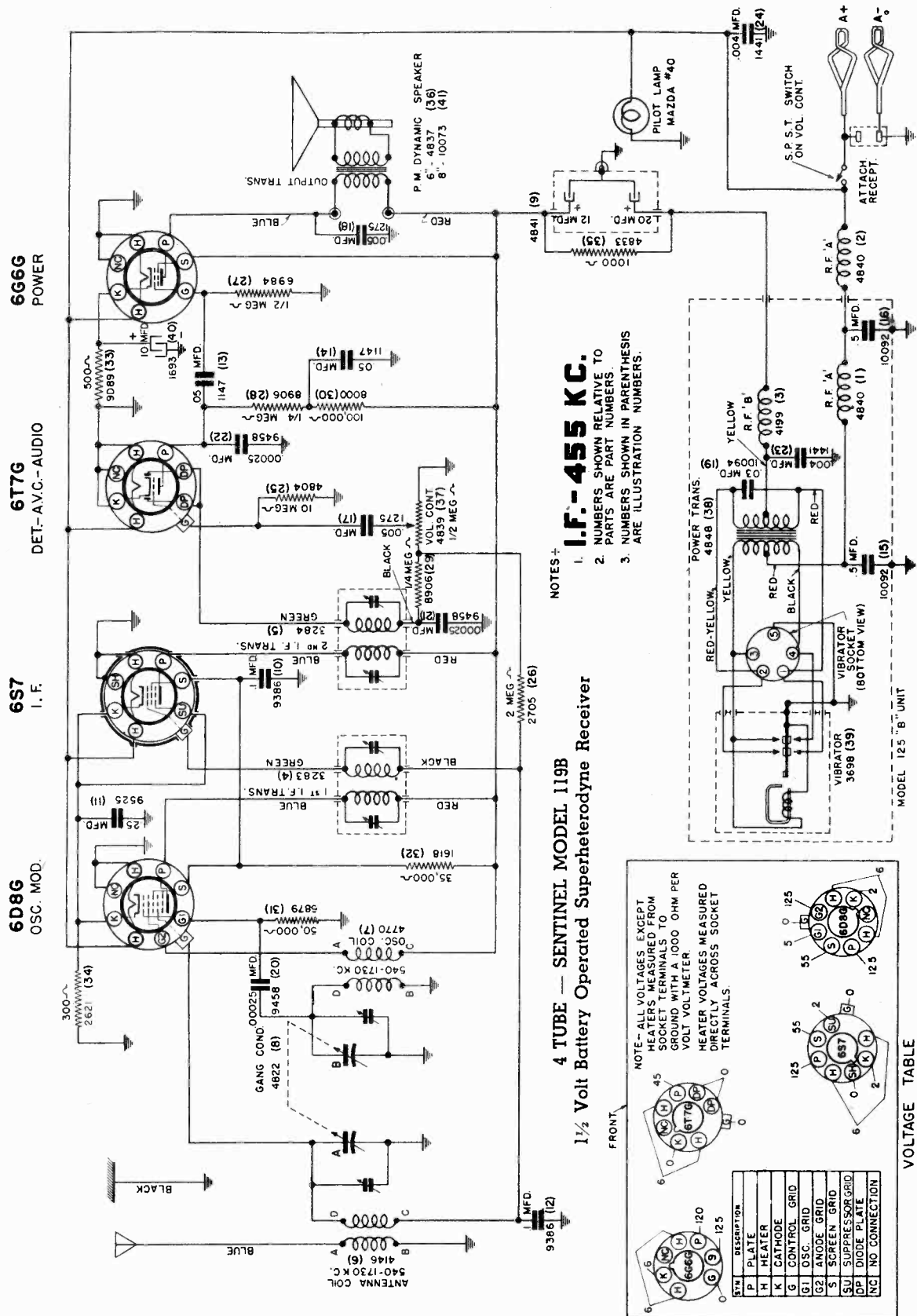
SYM	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G ₁	OSC. GRID
G ₂	OSC. PLATE
DP	DIODE PLATE
NC	NO CONNECTION

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

4 TUBE — SENTINEL MODEL 118B
 1 1/2 Volt Battery Operated Superheterodyne Receiver

SENTINEL RADIO CORP.

MODEL 119B
Schematic, Voltage
Socket



NOTES:
I.F. - 455 KC.
 1. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
 2. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

4 TUBE — SENTINEL MODEL 119B
 1 1/2 Volt Battery Operated Superheterodyne Receiver

NOTE - ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

FRONT

SYM	DESCRIPTION
P	PLATE
H	HEATER
K	CATHODE
G	CONTROL GRID
G1	OSC. GRID
G2	ANODE GRID
SU	SCREEN GRID
S1	SUPPRESSOR GRID
DI	DIODE PLATE
NC	NO CONNECTION

VOLTAGE TABLE
 (BOTTOM VIEW OF CHASSIS)

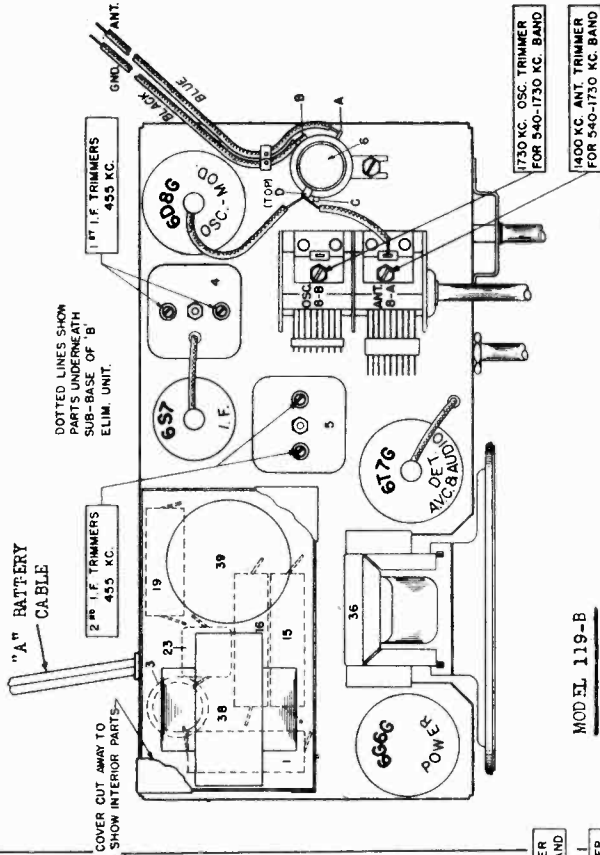
MODEL 118B

MODEL 119B

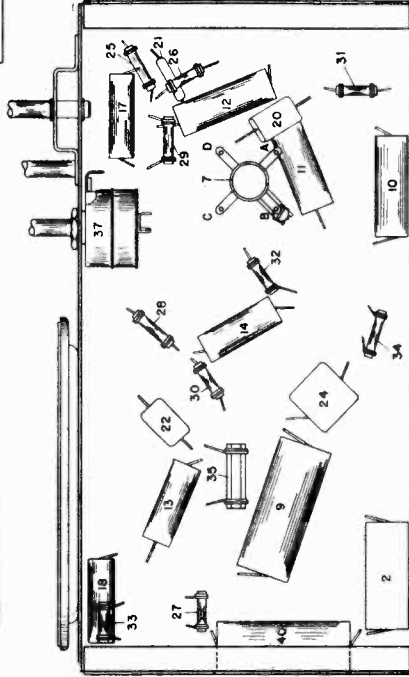
Alignment, Trimmers
Chassis

SENTINEL RADIO CORP.

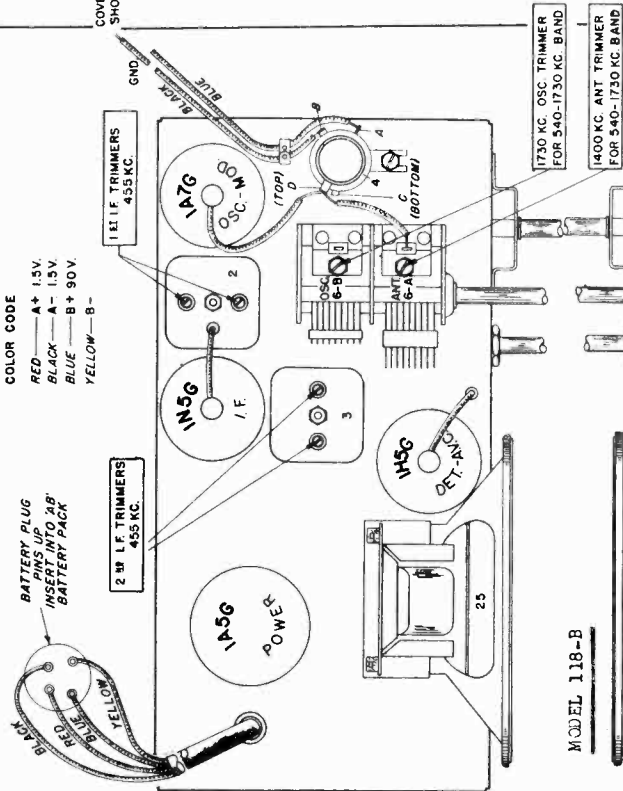
ALIGNMENT:— I.F. 455 KC THROUGH A .02 MFD. CONDENSER TO GRID CAP OF 6S8G TUBE—DO NOT REMOVE CAP— ADJUST IF TRIMMERS TO MAXIMUM OUTPUT. AT 1730 KC THROUGH .00025 MFD. CONDENSER TO RECEIVER ANTENNA (BLUE) LEAD, ADJUST OSCILLATOR TRIMMER TO MAX. AT 1400 KC, ANTENNA TRIMMER TO MAX.



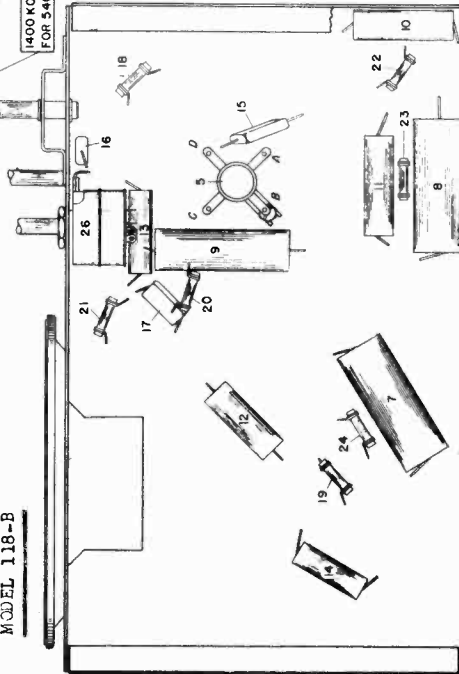
MODEL 119-B



ALIGNMENT:— I.F. 455 KC THROUGH A .02 MFD. CONDENSER TO GRID CAP OF 1A7G TUBE—DO NOT REMOVE GRID CAP—ADJUST IF TRIMMERS TO MAXIMUM OUTPUT AT 1730 KC THROUGH .00025 MFD. CONDENSER TO RECEIVER ANTENNA (BLUE) LEAD, ADJUST OSCILLATOR TRIMMER TO MAXIMUM. AT 1400 KC ANT. TRIMMER TO MAX.

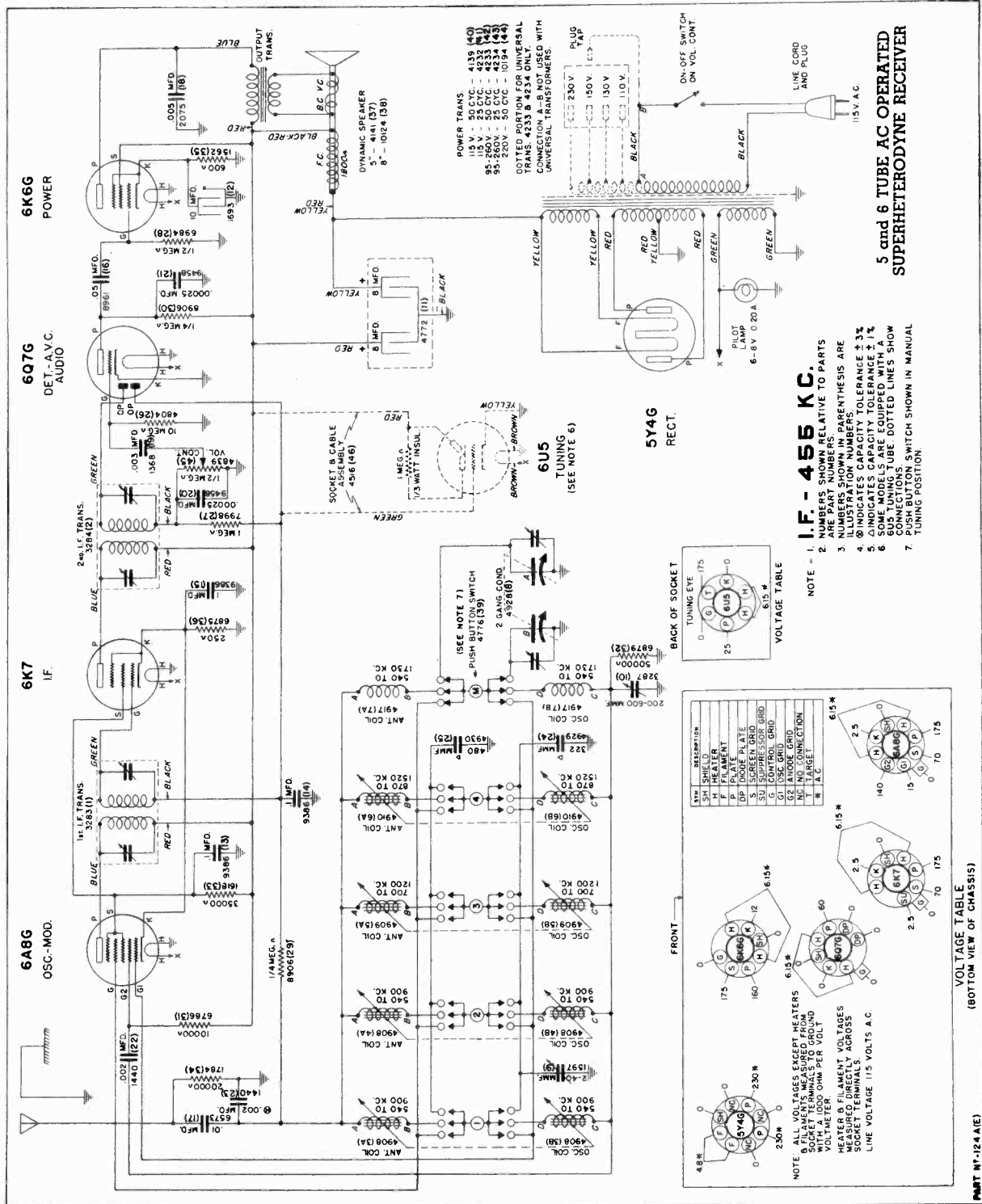


MODEL 118-B



SENTINEL RADIO CORP.

MODELS 124A, 124AE
Schematic, Voltage
Socket



MODELS 124A, 124AE
Alignment, Trimmers
Chassis

SENTINEL RADIO CORP.

ALIGNMENT PROCEDURE IN TABULATED FORM

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line needle to correct position.

(b) Use an accurately calibrated test oscillator with some type of output measuring device.

(c) Have ground lead of test oscillator attached to chassis.

(d) Press in manual tuning button.

TEST OSCILLATOR		Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
Set receiver dial to:	Adjust test oscillator frequency to:			Use dummy antenna in series with output of test oscillator consisting of:
Any point where no interfering signal is received	455 K. C.	.02 MFD. Condenser	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
(1) Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD. condenser	Adjust 1730 K. C. oscillator trimmer for maximum output.
(2) Exactly 1400 K. C.	Approx. 1400 K. C.	.00025 MFD. condenser	Adjust 1400 K. C. antenna trimmer for maximum output.
(3) Approx. 600 K. C.	Approx. 600 K. C.	.00025 Mfd. condenser	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum response.

NOTE: 870 K.C. oscillator trimmer need be adjusted only if 870-1520 K.C. Push Button does not tune from 870 to 1520 K.C. If necessary to adjust, proceed by:

(a) Attach test oscillator to set antenna and ground leads.

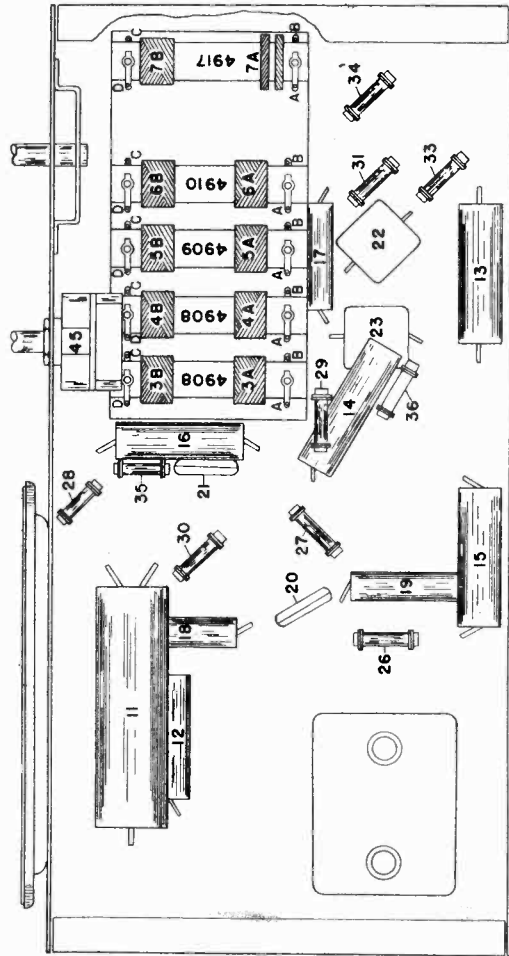
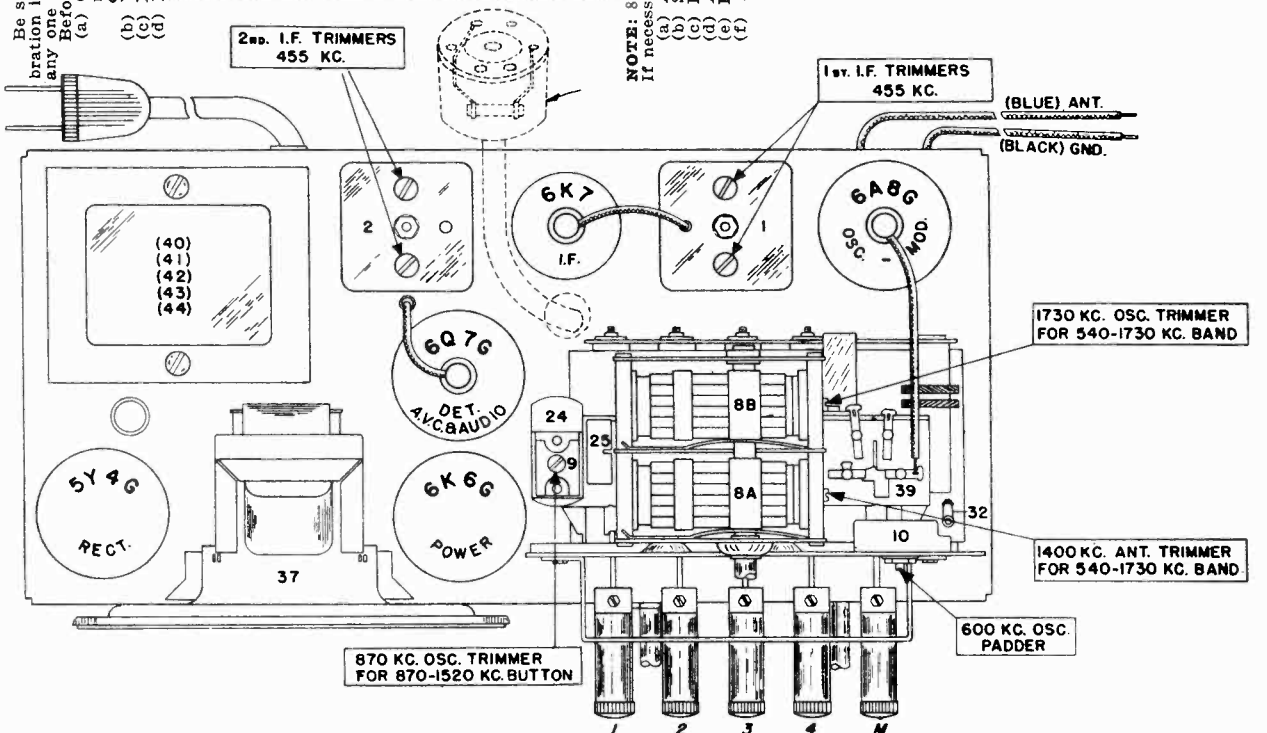
(b) Set test oscillator to exactly 850 K.C.—with attenuator adjusted for maximum signal output.

(c) Press in 870-1520 K.C. push button.

(d) Adjust 870-1520 K.C. oscillator push button to bring in 850 K.C. test signal to maximum output & leave in this position.

(e) Reset test oscillator frequency to exactly 870 K.C.

(f) Adjust 870 K.C. oscillator trimmer to bring in 870 K.C. test oscillator signal to maximum output.



MODELS 142A, 142AE

MODEL 143L

Alignment

SENTINEL RADIO CORP.

MODEL 125AE

Alignment, Trimmers

Chassis

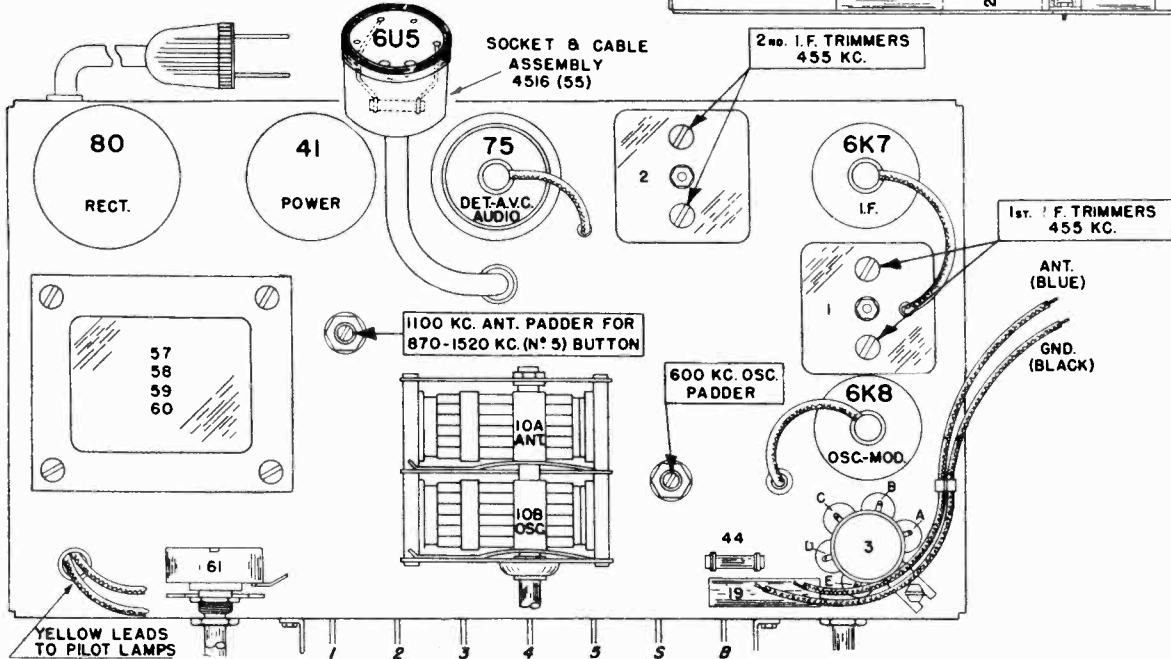
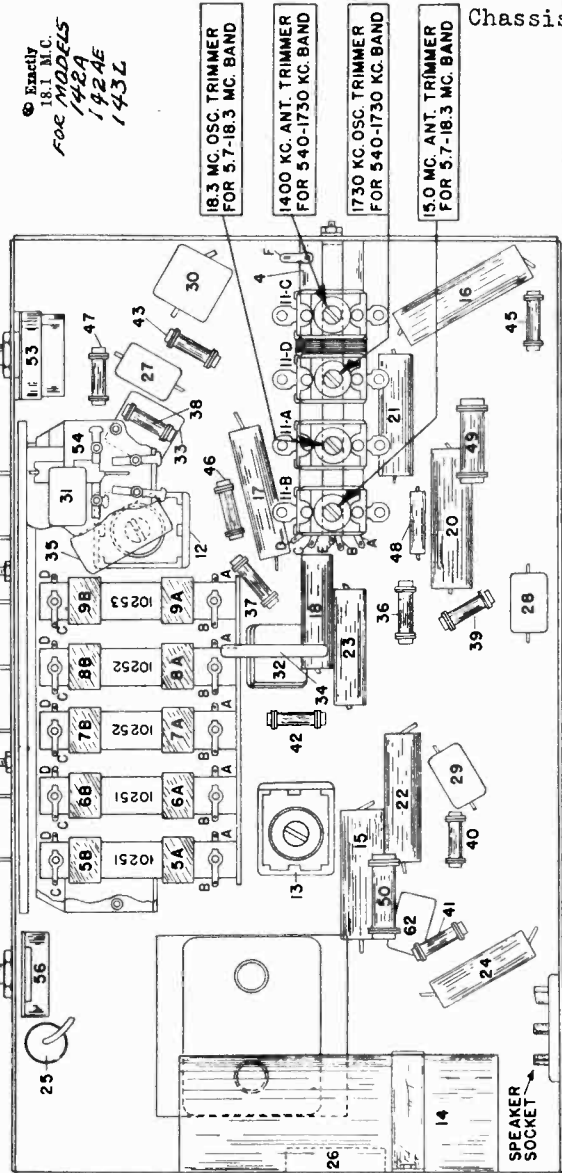
ALIGNMENT PROCEDURE IN TABULATED FORM

- (a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.
- (b) Use an accurately calibrated test oscillator with some type of output measuring device.
- (c) Have ground lead of test oscillator attached to chassis.
- (d) Push in manual push button.

TEST OSCILLATOR		Refer to parts layout diagram for location of trimmers mentioned below.
Place band switch for operation on:	Set receiver dial to:	Adjust test oscillator frequency to:
I.F. alignment use any band position	Any point where no interfering signal is received	Exactly 455 K.C.
1730 to 540 K.C. Band	(1) Exactly 1730 K.C. (2) Exactly 1400 K.C. (3) Approx. 600 K.C.	High side to grid cap of 6K8 tube. Do not remove cap. Receiver blue antenna lead Receiver blue antenna lead Receiver blue antenna lead
5.7 to 18.3 M.C. Band	(1) Exactly 18.3 M.C. (2) Exactly 15 M.C.	Adjust 1730 K.C. oscillator trimmer for maximum output. While rocking gang condenser adjust 1400 K.C. antenna trimmer for maximum output. While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output. Adjust 18.3 M.C. oscillator trimmer for maximum output. Be sure to use correct peak. If more than one peak is observed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use is tuned in. While rocking gang condenser adjust 15 M.C. antenna trimmer for maximum output.

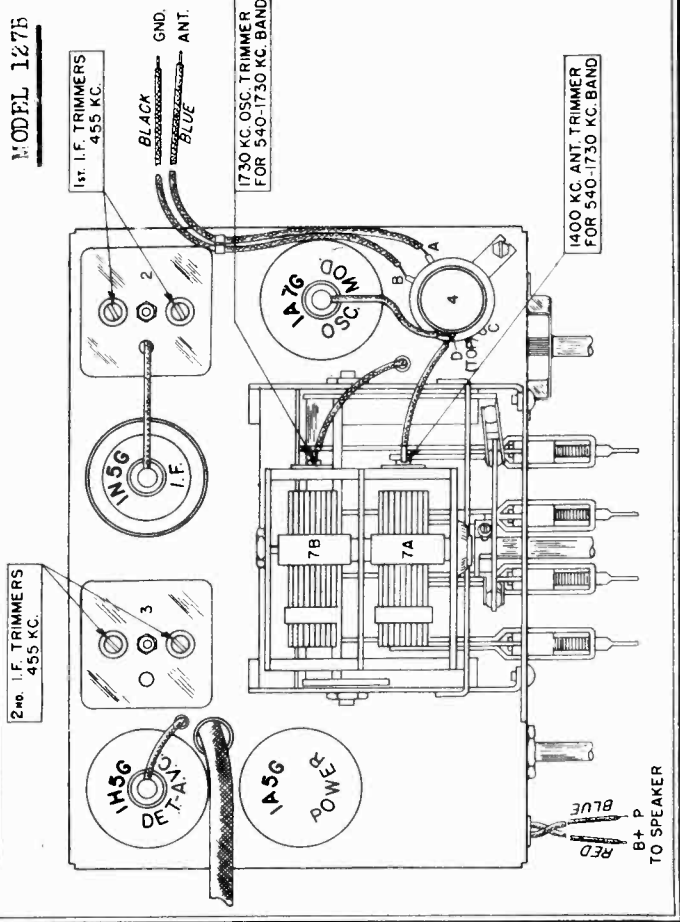
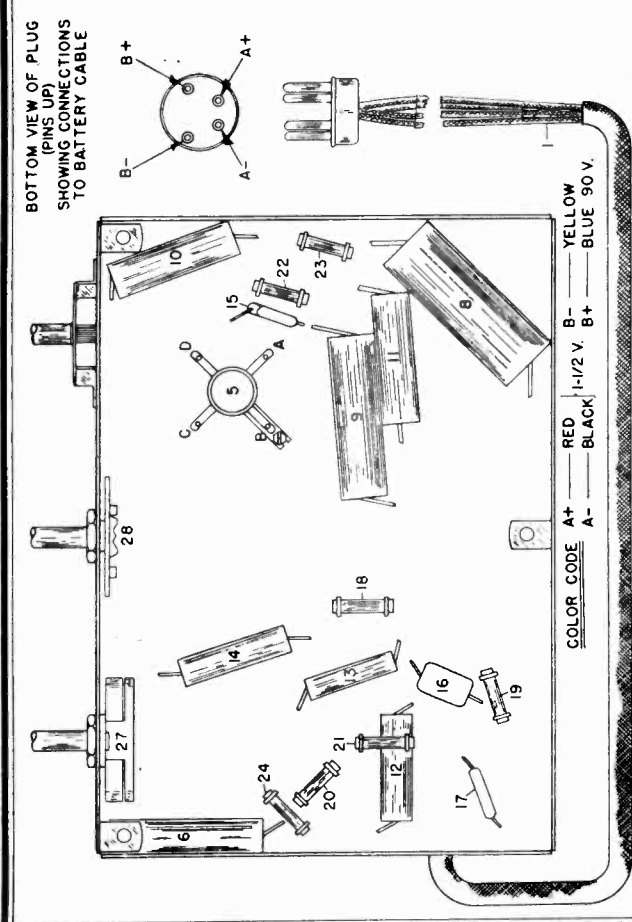
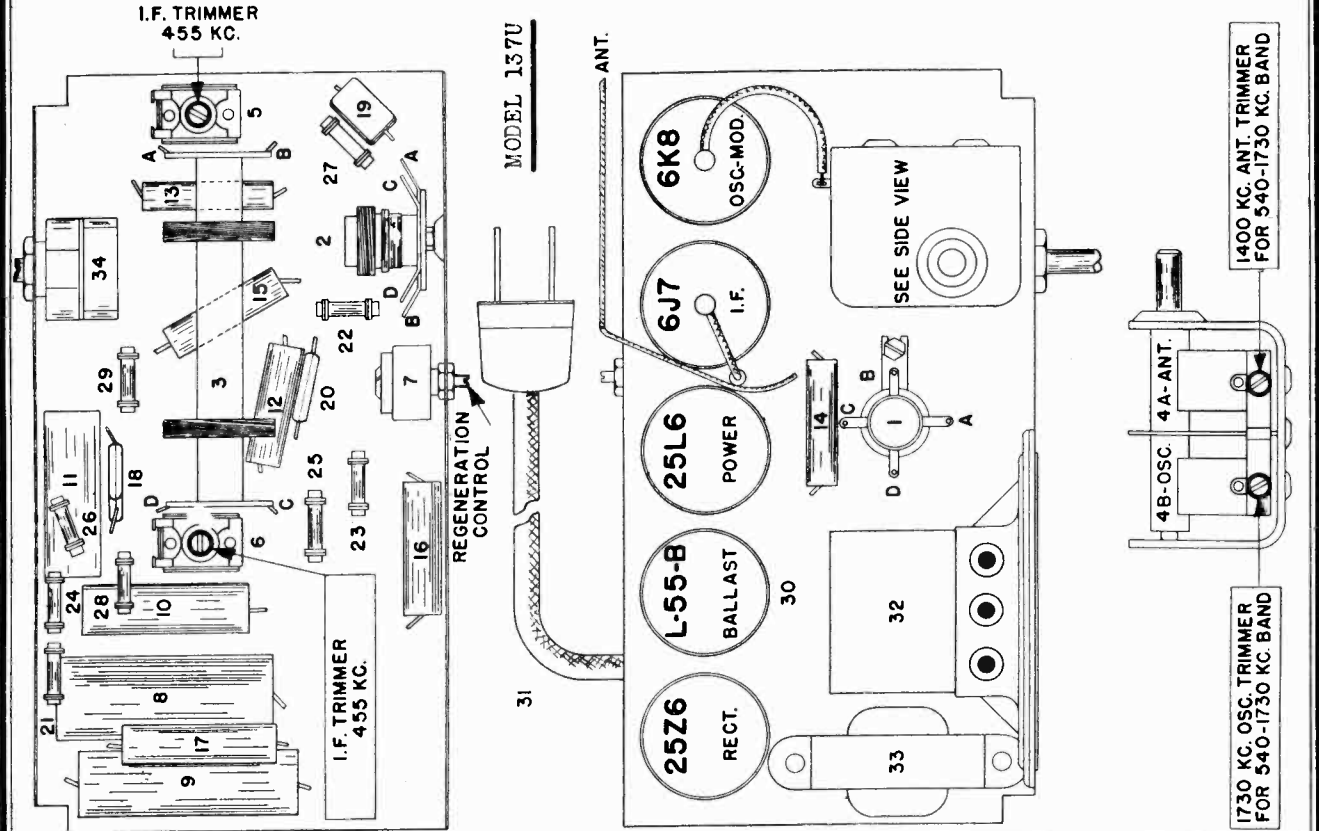
NOTE: (125AE ONLY)
1100 K.C. antenna padder for 870-1520 K.C. (No. 5) pushbutton need be adjusted only if there is an appreciable change in volume when same station is push button and manual tuned. Should there be a great difference adjust 1100 K.C. antenna padder by:
(a) Attach test oscillator to set antenna and ground leads with .00025 dummy ant. lead.
(b) Screw any two push buttons—except 870-1520 K.C. (No. 5) push button—all the way in—and the other two push buttons all the way out.
(c) Set test oscillator to exactly 1100 K.C.
(d) Press in 870-1520 K.C. push button and adjust this button for maximum test signal response.
(e) Next adjust 1100 K.C. antenna padder for maximum 1100 K.C. test oscillator signal response.

Exactly 18.1 M.C.
FOR MODELS
142A
142AE
143L



MODEL 127B
 MODEL 137U
 Trimmers
 Chassis

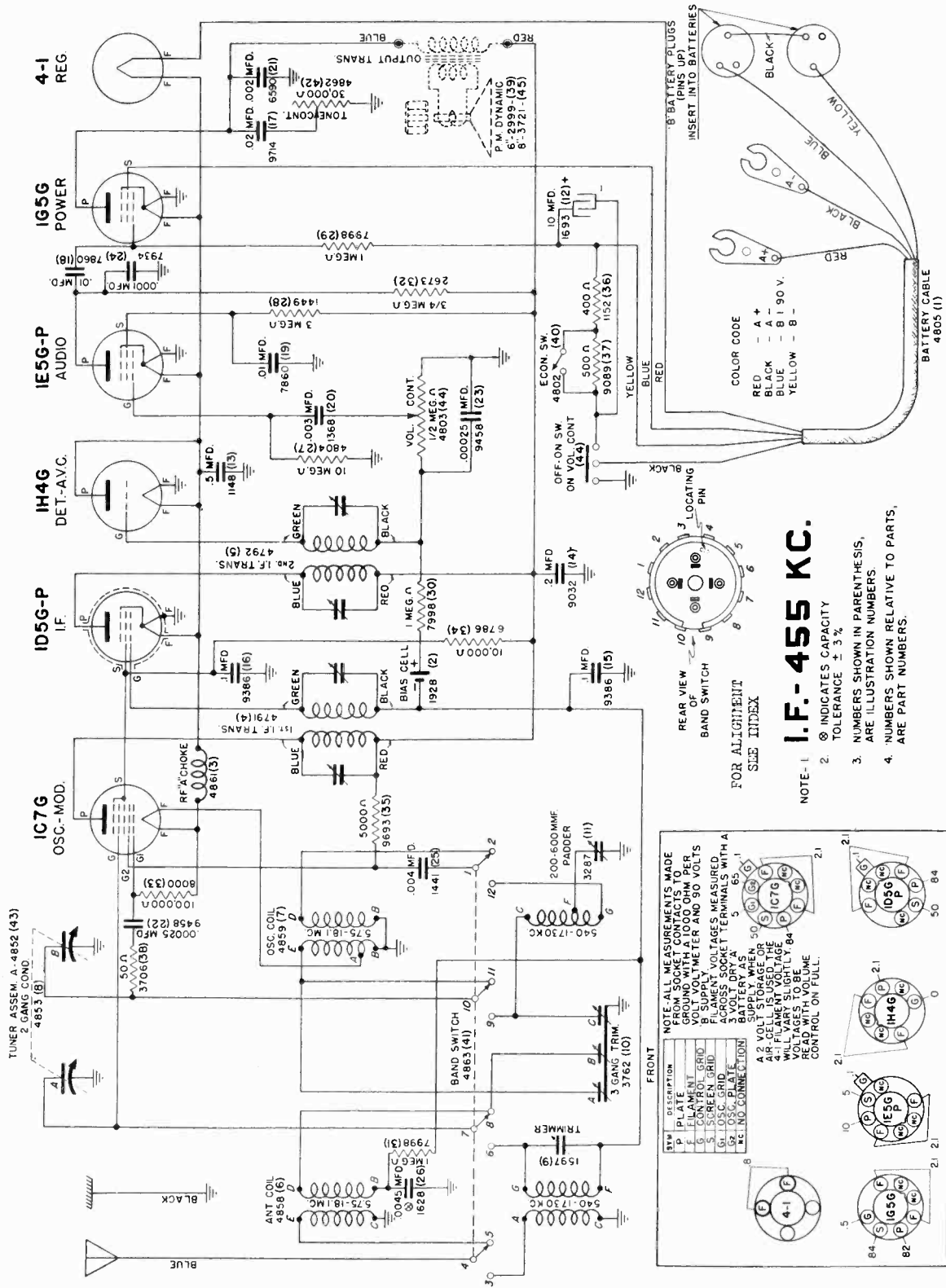
SENTINEL RADIO CORP.



SENTINEL RADIO CORP.

MODEL 128B
Schematic, Voltage
Socket

TWO BAND—SIX TUBE INCLUDING BALLAST TUBE
2 Volt Battery Operated Superheterodyne Receiver



I.F. - 455 KC.

NOTE - 1. NUMBERS SHOWN IN PARENTHESIS, ARE ILLUSTRATION NUMBERS.
2. TOLERANCE ± 3%
3. NUMBERS SHOWN IN PARENTHESIS, ARE PART NUMBERS.
4. NUMBERS SHOWN RELATIVE TO PARTS, ARE PART NUMBERS.

FOR ALIGNMENT SEE INDEX

REAR VIEW OF BAND SWITCH

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

NOTE - ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO BATTERY POSITIVE TERMINAL. B SUPPLY VOLTAGES MEASURED ACROSS SOCKET TERMINALS WITH A 3 VOLT DRY CELL BATTERY AS A REF. NO. CONNECTION.

A 2 VOLT STORAGE OR 90 AIR CELL IS USED THE VOLTAGE WILL VARY SLIGHTLY. READ WITH VOLUME CONTROL ON FULL.

3TM	DESCRIPTION	REL. NO.
P	PLATE	
E	ELIMINATOR	
S	SCREEN GRID	
G1	OSC. GRID	
G2	OSC. PLATE	

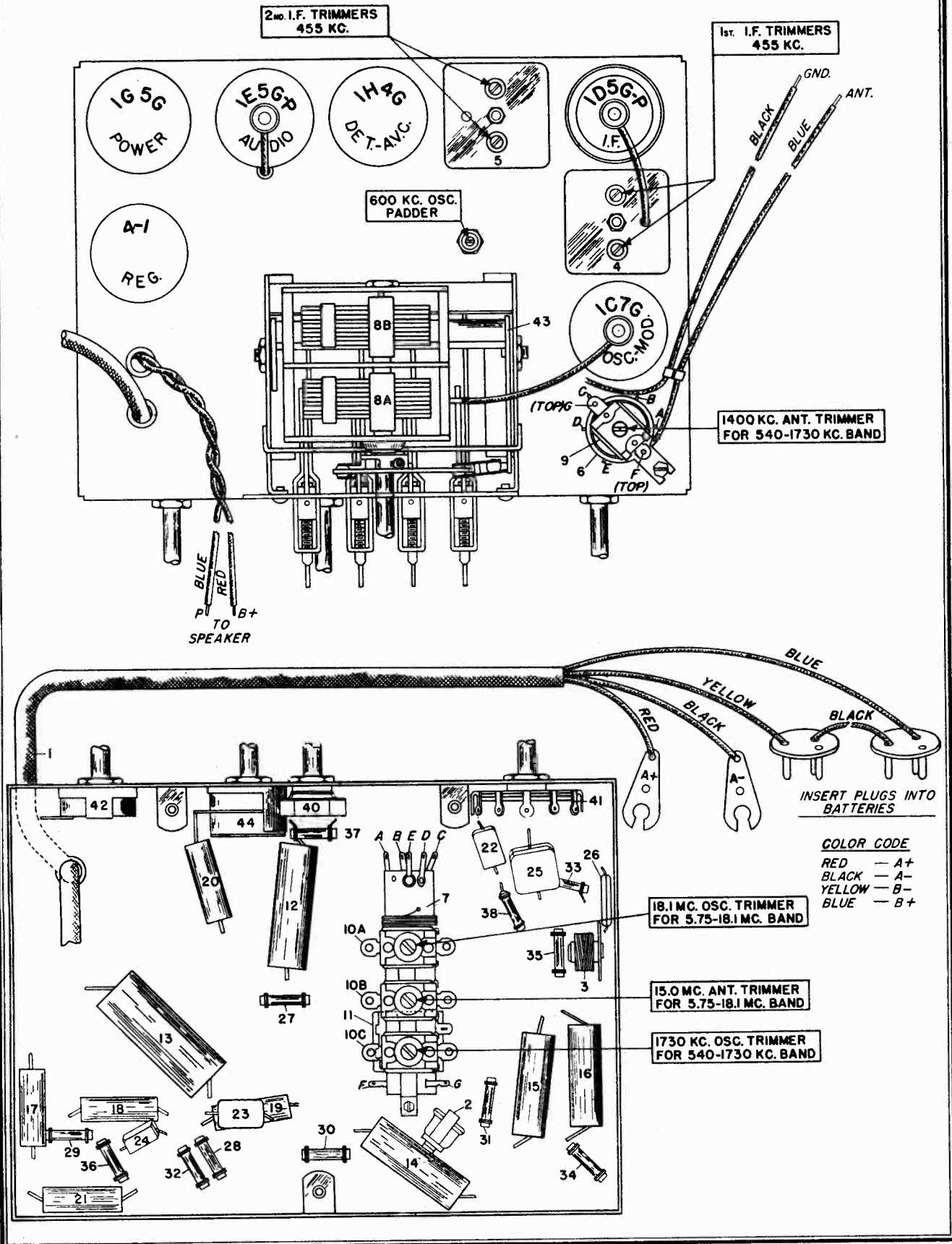
PART NO. 128-B

MODEL 128B

Trimmers

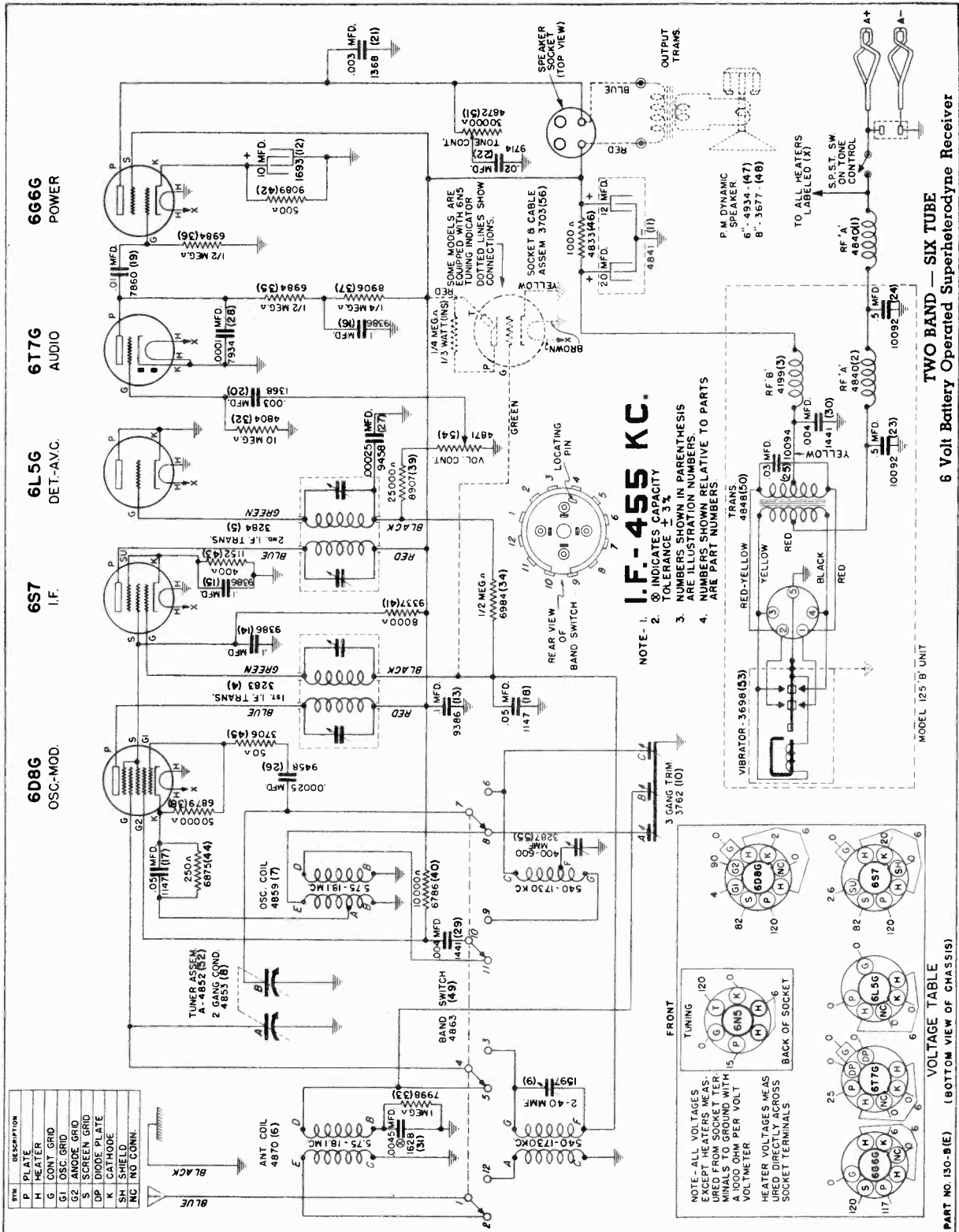
Chassis

SENTINEL RADIO CORP.



SENTINEL RADIO CORP.

MODELS 130B, 130BE
Schematic, Voltage
Socket



TWO BAND - SIX TUBE
6 Volt Battery Operated Superheterodyne Receiver

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

SENTINEL RADIO CORP.

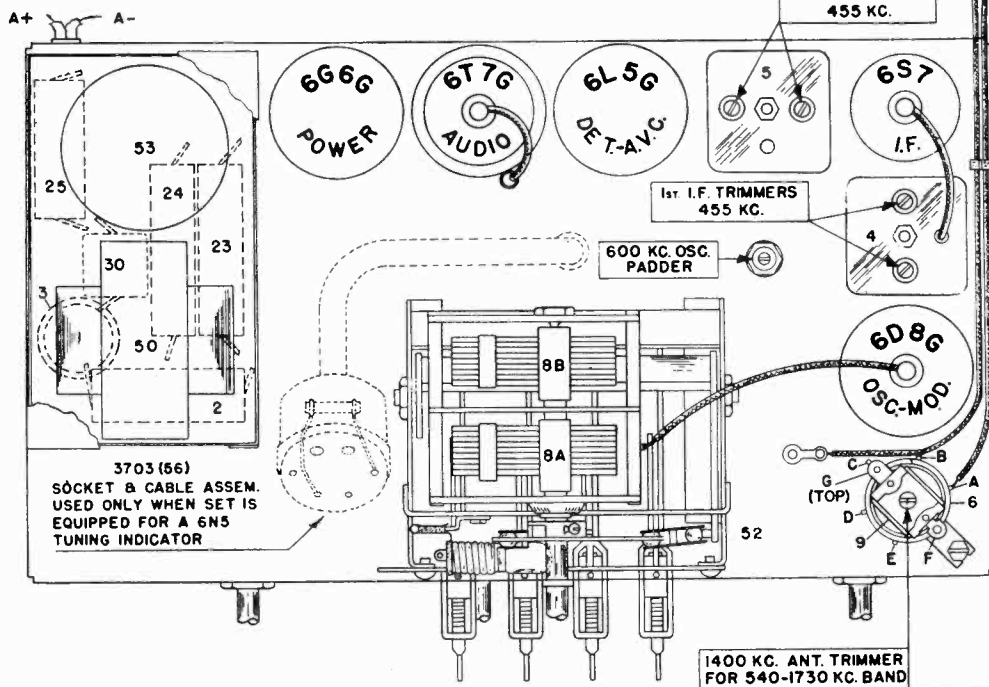
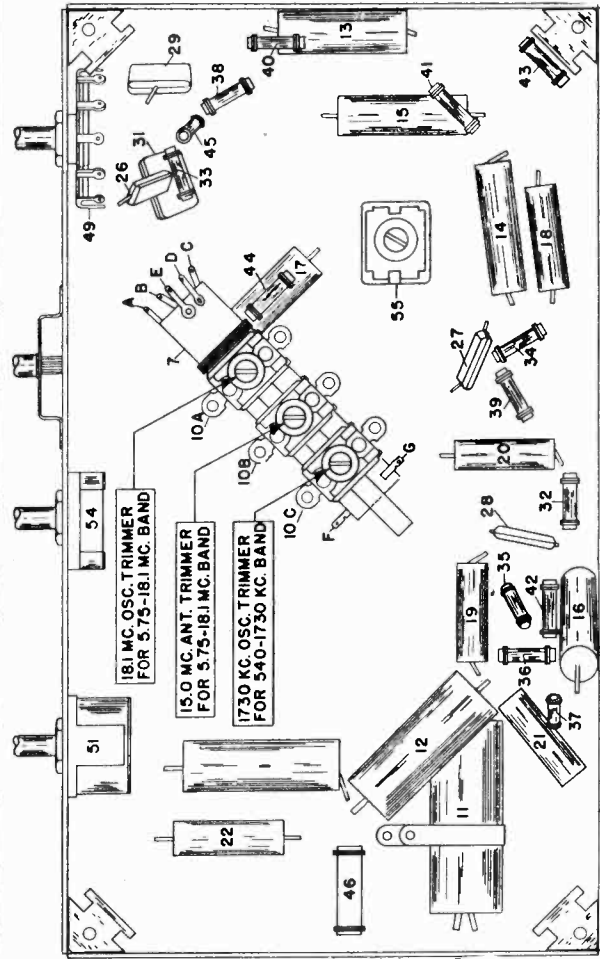
MODELS 130B, 130BE

Alignment, Trimmers

Chassis

ALIGNMENT PROCEDURE IN TABULATED FORM

TEST OSCILLATOR		Set receiver dial to:	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
Place band switch for operation on:	Any point where no interfering signal is received						Exactly 455 K.C.	.02 Mfd. condenser	High side to grid cap of 6D8G tube. Do not remove cap.
LF. ALIGNMENT use any band position	1730 TO 540 K.C. BAND	(1) Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	Adjust 1730 K.C. oscillator trimmer for maximum output.
		(2) Exactly 1400 K.C.	Exactly 1400 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 1400 K.C. antenna trimmer for maximum output.
		(3) Approx. 600 K.C.	Approx. 600 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
5.75 TO 18.1 M.C. BAND	5.75 TO 18.1 M.C. BAND	(1) Exactly 18.1 M.C.	Exactly 18.1 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	Adjust 18.1 M.C. oscillator trimmer for maximum output. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down trimmer (add capacity) until the second peak—which is the proper one to use—is tuned in.
		(2) Exactly 15 M.C.	Exactly 15 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	While rocking gang condenser adjust 15 M.C. antenna trimmer for maximum output.

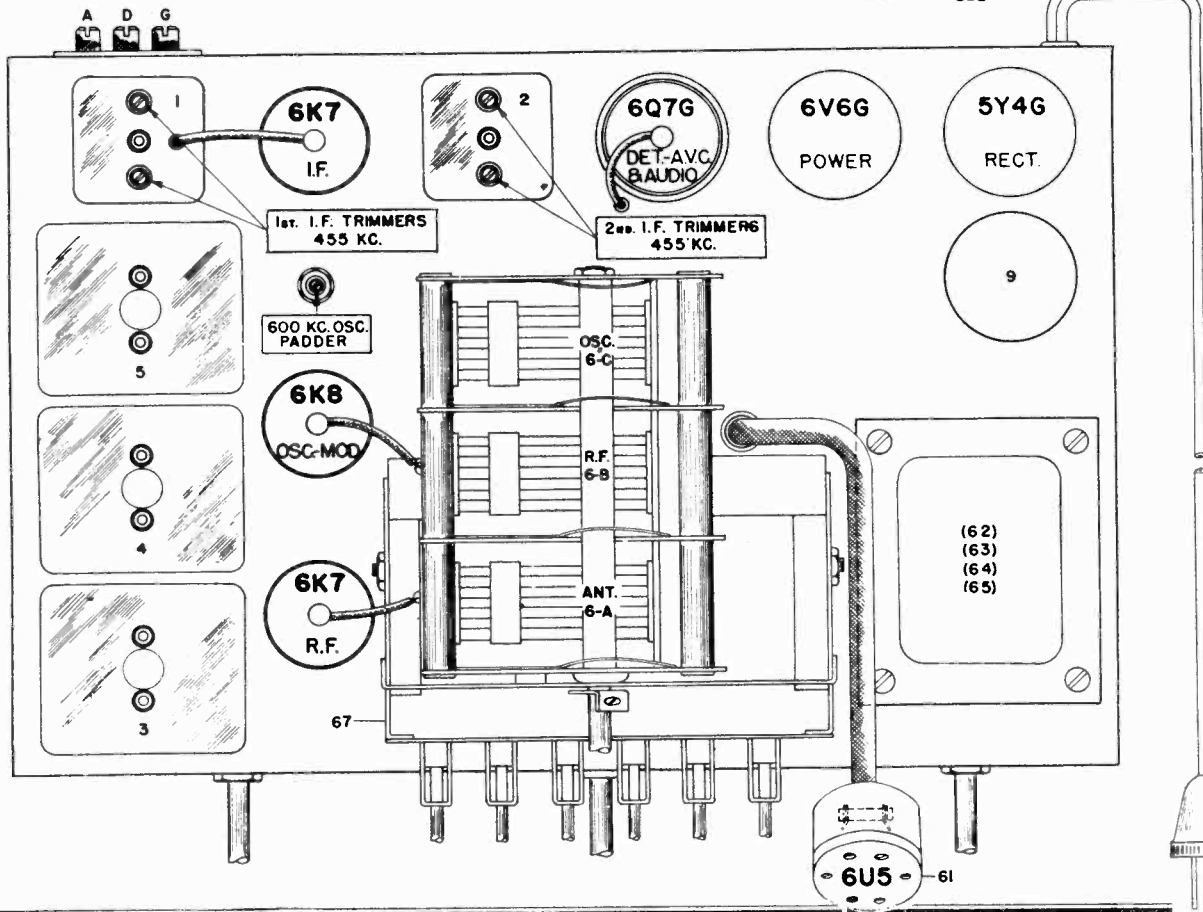
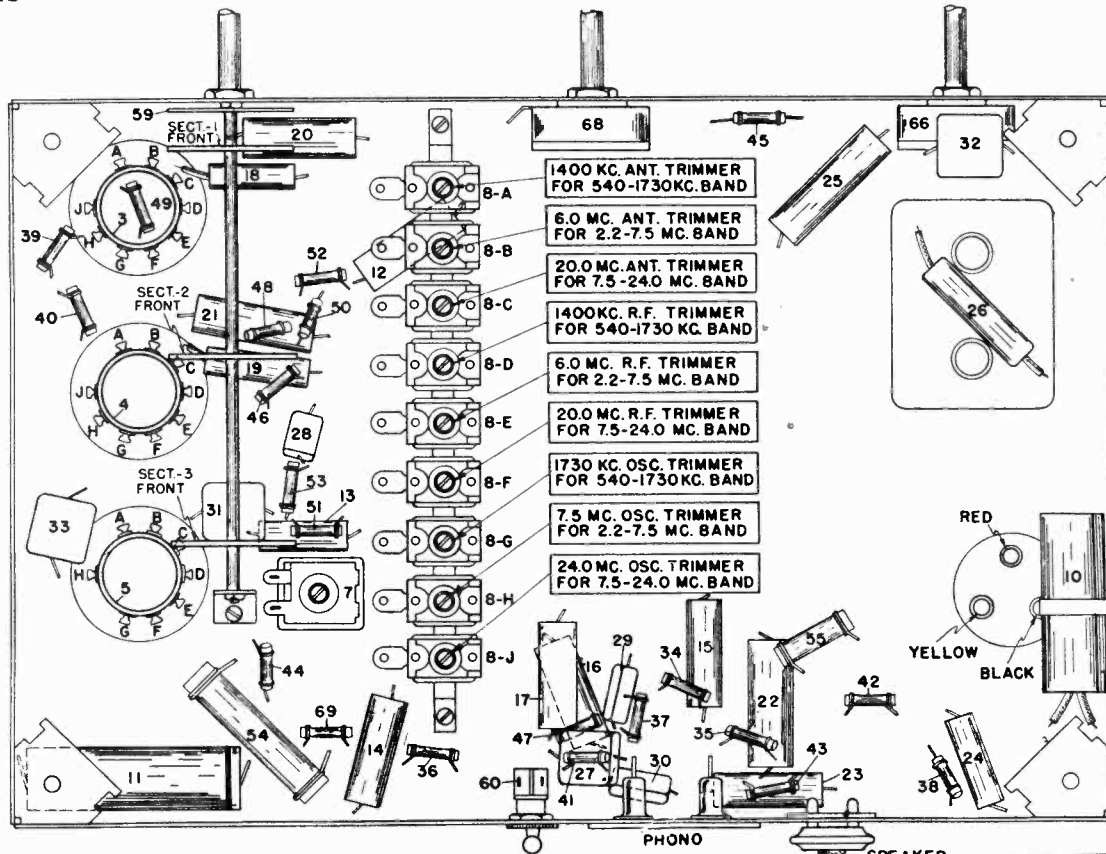


MODEL 138AE

Trimmers

Chassis

SENTINEL RADIO CORP.

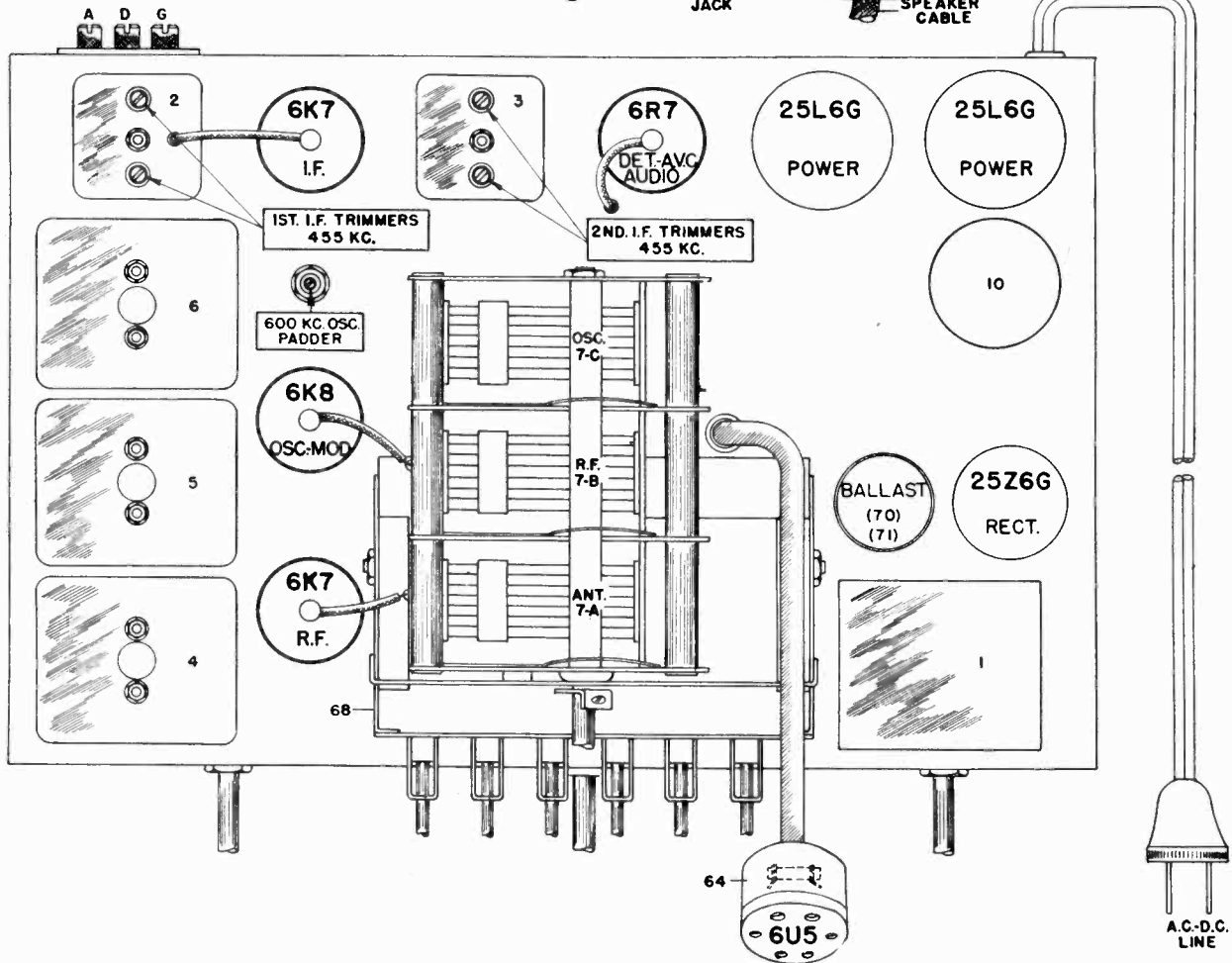
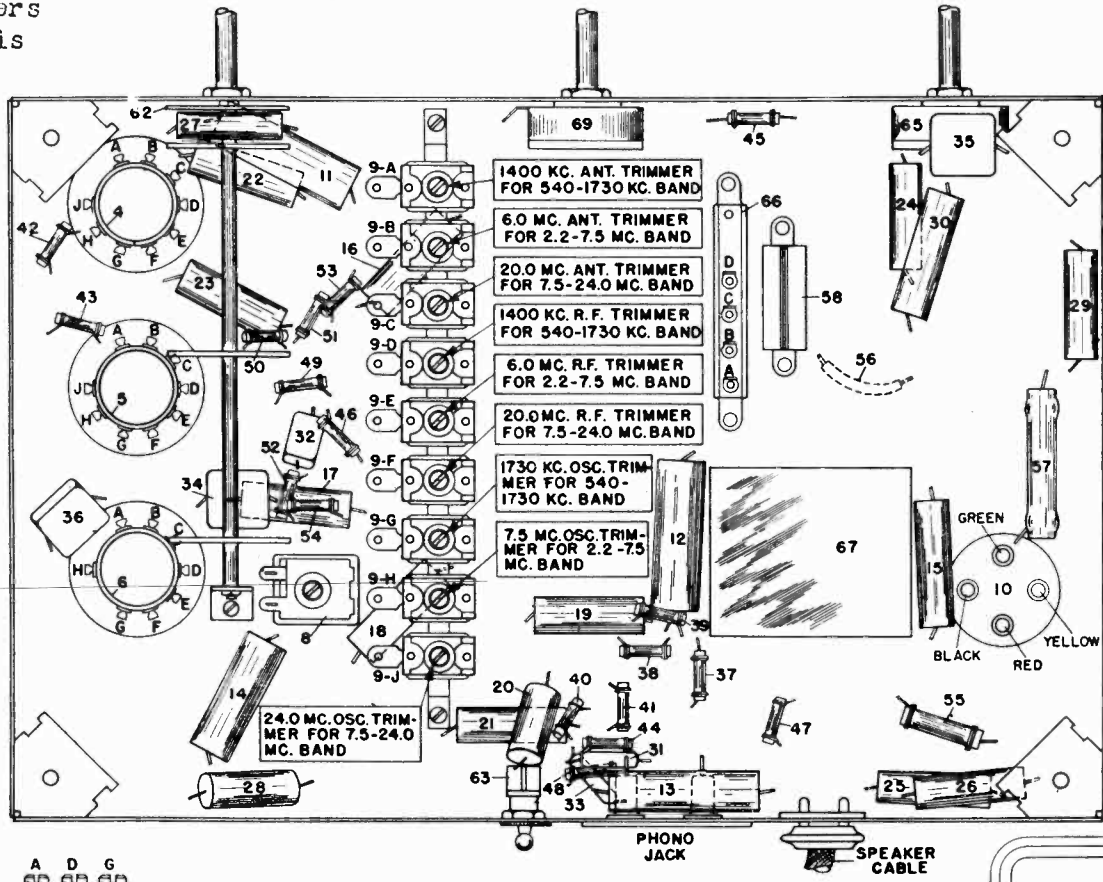


MODEL 139UE

Trimmers

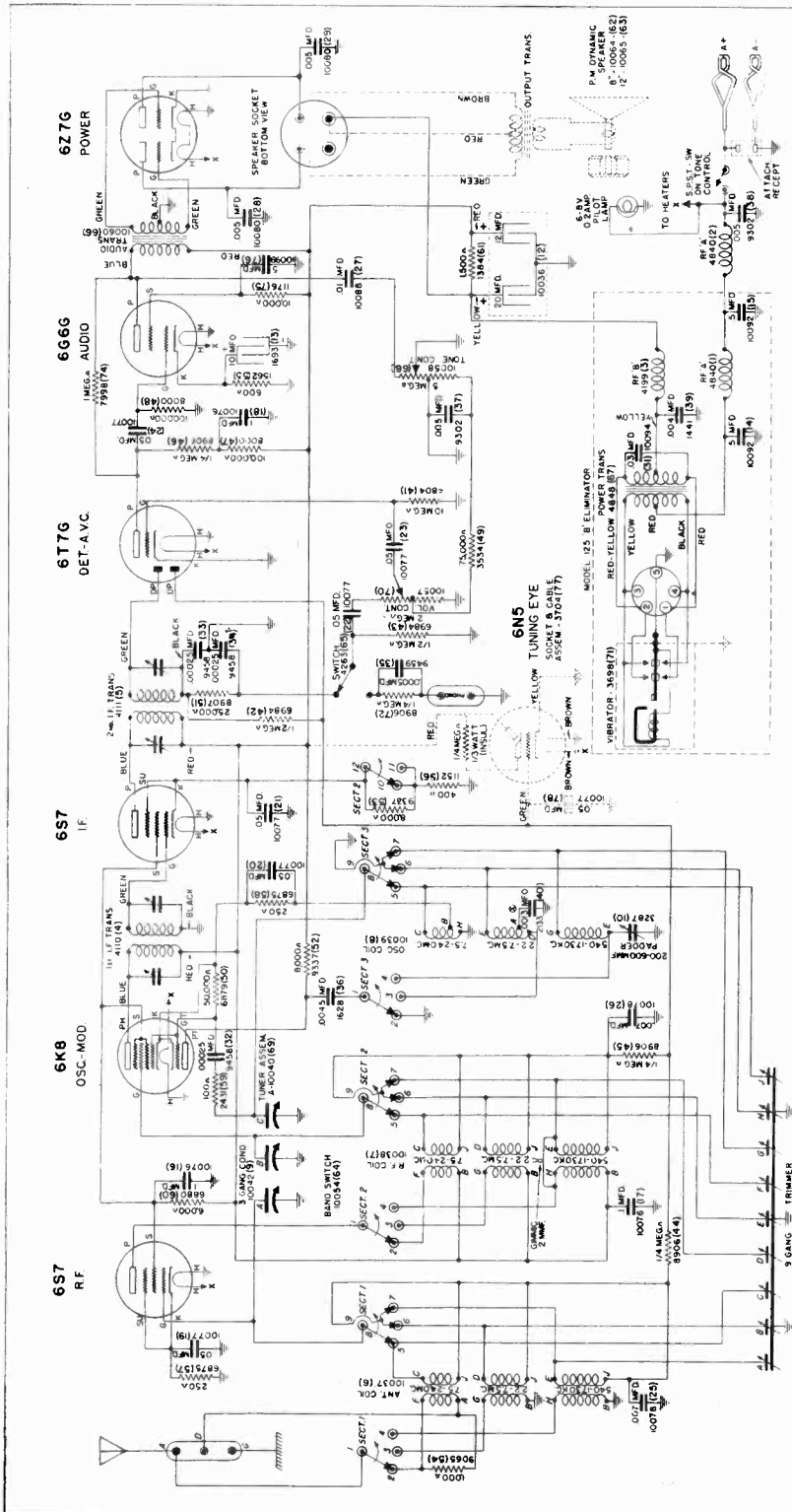
Chassis

SENTINEL RADIO CORP.



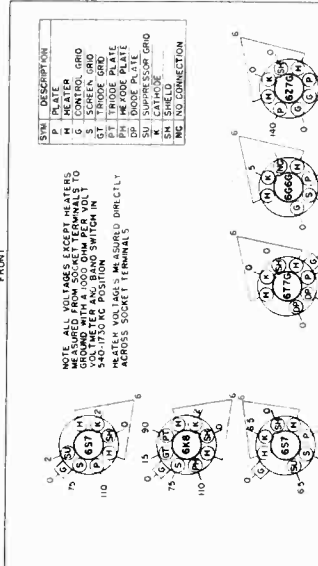
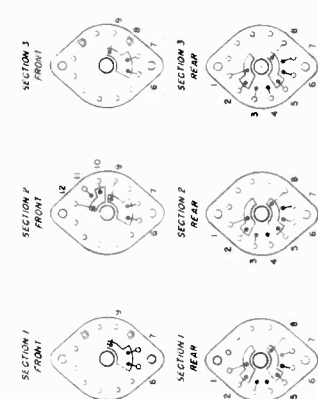
SENTINEL RADIO CORP.

MODELS 140B, 140BE
Schematic, Voltage
Socket



IF - 455 KC.

NOTE - 1. ② INDICATES CAPACITY
2. TOLERANCE ± 5%
3. NUMBERS SHOWN IN PARENTHESIS ARE PART NUMBERS RELATIVE TO PARTS
4. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS
5. PART NUMBERS SHOWN IN PARENTHESIS SHOW POSITION WHEN ADJUSTED FROM
6. SOME MODELS ARE EQUIPPED WITH A 6N5 TUNING EYE. DOTTED LINES SHOW CONNECTIONS



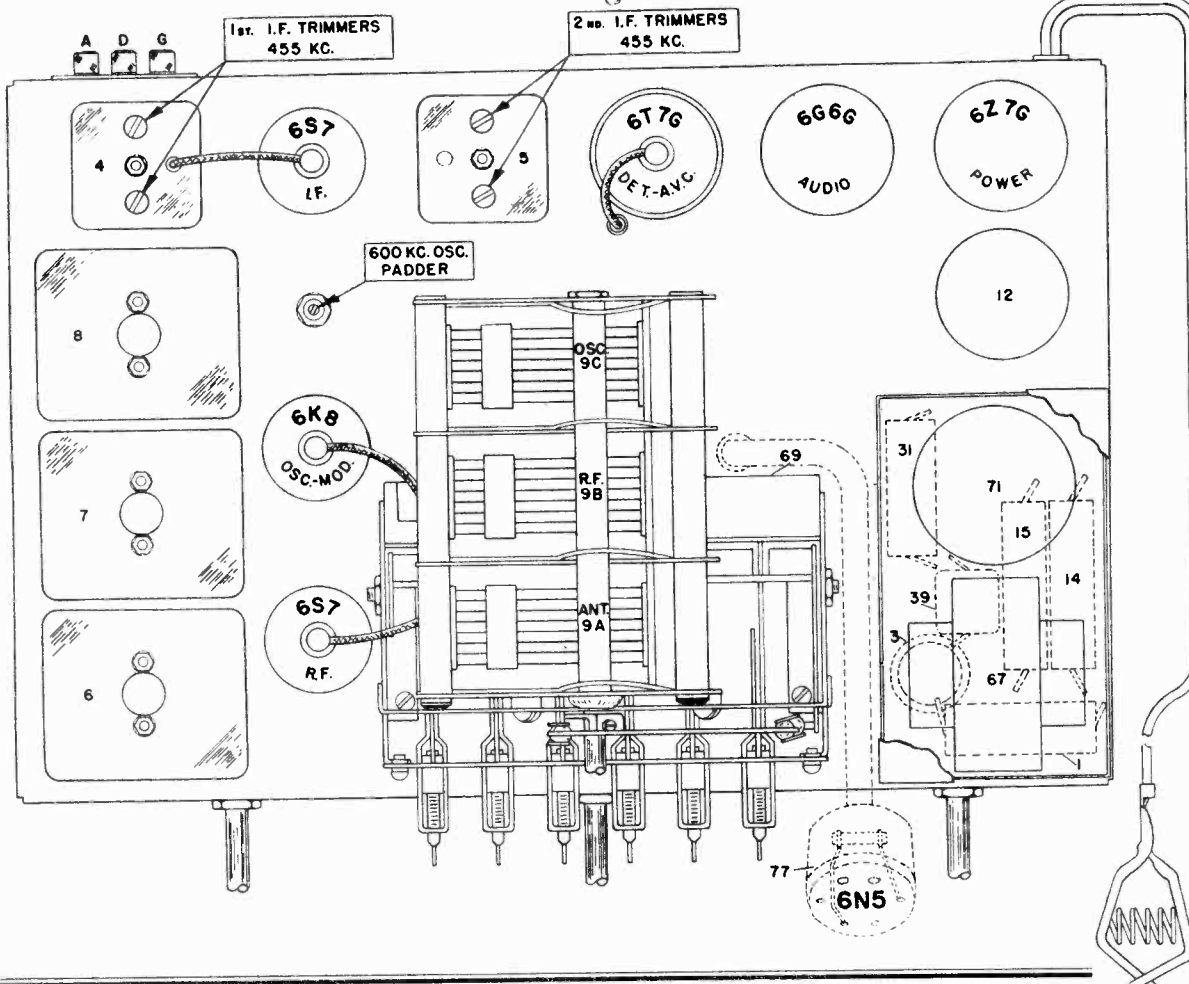
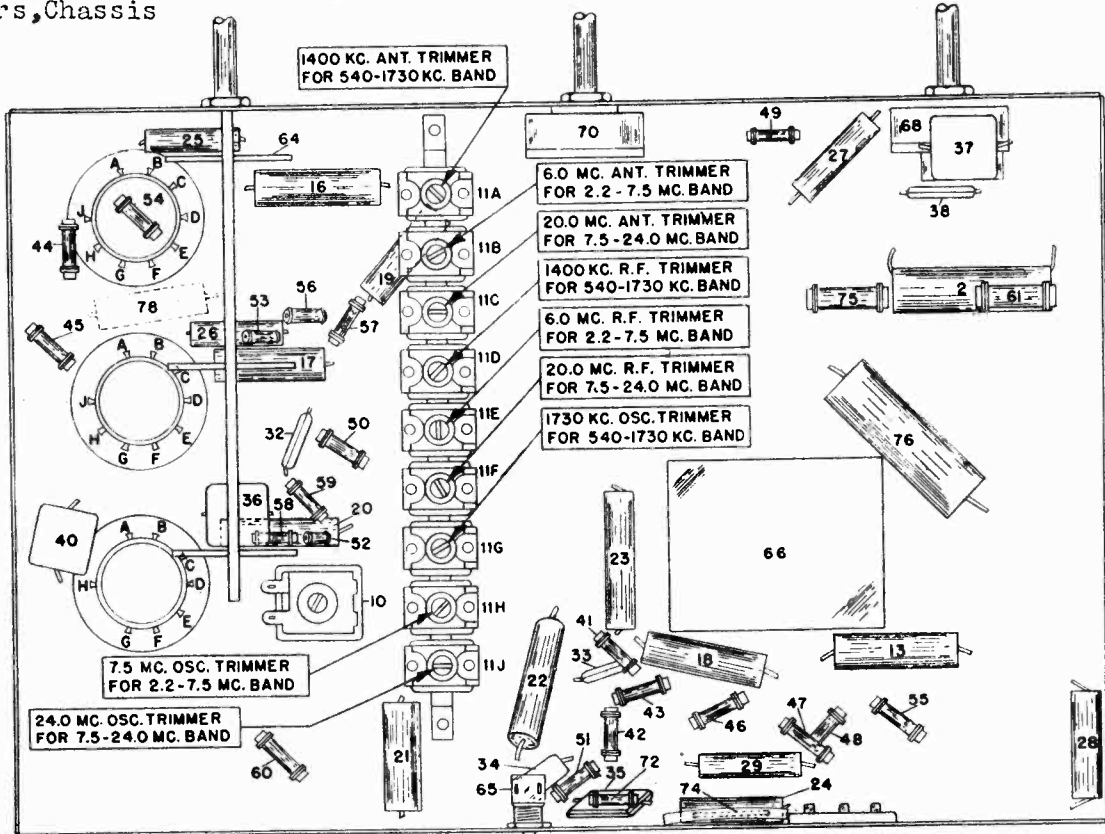
SENTINEL MODELS 140B AND 140BE
THREE BAND — SIX TUBE
6 Volt Battery Operated Superheterodyne Receiver

VOLTAGE TABLE
(80700 VIEW OF CHASSIS)

PART NO. 140-B(E)

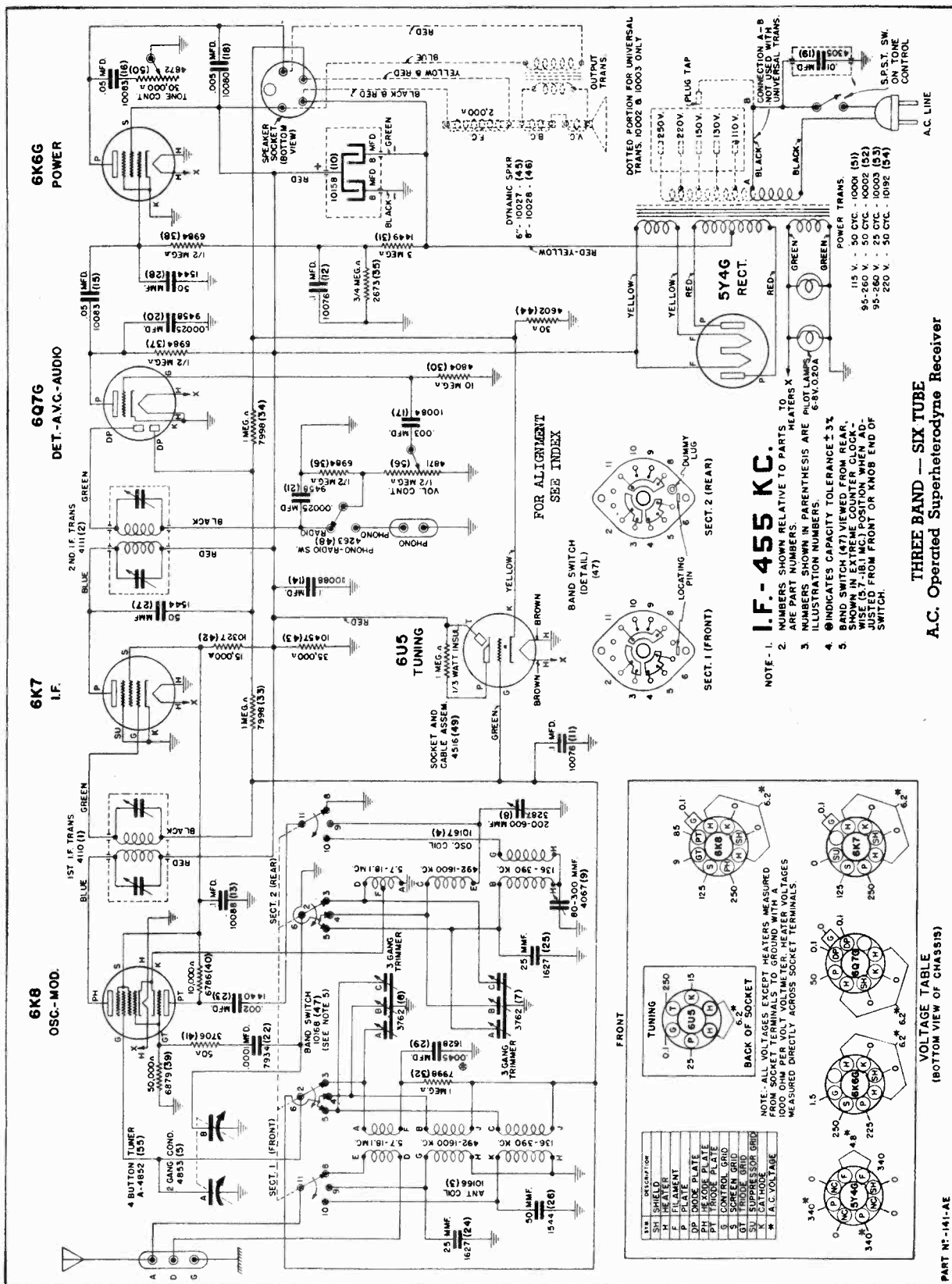
MODELS 140B, 140BE
Trimmers, Chassis

SENTINEL RADIO CORP.



SENTINEL RADIO CORP.

MODEL 141AE
Schematic, Voltage
Socket



THREE BAND — SIX TUBE
A.C. Operated Superhetrodyne Receiver

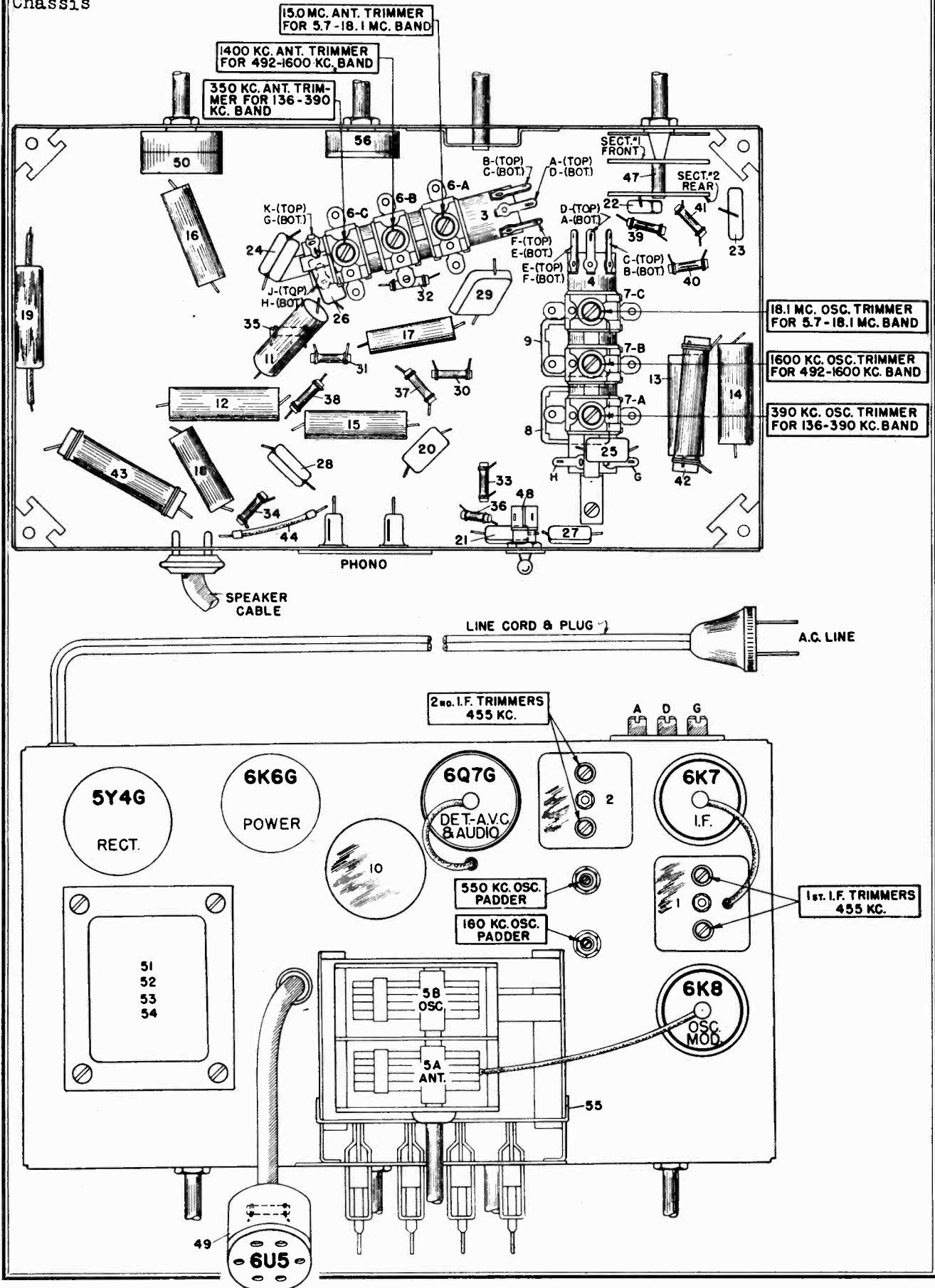
PART N°-141-AE

MODEL 141A-E

Trimmers

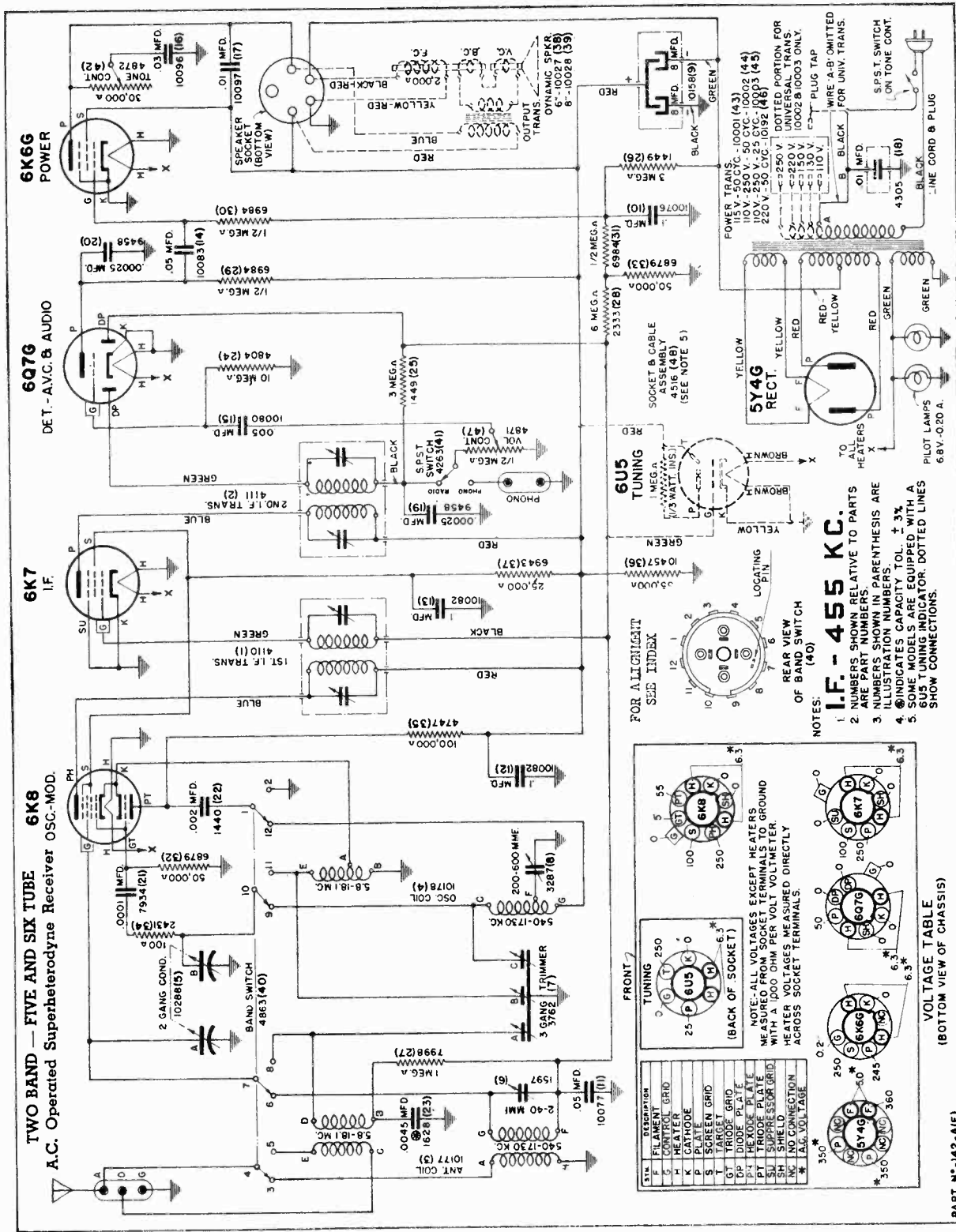
Chassis

SENTINEL RADIO CORP.



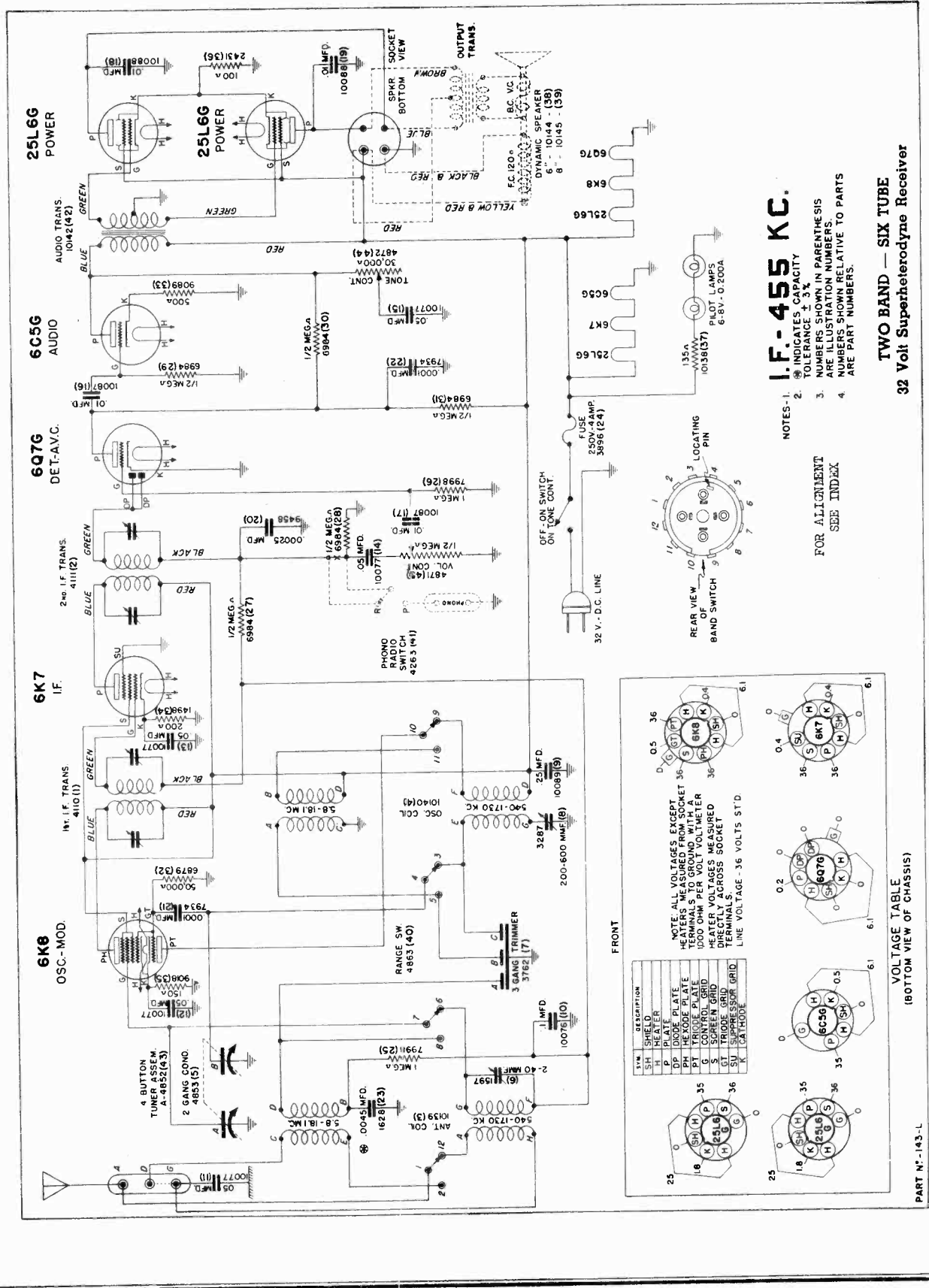
MODELS 142A, 142AE
Schematic, Voltage
Socket

SENTINEL RADIO CORP.



SENTINEL RADIO CORP.

MODEL 143L
Schematic, Voltage
Socket



I.F. - 455 KC.

NOTES - 1. * INDICATES CAPACITY TOLERANCE ± 3%
2. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
3. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.

TWO BAND - SIX TUBE
32 Volt Superheterodyne Receiver

FOR ALIGNMENT
SEE INDEX

FRONT

TYP	DESCRIPTION
SH	SHIELD
H	HEATER
P	PIATE
DP	DIODE PLATE
PH	HEXODE PLATE
G	CONTROL GRID
S	SCREEN GRID
GT	TRIODE GRID
SU	SUPPRESSOR GRID
K	KAISER

NOTE: ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT METER. HEATER VOLTAGES MEASURED ACROSS SOCKET TERMINALS. LINE VOLTAGE - 36 VOLTS STD.

VOLTAGE TABLE (BOTTOM VIEW OF CHASSIS)

PART N° - 143-L

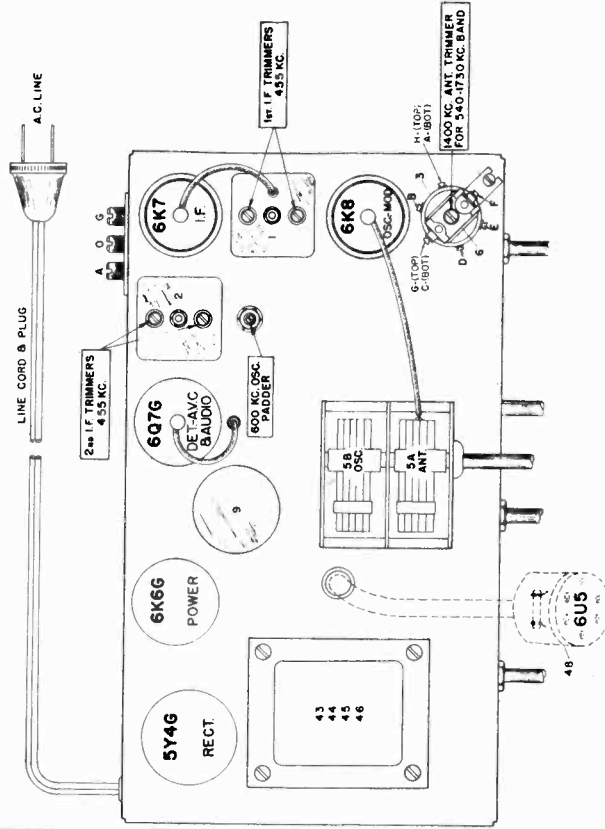
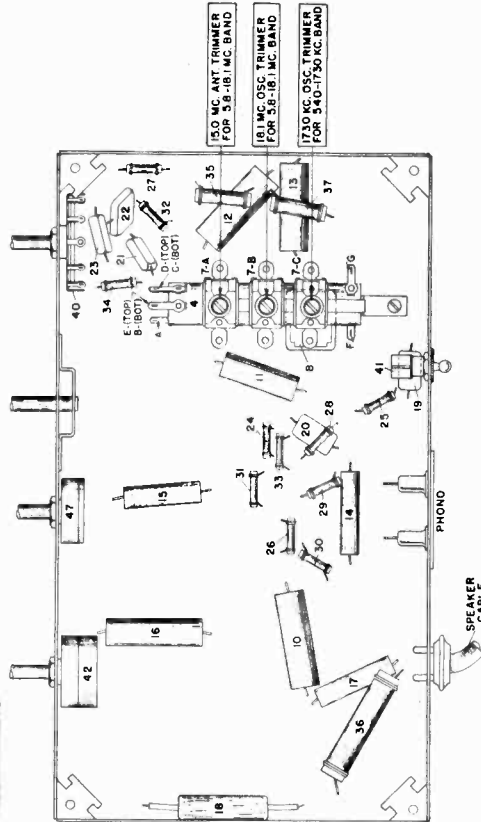
MODELS 142A, 142AE

MODEL 143L

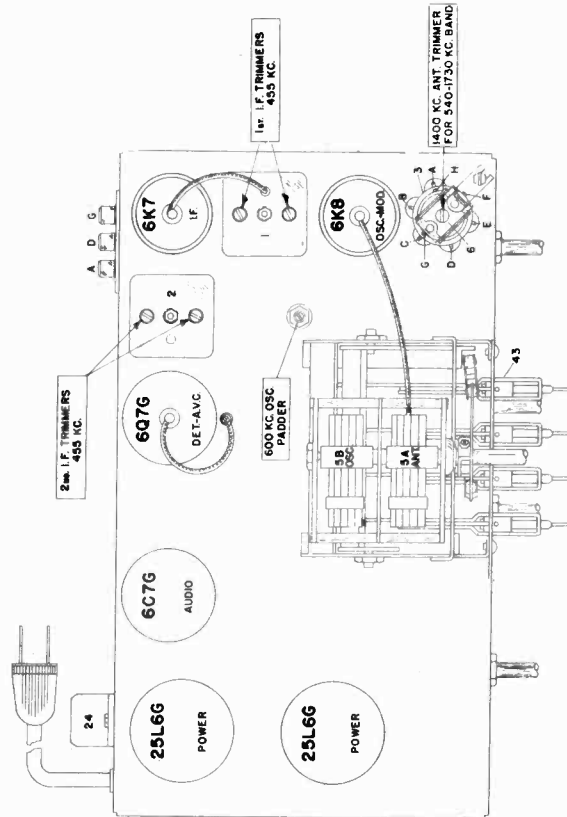
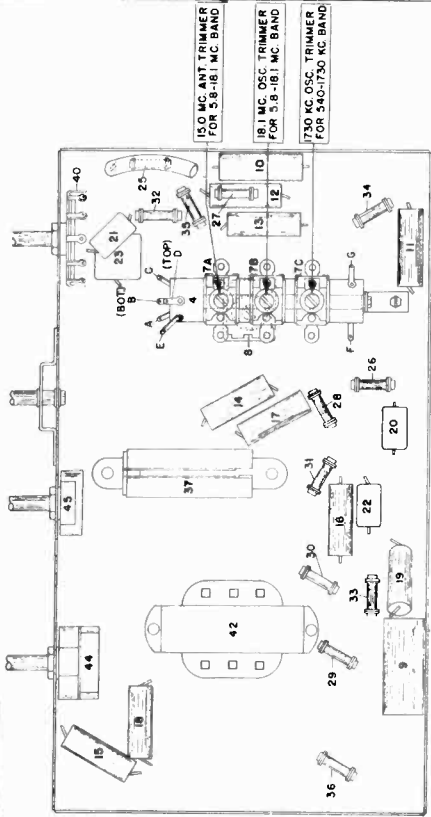
Trimmers, Chassis

SENTINEL RADIO CORP.

MODEL 142A, 142AE

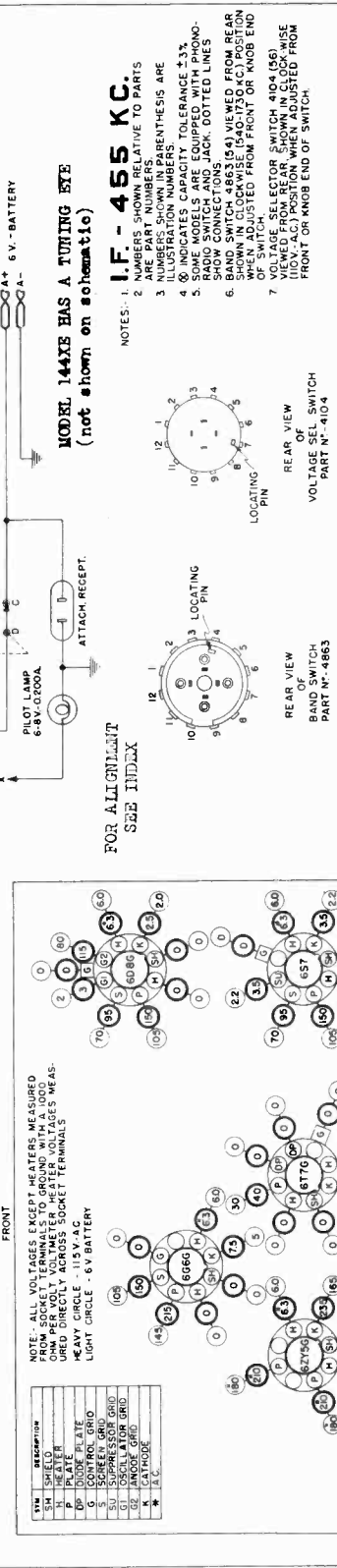
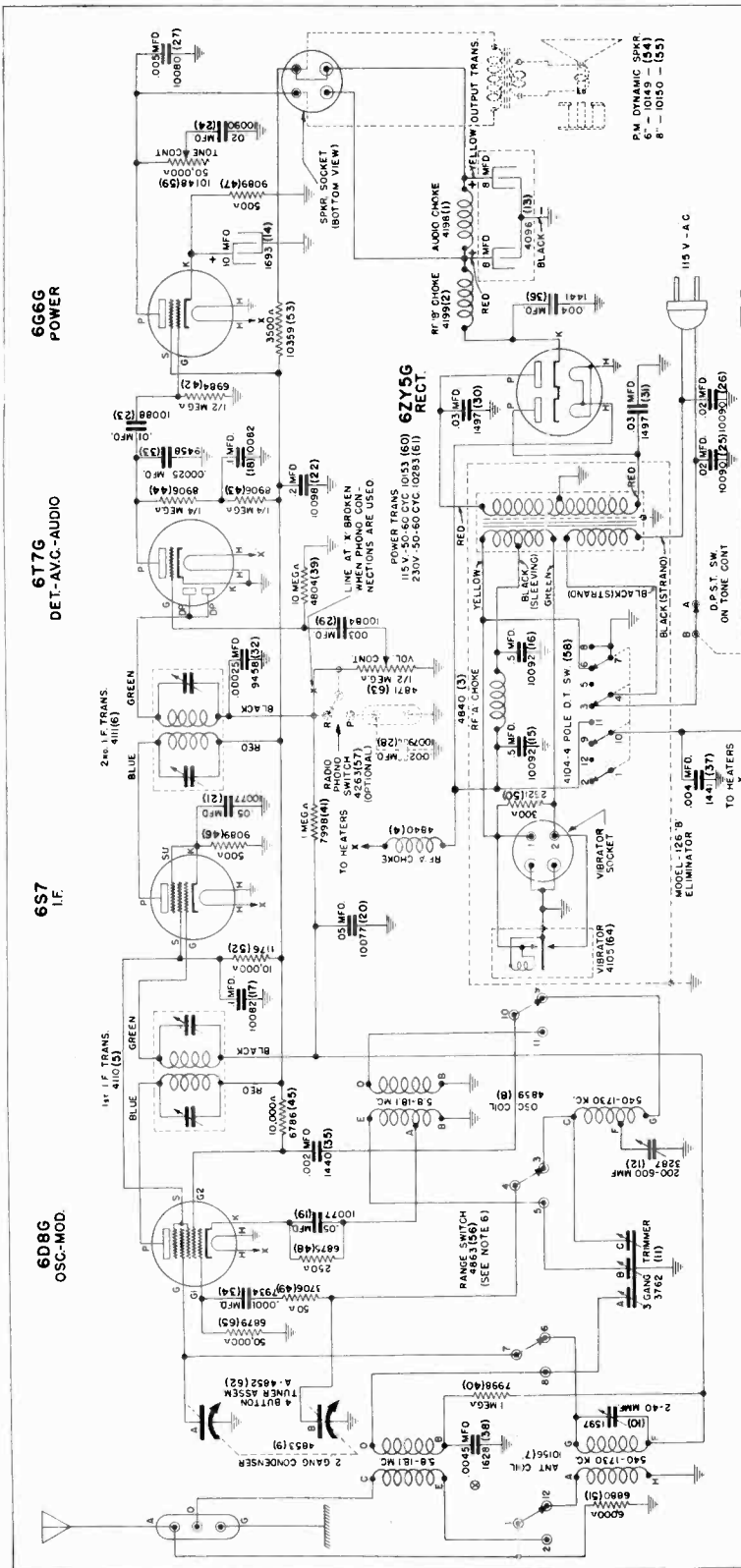


MODEL 143L



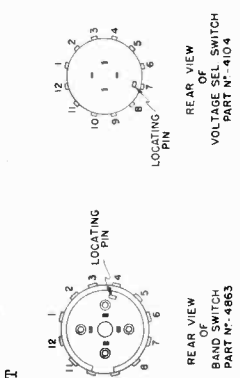
SENTINEL RADIO CORP.

MODELS 144X, 144XE
Schematic, Voltage
Socket



MODEL 144XE HAS A TUNING EYE
(not shown on schematic)

- NOTES: 1. NUMBERS SHOWN RELATIVE TO PARTS
2. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS
3. 4 & 6 INDICATE CAPACITY TOLERANCE $\pm 5\%$
4. 8 INDICATES CAPACITY TOLERANCE $\pm 10\%$
5. RADIO SWITCH AND JACK DOTTED LINES SHOW CONNECTIONS TO BE MADE FROM REAR VIEW
6. SHOWING CLOCKWISE (404-1730 KC) POSITION WHEN ADJUSTED FROM FRONT OR KNOB END OF SWITCH
7. VOLUME SELECTOR SWITCH 4104 (56) VIEWED FROM REAR, SHOWN IN CLOCKWISE (110V. A.C.) POSITION WHEN ADJUSTED FROM FRONT OR KNOB END OF SWITCH



NOTE: ALL VOLTAGES EXCEPT HEATERS MEASURED FROM POSITIVE HEATER TERMINALS. MEASURED DIRECTLY ACROSS SOCKET TERMINALS. LIGHT CIRCLE - 115V. A.C. BATTERY

SYM	DESCRIPTION	VOLTS
SH	SHIELD	
B	BATTERY	
H	HEATER	
DP	DIODE PLATE	
G	CONTROL GRID	
SU	SUPPRESSOR GRID	
OS	OSCILLATOR GRID	
W	WAX	
C	CATHODE	
*	A.C.	

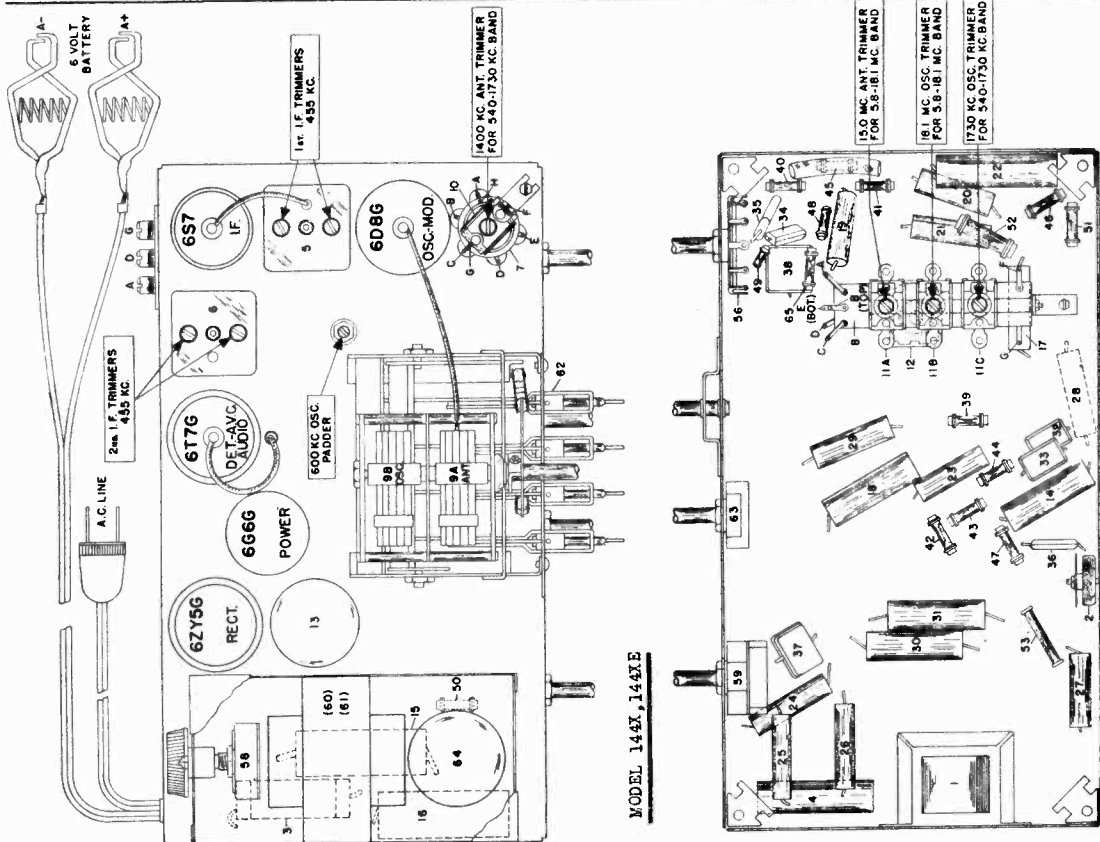
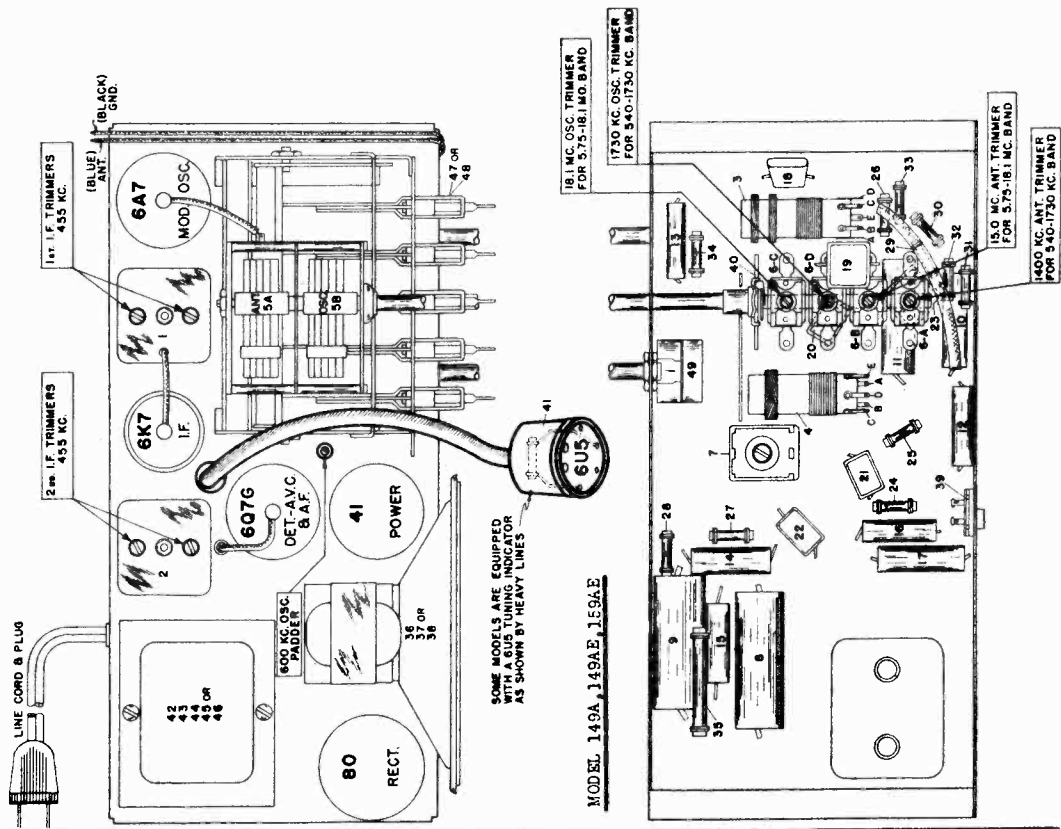
SENTINEL MODEL 144X 144XE
6 Volt Storage Battery or 110 Volt 60 Cycle A. C. Operated
TWO BAND—FIVE TUBE SUPERHETERODYNE RECEIVER

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

PART N-144-X

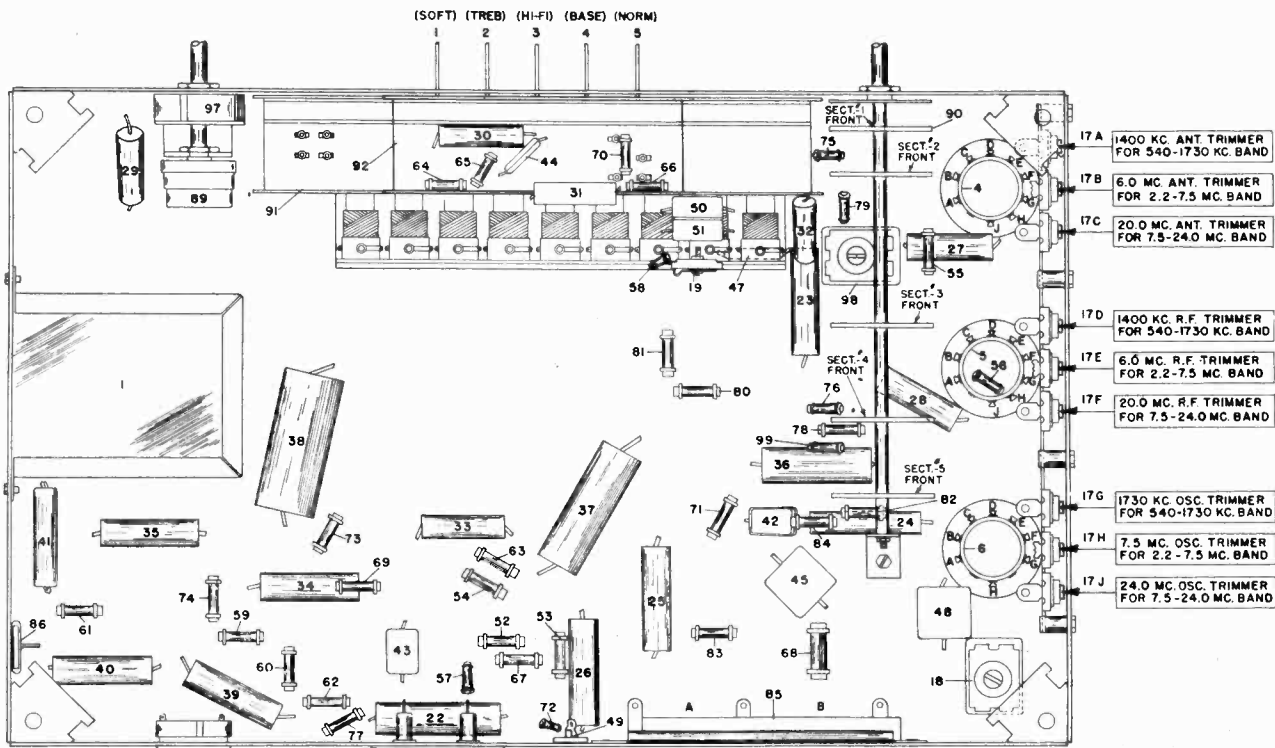
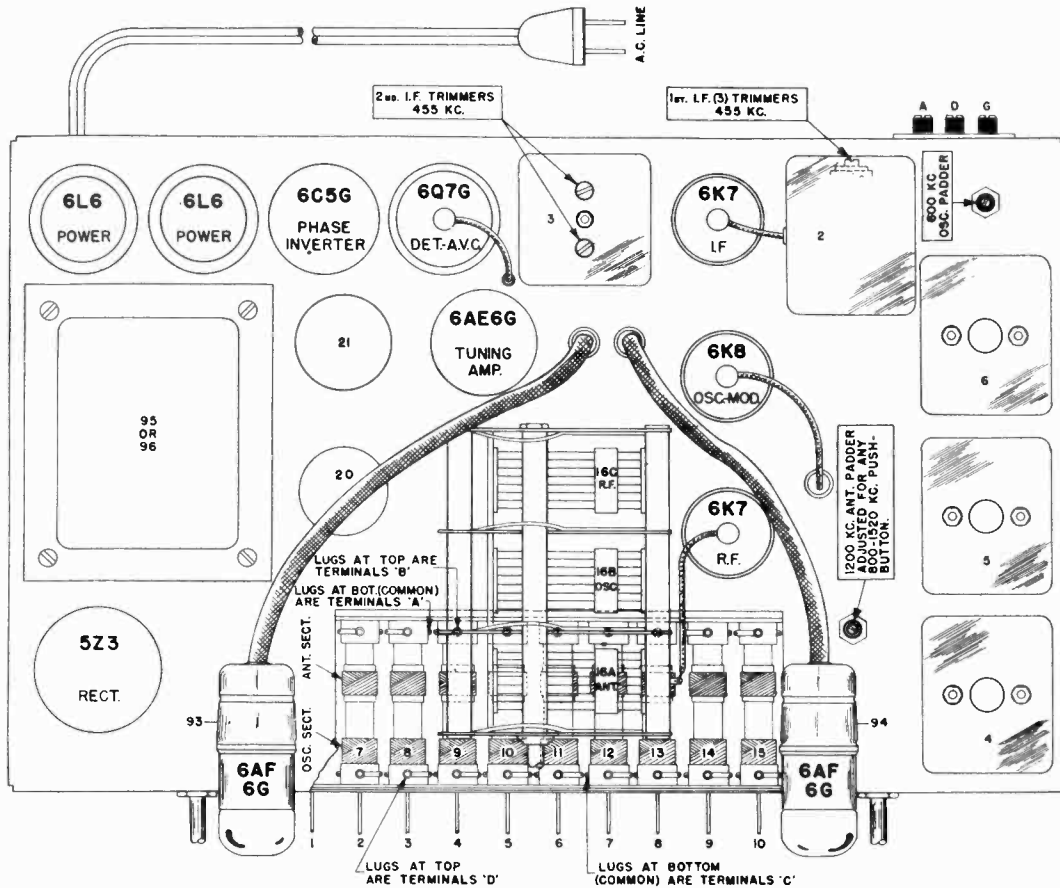
MODELS 144X, 144XE
 MODELS 149A, 149AE, 159AE
 Trimmers, Chassis

SENTINEL RADIO CORP.



MODEL 145AE
 Trimmers
 Chassis

SENTINEL RADIO CORP.

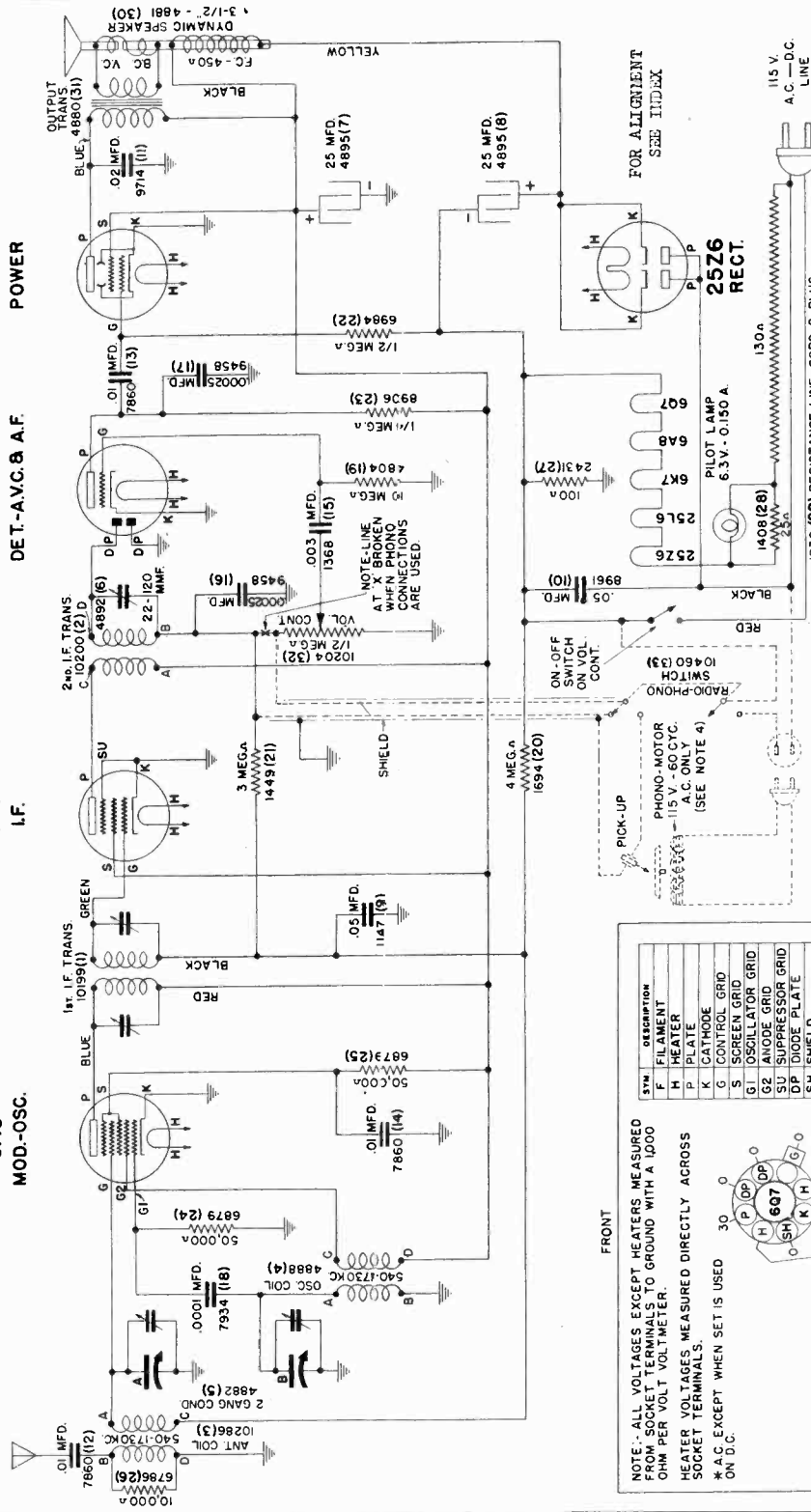


SENTINEL RADIO CORP.

MODEL 147U
Schematic, Voltage
Socket

SENTINEL MODEL 147U
5 tube A. C. - D. C. Operated Superheterodyne Receiver

6A8 MOD.-OSC. 6K7 I.F. 6Q7 DET.-A.V.C. & A.F. 25L6 POWER



- NOTES- 1. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
2. NUMBERS SHOWN IN PARENTHESIS ARE NUMBERS SHOWN IN PARTS PHONOGRAPH TO BE USED ONLY ON 115 V 60 CYCLE A.C. LINE. DOTTED LINES SHOW CONNECTIONS.

- EXTENSION LINE CORD
(34) 1831 - 220V (262 OHMS)
(35) 1832 - 150V (86 OHMS)
(36) 3379 - 125V (22 OHMS)
(37) 3381 - 230V LINE-PLUG RESISTANCE UNIT (275 OHMS)

FRONT

SYM	DESCRIPTION
F	FILAMENT
H	HEATER
P	PLATE
K	CATHODE
S	CONTROL GRID
G	SCREEN GRID
O	OSCILLATOR GRID
G2	ANODE GRID
SU	SUPPRESSOR GRID
SH	SHIELD PLATE
SH SHIELD	

NOTE: ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER.
HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.
* A.C. EXCEPT WHEN SET IS USED ON D.C.

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

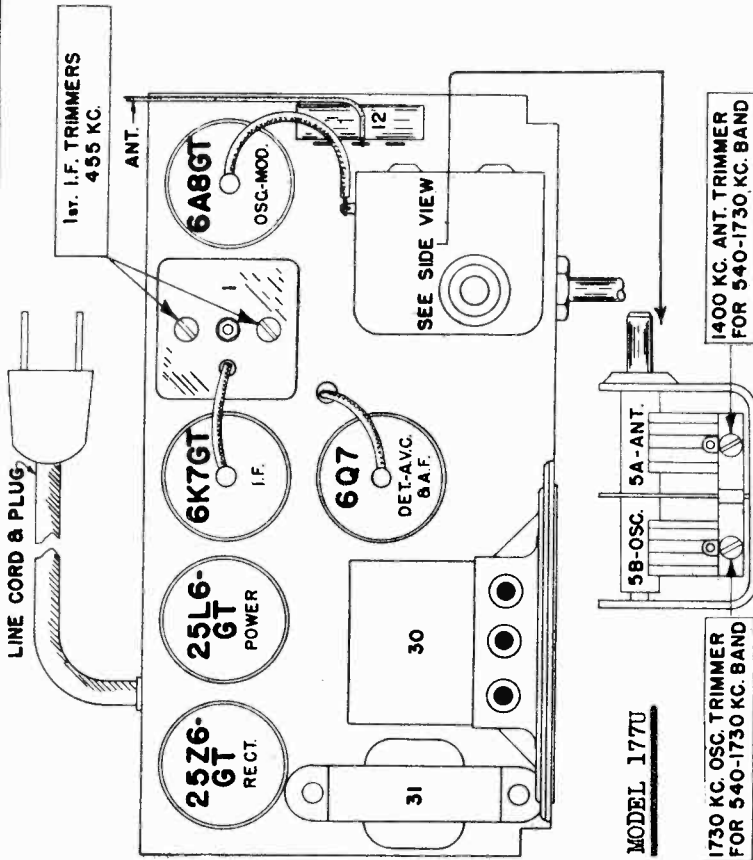
PART N°-(RC)-147-U

SENTINEL RADIO CORP.

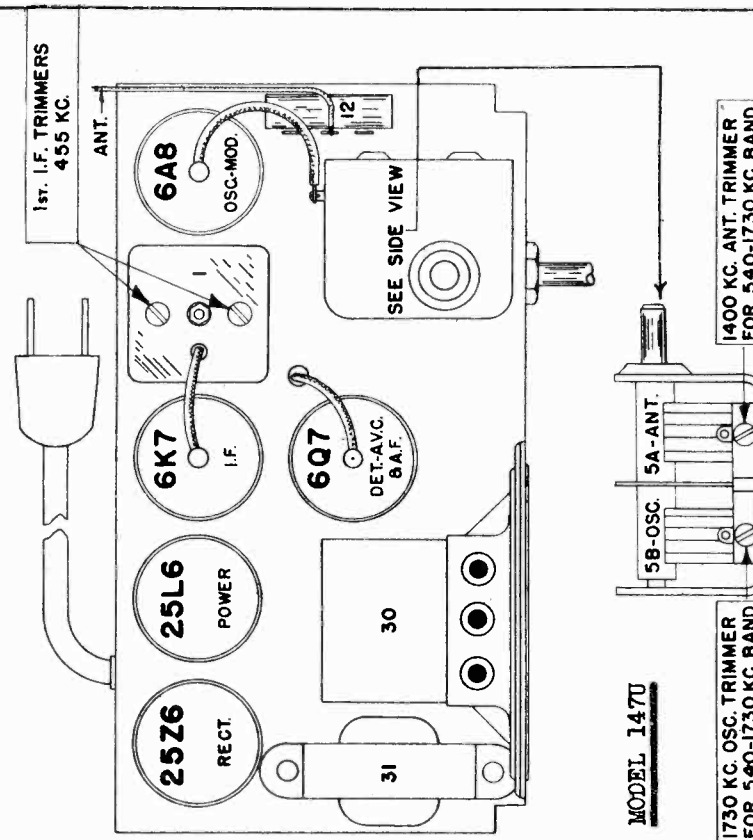
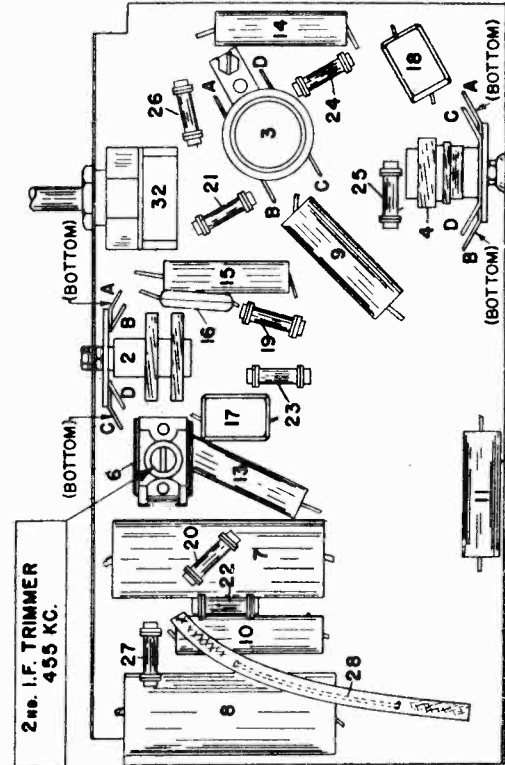
MODEL 147U

MODEL 177U

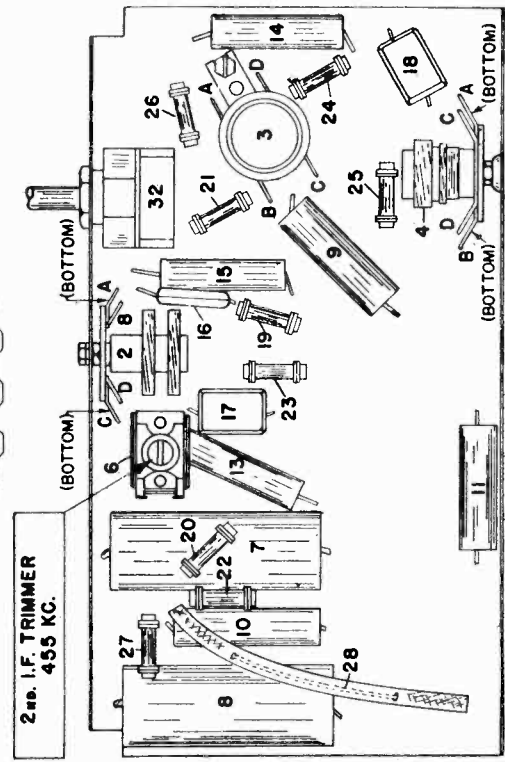
Trimmers, Chassis



MODEL 177U

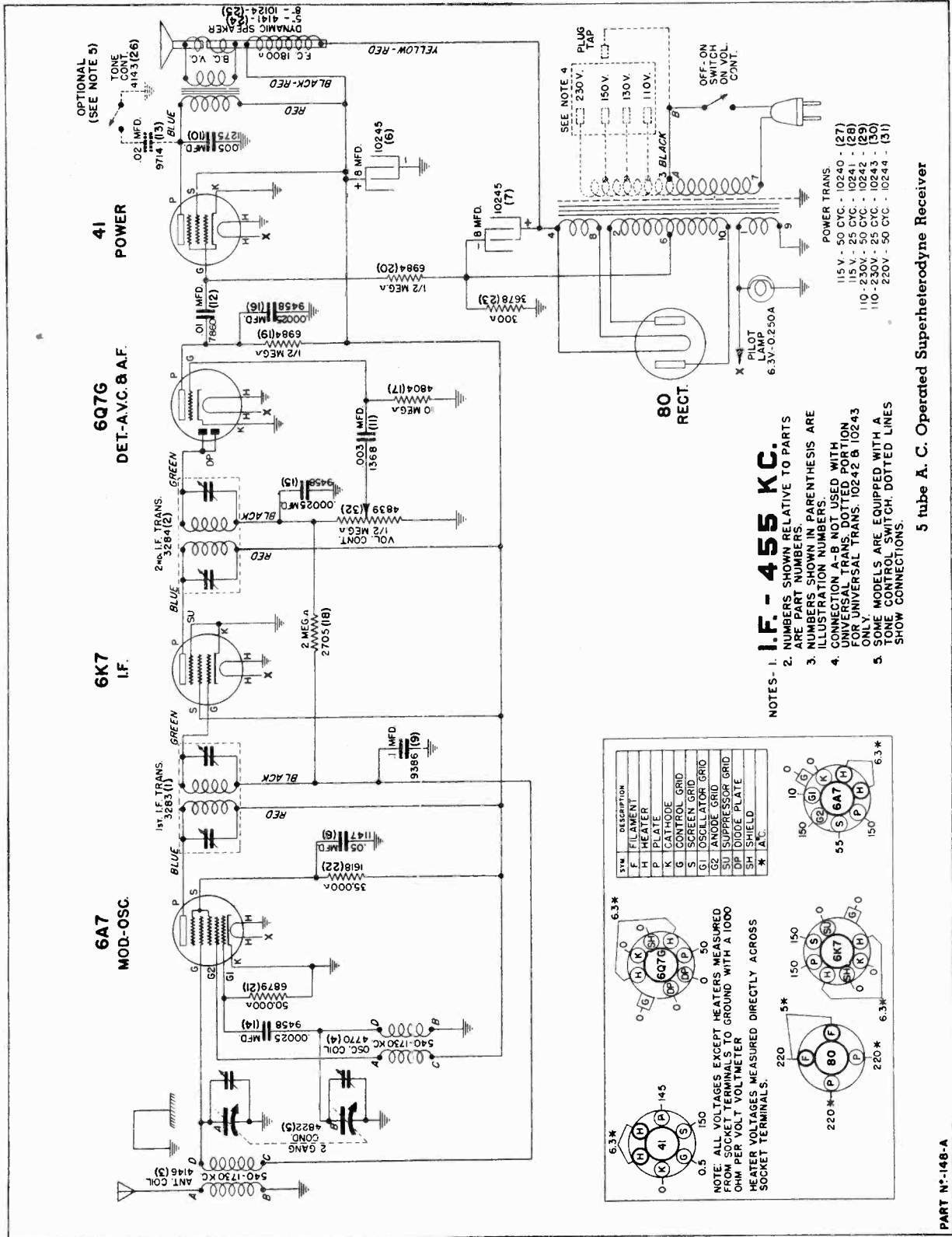


MODEL 147U



SENTINEL RADIO CORP.

MODEL 148A
Schematic, Voltage
Socket



I.F. - 455 KC.

NOTES - 1. NUMBERS SHOWN RELATIVE TO PARTS
 2. ARE PART NUMBERS.
 3. NUMBERS SHOWN IN PARENTHESIS ARE
 ILLUSTRATION NUMBERS.
 4. CONNECTION A-B NOT USED WITH
 UNIVERSAL TRANS. DOTTED PORTION
 ONLY UNIVERSAL TRANS. 10242 B 10243
 5. SOME MODELS ARE EQUIPPED WITH A
 TONE CONTROL SWITCH. DOTTED LINES
 SHOW CONNECTIONS.

SYM	DESCRIPTION
F	FILAMENT
H	HEATER
P	PLATE
K	CATHODE
G	CONTROL GRID
G1	OSCILLATOR GRID
G2	ANODE GRID
SU	SUPPRESSOR GRID
DP	DIODE PLATE
SH	SHIELD
*	A.C.

NOTE: ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER
 HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

5 tube A. C. Operated Superheterodyne Receiver

PART N°-148-A

MODEL 148A

Alignment, Trimmers
Chassis

SENTINEL RADIO CORP.

MODEL 151BL

Alignment

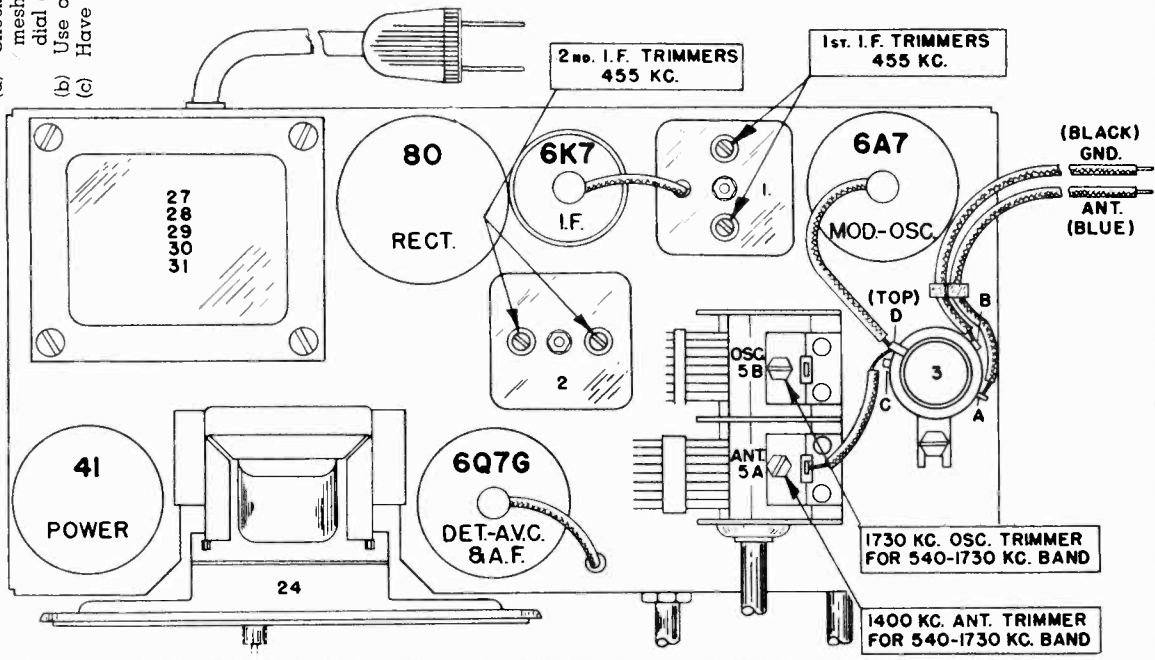
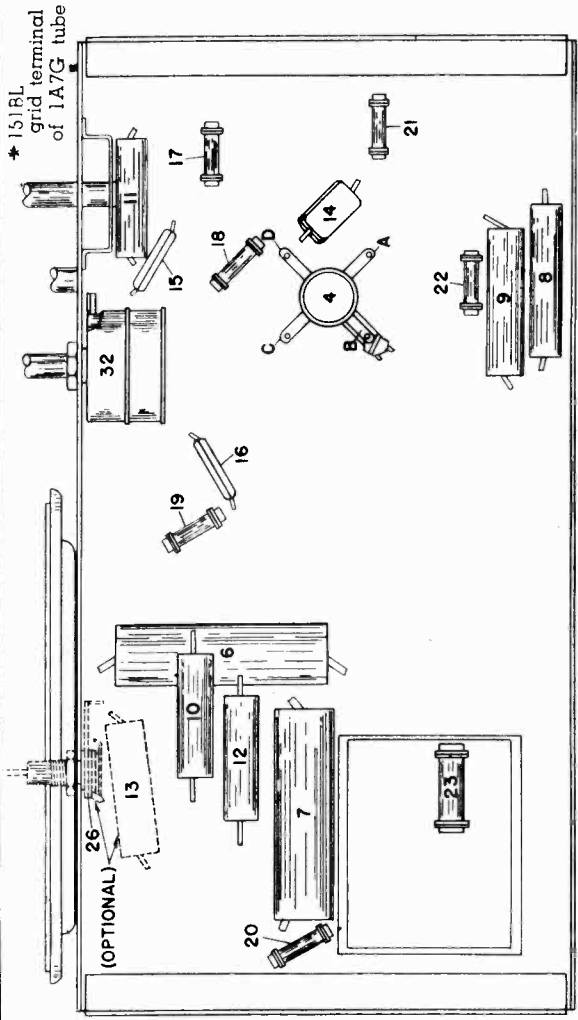
ALIGNMENT PROCEDURE IN TABULATED FORM

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

- (a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.
- (b) Use an accurately calibrated test oscillator with some type of output measuring device.
- (c) Have ground lead of test oscillator attached to chassis.

TEST OSCILLATOR		Refer to parts layout diagram for location of trimmers mentioned below:
Set receiver dial to:	Adjust test oscillator frequency to:	
I. F. Any point where no interfering signal is received	455 K. C.	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
1 Exactly 1730 K. C.	Exactly 1730 K. C.	Adjust 1730 K. C. oscillator trimmer for maximum output.
	Exactly 1400 K. C.	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.

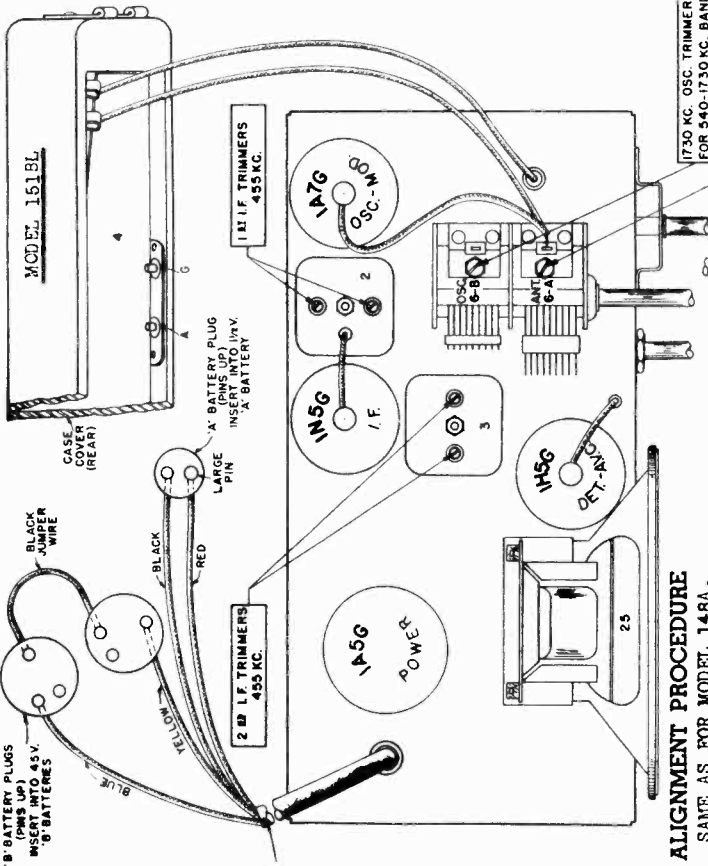
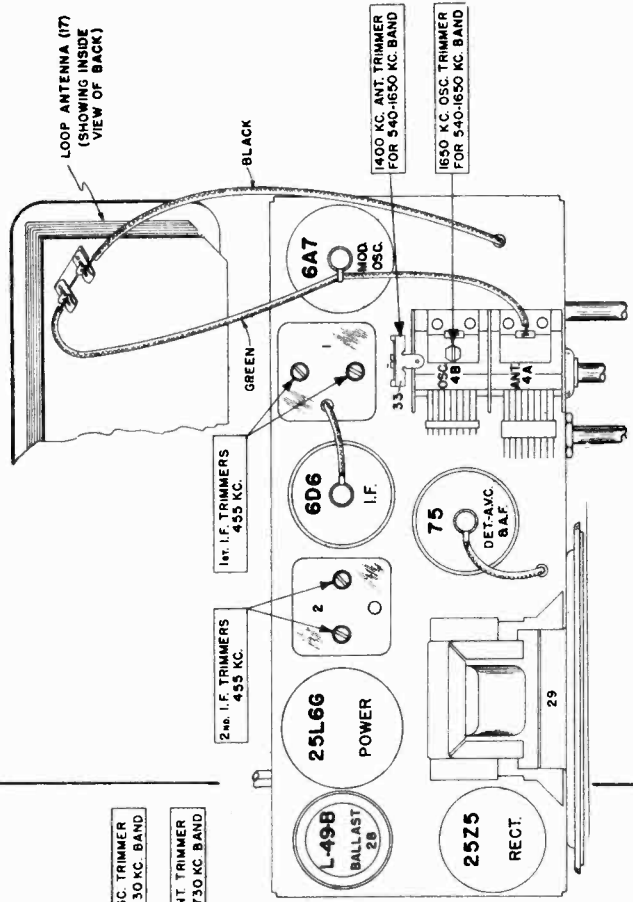
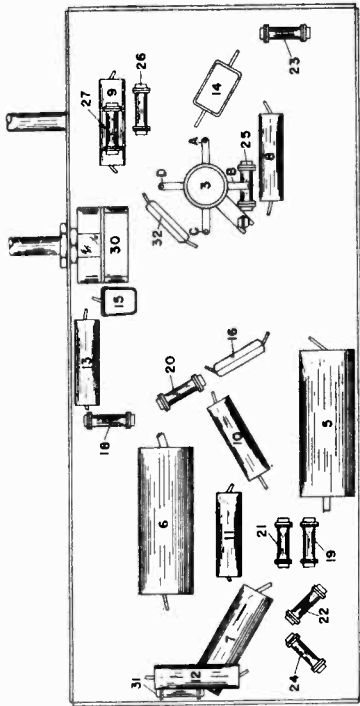


MODEL 151BL
MODEL 163UL

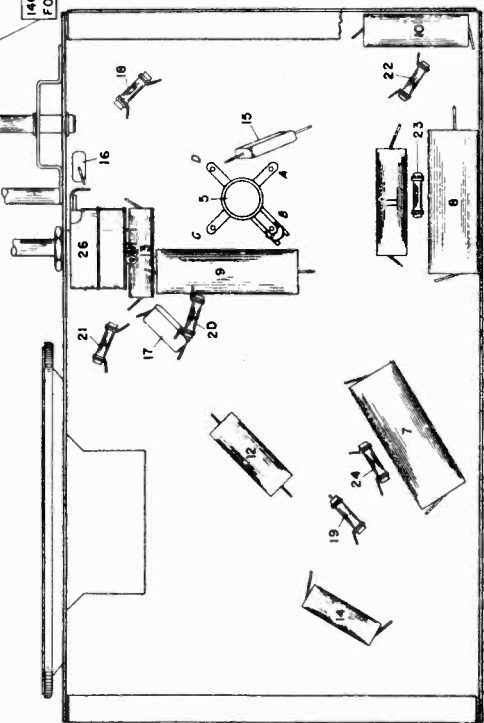
SENTINEL RADIO CORP.

Trimmers, Chassis

MODEL 163UL

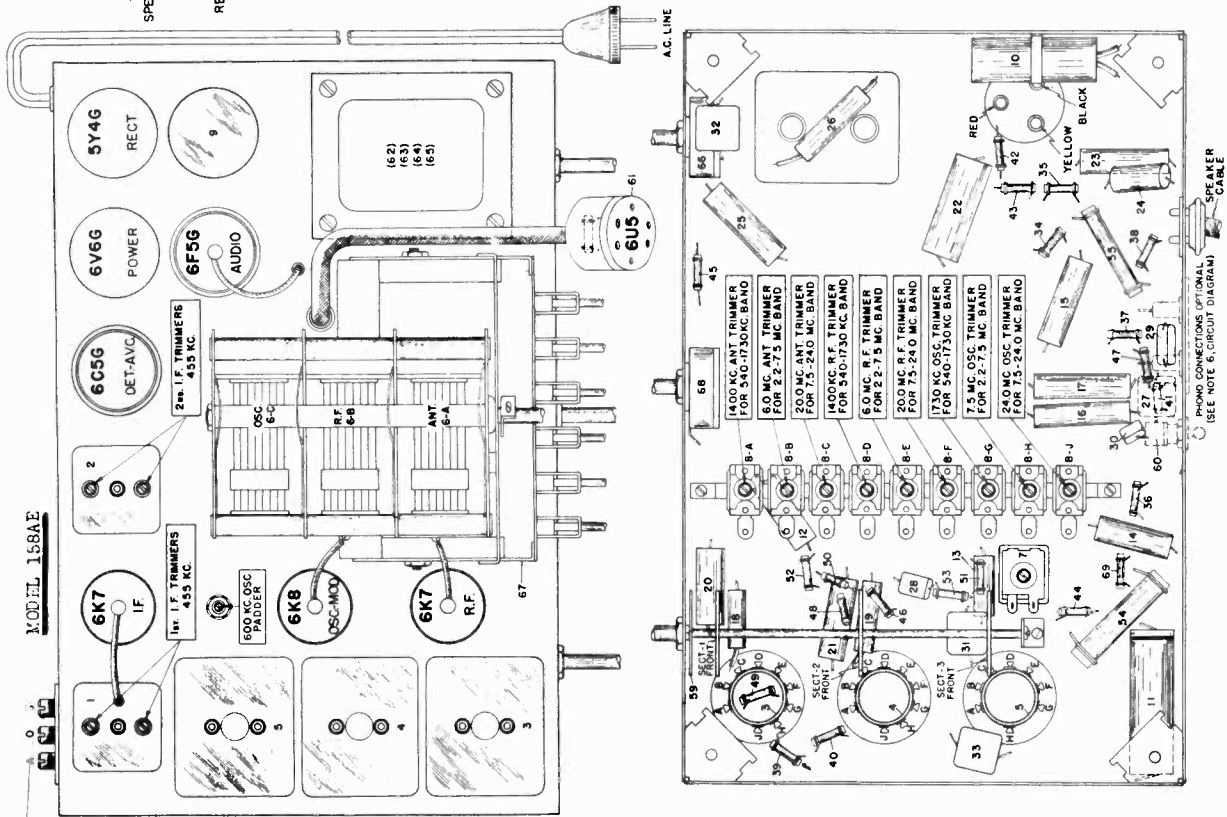
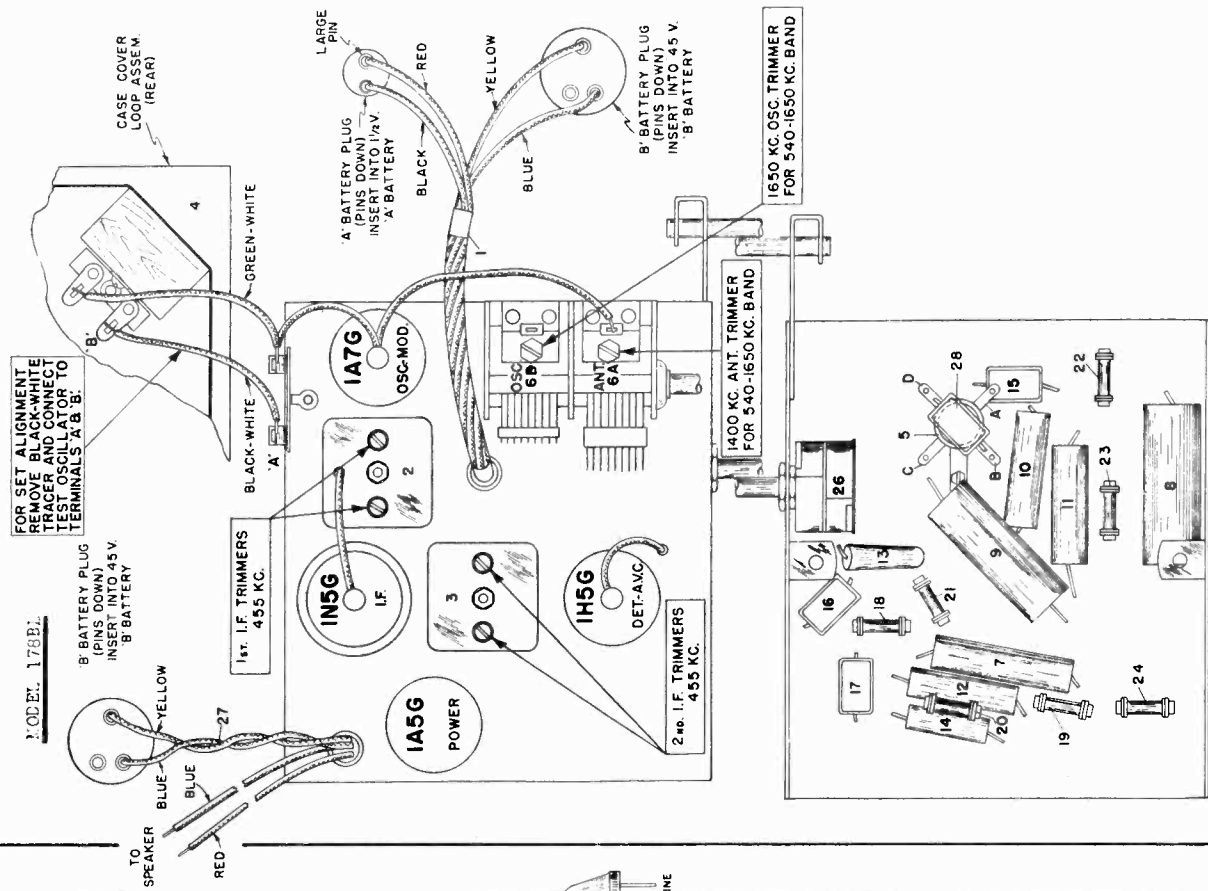


ALIGNMENT PROCEDURE
SAME AS FOR MODEL 148A.



MODEL 158AE
 MODEL 178BL
 Trimmers, Chassis

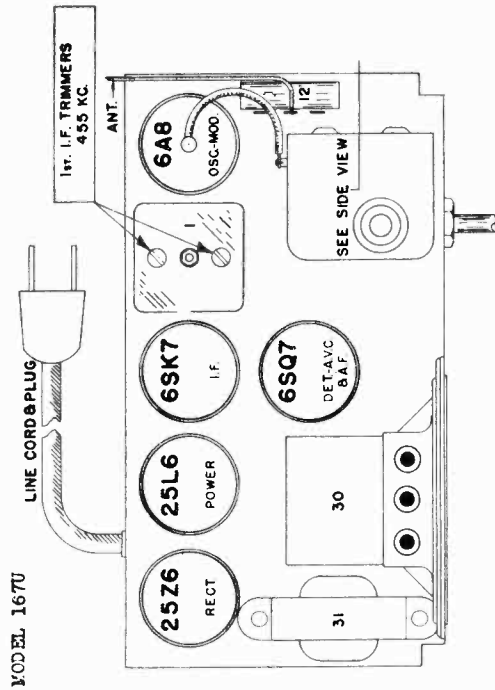
SENTINEL RADIO CORP.



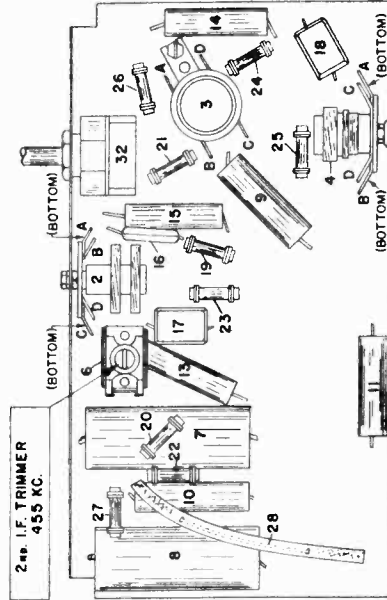
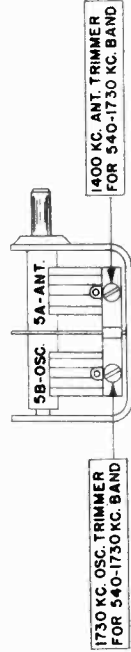
MODEL 163UL
Alignment
MODEL 167U
Socket, Trimmers
Chassis

SENTINEL RADIO CORP.

MODEL 178BL
Alignment



ALIGNMENT PROCEDURE
SEE INDEX.



ALIGNMENT PROCEDURE IN TABULATED FORM

Before starting alignment, check tuning dial adjustment by: turn gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial indicator must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.
Use an accurately calibrated test oscillator with some type of output measuring device.

MODEL 163UL

BEFORE ALIGNING, PLACE LOOP ANTENNA AND THE "A" AND "B" BATTERIES IN THE SAME APPROXIMATE POSITION IN THE BACK OF CHASSIS THAT THEY WILL BE IN WHEN THE SET IS IN THE CABINET AND THE CABINET BACK CLOSED.
When adjusting 1850 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, place test oscillator in series with set loop by:

1. Remove the black with white tracer wire used to connect loop antenna to Fahnestock clip on chassis.
2. Attach test oscillator to terminals marked "A" and "B" on parts layout diagram.

IMPORTANT—No condenser should be in series with generator leads.

TEST OSCILLATOR		Use dummy antenna in series with test oscillator consisting of	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below—and:
Set receiver dial to:	Adjust test oscillator frequency to:	.02 MFD condenser	High side to grid terminal of 1A7G tube Low side to chassis DO NOT REMOVE CAP.	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
I. F. where no interfering signal is received	455 K. C.			
(1) Exactly 1650 K. C.	Exactly 1650 K. C.	None	Attach in series with "B" Loop Terminals	Adjust 1650 K. C. oscillator trimmer for maximum output.
(2) Approx. 1400 K. C.	Exactly 1400 K. C.	None	Attach in series with "A" and "B" Loop Terminals	Adjust 1400 K. C. antenna trimmer for maximum output.

MODEL 178BL

IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME APPROXIMATE POSITION IN THE BACK OF CHASSIS IT WILL BE IN WHEN THE SET IS IN THE CABINET AND THE BACK ATTACHED.

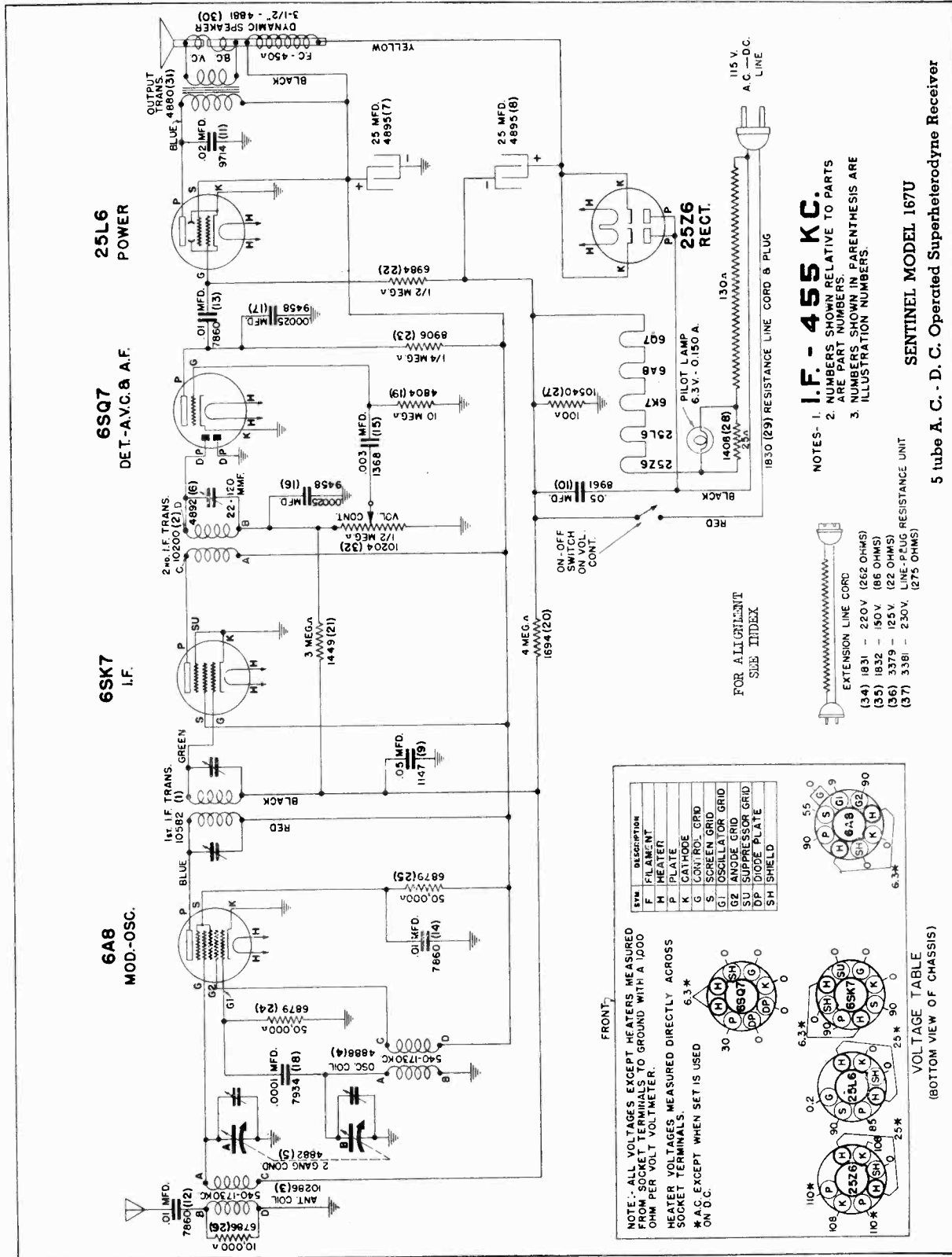
When adjusting 1850 K.C. oscillator trimmer and 1400 K.C. antenna trimmer, couple test oscillator to set loop by placing lead from high side of test oscillator on top of or near set loop. Be sure that neither the loop or test oscillator lead moves during alignment.

DO NOT ATTACH LOW SIDE OF TEST OSCILLATOR TO RECEIVER—LEAVE UNCONNECTED.

TEST OSCILLATOR		Use dummy antenna in series with test oscillator consisting of	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below—and:
Set receiver dial to:	Adjust test oscillator frequency to:	.02 MFD condenser	High side to grid terminal of 6A7 tube DO NOT REMOVE CAP.	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
I. F. where no interfering signal is received	455 K. C.			
(1) Exactly 1650 K. C.	Exactly 1650 K. C.	None	Lay lead on top of or close to loop	Adjust 1650 K. C. oscillator trimmer for maximum output.
(2) Approx. 1400 K. C.	Exactly 1400 K. C.	None	Lay lead on top of or close to loop	Adjust 1400 K. C. antenna trimmer for maximum output.

MODEL 167U
Schematic, Voltage
Socket

SENTINEL RADIO CORP.

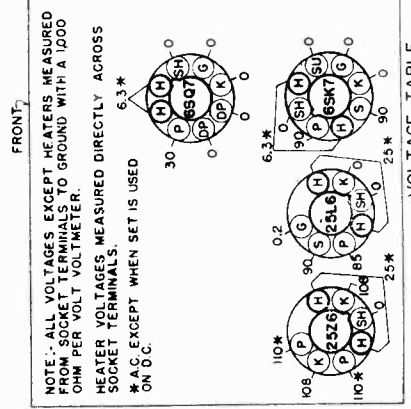


I.F. - 455 KC.
NOTES - 1. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
2. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

EXTENSION LINE CORD
(34) 1831 - 220V (266 OHMS)
(35) 1832 - 150V (86 OHMS)
(36) 3379 - 125V (22 OHMS)
(37) 3381 - 230V (275 OHMS)

SENTINEL MODEL 167U
5 tube A. C. - D. C. Operated Superheterodyne Receiver

SYM	DESCRIPTION
F	FILAMENT
H	HEATER
P	PLATE
K	CATHODE
S	CONTROL GRID
G	SCREEN GRID
G1	OSCELLATOR GRID
SZ	SUPPRESSOR GRID
DP	DIODE PLATE
SH	SHIELD



MODEL 127B MODEL 128B
MODEL 137U MODEL 138AE
MODEL 139UE MODELS 140B, 140BE

Alignment

Sentinel Model 141AE

Place band switch for operation on:	Set receiver dial to:	Adjust test oscillator frequency to:	TEST OSCILLATOR Use dummy antenna in series with test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmer mentioned below:
16 TO 470 K.C. BAND	Any point where no interfering signal is received	Exactly 455 K.C.	02 MFD condenser	High side to 1A7G tube; DO NOT remove cap	Adjust each of the second I.F. transformer trimmers for maximum output.
16 TO 470 K.C. BAND	(1) Exactly 1800 K.C. (2) Approx. 1800 K.C. (3) 550 K.C.	Exactly 1800 K.C. Approx. 1800 K.C. Approx. 550 K.C.	00025 Mfd condenser 00025 Mfd condenser 00025 Mfd condenser	Receiver blue antenna lead Receiver blue antenna lead Receiver blue antenna lead	Adjust 1600 K.C. oscillator trimmer for maximum output. While rocking gang condenser adjust 1400 K.C. antenna trimmer for maximum output. While rocking gang condenser adjust 550 K.C. oscillator pad for maximum output.
16 TO 390 K.C. BAND	(1) Exactly 330 K.C. (2) Approx. 330 K.C. (3) 180 K.C.	Exactly 330 K.C. Approx. 330 K.C. Approx. 180 K.C.	00025 Mfd condenser 00025 Mfd condenser 00025 Mfd condenser	Receiver blue antenna lead Receiver blue antenna lead Receiver blue antenna lead	Adjust 390 K.C. oscillator trimmer for maximum output. Adjust 350 K.C. antenna trimmer for maximum output. While rocking gang condenser adjust 180 K.C. oscillator trimmer for maximum output.
57 TO 18 M.C. BAND	(1) Exactly 18 M.C. (2) Approx. 15 M.C.	Exactly 18 M.C. Approx. 15 M.C.	400 Ohm carbon resistor 400 Ohm carbon resistor	Receiver blue antenna lead Receiver blue antenna lead	Adjust 18 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, then screw down trimmer until capacity until the second peak—which is the proper one to use—is tuned in. While rocking gang condenser adjust 15 M.C. antenna trimmer for maximum output.

ALIGNMENT PROCEDURE IN TABULATED FORM

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.
(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line, more needle to correct position.
(b) Use an accurately calibrated test oscillator with some type of output measuring device.
(c) Have ground lead of test oscillator attached to chassis.

Models 138AE, 139UE, 140B, 140BE, 145AE and 158AE

Place band switch for operation on:	Set receiver dial to:	Adjust test oscillator frequency to:	TEST OSCILLATOR Use dummy antenna in series with test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmer mentioned below:
170 TO 540 K.C. BAND	Any point where no interfering signal is received	Exactly 455 K.C.	02 MFD condenser	High side to 1C7G tube; DO NOT remove cap	Adjust each of the second I.F. transformer trimmers for maximum output—be sure to use proper peak. If more than one peak is noticed, then screw down trimmer until capacity until the second peak—which is the proper one to use—is tuned in.
170 TO 540 K.C. BAND	(1) Exactly 1730 K.C. (2) Exactly 1400 K.C. (3) 800 K.C.	Exactly 1730 K.C. Exactly 1400 K.C. Approx. 800 K.C.	00025 Mfd condenser 00025 Mfd condenser 00025 Mfd condenser	Receiver antenna lead Receiver antenna lead Receiver antenna lead	Adjust 1730 K.C. oscillator trimmer for maximum output. While rocking gang condenser adjust 1400 K.C. antenna trimmer for maximum output. While rocking gang condenser adjust 800 K.C. oscillator pad for maximum output.
75 TO 24 M.C. BAND	(1) Exactly 18.1 M.C. (2) Exactly 15 M.C.	Exactly 18.1 M.C. Exactly 15 M.C.	400 Ohm carbon resistor 400 Ohm carbon resistor	Receiver antenna lead Receiver antenna lead	Adjust 18.1 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, then screw down trimmer (add capacity) until the second peak—which is the proper one to use—is tuned in. Adjust 15 M.C. antenna trimmer for maximum output.
75 TO 24 M.C. BAND	(1) Exactly 24 M.C. (2) Approx. 20 M.C.	Exactly 24 M.C. Approx. 20 M.C.	400 Ohm carbon resistor 400 Ohm carbon resistor	Receiver antenna lead Receiver antenna lead	Adjust 24 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, then screw down trimmer (add capacity) until the second peak—which is the proper one to use—is tuned in. While rocking gang condenser adjust 20 M.C. antenna and R.F. trimmer for maximum output.

Sentinel Models 127B, 137U, 147U, 167U, and 177U.

ALIGNMENT PROCEDURE IN TABULATED FORM

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.
(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line, move to correct position.
(b) Use an accurately calibrated test oscillator with some type of output measuring device.
(c) Have ground lead of test oscillator attached to gang condenser frame.

Place band switch for operation on:	Set receiver dial to:	Adjust test oscillator frequency to:	TEST OSCILLATOR Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmer mentioned below—end:
455 K.C.	Any point where no interfering signal is received	Exactly 455 K.C.	02 MFD condenser	High side to 1A7G tube; DO NOT REMOVE CAP.	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. trimmers for maximum output. <i>6AB (137U, 147U, 167U, 177U)</i>
1730 K.C.	Exactly 1730 K.C.	Exactly 1730 K.C.	00025 MFD condenser	Receiver blue antenna lead	Adjust 1730 K.C. oscillator trimmer for maximum output.
1400 K.C.	Exactly 1400 K.C.	Exactly 1400 K.C.	00025 MFD condenser	Receiver blue antenna lead	Adjust 1400 K.C. antenna trimmer for maximum output.

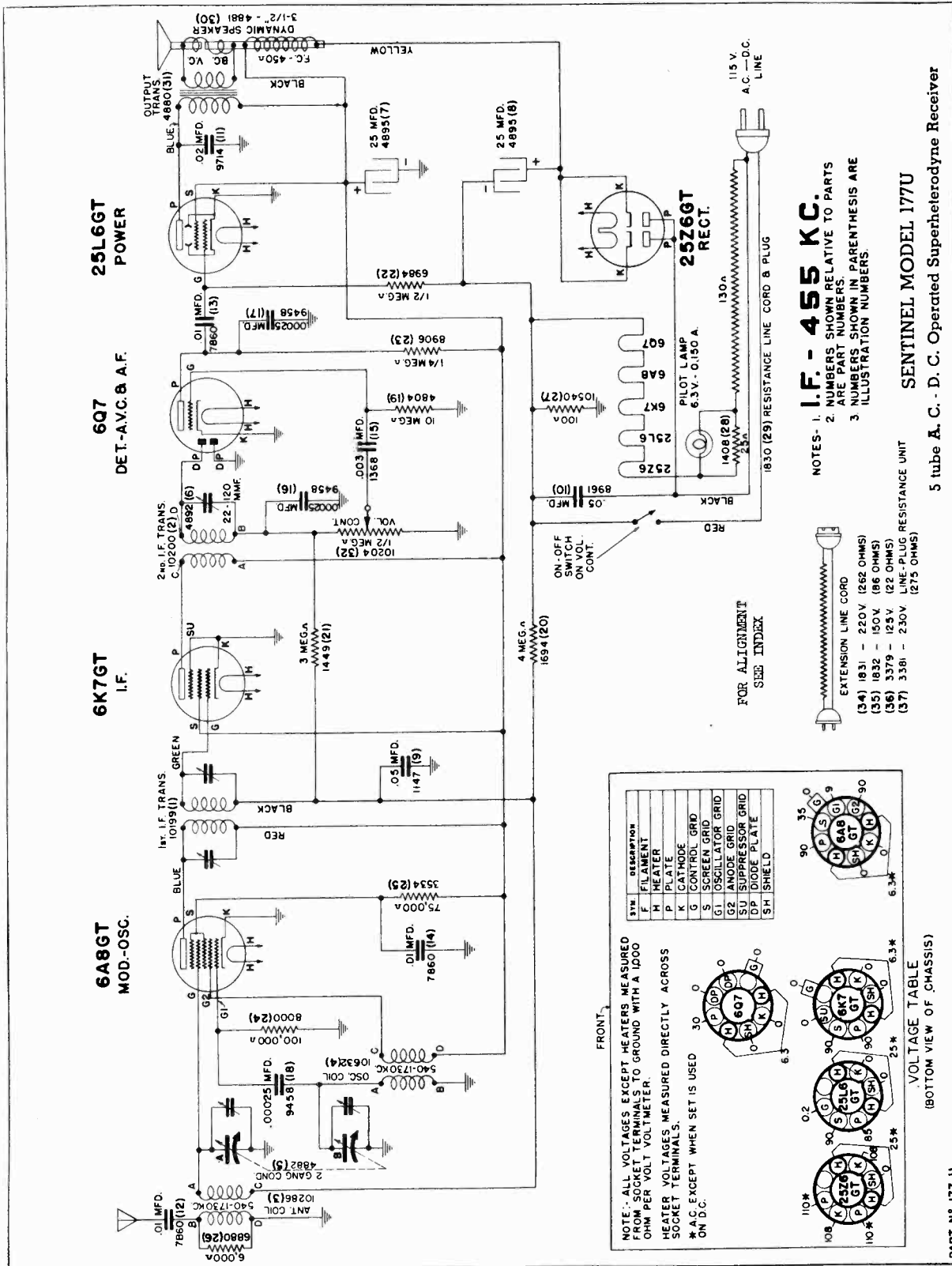
Sentinel Model 128B

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.
(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line, more needle to correct position.
(b) Use an accurately calibrated test oscillator with some type of output measuring device.
(c) Have ground lead of test oscillator attached to chassis.

Place band switch for operation on:	Set receiver dial to:	Adjust test oscillator frequency to:	TEST OSCILLATOR Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmer mentioned below and:
1730 TO 540 K.C.	Any point where no interfering signal is received	Exactly 455 K.C.	02 Mfd condenser	High side to 1C7G tube; DO NOT remove cap.	Adjust each of the second I.F. transformer trimmers for maximum output—be sure to use proper peak. If more than one peak is noticed, then screw down trimmer until capacity until the second peak—which is the proper one to use—is tuned in.
1730 TO 540 K.C.	(1) Exactly 1730 K.C. (2) Exactly 1400 K.C. (3) Approximately 800 K.C.	Exactly 1730 K.C. Exactly 1400 K.C. Approximately 800 K.C.	00025 Mfd condenser 00025 Mfd condenser 00025 Mfd condenser	Receiver blue antenna lead Receiver blue antenna lead Receiver blue antenna lead	Adjust 1730 K.C. oscillator trimmer for maximum output. Adjust 1400 K.C. antenna trimmer for maximum output. While rocking gang condenser adjust 800 K.C. oscillator pad for maximum output.
57 TO 18.1 M.C. BAND	Exactly 18.1 M.C.	Exactly 18.1 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	Adjust 18.1 M.C. oscillator trimmer for maximum output—be sure to use proper peak. If more than one peak is noticed, then screw down trimmer (add capacity) until the second peak—which is the proper one to use—is tuned in.
15 M.C.	Exactly 15 M.C.	Exactly 15 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	Adjust 15 M.C. antenna trimmer for maximum output.

MODEL 177U
Schematic, Voltage
Socket

SENTINEL RADIO CORP.



I.F. - 455 KC.

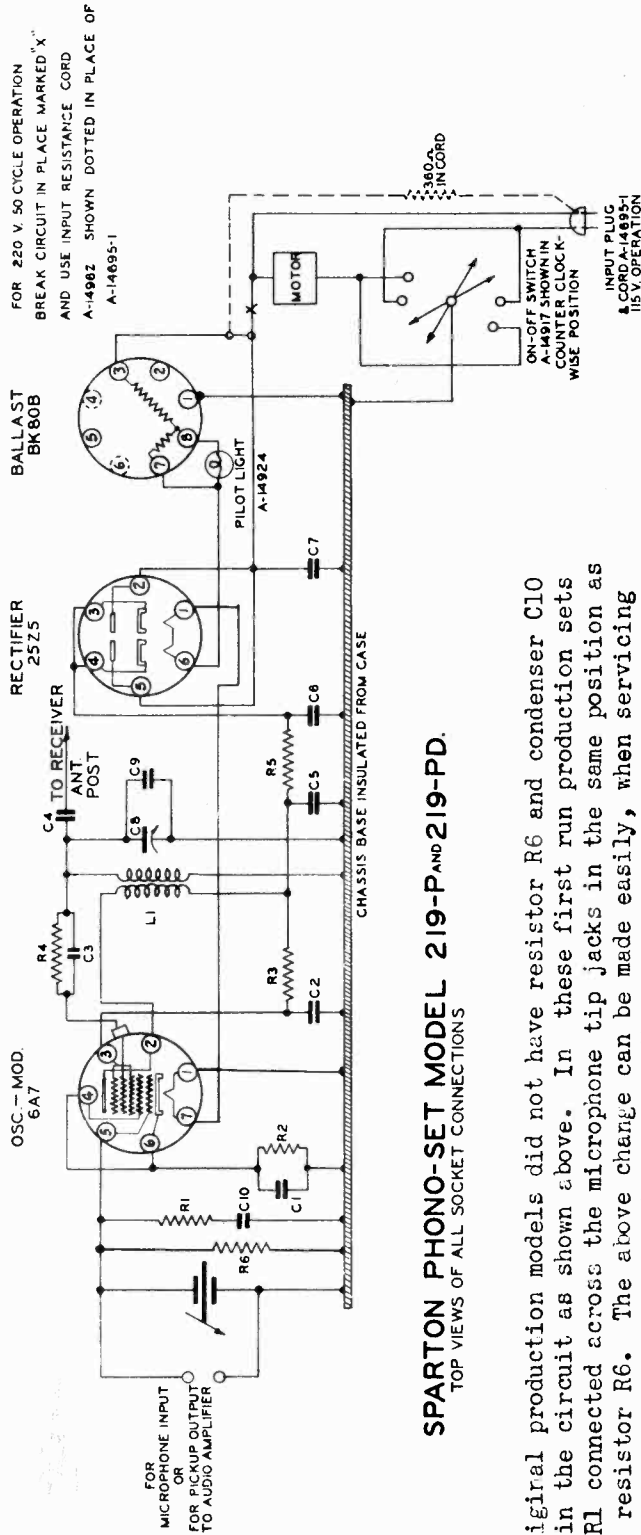
NOTES - 1. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS. PARENTHESIS ARE ILLUSTRATION NUMBERS.

SENTINEL MODEL 177U
5 tube A. C. - D. C. Operated Superheterodyne Receiver

PART N°-177-U

SPARKS WITHINGTON CO.

MODELS 219-P, 219-PD
Wireless Phonograph
Schematic, Voltage
Adjustments, Changes



SPARTON PHONO-SET MODEL 219-P AND 219-PD.
TOP VIEWS OF ALL SOCKET CONNECTIONS

NOTE: Original production models did not have resistor R6 and condenser C10 included in the circuit as shown above. In these first run production sets resistor R1 connected across the microphone tip jacks in the same position as shown for resistor R6. The above change can be made easily, when servicing any of the first run Models 219-P Wireless Phonographs.

The SPARTON Wireless Phonograph Models 219-P and 219-PD are shipped from the factory for operation at approximately 1550 kilocycles.

This frequency may be changed by adjusting a trimmer condenser which is reached through the hole in the bottom of the chassis. An insulated shaft screwdriver should be used. Turning the screw clockwise lowers the frequency and turning the screw counter-clockwise increases the frequency. The normal range of adjustment is from approximately 1200 kilocycles to approximately 1700 kilocycles.

- C1 1 MFD. 200V.
- C2 1 MFD. 200V.
- C3 50 MMFD. MICA
- C4 10 MMFD. MICA
- C5 10 MFD. 150V. ELECT.
- C6 15 MFD. 150V. ELECT.
- C7 1 MFD. 200V.
- C8 95-470 MMFD. MICA TRIM.
- C9 75 MMFD.
- C10 008/MFD. 400V
- R1 33,000 Ω. 25W.
- R2 820 Ω. 25W.
- R3 10,000 Ω. 25W.
- R4 10,000 Ω. 25W.
- R5 4700 Ω. 5W.
- R6 180,000 Ω. 25W.
- L1 OSCILLATOR COIL

- C-3140 110V. 60 CYCLE MOTOR
- C-3140-1 110V. 50 CYCLE MOTOR
- C-3140-2 110V. 40 CYCLE MOTOR
- C-3140-3 220V. 25 CYCLE MOTOR
- C-3140-4 220V. 50 CYCLE MOTOR
- C-3154-1 110V. 60 CYCLE MOTOR
- C-3154-2 110V. 50 CYCLE MOTOR
- C-3154-3 110V. 40 CYCLE MOTOR
- C-3154-4 220V. 50 CYCLE MOTOR

- C-3202-36C
- C-3202-36C
- C-720-343
- C-720-367
- A-14927-1
- C-3202-36C
- A-14911-3A
- A-14922
- C-2795-60C
- C-2795-60B
- C-2795-61B
- C-2795-74B
- C-2795-74B
- C-2795-70C
- C-2795-89B
- A-14926-1

VOLTAGE CHART

Tube	Function	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic Diagram)							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6A7	Oscillator-Modulator	0	120	80	4.5	0	4.5	6.3*	0
25Z5	Rectifier	6.3*	117*	150	117*	31.3*	-	-	-
EK-80B	Ballast	0	-	117*	-	-	31.3*	37%	-

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.
*AC volts.

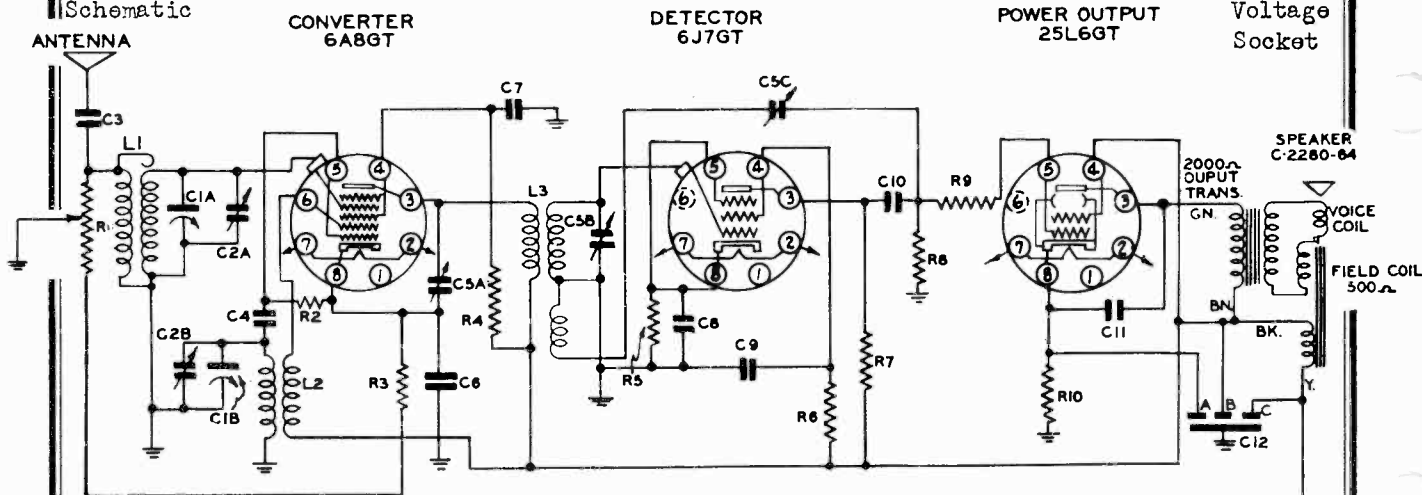
Antenna Not Connected.
Microphone Not Connected.

(Original) Effective November 1, 1938

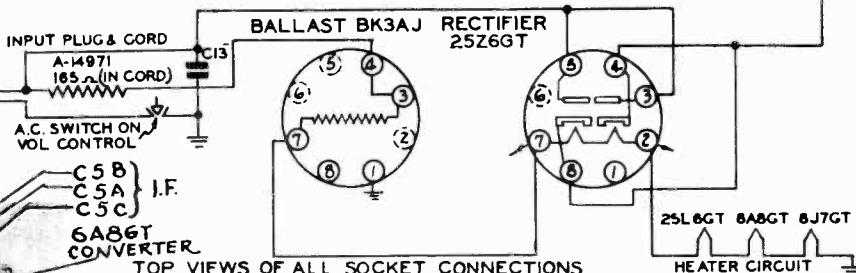
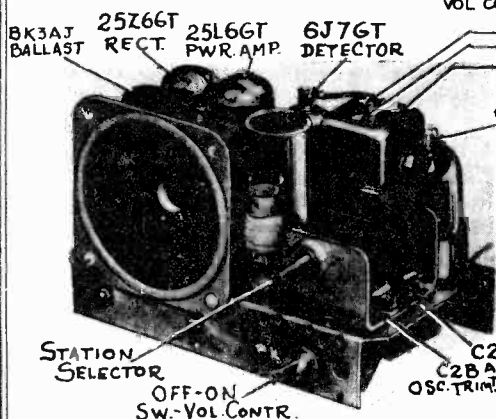
MODEL 409-GL
Schematic

SPARKS WITHINGTON CO.

Trimmers, Alignment



MODEL 409-GL
INTERMEDIATE
FREQUENCY 456 K.C.



TOP VIEWS OF ALL SOCKET CONNECTIONS

- C1A&B VARIABLE CONDENSER B-7288
- C2A&B ON VARIABLE CONDENSER
- C3 .001 MFD. 400 V. C-3204-2C
- C4 50 MMF. MICA C-720-343
- C5A&B C I.F. TRIMMER A-14792
- C6 .01 MFD. 200V. C-3202-76C
- C7 .05 MFD. 200V. C-3202-28C
- C8 10 MFD. 25 V. A-14782-2
- C9 .01 MFD. 200V. C-3202-20C
- C10 .01 MFD. 200V. C-3202-20C
- C11 .02 MFD. 400V. C-3204-78C
- C12A&B 20-25 MFD. ELECT. A-14972
- C13 .05 MFD. 400V. C-3204-28C
- R1 VOL. CONTROL & SWITCH A-12708-A1
- R2 56000 Ω .25 W. C-2795-83B
- R3 390 Ω .25 W. C-2795-57B
- R4 39000 Ω .25 W. C-2795-81B
- R5 27000 Ω .25 W. C-2795-79B
- R6 6.2 MEGOHM .25 W. C-2795-250B
- R7 560 000 Ω .25 W. C-2795-95B
- R8 560 000 Ω .25 W. C-2795-95B
- R9 100 000 Ω .25 W. C-2795-88B
- R10 150 Ω .5 W. C-2798-52C
- L1 B.C. ANT. COIL A-14974
- L2 B.C. OSC. COIL A-14975
- L3 I.F. TRANS. A-12989-5

VOLTAGE CHART

Line Voltage: 115 volts		Position of Volume Control: Full with Antenna Disconnected †								
Tube	Function	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6A8GT	Converter	0	11*	115	42	-2.8	115	5*	1.8	0
6J7GT	Detector	0	5.8*	**	**	**	115	0	**	0
25L6GT	P.O.	0	54*	105	115	0	0	7*	7.2	-
25Z6GT	Rectifier	0	58*	115*	148*	115*	0	54*	148*	-
BK3AJ	Ballast	0	0	62*	62*	0	0	58*	0	-

Notes: Voltage readings are for schematic diagram. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages. *AC volts. **Cannot be measured accurately with 1000 ohms per volt voltmeter.

† A regular outside antenna 50 feet in length excluding lead-in and 25 to 50 feet in height should be used for best results with this model.

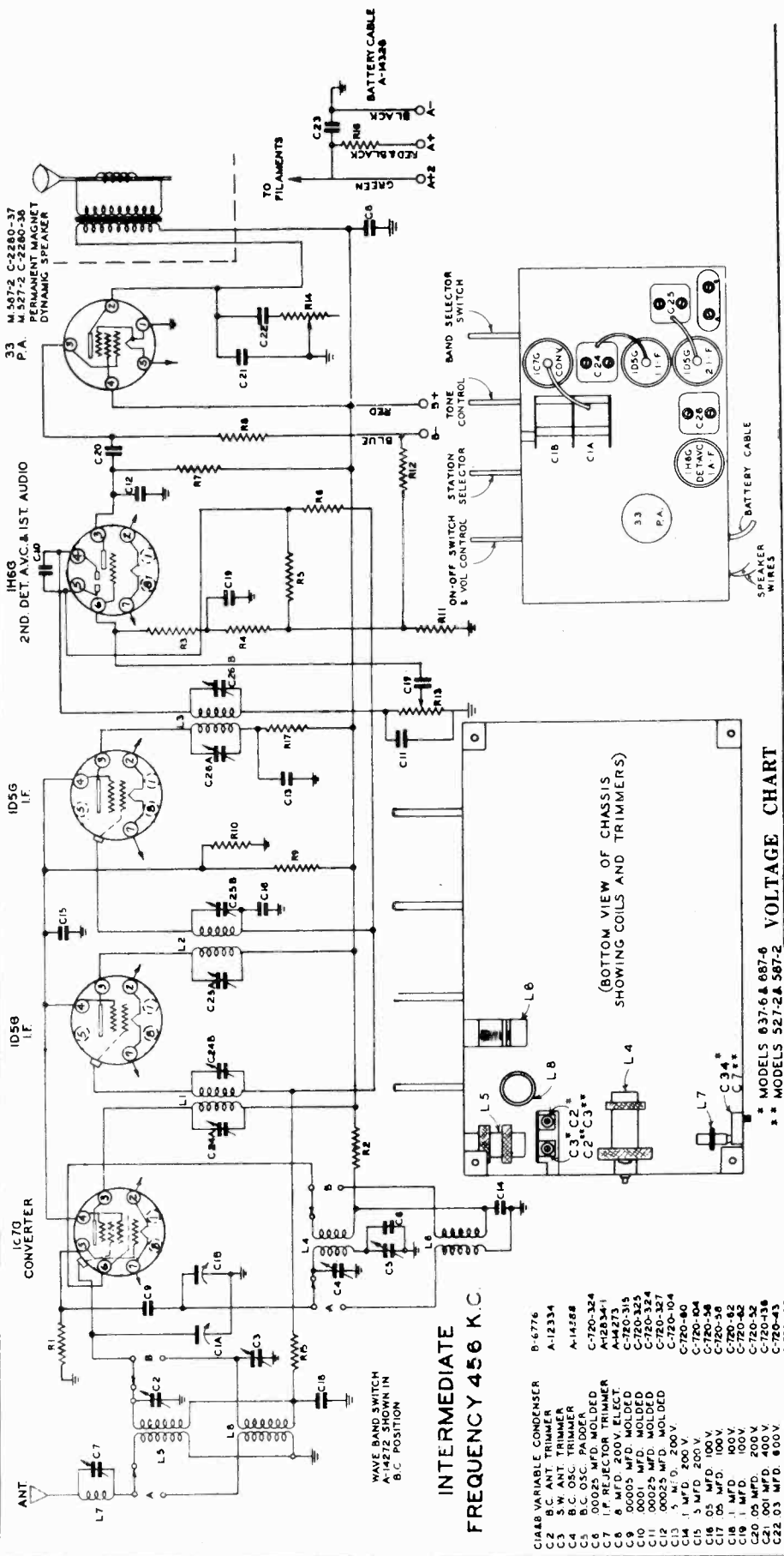
ALIGNMENT

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1							(Set dial pointer to last mark on scale when condenser plates are flush)*
2							(Back off, i.e. turn counterclockwise, regeneration cond. C5C "red spot" before I.F. is aligned)
3	I.F.	6A8GT	.1 mf.	456 K.C.	Open	C5A, B	
4							(Adjust C5C "red spot" turning in clockwise until greatest sensitivity is obtained. If oscil. occurs, turn out C5C until oscil. stops)
5	Broadcast Band	Ant.	200 mmf.	1500 KC	1500 KC	C2B Osc.	Peak accurately
6						C2A Ant.	Peak accurately
7							(Check calibration and sensitivity at 600 KC, 1000 KC, 1500 KC)
8							(Connect set to regular antenna and check reception of stations. Readjust C5C if set howls or oscillates on strong signals. Then recheck sensitivity)

*Model 409-GL chassis may be completely aligned without removing from cabinet.

SPARKS WITHINGTON CO.

MODELS 527-2, 587-2
Schematic, Voltage, Socket
Trimmers



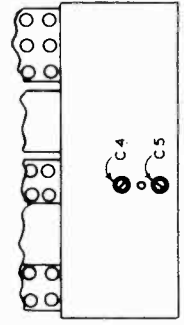
Position of Volume Control: Full with Antenna Disconnected
Position of Band Selector Switch: Broadcast

"A" Battery Voltage: 2 volts
"B" Battery Voltage: 135 volts

VOLTAGE CHART

Tube	Function	Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8	Grid Cap
1C7G	Converter	-	0	115	64	0	110	2	-	*
1D5G	First I-F Amplifier	-	0	115	56	0	-	2	-	*
1D5G	Second I-F Amplifier	-	0	111	56	0	-	2	-	*
1H6G	Det-AVC-1st A-F Amplifier	-	2	111	*	*	*	0	-	-
33	Power Amplifier	2	120	*	120	0	-	-	-	-

FOR ALIGNMENT
SEE INDEX



INTERMEDIATE
FREQUENCY 456 K.C.

- C1A8 VARIABLE CONDENSER B-6776
- C2 B.C. ANT. TRIMMER A-12334
- C3 S.W. ANT. TRIMMER A-14268
- C4 B.C. OSC. TRIMMER C-720-324
- C5 B.C. OSC. PADDED C-720-315
- C6 1000 μF. ELECTROLYTIC CAPACITOR A-12334-1
- C7 0.0005 MFD. MOLDDED A-14273
- C8 0.0005 MFD. MOLDDED C-720-325
- C9 0.0005 MFD. MOLDDED C-720-326
- C10 0.0005 MFD. MOLDDED C-720-327
- C11 0.0005 MFD. MOLDDED C-720-104
- C12 1 MFD. 200V. C-720-80
- C13 1 MFD. 200V. C-720-104
- C14 5 MFD. 200V. C-720-104
- C15 5 MFD. 100V. C-720-56
- C16 0.5 MFD. 100V. C-720-56
- C17 0.5 MFD. 100V. C-720-56
- C18 1 MFD. 100V. C-720-56
- C19 1 MFD. 100V. C-720-56
- C20 0.05 MFD. 200V. C-720-32
- C21 0.01 MFD. 400V. C-720-138
- C22 0.03 MFD. 800V. C-720-43
- C23 1 MFD. 100V. C-720-102
- C24 1 MFD. 100V. A-14315
- C25 1 MFD. 100V. A-14315
- C26 NO. 5 I.F. TRIMMER A-14315
- R1 47,000 Ω, 25 W. C-2705-825
- R2 10,000 Ω, 5 W. C-2708-744
- R3 470,000 Ω, 25 W. C-2705-948
- R4 220,000 Ω, 25 W. C-2705-908
- R5 100,000 Ω, 25 W. C-2705-948
- R6 100,000 Ω, 25 W. C-2705-948
- R7 220,000 Ω, 25 W. C-2705-948
- R8 470,000 Ω, 25 W. C-2705-948
- R9 18,000 Ω, 1 W. C-2717-784
- R10 50,000 Ω, 1 W. C-2707-684
- R11 150 Ω, 5 W. C-2708-524
- R12 300 Ω, 5 W. C-2708-524
- R13 100 Ω, 5 W. C-2708-574
- R14 100 Ω, 5 W. A-12084-7
- R15 5800 Ω, 25 W. C-2705-718
- R16 5800 Ω, 25 W. C-2705-708
- R17 4700 Ω, 25 W. A-12084-14
- R18 1 MΩ I.F. COIL A-12084-14
- L1 MΩ I.F. COIL A-12084-14
- L2 MΩ I.F. COIL A-12084-14
- L3 MΩ I.F. COIL A-12084-14
- L4 B.C. RT. COIL A-12084-14
- L5 B.C. RT. COIL A-12084-14
- L6 5 W. OSC. COIL A-12084-14
- L7 1 P. REFLECTOR COIL A-12084-14
- L8 5 W. RT. COIL A-12084-14

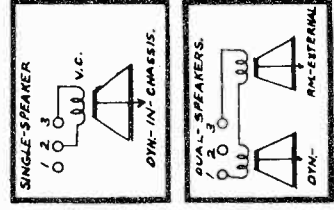
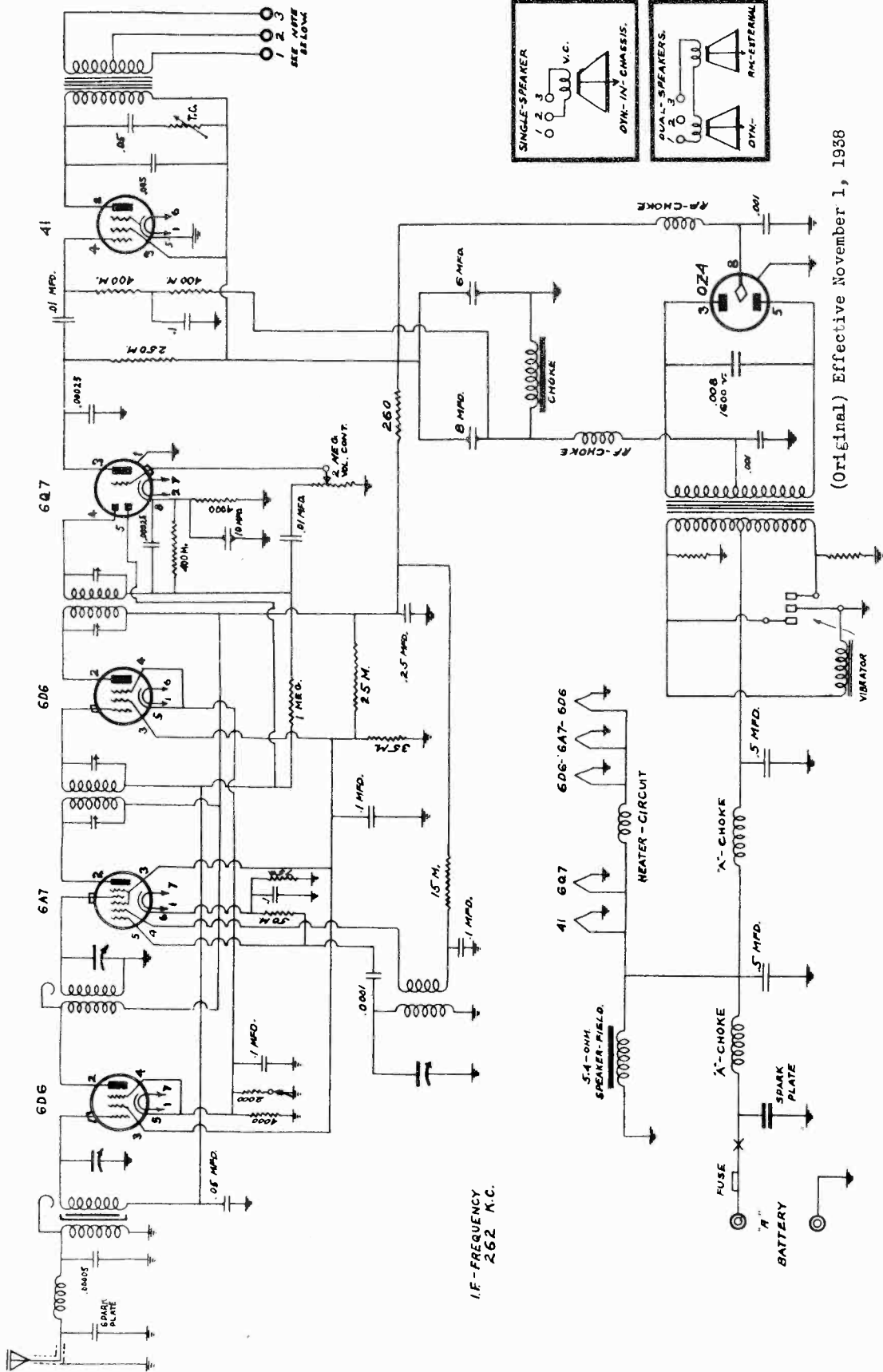
Notes: Voltage readings are for schematic diagram shown on page 2. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All measurements made with Weston Selective Analyzer No. 665, Type 2.
* Cannot be measured with Weston Selective Analyzer No. 665, Type 2.

MODEL 527-2 & 587-2

MODEL 699
Schematic
Speaker Connections

SPARKS WITHINGTON CO.

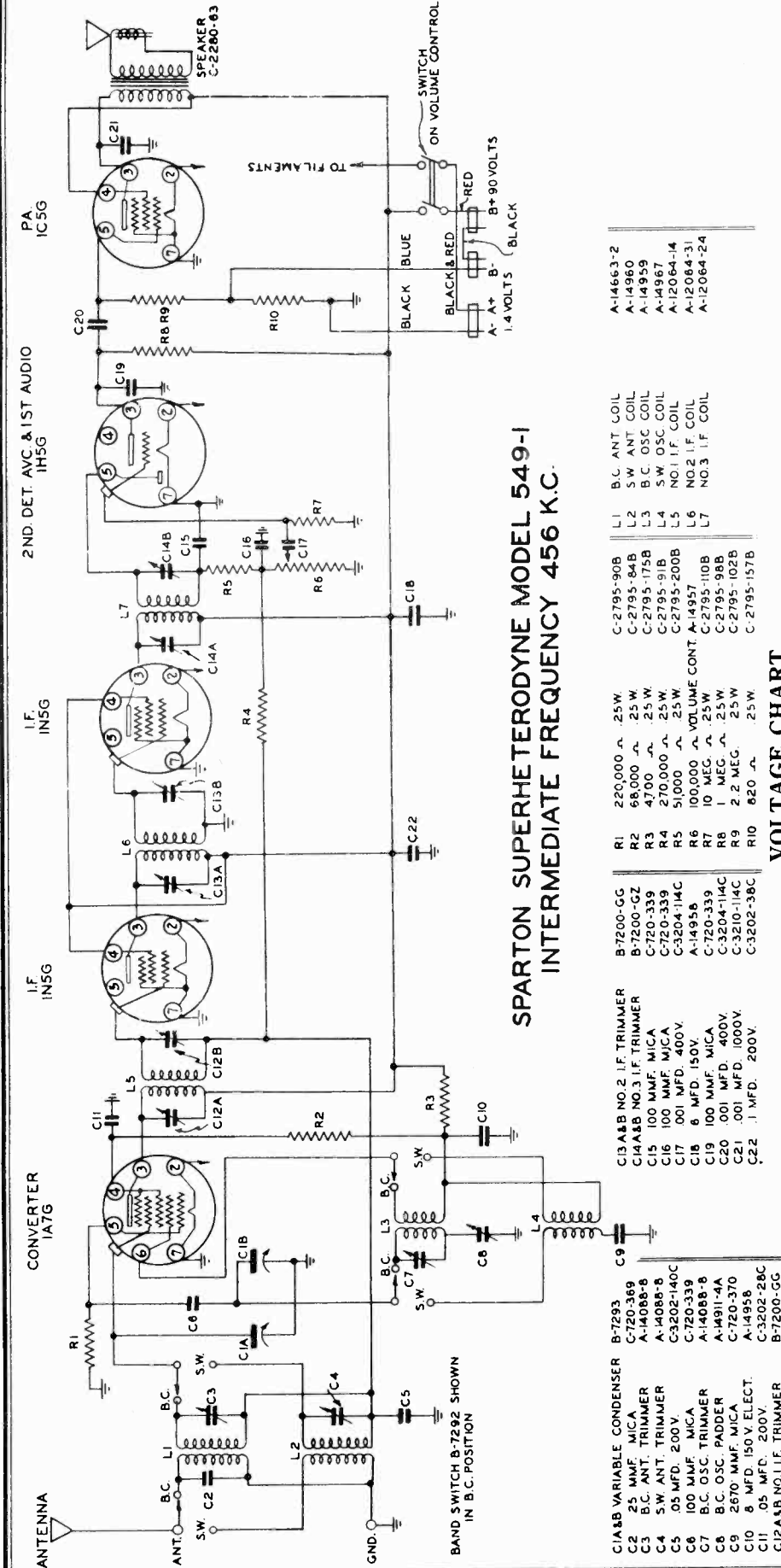
SPARTON SUPERHETERODYNE AUTOMOBILE RADIO MODEL 699
INTERMEDIATE FREQUENCY 262. K.C.



(Original) Effective November 1, 1938

SPARKS WITHINGTON CO.

MODEL 549-1
Schematic, Voltage



SPARTON SUPERHETERODYNE MODEL 549-1
INTERMEDIATE FREQUENCY 456 K.C.

Component	Value	Component	Value	Component	Value	Component	Value
C1A & B	VARIABLE CONDENSER	R1	220,000 Ω	C-2795-90B	B.C. ANT. COIL	L1	B.C. ANT. COIL
C2	25 MMF. MICA	R2	68,000 Ω	C-2795-84B	25 W	L2	25 W
C3	B.C. ANT. TRIMMER	R3	4700 Ω	C-2795-175B	B.C. OSC. COIL	L3	B.C. OSC. COIL
C4	5 W. ANT. TRIMMER	R4	270,000 Ω	C-2795-91B	25 W	L4	25 W
C5	.05 MFD. 200 V.	R5	51,000 Ω	C-2795-200B	25 W	L5	NO.1 I.F. COIL
C6	100 MMF. MICA	R6	100,000 Ω	A-14957	25 W	L6	NO.2 I.F. COIL
C7	100 MMF. MICA	R7	10 MEG. Ω	A-14957	25 W	L7	NO.3 I.F. COIL
C8	B.C. OSC. TRIMMER	R8	1 MEG. Ω	A-14957	25 W		
C9	2570 MMF. MICA	R9	2.2 MEG. Ω	C-2795-102B	25 W		
C10	8 MFD. 150 V. ELECT.	R10	620 Ω	C-2795-157B	25 W		
C11	.05 MFD. 200 V.						
C12A & B	NO. 1 I.F. TRIMMER						
C13A & B	NO. 2 I.F. TRIMMER						
C14A & B	NO. 3 I.F. TRIMMER						
C15	100 MMF. MICA						
C16	100 MMF. MICA						
C17	601 MFD. 400 V.						
C18	6 MFD. 150 V.						
C19	100 MMF. MICA						
C20	.001 MFD. 400 V.						
C21	.001 MFD. 1000 V.						
C22	.1 MFD. 200 V.						

VOLTAGE CHART

Tube	Function	Position of Volume Control: Full with Antenna Disconnected								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	
1A7G	Converter	80	1.4	80	30	*	70	0	69	*
1N5G	1st I.F. Amp.	*	1.4	78	80	0	-	0	0	0
1N5G	2nd I.F. Amp.	0	1.4	78	80	0	0	-	0	0
1H5G	2nd Det.-AVC-1st Audio	0	1.4	*	0	-	-	0	-	0
1C5G	Power Amp.	0	1.4	78	80	0	-	7.5	0	0

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. *Cannot be accurately measured with Model 665 Weston analyzer. (Original) Effective Feb. 1, 1939

MODEL 549-1
Alignment, Socket, Trimmers
MODEL 699
Voltage Alignment

SPARKS WITHINGTON CO.

Model 549-1

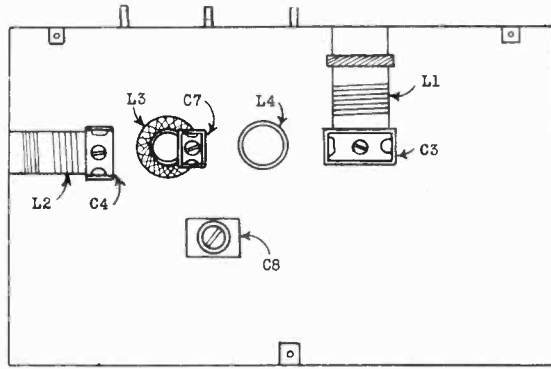
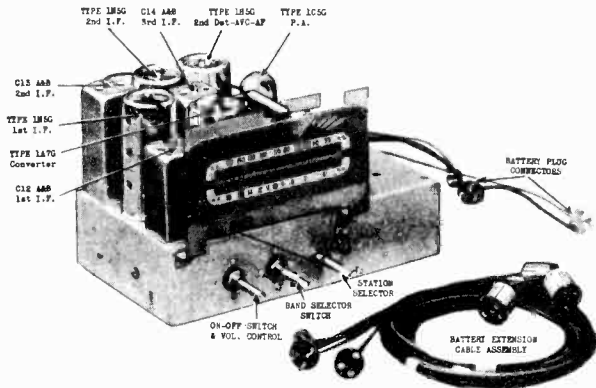
ALIGNMENT

Sparton Superheterodyne

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer to end of scale with tuning condenser gang closed)							
2	I.F.	1A7G Grid	.1 mf.	456 KC	BC	Open	C14 A,B C13 A,B C12 A,B	3 I.F. Transformer 2 I.F. Transformer 1 I.F. Transformer
3	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C7 Osc.	Peak accurately
4				600 KC	BC	600 KC	C3 Ant.	Peak accurately
5	(Repeat operation 3)							
6	(Check calibration and sensitivity at 600 KC, 900 KC, and 1500 KC)							
7	SW Band	Ant.	*	18 MC	SW	18 MC	C4 Ant.	**
8	(Check calibration and sensitivity at 6 MC and 18 MC)							
9	(Check operations 1 to 8 inclusive)							

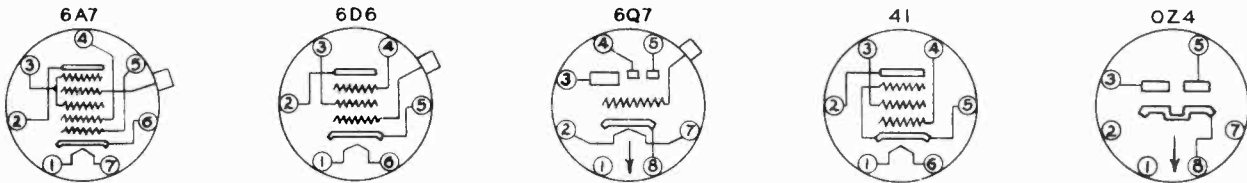
* 200 mmf. condenser and 100 ohm non-inductive resistor in series.

** Rock tuning control around 18 MC while adjusting this trimmer, and make sure that the signal is peaked on the fundamental rather than on the image.



CHASSIS DIAGRAM (Bottom View)

Sparton Superheterodyne Model 699



VOLTAGE CHART

Battery Voltage: 6.3 volts Position of Volume Control: Full with Antenna Disconnected

Tube	Function	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6D6	R.F. Amp.	0	200	75	6.2*	6.2*	5.5	-	-	0
6A7	Converter	5.5	200	75	105	-1.5	5	0	-	0
6D6	I.F.	0	200	75	6.2*	6.2*	5.5	-	-	0
6Q7	2nd Det. AVC 1st Audio	0	0	7.2	.1	.1	.1	5.6	1.2	0
41	P.A.	5.6	195	200	-.3	0	0	-	-	-
OZ4	Rectifier	0	0	290**	0	290**	0	0	205	-

*Or 8.6 volts depending on position of sensitivity switch.

**AC volts.

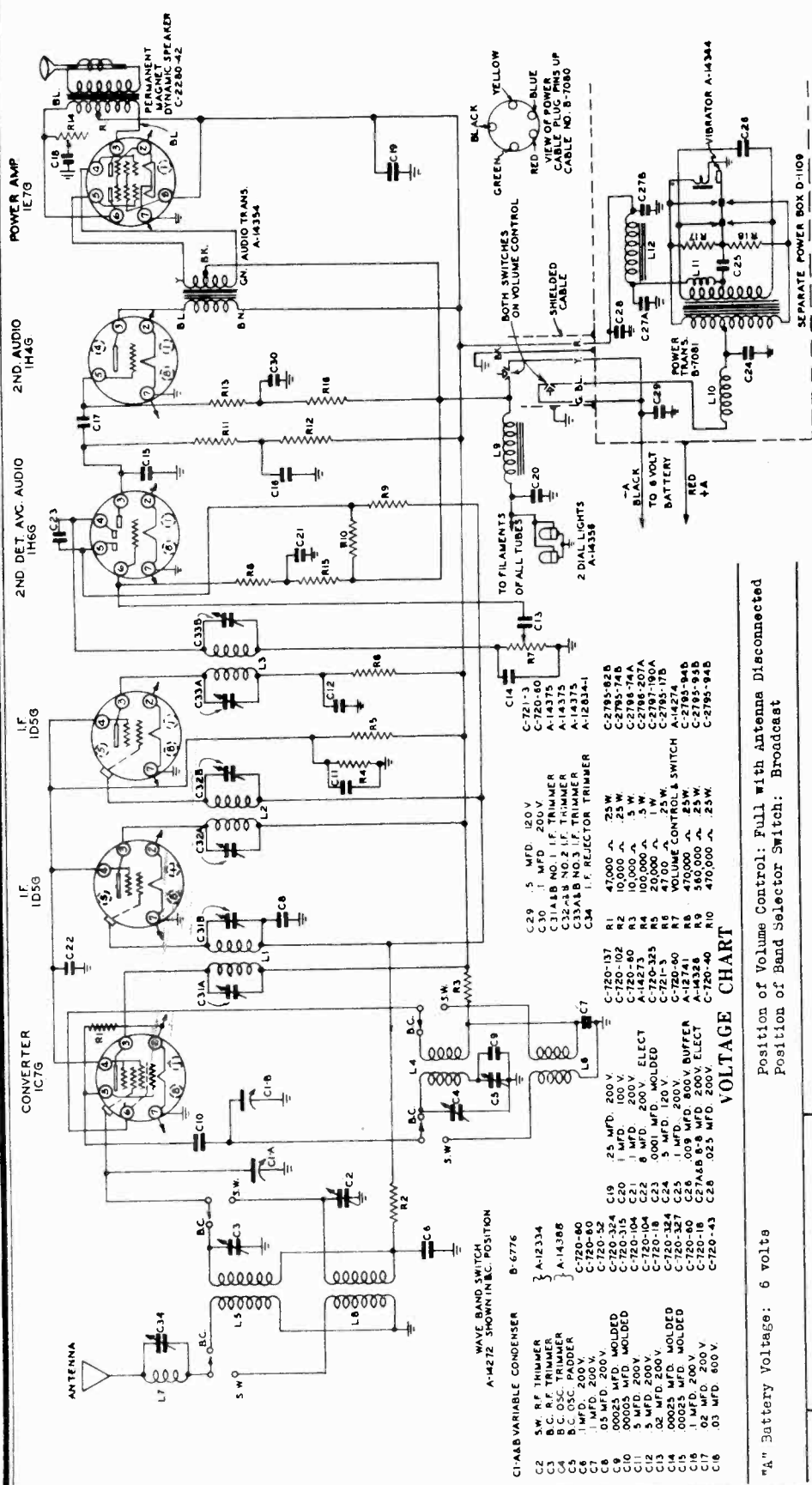
ALIGNMENT

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1	I.F.	6A7 Grid	.1 mf.	262	Closed	2 trimmers	2nd I.F.
2	Broad. Osc.	Ant.	250 mmf.	1580	Open	2 trimmers	1st I.F.
3	Broad. Ant. & R.F.	Ant.	250 mmf.	1400	1400	Osc. Ant. R.F.	Adj. to max. Adj. to max. Adj. to max.
4	Check sensitivity at 1000 KC and 600 KC.						
5	Check operations 1 to 4 inclusive.						

SPARKS WITHINGTON CO.

MODELS 637-6, 687-6
Schematic, Voltage

SPARTON SUPERHETERODYNE MODEL 637-6 & 687-6
INTERMEDIATE FREQUENCY 456 K.C.



VOLTAGE CHART

Position of Volume Control: Full with Antenna Disconnected
Position of Band Selector Switch: Broadcast

Tube	Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8	Grid Cap
1C7G	-	0	112	60	.05†	107	2	-	.05†
1D5G	-	0	112	47	-	-	2	-	.06†
1D5G	-	0	108	48	-	-	2	-	.05†
1H6G	-	0	.2	0	.04†	-	2	-	-
1H4G	-	0	112	-	-	-	2	-	-
1E7G	-	-	122	5.2	5.2	122	2	122	-

Notes: Voltage readings are for schematic diagram shown on back of this page. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits, except as noted below. All measurements made with Weston Selective Analyzer No. 665, Type 2.

* Cannot be measured with Weston Selective Analyzer No. 665, Type 2.
† 1 volt D-c scale

SPARKS WITHINGTON CO.

MODELS 527-2, 587-2

Alignment

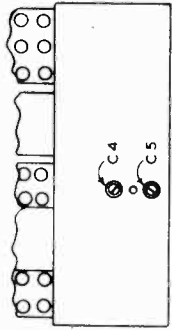
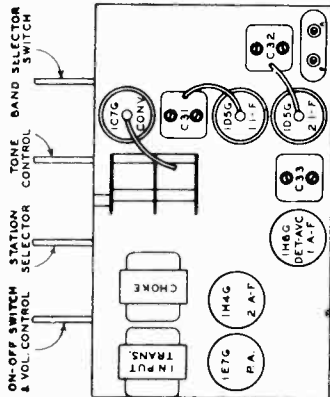
MODELS 637-6, 687-6

Alignment, Socket, Trimmers

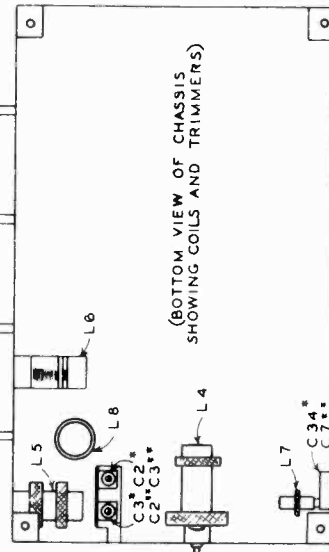
for 15,000 kilocycles would be 15,000 kilocycles minus twice 456 kilocycles or approximately 14,100 kilocycles. Therefore, a signal of this frequency may be found with the test oscillator generating a 15,000 kilocycle signal.

Note: There are no other trimmers for the short-wave or foreign band.

Important: All adjustments should be rechecked to assure accuracy and stability of adjustment and calibration.



END VIEW OF CHASSIS



(BOTTOM VIEW OF CHASSIS SHOWING COILS AND TRIMMERS)

* MODELS 637-6 & 687-6
 ** MODELS 527-2 & 587-2

Note: This condenser is the adjustment for the code rejector circuit and must be very carefully adjusted if best performance of the receiver is to be expected.

B. Alignment of Broadcast Band

1. Connect 150 mmf. dummy antenna in series with the antenna lead, tune test oscillator and receiver to a frequency of 1500 kilocycles and adjust condensers C4 (broadcast band oscillator trimmer) and C5* (broadcast antenna trimmer) reached from the bottom of the chassis. *C2 in Models 527-2, 587-2.

2. Tune test oscillator and receiver to 600 kilocycles and adjust condenser C5 (broadcast oscillator padder) reached from the front of the chassis.

3. Retune test oscillator and receiver to 1500 kilocycles and check adjustments of condenser C4 and condenser C5. Calibration of the broadcast band should also be checked at 900 kilocycles and 600 kilocycles. *C2 in Models 527-2, 587-2.

C. Alignment of Short-Wave Band

1. Turn the band selector switch to the short wave or "foreign" band.

2. Remove the 150 mmf. condenser from the test oscillator "antenna" lead and replace with a 400 ohm non-inductive resistor dummy antenna.

3. Tune test oscillator and receiver to a frequency of 15,000 kilocycles (15 megacycles) and adjust condenser C2* (short-wave antenna trimmer) reached from the bottom of the chassis. *C3 in Models 527-2, 587-2.

Caution: On this band care must be taken to adjust this condenser to the fundamental of the 15 megacycle signal and not to the image. The image signal is equal to the fundamental minus twice the intermediate frequency of the receiver.

A set that is adjusted to the image frequency instead of to the fundamental may be detected by tuning over the band and checking the sensitivity at various points. If a dead spot appears near the center of the band, the adjustable condenser for that band has probably been adjusted to the image instead of to the fundamental.

This type of mis-alignment may also be detected by tuning the test oscillator to a frequency of 15 megacycles and the station selector of the receiver to approximately 15,900 kilocycles. If a strong signal is found approximately at this frequency, it indicates that the band has been adjusted to the image frequency. The normal image frequency

Note: For proper alignment of these chasses, the procedure should be followed in the same order as given.

The dial pointer should be exactly parallel with the horizontal line of the dial scale when the condenser plates are fully meshed. If the pointer does not read correctly, loosen the two small set screws directly back of the diffusion disc and dial drum, hold the rotor plates fully meshed with the stator plates and set the pointer so that it is parallel with the horizontal lines on the kilocycle scale, then tighten the set screws.

IMPORTANT: Alignment of these models should not be attempted unless the voltage is maintained by a fully charged 6-volt storage battery.

A. Alignment of Intermediate-Frequency Stages

1. Turn on receiver and test oscillator and allow both to operate several minutes before attempting to adjust any condensers.

2. Turn the band selector switch to the broadcast position and turn the station selector knob until the rotor plates are completely out of mesh with the stator plates.

3. Connect "antenna" of test oscillator to grid cap of Type 1C7G converter tube and "ground" of test oscillator to chassis frame of receiver. Connect output meter "high tap" from plate of Type 1E7G tube to ground.

Note: It is advisable to read carefully the operating instructions included with the test oscillator being used in the alignment procedure.

4. Tune test oscillator to obtain a signal of 456 kilocycles.

5. Turn the volume control of receiver on full and adjust I-F condensers which are reached from the top of the chassis.

Note: Care should be taken when adjusting the I-F stages in order to insure proper and accurate adjustment.

6. Disconnect "antenna" lead of test oscillator from grid cap of converter tube Type 1E7G and connect to the antenna terminal of the chassis.

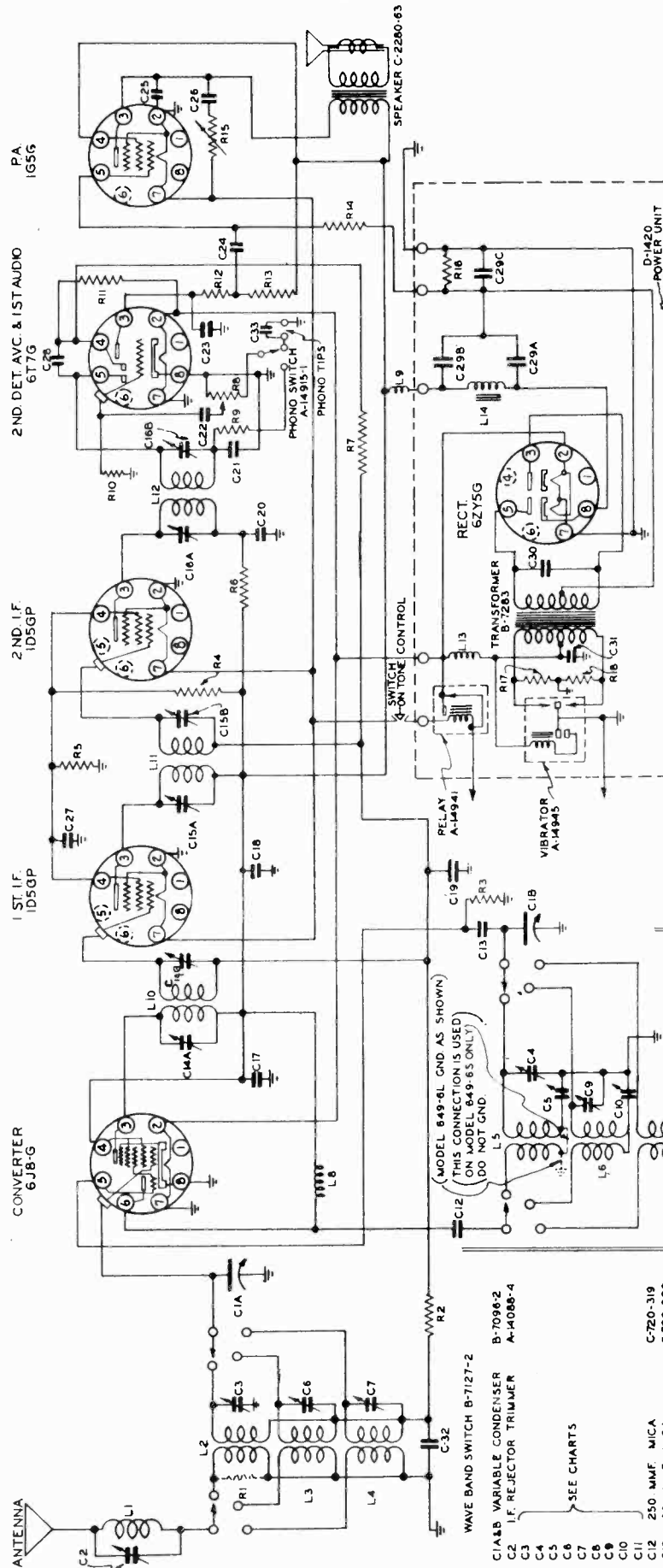
7. Tune test oscillator to a frequency of 456 kilocycles and adjust condenser C34* (reached from back of the chassis) to a point where the output of the receiver is at an absolute minimum. *C7 in Models 527-2, 587-2.

SPARKS WITHINGTON CO.

MODELS 649-6L, 649-6S

Schematic

SPARTON SUPERHETERODYNE MODELS 649-6S & 649-6L
INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF ALL SOCKET CONNECTIONS



PARTS USED IN MODEL 649-6L ONLY		PARTS USED IN MODEL 649-6S ONLY	
L2	L.W. ANT. COIL	L2	B.C. ANT. COIL
L3	B.C. ANT. COIL	L3	1ST. S.W. ANT. COIL
L4	S.W. ANT. COIL	L4	2ND. S.W. ANT. COIL
L5	L.W. OSC. COIL	L5	B.C. OSC. COIL
L6	B.C. OSC. COIL	L6	1ST. S.W. OSC. COIL
L7	S.W. OSC. COIL	L7	2ND. S.W. OSC. COIL
R1	12000 Ω .25 W.	R1	NOT USED
C3	L.W. ANT. TRIMMER	C-4	B.C. OSC. TRIMMER
C-4	L.W. OSC. TRIMMER	C-5	B.C. OSC. PADDER
C-5	L.W. OSC. PADDER	C-8	NOT USED
C-6	B.C. ANT. TRIMMER	C3	B.C. ANT. TRIMMER OSC.
C-7	S.W. ANT. TRIMMER	C6	1ST. S.W. ANT. TRIMMER
C9	B.C. OSC. TRIMMER	C7	2ND. S.W. ANT. TRIMMER
C10	B.C. OSC. PADDER	C10	1ST. S.W. PAD. .0014 MOLDED C-720-366
C11	3.00 MMF. MICA	C11	2ND. S.W. PAD. .00381 MOLDED C-720-353

IF REJECTOR COIL A-14877		OSC. PLATE CHOKES A-14881-1	
L1	SEE CHARTS	L8	B-4 HASH CHOKES A-14718-2
L2	SEE CHARTS	L9	NO. 1 I.F. COIL A-12064-14
L3	SEE CHARTS	L10	NO. 2 I.F. COIL A-12064-2
L4	SEE CHARTS	L11	NO. 3 I.F. COIL A-12064-15
L5	SEE CHARTS	L12	A HASH CHOKES A-14944
L6	SEE CHARTS	L13	SEE CHARTS
L7	SEE CHARTS	L14	SEE CHARTS

SEE CHARTS		C-2795-79B	
R1	27000 Ω .25 W.	R2	27000 Ω .25 W.
R2	36000 Ω .5 W.	R3	36000 Ω .5 W.
R3	56000 Ω .5 W.	R4	56000 Ω .5 W.
R4	4700 Ω .25 W.	R5	4700 Ω .25 W.
R5	56000 Ω .25 W.	R6	56000 Ω .25 W.
R6	4700 Ω .25 W.	R7	4700 Ω .25 W.
R7	56000 Ω .25 W.	R8	56000 Ω .25 W.
R8	4700 Ω .25 W.	R9	4700 Ω .25 W.
R9	56000 Ω .25 W.	R10	56000 Ω .25 W.
R10	4700 Ω .25 W.	R11	4700 Ω .25 W.
R11	56000 Ω .25 W.	R12	56000 Ω .25 W.
R12	4700 Ω .25 W.	R13	4700 Ω .25 W.
R13	56000 Ω .25 W.	R14	56000 Ω .25 W.
R14	4700 Ω .25 W.	R15	4700 Ω .25 W.
R15	56000 Ω .25 W.	R16	56000 Ω .25 W.
R16	4700 Ω .25 W.	R17	4700 Ω .25 W.
R17	56000 Ω .25 W.	R18	56000 Ω .25 W.

(Original) Effective Dec. 1, 1938

MODELS 649-6L, 649-6S
Voltage, Socket, Chassis

SPARKS WITHINGTON CO.

Sparton Superheterodyne Models

649-6L 649-6S

VOLTAGE CHART

Battery Condition: Good
Battery Voltage: 6.3 volts

Position of Volume Control: Full with Antenna Disconnected
Band Selector Switch: Broadcast

Tube	Function	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic Diagram)								Grid Cap
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	
6J8G	Converter	0	6.2	140	140	-14	140	0	0	.14
1D5GP	1st I-F Amp.	0	0	140	49	140	-	2.4	0	.2
1D5GP	2nd I-F Amp.	0	2.4	130	49	0	-	0	0	.2
6T7G	Det-AVC-1st A.F.	0	0	3.5 A	-2 B	-2 B	-	6.2	0	.02
1G5G	Power Amplifier	0	0	133	138	-1 C	-	2.4	0	-
6ZY5G	Rectifier	0	6.3	180*	0	180*	6	0	150	-

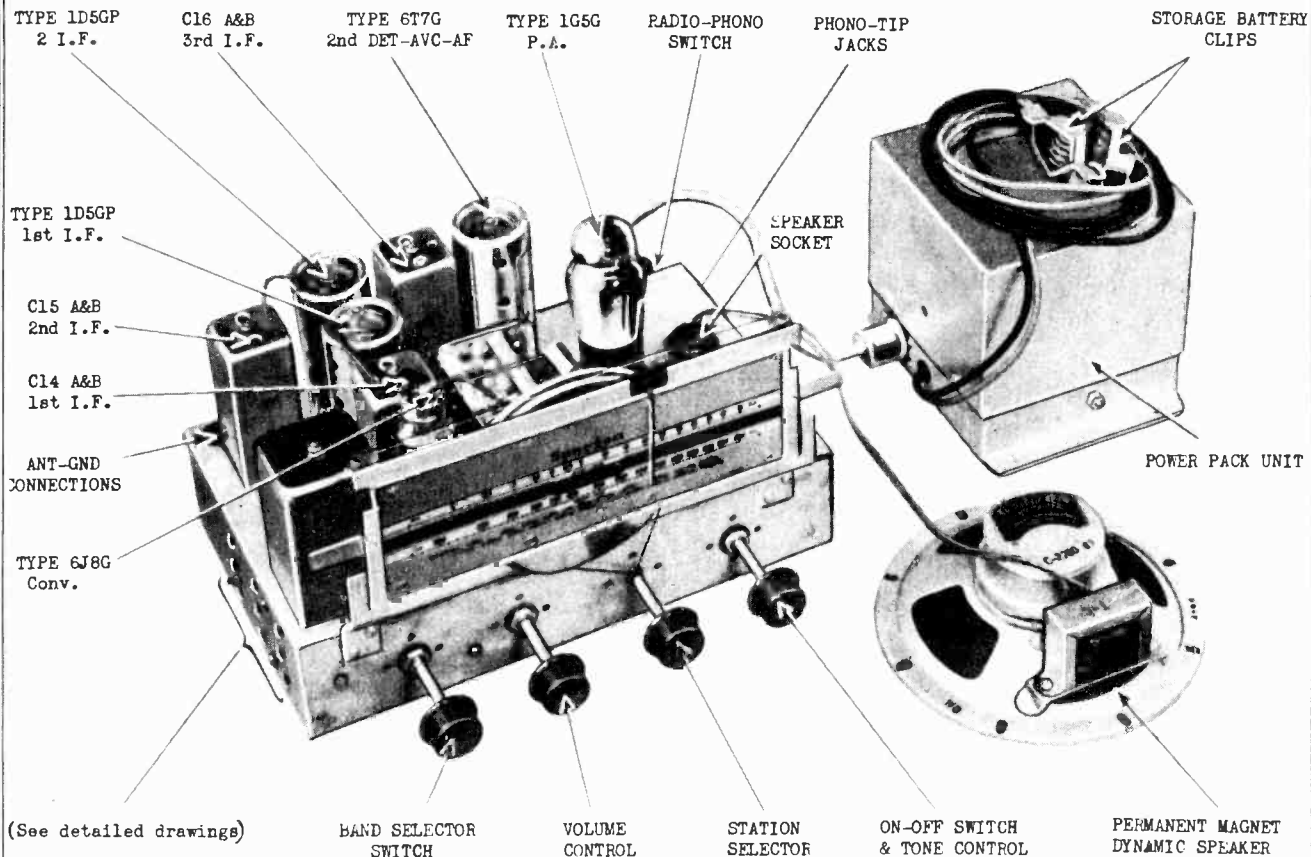
Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are - DC voltages.

*AC

A - 10 V. Scale

B - 25 V. Scale

C - 1 V. Scale

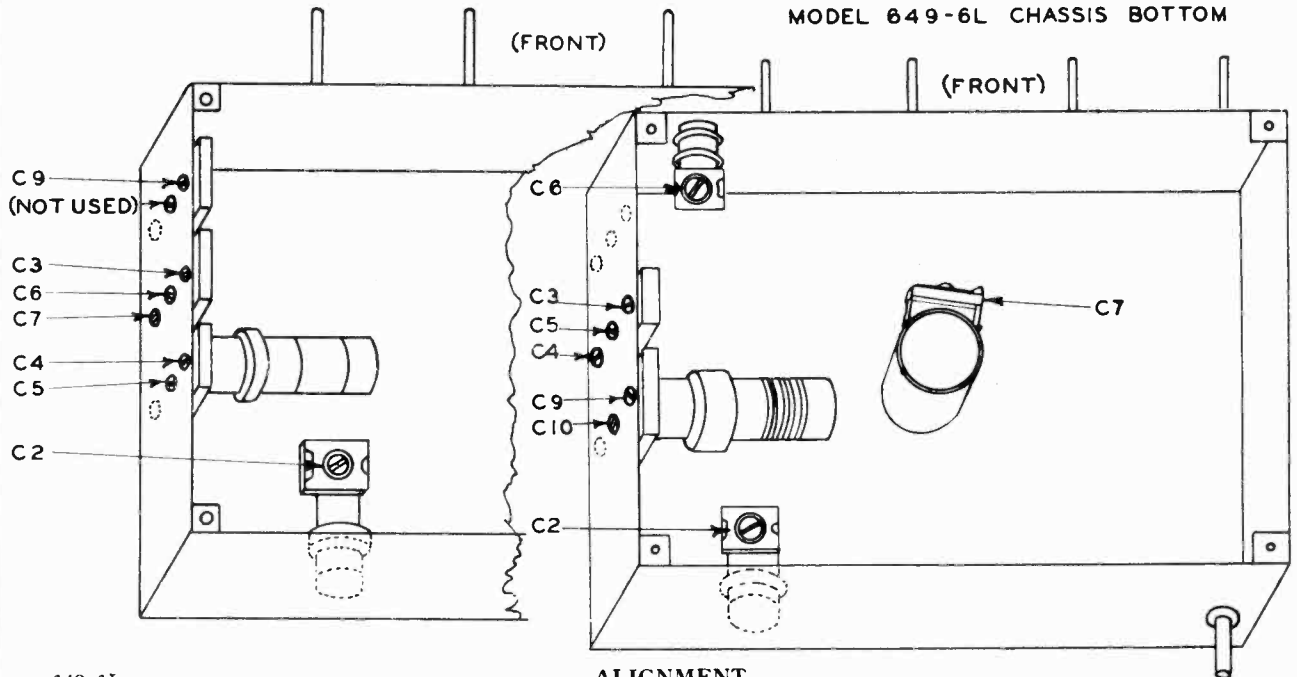


SPARKS WITHINGTON CO.

MODELS 649-6L, 649-6S
Alignment, Trimmers

MODEL 649-6S CHASSIS BOTTOM

MODEL 649-6L CHASSIS BOTTOM



649-6L

ALIGNMENT

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to last calibrated mark below 550KC)							
2	I.F.	6J8G Grid Cap	.1 mf.	456 KC	BC	(Open)	C16 A&B C15 A&B C14 A&B	3rd I.F.T. 2nd I.F.T. 1st I.F.T.
3	Rejector	Ant.	200 mmf.	456 KC	BC	(Open)	C2	Adj. to minimum
4	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C9 Osc. C6 Ant.	
5				600 KC	BC	600 KC	C10 Pad.	
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
8	Long-Wave Band	Ant.	200 mmf.	400 KC	LW	400 KC	C4 Osc. C3 Ant.	
9				150 KC	LW	150 KC	C5 Pad.	
10	(Repeat operation 8)							
11	(Repeat operations 8, 9 and 10 if necessary, to insure accurate alignment)							
12	(Check calibration and sensitivity at 150 KC, 260 KC and 400 KC)							
13	Short Wave Band	Ant.	*	18 MC	SW	18 MC	C6 Osc. C7 Ant.	Rock dial
14	(Check calibration and sensitivity at 6 MC, 15 MC and 18 MC)							

* 200 mmf. condenser and 100 ohm non-inductive resistor in series.

649-6S

ALIGNMENT

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to last calibrated mark below 550 KC)							
2	I.F.	6J8G Grid Cap	.1 mf.	456 KC	BC	(Open)	C16 A&B C15 A&B C14 A&B	3rd I.F.T. 2nd I.F.T. 1st I.F.T.
3	Rejector	Ant.	200 mmf.	456 KC	BC	(Open)	C2	Adj. to minimum
4	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C4 Osc. C3 Ant.	
5				600 KC	B.C.	600 KC	C5 Pad.	
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC, & 1500 KC)							
8	1st short wave Band	Ant.	*	7.0 MC	1 SW	7.0 MC	C9 Osc. C6 Ant.	
9	(Check calibration and sensitivity at 2.5 MC, 4.0 MC & 7.0 MC)							
10	2nd SWband	Ant.	*	21.0 MC	2 SW	21.0 MC	C7 Ant.	**
11	(Check calibration and sensitivity at 7.0 MC, 15 MC & 21 MC)							

* 200 mmf. condenser and 100 ohm non-inductive resistor in series.

** Rock dial while trimming.

If dial reading is off calibration, some adjustment may be made by moving the oscillator condenser lead toward or away from the chassis base plate.

MODELS 1068, 1068X
1078, 1078X
MODELS 1268, 1288P
MODEL 1089
MODEL 1288LXP

SPARKS WITHINGTON CO.

MODEL 1568 MODEL 8618
Selectronne Tuner
Trimmers, Adjustments

7. When all trimmers have been properly adjusted, replace Viso-Glo tube and socket in clamp, replace type 6HG6 Discriminator tube and attach Selectronne escutcheon plate to front of cabinet.

9. Any of the six stations to which the SPARTON Selectronne has been adjusted, may now be instantly received simply by pushing the Selectronne button down on the front of the cabinet. The knob pushed in that it is in the automatic position. (MODEL 1068, 1068X, 1078, 1078X, 1089, 1268, 1288P, 1288LXP ONLY)

Note: In case all six of the buttons should become depressed through improper manipulation of the Selectronne, simply reach into the Selectronne box (from the back of the cabinet) through the side next to the Viso-Glo, and apply a slight pressure of the thumb on the front of the Selectronne button across the trimmer which is in the automatic position. This will immediately release all buttons.

(MODEL 8618 ONLY)

NOTE: In case all six of the buttons should become depressed through improper manipulation of the Selectronne, simply apply a slight extra pressure of the fingers to any one of the buttons. This will immediately release all buttons.

WARNING - Never attempt to adjust the Selectronne with the 6HG6 Discriminator tube in the socket.

Unless the 6HG6 Discriminator tube is removed when the Selectronne is adjusted, automatic frequency control will prevent correct trimmer adjustments, with the result that unsatisfactory reception of stations may occur. With the 6HG6 Discriminator tube left in the socket, automatic frequency control action will bring in the station and close the Viso-Glo before the trimmers have been completely adjusted.

IMPORTANT

Always check the discriminator circuit to see if it is in proper adjustment and adjust it if necessary before adjusting the Selectronne.

TO CHECK THE ADJUSTMENT OF THE DISCRIMINATOR CIRCUIT, turn the automatic frequency control (A.F.C.) knob to the "off" position. Tune in the station which you wish to receive. Turn the knob to the "On" position. MATCH THE VISO-GLO. Repeat the procedure from "off" to "On" several times. The Viso-Glo should show the same position. If there is any variation in the Viso-Glo, it is an indication that the Discriminator circuit is out of adjustment and must be adjusted before attempting to make to adjust any station on the Selectronne.

IMPORTANT: The Type 6HG6 Discriminator tube must be in its socket when adjusting the discriminator circuit, and out of its socket when adjusting the Selectronne trimmers.

TO ADJUST THE DISCRIMINATOR CIRCUIT, it is necessary to remove the chassis from the cabinet. Place the A.F.C. knob in the "off" position and manually tune in a strong station so that the Viso-Glo closes as much as possible. Turn the A.F.C. knob to the "On" position. Turn the A.F.C. knob to the "Off" position. Turn the Discriminator circuit trimmer (see diagram on front of sheet) very slightly one way or the other until the Viso-Glo closes as far as possible. Then switch the A.F.C. knob to the "Off" position again. The Viso-Glo should close as far as possible. If it does not, adjust more accurately.

CAUTION - The blade of the screw driver postively must be an insulated (bakelite) one.

WARNING - Do not attempt to adjust the other trimmers until the Selectronne trimmer in the diagram as "Discriminator Trimmer".

JUNE 1938

(A) These trimmers are provided for each one of the six stations. They are reached through the three holes arranged in rows one above the other in the back cover of the Selectronne.

(B) Tune in the station in the usual way using manual tuning, watching the Viso-Glo so that the station will be perfectly "tuned in".

(C) Push in the band selector switch knob. This will extinguish the dial light and will connect the Selectronne motor, showing that the Selectronne is now connected.

(D) Turn the band selector switch knob to the extreme left (counter clockwise) to the automatic (Selectronne) position.

(E) Push in the Selectronne button which corresponds to the station just tuned in.

(F) Now from the back of the cabinet, with an ordinary screw-driver adjust the oscillator trimmer (center hole) in the row corresponding to the proper station, until the same station that was tuned in manually is heard. This station may be heard faintly until the remaining trimmers have been adjusted.

It is important that the same station is heard with this adjustment and not some other network station carrying the same program. Screw this trimmer to the right or left until the station is loudest.

Care should be taken in turning the adjusting screws so that they will not become disengaged from the trimmers by being turned out too far.

(G) In the same manner adjust the antenna trimmer (bottom hole) and then the antenna trimmer (top hole) to this same station.

Note: Perfect adjustment of these trimmers is easily obtained by removing the Viso-Glo tube and socket from its clamp and turning the tube toward the back of the cabinet so that every adjustment of the trimmers is obtained from the further turning of the trimmers will not result in any smaller shaded area between the green light sections of the Viso-Glo.

(MODEL 8618 ONLY)

(F) In the same manner adjust to this same station.

NOTE: MODEL 8618 ONLY) The chassis supplied with this model is equipped with a socket at the back of the chassis for using a type 8E5. Operation of this tube will be more easily observed if an extension cable and socket (or right-angle adapter) is used when making tuning adjustments.

(G) Re-adjust the oscillator trimmer (center hole) while watching the Viso-Glo to see if the shaded area can be made smaller.

(H) Check the above adjustments by pulling the band selector knob toward the "Off" position. The manual tuning control should show that the Viso-Glo shows any difference in the amount of shaded area in the tube as compared to the shaded area with the band switch knob pushed in. If the shaded area is larger with the band switch pushed in, readjust the Selectronne trimmer until the shaded area is equal to that obtained with the band switch knob pulled out.

6. Repeat the procedure in paragraph 5 for each of the six stations.

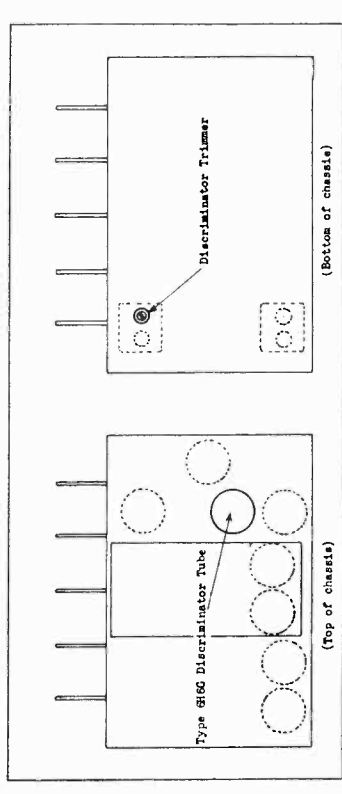
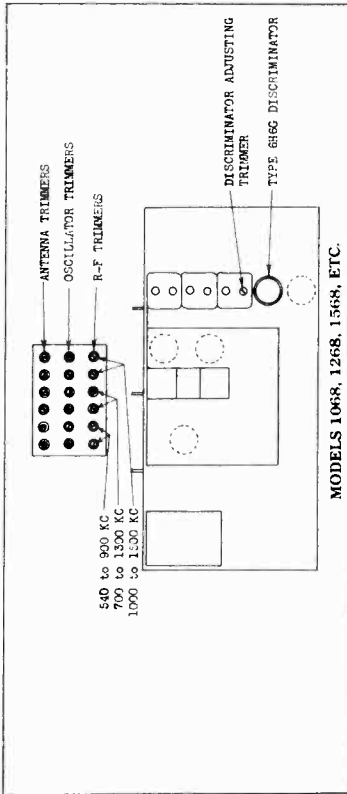
For example: A station having a frequency of 610 kc. should be placed in the 540 to 900 kc. group; a station at 950 should be placed in the 700 to 1300 kc. group, etc.

5. The six groups of the Selectronne are arranged in three groups according to frequency limits - 540 to 900 kc., 700 to 1300 kc. and 1000 to 1500 kc. (See illustration also back of Selectronne box). The six tabs corresponding to the six broadcast stations which have been chosen must be arranged in the steel plate so that the frequency (kilocycle) of each station will be included in the frequency limits of the proper group. (MODEL 1068, 1068X, 1078, 1078X, 1089, 1268, 1288P, 1288LXP ONLY)

Note: Each group has considerable overlap to allow for the selection of six stations which may have frequency allocations comparatively close together.

4. Remove type 6HG6 tube (Discriminator) from chassis (see illustration).

5. Adjust Selectronne trimmers for each one of the six stations as follows:



CHASSIS DIAGRAM OF MODEL 8618

MODEL 728X
Alignment, Trimmers
Socket, Chassis

SPARKS WITHINGTON CO.

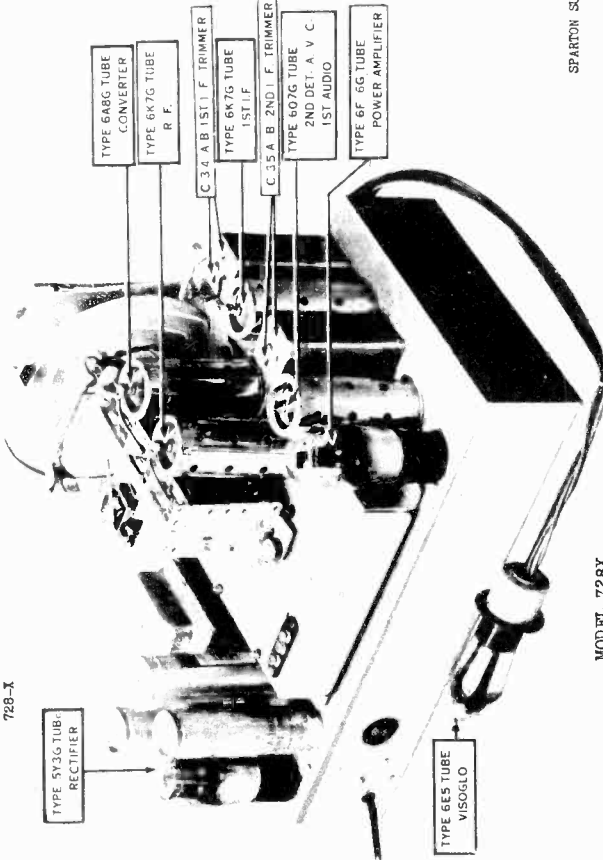
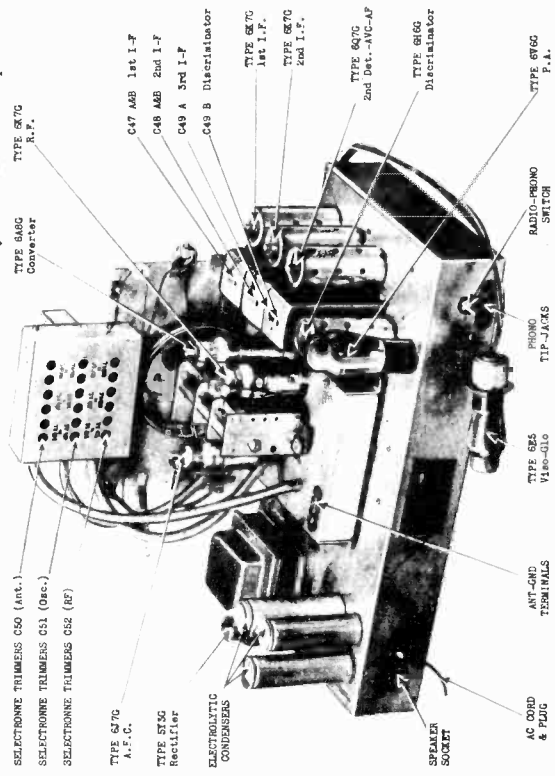
MODEL 1089
Socket, Trimmers, Chassis

MODEL 728X ALIGNMENT (see note)

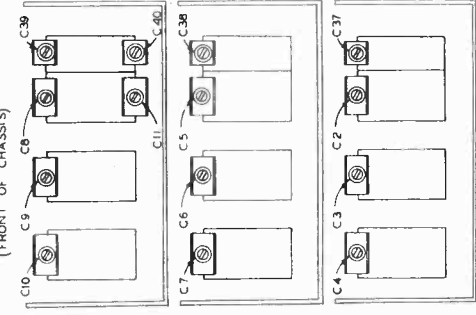
OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	I.F.	Conv. Grid	.1 mf.	456	EC	Open	C35A C35B 2nd I.F. Trans. C34A C34R 1st I.F. Trans.	
2	Broadcast Band	Ant.	200 mf.	1500	EC	1500	C8 Osc. C5 RF C2 ANT.	
3		Ant.	200 mf.	600	EC	600	C11 Pad	*
4		(Repeat operation 2)						
5		(Check calibration and sensitivity at 1500 KC, 900 KC and 600 KC)						
6	Long Wave Band	Ant.	200 mf.	400	L.W.	400	C39 Osc. C38 RF C37 Ant.	
7		Ant.	200 mf.	150	L.W.	150	C40 Pad	*
8		(Repeat operation 6. Also repeat operations 6, 7 and 8 if necessary)						
9	1st short wave band	Ant.	100 ohm series	7 MC.	1st S.W.	7 MC.	C9 Osc. C6 RF C3 Ant.	
10		(Check for calibration and sensitivity at 2.5 MC. and 7 MC.)						
11	2nd short wave band	Ant.	100 ohm series	21 MC.	2nd S.W.	21 MC.	C10 Osc. C7 RF C4 Ant.	Rock dial slightly while adjusting for maximum output.
12		(Check calibration and sensitivity at 8 MC. and 21 MC.)						
13		(Check operations 1 to 12 inclusive) *Rock variable condenser slightly while adjusting for maximum output.						

NOTE: Check to see that dial pointer points to last calibrated mark on right hand side of dial when variable condenser rotor plates are fully meshed with stator plates.

SPARTON SUPERHETERODYNE MODEL 1089



MODEL 728X TRIMMER LOCATIONS (under chassis) (FRONT OF CHASSIS)



MODEL 1089
Voltage, Alignment
Trimmers

SPARKS WITHINGTON CO.

Viso-Glo tube in socket
AFC Switch "OFF"

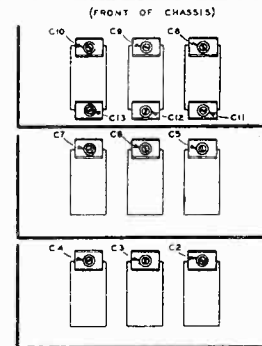
ALIGNMENT (see note)

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS	
1	I.F.	Conv. Grid	.1 mf.	456	BC	Open	C47 A,B	1st I.F. Trans.	
							C48 A,B	2nd I.F. Trans.	
							C48 A	3rd I.F. (Pri.)	
2	Discrim.	Conv. Grid	.1 mf.	456	BC	Open	C49 B	Adjust to minimum	
3	Broadcast Band	Ant.	200 mmf.	1500	BC	1500	C8 Osc.		
							C5 RF		
							C2 Ant.		
4		Ant.	200 mmf.	600	BC	600	C11 Pad		
5	(Repeat operation 3)								
6	(Check calibration and sensitivity 1500 KC, 900 KC and 600 KC) *								
7	1st Short Wave	Ant.	100 ohm	6 MC.	1st S.W.	6 MC.	C9 Osc.		
			200 mmf. series				C6 RF		
							C3 Ant.		
8		Ant.	200 mmf.	1.95 MC.	1st S.W.	1.95 MC.	C12 Pad		
9	(Repeat operation 7)								
10	(Check calibration and sensitivity at 6 MC. and 1.95 MC.)								
11	2nd Short-Wave Band	Ant.	100 ohm	18 MC.	2nd S.W.	18 MC.	C10 Osc.	Rock dial slightly while adjusting	
			200 mmf. series				C7 R.F.		
							C4 Ant.		
12		Ant.		6 MC.	2nd S.W.	6 MC.	C13 Pad		
13	(Repeat operation 11)								
14	(Check calibration and sensitivity at 18 MC. and 6 MC.)								
15	(Check operations 1 to 14 inclusive)								

* Check AFC by connecting generator to converter grid cap and tuning generator and receiver to 1500 KC. Note output meter reading with AFC switch "off". Switch AFC "on" and if output changes appreciably, touch up discriminator trimmer until there is no change in sensitivity.

NOTE: Check to see that dial pointer is parallel to horizontal lines on dial when variable condenser rotor plates are fully meshed with stator plates.

TRIMMER LOCATIONS (under chassis)



VOLTAGE CHART

Line Voltage: 115 volts

Position of Volume Control: Full with Antenna Disconnected

Tube	Function	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic Diagram)									
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7*	No. 8	Grid Cap	
6K7G	R.F.	0	0	300	75	0	-	6.3	0	-.2	
6A8G	Converter	0	0	300	91	-5.5	135	6.3	0	-.2	
6K7G	I.F.	0	0	300	75	0	-	6.3	0	-2.6	
6K7G	2nd I.F.	0	0	300	75	4	-	6.3	4.1	0	
6H6G	Discriminator	0	0	.5	0	.5	-	6.3	0	-	
6J7G	A.F.C.	0	0	300	85	4.5	-	6.3	4.4	0	
6Q7G	2nd Det. AVC-1st audio	0	0	100	-.2	-.1	-	6.3	0	0	
6V6G	P.A.	0	0	275	290	.5	.6	6.3	0	-	
5Y3G	Rect.	-	350*	-	350*	-	350*	-	350*	-	
6E5	Viso-Glo	6.3	50	-3	280	-4	0	-	-	-	

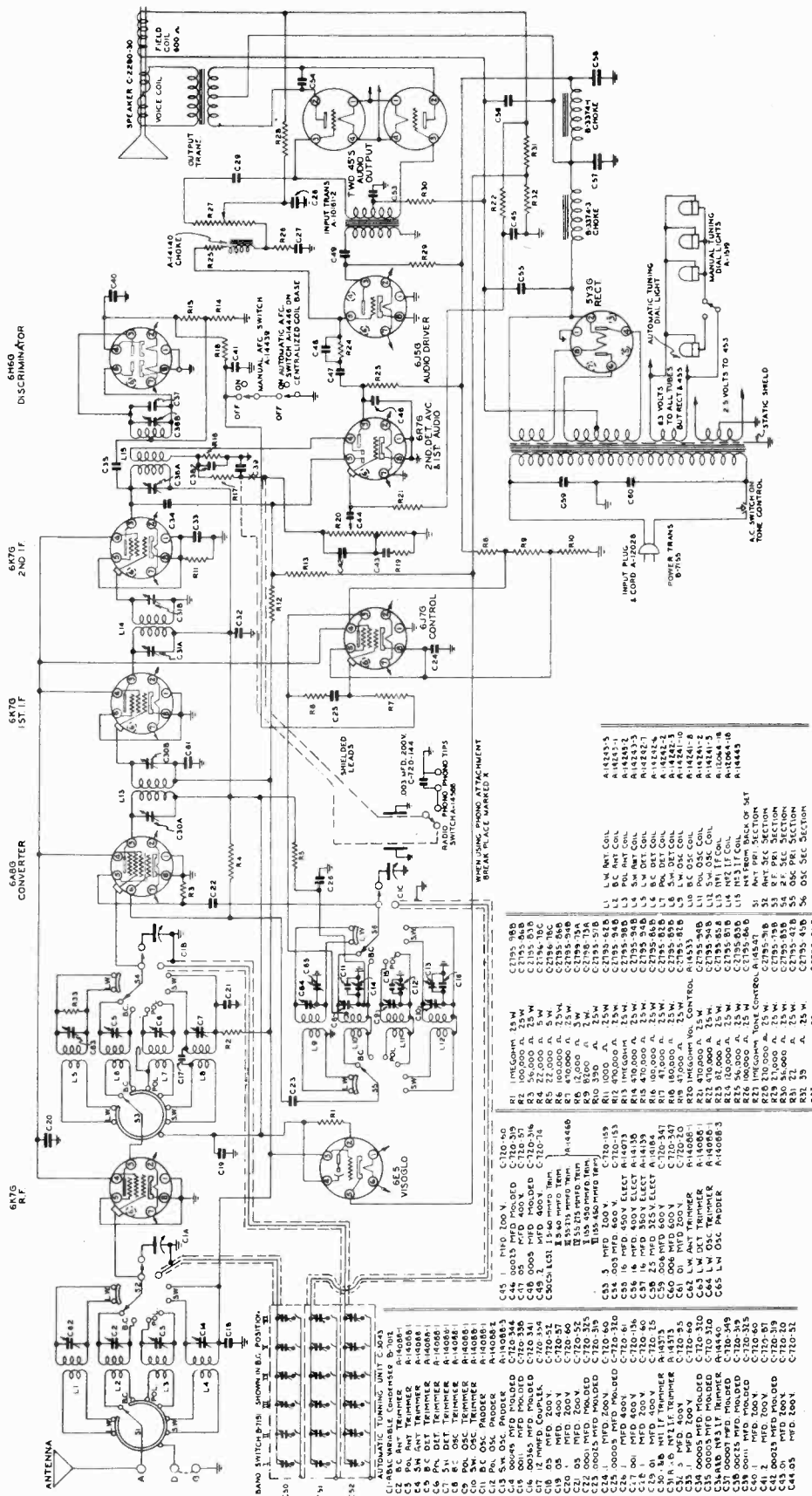
Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.

*AC volts.

SPARKS WITHINGTON CO.

MODEL 1288LXP
Schematic

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 1288-LXP
INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF ALL SOCKET CONNECTIONS

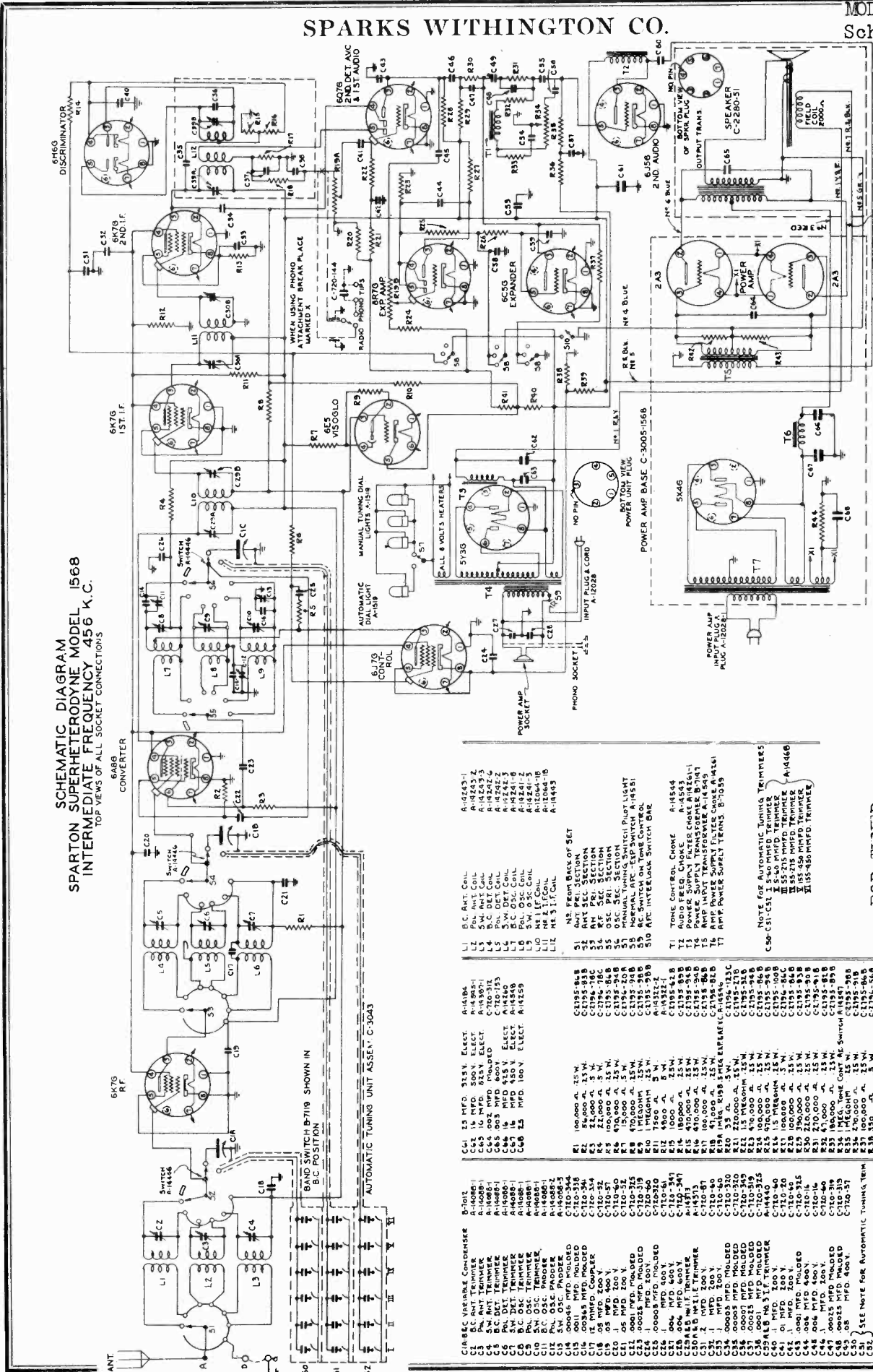


FOR TUNER
SEE INDEX

NOTE: THE VOLTAGE DATA AND CHASSIS LAYOUT OF
MODEL 1268 APPLY ALSO TO MODEL 1288 LXP FOR WHICH SEE INDEX

SPARKS WITHINGTON CO.

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 1568
INTERMEDIATE FREQUENCY 45.6 K.C.
TOP VIEWS OF ALL SOCKET CONNECTIONS



- A-4243-1 B.C. ANT. COIL
- A-4243-2 P.C. ANT. COIL
- A-4243-3 P.C. DET. COIL
- A-4243-4 P.C. DET. COIL
- A-4243-5 P.C. OSC. COIL
- A-4243-6 P.C. OSC. COIL
- A-4243-7 P.C. OSC. COIL
- A-4243-8 P.C. OSC. COIL
- A-4243-9 P.C. OSC. COIL
- A-4243-10 P.C. OSC. COIL
- A-4243-11 P.C. OSC. COIL
- A-4243-12 P.C. OSC. COIL
- A-4243-13 P.C. OSC. COIL
- A-4243-14 P.C. OSC. COIL
- A-4243-15 P.C. OSC. COIL
- A-4243-16 P.C. OSC. COIL
- A-4243-17 P.C. OSC. COIL
- A-4243-18 P.C. OSC. COIL
- A-4243-19 P.C. OSC. COIL
- A-4243-20 P.C. OSC. COIL
- A-4243-21 P.C. OSC. COIL
- A-4243-22 P.C. OSC. COIL
- A-4243-23 P.C. OSC. COIL
- A-4243-24 P.C. OSC. COIL
- A-4243-25 P.C. OSC. COIL
- A-4243-26 P.C. OSC. COIL
- A-4243-27 P.C. OSC. COIL
- A-4243-28 P.C. OSC. COIL
- A-4243-29 P.C. OSC. COIL
- A-4243-30 P.C. OSC. COIL
- A-4243-31 P.C. OSC. COIL
- A-4243-32 P.C. OSC. COIL
- A-4243-33 P.C. OSC. COIL
- A-4243-34 P.C. OSC. COIL
- A-4243-35 P.C. OSC. COIL
- A-4243-36 P.C. OSC. COIL
- A-4243-37 P.C. OSC. COIL
- A-4243-38 P.C. OSC. COIL
- A-4243-39 P.C. OSC. COIL
- A-4243-40 P.C. OSC. COIL
- A-4243-41 P.C. OSC. COIL
- A-4243-42 P.C. OSC. COIL
- A-4243-43 P.C. OSC. COIL
- A-4243-44 P.C. OSC. COIL
- A-4243-45 P.C. OSC. COIL
- A-4243-46 P.C. OSC. COIL
- A-4243-47 P.C. OSC. COIL
- A-4243-48 P.C. OSC. COIL
- A-4243-49 P.C. OSC. COIL
- A-4243-50 P.C. OSC. COIL

- 51 ANT. REL. SECTION
- 52 ANT. REL. SECTION
- 53 ANT. REL. SECTION
- 54 RF SEC. SECTION
- 55 OSC. SEC. SECTION
- 56 OSC. SEC. SECTION
- 57 MANUAL TUNING SWITCH PILOT LIGHT
- 58 MANUAL TUNING SWITCH PILOT LIGHT
- 59 MANUAL TUNING SWITCH PILOT LIGHT
- 60 MANUAL TUNING SWITCH PILOT LIGHT
- 61 MANUAL TUNING SWITCH PILOT LIGHT
- 62 MANUAL TUNING SWITCH PILOT LIGHT
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- 65 MANUAL TUNING SWITCH PILOT LIGHT
- 66 MANUAL TUNING SWITCH PILOT LIGHT
- 67 MANUAL TUNING SWITCH PILOT LIGHT
- 68 MANUAL TUNING SWITCH PILOT LIGHT
- 69 MANUAL TUNING SWITCH PILOT LIGHT
- 70 MANUAL TUNING SWITCH PILOT LIGHT
- 71 AMP. POWER SUPPLY TENS. 500-550
- 72 AMP. POWER SUPPLY TENS. 500-550
- 73 AMP. POWER SUPPLY TENS. 500-550
- 74 AMP. POWER SUPPLY TENS. 500-550
- 75 AMP. POWER SUPPLY TENS. 500-550
- 76 AMP. POWER SUPPLY TENS. 500-550
- 77 AMP. POWER SUPPLY TENS. 500-550
- 78 AMP. POWER SUPPLY TENS. 500-550
- 79 AMP. POWER SUPPLY TENS. 500-550
- 80 AMP. POWER SUPPLY TENS. 500-550
- 81 AMP. POWER SUPPLY TENS. 500-550
- 82 AMP. POWER SUPPLY TENS. 500-550
- 83 AMP. POWER SUPPLY TENS. 500-550
- 84 AMP. POWER SUPPLY TENS. 500-550
- 85 AMP. POWER SUPPLY TENS. 500-550
- 86 AMP. POWER SUPPLY TENS. 500-550
- 87 AMP. POWER SUPPLY TENS. 500-550
- 88 AMP. POWER SUPPLY TENS. 500-550
- 89 AMP. POWER SUPPLY TENS. 500-550
- 90 AMP. POWER SUPPLY TENS. 500-550
- 91 AMP. POWER SUPPLY TENS. 500-550
- 92 AMP. POWER SUPPLY TENS. 500-550
- 93 AMP. POWER SUPPLY TENS. 500-550
- 94 AMP. POWER SUPPLY TENS. 500-550
- 95 AMP. POWER SUPPLY TENS. 500-550
- 96 AMP. POWER SUPPLY TENS. 500-550
- 97 AMP. POWER SUPPLY TENS. 500-550
- 98 AMP. POWER SUPPLY TENS. 500-550
- 99 AMP. POWER SUPPLY TENS. 500-550
- 100 AMP. POWER SUPPLY TENS. 500-550

- C1 100,000 A. 25 W.
- C2 21,000 A. 5 W.
- C3 21,000 A. 5 W.
- C4 21,000 A. 5 W.
- C5 21,000 A. 5 W.
- C6 21,000 A. 5 W.
- C7 21,000 A. 5 W.
- C8 21,000 A. 5 W.
- C9 21,000 A. 5 W.
- C10 21,000 A. 5 W.
- C11 21,000 A. 5 W.
- C12 21,000 A. 5 W.
- C13 21,000 A. 5 W.
- C14 21,000 A. 5 W.
- C15 21,000 A. 5 W.
- C16 21,000 A. 5 W.
- C17 21,000 A. 5 W.
- C18 21,000 A. 5 W.
- C19 21,000 A. 5 W.
- C20 21,000 A. 5 W.
- C21 21,000 A. 5 W.
- C22 21,000 A. 5 W.
- C23 21,000 A. 5 W.
- C24 21,000 A. 5 W.
- C25 21,000 A. 5 W.
- C26 21,000 A. 5 W.
- C27 21,000 A. 5 W.
- C28 21,000 A. 5 W.
- C29 21,000 A. 5 W.
- C30 21,000 A. 5 W.
- C31 21,000 A. 5 W.
- C32 21,000 A. 5 W.
- C33 21,000 A. 5 W.
- C34 21,000 A. 5 W.
- C35 21,000 A. 5 W.
- C36 21,000 A. 5 W.
- C37 21,000 A. 5 W.
- C38 21,000 A. 5 W.
- C39 21,000 A. 5 W.
- C40 21,000 A. 5 W.
- C41 21,000 A. 5 W.
- C42 21,000 A. 5 W.
- C43 21,000 A. 5 W.
- C44 21,000 A. 5 W.
- C45 21,000 A. 5 W.
- C46 21,000 A. 5 W.
- C47 21,000 A. 5 W.
- C48 21,000 A. 5 W.
- C49 21,000 A. 5 W.
- C50 21,000 A. 5 W.

FOR TUNER
SEE INDEX

(Original) Effective Jan. 2, 1938

MODEL 1568
Alignment, Voltage
Socket, Trimmers, Chassis

SPARKS WITHINGTON CO.

SPARTON SUPERHETERODYNE MODEL
1568

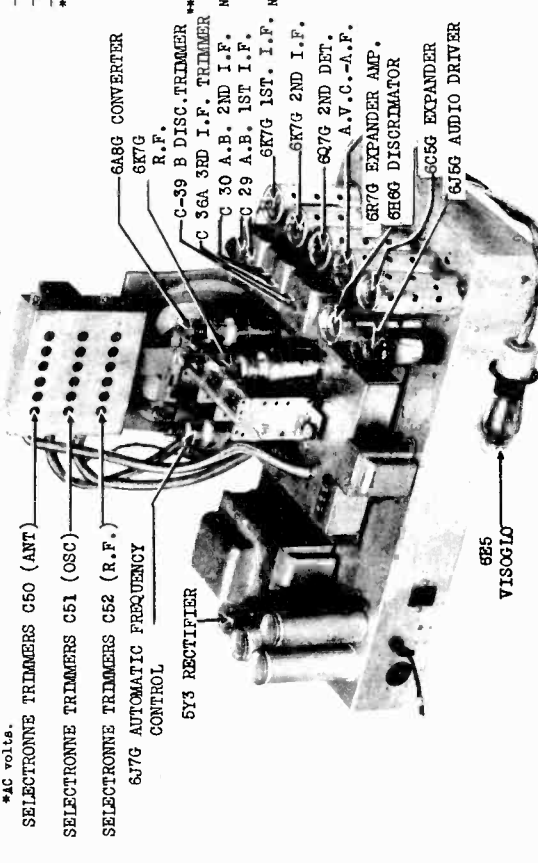
Sparton Superheterodyne Model
1568

VOLTAGE CHART

Position of Volume Control: Full with Antenna Disconnected

Tube	Function	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6K7G	R-F Converter	0	0	250	86	0	0	6	0	- .2
6B6G	Converter	0	0	250	86	7	140	6	0	- .4
6J7G	AFC-Control	0	0	225	86	4	0	6	4	0
6K7G	1st. I.F.	0	0	250	86	0	0	6	0	- 3
6K7G	2nd. I.F.	0	0	250	86	4	0	6	4	0
6H6G	Discriminator	0	0	0	0	0	0	6	0	0
6A7G	1st. Audio Det.-AFC	0	0	145	0	0	0	6	0	- 1
6A5G	Audio driver	0	0	250	0	0	0	6	0	0
6K7G	Expander Amplifier	0	0	56	0	0	0	6	0	- 1
6S5G	Expander	0	0	3.5	0	0	0	6	0	0
6X3G	Rectifier	0	400*	0	0	0	0	400*	0	0
6B5	Viso-Glo	0	20	- 1	245	4	6	0	0	0
(2) 2A3	Power Amplifier	60	350	0	60	0	0	0	0	0
5X4G	Rectifier	-	350*	-	350*	-	370*	370*	0	0

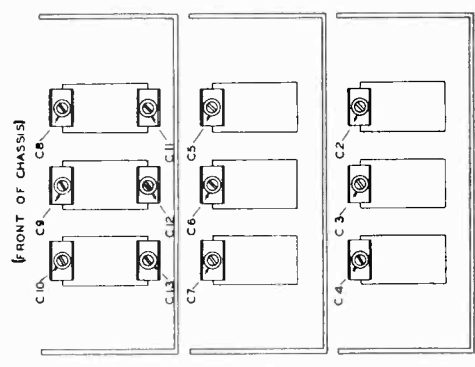
Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohm per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.
*AC volts.



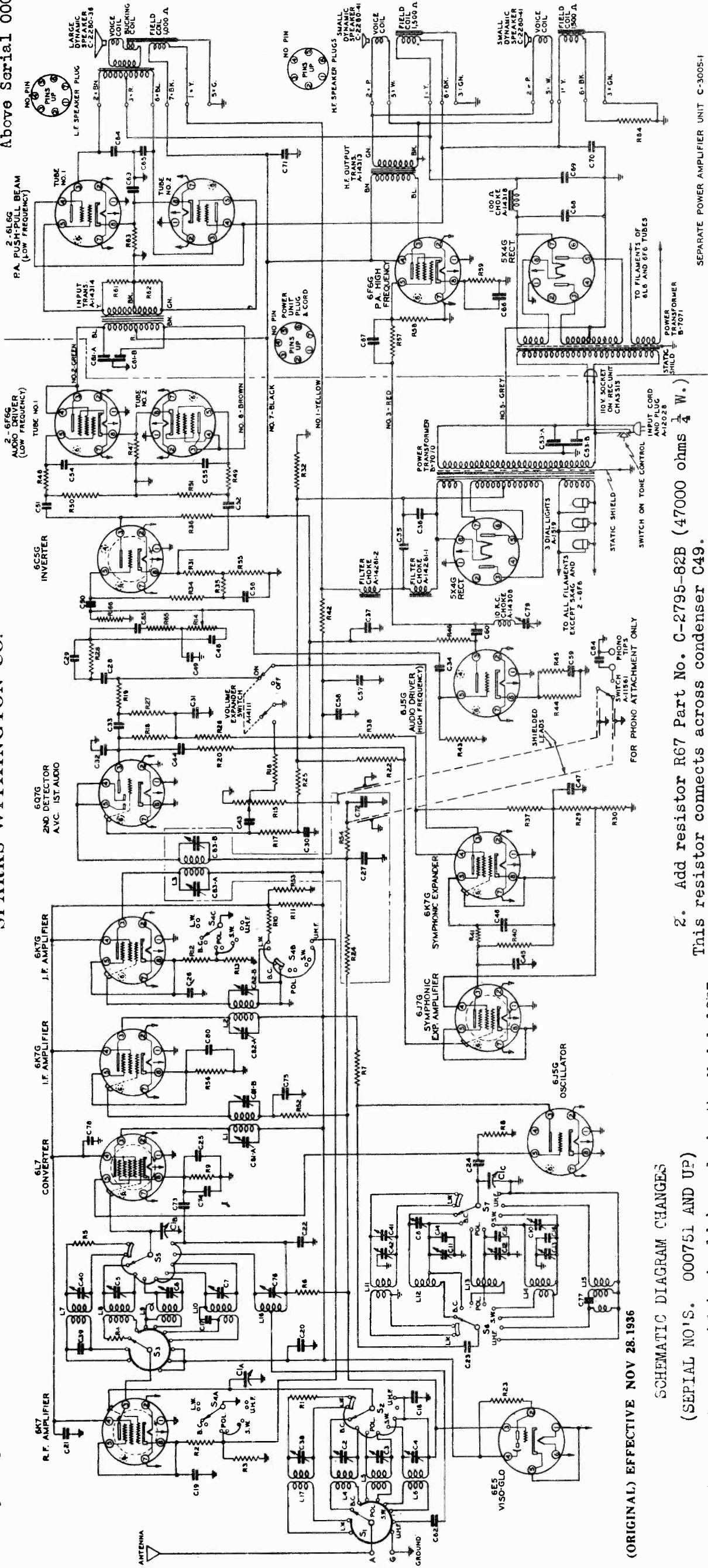
CHASSIS ILLUSTRATION

ALIGNMENT See Note:

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	SUMME ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	I. F.	Conv. Grid	.1 mf.	456	BC	Open	C29 A,B C30 A,B C39 A	1st I.F. Trans. 2nd I.F. Trans. 3rd I.F. (Pri.) Adjust to minimum
2	Discrim.	Conv. Grid	.1 mf.	456	BC	Open	C8 Osc.	
3	Broadcast Band	Ant.	200 mmf.	1500	BC	1500	C5 RF C7 Ant.	
4	(Repeat operation 3)	Ant.	200 mmf.	600	BC	600	C11 Pad	**
5	(Check calibration and sensitivity at 1500 KC, 900 KC and 600 KC.) *							
6	1st Short-Wave Band	Ant.	100 ohm 200 mmf. series	6 MC.	1st S.W.	6 MC.	C9 Osc. C6 RF C3 Ant.	
7	2nd Short-Wave Band	Ant.	200 mmf.	1.95 MC.	1st S.W.	1.95 MC.	C12 Pad	**
8	(Repeat operation 7)							
9	(Check calibration and sensitivity at 6 MC. and 1.95 MC.)							
10	2nd Short-Wave Band	Ant.	100 ohm 200 mmf. series	18 MC.	2nd S.W.	18 MC.	C10 Osc. C7 RF C4 Ant.	Rock dial slightly while adjusting
11	3rd Short-Wave Band	Ant.	200 mmf.	6 MC.	2nd S.W.	6 MC.	C15 Pad	**
12	(Repeat operation 11)							
13	(Check calibration and sensitivity at 18 MC. and 6 MC.)							
14	(Check operations 1 to 14 inclusive)							
15	Check AFC by connecting generator to converter-grid cap and using generator and receiver to 1500 KC. Note output meter reading with AFC switch "off". Switch AFC "on" and if output changes appreciably, touch up discriminator trimmer until there is no change in sensitivity. ** Rock variable condenser slightly while adjusting for maximum output.							



TRIMMER LOCATIONS (under chassis)



(ORIGINAL) EFFECTIVE NOV 28, 1936

SCHEMATIC DIAGRAM CHANGES

(SERIAL NO'S. 000751 AND UP)

The following changes, which should be made in the Model 1867 schematic diagram are effective Nov. 30, 1936, and are included in all SPARTON Model 1867 chassis with serial numbers above 000750.

1. Replace capacitor C49 Part No. C-720-142 (.003 mf. 200v.), by Part No. C-720-144 (.003 mf. 200v.). This capacitor connects from ground to the mid-point between the tone control (R14) and resistor R65.
2. Add resistor R56 Part No. C-2795-82B (47000 ohms $\frac{1}{4}$ W.). This resistor connects across capacitor C49.
3. Replace resistor R56 Part No. C-2795-63C (1200 ohms $\frac{1}{4}$ W.) by resistor Part No. C-2795-74C (10000 ohms $\frac{1}{4}$ W.). This resistor is in the cathode circuit of the Type 6K7G 1st. I-F Amplifier tube.

- SWITCH SECTIONS
- NO. FROM BACK OF SET
 - 51 ANT. PRIMARY
 - 52 ANT. SECONDARY
 - 53 R.F. PRIMARY
 - 54 R.F. SECONDARY
 - 55 BIAS AND SCREEN VOLTAGE
 - 56 OSC. PRIMARY
 - 57 OSC. SECONDARY

C1	1 MFD. 400 V.	C720-141	C720-141
C2	0.0025 MFD. MICA	C720-142	C720-142
C3	0.05 MFD. 200 V.	C720-143	C720-143
C4	0.05 MFD. 200 V.	C720-144	C720-144
C5	0.05 MFD. 200 V.	C720-145	C720-145
C6	0.05 MFD. 200 V.	C720-146	C720-146
C7	0.05 MFD. 200 V.	C720-147	C720-147
C8	0.05 MFD. 200 V.	C720-148	C720-148
C9	0.05 MFD. 200 V.	C720-149	C720-149
C10	0.05 MFD. 200 V.	C720-150	C720-150
C11	0.05 MFD. 200 V.	C720-151	C720-151
C12	0.05 MFD. 200 V.	C720-152	C720-152
C13	0.05 MFD. 200 V.	C720-153	C720-153
C14	0.05 MFD. 200 V.	C720-154	C720-154
C15	0.05 MFD. 200 V.	C720-155	C720-155
C16	0.05 MFD. 200 V.	C720-156	C720-156
C17	0.05 MFD. 200 V.	C720-157	C720-157
C18	0.05 MFD. 200 V.	C720-158	C720-158
C19	0.05 MFD. 200 V.	C720-159	C720-159
C20	0.05 MFD. 200 V.	C720-160	C720-160
C21	0.05 MFD. 200 V.	C720-161	C720-161
C22	0.05 MFD. 200 V.	C720-162	C720-162
C23	0.05 MFD. 200 V.	C720-163	C720-163
C24	0.05 MFD. 200 V.	C720-164	C720-164
C25	0.05 MFD. 200 V.	C720-165	C720-165
C26	0.05 MFD. 200 V.	C720-166	C720-166
C27	0.05 MFD. 200 V.	C720-167	C720-167
C28	0.05 MFD. 200 V.	C720-168	C720-168
C29	0.05 MFD. 200 V.	C720-169	C720-169
C30	0.05 MFD. 200 V.	C720-170	C720-170

R1	100 A	C-2795-108
R2	100 A	C-2795-109
R3	100 A	C-2795-110
R4	100 A	C-2795-111
R5	100 A	C-2795-112
R6	100 A	C-2795-113
R7	100 A	C-2795-114
R8	100 A	C-2795-115
R9	100 A	C-2795-116
R10	100 A	C-2795-117
R11	100 A	C-2795-118
R12	100 A	C-2795-119
R13	100 A	C-2795-120
R14	100 A	C-2795-121
R15	100 A	C-2795-122
R16	100 A	C-2795-123
R17	100 A	C-2795-124
R18	100 A	C-2795-125
R19	100 A	C-2795-126
R20	100 A	C-2795-127
R21	100 A	C-2795-128
R22	100 A	C-2795-129
R23	100 A	C-2795-130
R24	100 A	C-2795-131
R25	100 A	C-2795-132
R26	100 A	C-2795-133
R27	100 A	C-2795-134
R28	100 A	C-2795-135
R29	100 A	C-2795-136
R30	100 A	C-2795-137
R31	100 A	C-2795-138
R32	100 A	C-2795-139
R33	100 A	C-2795-140
R34	100 A	C-2795-141
R35	100 A	C-2795-142
R36	100 A	C-2795-143
R37	100 A	C-2795-144
R38	100 A	C-2795-145
R39	100 A	C-2795-146
R40	100 A	C-2795-147
R41	100 A	C-2795-148
R42	100 A	C-2795-149
R43	100 A	C-2795-150
R44	100 A	C-2795-151
R45	100 A	C-2795-152
R46	100 A	C-2795-153
R47	100 A	C-2795-154
R48	100 A	C-2795-155
R49	100 A	C-2795-156
R50	100 A	C-2795-157
R51	100 A	C-2795-158
R52	100 A	C-2795-159
R53	100 A	C-2795-160
R54	100 A	C-2795-161
R55	100 A	C-2795-162
R56	100 A	C-2795-163
R57	100 A	C-2795-164
R58	100 A	C-2795-165
R59	100 A	C-2795-166
R60	100 A	C-2795-167
R61	100 A	C-2795-168
R62	100 A	C-2795-169
R63	100 A	C-2795-170
R64	100 A	C-2795-171
R65	100 A	C-2795-172
R66	100 A	C-2795-173

L1	NO. 1 I.F. COIL	A-12064-2
L2	NO. 2 I.F. COIL	A-12064-2
L3	NO. 3 I.F. COIL	A-14243-1
L4	B.C. ANTENNA COIL	A-14243-1
L5	P.B. ANTENNA COIL	A-14243-2
L6	P.B. ANTENNA COIL	A-14243-2
L7	L.W. DETECTOR COIL	A-14242-1
L8	B.C. DETECTOR COIL	A-14242-1
L9	3 W. OSCILLATOR	A-14242-2
L10	3 W. OSCILLATOR	A-14242-2
L11	B.C.	A-14241-1
L12	B.C.	A-14241-1
L13	B.C.	A-14241-7
L14	S.W.	A-14241-8
L15	U.H.F. DETECTOR COIL	A-14242-5
L16	U.H.F. DETECTOR COIL	A-14242-5
L17	L.W. ANTENNA	A-14243-4

SPARTON SUPERHETERODYNE MODEL 1867 INTERMEDIATE FREQUENCY 456 K.C.

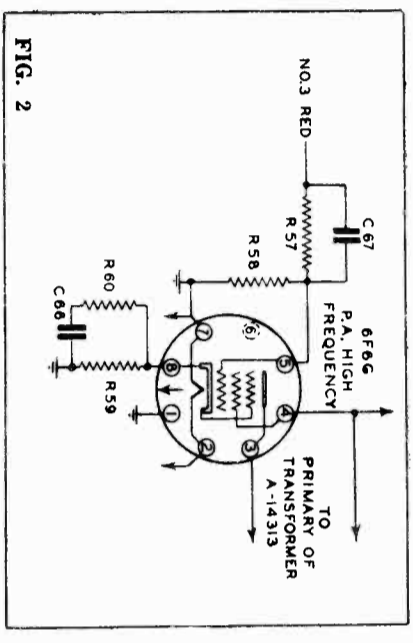
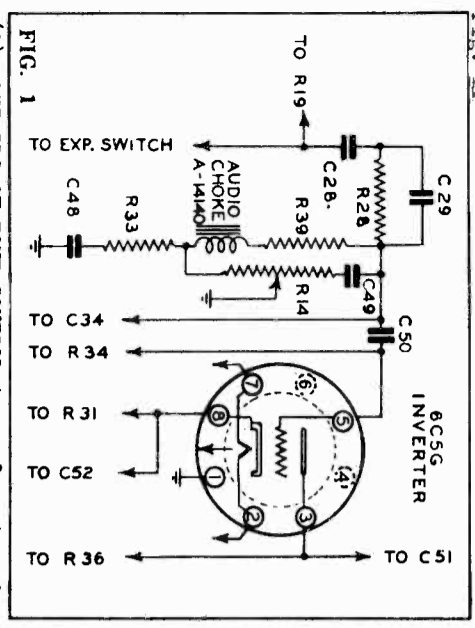
(FOR MODEL 1867 SERIAL NOS. 000751 AND UP)

The Schematic Diagram for the SPARTON Models 1867 (Serial Numbers 000001 to 000750 inclusive) is the same as shown except for the three general circuit changes as noted below:

(1) Change in Tone Control circuit as in Fig. 1.

(2) Change in Cathode Resistor Network of Type 6F6G High Frequency Power Amplifier as in Fig. 2.

(3) Change in Bias Resistor of Type 6K7G 1st. I-F Amplifier.



(1) DETAILS OF TONE CONTROL to conform to schematic

(2) DETAILS OF RESISTOR NETWORK change in Cathode of Type 6F6G High Frequency Power Amplifier:

Resistor R39 (27000 ohms .25 w.) removed
 Resistor R35 (100000 ohms .25 w.) removed
 Audio choke (A-14140) removed

Resistor R60 (180 ohms .25 w.) removed.
 Resistor R66 (470000 ohms .25 w.) added
 Resistor R65 (180000 ohms .25 w.) added
 Resistor R66 (470000 ohms .25 w.) added
 Condenser C85 (.02 mf. 200 v.) added

(Change in circuit as in Fig. 1) VOLTAGE TABLE

Line Voltage: 110 volts
 Symphonic Expander Control: OFF
 FOR EARLY AND LATE MODELS
 Position of Volume Control: Full with Antenna Disconnected
 Position of Band Selector Switch: Broadcast

Tube	Function	Voltage of Each Socket Prong to Ground (See Prong Numbers on Schematic Diagram)								
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8	Grid Cap
6K7	R-F Amplifier	0	6	272	117	0	-	0	0	0
6L7	Converter	0	6	260	140	-35	0	0	0	0
6J5G	Oscillator	0	6	260	0	0	0	0	0	0
6K7G	First I-F Amplifier	0	6	270	110	0	0	0	0	0
6K7G	Second I-F Amplifier	0	6	280	121	0	0	0	0	0
6Q7G	Det.-AVC-First A-F Amplifier	0	6	200	0	0	0	0	0	0
6J7G	Expander amplifier	0	6	200	0	0	0	0	0	0
6K7G	Symphonic Expander	0	6	1.2	97	3.25	90	0	92	90
6C5G	Inverter	0	6	233	265	0	0	0	0	-
6J5G	Driver (High Frequency)	0	6	235	0	0	0	0	0	-
(2) 6F6G	Driver (Low Frequency)	0	6	250	250	0	0	0	13	-
5X4G	Rectifier (Upper Chassis)	0	6	375	0	0	0	0	5.2	-
6S5	Viso-Glo	6	3	0	265	0	0	-	-	-
6F6G	Power Amplifier (High Frequency)	0	0	280	280	0	0	6.3	0	-
(2) 6L6G	Power Amplifier (Low Frequency)	0	0	395	305	0	0	6.3	16.5	-
5X4G	Rectifier (Lower Chassis)	0	0	360	0	0	0	5.2	.1	-

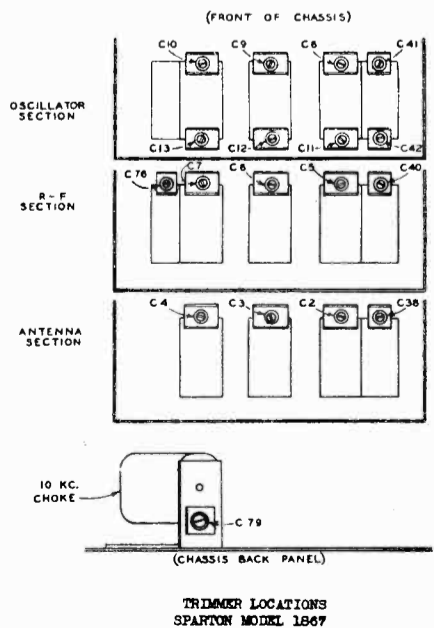
Notes: Voltage readings are for schematic diagram. Always use meter scale which will give greatest deflection within scale limits except as noted below. All measurements made with Weston Selective Analyzer No. 665, Type 2.
 1 10 volts A-C 2 250 volts D-C 3 5 volts D-C 4 25 volts D-C

This type of mis-alignment may also be detected by tuning the test oscillator to a frequency of 15 megacycles and the station selector to approximately 15,900 kilocycles. If a strong signal is found approximately at this frequency, it indicates that the band has been adjusted to the image frequency. The normal image frequency for 15 megacycles or 15,000 kilocycles would be 15,000 kilocycles minus twice 456 kilocycles or approximately 14,100 kilocycles. Therefore a signal of this frequency may be found with the test oscillator generating a 15 megacycle signal.

G. Alignment of Ultra High-Frequency Band

- Turn the band selector switch to the ultra high frequency band (tan diamond illuminated).
- Tune test oscillator and receiver to 50 megacycles and adjust condenser C76 (R-F trimmer).
- Check operation of receiver at 20 megacycles.

(Condenser C76 is the only adjustment in the ultra high frequency band).
 CAUTION: All adjustments should be rechecked to assure accuracy and stability of adjustment and calibration.



(4) Retune test oscillator and receiver to 345 kilocycles and check the adjustments of condensers C41, C40 and C38.

E. Alignment of 1st. Short-Wave Band

- Turn band selector switch to the 1st short-wave band (red diamond illuminated).
- Tune test oscillator and receiver to 6 megacycles and adjust the following condensers in the order given:
 C9 - Oscillator trimmer
 C6 - R-F trimmer
 C5 - Ant. trimmer
- Tune test oscillator and receiver to 1.95 megacycles and adjust condenser C12 (oscillator padder).
- Retune test oscillator and receiver to 6 megacycles and check the adjustments of condensers C9, C6 and C5.

F. Alignment of 2nd Short-Wave Band

- Connect the 100 ohm non-inductive dummy antenna resistor in series with the 200 mf. condenser connected between the test oscillator "antenna" lead and the grid cap of the 6L7 converter tube.
- Turn the band selector switch to the 2nd short-wave band (blue diamond illuminated).
- Tune test oscillator and receiver to 18 megacycles and adjust the following condensers in the order given:
 C10 - Oscillator trimmer
 C7 - R-F trimmer
 C4 - Ant. trimmer
- Tune test oscillator and receiver to 6 megacycles and adjust condenser C13 (oscillator padder).
- Retune test oscillator and receiver to 18 megacycles and check adjustments of condensers C10, C7 and C4.

IMPORTANT: To obtain the best sensitivity at 18 megacycles on this band, the dial should be turned back and forth slightly while adjusting the antenna and R.F. trimmers.
 CAUTION: On this band care must be taken to adjust the various condensers to the fundamental of the signal and not to the image. The image signal is equal to the fundamental minus twice the intermediate frequency of the receiver. A set that is adjusted to the image frequency instead of the fundamental may be detected by tuning over the band and checking the sensitivity at various points. If a dead spot appears near the center of the band, the adjustable condensers for that band have probably been adjusted to the image instead of the fundamental.

(4) Retune test oscillator and receiver to 1500 kilocycles and check the adjustments of condensers C8, C5 and C2.

(5) Calibration of the broadcast band should also be checked at 900 kilocycles and 800 kilocycles.

NOTE: The operation of the expansion circuit may be checked at this point as follows:
 (6) Tune test oscillator and receiver to 1500 kilocycles.

(7) Turn volume control of receiver to low volume position, and turn attenuator of test oscillator so that oscillator is delivering maximum output.

(8) Turn expander switch on. Watch output meter carefully and turn volume control of receiver to a point where about half scale deflection is obtained. The output reading should continue to increase for a few moments after the receiver volume control has stopped turning.

C. Alignment of 10 KC. Filter

NOTE: The purpose of this filter circuit is to eliminate the 10,000 cycle note caused by the beating of any two stations operating simultaneously on adjacent channels. It is very important that this filter circuit be adjusted to exactly 10,000 cycles, otherwise the very purpose of the filter is defeated.

- Connect output meter from plate of Type 6F6G high-frequency power output tube to ground.
- Connect lead from audio oscillator to grid cap of Type 6J7G 2nd det. tube.
- Turn receiver volume control to the off position and set tone control to give a convenient deflection on the output meter.
- Adjust condenser C79 (mounted directly in back of the Antenna Coil Section shield) so that minimum deflection of the output meter is obtained.

D. Alignment of Long-Wave Band

- Turn the band selector switch to the long wave position (yellow diamond illuminated).
- Tune test oscillator and receiver to 345 kilocycles and adjust the following condensers in the order given:
 C41 - Oscillator trimmer
 C40 - R-F trimmer
 C38 - Ant. trimmer
- Tune test oscillator and receiver to 150 kilocycles and adjust condenser C42 (oscillator padder).

STEP BY STEP PROCEDURE

NOTE: For proper alignment of these chassis, the procedure should be followed in the same order as given. The dial pointer should be exactly parallel with the horizontal line of the kilocycle scale when the condenser plates are fully meshed. If the pointer does not read correctly, loosen the set screw holding the pointer, hold the rotor plates fully meshed with the stator plates and set the pointer so that it is parallel with the horizontal lines on the kilocycle scale, then tighten the set screw.

A. Alignment of Intermediate-Frequency Stages

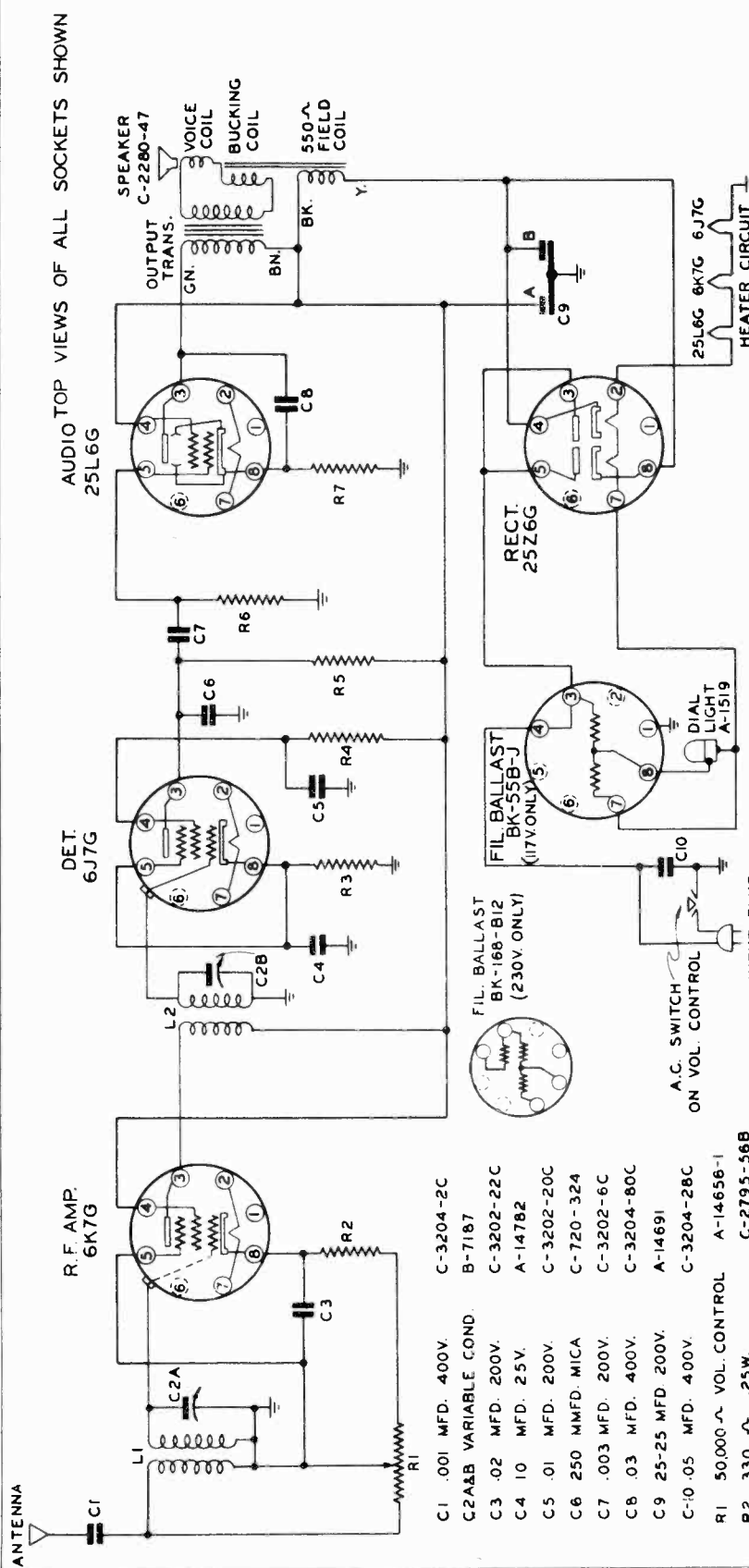
- Turn on receiver and test oscillator and allow both to operate several minutes before attempting to adjust any condensers.
- Turn the band selector switch to the Broadcast position (with white diamond illuminated) and turn the station selector knob until the rotor plates are completely out of mesh with the stator plates.
- Connect "antenna" of test oscillator to the grid cap of Type 6L7 converter tube and "ground" of test oscillator to chassis frame of receiver. Connect output meter "high tap" from plate of Type 6L6G Low-Frequency power output tube to ground. NOTE: It is advisable to read carefully the operating instructions included with the test oscillator.
- Tune test oscillator to obtain a signal of 456 kilocycles.
- Turn tone control to low note (base) position.
- Turn expander control to "off" position.
- Turn volume control of receiver on full and adjust I-F trimmers C81, C82 and C83 which are reached from the top of the chassis. NOTE: The intermediate frequency circuits are quite selective and care must be taken to insure proper adjustment.

B. Alignment of Broadcast Band

- Disconnect "antenna" lead of test oscillator from grid cap of converter tube and connect in series with a 200 mf. condenser dummy antenna to the antenna terminal of the chassis.
- Tune receiver and test oscillator to a frequency of 1500 kilocycles and adjust the following condensers in the order given:
 C8 - Oscillator trimmer
 C5 - R-F trimmer
 C2 - Ant. trimmer
- Tune test oscillator and receiver to 800 kilocycles and adjust condenser C11 (oscillator padder).

SPARKS WITHINGTON CO.

MODEL 5008
Schematic, Voltage
Alignment, Trimmers
Socket



VOLTAGE CHART

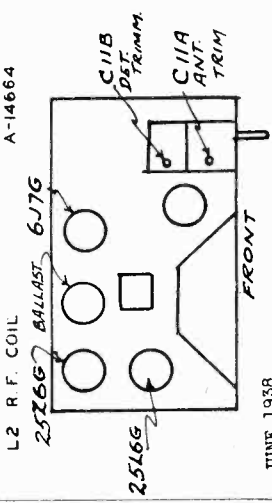
Line Voltage: 115 volts

Position of Volume Control: Full with Antenna Disconnected

Tube	Function	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6K7G	R.F.	0	6	102	102	0	-	0	5	0
6J7G	Det.	0	12	4.5	0	.3	-	6	1.5	0
25L6G	Power Amp.	0	36	90	102	0	-	12	7	-
25Z6G	Rect.	0	60	115	134	115	-	56	134	-
BK55B-J	Ballast	0	-	115	115	-	0	55	60	-

ALIGNMENT

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer on horizontal lines at end of scale with condenser closed)						
2	Broadcast Band	Ant.	200 mmf.	1500	1500	C11 A C11 B	
3	(Check calibration and sensitivity at 1000 kc. and 600 kc.)						
4	(Check operations 1 to 3 inclusive)						



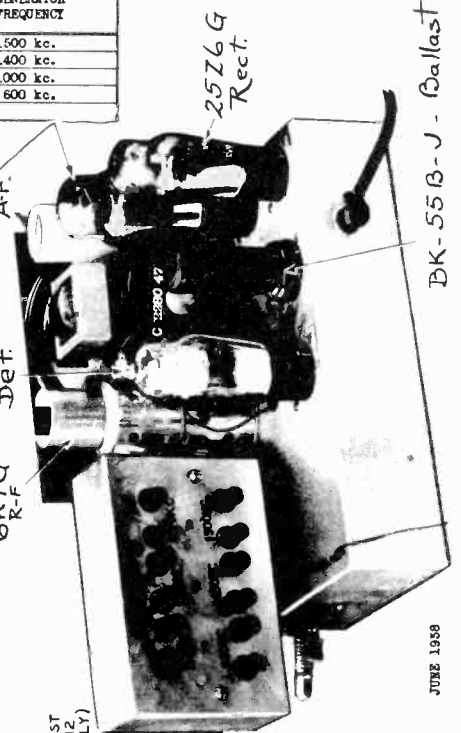
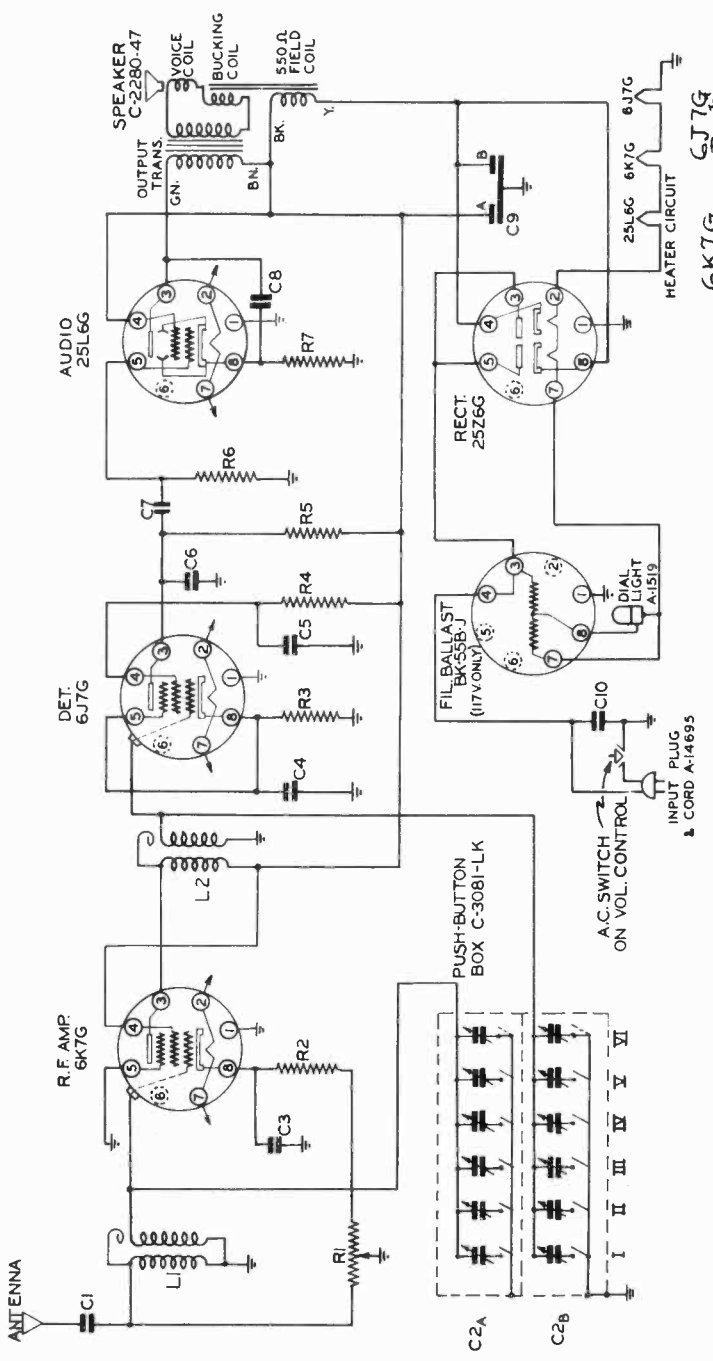
MODEL 5018

SPARKS WITHINGTON CO.

Schematic, Voltage
Alignment, Chassis

ALIGNMENT

OPERATION	ALIGNMENT OF TRIMMERS	PUSH BUTTON NO.	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY
1	R.F. & Det.	1	Ant.	200 mf.	1500 kc.
2	R.F. & Det.	2	Ant.	200 mf.	1400 kc.
5	R.F. & Det.	5 or 4	Ant.	200 mf.	1000 kc.
4	R.F. & Det.	5 or 6	Ant.	200 mf.	600 kc.
5	(Check operations 1 to 4 inclusive)				



- C1 .001 MFD. 400V C-3204-2C
- C2-A & B PUSH-BUTTON TRIMMERS C-3204-2C
- F-I 75-350 MMF. TRIM. B-7199-55K
- II-III 35-290 MMF. TRIM. B-7199-CGK
- IV-V 12-140 MMF. TRIM. B-7199-AAK
- C3 .02 MFD. 200 V C-3202-22C
- C4 10 MFD. 25V A-14782
- C5 .01 MFD. 200 V C-3202-20C
- C6 250 MMF. MOLDED C-720-324
- C7 .003 MFD. 200 V C-3202-6C
- C8 .03 MFD. 400 V C-3204-80C
- C9-A & B 25-25 MFD. ELECT. A-14691
- C10 .05 MFD. 400 V C-3204-28C
- R1 50,000 Ω VOL. CONTROL A-14656
- R2 330 Ω .25 W C-2795-56B
- R3 27,000 Ω .25 W C-2795-79B
- R4 6.2 MEG. OHM .25 W C-2795-250B
- R5 510,000 Ω .25 W C-2795-224B
- R6 560,000 Ω .25 W C-2795-95B
- R7 150 Ω .5 W C-2796-52C
- L1 ANTENNA COIL A-14663
- L2 R.F. COIL A-14664

VOLTAGE CHART

Tube	Function	Position of Volume Control: Full with Antenna Disconnected							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6K7G	R.F.	0	6	102	102	0	0	0	5
6J7G	Det.	0	12	2.5	0	.5	0	6	1.5
25L6G	Power Amp.	0	88	90	102	0	12	7	0
25Z6G	Rect.	0	60	115	134	115	0	88	154
BK-55B-J	Ballast	0	0	115	115	0	65	60	0

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 1% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohm per volt voltmeter. All AC voltages as with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.

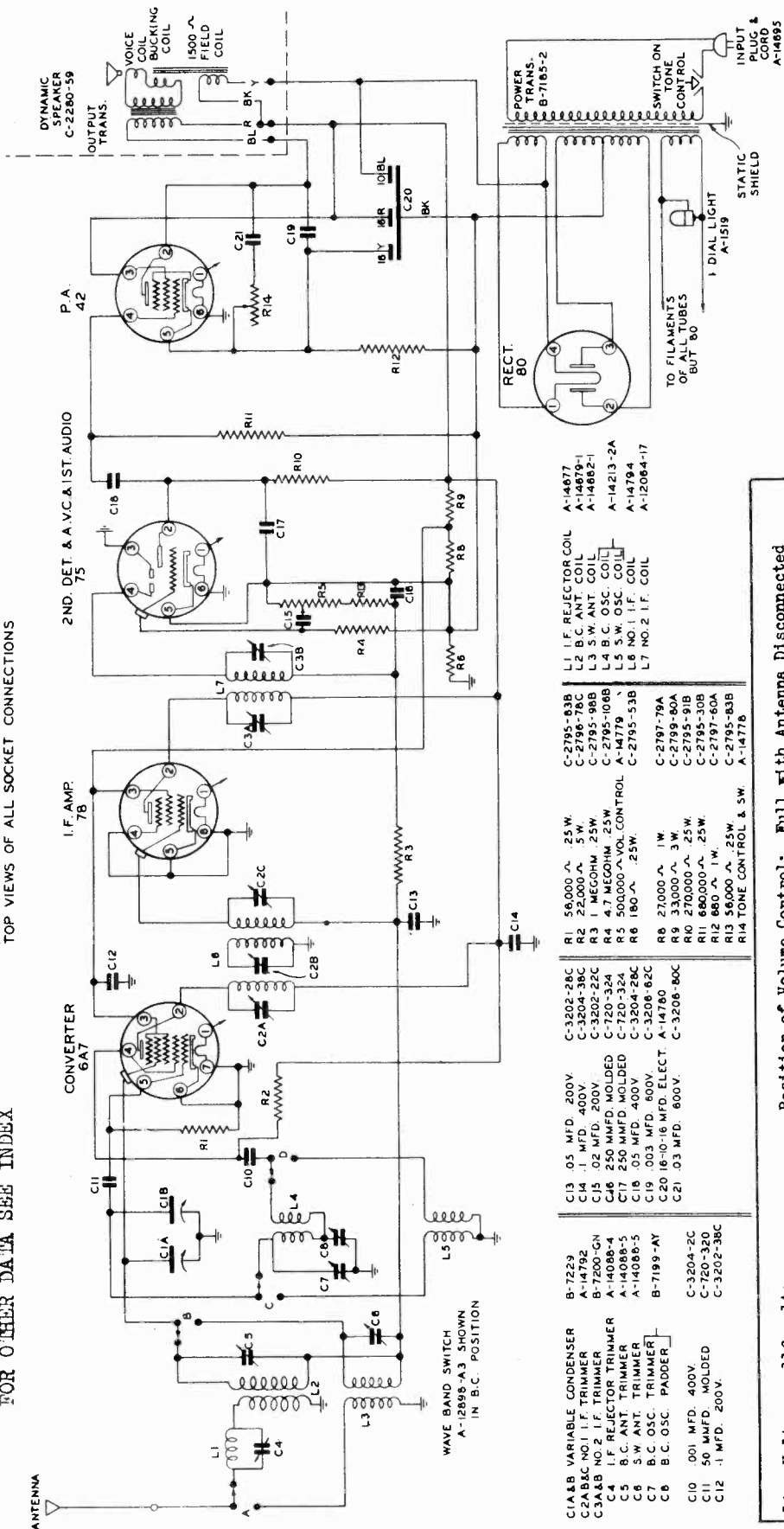
JUNE 1938

SPARKS WITHINGTON CO.

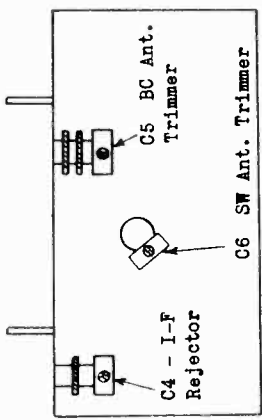
MODEL 5218
Schematic, Voltage
Trimmers

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 5218
INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF ALL SOCKET CONNECTIONS

FOR OTHER DATA SEE INDEX



- C1A B VARIABLE CONDENSER B-7229
- C2A B C NO. 1 I.F. TRIMMER A-14792
- C3A B NO. 2 I.F. TRIMMER B-7200-GN
- C4 I.F. REJECTOR TRIMMER A-14086-4
- C5 B.C. ANT. TRIMMER A-14086-5
- C6 S.W. ANT. TRIMMER A-14086-5
- C7 B.C. OSC. TRIMMER B-7199-AY
- C8 B.C. OSC. PADDER C-3204-2C
- C10 .001 MFD. 400V. C-3204-2C
- C11 50 MMFD. MOLDED C-720-320
- C12 .1 MFD. 200V. C-3202-3BC
- C13 .05 MFD. 200V. C-3202-28C
- C14 .1 MFD. 400V. C-3204-3BC
- C15 .02 MFD. 200V. C-3202-22C
- C16 250 MMFD. MOLDED C-720-324
- C17 250 MMFD. MOLDED C-720-324
- C18 .05 MFD. 400V. C-3204-28C
- C19 .003 MFD. 600V. C-3206-62C
- C20 16-10-16 MFD. ELECT. A-14780
- C21 .03 MFD. 600V. C-3206-80C
- C2A C2B C2C L6 L7 L8 L9 L10 L11 L12 L13 L14 L15 L16 L17 L18 L19 L20 L21
- R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14
- L1 L2 L3 L4 L5 L6 L7 L8 L9 L10 L11 L12 L13 L14 L15 L16 L17 L18 L19 L20 L21
- RECT. BO. TO FILAMENTS OF ALL TUBES BUT 80
- POWER TRANS. B-7105-2
- SWITCH ON TONE CONTROL
- INPUT PLUG & CORD A-14695
- STATIC SHIELD
- DIAL LIGHT A-1519
- VOICING COIL
- BUCKING COIL
- 1500-Ω FIELD COIL
- DYNAMIC SPEAKER C-2680-5B
- OUTPUT TRANS.
- BL R BK Y
- P.A. 42
- 2ND. DET. & A.V.C. 1ST. AUDIO 75
- I.F. AMP. 7B
- CONVERTER 6A7
- ANTENNA
- WAVE BAND SWITCH A-12898-A3 SHOWN IN B.C. POSITION
- TO FILAMENTS OF ALL TUBES BUT 80
- RECT. BO.
- POWER TRANS. B-7105-2
- SWITCH ON TONE CONTROL
- INPUT PLUG & CORD A-14695
- STATIC SHIELD
- DIAL LIGHT A-1519
- VOICING COIL
- BUCKING COIL
- 1500-Ω FIELD COIL
- DYNAMIC SPEAKER C-2680-5B
- OUTPUT TRANS.
- BL R BK Y
- P.A. 42
- 2ND. DET. & A.V.C. 1ST. AUDIO 75
- I.F. AMP. 7B
- CONVERTER 6A7
- ANTENNA
- WAVE BAND SWITCH A-12898-A3 SHOWN IN B.C. POSITION



TRIMMER LOCATIONS UNDER CHASSIS

Tube	Function	Position of Volume Control: Full with Antenna Disconnected							
		Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic Diagram)							
No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap	
6A7	Converter	6.2	252	17	225	-4.5	0	0	0
7B	I.F. Amp.	6.2	252	17	0	0	0	0	0
75	2nd Det. AVC-Audio	6.2	65	0	-0.2	-0.5	0	0	-0.2
42	P.A.	6.2	240	258	0	22	0	0	-
80	Rectifier	570	500	370	-	-	-	-	-

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.

MODEL 5218
 Alignment, Tuner
 MODELS 6218, 7618
 Voltage, Alignment
 Tuner

SPARKS WITHINGTON CO.

HOW TO ADJUST THE SPARTON SELECTRONNE IN THE MODELS

5218 6218 7618

1. Select six favorite nearby broadcast stations and detach the corresponding call letter tabs from the station call letter tab sheets.
2. Remove the Selectronne escutcheon plate from the front of the cabinet by means of the two screws and insert the station call letter tabs. Any tab may be used for any button, but it is usually more convenient for the operator if the tabs are arranged in sequence so that the tab for the lowest frequency station (station having lowest number of kilocycles (K.C.)) will be at the extreme left.
3. Using a small screwdriver or other tool that will fit the slot in the end of the button, push the button in as far as it will go and turn to the right or left until the dial pointer has moved to

- the desired station frequency. Be sure the button is pushed all the way in and the station is tuned in accurately.
4. Repeat the procedure in paragraph 3 for each of the remaining five buttons.
5. Check all buttons by pushing them in, one at a time, to determine whether desired stations are tuned properly.
6. Replace Selectronne escutcheon.
7. Any of the six stations to which the SPARTON Selectronne has been adjusted may now be received simply by pushing the Selectronne button for the desired station.

Model 6218, 7618

VOLTAGE CHART

Line Voltage: 115 volts		Position of Volume Control: Full with Antenna Disconnected								
Tube	Function	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6A7	Converter	6.1	250	60	150	-9	0	0	-	0
78	I.F. Amp.	6.1	250	60	0	0	0	-	-	0
75	2nd Det. AVC-Audio	6.1	37	0	-5	-1.5	0	-	-	-.7
78	Driver	6.1	250	0	10	0	-	-	-	-
6AC5G	P.A.	0	0	225	0	10	0	6.1	-	-
80	Rectifier	325	270	270	325	-	-	-	-	-
6E5	Viso-Glo	6.1	50	.2	250	5	0	-	-	-

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages. The Viso-Glo 6E5 is not used on Model 6218.

Models 5218; 6218, 7618.

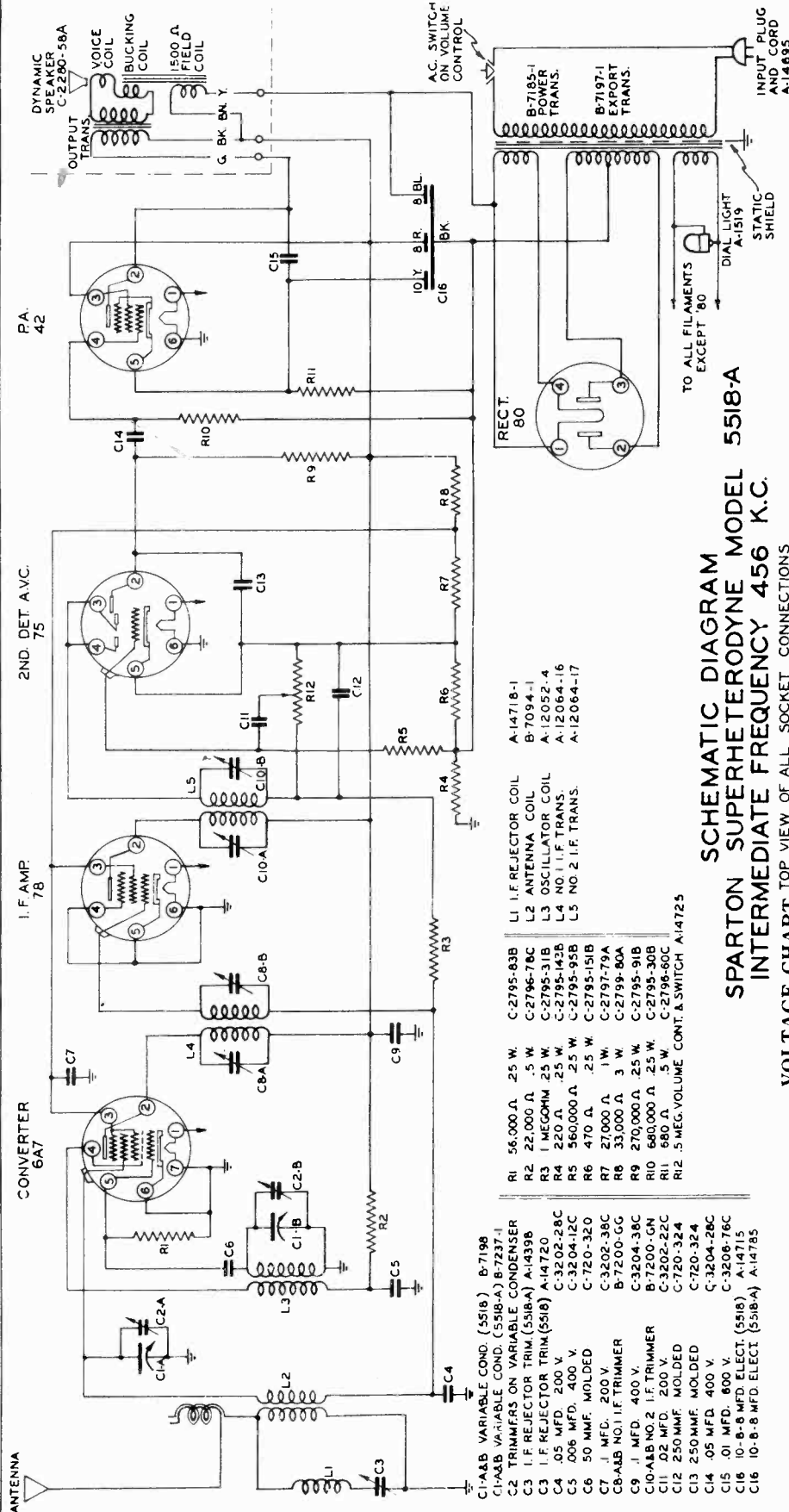
ALIGNMENT

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to last mark on scale when condenser plates are flush)							
2	I.F.	6A7 Grid	.1 mf.	456 KC	BC	Open	C5A, B; C2A, B, C	Adjust to approx. peak
3							C2B (Transfer)	Detune by tightening 1/2 t.
4							C5A, B; C2A, C	Peak accurately
5							C2B	Peak accurately*
6	Rejector	Ant.	200 mmf.	456 KC	BC	Open	C4	Adjust to minimum
7	Broad-cast	Ant.	200 mmf.	1500 KC	BC	1500 KC	C7 BC osc trim	Peak accurately
8	Band			600 KC	BC	600 KC	C8 BC osc pad	Peak accurately
9	(Repeat operations 7 and 8)							
10	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
11	S.W. Band	Ant.	*	18 MC	SW	18 MC	C6 SW ant trim	**
12	(Check calibration and sensitivity at 6.0 MC and 18 MC)							
13	(Check operations 1 to 13 inclusive)							
14								

*100 ohm non-inductive resistor and 200 mmf. condenser in series.
 **Rock dial while making this adjustment. Make certain that adjustment is made on fundamental signal and not on image. Peak accurately.

SPARKS WITHINGTON CO.

MODELS 5518, 5518A, 5518AX
Schematic, Voltage



**SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL
INTERMEDIATE FREQUENCY 456 K.C.**

VOLTAGE CHART TOP VIEW OF ALL SOCKET CONNECTIONS

Tube	Function	Position of Volume Control: Full with Antenna Disconnected								
		Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6A7	Converter	6.2	250	69	170	-1.2	0	0	-	0
7B	I.F. Amp.	6.2	250	69	0	0	0	0	-	0
7S	2nd Det. AVC	6.2	89	-1.4	-1.4	0	0	0	-	1.1
42	Power Amp.	6.2	225	250	0	17	0	0	-	-
80	Rectifier	350	300	300	350	-	-	-	-	-

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.

NOTE: Model 5518 has 6 push-buttons only -- no manual tuning. Models 5518A and 5518AX have 4 push-buttons and manual tuning. The same chassis is used in all three models with the exceptions as noted in the parts list.

JUNE 1938

MODELS 5518, 5518A
5518AX

SPARKS WITHINGTON CO.

Alignment, Chassis, Trimmers

MODELS 5518A, 5518AX

Tuner Data

ALIGNMENT

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to end of scale with condenser gang closed)						
2	I.F.	6A7 Grid	.1 mf.	456	Closed	C10 A, B C8 A, B	(2nd I.F.) (1st I.F.)
3	Rejector	Ant.	150 mmf.	456	Closed	C3	Adjust to min.
4	Broadcast Band	Ant.	150 mmf.	1500	1500	C2 A Ant. C2 B Osc.	
5	(Check for dial reading and sensitivity at 600 kc., 1000 kc.)						
6	(Check operations 1 to 5 inclusive)						

1. Select four favorite nearby broadcast stations and detach the corresponding call letter tabs from the station call letter tab sheets.

2. The tabs should be inserted in the ends of the knobs. For convenience it is recommended that the call letter tabs be arranged in sequence so that the tab for the station having the highest frequency (greatest number of kilocycles (k.c.)) will be at the extreme left. This, however, is not vital, since the Selectronne will operate with any arrangement of the tabs.

3. TO ADJUST SELECTRONNE BUTTONS, loosen selected button by turning one-half turn to left (counter-clockwise). Push this loosened button in as far as it will go, and while in this position, tune in manually the station desired or indicated by tab in end of this loosened button.

Then, with the button still pushed in as far as it will go, tighten by turning button to the right (clockwise) until it can be tightened no more.

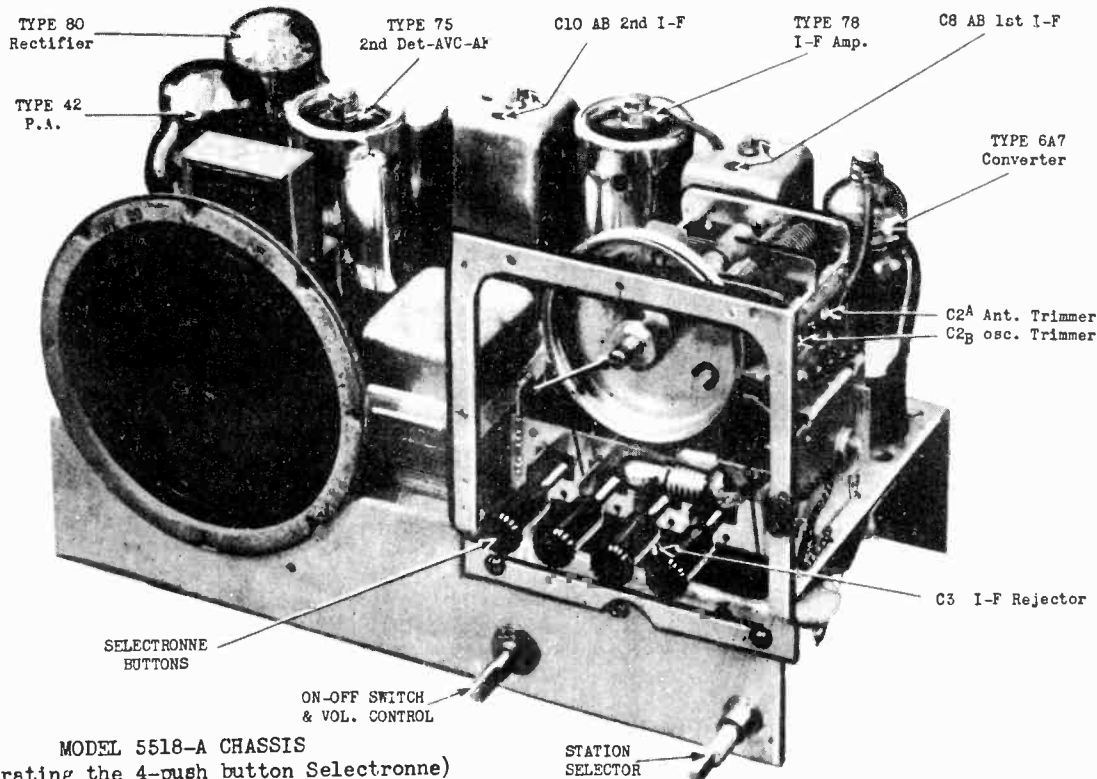
Be sure the station is tuned in accurately when pushed in button is tightened.

4. Repeat the procedure in paragraph 3 for each of the remaining three buttons and stations.

5. Be sure the Selectronne buttons have been tightened firmly.

6. Check all buttons by pushing them in, one at a time, to determine whether desired stations are tuned in properly.

7. Any of the four stations to which the SPARTON Selectronne has been adjusted may now be instantly received simply by pushing the Selectronne Button for the desired station.

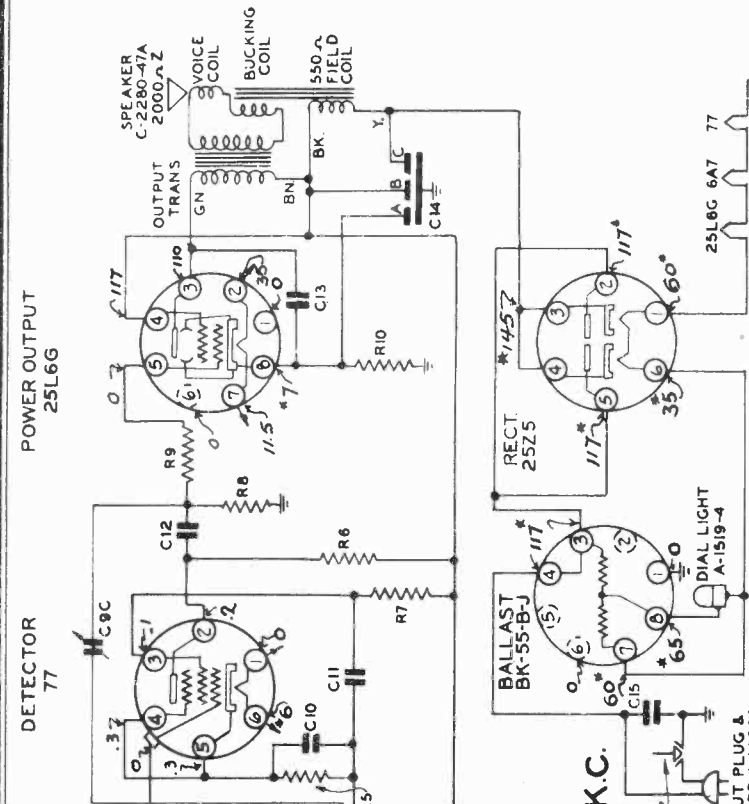


MODEL 5518-A CHASSIS
(Illustrating the 4-push button Selectronne)

SPARKS WITHINGTON CO.

MODEL 5028

Schematic, Voltage, Trimmers
Socket, Alignment



Sparton Superheterodyne Model
5028
INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF ALL SOCKET CONNECTIONS

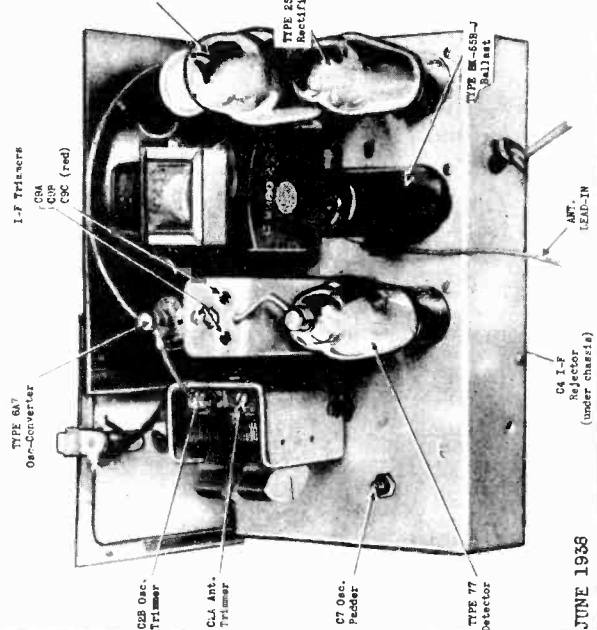
Notes: Voltage readings are for schematic diagram, Voltage of Socket Prongs to Gnd. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages are + DC voltages. Allow 15% + or - on all measurements. *AC volts. Line Voltage: 117 volts Position of Volume Control: Full with Antenna Disconnected

ALIGNMENT

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA FREQUENCY SETTING	BAND SWITCH COND. SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer at horizontal lines at end of scale with condenser closed)						
2	(Back off, i.e., turn counter-clockwise, regeneration cond. C9C "red spot" before I.F. is aligned)						
3	I.F. 6A7 grid	.1 mf.	456 KC	*	Open	C9 A,B	
4	(Adjust C9C "red spot", turning in clockwise until oscil. occurs, turn out C9C until oscil. stops)	Ant.	200 mmf.	456 KC	*	Open	C4 Adjust to minimum
5	Reflector	Ant.	200 mmf.	1500 KC	*	C2A Osc.	
6	Broadcast	Ant.	200 mmf.	600 KC	*	C1B Ant.	
7	Band					C7 Pad.	
8	(Repeat operation 6)						
9	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)						
10	(Connect set to regular antenna and check reception of stations. Readjust C9C if set howls or oscillates on strong signals. Then recheck sensitivity)						

* This model has Broadcast Band only.

- R1 50,000 Ω VOL CONTROL
- R2 390 Ω 25 W.
- R3 56,000 Ω 25 W.
- R4 39,000 Ω 25 W.
- R5 27,000 Ω 25 W.
- R6 580,000 Ω 25 W.
- R7 6.2 MEGOHM 25 W.
- R8 560,000 Ω 25 W.
- R9 56,000 Ω 25 W.
- R10 150 Ω 5 W.
- L1 I.F. REJECTOR COIL
- L2 ANT. COIL
- L3 OSC. COIL
- L4 NO. 11 F. COIL
- C1A & B VARIABLE CONDENSER } B-7187
- C2A & B ON VARIABLE COND. } C-3204-2C
- C3 .001 MFD. 400 V.
- C4 I.F. REJECTOR TRIM.
- C5 .01 MFD. 200 V.
- C6 50 MMFD. MOLDED
- C7 OSC. PADDER
- C8 .05 MFD. 200 V.
- C9A & B I.F. TRIMMER
- C10 10 MFD. 25 V.
- C11 0.1 MFD. 200 V.
- C12 .05 MFD. 200 V.
- C13 .02 MFD. 400 V.
- C14A & B 20-25-25 MFD ELECT. A-14907
- C15 .05 MFD. 400 V.

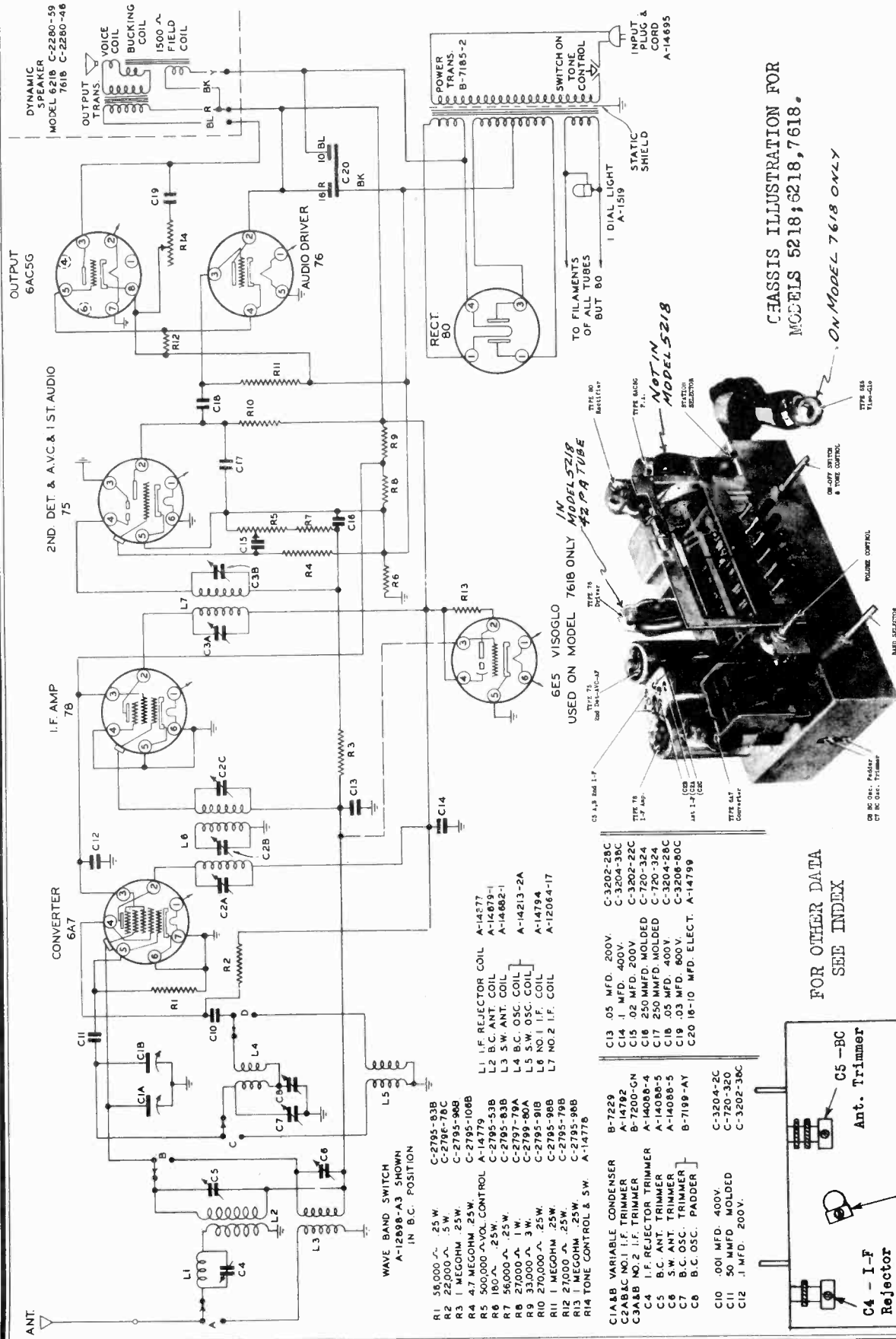


JUNE 1938

SPARKS WITHINGTON CO.

MODEL 5218
Chassis

MODELS 6218, 7618
Schematic, Trimmers
Socket, Chassis



CHASSIS ILLUSTRATION FOR
MODELS 5218; 6218, 7618.

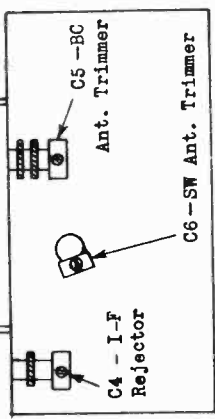
ON MODEL 7618 ONLY

SPARTON SUPERHETERODYNE MODELS 6218 & 7618
INTERMEDIATE FREQUENCY 456 K.C.
TOP VIEWS OF ALL SOCKET CONNECTIONS

JUNE 1938

FOR OTHER DATA
SEE INDEX

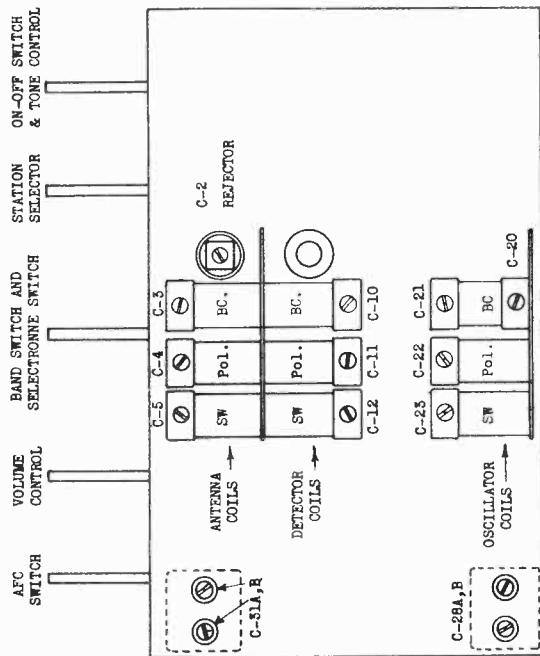
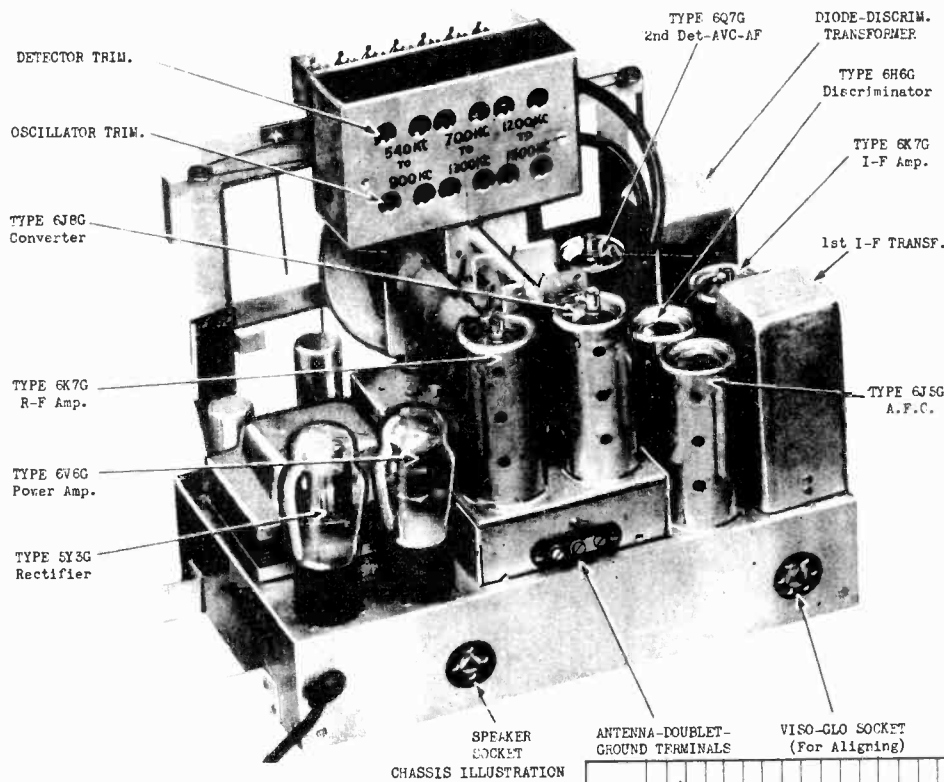
- R1 56,000 Ω, .25W C-2795-83B
- R2 22,000 Ω, .5W C-2795-79C
- R3 1 MEGOHM, .25W C-2795-94B
- R4 4.7 MEGOHM, .25W C-2795-106B
- R5 500,000 Ω VOL. CONTROL A-14379
- R6 180 Ω, .25W C-2795-53B
- R7 36,000 Ω, .25W C-2797-79A
- R8 33,000 Ω, .3W C-2799-80A
- R9 270,000 Ω, .25W C-2795-91B
- R10 1 MEGOHM, .25W C-2795-98B
- R11 270,000 Ω, .25W C-2795-79B
- R12 1 MEGOHM, .25W C-2795-96B
- R13 1 MEGOHM, .25W A-1477B
- R14 TONE CONTROL & SW A-1477B
- L1 I.F. REJECTOR COIL A-14277
- L2 B.C. ANT. COIL A-14679-1
- L3 S.W. ANT. COIL A-14682-1
- L4 B.C. OSC. COIL A-14213-2A
- L5 S.W. OSC. COIL A-14794
- L6 NO. 1 I.F. COIL A-12064-17
- L7 NO. 2 I.F. COIL A-12064-17
- C1 .001 MFD. 400V. C-3204-2C
- C2 .01 MFD. MOLDED C-720-320
- C3 .01 MFD. 200V. C-3202-38C
- C4 I.F. TRIMMER A-14782
- C5 B.C. ANT. TRIMMER A-14088-4
- C6 S.W. ANT. TRIMMER A-14088-5
- C7 B.C. OSC. TRIMMER A-14088-5
- C8 B.C. OSC. TRIMMER B-7199-AY
- C9 .001 MFD. 400V. C-3204-2C
- C10 .01 MFD. MOLDED C-720-320
- C11 .01 MFD. 200V. C-3202-38C
- C12 .01 MFD. 200V. C-3202-38C
- C13 .05 MFD. 200V. C-3202-28C
- C14 .1 MFD. 400V. C-3204-38C
- C15 .02 MFD. 200V. C-3202-22C
- C16 250 MMFD. MOLDED C-720-324
- C17 250 MMFD. MOLDED C-720-324
- C18 .05 MFD. 400V. C-3204-28C
- C19 .03 MFD. 600V. C-3208-80C
- C20 16-10 MFD. ELECT. A-14799



TRIMMER LOCATIONS UNDER CHASSIS

MODEL 8618
Alignment, Socket
Trimmers, Chassis

SPARKS WITHINGTON CO.



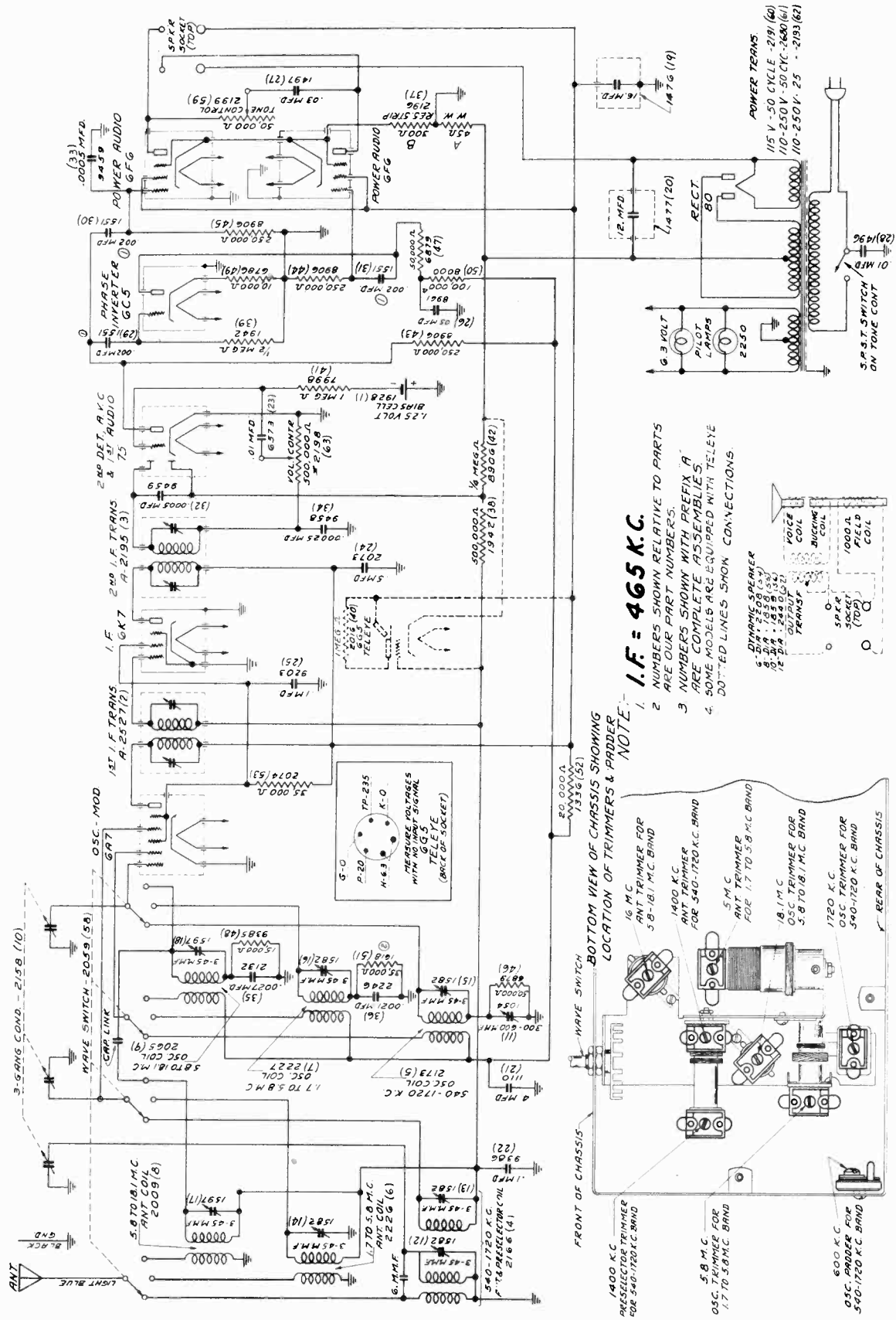
BOTTOM VIEW OF CHASSIS SHOWING TRIMMER LOCATIONS

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer to last mark below 550 KC with tuning condenser plates flush)							
2	I.F. Reflector	5Y3 Grid Ant.	.1 mfd. 200 mfd.	456 BC	BC	Open	C28, 31 (A, B)	Adjust to max. AFC off. Adjust to minimum.
3				456 BC	BC	Closed	C-2	
4	Broadcast Band	Ant.	200 mfd.	1500 BC	BC	1500	C21 Osc. C10 RF C-5 Ant.	
5				600 BC	BC	600	C20 Pad.	
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 800 KC, 1000 KC and 1500 KC)							
8	(Check operation of AFC circuit*)							
9	Police Band	Ant.	100 ohm series	5 MC.	Police	5 MC.	C22 Osc. C11 RF C4 Ant.	
10	(Check calibration and sensitivity at 1.9 MC., 4.0 MC. and 5 MC.)							
11	Short Wave Band	Ant.	100 ohm series	15 MC.	S.W.	15 MC.	C23 Osc. C12 RF C5 Ant.	
12	(Check calibration and sensitivity at 6.0 MC., 9.0 MC. and 15 MC.)							

*Check operation of AFC circuit by connecting generator to grid cap of 6J8 and tune generator and receiver to 1500 KC. Increase generator signal so that Viso-Glo just closes. Tune accurately with AFC switch "OFF". Now snap AFC switch "ON" and note the sensitivity as indicated on the Viso-Glo. If the sensitivity changes, the AFC (Discriminator) is not properly aligned and should be touched up (trimmer C-31B) until the AFC switch can be snapped "ON" and "OFF" without any change on the Viso-Glo.

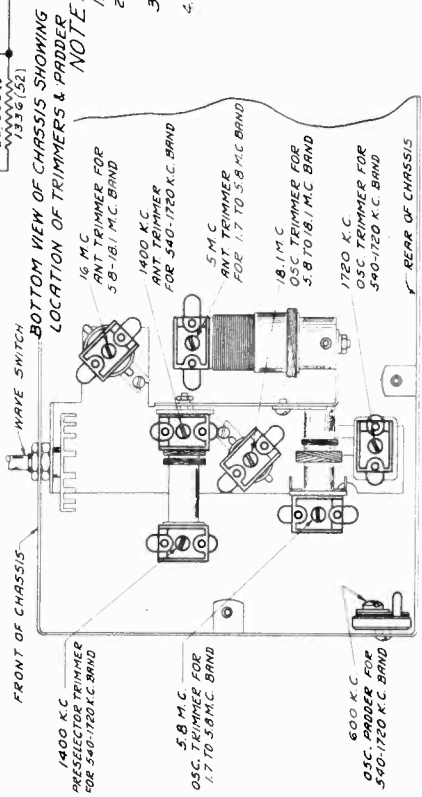
SPiEGEL INC.

MODEL 134, Chassis 46A
Schematic, Trimmers



I.F. = 465 K.C.

1. NUMBERS SHOWN RELATIVE TO PARTS.
2. NUMBERS SHOWN WITH PREFIX 'A' ARE COMPLETE ASSEMBLIES.
3. NUMBERS SHOWN WITH PREFIX 'A' ARE COMPLETE ASSEMBLIES.
4. SOME MODELS ARE EQUIPPED WITH TELETYPE DOTTED LINES SHOWN CONNECTIONS.



MODEL 134, Chassis 46A
Alignment, Voltage, Socket
Tuning Eye Notes

SPIEGEL INC.

ALIGNMENT PROCEDURE:

Realignment of this receiver should never be necessary unless one of the oscillator, antenna, or I. F. coils has been replaced. Lack of sensitivity, selectivity, and poor tone quality may be due to any one or a combination of causes, such as weak or defective tubes or speaker, inadequate or excessively long antenna, open or grounded bias resistor, bypass condenser, etc. Under no circumstances should realignment be attempted until all other possible sources have been first thoroughly investigated and have been definitely proven not to be the cause.

If an I. F. tube is replaced it is advisable to realign the I. F. Amplifier particularly if the replacement tube is one of a different manufacture than the one in the receiver. It is important when aligning to carefully follow the procedure in the order given, otherwise the receiver will lack sensitivity and the dial calibration will be incorrect.

IT IS IMPERATIVE THAT AN ACCURATELY CALIBRATED OSCILLATOR BE USED WITH SOME TYPE OF OUTPUT MEASURING DEVICE.

INTERMEDIATE ALIGNMENT:

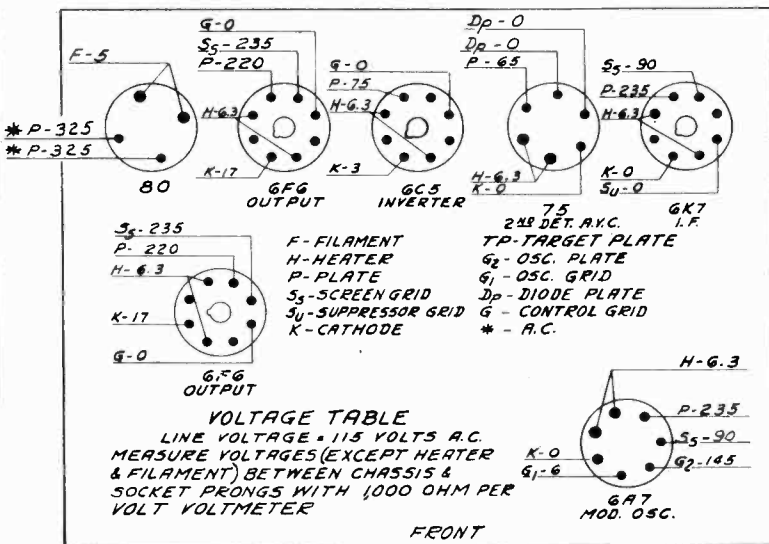
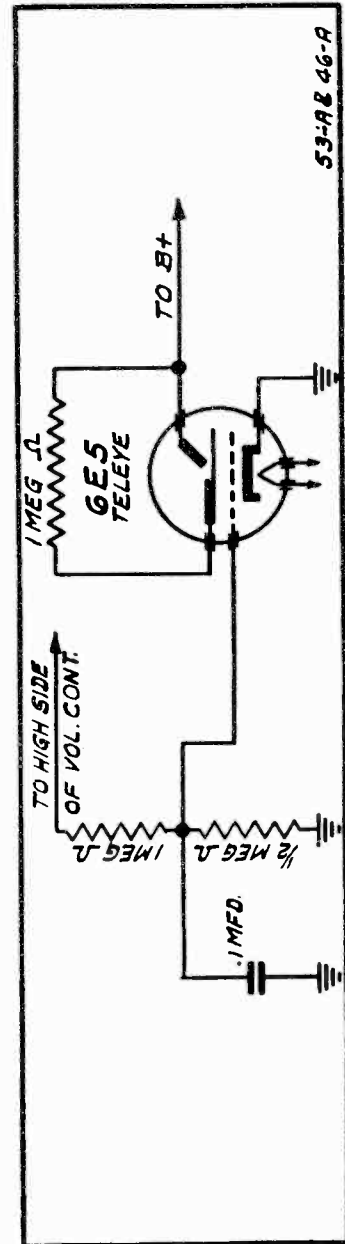
1. Connect the high side of the test oscillator output to the control grid of the 6D6 modulator tube through a .02 Mfd. condenser. Leave the grid cap connected to the grid terminal of the tube, and connect the ground side of the test oscillator to the receiver ground.
2. Set the test oscillator frequency to 465 kilocycles (this must be accurate).
3. Align the second intermediate transformer by turning one of the trimmer screws accessible through holes in the top of the transformer shields up and down (increasing and decreasing capacity) until maximum reading is obtained on the output meter, after which adjust the other trimmer screw of the same transformer for maximum sensitivity.
4. Adjust the first intermediate transformer in the same manner as the second I. F. transformer.

TO ALIGN THE VARIABLE CONDENSER:

It is important when aligning the gang condenser, padding and trimmer condensers to follow the procedure carefully, otherwise the receiver will be insensitive and the dial calibration will be incorrect. The padding and trimmer condensers located underneath the chassis will be referred to by their function as indicated on the circuit diagram.

1. Connect the high output side of the test oscillator through a 400 ohm resistor to the receiver antenna lead and the low side to the set ground.
2. Place the band selector switch for operation on the 5.8 to 18.1 megacycle band, tune the receiver dial, and set the test oscillator frequency to EXACTLY 18.1 MEGACYCLES.
Tune in the 18.1 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING THE 18.1 MEGACYCLE OSCILLATOR TRIMMER. When adjusting this trimmer two peaks, the fundamental and the image peak will be noticed. CARE MUST BE TAKEN THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 18.1 MEGACYCLES. Always back off the trimmer to minimum capacity, then screw down the trimmer (add capacity) until the first peak which is the fundamental and the proper one to use is tuned in. If the trimmer is screwed down beyond the point where the first peak is received, the incorrect image peak will be tuned in. After completing adjustment of the oscillator trimmer at 18.1 megacycles always check to see if the proper peak has been used. To do this leave the test oscillator frequency at 18.1 megacycles, increase the output of the test oscillator and tune the receiver dial to approximately 17.1 megacycles, and if the fundamental peak was used in aligning at 18.1 megacycles the test oscillator signal will be heard at approximately 17.1 megacycles on the receiver dial. If it is not possible to receive the signal, then the fundamental peak was not used and the 18.1 megacycle oscillator trimmer must be properly re-adjusted.
3. With band selector switch set for operation on 5.8 to 18.1 megacycle band tune the receiver dial and set test oscillator frequency to EXACTLY 16 MEGACYCLES. Adjust 16 megacycle antenna trimmer for maximum 16 megacycle signal sensitivity.
4. Place band selector switch for operation on 1.7 to 5.8 megacycle band, tune the receiver dial, and set test oscillator frequency to EXACTLY 5.8 MEGACYCLES. BRING IN 5.8 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING 5.8 megacycle oscillator trimmer.
5. With the band selector switch set for operation on the 1.7 to 5.8 megacycle band tune receiver dial and set test oscillator frequency to EXACTLY 5 MEGACYCLES. Then adjust 5 megacycle antenna trimmer for maximum 5 megacycle signal sensitivity.
6. Replace the 400 ohm resistor in series with test oscillator lead with a 200 Mmfd. condenser, place the band selector switch for operation on the 540 to 1720 kilocycle band, tune receiver dial, and set test oscillator frequency to EXACTLY 1720 KILOCYCLES. NEXT BRING IN THE 1720 KILOCYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING 1720 KILOCYCLE OSCILLATOR TRIMMER.
7. With band selector switch placed for operation on the 540 to 1720 kilocycle band set test oscillator frequency and receiver dial to EXACTLY 1400 KILOCYCLES. Adjust 1400 kilocycle preselector and antenna trimmers for maximum 1400 kilocycle signal sensitivity.
8. Leave band selector switch for operation on 540 to 1720 kilocycle band, tune receiver dial and set test oscillator frequency to approximately 600 kilocycles. While rocking gang condenser slightly to right and left adjust 600 kilocycle oscillator padder for maximum sensitivity.

Some of these model receivers were equipped with "Teleye" the cathode ray visual tuning indicator. A 6E5 tube was used in early production models, which was replaced by a 6G5 tube in later production. The parts and connections shown in the dotted lines on the complete circuit diagram are used only when a 6G5 "Teleye" tube is incorporated in the receiver. The diagram below shows 6E5 tube connections.



BOTTOM VIEW OF CHASSIS

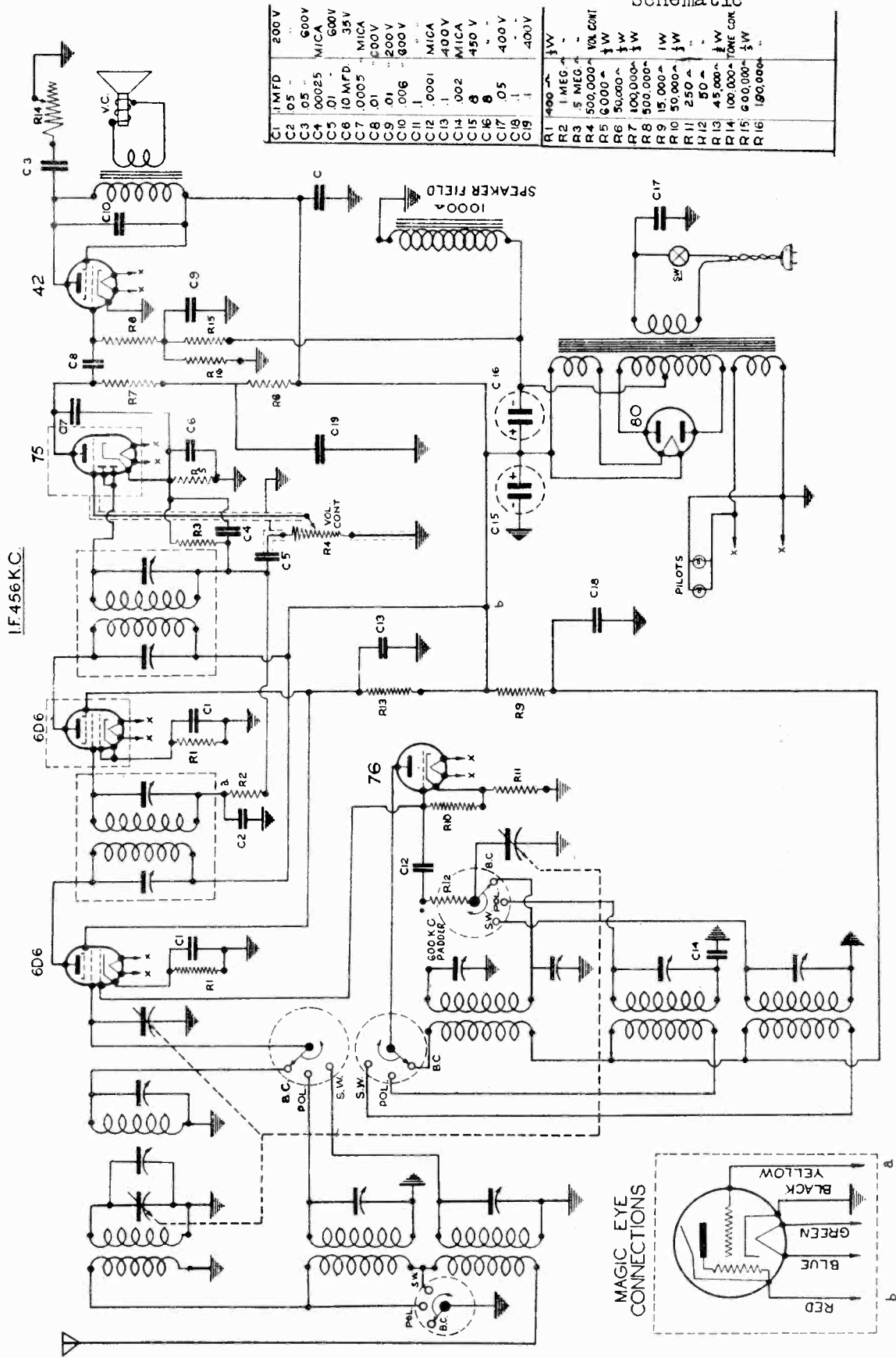
SPIEGEL INC.

MODELS 160, 180, 184, 6500, 6504

6518, 6546, 6550, 6562, 6564

Chassis 603 (1936)

Schematic



C1	1 MFD	200 V	R1	400	1W
C2	0.5	500V	R2	1 MEG	-
C3	0.5	MICA	R3	5 MEG	-
C4	0.0025	MICA	R4	500,000	VOL CONT
C5	0.1	600V	R5	6,000	1W
C6	10 MFD	35V	R6	50,000	1W
C7	0.0005	MICA	R7	100,000	1W
C8	0.1	500V	R8	500,000	1W
C9	0.1	200V	R9	15,000	1W
C10	0.006	500V	R10	50,000	1W
C11	0.001	MICA	R11	250	1W
C12	1	400V	R12	50	1W
C13	1	400V	R13	45,000	1W
C14	0.002	MICA	R14	100,000	TONE CONT
C15	8	450 V	R15	60,000	1W
C16	8	450 V	R16	180,000	-
C17	0.5	400 V			
C18	1	400V			
C19	1	400V			

MODELS 160, 180, 184, 6500, 6504, 6518, 6546, 6550, 6562, 6564
Chassis 603 (1936)
Alignment, Socket, Trimmers

SPIEGEL INC.

MODELS 178, 6708, 6754
Chassis 15 (1936)
Alignment

MODELS 160, 180, 184, 6500, 6504, 6518, 6546, 6550, 6562, 6564,
MODEL 603, (1936)

In case of faulty operation of the receiver, first make sure that the antenna and ground are in good condition and properly attached to the receiver. Then determine if any of the tubes are faulty. In case of trouble within the receiver itself, the circuit diagram shown on the opposite page will be useful to the service man in locating and correcting the trouble.

I. F. Alignment:

Connect a test oscillator or signal generator through a .1 mfd. condenser to the grid of the 6D6 tube and set the oscillator to 456 KC. Use an output meter connected to the speaker if possible, to obtain the most accurate adjustments. Peak each I. F. stage to maximum response, reducing the output of the oscillator as far as possible for final adjustments.

R. F. Alignment:

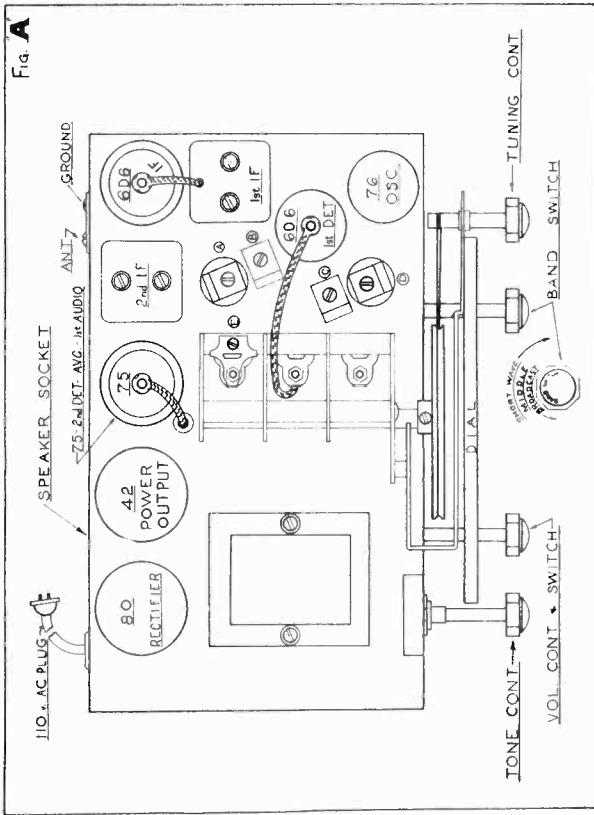
With test oscillator set at 1400 KC, feed this signal into the antenna lead of the receiver through a .00025 condenser. With band switch in broadcast position, set the dial pointer to 1400 KC.

Adjust the broadcast oscillator trimmer (the small trimmer attached to the coil located approximately in front of the range switch) to peak at 1400 KC. Next adjust the trimmer on the pre-selector (this coil is mounted in the center at the front of the chassis). Then adjust the one trimmer on top of the gang condenser.

Now set the test oscillator to 600 KC. Adjust the broadcast paddler condenser (the ceramic-base condenser adjustable through the right hand end of the chassis) in this manner. Move the dial slowly and repeatedly back and forth across the range while adjusting the paddler. Adjust for maximum gain.

Now set the range switch to middle wave band. Adjust the test oscillator to 4000 KC, and set the dial to 4000 KC. Adjust the two trimmers located on the tops of the two short wave coils, on top of the chassis, for maximum gain.

Now set the range switch to the short wave position, adjust the test oscillator to 15 megacycles. Turn the dial to read 15 megacycles. Adjust for maximum gain, the two trimmers located at the bases of the short wave coils.



MODELS 178, 6708, 6754 (1936) Chassis 15

FOREIGN BAND ALIGNMENT

The Foreign Band of 19 to 49 meters can be adjusted by two trimmers marked and illustrated in the drawing as follows: (1) The antenna coil trimmer, (2) the antenna coil trimmer. In preparing the test oscillator for alignment, set the oscillator with the .0001 mfd. condenser on the output lead of the test oscillator. Set the receiver pointer to 14,000 KC (also test on 14,000 KC).

Then proceed to adjust these two trimmers for peak at 14,000 KC. Adjust the antenna coil trimmer for alignment in servitude, no other adjustments are necessary for alignment in servitude.

Note: Always start this procedure by having the oscillator coil faintly light (in all the way), and the antenna coil trimmer fully light (in all the way). In order to prevent alignment on the image frequency, it is suggested that the following check be made: Readjust the pointer to 13,100 KC where the image frequency should be found. If properly aligned, the image frequency should be found to be stronger than the signal at 14,000 KC. If 13,100 KC is found to be stronger than the signal at 14,000 KC, it signifies that alignment was incorrectly made on the image frequency.

POLICE BAND

In preparing the test oscillator for alignment of this band, connect a 500 ohm carbon resistor in series with a .0001 mfd. condenser on the output lead of the test oscillator. This resistor is used with the test oscillator only on the Short Wave Bands and should not be used for Broadcast.

Set the receiver pointer to 4000 KC (also test oscillator) and adjust the Police Band oscillator trimmer to peak. After this has been carefully done, the next step is to adjust the Police Band antenna trimmer to peak the test oscillator to 1800 KC in preparation for adjusting the police band paddler condenser. Slowly increase or decrease the oscillator paddler condenser at the same time continuously tune back and forth across the signal with the receiver, until the maximum response is obtained. This is the easiest way to correctly adjust the oscillator to the R.F. antenna section. Return to 4000 KC and again go over the adjustments of this frequency to be certain that they were not put slightly out of alignment when adjustments were made at 1800 KC. Repeat on a scale no further adjustment should be necessary (in this respect) if the pointer is found off scale, it may be corrected and put on scale by readjustment of the police band oscillator trimmer. Alignment of the pointer can only be corrected by adjustment of the trimmer. The adjustment, the Police Band Oscillator Trimmer, Police Band Antenna Trimmer and Police Band Paddler Trimmer are the only three adjustments required in aligning this band.

SERVICE DATA FOR ALL BANDS

106 (short) stator and rotor plates of oscillator section on gong (short) spring. If oscillating properly, grounding the grid will cause an appreciable drop in oscillator voltage.

- P152 1 Megohm Resistor 1/4 Watt
P156 25,000 Ohm Resistor 1/4 Watt
P168 8,000 Ohm Resistor 1/4 Watt
P417 50,000 Ohm Resistor 1/4 Watt
P142 .02200V Condenser
P148 .05.200V Condenser
P335 .01.600V Condenser
P339 .02.200V Condenser
P355 .50.10V Condenser
P480 .0001 Micro Condenser
P573 .001 Micro Condenser
P279 .001 Micro Condenser
P334 .05.400V Condenser
P144 STRAIGHT DIAL MODEL
P142 Volume Control
P1058 Tone Control
P1143 Wave Switch
P1144 Switching Knob CPT
P496A Escutcheon Plate

GENERAL DATA

The alignment of this receiver requires the use of a test oscillator which will cover the frequencies of 456, 600, 1400, 1800, 4000, 6000, and 14,000 KC and an output meter, which is to be connected across the primary or secondary of the output transformer. The test oscillator should be set at a low volume control on maximum and the test oscillator output as low as possible, to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE

The intermediate frequency (I.F.) stages should be aligned properly on the first step. After the I.F. transformers have been properly aligned, the Broadcast Band should be aligned. Wave bands may be aligned, either at both of the Short Wave Bands may be aligned.

I. F. ALIGNMENT

Adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6C6) through a .05 or .1 mfd condenser. The ground on the test oscillator can be connected to the chassis ground. Align all five I.F. trimmers to peak or maximum response, there will be consequently three I.F. transformers to align. The I.F. transformer nearest the type (30) diode detector has only one trimmer, (single tuned) and should be the first adjustment. Next adjust the center I.F. transformer, which has two trimmers (double tuned). The I.F. transformer nearest the type (30) diode detector has only one trimmer, (single tuned) (double tuned) for peak.

BROADCAST BAND ALIGNMENT

Adjust the test oscillator to 1400 KC and connect the output to the antenna post marked 'A' through a .0001 mfd. mica condenser to give the equivalent of an antenna about 60 feet. Set the receiver pointer to 1400 KC and adjust the Broadcast Band antenna trimmer to peak. After this has been carefully done, the next step is to adjust the front trimmer of the gang condenser to peak. The front condenser section tunes the pre-selector circuit. Then adjust the Broadcast Band R. F. trimmer to peak. This trimmer aligns the grid or input circuit of the test oscillator. Next, set the dial pointer on the receiver and the test oscillator to 600 KC. Slowly increase or decrease the B. C. oscillator paddler condenser and at the same time continuously tune back and forth across the signal with the receiver until the maximum response is obtained. This is the easiest way to correctly adjust the oscillator to the R.F. antenna section. Return to 1400 KC and again go over the adjustments of this frequency to be certain that they were not put slightly out of alignment when adjustments were made at 600 KC. Repeat on a scale no further adjustment should be necessary (in this respect) if the pointer is found off scale, it may be corrected and put on scale by readjustment of the police band oscillator trimmer. Alignment of the pointer can only be corrected by adjustment of the trimmer. The adjustment, the Police Band Oscillator Trimmer, Police Band Antenna Trimmer and Police Band Paddler Trimmer are the only three adjustments required in aligning this band.

It is suspected that the oscillator has stopped but it is doubtful due to the presence of the usual amount of noise level, it is suggested that the oscillator plate voltage be checked. To ascertain whether the tube is oscillating, ground the oscillator grid of the 106 (short) spring.

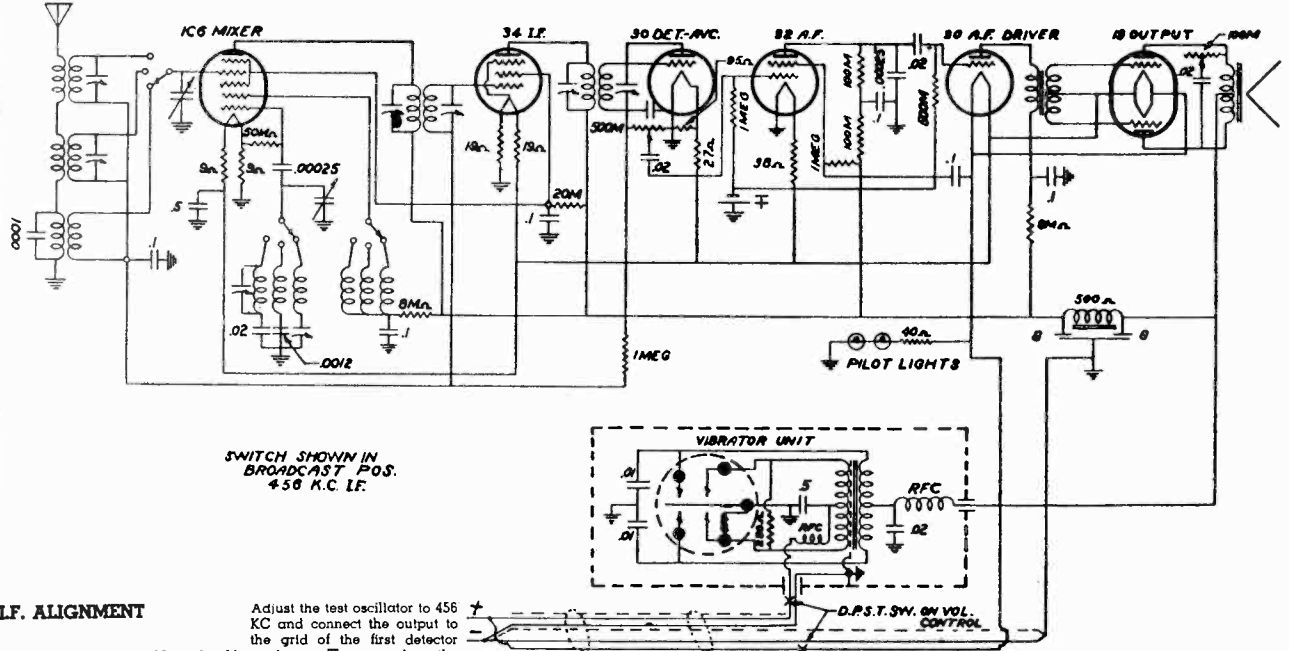
SERVICE DATA FOR ALL BANDS

- P354 Transformer With Broadcast
P152 1 Megohm Resistor 1/4 Watt
P156 25,000 Ohm Resistor 1/4 Watt
P168 8,000 Ohm Resistor 1/4 Watt
P417 50,000 Ohm Resistor 1/4 Watt
P142 .02200V Condenser
P148 .05.200V Condenser
P335 .01.600V Condenser
P339 .02.200V Condenser
P355 .50.10V Condenser
P480 .0001 Micro Condenser
P573 .001 Micro Condenser
P279 .001 Micro Condenser
P334 .05.400V Condenser
P144 STRAIGHT DIAL MODEL
P142 Volume Control
P1058 Tone Control
P1143 Wave Switch
P1144 Switching Knob CPT
P496A Escutcheon Plate

Schematic, Socket, Trimmers Alignment

SPIEGEL INC.

MODELS 102, 104, 112, 114, 124
172, 6750, 6752 Chassis Z4



LF. ALIGNMENT

Adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (1C6) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT

Adjust the oscillator to 1400 KC and connect the output to the antenna post marked "A" through a .0001 mfd. mica condenser to give the equivalent of an antenna about 60 feet. Set the receiver pointer to 1400 KC and adjust the rear gang condenser trimmer (oscillator circuit) to peak. After this has been carefully done, the next step is to adjust the front trimmer of the gang condenser to peak. The front condenser section tunes the RF or grid circuit of the 1C6 tube. Next re-set the dial pointer on the receiver and the test oscillator to 600 KC. Slowly increase or decrease the oscillator padding condenser and at the same time continuously tune back and forth across the signal with the receiver until the maximum reading is obtained on the output meter. This adjustment may seem a little complicated but is the easiest way to adjust the oscillator to the R.F. section. The padding condenser is located on the left hand side of the chassis, directly to the left of the 1C6 tube and in front of the first I.F. transformer. Return to 1400 KC and again go over the adjustments of this frequency to be certain that they were not put slightly out of alignment when adjustment was made at 600 KC. This completes the correct sequence of operations in properly aligning the receiver for the Broadcast Band, and must always be done before attempting to align the Short Wave Bands.

FOREIGN BAND ALIGNMENT

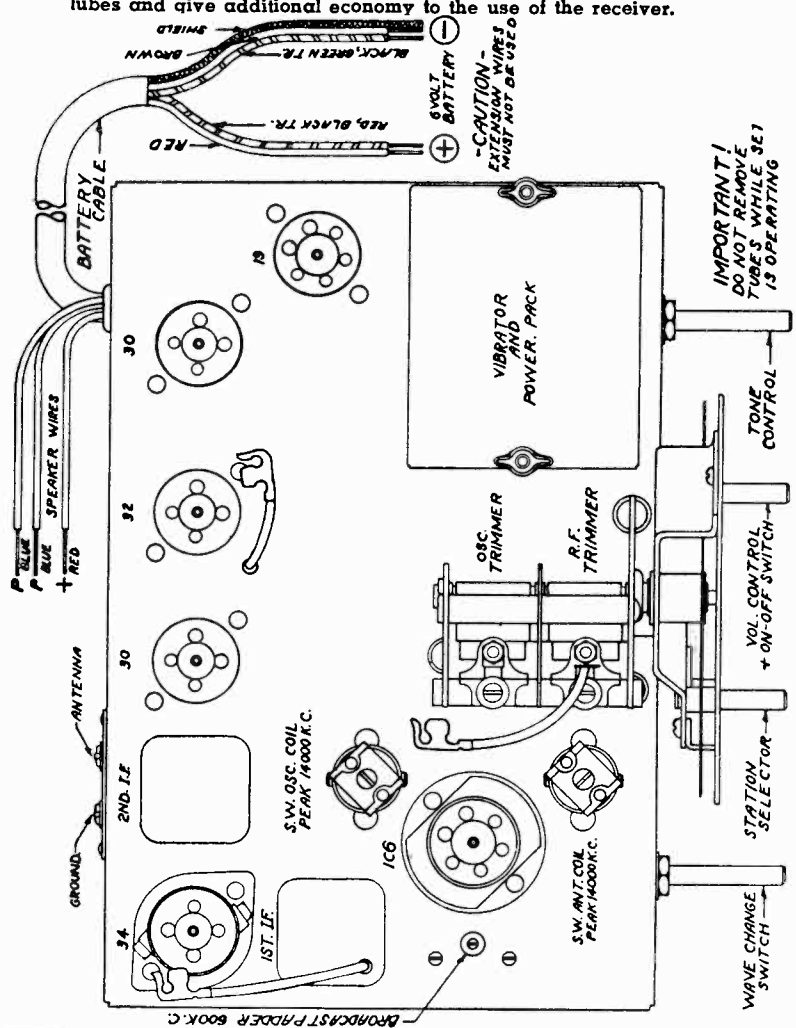
The Foreign Band of 19 to 49 meters can be adjusted by the two trimmers on the short wave coils located on the top of the chassis. Set the test oscillator to 14,000 KC. In preparing the test oscillator for alignment of this band, connect a 400 ohm carbon resistor in series with the .0001 mfd. condenser on the output lead of the test oscillator. The oscillator coil is located near the 1st I.F. Transformer and the antenna or R.F. coil is located directly in front of the Short Wave oscillator coil and alongside the front section of the gang condenser. These two trimmers should be adjusted for peak at 14,000 KC and as the inherent design of the circuit has been expressly developed for simplicity in servicing, no other adjustments are necessary for aligning this band. **Note:** Always start this procedure by having the oscillator coil trimmer loose (off all the way), and the antenna coil trimmer fairly tight (in all the way); otherwise it is possible to make a false alignment on the image frequency. In order to prevent alignment on the image frequency, it is suggested that the following check be made: Readjust the pointer to 13,100 KC where the image frequency should be found. If properly aligned, the image frequency will be found to be weaker. If, however, the signal at 13,100 KC is found to be stronger than the signal at 14,000 KC, it signifies that alignment was incorrectly made on the image frequency.

IMPORTANT: Do not attempt any adjustment of the gang condenser trimmers in aligning the Foreign Band as this will throw the Broadcast Band out of alignment.

POLICE BAND ALIGNMENT

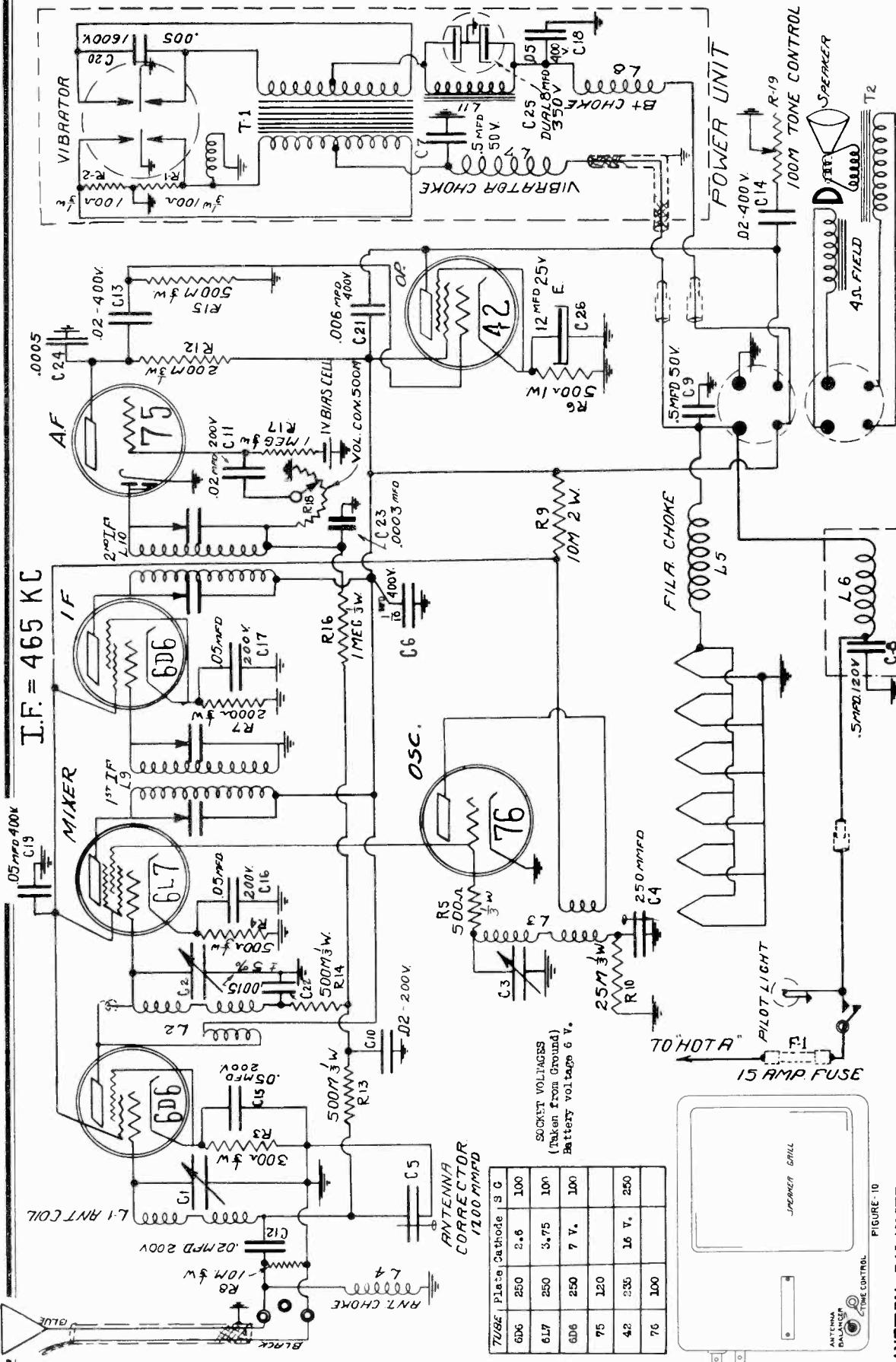
There is only one adjustment to be made in the alignment of the Police Band. Due to the circuit design and correct matching of the coils, no oscillator adjustment is necessary. Set the dial pointer to 4000 KC (also the test oscillator) and adjust the antenna coil trimmer to resonance. In preparing the test oscillator for alignment of this band, connect a 400 ohm carbon resistor in series with the .0001 mfd. condenser on the output lead of the test oscillator. This resistor is used with the test oscillator only on the Short Wave Bands and should not be used for Broadcast Band alignment. The two police band coils are under the chassis and the antenna coil trimmer is mounted on the end of the antenna coil. **Important:** This is the only adjustment necessary for the Police Band. Do not attempt any adjustment of the gang condenser trimmers in aligning the Police Band, otherwise the Broadcast Band will be thrown out of alignment.

IMPORTANT NOTE: The battery must never be charged while set is in operation. If a windcharger is used, it should always be disconnected from the battery when the receiver is being used. An inexpensive single pole switch can be used for disconnecting the windcharger from the battery. This will increase the life of the tubes and give additional economy to the use of the receiver.



MODEL 169, Chassis H1
Schematic, Voltage
Alignment

SPIEGEL INC.



DRAWING NO. B6-75 ms APPROVED - MK

ANTENNA BALANCER
First, tune in a weak station at or very near to 600 KC on the dial. Second, without changing any other control, insert a small screw driver into the antenna balancer screw shown in Figure 10 and turn it either to the left or right until the volume of the station is at its maximum point.

TUBE	Plate	Cathode	S	G
6D6	250	2.6	100	
6L7	250	3.75	100	
6B6	250	7 V.	100	
75	120			250
42	235	16 V.		
76	100			

SOCKET VOLTAGES
(Taken from Ground)
Battery voltage 6 V.

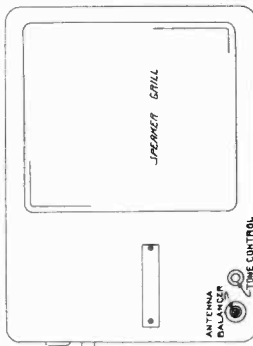
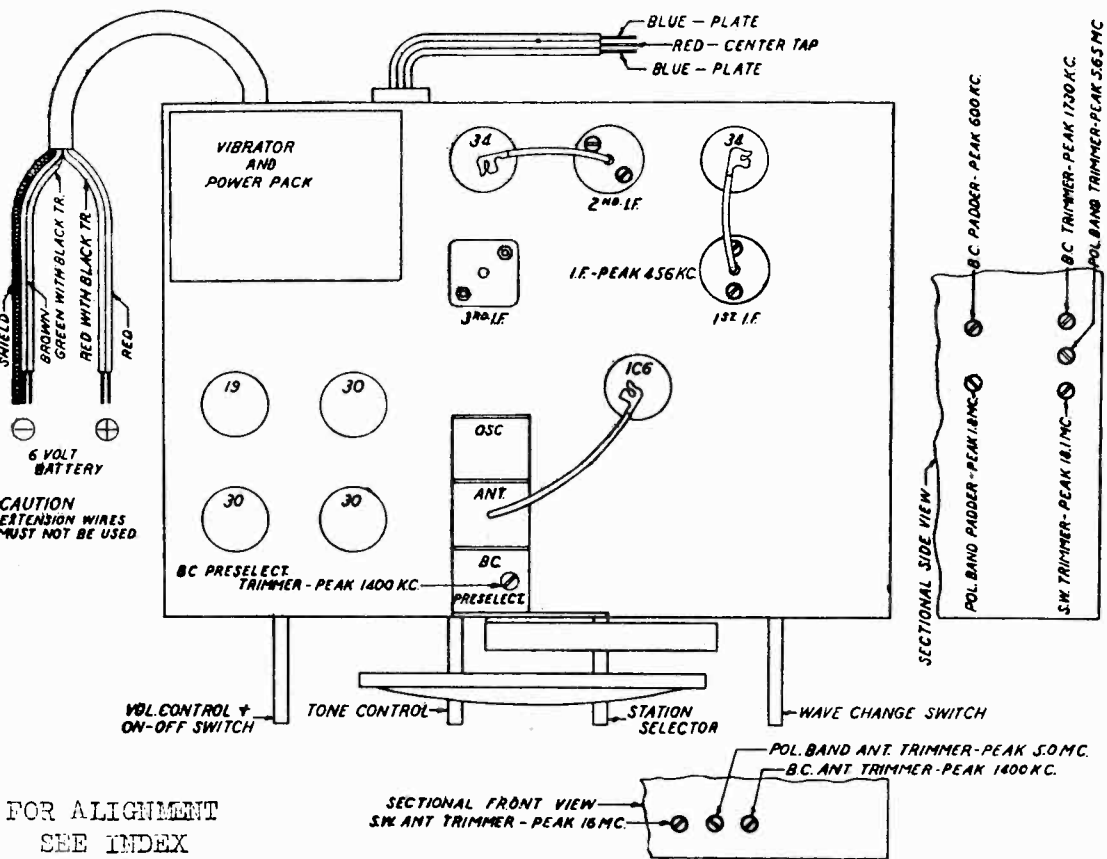
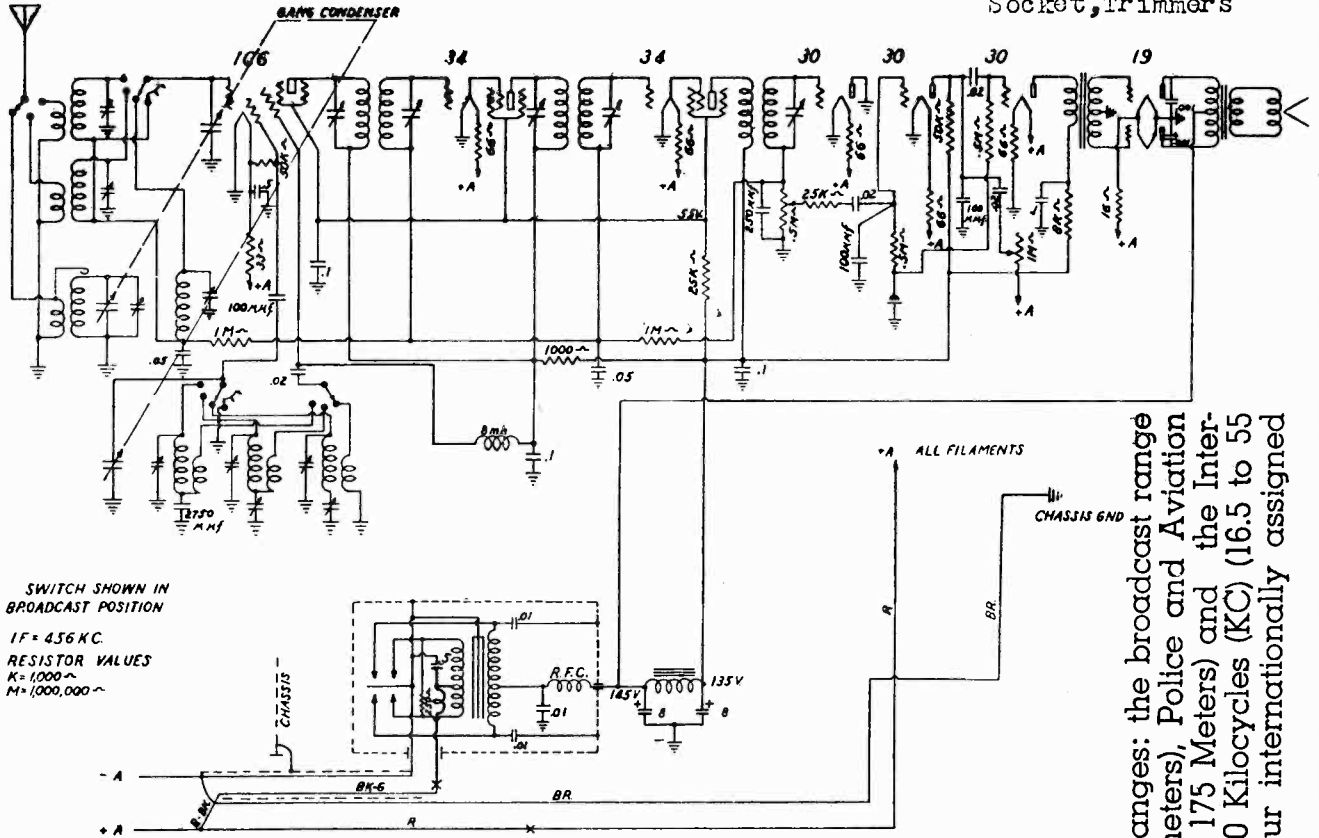


FIGURE 10

SPIEGEL INC.

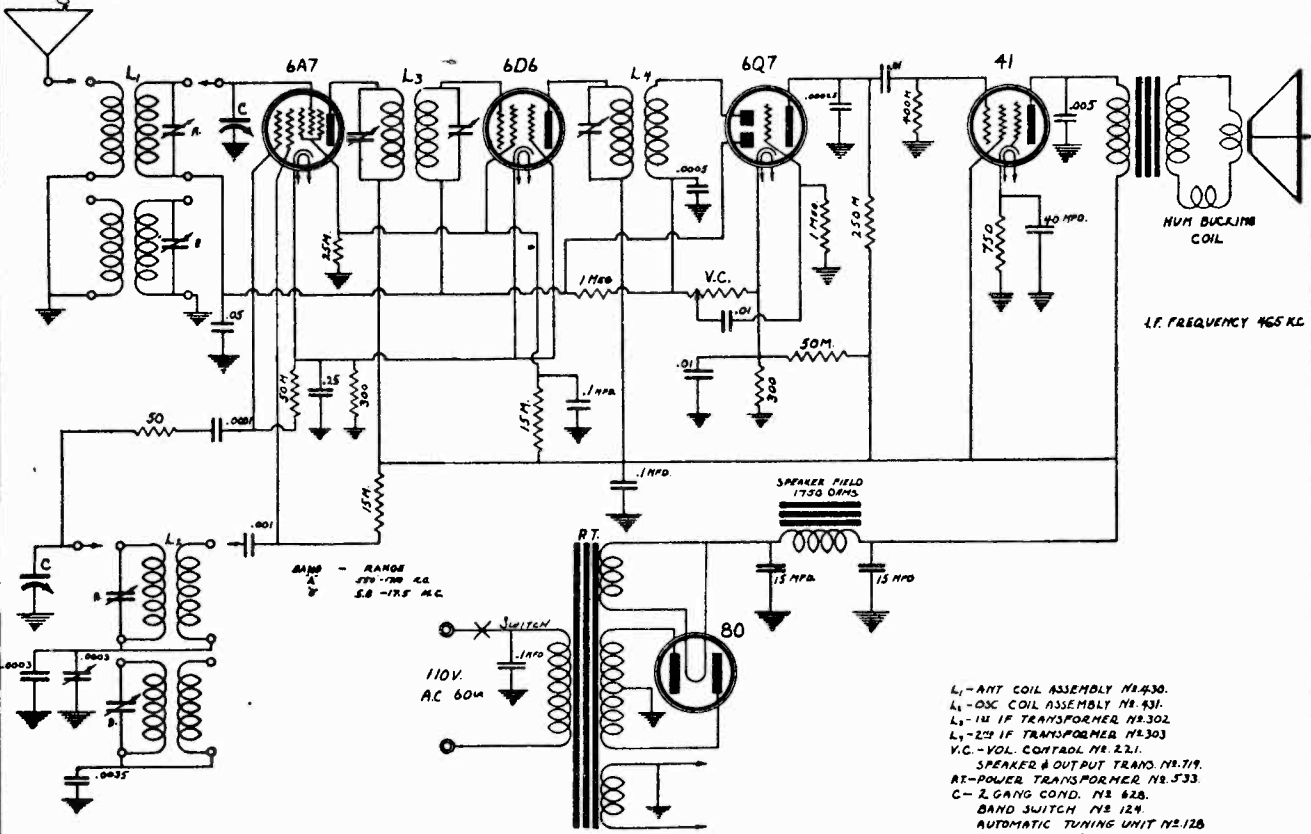
MODELS 178, 6708, 6754
 Chassis M5 (1936)
 Schematic, Voltage
 Socket, Trimmers



This receiver is designed to operate over three tuning ranges: the broadcast range which extends from 540 to 1700 Kilocycles (KC) (175 to 550 meters), Police and Aviation Band which extends from 1700 to 5500 Kilocycles (KC) (52 to 175 Meters) and the International Short Wave Band which extends from 5500 to 18,100 Kilocycles (KC) (16.5 to 55 meters). This latter range is the one which includes the four internationally assigned bands—the 19, 25, 31 and 49 meter bands.

MODELS 1002, 1003, Chassis 219
 Schematic, Socket, Trimmers
 Alignment

SPIEGEL INC.



- L₁ - ANT COIL ASSEMBLY NR.430.
- L₂ - OSC COIL ASSEMBLY NR.431.
- L₃ - 1st IF TRANSFORMER NR.302.
- L₄ - 2nd IF TRANSFORMER NR.303.
- V.C. - VOL. CONTROL NR.221.
- SPEAKER & OUTPUT TRANS. NR.719.
- RT - POWER TRANSFORMER NR.533.
- C - 2 GANG COND. NR.628.
- BAND SWITCH NR.124.
- AUTOMATIC TUNING UNIT NR.128.
- ELECTROLYTIC COND. -1F15-40- NR.1732.

DO NOT ATTEMPT TO OPERATE THIS RECEIVER ON DIRECT CURRENT (D.C.) OR ANY OTHER VOLTAGE OR CYCLE AS PERMANENT INJURY TO THE SET WILL RESULT.

AMT-101
 Designed by [Signature]
 Approved by L.W.C.

This receiver is designed to operate over two tuning ranges. The broadcast range which extends from 540 K.C. to 1730 and the foreign short wave band which extends from 5800 K.C. to 18000 K.C. The short wave range includes the five important short wave channels 19, 25, 31, 39 and 49 meter bands.

ALIGNMENT DATA

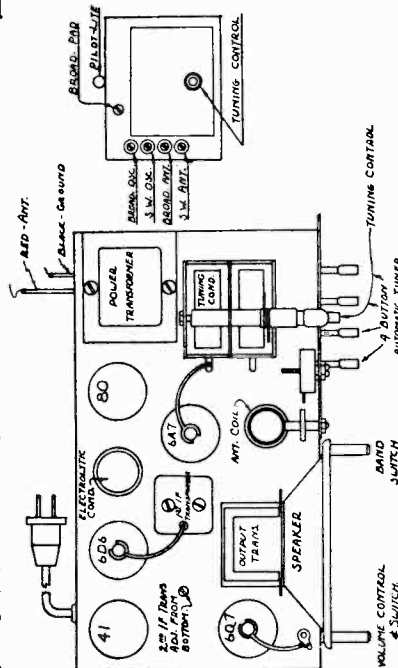
The alignment of this receiver requires the use of a test oscillator that will cover the following frequencies, 465, 600, 1400, 6000, and 15000 K.C. and an output meter which is to be connected across the output transformer on the speaker. All alignments should be made with the volume control set at maximum and the output of the test oscillator set as low as possible to prevent the automatic volume control from operating and thus giving incorrect readings during alignment.

INTERMEDIATE FREQUENCY: Set oscillator to 465 KC. Feed this to the grid of the pentagrid (6A7) converter tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

BROADCAST BAND: Set the band switch for broadcast reception. Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Re-set the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the broadcast padding condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

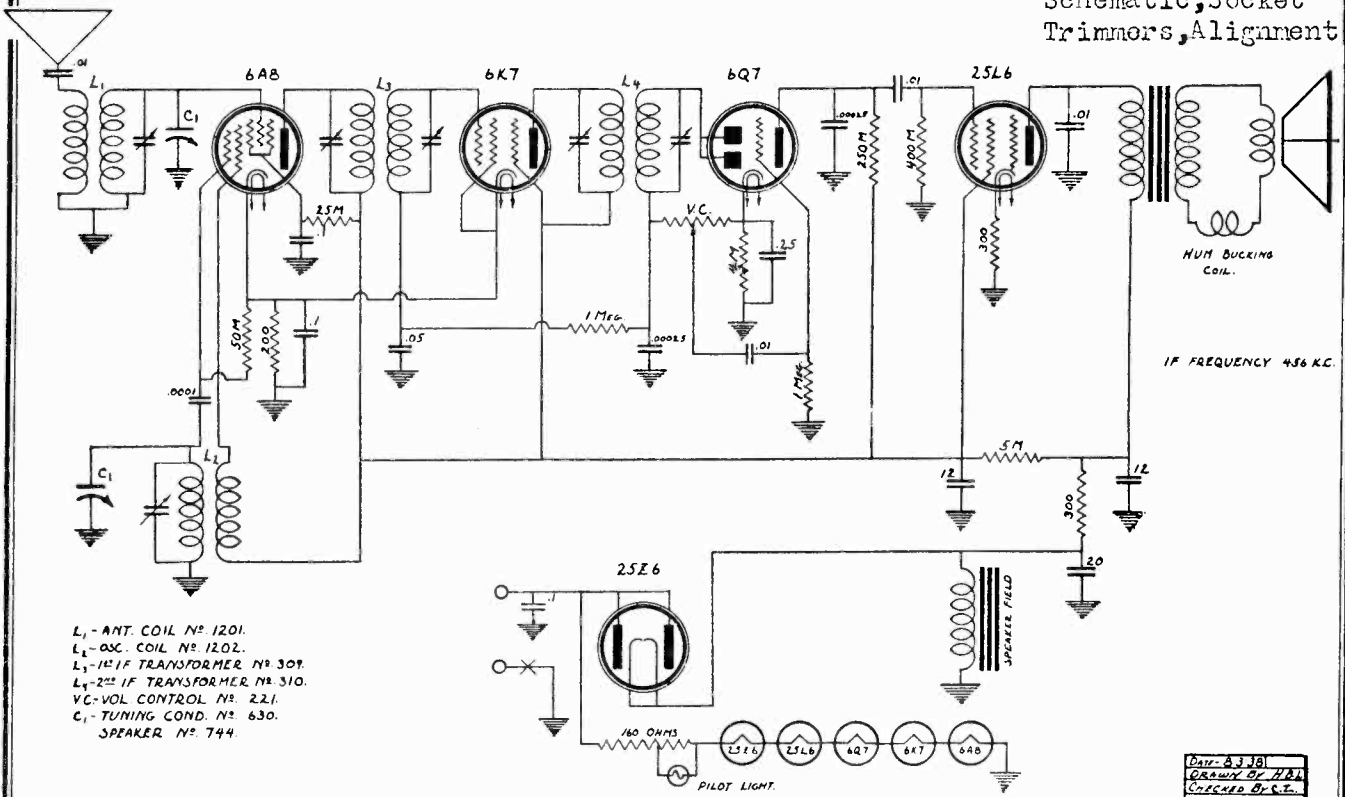
SHORT WAVE: Set band switch on short wave position. Connect the antenna of the radio receiver to the output of the test oscillator through a 400 ohm carbon resistor. Set oscillator and receiver dial at 15 megacycles. Adjust the short wave antenna and short wave oscillator trimming condensers for maximum output as indicated by readings on the output meter. No other adjustments are necessary for aligning this band.

It is advisable to check the sensitivity at 6000 KC to determine whether the circuits are properly aligned. Should the receiver lack sensitivity at this frequency check the .0035 mica condenser for short circuit.



SPIEGEL INC.

MODELS 1010, 1011
Chassis 216
Schematic, Socket
Trimmers, Alignment



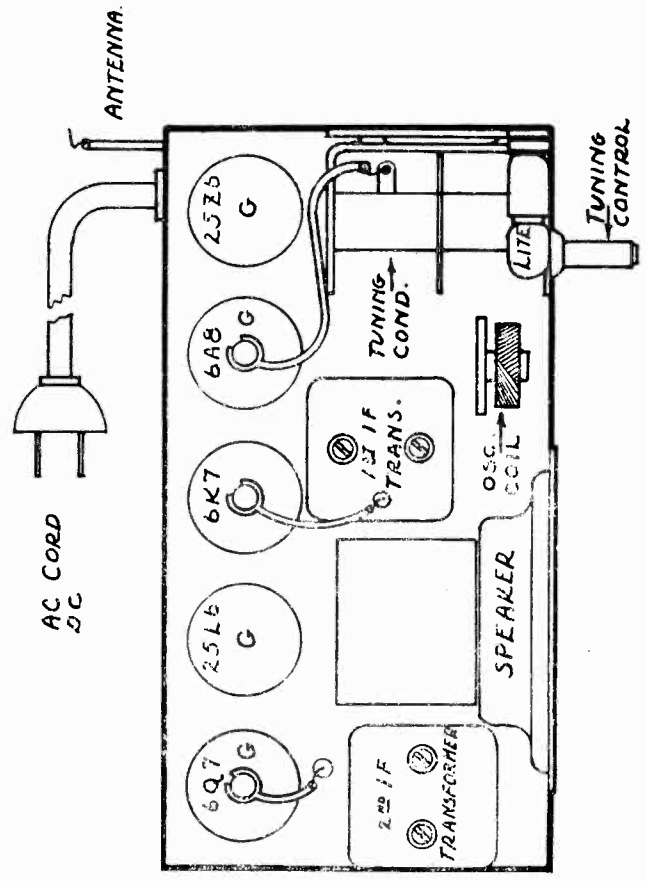
DATE: 6-3-38
DRAWN BY: H.B.L.
CHECKED BY: C.E.
APPROVED BY: [Signature]

INSTALLATION: For operation on 110-120 volts, 60 cycle A.C. or D.C.

ALIGNMENT: All alignments should be made with the volume control set at maximum and the output of the test oscillator set as low as possible to prevent the automatic volume control from operating and thus giving incorrect readings during alignment.

INTERMEDIATE FREQUENCY: Set oscillator to 456 KC. Feed this to the grid of the pentagrid (648) converter tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

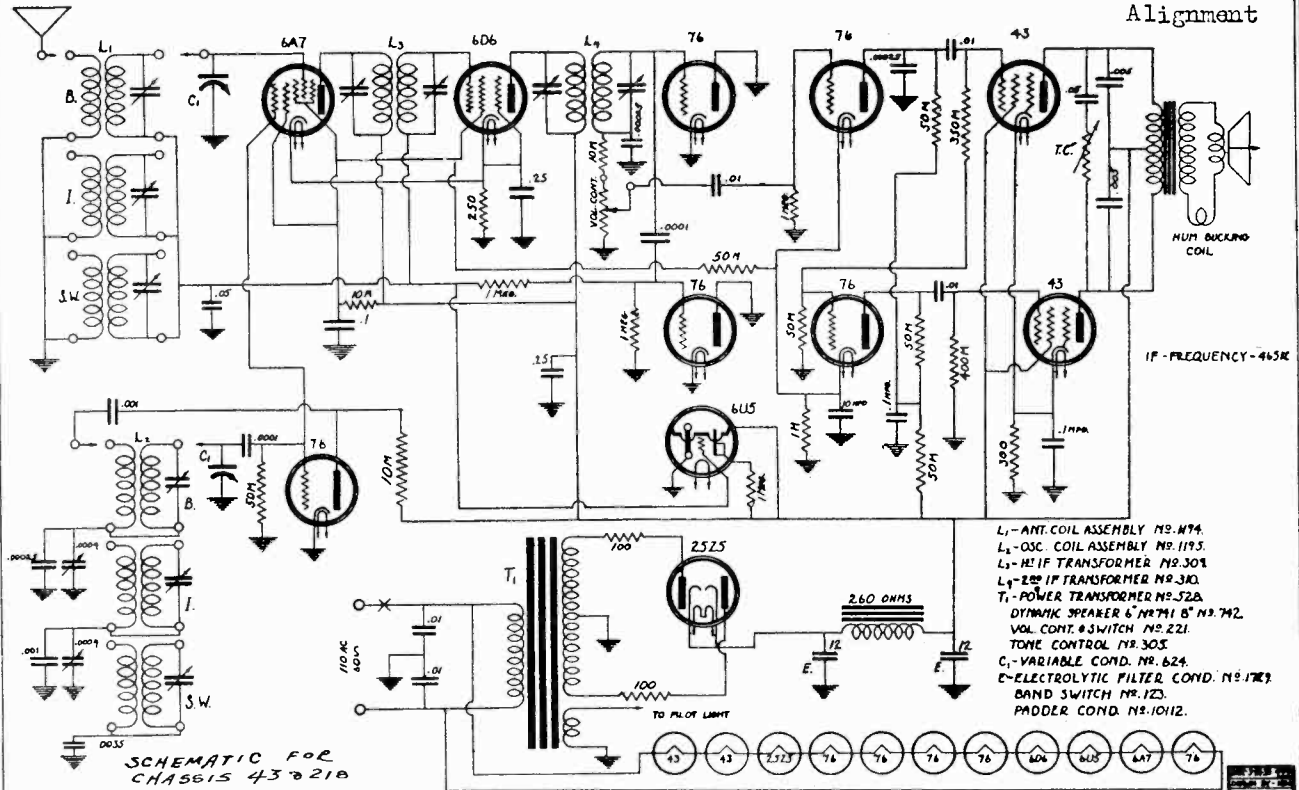
BROADCAST BAND: Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the antenna and oscillator trimmers for maximum signal (as indicated on the output meter). Re-set the dial pointer on the receiver and on the test oscillator to 600 KC and check for alignment.



MODELS 2066, 2067, 2068
Chassis 43
Schematic, Alignment

SPIEGEL INC.

MODELS 1052, 1053, Chassis 218
Schematic, Socket, Trimmers
Alignment
Chassis 220
Alignment



SWITCH POSITION

Left
Center
Right

BAND

Broadcast
Intermediate
Short Wave (foreign)

RANGE IN KILOCYCLES

540 — 1710 KC
1710 — 5800 KC
5800 — 17500 KC

FOR CHASSIS
43 SOCKET
LAYOUT
SEE INDEX.

ALIGNMENT: The alignment of this receiver (Chassis 43, 218, 220) should be made with the volume control set at maximum and the output of the test oscillator set as low as possible to prevent the automatic volume control from operating and thus giving incorrect readings during alignment.

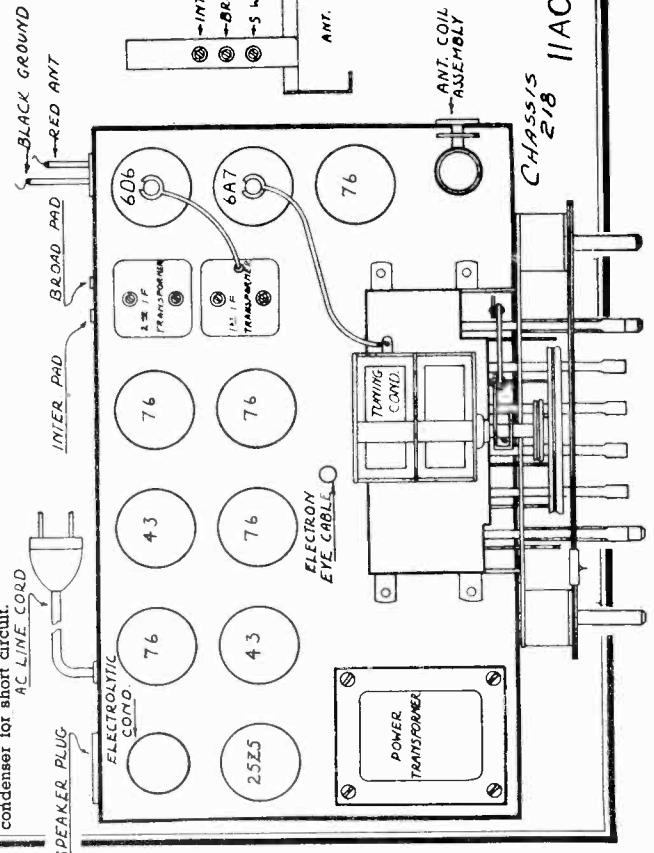
INTERMEDIATE FREQUENCY: Set oscillator to 465 KC. Feed this to the grid of the (6A7) tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

BROADCAST BAND: Set the band switch for broadcast reception. Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Re-set the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the broadcast padding condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

INTERMEDIATE BAND: For a dummy antenna use a .0002 mfd. mica condenser in series with a 400 ohm carbon resistor. Set band switch to the intermediate band position and feed a 5100 KC signal from the oscillator. Set dial pointer at 5100 KC. Adjust intermediate antenna and intermediate oscillator trimmers for maximum output. Re-set oscillator and set dial to approximately 1800 KC. Slowly increase or decrease the intermediate padding condenser while tuning back and forth across the signal with the station selector control until the maximum reading is obtained on the output meter. Re-check the 5100 KC adjustment.

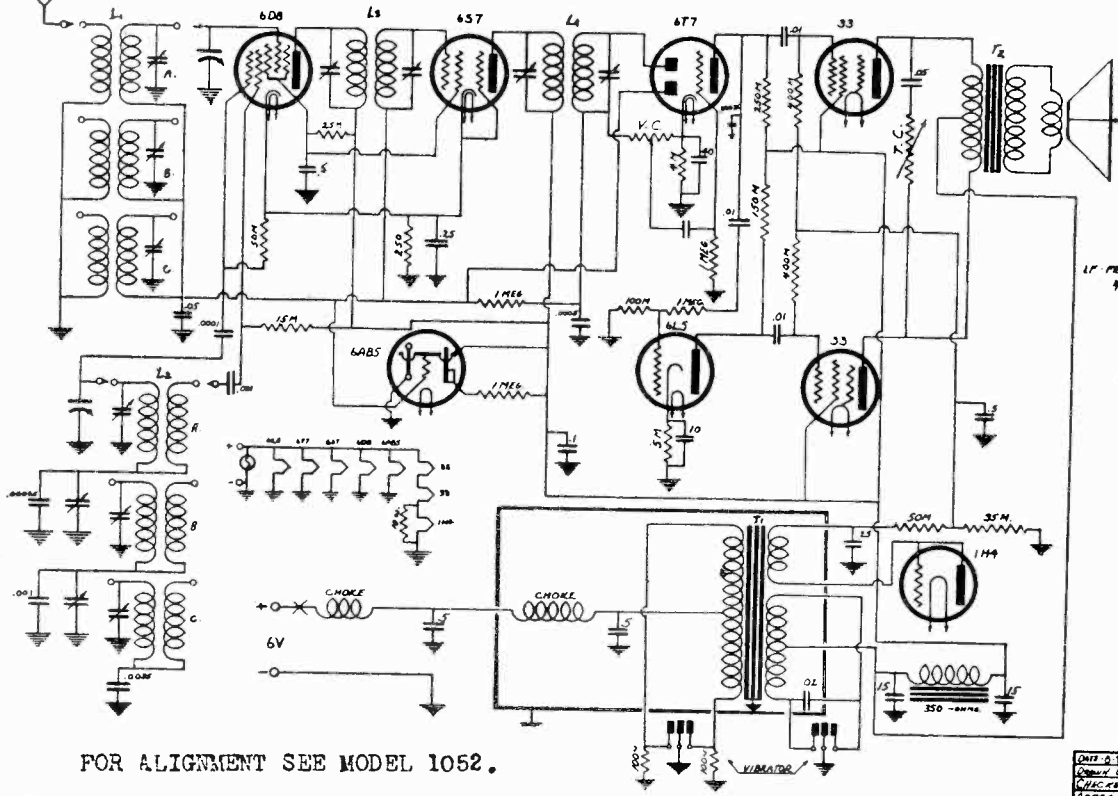
SHORT WAVE: Set band switch on short wave position. Connect the antenna of the radio receiver to the output of the test oscillator through a 400 ohm carbon resistor. Set oscillator and receiver dial at 15 megacycles. Adjust the short wave antenna and short wave oscillator trimming condensers for maximum output as indicated by readings on the output meter. No other adjustments are necessary for aligning this band.

It is advisable to check the sensitivity at 6000 KC to determine whether the circuits are properly aligned. Should the receiver lack sensitivity at this frequency check the .0035 mica condenser for short circuit.



MODELS 1104 to 1107 inc.
 1154 to 1157 inc. Ch. 220
 Schematic, Socket, Trimmers
 MODELS 2066, 2067, 2068 Chassis 43
 Socket, Trimmers

SPIEGEL INC.



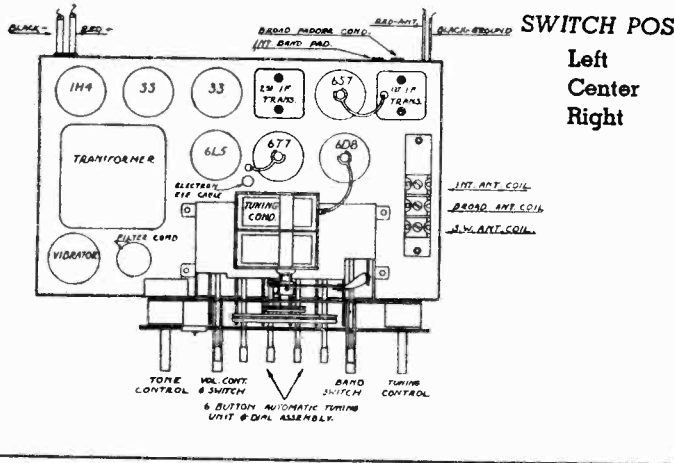
IF FREQUENCY
465 KC

MODELS

- 1104
- 1105
- 1106
- 1107
- 1154
- 1155
- 1156
- 1157

FOR ALIGNMENT SEE MODEL 1052.

UNIT # 1-30-43
 CHECKED BY
 APPROVED BY



SWITCH POSITION

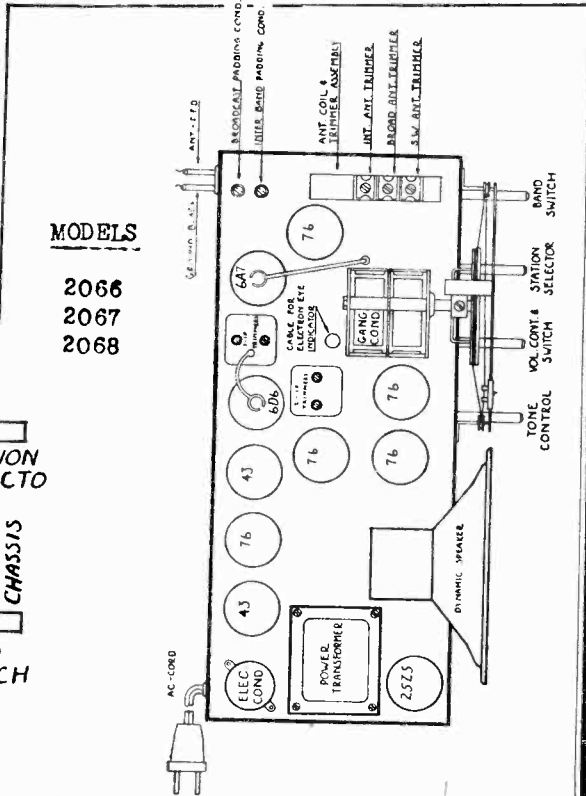
- Left
- Center
- Right

BAND

- Broadcast
- Intermediate
- Short Wave (foreign)

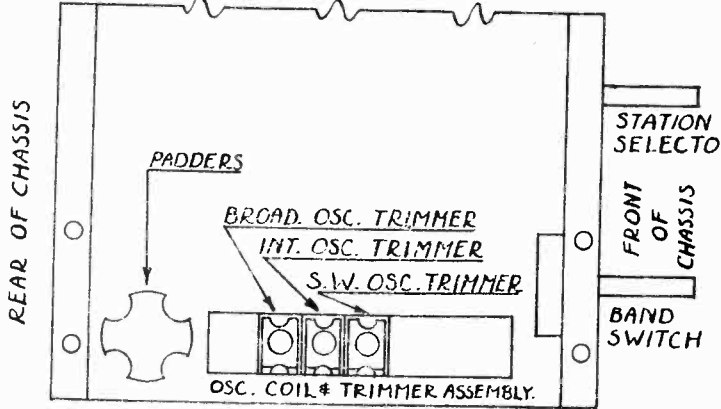
RANGE IN KILOCYCLES

- 540—1710 KC
- 1710—5800 KC
- 5800—17500 KC



MODELS

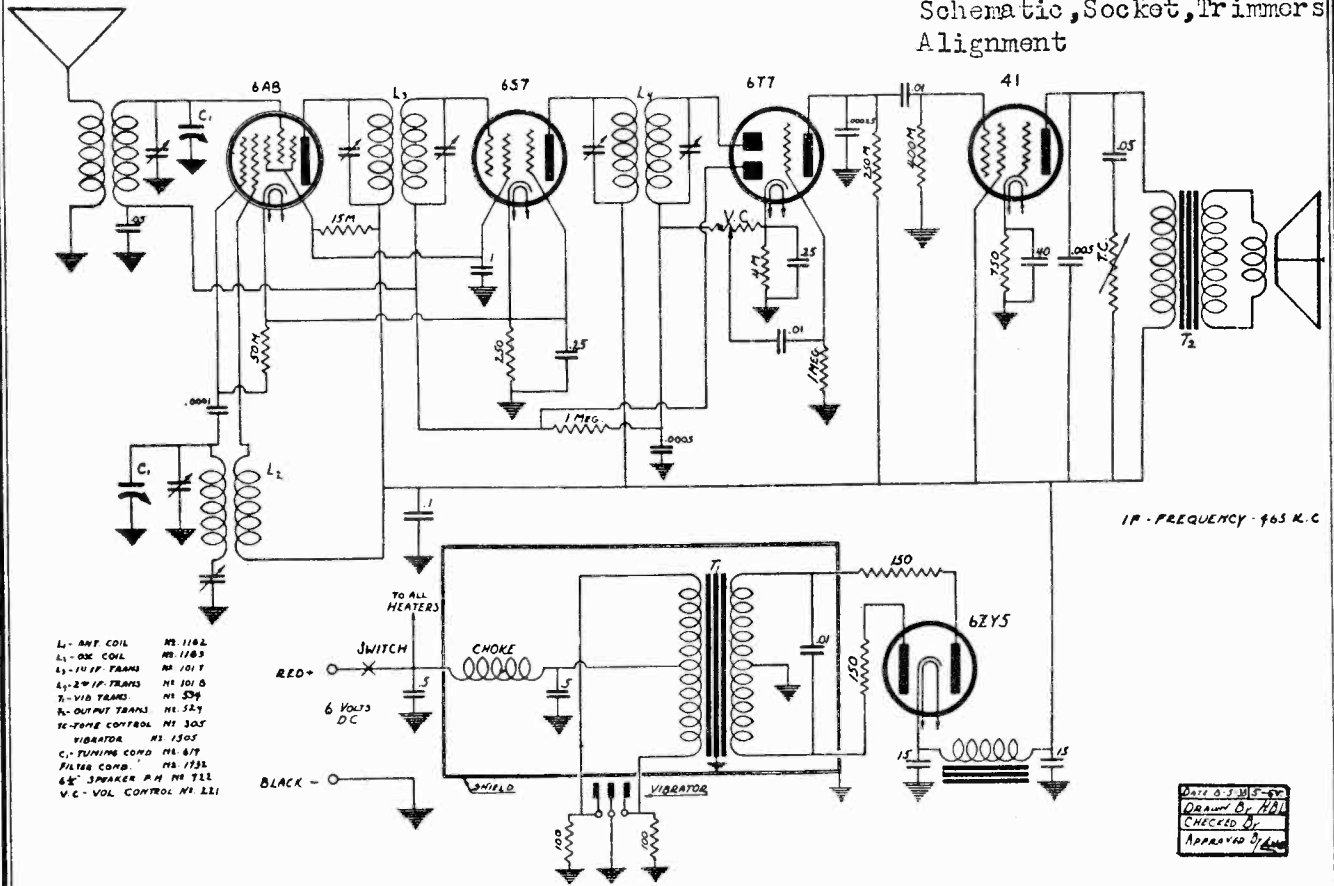
- 2066
- 2067
- 2068



BOTTOM VIEW OF CHASSIS:

SPIEGEL INC.

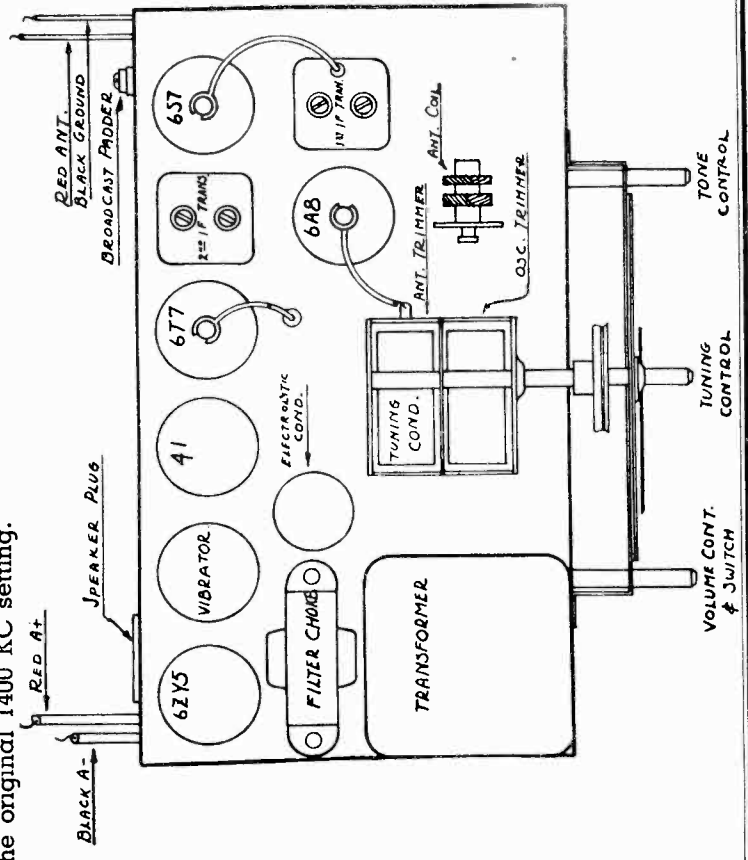
MODELS 1108 to 1111 inc.
Chassis 211
Schematic, Socket, Trimmers
Alignment



All alignments should be made with the volume control set at maximum and the output of the test oscillator set as low as possible to prevent the automatic volume control from operating and thus giving incorrect readings during alignment.

INTERMEDIATE FREQUENCY: Set oscillator to 465 KC. Feed this to the grid of the pentagrid (6A7) converter tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

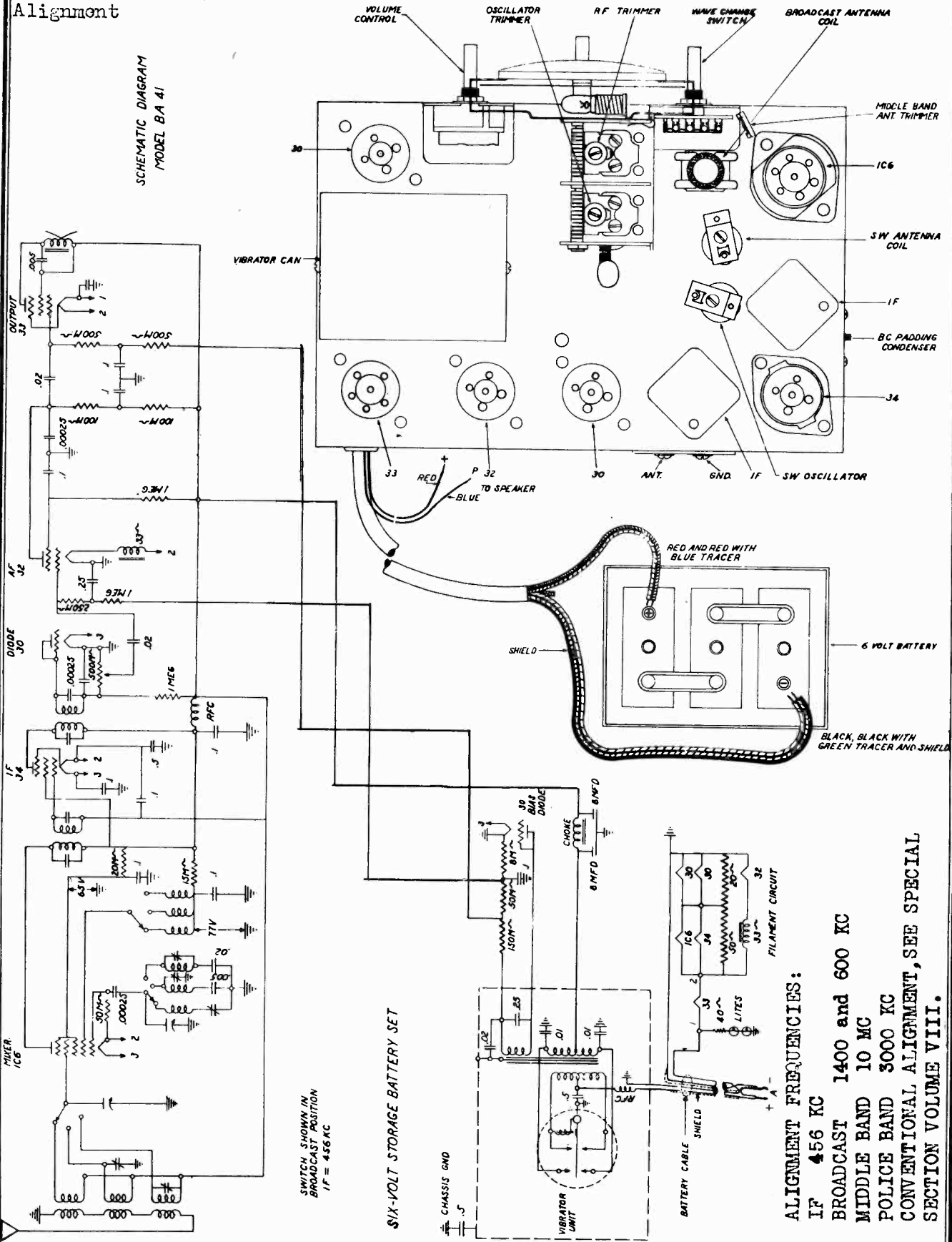
BROADCAST BAND: Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Reset the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the broadcast padding condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.



MODELS 1901, 1907, 1911, 1921
 1932, 1955, 1957, 1961, 1981
 Chassis X6, BA41
 Schematic, Socket, Trimmers
 Alignment

SPIEGEL INC.

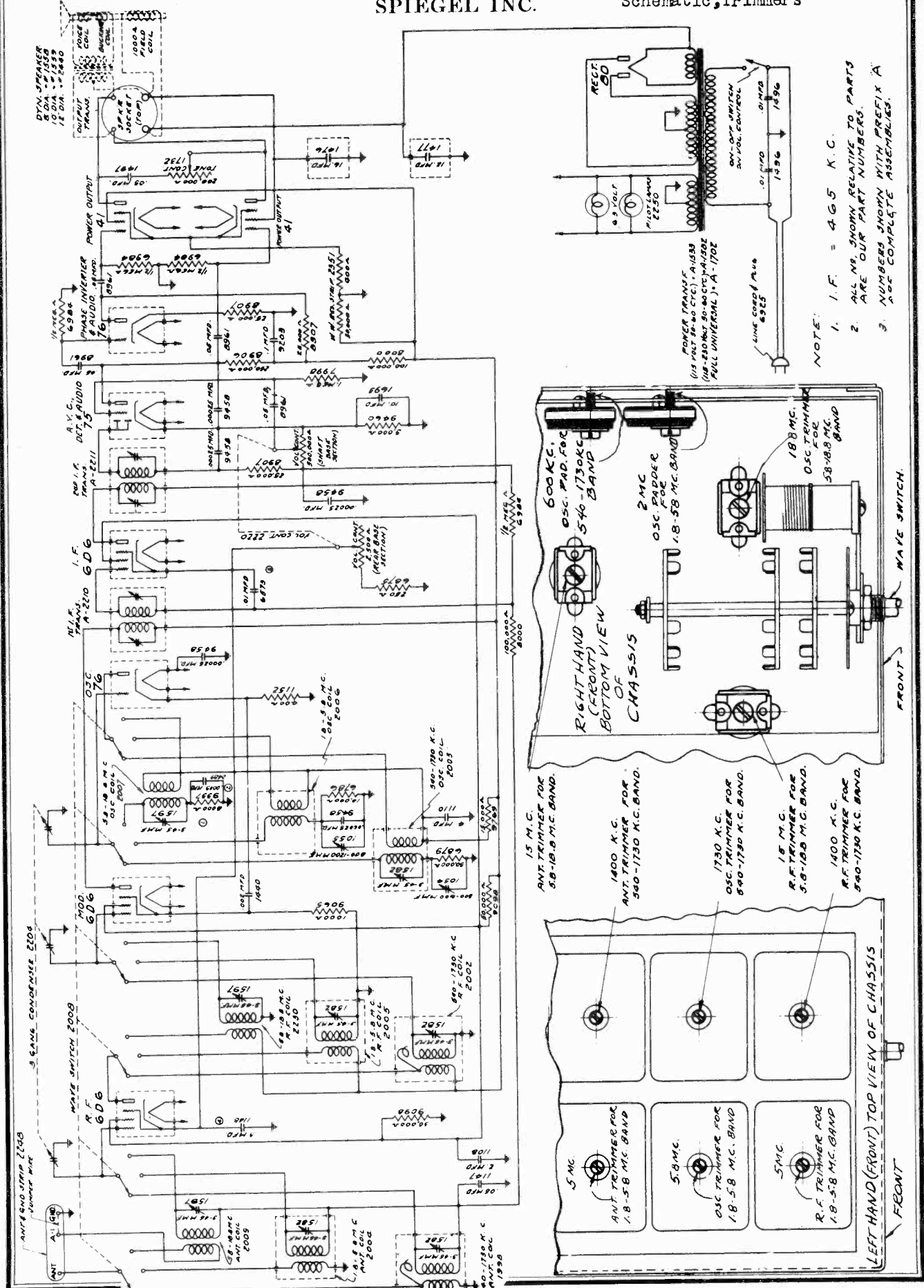
SCHEMATIC DIAGRAM
 MODEL BA 41



ALIGNMENT FREQUENCIES:
 IF 456 KC
 BROADCAST 1400 and 600 KC
 MIDDLE BAND 10 MC
 POLICE BAND 3000 KC
 CONVENTIONAL ALIGNMENT, SEE SPECIAL
 SECTION VOLUME VIII.

SPIEGEL INC.

MODELS 1903, 1960, Chassis 14A
Schematic, Trimmers



MODELS 1903, 1960, Chassis 14A

Alignment, Voltage

SPIEGEL INC.

TO ALIGN THE VARIABLE CONDENSER:

It is important when aligning the gang condenser, padding and trimmer condensers to follow the procedure carefully, otherwise the receiver will be insensitive and the dial calibration will be incorrect. The padding and trimmer condensers located underneath the chassis and inside of and accessible through the holes found in the top of the catacomb shield (mounted on top and in the left front corner of the receiver) will be referred to by their function as indicated on the circuit diagram.

1. Connect the high output side of the test oscillator through a 400 ohm resistor to the receiver antenna lead and the low side to the set ground.

2. Place the band selector switch for operation on the 5.8 to 18.8 megacycle band, tune the receiver dial, and set the test oscillator frequency to EXACTLY 18.8 MEGACYCLES.

Rotate gang condenser so that plates are completely out of mesh and then tune in the 18.8 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING THE 18.8 MEGACYCLE OSCILLATOR TRIMMER. When adjusting this trimmer two peaks, the fundamental and the image peak will be noticed. CARE MUST BE TAKEN THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 18.8 MEGACYCLES. Always back off the trimmer to minimum capacity, then screw down the trimmer (add capacity) until the first peak which is the fundamental and the proper one to use is tuned in. If the trimmer is screwed down beyond the point where the first peak is received, the incorrect image peak will be tuned in. After completing adjustment of the oscillation trimmer at 18 megacycles always check to see if the proper peak has been used. To do this leave the test oscillator frequency at 18.8 megacycles, increase the output of the test oscillator and tune the receiver dial to approximately 17.8 megacycles. Then vary the receiver dial slightly to the right and left of 17.8 megacycles, and if the fundamental peak was used in aligning at 18.8 megacycles the test oscillator signal will be heard at approximately 17.8 megacycles on the receiver dial. If it is not possible to receive the signal, then the fundamental peak was not used and the 18.8 megacycle oscillator trimmer must be properly readjusted.

3. With band selector switch set for operation on 5.8 to 18.8 megacycle band tune the receiver dial and set test oscillator frequency to EXACTLY 15 MEGACYCLES. Adjust 15 megacycle antenna and R.F. trimmers to maximum 15 megacycle signal sensitivity.

4. Leave band selector switch for operation on the 5.8 to 18.8 megacycle band, tune the receiver dial and set the test oscillator frequency to approximately 6 megacycles. While rocking gang condenser slightly to right and left adjust 6 megacycle oscillator padder for maximum sensitivity.

5. Place band selector switch for operation on 1.8 to 5.8 megacycle band, tune the receiver dial, and set test oscillator frequency to EXACTLY 5.8 MEGACYCLES.

Rotate gang condenser so that plates are completely out of mesh and then BRING IN 5.8 MEGACYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING 5.8 megacycle oscillator trimmer.

6. With the band selector switch set for operating on 1.8 to 5.8 Megacycle band tune receiver dial and set test oscillator frequency to EXACTLY 5 MEGACYCLES. Then adjust 5 megacycle antenna and R.F. trimmers for maximum 5 megacycle signal sensitivity.

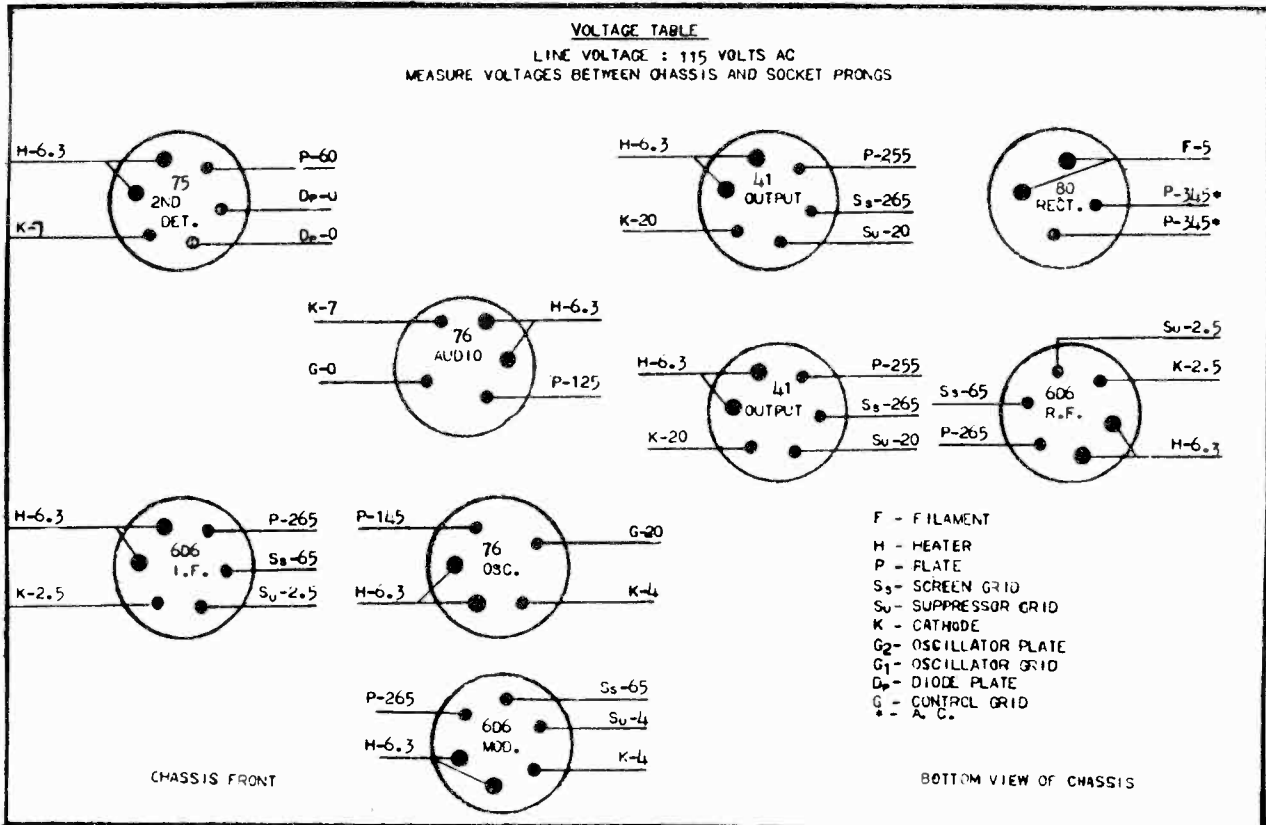
7. Leave band selector switch for operation on 1.8 to 5.8 megacycle band, tune receiver dial and set test oscillator frequency to approximately 2 megacycles. While rocking gang condenser slightly to right and left adjust 2 megacycle oscillator padder for maximum sensitivity.

8. Replace the 400 ohm resistor in series with test oscillator lead with a 200 Mmfd. condenser, place the band selector switch for operation on the 540 to 1730 kilocycle band and set test oscillator frequency to EXACTLY 1730 KILOCYCLES.

Rotate gang condenser so that plates are completely out of mesh and BRING IN THE 1730 KILOCYCLE SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING 1730 KILOCYCLE OSCILLATOR TRIMMER.

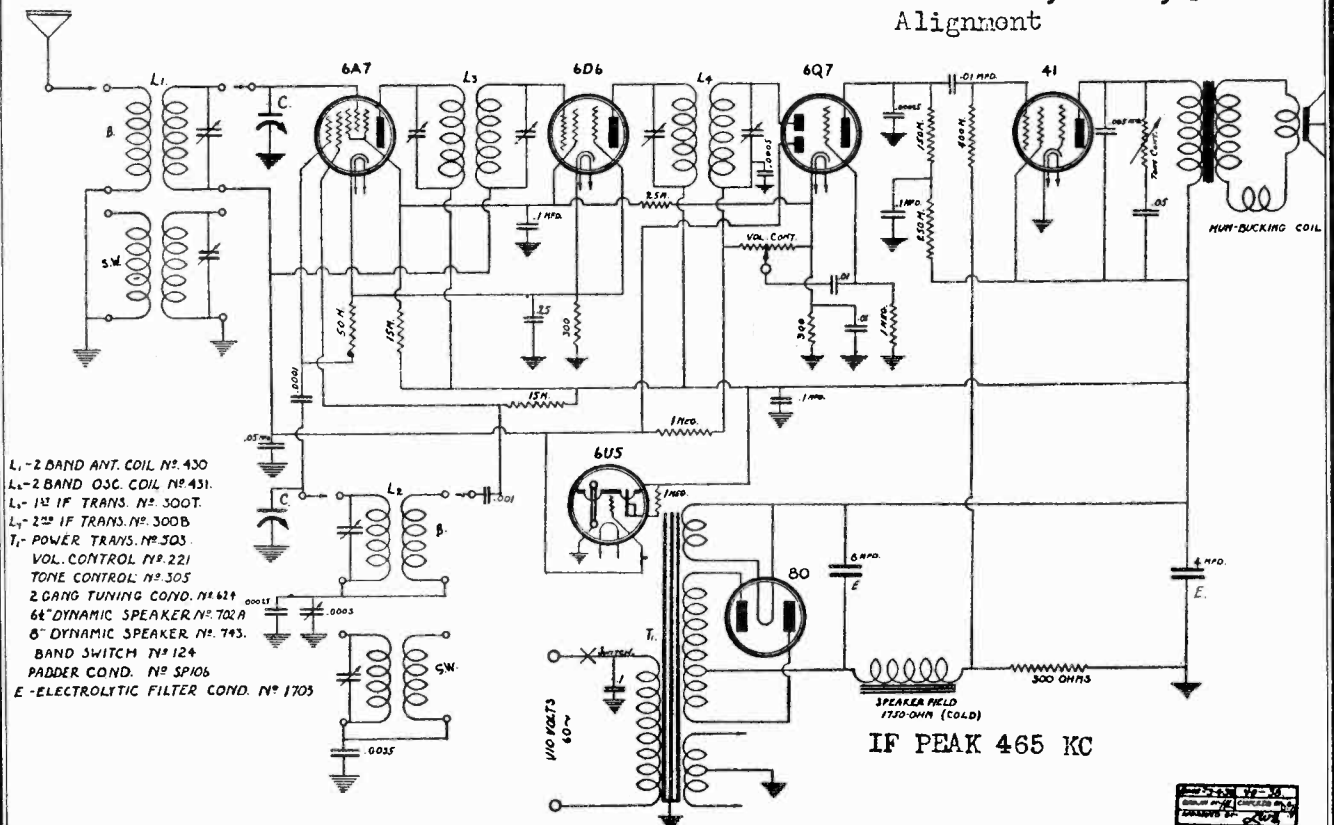
9. With band selector switch placed for operation on the 540 to 1730 kilocycle band set test oscillator frequency and receiver dial to EXACTLY 1400 KILOCYCLES. Adjust 1400 kilocycles R. F. and antenna trimmers for maximum 1400 kilocycle signal sensitivity.

10. Leave band selector switch for operation on 540 to 1720 kilocycle band, tune receiver dial and set test oscillator frequency to approximately 600 kilocycles. While rocking gang condenser slightly to right and left adjust 600 kilocycle oscillator padder for maximum sensitivity.



SPIEGEL INC.

MODELS 2000, 2001, 2050, 2051
 2008, 2009, 2018, 2019
 Chassis 40
 Schematic, Socket, Trimmers
 Alignment



- L₁ - 2 BAND ANT. COIL N° 430
- L₂ - 2 BAND OSC. COIL N° 431.
- L₃ - 1st IF TRANS. N° 300T.
- L₄ - 2nd IF TRANS. N° 300B
- T₁ - POWER TRANS. N° 303
- VOL. CONTROL N° 221
- TOPE CONTROL N° 305
- 2 GANG TUNING COND. N° 624
- 6A7 DYNAMIC SPEAKER N° 702A
- 8" DYNAMIC SPEAKER N° 743.
- BAND SWITCH N° 124
- PADDER COND. N° SP106
- E - ELECTROLYTIC FILTER COND. N° 1703

ALIGNMENT DATA

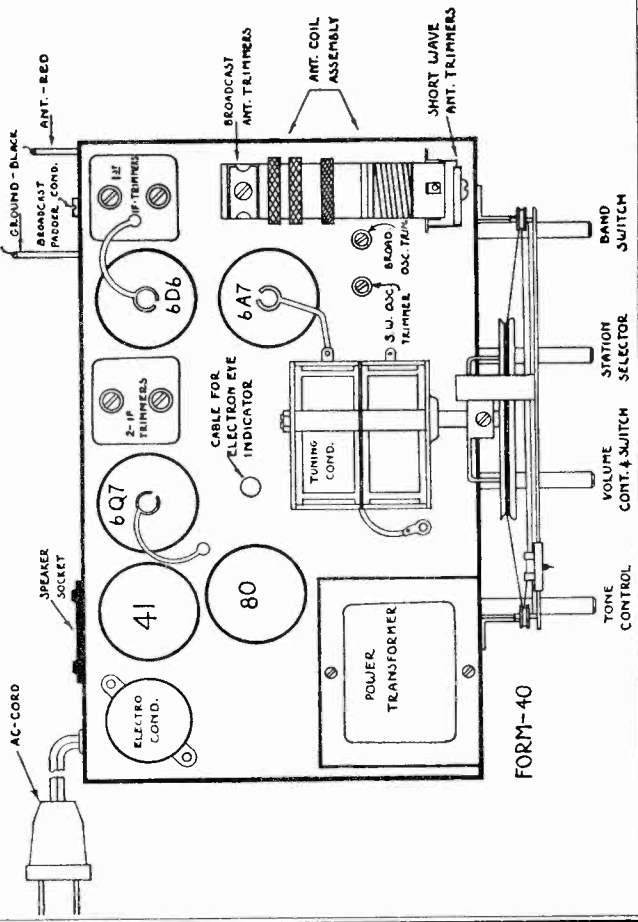
The alignment of this receiver requires the use of a test oscillator that will cover the following frequencies, 465, 600, 1400, 6000, and 15000 K.C. and an output meter which is to be connected across the output transformer on the speaker. All alignments should be made with the volume control set at maximum and the output of the test oscillator set as low as possible to prevent the automatic volume control from operating and thus giving incorrect readings during alignment.

INTERMEDIATE FREQUENCY: Set oscillator to 465 KC. Feed this to the grid of the pentagrid (6A7) converter tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

BROADCAST BAND: Set the band switch for broadcast reception. Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Re-set the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the broadcast padding condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

SHORT WAVE: Set band switch on short wave position. Connect the antenna of the radio receiver to the output of the test oscillator through a 400 ohm carbon resistor. Set oscillator and receiver dial at 15 megacycles. Adjust the short wave antenna and short wave oscillator trimming condensers for maximum output as indicated by readings on the output meter. No other adjustments are necessary for aligning this band.

It is advisable to check the sensitivity at 6000 KC to determine whether the circuits are properly aligned. Should the receiver lack sensitivity at this frequency check the .0035 mica condenser for short circuit.



MODELS 2000, 2001, 2050, 2051
 2008, 2009, 2018, 2019
 MODELS 2064, 2065, 4014, 4064
 4066 (1937)

SPIEGEL INC.

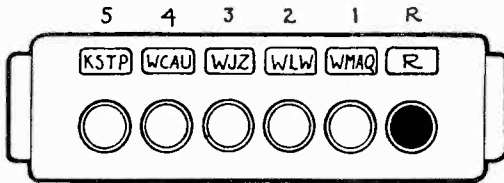
MODELS 2070, 2071, 4076 (1937)
 Tuner Data

MODELS 2000, 2001, 2050, 2051, 2008, 2009,
 2018, 2019 Chassis 40

Push Button Station Selector

ADJUSTMENT

The five stations wanted should be decided upon as this will determine which button must be used. Button number 1 as indicated in figure one is used for stations whose transmitting frequencies are between 920 K.C. and 1500 K.C. (as shown on the dial). Buttons 2 and 3 for stations whose frequencies are between 750 and 1400 K.C. Button number 4 for stations whose frequency is from 590 to 1150 and button 5 for those stations whose frequencies are between 540 and 1000 K.C.



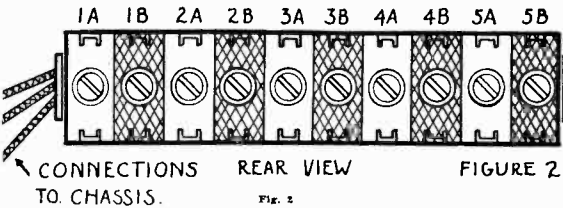
FRONT VIEW FIGURE 1

If a desired station falls in the range of button 1, tune the radio to this station with the colored button on the push button control panel pressed in (this button releases the automatic tuner and provides for manual tuning of the receiver).

Press in button 1 and with a screw driver turn adjusting screw 1B as shown in figure 2 until this same station is heard, then turn screw 1A until the station is heard with maximum volume as indicated by the closing of the electric eye on the front panel. Carefully re-adjust 1A and 1B again for maximum volume.

DO NOT FORCE the screws as the threads may be sheared and rendered useless. This may happen if you do not observe what range the station falls into, and thus use the wrong push button.

Proceed with button 2 in a similar way, first pressing in the manual tuning button and tuning to the desired station then pressing button 2 and adjusting screws 2B and 2A to the same program. Buttons 3, 4, and 5 are adjusted in a similar manner using screws 3B and 3A for the third button; 4B and 4A for the fourth button, etc.



CONNECTIONS REAR VIEW FIGURE 2 TO CHASSIS.

NOTE:—In some models the odd color release button is located to the extreme left instead of to the right as indicated in figure one. Thus if the release button is to the extreme left the adjustment screws in figure 2 are reversed. Reading from left to right they become 5B-5A-4B-4A, etc.

CAUTION

It is important that the adjustments be carefully made otherwise the reception of the radio station will be distorted and lacking in volume. In some instances it is advisable to re-adjust all the screws a few days after the initial setting to compensate for any drift due to room temperature, humidity, etc.

OPERATION

For manual tuning, press the release button and proceed to tune stations in the usual manner with the station selector knob.

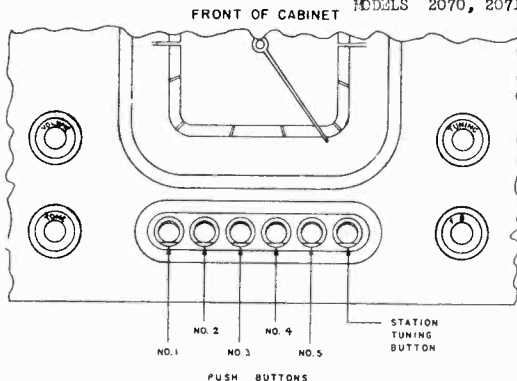
Do not attempt to press more than one button at a time as this will not tune any additional stations. Although this will not in any way injure the unit, it may result in the radio receiver squealing and having excessive interference.

To operate the automatic station tuning control it is only necessary to press in any one of the five station tuning buttons. This automatically disengages the manual tuning control from the electrical circuit. Thus it is possible to leave the dial tuned to any station and yet use the automatic push button station selector.

THE ODD COLORED RELEASE BUTTON SHOULD ALWAYS BE IN WHENEVER THE REGULAR TUNING KNOB IS USED TO SELECT THE STATIONS.

Station Call Letters may be inserted in the spaces provided and can be changed at will.

MODELS 2064, 2065, 4014, 4064, 4066 (1937) Chassis 745
 MODELS 2070, 2071, 4076 (1937) Chassis 1105



INSTAMATIC TUNING

The purpose of Instamatic tuning is to give the user instant, automatic tuning of any one of a selection of favorite broadcast stations. The control buttons are conveniently located just below the tuning dial. Pushing in any button will release any other button which happens to be already in. After the Instamatic tuning feature has been properly adjusted, this will instantly and automatically tune in the station selected by this button.

Before attempting to adjust or use Instamatic tuning, the "Installation" and "Operation" instructions must be carefully followed. When the receiver is operating satisfactorily using the tuning dial with the "Dial Tuning" button pressed in, the Instamatic feature may be easily adjusted by carefully following these instructions.

Located on the back of the chassis is a row of five pair of small bakelite adjustment knobs. Each pair of these knobs controls the tuning of the station for the Instamatic button which is in the same relative position.

With the receiver operating with the "Dial Tuning" button in and the wave switch on broadcast position, turn the tuning knob to the left until the 540 KC end of the band has been reached. Then turn the tuning knob to the right until a station, for which it is desired to have Instamatic tuning, is heard. Press in the Button No. 1. This is the button at the left hand end of the row. Reach around to the back of the receiver and turn upper knob of the Pair No. 1 until the same program is heard. Unless the wrong knob is being turned, several different stations will be heard during this procedure. If necessary to check that the same program is now tuned in, the "Dial Tuning" button may again be pressed. In this way it can be determined that the same station is tuned in with the Instamatic button as when the "Dial Tuning" button is in. If it is not the same station the adjustment knob should be turned again and these operations repeated until the same program is heard when either of these two buttons is pressed.

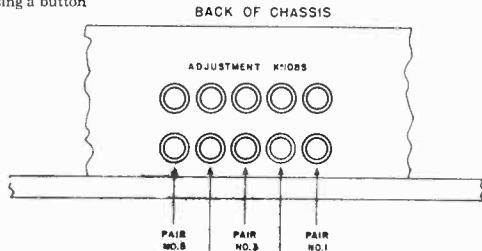
The bottom adjustment knob of the first pair is now turned until the station is heard the best. Both top and bottom knobs may then be adjusted to exact tuning by watching the magic eye and adjusting until the two edges of the green section are as close together as it is possible to get them.

The first Instamatic button is now properly adjusted for the station which was tuned in on the dial and the station's call letters may be pushed out of the station list, moistened on the back, and pressed into the hollow end of the button.

With the "Dial Tuning" button pressed in, the tuning knob is again turned to the right until the next station for which Instamatic tuning is wanted, is tuned in. The adjustment process for this station is the same as before, except that Button No. 2 and Pair No. 2 adjustment knobs are used. Proceeding in this way all five of the buttons may be properly adjusted for the stations desired.

It must be remembered that the "Dial Tuning" button must be pressed in whenever it is desired to tune in stations with the tuning knob, regardless of which wave band is in use. It must also be remembered that the wave switch must be in the broadcast position when Instamatic tuning is being used.

If desired the tuning dial may be left set to a station which is not set up on one of the buttons. The "Dial Tuning" button will then tune in this station when it is pressed. This will give an extra Instamatic tuned station, making a total of six different stations which can be instantly tuned in by simply pressing a button.



The approximate frequency coverage of each of the "Instamatic" control buttons is as follows:

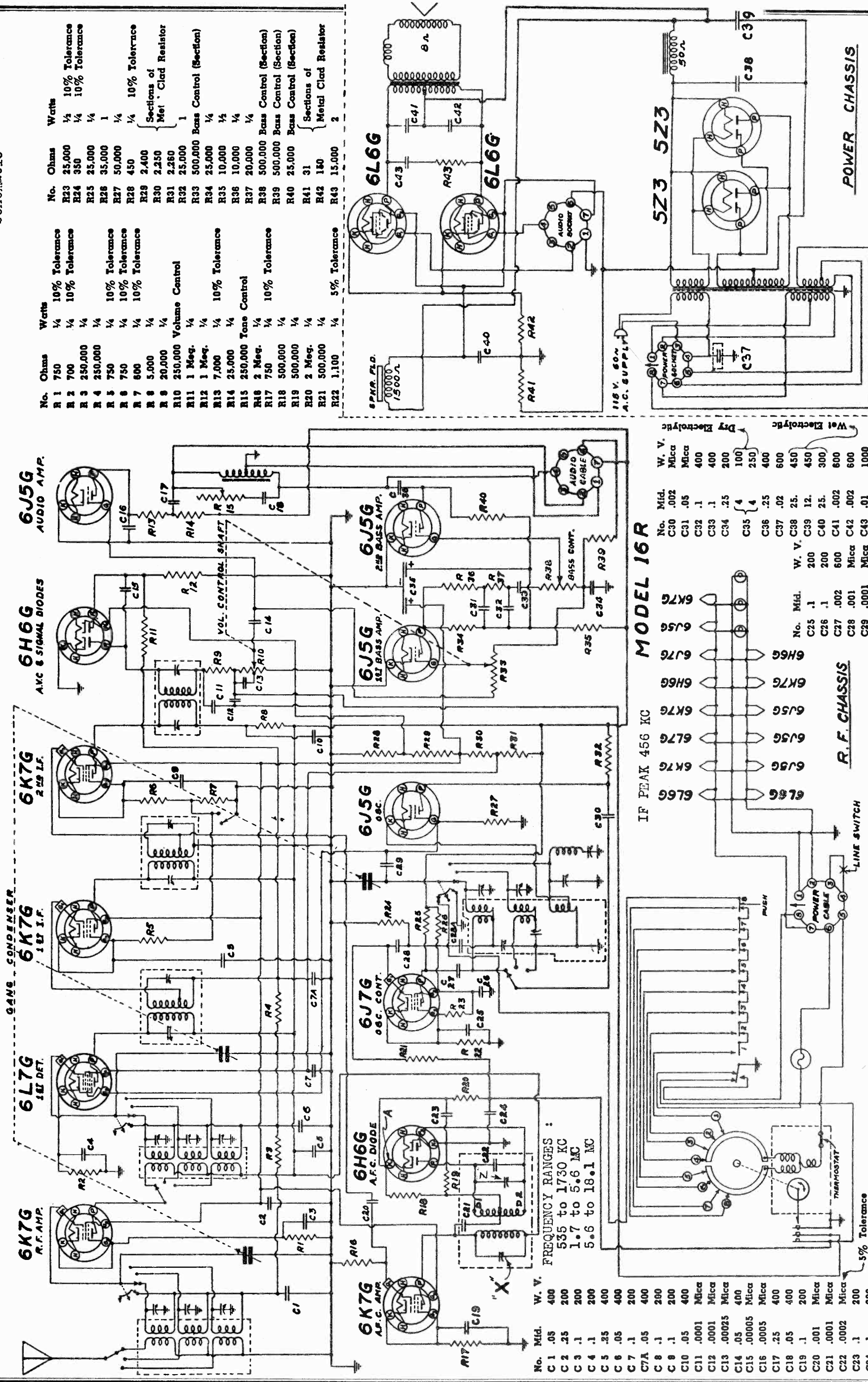
- 1—Stations between 540 and 1000 K.C.
- 2—Stations between 540 and 1000 K.C.
- 3—Stations between 750 and 1200 KC
- 4—Stations between 750 and 1200 KC
- 5—Stations between 1000 and 1500 KC

MODELS 2060,2061,4056,4074

Chassis 16R

Schematic

SPIEGEL INC.



No.	Ohms	Watts	Tolerance
R 1	750	1/4	10%
R 2	700	1/4	10%
R 3	250,000	1/4	10%
R 4	250,000	1/4	10%
R 5	250,000	1/4	10%
R 6	750	1/4	10%
R 7	600	1/4	10%
R 8	5,000	1/4	10%
R 9	20,000	1/4	10%
R 10	250,000	1/4	10%
R 11	1 Meg.	1/4	10%
R 12	1 Meg.	1/4	10%
R 13	7,000	1/4	10%
R 14	25,000	1/4	10%
R 15	250,000	1/4	10%
R 16	2 Meg.	1/4	10%
R 17	750	1/4	10%
R 18	500,000	1/4	10%
R 19	500,000	1/4	10%
R 20	2 Meg.	1/4	10%
R 21	500,000	1/4	10%
R 22	1,100	1/4	5%
R 23	25,000	1/4	10%
R 24	350	1/4	10%
R 25	25,000	1/4	10%
R 26	35,000	1	10%
R 27	50,000	1/4	10%
R 28	450	1/4	10%
R 29	2,400	1/4	10%
R 30	2,250	1/4	10%
R 31	2,250	1/4	10%
R 32	25,000	1	10%
R 33	500,000	1/4	10%
R 34	25,000	1/4	10%
R 35	10,000	1/4	10%
R 36	10,000	1/4	10%
R 37	20,000	1/4	10%
R 38	500,000	1/4	10%
R 39	500,000	1/4	10%
R 40	25,000	1/4	10%
R 41	31	1/4	10%
R 42	180	1/4	10%
R 43	15,000	2	5%

No.	Mid.	W. V.	W. V.	W. V.
C 30	.002			
C 31	.05			
C 32	.1			
C 33	.1			
C 34	.25			
C 35	.4			
C 36	.25			
C 37	.02			
C 38	.25			
C 39	.12			
C 40	.25			
C 41	.002			
C 42	.002			
C 43	.01			

No.	Mid.	W. V.	W. V.
C 25	.1		
C 26	.1		
C 27	.002		
C 28	.001		
C 29	.0001		

No.	Mid.	W. V.	W. V.
C 30	.002		
C 31	.05		
C 32	.1		
C 33	.1		
C 34	.25		
C 35	.4		
C 36	.25		
C 37	.02		
C 38	.25		
C 39	.12		
C 40	.25		
C 41	.002		
C 42	.002		
C 43	.01		

No.	Mid.	W. V.	W. V.
C 1	.05		
C 2	.25		
C 3	.1		
C 4	.1		
C 5	.25		
C 6	.05		
C 7	.1		
C 7A	.05		
C 8	.1		
C 9	.1		
C 10	.05		
C 11	.0001		
C 12	.0001		
C 13	.00025		
C 14	.05		
C 15	.00005		
C 16	.0005		
C 17	.25		
C 18	.05		
C 19	.1		
C 20	.001		
C 21	.0001		
C 22	.0002		
C 23	.1		
C 24	.1		

No.	Mid.	W. V.	W. V.
C 1	.05		
C 2	.25		
C 3	.1		
C 4	.1		
C 5	.25		
C 6	.05		
C 7	.1		
C 7A	.05		
C 8	.1		
C 9	.1		
C 10	.05		
C 11	.0001		
C 12	.0001		
C 13	.00025		
C 14	.05		
C 15	.00005		
C 16	.0005		
C 17	.25		
C 18	.05		
C 19	.1		
C 20	.001		
C 21	.0001		
C 22	.0002		
C 23	.1		
C 24	.1		

No.	Mid.	W. V.	W. V.
C 1	.05		
C 2	.25		
C 3	.1		
C 4	.1		
C 5	.25		
C 6	.05		
C 7	.1		
C 7A	.05		
C 8	.1		
C 9	.1		
C 10	.05		
C 11	.0001		
C 12	.0001		
C 13	.00025		
C 14	.05		
C 15	.00005		
C 16	.0005		
C 17	.25		
C 18	.05		
C 19	.1		
C 20	.001		
C 21	.0001		
C 22	.0002		
C 23	.1		
C 24	.1		

INSTRUCTIONS FOR ADJUSTMENT AND OPERATION OF THE ELECTRIC TUNER

It is very important to read the following instructions carefully before attempting to adjust the electric tuner. The electric tuner is made up of three integral units:

PUSH BUTTON SWITCH The push button switch consists of one (1) white button (extreme left), and eight (8) brown buttons whose numerical sequence is reckoned from left to right. The white button is provided for converting the set from automatic electric push button tuning to manual knob tuning. The brown buttons are provided for automatic electric tuning.

SELECTOR MECHANISM The selector mechanism is made up of the selector plate, eight (8) thumb screws, and the adjustment light bulb.

ELECTRIC MOTOR The power for this tuner is provided by a small, efficient electric motor, of the brushless variety. It is fitted with an automatic clutch and a silent gear train. The bearings and the oil retainer hold sufficient oil to lubricate the motor for a lifetime.

The first step to take in adjusting the electric push button device incorporated into this receiver is to choose eight (8) of the most powerful local stations, stations which are free from excess fading. Turn on the receiver (broadcast band) and press in the white button; tune in the station of the lowest frequency, using the station selector knob. Now hold the white button in and press in button number one (1), next to the white button. (See Figure 1). Both buttons are now locked into place; a small pilot lamp located at the rear of the chassis will light up unless the thumb screw at the rear accidentally happens to be correctly set. Loosen thumb screw number one (See Figure 2 for order of thumb screws) enough to allow it to slide freely back and forth until the light goes out. Now tighten the thumb screw; the adjustment for the first station is now complete. Out of the station call letter sheet supplied remove the proper station call block and insert into the window directly above button number one (1). Now release button number one (1) by pressing the white button in as far as it will go.

With the white button still in, tune in the station of the next highest frequency and holding the white button, press in button number two (2). Both buttons are now locked into place. Loosen thumb screw number two (see Figure 2) and slide back and forth until a point is reached at which the pilot lamp in the rear goes out; tighten the thumb screw. Insert the proper station call into the window of button number two (2).

Follow this same procedure for the remaining stations, always choosing the station with the next high-

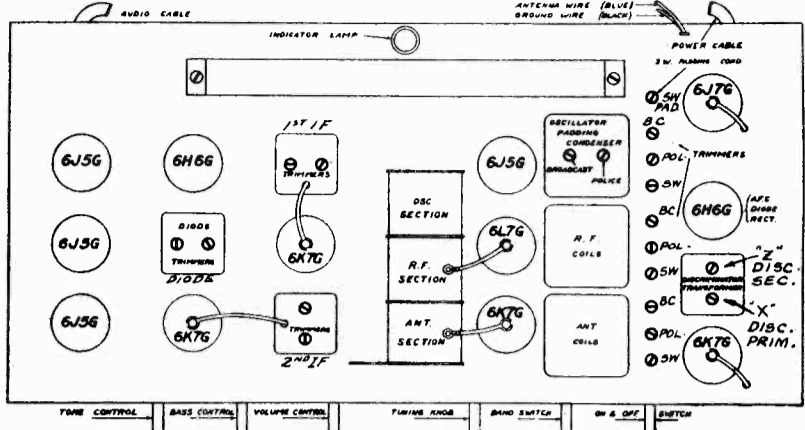
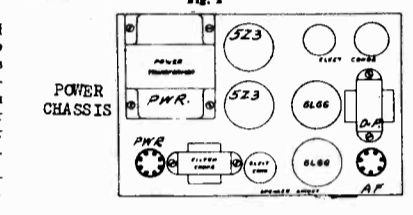
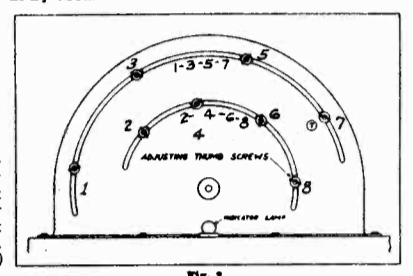
est frequency. After all eight (8) stations have been adjusted, check each adjustment by tuning in each station. NOTE: In the window above the white button insert the word "OFF" found in the call letter sheet.



HOW TO TUNE IN STATIONS USING THE ELECTRIC PUSH BUTTON TUNER

In order to operate the receiver satisfactorily—using the electric push button tuner, the white button must be in released position, that is, all the way out. To tune in a station, merely press the selector button which designates the station desired. Note: Should the station fail to come in clearly, check the adjustment by following the adjustment procedure described in the paragraph above. If by chance all of the buttons are pressed in, they may be released by pressing any one button all the way in.

To change from electric tuning to manual selecting, simply press in the white button. When the white button is in, the set may be tuned as a conventional receiver. Note: If it is desired to tune Short Wave or Police while the set is being operated with push buttons, it is not necessary to change over from push button tuning to manual tuning. Simply turn the band switch and proceed to tune with the selector knob. When the band switch is returned to broadcast the station last selected by button will automatically tune in by itself.

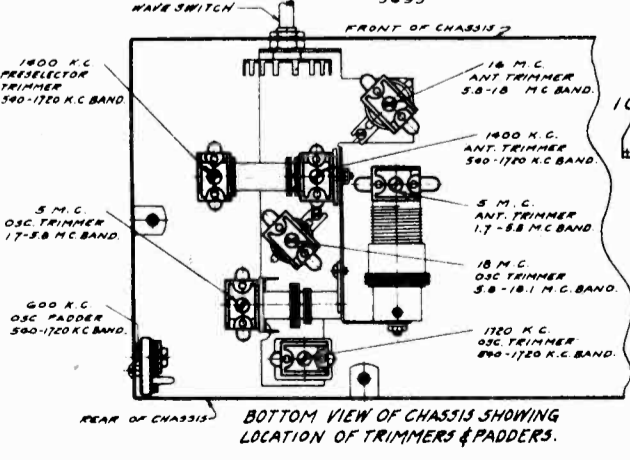
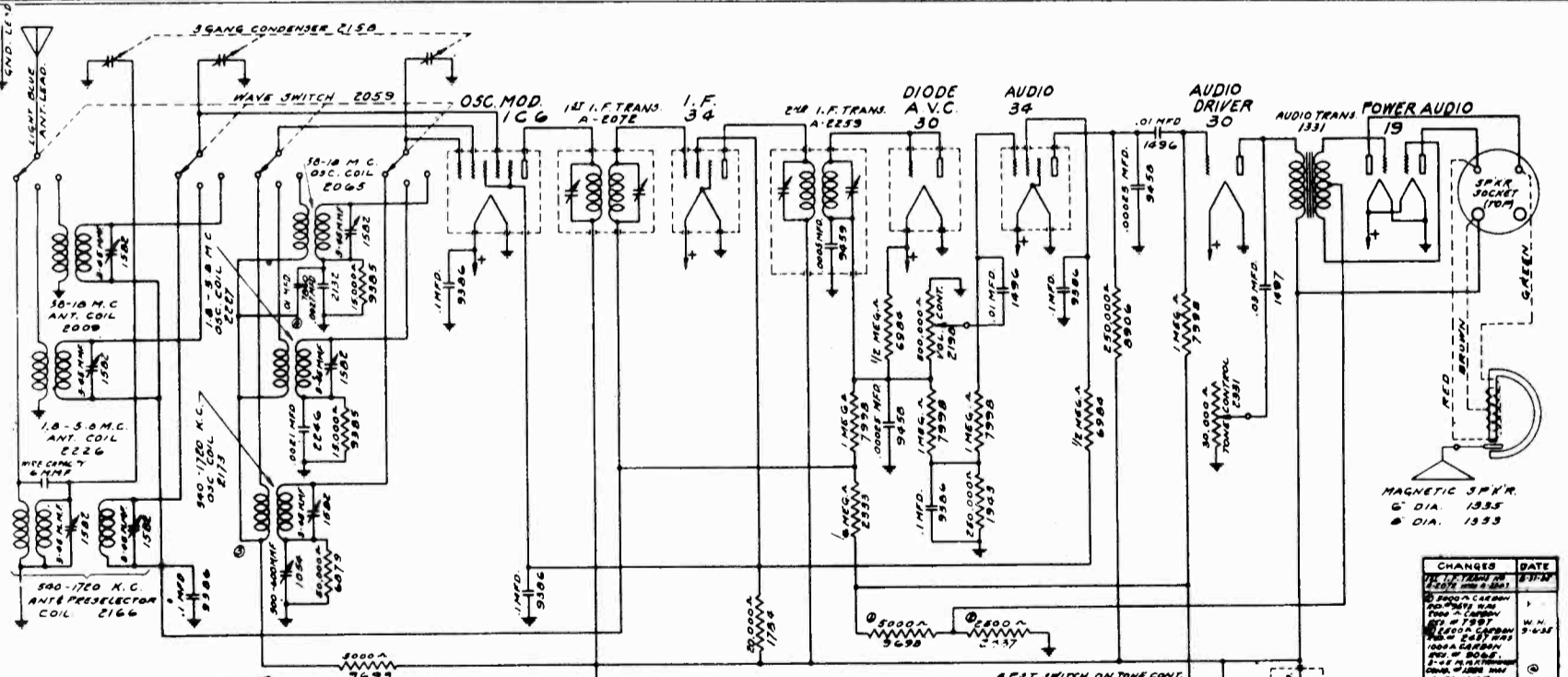


I.F. ALIGNMENT - Generator at 456 KC, connected to control grid of 6L7 thru .05 MFD condenser, align 1st, 2nd, and Diode transformer trimmers to peak. Connect a 0-200 microammeter between the ungrounded cathode of the 6H6 APC diode rectifier, and ground. The Cathode indicated as point "A" in the schematic. Place a 100 MFD condenser across the secondary of the discriminator transformer. These terminals are indicated as points "D1" and "D2" on the schematic. The condenser is used to detune the secondary circuit during the following primary adjustment: The primary is tuned by impressing an IF signal on the signal grid of the 6L7 and adjusting the trimmer marked "X" on the schematic and the chassis layout, to give a maximum meter indication. Signal strength should be approximately 100000 micro volts for the adjustment. With reduced signal strength repeat the adjustments of the entire I.F. system, for maximum sensitivity. The volume control should be on full for all adjustments. Without disturbing the generator or any of the other adjustments, the trimmer "Z" ("Disc. Sec.") should be adjusted as follows: Remove the 100 MFD condenser from across the discriminator secondary, increase the generator signal to approximately 100,000 micro volts, with volume control turned down to limit audio output, slowly turn the trimmer "Z" until a sudden sharp drop in current occurs the meter will now probably read in reverse and off scale. Reverse trimmer adjustment bringing meter reading to zero. Used only a non-metallic screw driver. It is sometimes convenient to use an offset of "remote zero" setting of the micro ammeter in making the adjustments so that zero current setting is higher on the scale. After the current has been brought to zero by the above described method the I.F. alignment and discriminator tuning is completed, and R.F. alignment may be accomplished.

BROADCAST BAND - Generator at 1730 KC, connected to the antenna thru a 200 MFD condenser, variable condenser at minimum, peak oscillator trimmer. Generator at 1400 KC, tuning in signal, peak the RF and antenna trimmers. Generator at 600 KC, while rocking variable condenser, peak the oscillator padding condenser.

POLICE BAND - Generator at 5600 KC, connected to antenna thru 400 Ohm resistor, variable condenser at minimum, peak oscillator trimmer. Generator at 5000 KC, tune in signal, peak RF and antenna trimmers. Generator at 1800 KC, while rocking variable across signal, pad the oscillator circuit for maximum response.

SHORTWAVE BAND - Generator at 18100 KC, gang condenser at minimum, peak oscillator trimmer. Generator at 16000 KC, locate signal on receiver, peak RF and antenna trimmers. Generator at 6000 KC, while rocking variable across signal, peak SW padding condenser.



NOTE
1. I.F. = 465 K.C.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
3. NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.

CONVENTIONAL ALIGNMENT see special section VOL. VIII.

ALIGNMENT - Peak I-F trimmers at 465 KC. After all adjustments have been made on receiver, adjust wave trap to 465 KC peak.
BROADCAST - Dial and generator to 1720 KC, adjust oscillator trimmer to peak. Dial and generator to 1400 KC, adjust antenna trimmer to peak. Dial and generator to 600 KC, pad oscillator circuit to maximum peak.
SHORT WAVE POLICE BAND - Dial and generator to 5 MC, peak oscillator trimmer, adjust antenna trimmer to maximum peak.
SHORTWAVE FOREIGN BAND - Dial and generator to 18 MC, peak the oscillator trimmer, then shift dial and generator to 16 MC and peak the antenna trimmer. NOTE - Rock the variable condenser during padding adjustment on broadcast band. No padding required on other bands.

CHANGES	DATE
1. I.F. TRANS. A-2072	8/27/34
2. I.F. TRANS. A-2259	8/27/34
3. OSC. MOD. I.C. 6	8/27/34
4. AUDIO DRIVER 30	8/27/34
5. AUDIO TRANS. 1331	8/27/34
6. POWER AUDIO 19	8/27/34
7. MAGNETIC SPKR. 6" DIA. 1335	8/27/34
8. REGULATOR 6-1	8/27/34
9. BATTERY CABLE 2251	8/27/34

MODELS 2070, 2071, 4076
 Chassis 1105
 Schematic, Voltage
 Socket

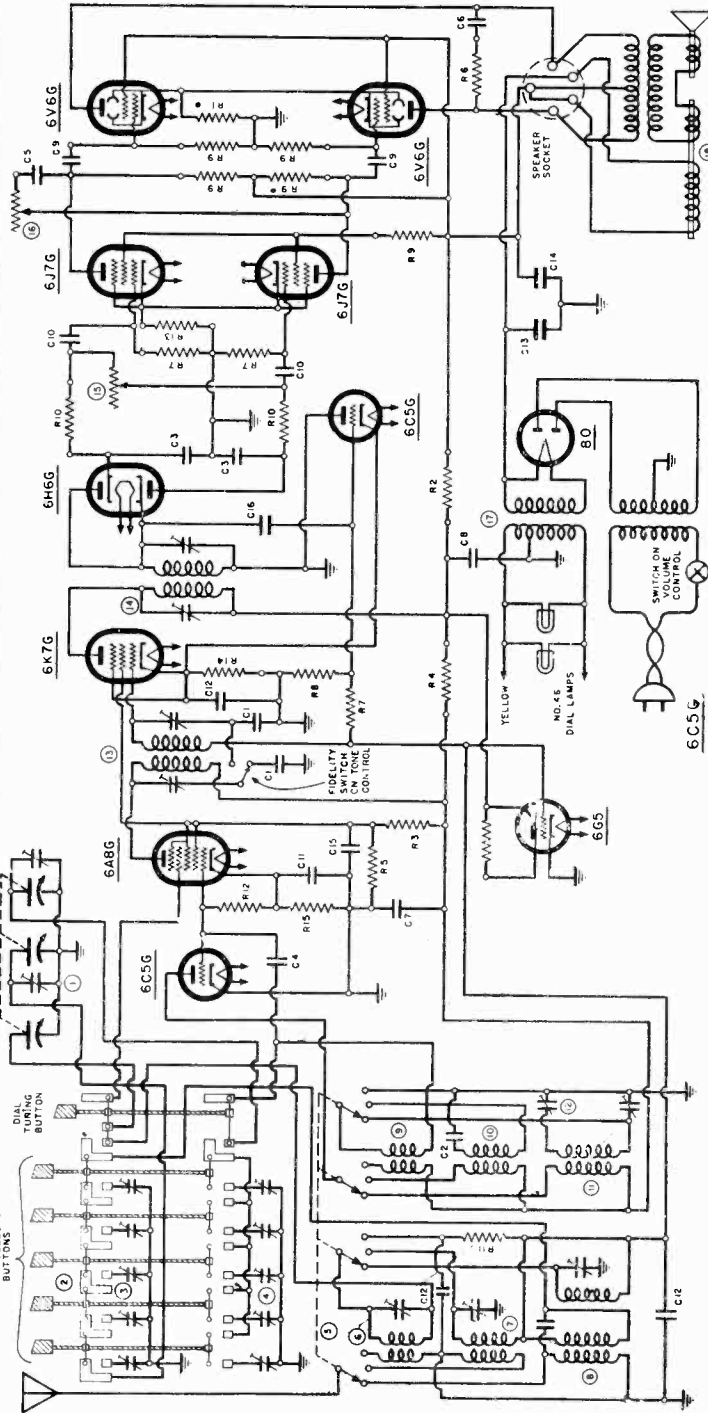
SPIEGEL INC.

DESCRIPTION

This receiver is an 11 tube alternating current operated superheterodyne.

The tubes used are a 6C5G oscillator, a 6A8G modulator, a 6K7G I.F. amplifier, a 6C5G A.V.C. rectifier, a 6H6G detector, a pair of 6J7G audio amplifiers, a pair of 6V6G power amplifiers, an 80 rectifier, and a 6G5 tuning indicator or magic eye.

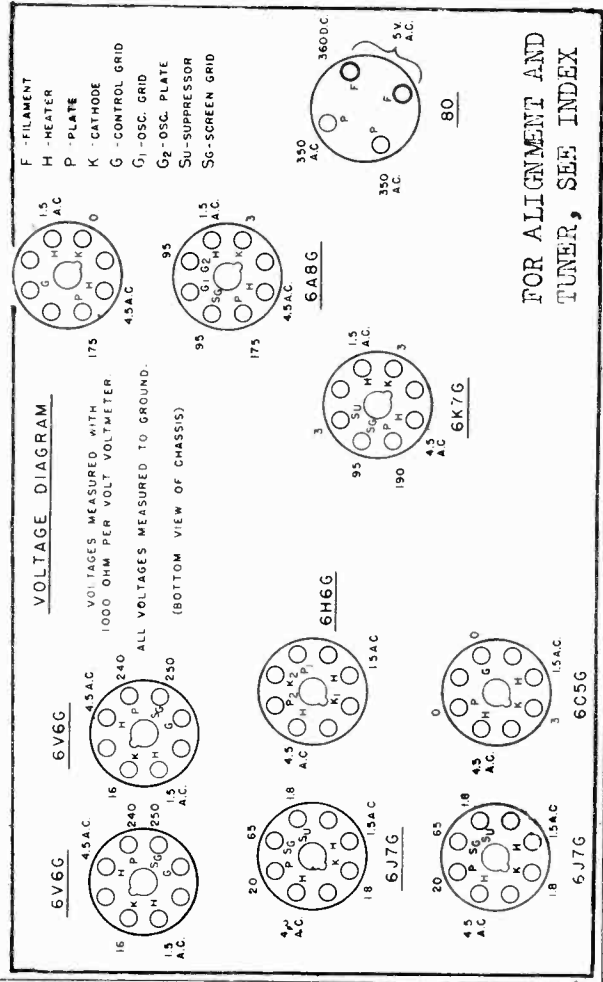
This receiver is made to cover 3 tuning bands, the standard broadcast band which ranges from 1680 K.C., to 535 K.C., the middle or police band which has a frequency range of from 5.4 M.C. to 1.7 M.C. and the high frequency or foreign band which is from 19 M.C. to 5.0 M.C.



PART NO.	DESCRIPTION
R1 60-144	250 OHM 2% WIRE WOUND RES.
R2 80-143	3000 1/2% CARBON RES
R3 60-145	5000 1% "
R4 60-146	10000 1% "
R5 61-17	250000 1/2% "
R6 80-5	100000 1% "
R7 60-18	500,000 1% MCGOHM 1/3W
R8 60-18	500,000 1% "
R9 60-24	250,000 1% "
R10 60-24	100,000 1% "
R11 60-25	50,000 1% "
R12 60-25	50,000 1% "
R13 60-23	500 1% "
R14 60-13	300 1% "
R15 60-12	250 1% "

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
C1 15-107	.002 MFD. MICA CONDENSER 1 1/2"	1 19-12	3 GANG CONDENSER
C2 15-106	.001 " "	2 69-115	6 BUTTON PUSH BUTTON SWITCH
C3 15-108	.0000025 " "	3 20-106	ANT. TRIMMER STRIP
C4 15-109	.000003 " "	4 20-107	WAVE SWITCH
C5 16-04	01 600V TUBULAR COND.	5 69-107	WAVE SWITCH
C6 16-04	01 600V TUBULAR COND.	6 10-183	5W. ART. COIL
C7 16-05	01 400V " "	7 10-184	POL. ANT. & PRESELECTION COIL
C8 16-07	05 200V " "	8 10-184	5W. OSC. COIL
C9 16-07	05 200V " "	9 10-184	5W. OSC. COIL
C10 16-05	02 450V WET ELECTROLYTIC	10 10-181	POL.
C11 16-24	160 450V WET ELECTROLYTIC	11 20-100	8 C. OSC. PAD
C12 16-24	160 450V WET ELECTROLYTIC	12 20-100	8 C. OSC. PAD
C13 16-24	160 450V WET ELECTROLYTIC	13 10-208	1ST I.F. TRANS.
C14 16-25	120 350V DRY	14 10-207	2ND " "
C15 16-25	120 350V DRY	15 26-112	VOLUME CONTROL WITH SWITCH
C16 16-03	.0000050 MICA CONDENSER	16 26-112	VOLUME CONTROL WITH SWITCH
		17 60-141	SPEAKER
		18	

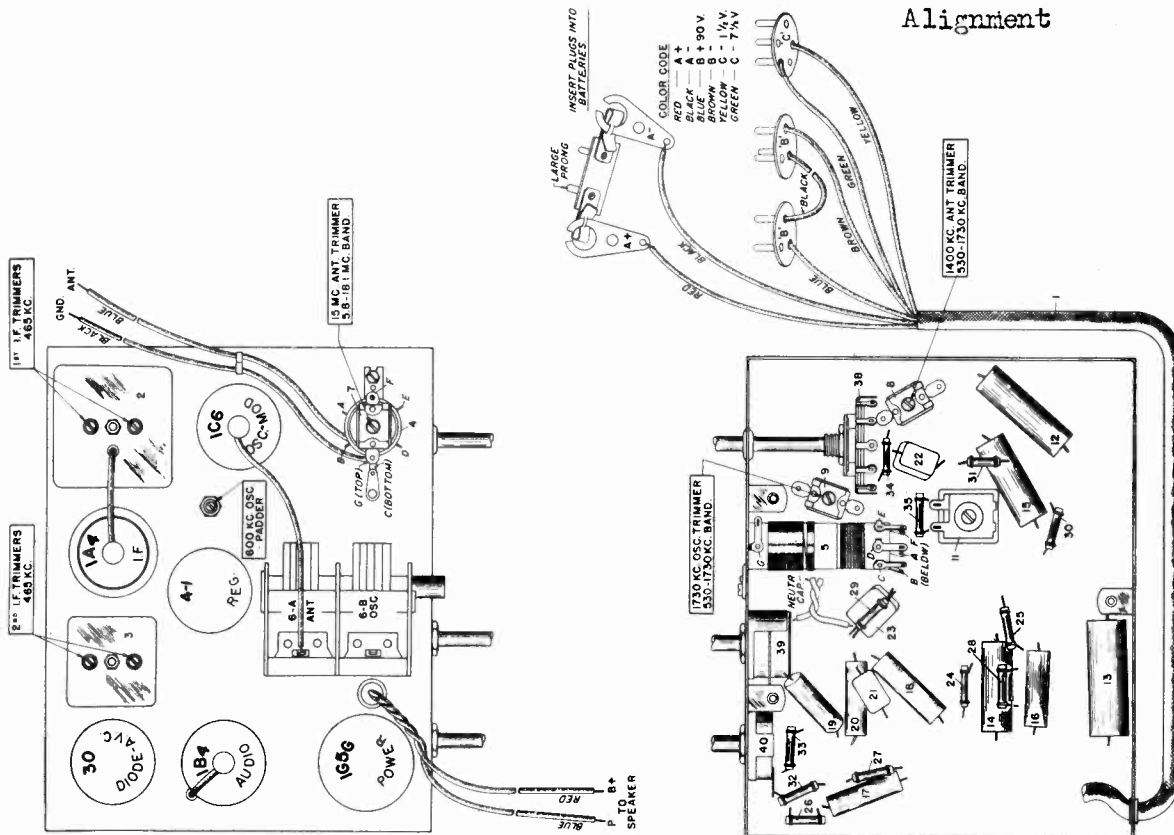
IF PEAK 456 KC



MODELS 2100 to 2103 inc.
2150 to 2153 inc.
Chassis 109B
Alignment, Trimmers, Chassis

SPIEGEL INC.

MODELS 2112, 2113, 2120
2121 Chas. 90B
2108 to 2111
Chassis 1090B
Alignment



ALIGNMENT PROCEDURE:

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, low battery voltage, open or grounded bias resistor, bypass condenser, inadequate or excessively long antenna, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proven not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT.

THE TRIMMER AND PADDING CONDENSER WILL BE REFERRED TO BY THEIR FUNCTION, AS SHOWN IN PARTS DIAGRAM.

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

- (a) Attach the ground lead of the test oscillator to the chassis. Connect the other lead to the grid of the 1C6 tube through a .02 Mfd. series condenser. **DO NOT REMOVE GRID CLIP.**
- (b) Set test oscillator to EXACTLY 465 KILOCYCLES and turn receiver volume control on full.
- (c) Peak each of the second I.F. transformer trimmers.
- (d) Peak each of the first I.F. transformer trimmers.

ALIGNING 1730-530 KILOCYCLE BAND:

- (a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line move needle to correct position.
 - (b) Remove test oscillator lead from grid of 1C6 tube and connect to receiver antenna lead through a .00025 Mfd. series condenser.
 - (c) Adjust band selector switch for operation on the 1730-530 kilocycle band.
 - (d) Set test oscillator frequency and receiver dial to EXACTLY 1730 kilocycles. Turn chassis on end and adjust 1730 kilocycle oscillator trimmer for maximum 1730 kilocycle test oscillator signal sensitivity.
 - (e) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles and adjust 1400 K. C. antenna trimmer for maximum sensitivity.
 - (f) Set test oscillator frequency and receiver dial to approximately 600 kilocycles. Then while rocking gang condenser slightly to right and left, adjust 600 K.C. oscillator padder for maximum sensitivity.
- ALIGNING 5.8-18.1 MEGACYCLE BAND:**
- (a) Replace .00025 Mfd. test oscillator antenna lead series condenser with a 400 ohm resistor, and place band selector switch for operation on 5.8-18.1 megacycle band.
 - (b) Tune receiver dial and set test oscillator frequency to approximately 15 megacycles.
 - (c) Rock gang condenser slightly to right and left and adjust 15 M.C. antenna trimmer for maximum 15 megacycle test signal response.

To assure more accurate trimmer setting, repeat all above adjustments several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

MODELS 2112, 2113, 2120, 2121
2108 to 2111 incl.
Socket, Trimmers, Chassis

SPIEGEL INC.

MODELS 2070, 2071, 4076
MODELS 4004, 4052
MODEL 4068
Alignment

MODELS 2070 - 2071 - 4076 , 4004 - 4052 , 4068.

ALIGNMENT PROCEDURE

The equipment required for re-aligning this receiver is an output meter and a modulated source of radio frequency (a signal generator or microvolter). This source of radio frequency must be accurately calibrated in frequency and must have a method of varying the output.

All alignments must be made with the volume control turned full on and with the signal input from the generator reduced to as low a value as possible while still giving a sufficient output to be easily read on the output meter.

Connect the output meter, through a .5 M.F. condenser and a resistance of such a value as to make the total meter resistance approximately 10,000 ohms, to the two plate pins of the speaker plug. The output meter remains connected during the entire alignment procedure.

Press in the dial Tuning button. Models 2070, 2071, 4076 and 4068.

Connect the signal generator to the grid cap of the 6A7 tube through a 1 M.F. condenser. Connect the ground of the generator to the ground lead of the receiver. With the wave switch on broadcast position and the dial set to about 1000 K.C., feed in a 456 K.C. signal. Adjust the trimmers on top of the first and second I.F. transformers until the maximum output is obtained. This aligns the I.F.

Leaving the signal generator connected to the grid cap of the 6A7, turn the wave switch to the right hand (short wave) position. Set the dial and the signal generator to 15.0 M.C. Tune in the signal by adjusting the 15.0 M.C. oscillator trimmer. The signal will be heard at two different settings of the trimmer. The proper setting is the one where the signal is heard when the trimmer is the loosest. Also when the dial of the receiver is turned the signal will be heard again at about 14.0 M.C. If the signal is heard at about 16.0 M.C. on the dial instead of 14.0 M.C. the wrong setting has been used and should be corrected.

Set the wave switch on broadcast position, turn the dial to the extreme high frequency end. Feed a 1680 K.C. signal to the receiver antenna post through a .00025 M.F. mica condenser. Adjust the 1680 K.C. broadcast oscillator trimmer for maximum output. Set the generator to 1500 K.C. and tune in this signal on the receiver. Then adjust the 1500 K.C. broadcast antenna trimmer and the 1500 K.C. broadcast preselector trimmer for maximum output. Set the generator to 600 K.C. and adjust the 600 K.C. broadcast oscillator pad to maximum output while tuning the receiver back and forth across the signal from the generator. This completes the alignment of the broadcast band.

The police band is aligned by feeding a 4.0 M.C. signal to the receiver antenna lead through the .00025 condenser. Turn the wave switch to the center position and tune the receiver to this signal. Adjust the 4.0 M.C. police antenna trimmer for best output.

grid cap of the 6A8G tube Models 2070, 2071, and 4076.

The short wave band is aligned in the same way using a 15 M.C. signal and adjusting the 15 M.C. short wave antenna trimmer after having turned the wave switch to the right hand position.

MODELS 2064 - 2065 - 4014 - 4064 - 4066.

ALIGNMENT PROCEDURE

The following alignment procedure is for use only by competent service men having the proper equipment. Re-alignment is very seldom needed and is usually only required after some major part has been replaced because of damage to the receiver.

The equipment required for re-aligning this receiver is an output meter and a modulated source of radio frequency (a signal generator or microvolter). This source of radio frequency must be accurately calibrated in frequency and must have a method of varying the output.

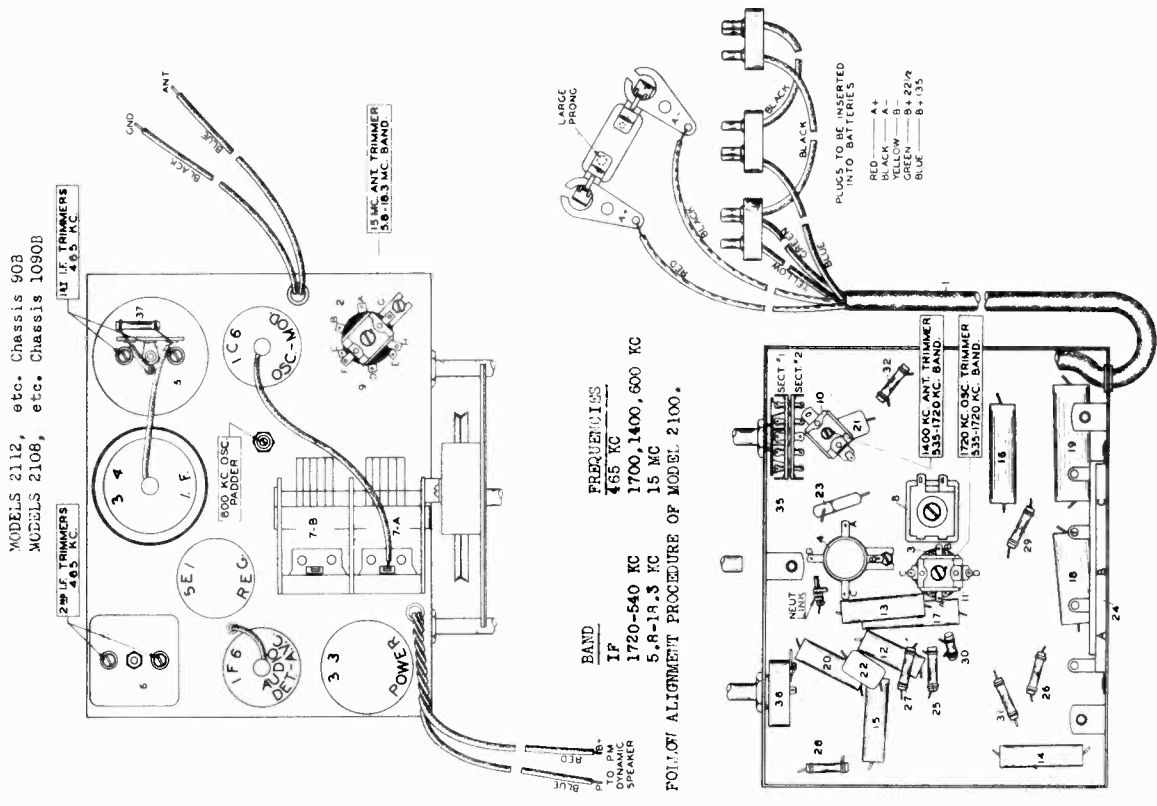
All alignments must be made with the volume control turned full on and with the signal input from the generator reduced to as low a value as possible while still giving a sufficient output to be easily read on the output meter.

Connect the output meter, through a .5 M.F. condenser and a resistance of such a value as to make the total meter resistance approximately 7000 ohms, to the two small pins of the speaker plug. The output meter remains connected during the entire alignment procedure.

Connect the signal generator to the grid cap of the 6A7 tube through a .1 M.F. condenser. Connect the ground of the generator to the ground lead of the receiver. With the wave switch on broadcast position, press in the dial tuning button and set the dial to about 1000 K.C. Then feed in a 456 K.C. signal. Adjust the trimmers on top of the first and second I.F. transformers until the maximum output is obtained. This aligns the I.F.

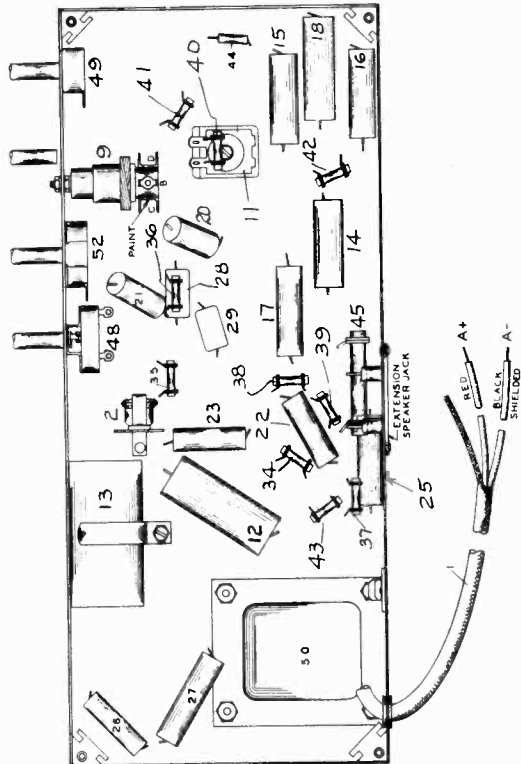
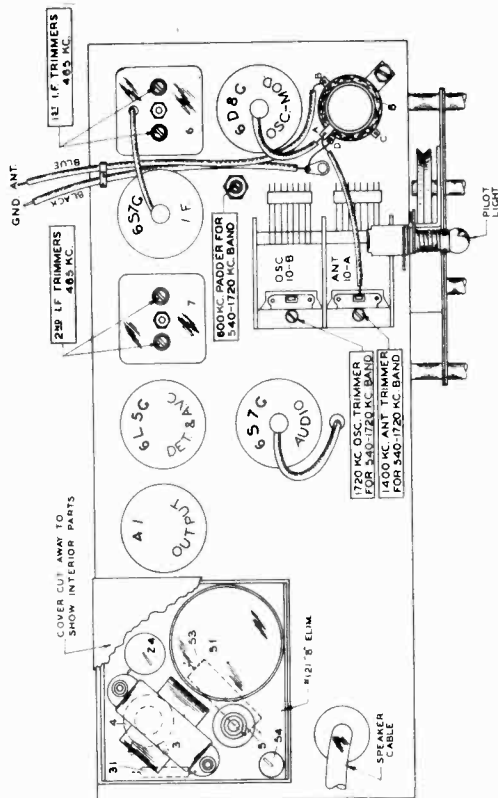
Leaving the wave switch on broadcast position turn the dial to the extreme high frequency end. Feed a 1730 K.C. signal to the receiver antenna lead through a .00025 M.F. mica condenser. Adjust the 1730 K.C. broadcast oscillator trimmer until maximum output is shown. Set the generator to 1400 K.C. and tune in this signal on the receiver. Then adjust the 1400 K.C. broadcast antenna trimmer to maximum output. Set the generator to 600 K.C. and adjust the 600 K.C. broadcast oscillator pad to maximum output while tuning the receiver back and forth across the signal from the generator. This completes the alignment of the broadcast band.

The short wave band is aligned while feeding a 6.0 M.C. signal to the receiver antenna lead through a .00025 M.F. mica condenser. Turn the wave switch to short wave position and tune in the 6.0 M.C. signal. Adjust the 6.0 M.C. short wave trimmer to maximum output.



MODELS 2222 to 2229 inc.
 Chassis 73B
 Socket, Trimmers, Chassis
 Alignment

SPIEGEL INC.



Lack of sensitivity, selectivity or poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, improperly connected or long battery, open or grounded bias resistor, bypass condenser, inadequate or excessively low antenna, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proven not to be the cause.

NOTE: BE SURE TO FOLLOW PROCEDURE CAREFULLY WHEN ALIGNING. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT.

IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER.

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

- (a) Connect the ground lead of the test oscillator to the chassis or set ground lead. Connect the other lead of the test oscillator to the grid cap of the No. 6D8G modulator tube through a .02 Mfd. condenser. DO NOT REMOVE GRID CLIP.
- (b) Set test oscillator to EXACTLY 465 kilocycles and turn receiver volume control on full.
- (c) Peak each of the second I.F. transformer trimmers.
- (d) Peak each of the first I.F. transformer trimmers.

To assure most accurate trimmer setting repeat above adjustment several times, always using lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING ANTENNA AND OSCILLATOR CIRCUIT:

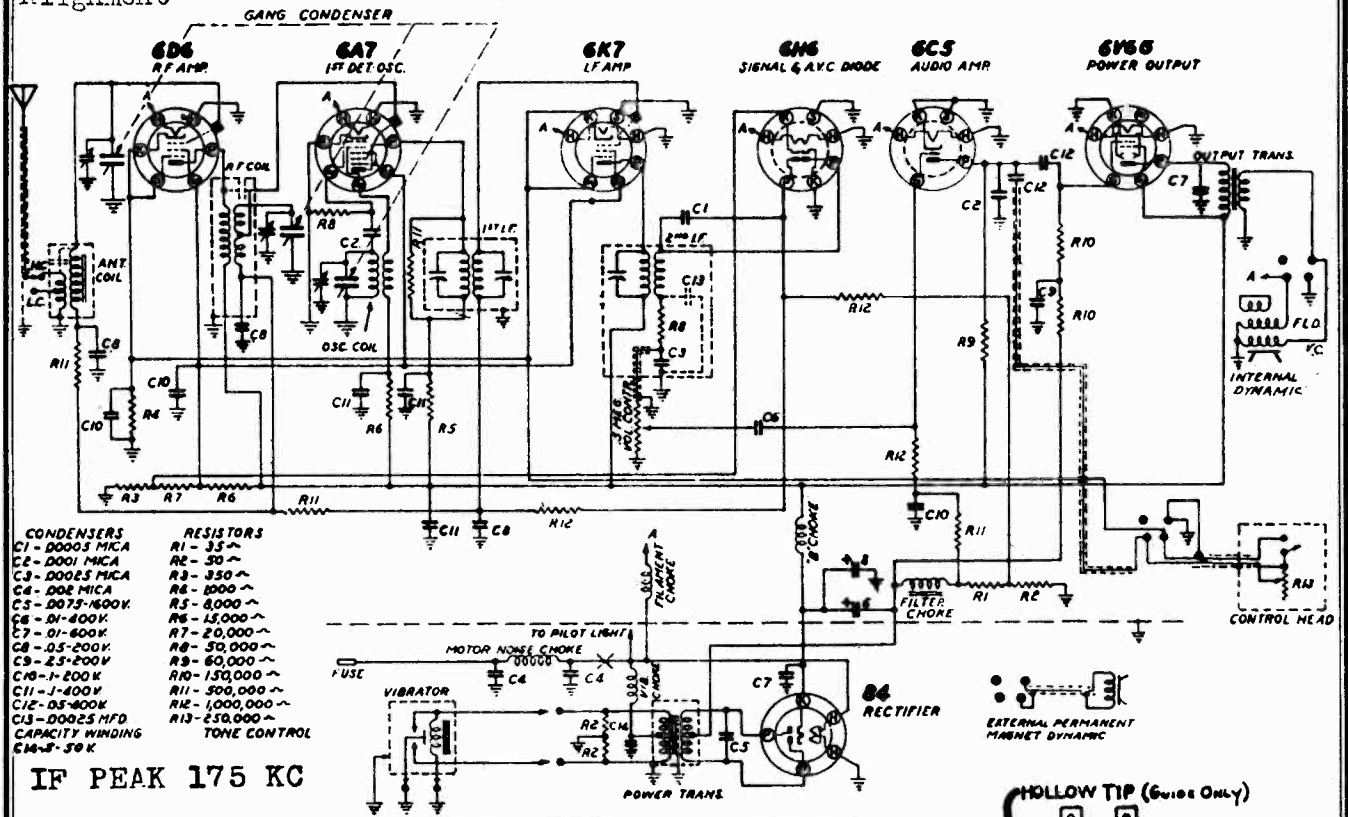
- (a) Connect the high output side of the test oscillator through a .00025 Mfd. condenser to the receiver antenna lead and the low side to the set ground.
- (b) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at low frequency end of the dial calibration. If the dial needle does not point exactly to the last line move needle to correct position.
- (c) Set receiver dial and test oscillator frequency to EXACTLY 1720 kilocycles.
- (d) Bring in 1720 KC test oscillator signal to maximum output by adjusting the trimmer condenser mounted on top of the oscillator section of the gang condenser. Looking at the front of the receiver the rear section of the condenser is the oscillator section.
- (e) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles.
- (f) Adjust trimmer on top of the front section gang condenser (antenna section) for maximum 1400 kilocycle test signal response.
- (g) Tune receiver dial and set test oscillator frequency to approximately 600 kilocycles.
- (h) While rocking the tuning condenser back and forth adjust 600 K.C. oscillator pad-der condenser which is accessible through the hole in the top of the chassis adjacent to the gang condenser for maximum 600 kilocycle signal response.

MODELS 2302, 2303 Chas. 78-780

Schematic, Socket, Trimmers

Alignment

SPIEGEL INC.



- | CONDENSERS | | RESISTORS | |
|------------------|-----------------|----------------|-------------------|
| C1 - 00005 MICA | R1 - 35 ~ | C2 - 0001 MICA | R2 - 30 ~ |
| C3 - 00025 MICA | R3 - 350 ~ | C4 - 002 MICA | R4 - 1000 ~ |
| C5 - 0075-1500V | R5 - 8000 ~ | C6 - 01-400K | R6 - 15,000 ~ |
| C7 - 01-800K | R7 - 20,000 ~ | C8 - 05-200K | R8 - 50,000 ~ |
| C9 - 25-200K | R9 - 60,000 ~ | C10 - 1-200K | R10 - 150,000 ~ |
| C11 - 1-400V | R11 - 300,000 ~ | C12 - 05-400K | R12 - 1,000,000 ~ |
| C13 - 00025 MFD | R13 - 250,000 ~ | TONE CONTROL | |
| CAPACITY WINDING | | EM-8-39 K | |

IF PEAK 175 KC

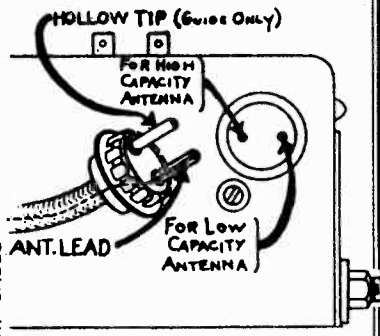
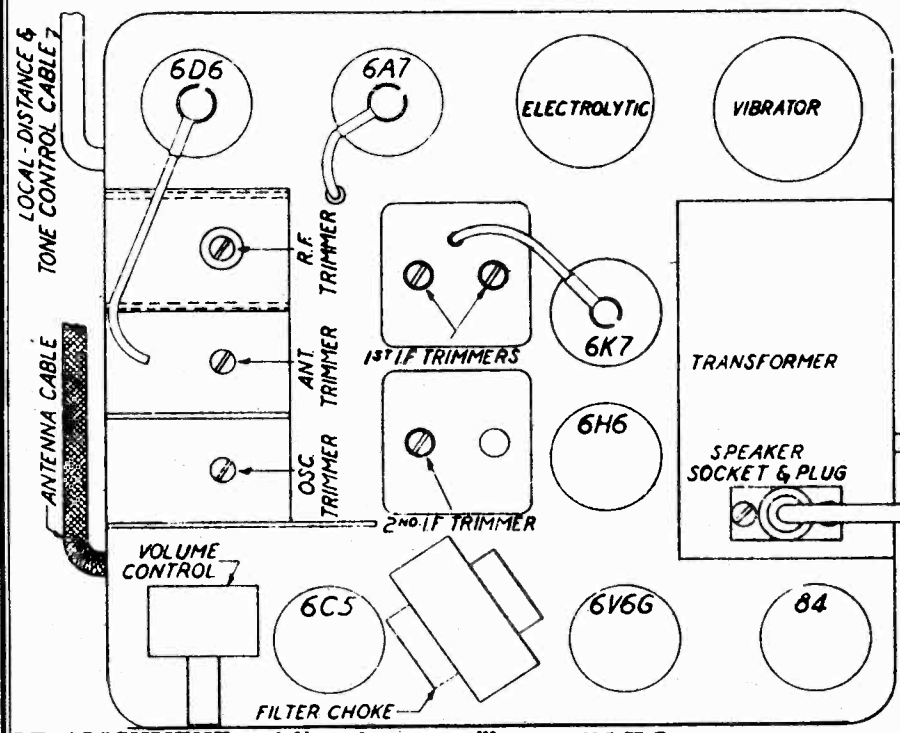
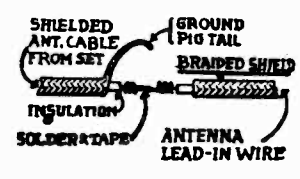


FIG. 17



7-Tube Auto Radio—
78-780 Chassis

I.F. ALIGNMENT. Adjust the test oscillator to 175 K.C. and connect the output directly to the grid of the first detector tube (6A7), without the use of any series condenser or resistor; the omission of series condenser and resistor to block out the AVC action. The ground on the test oscillator can be connected to the chassis ground. Align the trimmers of the first and second I.F. transformers to peak or maximum reading on the output meter.

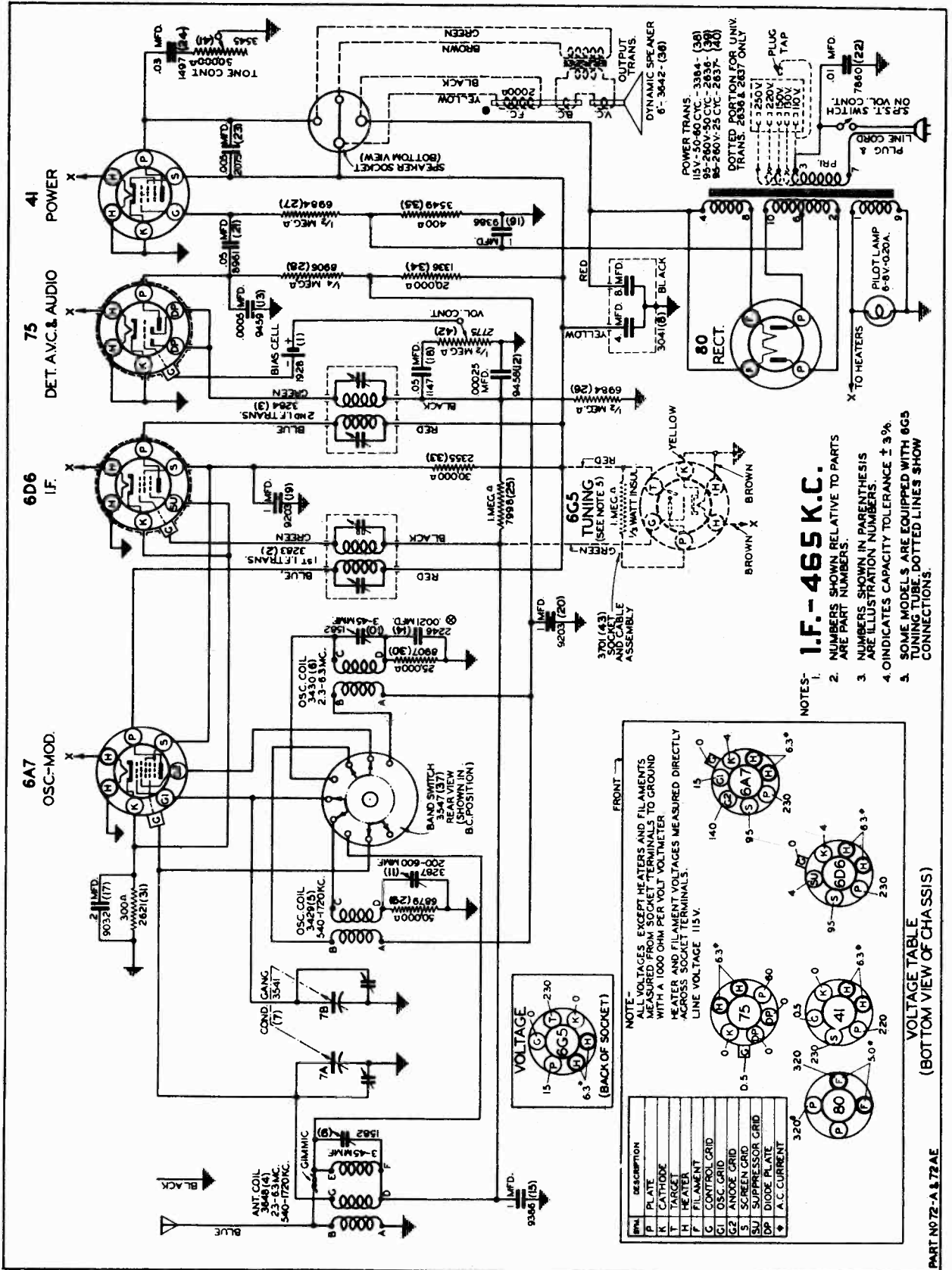
OSCILLATOR ALIGNMENT. Adjust the test oscillator to 1400 K.C. and connect the output to the antenna through

a .0001 mfd. mica condenser to give the equivalent of a low capacity type average auto antenna. Set the dial pointer to 1400 K.C. and adjust the oscillator trimmer to peak. (Front section of gang condenser.)

R.F. ALIGNMENT. The next step is to adjust the center and rear trimmers of the gang condenser to peak. The center section of the gang condenser tunes the antenna amplifier stage (6D6 tube), and the rear condenser section tunes the detector grid coil of the 6A7 tube.

SPIEGEL INC.

MODELS 4002, 4050, 5020
Chassis 1072AE
Schematic, Voltage



- NOTES:**
1. I.F. - 465 K.C.
 2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
 3. NUMBERS SHOWN IN PARENTHESES ARE ILLUSTRATION NUMBERS.
 4. O INDICATES CAPACITY TOLERANCE ± 3%.
 5. SOME MODELS ARE EQUIPPED WITH 6G5 TUNING TUBE. DOTTED LINES SHOW CONNECTIONS.

MODELS 4002, 4050, 5020
Chassis 1072AE

SPIEGEL INC.

Socket, Trimmers, Chassis
Alignment

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII.

Peak IF at 465 KC. Connect oscillator at 6A7 grid cap. Use .02 mfd. series condenser, DO NOT REMOVE GRID CAP. Peak second and first IF trimmers. 1720-540 KC Band.

Connect oscillator to antenna lead through .00025 mfd. series condenser. Gang condenser at maximum capacity, calibrate dial so needle falls on last line in this position.

Set oscillator signal at 1720 KC, tune dial to 1400 KC. Trim osc. sect. of gang condenser to maximum output.

With signal generator at 1400 KC, trim antenna section of gang condenser for maximum output.

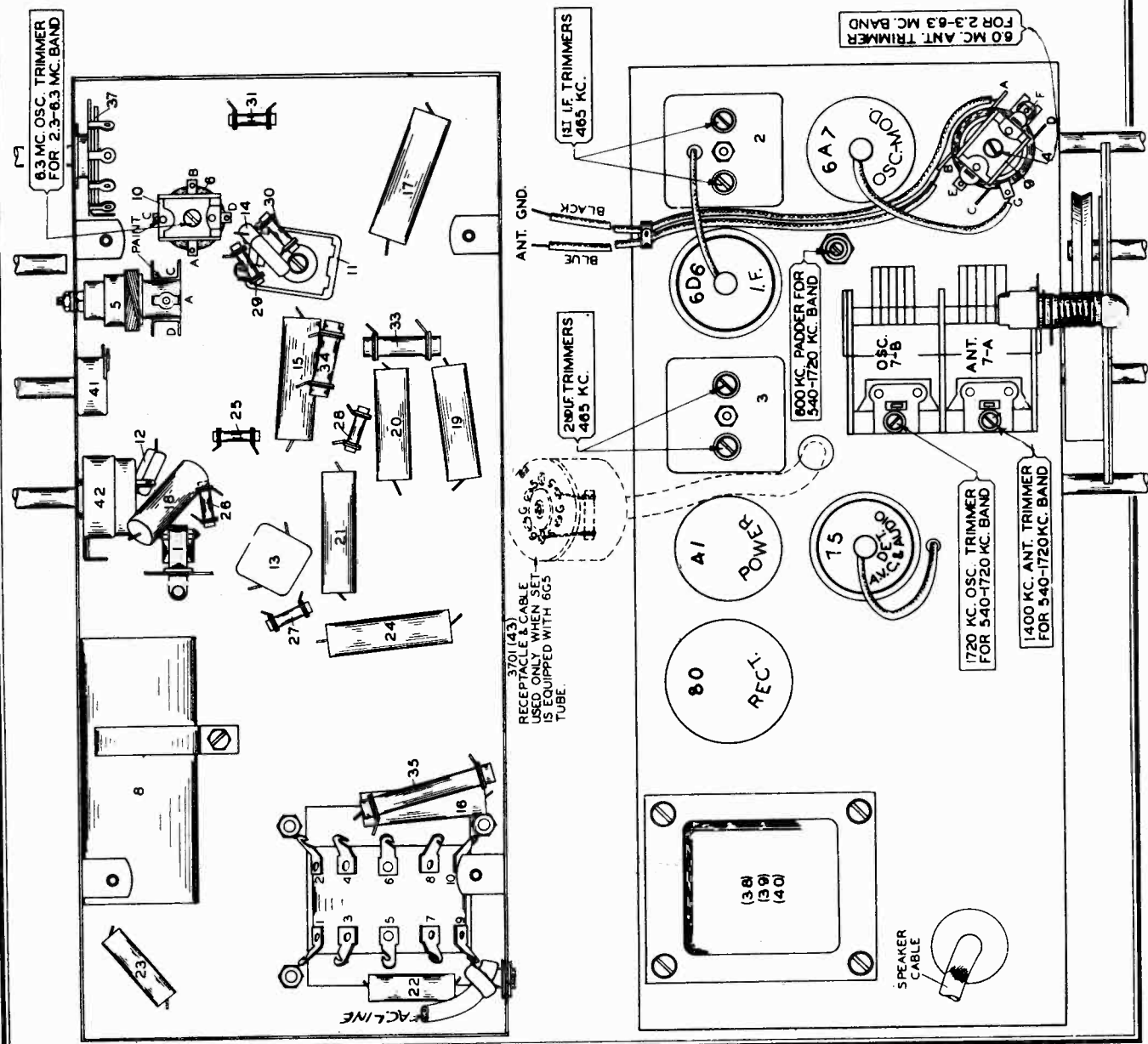
Now adjust 600 KC padder for maximum signal while rocking condenser.

2.3-6.3 MC Band

Signal at 6.3 MC through 400 ohm and .00025 mfd. dummy to antenna lead.

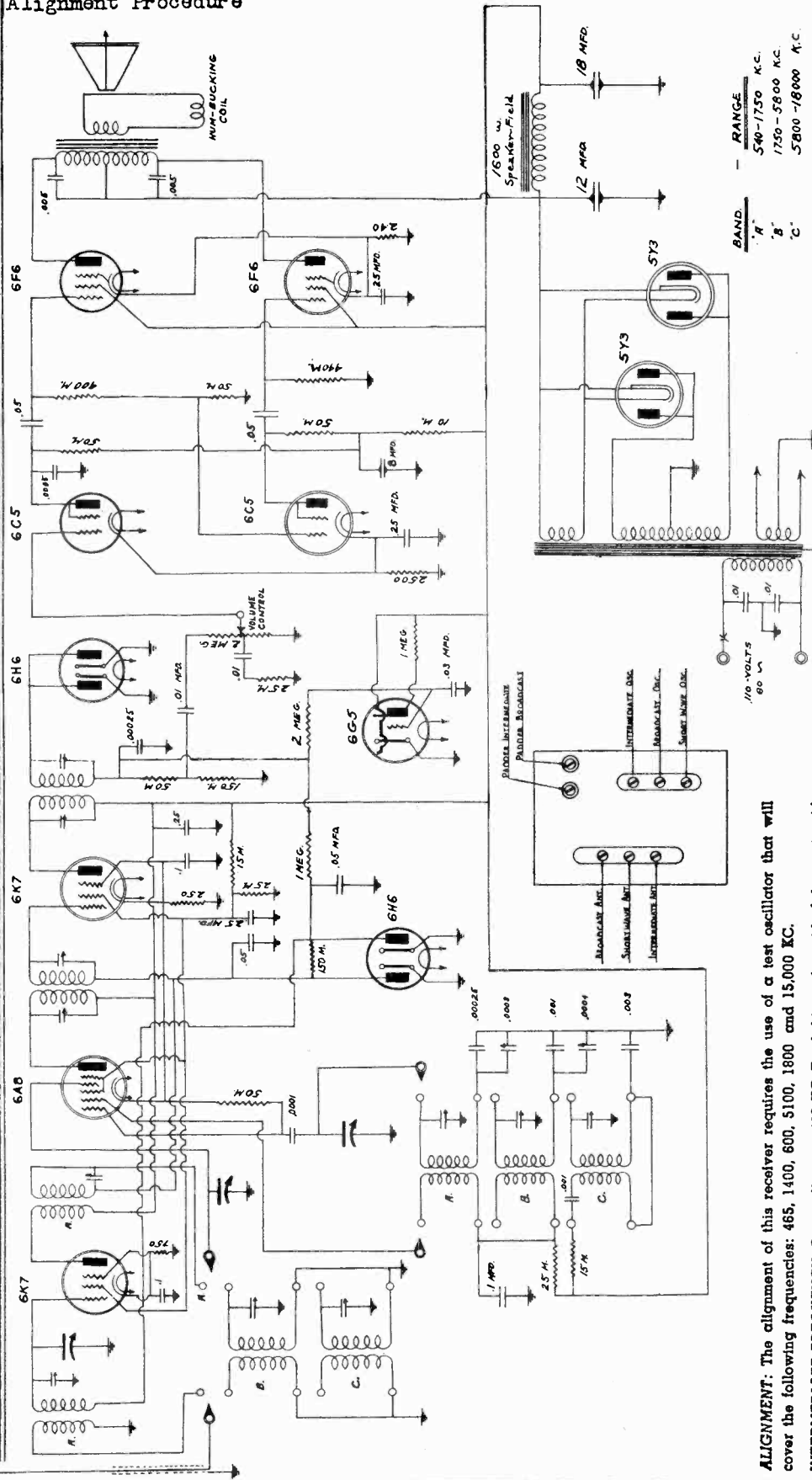
Band switch in 2.3-6.3 MC position. Adjust 6.3 MC osc. trimmer to maximum output.

Tune dial to 6 MC. Signal at 6 MC. Adjust 6 MC antenna trimmer for maximum sensitivity.



MODELS 4006, 4070, Chas. 12AC
 Schematic, Alignment, Trimmers
 MODELS 2204 to 2207, 2200 to 2203,
 2230 to 2233 inc. 2220, 2221
 Alignment Procedure

SPIEGEL INC.



INTERMEDIATE BAND: For a dummy antenna use a .0002 mid. mica condenser in series with a 400 ohm carbon resistor. Set band switch to the intermediate band position and feed a 5100 KC signal from the oscillator. Set dial pointer at 5100 KC. Adjust intermediate antenna and intermediate oscillator trimmers for maximum output. Re-set oscillator and set dial to approximately 1800 KC. Slowly increase or decrease the intermediate padding condenser while tuning back and forth across the signal with the station selector control until the maximum reading is obtained on the output meter. Re-check the 5100 KC adjustment.

SHORT WAVE: Set band switch on short wave position. Connect the antenna of the radio receiver to the output of the test oscillator through a 400 ohm carbon resistor. Set oscillator and receiver dial at 15 megacycles. Adjust the short wave antenna and short wave oscillator trimming condensers for maximum output as indicated by readings on the output meter. No other adjustments are necessary for aligning this band.

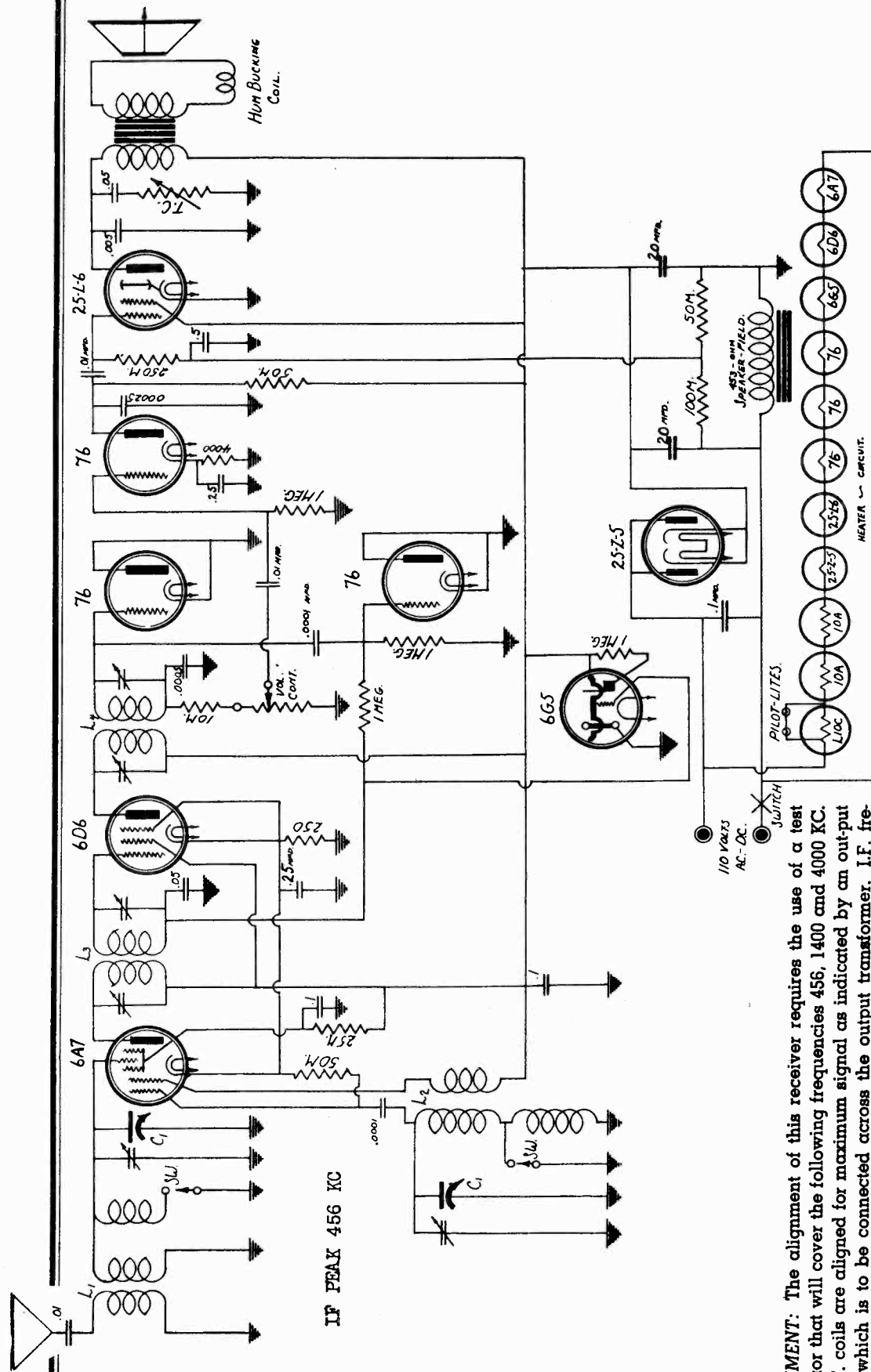
ALIGNMENT: The alignment of this receiver requires the use of a test oscillator that will cover the following frequencies: 465, 1400, 600, 5100, 1800 and 15,000 KC.

INTERMEDIATE FREQUENCY: Set oscillator to 465 KC. Feed this to the grid of the pentagrid converter tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

BROADCAST BAND: Set the band switch for broadcast reception. Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mid. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Adjust trimmer (underneath chassis) on R.F. coil for greatest output. Re-set the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the broadcast padding condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

SPIEGEL INC.

MODEL 4010, Chassis 11X
Schematic, Alignment



Date: 11-17-36
 Drawn By: H.B.L.
 Checked By: C.J.
 Approved By: [Signature]

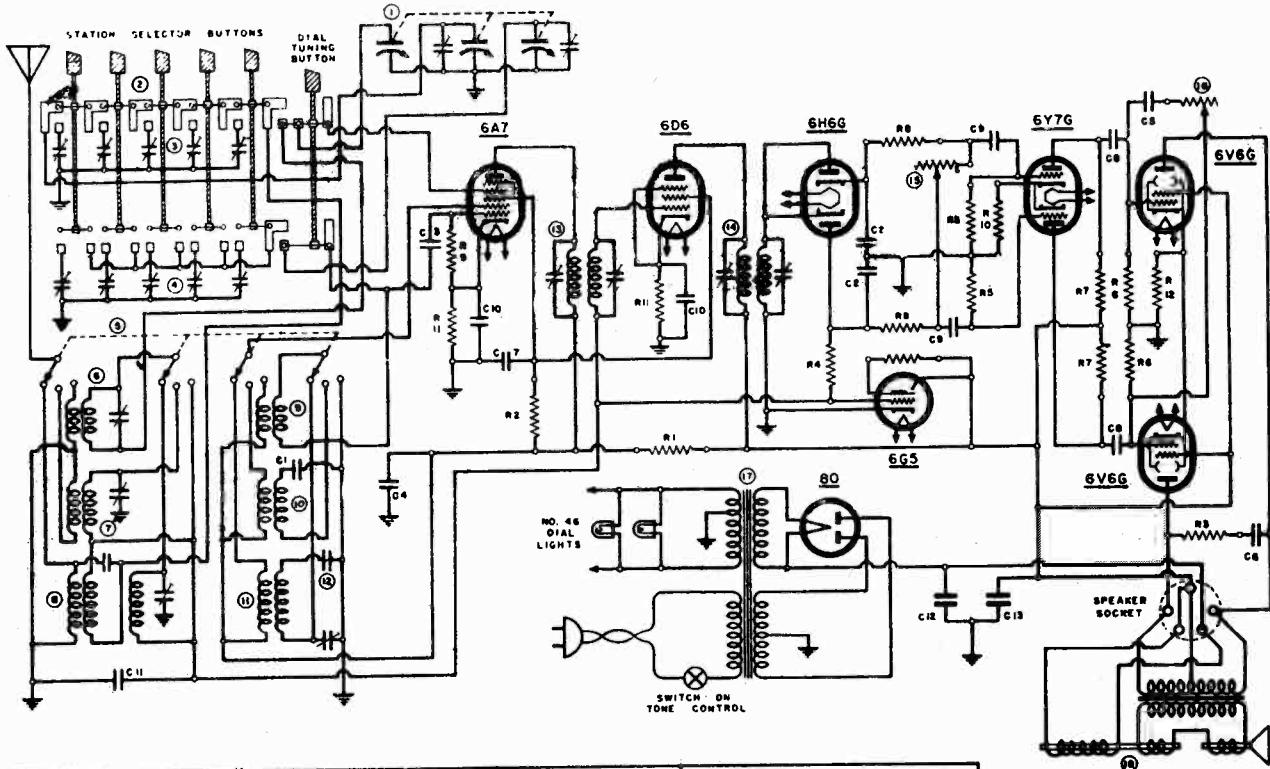
- L₁ - ANT. COIL (COMPLETE) N^o 118A.
- L₂ - OSC. COIL (COMPLETE) N^o 118A.
- L₃ - I-INTERMEDIATE FREQ. TRANS. N^o 310.
- L₄ - 2-INTERMEDIATE FREQ. TRANS. N^o 309.
- TC - TONE CONTROL N^o 215.
- C₁ - TUNING COND. N^o 622.
- SW - BAND SWITCH N^o 19.

ALIGNMENT: The alignment of this receiver requires the use of a test oscillator that will cover the following frequencies 456, 1400 and 4000 KC. The I.F. coils are aligned for maximum signal as indicated by an output meter which is to be connected across the output transformer. I.F. frequency is 456 KC. There are four adjustments for I.F. alignment.

To align broadcast band it is only necessary to align receiver at 1400 KC because of the initial setting at the factory. A 200 mmfd. condenser is necessary for a dummy antenna. This is inserted in series with the test oscillator and the antenna connection of the radio receiver. Set oscillator and pointer on dial to 1400 KC and adjust the two trimmer condensers on the tuning condenser for maximum output. Turn Band Switch to Short Wave position. Feed a 4000 KC signal from the test oscillator and check receiver.

MODEL 4068, Chassis 885
Schematic, Voltage, Socket

SPIEGEL INC.



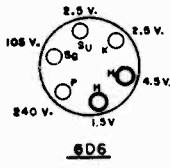
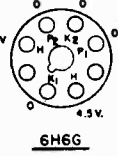
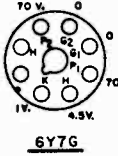
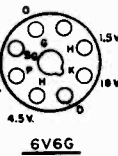
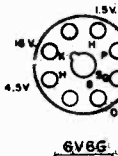
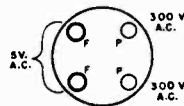
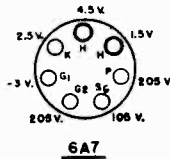
PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	885
R1	60-143 3000 OHM 1/2W CARBON RES	C1	15-106 .0011 MFD. MICA CONDENSER * 5%	1	19-121 3 GANG CONDENSER	
R2	6281 20,000 OHM 1W	C2	1504 .00025	2	68-115 PUSH BUTTON SWITCH	
R3	60-114 10,000 OHM 1/2W	C3	1503 .00005	3	20-105 ANT. TRIMMER STRIP	
R4	6020 1/2 W 1/2M	C4	1602 1 MFD. 600V. TUBULAR CONDENSER	4	20-107 OSC.	
R5	6017 1/2 W 1/2M	C5	1611 .006	5	69-107 WAVE SWITCH	
R6	6018 300,000 OHM 1/2W	C6	1608 .002	6	10-184 S.W. ANT. COIL	
R7	6024 250,000 OHM 1/2W	C7	1601 1 400V	7	10-182 POL.	
R8	60-125 110,000 OHM 1/2W	C8	1607 .05	8	10-179A S.C. ANT. & PRESELECTOR COIL	
R9	6023 50,000 OHM 1/2W	C9	1605 .02	9	10-188 S.W. OSC. COIL	
R10	8053 100 OHM 1/2W	C10	1600 1 200V	10	10-181 POL.	
R11	6012 230 OHM 1/2W	C11	1622 .05	11	10-180 S.C.	
R12	60-144 250 OHM 2W WIRE WOUND	C12	18-202 10 400V WET ELECTROLYTIC	12	20-100 S.C. OSC. PAD. COND.	
		C13	18-201 2 300V	13	10-201 1ST. I.F. TRANSFORMER	
				14	10-202 SMO	
				15	24-113 VOLUME CONTROL	
				16	28-110 TONE CONTROL WITH SWITCH	
				17	90-129 POWER TRANSFORMER	
				18		
				19		
				20		

IF PFAK 456 KC

VOLTAGE DIAGRAM

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
ALL VOLTAGES MEASURED TO GROUND.
(BOTTOM VIEW OF CHASSIS)

- F - FILAMENT
- H - HEATER
- P - PLATE
- K - CATHODE
- G - CONTROL GRID
- G₁ - OSC. GRID
- G₂ - OSC. PLATE
- Sg - SCREEN GRID
- Su - SUPPRESSOR



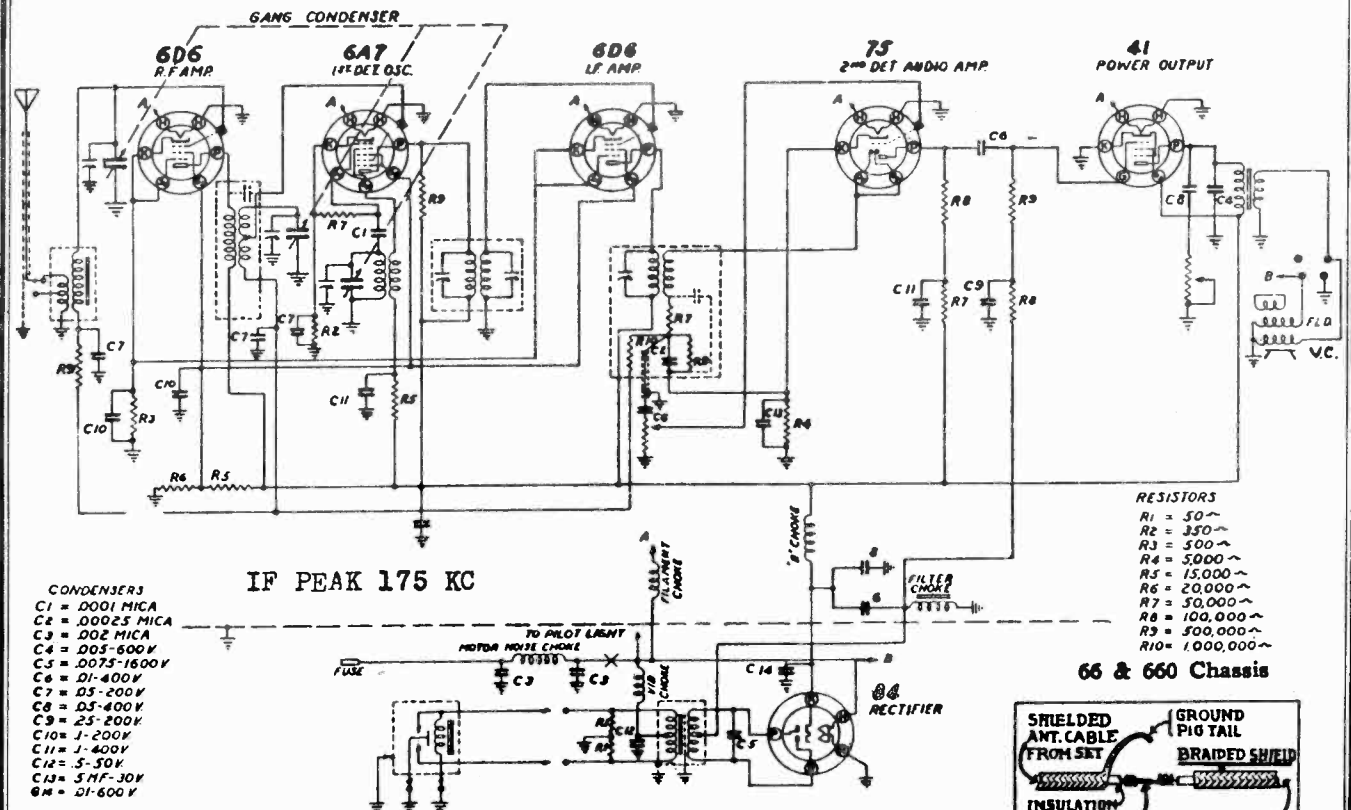
DESCRIPTION

This receiver is an 8 tube alternating current operated superheterodyne. The tubes used are a 6A7 as oscillator modulator, a 6D6 as I.F. amplifier, a 6H6G as A.V.C. and audio rectifier, a 6Y7G as audio voltage amplifier, an 80 as a power rectifier, a 6G5 as tuning indicator and two type 6V6G tubes as push pull audio power amplifiers.

This receiver is made to cover 3 tuning bands, the standard broadcast band which ranges from 1680 K.C. to 535 K.C., the middle or police band which has a frequency range of from 5.4 M.C. to 1.7 M.C. and the high frequency or foreign band which is from 19 M.C. to 5.0 M.C.

SPIEGEL INC.

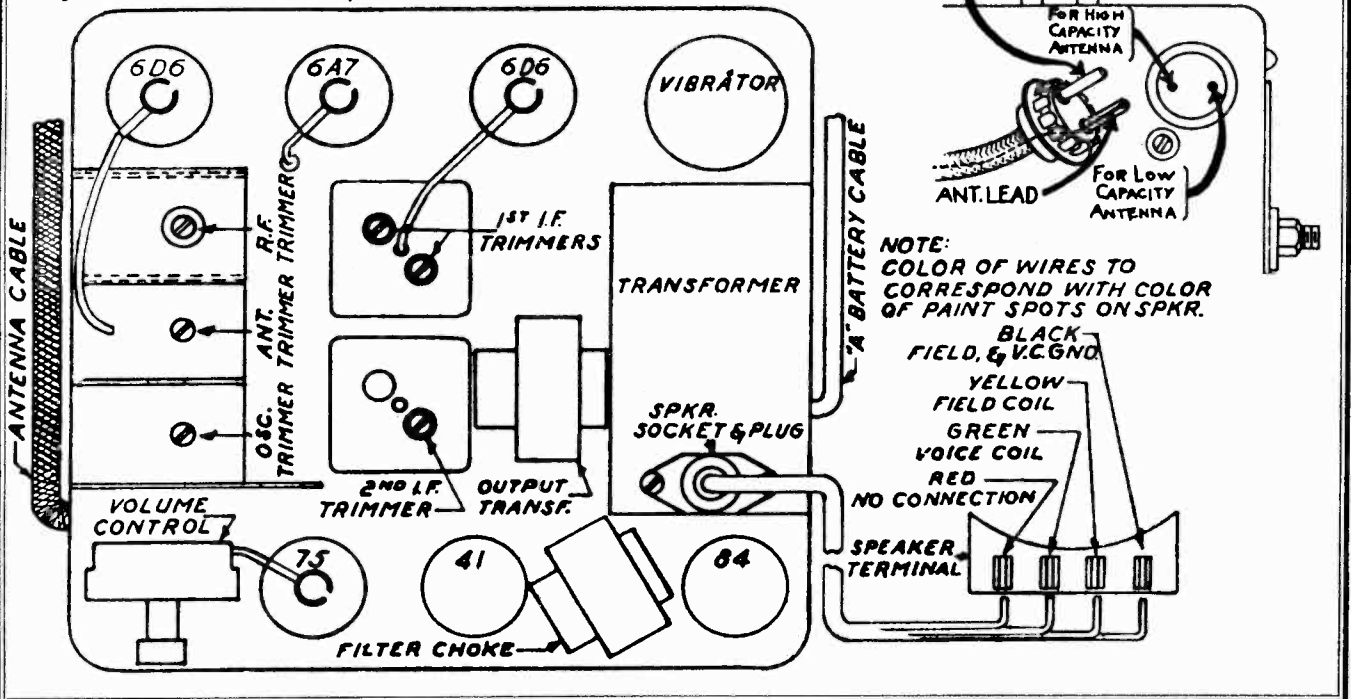
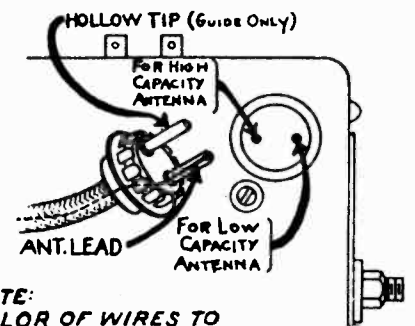
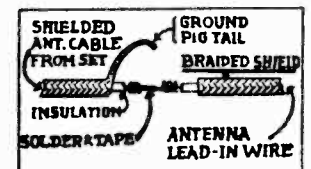
MODEL 4210, Chassis 66, 660
Schematic, Socket, Trimmers
Alignment, Connections



I.F. ALIGNMENT Adjust the test oscillator to 175 K.C. and connect the output directly to the grid of the first detector tube (6A7), without the use of any series condenser or resistor; the omission of series condenser and resistor to block out the AVC action. The oscillator trimmer to peak. (Front section of gang condenser.) Align the trimmers of the first and second I.F. transformers to peak or maximum reading on the output meter.

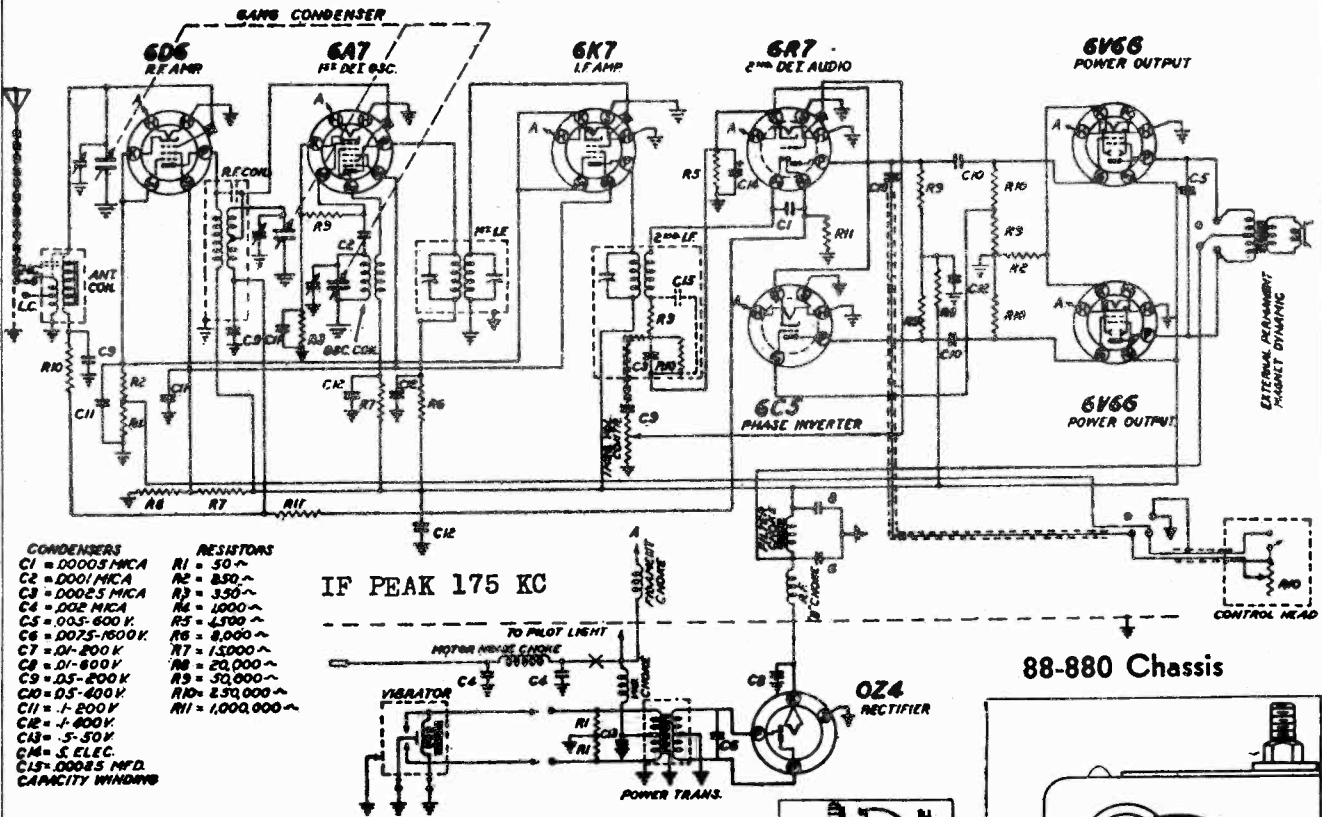
R.F. ALIGNMENT The next step is to adjust the center and rear trimmers of the gang condenser to peak. The center section of the gang condenser tunes the R.F. antenna amplifier stage

OSCILLATOR ALIGNMENT Adjust the test oscillator to 1400 K.C. and connect the output to the antenna through a .0001 mfd. mica condenser to give the equivalent of a low capacity type average auto antenna. Set the dial pointer to 1400 K.C. and adjust the



MODEL 4212, Chassis 88-880
Schematic, Socket, Trimmers
Alignment, Connections

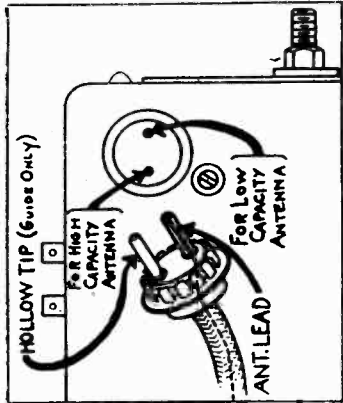
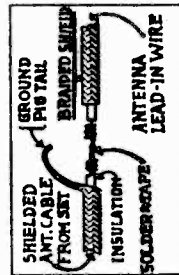
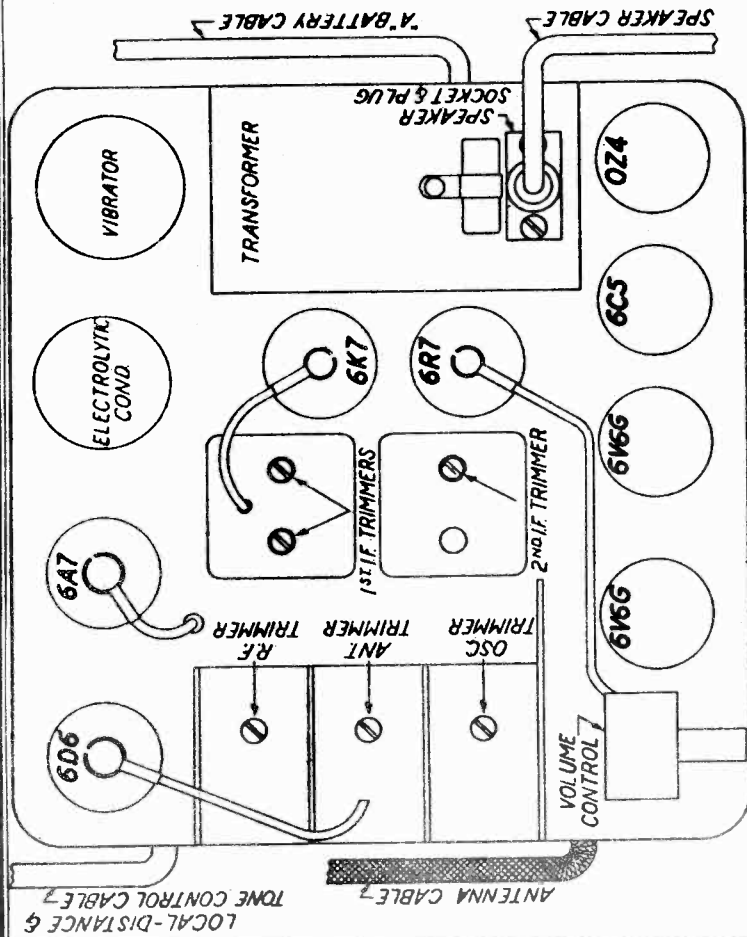
SPIEGEL INC.



- CONDENSERS**
 C1 = 00005 MICA
 C2 = 0001 MICA
 C3 = 00025 MICA
 C4 = 002 MICA
 C5 = 005-800 V.
 C6 = 0075-800 V.
 C7 = 01-800 V.
 C8 = 01-800 V.
 C9 = 05-200 K
 C10 = 05-400 V.
 C11 = 1-800 V.
 C12 = 1-800 V.
 C13 = 5-50 V.
 C14 = 5 ELEC.
 C15 = 00005 MFD. CAPACITY WINDOW
- RESISTORS**
 R1 = 50 ~
 R2 = 850 ~
 R3 = 350 ~
 R4 = 1000 ~
 R5 = 4500 ~
 R6 = 8,000 ~
 R7 = 15,000 ~
 R8 = 20,000 ~
 R9 = 50,000 ~
 R10 = 250,000 ~
 R11 = 1,000,000 ~

IF PEAK 175 KC

88-880 Chassis



ALIGNMENT DATA

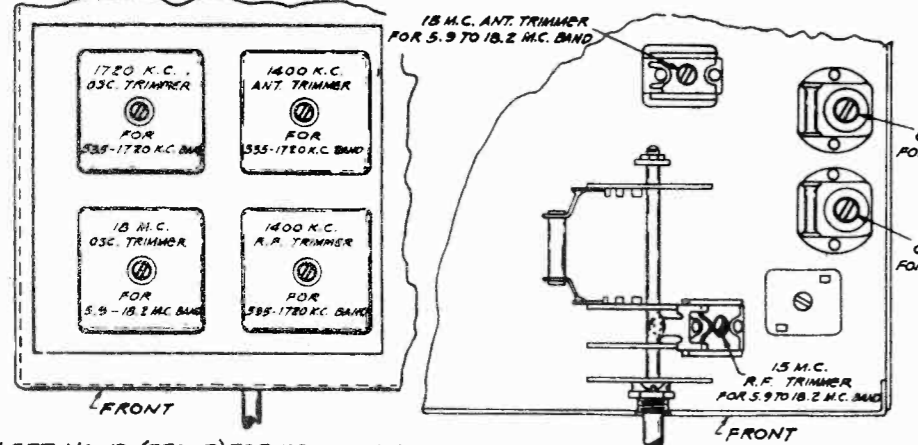
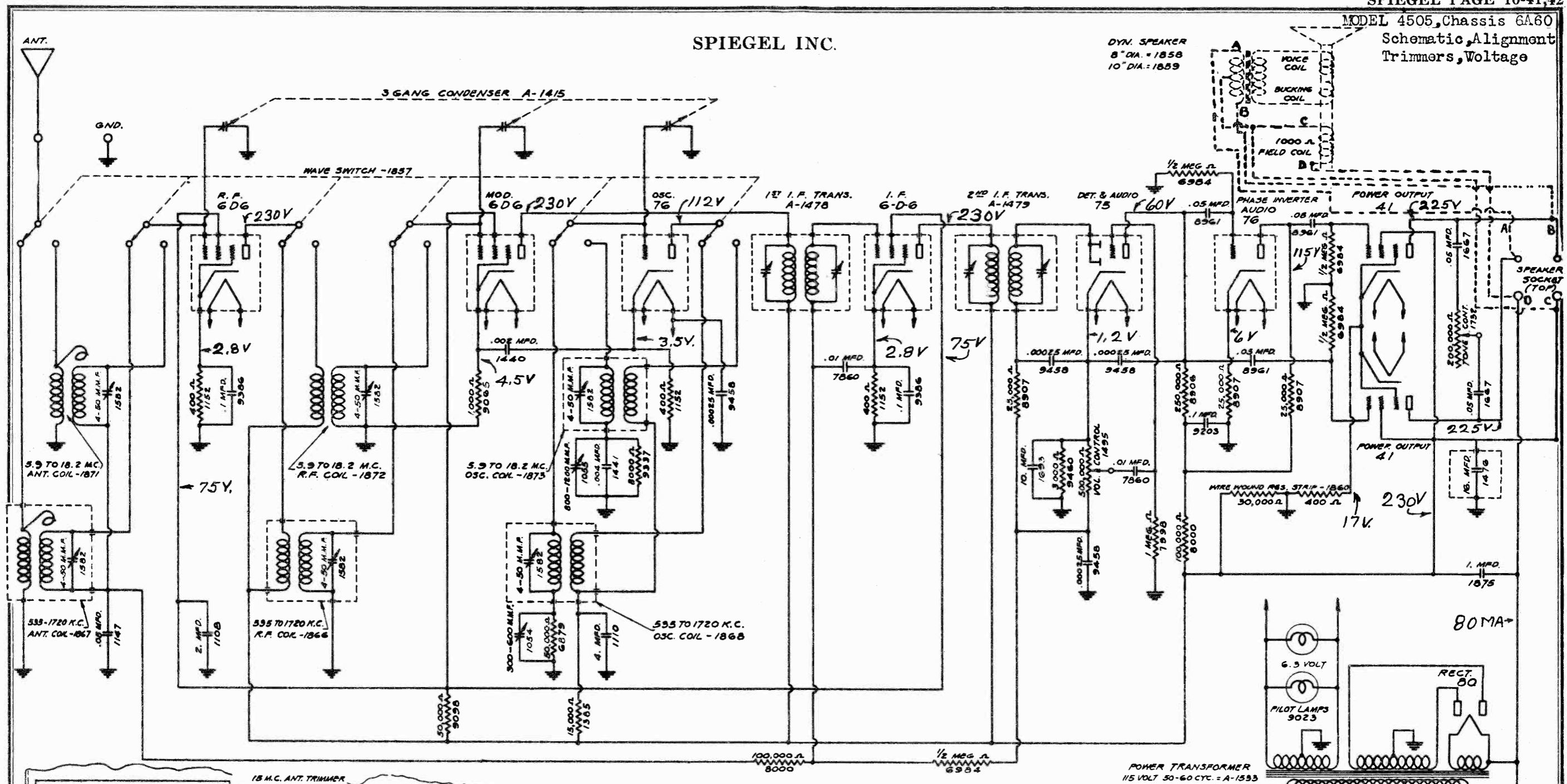
I.F. ALIGNMENT. Adjust the test oscillator to 175 K.C. and connect the output directly to the grid of the first detector tube (6A7), without the use of any series condenser or resistor; the omission of series condenser and resistor to block out the AVC action. The ground on the test oscillator can be connected to the chassis ground. Align the trimmers of the first and second I.F. transformers to peak or maximum reading on the output meter.

OSCILLATOR ALIGNMENT. Adjust the test oscillator to 1400 K.C. and connect the output to the antenna through a .0001 mfd. mica condenser to give the equivalent of a low capacity type average auto antenna. Set the dial pointer to 1400 K.C. and adjust the oscillator trimmer to peak. (Front section of gang condenser.)

R.F. ALIGNMENT. The next step is to adjust the center and rear trimmers of the gang condenser to peak. The center section of the gang condenser tunes the antenna amplifier stage (6D6 tube), and the rear condenser section tunes the detector grid coil of the 6A7 tube.

SPIEGEL INC.

MODEL 4505, Chassis 6A60
Schematic, Alignment
Trimmers, Voltage



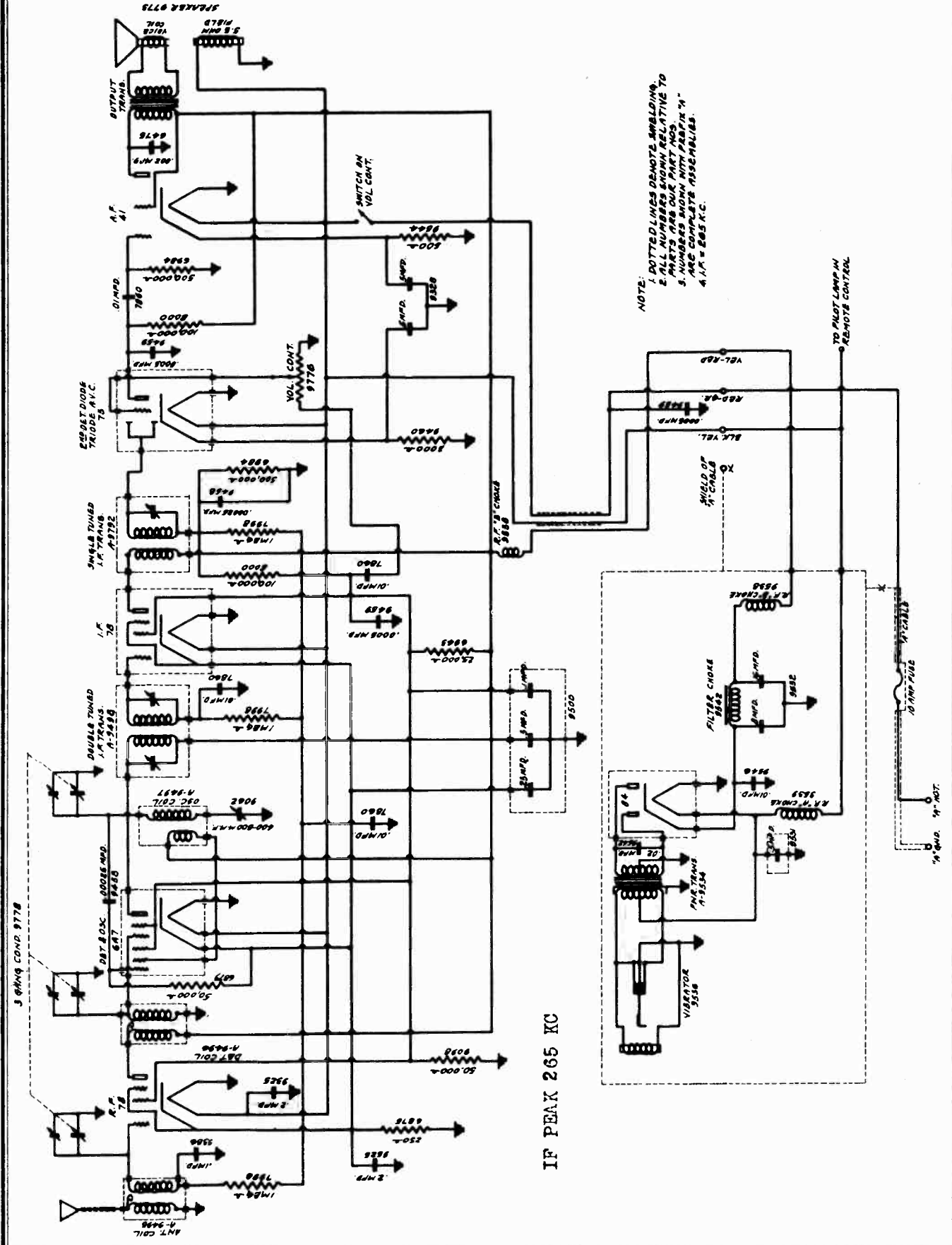
FREQUENCY RANGE -
1720 to 535 KC
5.9 to 18.2 MC

- NOTE:
1. I.F. = 465 K.C.
 2. ALL NOS. SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
 3. NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.

CONVENTIONAL ALIGNMENT - SEE SPECIAL SECTION, VOL. VIII.
Peak I-F trimmers at 465 KC. BROADCAST - Dial and trimmer to 1720 KC, peak oscillator trimmer. Dial and generator to 1400 KC, peak antenna and R-F trimmers. Dial and generator at 600 KC, pad the oscillator circuit for maximum peak, while rooking the variable gang condenser.
FOREIGN - Dial and generator at 18 MC, adjust the oscillator trimmer to peak. Dial and generator to 15 MC, adjust the R-F and antenna trimmers to maximum sensitivity while rooking the variable condenser across the signal. Dial and generator at 6.5 MC, pad the FOREIGN band oscillator circuit to maximum peak while rooking the variable condenser

SPIEGEL INC.

MODEL 4519 Auto
Chassis 603 (1934)
Schematic



SPIEGEL INC.

MODEL 4519 Auto
Chassis 603 (1934)
Voltage, Alignment

TUBE VOLTAGE

Type of Tube	Position of Tube	Fil. Volts	Plate Volts	Cathode Volts	Screen Volts	Grid No.1	Grid No.2	Grid No.3	Grid No.5
78	Radio Frequency	6	225	4	92				
6A7	Oscillator & Modulator	6	225	4		6.2	225	92	92
78	Intermediate Frequency	6	225	4	92				
75	2nd Detector Diode & AVC	6	135	1.5					
41	Output	6	218	15	225				
84	Rectifier	6	260*	235					

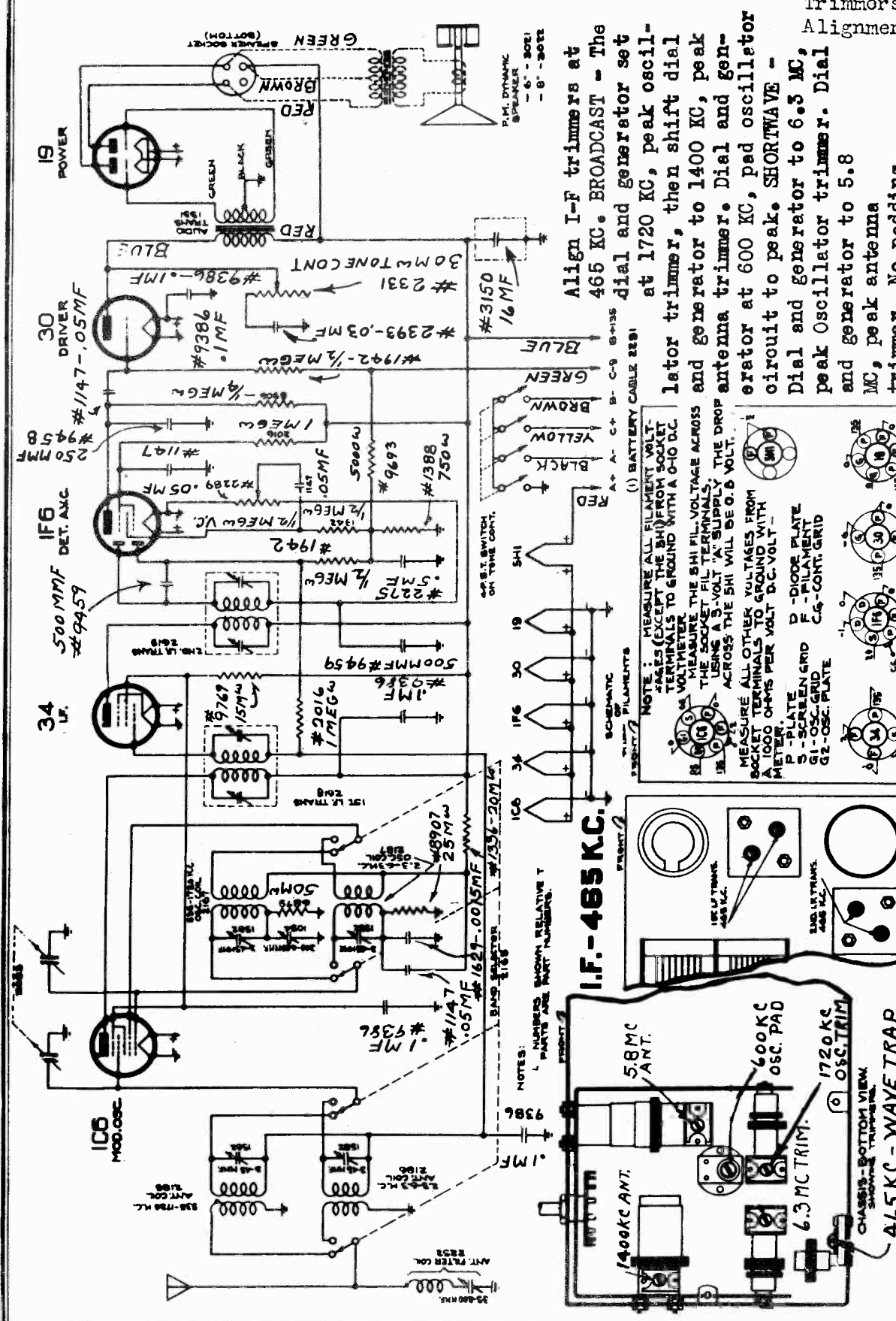
* A.C. each plate
Total "A" current - 6.2 amperes.

INTERMEDIATE FREQUENCY: Unless an intermediate transformer has become defective due to an open or burned out winding it should never be necessary to readjust the intermediate stage. Should this occur it is essential that an oscillator be used with some type of output measuring device to correctly tune the I.F. Transformers. Connect the high side of the oscillator output to the control grid cap (grid No. 4) of the 6A7 oscillator modulator tube leaving the grid cap disconnected. CONNECT A 50,000 OHM RESISTOR FROM THE CONTROL GRID CAP OF THE 6A7 TUBE TO THE ROTOR FRAME OF THE VARIABLE CONDENSER. If the output of the oscillator is too great the value of this resistor may be reduced. The ground side of the test oscillator should be connected to the chassis. Set the oscillator to 265 K.C. (this must be accurate) and adjust the output of the oscillator so that a convenient reading is obtained on the output meter. Align the first intermediate transformer by turning the intermediate frequency transformer trimmer screw up and down until maximum reading is obtained on the output meter. Both the primary and secondary trimmer screws should be adjusted in this manner. It is always best to recheck the grid side of the intermediate frequency transformer adjustment to make certain the alignment of the secondary has not been changed by the adjustment of the primary trimmer. The first I.F. transformer is double-tuned, the trimmers of which are accessible through the top of the I.F. can, one section of which is adjusted by turning the brass hex nut and other section by screwing in and out the set screw that is accessible through the hole provided in the brass hex nut. The second intermediate transformer has but one trimmer which is likewise accessible from the top of the intermediate transformer shield can. After both intermediate transformers are correctly adjusted the alignment of the intermediate stage is complete and the trimmers should not be further disturbed. The grid cap should be connected to the grid of the 6A7 tube and 50,000 ohm resistor removed.

VARIABLE CONDENSER ALIGNMENT: If the intermediate frequency stage has been realigned or if the antenna, R.F. or oscillator coil have been replaced it will be necessary to realign the variable condensers. If the receiver is not mounted in the set housing it will be necessary to place a metal shield along side of the variable condenser and flush against the side of the set chassis nearest the variable condenser trimmers. It is necessary to do this otherwise when the receiver is placed in the set housing the metal housing will detune the receiver. Three holes should be made in the shield to correspond with the hole provided in the set housing which permits alignment of the receiver when the set is in the housing. Be sure the shield is properly grounded to the receiver chassis. NOTE: When the receiver and "B" unite is removed from the set housing be sure to set the receiver on top of the "B" unit, otherwise considerable R.F. and audio hash will be encountered. Regardless of whether the receiver is mounted in the set housing or not the alignment procedure is the same. Adjust the variable condenser to minimum capacity. Connect the high output side of the set oscillator to set antenna lead and the low side to antenna shield lead or chassis. Then adjust the test oscillator to 1500 K. C. Next, BRING THIS SIGNAL IN BY ADJUSTING THE VARIABLE CONDENSER OSCILLATOR SECTION TRIMMER. Looking at the front of the receiver, the variable condenser trimmers are mounted on the left side of the set on the variable condenser and reading from the bottom up the trimmers are, oscillator, R.F. and antenna. After the oscillator section has been properly peaked, adjust the antenna and R.F. trimmers in the order mentioned. After the variable condenser trimmers have been correctly adjusted at 1500 K.C. tune the receiver to 800 K.C. and adjust the oscillator to this frequency. Then adjust the oscillator padding condenser which is located on the lefthand side to the rear of the chassis, to obtain maximum reading on the output meter. If the set is mounted in the receiver housing the padding condenser is accessible through the small hole in the side of the set housing. It may be necessary to turn the variable condenser slightly to the right and left to find the point where greatest output is obtained. If the alignment procedure is correctly followed the receiver will now track correctly over the entire tuning range. It is always advisable to align the receiver with the tubes to be used in the set whenever possible.

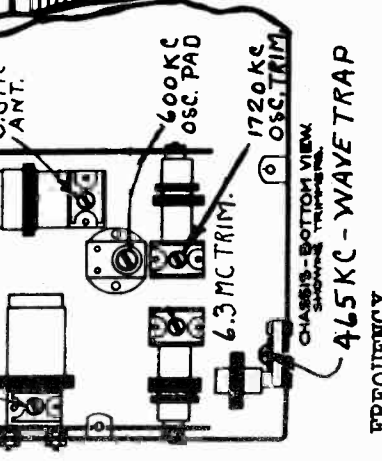
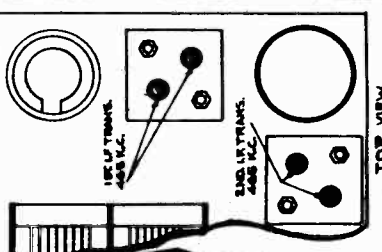
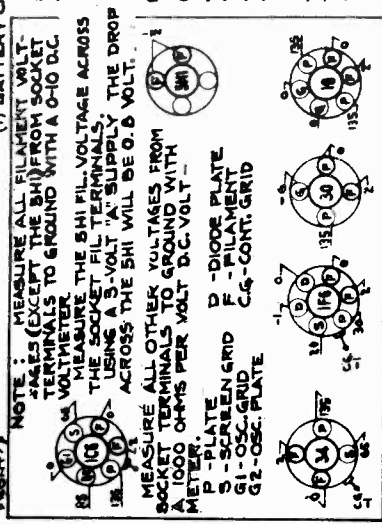
SPIEGEL INC.

MODELS 510C, 5110
Chassis 65B
Schematic, Voltage
Trimmers, Socket
Alignment



I.F. - 465 KC.

Align I-F trimmers at 465 KC. BROADCAST - The dial and generator set at 1720 KC, peak oscillator trimmer, then shift dial and generator to 1400 KC, peak antenna trimmer. Dial and generator at 600 KC, peak oscillator circuit to peak. **SHORTWAVE -** Dial and generator to 6.3 MC, peak oscillator trimmer. Dial and generator to 5.8 MC, peak antenna trimmer. No padding of oscillator circuit is required on the short wave band. When padding the BROADCAST oscillator rock variable condenser. Adjust wavetrap to 465 KC. Repeat all adjustments.



NOTE: MEASURE ALL FILAMENT VOLTAGES (EXCEPT THE SHI) FROM SOCKET TERMINALS TO GROUND WITH A 0-40 D.C. VOLTMETER. THE SHI FIL VOLTAGE ACROSS THE SOCKET FIL TERMINALS USING A 5-VOLT "A" SUPPLY. THE DROP ACROSS THE SHI WILL BE 0.6 VOLT.

MEASURE ALL OTHER VOLTAGES FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHMS PER VOLT D.C. VOLT METER.

P - PLATE
S - SCREEN GRID
G1 - OSC. GRID
G2 - OSC. PLATE

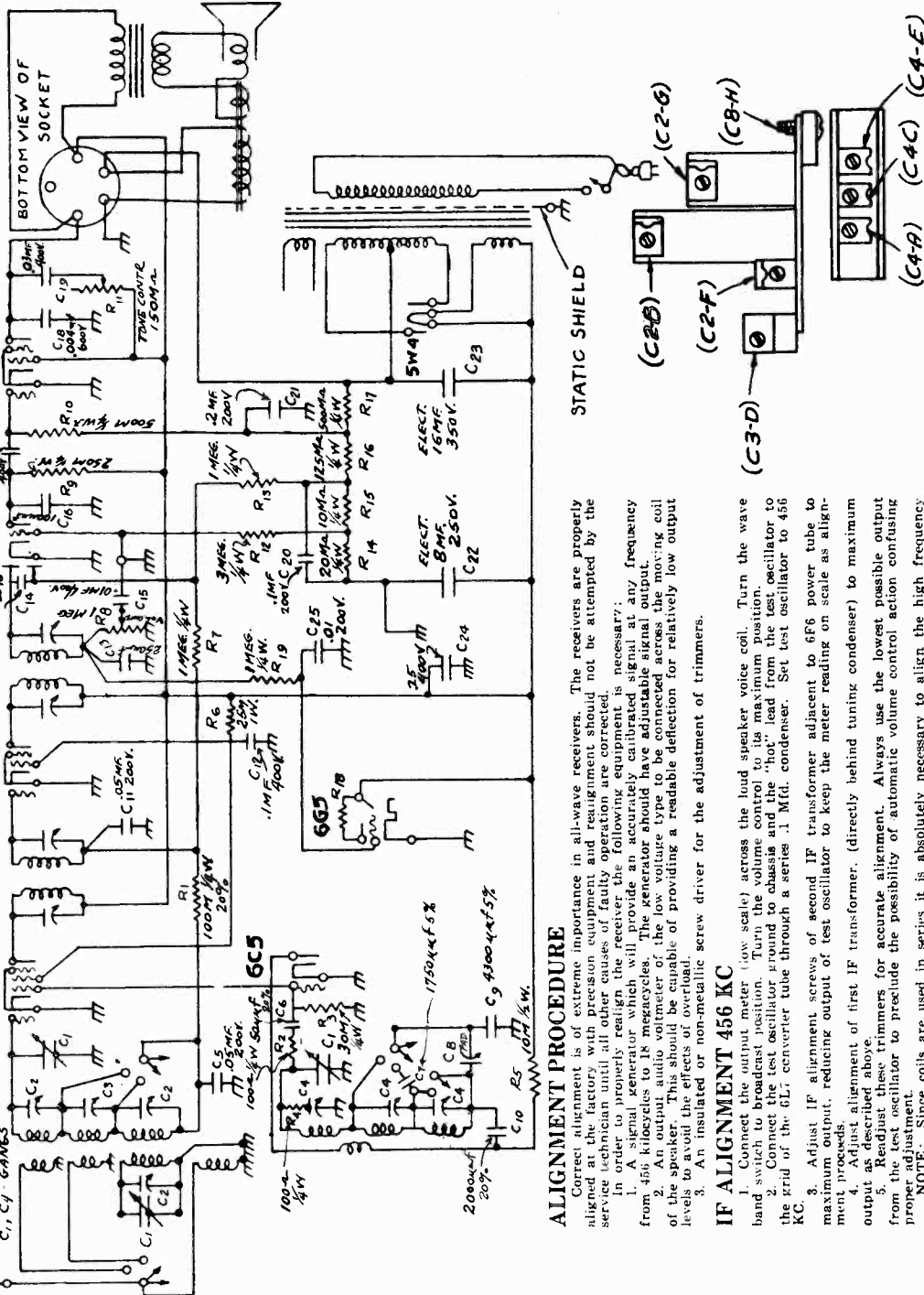
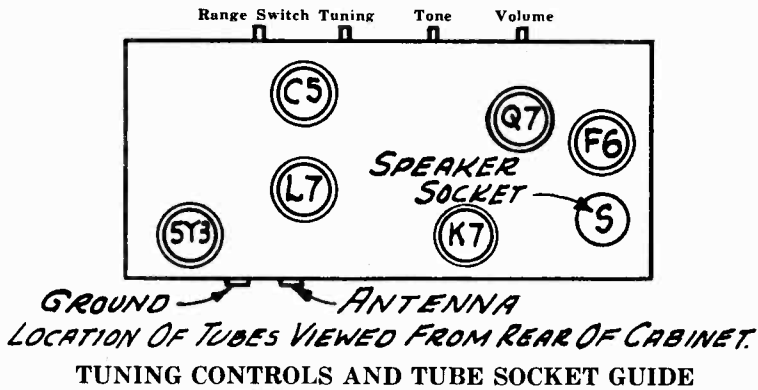
D - DIODE PLATE
F - FILAMENT
C.G. - CONT. GRID

FREQUENCY RANGES -
1720 to 535 KC
2.3 to 6.3 MC

CHASSIS - BOTTOM VIEW
SHOWING I.F. TRIMMERS

TOP VIEW
SHOWING I.F. TRIMMERS

MODELS 6502, 6552, Chas. 7AC
Schematic, Socket, Trimmers, Alignment **SPIEGEL INC.**



TRIMMER LAYOUT

BROADCAST BAND 535 TO 1800 KC

1. With test oscillator connected to antenna and ground through a 200 Mfd. condenser set oscillator and receiver dial to 1600 kilocycles.
2. Adjust broadcast oscillator trimmer (C2-F) for maximum output.
3. Adjust antenna circuit trimmer (C2-G) for maximum output.
4. Adjust prescaler trimmer (C2-H) for maximum output.
5. Set test oscillator and dial to 600 kilocycles and tune in the signal, then adjust broadcast band padding condenser (C2-A) for maximum output. This padding is mounted on the aluminum coil deck near the panel and is adjusted through a hole provided in the back of the chassis pan. Rock the condenser back and forth a degree or two in order to obtain proper maximum.
6. Repeat the 1600 KC adjustments described above for greater accuracy.

ALIGNMENT PROCEDURE

Correct alignment is of extreme importance in all-wave receivers. The receivers are properly aligned at the factory with precision equipment and readjustment should not be attempted by the service technician until all other causes of faulty operation are corrected.

In order to properly realign the receiver the following equipment is necessary:

1. A signal generator which will provide an accurately calibrated signal at any frequency from 455 kilocycles to 16 megacycles.
2. An audio output meter of the low impedance type, having adjustable sensitivity and coil levels to avoid the effects of overload.
3. An insulated or non-metallic screw driver for the adjustment of trimmers.

IF ALIGNMENT 456 KC

1. Connect the output meter (low scale) across the loud speaker voice coil. Turn the wave band switch to broadcast position. Turn the volume control to its maximum position.
 2. Connect the test oscillator ground to chassis and the "hot" lead from the test oscillator to the grid of the 6L7 converter tube through a series .1 Mfd. condenser. Set test oscillator to 456 KC.
 3. Adjust IF alignment screws of second IF transformer adjacent to 6F6 power tube to maximum output, reducing output of test oscillator to keep the meter reading on scale as alignment proceeds.
 4. Adjust alignment of first IF transformer. (directly behind tuning condenser) to maximum output as described above.
 5. Readjust these trimmers for accurate alignment. Always use the lowest possible output from the test oscillator to preclude the possibility of automatic volume control action confusing proper alignment.
- NOTE:** Since coils are used in series it is absolutely necessary to align the high frequency bands first, in the order indicated.

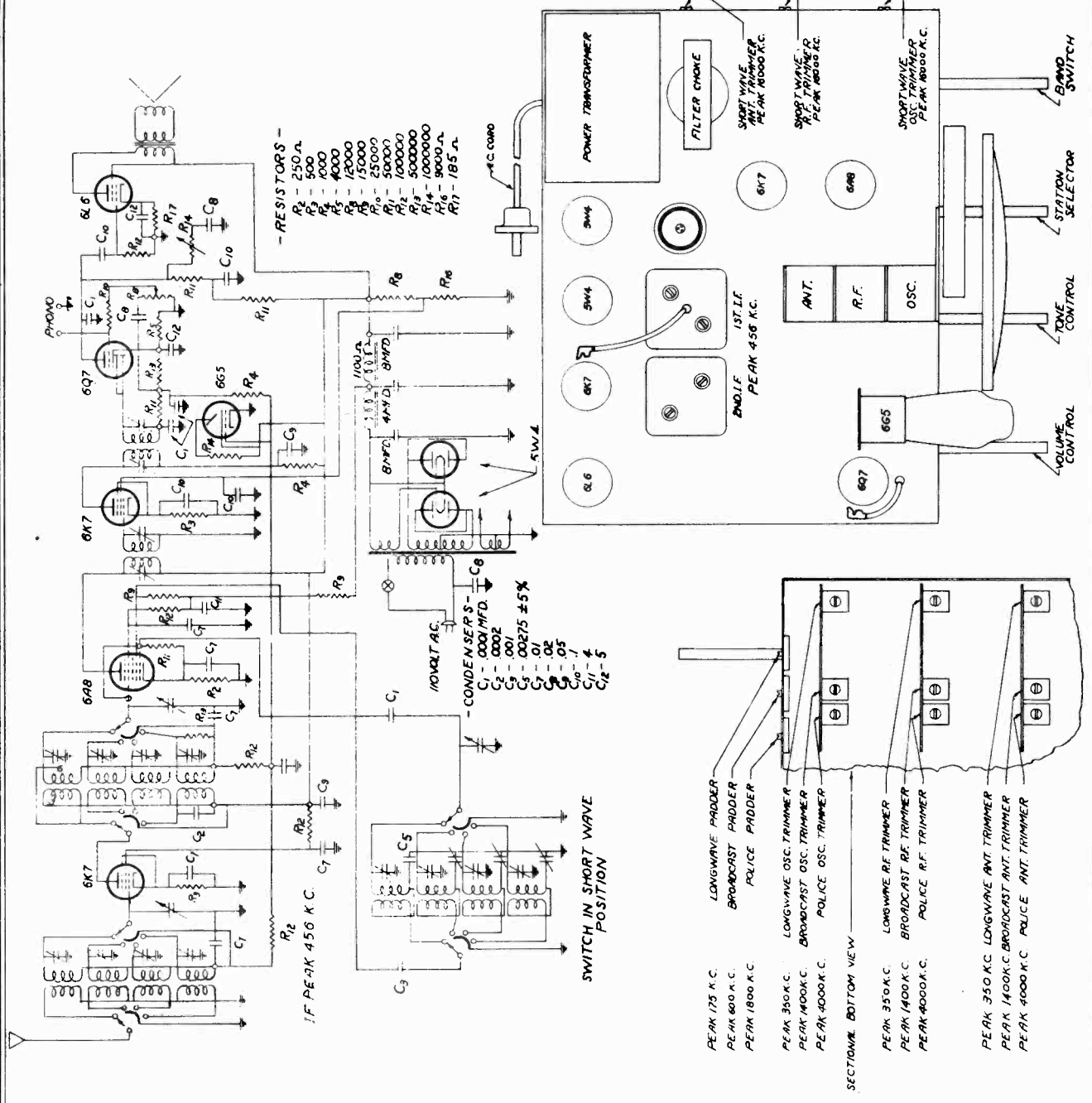
FOREIGN BAND 5.7 TO 18.5 MEGACYCLES

1. With test oscillator connected to the antenna and ground terminals through a 400 ohm resistor set oscillator at 16 megacycles.
2. Set the dial scale to 16 megacycles and adjust the oscillator trimmer condenser (C4-A) to resonance using the counterclockwise or low capacity point.
3. Adjust input circuit trimmer (C2-B) to maximum response, rocking the gang condenser back and forth a degree or two to obtain proper maximum.

POLICE OR MIDDLE BAND 1.75 TO 5.8 MEGACYCLES

1. With the test oscillator connected as above set the oscillator and dial to 5.5 megacycles.
2. Adjust oscillator trimmer condenser (C4-C) for maximum response using the counterclockwise or low capacity point.
3. Adjust input circuit trimmer (C3-D) to maximum response rocking the gang condenser as described above.

MODELS 6506, 6554, Chas. A.M.S
 SPIEGEL INC. Schematic, Socket, Trimmers, Alignment

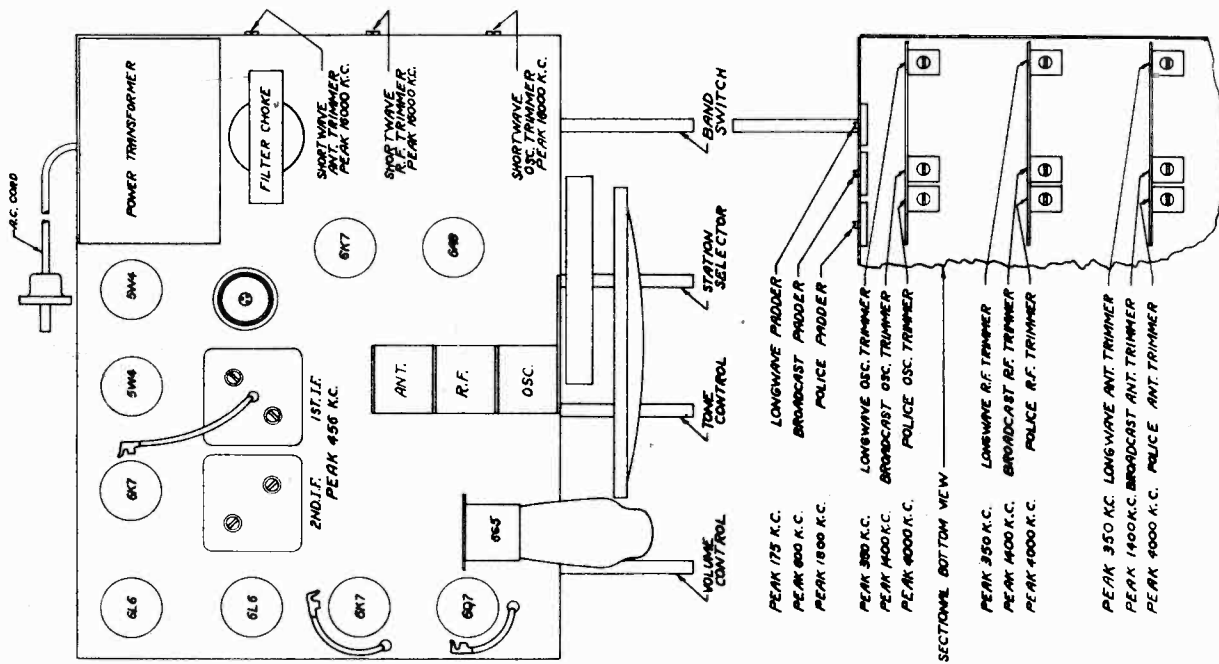
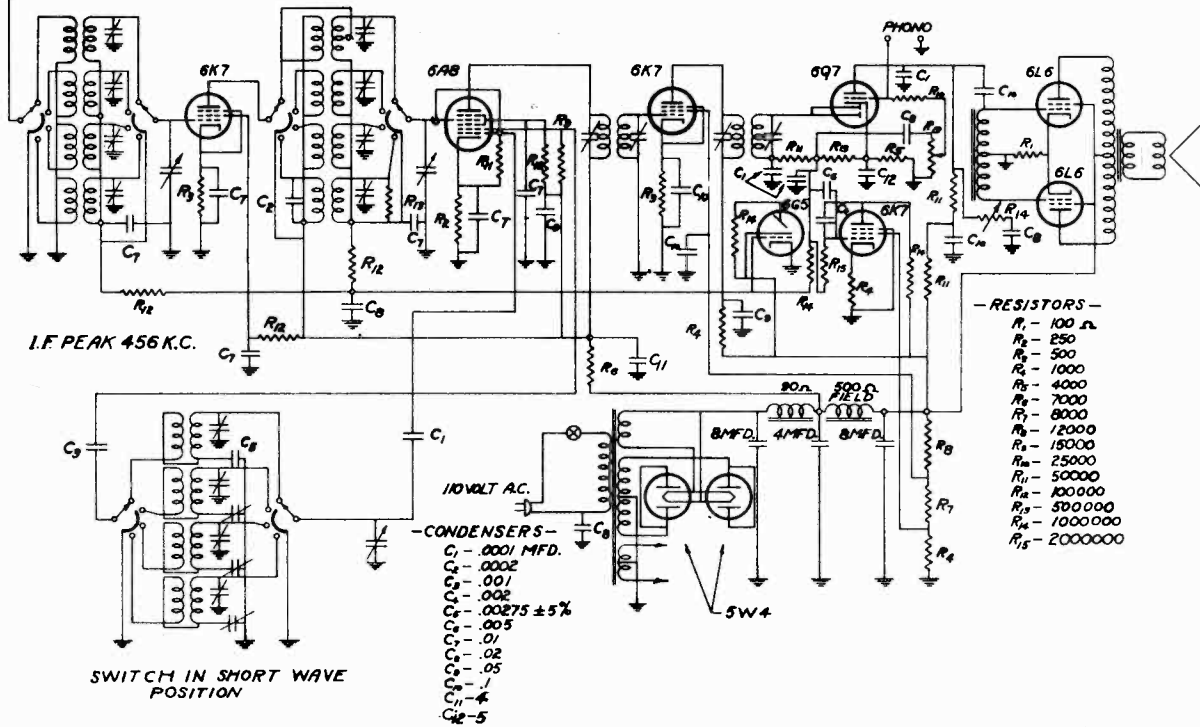


This radio receiver is designed for operation on standard American broadcasts, Police, Amateur, aviation, ships, foreign and U. S. governmental time and weather broadcasts. This vast coverage in radio entertainment and utility is divided into four parts or bands indicated on the tuning dial and the wave band indicating device.

The dial is calibrated with each band covering 340 degrees of tuning scale length and are each concentric with the center of the dial face. The innermost scale is calibrated from 150 to 375 K.C. (2000 to 800 meters) and covers the range necessary for receiving governmental time and weather reports. The second band from the center is for standard broadcasts covering from 550 to 1700 K.C. (175 to 545 meters). The third band from the center covers the intermediate short wave length broadcasts of Police, Amateur, Aircraft and ships and extends from 1700 to 5400 K.C. (55 to 180 meters). The fourth band covers all of the principle short wave channels for reception from countries all over the world. This band carries a calibration of from 5.5 to 18 megacycles (16.4 to 55 meters.) This short wave scale is the one which includes the five internationally assigned bands—the 19, 25, 31, 39 and 49 meter channels.

MODELS 6508, 6556, Chas. AM6
Schematic, Socket
Alignment, Trimmers

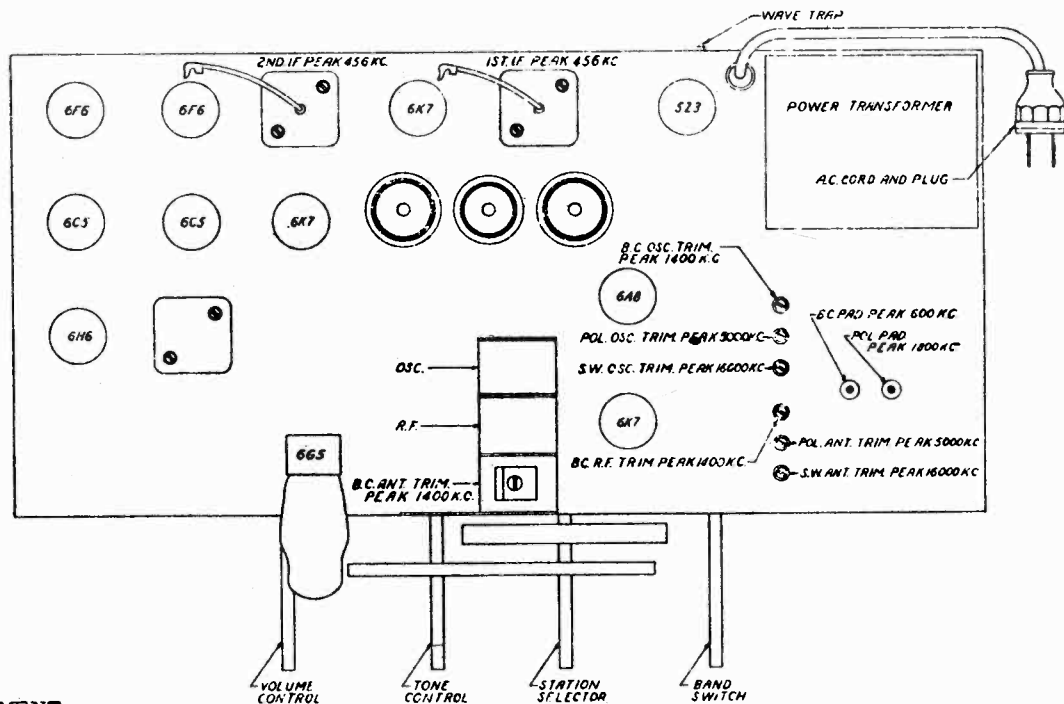
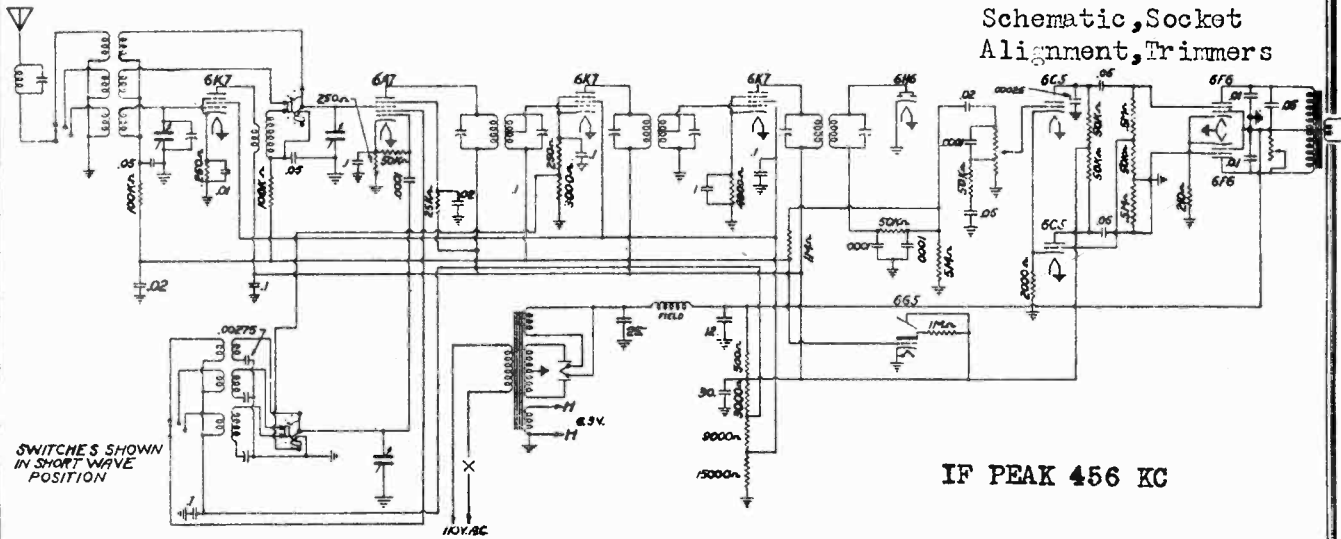
SPIEGEL INC.



The dial is calibrated with each band covering 340 degrees of tuning scale length and are each concentric with the center of the dial face. The innermost scale is calibrated from 150 to 375 K.C. (2000 to 800 meters) and covers the range necessary for receiving governmental time and weather reports. The second band from the center is for standard broadcasts covering from 550 to 1700 K.C. (175 to 545 meters). The third band from the center covers the intermediate short wave length broadcasts of Police, Amateur, Aircraft and ships and extends from 1700 to 5400 K.C. (55 to 180 meters). The fourth band covers all of the principle short wave channels for reception from countries all over the world. This band carries a calibration of from 5.5 to 18 megacycles (16.4 to 55 meters.) This short wave scale is the one which includes the five internationally assigned bands—the 19, 25, 31, 39 and 49 meter channels.

SPIEGEL, INC.

MODELS 5054, 5062, 6570
 6580, 6582, 6590
 Chassis AM7
 Schematic, Socket
 Alignment, Trimmers



ALIGNMENT

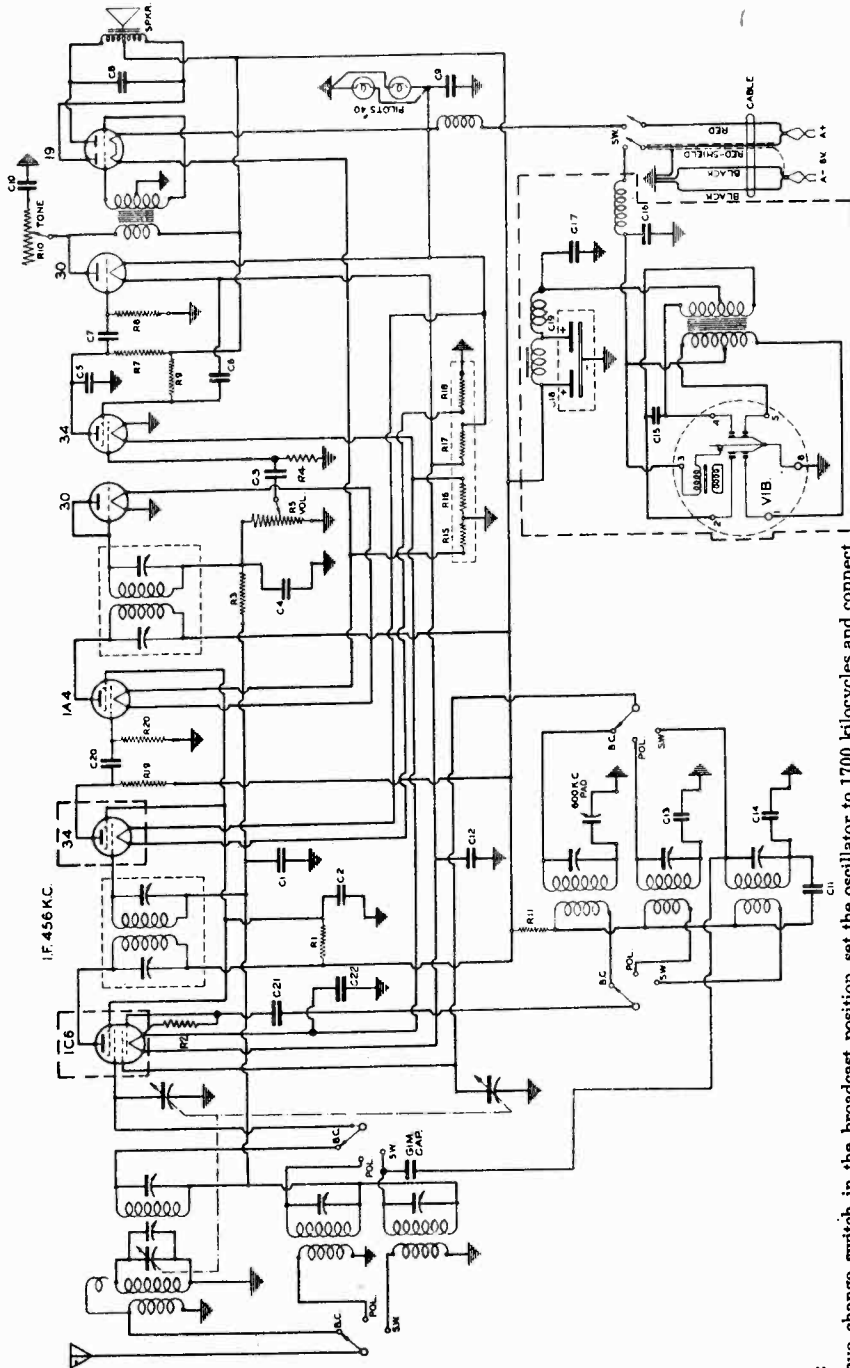
IF trimmer adj. at 456 KC through .05 or .1 mf dummy condenser.
BC osc. trimmer and ant. trimmer adj. at 1400 KC through .001 mf dummy.
Padder at 600 KC. Recheck at 1400 KC.
Foreign Band: Through .0001 mf dummy, adj. at 14000 KC both the S.W. oscillator and S.W. trimmers. Check for image frequency at 13100 KC for proper weaker signal.
Police Band: Through 400 ohm resistor .0001 mf cond. series dummy, adjust osc. trimmer and ant. trimmer at 4000 KC. Padder adj. 1800 KC. Recheck at 4000 KC.
Wave Trap: At rear of chassis near grd. & ant. post adj. wave trap screw at 456 KC.
Dial Calibration - Government & Weather Reports - 150 to 375 KC.
 Broadcast 550 to 1700 KC.
 Police, Amateur, Aircraft & Ships 1700 to 5400 KC.
 Short Wave 5.5 to 18 megacycles.

MODELS 5256, 5260, 6760, 6770
 6776 Chassis 700
 Schematic, Socket, Alignment

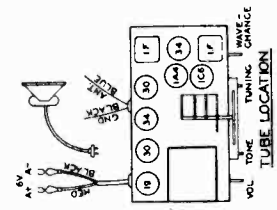
SPIEGEL INC.

I. F. Alignment:

Connect the oscillator through a .1 condenser to the grid of the 1C6 tube and set the oscillator to 456 kilocycles. Peak each I. F. stage to resonance as indicated by maximum output on the output meter.



LEGEND		W/D
R1	25M OHMS	
R2	50M	
R3	1MEG	
R4	500M	
R5	100M	
R6	1MEG	
R7	50M	
R8	5M	
R9	20	
R10	30	
R11	33	
R12	50M	
C1	.01	
C2	.00025	
C3	.0003	
C4	.0003	
C5	.0003	
C6	.1	
C7	.05	
C8	.1	
C9	.05	
C10	.03	
C11	.001	
C12	.005	
C13	.0027	
C14	.0075	
C15	.0075	
C16	.01	
C17	.01	
C18	.01	
C19	.01	
C20	.001	
C21	.001	
C22	.1	



7-Tube, 6-Volt Battery Operated Superheterodyne

R. F. Alignment:

With the wave change switch in the broadcast position, set the oscillator to 1700 kilocycles and connect in series with a .00025 condenser to the antenna of the receiver. Rotate the variable condenser to the 1700 setting of the dial and adjust the trimmer condenser of the broadcast oscillator to resonance. This trimmer is located on the right side of the chassis, second position from the front. Reset the test oscillator to 1400 kilocycles and adjust the antenna trimmer located on rear section of variable condenser. Adjust 1st detector trimmer under the chassis across preselector. Now set oscillator to 600 kilocycles and adjust padder located on side of chassis. Check alignment at 1000 kilocycles.

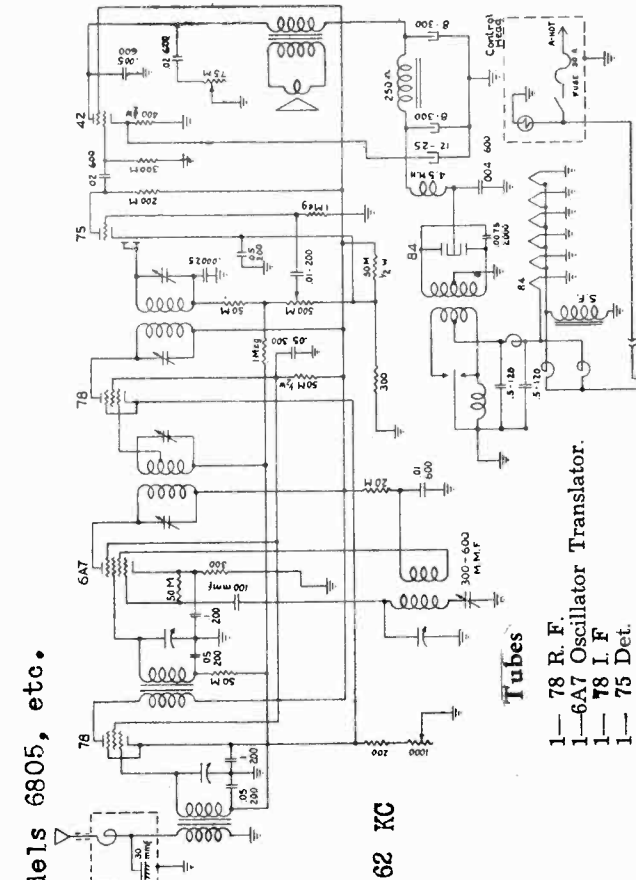
For aligning the police band, set test oscillator to 5 megacycles and switch to the police band position on the set. With the condenser rotated to this frequency setting as indicated on the dial, adjust oscillator trimmer located on the right side of the chassis, first position from the front. Now adjust antenna trimmer located on the front of the chassis, left position, to resonance.

The short wave band is aligned by setting the condenser to 18 megacycles and adjust the oscillator trimmer located on the right side of the chassis, third position from the front to resonance with an 18 megacycle signal from the test oscillator. Turn dial to 16 M. C. Set test oscillator to 16 M. C. and adjust antenna trimmer through right hand hole in front of chassis, rocking variable condenser slightly back and forth to get maximum peak.

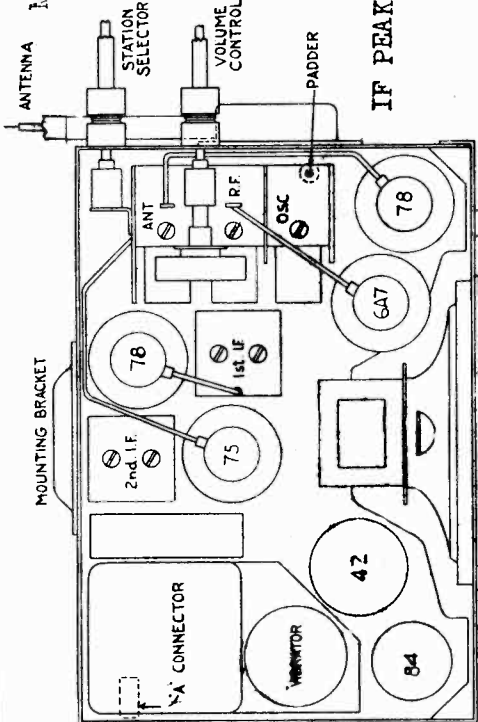
MODELS 6512, 6542, 6566
Chassis 14-142ES
Schematics, Socket, Trimmers
Alignment

SPIEGEL INC.

MODELS 6805 to 6808 inc.
6815 to 6818 inc. 6836
Chassis 14-112S



Models 6805, etc.



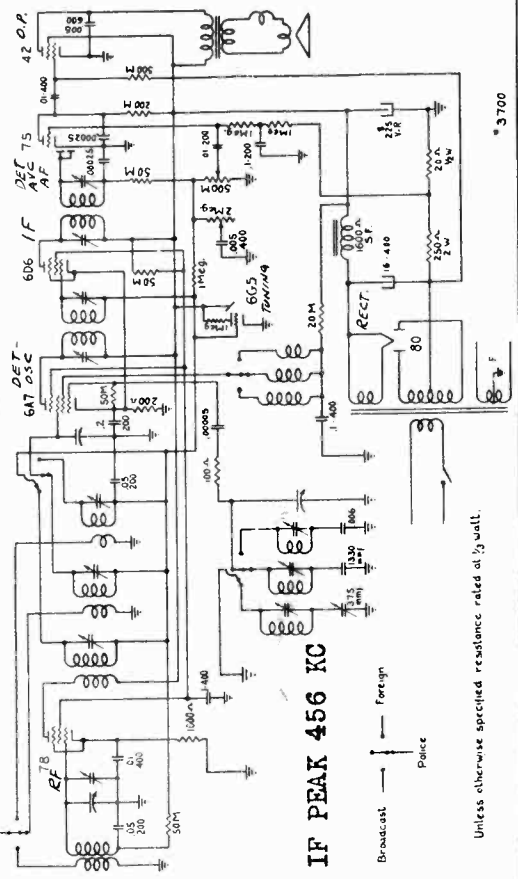
Tubes

- 1- 78 R. F.
- 1- 6A7 Oscillator Translator.
- 1- 78 I. F.
- 1- 75 Det.
- 1- 42 Output.
- 1- 84 Rectifier.

ALIGNMENT FREQUENCIES:
IF 262 KC thru .1mf dummy
OSC. 1570 KC thru .00025 mf dummy
Ant. & RF 1400 KC " "
PADDER 600 KC " "

FOR CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION VOL. VIII

Models 6512, etc.



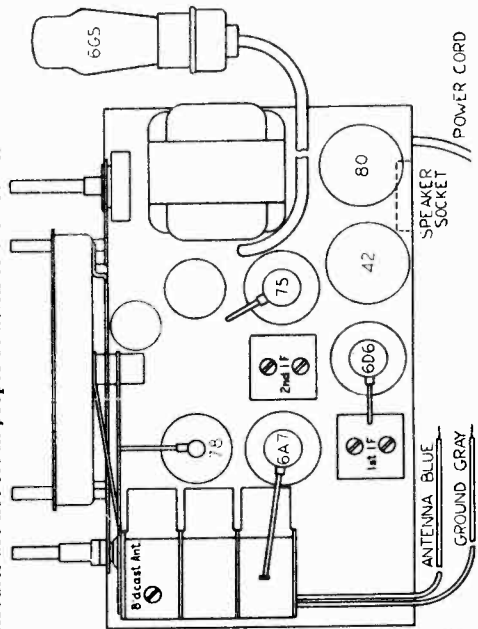
Alignment Frequencies

- Antenna Broadcast 1500KC 5000KC 1400KC
- Foreign Police 2000KC 2000KC Dummy
- 400 " dummy
- Padder 600KC
- Oscillator 260000
- Foreign Police Broadcast 15700KC 5400KC 1660 KC
- 400 " dummy

IF PEAK 456 KC

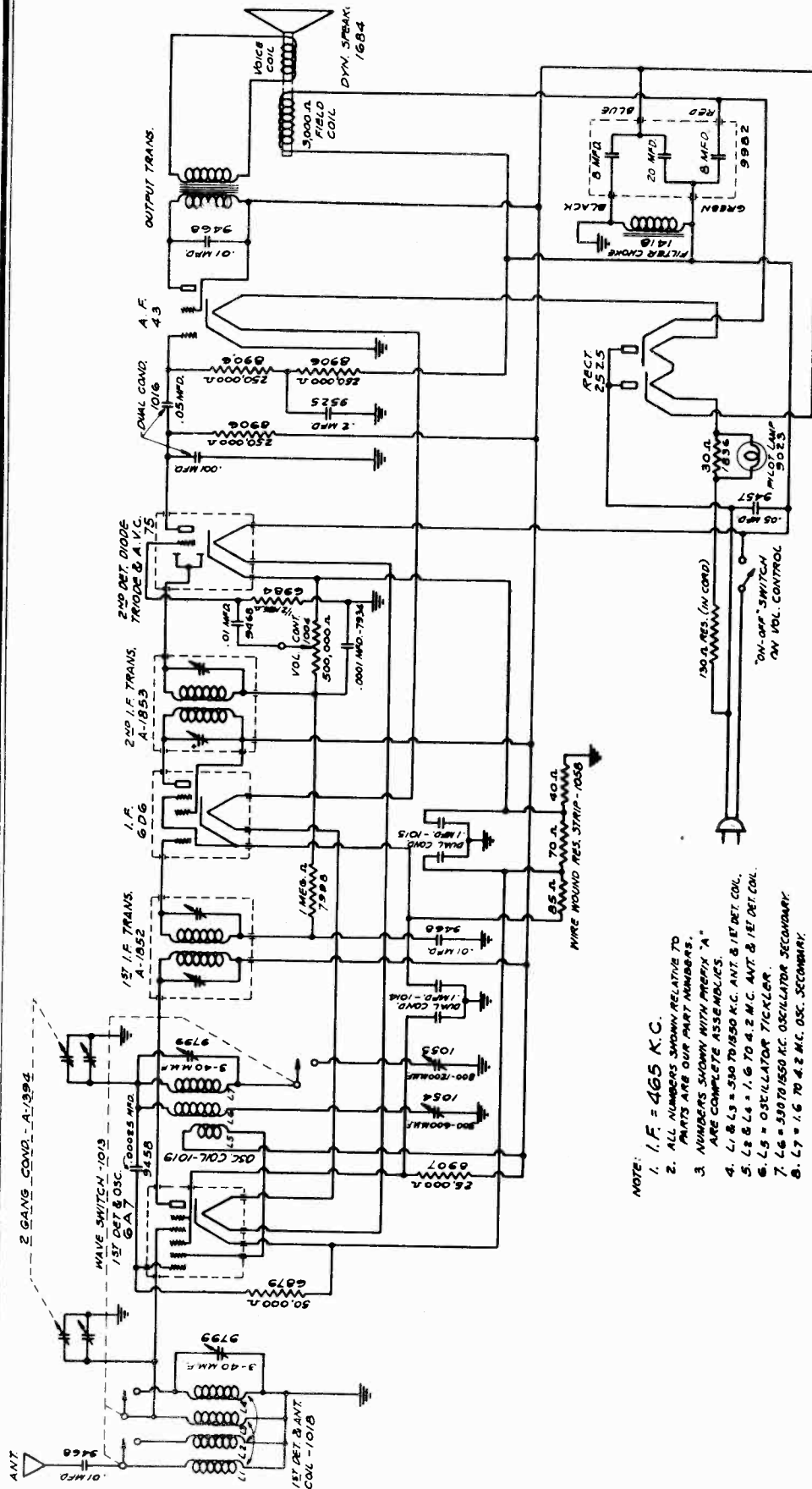
Unless otherwise specified resistance rated at 1/2 watt.

procedure for alignment at 15,000 kc must be followed exactly to insure proper tracking. A dead spot at about 12,000 kc will result if antenna and oscillator circuits are not set in proper relation to each other.



MODEL 9907, Chassis 5258
Schematic, Voltage Alignment

SPIEGEL INC.



NOTE:
1. I.F. = 465 K.C.
2. ALL NUMBERS SHOWN RELATIVE TO PARTS ARE OUR PART NUMBERS.
3. NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.
4. L1 & L3 = 530 TO 1850 K.C. ANT. & 1ST DET. COIL.
5. L2 & L4 = 1.6 TO 4.2 M.C. ANT. & 1ST DET. COIL.
6. L5 = OSCILLATOR TICKLER.
7. L6 = 330 TO 1550 K.C. OSCILLATOR SECONDARY.
8. L7 = 1.6 TO 4.2 M.C. OSC. SECONDARY.

TWO BAND FIVE TUBE AC/DC SUPERHETERODYNE 1550-540 Kilocycles 1.5- 4.8 Megacycles

CONVENTIONAL ALIGNMENT:
ALIGNMENT FREQUENCIES
IF 465 KC (Leave grid cap disconnected)
BROADCAST 1400 KC, 600 KC.
SHORT WAVE 1700 KC, 3.4 MC.
Align in order given, - check
SEE SPECIAL SECTION VOL. VIII.

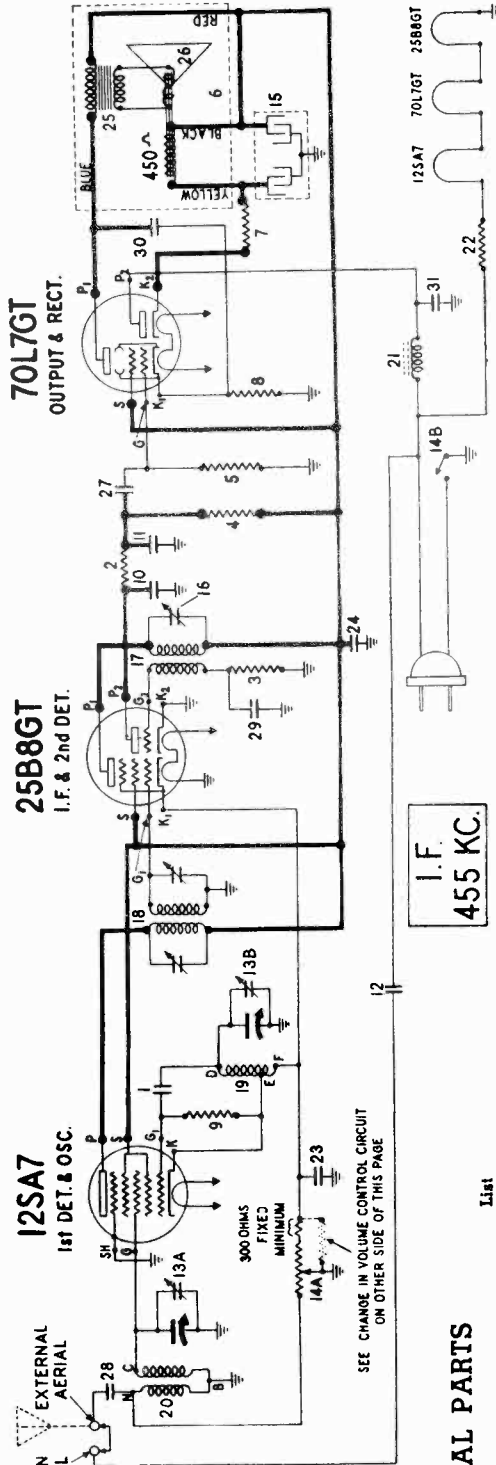
VOLTAGE TABLE
Line Voltage : 115

TUBE	FIL.	PLATE	SCREEN	CATHODE	GRID NO. 2	GRID NO. 3 and 5
6A7 Modulator and Oscillator	6	105	60	1.8	100	60
6D6 I. F. Amplifier	6	105	105	2.7		
75 2nd Det. Diode, Triode & AVC	6	40*		5		
43 Output	24	100	105	18**		
2525 Rectifier	24					

* Triode plate voltage. Comparative only is not the true voltage applied. The voltmeter, when readings are taken at this point, is in series with a very high resistance.
** Bias for the 43 output tube is obtained by the voltage drop across the filter choke. Read bias voltage from cathode to negative side of filter choke.

STEWART-WARNER CORP.

MODEL A6 Air Pal,
Chassis 07-31
Schematic, Voltage, Socket



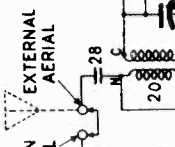
70L7GT
OUTPUT & RECT.

25B8GT
I.F. & 2nd DET.

12SA7
1st DET. & OSC.

I.F.
455 KC.

SEE CHANGE IN VOLUME CONTROL CIRCUIT
ON OTHER SIDE OF THIS PAGE



BUILT-IN AERIAL
EXTERNAL AERIAL
ANTENNA COIL
DIAGRAM NO 70
PART NO 116612

OSCILLATOR COIL
DIAGRAM NO 19
PART NO 116609

NOTE
TERMINALS OF COILS SHOWN IN
PICTORIAL VIEWS ABOVE ARE
LETTERED TO CORRESPOND TO
SIMILARLY LETTERED TERMINALS
ON THE CIRCUIT DIAGRAM

ELECTRICAL PARTS

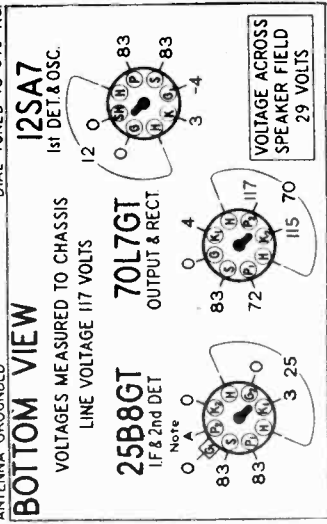
Diagram Number	Part Number	Description	List Price
1	83783	Condenser—mica 110 mmf.	\$0.20
2	110566	Resistor—carbon 33,000 ohms 1/4 watt.	.12
3-4-5	112971	Resistor—insulated 470,000 ohms 1/4 watt	.15
6	R-115053	Speaker—dynamic 3"	4.00
7	116013	Resistor—wire wound 50 ohms 1 watt.	.18
8	116064	Resistor—insulated 100 ohms (10%) 1/2 watt	.14
9	116086	Resistor—insulated 68,000 ohms (10%) 1/4 watt	.12
10-11-12	116224	Condenser—mica 260 mmfd. 500 volt.	.15
13A-13B	116578	Condenser—2 gang	2.50
14A-14E	116579	Volume control—20,000 ohms, with switch	1.10
15	116587	Condenser—electrolytic 20-20 mfd. 150 volt	.95
16	116599	Trimmer condenser (2nd I.F.)	.15
17	116603	Transformer—2nd I.F.	.70
18	116605	Transformer—1st I.F.	.80
19	116609	Coil—oscillator	.34
20	116612	Coil—antenna	.60
21	116616	R. F. Choke coil.	.32
22	116618	Resistor—65 ohms (10%), 2 W. w. w.	.20
23-24	116625	Condenser—1 mfd. 600 volt.	.25
25	R-116633	Transformer—output for R-115053 speaker	1.50

MISCELLANEOUS PARTS

Diagram Number	Part Number	Description	List Price
26	R-116635	Cone & Voice coil assembly for R-115053 speaker	1.45
27	116640	Condenser—.01 mid. 600 volt.	.15
28	116647	Condenser—.004 mfd. 600 volt.	.15
29	116819	Condenser—.05 mid. 600 volt.	.20
30-31	116893	Condenser—.02 mid. 600 volt.	.15
Part Number	Description	List Price	
116637	Cabinet—(walnut)	\$2.65	
116657	Cabinet (sprayed ivory) for 07-313	2.65	
112745	Clip—coil mounting	.01	
116576	Insulator—fibre for base (inside)	.04	
116716	Insulator—fibre for base (outside)	.06	
116532	Knob—volume control (red)	.18	
116533	Knob—tuning (red)	.18	
116886	Knob—volume control (ivory)	.24	
116887	Knob—tuning (ivory)	.24	
116584	Rubber foot for bottom of cabinet	.02	
116629	Screw—No. 8-32x1 1/2 Bind. H.M.S.	.01	
116630	Screw—No. 8-32x1 1/2 Bind. H.M.S.	.01	
116583	Terminal Strip (for antenna)	.12	
116592	Tube shield	.10	

SOCKET VOLTAGES

VOLUME CONTROL SET AT MAXIMUM VOLUME POSITION
DIAL TUNED TO 540 KC
ANTENNA GROUND



REAR OF CHASSIS

NOTE A: Due to the high resistance of resistor No. 4, only a small voltage will be read on a meter having a resistance of 1000 ohms per volt.

May 26, 1959

MODEL A6, Air Pal
Chassis 07-31
Alignment, Trimmers
Antenna Notes, Change

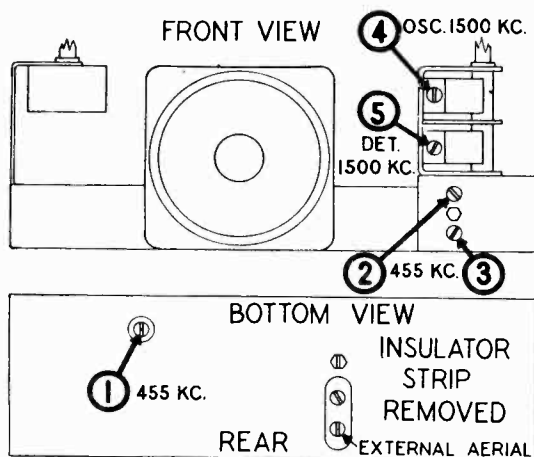
STEWART-WARNER CORP.

ALIGNMENT PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. Solder the output meter leads from output plate (P₁) to screen (S) of the 70L7GT tube (See voltage chart). The leads must be soldered since the bottom cover must be replaced during alignment. The output meter leads can be brought through the power cord opening.
2. Connect the ground lead of the signal generator through a .25 mfd. condenser to some portion of the chassis in the VICINITY OF THE GANG CONDENSER.
3. Remove the connector between the antenna terminals on the bottom of the set.
4. Turn the volume control to the maximum volume position and keep it in this position while aligning.
5. The tuning knob should be adjusted so that the nick which appears on the outer part of the knob is accurately centered and points away from the chassis when the gang condenser is in full mesh.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Lug on bottom gang condenser	455 KC	Any point where it does not affect signal	1	2nd I.F.	Adjust for maximum output. Then repeat adjustment. (If the set oscillates, see precautions under heading "I. F. Oscillation".)
				2-3	1st I.F.	
200 MMFD. Mica Condenser	Antenna Terminal on bottom (Terminal nearest back of chassis)	1500 KC	1500 KC	4	Broadcast Oscillator (Shunt)	Adjust trimmer for maximum output.
200 MMFD. Mica Condenser	Antenna Terminal on bottom (Terminal nearest back of chassis)	1500 KC	Tune to 1500 KC Generator Signal	5	Broadcast Antenna	Adjust for maximum output.



CHANGE IN VOLUME CONTROL CIRCUIT

On early releases of this model, a volume control was used which required a 4700 ohm resistor connected as shown by the dotted lines in the circuit diagram. In later production sets, a volume control with a different taper was used so the 4700 ohm resistor was not required. This later volume control carries the same part number.

When replacing a control using the resistor with a later type control, the connections are the same but the 4700 ohm resistor is omitted. Only the new controls are carried in stock by Stewart-Warner.

I. F. OSCILLATION

When aligning this set, I. F. oscillation may be encountered if the following precautions are not observed:

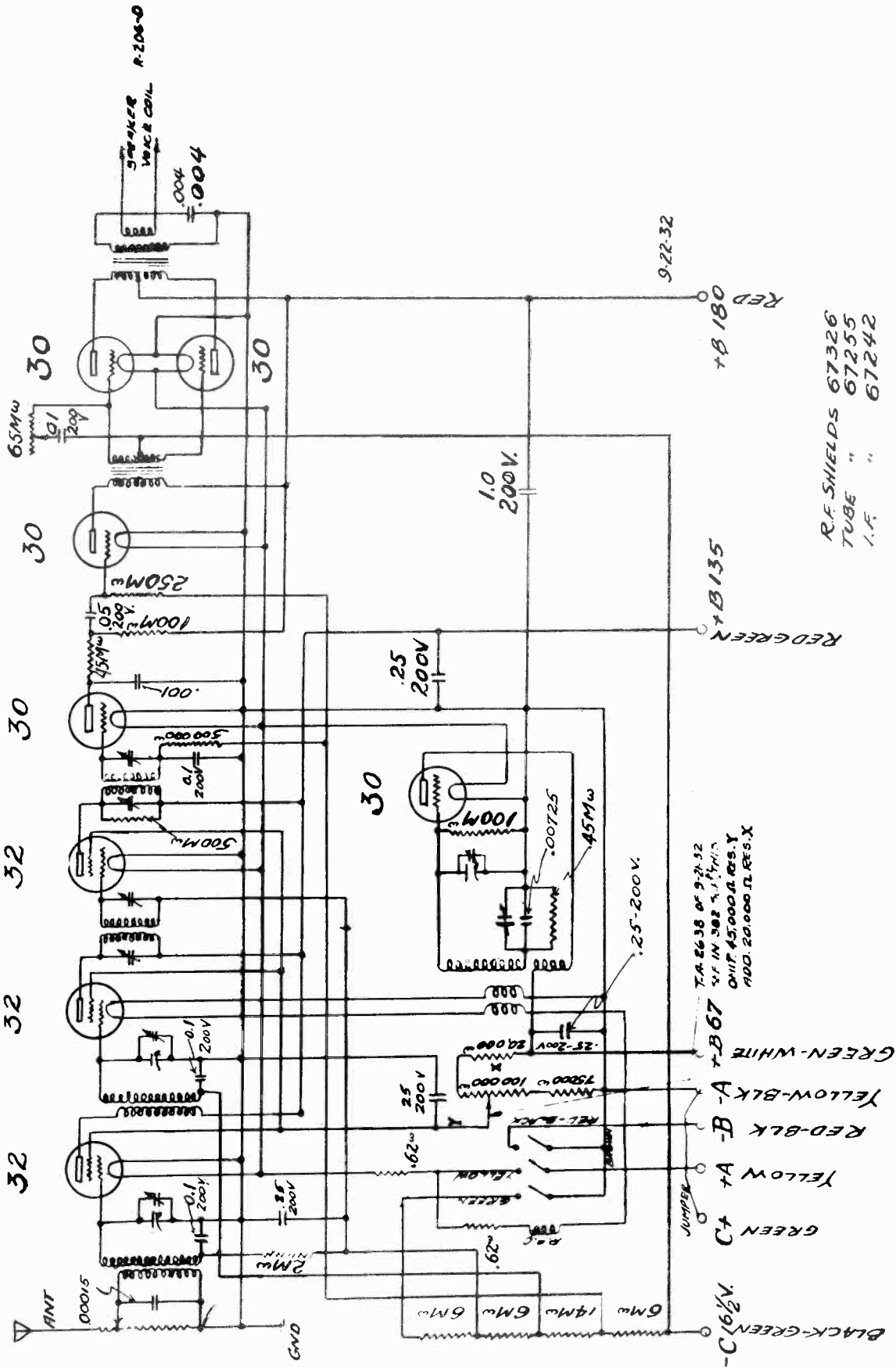
1. Keep the bottom cover plate on during alignment.
2. Keep the signal generator leads as far from the chassis as possible in order to prevent unnecessary feed-back.
3. Connect the ground lead of the signal generator through a .25 mfd. condenser to some part of the chassis in the VICINITY OF THE GANG CONDENSER.
4. Keep the orange lead of the volume control away from the 2nd I.F. transformer. Separating this lead from the others surrounding it at the base of the 25B8GT tube will also help.

BUILT-IN ANTENNA SYSTEM

The Built-In Antenna incorporated in this receiver will generally give very satisfactory results in localities where powerful broadcast stations exist. This Built-In Antenna will function when the terminals on the bottom of the chassis are connected together. In cases where noise is excessive or greater sensitivity is desired, remove the jumper connecting these terminals and connect an external antenna to the terminal marked "External Aerial." This is the terminal nearest the back of the set.

The Built-In Antenna Condenser No. 12 couples the primary of the antenna coil to one side of the power line, which acts as the antenna. The R. F. choke No. 21 is an iron-core choke whose impedance is high at broadcast frequencies. This choke serves to prevent condenser No. 31 from by-passing the signal voltage picked up by the power line. It also prevents feed-back into the antenna circuit of radio frequency energy generated in the set itself.

When aligning this receiver, the jumper connecting the antenna terminals on the bottom of the set should be removed. This will prevent picking up signals which might interfere with the alignment procedure.



STEWART-WARNER CORP.

910-1111 to 910-1119 inc Chassis 910-1111 Schematic, Voltage

MODELS 91-1111 to 91-1119 inc Chassis 91-1111 98-1111 to 98-1119 inc Chassis 98-1111 6V6G OUTPUT

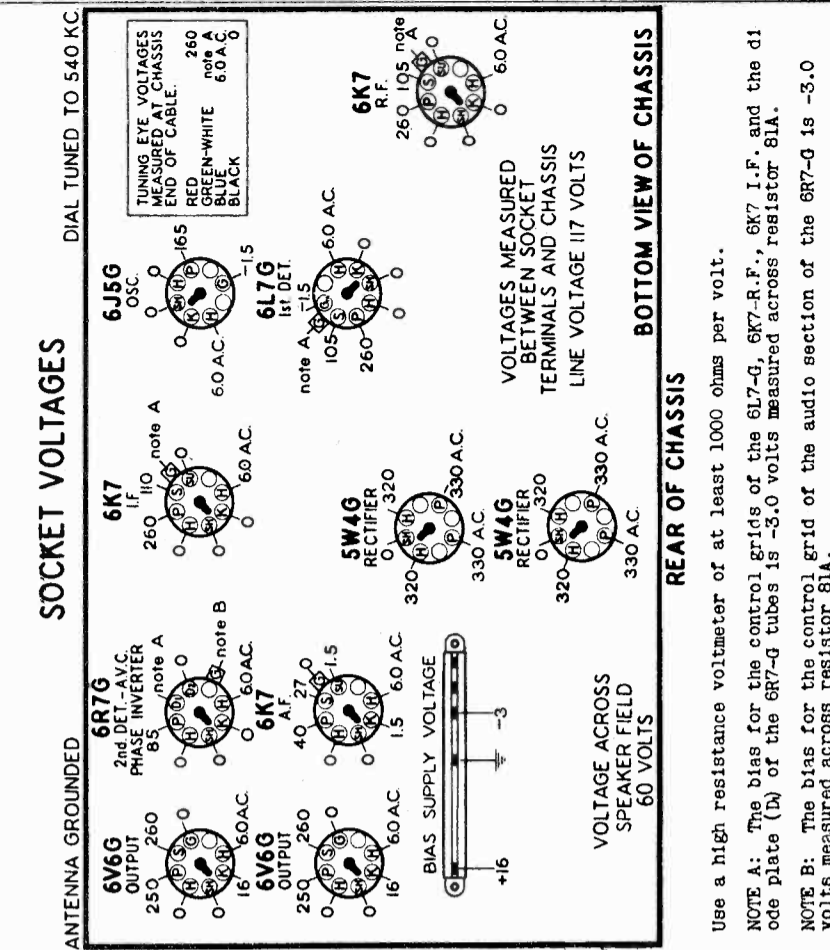
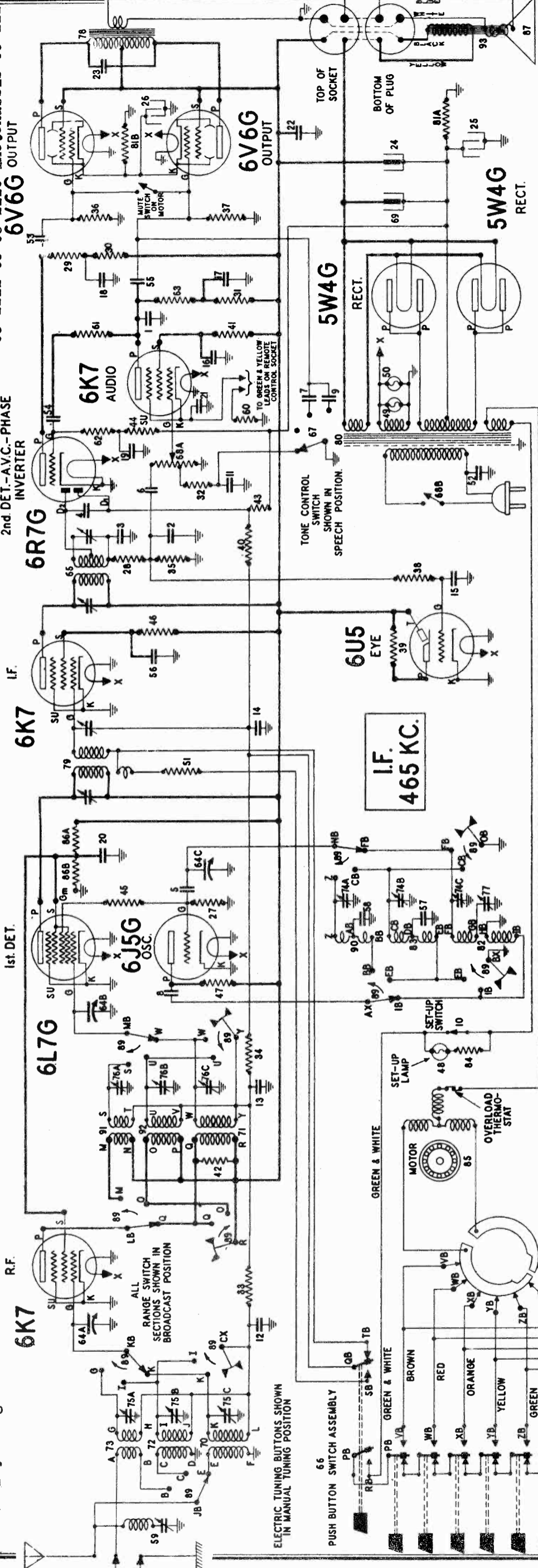
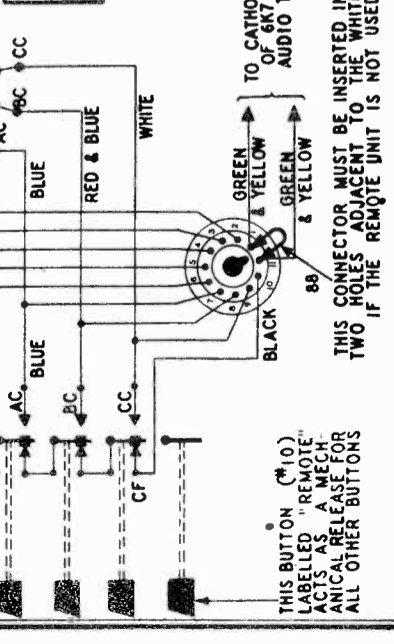
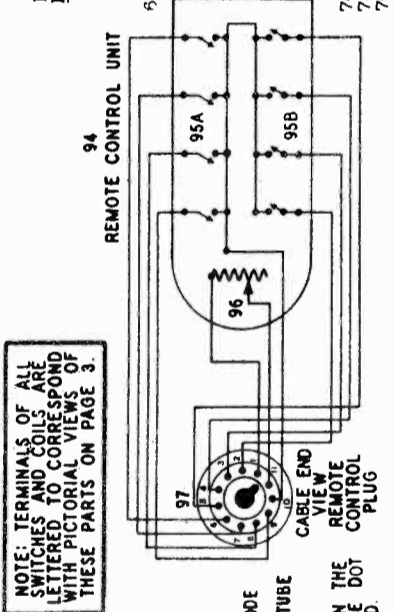


DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
62	112958	Resistor - carb. 18,000 ohms 1/4 watt (10%)	.12
63	112959	Resistor - carb. 120,000 ohms 1/4 watt (10%)	.12
64	C-113219	Condenser - variable gang	6.80
65	113229	Transformer - 2nd I. F.	1.64
66	113256	Push-Button Switch Assem.	3.75
67	113257	Switch - Tone control	.70
68A-68B	113258	Volume Control - 250,000 ohms with off-on switch	.95
69	113261	Condenser - elect. 30 mfd. 450 V.	1.40
70	113296	Coil - antenna (B.C.)	1.20
71	113298	Coil - R. F. (B.C.)	1.30
72	113301	Coil - antenna (Police)	.50
73	113301	Coil - antenna (S.W.)	.52
74A to C	113319	Condenser - trimmer - 3 section	.54
75A to C	113320	Condenser - trimmer - 3 section	.54
76A to C	113320	Condenser - trimmer - 3 section	.54
77	113346	Condenser - padding	.38
78	113361	Transformer - output	2.90
79	113362	Transformer - 1st I.F.	2.40
80	113394	Transformer - power 117 volt 60 cycle	9.00
81A-81B	113399	Resistor - Bias Strip Section A - 20 ohms Section B - 200 ohms	.38
82	113411	Coil - oscillator (B.C.)	.50
83	113412	Coil - oscillator (Police)	1.20
84	113430	Resistor - carbon 90 ohms	.26
85	112450	Motor - for electric tuning (supplied with tuning shaft & gear)	7.80
86A-86B	113469	Resistor - Bleeder Section A - 6800 ohms Section B - 5600 ohms	.92
87	R-113482	Cone - voice coil for R-115016 speaker	2.10
88	113499	Connector Link - for remote control plug	.01
89	113569	Switch - range	2.10
90	113607	Coil - oscillator (S.W.)	.52
91	113608	Coil - R.F. (S.W.)	.60
92	113609	Coil - R.F. (Police)	.50
93	R-115016	Speaker - dynamic 12"	10.00

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1	83539	Condenser - mica 260 mmfd.	.20
2-3-4	83785	Condenser - mica 110 mmfd.	.20
5	85061	Condenser - mica 51 mmfd.	.15
6	88026	Condenser - paper .02 mfd. 400 V.	.25
7	88029	Condenser - paper .004 mfd. 400V.	.25
8-9	86030	Condenser - paper .01 mfd. 400 V.	.30
10	86054	Switch - for set-up	.25
11	88185	Condenser - ceramic tube .006 mfd. 600 volt	.25
12-13	88189	Condenser - paper .05 mfd. 200 V.	.25
14-15	88191	Condenser - paper .1 mfd. 300 V.	.25
16-17-18	88191	Condenser - paper .5 mfd. 150 V.	.25
19	89900	Condenser - paper 1 mfd. 200 V.	.25
20	89421	Condenser - paper 25 mfd. 200 V.	.32
21	89532	Condenser - paper .25 mfd. 300 V.	.40
22	89643	Condenser - paper .04 mfd. 750V.	.24
23	89826	Condenser - elect. 30 mfd. 450 V.	1.80
24	89937	Condenser - elect. 10 mfd. 25 V.	.25
25-26	110377	Condenser - carb. 47,000 ohms 1/4 watt (10%)	.12
27-28-29	110552	Resistor - carb. 220,000 ohms 1/4 watt (10%)	.12
30-31-32	110553	Resistor - carb. 220,000 ohms 1/4 watt (10%)	.12
33	34-35	Resistor - carb. 220,000 ohms 1/4 watt	.12
36-37	36-37	Resistor - carb. 1 meg. 1/4 watt	.12
38-39	40-41	Resistor - carb. 4,700 ohm 1/4 W.	.12
42	42	Resistor - carb. 470,000 ohms 1/4 W.	.12
43-44	43-44	Resistor - carb. 100 ohm 1/4 watt	.12
45	45	Resistor - carb. 100,000 ohm 1 W.	.15
46	46	Resistor - carb. 15,000 ohm 1 W.	.15
47	47	Resistor - carb. 6.3 volt .25 amps.	.15
48-49-50	48-49-50	Lamp - 6.3 volt .25 amps.	.25
51	51	Resistor - W. 33 ohm 1/2 watt	.12
52	52	Condenser - paper .01 mfd. 600 V.	.24
53-54	53-54	Condenser - paper .05 mfd. 400 V.	.13
55-56	55-56	Condenser - paper .1 mfd. 150 V.	.20
57	57	Condenser - mica 1650 mmfd. (3%)	.50
58	58	Condenser - mica 4050 mmfd. (3%)	.40
59	59	Coil - wave trap (with trimmer)	.50
60	60	Resistor - carb. 1000 ohms 1/4 watt (10%)	.12
61	61	Resistor - carb. 220,000 ohms 1/4 watt (10%)	.12



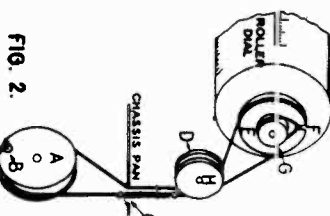


FIG. 2.

Place the knot on the cord in slot B. With the long free end of the cord (not the end with the spring attached), take it turns clockwise around pulley A, then thread the end up through hole C back of pulley D and up to the front of pulley E. Turn pulley E until the slot F is up as shown in the figure. Now, with the free end of the cord wind clockwise; it turns around E, out through slot F, 1 turn around G, back through slot F, and it turns around E. Bring the cord down back of pulley H and leave it hanging for the time being. With the end of the cord to which the tension spring is attached, take it turns counterclockwise around pulley A, (when viewed from the right) and then bring the cord up through hole C. Tie the free end of the cord hanging over pulley H, to the upper end of the tension spring. The spring should be extended so it is approximately 1 1/2" long when the tension in the cord system is equalized. If the Short Wave scale on the dial is not in the proper position under the pointer, loosen the set screw in hub G, rotate the dial scale to the proper position and tighten the set screw.

PART NUMBER	DESCRIPTION	LIST PRICE
113340	Washer - approx. 3/16" dia. (for mag. elect.)	.20
113341	Terminal Sp. - Ground	.20
113342	Connector - Ground	.20
113343	Socket - octal base (standard)	.20
113344	Socket - octal base (standard)	.20
113345	Bracket - dial (R.H.)	.20
113346	Bracket - dial (L.H.)	.20
113347	Roller Dial - 111111	2.40
113348	Roller Dial - 111111	2.40
113349	Roller Dial - 111111	2.40
113350	Roller Dial - 111111	2.40
113351	Roller Dial - 111111	2.40
113352	Roller Dial - 111111	2.40
113353	Roller Dial - 111111	2.40
113354	Roller Dial - 111111	2.40
113355	Roller Dial - 111111	2.40
113356	Roller Dial - 111111	2.40
113357	Roller Dial - 111111	2.40
113358	Roller Dial - 111111	2.40
113359	Roller Dial - 111111	2.40
113360	Roller Dial - 111111	2.40
113361	Roller Dial - 111111	2.40
113362	Roller Dial - 111111	2.40
113363	Roller Dial - 111111	2.40
113364	Roller Dial - 111111	2.40
113365	Roller Dial - 111111	2.40
113366	Roller Dial - 111111	2.40
113367	Roller Dial - 111111	2.40
113368	Roller Dial - 111111	2.40
113369	Roller Dial - 111111	2.40
113370	Roller Dial - 111111	2.40
113371	Roller Dial - 111111	2.40
113372	Roller Dial - 111111	2.40
113373	Roller Dial - 111111	2.40
113374	Roller Dial - 111111	2.40
113375	Roller Dial - 111111	2.40
113376	Roller Dial - 111111	2.40
113377	Roller Dial - 111111	2.40
113378	Roller Dial - 111111	2.40
113379	Roller Dial - 111111	2.40
113380	Roller Dial - 111111	2.40
113381	Roller Dial - 111111	2.40
113382	Roller Dial - 111111	2.40
113383	Roller Dial - 111111	2.40
113384	Roller Dial - 111111	2.40
113385	Roller Dial - 111111	2.40
113386	Roller Dial - 111111	2.40
113387	Roller Dial - 111111	2.40
113388	Roller Dial - 111111	2.40
113389	Roller Dial - 111111	2.40
113390	Roller Dial - 111111	2.40
113391	Roller Dial - 111111	2.40
113392	Roller Dial - 111111	2.40
113393	Roller Dial - 111111	2.40
113394	Roller Dial - 111111	2.40
113395	Roller Dial - 111111	2.40
113396	Roller Dial - 111111	2.40
113397	Roller Dial - 111111	2.40
113398	Roller Dial - 111111	2.40
113399	Roller Dial - 111111	2.40
113400	Roller Dial - 111111	2.40

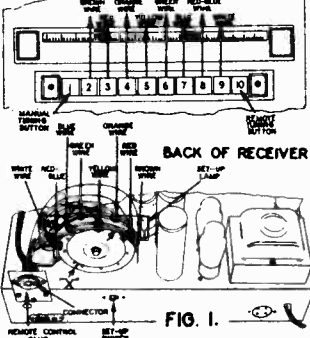


FIG. 1.

since weak stations will generally give poor results. Arrange the list so that the lowest frequency station appears first then the lowest frequency, continuing in this manner until stations are in numerical order. The frequency of your local stations may be obtained from your newspaper or radio call magazine. Only buttons No. 2 to No. 9 are used for automatic tuning. IT IS IMPERATIVE THAT THESE BUTTONS BE SET-UP IN THE FOLLOWING ORDER: Button No. 2 must be set to tune in the station whose frequency is lowest in your list of eight stations. Button No. 3 must be set to tune in the station next higher in frequency. Continue to follow this procedure until Button No. 9 will be set to tune in the station whose frequency is highest in your list. The actual setting up of the buttons is done as follows: 4. Place the small black "set-up switch" button which appears on the back of the chassis, in the right hand position. (See label on back of chassis.) LEAVE THIS SWITCH BUTTON IN THIS POSITION UNTIL ALL BUTTONS HAVE BEEN SET UP. 5. Push in the "Manual" button and use the tuning knob to tune in the station (lowest frequency on your list) that you have selected for Button No. 2. Be sure to tune in station correctly using the "Tuning Eye". The correct tuning point is indicated when the two open ends of the inverted "V" shaped shadow in the "Tuning Eye" are closest together. 6. PUSH IN BUTTON No. 2. The lamp mounted on the back of the chassis just to the right of the selector drum will be illuminated when the button is depressed. (See Fig. 1.) NOTE: If the lamp does not light up when the switch is in this position, it indicates that Button No. 2 is already correctly set to the desired station and no further adjustment need be made for this button. 7. Locate the contactor corresponding to Button No. 2. This contactor has a BROWN lead attached to it, (see Fig. 1 or label on back of the chassis for the color of the wire associated with each button) and is the extreme right end contact on the inner circle of the semi-circular bridge (not more than one-half turn). Loosen the knurled nut on this contactor to the point indicated by the white arrowhead on the side of the round drum. When this point is reached, the lamp will go out. If the contactor is moved farther than the point at which the lamp extinguishes, the lamp will again be illuminated. Move the contactor back and forth between the two points. Then tighten the knurled nut as tightly as possible, with the finger. The lamp should still be out after tightening the contactor. If it is not, the contactor must be reset. 8. The set-up for Button No. 2 is now complete. 9. Set-up the remaining seven buttons in a similar manner. The contactors for the buttons can be identified as follows: (See Fig. 1 or label on back of chassis.)

Button No. 2 - Brown Lead	Button No. 6 - Green Lead
Button No. 3 - Red Lead	Button No. 7 - Blue Lead
Button No. 4 - Orange Lead	Button No. 8 - Red-Blue Lead
Button No. 5 - Yellow Lead	Button No. 9 - White Lead

10. AFTER ALL BUTTONS HAVE BEEN SET-UP YOU MUST PLACE THE SMALL BLACK SET-UP SWITCH BUTTON IN THE LEFT HAND POSITION (white dot showing) OTHERWISE THE ELECTRIC TUNER MOTOR WILL NOT OPERATE. (See label on back of chassis just below this switch.) This re-connects the motor and enables you to tune to any of the eight selected stations by pushing the proper button. 11. To use the "Magic Keyboard" it is only necessary to push the button for the station you desire. 12. The "Magic Keyboard" push buttons may also be used on the Foreign or Intermediate bands. However, on these bands we recommend that, rather than setting a button to a station, you set the button to some particular location on the dial where foreign, police, aircraft or amateur stations are frequently received. Attempts to set buttons to short-wave stations are not recommended due to the extreme sharpness of tuning on these bands. 13. Label each button with the call letters of the stations you have selected, using the call letter tabs and the celluloid covers packed with your receiver. The printed paper tab should be inserted in the button by holding the ends and flexing the tab slightly, allowing it to snap into place. The celluloid cover tab should be flexed in a similar manner and placed on top of the paper tab.

REPLACING THE ROLLER DIAL DRIVE CORD

1. Tie a tension spring, part number 113177, to one end of about 30" of special dial cord part No. 113302.
2. Tie a large knot in the cord, 8 1/2" from the tension spring.
3. Turn the range switch to the Short Wave position -- all the way counterclockwise. Pulley A on the range switch shaft should be in the position shown in Fig. 2.

PART NUMBER	DESCRIPTION	LIST PRICE
113340	Washer - approx. 3/16" dia. (for mag. elect.)	.20
113341	Terminal Sp. - Ground	.20
113342	Connector - Ground	.20
113343	Socket - octal base (standard)	.20
113344	Socket - octal base (standard)	.20
113345	Bracket - dial (R.H.)	.20
113346	Bracket - dial (L.H.)	.20
113347	Roller Dial - 111111	2.40
113348	Roller Dial - 111111	2.40
113349	Roller Dial - 111111	2.40
113350	Roller Dial - 111111	2.40
113351	Roller Dial - 111111	2.40
113352	Roller Dial - 111111	2.40
113353	Roller Dial - 111111	2.40
113354	Roller Dial - 111111	2.40
113355	Roller Dial - 111111	2.40
113356	Roller Dial - 111111	2.40
113357	Roller Dial - 111111	2.40
113358	Roller Dial - 111111	2.40
113359	Roller Dial - 111111	2.40
113360	Roller Dial - 111111	2.40
113361	Roller Dial - 111111	2.40
113362	Roller Dial - 111111	2.40
113363	Roller Dial - 111111	2.40
113364	Roller Dial - 111111	2.40
113365	Roller Dial - 111111	2.40
113366	Roller Dial - 111111	2.40
113367	Roller Dial - 111111	2.40
113368	Roller Dial - 111111	2.40
113369	Roller Dial - 111111	2.40
113370	Roller Dial - 111111	2.40
113371	Roller Dial - 111111	2.40
113372	Roller Dial - 111111	2.40
113373	Roller Dial - 111111	2.40
113374	Roller Dial - 111111	2.40
113375	Roller Dial - 111111	2.40
113376	Roller Dial - 111111	2.40
113377	Roller Dial - 111111	2.40
113378	Roller Dial - 111111	2.40
113379	Roller Dial - 111111	2.40
113380	Roller Dial - 111111	2.40
113381	Roller Dial - 111111	2.40
113382	Roller Dial - 111111	2.40
113383	Roller Dial - 111111	2.40
113384	Roller Dial - 111111	2.40
113385	Roller Dial - 111111	2.40
113386	Roller Dial - 111111	2.40
113387	Roller Dial - 111111	2.40
113388	Roller Dial - 111111	2.40
113389	Roller Dial - 111111	2.40
113390	Roller Dial - 111111	2.40
113391	Roller Dial - 111111	2.40
113392	Roller Dial - 111111	2.40
113393	Roller Dial - 111111	2.40
113394	Roller Dial - 111111	2.40
113395	Roller Dial - 111111	2.40
113396	Roller Dial - 111111	2.40
113397	Roller Dial - 111111	2.40
113398	Roller Dial - 111111	2.40
113399	Roller Dial - 111111	2.40
113400	Roller Dial - 111111	2.40

Chassis Model	Used in Receiver Models	Voltage	Frequency
91-111	91-111 to 91-1119	117	80 cycles
98-111	98-111 to 98-1119	117	25 cycles
910-111	910-111 to 910-1119	100-240	60 cycles

These chassis are 11 tube, Electric Push-Button Tuning, Superheterodyne receivers. The tuning ranges are 535 to 1750 KC, 2.2 to 7.0 MC, and 6.8 to 22.5 MC. Incorporated in each chassis is a ruggedly constructed Electric Push-Button Tuner Unit, which was primarily designed to give long-life and consistent accuracy of tuning. Aside from the automatic tuning system this receiver incorporates several features described in the following paragraph which the service man should carefully read as they may aid him in rapidly locating the source of trouble.

VARIABLE SELECTIVITY: Two degrees of selectivity can be obtained by proper use of the first push-button labeled "Manual". When the button is in the "out" position the tuning of the receiver will be broad. With this button in the "in" position the tuning will be sharp. Broadening is accomplished by inserting a resistor and coil in series with the secondary of the first I. F. transformer. The series coil is mutually coupled into the primary of the same I. F. transformer - thereby causing a flattening of the overall selectivity.

AUDIO SYSTEM: The audio voltage developed across the diode load resistor is fed to the volume control which in turn couples the desired amount of this audio voltage to the control grid of the 6K7 1st audio tube. The output of this stage is coupled to one of the 6V6-G output tubes. Also a portion of the output of the 6K7 is coupled through a voltage divider network consisting of resistors No. 44, 51 and 52 to the control grid of the 6V6-G. This tube acts as the phase inverter and its output drives the other 6V6-G output tube. A mute switch connected across the control grids of the two 6V6-G output tubes is utilized to silence the receiver while the automatic tuning unit is in operation. This is accomplished by placing the mute switch on the back of the tuner motor. When the motor starts to operate the rotor pulls into the magnetic field of the stator, which causes the end of the motor shaft to push against the mute switch and cause its contacts.

TYPICAL TROUBLES AND THEIR SYMPTOMS.

1. SYMPTOM: When electric tuner button is depressed pointer travels to end of dial and motor hums. REMEDY: Black and brown leads from motor to contactor drum are connected in reverse. Reverse connections at motor terminals.
2. SYMPTOM: When either the second or third button from the left or right end of the Magic Keyboard is depressed the dial pointer will travel to the end of the dial and the motor will hum. REMEDY: This is caused by misalignment of contactor drum and gang condenser. Release set screw holding drum in place on shaft, and close the gang condenser completely. Place a slider contactor at each extremity of the slider bridge. Now set the contactor drum so that the division between the two sections (POINT "X" IN FIG. 1) is just below the contactor which you set at the extreme left end of the bridge (viewed from rear). The contactor on the extreme right of the bridge will now fall on point "X" just above the dead spot indicated by the white arrow on the drum. NOTE: The contactor on each extreme end must contact the same section of the contactor drum or the drum is incorrectly set. After the setting has been performed retighten the set screw.
3. SYMPTOM: Tuner fails to operate. REMEDY: (1) The small black set-up switch on the back of the tuner must be in the left hand position. (2) Overload thermostat on motor will open when temperature of motor reaches dangerous value (approx. 95° C). Thermostat will close automatically when motor cools down.

REMOTE CONTROL UNIT

This Stewart-Warner radio is designed to permit tuning from a remote point such as your armchair or any point within 20 ft. of the receiver cabinet. A special "Remote Tuner Kit" part No. 113600 is available to adapt your receiver for remote control. It can be purchased from any Stewart-Warner Dealer, Distributor, or from Stewart-Warner Corporation, Chicago, Illinois. This accessory kit consists of a remote control unit incorporating eight push buttons and a remote volume control. The unit is connected by a flat flexible cable to an eleven prong plug, which fits into a corresponding socket at the left rear of the receiver chassis. Following are the instructions for installation of the remote control unit: 1. Turn off the radio set. 2. Remove the wire connector which joins the two holes adjoining the white dot on the eleven hole socket. IMPORTANT: If at any time you decide to discontinue the use of the remote control unit, remove the plug and reinsert this wire connector in the two holes adjoining the white dot. Failure to replace the connector will make the set inoperative. 3. Insert the remote control plug in its socket and locate the remote control unit at some convenient point within 20 ft. of the set. The connecting cable may be placed beneath the rug, or along the floor. 4. PRESS IN THE "REMOTE" BUTTON (#10) on the Magic Keyboard and the unit is now ready for operation.

HOW TO SET UP THE PUSH BUTTONS

1. Be sure that your set is first connected to a good antenna system.
2. Turn on the set and allow it to operate at least one-quarter hour before setting up the push buttons.
3. Make a list of eight nearby stations which you wish to tune in with automatic tuning buttons. Be sure to select nearby powerful stations,

ALIGNMENT EQUIPMENT & PROCEDURE

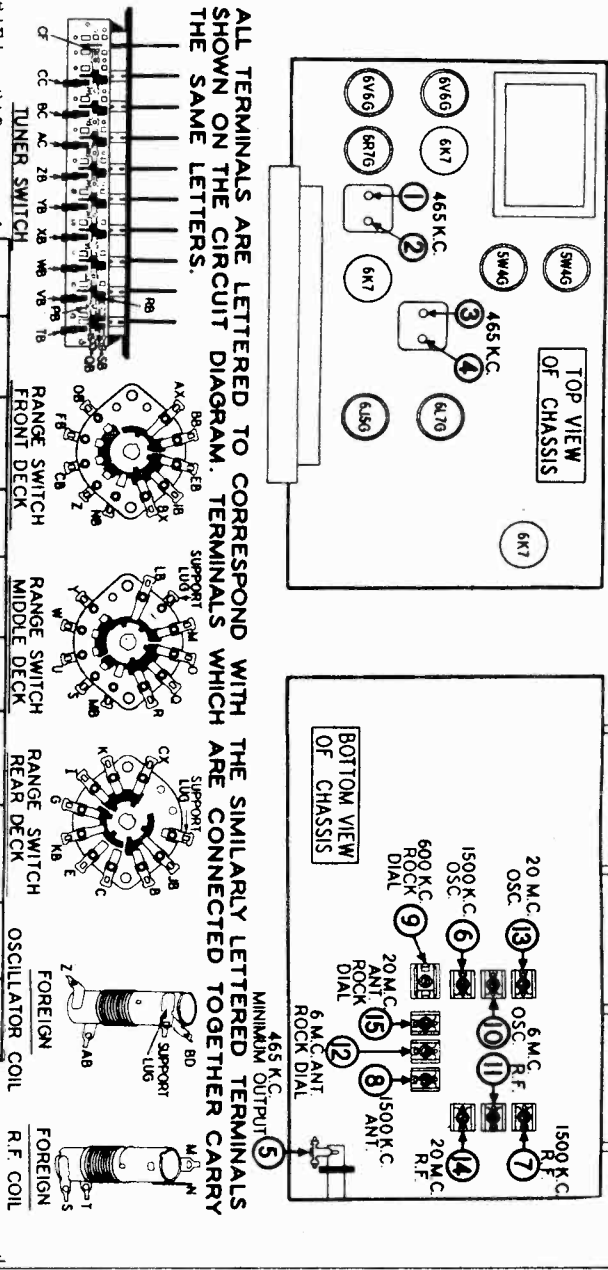
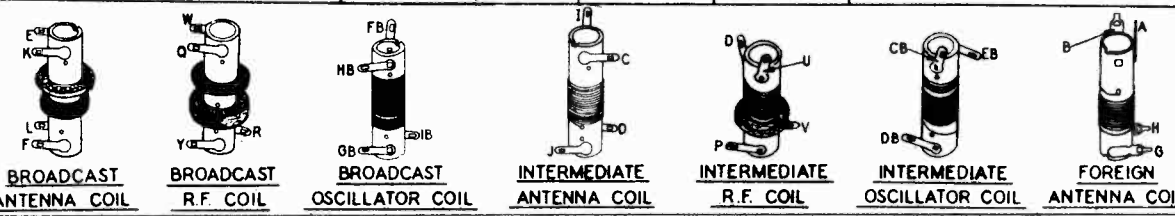
FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 20 MC. are required.

1. Connect the output meter across the voice coil or across the two plates of the two 6V6-G output tubes, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the "G" post on the antenna terminal strip at the rear of the chassis, or to the metal chassis. The ground and doublet terminals on the antenna terminal strip must be connected together throughout the alignment procedure.

- IMPORTANT -

THE FIRST PUSH-BUTTON ON THE LEFT, LABELLED "MANUAL" MUST BE PUSHED IN WHEN ALIGNING. FAILURE TO PUSH IN THIS BUTTON WILL MAKE CORRECT ALIGNMENT IMPOSSIBLE.

DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION (INDICATED BY ROLLER DIAL)	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	CONTROL GRID OF 6L7-6 TUBE	465 KC.	BROADCAST (CLOCKWISE)	ANY POINT WHERE SIGNAL DOES NOT AFFECT THE SIGNAL	1-2	2ND I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
					3-4	1ST I.F.	
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	485 KC.	BROADCAST (CLOCKWISE)	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	1500 KC.	BROADCAST (CLOCKWISE)	1500 KC.	6	BROADCAST OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	1900 KC.	BROADCAST (CLOCKWISE)	TUNE TO 1500 KC. GENERATOR SIGNAL	7	BROADCAST R. F.	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	900 KC.	BROADCAST (CLOCKWISE)	TUNE TO 900 KC. GENERATOR SIGNAL	8	BROADCAST ANTENNA	
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	6 MC.	INTERMEDIATE (CENTER)	6 MC.	9	BROADCAST OSCILLATOR (SERIES PAD)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETURNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	6 MC.	INTERMEDIATE (CENTER)	TUNE TO 6 MC. GENERATOR SIGNAL	10	INTERMEDIATE OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 5.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 6 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	6 MC.	INTERMEDIATE (CENTER)	TUNE TO 6 MC. GENERATOR SIGNAL	11	INTERMEDIATE R. F.	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	6 MC.	INTERMEDIATE (CENTER)	TUNE TO 6 MC. GENERATOR SIGNAL	12	INTERMEDIATE ANTENNA	
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	20 MC.	FOREIGN (COUNTER-CLOCKWISE)	20 MC.	13	FOREIGN OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 19.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 20 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	20 MC.	FOREIGN (COUNTER-CLOCKWISE)	TUNE TO 20 MC. GENERATOR SIGNAL	14	FOREIGN R. F.	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETURNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	20 MC.	FOREIGN (COUNTER-CLOCKWISE)	TUNE TO 20 MC. GENERATOR SIGNAL	15	FOREIGN ANTENNA	



MODELS 91-511 to 91-519

98-511 to 98-519

910-511 to 910-519

STEWART-WARNER CORP. Tuner, Drive Cord Data

MODELS 97-521 to 97-529

Voltage, Socket, Tuner, Drive Cord

Frequency
40 cycles
25 cycles
50-133

Voltage
117
117
100-240

Used in Receiver Models
91-511 to 91-519
98-511 to 98-519
910-511 to 910-519

Chassis Model
91-51
98-51
910-51

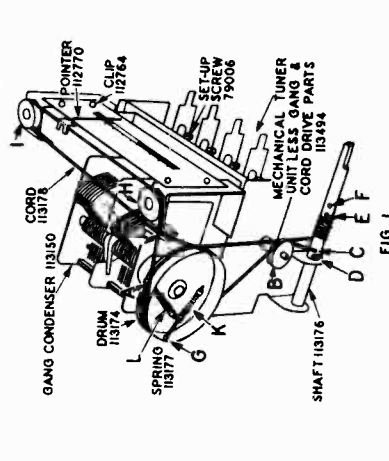
These chassis are 5 tube, single band push-button tuning superheterodyne receivers. The tuning range is 540 to 1725 KC. The intermediate frequency is 465 KC. Incorporated in each chassis is a four-button mechanical push-button tuner unit. These push buttons may be set to any station desired by the method described below under "How to Set Up the Push-Button Tuner".

The accuracy of tuning when using the push-button tuner, depends to a large extent upon the amount of "play" in the moving parts of this system. In cases where slight inaccuracy in tuning occurs check the following points:

1. Check to see that the button is correctly set to the station. If not, reset the button.
2. The tension must be maintained between the two sections of the anti back-lash gear on the left side of the unit in order that it functions properly--both anti back-lash springs must be in place in the gear and compressed slightly.
3. Note the small adjusting lug over the push-button shafts at the point where they slide into the tuner. The lug has a hole through which a small adjusting screw. These lugs should be adjusted for a minimum amount of "play". In other words the push-button shaft must have a minimum of movement in a vertical direction.

HOW TO SET UP THE PUSH-BUTTON TUNER

1. Be sure that your set is connected to a good antenna system.
2. Turn on the set and allow it to operate at least one-quarter hour before setting up the push buttons.
3. Select the four nearby stations to which you wish to set up the buttons. Be sure to select nearby power stations, and not stations that are weakly received or poor stations.
4. Pull off the entire button cap by grasping the button from the rear and turning it around until the button is removed. A round head adjusting screw will be exposed.
5. Insert a screw-driver in this screw and loosen it (about one turn counter-clockwise will be sufficient).
6. Keeping the screw-driver in the screw slot, PUSH AGAINST THE SCREW-DRIVER UNTIL THE PUSH BUTTON SHAFT IS FORCED ALL THE WAY IN. While the button is held in this position, grasp the tuning knob and tune in the desired station. Then retighten the adjusting screw, turning clockwise until reasonably tight.
7. **WARNING:** Do not attempt to turn the screw until it reaches a definite stop. Merely turn until you meet with appreciable resistance. To turn further may result in damage to the mechanism.
8. The set-up for this button is now complete. Replace the push button by pushing it on firmly.
9. Set up the three remaining buttons in a similar manner.
10. Label each button with the call letters of the stations you have selected, using the call letter tabs and the celluloid covers packed with your receiver. The printed paper tab should be inserted in the button by holding the ends and flexing it slightly, allowing it to flex in a similar manner and placed on top of the paper tab.
11. To use your push-button tuner it is only necessary for you to push in the button labeled with the call-letters of the desired station. Be sure that you push the button all the way in.

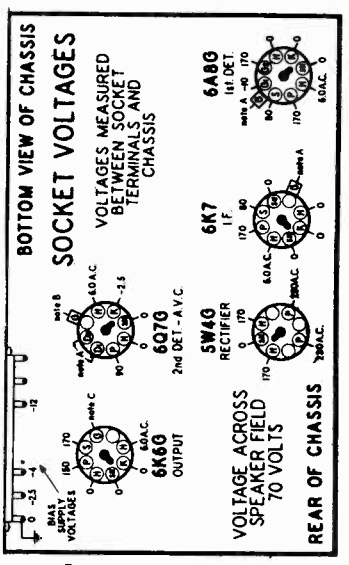


- TO THREAD THE DIAL POINTER DRIVE CORD PROCEED AS FOLLOWS:**
1. Carry the cord through the gang condenser and thread one end of the cord through the dial pointer.
 2. Carry the other end of the cord over the drum to the front around pulley H and then across to pulley J and counter-clockwise around it.
 3. Continue back to pulley J and down the front of the drum.
 4. Carry the end of the cord on around the drum and thread eyelet G.
 5. Tie both ends extending through eyelet G to tension spring K. In so doing, allow enough slack in the cord so that when spring K is hooked in place in the drum, it will be under tension on every little. If the spring is extended too much on it will not operate properly. The button operate too hard because of overloading. Push-button operation to the last dial division mark on the dial pointer to the last dial division mark on the right and clip it to the cord. (Be sure the gang condenser is closed before clipping the pointer to the cord.)

- HOW TO REPLACE THE DIAL CORD**
- TO THREAD THE GANG CONDENSER DRIVE CORD PROCEED AS FOLLOWS:**
1. Close the gang condenser. The set screw in the drum, Fig. 1, must be on the top side.
 2. Attach the top end through eyelet A, Fig. 1, on the drum. The tension spring L to this loop end, inside of the drum.
 3. Take one of the free ends of the cord; carry it down around the back of the drum and over the front of pulley B.
 4. Thread the end of the cord down through hole C in the drum. The tension spring M is hooked in place in the drum. Take a half turn around the shaft clockwise (when facing the unit).
 5. Thread the end of the cord down through hole D in the tuning shaft and pull through the slack in the cord.

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	83007	Condenser - paper .02 mfd. 600 V.
2-3	83539	Condenser - paper .250 mfd. 250 V.
4	86081	Condenser - mica 51 mfd.
5	86054	Switch - Tone Control
6-7	88189	Condenser - paper .05 mfd. 200 V.
8	88191	Condenser - paper .1 mfd. 300 V.
9	110510	Condenser - mica 3 mfd.
10	110552	Resistor - carb. 47,000 ohms 1/2 W.
11	110553	Resistor - carb. 220,000 ohms 1/2 W.
12	110554	Resistor - carb. 1 meg. 1/4 watt.
13	110555	Resistor - carb. 47,000 ohms 1/2 W.
14	110556	Resistor - carb. 33,000 ohms 1/2 W.
15	110580	Resistor - carb. 3.3 meg. 1/4 W.
16	110629	Lamp - 6.3 volt - .25 amp.
17	111252	Condenser - paper .05 mfd. 400 V.
18A - 18C-112740		Resistor - Wire Wound (Section A - 217 ohms) (Section B - 43 ohms) (Section C - 68 ohms)
19	112751	Transformer - Power 117 V. 60 C.
	113532	Transformer - Power 117 V. 25 C.
20	113523	Transformer - Power 100 to 240 volt 50 to 133 cycles
21	112796	Coil - Wave trap (with trimmer)
22	112803	Transformer - 1st I.P.
23	113035	Condenser - ceramic tube .008 mfd. 500 volt
24	113042	Coil - oscillator
25A - 25B-113047		Transformer - 2nd I.P.
		Volume Control - 500,000 ohms
26	113096	Condenser - elect. 8-8 mfd. 350 V.
	113536	Condenser - elect. dual 8-8 mfd. 350 volt (for model 910-51 only)
27	113097	Coil - Antenna
28A - 28B-113150		Condenser - variable gang-
29	U-113236	Cone - voice coil assembly for U-115008 Spkr.
30	U-113240	Transformer - output for U-115008 speaker
31	U-115008	Speaker - Dynamic (5 inch)
289A	Screw-wood	chassis mtg. #8 X 5/8" (models 91-513; 98-513 & 910-513)
77223	Washer - Chassis mtg.	(for models 910-513; 98-513; 91-513)
79006	Screw - #6-32 X 7/8 P11.	Hd. Mach. (for setting up push button)
81145	Retaining Ring	for drive shaft-----Per C
85040	Screw - #8 Hex.	Hd. for mtg. adjusting washer-----Per C
85299	Screw - chassis mtg.	#10 X 3/8" (for models 910-513; 98-513 & 91-513)
85427	Socket	octal base (standard)
85816	Spring	between gtr sections
86346	Eyelet	for dial cord-----Per doz.
89748	Washer - (paper)	for back of knobs-----Per doz.
110829	Washer	flat steel, for mtg. chassis

112745	Clip - coil mtg. (osc. & ant.)
112782	Pulley - dial cord drive (at left side)
112764	Clip - dial scale retaining
112765	Scale - dial
112770	Pointer - dial - over dial face
112776	Celluloid cover - over dial face
112798	Clip - for mtg. wave trap coil
112871	Cup washer for mtg. models 91-513; 98-513 & 910-513
112872	Screw - chassis mtg. #8 X 1 1/8 O.H. (models 98-513; 910-513 & 91-513)
112874	Screw - #10 X 1 1/8 chassis mtg.
112876	Screw - escutcheon mtg. #2 X 3/8 (models 91-514; 98-514, 910-514)
112879	Screw - escutcheon mtg. #2 X 3/8
112914	Escutcheon - dial
113022	Knob - Round Volume or Tuning
113054	Escutcheon for push buttons (with special ground)
113052	Escutcheon - for dial (models 91-514; 98-514 & 910-514)
113063	Escutcheon - for push buttons
113054	Escutcheon for push buttons (models 91-514; 98-514 & 910-514)
113093	Socket - for dial lamp
113103	Push Button
113124	Speaker Grille Bar - (chrome plate) (for models 91-514; 98-514 & 910-514)
113125	Speaker Grille Support Track (for models 91-514; 98-514 & 910-514)
113138	Knob - octagon volume or tuning
113158	Gear - & bushing assembly for dial drive
113166	Spring - for key return
113170	Adjusting lug for button shafts
113171	Bracket - for dial & condenser mtg.
113174	Dial Drum - and pintion assembly
113178	Shaft - dial drive
113177	Spring - dial cord tension
113178	Cord - for dial drive (38' req.) supplied in 4 ft. lengths
113189	Tab - celluloid - for push button-Per doz.
113232	Mtg. plates - for spade models 91-513; 98-513 & 910-513
113321	Tab - station call letters (4 sheets) (brown)
113322	Tab - station call letters (4 sheets) (black)
113494	Mechanical Tuner assembly - keys and housing only



DIAL TUNED TO 540. KC ANTENNA GROUNDED

Use a high resistance voltmeter of 1000 ohms per volt.

NOTE A: The bias for the control grids of the 6A8-G, 6K7, and the diode plates of the 6Q7-G tubes is -2.5 volts measured across resistor 18C.

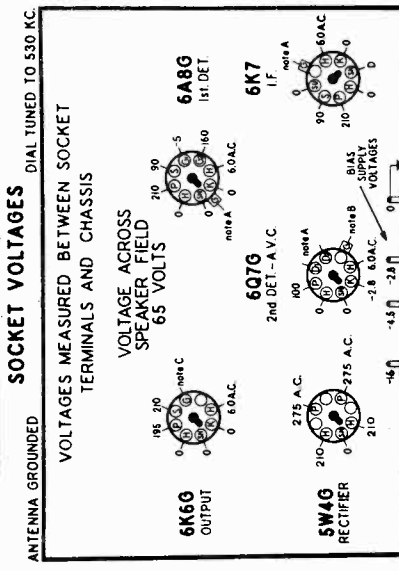
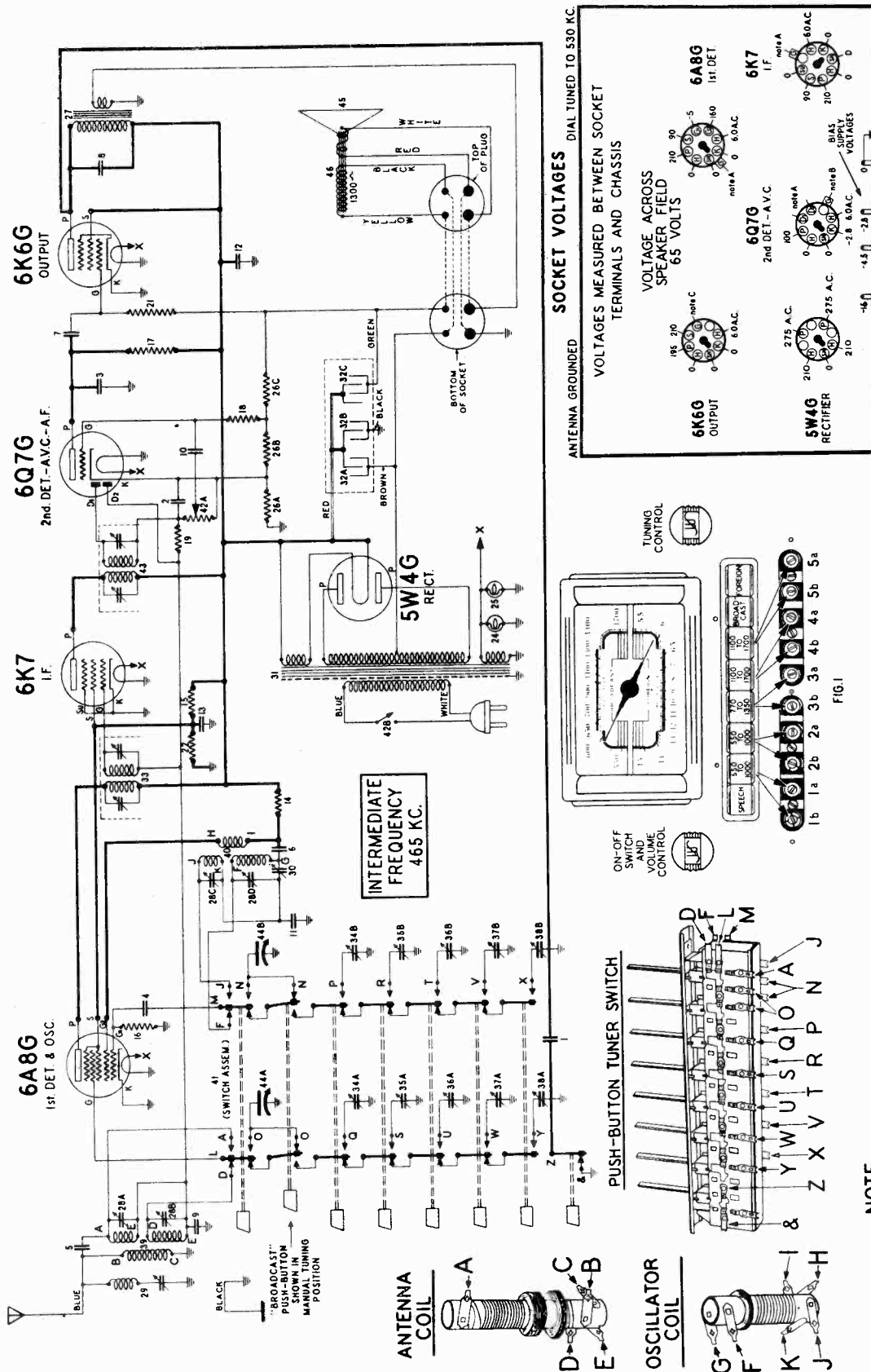
NOTE B: The bias for the control grid of the triode section of the 6Q7-G is -4 volts measured across resistors 18B and 18C.

NOTE C: The bias for the control grid of the 6B6-G output tubes is -12 volts measured across resistors 18A, 18B and 18C.

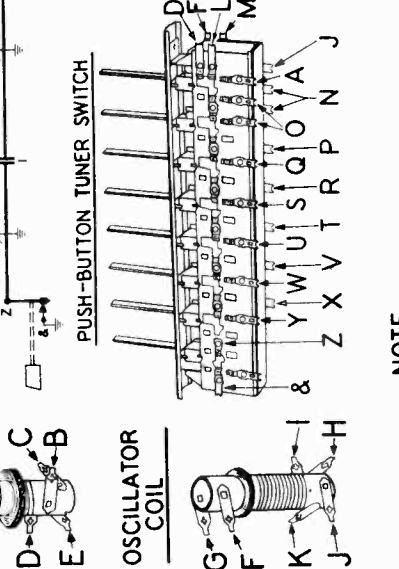
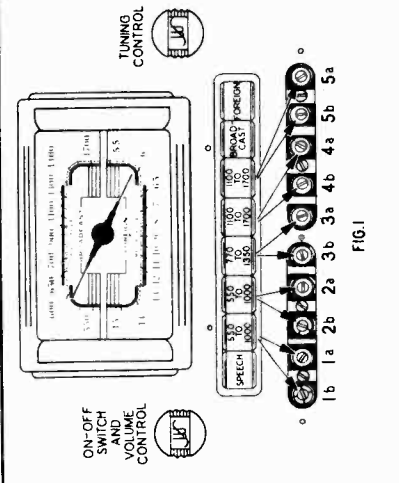
910-531 to 910-539
 Chassis 910-53
 Schematic, Voltage, Socket
 Tuner Switch, Coils

STEWART - WARNER CORP. MODELS 91-531 to 91-539
 Chassis 91-53

98-531 to 98-539
 Chassis 98-53



Use a high resistance voltmeter of 1000 ohms per volt. REAR OF CHASSIS



NOTE
 TERMINALS OF SWITCH AND COILS SHOWN IN PICTORIAL VIEWS ABOVE, ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM AT THE RIGHT. TERMINALS WHICH ARE CONNECTED TOGETHER CARRY THE SAME LETTER.

JUNE 1938

MODELS 91-531 to 91-539
 Chassis 91-53
 98-531 to 98-539
 Chassis 98-53
 91C-531 to 910-539

STEWART-WARNER CORP.

Chassis Model	Used In Receiver Models	Voltage	Frequency
91-53	91-531 to 91-539	117	60 cycles
98-53	98-531 to 98-539	117	25 cycles
910-53	910-531 to 910-539	100-240	50-133

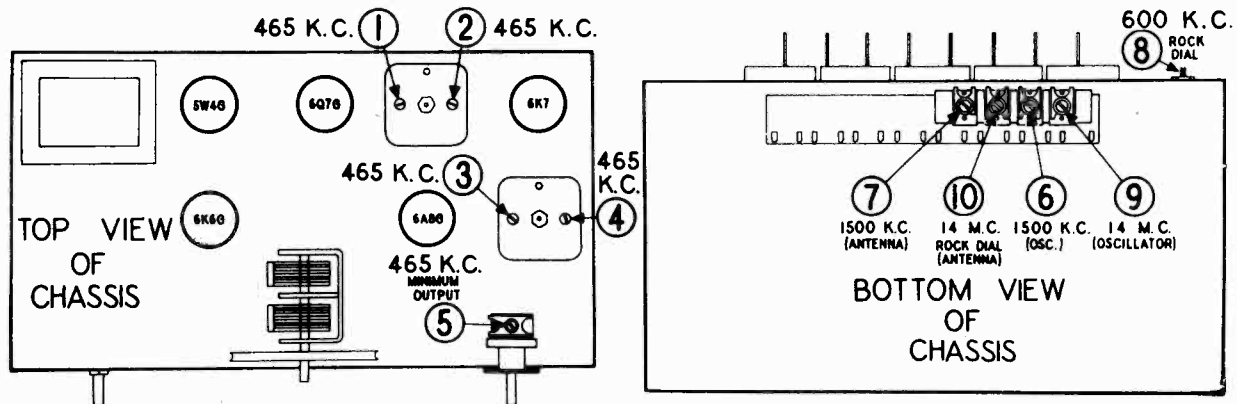
Alignment, Trimmers

These chassis are 5-tube, two band, push-button tuning superheterodyne receivers. The tuning ranges are 540 to 1725 KC and 5.4 to 15.4 MC. The I. F. is 465 KC.

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 14 MC are required.

- ① Connect the output meter across the voice coil or between the plate of the 6K6-G output tube and ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
- ② Connect the ground lead of the signal generator to the black (ground) wire or the chassis.
- ③ Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
- ④ With the gang condenser in full mesh, set the dial pointer in a horizontal position. If the pointer is incorrectly set, it is merely necessary to move the pointer to the correct position by hand, while holding the gang in the full mesh position.

DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD CONDENSER	CONTROL GRID OF 6A8-G TUBE	465 KC	BROADCAST BUTTON PUSHED IN	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	2nd I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
					3-4	1st I.F.	
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	465 KC	BROADCAST BUTTON PUSHED IN	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	1500 KC	BROADCAST BUTTON PUSHED IN	1500 KC	6	BROADCAST OSCILLATOR (Shunt)	ADJUST TRIMMER TO BRING IN SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	1500 KC	BROADCAST BUTTON PUSHED IN	TUNE TO 1500 KC GENERATOR SIGNAL	7	BROADCAST ANTENNA	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	600 KC	BROADCAST BUTTON PUSHED IN	TUNE TO 600 KC GENERATOR SIGNAL	8	BROADCAST OSCILLATOR (Series Pad)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	14 MC	FOREIGN BUTTON PUSHED IN	14 MC	9	FOREIGN OSCILLATOR (Shunt)	ADJUST TO BRING IN SIGNAL. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 13.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 14 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	14 MC	FOREIGN BUTTON PUSHED IN	14 MC	10	FOREIGN ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.



STEWART-WARNER CORP.

MODELS 91-531 to 91-539
98-531 to 98-539
910-531 to 910-539
Tuner Data, Parts List

HOW TO SET UP THE PUSH-BUTTON TUNER

HOW TO CHANGE THE OPERATING RANGE OF A BUTTON

The operating range of a button may be changed by merely changing the dual trimmer used with that button. Dual trimmers with the ranges indicated below can be obtained from your Stewart-Warner distributor, or directly from the Stewart-Warner Corporation, under the following part numbers:

Part Number	Tuning Range	List Price
112942	1100 to 1700 KC.	\$ 0.36
112943	770 to 1350 KC.	.45
112944	550 to 1000 KC.	.50

To make the change proceed as follows:

1. Remove the chassis from the cabinet.
2. By referring to Fig. 1, determine the dual trimmer associated with the button whose range you wish to change.
3. Unsolder the leads from the four terminals on the back of this dual trimmer.
4. Remove the 6/32 machine screw holding the dual trimmer to the front of the chassis.
5. From the above list select a dual trimmer which will cover the desired range.

6. Mount it on the front of the chassis with the 6/32 machine screw, and solder the leads to its four terminals in the same manner.

The button is now ready to be set to any strong station whose frequency is within the range of this new trimmer unit.

7. Set up button No. 2 for the selected station in a similar manner, using trimmer screws No. 2a and No. 2b. Proceed to set the remaining buttons in the same manner.

8. Label each button with the call letters of the stations you have selected, using the call letter tabs and the calluloid covers packed with the receiver. The printed paper tab should be inserted in the button by holding the ends and flexing it slightly, allowing it to snap into place. The calluloid cover tab should be flexed in a similar manner and placed on top of the paper tab.

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1	83217	Condenser - paper .04 mfd. 600 volt	.35
2-3	85039	Condenser - mica 260 mfd.	.20
4	85061	Condenser - mica 51 mfd.	.15
5	85454	Condenser - mica 11 mfd.	.15
6-7	86185	Condenser - paper .01 mfd. 400 volt	.25
8	86185	Condenser - ceramic tube .008 mfd.	.25
9-10	86189	Condenser - paper .06 mfd. 200 volt	.25
11	86682	Condenser - mica .0042 mfd.	.35
12	86682	Condenser - paper 1 mfd. 400 volt	.25
13	89421	Condenser - paper 1 mfd. 250 volt	.25
14	110550	Resistor - carbon 10,000 ohms 1/4 W.	.15
15	110551	Resistor - carbon 45,000 ohms 1/4 W.	.15
16	110552	Resistor - carbon 47,000 ohms 1/4 W.	.12

NOTE: Trimmer screws indicated by letter "a" are oscillator trimmers. Trimmer screws indicated by letter "b" are antenna trimmers.

In some instances it may be found necessary after the set has been operated for a month or more, to re-adjust the push-button trimmers to compensate for a slight drift due to extreme climatic changes.

PART NUMBER	DESCRIPTION	LIST PRICE
81145	Retaining Ring - for drive shaft--Per C	.50
85040	Screw - #6 Hex. Head (self-tapping)--Per C	.35
85427	Socket - octal base	.15
89746	Washer - (paper) for back of knobs	.005
110486	Plug - speaker (4 prong)	.12
110501	Socket - 4 prong (for speaker)	.16
110829	Washer - flat steel, for mtg. chassis	.01
111302	Card dial drive 6 or 50 ft.lgths.Per Ft.	.05
111357	Spring - drive cord tension	.02
111655	Shield Base - for tube shields	.03
112233	Drum and Bushing - for dial drive	.35
112745	Clip - coil mounting (osc. & ant.)	.01
112747	But - #6-32 Hex.	.01
112786	Scale - dial	.68
112874	Screw #10 X 1-1/8 Chassis Mtg.	.01
112945	Shaft - tuning	.10
113019	Clip - dial scale retaining	.01
113022	Knob - for controls	.10
113023	Socket - octal base (with special ground)	.124
113030	Escutcheon - dial	1.24
113039	Dial - mtg. plate and bracket	.06
113040	Light shield - cardboard (between button holes and dial frame)	.15
113077	Shield - tube	.06
113102	Push Button - only	.14
113106	Escutcheon Plate - for trimmer screws	.94
113114	Pointer - dial	.22
113189	Socket for dial lamp	.09
113321	Tab - calluloid for push button.Per doz.	.40
113323	Tab - calluloid call letters (4 sheets)	.09
113324	Tab - trimmer range (550 to 1000) Per doz.	.08
113325	Tab - trimmer range (770 to 1350) Per doz.	.08
113326	Tab - trimmer range (1100 to 1700) Per doz.	.08
113327	Tab - "Speech"	.09
113328	Tab - "Foreign"	.08
113544	Screws - escutcheon mtg. #2 X 3/8	.03
113545	Screws - P.B. escutcheon mtg. #3 X 3/8	.01
113566	Shield - for pilot light	.07

MODELS 1471 to 1479
Chassis R-147
MODELS 1481 to 1489
Chassis R-148
Hum Elimination

1937 Models
STEWART-WARNER CORP. Speaker Cone Replacements

HUM ELIMINATION IN THE MODEL R-147 CHASSIS November 28, 1936

FOR RESIDUAL HUM: (Between-station hum)

- Remove the .5 mfd. condense, part number 8899Q, connected from chassis, to the mounting nut of the input electrolytic condenser (the one nearest the power transformer). Replace the .5 mfd. condenser with a 10 mfd. 25 volt electrolytic condenser, our part number 89053. The positive terminal of this condenser must be connected to the chassis. This change should always be made in combination with the following one, since either change may increase the hum if made alone.
- Locate the 210,000 ohm resistor connected from the plate of the 6C5 tube to one of the 5Z4 socket terminals.
 - Disconnect the end of this resistor going to the 5Z4 socket.
 - Connect the added 51,000 ohm resistor in series with the disconnected end of the above 210,000 ohm resistor and the lug on the 5Z4 socket from which it was unsoldered.
 - Connect the added .25 mfd. condenser from chassis to the junction of the above two resistors.
- Remove the twisted green and brown wires connecting to the tone control and replace them with the shielded twisted pair supplied by Stewart-Warner. Ground the shield at both ends. Route the shielded wire so that the shielding does not ground the mounting nut on the electrolytic condenser nearest the power transformer.
- Separate the single green volume control wire from the power transformer and the A.C. leads.
- In all cases of either residual or modulation hum, tighten down the power transformer mounting screws after the set is hot.
- Early production sets did not have the resistance-capacity filter consisting of the 260,000 ohm resistor and the .1 mfd. condenser in the grid circuit of the 6F5. In these early sets a 1.1 megohm resistor was connected from the 6F5 grid to the bias resistor network. The later sets used a 760,000 ohm resistor connected from the grid to the filter resistor and condenser. If you are working on any of the early sets which do not have the filter, you should add a 260,000 ohm, 1/4 watt resistor in series with the end of the 1.1 megohm grid resistor which connects to the bias network. Then connect a .1 mfd., 150 volt condenser from chassis to the junction of the 260,000 ohm and 1.1 megohm resistors.

FOR MODULATION HUM: (On stations only)

- Replace the .1 mfd. screen-grid by-pass condenser, diagram No. 28, connected to the 6A8 socket with the .5 mfd., 150 volt by-pass condenser, part number 8899Q which was disconnected from the mounting nut of the input electrolytic condenser.

IMPORTANT

If there is still too much hum after making the above changes be sure to check for defective tubes.

The following material is required for this work:
 1 - 89532 - .25 mfd. 200 volt Tubular Paper Condenser
 1 - 89053 - 10 mfd., 25 volt Electrolytic Condenser
 1 - 83080 - 51,000 ohm 1/4 watt Carbon Resistor
 1 - Special Shielded Tone Control Cable

HUM ELIMINATION IN THE MODEL R-148 CHASSIS December 4, 1936

FOR MODULATION HUM: (On stations only) Make this change even though no modulation hum is heard in the shop.

- Remove the .1 mfd., 150 volt condenser connected to the screen grid circuit of the 6K7 R.F. tube.
- Replace it with a .5 mfd., 150 volt paper condenser, our part number 8899Q.

FOR RESIDUAL HUM: (Between-station hum)

- Locate the red-blue wire running from the 5V4G socket heater terminal to the speaker socket.
 - Disconnect one end of the wire and re-route the wire along the back of the chassis so that it is at least two inches above the 6H6 and 6C5 sockets when the chassis is upside down. Re-connect the wire.
- The blue and black twisted wire supplied by Stewart-Warner should be placed along the front of the chassis so it can be used to connect the heater terminals of the 6K7 R.F. and the 6L6 sockets. First connect the black wire to the grounded heater terminal of the 6K7 R.F. socket (the heater terminal near the front of the chassis) and the blue wire to the hot heater terminal of the same socket. The other end of the black wire must be connected to the grounded heater terminal of the 6L6 nearest the front of the chassis and the other end of the blue wire must be connected to the hot heater terminal of the other 6L6 socket (the one nearest the 6C5).
- Remove the input audio transformer mounting screw nearest the front of the set. Rotate the transformer around its other mounting screw until the free end is toward the rear of the chassis. There is a hole in the chassis at the proper point to mount the transformer by means of the small machine screw, lock-washer and nut. Pull the transformer leads away from the tube sockets. Sometimes an intermediate position of the transformer will result in less hum but this necessitates drilling either one or two new mounting holes.
- Tighten down the power transformer mounting bolts preferably when the set is hot.

SPEAKER CONE REPLACEMENT IN 1937 RADIO MODELS

We can now supply replacement cones which can be installed without special tools in all 1936-1937 Stewart-Warner speakers including staked spider models with the exception of some of the small five inch speakers. In describing the replacement of the cones we are dividing the various speaker models into three general groups as follows:

(A) - 8 and 12 INCH SPEAKERS WITH SPIDERS STAKED TO THE POLE PIECE

In order to facilitate the replacement of the cones in our 8 and 12 inch speakers with the spiders staked to the center of the pole piece, we will furnish special cones which can be installed without any special tools or equipment as described under "INSTALLING NEW CONES".

These cones have spiders fastened to the outside of the voice coils. The spiders are mounted on the speaker shells by means of screws. The necessary holes are already punched in the shell. The special cones are supplied complete with the necessary gaskets and mounting hardware under the part numbers in the table shown on page two of this bulletin.

(B) - SPEAKERS HAVING SPIDERS MOUNTED WITH SCREWS

The cones in these speakers can be replaced in the conventional manner as described later in this bulletin under "INSTALLING NEW CONES". The correct part numbers are tabulated below.

(C) - FIVE INCH SPEAKERS WITH SPIDERS STAKED TO THE POLE PIECE

Speakers in this group cannot be satisfactorily repaired without special equipment and therefore must be returned to the factory for repair. If the cone is damaged or if the speaker is out of the warranty the cost of replacing the cone will be the price of the cone plus a fifty cent labor charge. We will assume no transportation charges under these conditions.

INSTRUCTIONS FOR INSTALLING NEW CONES

- In staked spider models cut the old cone around the outer edge and break the spider away from the washer under which it is mounted. This washer should be left in place. In models having the spider fastened with screws, remove the screws and then cut out the cone around the outer edge. Remove the cone, voice coil and spider assembly and clean away all traces of the old cone and cement where the cone was cemented to the frame.
- Clean any particles from the air gap.
- Spread an even coat of quick drying household or speaker cement over the face of the speaker frame. If two complete cardboard gaskets are packed with the cone put the thin one on the frame and cover it with cement. If only one complete gasket is enclosed it should be applied later as described in paragraph 8.
- Set the replacement cone in place with the voice coil in the air gap. Make sure that the holes in the spider mounting line up with the holes in the speaker shell.
 - In the R-247-A, R-256-D and R-266-A speakers, place the small spacing bushings between the spider and the shell. Insert the screws through the shell, spacers and spider, then put on the lock washers and screw the nuts on loosely.
 - In other speakers place the small brackets, Part No. 89028, over the spider mounting bracket with the ends in the slots in the shell, and place the mounting screws through the holes in the shell and screw them into the brackets. Leave the screws loose.
- Insert three or four thin shims in the inside air gap to keep the voice coil centered.
- Firmly press down the edges of the cone.
- Cement the thick cardboard gasket to the edge of the cone, then lay the speaker on its face until the cement is thoroughly dry.
- Tighten the spider mounting screws, and then remove the thin shims from the air gap.
- Make sure that the voice coil is centered by pressing in on the cone near the outer edge and listening for evidence of rubbing. If the voice coil is rubbing, the spider mounting screws should be loosened and the voice coil centered so it does not rub.
- Solder the flexible voice coil leads to the proper terminals.

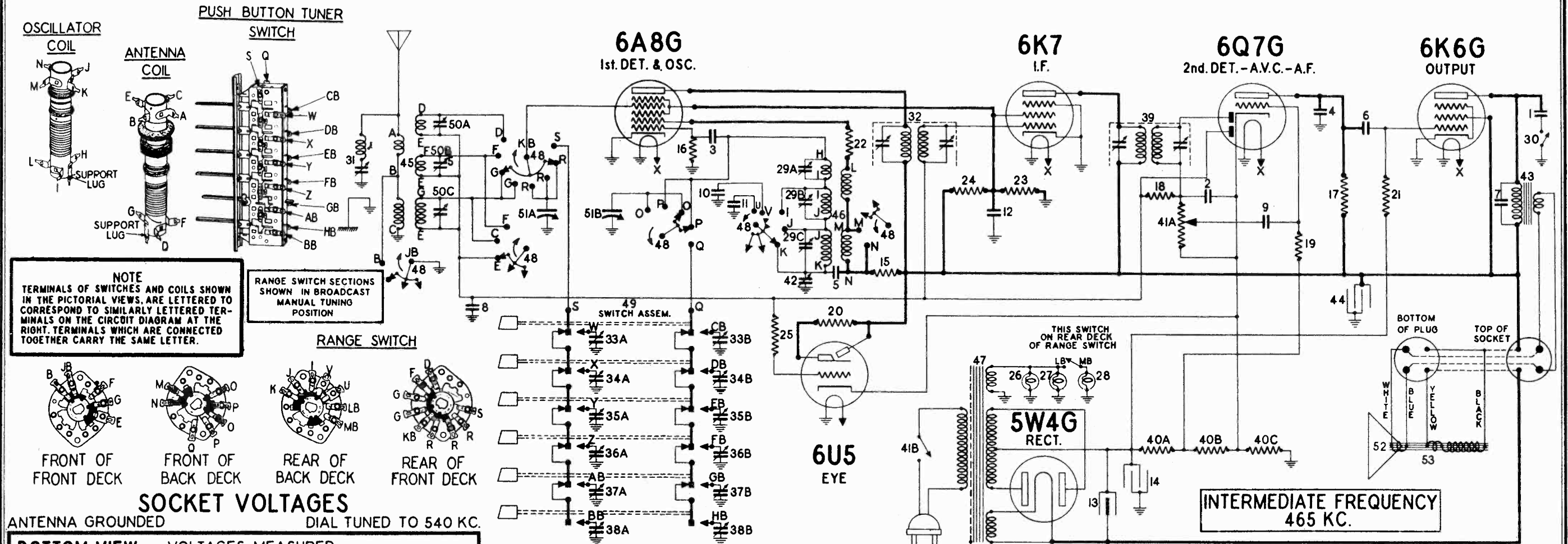
REPLACEMENT CONE PART NUMBERS

(FOR ALL 1936-1937 SPEAKER MODELS)

Speaker Model	Receiver Model	Replacement Cone part number	List Price of Replacement Cone
R-234-D.....	1611D, 1621D.....	Magnetic - Replace speaker	
R-245-A.....	1625D.....	Magnetic - Replace speaker	
R-243-A.....	1421.....	(Early production-spider fastened with screw, order cone #88100) (Late production-with staked spider-return to factory for repair)	
R-244-A.....	1425.....	88133.....	2.00
R-245-A.....	1601.....	88328.....	2.10
R-246-A.....	1441, 1671.....	Return to factory for repair	
R-247-A.....	1451, 1461, 1695, 1721, & 1731.....	110433.....	1.35
R-248-A.....	1455, 1465, 1725, 1735.....	110461.....	2.60
R-253-A.....	1475, 1706, 1709.....	110461.....	2.60
R-254-A.....	1485.....	88014.....	2.25
R-255-A.....	1495.....	89187.....	2.50
R-256-A.....	1495.....	89187.....	2.40
R-257-D.....	1631D, 1641D.....	89428.....	1.75
R-258-D.....	1635D, 1645D.....	110434.....	1.35
R-262-A.....	1499-P.....	89193.....	2.40
R-263-A.....	1499-P.....	89263.....	1.80
R-265-A.....	1685.....	89553.....	1.75
R-266-A.....	1471-X, 1701-X.....	110434.....	1.35
R-287-A.....	1691, 1751-X.....	89428.....	1.75
89966.....	1711.....	Return to factory for repair	

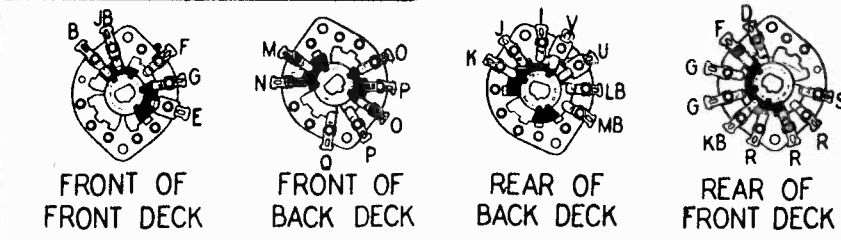
STEWART-WARNER CORP.

MODELS 91-611 to 91-619, Chassis 91-61
98-611 to 98-619, Chassis 98-61
910-611 to 910-619, Chassis 910-61
Schematic, Voltage, Socket, Coils



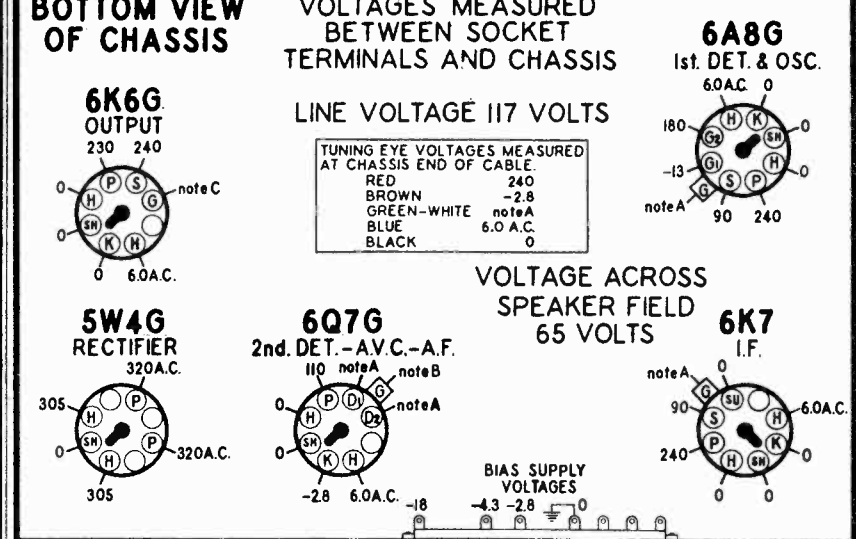
NOTE
TERMINALS OF SWITCHES AND COILS SHOWN
IN THE PICTORIAL VIEWS, ARE LETTERED TO
CORRESPOND TO SIMILARLY LETTERED TER-
MINALS ON THE CIRCUIT DIAGRAM AT THE
RIGHT. TERMINALS WHICH ARE CONNECTED
TOGETHER CARRY THE SAME LETTER.

RANGE SWITCH SECTIONS
SHOWN IN BROADCAST
MANUAL TUNING
POSITION



SOCKET VOLTAGES

ANTENNA GROUNDED DIAL TUNED TO 540 KC.



REAR OF CHASSIS

Use a high resistance voltmeter of 1000 ohms per volt.
NOTE A: The bias for the control grids of the 6A8-G, 6K7, 6U5, and the
diode plates of the 6Q7-G tubes is -2.8 volts measured across resistor 40C.
NOTE B: The bias for the control grid of the triode sections of the 6Q7-G
is -4.3 volts measured across resistor 40B and 40C.
NOTE C: The bias for the control grid of the 6K6-G output tubes is -18
volts measured across resistor 40A, 40B and 40C.

ELECTRICAL PARTS

Table with columns: DIAGRAM NUMBER, PART NUMBER, DESCRIPTION, LIST PRICE. Lists various components like capacitors, resistors, transformers, and lamps.

DIAGRAM PART DESCRIPTION LIST PRICE PART NUMBER DESCRIPTION LIST PRICE

Table with columns: DIAGRAM NUMBER, PART NUMBER, DESCRIPTION, LIST PRICE. Lists miscellaneous parts like washers, sockets, screws, and speaker components.

DIAL & MISCELLANEOUS PARTS

Table with columns: PART NUMBER, DESCRIPTION, LIST PRICE. Lists dial and miscellaneous parts like knobs, pointers, and retaining rings.

MODELS 91-611 to 91-619
98-611 to 98-619
910-611 to 910-619
Alignment, Trimmers, Tuner

STEWART-WARNER CORP.

MODELS 91-621 to 91-629
98-621 to 98-629
910-621 to 910-629
Tuner Data

ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 20 MC are required. 1. Connect the output meter across the voice coil or between the plate of the 6H6 output tube and ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.) 2. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure. 3. With the peak indicator in full scale, tune the dial position by hand, until the signal is correctly aligned. If the pointer is incorrectly set, it is necessary to move the pointer to the correct position by hand, while holding the gang in the full band position.

Table with 12 columns: TRIMMER NUMBER, RECEIVER DIAL SETTING, BAND POSITION, SIGNAL FREQUENCY, CONNECTION OF TRIMMER, TYPE OF ADJUSTMENT. Rows 1-12 detailing various trimmer adjustments like 2nd I.F., 1st I.F., WAVE TRAP, etc.

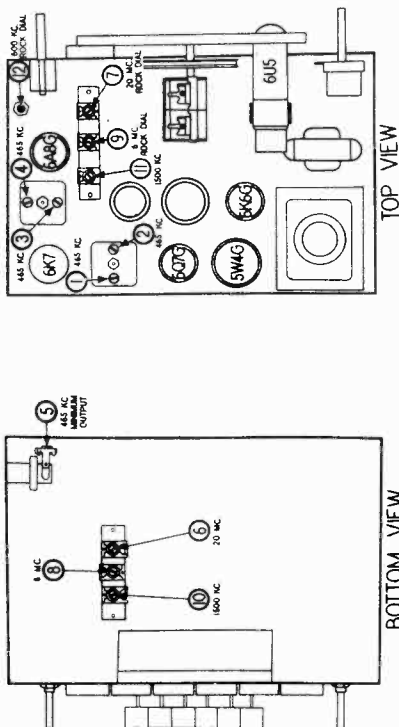
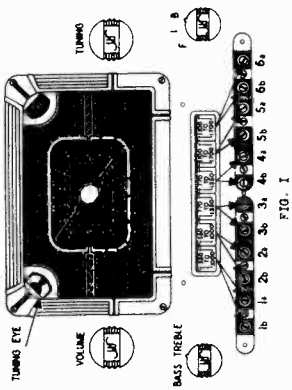


Table with 2 columns: Chassis Model, Voltage, Frequency. Lists models 91-61 to 910-61 and their corresponding voltage and frequency specifications.

These chassis are a tube, three band, push-button tuning superheterodyne receivers. The tuning ranges are 540 to 1720 KC, 2.2 to 7.0 MC and 6.7 to 23 MC. Incorporated in each chassis is a six-button tuner switch. Push-button tuning is obtained by substituting pre-set in the variable gang condenser. The push-button tuner switch provides a simple, rapid method of setting this substitution.

HOW TO SET UP THE PUSH-BUTTON TUNER

1. Be sure that your set is connected to a good antenna system. 2. Turn on the set and allow it to operate at least one-half hour before setting up the push-buttons. 3. Make a list of the frequencies of six nearby stations to which you can receive good reception. These frequencies will generally give poor results. Also be sure to select stations falling within the tuning range of the individual buttons, as indicated in Fig. 1. Each of the buttons on your push-button tuner has a definite operating range, as shown in Fig. 1. Therefore, frequency is in the operating range of a button before attempting to set-up that button for the particular station. AS THE ADJUSTING SCREWS ARE TURNED, THE LOCAL STATION SHOULD BE SELECTED. The frequencies of your local stations may be obtained from your newspaper or radio magazine. For example, suppose you wish to use a button in the tuning range of 700 KC. This frequency falls within the operating range of buttons No. 1 or No. 2, whose range is 650 to 1000-KC. Therefore, trimmer No. 1 or No. 2 can be used for the automatic tuning of that station.

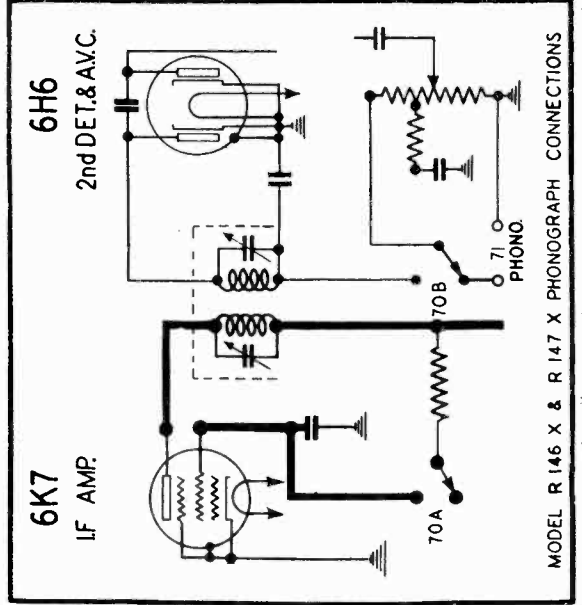


4. Remove the escutcheon around the push-buttons by taking out the five screws holding to the cabinet. A pair of which is used to tune a button to its correct station. 5. Turn the band switch knob (lower right) to the position in which the small 'jump' on the knob will point to the letter 'P' (Broadcast) on the cabinet. Now using the tuning knob (upper right), tune in two stations that you may identify the station by hearing its program. 6. Now turn the band switch knob until the 'jump' points to the letter 'A' (Automatic). The frequencies of the stations to this position will appear illuminated in the upper right corner of the dial. You will note as the knob is turned to this position your station will be selected. 7. Using a small screw-driver, insert it in the second screw from the left (No. 1a in Fig. 1) rotate the screw SLOWLY until the program that you are listening to is heard. The volume control, if it is adjustable, should be adjusted to the volume control. BE SURE THAT YOU ADJUST THIS PARTICULAR SCREW (1a) TO THE POINT WHERE THE TWO OPEN ENDS OF THE SCREW ARE EQUIDISTANT. IT IS ADVISABLE THAT YOU TURN THE SCREW AND OUT SO THAT IT WILL TUNE across the station several times in order that you may be sure that you have located this correct tuning point. 7. Next insert the screw-driver in the first screw on the left (No. 1b in Fig. 1) and turn until the program is indicated by the 'jump' on the knob. 8. Turn the 'tuning eye' being closest together. Now go back to trimmer screw No. 1a and see if any improvement in reception can be made by adjusting it. Also repeat this operation for screw No. 1b. NOTE: Trimmer screws indicated by letter 'a' are oscillation trimmer screws. Trimmer screws indicated by letter 'b' are antenna trimmers.

9. Set up button No. 2 for the selected station in a similar manner, using adjusting screws. 10. Repeat steps 7 and 8 for the remaining buttons in the same fashion.

HOW TO CHANGE THE OPERATING RANGE OF A BUTTON merely changing the dual trimmer used with that button. Dual trimmers with the ranges indicated below can be readily changed to any other range desired by using the following part numbers: LIST PRICE 112942 \$ 0.36 112943 .45 112944 .50 To make the change proceed as follows: 1. Remove the chassis from the cabinet. 2. By referring to Fig. 1, determine the dual trimmer associated with the button whose range you wish to change. 3. Unsolder the leads from the four terminals on the back of this dual trimmer. 4. Remove the 6/32 machine screw holding the dual trimmer to the front of the chassis. 5. From the above list, select a dual trimmer which will cover the desired range. 6. Mount it on the front of the chassis with the 6/32 machine screw, and solder the leads to its four terminals. The button is now ready to be set to any strong station whose frequency is within the range of this new trimmer unit.

FOR OTHER SERVICING DATA ON THESE MODELS, SEE INDEX



MODEL R 146 X & R 147 X PHONOGRAPH CONNECTIONS

The diagrams on this sheet show the phonograph and universal power transformer connections for the R-146-X, R-147-X and R-147-P chassis. Since these chassis are otherwise identical with the models R-146 and R-147, only additional parts for these models are listed to the right. All other parts and service data will be found in the R-146 or R-147 service manual.

Table with 4 columns: MODEL, PART NUMBER OF FUSE, CURRENT RATING OF FUSE, RATING OF FUSE. Lists fuse specifications for R-146-X, R-147-X, and R-147-P.

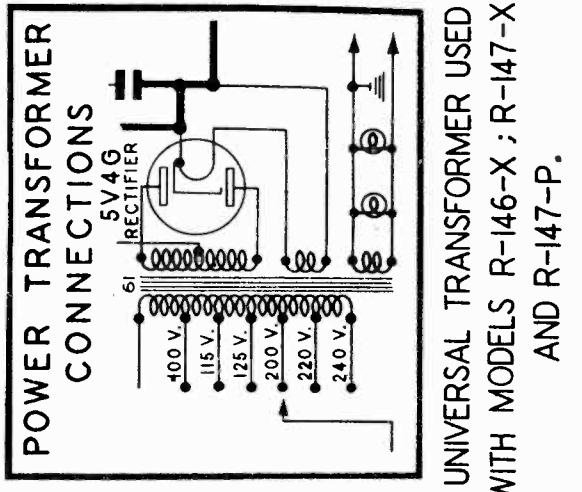
SPEAKERS AND OUTPUT TRANSFORMERS The R-266-A 8-inch dynamic speaker is used with model R-1471-X, and the R-263-A 12-inch dynamic speaker is used with model R-1475-X. Please note that these speakers require different output transformers. Speakers and output transformers are listed below for the models R-146-X, R-147-X and R-147-P respectively.

Table with 3 columns: MODEL, SPEAKER, OUTPUT TRANSFORMER. Lists speaker and transformer part numbers for R-1461-X, R-1465-X, R-1471-X, R-266-A, R-263-A, and R-1479-P.

MODELS R-146X, R-147X, R-147P
STEWART WARNER CORP.

Phonograph Connections
Universal Transformer
Data

SUPPLEMENTARY SERVICE DATA MODELS R-146-X, R-147-X, AND R-147-P.



MODEL R 147 P PHONOGRAPH CONNECTIONS

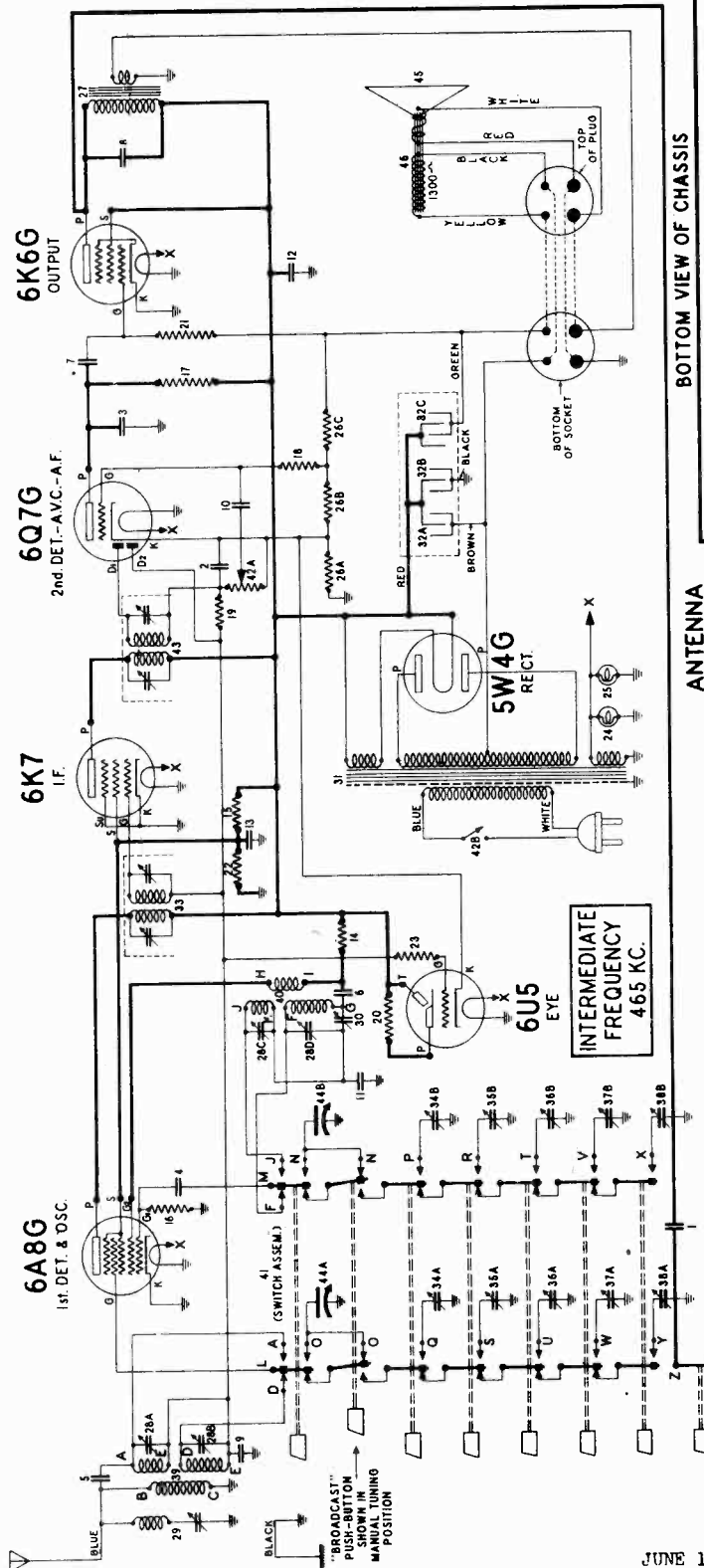
Table with 3 columns: DIAGRAM NUMBER, PART NUMBER, DESCRIPTION, LIST PRICE. Lists various parts like fuses, transformers, and speakers with their part numbers and prices.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 91-621 to 91-629
 Chassis 91-62
 98-621 to 98-629
 Chassis 98-62

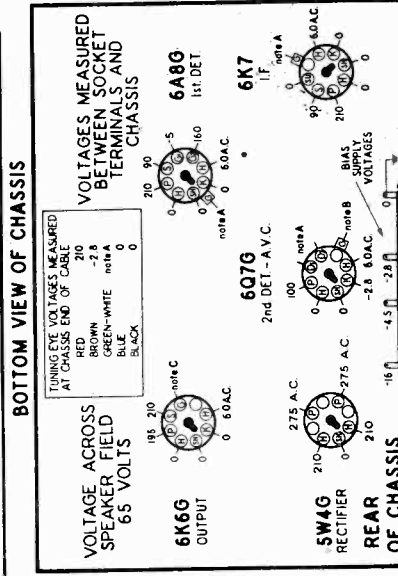
STEWART-WARNER CORP.

Chassis 910-62
 Schematic, Voltage, Socket
 Tuner Switch, Coils

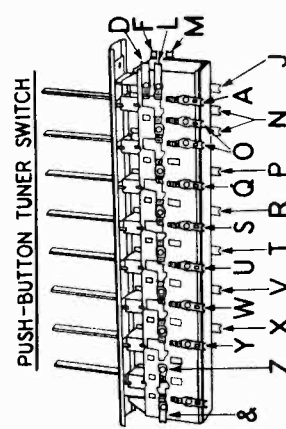
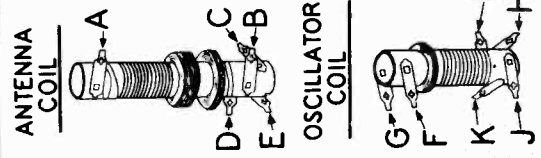


JUNE 1938

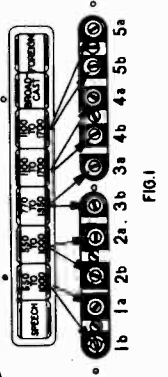
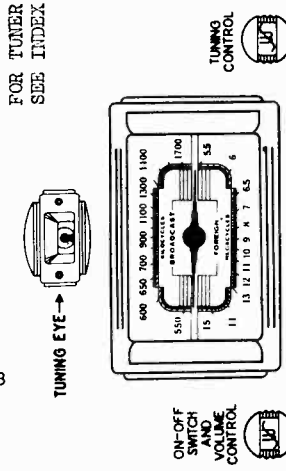
91-62, 98-62 AND 910-62 CHASSIS



NOTE A: The bias for the control grids of the 6A8-G, 6K7, 6Q7G, and the diode plates of the 6Q7-G tubes is -2.5 volts measured across resistor 28A.
 NOTE B: The bias for the control grid of the triode section of the 6Q7-G is -4.5 volts measured across resistors 28A and 28B.
 NOTE C: The bias for the control grid of the 6K6-G output tubes is -1.6 volts measured across resistors 28A, 28B and 28C.



NOTE
 TERMINALS OF SWITCH AND COILS SHOWN IN PICTORIAL VIEWS ABOVE, ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM AT THE RIGHT. TERMINALS WHICH ARE CONNECTED TOGETHER CARRY THE SAME LETTER.



MODELS 91-621 to 91-629
98-621 to 98-629
910-621 to 910-629
Alignment, Trimmers, Parts

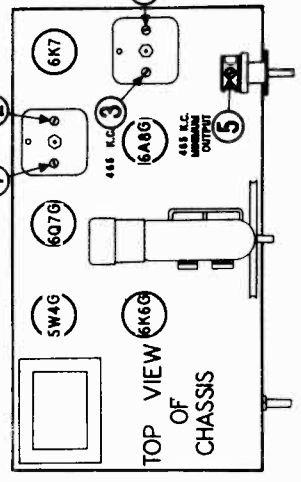
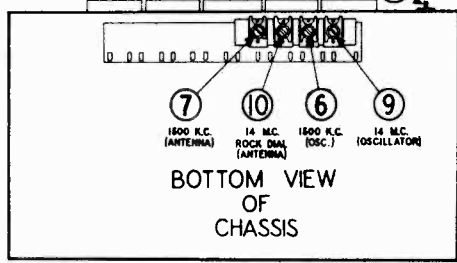
STEWART-WARNER CORP.

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	83217	Condenser - paper .04 mfd. 600 volt
2	83539	Condenser - mica 280 mfd.
3	85061	Condenser - mica 51 mfd.
4	85448	Condenser - mica 1 mfd.
5	89350	Condenser - paper .01 mfd. 400 volt
6	88185	Condenser - ceramic tube .008 mfd. 800 volt
9-10	89189	Condenser - paper .05 mfd. 200 volt
11	88587	Condenser - mica .0042 mfd.
12	88682	Condenser - paper .1 mfd. 400 volt
13	89421	Condenser - paper .1 mfd. 200 volt
14	110650	Resistor - carbon 10,000 ohms ± W.
15	110651	Resistor - carbon 470,000 ohms ± W.
16	110652	Resistor - carbon 47,000 ohms ± W.
17	110653	Resistor - carbon 220,000 ohms ± W.
18-19-20	110654	Resistor - carbon 1 meg. 1/4 watt
21	110659	Resistor - carbon 470,000 ohms ± W.
22	110658	Resistor - carbon 22,000 ohms ± W.
23	110670	Resistor - carbon 2.2 meg. 1/4 watt
24-25	110629	Lamp - 6.3 volt - 25 amp.
26A - 26B	112788	Resistor - (Section A - 35 ohms) (Section B - 240 ohms)
27	112790	Transformer - output
28A - 28B	112792	Condenser - trimmer (4 section)
29	112796	Coil - wave trap (with trimmer)
30	112799	Condenser - padder (530 - 850 mfd.)
31	112800	Transformer - power 117 V. 50-80 C.
31	112823	Transformer - power 100-240 volt
31	112833	Transformer - 50-133 cycles
31	112836	Transformer - power 117 V. 25 cycle
32A - 32C	112802	Condenser - electrolytic (dry) (Section A - 8 mfd. 400 volt) (Section B - 4 mfd. 400 volt) (Section C - 4 mfd. 400 volt)
33	112803	Transformer - 1st I.F.
34A - 34B	112942	Condenser - dual push button trimmer (1100 KC to 1700 KC)
35A - 35B	112943	Condenser - dual push button trimmer (770 KC to 1350 KC)
36A - 36B	112944	Condenser - dual push button trimmer (550 KC to 1000 KC)
37A - 37B	112944	Condenser - dual push button trimmer (550 KC to 1000 KC)
38	113011	Coil - ant. - broadcast-short-wave
40	113015	Coil Assembly - oscillator
41	113021	Push Button Switch Assembly
42A - 42B	113024	Volume Control (500,000 ohm) (with switch)
43	113047	Transformer - 2nd I.F.
44A - 44B	113126	Condenser - variable gang (Cone - voice coil assembly for R-113243 speaker) (Cone - voice coil assembly for R-113342 speaker) (R-115011 or R-115014 spkrs.)
45	115000	Speaker - dynamic (8 inch)
46	115014	Speaker - dynamic (8 inch)

LIST PRICE	DESCRIPTION	PRICE
111367	Spring - drive cord tension	.03
111885	Shield Base - for tube shields	.02
112233	Drum and Bushing - for dial drive	.35
112745	Clip - coil mounting (osc. & ant.)	.01
112747	Nut - #8-32 Hex.	.01
112786	Scale - dial	.01
112874	Screw #10 X 1-1/8 Chassis Mtg.	.01
112878	Screw - P.B. escutcheon mtg. #8 X 3/8	.01
112878	Screw - escutcheon mtg. #8 X 3/8	.01
112945	Shaft - tuning	.10
113019	Clip - dial scale retaining	.01
113022	Knob - for controls	.10
113025	Socket - octal base (with special ground)	.15
113030	Escutcheon - dial	1.24
113038	Dial - mtg. plate and bracket	.38
113040	Light Shield - cardboard (between button holes and dial frame)	.06
113077	Shield - tube	.15
113102	Push Button - only	.08
113108	Escutcheon Plate - for trimmer screws	.04
113114	Pointer - dial	.15
113127	Bracket & Clip - for tuning eye	.25
113130	Cable & Plug - for tuning eye	.55
113135	Escutcheon - for eye	.25
113144	Socket - for dial lamp	.08
113189	Tab - celluloid - for push button-Per doz.	.40
113321	Knob - station call letters (4 sheets) (brown)	.06
113323	Tab - trimmer range (550 to 1000)-Per doz.	.09
113324	Tab - trimmer range (770 to 1350)-Per doz.	.09
113325	Tab - trimmer range (1100 to 1700)-Per doz.	.09
113326	Tab - "Speech"-Per doz.	.08
113327	Tab - "Foreign"-Per doz.	.08
113328	Tab - "Foreign"-Per doz.	.08
5.00	113556	Shield - for pilot light

81145	Retaining Ring - for drive shaft	Per C	.50
85040	Screw - #6 Hex. Head (self-tapping)	Per C	.35
85427	Socket - octal base		.15
89745	Washer - (paper) for back of knobs		.15
110490	Plug - speaker (4 prong)		.15
110501	Socket - 4 prong (for speaker)		.15
110829	Washer - flat steel, for mtg. chassis		.01
110855	Sleeve - felt for tuning eye		.05
111302	Cord - dial drive 8 or 50 ft. lgths.	Per Ft.	.06

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.



Chassis Model
91-62 91-621 to 91-629
98-62 98-621 to 98-629
910-62 910-621 to 910-629

Used In Receiver Models
91-621 to 91-629 117
98-621 to 98-629 117
910-621 to 910-629 100-240

Frequency
80 cycles
25 cycles
50-133

These chassis are 8-tube, two band push-button tuning superheterodyne receivers. The tuning ranges are 540 to 1725 KC and 5.4 to 15.4 MC. The I. F. is 485 KC.

Incorporated in each chassis is an eight-button tuner switch. The first button on the left, labelled "Speech", is a tone control. The two buttons on the right, labelled "broadcast" and "Foreign", are used for band change. The other five buttons are for push-button tuning.

Push-button tuning is secured by substituting pre-set trimmers for the variable gang condenser. The push-button tuner switch provides a simple, rapid method for effecting this substitution.

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 14 MC are required.

- 1 Connect the output meter across the voice coil or between the plate of the 6K6-O output tube and ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
- 2 Connect the ground lead of the signal generator to the black (ground) wire or the chassis.
- 3 Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
- 4 With the gang condenser in full mesh, set the dial pointer in a horizontal position. If the pointer is incorrectly set, it is merely necessary to move the pointer to the correct position by hand, while holding the gang in the full mesh position.

Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.

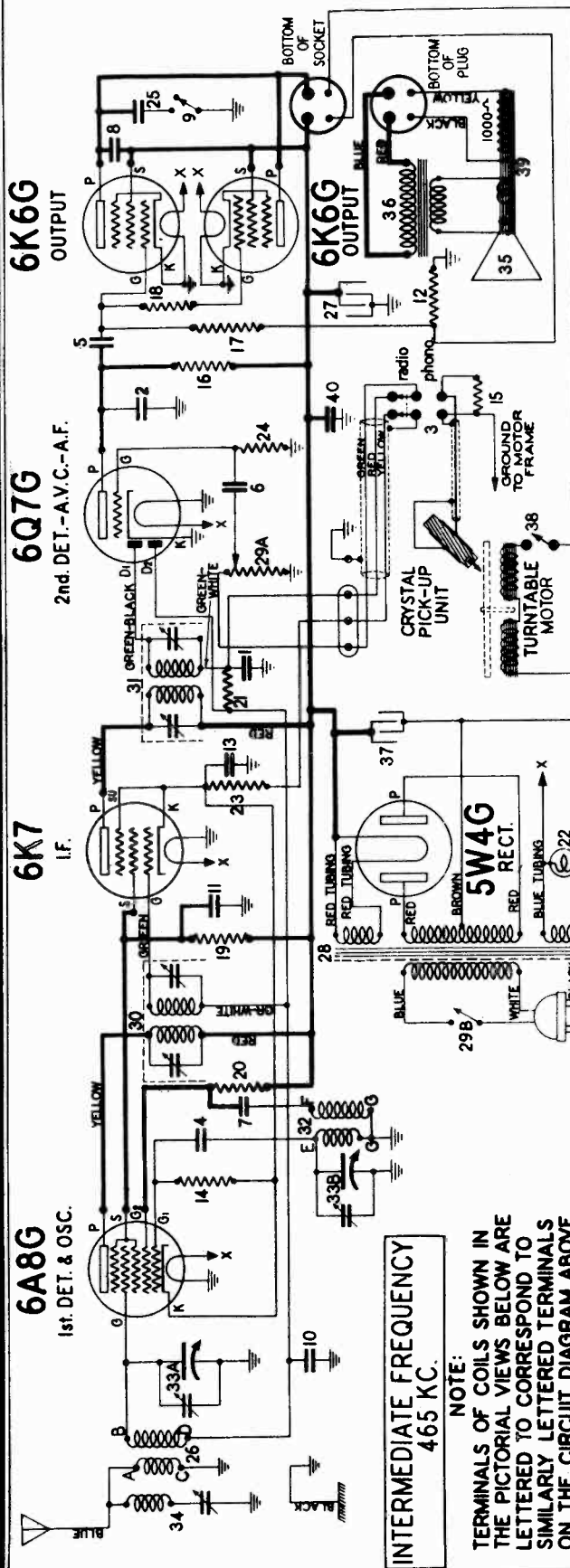
With the gang condenser in full mesh, set the dial pointer in a horizontal position. If the pointer is incorrectly set, it is merely necessary to move the pointer to the correct position by hand, while holding the gang in the full mesh position.

DUPPLY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
1 MFD. CONDENSER	CONTROL GRID OF 6A8-O TUBE	465 KC	BROADCAST BUTTON PUSHED IN	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2 3-4	2nd I.F. 1st I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue wire)	485 KC	BROADCAST BUTTON PUSHED IN	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue wire)	1500 KC	BROADCAST BUTTON PUSHED IN	1500 KC	6	BROADCAST OSCILLATOR (Shunt)	ADJUST TRIMMER TO BRING IN SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue wire)	1500 KC	BROADCAST BUTTON PUSHED IN	TUNE TO 1500 KC GENERATOR SIGNAL	7	BROADCAST ANTENNA	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue wire)	600 KC	BROADCAST BUTTON PUSHED IN	TUNE TO 600 KC GENERATOR SIGNAL	8	BROADCAST OSCILLATOR (Series Pack)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETURNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue wire)	14 MC	FOREIGN BUTTON PUSHED IN	14 MC	9	FOREIGN OSCILLATOR (Shunt)	ADJUST TO BRING IN SIGNAL. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 13.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 14 MC. WITH TRIMMER SCREEN PARTNER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue wire)	14 MC	FOREIGN BUTTON PUSHED IN	14 MC	10	FOREIGN ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETURNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.

910-641 to 910-649
 Chassis 910-64
 Schematic, Voltage, Socket
 Coils, Notes

STEWART-WARNER CORP.

MODELS 91-641 to 91-649
 Chassis 91-64
 98-641 to 98-649
 Chassis 98-64



6A8G
 1st DET. & OSC.

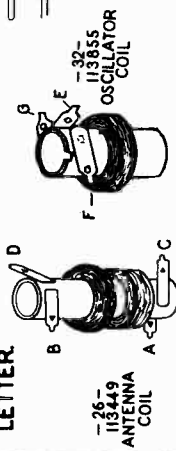
6K7
 I.F.

6Q7G
 2nd DET.-A.V.C.-A.F.

6K6G
 OUTPUT

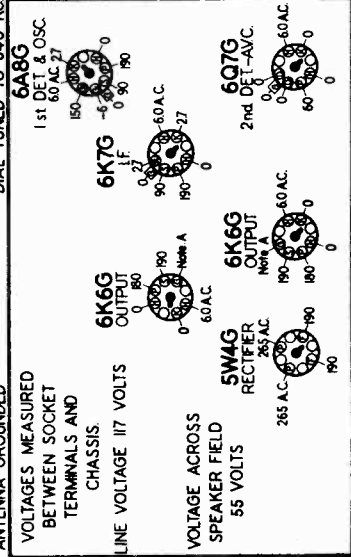
**INTERMEDIATE FREQUENCY
 465 KC.**

NOTE:
 TERMINALS OF COILS SHOWN IN
 THE PICTORIAL VIEWS BELOW ARE
 LETTERED TO CORRESPOND TO
 SIMILARLY LETTERED TERMINALS
 ON THE CIRCUIT DIAGRAM ABOVE
 TERMINALS WHICH ARE CONNECTED
 TOGETHER CARRY THE SAME
 LETTER.



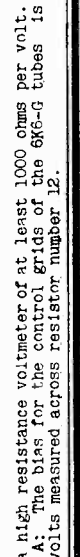
- 34-----113889--Coil - Wave trap
- 35-----R-114063 { Cone voice coil assembly (for R-115027 speaker) } -----20
- 36-----114064--Fr.-transformer - output -----1.25
- 37-----114329--Condenser - elect. 16 mfd. 350 V. .56
- 38-----114437 { Toggle Switch - phono power off- on switch } -----.75
- 39-----R-115027--Speaker - dynamic (9 inch) 300 V. - 4.90
- 40-----88191--Condenser - paper 1 mfd. 300 V. -.25

SOCKET VOLTAGES



ANTENNA GROUND
 VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS
 LINE VOLTAGE 117 VOLTS
 VOLTAGE ACROSS SPEAKER FIELD 55 VOLTS

REAR OF CHASSIS



Use a high resistance voltmeter of at least 1000 ohms per volt.
 NOTE A: The bias for the control grids of the 6A8G tubes is -15 volts measured across resistor number 12.

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
16	110553	Resistor - carb. 220000 ohm	.12
17	110559	Resistor - carb. 470000 ohm	.12
18	110560	Resistor - carb. 100 ohms 1/4 W.	.12
19	110566	Resistor - carb. 33000 ohms	.12
20	110569	Resistor - carb. 10000 ohms	.12
21	110580	Resistor - carb. 3.3 meg.	.15
22	110828	Lamp 6.3 volt - 25 watts	.15
23	112974	Resistor - carb. 250 ohm 1/4 (10%)	.12
24	112975	Resistor - carb. 10 meg. 1/4 watt	.12
25	113034	Condenser - paper .00217	.15
26	113449	Coil - antenna	.78
27	113808	Condenser - elect. 8 mfd. 300 V.	.66
28	113813	Transformer - power 177. 80C.-5.00	
29A	298-113652	Volume control - 500,000 ohm (with switch)	.98
30	113653	Transformer - 1st I.F.	.25
31	113654	Transformer - 2nd I.F.	.20
32	113655	Coil - Oscillator	.48
33A	33B-113889	Condenser - gang	6.30

The triode section of the 6Q7G tube utilizes a circuit arrangement which gives a minimum of distortion and excellent gain with zero bias on the grid. At high signal levels, this circuit gives less distortion than if the tube is operated with a fixed bias. The proper operation of this circuit depends largely on the high resistance of the grid resistor, No. 24 in the circuit diagram. This resistor is rated at 10 megohms. Do not substitute any lower value since this would increase distortion and decrease amplification.

November 15, 1938

MODELS 91-641 to 91-649
98-641 to 98-649
910-641 to 910-649

STEWART-WARNER CORP.

Alignment, Trimmers
Phono. Data, Tuner Data

ALIGNMENT EQUIPMENT & PROCEDURE

For alignment, an output meter and an accurately calibrated signal generator with a tuning range from 465 KC. to 1500 KC. are required.

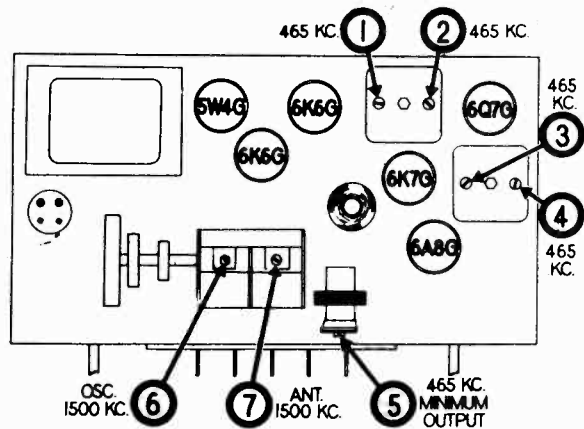
- 1- Connect the output meter across the voice coil or between the plate of either of the 6K6G tubes and ground through a .1 mfd. condenser. (These tubes are connected in parallel, not push-pull). The connection will depend upon the type of meter. (The more sensitive type should be connected across the voice coil.)
- 2- Connect the ground lead of the signal generator to the chassis of the receiver and keep it connected in this manner throughout the entire alignment procedure.
- 3- Turn the volume control to the maximum volume position and leave it in this position throughout the entire alignment procedure.
- 4- With the gang condenser in full mesh, set the pointer to the last mark on the left end of the dial scale. If the pointer is only slightly off calibration, loosen the set screw in the pointer cord drive drum, which is the outer drum on the left hand side of the gang condenser and with the gang condenser in full mesh turn the drum until the pointer is in the correct position. If the pointer is off calibration several dial divisions, release it from the pointer drive cord by spreading the clip on the pointer. Then slide the pointer along the cord until it is set to the last division on the left end of the dial scale. Hold the pointer in place and check to see if the gang condenser is still fully meshed, then tighten the pointer clip being careful not to cut the cord. Place a drop of household or speaker cement on the cord and pointer clip to prevent the pointer from slipping.

DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	CONTROL GRID OF 6A8G TUBE (Do not remove grid clip)	465 KC.	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2 3-4	2ND I.F. 1ST I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
200 MMFD. MICA CONDENSER	ANTENNA LEAD	465 KC.	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING STRONG GENERATOR SIGNAL.
200 MMFD. MICA CONDENSER	ANTENNA LEAD	1500 KC.	1500 KC.	6	BROADCAST OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT.
200 MMFD. MICA CONDENSER	ANTENNA LEAD	1500 KC.	1500 KC.	7	BROADCAST ANTENNA	ADJUST FOR MAXIMUM OUTPUT.

DIAL AND MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
112745	Clip - coil mounting (osc. & ant.)	.01
112798	Clip - for mtg. wave trap coil	.01
113178	Cord - band indicator (28" required) (supplied in 4 ft. lengths)	.30
113882	Condenser - drive drum & pinion gear	.70
113884	Dial drive drum and hub	.42
113812	Dial Frame & Pulley Assembly	.54
114321	Dial Scale	.50
113661	Dial Scale Retainer	.03
113755	Escutcheon - dial	.40
113756	Escutcheon - push button	.32
113156	Gear - and bushing assembly for dial drive	.22
113022	Knob - round - volume or tuning	.10
113170	Adjusting Lug - for button shafts	.01
110496	Plug - speaker (4 prong)	.12
113856	Pointer	.06
112762	Pulley - dial cord drive (at left side)	.04
113762	Push Button	.04
113880	Push Button Tuner Unit Assembly	4.60
81145	Retaining Ring - for drive shaft	Per C .50
113463	Rubber Bushing - motor mtg.	.03
113672	Rubber Grommet (on tuning shaft)	.02
85040	Screw - #6 Hex. Hd. for mtg. adjusting washer	Per C .35
112874	Screw - #10 X 1 1/8 chassis mtg.	.10
112879	Screw - escutcheon mtg. #2 X 3/8	.03
114431	Screw #6-40 X 7/8 - for setting up buttons	.01
85627	Set Screw - 8/32 square head	.02
113860	Shaft - tuning	.08
113875	Socket - for dial lamp	.15
110501	Socket - 4 prong (for speaker)	.16
113025	Socket - octal base (with special ground)	.15
85427	Socket - octal base (standard)	.15
113177	Spring - dial cord tension	.09
85815	Spring - between gear sections	.01
113169	Spring - for key return	.01
114041	Tabs - station call letters	.35
84412	Terminal strip - phono	.03
110829	Washer - flat steel - for mtg. chassis	.01
89746	Washer - (paper) for back of knobs	.006

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.



The connections to the phonograph unit are made at the terminal strip located on the back of the radio chassis. **IMPORTANT:** If the receiver chassis is removed from the cabinet for test, you must put a jumper wire between the two outside terminals of this terminal strip. Also the center terminal must be grounded to the chassis.

HOW TO SET-UP AND USE THE PUSH BUTTON TUNER.

1. Connect receiver to good antenna system.
2. Remove escutcheon surrounding push buttons.
3. Select five nearby stations to which you wish to set up the buttons. Be sure to select nearby, powerful stations, since weak signals will generally give better results when tuned manually. Any button may be used for a station on any part of the dial.
4. Loosen the screw at the side of the push button shaft (about one turn counter-clockwise will be sufficient).
5. Keep the screw driver inserted in the screw slot and push against the screw. At the same time tune in the station using the tuning knob. **YOU MUST PUSH AGAINST THE SCREW DRIVER DURING THE ENTIRE TIME THAT YOU ARE TUNING.** Be sure that you tune in the station to the point where the program is heard with the least hiss and deepest tone, and not to the point of greatest volume. Now, still pushing against the screw driver, retighten the screw, turning it to the right (clockwise) until it is **REASONABLY TIGHT.** To turn further may result in damage to the mechanism.
6. The set up for this button is now complete. Set-up the remaining buttons in the same manner and replace the escutcheon.

PHONOGRAPH CONNECTIONS

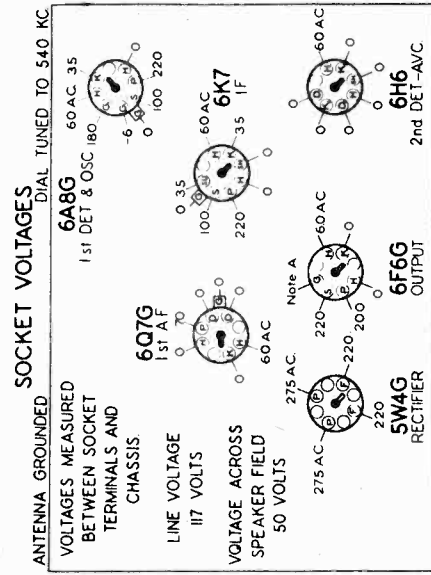
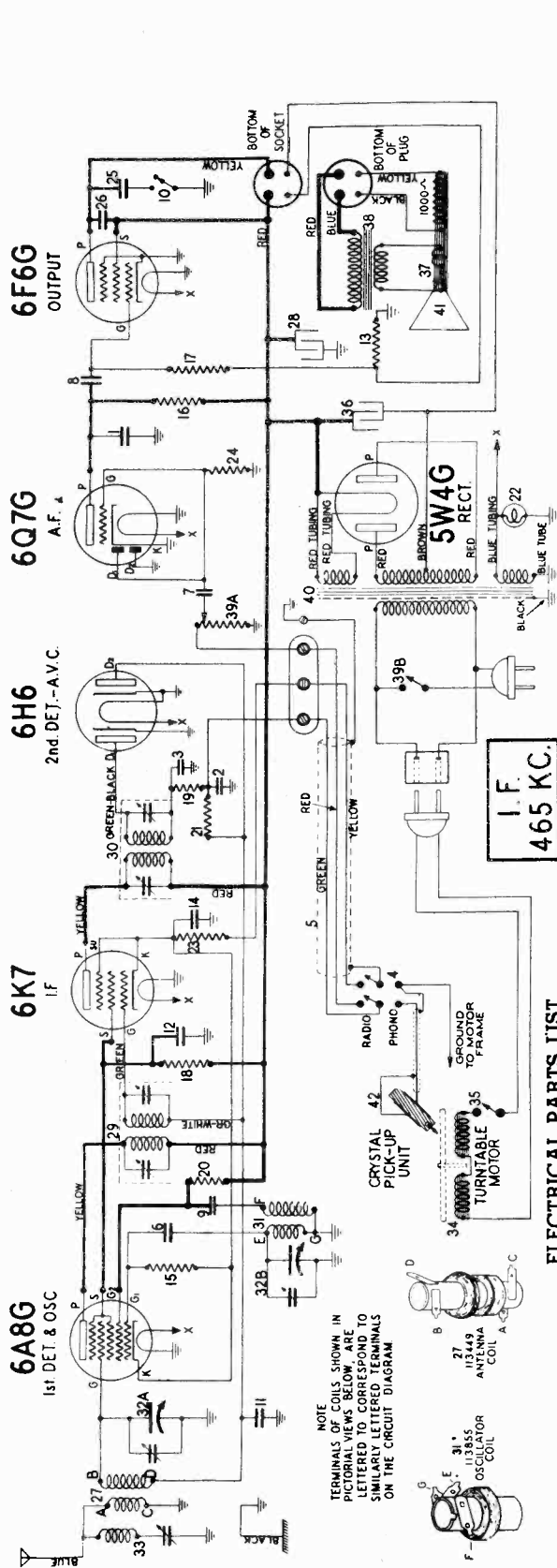
This receiver is equipped with a phonograph turntable and a crystal pickup unit for phonograph operation. The phonograph turntable motor is wired directly to the line cord. A socket is inserted in parallel with this power supply line into which is plugged the short power cord from the radio chassis.

The crystal pickup unit is switched into the audio amplifier section of the radio by means of a double pole double throw switch located in the top panel. With this switch in the phonograph position the receiver volume control is disconnected from the low side of the 2nd I.F. transformer and connected across the crystal pickup unit. The radio frequency section of the receiver is at the same time silenced by the opening of the cathodes of the 6A8G and 6K7G tubes.

TESTING When the phonograph pickup leads are disconnected as this model chassis is removed from the cabinet for testing, the set will not operate unless the proper connections are made at the phonograph terminal strip. The two outside terminals must be connected together and the center terminal must be grounded to the chassis.

MODEL 91-648, Chassis 91-64
 STEWART-WARNER CORP. (With "S" stamped on chassis)
 Schematic, Voltage, Socket

THIS APPLIES ONLY TO THE 91-648 RECEIVER IDENTIFIED BY THE LETTER S STAMPED ON BACK OF CHASSIS.



ELECTRICAL PARTS LIST

Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica 260 mmfd.	.20
2-3	83783	Condenser—mica 110 mmf.	.20
4	84566	Switch—"phono-radio"; D.P.D.T.	1.50
5	84572	Cable—Shielded for Phono. Pickup.	.60
6	85061	Condenser—mica 51 mmfd.	.15
7-8	88026	Condenser—paper .02 mfd. 400 Volt	.25
9	88030	Condenser—paper .01 mfd. 400 Volt	.25
10	88054	Switch for tone control	.30
11	88189	Condenser—paper .05 mfd. 200 Volt	.25
12	88191	Condenser—paper .1 mfd. 300 Volt	.25
13	88462	Resistor—W. W. 270 ohms 1 W. 10°.	.15
14	89532	Condenser—paper .25 mfd. 200 Volt	.32
15	110552	Resistor—carbon 47,000 ohms 1/4 W. 12	.12
16	110553	Resistor—carbon 270,000 ohms 1/4 W. 12	.12
17	110559	Resistor—carbon 470,000 ohms 1/4 W. 12	.12
18-19	110566	Resistor—carbon 33,000 ohms 1/4 W. 12	.12
20	110569	Resistor—carbon 10,000 ohms 1/4 W. 12	.12
21	110580	Resistor—carbon 3.3 meg. 1/4 watt	.12
22	110629	Dial bulb—6.3 volt .25 amps.	.15
23	112974	Resistor—carbon 220 ohms 1/4 W. (10°)	.15
24	112975	Resistor—carbon 10 meg. 1/4 watt.	.12
25	113034	Condenser—paper .04 mfd. 600 volt	\$0.15
26	113035	Condenser—paper .006 mfd. 600 V.	.14
27	113449	Antenna coil	.78
28	113808	Condenser—electrolytic 8 mfd. 350 V.	.66
29	113853	Transformer—1st I.F.	1.25
30	113854	Transformer—2nd I.F.	1.20
31	113855	Coil—oscillator	.48
32A, 32B	113869	Condenser—gang	3.30
33	113889	Coil—wave trap	.54
34	114400	Phono. motor & turntable	10.50
35	114437	Toggle switch—phono. power off-on switch	.75
36	114972	Condenser—elect. 16 mfd. 450 V	.78
37	U-115048	Speaker—dynamic 6"	5.40
38	U-116212	Output transformer for U-115048 speaker	1.50
39A, 39B	116274	Volume control 500,000 ohms with switch	.96
40	116283	Transformer—power 110 V 60 C.	3.50
41	U-116296	Cone & voice coil assembly for U-115048 speaker	1.70
42	116300	Phono. pickup head	7.50

Use a high resistance voltmeter of at least 1000 ohms per volt.
 NOTE A: The bias for the control grid of the 6F6G tube is —13.5 volts measured across resistor number 13.

MODEL 91-648, Ch. 91-64
 (With "S" stamped on chassis) STEWART-WARNER CORP.
 Alignment, Trimmers, Tuner
 Phono. Connections

THIS APPLIES ONLY TO THE 91-648 RECEIVER IDENTIFIED BY THE LETTER S STAMPED ON BACK OF CHASSIS.

ALIGNMENT PROCEDURE

FOR ALIGNMENT, an output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or between the plate of the 6F6G output tube and ground through a .1 mfd. condenser. The connection will depend upon the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the chassis of the receiver and keep it connected in this manner throughout the entire alignment procedure.
3. Turn the volume control to the maximum volume position and leave it in this position throughout the entire alignment procedure.
4. With the gang condenser in full mesh, the pointer should be at the last dial division at the left end of the dial scale. With the gang condenser in this position the set screw on the large drum should be nearly straight down.
5. IF YOU DISCONNECT THE PHONOGRAPH PICK-UP CABLE, PUT A JUMPER BETWEEN THE TWO OUTSIDE TERMINALS OF THE TERMINAL STRIP, AND GROUND THE CENTER TERMINAL TO CHASSIS.

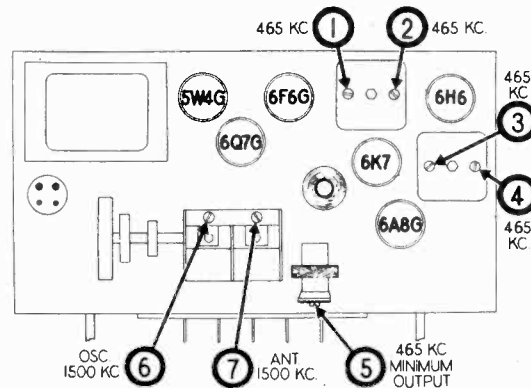
Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 Mfd. Condenser	Control Grid of 6A8G Tube (Do not remove grid clip)	465 KC	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
				3-4	1st I.F.	
400 Ohm Carbon Resistor	Antenna Lead	465 KC	Any Point Where It Does Not Affect the Signal	5	Wave Trap	Adjust for Minimum Output Using Strong Generator Signal.
400 Ohm Carbon Resistor	Antenna Lead	1500 KC	1500 KC	6	Broadcast Oscillator	Adjust for Maximum Output.
400 Ohm Carbon Resistor	Antenna Lead	1500 KC	Tune to 1500 KC Generator Signal	7	Broadcast Antenna	Adjust for Maximum Output.

DIAL AND MISCELLANEOUS PARTS

Part No.	Description	List Price
113170	Adjusting Lug for Push Button shaft	\$0.01
112745	Clip—for coil mtg.	.01
112798	Clip—for wave trap coil mtg.	.01
89912	Clip—Grounding for Tube Base	.02
113178	Cord—dial drive (supplied in 4 ft. lengths)	.30
113882	Drive drum (small) and Pinion Gear for gang condenser	.70
113884	Dial drive drum and hub (large)	.42
113812	Dial Frame and Pulley Assembly	.54
114321	Dial scale	.50
113861	Dial Scale Retainer Clip	.03
113755	Escutcheon for dial	.40
113756	Escutcheon for push buttons	.32
113022	Knob	.10
114320	Mechanical Push Button Mechanism, complete	7.50
84571	Needle Cup for Phonograph	.10
110496	Plug for speaker	.12
113856	Pointer—dial	.06
113762	Push Buttons	.04
116165	Receptacle for 2 prong plug for phono. motor	.50
81145	Retaining Clip for tuning shaft	Per C .50
114598	Rubber tube for tuning shaft	.01
85040	Screw—for mtg. adjusting lug No. 6x1/4 Hex. Hd.	.35
112874	Screw—chassis mtg. No. 10x1 1/8"	.01
114431	Screw—for setting up push buttons No. 6-40x7/8"	.01
114914	Screw—for mtg. escutcheon, Phillips head	Per doz. .15
116185	Screw—for push button escutcheon mtg. No. 2x3/8"	.01
116423	Screw—Needle, for head	.01
85827	Set Screw—No. 8-32 Square Head	.02
113860	Shaft—tuning	.08
88164	Shield Cap	.06
88161	Shield, tube	Per section .08
89911	Shield—Base	.04
85427	Socket—octal base (standard)	.15
113025	Socket—octal base (with special ground)	.15
110501	Socket for speaker plug	.16
113875	Socket—for dial lamp	.15
113169	Spring—return for push buttons	.01
113177	Spring—for dial cord tension	.09
114041	Tabs—station call letters	.35
84412	Terminal Strip—phono.	.03
116410	Turntable	2.00
116530	Washer—for back of knob paper	.005
110829	Washer—for chassis mtg.	.01

PHONOGRAPH CONNECTIONS

This receiver is equipped with a phonograph turntable and a crystal pickup unit for phonograph operation. The crystal pickup unit is switched into the audio amplifier section of the radio by means of a double-pole double-throw switch adjacent to the turntable. With this switch in the phonograph position (marked P) the receiver volume control is disconnected from the low side of the 2nd I.F. transformer and connected across the crystal pickup unit. The radio frequency



section of the receiver is at the same time silenced by the opening of the cathodes of the 6A8G and 6K7 tubes.

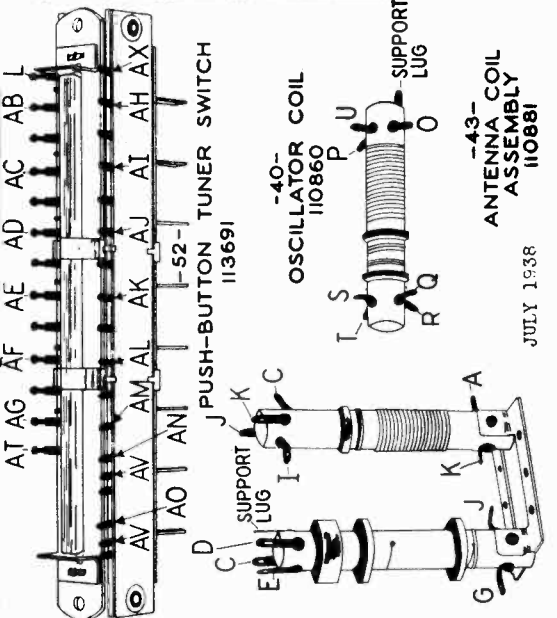
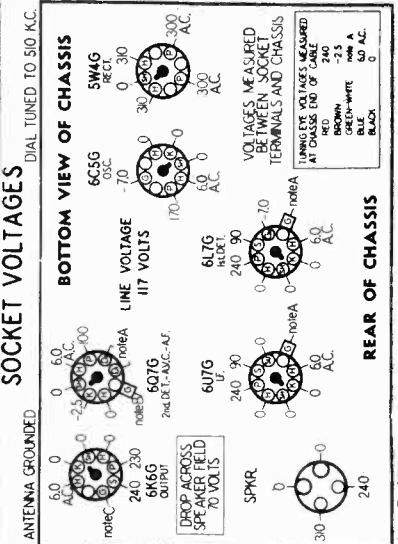
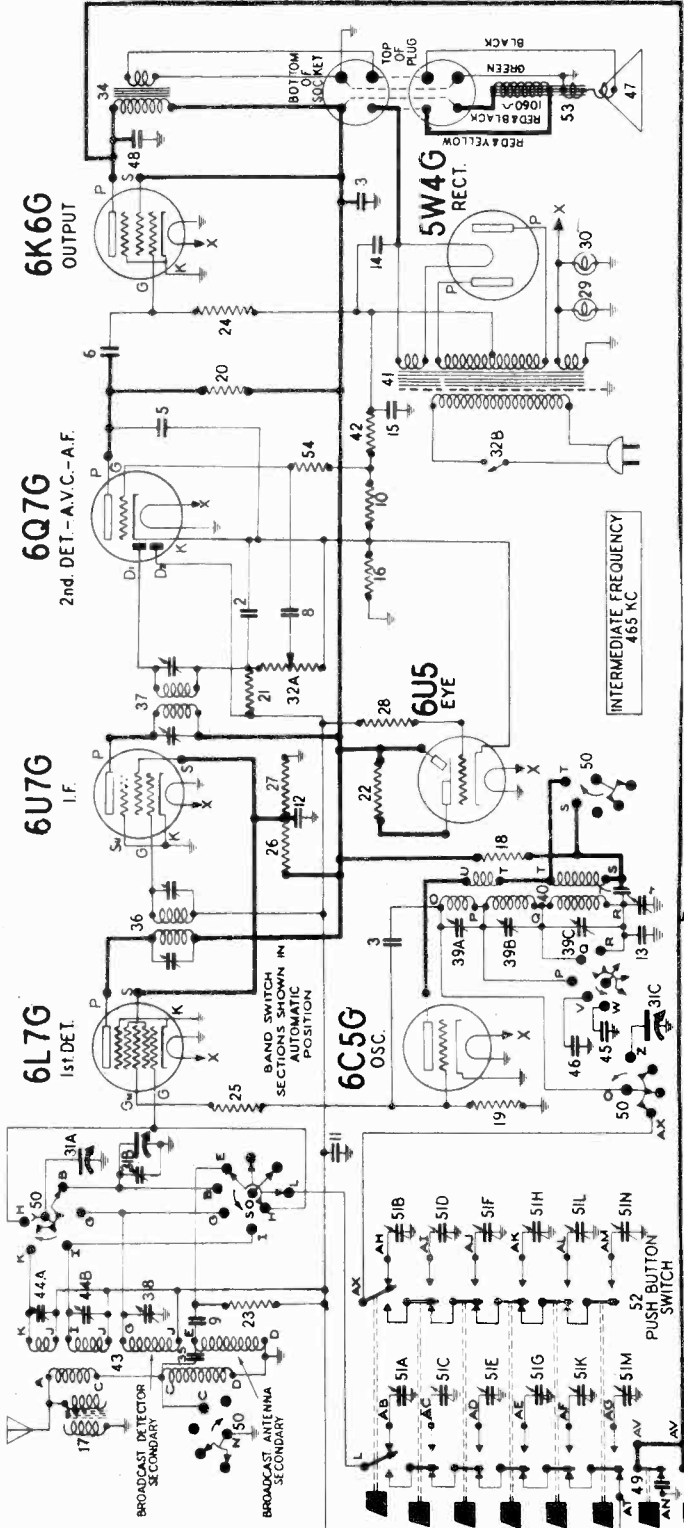
The connections to the phonograph unit are made at the terminal strip located on the back of the radio chassis. **IMPORTANT:** If the receiver chassis is removed from the cabinet for test, you must put a jumper wire between the two outside terminals of this terminal strip. Also the center terminal must be grounded to the chassis.

HOW TO SET UP AND USE THE PUSH BUTTON TUNER

1. Connect receiver to good antenna system and operate for fifteen minutes, then remove escutcheon surrounding push buttons.
2. Select five nearby stations to which you wish to set up the buttons. Be sure to select nearby, powerful stations, since weak signals will generally give better results when tuned manually. Any button may be used for a station on any part of the dial.
3. Loosen the screw at the side of the push button shaft (about one turn counter-clockwise will be sufficient). Keep the screw driver inserted in the screw slot and push against the screw. At the same time carefully tune in the station using the tuning knob. **YOU MUST PUSH AGAINST THE SCREW DRIVER DURING THE ENTIRE TIME THAT YOU ARE TUNING.** Now, still pushing against the screw driver, retighten the screw, turning it to the right (clockwise) until it is **REASONABLY TIGHT.** To turn further may result in damage to the mechanism.
4. The setup for this button is now complete. Set up the remaining buttons in the same manner and replace the escutcheon.

MODELS 91-711 to 91-719
 Chassis 91-71
 98-711 to 98-719
 Chassis 98-71
 910-711 to 910-719

STEWART-WARNER CORP. Schematic, Voltage, Coils
 Tuner Switch, Notes



SOCKET VOLTAGES
 DIAL TUNED TO 510 KC.

ANTENNA GROUNDED

ANTENNA UNGROUNDED

REAR OF CHASSIS

IMPORTANT: Use a high resistance voltmeter of at least 1,000 ohms per volt.

NOTE A: The bias for the control grids of the 6L7G, 6Q7G, 6U5, and 6K6G is -2.5 volts measured across resistors 10 and 16.

NOTE B: The bias for the control grid of the 6K6G is -1 volt measured across resistors 10 and 16.

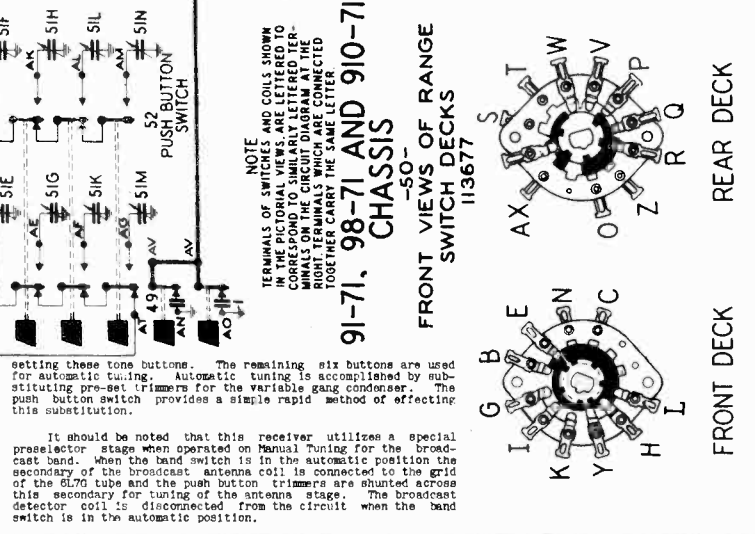
NOTE C: The bias for the control grid of the 6K6G output tube is -1.8 volts measured across resistors 10 and 16.

Chassis Model	Used in Receiver Models	Voltage	Frequency
91-71	91-711 to 91-719	117	60 cycles
98-71	98-711 to 98-719	117	26 cycles
910-71	910-711 to 910-719	100-240	50-133

These chassis are 8 tube, three band, push button tuning superheterodyne receivers. The tuning ranges are 525 to 1760 KC; 1.7 to 5.8 MC; and 5.3 to 18.1 MC.

Incorporated in each chassis is an eight button tuner switch. The first two buttons on the left are tone controls. Four different tone qualities may be imparted to a program by properly setting these tone buttons. The remaining six buttons are used for automatic tuning. Automatic tuning is accomplished by substituting pre-set trimmers for the variable gang condenser. The push button switch provides a simple rapid method of effecting this substitution.

It should be noted that this receiver utilizes a special preselector stage when operated on Manual Tuning for the broadcast band. When the band switch is in the automatic position the secondary of the broadcast antenna coil is connected to the grid of the 6L7G tube and the push button trimmers are shunted across this secondary for tuning of the antenna stage. The broadcast detector coil is disconnected from the circuit when the band switch is in the automatic position.



JULY 1938

MODELS

91-711 to 91-719

98-711 to 98-719

STEWART-WARNER CORP.

910-711 to 910-719

Alignment, Trimmers

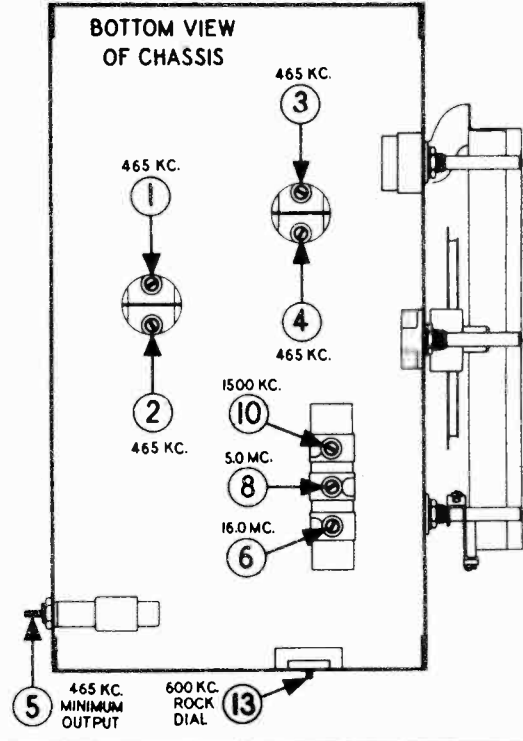
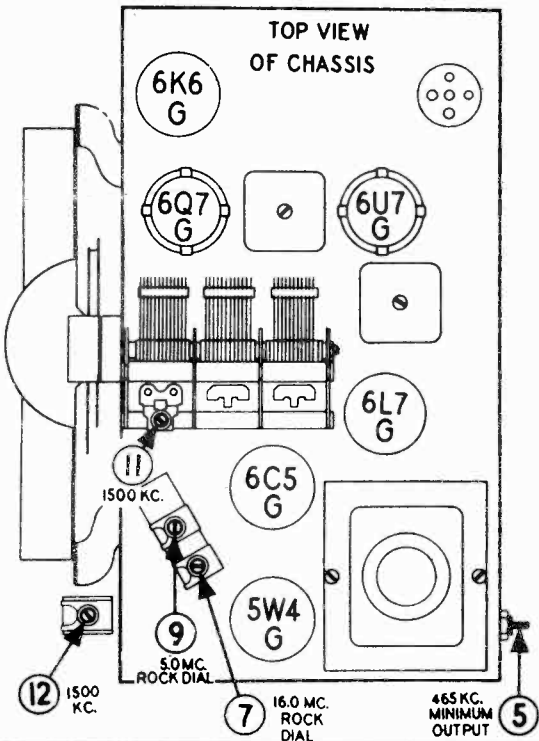
ALIGNMENT EQUIPMENT & PROCEDURE

For alignment, an output meter and an accurately calibrated signal generator with a tuning range from 465 KC. to 16.0 MC. are required.

- 1- Connect the output meter across the voice coil or between the plate of the 6K6 tube and ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
- 2- Connect the ground lead of the signal generator to the chassis of the receiver.
- 3- Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
- 4- With the gang condenser in full mesh set the pointer on the last scale division on the low frequency end of the dial. This may be accomplished by releasing the clip on the pointer slider; where it attaches to the dial cord.

IMPORTANT: THE BROADCAST BAND MUST BE ALIGNED AFTER THE SHORT-WAVE BAND.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF SIG. GEN. OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RANGE SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD CONDENSER	CONTROL GRID OF 6L7G TUBE	465 KC.	BROADCAST (MANUAL TUNING)	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	1ST I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT
					3-4	2ND I.F.	
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	465 KC.	BROADCAST (MANUAL TUNING)	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	16 MC.	SHORT WAVE (Counter-clockwise)	16 MC.	6	SHORT WAVE OSCILLATOR	ADJUST TO BRING IN SIGNAL. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 15.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 16 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	16 MC.	SHORT WAVE (Counter-clockwise)	TUNE TO 16 MC. GENERATOR SIGNAL	7	SHORT WAVE ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	5.0 MC.	POLICE	5.0 MC.	8	POLICE OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 4.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 5.0 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	5.0 MC.	POLICE	TUNE TO 5.0 MC. GENERATOR SIGNAL	9	POLICE ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	1500 KC.	BROADCAST (MANUAL TUNING)	1500 KC.	10	BROADCAST OSCILLATOR (Shunt)	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	1500 KC.	BROADCAST (MANUAL TUNING)	TUNE TO 1500 KC. GEN. SIG.	11	ANTENNA	ADJUST FOR MAXIMUM OUTPUT.
					12	DETECTOR	
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	600 KC.	BROADCAST (MANUAL TUNING)	TUNE TO 800 KC. GENERATOR SIGNAL	13	BROADCAST OSCILLATOR (Series Pad)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.



STEWART-WARNER CORP.

MODELS 91-711 to 91-719
98-711 to 98-719
910-711 to 910-719
Tuner Data, Drive Cord Data
Parts

112879	Screw - escutcheon mfg. #2 X 3/8	.....	.03
113040	Light shield - cardboard (between button holes and dial frame)	.....	.08
113102	Push Button - (See 113717 for special tone button)	.....	.08
113189	Tab - Celluloid - for push buttons	.....	.09
113321	Tab - station call letters (4 sheets) (brown)	.....	.40
113323	Tab - Trimmer range (550 to 1000)	.....	.09
113324	Tab - Trimmer range (770 to 1350)	.....	.01
113325	Tab - Trimmer range (1100 to 1700)	.....	.01
113692	Escutcheon - around push buttons	.....	1.10
113694	Cable & Plug - for tuning eye	.....	.74
113717	Push button for tone control only	.....	.10

ELECTRICAL PARTS

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1	83007	Condenser - paper .02 mfd. 600 volt	.35
2	83539	Condenser - mica 250 mmfd.	.15
3	85091	Condenser - mica 51 mmfd.	.40
4	85285	Condenser - padding	.25
5	85394	Condenser - mica 510 mmfd.	.25
6	89026	Condenser - paper .02 mfd. 400 volt	.25
7	89030	Condenser - paper .01 mfd. 400 volt	.15
8-9	86189	Condenser - paper .05 mfd. 200 volt	.15
10	86465	Wire Wound Resistor 25 ohms 1/2 watt	.25
11	86534	Condenser - paper .05 mfd. 150 volt	.25
12	89421	Condenser - paper 1 mfd. 200 volt	.40
13	89564	Condenser - mica 345 mmfd. (3%)	1.60
14	89937	Condenser - elect. 30 mfd. 450 volt	.80
15	110377	Condenser - elect. 10 mfd. 25 volt	.12
16	110534	Resistor - wire wound 40 ohm 1/2 watt	1.02
17	110536	Coil - wave trap	.15
18	110550	Resistor - carbon 10,000 ohms 1/2 W.	.12
19	110552	Resistor - carbon 220,000 ohms 1/2 W.	.12
20	110553	Resistor - carbon 1 meg. 1/4 watt	.12
21-22	110554	Resistor - carbon 1 meg. 1/4 watt	.12
23-24	110559	Resistor - carbon 470,000 ohms 1/2 W.	.12
25	110560	Resistor - carbon 100 ohm 1/4 watt	.30
26	110561	Resistor - carbon 15,000 ohms 2 W.	.12
27	110562	Resistor - carbon 22,000 ohms 1/2 W.	.15
28	110570	Resistor - carbon 2.2 meg. 1/4 watt	.15
29-30	110729	Lamp - 6.3 volt .25 amps.	4.50
31A to C	110743	Condenser - variable gang	.90
32A-32B	110766	Volume Control - 1 meg. (with on-off switch)	1.25
33	110768	Condenser - elect. 8 mfd. 450 volt	1.65
34	110789	Transformer - output	.18
35	110850	Condenser - wire 7 mmf.	1.85
36	110851	Transformer - 1st I.F.	1.65
37	110853	Transformer - 2nd I.F.	.24
38	110854	Condenser - trimmer (single section)	.65
39A to C	110859	Condenser - trimmer (3 section for osc. coil)	5.00
40	110860	Coil - osc. (less trimmers)	7.50
41	110862	Transformer - power (115 V. 60 cycle)	.12
42	112076	Transformer - power (115 V. 25 cycle)	.90
43	110872	Resistor - wire wound 160 ohms 1 W.	.44
44	110881	Coil - preassembly with trimmers	.40
44A-44B	110882	Condenser - trimmer	.30
45	110908	Condenser - mica .00332 mfd. (3%)	1.80
46	110977	Condenser - mica 960 mmfd. (3%)	.24
47	110945	Coil - and voice coil assem. (for R-279A spkr.)	7.50
48-49	111214	Condenser - paper .01 mfd. 600 volt	1.20
41	112076	Transformer - power (115 V. 25 cycle)	2.75
50	113677	Range Switch	4.20
51A to N	113690	Trimmer condenser for push button - complete assembly	8.00
52	113691	Push button switch (8 keys)	4.20
53	R-279-A	Speaker - dynamic 10 inch.	8.00
54	110554	Resistor - carbon 1 meg. 1/4 watt	.12

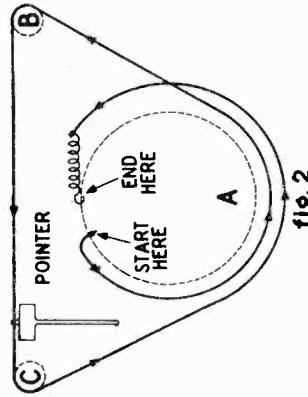
10. Set up button No. 4 for the selected station in a similar manner, using trimmer screws No. 4a and No. 4b. The remaining buttons can all be set-up in the same fashion.

11. Label each button with the call letters of the stations you have selected using the call letter tabs and the celluloid covers packed with your receiver. The printed paper tab should be inserted in the button by holding the ends and flexing it slightly, allowing it to snap into place. The celluloid cover tab should be flexed in a similar manner and placed on top of the paper tab.

12. In some instances it may be necessary, after the set is operated for a month or more, to reset the trimmers as they may drift due to heat, humidity, etc.

HOW TO REPLACE THE DIAL CORD

Before attempting to replace the dial cord, fully mesh the gang condenser. The holes in drum A should be in the top position as shown in the diagram above.



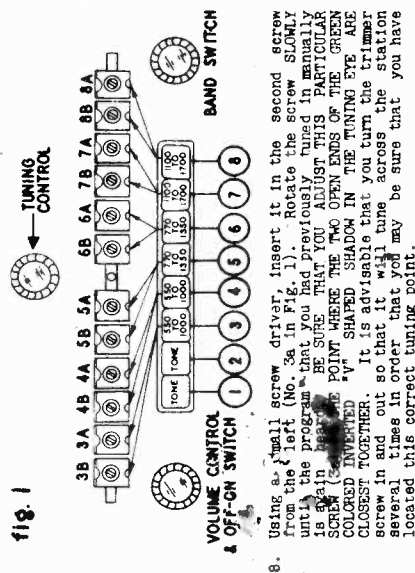
The pointer drive cord should be 33 inches or more in length. Place one end of the cord through the left hole in drum and knot the end. Run the free end of the cord down around the drum and up to pulley B. Continue over pulley B. Tie the cord to drum A. Bring the cord up around drum A. Tuck the cord to the end of the tension spring so that the spring will be extended to about 1-1/8 inches, when hooked to the slot in the drum. Now place the pointer on its track so that it points to the last scale division on the low frequency end of the dial, then clip it to the cord.

DIAL DRIVE AND MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
67449	Screw - 8 X 3/8" Self Tapping (for dial brackets)	.03
67568	Washer - embossed (for ptg. electrolytic)	.05
81068	Cord - dial drive (35' lengths)	.10
81069	Spring - for tightening drive rope	.05
85427	Socket - octal base (standard)	.15
85765	Terminal Strip - antenna - ground	.08
86182	Shield - tube (long section)	.03
86184	Shield cap tube, grid type	.005
86916	Rubber footing (padding)	.005
86917	Shield - tube bases for back of knobs	.04
89912	Shield - tube bases for tube base	.02
110496	Plug - speaker (4 prong)	.15
110501	Socket - 4 prong (for speaker)	.12
110627	Socket - dial lamp	.20
110679	Knob - tuning	.48
110690	Drum and disc assembly	.25
110692	Bracket - dial support (R.H.)	1.70
110694	Bracket - dial support (L.H.)	.85
110707	Frame - dial; with scale complete	1.00
110715	Scale - dial	.14
110716	Start - dial drive (with brkt. & indic. assem.)	.01
110785	Pointer - dial	.01
110826	Speed nut - retainer for escutcheon to cabinet	.05
110827	Spacer - flat steel, for mfg. chassis	.05
111030	Escutcheon - #10 for chassis mfg.	.05
111030	Escutcheon - with tuning eye	.05
111085	Sleeve - felt for tuning eye	1.00

HOW TO SET UP THE PUSH-BUTTON TUNER

- Be sure that your set is connected to the customer's antenna and that the push button trimmer is set-up using this antenna (not the antenna in the service shop) otherwise the antenna trimmer will be incorrectly aligned.
- Turn the set on and allow it to operate at least one-quarter hour before setting up the push buttons.
- Make a list of six nearby stations to which you wish to set up the buttons. Be sure to select nearby, powerful stations, since weak signals will generally give poor results, also BE SURE TO SELECT STATIONS FALLING WITHIN THE TUNING RANGE OF THE INDIVIDUAL BUTTONS AS INDICATED IN FIG. 1.
- Each of the buttons on your Push Button Tuner has a definite operating range, as shown in Fig. 1; therefore it is imperative that you select a station which is in the operating range of the particular station assigned to the button. NEVER BE TOO LOOSELY OR TOO TIGHTLY ADJUSTED, IT IS IMPORTANT THAT THE PROPER TRIMMER SCREWS ARE USED: The frequency of your local stations may be obtained from your local newspaper or radio call magazine. For example, suppose you want to set a button to station WJW whose frequency falls within the operating range of buttons No. 3 or No. 4, whose range is 550 to 1000 kilocycles. IT SHOULD BE NOTED THAT WHENEVER IT IS POSSIBLE TO USE BUTTONS HAVING DIFFERENT RANGES, TO SET TO A GIVEN STATION, THE CORRECT BUTTON TO USE WILL BE THAT ONE FOR WHICH THE TRIMMER SCREWS ARE NOT TOO LOOSELY SET. "DRIFTING" IS A DIRECT RESULT OF LOOSE TRIMMER SCREWS AND THEREFORE SUCH SETTINGS OF TRIMMER SCREWS SHOULD BE AVOIDED IF POSSIBLE.
- Remove the escutcheon surrounding the push buttons by taking out the five screws holding it to the cabinet. This will expose to you twelve trimmer adjusting screws, which are used to set each button to its correct station.
- Turn the band switch to the BROADCAST MANUAL TUNING POSITION (position next to the extreme clockwise setting). Then use the tuning knob to bring in the station that you desire to set to button No. 3. This is done so that you may identify the station by hearing its program.
- Now turn the band switch to the AUTOMATIC POSITION (extreme clockwise). You will note as this is done your station will not be heard.
- Push in button No. 3 and turn your volume control to the maximum clockwise position.



- Using a small screw driver, insert it in the second screw from the left (No. 3a in Fig. 1). Rotate the screw SLOWLY until the program heard previously is heard. Then manually turn the program knob to the next station. Repeat this procedure for each of the other buttons. THE POINT HERE ARE THE OPEN ENDS OF THE GREEN COLORED INVERTED "Y" SHAPED SHADOW IN THE TUNING EYE CLOSEST TOGETHER. It is advisable that you turn the trimmer screw in and out so that it will tune across the station several times in order that you may be sure that you have located this correct tuning point.
- Now insert the screw driver in the first trimmer screw on the left (No. 3b in Fig. 1) and turn until the program is received with maximum volume, and the correct position is indicated by the ends of the inverted "Y" in the tuning eye being closest together. Now go back to trimmer screw No. 3a and see if any improvement in reception can be made by adjusting it. Also repeat this operation for trimmer screw No. 3b.

MODELS 91-811 to 91-819
 Chassis 91-81
 98-811 to 98-819
 Chassis 98-81
 910-811 to 910-819
 Chassis 910-81

STEWART-WARNER CORP.

Tuner Data,
 Drive Cord Data

CHASSIS MODEL	USED IN RECEIVER MODELS	VOLTAGE	FREQUENCY
91-81	91-811 to 91-819	117	60 cycles
98-81	98-811 to 98-819	117	25 Cycles
910-81	910-811 to 910-819	100-240	50-133

These chassis are 8 tube, three band, push button tuning superheterodyne receivers. The tuning ranges are 530 to 1730 KC. 2.2 to 7.0 MC and 6.8 to 22.5 MC.

Incorporated in each chassis is an eight button tuner switch. The first two buttons on the left are tone controls. Four different tone qualities may be imparted to a program by properly setting these tone buttons. The remaining six buttons are used for automatic tuning. Automatic tuning is accomplished by substituting pre-set trimmers for the variable gang condenser. The push-button switch provides a simple rapid method of effecting this substitution.

It should be noted that the R.F. stage in this receiver operates only on the Broadcast Band. When the band switch is in the "Automatic", "Intermediate" or "Foreign" positions this R.F. stage is not utilized.

A feature of this set is the special push-pull output stage. Instead of using a push-pull input transformer or a separate phase inverter tube the phase inversion is accomplished as follows. One of the 6K6G output tubes has a 3,300 ohm load resistor in its screen circuit across which is built up an audio voltage which is 180 electrical degrees out of phase with respect to the input grid voltage. This phase inverted voltage obtained across the screen resistor is now applied to the grid of the other output tube in this push-pull output combination. NOTE: It can be readily seen from the above explanation that if the 6K6G output tube, from which the phase inversion voltage is obtained, is removed from the set or becomes defective, it will be impossible for any signal to be heard in the speaker.

HOW TO SET UP THE PUSH-BUTTON TUNER

1. Be sure that the customer has an adequate antenna system and that the push button trimmers are set-up using this antenna (not the antenna in the service shop) otherwise the antenna trimmer will be incorrectly aligned.
2. Turn on the set and allow it to operate at least one quarter-hour before setting up the push buttons.
3. Make a list of the frequencies, of six nearby stations to which you wish to set-up the buttons. Be sure to select nearby, powerful stations, since weak signals will generally give poor results. Also BE SURE TO SELECT STATIONS FALLING WITHIN THE TUNING RANGE OF THE INDIVIDUAL BUTTONS, as indicated in Fig. 1.

Each of the buttons on your Push Button Tuner has a definite operating range, as shown in Fig. 1, therefore, it is imperative that you select a station whose frequency is in the operating range of a button before attempting to set-up that button for the particular station.

AS THE ADJUSTING SCREWS SHOULD NEVER BE TOO LOOSELY OR TOO TIGHTLY ADJUSTED, IT IS IMPORTANT THAT THE PROPER BUTTON BE SELECTED. The frequencies of your local stations may be obtained from your newspaper or radio call magazine. For example, suppose you want to set a button to station WLW whose frequency is 700 kilocycles. Refer to Fig. 1 which shows that this frequency falls within the operating range of buttons No. 3 or No. 4, whose range is 550 to 1000 KC. Therefore either button No. 3 or No. 4 can be used for the automatic tuning of WLW.

IT SHOULD BE NOTED THAT WHENEVER IT IS POSSIBLE TO USE TWO BUTTONS, HAVING DIFFERENT RANGES, TO SET TO A GIVEN STATION, THE CORRECT BUTTON TO USE WILL BE THAT ONE FOR WHICH THE TRIMMER SCREWS ARE NOT TOO LOOSELY SET. "DRIFTING" IS A DIRECT RESULT OF LOOSE TRIMMER SCREWS AND THEREFORE SUCH SETTINGS OF TRIMMER SCREWS SHOULD BE AVOIDED IF POSSIBLE.

4. Remove the escutcheon around the push-button by taking out the six screws holding it to the cabinet. This will expose to view twelve adjusting screws, each pair of which is used to tune a button to its correct station. The trimmers associated with each button are shown in Figure 1.

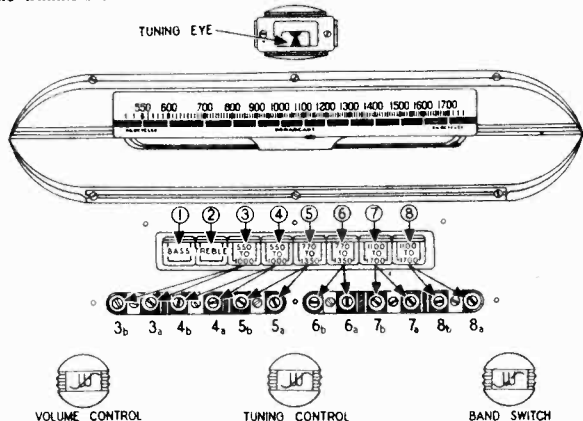


Fig. 1

5. Turn the band switch control (Right hand knob) clockwise until the BROADCAST SCALE appears on the roller dial. Then using the tuning knob (center) tune in the station you desire to set to button No. 3. This is done so that you may identify the station by hearing its program.
6. Now turn the band switch knob to the extreme clockwise position (The words "MAGIC KEYBOARD" will now appear in the dial scale opening). You will note when this switch is turned the station tuned in will not be heard.
7. Now push in the third button from the left (No. 3 in Fig. 1). Using a small screw driver insert it in the second screw from the left (No. 3a in Fig. 1). Rotate the screw SLOWLY until the program that you have previously tuned in manually is again tuned in. If it cannot be heard, advance the volume control. BE SURE THAT YOU ADJUST THIS PARTICULAR SCREW (3a) TO THE POINT WHERE THE TWO OPEN ENDS OF THE INVERTED "V" SHADOW IN THE "TUNING EYE" ARE CLOSEST TOGETHER. It is advisable that you turn the screw in and out so that it will tune across the station several times in order that you may be sure that you have located this correct tuning point.
8. Next insert the screw-driver in the first screw on the left (No. 3b Fig. 1) and turn it until the program is received with maximum volume. The correct position is indicated by the ends of the inverted "V" in the "Tuning Eye" being closest together. Now go back to screw No. 3a and see if any im-

provement in the reception can be made by adjusting it. Also repeat this operation for screw No. 3b.

9. Set up button No. 4 for the selected station in a similar manner, using screws No. 4a and 4b, and proceed to set up the remaining buttons in the same fashion, always tuning in the station initially with the "a" screw for that particular button.
10. Label each button with the call letters of the station you have selected using the call letter tabs and celluloid covers packed with your receiver. The printed paper tab should be inserted in the button by holding the ends and flexing them slightly and then allowing the tab to snap into place. The celluloid cover tab should be flexed in a similar manner and placed over the paper tab.

IMPORTANT

11. In some instances it may be necessary, after the set is operated for a month or more, to reset the screws as they may change their setting due to heat, humidity, etc.

HOW TO CHANGE THE OPERATING RANGE OF A BUTTON

The operating range of a button may be changed by merely changing the dual trimmer used with that button. Dual trimmers with the ranges indicated below can be obtained from your Stewart-Warner distributor, or directly from the Stewart-Warner Corporation, under the following part numbers:

Part Number	Tuning Range	List Price
112942	1100 to 1700 KC.	\$0.36
112943	770 to 1350 KC.	.45
112944	550 to 1000 KC.	.50

To make the change proceed as follows:

1. Remove the chassis from the cabinet.
2. By referring to Fig. 1, determine the dual trimmer associated with the button whose range you wish to change.
3. Unsolder the leads from the four terminals on the back of this dual trimmer.
4. Remove the 6/32 machine screw holding the dual trimmer to the front of the chassis.
5. From the above list select a dual trimmer which will cover the desired range.
6. Mount it on the front of the chassis with the 6/32 machine screw, and solder the leads to its four terminals. The button is now ready to be set to any strong station whose frequency is within the range of this new trimmer unit.

REPLACING THE ROLLER DIAL DRIVE CORD

1. Tie a tension spring, part number 113177, to one end of about 30" of special dial cord part No. 111302.
2. Tie a large knot in the cord, 6 1/4" from the tension spring.
3. Turn the range switch to the Short Wave position—all the way counter-clockwise. Pulley A on the range switch shaft should be in the position shown in Fig. 2.
4. Place the knot on the cord in slot B.
5. With the long free end of the cord (not the end with the spring attached), take 1 1/2 turns clockwise around pulley A, then thread the end up through hole C back of pulley D and up to the front of pulley E.
6. Turn pulley E until the slot F is up as shown in the figure. Now, with the free end of the cord wind clockwise; 1 1/2 turns around E, out through slot F, 1 turn around G, back through slot F, and 1 1/4 turns around E.
7. Bring the cord down back of pulley H and leave it hang for the time being.
8. With the end of the cord to which the tension spring is attached, take 1 1/2 turns counter-clockwise around pulley A, (when viewed from the right end) and bring the cord up through hole C.
9. Tie the free end of the cord hanging over pulley H, to the upper end of the tension spring. The spring should be extended so it is approximately 1 1/2" long when the tension in the cord system is equalized.

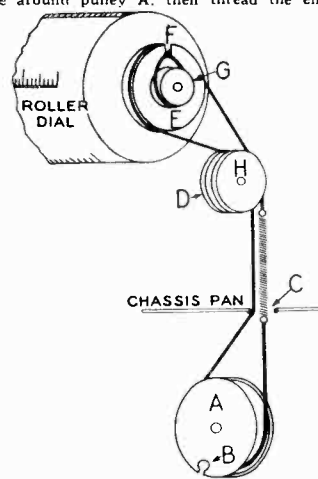
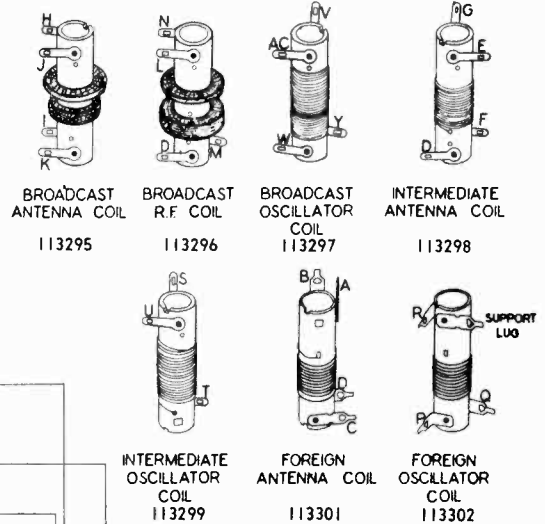
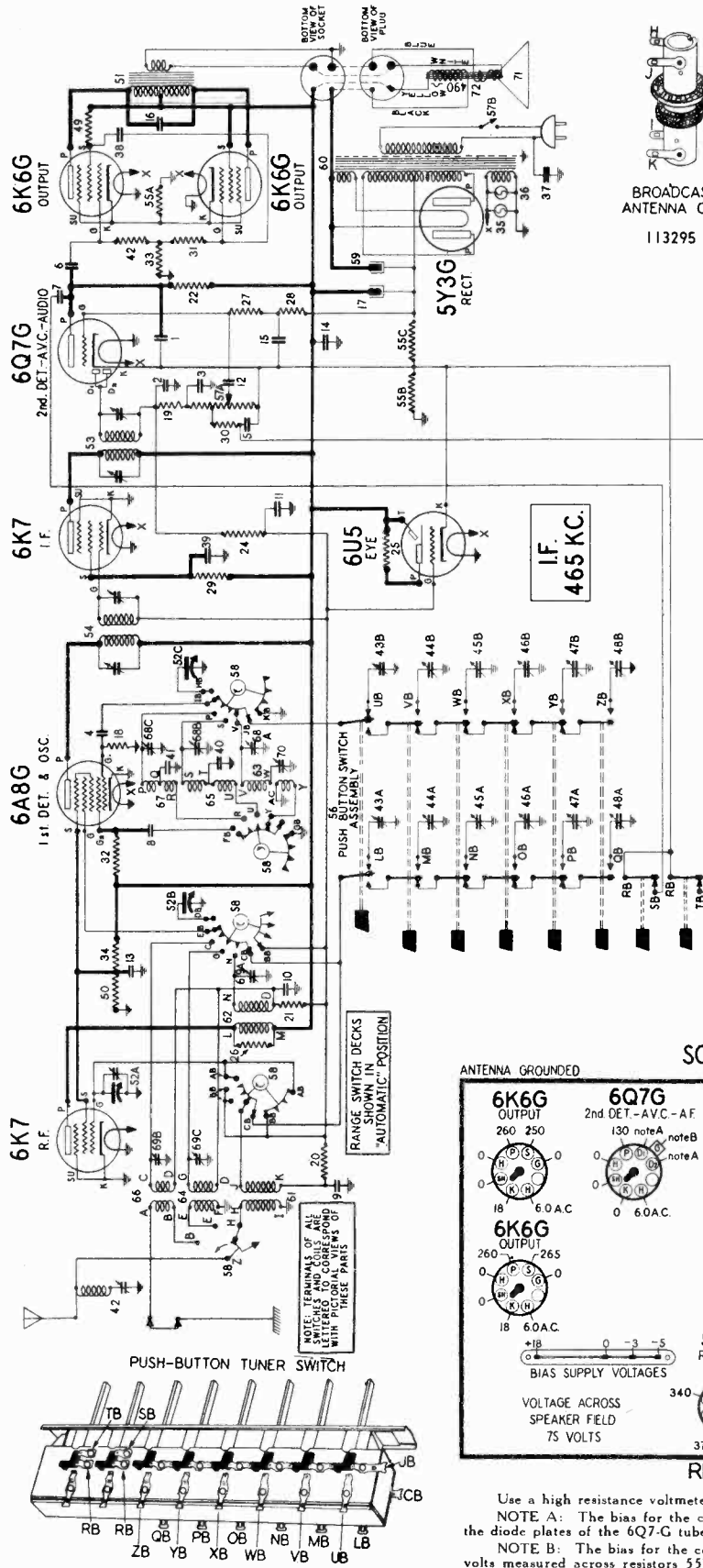


Fig. 2

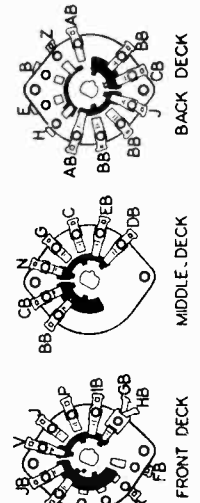
If the Short Wave scale on the dial is not in the proper position under the pointer, loosen the set screw in hub G, rotate the dial scale to the proper position and tighten the set screw.

MODELS 91-811 to 91-819
 98-811 to 98-819
 910-811 to 910-819

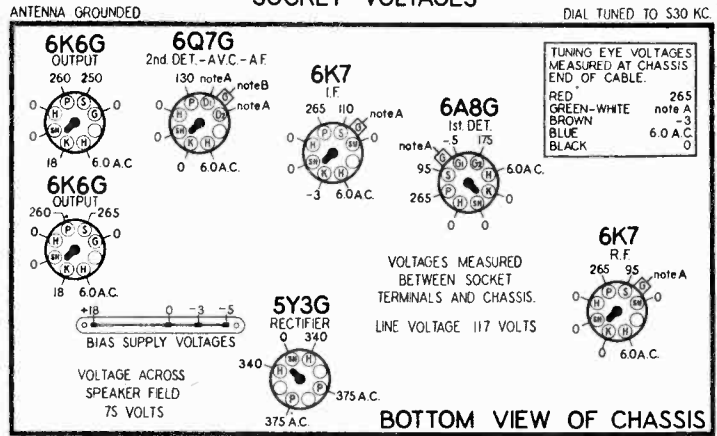
STEWART-WARNER CORP. Schematic, Voltage, Socket Tuner Switch, Coils



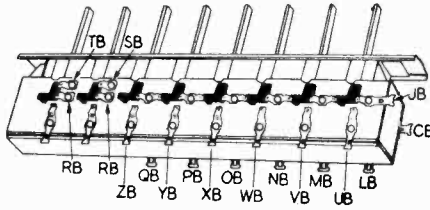
JUNE 1938
91-81, 98-81 AND 910-81 CHASSIS



SOCKET VOLTAGES



REAR OF CHASSIS

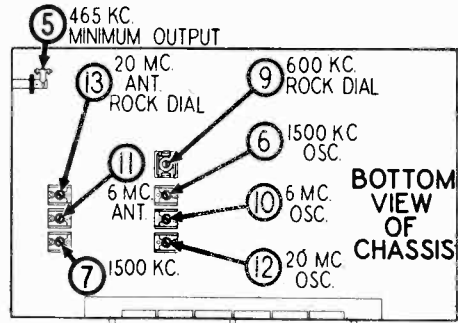
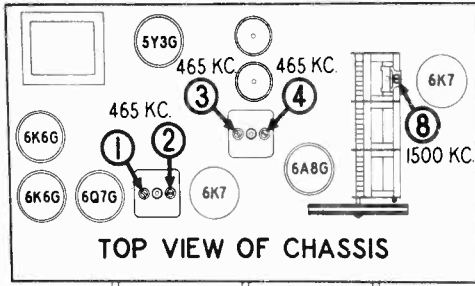


Use a high resistance voltmeter of at least 1000 ohms per volt.
 NOTE A: The bias for the control grids of the 6A8-G, 6K7 R. F., 6U5 and the diode plates of the 6Q7-G tubes is -3 volts measured across resistor 55B.
 NOTE B: The bias for the control grid of the triode section of the 6Q7-G tube is -5 volts measured across resistors 55B and 55C.

MODELS 91-811 to 91-819
98-811 to 98-819
910-811 to 910-819
Alignment, Trimmers, Parts

STEWART-WARNER CORP.

- 01 Tab—trimmer range (1100 to 1700)
- 02 Drum—dial drive
- 03 Gear—on range switch shaft
- 04 Gear—on range switch shaft
- 05 Bracket—dial (R.H.)
- 06 Pulley—on auxiliary range switch shaft
- 07 Pulley—on auxiliary range switch shaft
- 08 Pulley—on auxiliary range switch shaft
- 09 Pulley—on auxiliary range switch shaft
- 10 Pulley—on auxiliary range switch shaft
- 11 Pulley—on auxiliary range switch shaft
- 12 Pulley—on auxiliary range switch shaft
- 13 Pulley—on auxiliary range switch shaft
- 14 Pulley—on auxiliary range switch shaft
- 15 Pulley—on auxiliary range switch shaft
- 16 Pulley—on auxiliary range switch shaft
- 17 Escutcheon—dial
- 18 Escutcheon—dial
- 19 Escutcheon—dial
- 20 Escutcheon—dial
- 21 Escutcheon—dial
- 22 Escutcheon—dial
- 23 Escutcheon—dial
- 24 Escutcheon—dial
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- 92 Escutcheon—dial
- 93 Escutcheon—dial
- 94 Escutcheon—dial
- 95 Escutcheon—dial
- 96 Escutcheon—dial
- 97 Escutcheon—dial
- 98 Escutcheon—dial
- 99 Escutcheon—dial
- 100 Escutcheon—dial



FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 20 MC are required.

- (1) Connect the output meter across the voice coil or across the plates of the 6K6G output tubes depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
- (2) Connect the ground lead of the signal generator to the receiver chassis or to the "G" terminal at the back of the chassis. NOTE: The "G" and "D" terminals on this terminal strip must be connected together.
- (3) Turn the volume control to the maximum volume position and keep it in this position throughout the alignment procedure.
- (4) With the gang condenser in full mesh, set the pointer to the last mark on the left end of the dial scale. If the pointer is incorrectly set, it is only necessary to loosen the set screw on the dial cord drive drum and push the gang condenser to full mesh with the pointer properly set, then retighten the set screw.

DIAL AND MISCELLANEOUS PARTS

- 11317 Spring—dial tension
- 11318 Spring—dial tension
- 11319 Spring—dial tension
- 11320 Spring—dial tension
- 11321 Spring—dial tension
- 11322 Spring—dial tension
- 11323 Spring—dial tension
- 11324 Spring—dial tension
- 11325 Spring—dial tension
- 11326 Spring—dial tension
- 11327 Spring—dial tension
- 11328 Spring—dial tension
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- 11367 Spring—dial tension
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- 11389 Spring—dial tension
- 11390 Spring—dial tension
- 11391 Spring—dial tension
- 11392 Spring—dial tension
- 11393 Spring—dial tension
- 11394 Spring—dial tension
- 11395 Spring—dial tension
- 11396 Spring—dial tension
- 11397 Spring—dial tension
- 11398 Spring—dial tension
- 11399 Spring—dial tension
- 11400 Spring—dial tension

Dummy Anl. in Series with Sig. Gen.	Connection of Sig. Generator to Receiver	Signal Generator Frequency	Band Switch Position (Indicated by Roller Dial)	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
1 MFD Condenser	Control Grid of 6A8-G Tube	465 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2 3-4	2nd I.F. 1st I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
400 OHM Carbon Resistor	Antenna Terminal	465 KC	Broadcast	Any Point Where It Does Not Affect the Signal	5	Wave Trap	Adjust for Minimum Output. Using a Strong Generator Signal.
400 OHM Carbon Resistor	Antenna Terminal	1500 KC	Broadcast	1500 KC	6	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
400 OHM Carbon Resistor	Antenna Terminal	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	7 8	Broadcast Detector Broadcast Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	Antenna Terminal	600 KC	Broadcast	Tune to 600 KC Generator Signal	9	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	Antenna Terminal	6 MC	Intermediate	6 MC	10	Intermediate Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 5.1 MC. If Image does not appear, Retune at 6MC with Trimmer. Screw farther Out. Recheck Image.
400 OHM Carbon Resistor	Antenna Terminal	6 MC	Intermediate	Tune to 6 MC Generator Signal	11	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	Antenna Terminal	20 MC	Foreign	20 MC	12	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was obtained by Tuning in Image at Approx. 19.1 MC. If Image does not appear, Retune at 20MC with Trimmer. Screw farther Out. Recheck Image.
400 OHM Carbon Resistor	Antenna Terminal	20 MC	Foreign	Tune to 20 MC Generator Signal	13	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

ELECTRICAL PARTS

Part Number	Description	List Price
11302	Card—dial drive & or 50 ft. length	05
11303	Shield base—for tube shields	01
11304	Screw—No. 10 x 1/4 chassis mtg.	01
11305	Screw—No. 10 x 1/4 chassis mtg.	01
11306	Screw—No. 10 x 1/4 chassis mtg.	01
11307	Screw—No. 10 x 1/4 chassis mtg.	01
11308	Screw—No. 10 x 1/4 chassis mtg.	01
11309	Screw—No. 10 x 1/4 chassis mtg.	01
11310	Screw—No. 10 x 1/4 chassis mtg.	01
11311	Screw—No. 10 x 1/4 chassis mtg.	01
11312	Screw—No. 10 x 1/4 chassis mtg.	01
11313	Screw—No. 10 x 1/4 chassis mtg.	01
11314	Screw—No. 10 x 1/4 chassis mtg.	01
11315	Screw—No. 10 x 1/4 chassis mtg.	01
11316	Screw—No. 10 x 1/4 chassis mtg.	01
11317	Screw—No. 10 x 1/4 chassis mtg.	01
11318	Screw—No. 10 x 1/4 chassis mtg.	01
11319	Screw—No. 10 x 1/4 chassis mtg.	01
11320	Screw—No. 10 x 1/4 chassis mtg.	01
11321	Screw—No. 10 x 1/4 chassis mtg.	01
11322	Screw—No. 10 x 1/4 chassis mtg.	01
11323	Screw—No. 10 x 1/4 chassis mtg.	01
11324	Screw—No. 10 x 1/4 chassis mtg.	01
11325	Screw—No. 10 x 1/4 chassis mtg.	01
11326	Screw—No. 10 x 1/4 chassis mtg.	01
11327	Screw—No. 10 x 1/4 chassis mtg.	01
11328	Screw—No. 10 x 1/4 chassis mtg.	01
11329	Screw—No. 10 x 1/4 chassis mtg.	01
11330	Screw—No. 10 x 1/4 chassis mtg.	01
11331	Screw—No. 10 x 1/4 chassis mtg.	01
11332	Screw—No. 10 x 1/4 chassis mtg.	01
11333	Screw—No. 10 x 1/4 chassis mtg.	01
11334	Screw—No. 10 x 1/4 chassis mtg.	01
11335	Screw—No. 10 x 1/4 chassis mtg.	01
11336	Screw—No. 10 x 1/4 chassis mtg.	01
11337	Screw—No. 10 x 1/4 chassis mtg.	01
11338	Screw—No. 10 x 1/4 chassis mtg.	01
11339	Screw—No. 10 x 1/4 chassis mtg.	01
11340	Screw—No. 10 x 1/4 chassis mtg.	01
11341	Screw—No. 10 x 1/4 chassis mtg.	01
11342	Screw—No. 10 x 1/4 chassis mtg.	01
11343	Screw—No. 10 x 1/4 chassis mtg.	01
11344	Screw—No. 10 x 1/4 chassis mtg.	01
11345	Screw—No. 10 x 1/4 chassis mtg.	01
11346	Screw—No. 10 x 1/4 chassis mtg.	01
11347	Screw—No. 10 x 1/4 chassis mtg.	01
11348	Screw—No. 10 x 1/4 chassis mtg.	01
11349	Screw—No. 10 x 1/4 chassis mtg.	01
11350	Screw—No. 10 x 1/4 chassis mtg.	01
11351	Screw—No. 10 x 1/4 chassis mtg.	01
11352	Screw—No. 10 x 1/4 chassis mtg.	01
11353	Screw—No. 10 x 1/4 chassis mtg.	01
11354	Screw—No. 10 x 1/4 chassis mtg.	01
11355	Screw—No. 10 x 1/4 chassis mtg.	01
11356	Screw—No. 10 x 1/4 chassis mtg.	01
11357	Screw—No. 10 x 1/4 chassis mtg.	01
11358	Screw—No. 10 x 1/4 chassis mtg.	01
11359	Screw—No. 10 x 1/4 chassis mtg.	01
11360	Screw—No. 10 x 1/4 chassis mtg.	01
11361	Screw—No. 10 x 1/4 chassis mtg.	01
11362	Screw—No. 10 x 1/4 chassis mtg.	01
11363	Screw—No. 10 x 1/4 chassis mtg.	01
11364	Screw—No. 10 x 1/4 chassis mtg.	01
11365	Screw—No. 10 x 1/4 chassis mtg.	01
11366	Screw—No. 10 x 1/4 chassis mtg.	01
11367	Screw—No. 10 x 1/4 chassis mtg.	01
11368	Screw—No. 10 x 1/4 chassis mtg.	01
11369	Screw—No. 10 x 1/4 chassis mtg.	01
11370	Screw—No. 10 x 1/4 chassis mtg.	01
11371	Screw—No. 10 x 1/4 chassis mtg.	01
11372	Screw—No. 10 x 1/4 chassis mtg.	01
11373	Screw—No. 10 x 1/4 chassis mtg.	01
11374	Screw—No. 10 x 1/4 chassis mtg.	01
11375	Screw—No. 10 x 1/4 chassis mtg.	01
11376	Screw—No. 10 x 1/4 chassis mtg.	01
11377	Screw—No. 10 x 1/4 chassis mtg.	01
11378	Screw—No. 10 x 1/4 chassis mtg.	01
11379	Screw—No. 10 x 1/4 chassis mtg.	01
11380	Screw—No. 10 x 1/4 chassis mtg.	01
11381	Screw—No. 10 x 1/4 chassis mtg.	01
11382	Screw—No. 10 x 1/4 chassis mtg.	01
11383	Screw—No. 10 x 1/4 chassis mtg.	01
11384	Screw—No. 10 x 1/4 chassis mtg.	01
11385	Screw—No. 10 x 1/4 chassis mtg.	01
11386	Screw—No. 10 x 1/4 chassis mtg.	01
11387	Screw—No. 10 x 1/4 chassis mtg.	01
11388	Screw—No. 10 x 1/4 chassis mtg.	01
11389	Screw—No. 10 x 1/4 chassis mtg.	01
11390	Screw—No. 10 x 1/4 chassis mtg.	01
11391	Screw—No. 10 x 1/4 chassis mtg.	01
11392	Screw—No. 10 x 1/4 chassis mtg.	01
11393	Screw—No. 10 x 1/4 chassis mtg.	01
11394	Screw—No. 10 x 1/4 chassis mtg.	01
11395	Screw—No. 10 x 1/4 chassis mtg.	01
11396	Screw—No. 10 x 1/4 chassis mtg.	01
11397	Screw—No. 10 x 1/4 chassis mtg.	01
11398	Screw—No. 10 x 1/4 chassis mtg.	01
11399	Screw—No. 10 x 1/4 chassis mtg.	01
11400	Screw—No. 10 x 1/4 chassis mtg.	01

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

Schematic, Voltage
Socket, Tuner Switch

STEWART WARNER CORP.

MODELS 91-821 to 91-829, Chassis 91-82
98-821 to 98-829, Chassis 98-82
910-821 to 910-829, Chassis 910-82

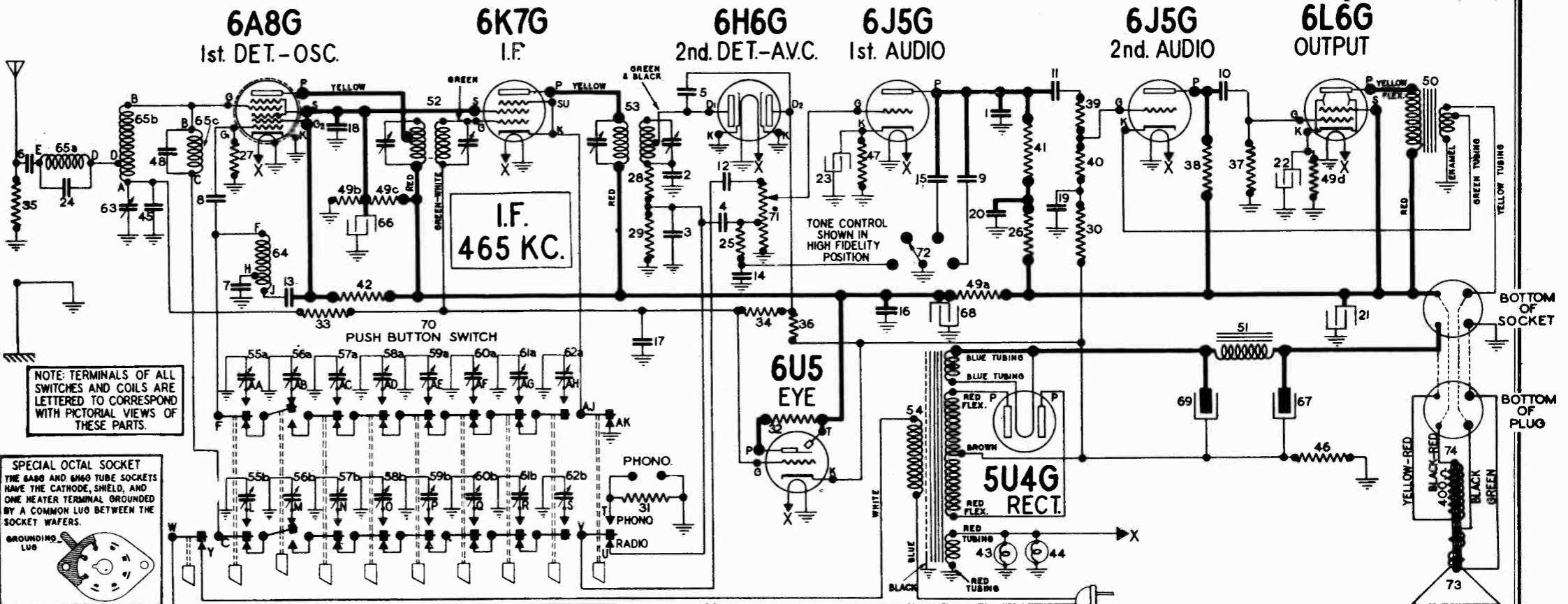
ELECTRICAL PARTS

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1	83539	Condenser - mica .260 mmfd.	.20
2-3-4-5	83783	Condenser - mica .110 mmfd.	.20
6	83784	Condenser - mica .0011 mfd.	.25
7	84371	Condenser - mica .0004 mfd. 10%	.20
8	85061	Condenser - mica .51 mmfd.	.15
9-10-11-12	88026	Condenser - paper .02 mfd. 400 volt.	.25
13-14-15	88030	Condenser - paper .01 mfd. 400 volt.	.25
16	88191	Condenser - paper .1 mfd. 300 volt.	.25
17-18	89421	Condenser - paper .1 mfd. 200 volt.	.25
19	89532	Condenser - paper .25 mfd. 200 volt.	.32
20	89643	Condenser - paper .25 mfd. 300 volt.	.40
21	89937	Condenser - elect. .30 mfd. 450 volt.	1.60
22-23	110377	Condenser - elect. 10 mfd. 25 volt.	.80
24	110510	Condenser - wire 3 mmfd.	.12
25-26	110552	Resistor - carb. 47,000 ohms 1/4 watt.	.12
27-28	110553	Resistor - carb. 220,000 ohms 1/4 watt.	.12
29-30-31	110554	Resistor - carbon 1 megohm 1/4 watt.	.12
32-33-34	110557	Resistor - carb. 4,700 ohms 1/4 watt.	.12
35	110559	Resistor - carb. 470,000 ohms 1/4 watt.	.12
36	110564	Resistor - carb. 100,000 ohms 1/4 watt.	.12
37-38-39	110592	Resistor - carb. 22,000 ohms 1 watt.	.12
40-41	110629	Lamp - 6.3 volt .25 amps.	.15
42	111122	Condenser - mica 3,580 mmfd. (3%)	.48
43-44	112182	Resistor - wire wound 27 ohm 1/4 watt.	.12
45	112961	Resistor - carb. 2,700 ohm 1/4 watt.	.12
46	113886	Condenser - mica .0002 mfd. (3%)	.22
49A to 49D	113895	Resistor - Bleeder Section A - 1500 ohms Section B - 2800 ohms Section C - 2800 ohms Section D - 170 ohms	1.15
50	113896	Transformer - output	1.92
51	113939	Filter Choke	2.10
52	113941	Transformer - 1st I.F.	1.54
53	113946	Transformer - 2nd I.F.	1.50
54	113948	Transformer - power 117 V. 50-60 C.	9.20
55A-55B	113953	Condenser - trimmer (1170 to 1350 KC)	.46
56A-56B	113954	Condenser - trimmer (650 to 1300 KC)	.60
57A-57B	113955	Condenser - trimmer (540 to 770 KC)	.62
58A-58B	113956	Condenser - padder	.34
59A-59B	113957	Coil - oscillator	.42
60A-60B	113959	Coil - antenna	1.10
61A-61B	113961	Condenser - elect. 10 mfd. 200 volt.	.60
62A-62B	113962	Condenser - elect. 10 mfd. 450 volt.	.72
63	113963	Condenser - elect. 16 mfd. 350 volt.	.68
64	113965	Condenser - elect. 16 mfd. 450 volt.	1.04
65A-65B-65C	113966	Switch - push button	5.40
66	113967	Volume control	.84
67	113968	Switch - tone control	.68
68	J-114138	Cone - voice coil assembly for J-115029 speaker	2.90
69	J-115029	Speaker - dynamic (10 in.)	8.90

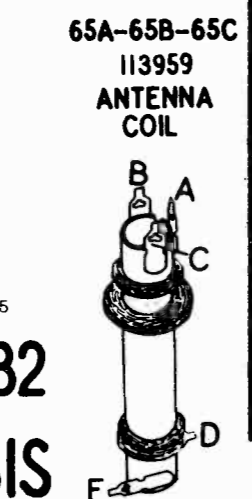
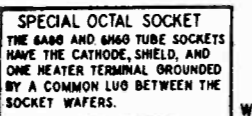
DIAL & MISCELLANEOUS PARTS.

PART NUMBER	DESCRIPTION	LIST PRICE
114451	Cabinet Leg - Front	1.00
114452	Cabinet Leg - Rear	1.00
112745	Clip for coil mounting	.01
114297	Escutcheon - for push buttons	1.80
114211	Knobs - for volume or tone	.16
110496	Plug - Speaker (4 prong)	.12
113651	Push button	.08
114096	Screw - chassis mtg. #10-32 X 1 1/2	.02
112879	Screw - escutcheon mtg. #2 X 3/8	.03
113077	Shield - tube	.15
81834	Socket - 6 prong	.10
110501	Socket - 4 prong (for speaker)	.16
114223	Socket - dial lamp	.18
114611	Socket - octal base (standard)	.15
114612	Socket - octal base (with special ground)	.15
114250	Tab - station call letters	.55
85785	Terminal strip - antenna - ground	.15
89709	Terminal strip - phono	.15
67568	Washer - embossed (for mtg. electrolytic)	.05
110629	Washer - flat steel, for mtg. chassis	.01
89746	Washer - (paper) for back of knobs	.005

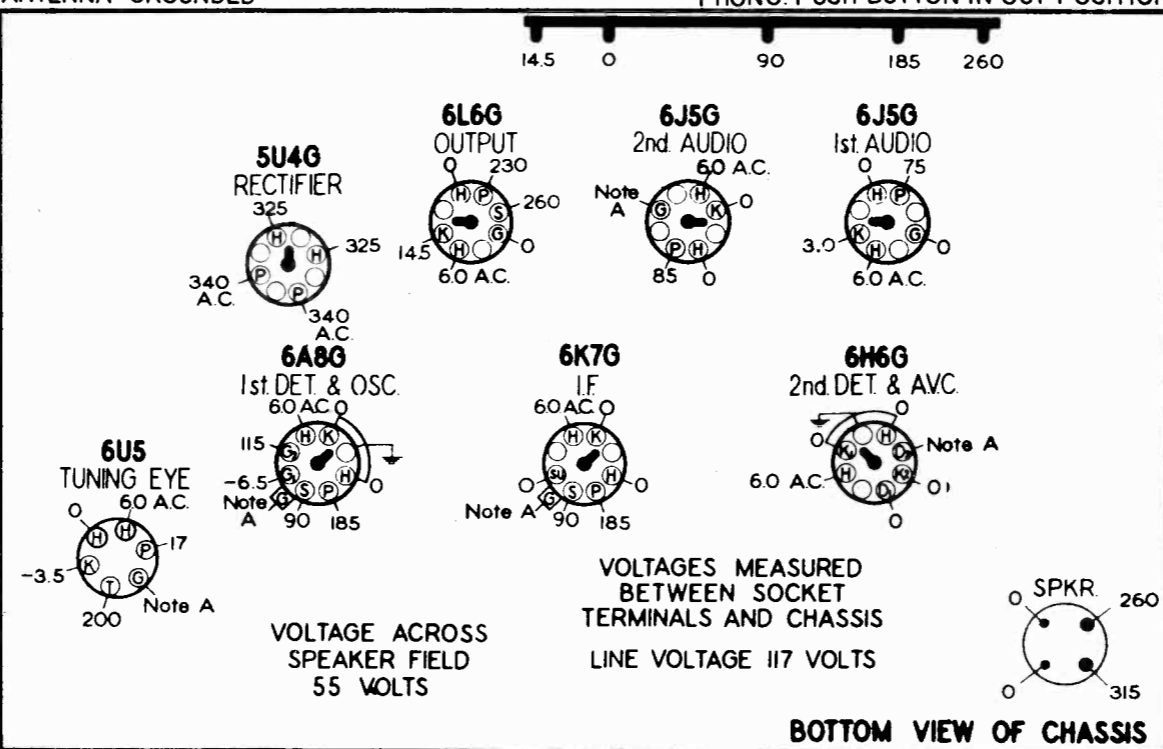
MODELS 91-82, 98-82
AND 910-82 CHASSIS



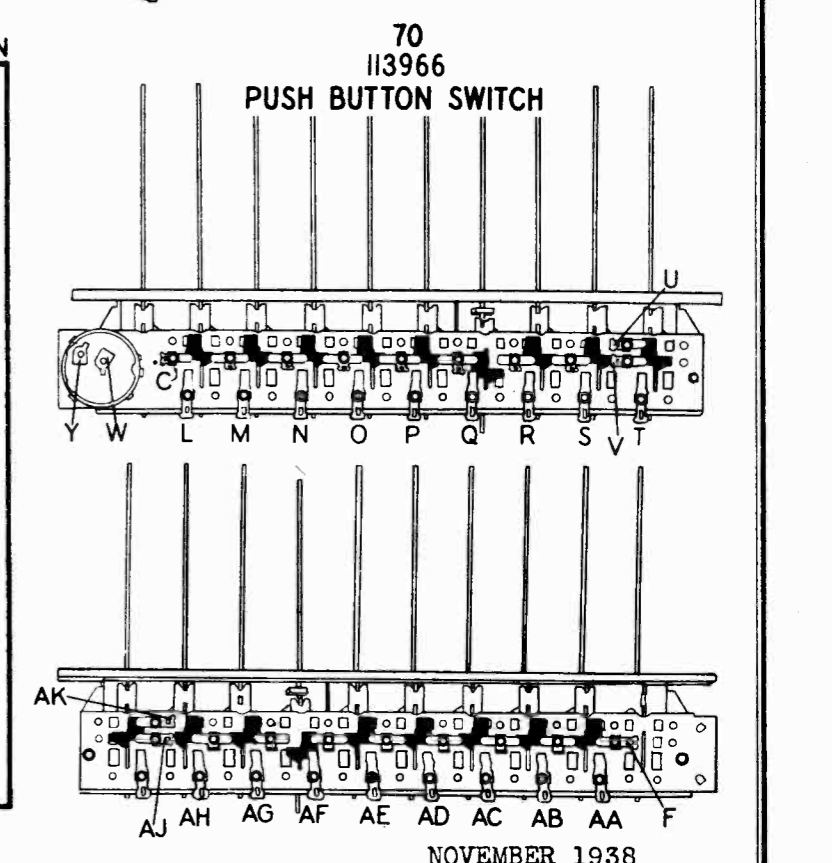
NOTE: TERMINALS OF ALL SWITCHES AND COILS ARE LETTERED TO CORRESPOND WITH PICTORIAL VIEWS OF THESE PARTS.



SOCKET VOLTAGES



VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS
LINE VOLTAGE 117 VOLTS
VOLTAGE ACROSS SPEAKER FIELD 55 VOLTS
BOTTOM VIEW OF CHASSIS



Use a high resistance voltmeter of at least 1000 ohms per volt.
NOTE A: The bias for the control grids of the 6J5-7 2nd audio, 6A8-G, 6K7-G, 6U5, and the diode plate of the 6H6-G tubes is -3.5 volts measured across resistor No. 46.

STEWART-WARNER CORP.

MODELS 91-821 to 91-829

98-821 to 98-829

910-821 to 910-829

Alignment, Trimmers

Antenna Data

ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 1.5 MC are required.

1. Connect the output meter across the voice coil or, in series with .1 mfd. condenser, from the plate of the 6L6-G output tube to ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the "G" post on the antenna terminal strip at the rear of the chassis, or to the metal chassis. The ground and antenna terminals on the antenna terminal strip must be connected together throughout the alignment procedure.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.

DUMMY ANT IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF SIGNAL GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	PUSH IN BUTTON NUMBER	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	CONTROL GRID OF 6A8-G TUBE	465 KC.	PUSH IN ANY BUTTON EXCEPT NO. 1 OR 10	2 3-4	2ND I.F. 1ST I.F.	ADJUST FOR MAXIMUM OUTPUT THEN REPEAT ADJUSTMENT
200 MFD. CONDENSER	ANTENNA TERMINAL	465 KC.	#9 (TRIMMER #9a & 9b TUNED TO APPROXIMATELY 800 KC.)	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.

- IMPORTANT -

RE-TUNE PUSH-BUTTON TRIMMERS TO STATIONS AS RE-ALIGNING THE I.F. STAGES MAY HAVE CAUSED DETUNING OF THE STATIONS TO WHICH THE BUTTONS WERE SET.

DESCRIPTION OF ANTENNA CIRCUIT AND ITS FUNCTIONS

Since the antenna circuit of this receiver differs radically from the conventional type, a detailed explanation of the functions of the various sections of this special circuit, and the reasons for the above alignment procedure is given below.

The purposes of this antenna circuit are (1) to transfer the incoming station signal, with maximum gain, to the grid of the first detector tube, (2) to reduce to a minimum, code interference or other undesired signals in the vicinity of the intermediate frequency (465 KC.) (3) to reduce to a minimum the response of image signals. The three coils which perform these functions are wound on a single form and are indicated by No. 65a, No. 65b and No. 65c in the figure at the lower right.

The primary circuit of this antenna system consists of an antenna in series with condenser No. 6, the condenser and coil combination between points E and D, the section of coil 65b between points D and A and the two condensers Nos. 63 and 45 to ground. The resistor No. 35 is shunted directly across this antenna primary circuit and its purposes will be covered later.

The secondary circuit consists of the two parallel condensers Nos. 63 and 45 which are in series with the section of the antenna coil between points A and B, also in series with the coil and condenser combination between points B and C, and the antenna section of the push button trimmer condenser No. 55b. The secondary circuit is tuned to resonance with the incoming station signal, by the push button trimmer condenser No. 55b.

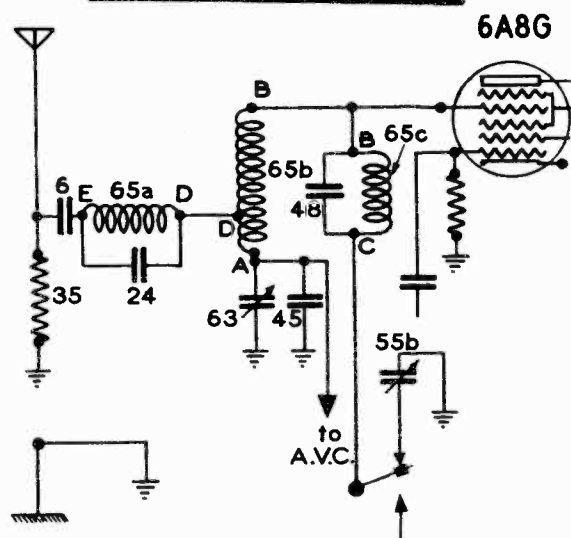
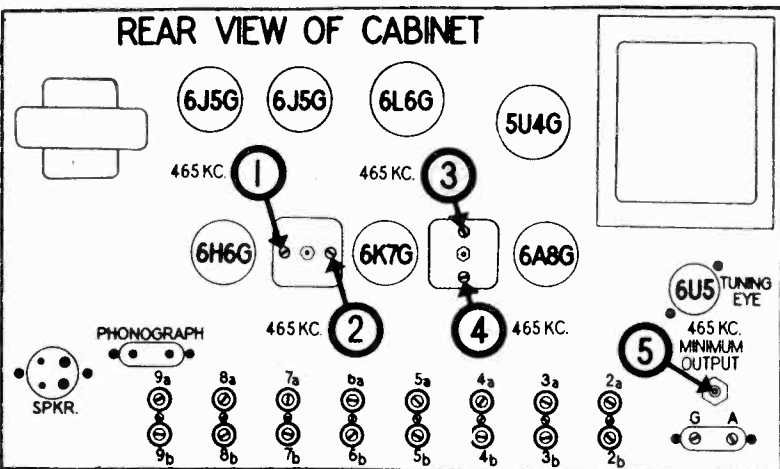
Reduction of image response is accomplished with the aid of the section No. 65c of the antenna coil. This section of the antenna coil acts as a wave trap resonated 930 KC higher than the signal. It is a part of a series resonant circuit made up of the 65c section of the coil and the push button trimmer condenser #55b. This circuit will be approximately resonant to the image signals AT ALL TIMES and will effectively reduce image interference caused by code or police stations operating at the high frequency end of the broadcast band. The purpose of condenser No. 48 is to cause this image reduction circuit to "track" properly.

The wave trap circuit for reduction of 465 KC code signals is composed of the section DA of coil 65b which is in series with condensers No. 63 and 45 (condenser No. 63 is trimmer No. 5 in the above alignment chart). It should be noted that coil section D-A is inductively coupled to the B-C section of the coil and is considered a part of the wave trap circuit. Trimmer condenser No. 63 is adjusted for minimum output with a 465 KC incoming signal at the antenna. At minimum output the voltage developed across coil A-B will be balanced out by the voltage developed across condensers No. 63 and 45 which is 180° out of phase with the voltage developed across the coil. Therefore, it will be seen that any 465 KC interference signals will only develop a very small voltage between the control grid of the 6A8-G and ground thus effectively eliminating 465 KC code interference.

The 65a section of the antenna coil between points E and D when considered in series with condenser No. 63 and 45 has a resonant peak at 600 KC. The purpose of this circuit being to increase the gain of the receiver on the low end of the broadcast band. Condenser No. 24 which is shunted across coil section 65a has for its purpose the reduction of image responses from signals in the vicinity of 2.5 MC.

Condenser No. 8 is a direct current blocking condenser which keeps the bias voltage and the voltage developed by the A.V.C. system from being shorted out to ground by resistor No.

REAR VIEW OF CABINET



35. Resistor No. 35 was shunted across the primary antenna circuit for two reasons: (1) to make the overall sensitivity of the receiver more uniform and (2) to eliminate detuning effects in the secondary antenna circuit when different types of antenna systems are used with this receiver.

MODELS 91-821 to 91-829

98-821 to 98-829

910-821 to 910-829

Tuner Data, Phono., Notes

STEWART WARNER CORP.

Chassis Model	Used in Receiver Models	Voltage	Frequency
91-82	91-821 to 91-829	117	60 cycles
98-82	98-821 to 98-829	117	25 cycles
910-82	910-821 to 910-829	100-240	50-133

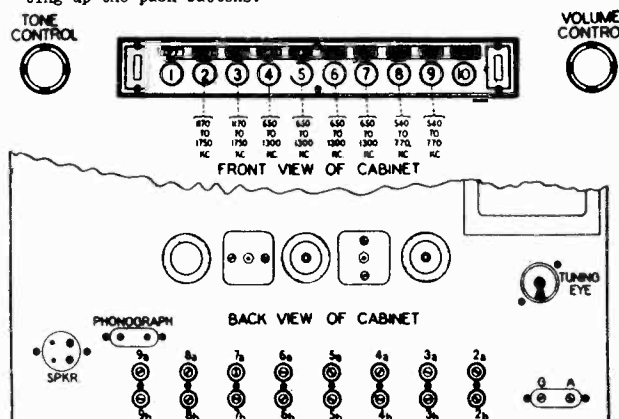
These chassis are 8 tube single band push button tuning superheterodyne receivers. The tuning range covered by the eight tuning buttons is 540 to 1750 kilocycles. These receivers also incorporate the new Peri-dynamic speaker system which is an exclusive Stewart-Warner feature and was designed for the express purpose of giving you the ultimate in tone quality and high fidelity reception.

For greatest ease and simplicity in tuning, these chassis are provided with eight push buttons (Nos. 2 to 9 in Fig. 1). These buttons automatically tune in the stations for which they are labeled. Two other buttons are provided on the keyboard (Nos. 1 and 10 in Fig. 1). Button No. 1 is pushed in only WHEN IT IS DESIRED TO TURN THE RECEIVER OFF. Button No. 10 is pushed in when you desire to use the phonograph pick up. TO TURN THE RECEIVER ON MERELY PUSH ANY ONE OF THE BUTTONS FROM NO. 2 TO 9.

HOW TO SET UP THE PUSH BUTTONS.

The push buttons of your radio receiver are not previously set to stations at the factory. Therefore, unless your dealer has already set and labeled the various push buttons, it will be necessary to make the following adjustments before any stations can be received by using these buttons, proceed as outlined below:

1. Be sure that your set is connected to a good antenna system.
2. Turn on the set at least one quarter hour before setting up the push buttons.



12. In some instances it may be necessary, after the set is operated for a month or more, to re-set the trimmer adjusting screws as they may change their setting due to heat and humidity. Changes in the setting of the trimmer screws will cause poor tone quality.

USE OF THE TUNING EYE.

The tuning eye is located at the rear of the chassis (as shown in Fig. 1) and should be used when setting up the push buttons to the various stations. Its purpose is to indicate visually the exact point at which the receiver is correctly tuned to a station. Any station is correctly tuned in when the two open ends of the "V" shadow in the tuning eye are closest together. On strong signals the ends will come together - on weaker stations, they will be more separated. REGARDLESS OF WHETHER YOU ARE TUNING IN A STRONG OR A WEAK STATION, THE TRIMMER SCREWS SHOULD ALWAYS BE ADJUSTED TO THE POINT WHERE THE ENDS OF THE "V" IN THE EYE ARE CLOSEST TOGETHER.

NOTE: This tuning eye should be removed from its socket in the chassis after the push buttons have all been set-up. Failure to remove this tube may result in buzzing or rattling sounds such as described below under "Rattles and Buzzes".

CONNECTING A PHONOGRAPH PICK-UP UNIT.

The connections to your receiver from a high impedance pick-up unit are made to the terminal strip on the back of the chassis (see Fig. 1, back view, for this terminal strip labeled "PHONOGRAPH"). The two leads from the phonograph pick-up unit are connected to the two terminals on this strip. In case hum is encountered when using this unit, reverse the connections to this terminal strip. If the hum persists, make sure that the receiver has a ground wire connected to it as described under "GROUND CONNECTIONS."

HOW TO CHANGE THE OPERATING RANGE OF A BUTTON.

The operating range of a button may be changed by merely changing the dual trimmer used with that button. Dual trimmers with the ranges indicated below can be obtained from your Stewart-Warner distributor, or directly from the Stewart-Warner Corporation, under the following part numbers:

Part Number	Tuning Range	List Price
113953	1170 to 1750 KC.	.46
113954	650 to 1300 KC.	.60
113955	540 to 770 KC.	.62

To make the change proceed as follows:

1. Remove the chassis from the cabinet.
2. By referring to Fig. 1, determine the dual trimmer associated with the button whose range you wish to change.
3. Unsolder the leads from the four terminals on the back of this dual trimmer.
4. Remove the 6/32 machine screw holding the dual trimmer to the front of the chassis.
5. From the above list select a dual trimmer which will cover the desired range.
6. Mount it on the chassis with the 6/32 machine screw, and solder the leads to its four terminals.

The button is now ready to be set to any strong station whose frequency is within the range of this new trimmer unit.

RATTLES & BUZZES.

If during normal operation, buzzing or rattling sounds are heard in the receiver, they will in all probability originate in one or more of the sources listed in this paragraph. These rattles or buzzes generally occur with the tone control in the bass position and with the volume control advanced to a fairly loud level. Check the following for probable sources of noise.

- (1) Loose tube shields. See that shields are properly located, and making good mechanical contact with tube shield base.
- (2) Loose elements in any of the tubes. This applies especially to the 6U5 tuning eye tube. This tube should be removed from the chassis after the buttons have been set-up.
- (3) Loose escutcheon or cabinet parts. Check for mechanical vibration of any parts not securely fastened.

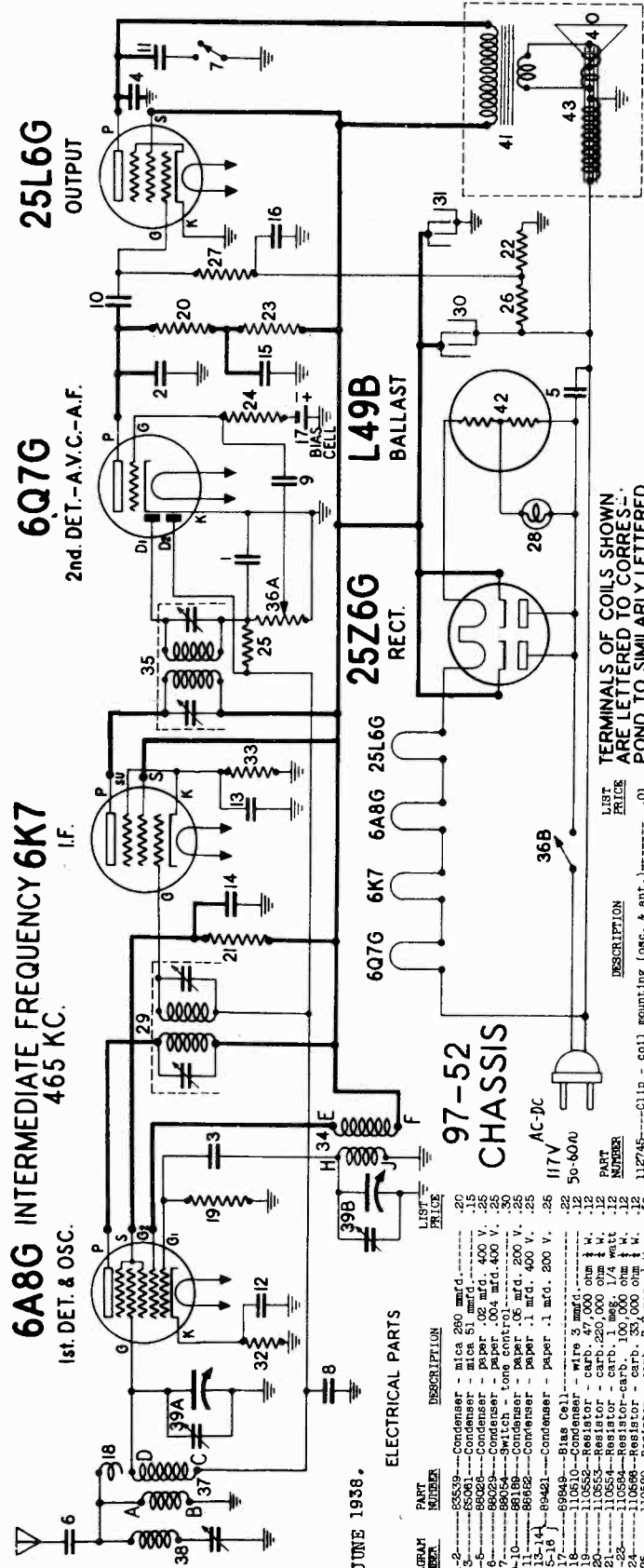
STEWART-WARNER CORP.

MODELS 97-521 to 97-529

Chassis 97-52

Schematic, Voltage

Socket



25L6G
OUTPUT

6Q7G
2nd DET.-A.V.C.-A.F.

6A8G
1st DET. & OSC.

25Z6G
RECT.

L49B
BALLAST

97-52
CHASSIS

ELECTRICAL PARTS

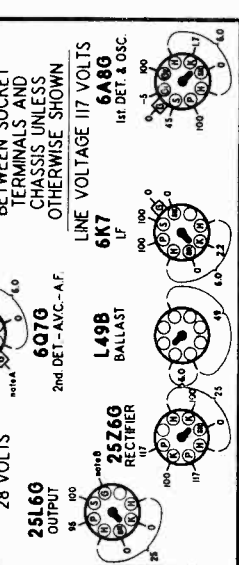
DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1-2	85539	Condenser - mica 280 mmfd.	.20
4-5	88024	Condenser - mica 51 mmfd.	.15
6	88029	Condenser - paper .004 mfd. 400 V.	.25
7	88054	Switch - tone control	.30
8-9-10	88189	Condenser - paper .05 mfd. 200 V.	.25
11-12-13-14	88682	Condenser - paper .1 mfd. 400 V.	.25
15-16	89421	Condenser - paper .1 mfd. 200 V.	.25
17	89849	Bias Cell	.22
18	110610	Condenser - wire 3 mmfd.	.12
20	110525	Resistor - carb. 27,000 ohm 1/4 watt	.12
21	110584	Resistor - carb. 1 meg. 1/4 watt	.12
22-23	110584	Resistor - carb. 100,000 ohm 1/4 watt	.12
24	110698	Resistor - carb. 33,000 ohm 1/4 watt	.12
25-26	110594	Resistor - carb. 330,000 ohm 1/4 watt	.12
27	110629	Lamp - 5.3 volt - 25 amp.	.15
28	112803	Transformer - 1st I.F.	1.20
29	112898	Transformer - elect. 16 mfd. 150 V.	.50
30-31	113042	Coil - oscillator	.12
32	113047	Transformer - 2nd I.F.	1.10
33	113048	Volume control - 500,000 ohms	1.00
34	113092	Coil - with off on switch	.74
35	113119	Coil - with trap (with trimmer)	.74
36	39B	Coil - voice coil	3.00
37	113150	Condenser - variable gang	3.00
38	R-113241	Cone - voice coil assem. for R-115012 speaker	1.26
39	R-113343	Transformer - output for R-115012 speaker	1.00
40	R-115012	Speaker - Dynamic 5 inch	4.12

TERMINALS OF COILS SHOWN ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM.

ANTENNA GROUNDED

SOCKET VOLTAGES

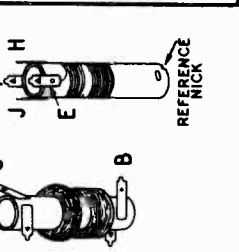
DIAL TUNED TO 540 KC



ANTENNA COIL

OSCILLATOR COIL

REFERENCE



REAR OF CHASSIS

MODELS 97-521 TO 97-529

NOTE A: The bias for the control grid of the 6Q7-G tube is -1.0 volt, supplied by the bias cell. Due to the high resistance of the cell, the voltmeter will indicate only a fraction of a volt.

NOTE B: The bias for the control grid of the 25L6-G output tube is -10 volts measured across resistor 22.

PART NUMBER	DESCRIPTION	LIST PRICE
2694	Screw - wood, chassis mtg. #6 X Per C	.80
7223	Washer - chassis mtg. (model 97-523)	.01
79008	Screw - #6-32 X 7/8 "Fl. Rd. Mech. [for setting up push button]	.01
81145	Screw - #6-32 X 7/8 "Fl. Rd. Mech. [for setting up push button]	.05
82999	Screw - chassis mtg. #10 X 3/8" (for setting up push button)	.05
85427	Screw - chassis mtg. #10 X 3/8" (for setting up push button)	.05
85615	Spring - bottom (standard)	.15
88348	Washer - for cord drive	.06
89746	Washer - (paper) for back of knobs	.006
110629	Washer - flat steel, for mtg. chassis housing only	.01

DIAL & MISCELLANEOUS PARTS

MODELS 97-521 to 97-529

Chassis 97-52

STEWART WARNER CORP.

Alignment, Trimmers

Chassis Model

Used In Receiver Models

Voltage

97-52

97-521 to 97-529

117 volts A.C. or D.C.

This chassis is a 5 tube, single band push-button tuning superheterodyne receiver. It is designed for operation on either alternating or direct current, and incorporates an L-49-B ballast resistor tube. The tuning range of this receiver is 540 to 1725 KC. The intermediate frequency is 465 KC.

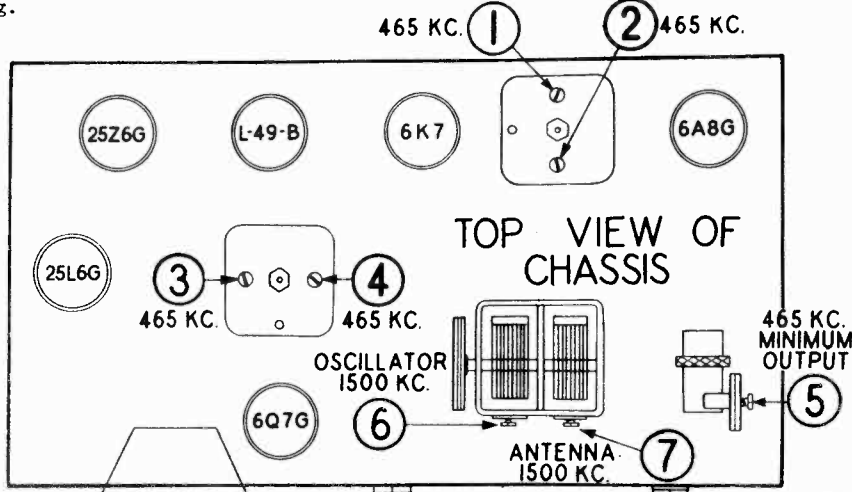
Incorporated in each chassis is a four-button mechanical push-button tuner unit. These push buttons may be set to any station desired by the method described below under "How To Set Up The Push-Button Tuner".

The accuracy of tuning when using the push-button tuner, depends to a large extent upon the amount of "play" in the moving parts of this system. In cases where slight inaccuracy in tuning occurs check the following points:

1. Check to see that the button is correctly set to the station. If not, reset the button.
2. The tension must be maintained between the two sections of the anti back-lash gear on the left side of the unit in order that it functions properly--both anti back-lash springs must be in place in the gear and compressed slightly.
3. Note the small adjusting lug over the push-button shafts at the point where they slide into the tuner. The lug is held in place by a hex-head screw. These lugs should be adjusted for a minimum amount of "play" In other words the push-button shaft must have a minimum of movement in a vertical direction.

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 1500 KC are required.

- ① Connect the output meter across the voice coil or between the plate of the 25L6-G output tube and ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
- ② Connect the ground lead of the signal generator to the chassis of the receiver through a .1 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to do this may have serious results as one side of the power line may be grounded in the signal generator.
- ③ Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
- ④ With the gang condenser in full mesh, set the pointer to the last mark on the right end of the dial scale. If the pointer is only slightly off calibration, loosen the set-screw in the dial drive drum at the left side of the gang condenser and set the pointer to the last mark on the right end of the dial when the gang condenser is in full mesh. If the pointer is off calibration several dial divisions, release it from the pointer drive cord by spreading the clip on the pointer. Then slide the pointer along the cord until it is set to the last dial division on the right end of the dial. Holding it in place check to see if the gang condenser is in full mesh, and tighten the pointer clip, being careful not to cut the cord. Place a drop of household or speaker cement on the cord and pointer clip to prevent the pointer from slipping.

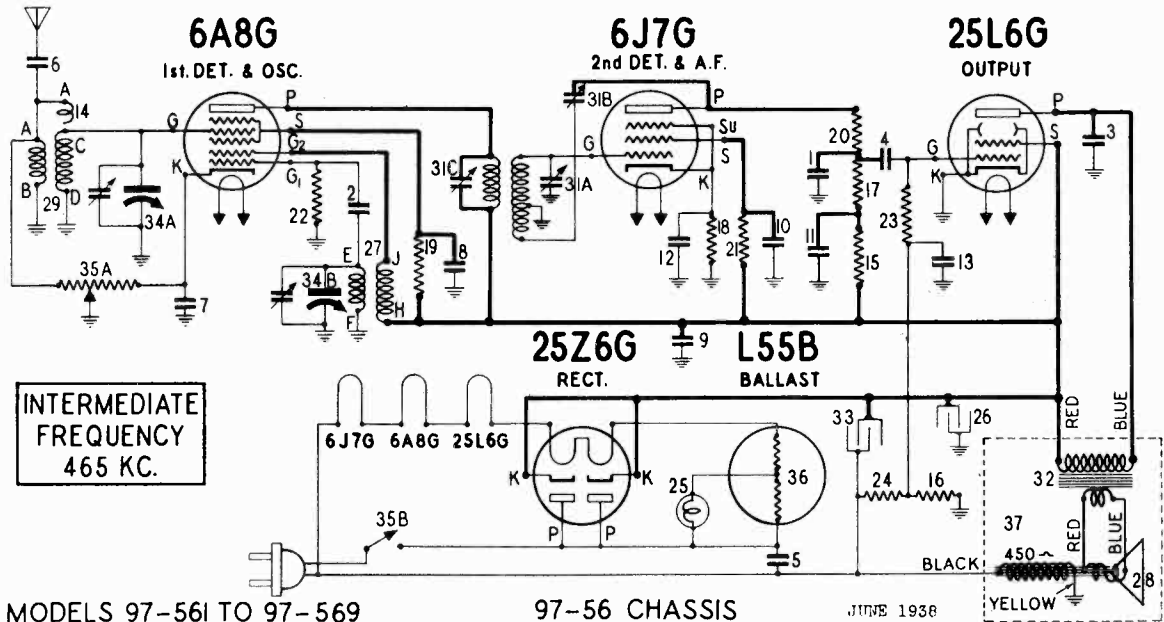


DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD CONDENSER	CONTROL GRID OF 6A8-G TUBE	465 KC	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	1st I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
				3-4	2nd I.F.	
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	465 KC	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	1500 KC	1500 KC	6	BROADCAST OSCILLATOR (Shunt)	ADJUST TRIMMER TO BRING IN SIGNAL.
400 OHM CARBON RESISTOR	ANTENNA LEAD (Blue Wire)	1500 KC	TUNE TO 1500 KC GENERATOR SIGNAL	7	BROADCAST ANTENNA (Shunt)	ADJUST FOR MAXIMUM OUTPUT.

Schematics, Voltage,
Socket

MODELS 97-561 to 97-569
STEWART-WARNER CORP. Chassis 97-56

97-561S to 97-569S
Chassis 97-56S

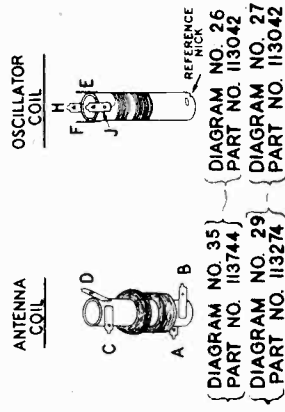


MODELS 97-561 TO 97-569

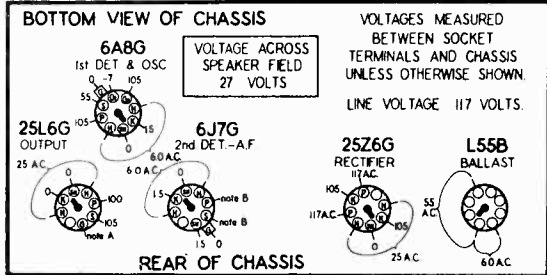
97-56 CHASSIS

JUNE 1938

NOTE
TERMINALS OF COILS SHOWN IN PICTORIAL VIEWS BELOW ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM ABOVE. TERMINALS WHICH ARE CONNECTED TOGETHER CARRY THE SAME LETTER.



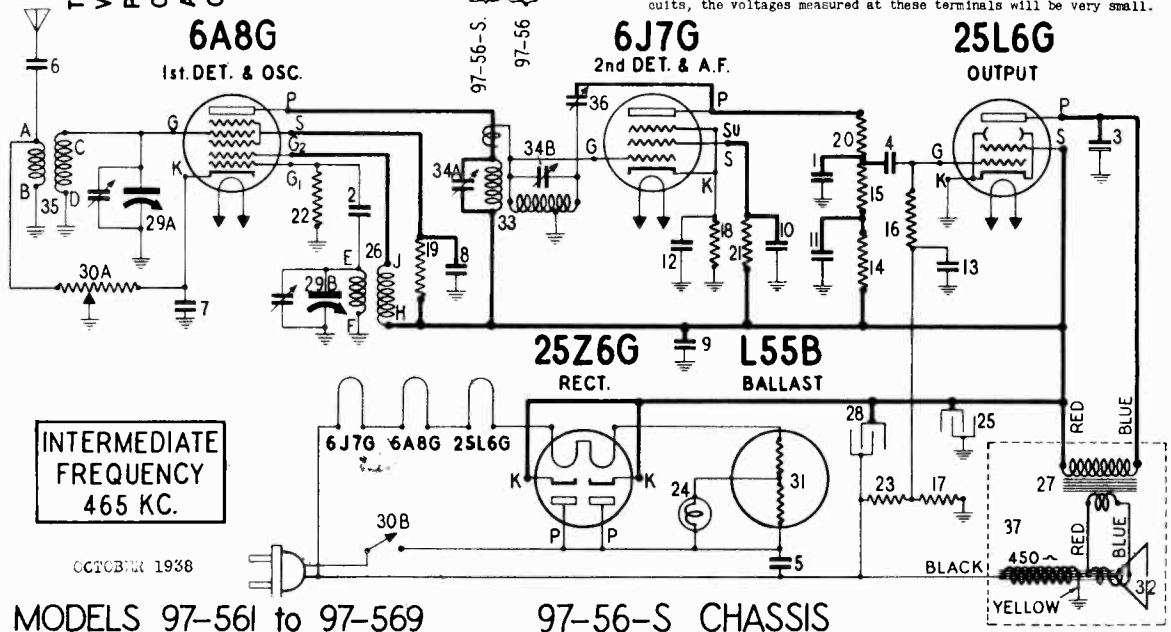
SOCKET VOLTAGES CHASSIS 97-56, 97-56-S. ANTENNA GROUNDED. DIAL TUNED TO 540 KC.



Use a high resistance voltmeter of a least 1000 ohms per volt.

NOTE A: The bias for the control grid of the 25L6G output tube is -6.0 volts. Due to the high resistance in this grid circuit the voltage measured will be extremely small.

NOTE B: Due to the high resistance in the plate and screen grid circuits, the voltages measured at these terminals will be very small.



MODELS 97-561 to 97-569

97-56-S CHASSIS

OCTOBER 1938

MODELS 97-561 to 97-569
97-561S to 97-569S

STEWART WARNER CORP.

Tuner Data, Alignment

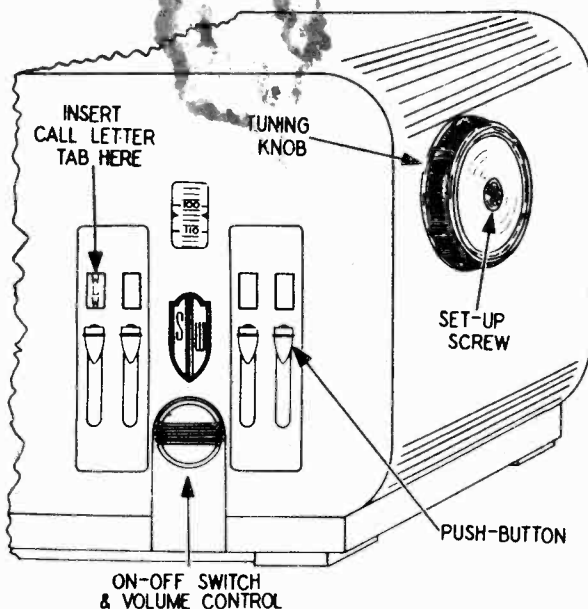
MODELS 97-571 to 97-579

Tuner Data

CHASSIS 97-56, 97-56S AND 97-57

HOW TO SET UP THE PUSH-BUTTON TUNER.

1. Be sure that your set is connected to a good antenna system.
2. Turn on the set and allow it to operate at least one-quarter hour before setting up the push buttons.
3. Select the four nearby stations to which you wish to set up the buttons. Be sure to select nearby, powerful stations, since weak signals will generally give poor results. Any button may be set to any desired station.



4. The large tuning knob at the side of your set has a screw located in the center. Grasp this tuning knob firmly and then using a screw-driver or a coin turn the screw counter-clockwise not more than two whole turns. (When viewed from the side of the cabinet.)
5. Push down any one of the four buttons that you wish to set to a station. Be sure to push the button all the way down, otherwise the setting will be incorrect.
6. Holding the push-button down firmly, turn the tuning knob until the station you desire is tuned in. Tune in strong nearby stations for best results. Be sure to tune in the stations correctly by tuning to the point where the program is heard with the least hiss or distortion and not to the point of greatest volume.
7. Release the push button that you have just set up. **WARNING:** Do not attempt to use any button until you have completed the set-up of all four buttons. Do not re-tighten the set-up screw until all buttons have been set-up.
8. Proceed to set-up the next button by pushing down on the button firmly and tuning in the desired station, using the tuning knob. The rest of the buttons should be set-up in a similar manner.
9. After all of the buttons have been set-up YOU MUST RE-TIGHTEN THE SCREW IN THE TUNING KNOB; OTHERWISE ALL SETTINGS OF THE BUTTONS WILL BE DESTROYED. GRASP THE KNOB FIRMLY AND THEN USE A SCREW DRIVER OR A COIN TO TIGHTEN THE SCREW SECURELY.
10. The push buttons should now be labelled with their proper call letters. The call letter sheets are supplied with your receiver. The individual call letter tab should be moistened on its gummed side and stuck to the small square in the cabinet panel just above the push button.

97-56 CHASSIS ONLY

THE INTERMEDIATE FREQUENCY AMPLIFIER.

This 97-56 chassis employs one stage of intermediate frequency amplification. The intermediate frequency transformer is adjusted to 465 KC and is tuned in the usual manner. In addition to the two trimmers used in tuning the windings to their proper frequency, this transformer has mounted on it an additional trimmer condenser which is used to feed back a portion of the intermediate frequency signal appearing in the plate circuit of

the 6J7-G tube. This signal is introduced into the 6J7-G grid circuit through a coupling coil, which is a part of the secondary coil. This regeneration increases the amplification and selectivity obtainable from this stage, and makes the performance of this set comparable to that which is obtained from a set employing an additional I.F. transformer.

When aligning the intermediate frequency amplifier, the output of the signal generator is set at 465 KC and is coupled to the grid of the 6A8-G tube in the customary manner. The primary and secondary windings are tuned by adjusting Trimmer Screws No. 1 and No. 2 until a maximum deflection is obtained on the output meter. If the set has a tendency to oscillate when adjusting these trimmer screws, turn Trimmer Screw No. 5 to the left (counter-clockwise) until the oscillation ceases. The signal generator is next coupled to the antenna lead, and Trimmers No. 3 and No. 4 are aligned for maximum output, using a generator frequency of 1500 KC. Now connect the set to the CUSTOMER'S antenna and tune in a station on the low frequency end of the dial. The regeneration control, Trimmer No. 5 is now adjusted to give maximum output of the set, consistent with good stability and tone quality. After changing the setting of Trimmer No. 5 it is necessary to re-adjust Trimmers No. 1 and No. 2, as their setting will be found to have changed slightly. The output of the signal generator is set at 465 KC and is coupled to the grid of the 6A8-G tube through a .1 mfd. condenser and Trimmers No. 1 and No. 2 adjusted, as was done previously.

A-C OPERATION

When the set is used on alternating current, all D-C potentials are supplied by a 25Z6G rectifier tube and its associated filter circuit. The tube is connected for half-wave rectification of the A-C supply.

If any hum is noticed when the set is used on A-C, reversing the power plug in the receptacle will sometimes reduce the hum level. When the set has not been used for some time, or the filter condensers have been replaced, a slight hum may be audible when the set is first turned on. This hum may not clear up immediately upon reversal of the power plug. However, it will probably be eliminated after approximately five minutes operation by which time the anode plates of the electrolytic capacitors in the filter system will have reformed.

D-C OPERATION

If the set fails to operate after allowing time for the tubes to reach their normal operating temperatures, reverse the power plug in the receptacle. When the set is used on direct current, the 25Z6G rectifier tube and the filter system remains in the circuit and serve two purposes. If the power cord should be plugged in with incorrect polarity, the 25Z6G tube protects the filter condensers from damage. On correct D-C polarity the 25Z6G tube passes the D-C and the filter circuit aids in smoothing the supply voltage, thus minimizing line noises.

97-56-S CHASSIS ONLY

I.F. TRANSFORMER & REGENERATION CONTROL

This 97-56-S chassis employs only one intermediate frequency transformer, the windings of which are capacitively coupled. The two trimmers used to tune the primary and secondary of this transformer are mounted on the transformer assembly, and are accessible from the rear of the chassis. Also associated with this intermediate frequency transformer is an additional trimmer condenser, which is accessible through a hole in the rear of the chassis. This condenser is used to feed back a portion of the intermediate frequency signal appearing in the plate circuit of the 6J7-G tube. This signal is introduced into the 6J7-G grid circuit through a coupling coil, which is a part of the secondary coil. The regeneration obtained increases the amplification and selectivity obtainable from the intermediate frequency transformer, and makes the performance of this set comparable to that which is obtained from a set employing an intermediate frequency stage.

ADJUSTMENT OF REGENERATION CONTROL.

IF DISTANT STATIONS COME IN WITH INSUFFICIENT VOLUME: Through the opening near the bottom of the center of the back of the cabinet, you will see an adjusting screw. Using a non-metallic instrument (a piece of wood whittled in the shape of a screw driver will serve the purpose), turn this screw to the left (counter-clockwise). As you turn counter-clockwise the volume will be increased up to a certain point at which the set will begin to squeal. Turn the screw back until the squeal just disappears and good tone quality is obtained.

IF THE RECEIVER HOWLS OR SQUEALS: Using the same screw mentioned above and a non-metallic instrument (a piece of wood whittled in the shape of a screw driver will serve the purpose) turn the screw clockwise very, very slightly until the squeal or howl ceases.

STEWART WARNER CORP.

Alignment, Trimmers

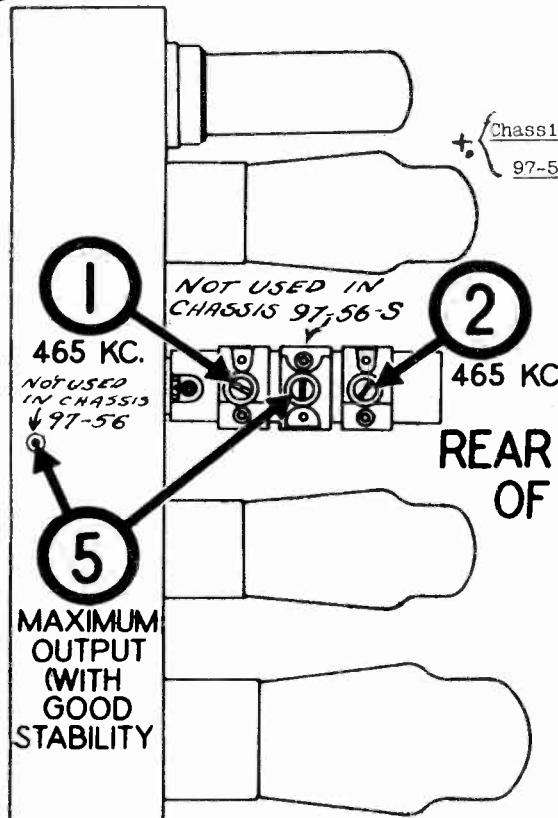
FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 485 KC to 1500 KC are required.

- ① Connect the output meter across the voice coil or between the plate of the 25L6-G output tube and ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
- ② Connect the ground lead of the signal generator to the chassis of the receiver through a .1 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to do this may have serious results as one side of the power line may be grounded in the signal generator.
- ③ Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
- ④ With the gang condenser in full mesh, set the indicator to the last mark on the top end of the dial scale. If the pointer is only slightly off calibration, it may be possible to slip the dial drum just enough to correct for this slight mis-calibration. If the dial is several divisions off calibration, loosen the set screw on the condenser shaft. Then grasp the end of the tuning shaft and turn the dial until the last division of the scale is directly under the indicator, when the gang is in full mesh. Then retighten the set-screw.
- ④ TO CALIBRATE THE DIAL:- Remove the chassis from the cabinet and set it on a flat surface (insulated from ground). Release the set screw in the collar which connects the gang condenser shaft with the tuning unit. Holding the gang in full mesh turn the dial until the last dial division (just below 55) on the low frequency end is exactly 4 3/8 inch above the table surface. Now retighten the set screw in the coupler collar. The 4 3/8 inch division on the ruler (when measured vertically from table surface) is to be used as the dial indicator for all calibrations and alignment.

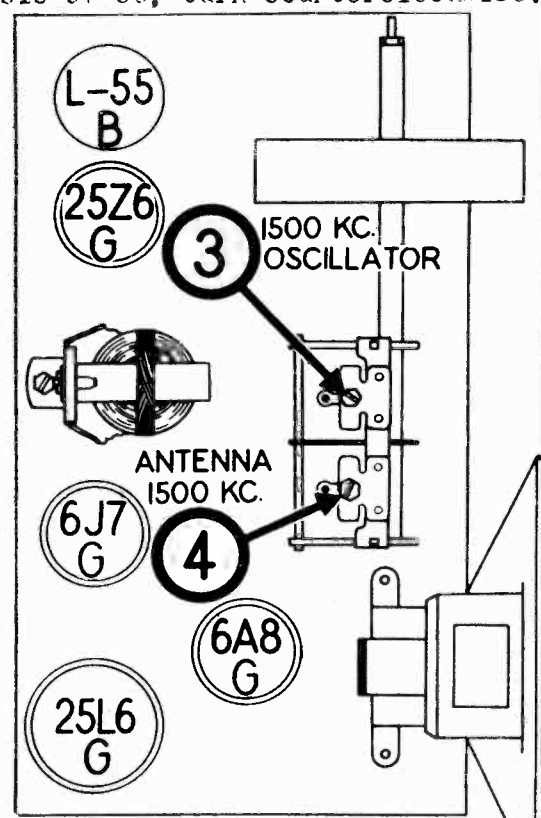
DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	CONTROL GRID OF 6A8-G TUBE	485 KC	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	I. F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT. IF OSCILLATION OCCURS TURN REGENERATION CONTROL TRIMMER #5 ONE-QUARTER TURN
200 MMFD. CONDENSER	ANTENNA LEAD (BLUE WIRE)	1500 KC	+ 1500 KC	3	BROADCAST OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
200 MMFD. CONDENSER	ANTENNA LEAD (BLUE WIRE)	1500 KC	TUNE TO 1500 KC GEN. SIG.	4	BROADCAST ANTENNA (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
CONNECT RECEIVER TO CUSTOMER'S ANTENNA OR TO A .50 MMFD. MICA CONDENSER IN SERIES WITH THE SIGNAL GENERATOR.		TUNE IN A WEAK SIGNAL ON THE LOW FREQUENCY END OF THE DIAL. A WEAK SIGNAL IS REQUIRED SO THAT VOLUME CONTROL MAY BE SET TO MAXIMUM VOLUME POSITION.		5	REGENERATION CONTROL	ADJUST TRIMMER TO GIVE MAXIMUM OUTPUT, CONSISTENT WITH GOOD STABILITY AND TONE QUALITY.
.1 MFD. CONDENSER	CONTROL GRID OF 6A8-G TUBE	485 KC	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	I. F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.

THIS ADJUSTMENT MUST AGAIN BE MADE AFTER THE REGENERATION CONTROL TRIMMER HAS BEEN SET.

- On chassis 97-56-3, turn clockwise.
- On chassis 97-56, turn counterclockwise.



Chassis MEASURED 4 3/8" UP FROM TABLE 97-56-S. SURFACE



MODELS 97-561 to 97-569
97-561S to 97-569S STEWART-WARNER CORP.

Parts Lists

97-56 CHASSIS 97-56-S CHASSIS

ELECTRICAL PARTS

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1	83539	Condenser - mica 260 mmfd.	.20
2	83783	Condenser - mica 110 mmfd.	.20
3-4-5	88026	Condenser - paper .02 mfd. 400 volt	.25
6	88029	Condenser - paper .004 mfd. 400 volt	.25
7-8-9-10-11	89421	Condenser - paper .1 mfd. 200 volt	.25
12-13	89532	Condenser - paper .25 mfd. 200 volt	.32
14	110510	Condenser - wire 3 mmfd.	.12
15-16	110553	Resistor - carbon 220,000 ohm 1/4 watt	.12
17	110559	Resistor - carbon 470,000 ohm 1/4 watt	.12
18	110565	Resistor - carbon 22,000 ohm 1/4 watt	.12
19	110566	Resistor - carbon 33,000 ohm 1/4 watt	.12
20	110569	Resistor - carbon 10,000 ohm 1/4 watt	.12
21	110570	Resistor - carbon 2.2 meg. 1/4 watt	.15
22	110578	Resistor - carbon 68,000 ohm 1/4 watt	.12
23	110584	Resistor - carbon 330,000 ohm 1/4 watt	.12
24	110591	Resistor - carbon 680,000 ohm 1/4 watt	.12
25	110629	Lamp - 6.3 volt - .25 amps.	.15
26	112898	Condenser - electrolytic 16 mfd. 150 volt	.50
27	113042	Coil - oscillator	.45
28	R-113241	Cone - voice coil assem. for R-115013 spkr.	1.25
29	113274	Coil - antenna	.65
30	113275	Transformer - I.F. (with trimmer)	1.44
31A to 31C	113278	Condenser - trimmer (3 section for I.F.)	.46
32	R-113343	Transformer - output for R-115013 spkr.	1.00
33	113472	Condenser - electrolytic 40 mfd. 150 volt	.56
34A - 34B	113478	Condenser - variable gang-	3.20
35A - 35B	113501	Volume Control-20,000 ohms with on-off switch	.92
36	113506	Ballast Resistor - L55B	.65
37	R-115013	Speaker - dynamic 5 inch-	4.75

ELECTRICAL PARTS

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1	83539	Condenser - mica 260 mmfd.	.20
2	83783	Condenser - mica 110 mmfd.	.20
3-4-5	88026	Condenser - paper .02 mfd. 400 volt	.25
6	88029	Condenser - paper .004 mfd. 400 volt	.25
7-8-9-10-11	89421	Condenser - paper .1 mfd. 200 volt	.25
12-13	89532	Condenser - paper .25 mfd. 200 volt	.32
14	110553	Resistor - carbon 220,000 ohm 1/4 watt	.12
15-16	110559	Resistor - carbon 470,000 ohm 1/4 watt	.12
17	110564	Resistor - carbon 100,000 ohm 1/4 watt	.12
18	110565	Resistor - carbon 22,000 ohm 1/4 watt	.12
19	110566	Resistor - carbon 33,000 ohm 1/4 watt	.12
20	110569	Resistor - carbon 10,000 ohm 1/4 watt	.12
21	110570	Resistor - carbon 2.2 meg. 1/4 watt	.15
22	110578	Resistor - carbon 68,000 ohm 1/4 watt	.12
23	110584	Resistor - carbon 330,000 ohm 1/4 watt	.12
24	110629	Lamp - 6.3 volt - .25 amps.	.15
25	112898	Condenser - electrolytic 16 mfd. 150 volt	.50
26	113042	Coil - oscillator	.45
27	R-113343	Transformer - output for R-115013 speaker	1.00
28	113472	Condenser - electrolytic 40 mfd. 150 volt	.56
29A - 29B	113478	Condenser - variable gang- Volume control-20,000 ohms with on-off switch	3.20
30A - 30B	113501	Volume control-20,000 ohms with on-off switch	.92
31	113506	Ballast Resistor - L55B	.65
32	R-113737	Cone - voice coil assem. for R-115025 speaker	1.90
33	113738	Transformer - I.F. (with trimmer)	1.26
34A - 34B	113743	Condenser - trimmer (2 section for I.F.)	.30
35	113744	Coil - antenna	.72
36	113745	Condenser - trimmer (regen. control)	.28
37	R-115025	Speaker - dynamic 5" (sub. R-115013)	4.80

DIAL & MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
83624	Screw - Self Tapping 8 X 1/4 for mounting I.F. transformer	\$.01
85427	Socket - tube, 8 prong	.15
85827	Set screw - 8/32 square head	.02
112745	Clip - coil mounting (osc. & ant.)	.01
113500	Mechanical Tuner Unit - less tenite tips for push buttons	3.90
113504	Collar - Coupling (between tuner unit and gang cond. shaft)	.08
113510	Tip - for push button (walnut)	.05
113529	Tip - for push button (ivory)	.06
113530	Knob - tuning (walnut)	.25
113531	Knob - tuning (ivory)	.30
113537	Screw for tuning knob & set-up	.18
113543	Socket - dial lamp	.18
113550	Tab - station call letters	.28
113557	Key - for push button tuner (left hand)	.24
113558	Clutch Spring - for tuner (on cam shaft)	.04
113559	Spring - for key return	.02
113580	Dial Scale - Celluloid Strip	.22
113572	Key - for push button (right hand)	.24
113573	Knob - Volume (walnut)	.18
113574	Knob - Volume (ivory)	.18

PART NUMBER	DESCRIPTION	LIST PRICE
83624	Screw - self tapping 8 X 1/4 for mounting I.F. transformer	.01
85427	Socket - tube, 8 prong	.15
85827	Set screw - 8/32 square head	.02
88161	Shield Tube - (short section)	.06
88162	Shield Tube - (long section)	.08
88164	Shield Cap - tube, grid type	.06
89911	Shield - Tube, base	.04
89912	Clip - grounding, for tube base	.02
112745	Clip - coil mounting (osc. & ant.)	.01
113500	Mechanical Tuner Unit - less tenite tips for push buttons	3.90
113504	Collar - Coupling (between tuner unit and gang condenser shaft)	.08
113537	Screw for tuning knob & set-up	.18
113543	Socket - dial lamp	.18
113548	Felt Pad - behind push buttons	.01
113550	Tab - station call letters	.28
113557	Key - for push button tuner (left hand)	.24
113558	Clutch spring - for tuner (on cam shaft)	.04
113559	Spring - for key return	.02
113580	Dial Scale - celluloid strip	.22
113572	Key - for push button (right hand)	.24
113582	Dial Window - celluloid	.12
113636	Screw - #8 X 3/4" for chassis mtg.	.01
113638	Screw - Back cover retaining	.01
113639	Screw - #8 X 1" for chassis mtg.	.01

Chassis Model Used in Receiver Models **Voltage**
97-56 97-561 to 97-569 117 volts A.C. or D.C.
This chassis is a 5 tube single band push-button tuning superheterodyne receiver. It is designed for operation on either alternating or direct current, and incorporates an L-55-B ballast resistor tube. The tuning range of the receiver is 540 to 1720 KC.

IMPORTANT: In cases where it is found that the push-button tuner does not tune in stations correctly due to extreme sharpness in tuning it is only necessary to back off (turn counter clockwise) the regeneration control trimmer (#5) slightly. This will make tuning broader and will result in more accurate tuning when using the push button tuner.

Chassis Model Used in Receiver Models **Voltage**
97-56-S 97-561 to 97-569 117 Volts A.C. or D.C.

This chassis is a 5 tube single band push-button tuning superheterodyne receiver. It is designed for operation on either alternating or direct current, and incorporates an L-55-B ballast resistor tube. The tuning range of the receiver is 540 to 1720 KC.

IMPORTANT: In cases where it is found that the push-button tuner does not tune in stations correctly due to extreme sharpness in tuning it is only necessary to turn the regeneration control trimmer (#5) slightly clockwise. This will make tuning broader and will result in more accurate tuning when using the push button tuner.

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
113922	113921	Yellow Push Button	.50
114126	114125	Blue Push Button	.50
113920	114124	Blue Push Button	.50
#72	#36	Yellow Push Button	.50
113785	113798	Blue Push Button	.50
113786	113797	Blue Push Button	.50
113783	113796	Blue Push Button	.50
#73	#45	White Push Button	.50
113805	113806	Gold Push Button	.50
113823	113824	Gold Push Button	.50
113832	113833	Burnt Orange Push Button	.50
113841	113842	Black Push Button	.50
#24	#61	Gray Push Button	.50
113779	113778	Red Push Button	.50

KNOBES AND PUSH-BUTTONS

WHEN ORDERING GIVE COLOR AS WELL AS PART NUMBER

97-56-S

STEWART-WARNER CORP.

MODELS 97-571 to 97-579
 Chassis 97-57
 Schematic, Voltage
 Socket, Changes

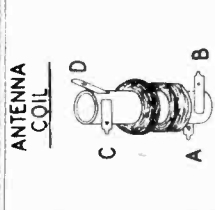
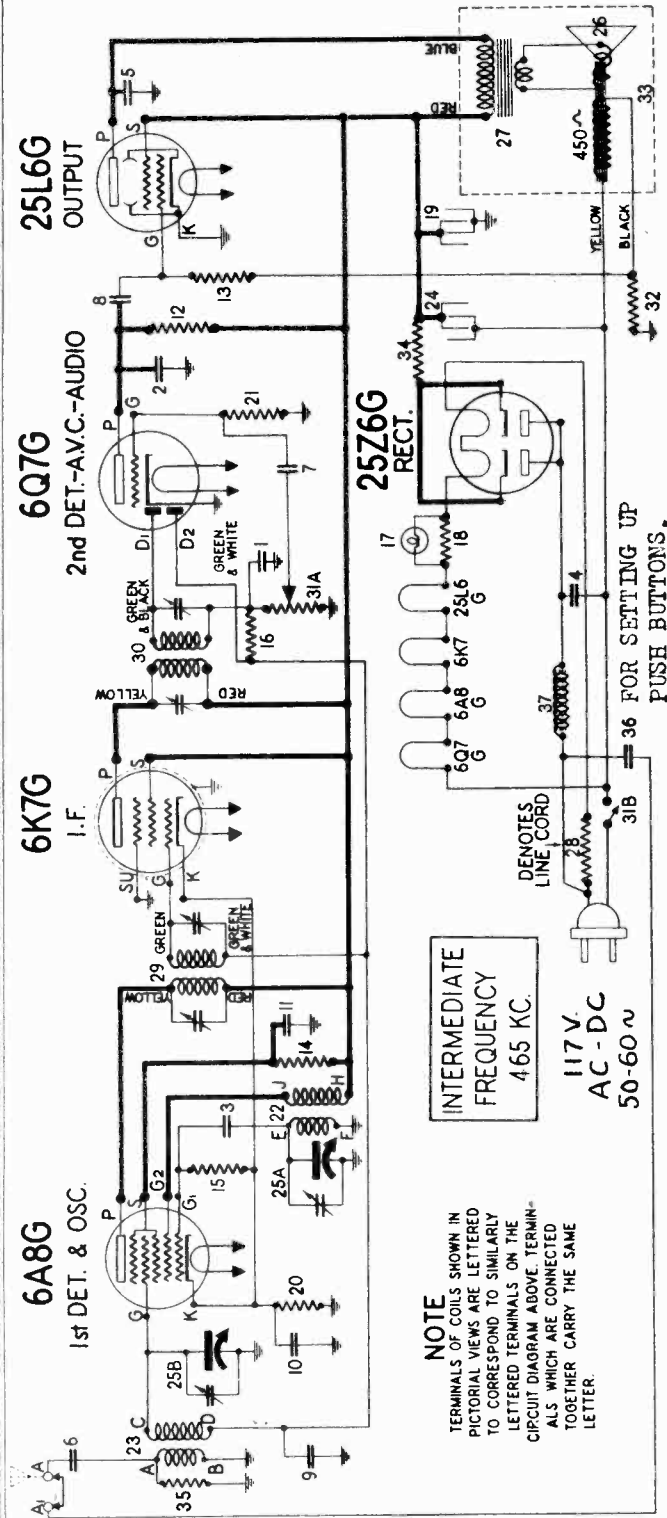


DIAGRAM NO. 23
 PART NO. 113449

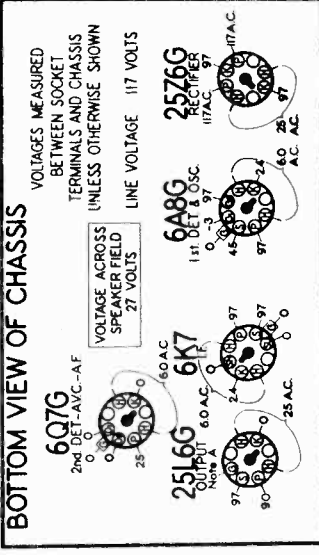
DIAGRAM NO. 22
 PART NO. 113042

NOTE
 TERMINALS OF COILS SHOWN IN PICTORIAL VIEWS ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM ABOVE. TERMINALS WHICH ARE CONNECTED TOGETHER CARRY THE SAME LETTER.

**MODELS 97-571 to 97-579
 97-57 CHASSIS**

SEE 97-56 CHASSIS.
 PUSH BUTTONS,
 FOR SETTING UP

ANTENNA GROUNDED
 SOCKET VOLTAGES
 DIAL TUNED TO 540 KC



REAR OF CHASSIS

Use a high resistance voltmeter of at least 1000 ohms per volt.
 NOTE A.- The bias for the control grid of the 25L6-G tube is -6.7 volts, measured across resistor number 32.

CIRCUIT CHANGE

Resistor No. 18 connected in parallel with the dial bulb has been changed to a 3 watt molded wire wound resistor, Part No. 116479. This size is being used in place of the original 1/2 watt rating, to prevent failure of the resistor if the dial bulb burns out. The 3 watt resistor should be used for replacement in all cases.

TUBE CHANGE

A small percentage of these chassis was equipped with 6K7 metal I.F. tubes but most of them are using the 6K7 Glass tube. Because of shield requirements, these tubes cannot be used interchangeably. In other words, a metal tube must be used to replace a metal tube, while in a chassis originally equipped with a glass I.F. tube, a glass tube must be used as a replacement.

CORRECTING OSCILLATION & SQUEALING

If a "squeal" develops with the volume control fairly well advanced, separate the 6Q7G grid lead and the speaker wires as much as possible by pulling the grid lead to the side of the 6Q7G nearest the variable condenser. If there is a loud heterodyne whistle when tuning in stations, the I.F. stage may be oscillating. If this happens, move the lead from the 6A8G cathode to the 6Q7G cathode as close to the chassis and as far from other wires as possible. If necessary, connect a .05 mfd. 200 volt condenser to one of the above cathode terminals which does not already have such a condenser connected directly to it.

MODELS 97-571 to 97-579

Alignment, Trimmers, Parts

Antenna Notes

STEWART WARNER CORP.

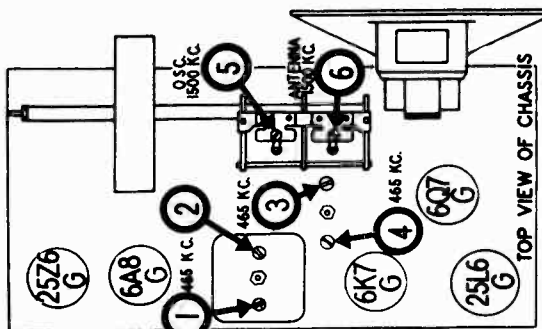
ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 1500 KC are required.

- ① Connect the output meter across the voice coil or between the plate of the 25L6-G output tube and ground through a .1 mfd. condenser, depending upon the type of meter. The more sensitive type should be connected across the voice coil.
 - ② Connect the ground lead of the signal generator to the chassis of the receiver through a .25 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to do this may have serious results as the signal generator may be connected to one side of the power line, or it may be grounded externally.
 - ③ Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
- TO CALIBRATE THE DIAL:-- Remove the chassis from the cabinet and set it on a flat surface (insulated from ground). Release the set screw in the collar which connects the gang condenser shaft with the tuning unit. Holding the gang in full mesh turn the dial until the last dial division (just below 55) on the low frequency end is exactly 4 3/8 inch above the table surface. Now retighten the set screw in the coupler collar. The 4 3/8 inch division on the ruler (when measured vertically from table surface) is to be used as the dial indicator for all calibrations and alignment.

DUMMY ANT IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
200 MMFD. MICA CONDENSER	CONTROL GRID OF 6A8-G TUBE	465 KC	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	1ST I. F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT
				3-4	2ND I. F.	
200 MMFD. MICA CONDENSER	ANTENNA LEAD (Blue Wire)	1500 KC	1500 KC	5	BROADCAST OSCILLATOR (Shunt)	ADJUST TRIMMER TO BRING IN SIGNAL.
200 MMFD. MICA CONDENSER	ANTENNA LEAD (Blue Wire)	1500 KC	TUNE TO 1500 KC GENERATOR SIGNAL	6	BROADCAST ANTENNA (Shunt)	ADJUST FOR MAXIMUM OUTPUT.

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1-2	83539	Condenser - mica 280 mmfd.	.20
3	83783	Condenser - mica, 110 mmf.	.20
4	111252	Condenser - paper .05 mfd. 400 V.	.13
5	88026	Condenser - paper .02 mfd. 400 V.	.25
6	88029	Condenser - paper .004 mfd. 400 V.	.25
7-8	88030	Condenser - paper .01 mfd. 400 V.	.25
9-10	88189	Condenser - paper .05 mfd. 200 V.	.25
11	89421	Condenser - paper .1 mfd. 200 V.	.25
12	110553	Resistor - carb. 220,000 ohms ± W.	.12
13	110559	Resistor - carb. 470,000 ohms ± W.	.12
14	110586	Resistor - carb. 33,000 ohms ± W.	.12
15	110578	Resistor - carb. 68,000 ohms ± W.	.12
16	110580	Resistor - carb. 3.3 meg. 1/4 watt	.12
17	110629	Lamp - 6.3 volt - .25 amps.	.15
18	110975	Resistor - W. W. 33 ohms ± W.(10%)	.12
19	112898	Condenser - elect. 16 mfd. 150 V.	.50
20	112974	Resistor - carb. 220 ohm ± W.(10%)	.15
21	112975	Resistor - carbon 10 meg. 1/4 watt	.12
22	113042	Coil - oscillator	.45
23	113449	Coil - antenna	.78
24	113472	Condenser - elect. 40 mfd. 150 V.	.58
25A - 25B	113478	Condenser - variable gang	3.20
26	R-114061	{ Cone - voice coil assembly (for R-115039 speaker)	1.50
27	R-114082	Transformer - output	1.20
	114797	{ Power cord - (series resistance 143 ohms) Brown	.98
28	114951	{ Power Cord - (series resistance 143 ohms) Ivory	1.00
29	114802	Transformer - 1st I.F.	1.10
30	114804	Transformer - 2nd I.F.	.85
31A - 31B	114814	{ Volume control 1 megohm with off-on switch	.96
32	114815	Resistor - W.W. 110 ohms ± W.(10%)	.14
33	R-115039	Speaker - dynamic 5 inch	3.95
34	116013	Resistor - W.W. 50 ohms 1 watt	.18
35	110569	Resistor - carb. 10,000 ohms ± W.	.12
36	116224	Condenser - mica 280 mmfd. 500 V.	.15
37	116232	R. F. Choke	.48



KNOBBS & PUSH BUTTONS

WHEN ORDERING GIVE COLOR AS WELL AS PART NUMBER

COLOR	PUSH BUTTON	TUNING KNOB	VOLUME KNOB
IVORY	113529	113531	113574
LITE WALNUT	114710	114711	114712
METALLIC BLUE	116132	116133	116134
METALLIC GREEN	116137	116138	116139
METALLIC RED	116141	116142	116143

PUSH BUTTON & CONTROL KNOB PRICES

COLOR	PUSH BUTTON	TUNING KNOB	VOLUME KNOB
IVORY	.05	.30	.18
LITE WALNUT	.05	.28	.18
METALLIC COLORS	.09	.40	.22

PART NUMBER	DESCRIPTION	LIST PRICE	PART NUMBER	DESCRIPTION	LIST PRICE
112745	Clip - coil mounting (osc. & ant.)	.01	113499	Screw - #8 X 1" for chassis mounting	.01
89912	Clip - grounding, for tube base	.02	113537	Screw - for tuning knob (antique bronze)	.18
113558	Clutch Spring - for tuner (on cam shaft)	.04	113538	Screw - for tuning knob (chrome head)	.14
113504	Collar - Coupling (between tuner unit and gang condenser shaft)	.08	112865	Shield - base; for tubes	.03
85321	Connector - for Internal Antenna	.01	88185	Shield Cap - for tubes (plain)	.06
113580	Dial Scale - celluloid strip	.22	112864	Shield - for tubes	.08
113582	Dial Window - celluloid	.12	88181	Shield Tube - (short section)	.08
113557	Key - for push button tuner (left hand)	.24	86427	Socket - octal base (standard)	.15
113572	Key - for push button tuner (right hand)	.24	113543	Socket - dial lamp	.18
113500	Mechanical Tuner Unit - less tenite tips for push buttons	3.80	113559	Spring - for key return	.02
			113560	Tab - station call letters	.28
			116223	Terminal Strip - A - A1	.12

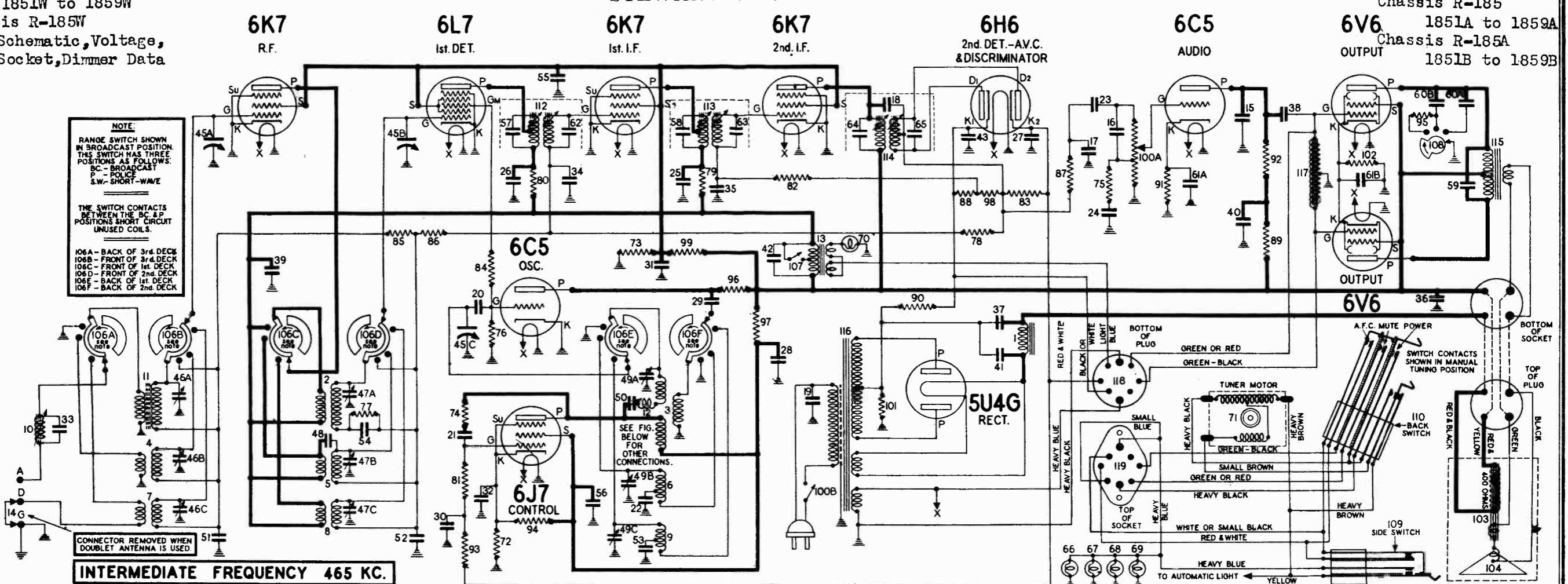
BUILT-IN ANTENNA SYSTEM

The Built-In Antenna incorporated in this receiver will generally give very satisfactory results in localities where powerful broadcast stations exist. This Built-In Antenna will function when terminals A and A₁ on the back of the chassis are connected together. In cases where noises are excessive or greater sensitivity is desired, remove the jumper connecting terminals A and A₁ and connect an external antenna to terminal A. In some locations, due to peculiar power line conditions, hum or noise may be excessive when the Built-In Antenna is used. In such cases reverse the power line plug. If this doesn't correct the condition, remove the connector between A and A₁ on the back of the chassis, and connect an external antenna to A.

MODELS 97-571 to 97-579 97-57 CHASSIS

Chassis R-185B 1851W to 1859W Chassis R-185W Schematic, Voltage, Socket, Dimmer Data STEWART-WARNER CORP. MODELS 1851 to 1859 Chassis R-185 1851A to 1859A Chassis R-185A 1851B to 1859B

R-185 CHASSIS (RECEIVER MODELS 1851 TO 1859)



NOTE: RANGE SWITCH SHOWN IN BROADCAST POSITION. THIS SWITCH HAS THREE POSITIONS AS FOLLOWS: BC - BROADCAST P - POLICE S.W. - SHORT-WAVE THE SWITCH CONTACTS BETWEEN THE BC & P POSITIONS SHORT CIRCUIT UNUSED COILS.

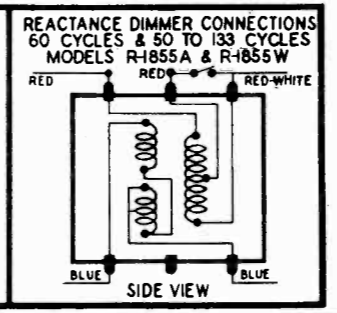
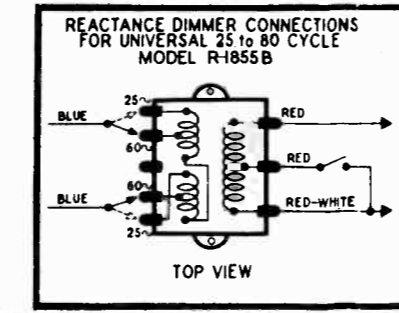
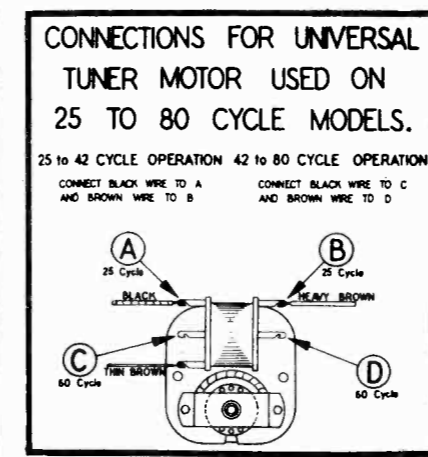
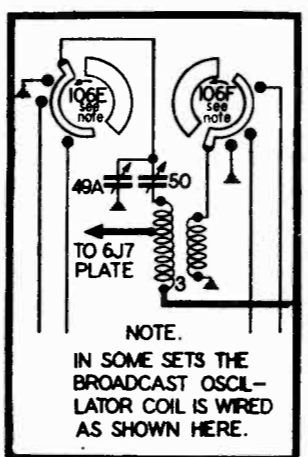
106A - BACK OF 3rd DECK 106B - FRONT OF 3rd DECK 106C - FRONT OF 1st DECK 106D - FRONT OF 2nd DECK 106E - BACK OF 1st DECK 106F - BACK OF 2nd DECK

CONNECTOR REMOVED WHEN DOUBLET ANTENNA IS USED

INTERMEDIATE FREQUENCY 465 KC.

Table with columns: DIAGRAM NUMBER, DESCRIPTION, LIST PRICE. Lists components like coils, capacitors, resistors, and their prices.

Table with columns: DIAGRAM NUMBER, DESCRIPTION, LIST PRICE. Lists components like resistors, capacitors, and their prices.



SOCKET VOLTAGES DECEMBER 1937 DIAL TUNED TO 525 KC. Includes diagrams for bottom view and rear of chassis with voltage measurements for various tubes and components.

IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt. NOTE A: The bias for the control grids of the 6L7 1st Det., 6K7 R.F., 6K7 1st I.F. and 6K7 2nd I.F. tubes, also the voltage on the 6H6 diodes and cathodes and the control grid of the 6J7, is -3.6 volts measured across resistor number 101.

1851W to 1859W Alignment

STEWART WARNER CORP.

MODELS 1851 to 1859

1851A to 1859A

1851B to 1859B

The model R-185 chassis, is a full tube, three band, automatic tuning superheterodyne receiver. It has an intermediate frequency of 465 KC. and a tuning range of 525 KC. to 18,100 KC. The circuit is of the latest design

incorporating such refinements as a special high efficiency R.F. unit, automatic frequency control, reactance dimmer, tuning indicator, and iron core I.F. transformers.

ALIGNMENT EQUIPMENT & PROCEDURE

1. Before attempting to align the receiver check to see that the dial pointer is opposite the last scale division on the low frequency end of the dial when the gang condenser is in full mesh. Also when the gang condenser is in full mesh the stop pin on the left side of the tuner should be resting against the back stop. If after examination it is found that the gang is in full mesh and the stop pin is against the back stop, but the pointer is set to the wrong position, it will only be necessary to loosen the set screw on the dial drive gear at the left side of the mechanism, then grasp the large drum on the same side of the tuner and turn it until the pointer is set correctly. Now retighten the set screw on the gear being careful to see that the gear is meshing properly.

On the other hand if the stop pin does not rest against the back stop with the gang condenser in full mesh, loosen the set screw on the gang condenser side of the flexible coupler. Then turn the tuning knob until the stop pin rests against the back stop on the tuner. Now re-

tighten the set screw in the flexible coupler and proceed to set the pointer to its correct position by the method described in the previous paragraph.

2. Connect the output meter across the two plates of the two 6V6 power output tubes or across the voice coil of the speaker, depending on the type of meter. The more sensitive type should be connected across the voice coil.

3. Connect the ground lead of the signal generator to the chassis and leave it there throughout the entire alignment procedure.

4. Turn the volume control to the maximum volume position.

5. Keep the Ground and Doublet connections on the antenna terminal strip connected together throughout the entire alignment procedure.

Table with columns: TYPE OF DUMMY ANT. IN SERIES WITH SIG. GEN., POINT TO CONNECT OUTPUT OF SIGNAL GENERATOR, SIGNAL GENERATOR FREQUENCY, RANGE SWITCH POSITION, RECEIVER DIAL SETTING, TRIMMER NUMBER (see diag. next page), TRIMMER DESCRIPTION, TYPE OF ADJUSTMENT.

A.F.C. ALIGNMENT

IMPORTANT: The following adjustment must be made after every re-adjustment of the I.F. and broadcast band trimmers.

The A.F.C. Discriminator should be adjusted as follows:

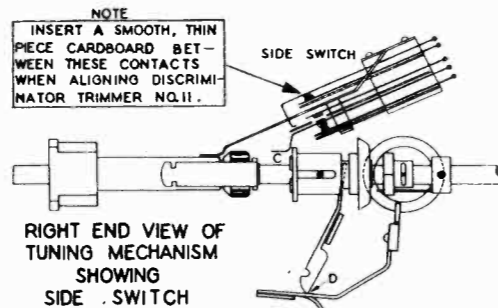
- 1. Be sure no buttons are depressed. Loosely couple the output of the signal generator to the 6L7 control grid by clipping the signal generator output lead to the insulation on the control grid wire, or connect to the grid clip through a 50 mmfd. mica condenser. BE SURE THE RANGE SWITCH IS IN THE BROADCAST (COUNTER-CLOCKWISE) POSITION.
2. Adjust the signal generator to resonance with I.F. system by tuning the signal generator dial for maximum output meter deflection. Be sure that the receiver dial is at some point where it has no tuning effect on the generator signal. Switch off the modulation.
3. With the signal generator connected and operating as in #2, connect antenna and manually tune in powerful local station in region of 1000 KC. or lower. (Avoid stations around 950 KC. which might beat with second harmonic of test oscillator.)
4. Adjust receiver tuning dial to obtain zero beat between the test oscillator and the incoming signal. (A very slight adjustment is all that is required. Be careful not to tune off signal.)
5. Refer to the figure on the right. It is now necessary to open the A.F.C. contacts & allow it to function. This may be done by placing a piece of smooth cardboard between the A.F.C. contacts as shown in any way. Be careful not to bend or malform the switch in any way.
6. Now adjust the secondary of the discriminator transformer (Trimmer #11) to restore zero beat. NOTE: This trimmer should be adjusted to the point where the frequency of the beat note increases rapidly if the trimmer is turned in either direction. Other zero beat points may be found with the Trimmer all the way in or all the way out, but these settings are incorrect.

THE AFC MUST NOW BE ALIGNED.

If this operation has been performed correctly, the opening or closing of the A.F.C. contacts on the side switch by inserting or removing the cardboard, should not change the beat note by more than a slight rumble.

NOTE: Where a second signal generator is available step #3 above may be varied as follows:

Connect second signal generator (set at about 1000 KC.) to antenna and tune in its signal. Switch off modulation and proceed as before. This method is somewhat preferable to the first as the zero beat setting is more easily determined when both signals are unmodulated.



MODELS 1851 to 1859 1851A to 1859A

STEWART-WARNER CORP.

1851B to 1859B 1851W to 1859W

Trimmers, Phono. Data "Magic Keyboard" Data Parts List

DIAL DRIVE & MISCELLANEOUS PARTS.

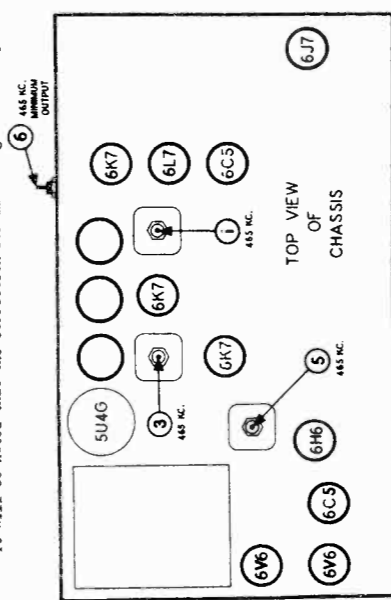
FOR A COMPLETE PARTS LIST SEE THE SPECIAL "MAGIC KEYBOARD" WHEREVER THE WORD RIGHT OR LEFT APPEARS IN THE FOLLOWING LIST, IT IS UNDERSTOOD THAT YOU ARE STANDING IN FRONT OF THE RECEIVER.

Table with columns: PART NUMBER, DESCRIPTION, LIST PRICE. Lists various mechanical and electrical parts like indicators, belts, bushings, clips, cords, etc.

TESTING THE A.F.C. SYSTEM.

A.F.C. system is not as marked at stations near the low frequency end of the dial scale as it is at the higher broadcast frequencies. This is characteristic of A.F.C. systems. However, if opening the A.F.C. contacts on the side switch by inserting the piece of cardboard between the contacts has no effect on the signal, the receiver is mistuning in one direction only, check the receiver as follows:

- 1. Re-align I.F., broadcast band, and discriminator trimmers.
2. Check all the tubes in the receiver. Defective 6H6 and 6J7 tubes, also the R.F., 1st Detector, and I.F. tubes may cause poor A.F.C. action.
3. If the above procedure fails to remedy the defect in A.F.C. action, check the entire A.F.C. circuit itself for possible troubles.



HOW TO SET-UP THE "MAGIC KEYBOARD"

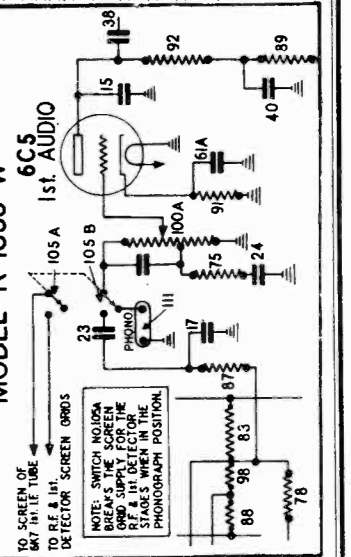
SELECTING THE PROPER STATIONS: When setting up the "Magic Keyboard" selector shaft and push it in until the last button is released. Then pull the knob out again.

LABELLING THE PUSH BUTTONS: Call letter labels are supplied with each set-up button. Remove the cap of the push button by pulling on the letter tab. IN REPLACING THE CAP START AT THE BOTTOM AND PRESS ON THE TOP.

STEP BY STEP PROCEDURE:

- 1. Connect a good outside aerial to the receiver and allow the receiver to operate for 20 minutes before setting-up.
2. Pull off the large tuning knob. As this knob is removed another small "set-up" knob on the same shaft will appear, partly hidden behind the panel face.
3. Pull out this set-up knob AS FAR AS IT WILL GO.
4. Rotate the set-up knob clockwise. After dial pointer reaches the end of the dial scale continue to turn the knob clockwise until you have forced it to a definite stop. This last twist unlocks the cams.
5. Push any button you wish to set to a station. The tuner will operate and carry the pointer to some new point on the dial scale.
6. Tune the receiver to the desired station with the dial set-up knob. TUNE CAREFULLY AND WATCH THE "REACTANCE DIMMER" FOR THE POINT OF MINIMUM ILLUMINATION SO THAT THE RECEIVER WILL BE CORRECTLY TUNED TO THE STATION.
7. Push in the next button you want to set up for a station. This automatically completes the setting up of the previous station, and causes its button to pop out. Do not push in any buttons that are already set up and which you do not wish to change, since pushing a button with the cams unlocked will shift its setting.
8. Tune in the station for the button that is now depressed.
9. Set-up other buttons as desired in the same manner, that is, push in the button, tune in the station, then push in the next button.

PHONOGRAPH CONNECTIONS FOR MODEL R-1855-W



"MAGIC KEYBOARD" PARTS LIST

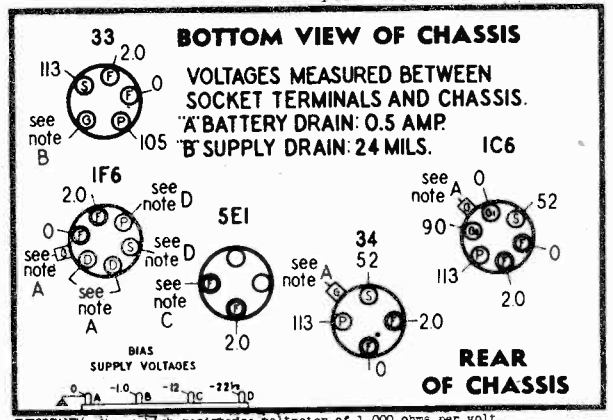
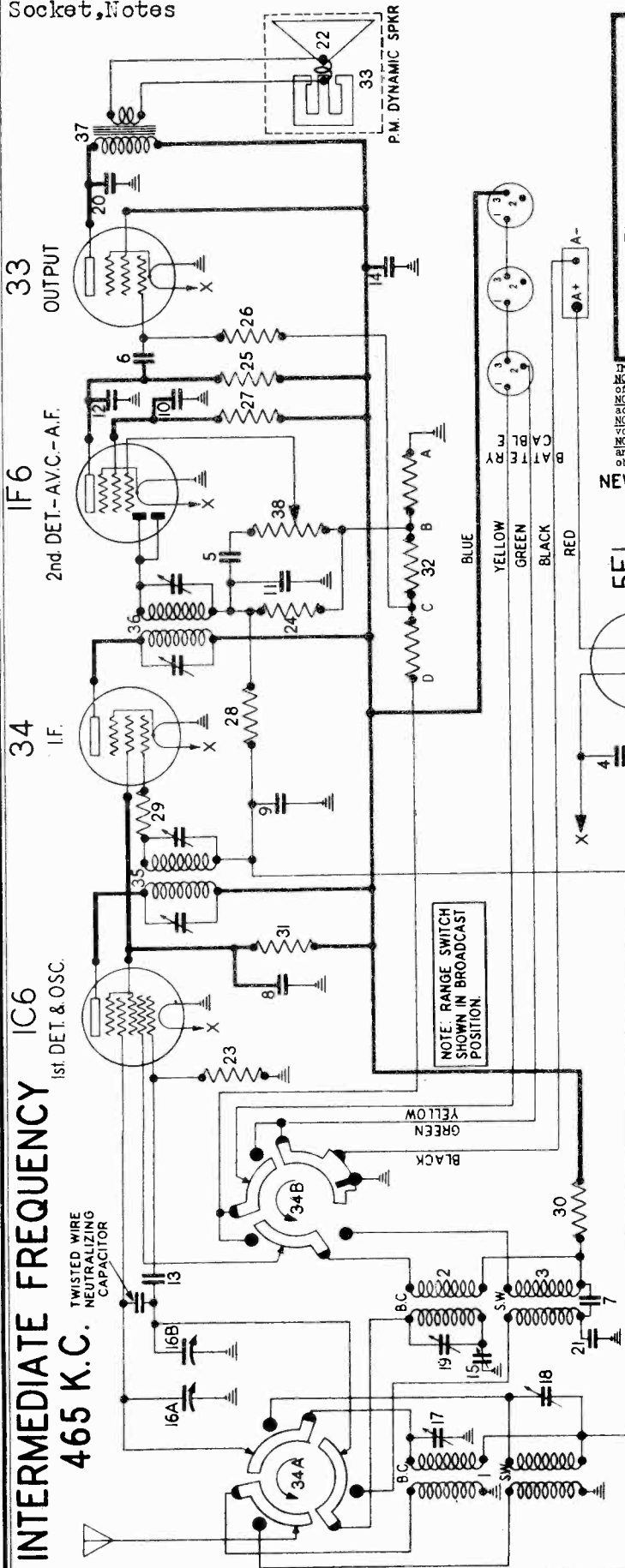
FOR A COMPLETE PARTS LIST SEE THE SPECIAL "MAGIC KEYBOARD"

Table with columns: PART NUMBER, DESCRIPTION, LIST PRICE. Lists various mechanical and electrical parts like mechanisms, buttons, springs, washers, etc.

Schematic, Voltage Socket, Notes

STEWART-WARNER CORP.

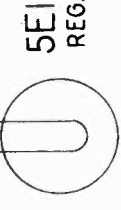
MODELS 1901 to 1909
Chassis R-190D



IMPORTANT: Use a high resistance voltmeter of 1,000 ohms per volt.
NOTE A: The bias for the control grids of the IC6, 34, 1F6 and the diode plates of the 1F6 is -1.0 volt measured across section AB of resistor number 28.
NOTE B: The bias for the control grid of the 33 output tube is -12 volts measured across section AC of resistor number 32.
NOTE C: This voltage will vary between 2 and 3 volts depending upon the terminal voltage of the A battery.
NOTE D: Due to the high resistance in these circuits (1/2 megohm in the plate and 2 megohms in the screen) only a slight deflection of the voltmeter will be obtained unless a vacuum tube voltmeter is used.

NEW BATTERIES DIAL TUNED TO 540 KC.

SOCKET VOLTAGES



OCTOBER 1937

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1	112207	Coil - antenna, broadcast & S.W.	\$.95
2	112208	Coil - oscillator, broadcast	.95
3	112209	Coil - oscillator, S.W.	.95
4	85429	Condenser - paper .5 mfd. 300 volt	.55
5-6-7	85437	Condenser - paper .05 mfd. 200 volt	.30
8-9	85974	Condenser - paper .1 mfd. 200 volt	.25
10	88030	Condenser - paper .01 mfd. 200 volt	.25
11	81155	Condenser - mica 500 mfd.	.25
12	81157	Condenser - mica 250 mfd.	.30
13	86173	Condenser - mica 50 mfd.	.20
14	89982	Condenser - paper .2 mfd. 200 volt	.23
15	112048	Condenser - padding (300-600 mfd.)	.60
16A-16B	112212	Condenser - variable range	4.00
17-18-19	112213	Condenser - trimmer (3-45 mfd.)	.25
20	112214	Condenser - paper .003 mfd. 400 volt	.50
21	112215	Condenser - mica .0045 mfd.	.25
22	112221	Cone - voice coil assembly for 6" spkr.	1.90
	112222	Cone - voice coil assembly for 8" spkr.	2.05
23	86022	Resistor - carbon 50,000 ohms 1 watt	.18
24-25-26	67262	Resistor - carbon 1/2 meg. 1/4 watt	\$.12
27	67302	Resistor - carbon 2 meg. 1/2 watt	.25
28	67939	Resistor - carbon 1 meg. 1/2 watt	.25
29	81727	Resistor - carbon 1,000 ohms 1/4 w.	.20
30	83285	Resistor - carbon 10,000 ohms 1/2 w.	.25
31	112051	Resistor - carbon 15,000 ohms 1/3 w.	.15
32	112216	Resistor - wire wound (Sect. AB - 130 ohms) (Sect. BC - 1540 ohms) (Sect. CD - 1330 ohms)	.75
33	112217	Speaker - P.M. Dynamic, 6 inch (1901) 7.50	
	112218	Speaker - P.M. Dynamic, 8 inch (1905) 9.00	
34A-34B	112219	Transformer - 1st I.F.	1.35
35	112210	Transformer - 2nd I.F.	2.00
36	112211	Transformer - output (for 6" spkr.)	1.80
37	112569	Transformer - output (for 8" spkr.)	2.00
38	112220	Volume control - 1/2 meg.	.95

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

R-190-D CHASSIS

The Model R-190-D chassis is a five tube battery receiver using "A" and "B" batteries. The standard superheterodyne circuit which this receiver employs includes automatic volume control and a class A single pentode output system. The tuning range covers the standard broadcast range from 540 to 1720 KC. and the popular short wave bands from 5.7 to 18.5 MC. Automatic volume control is accomplished by supplying the filtered A.V.C. voltage to the control grids of both the 16B and 34 tubes.

An unusual arrangement of a combined on-off switch and range switch is also utilized in the circuit of this receiver. The action of this switch is as follows: 1. In the extreme counter-clockwise position the receiver is turned off with both the "A" and "B" supply circuits open. 2. With the switch in the middle position the "A" and "B" supplies are connected and the antenna and oscillator coils for the broadcast band are now in circuit to permit tuning on that band. 3. In the extreme clockwise position, the receiver will tune in the short wave band.

MODELS 1901 to 1909

Chassis R-190D

STEWART-WARNER CORP.

Alignment, Trimmers

Battery Connections

POWER SUPPLY & BATTERY CONNECTIONS

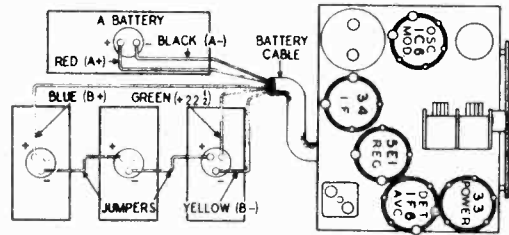
The power supply of this receiver consists of three "B" batteries and one "A" battery. No "C" battery is needed as the first 22-1/2 volts of the "B" battery supply serves as a "C" battery. Proper intermediate bias voltages are secured from the tapped candohm resistor number 32

The +22-1/2 volt tap on the "B" battery is the negative connection for the plate supply and it is connected to "A-" and ground. This allows a maximum plate supply voltage of 113-1/2 volts with fresh batteries.

The "A" supply may be a 2-1/2 volt Air Cell, a 3 volt dry battery, or a 2 volt storage battery since the filaments of all tubes in the receiver are supplied through a type 5E1 voltage regulator tube. The purpose of this tube is to maintain a safe filament voltage with battery voltages ranging from 2 to 3 volts. The voltage drop across the tube will decrease as the battery voltage decreases thus maintaining nearly a constant filament potential.

If a 2 volt storage cell is to be used and the tubes in the receiver are not new it is desirable to remove the 5E1 voltage regulator tube and replace it by a plug which merely shorts out the two large terminals of the 5E1 tube socket. This plug may be made up by removing the base of an old 4 prong tube and connecting the two large pins together with a piece of wire. **BE CAREFUL NOT TO CONNECT ANYTHING TO EITHER OF THE SMALL PINS OR THE OTHER TUBES MAY BE BURNED OUT.**

In order to simplify connections to the batteries, plugs are provided and the method of connection to the batteries is shown in the diagram on the right.



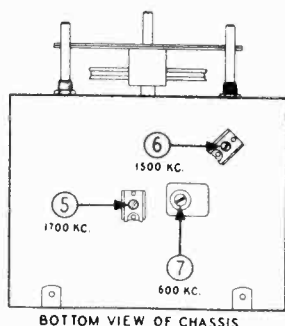
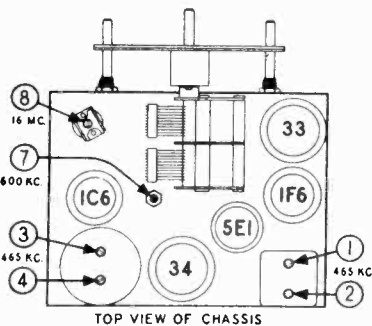
ALIGNMENT EQUIPMENT & PROCEDURE

For proper alignment, an output meter and an accurately calibrated signal generator with a tuning range from 465 KC. to 16 MC. are required.

- ① - Connect the output meter across the voice coil or between the plate of the 33 tube and ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
- ② - Connect the ground lead of the signal generator to the chassis of the receiver.
- ③ - Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
- ④ - With the gang condenser in full mesh set the pointer on the horizontal black line below 540 KC. on the dial.
- ⑤ - Using a bakelite screw driver proceed to align in exactly the same order as shown in the table below.

ORDER OF ALIGN.	DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RANGE SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
A	.1 MFD. CONDENSER	CONTROL GRID OF 34 TUBE (Do not remove grid clip)	465 KC.	BROADCAST (Center Position)	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1 2	2ND. I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
B	DITTO	CONTROL GRID OF 1C6 TUBE (Do not remove grid clip)	DITTO	DITTO	DITTO	3 4	1ST. I.F.	ADJUST TRIMMERS 3 & 4 FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT OF TRIMMERS NO. 1 & 2. SEE NOTE A BELOW.
C	400 OHM CARBON RESISTOR	ANTENNA LEAD	1700 KC.	DITTO	1700 KC.	5	BROADCAST OSCILLATOR (Shunt)	ADJUST TRIMMER TO BRING IN SIGNAL.
D	DITTO	DITTO	1500 KC.	DITTO	TUNE TO 1500 KC. GENERATOR SIGNAL	6	BROADCAST ANTENNA	ADJUST FOR MAXIMUM OUTPUT.
E	DITTO	DITTO	600 KC.	DITTO	TUNE TO 600 KC. GENERATOR SIGNAL	7	BROADCAST OSCILLATOR (Series Pad)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
F	DITTO	DITTO	16 MC.	SHORT-WAVE (Clockwise)	TUNE TO 16 MC. GENERATOR SIGNAL	8	SHORT-WAVE ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.

NOTE A: Now repeat adjustment of trimmers 3 and 4 again for greater sensitivity. This may cause oscillation. If oscillation occurs repeat steps A and B and disregard the adjustment mentioned in this note, i.e., after adjusting 1 and 2, do not repeat adjustment of 3 and 4. **Important:** Please note that in repeating step A, the signal generator must be connected to the 34 control grid. In step B, the connection is to the 1C6 grid.



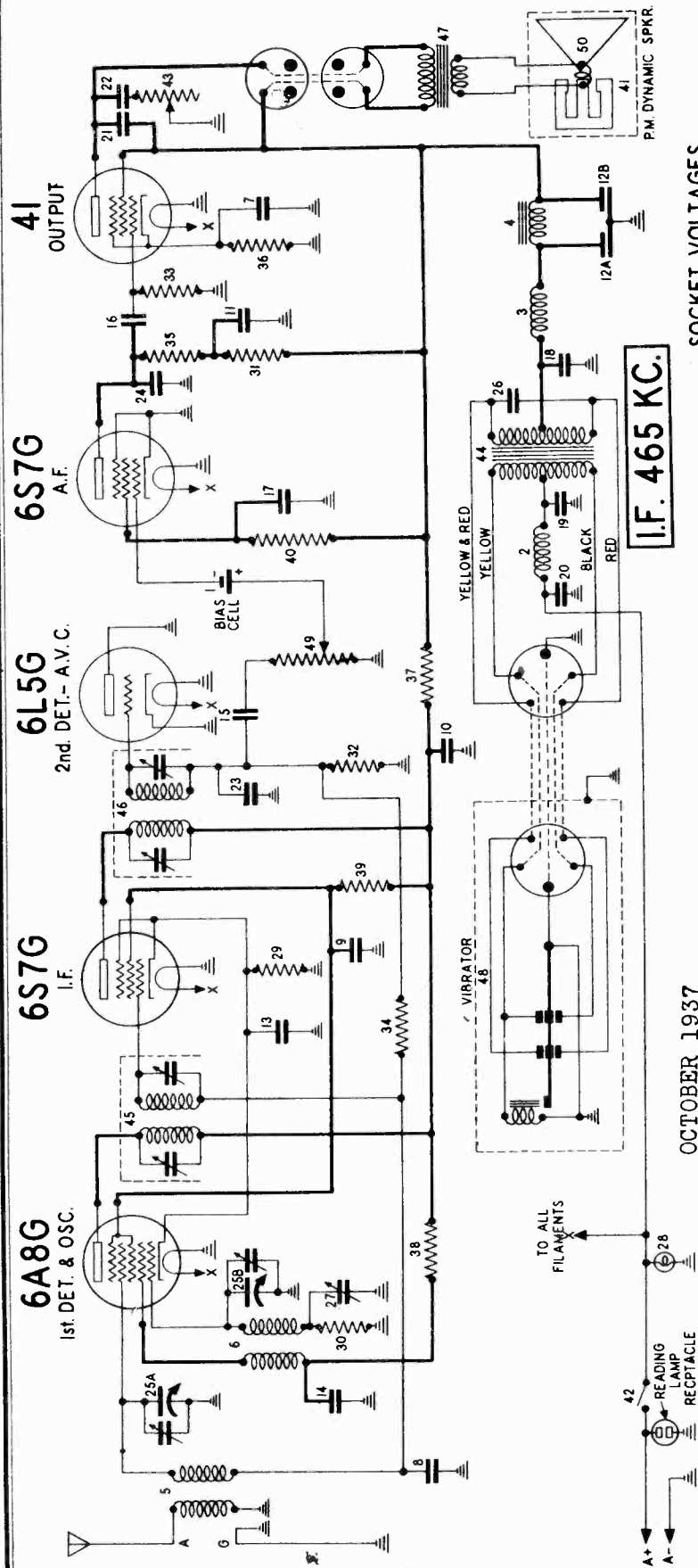
DIAL DRIVE & MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
112206	Cable - battery (with plugs)	\$.90
112224	Dial - complete assembly	2.70
112067	Escutcheon - with window	1.75
112226	Knob - tuning	.25
112227	Knob - volume and range switch	.25
112228	Plug - "B" battery (3 prong)	.15
112229	Plug - "A" battery (2 prong)	.12
112230	Pointer - dial	.35
112225	Scale - dial	1.00

Schematic, Voltage Socket

STEWART-WARNER CORP.

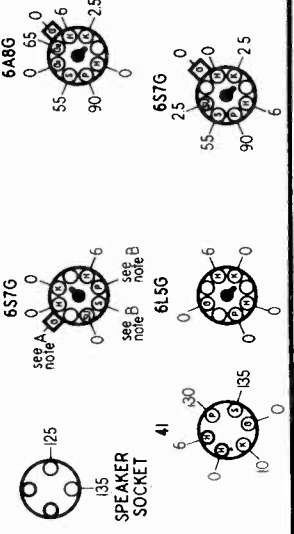
MODELS 1911 to 1919 Chassis R-191D



I.F. 465 KC.

SOCKET VOLTAGES SET TUNED TO 530 KC.

BATTERY VOLTAGE 60
 VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS
 BATTERY DRAIN-27 AMPERES B SUPPLY DRAIN-21 MILLIAMPERES



REAR OF CHASSIS

IMPORTANT: Use a high resistance voltmeter of 1,000 ohms per volt.
 NOTE A: The bias for the control grid of the 6S7-G A.F. tube is 1.0 volt supplied by the bias cell. Due to the high resistance of the cell, the voltmeter will only indicate a fraction of a volt.
 NOTE B: Because of the high resistance in the plate and screen circuits of the 6S7-G A.F. tube, only a slight deflection of the voltmeter will be obtained unless a vacuum tube voltmeter is used.

MODELS 1911 to 1919 R-191-D CHASSIS

OCTOBER 1937

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE	DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1	89849	Cell - bias (1.25 volt)	.22	28	84056	Lamp - pilot 6.3 volt .2 amp.	.15
2	12041	Choke - R.F. ('A' supply)	.60	29	8782	Resistor - carbon 50,000 ohm 1/4 watt	.25
3	12042	Choke - R.F. ('B' supply)	.80	30	8780	Resistor - carbon 100,000 ohm 1/4 watt	.15
4	12043	Choke - filter	1.40	31	8782	Resistor - carbon 1/2 megohm 1/4 watt	.12
5	12044	Coil - antenna	1.00	32	8782	Resistor - carbon 1/2 megohm 1/4 watt	.25
6	12045	Coil - oscillator	1.00	33	8782	Resistor - carbon 1/2 megohm 1/4 watt	.25
7	89053	Condenser - electrolytic 10 mfd. 25 volt	.92	34	8781	Resistor - carbon 400,000 ohm 1/4 watt	.15
8-9	83974	Condenser - paper .1 mfd. 200 volt	.25	35	112049	Resistor - carbon 750 ohm 1/3 watt	.15
10-11	83974	Condenser - paper .1 mfd. 200 volt	.25	36	112050	Resistor - carbon 1,500 ohm 1/3 watt	.15
12A-12B	110604	Condenser - electrolytic (Sect. A)	1.60	37	112051	Resistor - carbon 5,000 ohm 1/2 watt	.15
13	8982	Condenser - paper .05 mfd. 200 volt	.23	38	112052	Resistor - carbon 15,000 ohm 1/3 watt	.15
14-15-16	83437	Condenser - paper .05 mfd. 200 volt	.30	39	112053	Resistor - carbon 4 megohm 1/3 watt	8.50
17	86070	Condenser - paper .03 mfd. 400 volt	.25	40	112054	Speaker - P.M. dynamic (6 inch) R-191-D	9.50
18	82900	Condenser - mica .004 mfd.	.50	41	112055	Switch - on-off (S.P.S.T.)	.75
19-20	82900	Condenser - mica .004 mfd.	.50	42	112056	Volume control - 50,000 ohms	1.05
21	84336	Condenser - paper .5 mfd. 300 volt	.55	43	112057	Transformer - power	3.50
22	84336	Condenser - paper .002 mfd. 600 volt	.25	44	112058	Transformer - 1st I.F.	2.00
23	81157	Condenser - mica 250 mfd.	4.00	45	112059	Transformer - 2nd I.F.	2.00
24	81157	Condenser - mica 100 mfd.	2.25	46	112060	Transformer - output for 6 inch spkr.	1.70
25A-25B	112046	Condenser - variable gang	4.00	47	112060	Transformer - output for 8 inch spkr.	2.00
26	112047	Condenser - buffer .03 mfd. 800 volt	4.25	48	111122	Vibrator - synchronous	4.50
27	112048	Condenser - padding (300-600 mmf.)	.60	49	111122	Volume control - 1/2 megohm	.90
				50	112221	Cone - voice coil assem. for 6" spkr.	1.90
					112222	Cone - voice coil assem. for 8" spkr.	2.05

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

MODELS 1911 to 1919
Chassis R-191D

STEWART-WARNER CORP.

Alignment, Trimmers
Circuit Data

CIRCUIT DESCRIPTION

The model R-191-D chassis is a six volt battery powered superheterodyne receiver. It has an intermediate frequency of 465 KC. and the tuning range is from 540 to 1720 KC.

The incoming signal picked up by the antenna is induced in the tuned secondary of the antenna coil and impressed on the control grid of the 6A8G first detector and oscillator tube. The oscillator circuit is tuned to a frequency 465 KC. higher than that of the incoming signal, and the resultant 465 KC. output is amplified in the I.F. stage, using a 6S7G tube. The amplified I.F. voltage is impressed on the grid of the 6L5G second detector tube. The plate of the 6L5G tube is grounded and the grid acts as the plate of a linear diode detector and A.V.C. source. The direct current voltage developed across the 1/2 megohm diode load resistor is used as A.V.C. voltage and applied to the control grids of the 6A8G and 6S7G (I.F.) tubes through a resistance capacity filter system. Self bias is obtained across the cathode resistor 25 to maintain bias at all times.

The potentiometer type volume control 49 serves as a continuously variable voltage divider of the audio voltage developed. Any portion of the audio voltage can be applied to the control grid of the 6S7G A.F. tube. It should be noted that the bias for the 6S7G A.F. tube is obtained from a bias cell. The 6S7G A.F. tube is resistance coupled to the 4I power output tube. Grid bias for the output tube is obtained across the cathode resistor 36.

The continuously variable resistor type tone control regulates the high note content of the audio output.

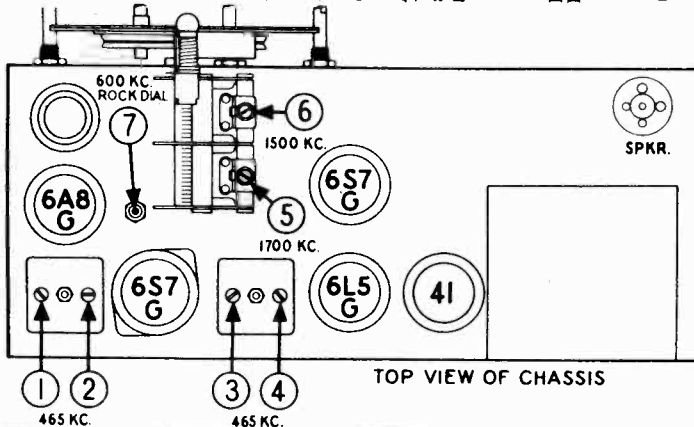
All tube heaters are connected directly to the six volt supply circuit. "B" voltage is supplied by a synchronous full wave vibrator (48). The complete "B" supply, consisting of vibrator, power transformer, chokes and condensers, is housed in a metal shield to eliminate interference. R.F. filter chokes in the power supply input and output circuit prevent interference from getting into the "A" and "B" leads.

ALIGNMENT EQUIPMENT & PROCEDURE

For proper alignment, an output meter and an accurately calibrated signal generator with a tuning range from 465 KC. to 1800 KC. are required.

- ① Connect the output meter between the plate of the 4I tube and ground, or across the voice coil, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
- ② Connect the ground lead of the signal generator to the chassis of the receiver.
- ③ Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure. Turn tone control to brilliant position.
- ④ With the gang condenser in full mesh set the pointer on the black horizontal line below 550 KC. on the dial.
- ⑤ Proceed to align in exactly the same order as shown in the table below.

ORDER OF ALIGN.	DUMMY AMPL. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
A	.1 MFD. CONDENSER	CONTROL GRID OF 6A8G TUBE	465 KC.	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1 2	1ST I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
B	.1 MFD. CONDENSER	CONTROL GRID OF 6A8G TUBE	465 KC.	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	3 4	2ND I.F.	ADJUST TRIMMERS 3 & 4 FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT OF TRIMMERS NO. 1 & 2.
C	250 MUF. CONDENSER	ANTENNA LEAD	1700 KC.	1700 KC.	5	OSCILLATOR (Shunt)	ADJUST TRIMMER TO BRING IN SIGNAL.
D	250 MUF. CONDENSER	ANTENNA LEAD	1500 KC.	TUNE TO 1500 KC. GENERATOR SIGNAL	6	ANTENNA	ADJUST FOR MAXIMUM OUTPUT.
E	250 MUF. CONDENSER	ANTENNA LEAD	600 KC.	TUNE TO 600 KC. GENERATOR SIGNAL	7	OSCILLATOR (Series Pad)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.



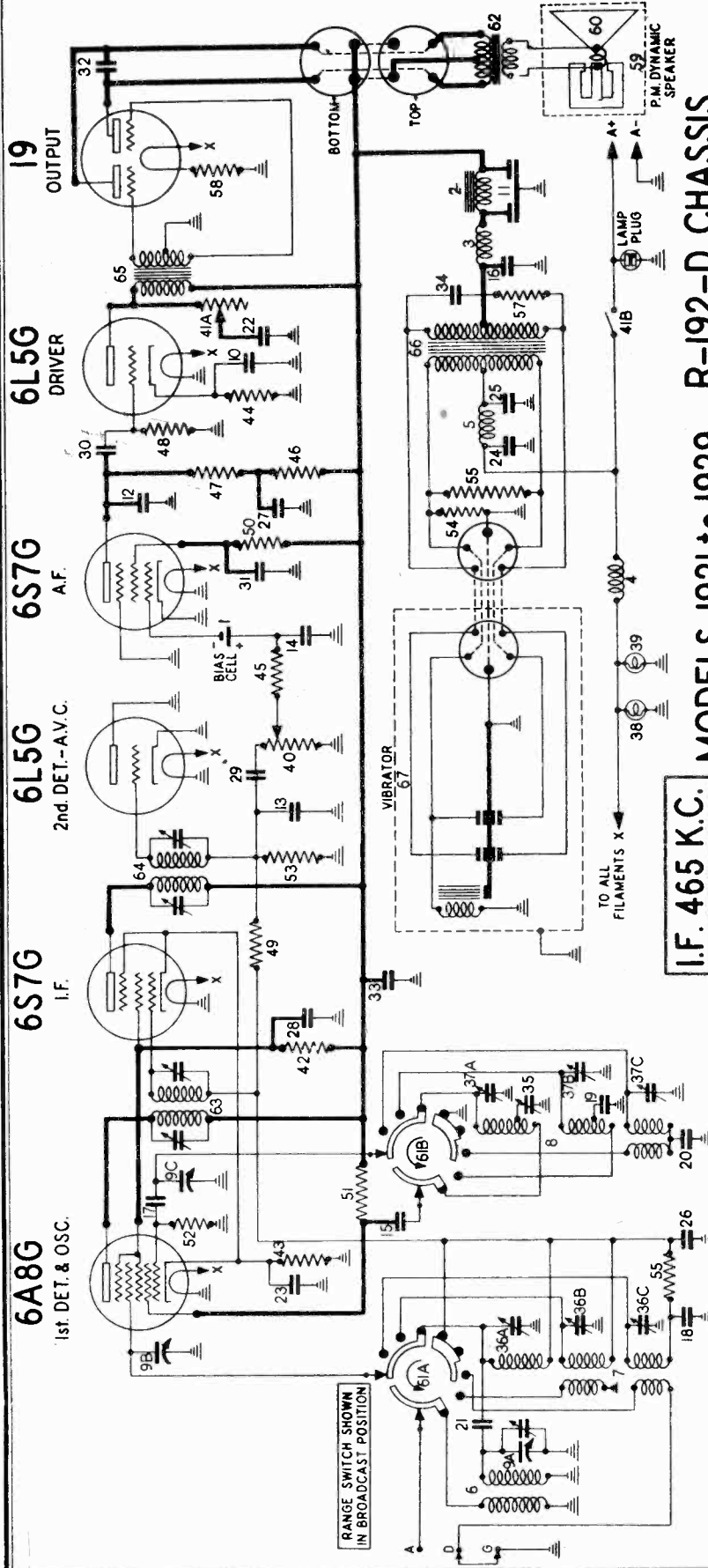
DIAL DRIVE & MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
112064	Cable - battery	\$1.40
112065	Dial - complete assembly	2.50
112067	Escutcheon - with window	1.75
112068	Knob - all controls	.25
110782	Cord - for dial drive (2 ft.)	.10
112066	Scale - dial (riveted to support)	.80
111357	Spring - drive cord tension	.03
112069	Shield - for vibrator and "B" supply	1.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

STEWART-WARNER CORP.

Schematic, Voltage Socket



I.F. 465 K.C.
MODELS 1921 to 1929
R-192-D CHASSIS
SOCKET VOLTAGES

DIAGRAM NUMBER PART NUMBER DESCRIPTION LIST PRICE

1	89849	Cell - Bias (1.25 volt)	\$.22
2	112043	Choke - filter	1.40
3	112042	Choke - R.F. ("A" supply)	.50
4-5	112041	Choke - R.F. ("B" supply)	.50
6	112239	Coil - antenna (Broadcast)	1.50
7	112240	Coil - antenna (Police and Short Wave)	1.25
8	112241	Coil - oscillator	1.25
9A-9B-9C	112242	Condenser - gang	1.25
10	112247	Condenser - electrolytic 10 mfd. 25 volt.	1.70
11	112248	Condenser - mica 250 mfd. 150 volts.	5.50
12-13	81157	Condenser - mica 100 mfd.	.25
14	81158	Condenser - mica 100 mfd.	.25
15-16	84200	Condenser - mica .004 mfd.	.25
17	86175	Condenser - mica .004 mfd.	.25
18	112215	Condenser - mica 50 mfd.	.20
19	112245	Condenser - mica 4500 mfd.	.35
20	112246	Condenser - mica 1500 mfd.	.35
21	112247	Condenser - mica 2700 mfd.	.35
22	112248	Condenser - mica 4000 mfd.	.35
23	112249	Condenser - mica 800 mfd. 500 volt.	.40
24-25	83429	Condenser - paper .5 mfd. 200 volt.	.25
26-27-28	83974	Condenser - paper .5 mfd. 200 volt.	.25
29-30-31	86030	Condenser - paper .01 mfd. 400 volt.	.25
32	83011	Condenser - paper .01 mfd. 400 volt.	.25
33	89852	Condenser - paper .03 mfd. 500 volt.	.25
34	112047	Condenser - buffer (.03 mfd. 500 volt.)	.25
35	112048	Condenser - buffer (200-500 mfd.)	.70
36A to C	112243	Condenser - trimmer (3 section)	1.70
37	83276	Lamp - dial 6.3 volt.	1.05
38-39	112255	Resistor - volume control 1/2 megohm.	1.05

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

DESCRIPTION PART NUMBER LIST PRICE

Resistor - tone control 50,000 ohms	112253	\$.20
Resistor - "on-off" switch (with carbon 31,000 ohms 1/2 watt)	84241	.20
Resistor - carbon 300 ohms 1/4 watt	83233	.25
Resistor - carbon 2500 ohms 1/2 watt	84236	.12
Resistor - carbon 50,000 ohms 1/4 watt	89859	.12
Resistor - carbon 180,000 ohms 1/2 watt	81181	.20
Resistor - carbon 1/2 meg. 1/4 watt	67263	.12
Resistor - carbon 1 meg. 1/2 watt	67839	.25
Resistor - carbon 4 megohm 1/3 watt	112052	.15
Resistor - carbon 10,000 ohms 1 watt	81152	.20
Resistor - carbon 50,000 ohms 1 watt	86022	.25
Resistor - carbon 500,000 ohms 1/2 watt	81509	.35
Resistor - wire wound 100 ohms 1/2 watt	84129	.20
Resistor - carbon 1 megohm 1/2 watt	84868	.15
Resistor - carbon 3,000 ohms 1 watt	112550	.20
Resistor - wire wound 15.4 ohms 1 watt	112248	.25
Speaker - dynamic 6 inch-Model 1921-D	112250	7.50
Speaker - dynamic 8 inch-Model 1925-D	112253	8.50
Cone - voice coil (8" speaker)	112254	1.90
Cone - voice coil (6" speaker)	112254	2.05
Switch - range	112254	1.70
Transformer - output (6" speaker)	112252	1.70
Transformer - output (8" speaker)	112252	2.00
Transformer - push-pull	112056	2.00
Transformer - 2nd I.F.	112059	2.00
Transformer - push-pull input	112254	2.00
Transformer - power	112057	3.50
Transformer - synchronous	11112	4.50
Vibrator	67	1.50

IMPORTANT: Use a high resistance voltmeter of 1,000 ohms per volt.

NOTE A: The bias for the control grid of the 6S7G A.F. tube is -1.0 volt supplied by the bias cell. Due to the high resistance of the cell, the voltmeter will indicate only a fraction of a volt.

NOTE B: Because of the high resistance of the plate and screen circuits of the 6S7G A.F. tube only a slight deflection of the voltmeter will be obtained.

MODELS 1921 to 1929

Chassis R-192D

Alignment, Trimmers

STEWART-WARNER CORP.

MODEL R-192-D CHASSIS (RECEIVER MODELS 1921 to 1929)

The model R-192-D is a six volt battery powered superheterodyne receiver. The circuit employed includes automatic volume control and a push pull class B output system.

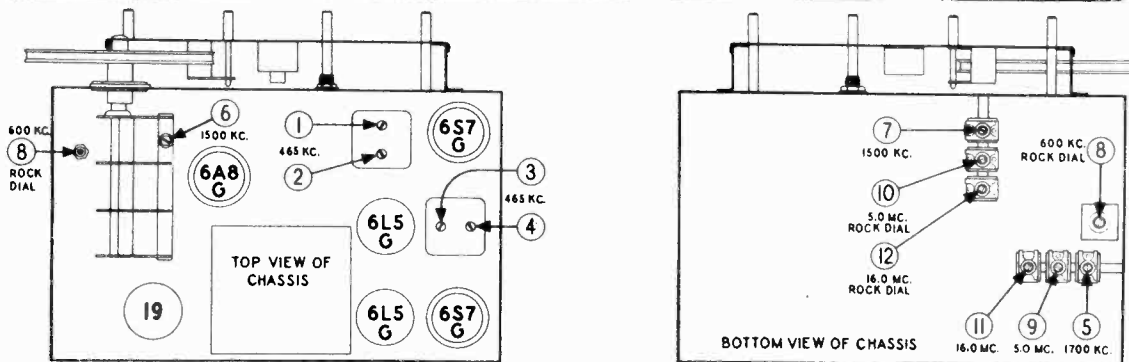
The 6L5 second detector is connected as a diode, the plate being grounded and the control grid acting as a diode plate. "B" voltage is supplied by a synchronous full-wave vibrator.

ALIGNMENT EQUIPMENT & PROCEDURE

For proper alignment, an output meter and an accurately calibrated signal generator with a tuning range from 465 KC. to 18 MC. are required.

- ① Connect the output meter across the plates of the 19 tube, or across the voice coil, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
- ② Connect the ground lead of the signal generator to the chassis of the receiver and keep it connected in this manner throughout the entire alignment procedure.
- ③ Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure. Turn tone control to brilliant position.
- ④ With the gang condenser in full mesh set the pointer on the black horizontal line below 550 KC. on the dial.
- ⑤ Proceed to align in exactly the same order as shown in the table below.

ORDER OF ALIGN.	DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RANGE SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
A	.1 MFD. CONDENSER	CONTROL GRID OF 6A8 TUBE	465 KC.	BROADCAST Clockwise	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1 2	1ST I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
B	.1 MFD. CONDENSER	CONTROL GRID OF 6A8 TUBE	465 KC.	BROADCAST Clockwise	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	3 4	2ND. I.F.	ADJUST TRIMMERS 3 & 4 FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT OF TRIMMERS NO. 1 & 2.
C	400 OHM CARBON RESISTOR	ANTENNA TERMINAL	1700 KC.	BROADCAST Clockwise	1700 KC.	5	BROADCAST OSCILLATOR (Shunt)	ADJUST TRIMMER TO BRING IN SIGNAL.
D	400 OHM CARBON RESISTOR	ANTENNA TERMINAL	1500 KC.	BROADCAST Clockwise	TUNE TO 1500 KC. GEN. SIG.	6	BROADCAST ANTENNA	ADJUST FOR MAXIMUM OUTPUT.
E	400 OHM CARBON RESISTOR	ANTENNA TERMINAL	1500 KC.	BROADCAST Clockwise	TUNE TO 1500 KC. GEN. SIG.	7	BROADCAST 1ST DET.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT OF TRIMMER 5.
F	400 OHM CARBON RESISTOR	ANTENNA TERMINAL	600 KC.	BROADCAST Clockwise	TUNE TO 600 KC. GENERATOR SIGNAL	8	BROADCAST OSCILLATOR Series Pad	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
G	400 OHM CARBON RESISTOR	ANTENNA TERMINAL	5.0 MC.	POLICE (Center)	5.0 MC.	9	POLICE OSCILLATOR	ADJUST TO BRING IN SIGNAL. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 4.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 5.0 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
H	400 OHM CARBON RESISTOR	ANTENNA TERMINAL	5.0 MC.	POLICE (Center)	TUNE TO 5.0 MC. GENERATOR SIGNAL	10	POLICE ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
I	400 OHM CARBON RESISTOR	ANTENNA TERMINAL	16.0 MC.	SHORT-WAVE Counter-clockwise	16.0 MC.	11	SHORT-WAVE OSCILLATOR	ADJUST TO BRING IN SIGNAL. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 15.1 KC. IF IMAGE DOES NOT APPEAR REALIGN AT 16 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
J	400 OHM CARBON RESISTOR	ANTENNA TERMINAL	16.0 MC.	SHORT-WAVE Counter-clockwise	TUNE TO 16 MC. GENERATOR SIGNAL	12	SHORT-WAVE ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.



DIAL DRIVE & MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE	PART NUMBER	DESCRIPTION	LIST PRICE
112651	Arm - for band indicator drive	.25	112258	Scale - dial	1.50
112074	Cable - battery	1.40	112654	Shaft - for pointer	.10
110782	Cord - for band indicator (2 ft.)	.10	112655	Shaft - dial drive	.10
112257	Dial - complete mechanism	7.50	112069	Shield - for vibrator & "B" supply	1.50
112259	Escutcheon - with celluloid	2.80	89283	Socket - dial lamp	.10
112226	Knob - all controls	.25	111357	Spring - drive cord tension	.03
112652	Link - for band indicator	.06	112256	Terminal strip - G.D.A.	.35
89170	Plug - for extension lamp	.15	112657	Pulley - for pointer drive (on pointer shaft)	.20
112260	Pointer - for dial	.30	112656	Drum - & flexible coupler	1.20
112653	Retaining ring - for drive shaft	.05			

Schematic, Voltage Socket

STEWART-WARNER CORP.

MODELS 3041 to 3049 Chassis R-304, R-304A

SOCKET VOLTAGES

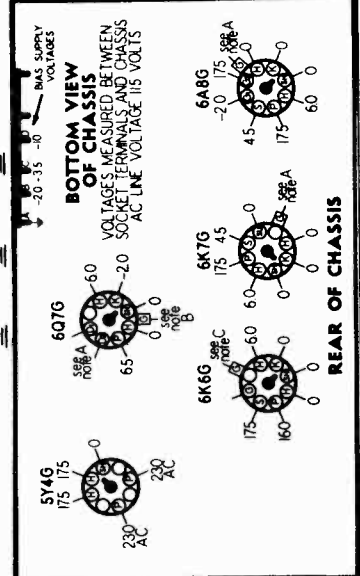
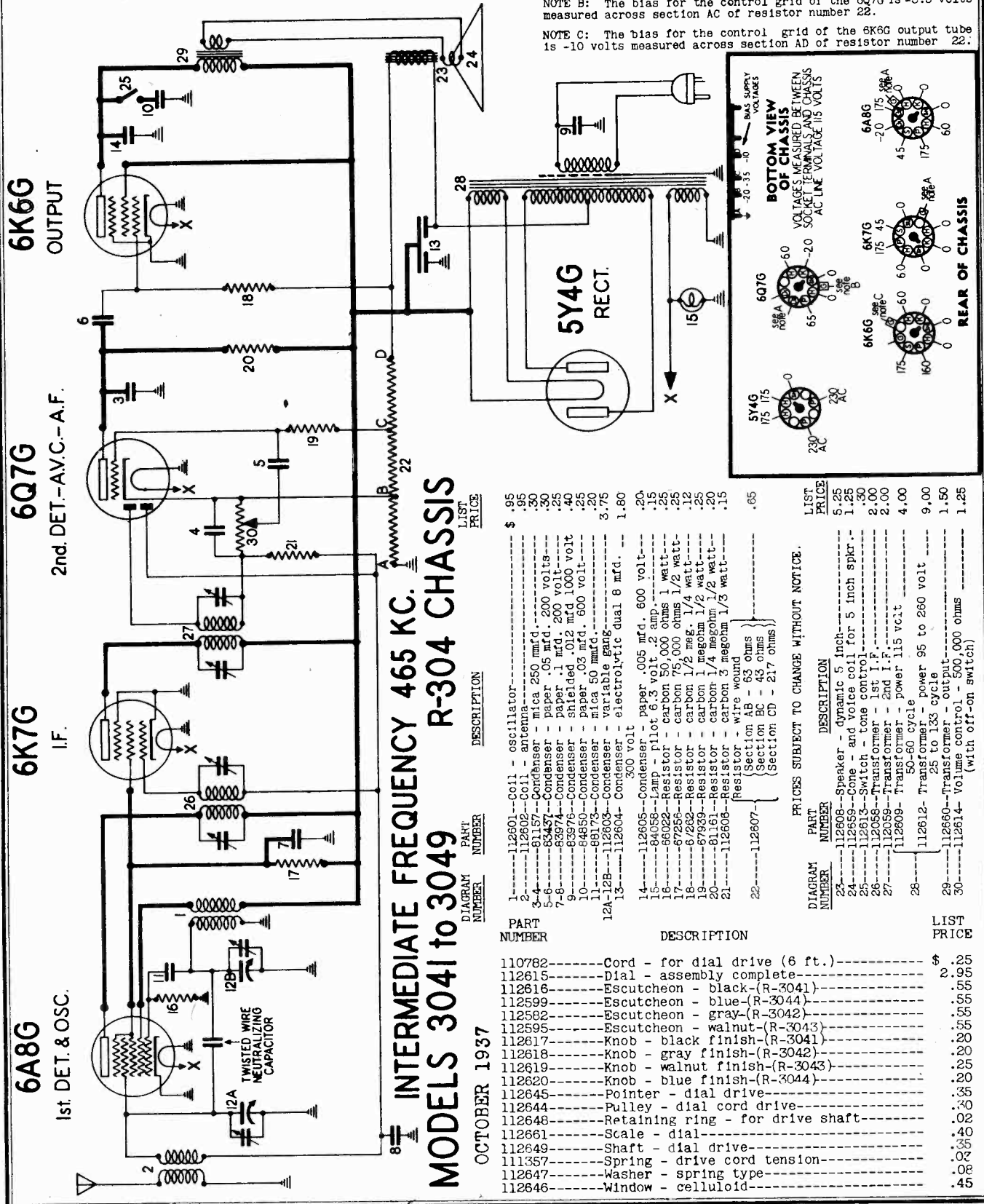
The model R-304 chassis is a five tube superheterodyne receiver. It has an intermediate frequency of 465 KC. and a tuning range from 540 to 1720 KC.

VOLUME CONTROL ON FULL DIAL TUNED TO 540 KC. IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt.

NOTE A: The bias for the control grids of the 6A8G, 6K7G and the diode plates of the 6Q7G is -2.0 volts measured across section AF of resistor number 22.

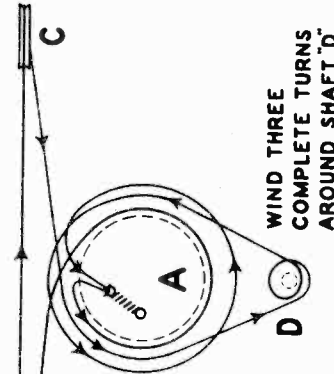
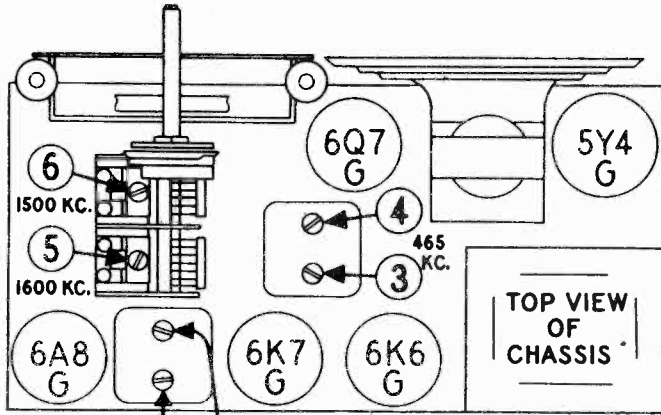
NOTE B: The bias for the control grid of the 6Q7G is -3.5 volts measured across section AC of resistor number 22.

NOTE C: The bias for the control grid of the 6K6G output tube is -10 volts measured across section AD of resistor number 22.



INTERMEDIATE FREQUENCY 465 KC. MODELS 3041 to 3049 R-304 CHASSIS

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1	112601	Coil - oscillator	.95
2	112602	Coil - antenna	.95
3	61157	Condenser - mica 250 mfd.	.30
4	83437	Condenser - paper .05 mfd. 200 volts	.25
5	83974	Condenser - paper 1 mfd. 200 volt	.30
6	83978	Condenser - shielded .012 mfd 1000 volt	.40
7	84850	Condenser - paper .03 mfd. 600 volt	.25
8	88173	Condenser - mica 50 mfd.	.20
9	112603	Condenser - variable gang	3.75
10	112604	Condenser - electrolytic dual 8 mfd. 300 volt	1.80
11	112605	Condenser - paper .005 mfd., 600 volt	.20
12	84058	Lamp - pilot 6.3 volt .2 amp.	.15
13	66022	Resistor - carbon 50,000 ohms 1 watt	.25
14	67256	Resistor - carbon 75,000 ohms 1/2 watt	.25
15	67257	Resistor - carbon 100,000 ohms 1/2 watt	.25
16	67258	Resistor - carbon 150,000 ohms 1/2 watt	.25
17	67259	Resistor - carbon 200,000 ohms 1/2 watt	.25
18	67260	Resistor - carbon 300,000 ohms 1/2 watt	.25
19	67261	Resistor - carbon 400,000 ohms 1/2 watt	.25
20	67262	Resistor - carbon 500,000 ohms 1/2 watt	.25
21	67263	Resistor - carbon 600,000 ohms 1/2 watt	.25
22	112607	Resistor - wire wound (Section AB - 53 ohms) (Section BC - 43 ohms) (Section CD - 217 ohms)	.85
23	112608	Speaker - dynamic 5 inch	5.25
24	112609	Cone and voice coil for 5 inch spkr.	1.25
25	112610	Switch - tone control	.30
26	112611	Transformer - 1st I.F.	2.00
27	112612	Transformer - 2nd I.F.	2.00
28	112613	Transformer - power 115 vclt 50-60 cycle power 95 to 280 volt 25 to 153 cycle	4.00
29	112614	Transformer - output	9.00
30	112615	Volume control - 500,000 ohms (with off-on switch)	1.50
			1.25



ALIGNMENT EQUIPMENT & PROCEDURE

For proper alignment, an output meter and an accurately calibrated signal generator with a tuning range from 465 KC. to 1600 KC. are required.

- 1 Connect the output meter between the plate of the 6X8G tube and ground, or across the voice coil, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
- 2 Connect the ground lead of the signal generator to the chassis of the receiver.
- 3 Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
- 4 With the gang condenser in full mesh set the pointer to the 540 KC. division on the dial.
- 5 Proceed to align in exactly the same order as shown in the table below.

ORDER OF ALIGN.	DUMMY ANT. IN SERIES WITH SIG. GEN.	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
A	.1 MFD. CONDENSER	CONTROL GRID OF 6A8G TUBE	465 KC.	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1 2	1ST I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
B	.1 MFD. CONDENSER	CONTROL GRID OF 6A8G TUBE	465 KC.	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	3 4	2ND I.F.	ADJUST TRIMMERS 3 & 4 FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT OF TRIMMERS NO. 1 & 2.
C	400 OHM CARBON RESISTOR	ANTENNA LEAD	1600 KC.	1600 KC.	5	OSCILLATOR	ADJUST TO BRING IN SIGNAL. SEE NOTE BELOW TABLE.
D	400 OHM CARBON RESISTOR	ANTENNA LEAD	1500 KC.	TUNE TO 1500 KC. GENERATOR SIGNAL	6	ANTENNA	ADJUST FOR MAXIMUM OUTPUT.

NOTE: The oscillator section of the gang is provided with two trimmers connected in parallel, one on the top (No. 5) and one on the bottom. Normally the bottom trimmer will require no adjustment, but if trimmer No. 5 has to be turned too far out or too far in the bottom trimmer should be adjusted until trimmer No. 5 peaks about half way in.

DIAL CORD INSTALLATION: The dial cord to be used should be approximately 27 inches long.

Open the gang condenser all the way (plates all out) and unclip the tension spring from drum A.

1. Thread both ends of the dial cord through the opening at the top of drum A and tie them to one end of the tension spring.
2. Wind one complete turn counter-clockwise around drum A. (Use only one end of the cord).
3. Run the cord around pulley B from back to front, then across to the front of pulley C.
4. Run the cord around pulley C, over drum A (in back of windings) down to shaft D.
5. Wind three complete turns around shaft D.
6. Run the cord up to drum A and wind one complete turn counter-clockwise around the drum.
7. Fasten the tension spring to the clip inside the drum.
8. With the gang condenser fully closed clip the pointer to the dial cord so that it comes opposite the 540 KC. marking on the dial.

WIND THREE COMPLETE TURNS AROUND SHAFT D

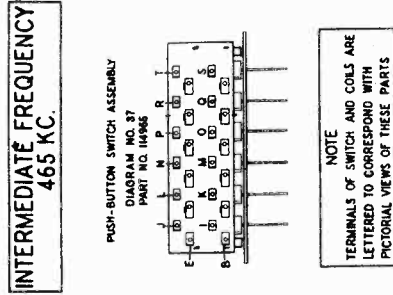
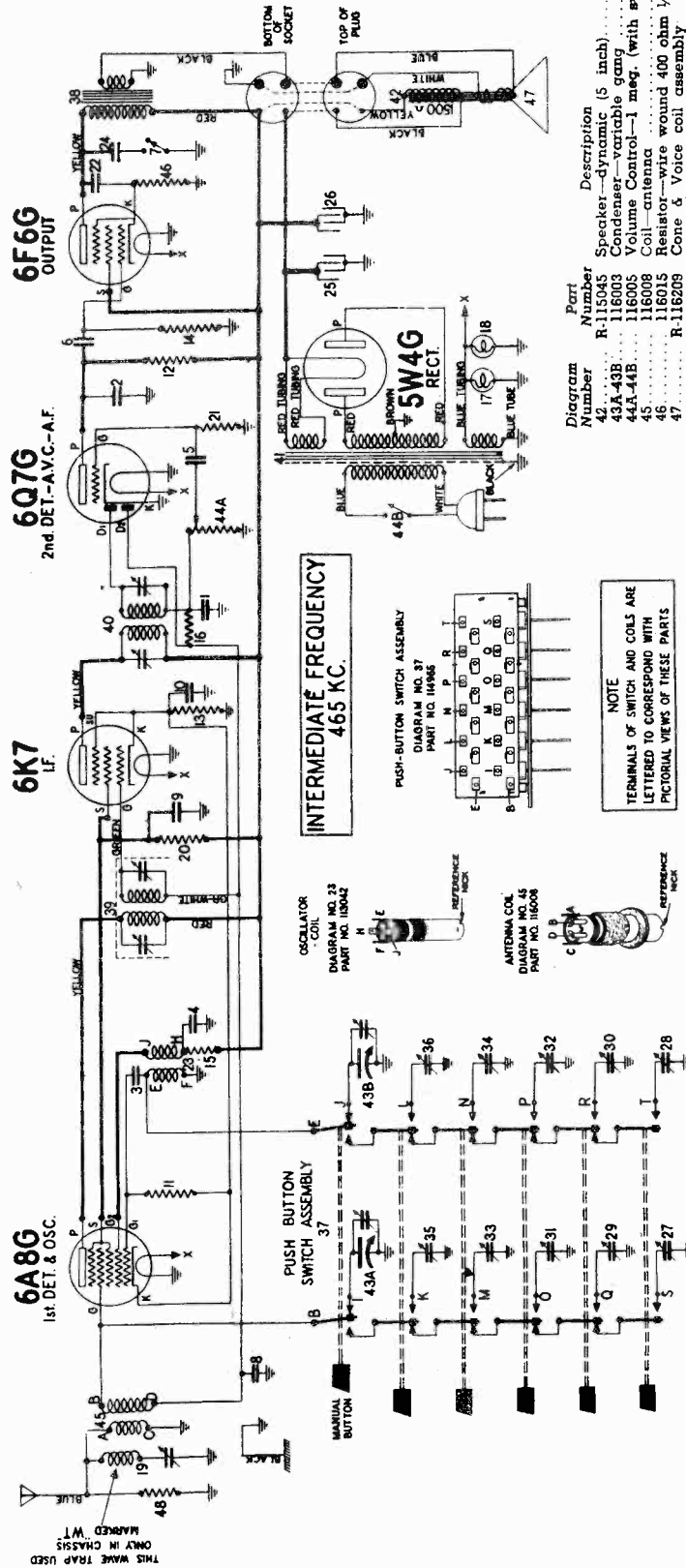
MODELS 3041 to 3049 CHASSIS R-304, R-304-A

ELIMINATION OF OSCILLATION: Some of the model R-304 receivers may oscillate or "growl" especially when tuned to weak stations or between stations. This oscillation can always be eliminated by connecting a ground to the receiver. However, if the set is to be used without a ground, it can be kept from oscillating by connecting a buffer condenser from one side of the power line to the chassis within the receiver. The condenser should have a capacity of .01 mfd. and a voltage rating of 1000 volts. Later production receivers are built with such a line buffer condenser to prevent oscillation. Sets using the condenser can be identified by the letter "S" on the back of the chassis also on the packing carton near the serial number.

08-521 to 08-529
 Chassis 08-52
 010-521 to 010-529
 Chassis 010-52
 Schematic, Voltage, Socket
 Coils, Tuner Switch

STEWART-WARNER CORP.

MODELS 01-521 to 01-529
 Chassis 01-52



ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica 260 mmfd.	\$0.20
3	85061	Condenser—mica 51 mmfd.	.15
4-5-6	88030	Condenser—paper .01 mfd. 400 volt.	.25
7	88054	Switch—tone control	.30
8	88189	Condenser—paper .05 mfd. 200 volt.	.25
9	88682	Condenser—paper .1 mfd. 400 volt.	.25
10	89532	Condenser—paper .25 mfd. 200 volt.	.32
11	110552	Resistor—carb. 47,000 ohms 1/4 watt.	.12
12	110558	Resistor—carb. 220,000 ohms 1/4 watt.	.12
13	110558	Resistor—carb. 330 ohms 1/4 watt.	.12
14	110559	Resistor—carb. 470,000 ohms 1/4 watt.	.12
15	110562	Resistor—carb. 22,000 ohms 1/2 watt.	.12
16	110580	Resistor—carb. 3.3 meg. 1/4 watt.	.15
17-18	110629	Lamp—6.3 volt .25 amp.	.15
19	112796	Wave trap (with trimmer) (Model 01-52 WT only)	.50
20	112960	Resistor—carb. 47,000 ohms 1/2 watt.	.12
21	112975	Resistor—carb. 10 meg. 1/4 watt.	.12
22	113035	Condenser—paper .006 mfd. 600 volt.	.14
23	113042	Coil—oscillator	.45
24	113202	Condenser—paper .02 mfd. 500 volt.	.15
25-26	114258	Condenser—elect. 8 mfd. 450 volts.	.98
27-28-29-30	116501	Push Button Trim. (550 KC to 1000 KC)	.40
31-32-33-34	116502	Push Button Trim. (700 KC to 1400 KC)	.40
35-36	116503	Push Button Trim. (850 KC to 1720 KC)	.40
37	114965	Switch Assembly—for push buttons.	2.85
38	114994	Transformer—output	1.25
39	114996	Transformer—1st I.F.	1.00
40	114997	Transformer—2nd I.F.	1.85
41	114999	Transformer—power 117 volt 60 cycle 3.50	3.50

SOCKET VOLTAGES

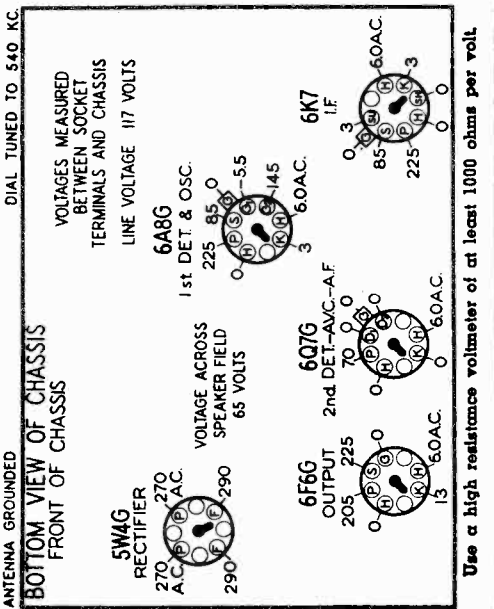


Diagram Number	Part Number	Description	List Price
42	R-115045	Speaker—dynamic (5 inch)	4.50
43A-43B	116003	Condenser—variable mica	2.90
44A-44B	116005	Volume Control—1 meg. (with switch)	.86
45	116008	Coil—antenna	.70
46	116015	Resistor—wire wound 400 ohm 1/2 W.	.12
47	R-116209	Cone & Voice coil assembly (For R-115045 speaker)	1.40
48	110569	Resistor—carb 10,000 ohms 1/4 watt.	.12

DIAL & MISCELLANEOUS PARTS

Part No.	Description	List Price
114955	Clamp—for dial cord	.01
112745	Clip—for oscillator coil mtg.	.01
112798	Clip—for mtg. wave trap coil	.01
113019	Clip—dial scale retaining	.01
116009	Clip—for antenna coil mtg.	.01
114854	Dial Cord—(19" required)	Per Ft. .03
116006	Dial scale	.22
112233	Drum & Bushing—for dial drive	.35
113146	Escutcheon—for dial	.84
113022	Knobs—for tuning or volume	.10
113138	Mtg. Plate & Bracket for dial	.42
110496	Plug—speaker (4 prong)	.12
114977	Pointer—for dial	.16
113102	Push Button	.08
81145	Retaining ring—for drive shaft	Per C .50
85827	Set Screw—8/32 Square head	.02
112874	Screw—No. 10 x 1 1/2 Chassis Mtg.	.01
114914	Screw—Special Head—for mtg. escutcheon.	Per Dz. .10
112945	Shaft—tuning	.15
110501	Socket—4 prong (for speaker)	.16
114876	Socket—social base	.15
114878	Socket—social base—with special ground	.15
114980	Socket—for dial lamp	.15
114968	Spring—dial cord tension	.09
113189	Tab—celluloid—for push button	Per Dz. .03
113321	Tab—station call letters (4 sheets brown)	Per Set .005
116530	Washer—(paper) for back of knobs	.01
110829	Washer—flat steel, for mtg' chassis	Per C .50
111456	Washer—spring washer	Per C .50

MODELS 01-521 to 01-529
08-521 to 08-529
010-521 to 010-529
Alignment, Trimmers, Tuner

STEWART-WARNER CORP.

MODELS 01-531 to 01-539
01-531S to 01-539S
010-531 to 010-539
010-531S to 010-539S
Alignment, Trimmers

01-53, 01-53S, 010-53 and 010-53S CHASSIS
ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 14 MC are required.

1. Connect the output meter across the voice coil or between the plate of the 6K6-G output tube and ground in series with a .1 mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the black (ground) wire or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the alignment procedure.
4. With the gang condenser in full mesh, set the dial pointer in a horizontal position. If the pointer is incorrectly set, it is merely necessary to move the pointer to the correct position by hand, while holding the gang in the full mesh position.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
1 MFD Condenser	Control Grid of 6A8-G Tube	465 KC	Broadcast Clockwise	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	2nd I. F.	Adjust for maximum output. Then repeat adjustment.
200 MFD. Carbon Condenser	Antenna Terminal or Antenna Lead	465 KC	Broadcast Clockwise	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	3-4	1st I. F.	Adjust for minimum output using a strong generator signal.
400 OHM Carbon Resistor	Antenna Terminal or Antenna Lead	14 MC	Foreign (Counter-Clockwise)	14 MC	5	Wave Trap	Adjust for maximum output. Wipe or scrape by tuning in image on opposite side of image at 14 MC. with trimmer screw further out. Feedback linkage.
400 OHM Resistor	Antenna Terminal or Antenna Lead	14 MC	Foreign (Counter-Clockwise)	14 MC	6	Foreign Oscillator (Shunt)	Adjust for maximum output. Wipe or scrape by tuning in image on opposite side of image at 14 MC. with trimmer screw further out. Feedback linkage.
200 MFD. Condenser	Antenna Terminal or Antenna Lead	1500 KC	Broadcast Clockwise	1500 KC	7	Foreign Antenna	Adjust for maximum output. Wipe or scrape by tuning in image on opposite side of image at 14 MC. with trimmer screw further out. Feedback linkage.
200 MFD. Condenser	Antenna Terminal or Antenna Lead	1500 KC	Broadcast Clockwise	Tune To 1500 KC Generator Signal	8	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MFD. Condenser	Antenna Terminal or Antenna Lead	600 KC	Broadcast Clockwise	Tune To 600 KC Generator Signal	9	Broadcast Antenna	Adjust for maximum output. Wipe or scrape by tuning in image on opposite side of image at 14 MC. with trimmer screw further out. Feedback linkage.
200 MFD. Condenser	Antenna Terminal or Antenna Lead	600 KC	Broadcast Clockwise	Tune To 600 KC Generator Signal	10	Broadcast Oscillator (Series Prod.)	Adjust for maximum output. Wipe or scrape by tuning in image on opposite side of image at 14 MC. with trimmer screw further out. Feedback linkage.

01-52, 08-52 and 010-52 CHASSIS
ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 1500 KC are required.

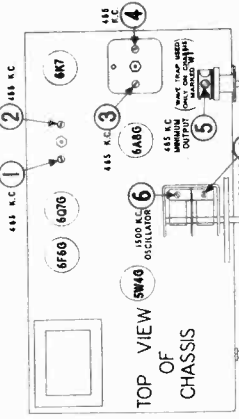
1. Connect the output meter across the voice coil or between the plate of the 6F6-G output tube and ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the black (ground) wire or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. With the gang condenser in full mesh, set the dial pointer in a horizontal position. If the pointer is incorrectly set, it is merely necessary to move the pointer to the correct position by hand, while holding the gang in the full mesh position.
5. Push in the "MANUAL" button, and keep it depressed during the entire alignment procedure.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Trimmer Number	Trimmer Description	Type of Adjustment
1 MFD CONDENSER	CONTROL GRID OF 6A8-G TUBE	465 KC	1-2	2nd I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
200 MFD MICA CONDENSER	ANTENNA LEAD (Blue Wire)	465 KC	3-4	1st I.F.	ADJUST FOR MINIMUM OUTPUT USING A FOREIGN GENERATOR SIGNAL.
200 MFD MICA CONDENSER	ANTENNA LEAD (Blue Wire)	1500 KC	5	WAVE TRAP	BROADCAST OSCILLATOR (SHUNT)
200 MFD MICA CONDENSER	ANTENNA LEAD (Blue Wire)	1500 KC	6	BROADCAST OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
200 MFD MICA CONDENSER	ANTENNA LEAD (Blue Wire)	1500 KC	7	BROADCAST ANTENNA (SHUNT)	

When setting up buttons, always allow the set to warm up thoroughly so that all parts of the chassis may attain normal operating temperatures. This will minimize frequency drift in the tuned circuits.

Select the most powerful nearby stations for automatic tuning, since weak signals will not give as good results.

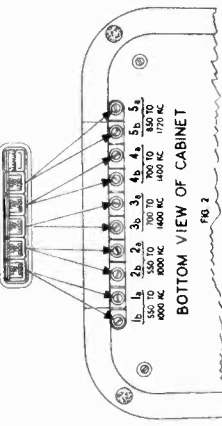
Also select stations whose frequencies fall within the range indicated in Fig. 2. It is often possible to set the trimmers to tune in stations falling outside of the indicated frequency ranges, but the trimmers are then too tight or too loose and may not hold their settings.



SETTING UP PUSH BUTTONS

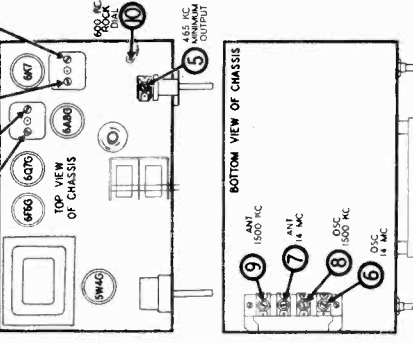
Fig. 2 is a bottom view of the cabinet, showing the selector trimmer condensers used with the push buttons. The arrows in this diagram indicate the two trimmers for each button.

In setting up a station on any push button, the trimmer marked "a" is the oscillator trimmer and must be adjusted first to tune in the desired station. The trimmer marked "b" is the antenna trimmer, and is to be adjusted until the desired station is heard with the deepest tone.



DIAL & MISCELLANEOUS PARTS

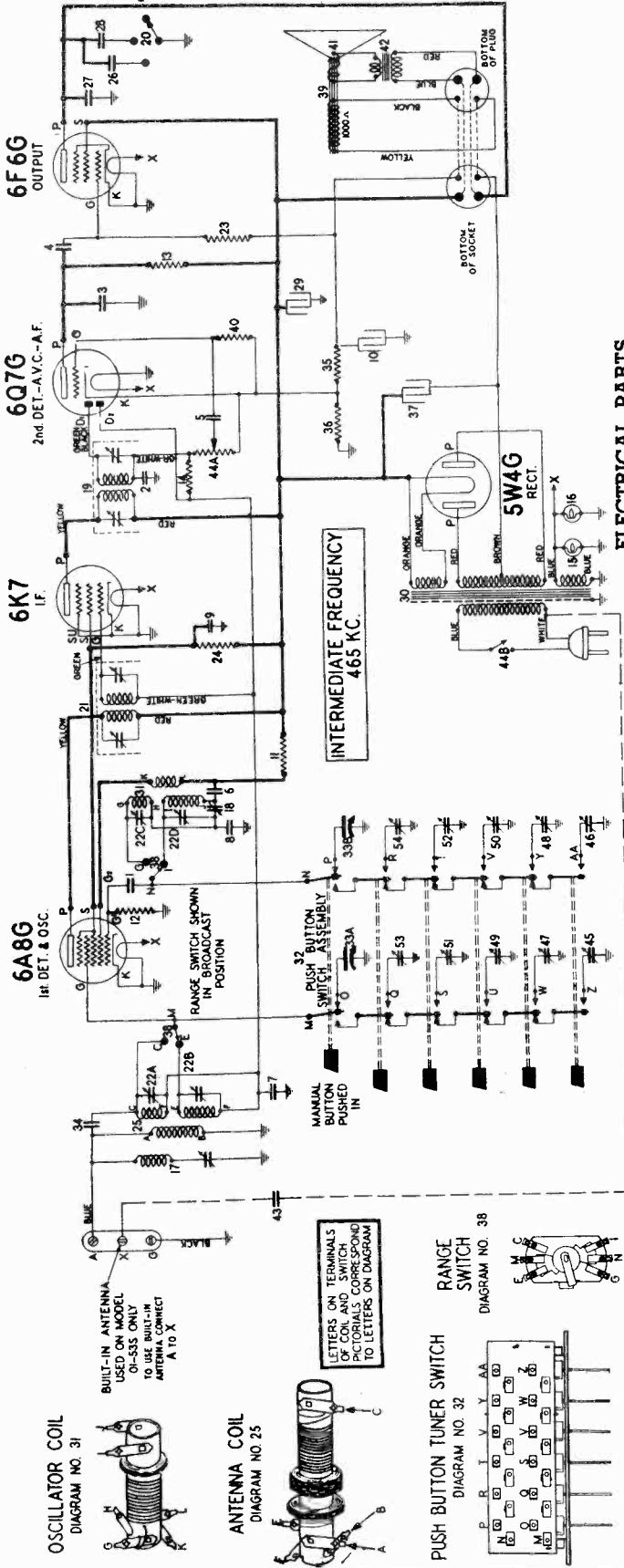
Part Number	Description	List Price
114955	Clamp for dial cord	\$.01
114956	Clamp for dial cord	\$.01
112788	Clip for mounting wave trap coil	\$.01
83329	Clamp for dial scale retaining	Per Ft. .03
114854	Dial Cord (18" required)	Per Ft. .25
114855	Dial Cord (18" required)	Per Ft. .25
114856	Dial Scale (Model 010-53S)	Per Ft. .45
112223	Drum & Bushing for dial drive	\$.35
112224	Drum & Bushing for dial drive	\$.42
113128	Mounting Plate & Bracket for dial	Per C .30
114977	Printer for dial	Per C .16
113102	Push Button for drive shaft	Per C .07
114148	Rotor for voltage switch on power transformer	Per C .30
114149	Rotor for voltage switch on power transformer	Per C .30
114150	Rotor for voltage switch on power transformer	Per C .30
114151	Rotor for voltage switch on power transformer	Per C .30
114152	Rotor for voltage switch on power transformer	Per C .30
114153	Rotor for voltage switch on power transformer	Per C .30
114154	Rotor for voltage switch on power transformer	Per C .30
114155	Rotor for voltage switch on power transformer	Per C .30
114156	Rotor for voltage switch on power transformer	Per C .30
114157	Rotor for voltage switch on power transformer	Per C .30
114158	Rotor for voltage switch on power transformer	Per C .30
114159	Rotor for voltage switch on power transformer	Per C .30
114160	Rotor for voltage switch on power transformer	Per C .30
114161	Rotor for voltage switch on power transformer	Per C .30
114162	Rotor for voltage switch on power transformer	Per C .30
114163	Rotor for voltage switch on power transformer	Per C .30
114164	Rotor for voltage switch on power transformer	Per C .30
114165	Rotor for voltage switch on power transformer	Per C .30
114166	Rotor for voltage switch on power transformer	Per C .30
114167	Rotor for voltage switch on power transformer	Per C .30
114168	Rotor for voltage switch on power transformer	Per C .30
114169	Rotor for voltage switch on power transformer	Per C .30
114170	Rotor for voltage switch on power transformer	Per C .30
114171	Rotor for voltage switch on power transformer	Per C .30
114172	Rotor for voltage switch on power transformer	Per C .30
114173	Rotor for voltage switch on power transformer	Per C .30
114174	Rotor for voltage switch on power transformer	Per C .30
114175	Rotor for voltage switch on power transformer	Per C .30
114176	Rotor for voltage switch on power transformer	Per C .30
114177	Rotor for voltage switch on power transformer	Per C .30
114178	Rotor for voltage switch on power transformer	Per C .30
114179	Rotor for voltage switch on power transformer	Per C .30
114180	Rotor for voltage switch on power transformer	Per C .30
114181	Rotor for voltage switch on power transformer	Per C .30
114182	Rotor for voltage switch on power transformer	Per C .30
114183	Rotor for voltage switch on power transformer	Per C .30
114184	Rotor for voltage switch on power transformer	Per C .30
114185	Rotor for voltage switch on power transformer	Per C .30
114186	Rotor for voltage switch on power transformer	Per C .30
114187	Rotor for voltage switch on power transformer	Per C .30
114188	Rotor for voltage switch on power transformer	Per C .30
114189	Rotor for voltage switch on power transformer	Per C .30
114190	Rotor for voltage switch on power transformer	Per C .30
114191	Rotor for voltage switch on power transformer	Per C .30
114192	Rotor for voltage switch on power transformer	Per C .30
114193	Rotor for voltage switch on power transformer	Per C .30
114194	Rotor for voltage switch on power transformer	Per C .30
114195	Rotor for voltage switch on power transformer	Per C .30
114196	Rotor for voltage switch on power transformer	Per C .30
114197	Rotor for voltage switch on power transformer	Per C .30
114198	Rotor for voltage switch on power transformer	Per C .30
114199	Rotor for voltage switch on power transformer	Per C .30
114200	Rotor for voltage switch on power transformer	Per C .30



01-531S to 01-539S
 Chassis 01-53S
 010-531S to 010-539S
 Chassis 010-53S
 Schematic, Voltage, Socket
 Tuner Switch, Coils

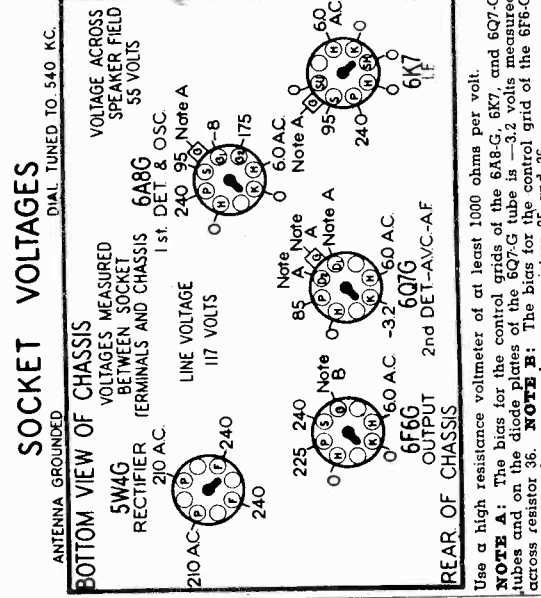
STEWART-WARNER CORP.

MODELS 01-531 to 01-539
 Chassis 01-53
 010-531 to 010-539
 Chassis 010-53



ELECTRICAL PARTS

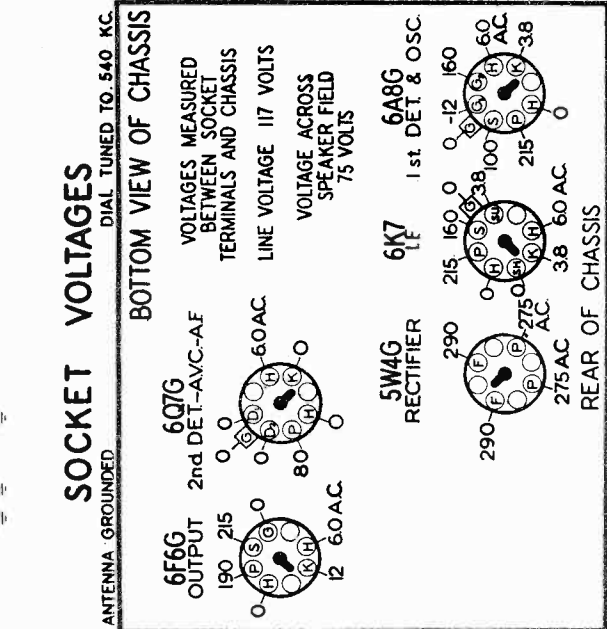
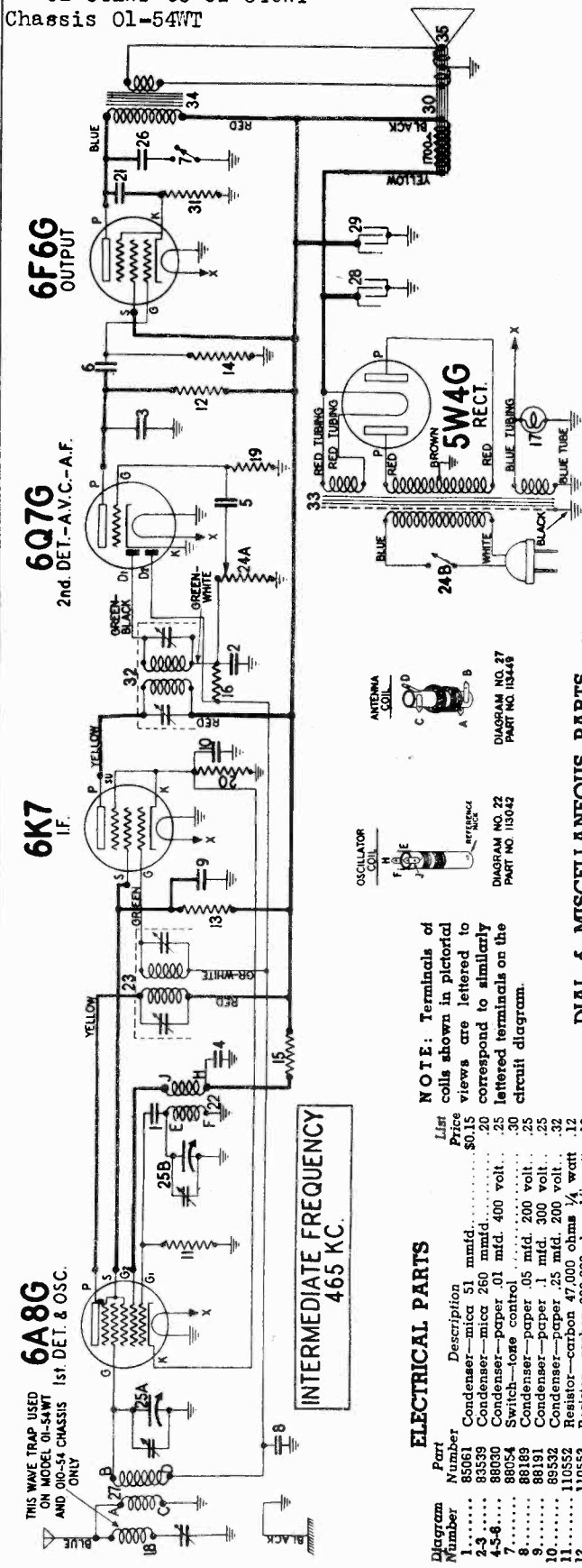
Diagram Number	Part Number	Description	List Price	
1	85061	Condenser—mica 51 mmfd.	\$.15	
2-3	85394	Condenser—mica 510 mmfd.	\$.25	
4	88926	Condenser—paper .02 mfd. 400 volt.	.25	
5-6	88930	Condenser—paper .01 mfd. 400 volt.	.25	
7	88189	Condenser—paper .05 mfd. 200 volt.	.25	
8	88587	Condenser—mica .0042 mfd.	.25	
9	88682	Condenser—paper .1 mfd. 400 volt.	.25	
10	{110377 {112113	Condenser—electrolytic 10 mfd. 35 volt. (Model 010-53 & 010-53S)	.80	
11	110550	Resistor—carbon 10,000 ohm 1/2 watt.	.15	
12	110552	Resistor—carbon 47,000 ohms 1/2 watt.	.12	
13	110553	Resistor—carbon 220,000 ohms 1/2 watt.	.12	
14	110580	Resistor—carbon 3.3 meg. 1/2 watt.	.12	
15-16	{110629 {112113	Lamp—dial 6.3 volt .25 amps. (Model 010-53 & 010-53S)	.85	
17	112796	Wave trap (with trimmer)	.50	
18	112799	Condenser—padder (530 to 630 mmfd.)	.36	
19	{112804 {116362	Transformer—2nd I.F. (Model 010-53S)	1.00	
20	112870	Switch—tone control	.40	
21	{112884 {116358	Transformer—1st I.F. (Model 010-53S)	1.20	
22A to 22D	112893	Transformer—trimmer 4 section.	.60	
23	112971	Resistor—insulated 470,000 ohms 1/2 watt.	.15	
24	112999	Resistor—carbon 33,000 ohms 1 watt.	.20	
25	{113011 {113024	Coil—antenna (Model 010-53S)	1.20	
26	113034	Condenser—paper .04 mfd. 600 volt.	.15	
	27	Condenser—paper .006 mfd. 600 volt.	.14	
	28	Condenser—paper .02 mfd. 600 volt.	.15	
	29	Condenser—electrolytic 8 mfd. 450 volt.	.98	
	30	{114530 {116352	Power transformer 117 volt 60 cycle	3.50
	31	{114959 {116419	Power transformer 100-240 V., 40-133 cycles	7.75
	32	Coil—oscillator (Model 010-53S)	.65	
	33A-33B	Switch—for push buttons.	2.85	
	34	Condenser—variable gang	2.85	
	35	Condenser—mica 15 mmfd.	2.50	
	36	Resistor—wire wound 240 ohms 1 watt.	.12	
	37	Resistor—wire wound 60 ohms 1/2 watt.	.12	
	38	Switch—range	.78	
	39	Speaker—dynamic (6 in.)	4.50	
	40	Resistor—insulated 10 meg. 1/2 watt	.12	
	41	Cone—assem. (for U-115043 speaker)	1.85	
	42	Output transformer (for U-115043 speaker)	1.50	
	43	Volume control, 500,000 ohms, with switch	.96	
	44A-44B	Power transformer 100-240 V., 40-133 cycles	7.75	
	45	Transformer—1st I.F. (Model 010-53S)	1.00	
	46	Transformer—2nd I.F. (Model 010-53S)	1.00	
	47	Coil—antenna (Model 010-53S)	.85	
	48	Coil—antenna (Model 010-53S)	.85	
	49	Coil—antenna (Model 010-53S)	2.50	
	50	Push Button Trimmer (550 KC to 1000 KC)	.40	
	51	Push Button Trimmer (700 KC to 1400 KC)	.40	
	52	Push Button Trimmer (850 KC to 1720 KC)	.40	
	53-54	Push Button Trimmer	.40	



MODELS 01-541 to 01-549
 Chassis 01-54
 01-541S to 01-549S
 Chassis 01-54S
 01-541WT to 01-549WT
 Chassis 01-54WT

STEWART-WARNER CORP.

08-541 to 08-549
 Chassis 08-54
 010-541 to 010-549
 Chassis 010-54
 010-541S to 010-549S
 Schematic, Voltage, Socket



Use a high resistance voltmeter of at least 1,000 ohms per volt.

NOTE: Terminals of coils shown in pictorial views are lettered to correspond to similarly lettered terminals on the circuit diagram.

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	85161	Condenser—mica 51 mmid.	\$0.15
2	85162	Condenser—mica 260 mmid.	.20
3-6	89033	Condenser—paper .01 mid. 400 volt.	.25
7	89054	Switch—tone control.	.30
8	88191	Condenser—paper .05 mid. 200 volt.	.25
9	88192	Condenser—paper .25 mid. 200 volt.	.25
10	89532	Condenser—paper .05 mid. 200 volt.	.32
11	110552	Resistor—carbon 47,000 ohms 1/4 watt	.12
12	110553	Resistor—carbon 220,000 ohms 1/4 watt	.12
13	110558	Resistor—carbon 33,000 ohms 1/4 watt	.12
14	110559	Resistor—carbon 470,000 ohms 1/4 watt	.12
15	110560	Resistor—carbon 10,000 ohms 1/4 watt	.12
16	110580	Resistor—carbon 3.3 meg. 1/4 watt.	.42
17	110629	Lamp—dial 6 volt .25 amp.	.15
18	112796	Wave trap (Models 01-54 WT, 010-54 and 010-54S chassis only)	.50
19	112875	Resistor—carbon 10 meg. 1/4 watt.	.12
20	112894	Resistor—carbon 220 ohm 1/4 watt.	.12
21	113035	Condenser—ceramic tube .006 mid. 600 volt	.14
22	113042	Coil—oscillator	.45
23	113046	Transformer—1st I.F.	1.00
23	116425	Transformer—1st I.F. (Model 010-54S only)	1.10
24A-24B	113049	Volume control—500,000 ohms with switch	1.00
25A-25B	113150	Condenser—variable gang	3.00
26	113202	Condenser—paper .02 mid. 600 volt.	.15
27	113202	Coil—antenna	.78
28,29	114255	Condenser—electrolytic 8 mid. 450 volt	.98
30	U-115036	Speaker—dynamic; 5 inch.	4.00
31	116015	Resistor—wire wound 400 ohms 1/2 watt	.12
32	116179	Transformer—2nd I.F. (Model 010-54S only)	1.00
33	116180	Transformer—power 117 volt 60 cycle	1.05
33	116336	Transformer—power 100-240 volt; 40-133 cycles	3.75
34	U-116304	Transformer—output, for U-115047 speaker	7.75
35	U-116305	Cone & Voice coil—for U-115047 speaker	1.50
33	116336	Transformer—power 100-240 volt; 40-133 cycles	1.50
23	116425	Transformer—1st I.F. (Model 010-54S only)	7.75
32	116425	Transformer—2nd I.F. (Model 010-54S only)	1.10
			1.05

DIAL & MISCELLANEOUS PARTS

Part No.	Description	List Price
113170	Adjusting lug—for button shafts.	\$0.01
113171	Bracket—for dial & condenser mtg.	.64
112776	Celluloid Cover—over dial face.	.28
112745	Clip—coil mtg. (Oscillator & antenna).	.01
112764	Clip—dial scale retaining.	.01
112798	Clip—for mtg. wave trap.	.01
113178	Cord—dial (supplied in 4 ft. lengths).	.30
113174	Dial Drum—and pinion assembly.	.44
116175	Dial scale.	.30
112914	Escutcheon—dial.	.35
113053	Escutcheon—for push buttons.	.32
114148	Gear—and bushing assembly for dial drive.	.22
113022	Knob—tone & volume control.	.10
113494	Mechanical tuner assembly—keys & housing only	3.00
112770	Pointer—dial	.08
112762	Pulley—dial cord drive.	.04
113103	Push button (w/ant)	.06
81145	Rotor cap for voltage switch on transformer.	.50
114898	Retaining Ring—for drive shaft. Per C	.50
85040	Rubber Tubing—for drive shaft.	.01
85827	Set Screw—No. 6 Hex. Hd. for mtg. adjusting washer Per C	.35
112874	Screw—No. 10x1 1/2 Square Head	.02
114831	Screw—No. 6-40x3/4 for setting up buttons.	.01
114814	Screw—Special head for mtg. escutcheon Per dz.	.15
113176	Shaft—dial drive	.18
112768	Socket—for dial lamp	.15
114876	Socket—octal base	.15
85818	Socket—octal base—with special ground.	.15
113169	Spring—between gear sections	.01
113169	Spring—for key return.	.09
113169	Spring—dial cord tension.	.09
113221	Tab—celluloid for push button.	.09
116520	Washer—station call letters (4 sheets) (Brown).	.005
110829	Washer—flat steel for mtg. chassis.	.01

CHASSIS 01-61, 01-61S
010-61, 010-61S
Alignment, Trimmers

STEWART-WARNER CORP.

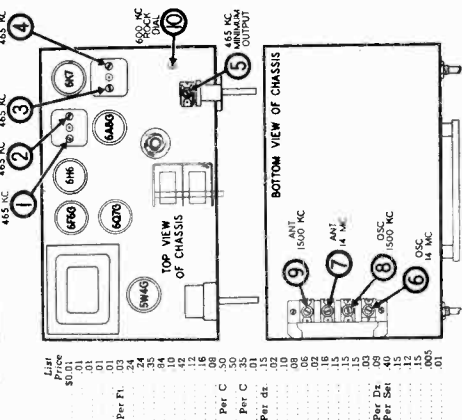
CHASSIS 01-54, 01-54S
01-54WT, 08-54, 010-54
010-54S
Alignment, Trimmers
Tuner, Drive Cord Data

01-61, 01-61S, 010-61 and 010-61S CHASSIS ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 14 MC are required.

1. Connect the output meter across the voice coil or between the plate of the 6F6-G output tube and ground in series with a .1 mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the black (ground) wire or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. With the gang condenser in full mesh, set the dial pointer in a horizontal position. If the pointer is incorrectly set, it is merely necessary to move the pointer to the correct position by hand, while holding the gang in the full mesh position.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
1 MFD. Condenser	Control Grid of 6A8-G Tube	465 KC	Broadcast Clockwise	Any Point Where It Does Not Affect the Signal	1-2	2nd I. F.	Adjust for maximum output. Then repeat adjustment.
200 MMFD. Mica Condenser	Antenna or Antenna Lead	465 KC	Broadcast Clockwise	Any Point Where It Does Not Affect the Signal	3-4	1st I. F.	Adjust for maximum output. Then repeat adjustment.
400 OHM Carbon Resistor	Antenna Terminal or Antenna Lead	14 MC	Foreign (Counter-Clockwise)	14 MC	5	Wave Trap	Adjust for minimum output using a strong generator signal.
400 OHM Resistor	Antenna Terminal or Antenna Lead	14 MC	Foreign (Counter-Clockwise)	14 MC	6	Foreign Antenna (Shunt)	Adjust for minimum output. When adjustment is obtained, try tuning it in. If the signal image does not appear, retune at 14 MC with trimmer screw turned out. Repeat image.
400 OHM Resistor	Antenna Terminal or Antenna Lead	14 MC	Foreign (Counter-Clockwise)	14 MC	7	Foreign Antenna	Try to increase output by detuning trimmer and returning to 14 MC. If maximum output is obtained.
200 MMFD. Mica Condenser	Antenna Terminal or Antenna Lead	1500 KC	Broadcast Clockwise	1500 KC	8	Broadcast Antenna (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	Antenna Terminal or Antenna Lead	1500 KC	Broadcast Clockwise	Tune To Generator	9	Broadcast Antenna	Adjust for maximum output.
200 MMFD. Mica Condenser	Antenna Terminal or Antenna Lead	600 KC	Broadcast Clockwise	Tune To Generator	10	Broadcast Oscillator (Series Pad)	Adjust for maximum output. Tuning trimmer and returning to 600 KC until maximum output is obtained.



DIAL & MISCELLANEOUS PARTS

Part Number	Description	Price
114935	Clamp for dial cord	\$0.01
114936	Clip for mounting wave trap coil	.01
132019	Clip for dial scale retaining	.01
14854	Dial Cord (13" required)	.03
14875	Dial scale Model 010-61S	.24
119233	Drum & Bushing for dial drive	.35
115146	Excitechton for dial volume	.10
113138	Mounting Plate & Bracket for dial	.42
14936	Pusher for dial	.16
113102	Push button for drive shaft	.98
131416	Rotor for voltage switch on power transformer	.50
85940	Screw No. 6 Hex. Hd. Chassis	.35
112788	Screw-Special head for mounting recatchen	.01
115914	Set Screw-.53 Square Head	.15
88227	Shield for 6Q7 tube (half section)	.08
88161	Shield cap	.02
88154	Shield cap	.02
10501	Socket-50 pin base with special ground	.15
114876	Socket-50 pin base with special ground	.15
114876	Socket for dial lamp	.05
113189	Tab-cathode for push button	.05
11321	Tab-cathode for push button	.05
11321	Tab-cathode for push button	.05
84407	Terminal Strip P.C.A. (Model 010-61S)	.12
116536	Terminal Strip P.C.A. (Model 010-61S)	.12
116536	Terminal Strip P.C.A. (Model 010-61S)	.12
112929	Washer-for steel, for mounting chassis	.01

01-54, 01-54S, 08-54, 010-54, and 010-54S CHASSIS ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 1500 KC are required.

1. Connect the output meter across the voice coil or between the plate of the 6F6-G output tube and ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the black (ground) wire or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. With the gang condenser in full mesh, set the pointer to the last mark on the right end of the dial scale. If the pointer is only slightly off calibration, loosen the set-screw in the dial drive drum at the left side of the gang condenser and set the pointer to the last mark on the right end of the dial when the gang condenser is in full mesh. If the pointer is off calibration several dial divisions, release it from the pointer drive cord by spreading the clip on the pointer. Then slide the pointer along the cord until it is set to the last dial division on the right end of the dial. Holding it in place check to see if the gang condenser is in full mesh, and tighten the pointer clip, being careful not to cut the cord. Place a drop of household oil or speaker cement on the cord and pointer clip to prevent the pointer from slipping.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Trimmer Number	Trimmer Description	Type of Adjustment
1 Mfd. Condenser	Control Grid of 6A8-G Tube	465 KC	1-2	1st I.F.	Adjust for Maximum Output
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	465 KC	3-4	2nd I.F.	Adjust for Maximum Output
400 OHM Resistor	Antenna Lead (Blue Wire)	1500 KC	5	Wave Trap	Adjust for Minimum Output Using A Strong Generator Signal.
400 OHM Resistor	Antenna Lead (Blue Wire)	1500 KC	6	Broadcast Antenna (Shunt)	Adjust Trimmer To Bring In Signal.
400 OHM Resistor	Antenna Lead (Blue Wire)	1500 KC	7	Broadcast Antenna (Shunt)	Adjust for Maximum Output.

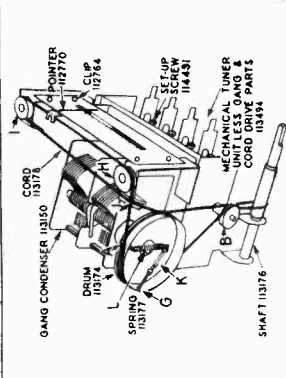


FIG 1

HOW TO REPLACE DIAL POINTER DRIVE CORD

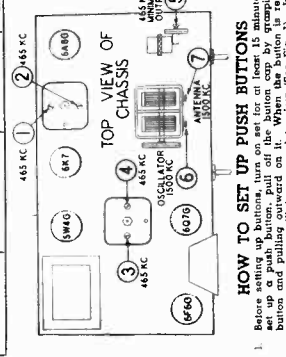
1. Close the gang condenser and thread one end of the cord through pulley J and then across to pulley I and counter-clockwise around pulley H and then across to pulley J and counter-clockwise around pulley G.
2. Carry the other end of the cord over the drum to the front around pulley F and then across to pulley I and counter-clockwise around pulley H and then across to pulley J and counter-clockwise around pulley G.
3. Continue back to pulley J and down the front of the drum. Carry the end of the cord on around the drum and thread through eyelet G.
4. The cord should extend through eyelet G to tension spring K. The cord should be pulled through eyelet G to tension spring K so that when spring K is looked in place in the drum, it will be extended only a very little. If the spring is extended too much, it will tend to make the push button operate too hard because of overloading.
5. Be sure the gang condenser is closed, then set the dial pointer to the last dial division mark on the right and clip it to the cord.

HOW TO SET UP PUSH BUTTONS

1. Before setting up push buttons, be sure the dial drive drum is in mesh. To adjust the dial drive drum, turn the dial drive drum clockwise until the set-up screw is tight and loosen it about one turn counter-clockwise until it is in mesh. Then turn the dial drive drum clockwise until the set-up screw is tight and loosen it about one turn counter-clockwise until it is in mesh. While the button is held in this position, turn the dial drive drum clockwise until the set-up screw is tight and loosen it about one turn counter-clockwise until it is in mesh.
2. SCREW DRIVEN UNTIL THE PUSH BUTTON SHAFT IS FORCED INTO THE WAY IN. While the button is held in this position, turn the dial drive drum clockwise until the set-up screw is tight and loosen it about one turn counter-clockwise until it is in mesh.

HOW TO REPLACE THE DIAL DRIVE CORD

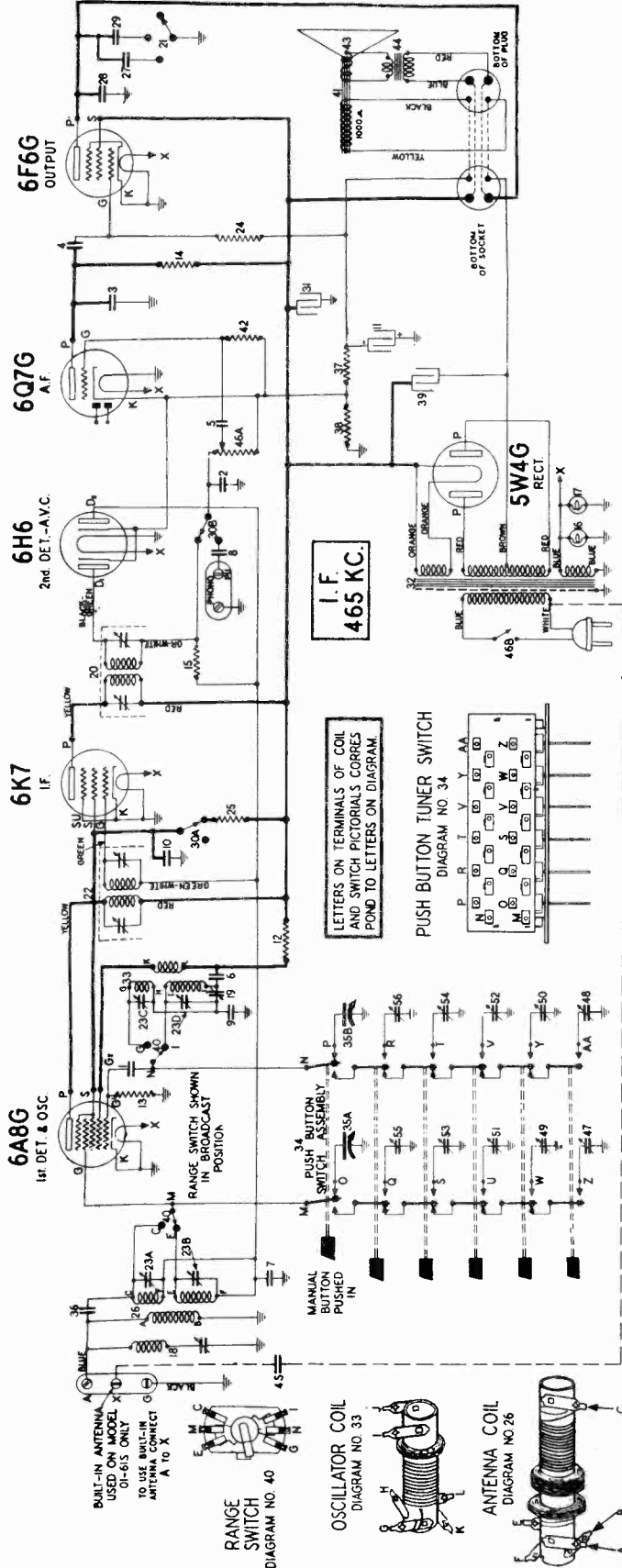
1. Close the gang condenser. The set screw in the drum, Fig. 1, must be set at the dial cord to the spring L and thread the other end through hole A and down the front of the drum to the tuning shaft. Coat the drum with oil. Then turn the dial drive drum clockwise until the dial cord is tight. Then turn the dial drive drum clockwise until the dial cord is tight. Thread the cord through hole A and tie the other end to spring L. Tie the cord so that spring L will be extended to about 1/4 inch.



MODELS 01-611 to 01-619
Chassis 01-61
01-611S to 01-619S
Chassis 01-61S
010-611 to 010-619
Chassis 010-61

STEWART-WARNER CORP.

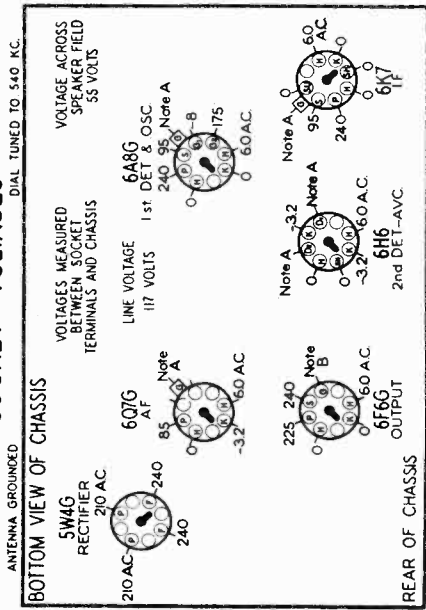
010-611S to 010-619S
Chassis 010-61S
Schematic, Voltage
Socket, Coils



ELECTRICAL PARTS

Table with columns: Diagram Number, Part Number, Description, List Price. Lists various components such as condensers, resistors, capacitors, and transformers with their respective part numbers and prices.

SOCKET VOLTAGES

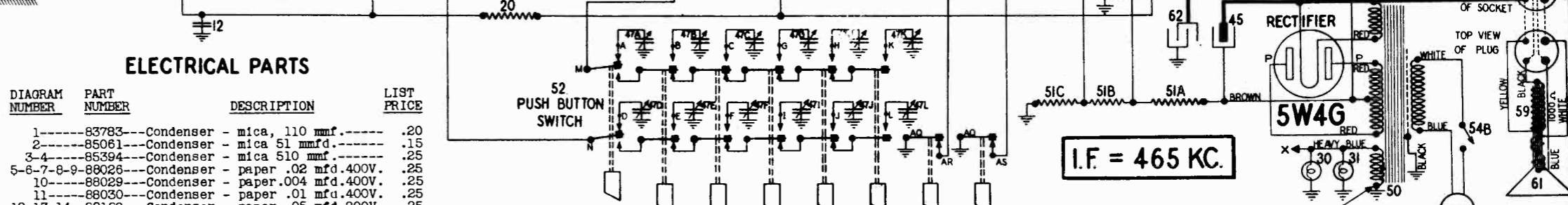
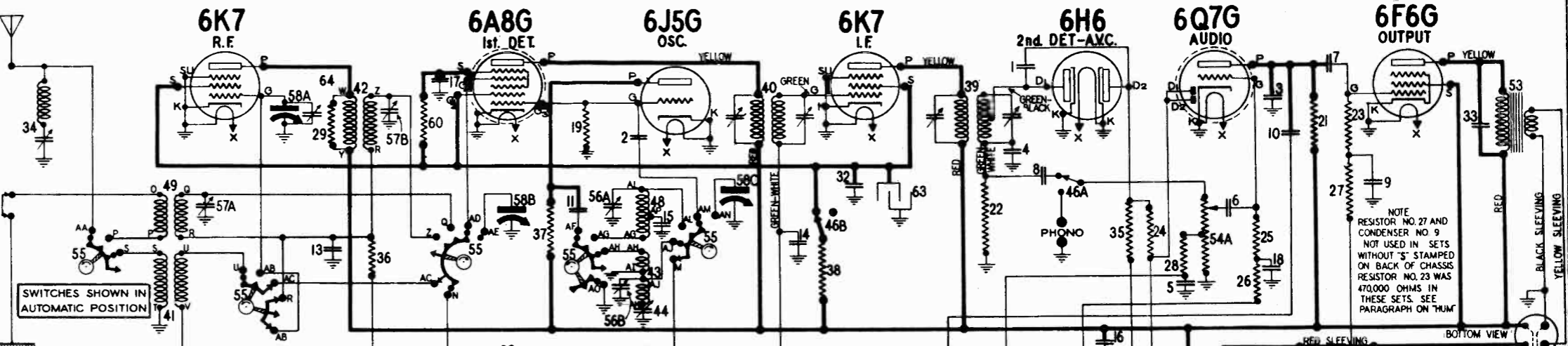
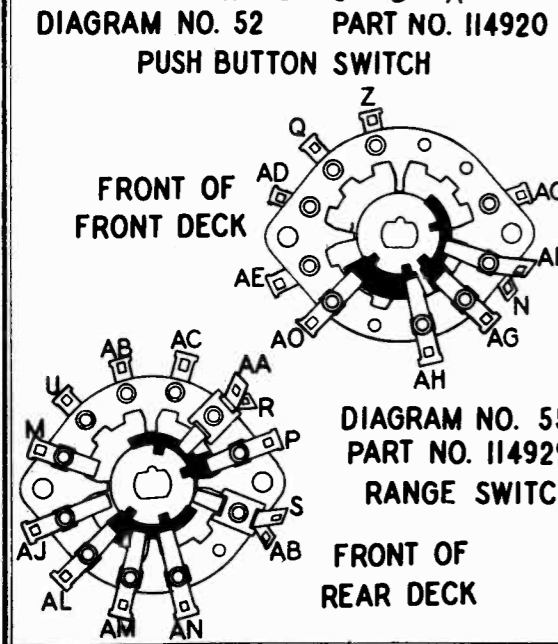
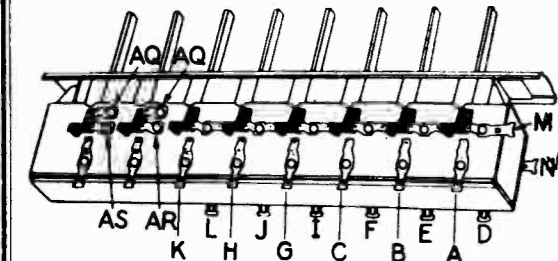
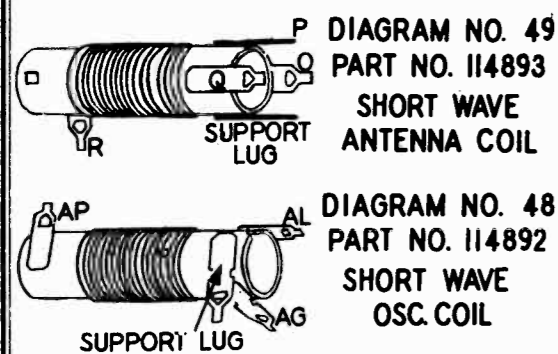
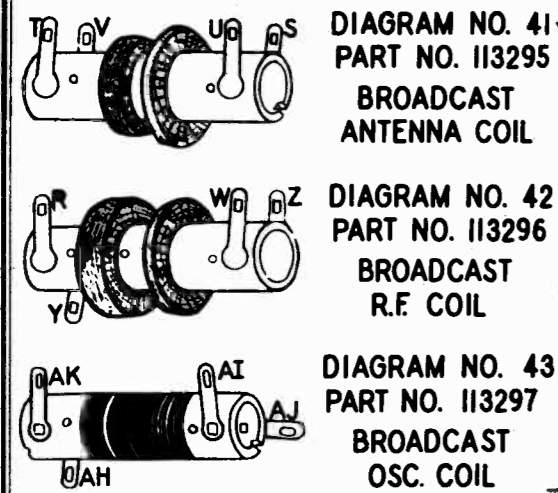


NOTE A: The bias for the control grids of the 6A8-G, 6K7, and 6Q7-G tubes and on the diode plates of the 6H6 tube is -3.2 volts measured across resistor 38. NOTE B: The bias for the control grid of the 6F6-G tube is -1.6 volts measured across resistors 37 and 38.

Schematic, Voltage, Socket
Tuner Switch, Coils

STEWART-WARNER CORP.

MODELS 01-811 to 01-819, Chassis 01-81
08-811 to 08-819, Chassis 08-81
010-811 to 010-819, Chassis 010-81



ELECTRICAL PARTS

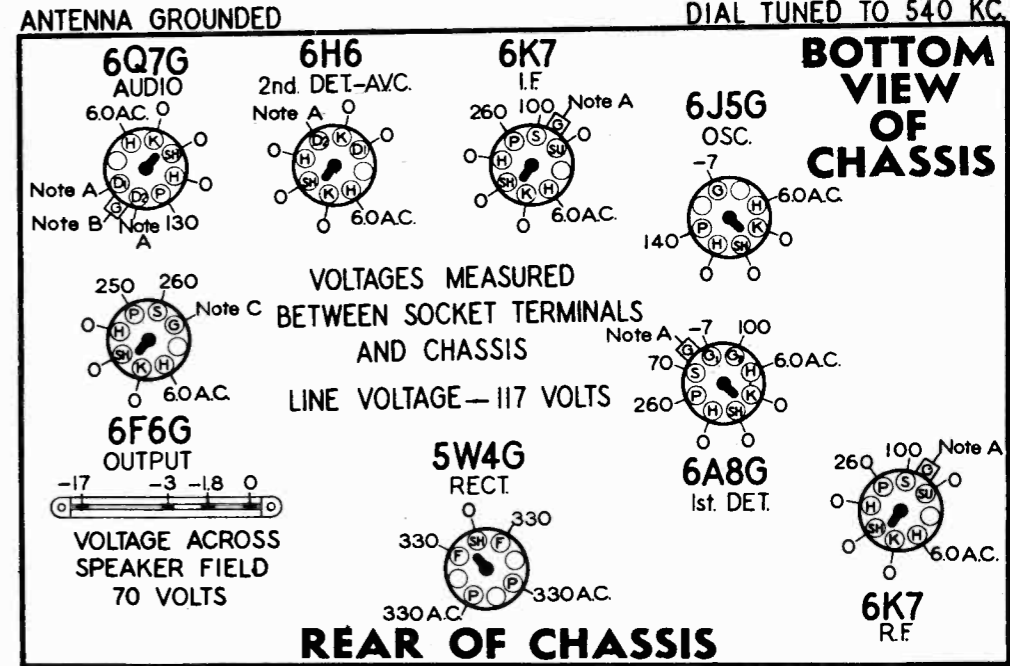
DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1	83783	Condenser - mica, 110 mmf.	.20
2	85061	Condenser - mica 51 mmfd.	.15
3-4	85394	Condenser - mica 510 mmf.	.25
5-6-7-8-9	88026	Condenser - paper .02 mfd. 400V.	.25
10	88029	Condenser - paper .004 mfd. 400V.	.25
11	88030	Condenser - paper .01 mfd. 400V.	.25
12-13-14	88189	Condenser - paper .05 mfd. 200V.	.25
15	88587	Condenser - mica .0042 mfd.	.35
16-17	88882	Condenser - paper .1 mfd. 400V.	.25
18	89421	Condenser - paper .1 mfd. 200V.	.25
19	110552	Resistor - carb. 47,000 ohms ± W.	.12
20-21	110553	Resistor - carbon 220,000 ohms	.12
22-23		1/4 watt	
24-25	110554	Resistor - carb. 1 meg. 1/4 watt	.12
26	110559	Resistor - carb. 470,000 ohms ± W.	.12
27	110564	Resistor - carb. 100,000 ohms ± W.	.12
28	110565	Resistor - carb. 22,000 ohms ± W.	.12
29	110573	Resistor - carb. 2,200 ohms ± W.	.12
30-31	110629	Lamp - 6.3 volt .25 amp.	.15
32	111252	Condenser - paper .05 mfd. 400V.	.13
33		Condenser - mica 2,000 mmfd.	
34	111346	1000 volt	.22
35	112796	Coil - wave trap (with trimmer)	.50
36	112971	Resistor - insul. 470,000 ohm ± W.	.15
37	112987	Resistor - insul. 220,000 ohm ± W.	.15
38	112997	Resistor - carb. 22,000 ohms 1W.	.15
39	112998	Resistor - insul. 22,000 ohms 2 W.	.20
40	113229	Transformer - 2nd I.F.	1.64
41	113237	Transformer - 1st I.F.	1.20
42	113295	Coil - antenna (B.C.)	1.20
43	113296	Coil - R.F. (B.C.)	1.50
44	113297	Coil - oscillator (B.C.)	.48
45	113346	Condenser - padding	.38
46	113965	Condenser - elect. 16 mfd. 450 V.	1.04
47A-47F	114141	Switch - radio phono (D.P.D.T.)	.44
47A-47F	116501	Trimmer Condenser (100-450 mmfd)	.40
47G-47J	116502	Trimmer Condenser (25-300 mmfd)	.40
47K-47L	116503	Trimmer Condenser (15-200 mmfd)	.40
48	114892	Oscillator Coil - short wave	.80
49	114893	Antenna Coil - short wave	.80
50	114897	Transformer - power 117 V. 80 C.	4.35
51	114906	Resistor - metal clad Section A - 190 ohms Section B - 17 ohms Section C - 28 ohms	.44
52	114920	Push Button Switch Assembly	3.80
53	114927	Transformer - output	1.50
54A-54B	114928	Volume control 1 meg. with off-on switch	1.00
55	114929	Range Switch	1.85
58A-58B	114937	Condenser - trimmer 2 sections	.30
57A-57B		R-115042 Speaker	
58A-B-C	114949	Condenser - variable gang	8.00
59	R-115042	Speaker - dynamic 10"	8.75
60	116059	Resistor - insul. 22,000 ohms ± W. (Cone & Voice Coil Assembly for R-115042 Speaker)	.12
61	R-116210		2.25
62	116262	Condenser - elect. 16 mfd. 450 V.	.78
63	116263	Condenser - elect. 4 mfd. 450 V.	.58
64	113468	Trimmer - Single Section (Used on some sets only)	.15

TERMINALS OF SWITCHES AND COILS SHOWN IN THE PICTORIAL VIEWS ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM ABOVE.

DIAL AND MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
114032	Bracket & Pulley Assembly - right hand	.34
114034	Bracket & Pulley Assembly - left hand	.34
114042	Clamp - for dial scale	.10
112745	Clip - coil mounting	.01
112798	Clip - for mtg. wave trap coil	.01
85321	Connector - ground	.01
111302	Cord - dial drive 6 or 50 ft. lengths Per Ft.	.05
114921	Dial back ground - brown suede paper	.10
114915	Dial mtg. plate	.38
114922	Dial scale - glass	.84
113338	Drum - dial drive	.54
114912	Escutcheon for dial	2.25
114624	Escutcheon for push buttons	1.28
113041	Knob for tuning or volume	.10
116335	Knob for range switch	.15
110496	Plug - speaker (4 prong)	.12
116302	Pointer & slide assembly	.15
113149	Push button	.08
113463	Rubber bushing - chassis mtg.	.03
112874	Screw - #10 X 1 1/8 chassis mtg.	.01
114914	Screw - special head for mtg. escutcheon Per Doz.	.15
116185	Screw - #2 X 3/8 for push button escutcheon mtg.	.01
85827	Set Screw - 8/32 square head	.02
114025	Shaft - tuning	.18
112864	Shield - for tubes	.05
112865	Shield - base, for tubes	.03
113094	Socket - pilot light assem.	.15
114117	Socket - dial lamp	.18
114876	Socket - octal base	.15
114878	Socket - octal base with spec. ground	.15
110501	Socket - speaker (4 prong)	.16
115177	Spring - dial cord tension	.09
118311	Tabs - station call letter sheets Per Set	.35
114698	Terminal Strip - celluloid for push buttons	.03
84407	Terminal Strip - phono	.12
85066	Terminal Strip - G.D.A.	.20
67568	Washer - embossed (for mtg. elect.)	.05
116530	Washer - (paper) for back of knobs	.005
110629	Washer - flat steel, for mtg. chassis	.01

01-81, 08-81 AND 010-81 CHASSIS
SOCKET VOLTAGES



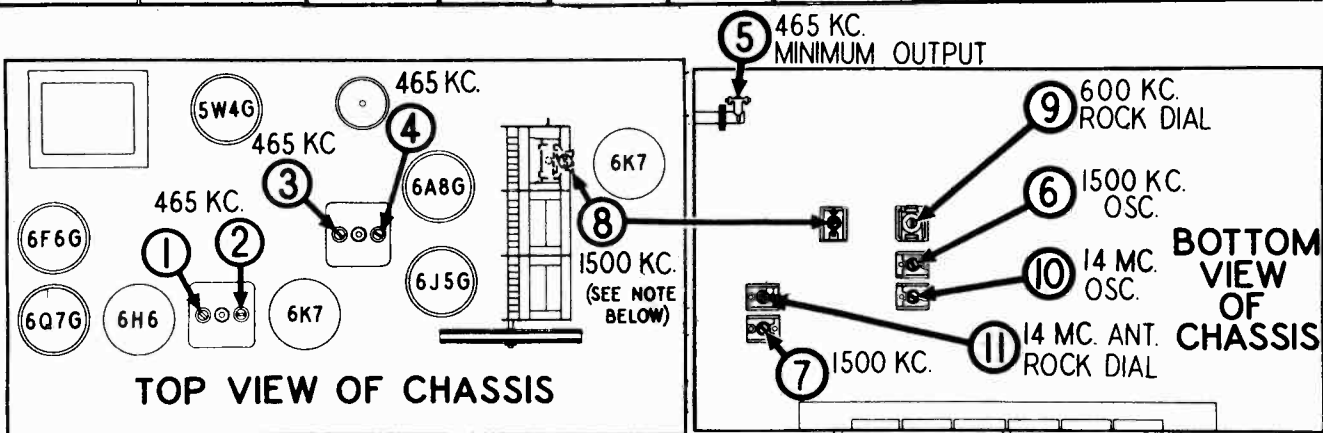
STEWART-WARNER CORP. MODELS 01-811 to 01-819
 08-811 to 08-819
 010-811 to 010-819
 Alignment, Trimmers

ALIGNMENT EQUIPMENT & PROCEDURE

ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 14 MC are required.

1. Connect the output meter across the voice coil or between the plate of the 6F6G output tube and ground, in series with a .1 mfd. condenser depending upon the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis or to the "G" terminal at the back of the chassis. NOTE:—The "G" and "D" terminals on this terminal strip must be connected together.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the alignment procedure.
4. With the gang condenser in full mesh, set the pointer to the last mark on the left end of the dial scale. If the pointer is incorrectly set, it is only necessary to loosen the set screw on the dial cord drive drum and push the gang condenser in full mesh with the pointer properly set, then retighten the set screw.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF SIG. GENERATOR TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RANGE SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD CONDENSER	CONTROL GRID OF 6A8G TUBE	465 KC	BROADCAST	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2 3-4	2ND I.F. 1ST I.F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
200 MFD. MICA CONDENSER	ANTENNA TERMINAL	465 KC	BROADCAST	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT. USING A STRONG GENERATOR SIGNAL.
200 MFD. MICA CONDENSER	ANTENNA TERMINAL	1500 KC	BROADCAST	1500 KC	6	BROADCAST OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
200 MFD. MICA CONDENSER	ANTENNA TERMINAL	1500 KC	BROADCAST	TUNE TO 1500 KC GENERATOR SIGNAL	7 8	BROADCAST DETECTOR BROADCAST ANTENNA	ADJUST FOR MAXIMUM OUTPUT.
200 MFD. MICA CONDENSER	ANTENNA TERMINAL	600 KC	BROADCAST	TUNE TO 600 KC GENERATOR SIGNAL	9	BROADCAST OSCILLATOR (SERIES)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	14 MC	FOREIGN	14 MC	10	FOREIGN OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 13.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 14 MC WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	14 MC	FOREIGN	TUNE TO 14 MC GENERATOR SIGNAL	11	FOREIGN ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.



NOTE: ON SOME SETS TRIMMER NO. 8 IS LOCATED ON THE REAR SECTION OF THE GANG CONDENSER, WHILE ON OTHERS IT IS LOCATED UNDERNEATH THE CHASSIS.

MODELS 01-811 to 01-819
 08-811 to 08-819
 010-811 to 010-819
 Tuner, Drive Cord Data
 STEWART-WARNER CORP.

CIRCUIT FEATURES

This chassis is an 8 tube, two band, push button tuning superheterodyne receiver. The tuning ranges are 530 to 1730 KC and 5.5 to 16 MC.

Incorporated in each chassis is an eight button tuner switch. The first two buttons on the left are tone controls. Four different tone qualities may be imparted to a program by properly setting these tone buttons. The remaining six buttons are used for automatic tuning. Automatic tuning is accomplished by substituting pre-set trimmers for the variable gang condenser. The push-button switch provides a simple rapid method of effecting this substitution.

It should be noted that the R.F. stage in this receiver operates only on the Broadcast Band. When the band switch is in the "Automatic", "Intermediate" or "Foreign" positions this R.F. stage is not utilized.

HOW TO SET UP THE PUSH BUTTON TUNER

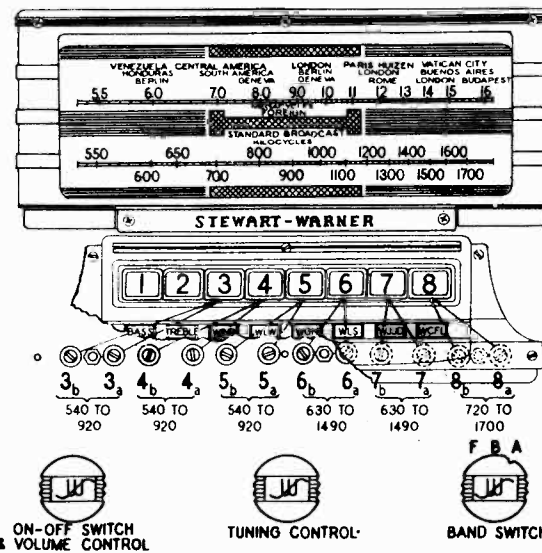
1. Connect your set to a good antenna system.
2. Turn on the set and allow it to operate at least one-quarter hour before setting up the push buttons.
3. Make a list of the frequencies of six nearby stations to which you wish to set up the buttons. Be sure to select nearby, powerful stations, since weak stations will generally give better results when tuned manually. Also be sure to select stations falling within the tuning range of the individual buttons, as indicated in Fig. 1.

Each of the buttons on your "Magic Keyboard" can be made to tune in stations in a definite frequency range as shown in Fig. 1. It is imperative that you select a station whose frequency is in the operating range of a button before attempting to set-up that button for the particular station. IT IS IMPORTANT THAT THE PROPER BUTTONS BE SELECTED AS THE ADJUSTING SCREW SHOULD NEVER BE TOO LOOSELY OR TOO TIGHTLY ADJUSTED. For example, suppose you want to set a button to station KDKA whose frequency is 980 kilocycles. Refer to Fig. 1, which shows that this frequency falls within the operating range of buttons No. 6 or No. 7, whose range is 630 to 1490 KC or of button No. 8 whose range is 720 to 1700 KC. Therefore either buttons No. 6, No. 7 or No. 8 can be used for the automatic tuning of stations KDKA.

heard, advance the volume control. BE SURE THAT YOU ADJUST THIS PARTICULAR SCREW (3a) TO THE POINT WHERE THE PROGRAM IS HEARD WITH THE DEEPEST TONE. It is advisable that you turn the screw in and out so that you will tune across the station several times in order that you may be sure you have located the correct tuning point.

8. Next insert the screw driver in the first screw on the left (No. 3b, Fig. 1) and turn it until the program is received with deepest tone. Now go back to screw No. 3a and see if any improvement in the reception can be made by adjusting it. Also repeat this adjustment for screw No. 3b.
9. Set up button No. 4 for the selected station in a similar manner, using screws No. 4a and 4b, and proceed to set up the remaining buttons in the same fashion, always tuning in the station initially with the "a" screw for that particular button.
10. Call letter tabs and celluloid windows are supplied with your receiver. The tabs are used to label the six push buttons set up for stations. The celluloid tabs are supplied as a perforated sheet which is to be broken into eight sections. Select the proper call letter tabs from the station call letter sheets supplied. Place the call letter tab in back of the celluloid window and insert it in its proper slot in the push button escutcheon.
11. Replace the escutcheon with its six retaining screws.

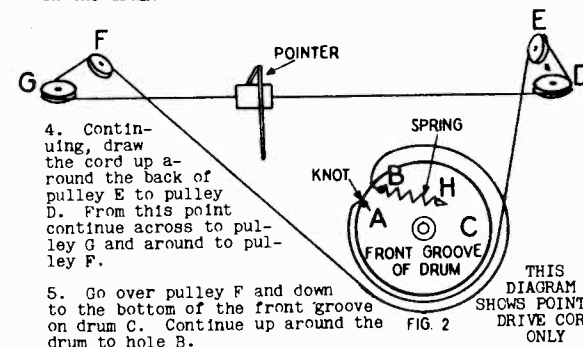
IMPORTANT
 12. In some instances it may be necessary, after the set is operated for a month or more, to reset the screws as they may change their setting due to heat, humidity, etc.



4. Remove the escutcheon around the push buttons taking out the six screws holding it to the cabinet. This will expose to view six pairs of adjusting screws, each pair of which is used to tune in a station that you wish to set-up on a particular button.
5. Turn the band switch (Right hand knob) to the center (B) position, as indicated by the notch on the band switch knob. Then using the tuning knob (center) tune in the station you desire to set to button No. 3. This is done so that you may identify the station by hearing its program.
6. Now turn the band switch knob to the extreme clockwise position. The notch on the band switch knob will now indicate the "A" (Automatic) position. You will note when this switch is turned, the station previously tuned in will not be heard.
7. Now push in the third button from the left (No. 3 in Fig. 1). Using a small screw driver, insert it in the second screw from the left (No. 3a in Fig. 1). Rotate the screw SLOWLY until the program that you have previously tuned in manually is again tuned in. If it cannot be

REPLACING THE DIAL POINTER DRIVE CORD

1. Tie a large knot in one end of about 51" of special dial cord, part No. 111302.
2. Thread the free end of the cord through hole A in drum C (threading from the inside of the drum out) See Fig. 2.
3. After pulling the cord through hole A, make one half turn around the drum C in a counter-clockwise direction (viewed from the front), using the front groove in the drum.



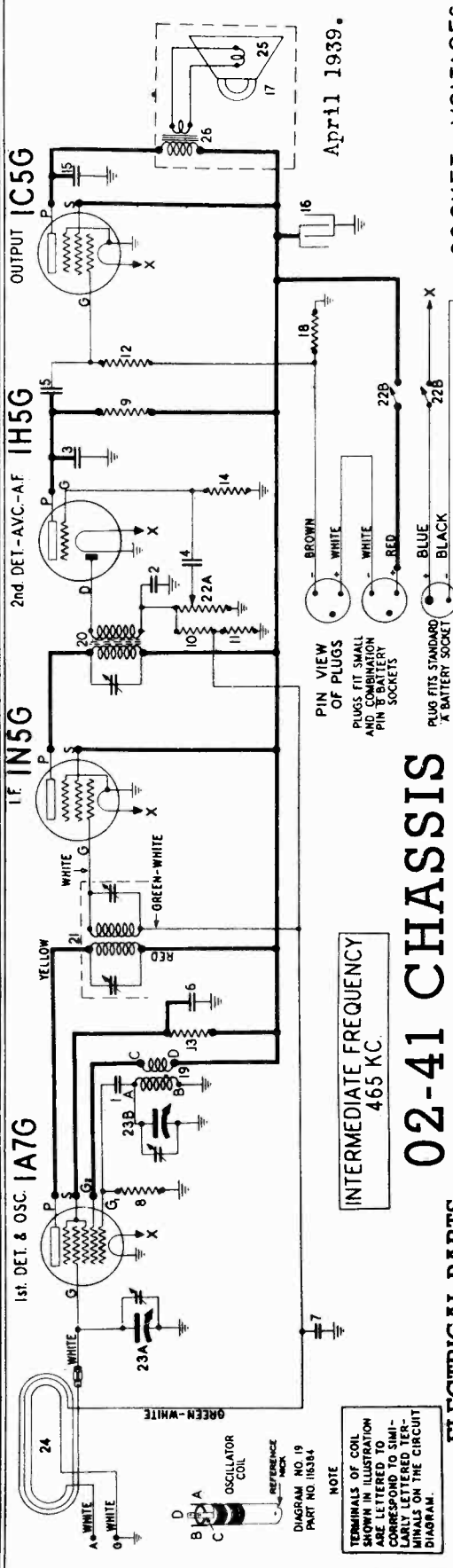
4. Continuing, draw the cord up around the back of pulley E to pulley D. From this point continue across to pulley G and around to pulley F.
5. Go over pulley F and down to the bottom of the front groove on drum C. Continue up around the drum to hole B.
6. Draw the cord through hole B and tie it to the end of the tension spring in such a manner that when the spring is clipped on to lug H it will be extended to about 1 1/2" long.

HUM

In some of the first sets produced Resistor No. 23 in the 6F6G grid circuit was 470,000 ohms, also condenser No. 9 and Resistor No. 27 were omitted. The hum level in these sets can be reduced by adding these two parts and changing Resistor No. 23 to 220,000 ohms. All chassis with this circuit change are stamped with the letter "9" on the back.

STEWART-WARNER CORP.

MODELS 02-411 to 02-419
Chassis 02-41
Schematic, Voltage
Socket, Notes



ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2-3	85061	Condenser—mica 51 mmfd.	.....
4-5	88030	Condenser—paper .01 mfd. 400 volt.	.....
6-7	88189	Condenser—paper .05 mfd. 200 volt.	.....
8	110553	Resistor—carbon 220,000 ohms 1/4 watt	.....
9	110554	Resistor—carbon 1 megohm 1/4 watt.	.....
10-11-12	110570	Resistor—carbon 2.2 meg. 1/4 watt.	.....
13	110578	Resistor—carbon 68,000 ohms 1/4 watt.	.....
14	110580	Resistor—carbon 3.3 meg. 1/4 watt.	.....
15	113035	Condenser—ceramic tube .006 mfd. 600 volt.	.....
16	113118	Condenser—electrolytic 8 mfd. 150 volt	.....
17	R-115049	Speaker—P.M. dynamic (5 1/4")	6.25
18	116061	Resistor—800 ohm 1/4 watt 10%	.....
19	116384	Coil—oscillator	45
20	116385	Transformer—2nd I.F.	90
21	116386	Transformer—1st I.F.	1.20
22A-22B	116393	Volume control—1 meg. (with on-off switch)	96
23A-23B	116401	Condenser—variable gang	2.75
24	116437	Loop antenna assembly	1.60
25	R-116461	Cone and voice coil for R-115049 speaker	1.55
26	R-116462	Transformer—output for R-115049 speaker	.90

MISCELLANEOUS PARTS

Part Number	Description	List Price
116399	Cable—for batteries	\$.60
116441	Cabinet	6.25
112745	Clip—coil mounting	.01
113019	Clip—dial scale retaining	.01
113178	Cord—dial (supplied in 4 ft. lengths)	.30
116442	Dial scale	.18
116418	Grille—for speaker	.40
116405	Indicator—on-off	.18
116411	Indicator lever assembly	.09
116416	Knob—for tuning or volume	.12
116488	Nut—No. 8—32 wing nut	.01
116409	Pointer	.05
81145	Retaining ring—for drive shaft	Per C
116455	Screw—chassis mounting (No. 10x5/8)	.01
85827	Set screw—No. 8-32 square head	.02
116403	Shaft, tuning	.08
116395	Shield—tube	.08
116392	Shield cap—tube	.02
116392	Shield base—tube	.03
114876	Socket—octal base	.15
113169	Spring—for indicator lever	.01
111981	Spring—for dial cord tension	.03
85785	Terminal strip—antenna—ground	.15
84015	Washer—paper, for back of knobs	.01
116414	Window dial	.25

02-41 CHASSIS

REAR OF CHASSIS

SOCKET VOLTAGES
DIAL TUNED TO 540 KC

1A7G
1st. DET. & OSC.
83 35 O
15 (P) (F) (G) (A) (B) (C) (D) (E) (H) (K) (L) (M) (N) (O)

1N5G
IF
83 35 O
15 (P) (F) (G) (A) (B) (C) (D) (E) (H) (K) (L) (M) (N) (O)

1H5G
2nd DET.-AVC.-AF
83 35 O
15 (P) (F) (G) (A) (B) (C) (D) (E) (H) (K) (L) (M) (N) (O)

1C5G
OUTPUT
83 35 O
15 (P) (F) (G) (A) (B) (C) (D) (E) (H) (K) (L) (M) (N) (O)

NOTE A: The bias for the control grid of the 1C5G tube is -7.5 volts measured across resistor 18.
NOTE B: Due to the high resistance of plate resistor No. 83 only a slight deflection will be obtained when using a meter having a resistance of 1000 ohms per volt.

IN THIS RECEIVER, THE LOOP ANTENNA ON THE BACK OF THE COVER OF THE CASE, TAKES THE PLACE OF THE LOOP ANTENNA, AND THE BATTERIES MUST BE MOUNTED IN THE CABINET IN THEIR CORRECT POSITION.

Holes are provided in the bottom of the case to permit the adjustment of both antenna and oscillator trimmers with the receiver completely assembled. These two adjustments should be made with a signal generator but without an output meter since it is impractical to keep the output meter connected when the back is mounted on the cabinet. That is, the antenna and oscillator trimmers can be adjusted by ear using a signal generator. The I F trimmers must be adjusted with an output meter in the conventional way.

MODELS 02-411 to 02-419

Chassis 02-41

Alignment, Trimmers

Loop, Battery Data

STEWART-WARNER CORP.

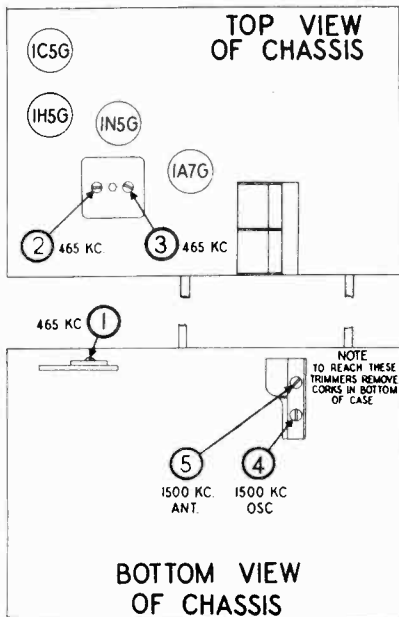
ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT an output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or between the plate of the 1C5G output tube and ground through a 0.1 Mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the Ground Terminal or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position while aligning.
4. With the gang condenser in full mesh, set the dial pointer in a horizontal position. If the pointer is incorrectly set, it is merely necessary to move the pointer to the correct position by hand, while holding the gang in the full mesh position.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Control Grid of 1A7G	465 KC	Any Point Where It Does Not Affect Signal	1	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				2-3	1st I.F.	
400 Ohm Carbon Resistor	Antenna Terminal On Bottom Of Cabinet	1500 KC	1500 KC	4	Broadcast Oscillator (Shunt)	Adjust trimmer for maximum output.
400 Ohm Carbon Resistor	Antenna Terminal On Bottom Of Cabinet	1500 KC	Tune To 1500 KC Generator Signal	5	Broadcast Antenna	Adjust for maximum output.

Before proceeding further with alignment, disconnect the output meter, and replace chassis, batteries and loop in cabinet, being sure to connect the loop. Using a weak signal from the signal generator, make the following adjustments by ear. The trimmers may be reached through the holes in the bottom of the cabinet by removing corks.



LOOP ANTENNA

A built-in loop antenna is incorporated in this receiver. Due to the directional effect of this type of antenna it will often be possible to increase the signal volume by rotating the entire set.

In some locations it may be desirable to install an external antenna to increase the volume of weak or distant stations. This external antenna should be connected to the screw marked A on the terminal strip located on the bottom of the receiver case. Connect a ground wire to the post marked G on the same terminal strip.

NOTE: You must connect a ground wire to this receiver when using a separate outside aerial, otherwise you will not obtain a satisfactory increase in signal pickup.

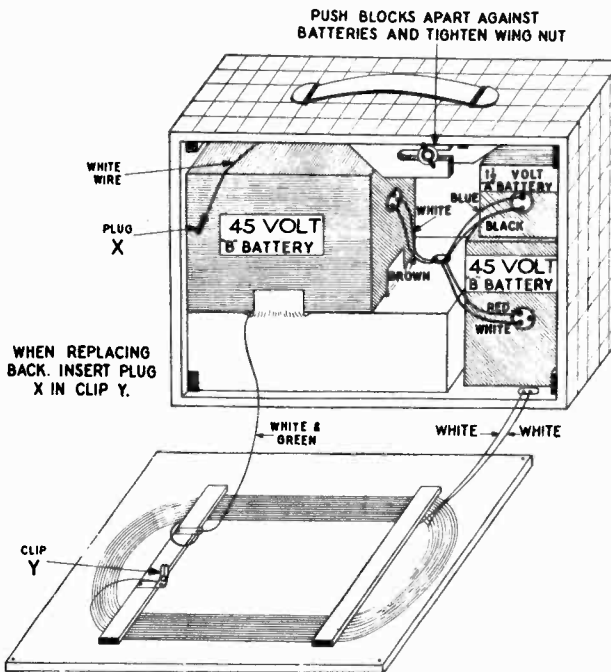
INSTALLATION OF BATTERIES

The following 1½ volt "A" batteries will fit the space provided: Burgess No. 4FAP1, Eveready No. 742, or Ray-O-Vac No. P94A.

"B" batteries of the proper size are Burgess B30PI, Eveready No. 762 and Ray-O-Vac No. 5303.

A plug and clip connection on the loop is provided to facilitate the installation of batteries. Before replacing the back of the cabinet always be sure that this plug is pushed into the clip and that the blocks are holding the batteries firmly in their positions.

Do not permit any of the battery cable plugs to come in contact with the receiver chassis or any battery terminal other than that to which it is to be connected.

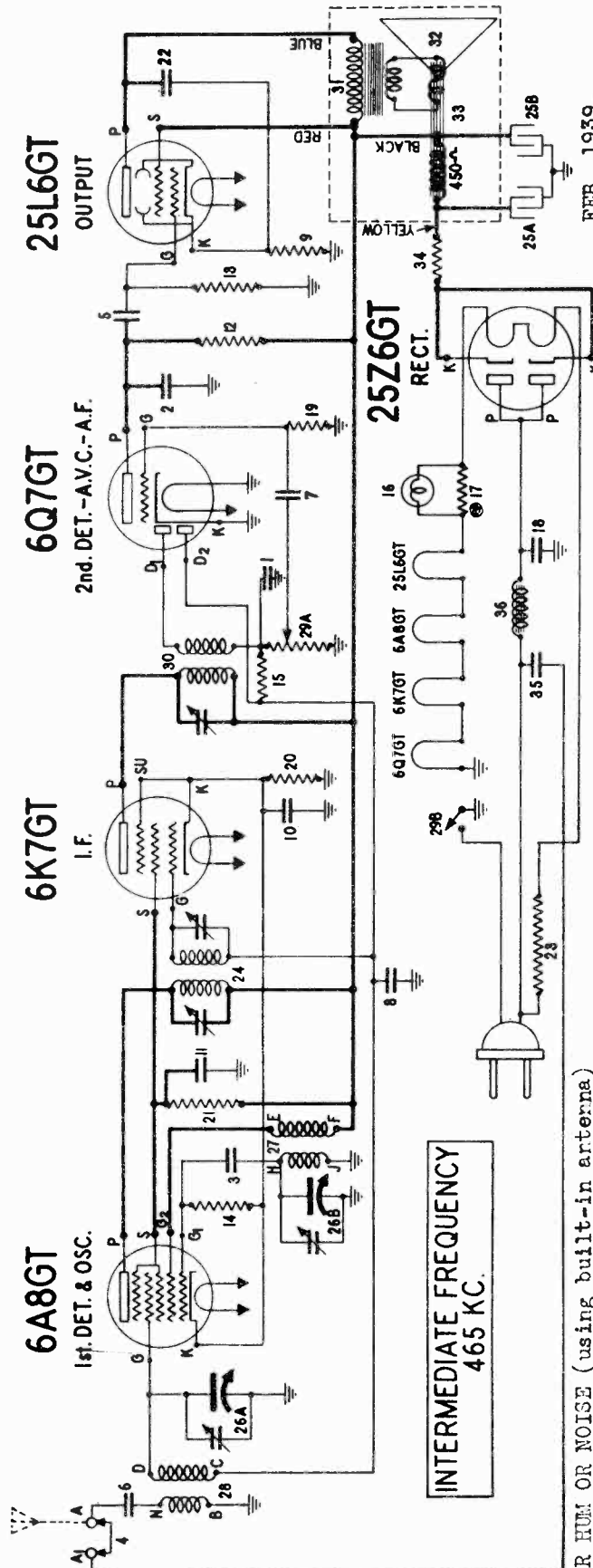


Chassis 07-513
Schematic, Voltage
Socket, Coils, Changes

STEWART-WARNER CORP.

MODELS 07-511 to 07-519
Chassis 07-51
07-5113 to 07-5193

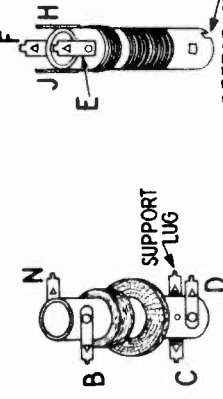
To prevent filter condenser and rectifier tube failure caused by line surges, a 50 ohm resistor is connected in the rectifier cathode circuit.



FEB. 1939.

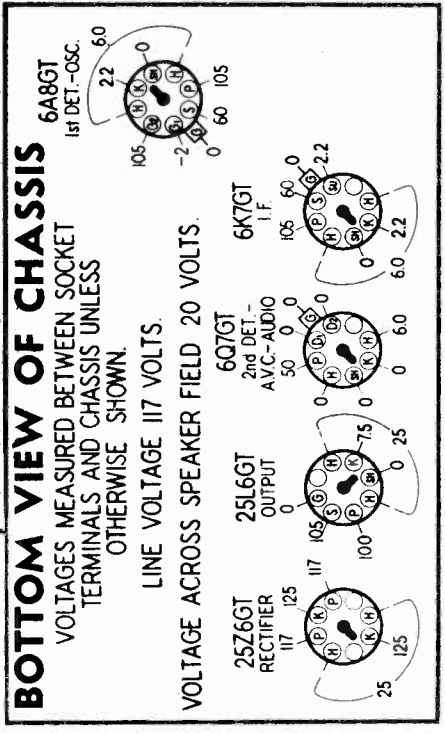
DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1-2	65360	Condenser - mica 200 mfd.	.20
3	65764	Condenser - mica 100 mfd.	.01
4	65321	Connector	.01
5	86026	Condenser - paper .02 mfd. 400 volt	.25
6-7	86028	Condenser - paper .04 mfd. 400 volt	.25
8	86189	Condenser - paper .05 mfd. 200 volt	.25
9	86190	Condenser - paper .05 mfd. 200 volt	.25
10-11	69421	Resistor - paper 200 ohms	.25
12	110554	Resistor - carb. 250,000 ohms 1/2 watt	.12
13	110559	Resistor - carb. 470,000 ohms 1/2 watt	.12
14	110578	Resistor - carb. 68,000 ohms 1/2 watt	.12
15	110579	Resistor - carb. 50,000 ohms 1/2 watt	.12
16	110580	Resistor - carb. 50,000 ohms 1/2 watt	.12
17	110575	Resistor - wire wound 33 ohms W104	.12
18	112754	Resistor - paper .05 mfd. 400 volt	.12
19	112754	Resistor - carbon 10 meg. 1/4 watt	.12
20	112754	Resistor - carbon 250 ohms 1/4 watt	.12
21	114108	Condenser - paper .03 mfd. 750 volt	.25
22	114108	Condenser - paper .03 mfd. 750 volt	.25
23	114797	Power cord (dropping resist. 143 ohms 104) Brown	.98
24	114802	Transformer - 1st I.F. 15 mfd. 150 v.	1.10
25A	25B	Transformer - 2nd I.F. 15 mfd. 150 v.	1.10
26A	26B	Transformer - 1st A.V.C. 15 mfd. 150 v.	1.10
27	114872	Condenser - electrolytic 5000 uf. 50 v.	.18
28	114872	Oscillator coil	.18
29	114872	Antenna coil	.18
30	114872	Volume control - 1 meg. with switch	.18
31	R-115041	Transformer - 2nd I.F. 15 mfd. 150 v.	.18
32	R-114866	Transformer-output (for R-115041 spkr)	.18
33	O-115041	Cone & Voice Coil (for R-115041 spkr)	.18
34	R-115041	Cone & Voice Coil (for O-115041 spkr)	.18
35	115041	Speaker - dynamic (4 inch) 500 volt	.18
36	115041	Speaker - dynamic (4 inch) 500 volt	.18
37	115041	Speaker - dynamic (4 inch) 500 volt	.18
38	115041	Speaker - dynamic (4 inch) 500 volt	.18
39	115041	Speaker - dynamic (4 inch) 500 volt	.18
40	115041	Speaker - dynamic (4 inch) 500 volt	.18
41	115041	Speaker - dynamic (4 inch) 500 volt	.18
42	115041	Speaker - dynamic (4 inch) 500 volt	.18
43	115041	Speaker - dynamic (4 inch) 500 volt	.18
44	115041	Speaker - dynamic (4 inch) 500 volt	.18
45	115041	Speaker - dynamic (4 inch) 500 volt	.18
46	115041	Speaker - dynamic (4 inch) 500 volt	.18
47	115041	Speaker - dynamic (4 inch) 500 volt	.18
48	115041	Speaker - dynamic (4 inch) 500 volt	.18
49	115041	Speaker - dynamic (4 inch) 500 volt	.18
50	115041	Speaker - dynamic (4 inch) 500 volt	.18

OSCILLATOR COIL
DIAGRAM NO. 27
PART NO. 114872



NOTE
TERMINALS OF COILS SHOWN
IN PICTORIAL VIEWS ABOVE ARE
LETTERED TO CORRESPOND TO
SIMILARLY LETTERED TERMINALS
ON THE CIRCUIT DIAGRAM.

ANTENNA COIL
DIAGRAM NO. 28
PART NO. 114873



FOR HUM OR NOISE (using built-in antenna)
1. Try reversing power line plug.
2. If not corrected, Remove connector between A and A1. of chassis, and connect an external antenna to A.

BOTTOM VIEW OF CHASSIS
VOLTAGES MEASURED BETWEEN SOCKET
TERMINALS AND CHASSIS UNLESS
OTHERWISE SHOWN.
LINE VOLTAGE 117 VOLTS.
VOLTAGE ACROSS SPEAKER FIELD 20 VOLTS.

REAR OF CHASSIS

Resistor No. 17 changed to a 3 watt molded wire-wound resistor, Part 116479 to prevent failure of the resistor if the dial bulb burns out.

IMPORTANT: Use a high resistance voltmeter of at least 1000 ohms per volt.

MODELS 07-511 to 07-519
07-511S to 07-519S STEWART-WARNER CORP.

Alignment, Trimmers
Antenna Notes

07-51 CHASSIS

ALIGNMENT PROCEDURE

ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 1500 KC are required.

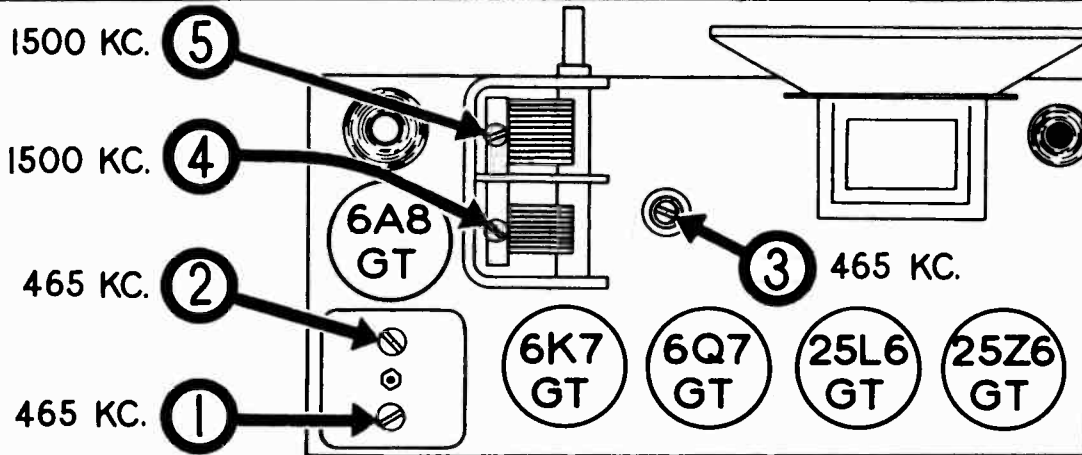
Connect the output meter across the voice coil or between the plate of the 25L6-GT output tube and ground through a .1 mfd. condenser, depending upon the type of meter. The more sensitive type should be connected across the voice coil.

Connect the ground lead of the signal generator to the chassis of the receiver through a .25 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to do this may have serious results as the signal generator may be connected to one side of the power line, or it may be grounded externally.

Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.

Remove the connector between Terminals A and A₁.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF SIG. GENERATOR TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
200 MMFD. MICA CONDENSER	CONTROL GRID OF 6A8-G TUBE	465 KC	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1-2	1ST I. F.	ADJUST FOR MAXIMUM OUTPUT THEN REPEAT ADJUSTMENT
				3	2ND I. F.	
200 MMFD. MICA CONDENSER	ANTENNA TERMINAL (A)	1500 KC	1500 KC	4	BROADCAST OSCILLATOR (Shunt)	ADJUST TRIMMER TO BRING IN SIGNAL.
200 MMFD. MICA CONDENSER	ANTENNA TERMINAL (A)	1500 KC	TUNE TO 1500 KC GENERATOR SIGNAL	5	BROADCAST ANTENNA (Shunt)	ADJUST FOR MAXIMUM OUTPUT.



MISCELLANEOUS PARTS

BUILT-IN ANTENNA SYSTEM

The Built-In Antenna incorporated in this receiver will generally give very satisfactory results in localities where Powerful broadcast stations exist. This Built-In Antenna will function when terminals A and A₁ on the back of the chassis are connected together. In cases where noises are excessive or greater sensitivity is desired, remove the jumper connecting terminals A and A₁ and connect an external antenna to terminal A.

Refer to the circuit diagram on the opposite page. Condenser No. 35 couples the primary of the antenna coil to one side of the power line, which acts as the antenna. The R. F. choke No. 36 is an iron-core choke whose impedance is high at broadcast frequencies. This choke serves to prevent feed-back into the antenna circuit, of radio frequency energy generated in the set itself. It also prevents condenser No. 18 from by-passing the signal voltage picked up by the power line.

When aligning this receiver, the jumper connecting terminals A and A₁ should be removed. This will prevent picking up signals which might interfere with the alignment procedure. When the I. F. channel is being aligned, the gang condenser should be set at a point where no interfering signal will be received.

PART NUMBER	DESCRIPTION	LIST PRICE
112745	Clip - coil mounting	.01
114876	Socket - octal base	.15
114982	Socket - for dial lamp	.20
116223	Terminal Strip - for antenna (A-A ₁)	.12

CABINETS

114900	Cabinet - ivory (plaskon) for 07-512	5.50
114950	Cabinet - walnut; for 07-511	3.00
116332	Cabinet - sprayed ivory for 07-513	4.25
116339	Cabinet - metallic blue	4.25
116340	Cabinet - metallic red	4.25
116341	Cabinet - metallic green	4.25

CABINET BACKS

116369	Cabinet back (ivory) for 07-512	.10
116370	Cabinet back (ivory) for 07-512-S	.10
116371	Cabinet back (walnut) for 07-511 & 07-513	.10

TUNING KNOBS

114973	Knob - tuning (red)	.45
116297	Knob - tuning (ivory)	.40

VOLUME KNOBS

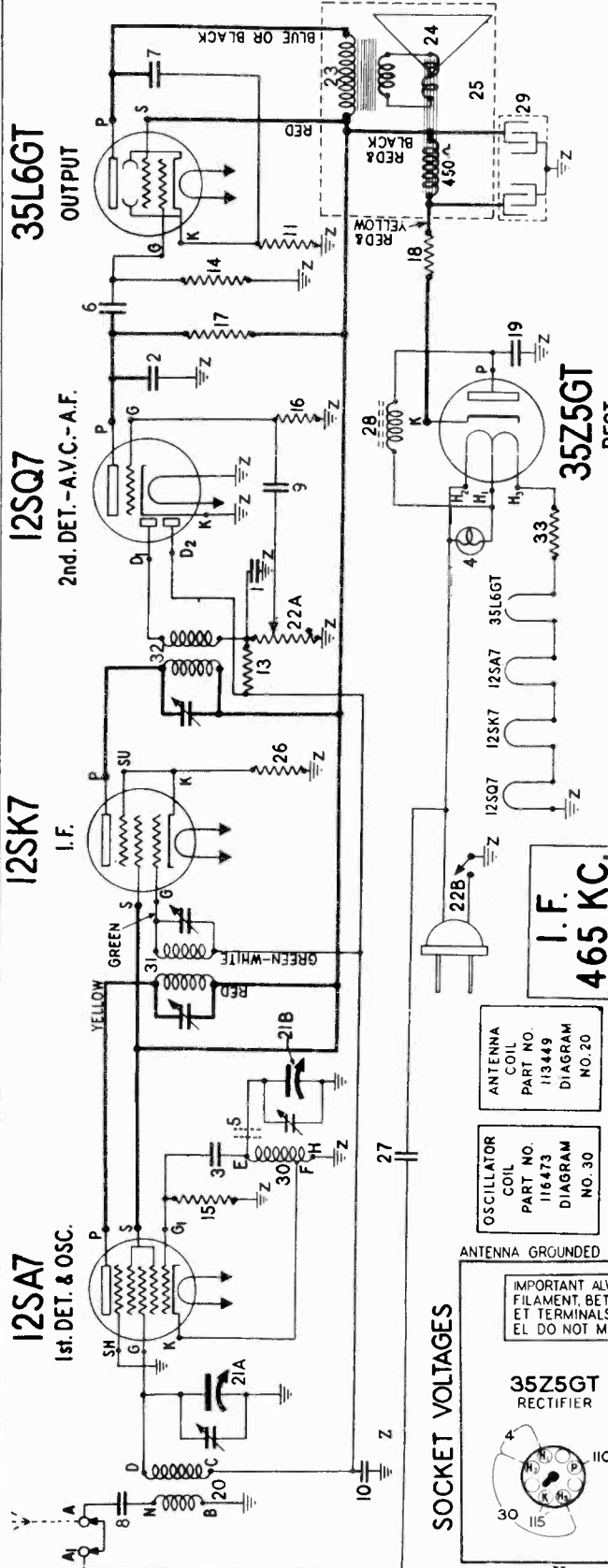
114867	Knob - volume (red)	.08
116299	Knob - volume (ivory)	.08

07-551 to 07-559

MODELS 07-511H to 07-519H

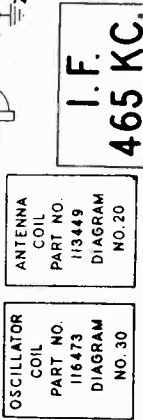
Chassis 07-55
Schematic, Voltage
Socket, Notes

STEWART-WARNER CORP Chassis 07-51H



APPLIES ONLY TO CHASSIS STAMPED 07-51H OR 07-55.

List Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica 260 mmdf	\$.20
3	114870	Condenser—mica 110 mmdf	.20
4	114879	Lamp—dial 6 to 8 volt .25 amps.	.16
5	85296	Condenser—paper .02 mfd. 400 volt (07-55 only)	.25
6-7	88026	Condenser—paper .02 mfd. 400 volt	.25
8-9	88029	Condenser—paper .004 mfd. 400 volt	.25
10	88189	Condenser—paper .05 mfd. 200 volt	.25
11	89276	Resistor—wire wound 140 ohms 1/2 watt	.12
13-14	89421	Condenser—paper 1 mfd. 200 volt	.25
15	110559	Resistor—carbon 470,000 ohms 1/4 watt	.12
16	110578	Resistor—carbon 68,000 ohms 1/4 watt	.12
17	110580	Resistor—carbon 5.3 meg. 1/4 watt	.12
18	110591	Resistor—carbon 680,000 ohms 1/4 watt	.12
19	110975	Resistor—wire wound 35 ohms 1/2 watt (10%)	.12
20	111252	Condenser—paper .05 mfd. 400 volt	.13
21	113449	Coil—antenna	.78
22	116232	R. F. Choke	.48
23	0-116343	Transformer—output for 0-115041 speaker. 150 volt	1.75
24	0-115041	Speaker—dynamic 4" (07-51H)	4.70
25	R-115041	Speaker—dynamic 4" (07-51H)	4.70
26	0-115050	Speaker—dynamic 4" (used on some 07-51H)	3.75
27	R-115051	Speaker—dynamic 4" (used on some 07-51H)	3.75
28	0-116062	Resistor—150 ohms ± 20% 1/4 watt	.12
29	116224	Condenser—mica 260 mmdf. 500 volt.	.15
30	0-116342	Transformer—output for 0-115041 speaker. 150 volt	1.75
31	0-115041	Speaker—dynamic 4" (07-51H)	4.70
32	0-115050	Speaker—dynamic 4" (used on some 07-51H)	3.75
33	R-115051	Speaker—dynamic 4" (used on some 07-51H)	3.75
34	0-116487	Transformer—output for 0-115051 speaker. 1.25	1.25
35	R-116486	Transformer—output for 0-115051 speaker. 1.25	1.25
36	0-116524	Transformer—output for 0-115051 speaker. 1.65	1.65
37	R-116524	Transformer—output for 0-115051 speaker. 1.65	1.65
38	0-116527	Resistor—100 ohms ± 10% 5 watt W.W.	1.26
39	116470	Condenser—electrolytic 20-20 mfd. 150 volt	.95
40	116475	Coil—oscillator	.35
41	116474	Transformer—1st I.F.	1.10
42	116475	Transformer—2nd I.F.	1.10
43	0-116487	Transformer—output for 0-115050 speaker. 1.25	1.25
44	R-116524	Transformer—output for 0-115051 speaker. 1.65	1.65
45	116527	Resistor—100 ohms ± 10% 5 watt W.W.	1.26



SOCKET VOLTAGES

IMPORTANT ALWAYS MEASURE ALL VOLTAGES, EXCEPT FILAMENT, BETWEEN THIS LUG AND THE TUBE SOCKET TERMINALS ON THE 07-55 CHASSIS. IN THIS MODEL DO NOT MEASURE VOLTAGES TO CHASSIS.

DIAL TUNED TO 540 KC

VOLUME CONTROL LINE VOLTAGE 117 VOLTS

VOLTAGE ACROSS SPEAKER FIELD 25 VOLTS

35Z5GT RECTIFIER
4 110 30 115

35L6GT OUTPUT
90 85 35

12SQ7 2ND DET-AVC-A.F.
30 12 90

12SK7 I.F.
12 13 90

12SA7 1ST DET & OSC
90 90 12

REAR OF CHASSIS BOTTOM VIEW

Use a high resistance voltmeter of at least 1,000 ohms per volt.

“Z” GROUNDS MARKED

07-55 CHASSIS: ALL GROUNDS MARKED “Z” ARE NOT CONNECTED DIRECTLY TO CHASSIS BUT ARE CONNECTED TOGETHER AND GROUNDED TO CHASSIS THROUGH .1 MFD. CONDENSER (PART NO. 89421).

07-51H CHASSIS: GROUNDS MARKED “Z” CONNECTED DIRECTLY TO CHASSIS.

MODELS 07-51H to 07-519H
 Chassis 07-51H
 07-551 to 07-559
 Chassis 07-55
 Alignment, Trimmers
 Antenna Data

STEWART-WARNER CORP.

ALIGNMENT PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. On the 07-51H, connect the output meter across the voice coil or between the plate of the 35L6GT output tube and chassis through a .1 mfd. condenser, depending upon the type of meter. The more sensitive type should be connected across the voice coil. THE CONNECTIONS FOR THE 07-55 ARE THE SAME EXCEPT CONNECT THE GROUND LEAD TO THE POINT SHOWN IN FIG. 2 INSTEAD OF TO CHASSIS.
2. When aligning the 07-51H chassis, connect the ground lead of the signal generator to the chassis of the receiver through a .25 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. FOR THE GROUND LEAD CONNECTION TO THE 07-55 CHASSIS, REFER TO "BOTTOM VIEW," FIG. 2.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. Remove the connector between Terminals A and A₁.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator To Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Mica Condenser	Trimmer Lug On Front Section Of Variable Condenser	465 KC	1750 KC	1	2nd I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
				2-3	1st I.F.	
200 MMFD. Mica Condenser	Antenna Terminal (A)	1500 KC	1500 KC	4	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Antenna Terminal (A)	1500 KC	Tune To 1500 KC Generator Signal	5	Broadcast Antenna (Shunt)	Adjust for Maximum Output.

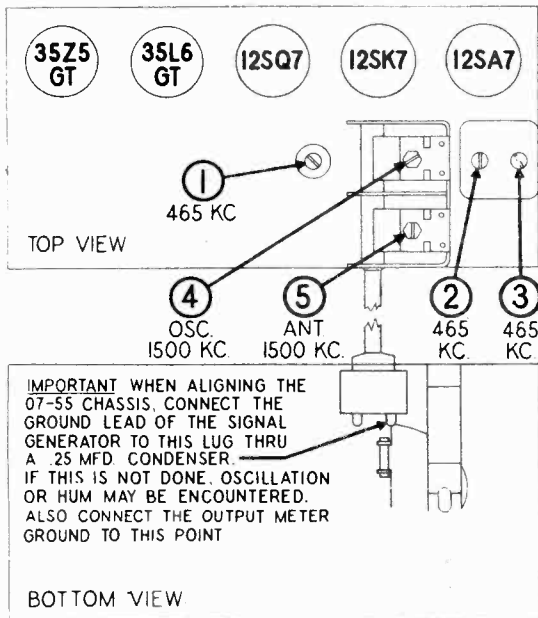


Fig. 2

BUILT-IN ANTENNA SYSTEM

The Built-In Antenna incorporated in this receiver will generally give very satisfactory results in localities where powerful broadcast stations exist. This Built-In Antenna will function when terminals A and A₁ on the back of the chassis are connected together. In cases where noise is excessive or greater sensitivity is desired, remove the jumper connecting terminals A and A₁ and connect an external antenna to terminal A.

The Built-In Antenna Condenser No. 27 couples the

primary of the antenna coil to one side of the power line, which acts as the antenna. The R. F. choke No. 28 is an iron-core choke whose impedance is high at broadcast frequencies. This choke serves to prevent condenser No. 19 from by-passing the signal voltage picked up by the power line. It also prevents feed-back into the antenna circuit of radio frequency energy generated in the set itself.

When aligning this receiver, the jumper connecting terminals A and A₁ should be removed. This will prevent picking up signals which might interfere with the alignment procedure.

MISCELLANEOUS PARTS

Part No.	Description	List Price
116485	Asbestos Pad-Model 07-55 only	\$0.03
116467	Base-Condenser Mounting	.04
116471	Cover for elect. condenser-(07-55) only	.05
116651	Clamp for power cord-(07-55) only	.02
112745	Clip-coil mounting	.01
114982	Socket-for dial lamp	.20
114876	Socket-octal base	.15
85040	Screw-No. 6 Hex. Hd.-Per C	.35
116223	Terminal strip-antenna (A-A ₁)	.12

CABINETS

116750	Cabinet (wood)-(07-514H) and (07-554)	7.00
116341	Cabinet (metallic green)-(07-513H) (07-553)	2.75
116340	Cabinet (metallic red) (07-513H) (07-553)	2.75
116339	Cabinet (metallic blue)-(07-513H) (07-553)	2.75
116338	Cabinet (sprayed ivory)-(07-513H) (07-553)	2.75
114950	Cabinet (walnut)-(07-511H) (07-551)	2.00
114900	Cabinet (ivory plaskon)-(07-512H) (07-512H-S) (07-552S) (07-552)	3.40

CABINET BACK

116497	Cabinet Back (walnut) (07-511H) (07-513H)	.12
116496	Cabinet Back (ivory) (07-513H) (07-512H)	.12
116481	Cabinet Back (ivory) (07-552S)	.12
116480	Cabinet Back (walnut) (07-551) (07-553)	.12
116477	Cabinet Back (ivory) (07-551) (07-553) (07-552)	.12

TUNING KNOBS

116297	Knob-tuning (ivory)-(07-513H) (07-553)	.40
114975	Knob-tuning (walnut)-(07-511H) (07-551) (07-514H)	.45
114973	Knob-tuning (red)-(07-512H) (07-512H-S) (07-513H) (07-553) (07-552) (07-552S)	.45

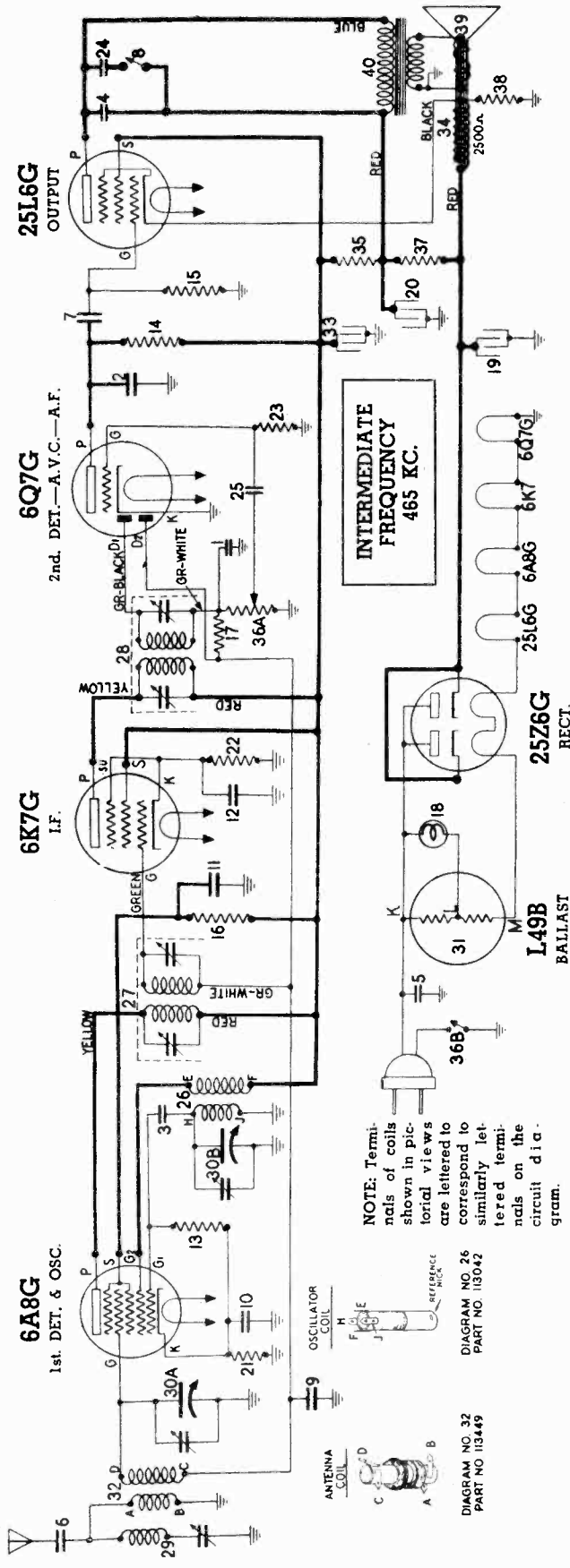
VOLUME KNOBS

116299	Knob-tuning (ivory) (07-513H) (07-553)	.08
114933	Knob-tuning (walnut) (07-511H) (07-514H) (07-551)	.12
114867	Knob-tuning (red) (07-512H-S) (07-512H) (07-513H) (07-552S) (07-552) (07-553)	.08

Schematic, Voltage Socket

STEWART-WARNER CORP.

MODELS 07-631 to 07-639
Chassis 07-63



NOTE: Terminals of coils shown in pictorial views are lettered to correspond to similarly lettered terminals on the circuit diagram.

DIAGRAM NO. 32
PART NO. 113449

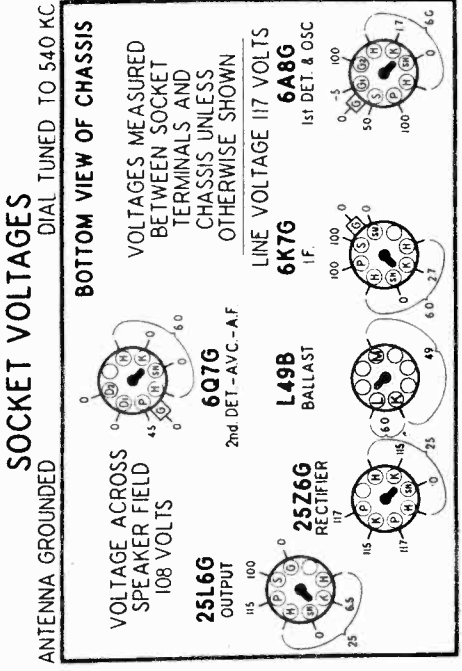
DIAGRAM NO. 26
PART NO. 113042

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica 280 mmd.	.20
3	85061	Condenser—51 mmd.	.15
4-5	86026	Condenser—paper 02 mfd. 400 volt	.25
6	86023	Condenser—paper 004 mfd. 400 volt	.25
7	86030	Condenser—paper 01 mfd. 400 volt	.25
8	86054	Switch—tone control	.30
9	86189	Condenser—paper 05 mfd. 200 volt	.25
10-11-12	89421	Condenser—paper 1 mfd. 200 volt	.25
13	110532	Resistor—carbon 47,000 ohms 1/4 watt	.12
14	110533	Resistor—carbon 220,000 ohms 1/4 watt	.12
15	110539	Resistor—carbon 470,000 ohms 1/4 watt	.12
16	110586	Resistor—carbon 33,000 ohms 1/4 watt	.12
17	110590	Resistor—carbon 3.3 meg. 1/4 watt	.12
18	110623	Lamp—6.3 volt .25 amps.	.15
19-20	112898	Condenser—electrolytic 16 mfd. 150 v.	.50
21-22	112951	Resistor—carbon 400 ohms 1/4 watt	.12
23	112975	Resistor—carbon 10 meg. 1/4 watt	.12
24	113034	Condenser—paper 04 mfd. 600 volt	.15
25	113035	Condenser—paper .006 mfd. 600 volt	.14
26	113042	Coil—oscillator	.45
27	113046	Transformer—1st I.F.	1.00
28	113047	Transformer—2nd I.F.	1.10
29	113119	Coil—wave trap (with trimmer)	.50
30A-30B	113150	Condenser—variable gang	3.00
31	113365	Ballast Resistor (tube) L-49-B	.78
32	113449	Coil—antenna	.45
33	113472	Condenser—electrolytic 40 mfd. 150 v.	.56
34	U-115044	Speaker—dynamic 5"	4.80
35	116060	Resistor—carbon 1500 ohms 1/2 watt	.15
36A-36B	116270	Volume control—1 meg. with switch	.94
37	116275	Resistor—wire wound 50 ohms 1/2 watt	.15
38	116301	Resistor—wire wound 80 ohms 1 watt	.15
39	U-116306	Cone—voice coil for U-115044 speaker	1.40
40	U-116307	Output transformer for U-115044 spkr.	1.75

DIAL & MISCELLANEOUS PARTS

Part No.	Description	List Price
113170	Adjusting lug—for button shafts	\$0.01
113171	Bracket—for dial and condenser mtg.	.64
112745	Celluloid covers—over dial face	.28
112745	Clip—for coil mtg.	.01
112764	Clip—dial scale retaining	.01
112798	Clip—for wave trap mtg.	.01
113178	Coil—dial (supplied in 4 ft. lengths)	.30
113174	Dial Drum—and pinion assembly	.44
115175	Dial scale	.30
113053	Escutcheon—for push buttons	.32
112914	Escutcheon—dial	.35
113156	Gear and Bushing assembly for dial drive	.22
113022	Knob—tone and volume control	.10
113494	Mechanical tuner assembly; keys & housing only	3.00
112770	Pointer—dial	.08
112762	Push button—cord drive	.04
113102	Push button (w/adjust)	.06
91143	Retaining ring—for tuning shaft	Per C
14598	Rubber tube on tuning shaft	.50
85040	Screw—No. 6 x 1/4 Hex. Hd. for Mtg. Adjust. Lug	.35
112874	Screw—for chassis mtg. 10 x 1 1/8"	.01
114431	Screw—No. 6-40 x 7/8" for setting up buttons.	.01
114314	Screw special head for mtg. escutcheon	Per dz.
85327	Set Screw—8-32 square head	.02
113176	Shaft—dial drive	.18
112864	Shield—for tubes	.08
112865	Shield—base for tubes	.03
112817	Socket—for dial lamp	.22
114876	Socket—acral base	.15
113189	Spring—for key return	.01
113177	Spring—dial cord tension	.09
113189	Tab—celluloid for push button	Per dz.
113321	Tab—station call letters for push buttons	.40
116530	Washer—paper for back of knobs	.005
110829	Washer for chassis mtg.	.01



SOCKET VOLTAGES
DIAL TUNED TO 540 KC

ANTENNA GROUND

VOLTAGE ACROSS SPEAKER FIELD 108 VOLTS

2516G OUTPUT 115 100

6Q7G 2nd DET.-A.V.C.-A.F. 45 0 60

L49B BALLAST 100 100

25Z6G RECTIFIER 117 100

6A8G 600V 1st DET. & OSC 0 5 100

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS UNLESS OTHERWISE SHOWN

LINE VOLTAGE 117 VOLTS

REAR OF CHASSIS

Use a high resistance voltmeter of at least 1,000 ohms per volt.

MODELS 07-631 to 07-639

Chassis 07-63

Alignment, Trimmers, Tuner

Drive Cord Data

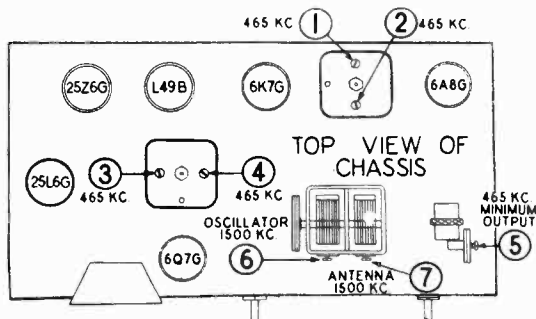
STEWART-WARNER CORP.

ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 1500 KC are required.

1. Connect the output meter across the voice coil or between the plate of the 25L6-G output tube and chassis through a .1 mfd. condenser, depending upon the type of meter. The more sensitive type should be connected across the voice coil.
2. Connect the ground lead of the signal generator to the chassis of the receiver through a .25 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to do this may have serious results as the signal generator may be connected to one side of the power line, or it may be grounded externally.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. With the gang condenser in full mesh, set the pointer to the last mark on the right end of the dial scale. If the pointer is only slightly off calibration, loosen the set-screw in the dial drive drum at the left side of the gang condenser and set the pointer to the last mark on the right end of the dial when the gang condenser is in full mesh. If the pointer is off calibration several dial divisions, release it from the pointer drive cord by spreading the clip on the pointer. Then slide the pointer along the cord until it is set to the last dial division on the right end of the dial. Holding it in place check to see if the gang condenser is in full mesh, and tighten the pointer clip, being careful not to cut the cord. Place a drop of household or speaker cement on the cord and pointer clip to prevent the pointer from slipping.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Mica Condenser	Control Grid of 6A8-G Tube.	465 KC	Any Point Where It Does Not Affect The Signal	1-2	1st I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
				3-4	2nd I.F.	
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	465 KC	Any Point Where It Does Not Affect The Signal	5	Wave Trap	Adjust for Minimum Output Using a Strong Generator Signal.
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	1500 KC	1500 KC	6	Broadcast Oscillator (Shunt)	Adjust Trimmer to Bring in Signal.
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	1500 KC	Tune To 1500 KC Generator Signal	7	Broadcast Antenna (Shunt)	Adjust for Maximum Output.



HOW TO SET UP PUSH BUTTONS

1. Before setting up buttons, turn on set for at least 15 minutes. To set up a push button, pull off the button cap by grasping the button and pulling outward on it. When the button is removed, the set-up screw will be exposed to view (See Fig. 1). Insert a screw-driver in this screw and loosen it (about one turn counter-clockwise will be sufficient).
2. Keeping the screw-driver in the screw slot, PUSH AGAINST THE SCREW-DRIVER UNTIL THE PUSH BUTTON SHAFT IS FORCED ALL THE WAY IN. While the button is held in this position, grasp the tuning knob and tune in the desired station. Then retighten the adjusting screw, turning clockwise until reasonably tight.

WARNING: Do not attempt to turn the screw until it reaches a definite stop. Merely turn until you meet with appreciable resistance. To turn further may result in damage to the mechanism.

HOW TO REPLACE THE DIAL DRIVE CORD

1. Close the gang condenser. The set screw in the drum, Fig. 1, must be on the top side.
2. Tie one end of the dial cord to the spring L and thread the other end through hole A and down the front of the drum to the tuning shaft. Continue around the shaft, then over pulley B and up the rear side of the drum.

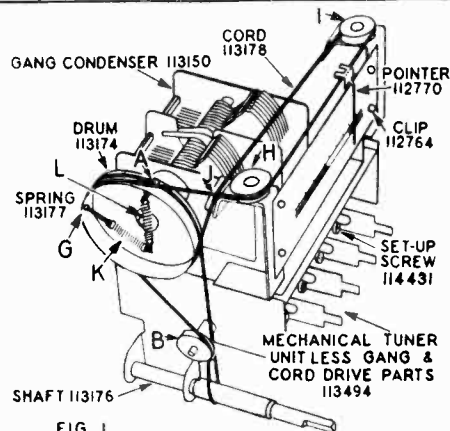
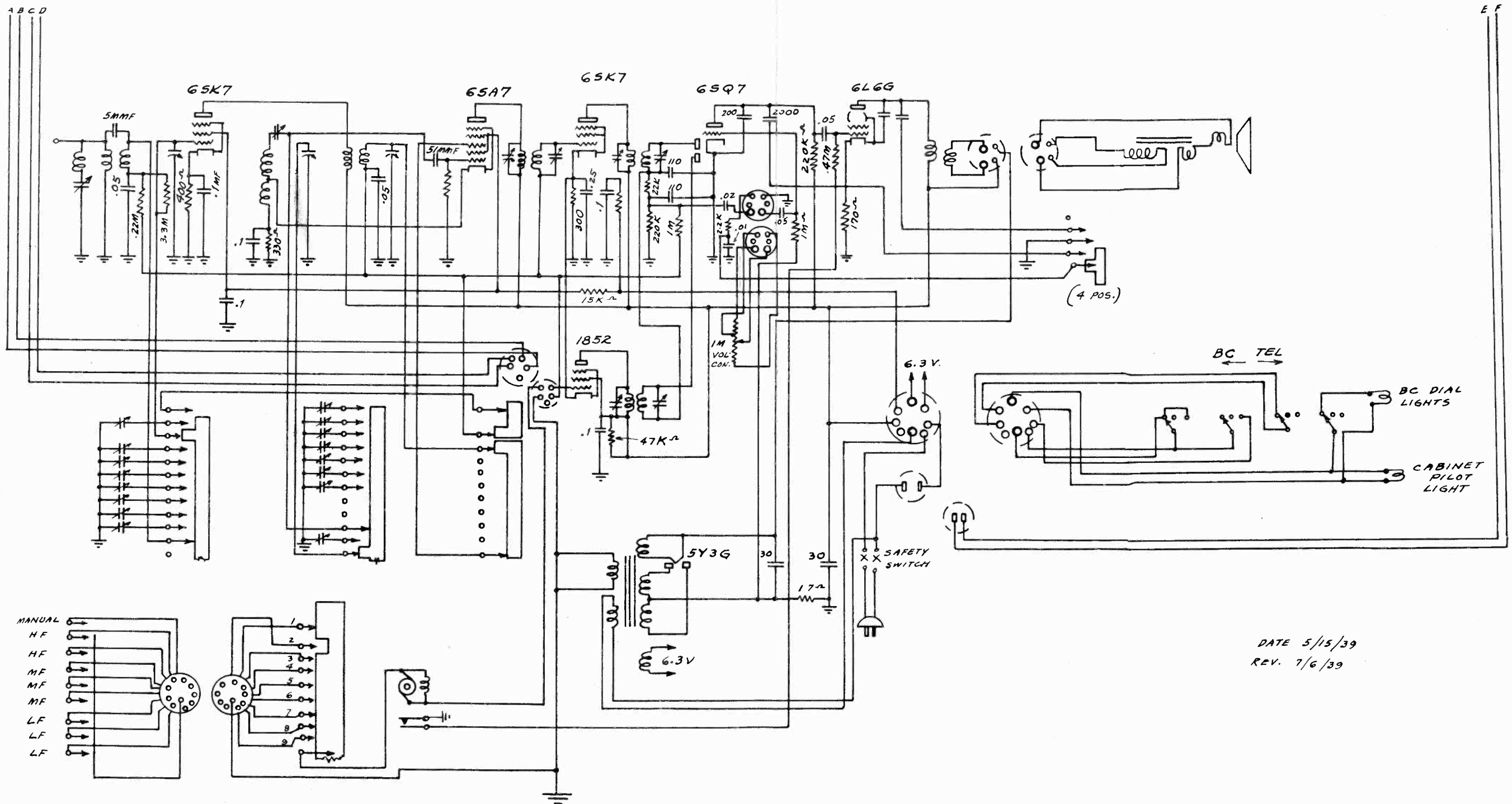


FIG. 1

HOW TO REPLACE DIAL POINTER DRIVE CORD

1. Close the gang condenser and thread one end of the cord through eyelet G and tie it to spring K.
2. Carry the other end of the cord over the drum to the front around pulley H and then across to pulley I and counter-clockwise around it.
3. Continue back to pulley J and down the front of the drum. Carry the end of the cord on around the drum and thread through eyelet G. Tie both ends extending through eyelet G to tension spring K.
4. **IMPORTANT:** In so doing, allow enough slack in the cord so that when spring K is hooked in place in the drum, it will be extended only a very little. If the spring is extended too much, it will tend to make the push button operate too hard because of overloading.
5. Be sure the gang condenser is closed, then set the dial pointer to the last dial division mark on the right and clip it to the cord



DATE 5/15/39
REV. 7/6/39

STROMBERG-CARLSON TEL. MFG. CO. Schematic

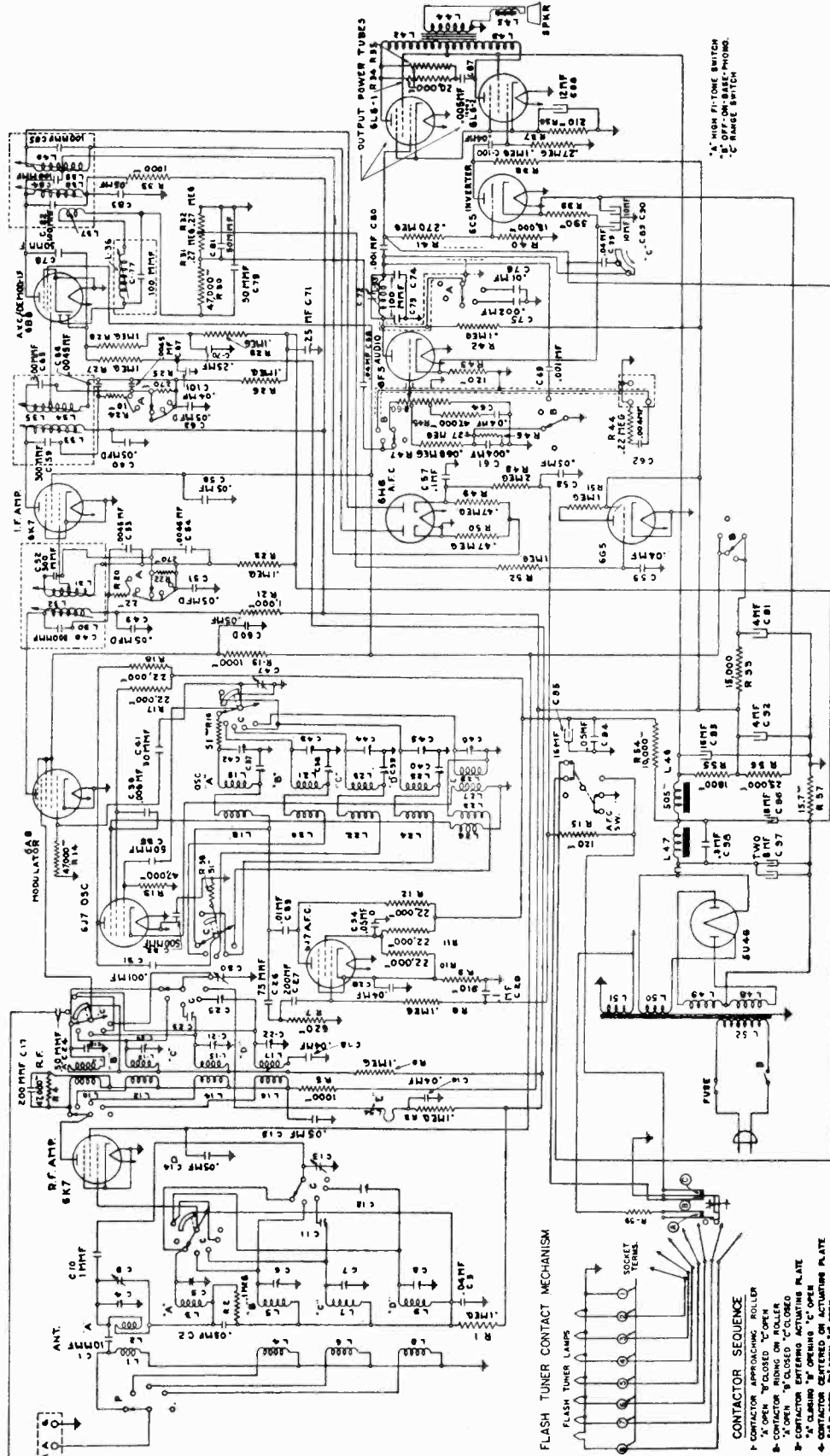


Fig. 2. Schematic Circuit.
APPARATUS SPECIFICATIONS

No. 255-L 50 to 60 Cycles; P-27633 Chassis; P-27504 Loud Speaker
 No. 255-LB 25 to 60 Cycles; P-27634 Chassis; P-27504 Loud Speaker

IF PEAK 465 KC

- FLASH TUNER CONTACT MECHANISM**
- FLASH TUNER LAMPS
 - SOCKET TERMINALS
- CONTACTOR SEQUENCE**
- ↑ CONTACTOR APPROACHING ROLLER
 - ↑ OPEN "C" CLOSED "C" OPEN
 - ↑ CONTACTOR RIDING ON ROLLER
 - ↑ OPEN "B" CLOSED "B" CLOSED
 - ↑ CONTACTOR OFFERING ACTUATING PLATE
 - ↑ CONTACTOR OFFERING ACTUATING PLATE
 - ↑ CLOSED "A" OPEN "A" OPEN

MODELS 255L, 255LB

Chassis Views

STROMBERG-CARLSON TEL. MFG. CO.

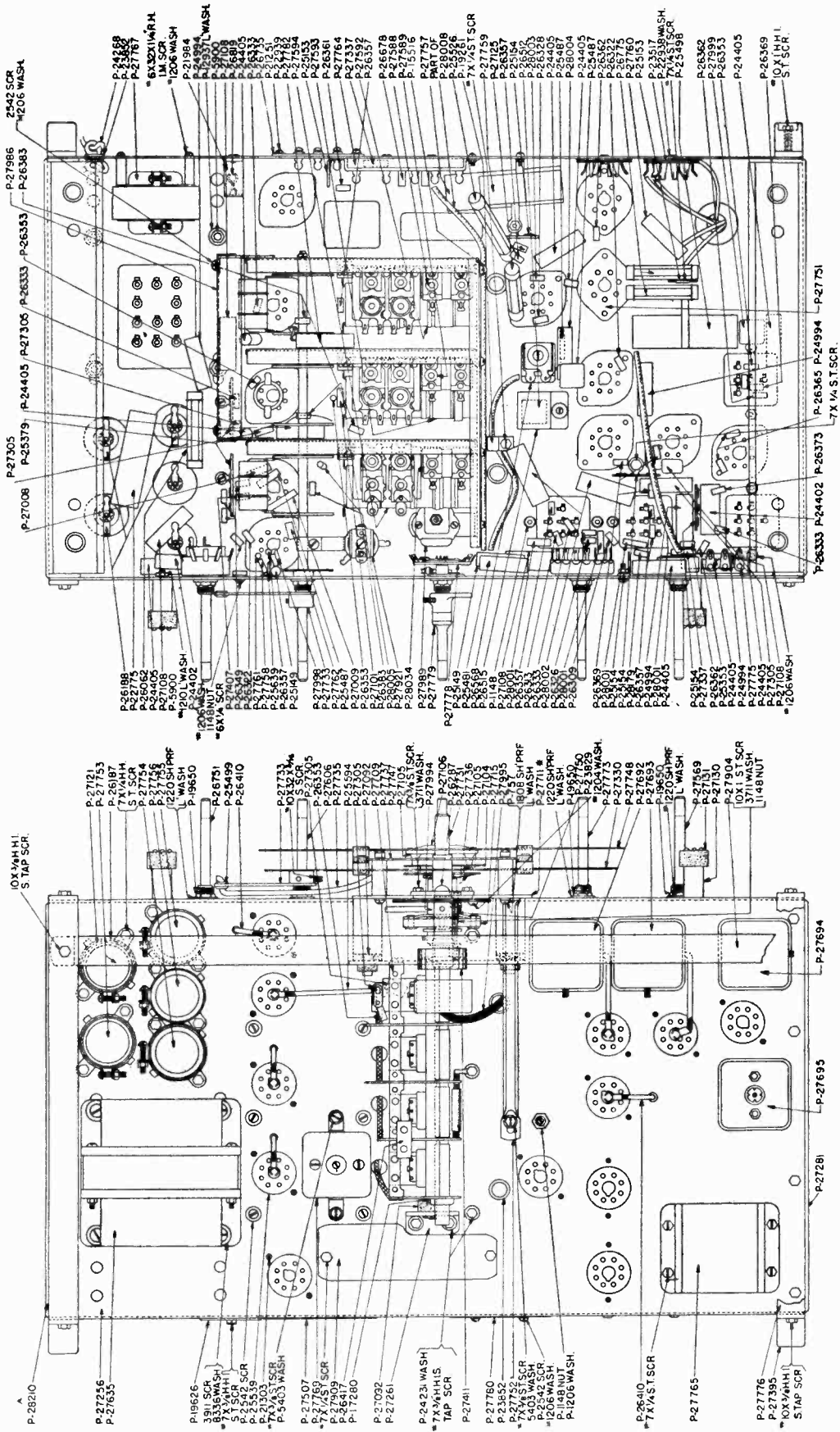


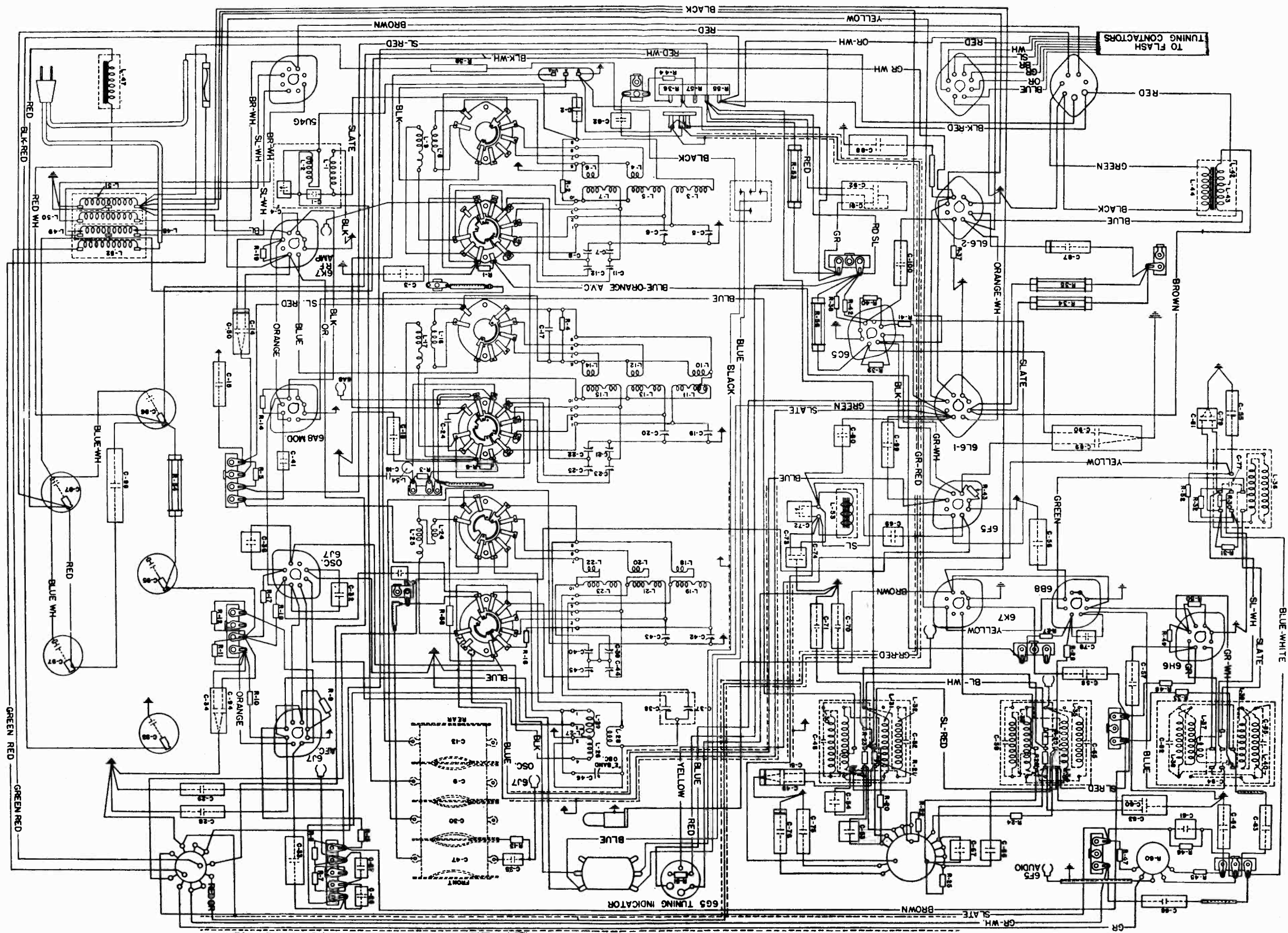
Fig. 6. Chassis Assembly.

Stromberg-Carlson

No. 255 Radio Receivers

- Type of Circuit..... Superheterodyne with Automatic Frequency Control
- Tuning Ranges..... A—530 to 1600 Kc.; B—1600 to 4800 Kc.; C—4800 to 11,000 Kc.
D—11,000 to 22,000 Kc.; E—22,000 to 60,000 Kc.
- Number and Types of Tubes..... 2 No. 6K7, 1 No. 6A8, 2 No. 6J7, 1 No. 6B8, 1 No. 6H6, 1 No. 6F5
1 No. 6C5, 2 No. 6L6, 1 No. 6G5, 1 No. 5U4G
- Input Voltage Rating..... 105 to 125 Volts A. C.
- Power Frequency Rating..... 25 to 60 Cycles and 50 to 60 Cycles
- Input Power Rating..... 145 Watts
- Frequency of Intermediate Amplifier..... 465 Kilocycles

STROMBERG-CARLSON TEL. MFG. CO.



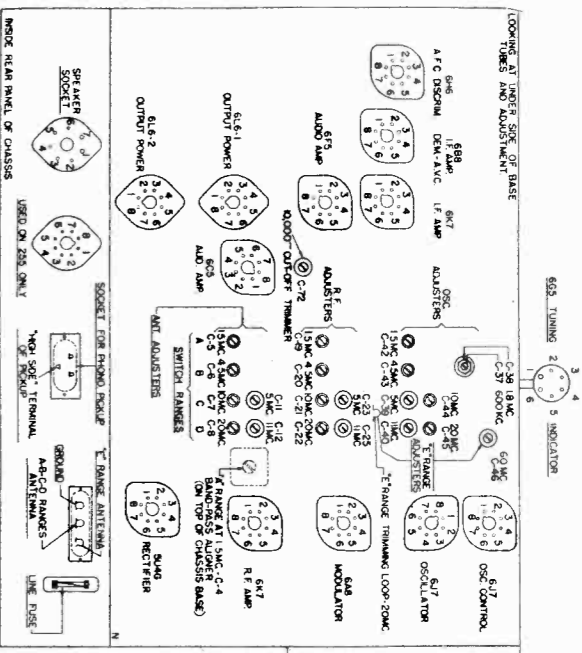


Fig. 1. Terminal layout for Voltage Measurement Chart and Location of the Various Adjusting Adaptors.

CONTINUITY TEST FOR NO. 255 RECEIVER.
ALSO MODEL 280
Nov. 1, 1937.

- For making a continuity test on the No. 255 Receivers, use the same test chart and instructions as are used on the No. 250 Receivers with the addition of the following tests for the Flash Tuner Unit:
1. Remove Flash Tuner Lamp Plug from Flash Tuner Lamp Socket. (This socket is located next to the speaker socket on rear of chassis).
 2. Operate A.P.C. to "ON" position (This switch is located directly under dial on front of chassis). Operate tuning dial until Finger No. 2 on Flash Tuner Unit makes contact on Switch (See Flash Tuner Sketch on Page 8 of Engineering Data Sheet for the No. 255 Receiver for the correct location of fingers). Read from No. 1 terminal of Flash Tuner Socket to chassis base, reading should be "S". Operate A.P.C. switch to "OFF" position. Reading should be "S". Read from No. 2 terminal of Flash Tuner Socket to chassis base, reading should be "0". Operate A.P.C. switch to "ON" position. Read from No. 2 terminal of Flash Tuner Socket to chassis base, reading should be 10".

NORMAL VOLTAGE READINGS

The various values of voltages listed in the following table are obtained by measuring between the various tube sockets and the chassis ground. Figure 1 shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and allowance should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring the following ranges: 0-25, 0-10, 0-100, 0-250, 0-500, 0-1000 volts except when an asterisk appears after any given volt-
age value in which case the 250 volt scale was used.

Tube	Circuit	Terminals of Sockets								Heater Voltages Between Heater Terminals	
		1	2	3	4	5	6	7	8	Socket Terminal Number	Volt
6A7	R. F. Amp.	0	0	+230	+30	0	+80	6.1	0	2.7	6.1
6A8	Modulator	0	0	+250	+80	-2.0	+90	6.1	0	2.7	6.1
6I7	Oscillator	0	0	6.1	+60	+180	0	0	0	2.7	6.1
6I7	Oscillator Control	0	0	+190	+110	+5.8	0	6.1	+5.8	2.7	6.1
6K7	I. F. Amp.	0	0	+235	+90	0	0	6.1	0	2.7	6.1
6I8	Dem.-A. V. C.	0	0	+225	-0.1	-0.1	+90	0	0	2.7	6.1
6I6	A. F. C.	0	0	-0.25	0	-0.2	-0.2	6.1	0	2.7	6.1
6I5	Audio Amp.	0	0	+135	+135	0	0	6.1	+1.3	2.7	6.1
6C5	Audio Amp.	0	0	+100	+135	0	+1.3	+5.2	2.7	6.1	6.1
6I6 No. 1	Audio Output	0	0	+300	+305	0	0	6.1	+22	2.7	6.1
6I6 No. 2	Audio Output	0	0	+300	+305	0	0	6.1	+22	2.7	6.1
6G5	Tuning Indicator	6.1	+0.5	-0.2*	+245	0	0	—	—	1.6	6.1
5U4G	Rectifier	0	+430	—	395	—	395	—	+430	2.8	4.8
Speaker Socket		—	+420	0	0	+430	+430	0	+320	—	—

A. C. voltages are indicated by italics. Receiver tuned to 1000 kc., no signal.

STROMBERG-CARLSON TEL. MFG. CO. SOCKET, TUNING, VOLTAGE, CONTINUITY MODELS 255L, 250LB

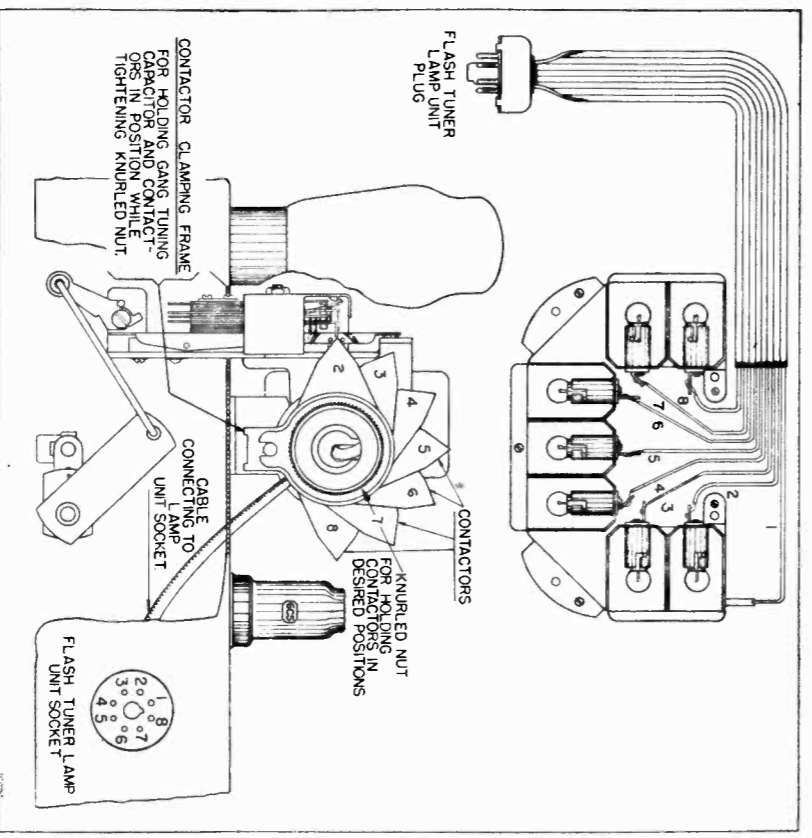


Fig. 4. Showing Flash Tuner Lamp Unit with Escutcheon Plate Removed (Top Figure) and Rear View of Receiver Showing Flash Tuner Mechanism (Bottom Figure).

PROCEDURE FOR OBTAINING REPRODUCTION FROM PHONOGRAPH RECORDS

A socket having three contacts is provided on the rear of the chassis base, and is wired to the "Off-On-Bass-Phonograph" switch assembly located on the front of the receiver. A three prong plug is also inserted in the socket so that if at any time it is desired to use an electric pick-up and phonograph unit in conjunction with this receiver, it may readily be accomplished.

In order to obtain the best quality of phonograph reproduction when using an electric pick-up and phonograph unit with this receiver, a Stromberg-Carlson No. 10 Record Player is recommended. This record player is equipped with a specially designed single record playing motor unit, and uses a crystal type pick-up in conjunction with a specially equalized circuit. To attach this instrument to the No. 255 receiver, a specially constructed adapter cable should be used. This cable should be inserted into the appropriate socket located on the rear of the chassis base. Then, the power supply plug of the phonograph unit should be inserted into a suitable power supply receptacle, and the unit will be ready for use.

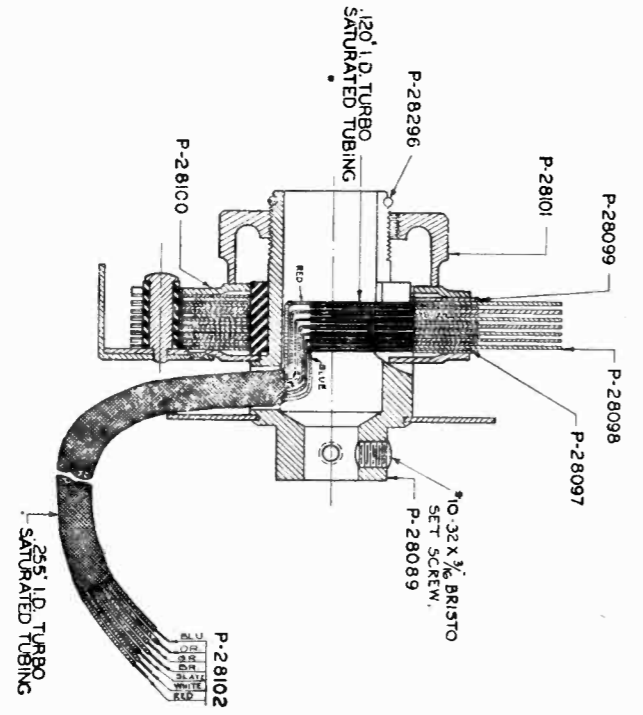


Fig. 5. Section View of Flash Tuner Contactors Assembly.

If the Stromberg-Carlson No. 10 Record Player is not used and the electric pick-up to be used is of the high impedance type, it will be necessary to connect a low capacity shielded cable between the three-prong plug furnished with the receiver and the pick-up. This shielded cable should be of the low capacity type, in order to prevent the excessive cutting of high frequencies which is caused when a shielded cable having high capacity is used. The length of the shielded cable used should be kept as short as possible.

If a pick-up of the low impedance type is used, it will be necessary to connect a "matching transformer" between the three-prong plug and the pick-up. The transformer should be located as near to the receiver as possible, in which case it will not be necessary to use a shielded cable.

Phonograph Data STROMBERG-CARLSON TEL. MFG. CO.

STROMBERG-CARLSON TEL. MFG. CO. MODELS 255L, 255LB
Alignment, Part 1

sary to make use of a signal generator whose high frequency range does not extend beyond 20 megacycles, using harmonics of 20 megacycles for aligning this range on 60 megacycles.

In aligning the radio frequency circuits for this range, replace the 0.1 mfd. capacitor which was placed in series with the signal generator's output lead for the I. F. alignment with a 400-ohm carbon type resistor. This lead should then be connected to the antenna binding post marked "U. H. A." located on the rear of the receiver chassis. The ground terminal (or low side) of the signal generator should be connected to the ground binding post on the receiver.

1. Operate the Range Switch on the receiver chassis to the "E" range position and set the signal generator's frequency and the receiver's tuning dial to 60 megacycles.
2. Adjust the aligning capacitor C-46 until maximum voltage output is obtained on the output meter.
3. Set the signal generator's frequency and the receiver's tuning dial to 20 megacycles and adjust the "E" range trimming loop, L-54, until maximum voltage output is obtained on the output meter. The adjustment of this loop is obtained by distorting its normally circular shape until it offers the correct inductive effect. If the oscillator does not track with the tuning dial scale at this frequency, it will be necessary to also adjust the oscillator's tuning loop.
4. Reset both the signal generator's frequency and the receiver's tuning dial to 60 megacycles and repeat operation No. 2.

Alignment of Short-Wave Range (Also referred to as "D" Band)

In aligning the radio frequency circuits for this range use the same artificial antenna (400-ohm carbon type resistor) in series with the output terminals of the signal generator, as was used for aligning the Ultra-Short Wave Range. Connect this lead to the antenna binding post marked "A" located on the rear of the receiver chassis, and align as follows:

1. Operate the Range Switch on the receiver chassis to the "D" range position and set the signal generator's frequency and the receiver's tuning dial to 20 megacycles.
2. Adjust aligning capacitors C-45, C-22, and C-8 respectively; and at the same time rotate the gang tuning capacitor slightly back and forth through resonance until maximum voltage output is obtained on the output meter.
3. Set the signal generator's frequency and the receiver's tuning dial to 11 megacycles and adjust aligning capacitors C-40, C-25, and C-12 respectively; and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
4. Reset both the signal generator's frequency and the receiver's tuning dial to 20 megacycles and repeat operation No. 2.

Alignment of Short-Wave Range (Also referred to as "C" Band)

In aligning the radio frequency circuits for this range use the same artificial antenna and binding post on the receiver chassis as was used for aligning the "D" range.

1. Operate the Range Switch on the receiver chassis to the "C" range position and set the signal generator's frequency and the receiver's tuning dial to 10 megacycles.
2. Adjust the aligning capacitors C-44, C-21, and C-7 respectively; and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
3. Set the signal generator's frequency and the receiver's tuning dial to 5 megacycles and adjust the aligning capacitors C-39, C-23, and C-11 respectively; and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
4. Reset both the signal generator's frequency and the receiver's tuning dial to 10 megacycles and repeat operation No. 2.

Alignment of Aircraft Range (Also referred to as "B" Band)

In aligning the radio frequency circuits for this range, use the same artificial antenna and antenna binding post as was used for aligning the "C" range, and align this range as follows:

1. Operate the Range Switch on the receiver chassis to the "B" range position and set the signal generator's frequency and the receiver's tuning dial to 4.5 megacycles.
2. Adjust the aligning capacitors C-43, C-20, and C-6 respectively; and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
3. Set the signal generator's frequency and the receiver's tuning dial to 1.8 megacycles and adjust the aligning capacitor C-28; and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
4. Reset both the signal generator's frequency and the receiver's tuning dial to 4.5 megacycles and repeat operation No. 2.

Alignment of Standard Broadcast Range (Also referred to "A" Band)

In aligning the radio frequency circuits for this range, replace the 400-ohm resistor in series with the signal generator's output with a 200-micro-microfarad capacitor and align this range as follows:

1. Operate the Range Switch to the "A" range position and set the signal generator's frequency and the receiver's tuning dial to 1.5 megacycles (1500 kilocycles).
2. Adjust the aligning capacitors C-42, C-19, C-4, and C-5 respectively; and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.

ALIGNMENT DATA

Dial Adjustment

Before aligning the circuits of these receivers, the tuning dial must be properly aligned to "track" with the gang tuning capacitor. To check whether the dial is set correctly with respect to the gang tuning capacitor, rotate the Rapid Station Selector knob in a counter-clockwise direction so that the gang tuning capacitor is set to the "Normal" position. The dial alignment lines (black lines) which are located at the extreme low frequency end of each scale on the dial. If these lines do not center over the illuminated dial indicator line, loosen the two set screws located on the hub of the dial. Then, rotate the dial so that these alignment lines are centered over the illuminated dial indicator line. The two set screws of the dial hub should then be securely tightened.

Intermediate Frequency and A. F. C. Circuit Adjustments

The intermediate frequency system employed in this receiver is a complex circuit. The first I. F. amplifier is coupled through the pentode section of the No. 6K7 tube. The second and third I. F. transformers are coupled through the pentode section of the No. 6B8 tube. The third I. F. transformer is in effect a distributing transformer which feeds the secondary of a push-pull transformer (A. V. C.) with the I. F. signal, while the other network of these networks links the diode stage (Demodulator-A. V. C.) with the I. F. signal, while the other network resembles the secondary of a push-pull transformer and constitutes the tuned "Discriminator" circuit. This "Discriminator" network, operating into the No. 6B6 tube supplies the characteristic voltage demanded by the oscillator control tube. The fourth I. F. transformer feeds the diode plates of the No. 6B8 tube.

The intermediate frequency used in these receivers is 465 kilocycles. Because of the necessity of obtaining the proper shape of resonance curve of these stages in a high fidelity receiver, it is recommended that unless it is absolutely essential, these I. F. adjustments be untouched. In the factory these adjustments are made using a visual system which allows the operator to see the exact shape of the resonance curve. For this reason it is best to have these adjustments made at the factory. However, in the case where this cannot be done, the following procedure should be followed:

1. Operate the Range Switch of the receiver to the "A" range position, and set the tuning dial to its extreme low frequency position. Set the Fidelity Control to its "Normal" position, the Automatic Frequency Control knob to the "Off" position and the "Off-On-Bass" Control knob to its "Normal" position. Never attempt to align the I. F. or I. F. circuits of this receiver with the Fidelity Control knob set at any position other than the "Normal Fidelity" position, and the Automatic Frequency Control knob set at the "On" position unless specifically directed in the following paragraphs.
2. Apply between the chassis base (or ground binding post) of the receiver and the grid of the No. 6A8 modulator tube, a modulated signal of 465 kilocycles from the signal generator, using a 0.1 mfd. capacitor in series with the connection between the output terminal of the signal generator and the grid of the No. 6A8 tube. Do not remove the chassis grid lead connecting to this tube. The ground (or low side) terminal of the signal generator should be connected to either the chassis base or the ground binding post terminal.
3. Now noting from Figure 1, the alignment adjustments for the First, Second, Third, and Fourth I. F. Transformers, align the I. F. circuits in the following manner:
Adjust the fourth I. F. transformer primary circuit for maximum output.
Adjust the third I. F. transformer "Discriminator" circuit midway between the peaks where maximum output is obtained.
Adjust the second I. F. transformer secondary circuit for maximum output.
Adjust the second I. F. primary circuit for maximum output.
Adjust the first I. F. secondary circuit for maximum output.
Adjust the first I. F. primary circuit for maximum output.

Carefully make all the above adjustments, watching carefully the output meter and reduce the output of the test oscillator as required.
To make the final adjustment of the "Discriminator" circuit proceed as follows:
Check the position of the A. F. C. control knob which should be set to the "off" position. Before making this circuit adjustment be sure that the I. F. Amplifier is tuned exactly to 465 kilocycles. With the signal generator still set at a frequency of 465 kilocycles, adjust the signal generator's output control so that a signal of 50,000 to 100,000 microvolts is fed into the No. 6A8 Modulator tube. Now observe the reading of the milliammeter which is connected in series with the cathode of the No. 6J7 oscillator control tube. Rotate the A. F. C. Control knob to the "on" position, and observe whether there is any difference in the reading of the milliammeter. When this circuit is correctly adjusted, there should be no difference in the reading of the milliammeter. If there is a difference, rotate the A. F. C. Control knob to the "off" position, and read the milliammeter reading while rotating the Automatic Frequency Control knob to the "off" and "on" position at a rate of about two cycles per second, adjust the "Discriminator" circuit by means of the screw adjustment located on the third I. F. transformer until the meter reading has the same value regardless of whether the A. F. C. Control knob is rotated to the "on" or "off" position. When this condition is obtained the "Discriminator" circuit of these receivers is properly adjusted.

Radio Frequency Adjustments

The alignment of the radio frequency circuits in these receivers should be very carefully made and in the order specified.
When making any aligning adjustments of these circuits, the A. F. C. Control knob should be rotated to the "off" position, the Fidelity Control knob should be set for "Normal" operation, and the "Off-On-Bass-Phono-graph" Control knob should also be set for "Normal" operation.

Alignment of Ultra-Short Wave Range (Also referred to as "E" Band)

In order to align the circuits of this range, it is desirable to have a signal generator whose high frequency range will go to 80 megacycles. Such equipment, however, is rare and costly, and in most cases it will be necessary to make use of a signal generator whose high frequency range does not extend beyond 20 megacycles, using harmonics of 20 megacycles for aligning this range on 60 megacycles.

MODELS 255L, 255LB
Alignment, Part 2 STROMBERG-CARLSON TEL. MFG. CO.
Parts List

REPLACEMENT PARTS

Part Number	Schematic Circuit Designation	Part
21894		Fuse Block Assembly
22775	C98	Capacitor, 4 Mfd.
23317		Tube Socket, 7 Prong
24258		Cord, Power Supply
24314	C1	Capacitor, Type "O", 10 Mmfd.
24402	C29, C57	Capacitor, .1 Mfd.
24405	C8, C18, C19, C28, C55, C64, C68, C99, C100, C101	Capacitor, .01 Mfd.
24550	C84	Capacitor, Type "O", 100 Mmfd.
24994	C15, C56, C58, C83	Capacitor, .05 Mfd.
25140	C38, C76	Capacitor, .01 Mfd.
25481	C75	Capacitor, .002 Mfd.
25487	C31, C69, C80	Capacitor, Type "W", .001 Mfd.
25498	C88, C90	Electrolytic Capacitor, 10 Mfd., 25 Volts; 10 Mfd., 25 Volts
25536	R55	Resistor, Type "E", 15,000 Ohms
25539		Tube Socket, 8 Prong
26002	R54	Resistor, Type "E", 10,000 Ohms
26287		Pilot Lamp
26309	R24	Resistor, Type "E", 10 Ohms
26313	R20	Resistor, Type "E", 22 Ohms
26322	R19, R43	Resistor, Type "E", 150 Ohms
26326	R22, R25	Resistor, Type "E", 270 Ohms
26328	B39	Resistor, Type "E", 390 Ohms
26333	R5, R19, R21, R33	Resistor, Type "E", 1,000 Ohms
26349	R10, R11, R12, R17	Resistor, Type "E", 22,000 Ohms
26353	R4, R13, R14, R30, R15	Resistor, Type "E", 41,000 Ohms
26357	R2, R6, R23, R26, R29, R38, R42	Resistor, Type "E", 1 Megohm
26361	R44	Resistor, Type "E", 22 Megohm
26362	R31, R32, R37, R40	Resistor, Type "E", 27 Megohm
26365	R49, R50	Resistor, Type "E", 47 Megohm
26369	R27, R28, R51, R52	Resistor, Type "E", 1 Megohm
26373	R48	Resistor, Type "E", 2.2 Megohm
26383	R1, R3, R6	Resistor, Type "E", 1 Megohm
26410		Grid Clo Assembly
27688	L48, L49, L50, L51, L52	Power Transformer (25 to 60 Cycles Chassis)
27645	L8, L9	Antenna Transformer, "D" Range
27644	L16, L17	B. F. Transformer, "D" Range
27645	L21, L22	Oscillator Transformer, "D" Range
27692	L30, L31, L32	First I. F. Transformer
27693	L33, L34, L35	Second I. F. Transformer
27694	L37, L38, L39, L40	Third I. F. Transformer
27695	L36	Fourth I. F. Transformer
27710	C9, C13, C30, C17	Gang Tuning Capacitor
27715		Coupling Assembly (Tuning Drive)
27720		Gear and Bracket Assembly
27728		Spring
27731		Drive Assembly
27732		Musk Assembly
27733		Lever Assembly, Musk Actuator
27738		Rod
27739		Spring Washer
27737		Indicator Frame Assembly
27748		Dial
27751		Tube Socket, 8 Prong
27752		Brace, Dial Support
27753	C97	Electrolytic Capacitor, 8 Mfd., 500 Volts
27754	C96	Electrolytic Capacitor, 16 Mfd., 400 Volts
27755	C93	Electrolytic Capacitor, 16 Mfd., 350 Volts
27756	C95	Electrolytic Capacitor, 16 Mfd., 300 Volts
27757	C91, C92	Electrolytic Capacitor, 4 Mfd., 250 Volts; 4 Mfd., 100 Volts
27758	C94	Capacitor, Type "O", 75 Mmfd.
27759	C98	Capacitor, 15 Mfd., 30 Volts
27760	C92	Capacitor, .005 Mfd., 1,000 Volts
27781	R7	Resistor, Type "E", 620 Ohms
27782	R9	Resistor, Type "E", 910 Ohms

27784	R30, R55, R57	Resistor, "E" Voltage Divider
27785	L42, L43, L44	Output Transformer
27787	I47	Choke Assembly
27789	L1, L2	Antenna Transformer, "A" Range
27793		Switch Assembly, High Fidelity-Tone Control
27794		Switch, A. F. C.
27799		Crank Arm
27805	C2	Capacitor, .03 Mfd.
27806	C6	Capacitor, H. F. Aligner for "A" Range Antenna Transformer
27812	L26, L27, L28, L29	Oscillator Transformer, "E" Range
27921	C46	Capacitor, Aligner, "E" Range
27984		Shield, "D" and "E" Range-Calls
27988	I54	Antenna Transformer Tuning Loop, "E" Range
27989	C37, C38	I. F. Aligners for "A" and "E" Range Oscillators
27994		Pilot Lamp Socket Assembly
27998		Cable Assembly (Tuning Indicator Unit)
27998	C27	Capacitor, Type "O", 200 Mmfd.
27999	C79, C81	Capacitor, Type "WD", 50 Mmfd.
28001	C53, C54, C66, C67	Capacitor, Type "W", .0015 Mfd.
28002	C70, C71	Capacitor, 25 Mfd., 150 Volts
28003	R30	Resistor, Type "E", 15,000 Ohms
28004	R41	Resistor, Type "E", 27 Megohm
28005	R16, R58	Resistor, Type "E", 51 Ohms
28008		Cable Assembly, Phonograph Switch to Phonograph Socket
28043	C39, C40, C42, C43, C44, C45	Capacitors, Aligning
28179	R47	Resistor, Type "E", 68,000 Ohms
28179	C10	Capacitor (Dimmick)
28332	C13, C74	Capacitor, Two, Type "W", 100 Mmfd.
28315	L53	Coil Assembly (High Frequency Cut-Off Filter)
28331		Socket (Tuning Indicator Tube)
28356	C72	Capacitor (High Frequency Cut-Off Filter)
28378		Socket, Phonograph Unit
28378		Antenna and Ground Binding Posts
28378		Switch Assembly, "Off-On Bass-Tone" Control
28378		Resistor, Type "E", 20,000 Ohms
28378		Fuse, 5 Amperes
28378		Capacitor, Type "W", .008 Mfd.
28378		Capacitor, Type "2", .008 Mfd.
28378		Capacitor, 100 Mmfd.
28378		High-Bay Bushing
28378		Capacitor, Type "O", 300 Mmfd.
28378		Washer, Felt
28378		Washer, Dial Clamp
28378		Capacitor, Type, .05 Mfd.
28378		Insulating Tube
28378		Resistor, Type "F", 25,000 Ohms
28378		Capacitor, Type "O", 50 Mmfd.
28378		Fixed Capacitor, First I. F. Transformer
28378		Capacitor, Type "W", .004 Mfd.
28378		Resistor, Type "E", 22,000 Ohms
28378		Clamp Assembly
28378		Load Speaker
28378		Potentiometer, Volume Control
28378		Capacitors, Aligning
28378		Hi-Resonator Coil "A" Range, Antenna Transformer "B" and
28378		B. F. Transformers, "A", "B", and "C" Range
28378		Oscillator Transformer, "A", "B", and "C" Range
28378		Range Switch Assembly
28378		Power Transformer (50 to 60 Cycles Chassis)

MISCELLANEOUS PARTS

- Knob Assembly (Used on Volume, Range Switch and Off-On-Bass-Phonograph Controls Shafts)
- Knob Assembly (Used on Fidelity and A. F. C. Controls Shafts)
- Knob Assembly (For Rapid Station Selector Control Shaft)
- Knob Assembly (For Vernier Station Selector Control Shaft)
- Felt Washer (Used on Volume, Fidelity, Range Switch, A. F. C. and Off-On-Bass-Phonograph Controls Shafts)
- Felt Washer (Used on Rapid Station Selector Control Shaft)

A. F. C. FLASH TUNER PARTS

- Binding Washer
- Lever
- Rod for Actuating A. F. C. Switching Mechanism
- Lever and Spring Combination
- Capacitor Assembly
- Indicator for Capacitor
- Insulation Disc between Condensers
- Blue Wire of Cable Connecting to Flash Tuner Lamp Unit Socket
- Orange Wire of Cable Connecting to Flash Tuner Lamp Unit Socket
- Red Wire of Cable Connecting to Flash Tuner Lamp Unit Socket
- Brown Wire of Cable Connecting to Flash Tuner Lamp Unit Socket
- White Wire of Cable Connecting to Flash Tuner Lamp Unit Socket
- Red Wire of Cable Connecting to Flash Tuner Lamp Unit Socket
- Locking Ring Spring
- Locking Ring
- Resistor, Flexible, 10 Ohms

28437

- Set the signal generator's frequency and the receiver's tuning dial to 0.6 megacycles (600 kilocycles) and adjust the aligning capacitor C-37, and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum voltage output is obtained on the output meter.
- Reset both the signal generator's frequency and the receiver's tuning dial to 1.5 megacycles and repeat operation No. 2.

Adjustment of 10 Kilocycle Audio Cut-Off Filter

The adjustment of this filter is correctly made at the factory and no additional adjustment is required.

Instructions for Setting Up the A. F. C. Flash Tuning Unit

- Remove the flash tuner lamp unit escutcheon plate by removing the four screws.
- Remove the lists of station letters from the P-28420 package assembly which is tacked inside of the cabinet.
- Remove the seven power squares on which are printed the words "Tone", "Beauty", "Value", "Action", "Flash", "Tuning", and "Radio" from the square frames located on the rear side of the lamp unit escutcheon plate.
- Remove the station letters of the seven stations which it is desired to set up in the flash tuning unit from the station letters on the power squares. It will be noted that the letters of the stations are printed on partly cut squares to facilitate ease in removing the desired letters. Insert one of these seven station letters into each frame of the flash tuner lamp unit. The recommended method of inserting these station letters into the frames of the escutcheon plate is arrange them according to the frequency of the stations as follows:

Looking at the front of the escutcheon plate the station having the highest frequency should appear in the top right-hand frame, and then in successive order according to frequency the remaining station letters should be inserted into the other frames; the top left-hand frame containing the station letters of the station having the lowest frequency. Insert into the remaining two frames be sure to have the letters located between two pieces of transparent material.

- Fasten the escutcheon plate again to the lamp unit by means of the four screws. The receiver is now ready to be operated and the flash unit controls located on the rear of the chassis base adjusted for the seven favorite stations.

Rotate the "On-Off-Bass-Phonograph" Control knob from its complete counter-clockwise position, slightly clockwise from this position which turns the set "on" (indicated by illumination of the dial). Wait a few seconds to reach operating temperature. Then turn the knob to the "Fidelity" Control knob to the "Normal" position. Now carefully tune in the desired station having the highest frequency, watching the tuning indicator so that the receiver will be exactly tuned to this station.

After carefully tuning in the desired station rotate the A. F. C. Control knob to the "On" position. Now, clamping from Figure 4 the sketch which shows the contactor cleaning frame and knurled nut, hold the contactor, numbered 2, so that its point is engaged between the two small rollers of the switching mechanism as also shown in Figure 4. When the point is properly engaged between the rollers, the lamp of the lamp unit which is located behind the station letters on the escutcheon plate will glow. The gang tuning capacitor and the contactors from rotating by means of the extended portion of the contactor clamping frame. It is extremely important to keep the gang tuning capacitor and the contactors from rotating when tightening the large knurled nut.

- Now rotate the A. F. C. Control knob to the "off" position and note whether the tuning has been shifted by watching the tuning indicator. If a change is noted it will be necessary to repeat operation No. 7.
- When no change is noticed after performing the above operations Nos. 7 and 8, the remaining six favorite stations should be set up in the same manner.

With the A. F. C. flash tuning unit in operation, the receiver will be automatically kept in tune with any one of the seven favorite stations as long as the station is operating or provided it has no unusual fading conditions. However, if the receiver is to be used for the Automatic Frequency Control which is present in other adjacent channels. This same phenomenon will occur if two stations in adjacent channels are almost of equal signal strength with the weakest signal fading slightly; with this condition the strong signal will have a tendency to "pull in" when the receiver is tuned to the station which is slightly weaker and fading.

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 320H, 320HB
320T, 320TB
Schematic, Socket
Trimmers

Type of Circuit Superheterodyne
Tuning Ranges A—530 to 1700 Kc.; C—5900 to 18,000 Kc.
Number and Types of Tubes 1 No. 6A8, 1 No. 6K7, 1 No. 6Q7G, 1 No. 6V6G, 1 No. 80
Voltage Rating 105 to 125 Volts, A. C.
Input Power Frequency 25 to 60 Cycles and 50 to 60 Cycles
Input Power Rating 40 Watts
Frequency of Intermediate Amplifier 455 Kilocycles

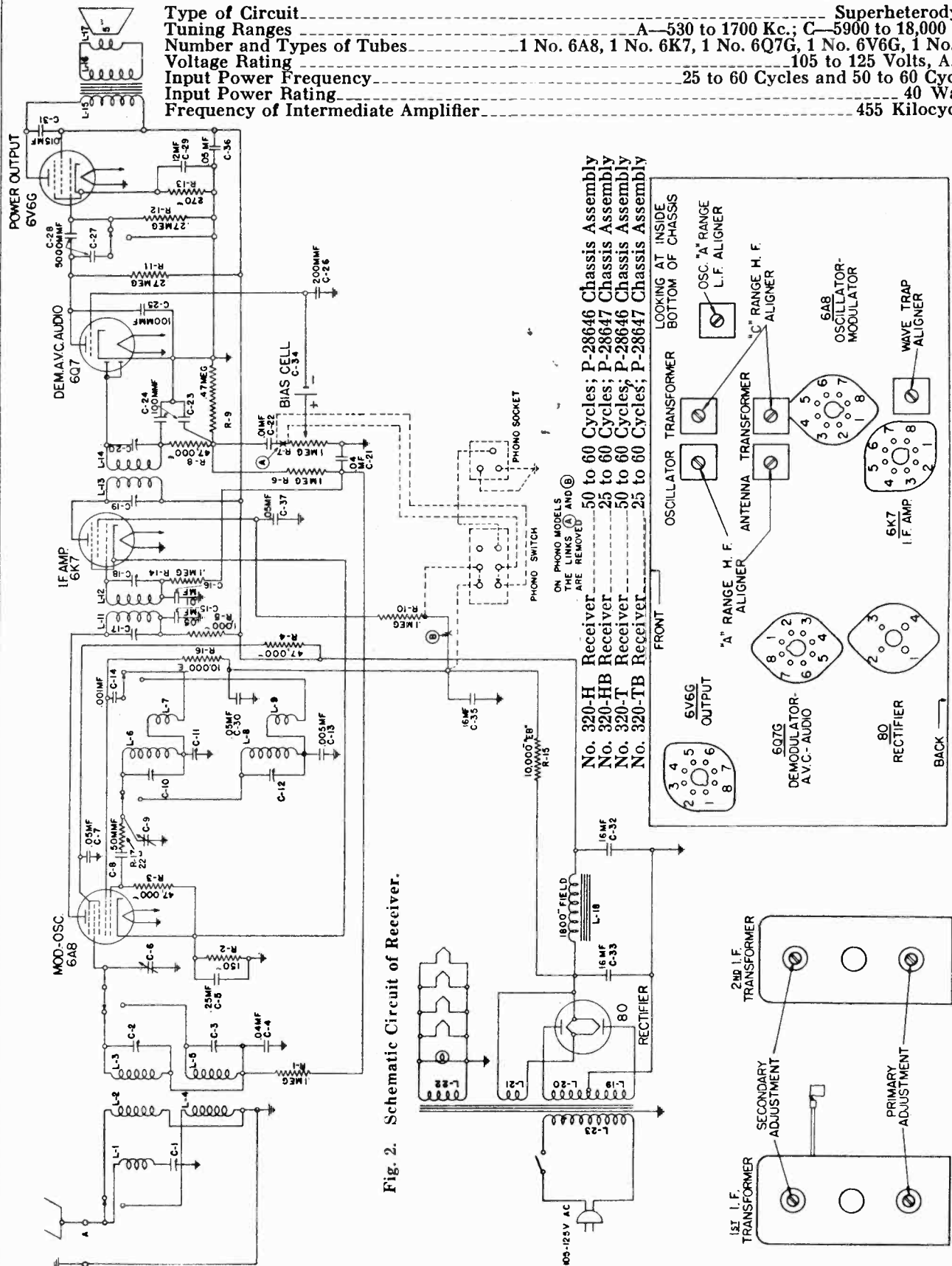


Fig. 2. Schematic Circuit of Receiver.

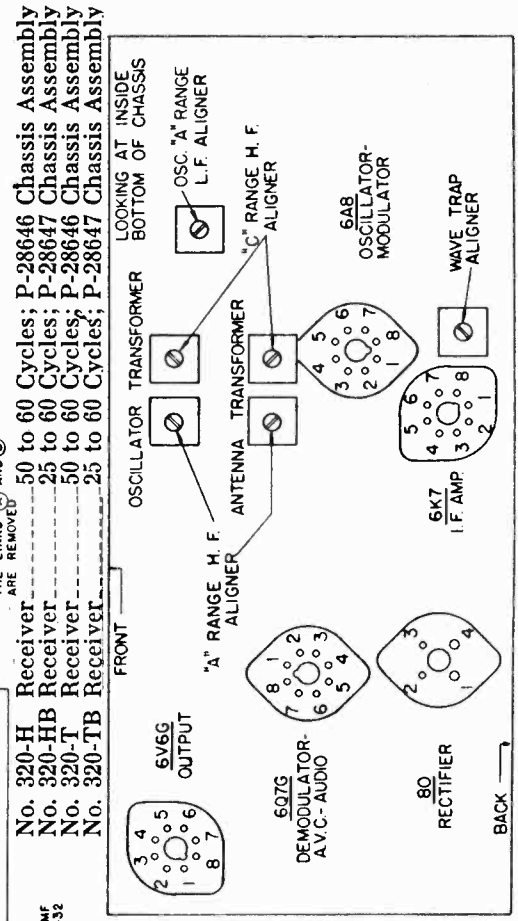


Fig. 1. Terminal Layout

No. 320-H Receiver 50 to 60 Cycles; P-28646 Chassis Assembly
No. 320-HB Receiver 25 to 60 Cycles; P-28647 Chassis Assembly
No. 320-T Receiver 25 to 60 Cycles; P-28646 Chassis Assembly
No. 320-TB Receiver 25 to 60 Cycles; P-28647 Chassis Assembly

MODELS 320H, 320HB

320T, 320TB

STROMBERG-CARLSON TEL. MFG. CO.

Chassis Wiring, Voltage

Tube	Circuit	Cap	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts
6A8	Mod.—Osc.	0	0	0	+174	+64	-7.2	+176	6.1	+1.8	2-7	6.1
6K7	I. F. Amp.	0	0	0	+176	+62	+1.8	+210	6.1	+1.8	2-7	6.1
6Q7G	Dem.—A. V. C. —Audio	0	0	0	+65*	0	0	+65*	6.1	0	2-7	6.1
6V6G	Audio Output	—	0	0	+167	+176	0	0	6.1	+8.2	2-7	6.1
80	Rectifier	—	+260	258	258	+260	—	—	—	—	1-4	4.8

Receiver tuned to 1000 Kc., no signal. A. C. voltages are indicated by italics.

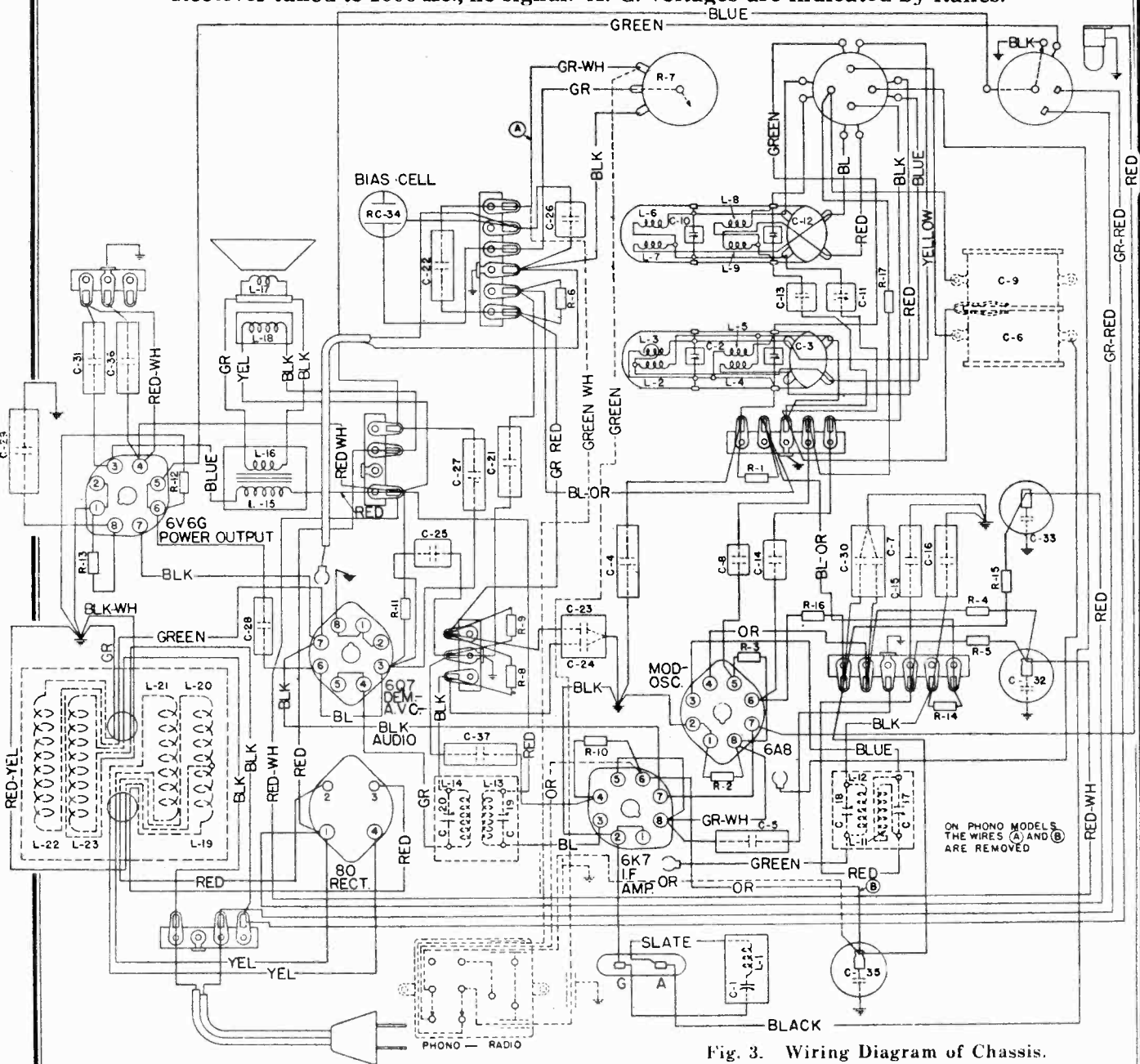


Fig. 3. Wiring Diagram of Chassis.

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 320H, 320HB
320T, 320TB
Alignment, Parts

3. Adjust the antenna's "C" range high frequency aligner for maximum output, at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.

Alignment of Standard Broadcast Range (Also Referred to as "A" Range)

In aligning the radio frequency circuits for this range, replace the 400-ohm carbon type resistor in series with the test oscillator's output lead with a 200-micro-microfarad capacitor and align these circuits as follows:

1. Rotate the Range Switch control knob to the Standard Broadcast ("A") range position and set the test oscillator's frequency and the receiver's tuning dial to 1.5 megacycles.
2. Adjust the oscillator's "A" range high frequency aligner for maximum output.
3. Adjust the antenna's "A" range high frequency aligner for maximum output.
4. Set the test oscillator's frequency and the receiver's tuning dial to 0.6 megacycles.
5. Adjust the oscillator's "A" range low frequency aligner (series aligner) for maximum output, and at the same time rotate the gang tuning capacitor slightly back and forth through resonance until maximum output is obtained.
6. Reset both the test oscillator's frequency and receiver's tuning dial to 1.5 megacycles and repeat operations Nos. 2 and 3.

Wave Trap Adjustment

In adjusting the wave trap circuit, set the Range Switch control knob to the Standard Broadcast range position and set the dial pointer to 1000 kilocycles.

Connect a 200-micro-microfarad capacitor in series with the output terminal of the modulated test oscillator and the antenna binding post on the receiver, and the ground terminal of the test oscillator to the ground binding post on the receiver. Then, with the modulated test oscillator set at the frequency of the intermediate amplifier, adjust the wave trap assembly by the following procedure until the maximum signal to the receiver and adjust the wave trap aligner until a minimum indication is obtained on the output meter.

PROCEDURE FOR OBTAINING REPRODUCTION FROM PHONOGRAPH RECORDS

In order to obtain reproduction of phonograph records in conjunction with the No. 320 Receiver, the following instructions should be followed:

To equip these receivers for phonograph operation, it will be necessary to purchase and install a Stromberg-Carlson Phonograph Adapter. Complete instructions on how to install and operate this switch are furnished with each P-28909 Switch Assembly.

To obtain the best quality of phonograph reproduction from these receivers, a Stromberg-Carlson Record unit, and uses a crystal type pick-up in conjunction with a specially equalized circuit.

If a Stromberg-Carlson Record Player is not used and the electric pick-up to be used is of the high impedance type, it will be necessary to connect a low capacity shielded cable between the three-prong socket and plug of the P-28909 Switch Assembly and the pick-up. This shielded cable should be of the low capacity type, in order to prevent excessive coupling of high frequencies which is caused when a shielded cable having high capacity is used. The length of the shielded cable used should be kept as short as possible.

If a pick-up of the low impedance type is used, it will be necessary to connect a "matching transformer" between the three-prong socket and plug of the P-28909 Switch Assembly, and the pick-up. The transformer should be located as near to the receiver as possible, in which case it will not be necessary to use a shielded cable.

28556	C35	Electrolytic Capacitor, 16 Mfd., 250 Volts
28556	L3, L4, L5	Coil Assembly, Antenna Transformer
28661	L6, L7, L8, L9	Coil Assembly, Oscillator Transformer
28663	L13, L14	Second I. F. Transformer
28664	L11, L12	First I. F. Transformer
28665	L17, L18	Load Speaker Assembly
28670	C6, C3	Gang Tuning Capacitor and Bracket Assembly
28685		Range Switch
28692		Phono Dial Socket Assembly
28693		Dial Pointer
28695		Blas Cell
28696	C34	L. F. Aligning Capacitor ("A" Range) and Oscillator Transformer
28787	C11	H. F. Aligning Capacitor, Antenna Transformer, "A" Range
28805	C10, C12	Power Transformer (50 to 60 Cycle Chassis)
28901	L19, L20, L21, L22, L23	Power Transformer (55 to 60 Cycle Chassis)
28902	L19, L20, L21, L22, L23	Large Pulley For Dial Drive
29128		Spring for Dial Drive

MISCELLANEOUS PARTS

- Black Cord for Drive
- Felt Washer (Used on Volume and Off-On-Tone Control Shafts)
- Knob (Used on Station Selector Control Shaft)
- Knob (Used on Range Switch Control Shaft)
- Knob (Two Required, Used on Volume and Off-On-Tone Control Shafts)

28556	R16	Resistor, Type "E", 10,000 Ohms
28557	R3, R4, R8	Resistor, Type "E", 7,000 Ohms
28558	R11, R10, R14	Resistor, Type "E", 47 Megohm
28559	R1, R11	Resistor, Type "E", 27 Megohm
28565	R9	Resistor, Type "E", 47 Megohm
28569	R6	Resistor, Type "E", 1 Megohm
28572	C23, C24	Capacitor Assembly, Type "WJ" (2-100 Mmfd.)
27101	C26	Capacitor, Type "O", 200 Mmfd.
27108	C27, C30	Capacitor Assembly (2-0.5 Mfd.)
27119	L1	Wave Trap Coil
27120	R10	Resistor, Type "E", 10,000 Ohms
27121	R13	Resistor, Type "E", 10,000 Ohms
27122	C13	Capacitor, Type "W", .005 Mfd.
27685	C29	Electrolytic Capacitor, 28 Mfd., 25 Volts
29002	C3	Capacitor, .25 Mfd.
28584	C31	Volume Control, 100 Mmfd.
28652	C31	Resistor, .015 Mfd., 200 Volts, A.C.
28654	C33	Electrolytic Capacitor, 16 Mfd., 300 Volts
28655	C32	Electrolytic Capacitor, 16 Mfd., 200 Volts

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on these receivers, and ordinarily no readjustments are necessary. However, should it become necessary to make any readjustments, the alignment procedure should be followed in the following manner: It is recommended that the Stromberg-Carlson P-27657 and P-27658 aligning tools be used.

To accurately align the circuits in these receivers, it is necessary to use a high grade, modulated test oscillator (Signal Generator), the output voltage of which can be varied. In conjunction with this test oscillator, a sensitive output meter should be used for determining the maximum signal voltage developed across the voice coil of the loud speaker.

In making any alignment adjustments, always adjust the test oscillator's output voltage to the minimum value where a good alignment may still be obtained. Never attempt to make any alignment adjustments using a strong signal. Before proceeding with the alignment of any circuits in these receivers be sure that the "Off-On-Tone" control is in the counter-clockwise position, slightly clockwise to position where set turns "on". Figure 1 shows the location of all the aligning capacitors in these receivers.

In making any alignment adjustments on these receivers, it will not be necessary to remove the chassis from the cabinet. The aligning capacitors for the intermediate frequency circuits of these receivers are easily accessible either through the rear of the receiver, and the aligning capacitors for the radio frequency circuits are easily accessible either through the bottom of the cabinet or through the bottom of the cabinet shelf depending upon the style of cabinet.

Dial Adjustment

Before aligning the circuits of any of these receivers, the tuning dial must be properly aligned. To track the gang tuning capacitors. To check whether the dial is set correctly with respect to the gang tuning capacitor, rotate the "Station Selector" knob in a clockwise direction so that the gang tuning capacitor is set to its maximum capacity position. Then, with the gang tuning capacitor in this position, the dial pointer should center over the inside, lower right-hand border line (line immediately below the .53 megacycle calibration mark on the "Broadcast" scale).

Intermediate Frequency Adjustments

The intermediate frequency used in these receivers is 455 kilocycles. In making these circuit adjustments always align the circuits in the order given in these instructions.

1. Rotate the Range Switch control knob to the Standard Broadcast Range position (arrow on knob pointing in direction of letters BR).
2. Set the dial pointer to the extreme low frequency position on the receiver's dial. Rotate the "Off-On-Tone" control to its maximum clockwise position (maximum volume). Rotate the Volume control knob to its maximum clockwise position (maximum volume).
3. Apply between the chassis base (for ground binding post) of the receiver and the grid of the No. 6A8 triode section of the second I. F. transformer, a 455 kilocycle test oscillator. The test oscillator should be connected to the grid of the No. 6A8 tube. Do not remove the chassis grid lead connecting to this tube. The ground (or low side) terminal of the test oscillator should be connected to either the chassis base or the ground binding post terminal.
4. Now, noting from Figure 1, the aligning capacitors for the first and second I. F. transformers, align the primary of second I. F. transformer.
5. Now, noting from Figure 1, the aligning capacitors for the first and second I. F. transformers, align the secondary of second I. F. transformer.
6. Now, noting from Figure 1, the aligning capacitors for the first and second I. F. transformers, align the primary of first I. F. transformer.

Adjusting the circuits to obtain maximum reading on the output meter, reducing the output of the test oscillator as required.

Radio Frequency Adjustments

The alignment of the radio frequency circuits in these receivers should be very carefully made and in the order specified.

Alignment of Short Wave Range (Also Referred to as "C" Range)

In aligning the radio frequency circuits for this range, replace the 0.1-microfarad capacitor which was placed in series with the test oscillator's output lead for the I. F. alignments, with a 400-ohm carbon type resistor. This lead should then be connected to the antenna binding post located on the rear of the receiver chassis. The ground terminal (or low side) of the test oscillator should be connected to the ground binding post on the receiver.

1. Rotate the Range Switch control knob to the Short Wave ("C") range position, and set the test oscillator's frequency and the receiver's tuning dial to 17 megacycles.
2. Adjust the oscillator's "C" range high frequency aligner for maximum output.

REPLACEMENT PARTS

Part	Circuit Designation	Part	Part
Spring Washer		R16	28245
Socket, 4 Prong		R3, R4, R8	28553
Capacitor, .04 Mfd.		R11, R10, R14	28554
Capacitor, .05 Mfd.		R1, R11	28555
Capacitor, .01 Mfd.		R9	28565
Capacitor, Type "W", .001 Mfd.		R6	28569
Capacitor, Type "W", .001 Mfd.		C23, C24	28572
Capacitor, Type "W", .001 Mfd.		C26	27101
Capacitor, Type "W", .001 Mfd.		C27, C30	27108
Capacitor, Type "W", .001 Mfd.		L1	27119
Capacitor, Type "W", .001 Mfd.		R10	27120
Capacitor, Type "W", .001 Mfd.		R13	27121
Capacitor, Type "W", .001 Mfd.		C13	27122
Capacitor, Type "W", .001 Mfd.		C29	27685
Capacitor, Type "W", .001 Mfd.		C3	29002
Capacitor, Type "W", .001 Mfd.		C31	28584
Capacitor, Type "W", .001 Mfd.		C31	28652
Capacitor, Type "W", .001 Mfd.		C33	28654
Capacitor, Type "W", .001 Mfd.		C32	28655

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 325J, 325JB

325N, 325NB

325S, 325SB

ELECTRICAL SPECIFICATIONS

Schematic, Socket Trimmers

Type of Circuit Superheterodyne with Electric Tuning
 Tuning Ranges A—530 to 1700 Kc.; C—5800 to 18,000 Kc.
 Number and Type of Tubes 1 No. 6A8, 1 No. 6K7, 1 No. 6Q7G, 1 No. 6V6G, 1 No. 80
 Voltage Rating 105 to 125 Volts
 Power Frequency Rating 25 to 60 Cycles and 50 to 60 Cycles
 Input Power Rating 42 Watts
 Frequency of Intermediate Amplifier 455 Kilocycles

APPARATUS SPECIFICATIONS

No. 325-J	Receiver	50 to 60 Cycles;	P-28816 Chassis Assembly
No. 325-JB	Receiver	25 to 60 Cycles;	P-28817 Chassis Assembly
No. 325-N	Receiver	50 to 60 Cycles;	P-28816 Chassis Assembly
No. 325-NB	Receiver	25 to 60 Cycles;	P-28817 Chassis Assembly
No. 325-S	Receiver	50 to 60 Cycles;	P-28816 Chassis Assembly
No. 325-SB	Receiver	25 to 60 Cycles;	P-28817 Chassis Assembly

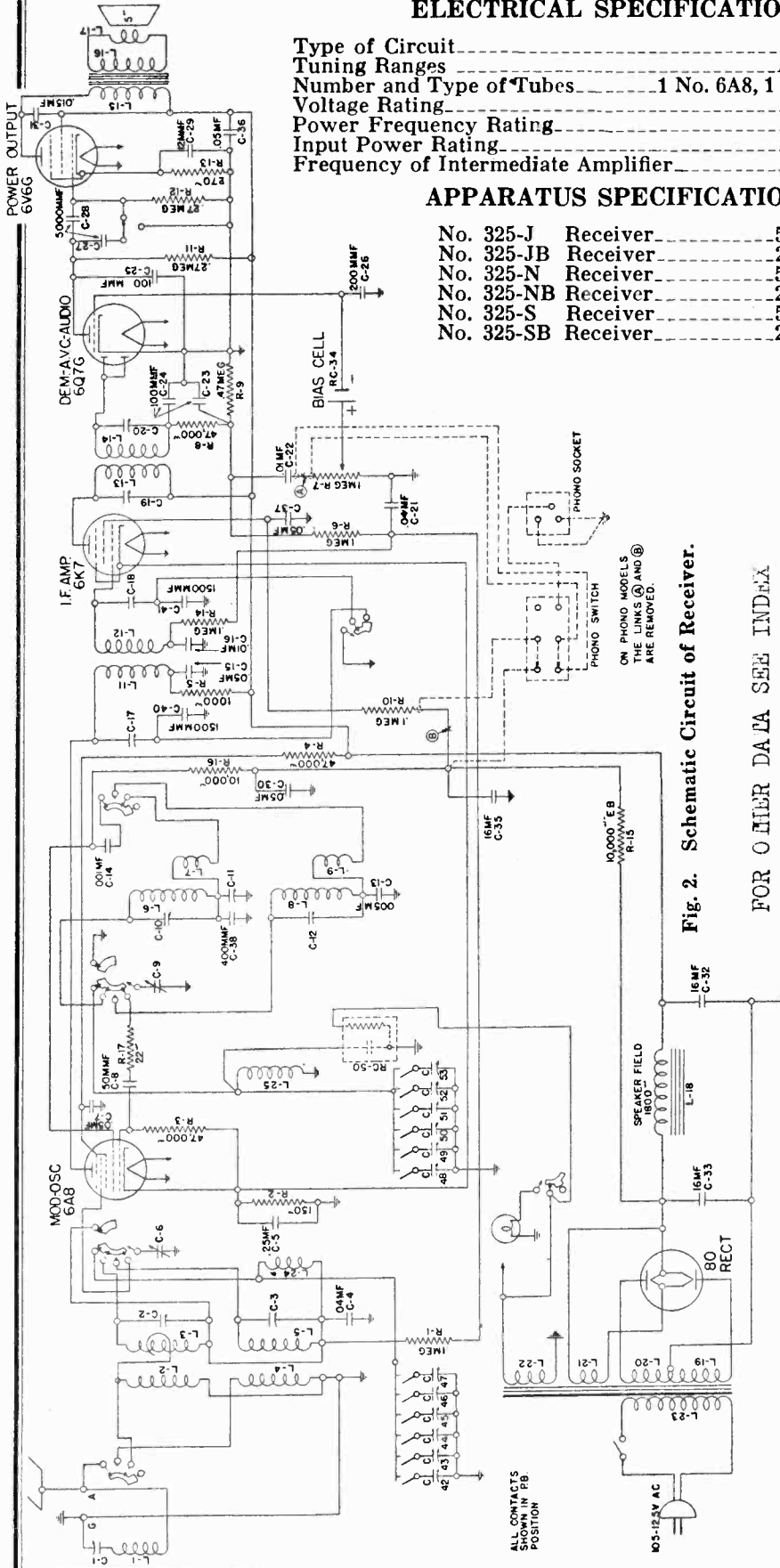


Fig. 2. Schematic Circuit of Receiver.

FOR OTHER DATA SEE INDEX

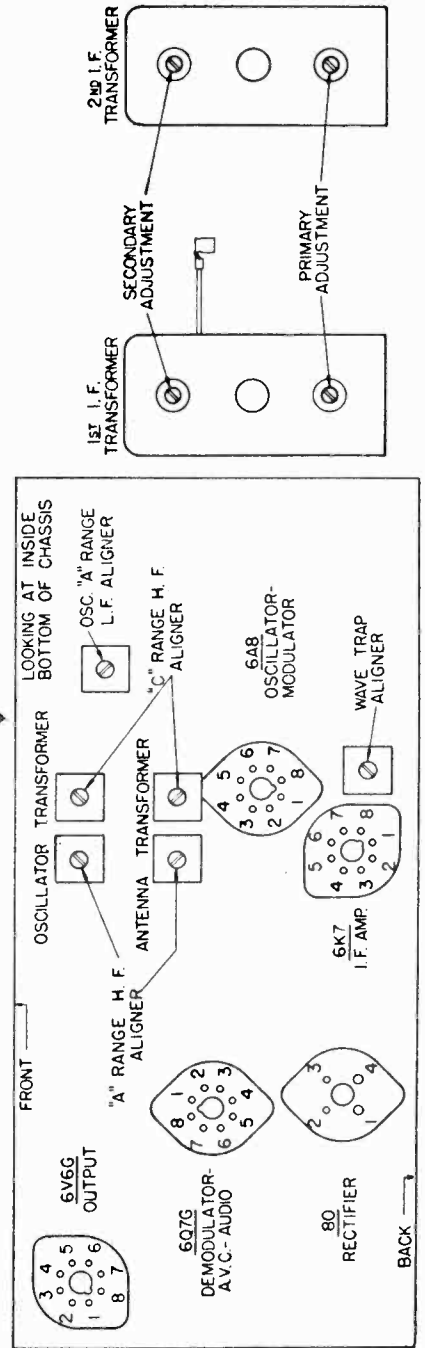


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

MODELS 325J, 325JB
325N, 325NB
325S, 325SB

STROMBERG-CARLSON TEL. MFG. CO.

Chassis Wiring

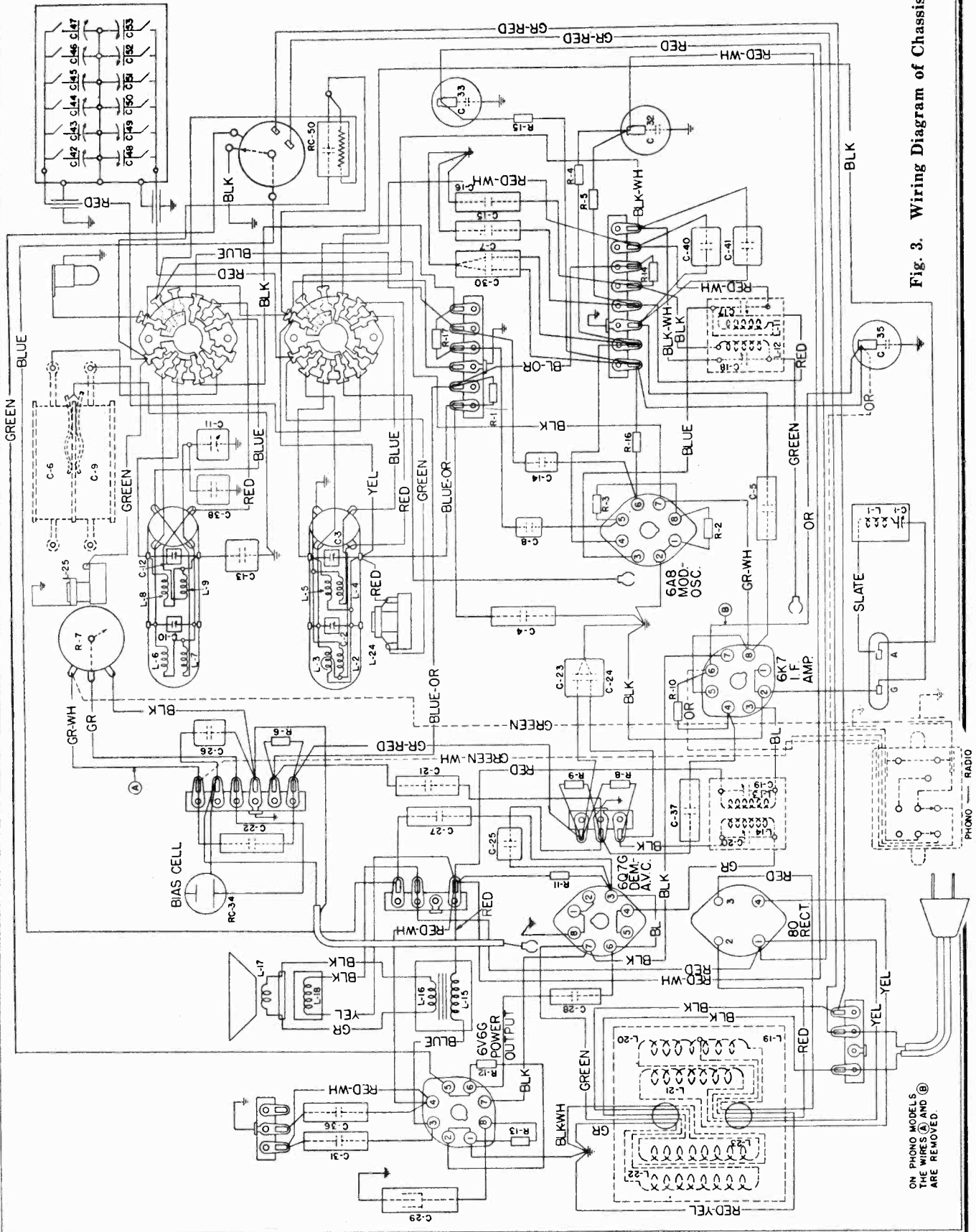


Fig. 3. Wiring Diagram of Chassis.

Voltage Alignment
Phonograph Data

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 325J, 325JB
325N, 325NB
325S, 325SB

microfarad capacitor in series with the connection between the output terminal of the test oscillator and the grid of the modulated test oscillator. The ground terminal of the test oscillator should be connected to either the chassis base or the ground binding post terminal.

- Now, noting from Figure 1, the aligning capacitors for the first and second I. F. transformers, align the secondary of second I. F. transformer.
- Primary of second I. F. transformer.
- Secondary of first I. F. transformer.
- Primary of first I. F. transformer.

Adjusting the circuits to obtain maximum reading on the output meter, reducing the output of the test oscillator as required.

Radio Frequency Adjustments

The alignment of the radio frequency circuits in these receivers should be very carefully made and in the order specified.

Alignment of Short Wave Range (Also Referred to as "C" Range)

In aligning the radio frequency circuits for this range, replace the 0.1-microfarad capacitor which was placed in series with the test oscillator's output lead for the I. F. alignments, with a 400-ohm carbon type resistor. This lead should then be connected to the antenna binding post located on the rear of the receiver chassis. The ground terminal (or low side) of the test oscillator should be connected to the ground binding post on the amplifier.

- Rotate the Electric Tuning and Range Switch control knob to the Short Wave ("C") range position, and set the test oscillator's frequency and the receiver's tuning dial to 17 megacycles.
- Adjust the oscillator's "C" range high frequency aligner for maximum output.
- Adjust the antenna's "C" range high frequency aligner for maximum output and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.

Alignment of Standard Broadcast Range (Also Referred to as "A" Range)

In aligning the radio frequency circuits for this range, replace the 400-ohm carbon type resistor in series with the test oscillator's output lead with a 200-micro-microfarad capacitor and align these circuits as follows:

- Rotate the Range Switch control knob to the Standard Broadcast ("A") range position and set the test oscillator's frequency and the receiver's tuning dial to 1.5 megacycles.
- Adjust the oscillator's "A" range high frequency aligner for maximum output.
- Adjust the antenna's "A" range high frequency aligner for maximum output.
- Set the test oscillator's frequency and the receiver's tuning dial to 0.6 megacycles.
- Adjust the oscillator's "A" range low frequency aligner (series aligner) for maximum output, and at the same time rotate the gang tuning capacitor slightly back and forth through resonance until maximum output is obtained.
- Reset both the test oscillator's frequency and receiver's tuning dial to 1.5 megacycles and repeat operations Nos. 2 and 3.

Wave Trap Adjustment

In adjusting the wave trap circuit, set the Electric Tuning and Range Switch control knob to the Standard Broadcast range position and set the dial pointer to 1000 kilocycles.

Connect a 200-micro-microfarad capacitor in series with the output terminal of the modulated test oscillator and the antenna binding post on the receiver, and the ground terminal of the test oscillator to the #10 binding post on the receiver. Then, with the modulated test oscillator and amplifier, adjust the wave trap aligner until a minimum indication is obtained on the output meter.

PROCEDURE FOR OBTAINING REPRODUCTION FROM PHONOGRAPH RECORDS

In order to obtain reproduction of phonograph records in conjunction with the No. 325 Receiver, the following instructions should be followed:

To equip these receivers for phonograph operation, it will be necessary to purchase and install a Stromberg P-28909 Switch Assembly. The rear of the chassis base of the receiver is already drilled for mounting this switch assembly. Complete instructions on how to install and operate this switch are furnished with each P-28909 Switch Assembly.

To obtain the best quality of phonograph reproduction from this receiver, a Stromberg-Carlson Record Player is recommended. The record player is equipped with a correctly designed single record playing motor unit, and uses a crystal type pick-up, in conjunction with a specially equalized circuit.

If the Stromberg-Carlson Record Player is not used and the electric pick-up to be used is of the high impedance type, P-28909 Switch Assembly, a capacity shielded cable between the three-prong socket and the P-28909 Switch Assembly, and the pick-up. This shielded cable should be of the low capacity type, in order to prevent excessive cutting of high frequencies which is caused when a shielded cable having high capacity is used. The length of the shielded cable should be kept as short as possible.

If a pick-up of the low impedance type is used, it will be necessary to connect a "matching transformer" between the three-prong socket and plug of the P-28909 Switch Assembly, and the pick-up. The transformer should be located as near to the receiver as possible, in which case it will not be necessary to use a shielded cable.

NORMAL VOLTAGE READINGS

The various values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base, with the tubes in their respective sockets. The receiver is, therefore, in operation when the measurements are made. Figure 1, shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and allowances should be made for differences when the line voltage is higher or lower. A meter with a scale of 1000 ohms per volt should be used for measuring the voltages. Voltages shown in bold face type are those obtained on the lowest possible scale of a meter having the following ranges: 0-25, 0-10, 0-100, 0-250, 0-500, 0-1000 volts except when an asterisk appears after any given voltage value in which case the 250 volt scale was used.

Tube	Circuit	Heater Voltages Between Heater Terminals										
		Cap		Socket Terminal Numbers		Volts		Terminal Numbers				
6A8	Mod.—Osc.	0	0	+174	+64	-7.2	+176	6.1	+1.8	2-7	8	6.1
6K7	I. F. Amp.	0	0	+176	+62	+1.8	+210	6.1	+1.8	2-7	6.1	6.1
6Q7G	Dem.—A. V. C.—Audio	0	0	+65*	0	0	+65*	6.1	0	2-7	6.1	6.1
6V6G	Audio Output	—	0	+167	+176	0	0	6.1	+8.2	2-7	6.1	6.1
80	Rectifier	—	+260	258	+260	—	—	—	—	1-4	4-8	4-8

Receiver tuned manually to 1000 Kc., no signal. A. C. voltages are indicated by italics.

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on these receivers, and ordinarily no readjustment is necessary. However, should it become necessary to make any readjustments, the alignment procedure given in the following paragraphs should be carefully followed. In order to make these alignment adjustments in an easy and satisfactory manner, it is recommended that the Stromberg-Carlson P-27687 and P-27688 aligning tools be used.

To accurately align the circuits in these receivers, it is necessary to use a high grade, modulated test oscillator (Signal Generator), the output voltage of which can be varied. In conjunction with this test oscillator, a sensitive output meter should be used for determining the maximum signal voltage developed across the voice coil of the loud speaker.

In making any alignment adjustments, always adjust the test oscillator's output voltage to the minimum value where a good alignment may still be obtained. Never attempt to make any alignment adjustments using a strong signal. Before proceeding with the alignment of any circuits in these receivers be sure that the "Normal Tone" control knob is set for maximum treble response (position where knob is turned to its minimum counterclockwise position, slightly clockwise to position where set turns "on"). Figure 1, shows the location of all the aligning capacitors in these receivers.

In making any alignment adjustments on these receivers, it will not be necessary to remove the chassis from the cabinet. The aligning capacitors for the intermediate frequency circuits and the radio frequency circuits are easily accessible either through the bottom of the cabinet or through the bottom of the cabinet shelf depending upon the style of cabinet.

Dial Adjustment

Before aligning the circuits of any of these receivers, the tuning dial must be properly aligned to track with the gang tuning capacitors. To check whether the dial is set correctly with respect to the gang tuning capacitor, rotate the "Station Selector" knob in a clockwise direction so that the dial pointer is set to its maximum capacity position. Then, with the gang tuning capacitor set to its maximum capacity position, place on the horizontal center line of the dial plate. To do this, align the pointer with the short black line located at the extreme right-hand edge of the dial plate.

Intermediate Frequency Adjustments

The intermediate frequency used in these is 455 kilocycles. In making these circuit adjustments always align the circuits in the order given in these instructions.

- Rotate the Electric Tuning and Range Switch control knob to the Standard Broadcast Range position (arrow on knob pointing in direction of letters BR.).
- Set the dial pointer to the extreme low frequency position on the receiver's dial. Rotate the "Off-On-Tone" control knob slightly clockwise to its maximum counterclockwise position which is the "Normal Position". Rotate the Volume control knob to its maximum clockwise position (maximum volume).
- Apply between the chassis base (or ground binding post) of the receiver and the grid of the No. 6A8 modulator-oscillator tube, a modulated signal of 455 kilocycles from the test oscillator, using a 0.1-

MODELS 325
 MODELS 335, 336
 MODELS 340, 341
 MODELS 345
 MODELS 350

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 335L, 335LB
 336P, 336PB

Alignment,

Electric Tuning Data

PROCEDURE FOR OBTAINING REPRODUCTION FROM PHONOGRAPH RECORDS

To equip these receivers for phonograph operation, it will be necessary to purchase and install in the receiver a special pickup. The pickup should be of the type which is used in the chassis of these receivers already furnished with each P-2967 Switch Assembly.

To obtain the best reproduction from phonograph records, when using an electric pick-up and phonograph unit with this receiver, a Stromberg-Carlson Record Player is recommended. This record player is equipped with a special pickup which is designed to give the best reproduction obtainable from a record. The record player should be of the type which is used in the chassis of these receivers already furnished with each P-2967 Switch Assembly.

If the Stromberg-Carlson Record Player is not used and the electric pick-up to be used is of the high impedance type, it will be necessary to connect a low impedance cable between the three-prong socket on the back of the receiver and the three-prong socket on the back of the low impedance type pickup. This cable should be of the type which is used in the chassis of these receivers already furnished with each P-2967 Switch Assembly.

INSTRUCTIONS FOR SETTING UP THE ELECTRIC TUNING ARRANGEMENT

1. Approximately 100 to 200 stations for electric tuning, the radio receiver should be turned "on" for approximately 10 minutes.

2. Set the Range Switch Control Knob to the manual tuning position for the Standard Broadcast Range (arrow on knob pointing in direction of the letters "BR").

If the particular model is a No. 336-P Receiver, check the position of the "Radio-Phone" control knob. For radio reception this knob should be rotated so that the arrow on the knob points in the direction of the word "Radio".

3. Remove the list of station letters from the P-28781 package assembly which is tacked inside of the cabinet.

4. Remove the two screws which hold the electric tuning escutcheon plate (metal plate). Then, remove the escutcheon, the strip of transparent material and the strip of paper on which the six stars are printed.

5. Remove the five screws which hold the electric tuning escutcheon in the front panel.

6. From the lists of stations, remove the call letters of the six stations which it is desired to set up for electric tuning. These six stations should preferably be selected and set up in the daytime so that the best service will be obtained at all times.

CAUTION: Each tuning adjustment for electric tuning has assigned frequency limits. These limits are marked on the escutcheon plate. Do not tune any station outside of these limits. The six stations are selected so that the frequency of each station will be within the assigned frequency limits of its assigned frequency limits.

It will be noted that the station letters are printed on a partially cut square to facilitate use in removing the desired station letters. In setting up these six favorite stations, the following order should be followed:

Looking at the front of the receiver, the station letters of the station having the highest frequency should be placed in the upper left-hand corner of the escutcheon plate. The station letters of the station having the lowest frequency should be placed in the lower right-hand corner of the escutcheon plate.

After the six station letters have been placed on the escutcheon plate, the transparent strip should be removed over the station call letters and the escutcheon plate then fastened into its position on the electric tuning escutcheon by means of the two screws.

The tuning adjustments for the six favorite stations can now be made, starting with the station having the highest frequency and proceeding as follows:

1. **IMPORTANT:** By means of the slotted shaft of the Electric Tuning Switch, which is located at the rear of the chassis base, so that the slotted shaft points in the direction of the word "Set-Up" (maximum clockwise rotation).

2. With the receiver turned "on", and the Range Switch control knob set to the standard broadcast position, insert the station letters of the remaining five stations into the other five holes of the escutcheon plate, one by one, by means of the station selector knobs on the back of the receiver.

3. Adjust the Electric Tuning and Range Switch control knob to the electric tuning position (arrow on knob pointing in direction of the word "Set-Up").

4. With the electric tuning escutcheon still removed from the cabinet, look in the upper left-hand corner of the escutcheon plate for the station having the highest frequency (provided, of course, that the station chosen has a frequency within the assigned frequency limits for this button). Now, looking in on the electric tuning unit, rotate the tuning dial to the position where the desired station is indicated.

5. In order to check whether the program being received is from the desired station, simply rotate the Range Switch control knob to the manual tuning position (arrow on knob pointing in direction of the word "Manual").

6. **IMPORTANT:** Always use the tuning indicator unit when setting up stations for electric tuning in order to determine when resonance with the desired station is obtained.

7. When the oscillator tuning adjustment has been properly made as mentioned in paragraph 6 above, the screw of the antenna (SWF) tuning adjustment (designated 1560 to 1000 kilocycles) should be rotated so that it is in resonance with the desired station. The antenna tuning adjustment should be rotated so that it is in resonance with the desired station.

8. When these adjustments have been properly made, the station having the highest frequency is correctly set up for electric tuning selection.

9. Now proceed to set up the remaining five stations in the same manner as mentioned in Paragraphs 7, 8, 9 and 10 above, proceeding according to the frequency of the remaining stations.

10. **IMPORTANT:** When all of the adjustments have properly been made for the six desired stations, the tuning indicator unit should be rotated so that the slotted shaft of the word "Operate" (minimum counter-clockwise rotation) is in the direction of the word "Operate".

The electric tuning escutcheon should then be refastened into its position on the cabinet by means of the five special screws.

In making any alignment adjustments, always adjust the test oscillator's output voltage to the minimum value possible. Before proceeding with the alignment of any circuits in these receivers be sure that the "Off-On" control knob is set for maximum treble response (position where knob is rotated from its maximum counterclockwise position to the "Set-Up" position). When the aligning adjustments have been completed, the electric tuning switch should be rotated back to the "Operate" position. Figure 1, shows the location of all the aligning capacitors in these receivers.

In making any alignment adjustments, always adjust the test oscillator to the minimum value possible. Before proceeding with the alignment of any circuits in these receivers be sure that the "Off-On" control knob is set for maximum treble response (position where knob is rotated from its maximum counterclockwise position to the "Set-Up" position). When the aligning adjustments have been completed, the electric tuning switch should be rotated back to the "Operate" position. Figure 1, shows the location of all the aligning capacitors in these receivers.

In making any aligning adjustments of the radio frequency circuits of the No. 336-P Receiver, it will be necessary to use the following procedure:

1. In making any aligning adjustments of the radio frequency circuits of the intermediate frequency circuit of these receivers are easily accessible through the bottom of the cabinet.

Dial Adjustment

Before aligning the circuits of any of these receivers, the tuning dial must be properly aligned in conjunction with the gang tuning capacitors. To check whether the dial is set correctly with respect to the gang tuning capacitors, rotate the dial to the extreme low frequency position (position where the dial pointer is set to its maximum capacity position). Then, with the gang tuning capacitor in this position, rotate the dial to its extreme right-hand edge of the dial plate. To do this, align the pointer with the short black line located at the extreme right-hand edge of the dial plate.

Intermediate Frequency Adjustments

The intermediate frequency used in these receivers is 455 kilocycles. In making these circuit adjustments always align the circuits in the order given in these instructions.

1. Set the Electric Tuning and Range Switch control knob to the manual tuning standard broadcast position (arrow on knob pointing in direction of letters "BR"). Set the dial pointer by means of the Station Selection knob to the extreme low frequency position on the receiver's dial. Rotate the "Off-On" control knob to the maximum treble response position. By aid of a screwdriver, rotate the slotted shaft of the Electric Tuning switch located on the rear of the chassis base so that the slotted shaft points in the direction of the word "Set-Up" (maximum volume). Rotate the Volume control knob to its maximum clockwise position (maximum volume).

2. Apply between the chassis base (ground binding post) of the receiver and the grid of the No. 648 modulator-oscillator tube, a modulated signal of 455 kilocycles from the test oscillator, using a 0.1 microfarad capacitor. Do not rotate the test oscillator until the terminal of the test oscillator is grounded (or low side) terminal of the test oscillator should be connected to either the chassis base or ground binding post.

3. Now, rotate the test oscillator frequency dial to the maximum output and at the same time rotate the test oscillator's "C" range high frequency aligner for maximum output.

4. Adjust the antenna's "C" range high frequency aligner for maximum output and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.

5. Now, rotate the test oscillator frequency dial to the maximum output and at the same time rotate the test oscillator's "A" range high frequency aligner for maximum output.

6. Adjust the antenna's "A" range high frequency aligner for maximum output and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.

7. In aligning the radio frequency circuits for this range, replace the 0.1-microfarad capacitor which was placed in step 2 with a 200-microfarad capacitor and align these circuits as follows:

1. Rotate the Electric Tuning and Range Switch control knob to the manual tuning. Standard Broadcast position and set the test oscillator's frequency and the receiver's tuning dial to 1.5 megacycles.

2. Adjust the oscillator's "C" range high frequency aligner for maximum output.

3. Adjust the antenna's "C" range high frequency aligner for maximum output and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.

4. Adjust the oscillator's "A" range high frequency aligner for maximum output.

5. Adjust the antenna's "A" range high frequency aligner for maximum output and at the same time rotate the gang tuning capacitor slightly back and forth through resonance until maximum output is obtained.

6. Reset both the test oscillator's frequency and receiver's tuning dial to 1.5 megacycles and repeat operations Nos. 2 and 3.

7. In adjusting the wave trap circuit, set the Electric Tuning and Range Switch control knob to the manual tuning. Standard Broadcast position (arrow on knob pointing in direction of letters "BR"). Set the dial pointer to the position where the word "Set-Up" is indicated on the back of the receiver chassis, to the "Set-Up" position.

8. Connect a 200-microfarad capacitor in series with the output terminal of the modulated test oscillator and the antenna binding post on the receiver, and the ground terminal of the test oscillator to the ground binding post on the receiver's base, with the modulated test oscillator set at the frequency of the intermediate frequency (455 kilocycles) and the test oscillator's output meter.

9. **IMPORTANT:** When all the aligning adjustments have been completed, it is important that the Electric Tuning Switch (located on the rear of the receiver chassis) be reset to the "Operate" position.

10. **IMPORTANT:** When all the adjustments have properly been made for the six desired stations, the tuning indicator unit should be rotated so that the slotted shaft of the word "Operate" (minimum counter-clockwise rotation) is in the direction of the word "Operate".

The electric tuning escutcheon should then be refastened into its position on the cabinet by means of the five special screws.

11. Now proceed to set up the remaining five stations in the same manner as mentioned in Paragraphs 7, 8, 9 and 10 above, proceeding according to the frequency of the remaining stations.

12. **IMPORTANT:** When all of the adjustments have properly been made for the six desired stations, the tuning indicator unit should be rotated so that the slotted shaft of the word "Operate" (minimum counter-clockwise rotation) is in the direction of the word "Operate".

The electric tuning escutcheon should then be refastened into its position on the cabinet by means of the five special screws.

13. **IMPORTANT:** When all the adjustments have properly been made for the six desired stations, the tuning indicator unit should be rotated so that the slotted shaft of the word "Operate" (minimum counter-clockwise rotation) is in the direction of the word "Operate".

The electric tuning escutcheon should then be refastened into its position on the cabinet by means of the five special screws.

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 335L, 335LB

336P, 336PB

Schematic

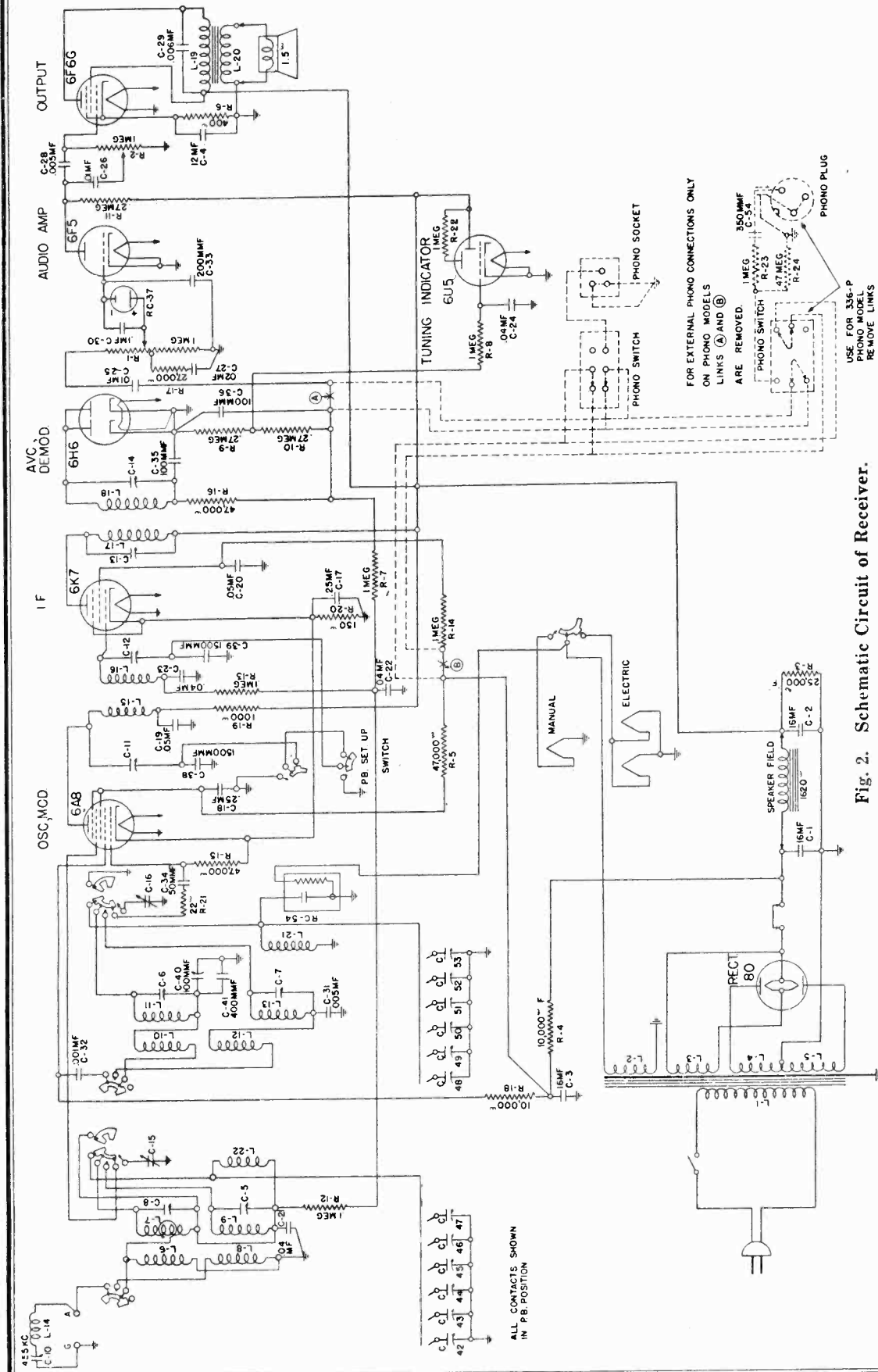


Fig. 2. Schematic Circuit of Receiver.

Superheterodyne with Electric Tuning
 Range "A", 530 to 1700 Kc.; Range "C", 5900 to 18,000 Kc.
 Number and Type of Tubes 1 No. 6A8; 1 No. 6K7; 1 No. 6H6; 1 No. 6F5; 1 No. 6F6G; 1 No. 6U5; 1 No. 80
 Power Supply Voltage 105 to 125 Volts, A. C.
 Input Power Rating .50 to 60 Cycles and 25 to 60 Cycles
 Radio Models Only 65 Watts
 Radio-Phono Models 80 Watts
 Frequency of Intermediate Amplifier 455 Kilocycles

MODELS 335L, 335LB
336P, 336PB STROMBERG-CARLSON TEL. MFG. CO.
Chassis Wiring

- No. 335-L Receiver..... 50 to 60 Cycles; P-28818 Chassis Assembly; P-27605 Loud Speaker
- No. 335-LB Receiver..... 25 to 60 Cycles; P-28819 Chassis Assembly; P-27605 Loud Speaker
- No. 336-P Receiver..... 60 Cycles Only; P-29415 Chassis; P-29439 Phono Unit; P-29464 Loud Speaker
- No. 336-PB Receiver..... 25 Cycles Only; P-29416 Chassis; P-29440 Phono Unit; P-29464 Loud Speaker

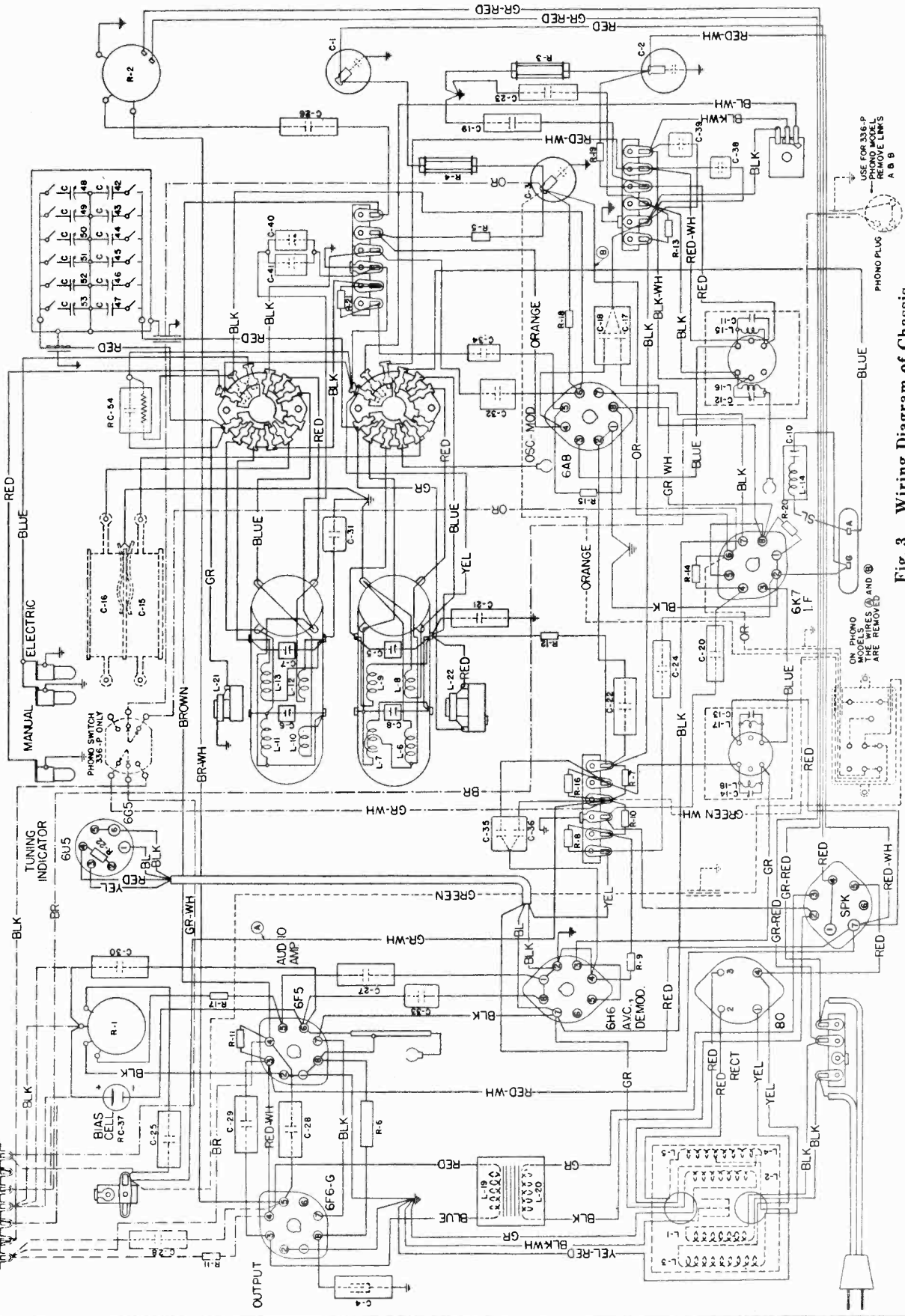


Fig. 3. Wiring Diagram of Chassis.

USE FOR 336-P
PHONO MODEL
REMOVE LENS
A B B

ON PHONO
MODELS 335L, 335LB, AND 336-P
ARE REMOVED

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 337H, 337HB
337L, 337LB
Schematic

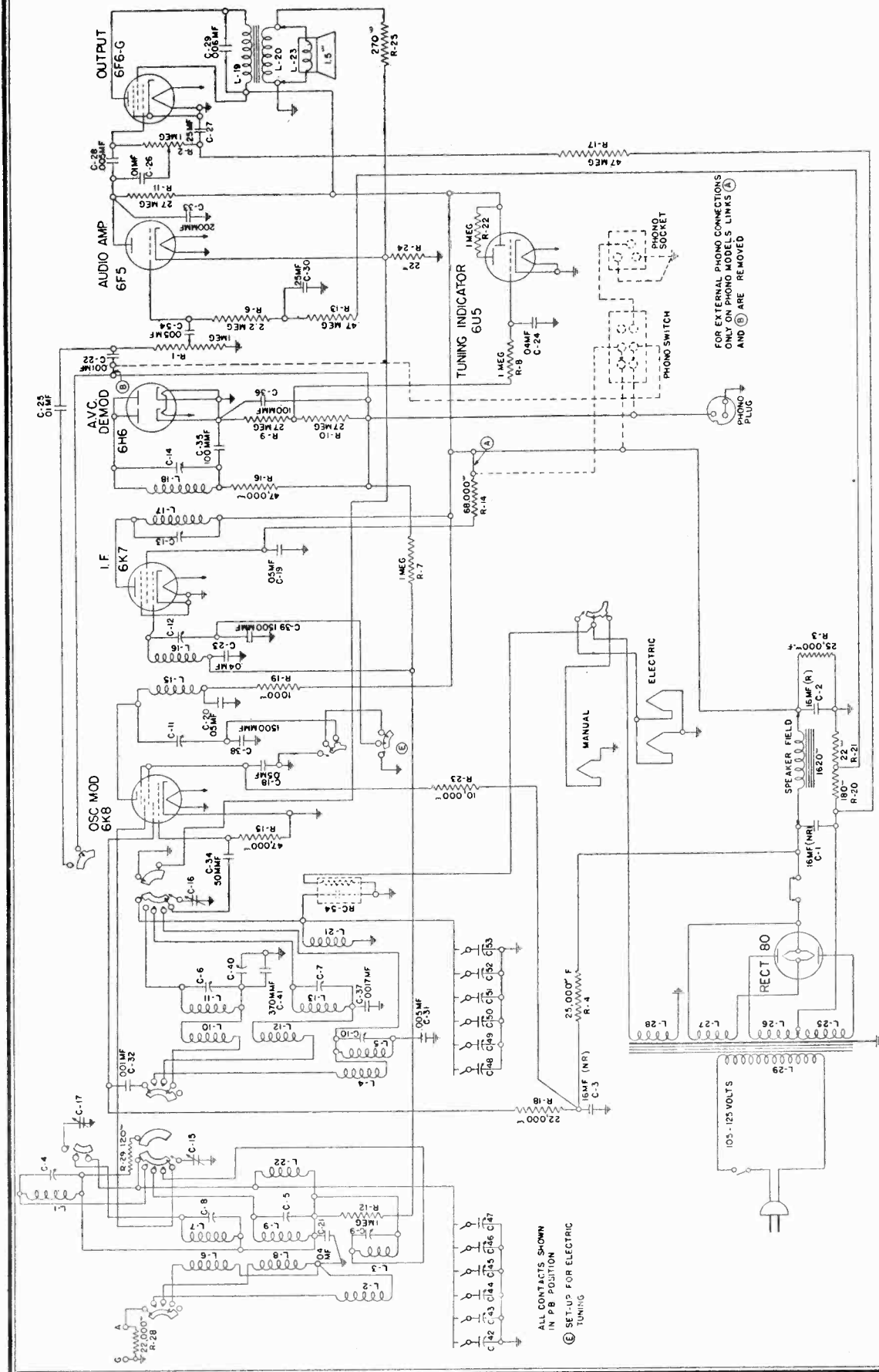


Fig. 2. Schematic Circuit of Receiver.

Type of Circuit	Superheterodyne with Electric Tuning
Tuning Ranges	.53 to 1.7 Mc.; 2.25 to 7.6 Mc.; 7.6 to 23 Mc.
Number and Type of Tubes	1 No. 6K8, 1 No. 6K7, 1 No. 6H6, 1 No. 6F6G, 1 No. 6U5, 1 No. 80
Voltage Rating	105 to 125 Volts
Power Frequency Rating	25 to 60 Cycles and 50 to 60 Cycles
Input Power Rating	70 Watts
Frequency of Intermediate Amplifier	455 Kilocycles

MODELS 337H, 337HB

337L, 337LB

STROMBERG-CARLSON TEL. MFG. CO.

Chassis Wiring

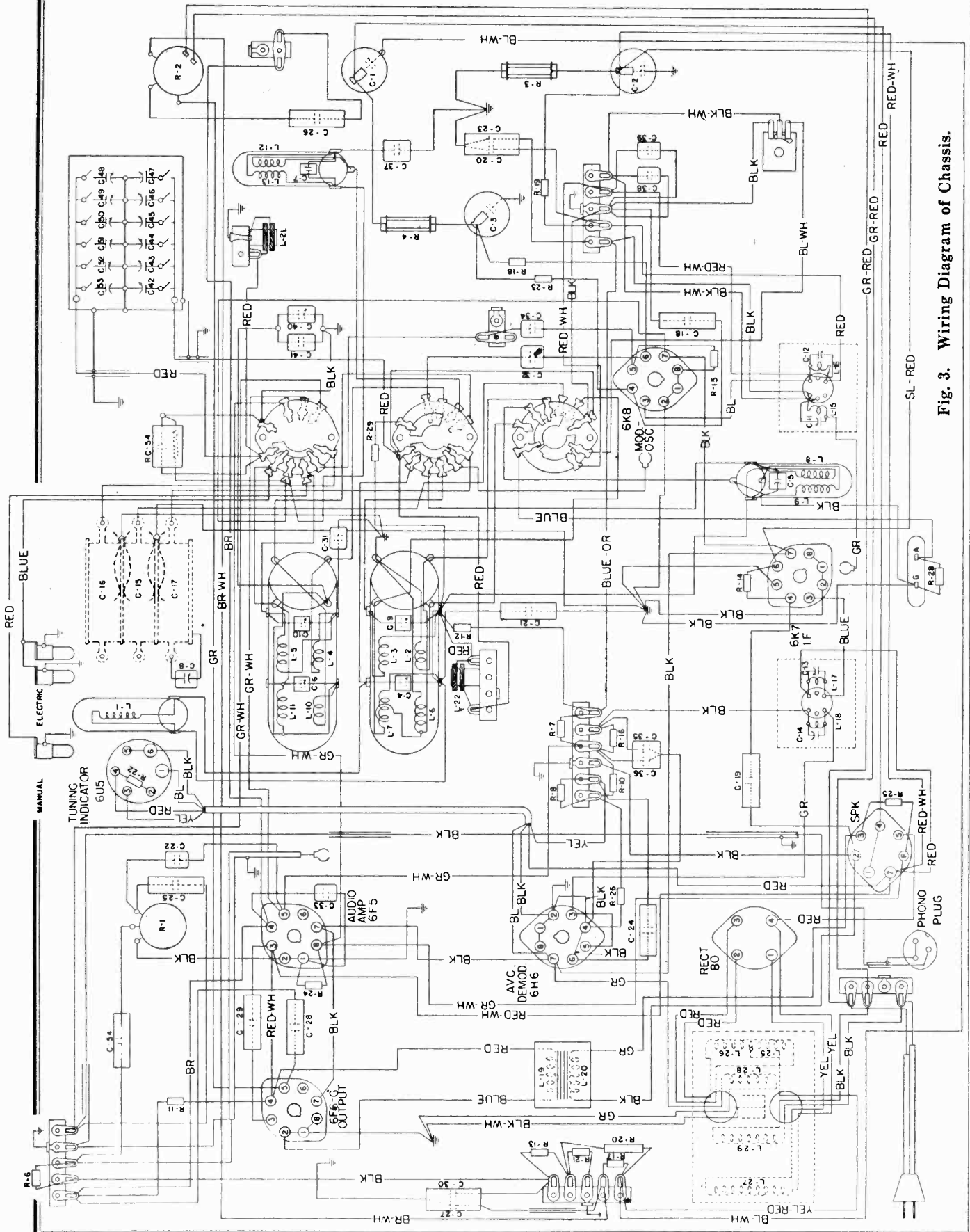


Fig. 3. Wiring Diagram of Chassis.

MODELS 337H, 337HB

337L, 337LB

STROMBERG-CARLSON TEL. MFG. CO.

Alignment, Phono.

Tuner Data

is easily obtainable by simply rotating the Range Switch control knob so that the arrow on the knob points in the direction of the designation for the desired type of tuning. When manually tuning the receiver in either the Standard Broadcast or Short Wave ranges, the electric tuning arrangement is made inoperative and the dial of the receiver is illuminated. When the Range Switch control knob is set for electric tuning (arrow on Range Switch control knob pointing in direction of the star), the dial illumination ceases and the station letters of the tuning indicator tube which operates on the cathode-ray principle.

1. Set the Electric Tuning and Range Switch control knob to the manual tuning standard broadcast position (arrow on knob pointing in direction of letter "A"). Set the dial pointer, by means of the Station Selector knob to the extreme low frequency position on the receiver's dial. Rotate the "Off-On-Tone" control knob slightly clockwise from its most counter-clockwise position, which is the "normal" position. By aid of a screwdriver rotate the slotted shaft of the Electric Tuning Set-Up Switch located at the rear of the chassis base, so that the slot of the shaft points in the direction of the "Set-Up" position (maximum volume). Rotate the Volume control knob to its maximum clockwise position.
2. Apply between the chassis base (or ground binding post) of the receiver and the grid of the No. 6K8 microfarad capacitor in series with the connection between the output terminal of the test oscillator and the grid of the No. 6K8 tube. Do not remove the chassis grid lead connecting to this tube. The ground (or low side) terminal of the test oscillator should be connected to either the chassis base or the ground binding post terminal.
3. Now, noting from Figure 1, the aligning capacitors for the first and second I. F. transformers, align the I. F. circuits in the following manner:
 - a. Secondary of second I. F. transformer.
 - b. Primary of second I. F. transformer.
 - c. Secondary of first I. F. transformer.
 - d. Primary of first I. F. transformer.

Adjusting the circuits to obtain maximum reading on the output meter, reducing the output of the test oscillator as required.

Radio Frequency Adjustments

The alignment of the radio frequency circuits in these receivers should be very carefully made and in the order specified.

CAUTION: Be sure that the Electric Tuning Set-Up Switch is set to the "Set-Up" position.

Alignment of Short Wave Range (Also Referred to as "C" Range)

In aligning the radio frequency circuits for this range, replace the 0.1-microfarad capacitor which was placed in series with the test oscillator's output lead for the I. F. alignments, with a 400-ohm carbon type resistor. This lead should then be connected to the antenna binding post located on the rear of the receiver's chassis. The ground terminal (or low side) of the test oscillator should be connected to the ground binding post on the receiver.

1. Rotate the Electric Tuning and Range Switch control knob to the Short Wave ("C") range position, and set the test oscillator's frequency and the receiver's tuning dial to 20 megacycles.
2. Adjust the receiver's oscillator "C" range high frequency aligner for maximum output.
3. Adjust the antenna "C" range high frequency aligner for maximum output and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.

Alignment of Short Wave Range (Also Referred to as "B" Range)

In aligning the radio frequency circuits for this range, use the same artificial antenna and antenna binding post as was used for aligning the "C" range, and align this range as follows:

1. Rotate the Electric Tuning and Range Switch control knob to the Short Wave ("B") range position, and set the test oscillator's frequency and the receiver's tuning dial to 7 megacycles.
2. Adjust the receiver's oscillator "B" range high frequency aligner for maximum output.
3. Adjust the antenna "B" range high frequency aligner for maximum output and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.

Alignment of Standard Broadcast Range (Also Referred to as "A" Range)

In aligning the radio frequency circuits for this range, replace the 400-ohm carbon type resistor in series with the test oscillator's output lead with a 200-micro-microfarad capacitor and align these circuits as follows:

1. Rotate the Electric Tuning and Range Switch control knob to the manual tuning, Standard Broadcast ("A") range position and set the test oscillator's frequency and the receiver's tuning dial to 1.5 megacycles.
2. Adjust the receiver's oscillator "A" range high frequency aligner for maximum output.
3. Adjust the antenna "A" range high frequency aligner for maximum output.
4. Set the test oscillator's frequency and the receiver's tuning dial to 0.6 megacycles.
5. Adjust the receiver's oscillator "A" range low frequency aligner (series aligner) for maximum output, and in the same manner rotate the gang tuning capacitor slightly back and forth through resonance until maximum output is obtained.
6. Reset both the test oscillator's frequency and receiver's tuning dial to 1.5 megacycles and repeat operations Nos. 2 and 3.

OBTAINING REPRODUCTION FROM PHONOGRAPH RECORDS

These receivers are equipped with a three-contact phono socket, which is connected to the receiver circuit by a short, shielded cable which protrudes from the rear of the chassis base. A three-prong plug is also furnished for connecting the pick-up cable to the phono socket.

To obtain the best quality of phonograph reproduction from these receivers, a Stromberg-Carlson Record Player is recommended. The Record Player is equipped with a correctly designed single record playing motor unit, and uses a crystal type pick-up in conjunction with a specially equalized circuit.

In order to prevent radio signals from interfering with the phonograph reproduction, it is necessary to set the speaker volume control knob to the "Off" position. When the turntable has attained speed, raise the turntable switch should then be pushed to the "On" position. When the needle point enters the outside groove, the pick-up and lower it gently on to the record so that the needle point enters the same as for radio reception. The volume (sound level) and the tone for phonograph reproduction can be controlled the same as for radio reception, i. e., by means of the "Volume" and "Off-On-Tone" control knobs located on the front panel of the radio receiver.

If the Stromberg-Carlson Record Player is not used and the electric pick-up to be used is of the high impedance type, it will be necessary to connect a shielded cable between the three-prong socket plug and the pick-up. For best reproduction, this shielded cable should be of the low capacity type. The length of the shielded cable should be kept as short as possible. The shield of the cable to that prong which is farthest away from the other two prongs; a short connecting wire must also be soldered from this prong to the upper right-hand prong when looking at the rear of the plug, that is, the side opposite to the prong side. The inside wire conductor of the shielded cable should then be soldered to the other terminal of the plug.

If a pick-up of the low impedance type is used, it will be necessary to connect a "matching transformer" between the three-prong socket plug and the pick-up. The transformer should be located as near to the receiver as possible, in which case it will not be necessary to use a shielded cable.

Instructions for Setting Up the Electric Tuning Arrangement

1. Before proceeding to set up the stations for electric tuning, the radio receiver should be turned "on" for approximately twenty to thirty minutes.
2. Set the Range switch control knob to the manual tuning position for the Standard Broadcast range (arrow on knob pointing in direction of the letter "A").
3. Remove the list of station letters from the P-28781 package assembly which is tucked inside of the cabinet.
4. Remove the two screws which hold the electric tuning escutcheon plate (metal plate). Then, remove from the escutcheon, the strip of transparent material and the strip of paper on which the six stars are printed.
5. Remove the five screws which hold the electric tuning escutcheon to the front panel.
6. From the lists of stations, remove the call letters of the six stations which it is desired to set up for electric tuning. These six stations should preferably be selected and set up in the daytime so that the best service will be obtained at all times.

CAUTION: Each button adjustment for electric tuning has assigned frequency limits. These limits are designated for each adjustment on the cover plate which covers the electric tuning adjusting capacitors (visible when the electric tuning escutcheon is removed from the cabinet). The six stations should be selected so that the frequency of each station will be within the assigned frequency limits of its associated post button.

It will be noted that the station letters are printed on partially cut squares to facilitate ease in removing the desired station letters. In setting up these six favorite stations, the following order should be followed:

Looking at the front of the receiver, the station letters of the station having the highest frequency should be inserted into the furthest left-hand square of the escutcheon. Then, in successive order, according to the frequency, insert the station letters of the remaining five stations into the corresponding squares of the escutcheon. The station having the lowest frequency should be inserted into the furthest right-hand square of the escutcheon.

After the six station call letters have been inserted into the escutcheon, the transparent strip should be replaced over the station call letters and the escutcheon plate then fastened into its position on the electric tuning escutcheon by means of the two screws.

The tuning adjustments for the six favorite stations can now be made, starting with the station having the highest frequency and proceeding as follows:

IMPORTANT: By aid of a screwdriver, rotate the slotted shaft of the electric tuning switch, which is located at the rear of the chassis base, so that the slot of the shaft points in the direction of the word, "Set-Up" (maximum clockwise rotation).

8. With the receiver turned "on", and the Range Switch control knob set to the standard broadcast position, the Volume control knob pointing in direction of letter "A", tune the receiver in the conventional manner by means of the station selector knobs to that station having the highest frequency (of the six chosen for setting up in the electric tuning arrangement) and carefully note the program which it is broadcasting. Then, rotate the Range Switch control knob to the electric tuning position, arrow on knob pointing in direction of the small star (large star and station letters become illuminated).

MODELS 337H, 337HB
337L, 337LB
MODELS 350M, 350MB
350R, 350RB, 350P
350PB, 350V, 350VB

STROMBERG-CARLSON TEL. MFG. CO.

Voltage, Socket
Trimmers

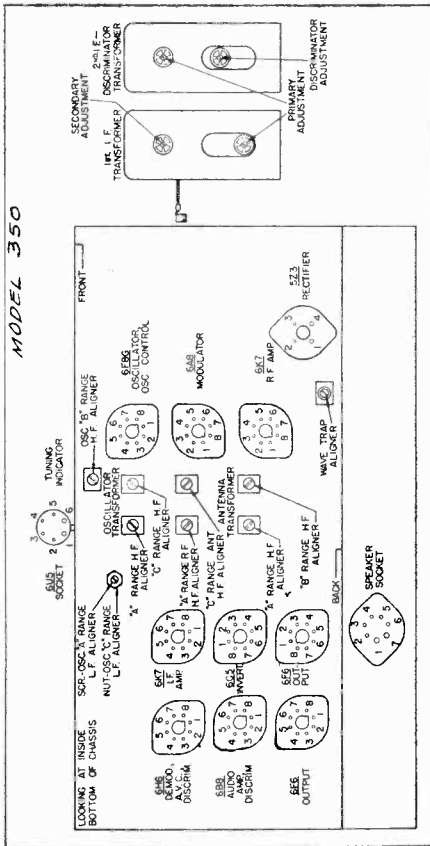


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Aligning Adjustments for the K. F., I. F. and Discriminator Circuits.

NORMAL VOLTAGE READINGS

The various values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base, with all the tubes in their respective sockets except the No. 8U5 tube. The receiver is, therefore, in operation when the measurements are made. Figure 1, shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and allowance should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-25, 0-10, 0-500, 0-5000, 0-1000 volts except when an asterisk appears after any given voltage value, in which case the 500 volt scale was used.

Tube	Circuit	Terminals of Sockets								Heater Voltages Between Heater Terminals	
		1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts
6K7	R. F. Amp.	0	0	+205	+99	0	0	6.2	0	2-7	6.2
6A8	Modulator	0	0	+227	+99	-5.9	+99	6.2	0	2-7	6.2
6F8-G	Oscillator and Oscillator Control	0	0	+153	+7.8	-5.9	+152	6.2	0	2-7	6.2
6K7	I. F. Amp.	0	0	+210	+57	0	+57	6.2	0	2-7	6.2
6H6	Discriminator, Demodulator, A. V. C.	0	0	0	0	0	0	6.2	0	2-7	6.2
6I38	Discriminator, Audio Amp.	0	0	+20*	0	0	+38*	6.2	0	2-7	6.2
6C5	Audio Inv.	0	0	+120	+215	0	0	6.2	+5.9	2-7	6.2
6F6	Audio Output	0	0	+300	+308	0	0	6.2	+19	2-7	6.2
6F6	Audio Output	0	0	+300	+308	0	0	6.2	+19	2-7	6.2
6U5†	Tuning Ind.	6.2	+19	0	+217	-3	0	0	0	1-6	6.2
5Z3	Rectifier	+410	397	397	+410	0	0	0	0	1-4	4.8
Speaker Socket		+390	0	0	+410	+110	0	+308	0		

Receiver tuned manually to 1000 Kc., no signal. A. C. voltages are indicated by italics.

APPARATUS SPECIFICATIONS

- No. 337 H 50 to 60 Cycles; P-20588 Chassis Assembly; P-27557 Speaker
- No. 337 HB 25 to 60 Cycles; P-29589 Chassis Assembly; P-27557 Speaker
- No. 337 L 50 to 60 Cycles; P-29588 Chassis Assembly; P-27605 Speaker
- No. 337 LB 25 to 60 Cycles; P-29589 Chassis Assembly; P-27605 Speaker

A special temperature controlled compensating capacitor is used in the oscillator circuit of these receivers when operating the electric tuning arrangement in order to eliminate drift in the oscillator's frequency. These receivers are also provided with a low level bass frequency compensating circuit in conjunction with the volume control circuit so that balanced reproduction is obtained for any setting of the volume control.

NORMAL VOLTAGE READINGS

The values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base, with the tubes in their respective sockets. The receiver is, therefore, in full operation when the measurements are made. Figure 1, shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and allowance should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-25, 0-10, 0-100, 0-250, 0-500, 0-5000, 0-1000 volts except when an asterisk appears after any given voltage value in which case the 250 volt scale was used.

Tube	Circuit	Terminals of Sockets								Heater Voltages Between Heater Terminals	
		1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts
6K8	Mod., Osc.	0	0	+230	+92	-6.5	+73	6.3	0	2-7	6.3
6K7	I. F. Amp.	0	0	+230	+70	0	+230	6.3	0	2-7	6.3
6H6	Dem., A. V. C.	0	0	0	0	0	6.3	0	0	2-7	6.3
6F5	Audio Amp.	0	0	+230	+56	0	0	6.3	0	2-7	6.3
6F6G	Audio Output	0	0	+212	+227	0	0	6.3	0	2-7	6.3
6U5	Tuning Ind.	0	0	+220	0	+45*	6.3	0	0	1-6	6.3
80	Rectifier	+350	345	345	+350	0	0	+350	0	1-4	4.8
Speaker Socket		+350	0	0	+350	+350	0	+230	0		

Receiver tuned manually to 1000 Kc., no signal. A. C. voltages are indicated by italics.

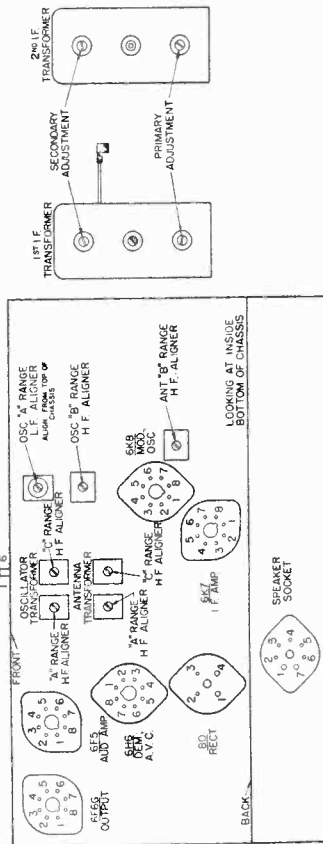
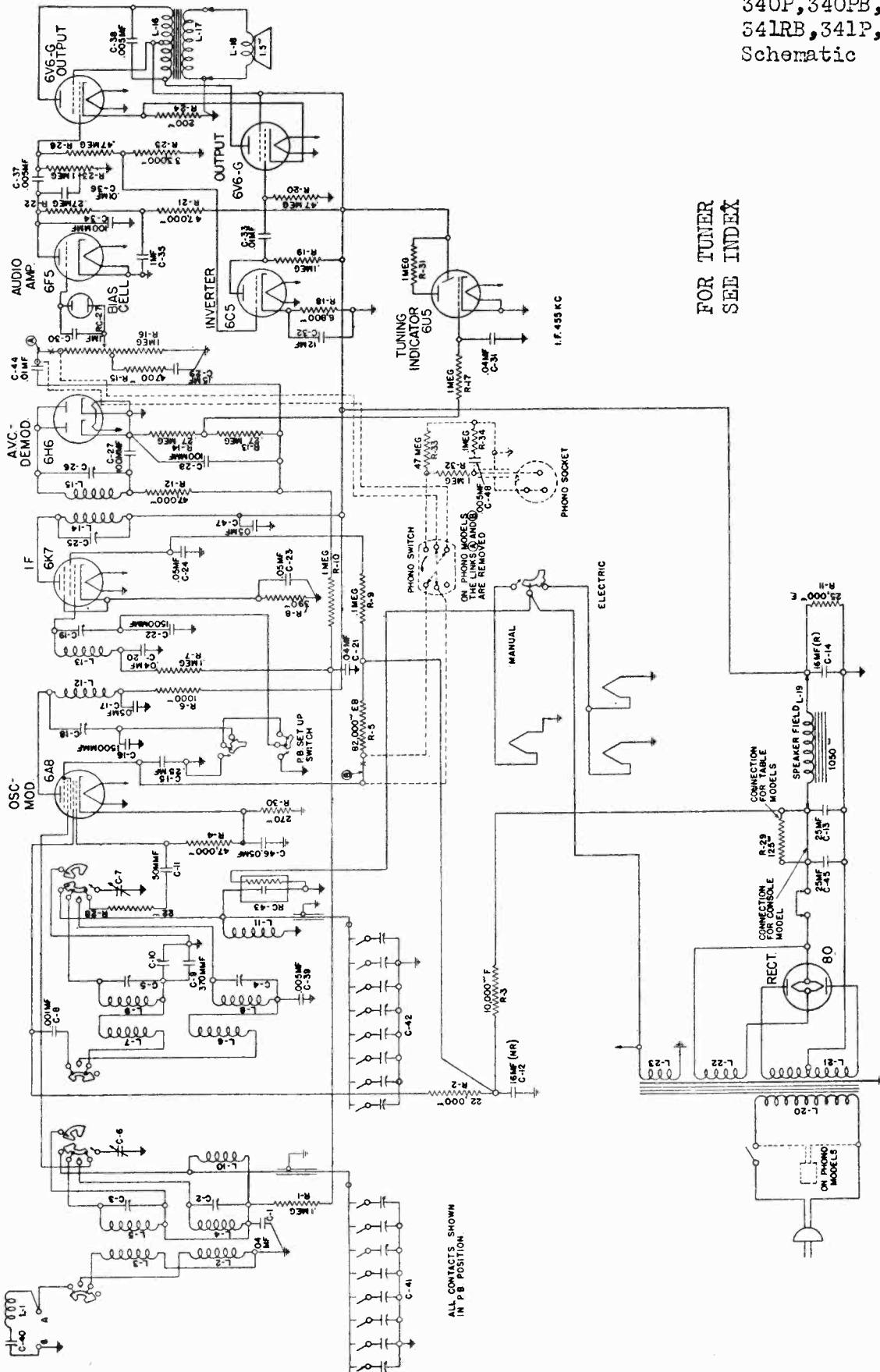


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Aligning Adjustments.

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 340F, 340FB
 340H, 340HB, 340M
 340MB, 340V, 340VB
 340P, 340PB, 341R
 341RB, 341P, 341PB
 Schematic



FOR TUNER
 SEE INDEX

I.F. 455 KC

Fig. 2. Schematic Circuit of Receiver.

MODELS 340F, 340FB
340H, 340HB, 340M
340MB, 340V, 340VB
340P, 340PB, 341R
341RB, 341P, 341PB
Chassis Wiring

STROMBERG-CARLSON TEL. MFG. CO.

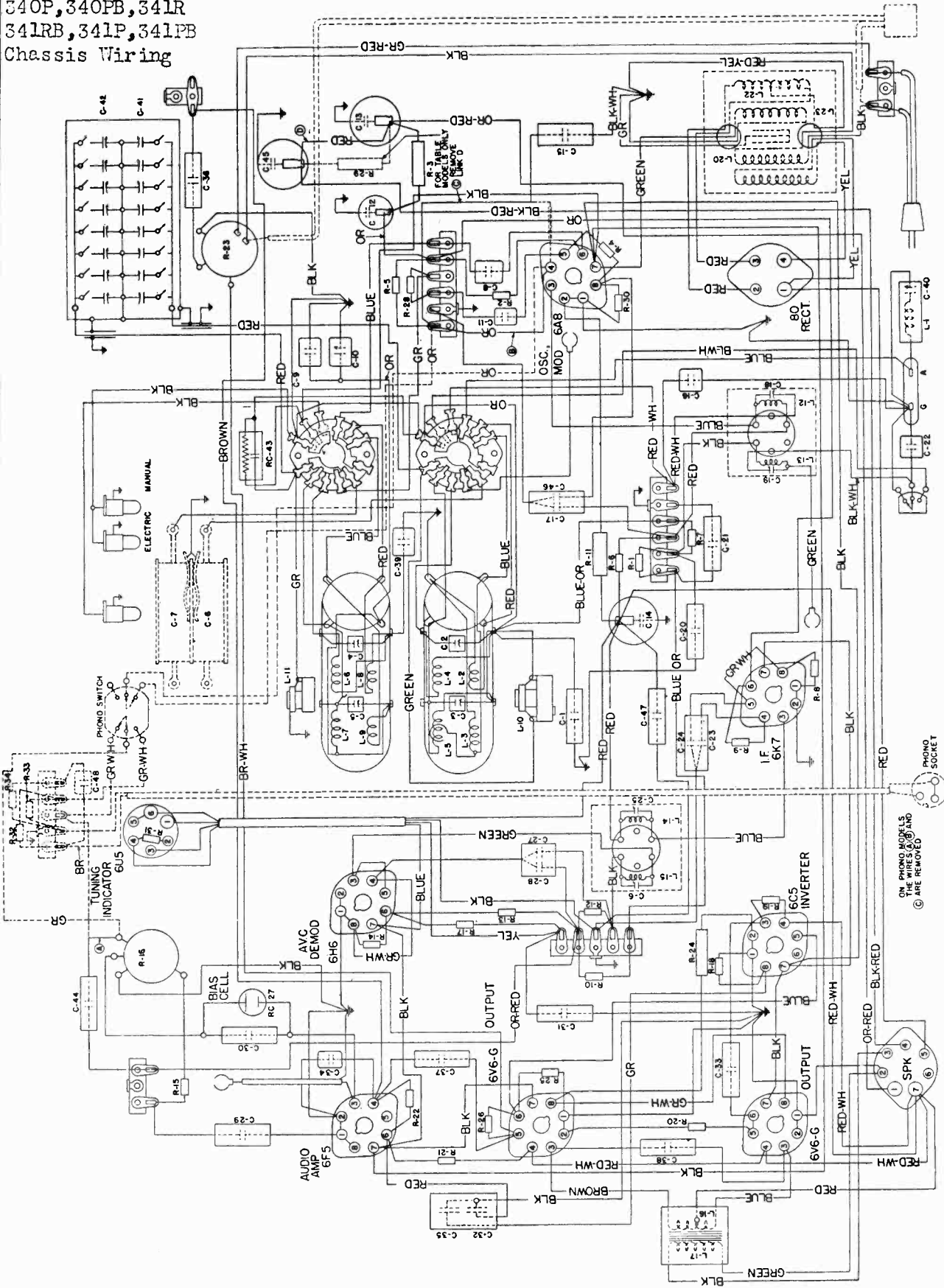


Fig. 3. Wiring Diagram of Chassis.

341RB, 341P, 341PB
Voltage, Socket
Trimmers, Circuit Data

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 340F, 340FB
340H, 340HB, 340M
340IB, 340V, 340VB
340P, 340PB, 341R

Arrangement, appearing on page... Manual or electric tuning for the Standard Broadcast range is easily obtainable by simply rotating the range control knob... Manual or electric tuning for the Standard Broadcast range is easily obtainable by simply rotating the range control knob... Manual or electric tuning for the Standard Broadcast range is easily obtainable by simply rotating the range control knob...

A special temperature controlled compensating capacitor is used in the oscillator circuit of these receivers when operating the electric tuning arrangement in order to eliminate drift in the oscillator's frequency... In addition to the above features, the No. 340-P receiver is also equipped with a single record playing phonograph unit, amply capable of crystal type pick-up in conjunction with a specially equalized circuit.

NORMAL VOLTAGE READINGS

The values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base, with the tubes in their respective sockets... The receiver is, therefore, in all operational conditions, measurements are made.

Table with columns: Tube, Circuit, Cap, 1, 2, 3, 4, 5, 6, 7, 8, Heater Voltages Between Heater Terminals. Rows include 6A8 Mod. Osc., 6K7 I. F. Amp., 6H6 Dem. A. V. C., 6F5 Audio Amp., 6C5 Audio Inv., 6V6-G Audio Output, 6V6-G Audio Output, 6U5 Tuning Ind., 80 Rectifier, and Speaker Socket.

Receiver tuned manually to 1000 kc., no signal. A. C. voltages are indicated by italics.

Stromberg-Carlson Nos. 340 and 341 Radio Receivers

STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY
ROCHESTER, NEW YORK

ELECTRICAL SPECIFICATIONS

- Type of Circuit: Superheterodyne with Electric Tuning
Tuning Ranges: Range "A", 530 to 1700 Kc.; Range "C", 540 to 18,000 Kc.
Power Supply Voltage: 110, 115, 120, 125 Volts, A. C.
Input Power Rating: 50 to 60 Cycles and 25 to 60 Watts

APPARATUS SPECIFICATIONS

- No. 340-F Receiver: 50 to 60 Cycles; P-28961 Chassis Assembly; P-26170 Speaker
No. 340-FB Receiver: 25 to 60 Cycles; P-28962 Chassis Assembly; P-26170 Speaker
No. 340-HB Receiver: 25 to 60 Cycles; P-28962 Chassis Assembly; P-26170 Speaker
No. 340-MB Receiver: 25 to 60 Cycles; P-28961 Chassis Assembly; P-26170 Speaker
No. 340-VB Receiver: 25 to 60 Cycles; P-28962 Chassis Assembly; P-26170 Speaker
No. 340-YB Receiver: 25 to 60 Cycles; P-28962 Chassis Assembly; P-26170 Speaker
No. 340-PB Receiver: 25 to 60 Cycles; P-28962 Chassis Assembly; P-26170 Speaker
No. 340-RB Receiver: 25 to 60 Cycles; P-28962 Chassis Assembly; P-26170 Speaker
No. 341-PB Receiver: 25 to 60 Cycles; P-28962 Chassis Assembly; P-26170 Speaker
No. 341-RB Receiver: 25 to 60 Cycles; P-28962 Chassis Assembly; P-26170 Speaker
No. 341-PB Receiver: 25 to 60 Cycles; P-28962 Chassis Assembly; P-26170 Speaker

CIRCUIT DESCRIPTION

These receivers are nine tube, instantaneous "Electric Tuning" superheterodyne receivers employing metal tubes and a highly efficient dynamic speaker. There are two tuning ranges, the frequency limits of each range being listed under the "Electrical Specifications" given above.

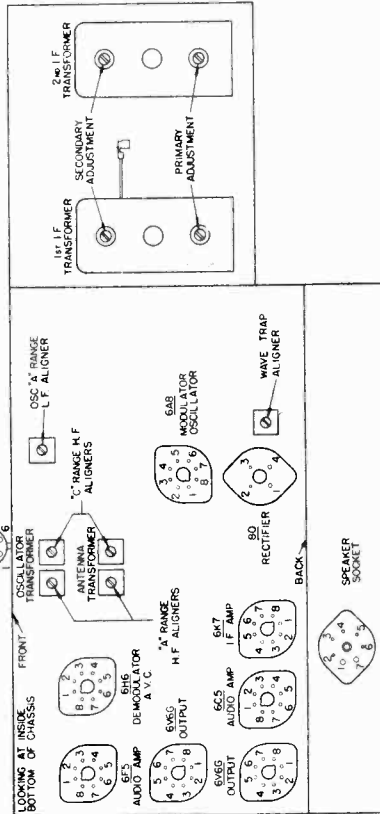


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Aligning Capacitors.

P-29976 Issue 1 Printed in U. S. A.

MODELS 340F, 340FB
340H, 340HB, 340M
340MB, 340V, 340VB

STROMBERG-CARLSON TEL. MFG. CO.

340P, 340PB, 341R
341RB, 341P, 341PB
Alignment

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on these receivers, and ordinarily no readjustments are necessary. However, should it become necessary to make any readjustments, the alignment procedure given in the following paragraphs should be carefully followed. In order to make these aligning adjustments easy and satisfactory manner, it is recommended that the Stromberg-Carlson P-24008 aligning tool be used.

To accurately align the circuits in these receivers, it is necessary to use a high grade, modulated test oscillator. (Signal Generator), the output voltage of which can be varied. In conjunction with this test oscillator, an output meter should be used for determining the maximum signal voltage developed across the voice coil of the loud speaker.

In making any alignment adjustments, always adjust the test oscillator's output voltage to the minimum value where a good alignment may still be obtained. Never attempt to make any alignment adjustments using a strong signal. Before proceeding with the alignment of any circuits in these receivers be sure that the "Off-On" control knob is set for maximum treble response (position where knob is rotated from its maximum counterclockwise position where set turns on), and that the slotted shaft of the electric tuning set-up switch (located on the top of the chassis) is in the "Set-Up" position. When the aligning adjustments have been completed the slotted shaft of the electric tuning set-up switch should be rotated so that the slot points in the direction of the word, "Operate". Figure 1, shows the location of all the aligning capacitors in these receivers.

Dial Adjustment

Before aligning the circuits of any of these receivers, the tuning dial must be properly aligned to track with the gang tuning capacitors. To check whether the dial is set correctly with respect to the gang tuning capacitors, rotate the "Station Selector" knob in a clockwise direction so that the gang tuning capacitors are set to their maximum capacity position. Then, with the gang tuning capacitors in this position, the dial pointer should be placed on the horizontal center line of the dial. To do this, align the pointer with the short black line located at the extreme right-hand edge of the dial plate.

Intermediate Frequency Adjustments

The intermediate frequency used in these receivers is 455 kilocycles. In making these circuit adjustments always align the circuits in the order given in these instructions.

1. Set the Electric Tuning and Range Switch control knob to the manual tuning standard broadcast position. (Set volume knob to minimum volume). Rotate the dial pointer by means of the Station Selector knob to the extreme low frequency position on the dial. (The word "Normal" or "Tone" control knob slightly clockwise from its most counter-clockwise position, which is the "normal" position). By aid of a screwdriver rotate the slotted shaft of the Electric Tuning Set-Up switch located at the rear of the chassis base, so that the slotted shaft points in the direction of the word "Set-Up" (maximum clockwise rotation). Rotate the Volume control knob to its maximum clockwise position (maximum volume).
2. Apply between the chassis base (or ground binding post) of the receiver and the grid of the No. 6A8 modulator-oscillator tube, a modulated signal of 455 kilocycles from the test oscillator. The microfarad capacitor in series with the connection between the output terminal of the test oscillator and the grid of the No. 6A8 tube. Do not remove the chassis grid lead connecting to this tube. The ground (or low side) terminal of the test oscillator should be connected to either the chassis base or the ground binding post terminal.
3. Now, noting from Figure 1, the aligning capacitors for the first and second I. F. transformers, align the I. F. circuits in the following manner:
 - Secondary of second I. F. transformer.
 - Primary of second I. F. transformer.
 - Secondary of first I. F. transformer.
 - Primary of first I. F. transformer.

Adjusting the circuits to obtain maximum reading on the output meter, reducing the output of the test oscillator as required.

Radio Frequency Adjustments

The alignment of the radio frequency circuits in these receivers should be very carefully made and in the order specified.

Alignment of Short Wave Range (Also Referred to as "C" Range)

In aligning the radio frequency circuits for this range, replace the 0.1-microfarad capacitor which was placed in series with the test oscillator's output lead for the I. F. alignment with the carbon type resistor. This lead should then be connected to the antenna binding post located on the rear of the receiver. The ground terminal (or low side) of the test oscillator should be connected to the ground binding post on the receiver.

1. Rotate the Electric Tuning and Range Switch control knob to the Short Wave ("C") range position, and set the test oscillator's frequency and the receiver's tuning dial to 17 megacycles.

2. Adjust the oscillator's "C" range high frequency aligner for maximum output.
3. Adjust the antenna's "C" range high frequency aligner for maximum output and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.

Alignment of Standard Broadcast Range (Also Referred to as "A" Range)

In aligning the radio frequency circuits for this range, replace the 400-ohm carbon type resistor in series with the test oscillator's output lead with a 200-micro-microfarad capacitor and align these circuits as follows:

1. Rotate the Electric Tuning and Range Switch control knob to the manual tuning, Standard Broadcast ("A") range position and set the test oscillator's frequency and the receiver's tuning dial to 1.5 megacycles.
2. Adjust the oscillator's "A" range high frequency aligner for maximum output.
3. Adjust the antenna's "A" range high frequency aligner for maximum output.
4. Set the test oscillator's frequency and the receiver's tuning dial to 0.6 megacycles.
5. Adjust the oscillator's "A" range low frequency aligner (series aligner) for maximum output, and at the same time rotate the gang tuning capacitor slightly back and forth through resonance until maximum output is obtained.
6. Reset both the test oscillator's frequency and receiver's tuning dial to 1.5 megacycles and repeat operations Nos. 2 and 3.

Wave Trap Adjustment

In adjusting the wave trap circuit, set the Electric Tuning and Range Switch control knob to the manual tuning, Standard Broadcast position (arrow on knob pointing in direction of letters "BK"). Set the dial pointer to 1000 kilocycles and the Electric Tuning Set-Up Switch, located on the back of the receiver chassis, to the "Set-Up" position.

Connect a 200-micro-microfarad capacitor in series with the output terminal of the modulated test oscillator and the antenna binding post on the receiver, and the ground terminal of the test oscillator to the ground amplifier, 600 kilocycles, supply a fairly strong signal to the receiver and adjust the wave trap aligner until a minimum indication is obtained on the output meter.

IMPORTANT: When all the aligning adjustments have been completed, it is important that the Electric Tuning Set-Up Switch (located on the rear of the receiver chassis) be re-set to the "Operate" position.

OBTAINING REPRODUCTION FROM PHONOGRAPH RECORDS FOR NOS. 340 AND 341 RECEIVERS NOT EQUIPPED WITH A RECORD PLAYING UNIT

In order to obtain reproduction of phonograph records in conjunction with these receivers, the following instructions should be followed.

To equip these receivers for phonograph operation, it will be necessary to purchase and install a Stromberg-Carlson P-29712 Package Assembly. The rear of the chassis base of the receiver is already drilled for this assembly. Complete instructions on how to install and operate this assembly are furnished with each P-29712 Package Assembly.

To obtain the best quality of phonograph reproduction from these receivers, a Stromberg-Carlson Record Player is recommended. The record player in conjunction with a correctly equalized circuit, a Stromberg-Carlson Record Player is not used and the electric pick-up to be used is of the high impedance type, it will be necessary to connect a low capacity shielded cable between the three-prong socket and plug of the P-29712 Package Assembly, and the pick-up. This shielded cable should be of the low capacity type. The length of the shielded cable used should be kept as short as possible.

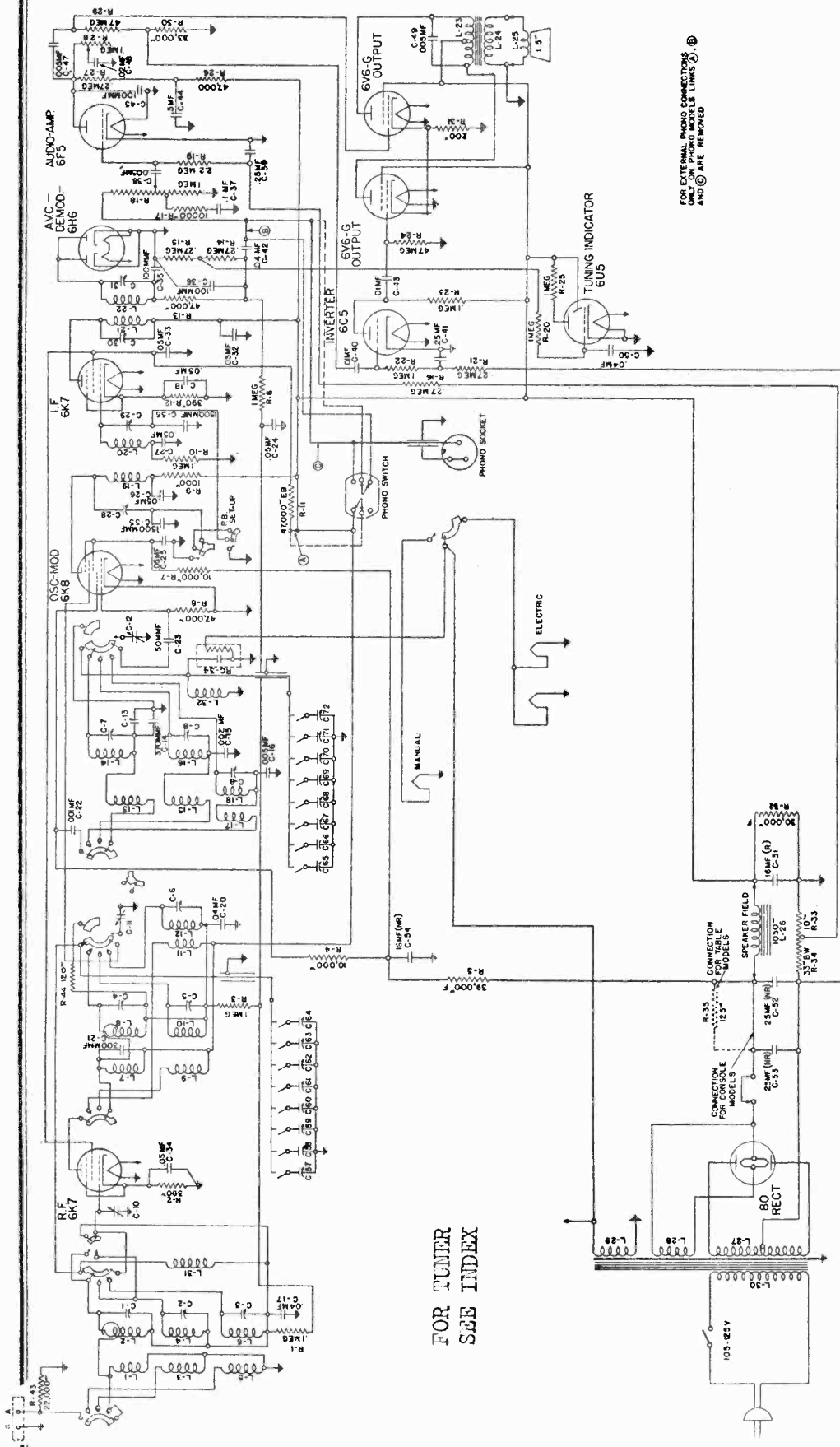
If a pick-up of the low impedance type is used, it will be necessary to connect a "matching transformer" between the three-prong socket and plug of the P-29712 Package Assembly, and the pick-up. The transformer should be located as near to the receiver as possible in which case it will not be necessary to use a shielded cable.

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 345F, 345FB

345M, 345MB

Schematic



FOR TUNER
SEE INDEX

ELECTRICAL SPECIFICATIONS

Type of Circuit..... Superheterodyne with Electric Tuning
 Tuning Ranges..... A—53 to 1.7 Mc.; B—2.25 to 7.6 Mc.; C—7.6 to 23 Mc.
 Number and Type of Tubes..... 1 No. 6K8, 2 No. 6K7, 1 No. 6H6, 1 No. 6F5, 1 No. 6C5, 2 No. 6V6G, 1 No. 6U5, 1 No. 80
 Voltage Rating..... 105 to 125 Volts
 Power Frequency Rating..... 25 to 60 Cycles and 50 to 60 Cycles
 Input Power Rating..... 85 Watts
 Frequency of Intermediate Amplifier..... 455 Kilocycles

APPARATUS SPECIFICATIONS

No. 345-F Receiver..... 50 to 60 Cycles; P-29447 Chassis Assembly; P-26170 Speaker
 No. 345-FB Receiver..... 25 to 60 Cycles; P-29448 Chassis Assembly; P-26170 Speaker
 No. 345-M Receiver..... 50 to 60 Cycles; P-29447 Chassis Assembly; P-26170 Speaker
 No. 345-MB Receiver..... 25 to 60 Cycles; P-29448 Chassis Assembly; P-26170 Speaker

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 345F, 345FB
345M, 345MB
Voltage Alignment

NORMAL VOLTAGE READINGS

The values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base, with the tubes in their respective sockets. The receiver is, therefore, in full operation when the measurements are made. Figure 1, shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and allowance should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-2.5, 0-10, 0-100, 0-250, 0-500, 0-1000 volts except when an asterisk appears after any given voltage value in which case the 250 volt scale was used.

Tube	Circuit	Terminals of Sockets								
		1	2	3	4	5	6	7	8	
6K7	R. F. Amp.	0	0	+240	+81	+2.5	+240	6.3	+2.5	8
6K8	Mod., Osc.	0	0	+215	+73	-6.0	+81	6.3	0	2-7
6K7	I. F. Amp.	0	0	+240	+81	+2.5	0	6.3	+2.5	2-7
6H6	Dem., A. V. C.	0	0	0	0	0	0	6.3	0	2-7
6I75	Audio Amp.	0	0	0	+83*	-1.0	+190	6.3	0	2-7
6C5	Audio Inv.	0	0	+105	+240	+1	-5.0	6.3	0	2-7
6V6G	Audio Output	0	0	+235	+240	0	0	6.3	+14	2-7
6V6G	Audio Output	0	0	+235	+240	0	0	6.3	+14	2-7
6U5	Tuning Ind.	6.3	+20*	+1	+240	0	0	0	0	1-6
80	Rectifier	+370	360	+370	0	0	0	0	0	1-4
Speaker Socket		+370	0	0	+370	+370	0	+240	0	0

Receiver tuned manually to 1000 Kc., no signal. A. C. voltages are indicated by italics.

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on these receivers, and ordinarily no re-adjustments are necessary. However, should it become necessary to make any re-adjustments, the alignment procedure given in the following paragraphs should be carefully followed. In order to make these aligning adjustments in an easy and satisfactory manner, it is recommended that the Stromberg-Carlson P-24608 aligning tool be used.

To accurately align the circuits in these receivers, it is necessary to use a high grade, modulated test oscillator (Signal Generator), the output voltage of which can be varied. In conjunction with this test oscillator, a sensitive output meter should be used for determining the maximum signal voltage developed across the voice coil of the loud speaker.

IMPORTANT: In making any R. F. or I. F. alignment adjustments, always adjust the test oscillator's output voltage to the minimum value where a good alignment may still be obtained. Never attempt to make alignment adjustments using a strong signal. Before proceeding with the alignment of any R. F. or I. F. circuits in these receivers be sure that the "Off-On-Tone" control knob is set for maximum treble response, and that the Electric Tuning Set-Up Switch, located on the rear of the chassis base, is rotated to the "Set-Up" position. When the aligning adjustments have been completed the Electric Tuning Set-Up Switch should be rotated back to the "Operate" position. Figure 1, shows the location of all the aligning capacitors in these receivers.

Dial Adjustment

Before aligning the circuits of any of these receivers, the tuning dial must be properly aligned to track with the gang tuning capacitors. To check whether the dial is set correctly with respect to the gang tuning capacitors, rotate the "Station Selector" knob in a clockwise direction so that the gang tuning capacitors are set to the station of maximum frequency. Then, rotate the tuning pointer to the "P" position. The tuning pointer should be placed on the horizontal center line of the dial. To do this, align the pointer with the short black line located at the extreme right-hand edge of the dial plate.

Intermediate Frequency Adjustments

The intermediate frequency used in these receivers is 455 kilocycles. In making these circuit adjustments always align the circuits in the order given in these instructions.

1. Set the Electric Tuning and Range Switch control knob to the manual tuning Standard Broadcast range position (arrow on knob pointing in direction of letter "A"). Set the dial pointer by means of the Station Selector knobs to the extreme low frequency position on the receiver's dial. Rotate the "Off-On-

Tone" control knob slightly clockwise from its most counter-clockwise position. By aid of a screwdriver, rotate the tuning set-up switch, located at the rear of the chassis base, so that the slot points in the direction of the word "Set-Up". Rotate the Volume control knob to its maximum clockwise position (maximum volume).

2. Apply between the chassis base (or ground binding post) of the receiver and the grid of the No. 6K8 modulator-oscillator tube, a modulated signal of 455 kilocycles from the test oscillator, using a 0.1 microfarad capacitor. The test oscillator should be connected to the test oscillator and the grid of the No. 6K8 tube. Do not remove the chassis grid lead connected to this ground (or low side) terminal of the test oscillator should be connected to either the chassis base or the ground binding post terminal of the receiver.

3. Now, noting from Figure 1, the aligning capacitors for the first and second I. F. transformers, align the I. F. circuits in the following manner:
 - Secondary of second I. F. transformer.

Primary of second I. F. transformer.

Secondary of first I. F. transformer.

Primary of first I. F. transformer.

Adjusting the circuits to obtain maximum reading on the output meter, reducing the output of the test oscillator as required.

Radio Frequency Adjustments

The alignment of the radio frequency circuits in these receivers should be very carefully made and in the order specified.

CAUTION: Be sure that the Electric Tuning Set-Up Switch is set to the "Set-Up" position.

Alignment of Short Wave Range, "C"

In aligning the radio frequency circuits for this range, replace the 0.1 microfarad capacitor which was placed in series with the test oscillator with the test oscillator lead connected to the rear of the antenna ground terminal (or low side) of the test oscillator should be connected to the ground binding post on the receiver.

1. Rotate the Electric Tuning and Range Switch control knob to the "C" Short Wave range position, and set the test oscillator's frequency and the receiver's tuning dial to 20 megacycles.

2. Adjust the receiver's oscillator "C" range H. F. aligner for maximum output.

3. Adjust the R. F. transformer "C" range H. F. aligner for maximum output and at the same time rotate the gang tuning capacitors back and forth through resonance until maximum output is obtained.

4. Adjust the antenna "C" Range H. F. aligner for maximum output and at the same time rotate the gang tuning capacitors back and forth through resonance until maximum output is obtained.

Alignment of Short Wave Range, "B"

In aligning the radio frequency circuits for this range, use the same artificial antenna (400 ohm resistor) and antenna binding post as was used for aligning the "C" range, and align as follows:

1. Rotate the Electric Tuning and Range Switch control knob to the "B" Short Wave range position, and set the test oscillator's frequency and the receiver's tuning dial to 7 megacycles.

2. Adjust the receiver's oscillator "B" range H. F. aligner for maximum output.

3. Adjust the R. F. transformer's "B" range H. F. aligner for maximum output and at the same time rotate the gang tuning capacitors back and forth through resonance until maximum output is obtained.

4. Adjust the antenna "B" range H. F. aligner for maximum output and at the same time rotate the gang tuning capacitors back and forth through resonance until maximum output is obtained.

Alignment of Standard Broadcast Range, "A"

In aligning the radio frequency circuits for this range, replace the 400-ohm carbon type resistor in series with the test oscillator's output lead with a 200-micro-microfarad capacitor and align these circuits as follows:

1. Rotate the Electric Tuning and Range Switch control knob to the manual tuning Standard Broadcast range position and set the test oscillator's frequency and the receiver's tuning dial to 1.5 megacycles.

2. Adjust the receiver's oscillator "A" range H. F. aligner for maximum output.

3. Adjust the R. F. transformer's "A" range H. F. aligner for maximum output.

4. Adjust the antenna "A" range H. F. aligner for maximum output.

5. Set the test oscillator's frequency and the receiver's tuning dial to 0.6 megacycles.

6. Adjust the receiver's oscillator "A" range L. F. aligner (series aligner) for maximum output, and at the same time rotate the gang tuning capacitors slightly back and forth through resonance until maximum output is obtained.

7. Reset both the test oscillators frequency and receiver's tuning dial to 1.5 megacycles and repeat operations Nos. 2, 3 and 4.

MODELS 335L, 335LB
336P, 336PB

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 345F, 345FB
345M, 345MB

Voltage, Socket, Trimmers

Socket, Trimmers
Bass Response Data

APPARATUS SPECIFICATIONS

- No. 335-L Receiver..... 50 to 60 Cycles; P-28818 Chassis Assembly; P-27605 Loud Speaker
- No. 335-LB Receiver..... 25 to 60 Cycles; P-28819 Chassis Assembly; P-27605 Loud Speaker
- No. 336-P Receiver..... 60 Cycles Only; P-29415 Chassis; P-29439 Phono Unit; P-29464 Loud Speaker
- No. 336-PB Receiver..... 25 Cycles Only; P-29416 Chassis; P-29440 Phono Unit; P-29464 Loud Speaker

NORMAL VOLTAGE READINGS

The values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base, with the tubes in their respective sockets, and the receiver in full operation when the measurements are made. Figure 1, shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and allowance should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1600 ohms per volt should be used for the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-2.5, 0-10, 0-250, 0-500, 0-1000 volts except when an asterisk appears after any given voltage value in which case the 250 volt scale was used.

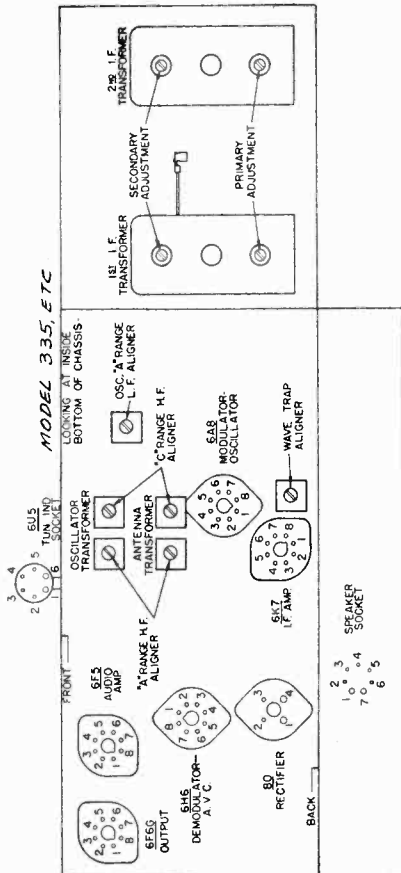


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Aligning Capacitors.

Tube	Circuit	Cap	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts
6A8	Mod., Osc.	0	0	0	+245	+68	-10	+235	6.2	+2.8	2-7	6.2
6K7	I. F. Amp.	0	0	0	+250	+78	+2.8	+280	6.2	+2.8	2-7	6.2
6H6	Dem., A. V. C.	—	0	0	0	0	0	0	6.2	0	2-7	6.2
6F5	Audio Amp.	0	0	0	+250	+56	0	0	6.2	0	2-7	6.2
6F6G	Audio Output	—	0	0	+235	+250	0	0	6.2	+14.5	2-7	6.2
6U5	Tuning Ind.	—	6.2	+18*	-1.5	+250	0	0	—	—	1-6	6.2
80	Rectifier	—	+360	350	350	+360	—	—	—	—	1-4	5.0
Speaker Socket			+360	0	0	+360	+360	0	+250	—	—	—

Receiver tuned manually to 1000 Kc., no signal. A. C. voltages are indicated by italics.

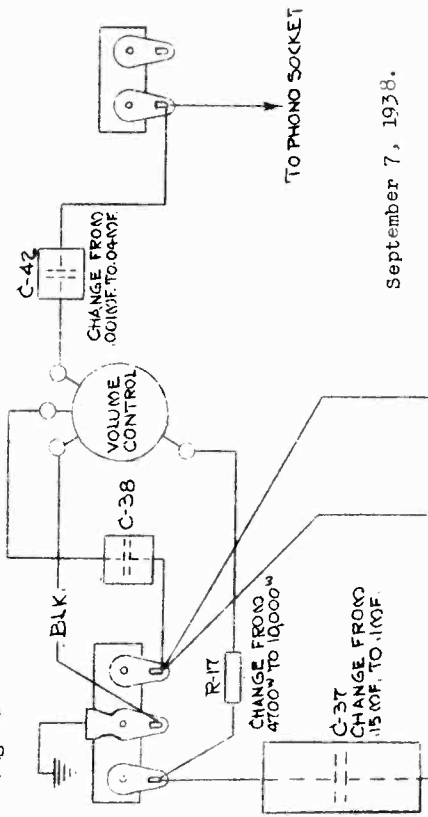
Increasing Bass Response of 345 Receivers

Remove the 4700 ohm resistor (R-17) from the volume control tap and replace with a 10,000 ohm resistor, Pc. 26345.

Remove the .15 mf capacitor (C-37) from the volume control tap and replace with a .1 mf capacitor, Pc. 24402.

Remove the .001 mf capacitor (C-42) from the high side of the volume control and replace with a .04 mf capacitor, Pc. 24405.

Caution: Do not mistake capacitor C-38 for one of the capacitors to be changed.



September 7, 1938.

VOLUME CONTROL CIRCUIT

TO #1 TERMINAL ON 6F5 TUBE

MODEL 345

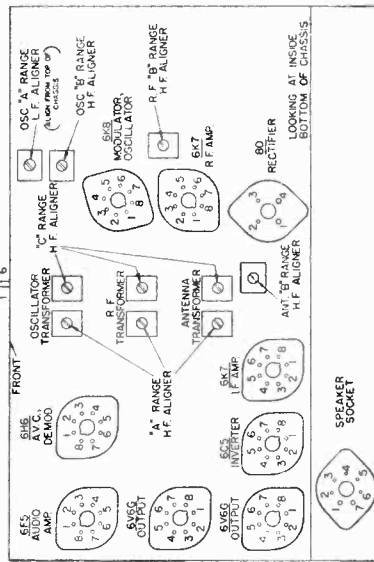
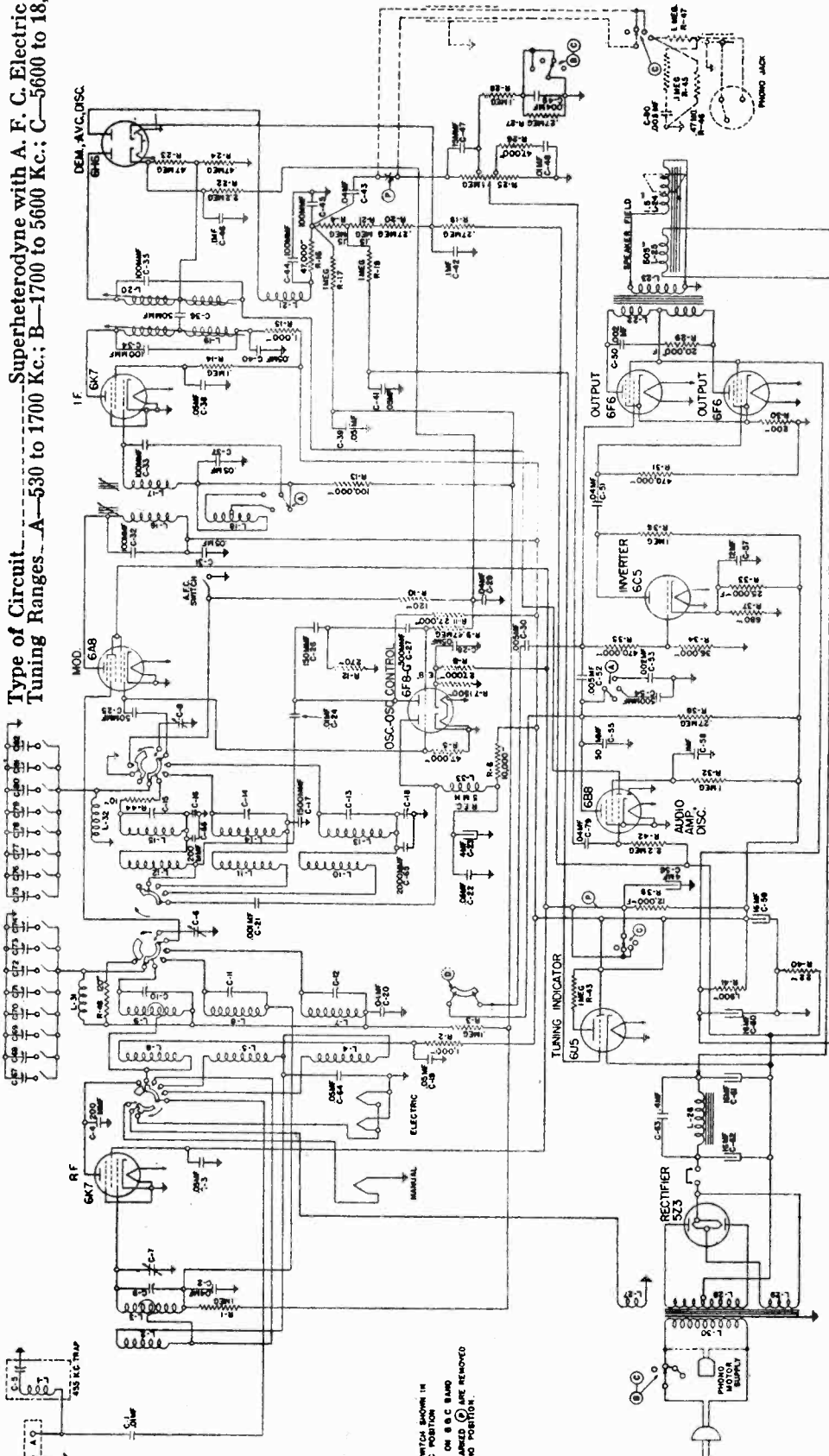


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 350M, 350MB
350R, 350RB, 350P
350PB, 350V, 350VB
Schematic

Type of Circuit.....Superheterodyne with A. F. C. Electric Tuning
Tuning Ranges.....A—530 to 1700 Kc.; B—1700 to 5600 Kc.; C—5600 to 18,000 Kc.



Voltage Rating.....105 to 125 Volts, A. C.
Power Frequency Rating.....See "Apparatus Specifications"
Input Power Rating.....120 Watts
Radio Models Only.....140 Watts
Radio-Phono. Models.....455 Kilocycles
Frequency of Intermediate Amplifier.....

APPARATUS SPECIFICATIONS

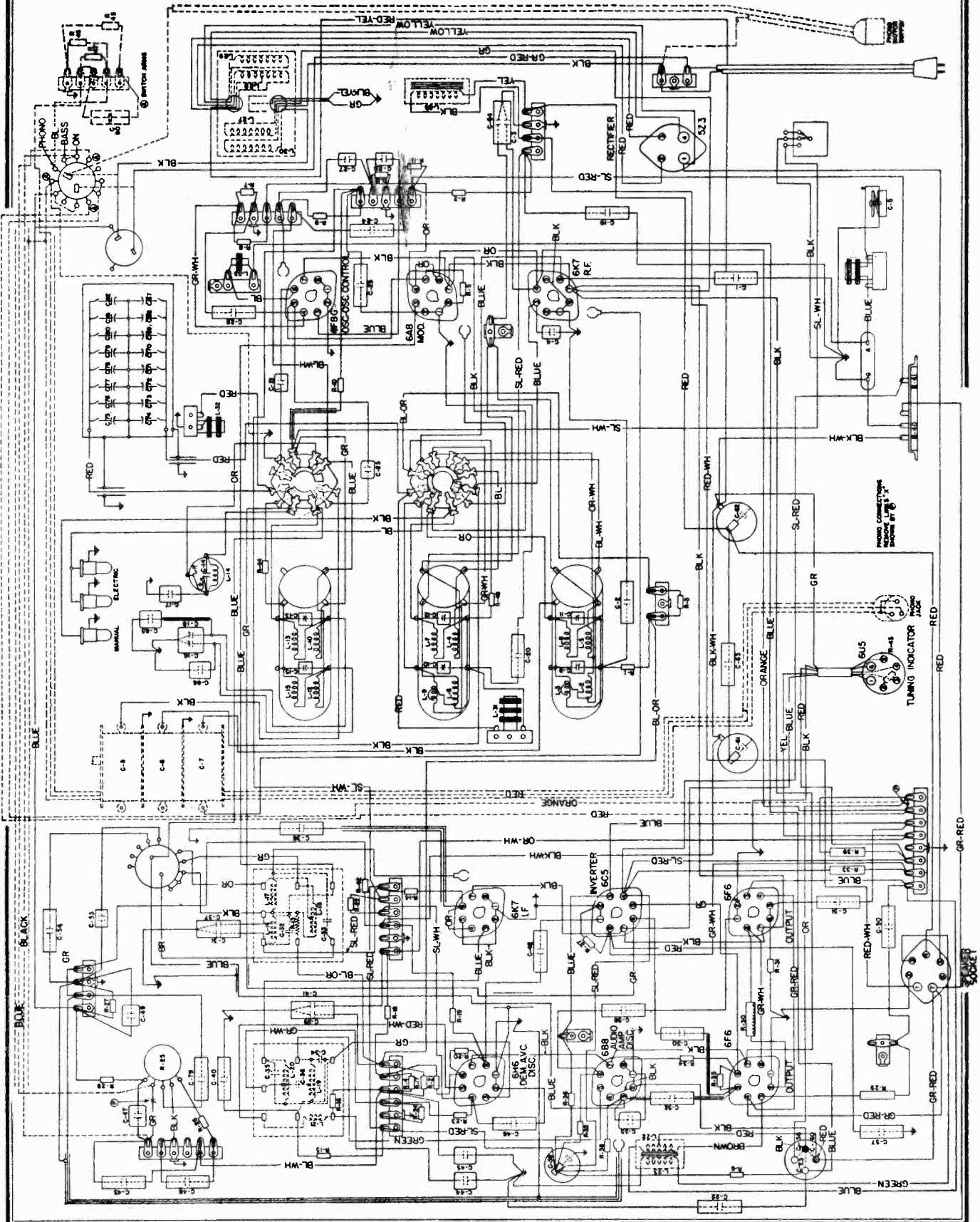
- No. 350-M Receiver.....50 to 60 Cycles; P-29043 Chassis; P-27504 Speaker
- No. 350-MB Receiver.....25 to 60 Cycles; P-29044 Chassis; P-27504 Speaker
- No. 350-R Receiver.....50 to 60 Cycles; P-29043 Chassis; P-27504 Speaker
- No. 350-RB Receiver.....25 to 60 Cycles; P-29044 Chassis; P-27504 Speaker
- No. 350-P Receiver.....60 Cycles Only; P-29066 Chassis; P-29443 Phono. Motor Unit
- No. 350-PB Receiver.....25 Cycles Only; P-27504 Chassis; P-29444 Phono. Motor Unit
- No. 350-V Receiver.....50 to 60 Cycles; P-29043 Chassis; P-27504 Speaker
- No. 350-VB Receiver.....25 to 60 Cycles; P-29044 Chassis; P-27504 Speaker

FOR TUNER
SEE INDEX

MODELS 350M, 350MB
350R, 350RB, 350P
350PB, 350Y, 350VB
Chassis Wiring

STROMBERG-CARLSON TEL. MFG. CO.

Fig. 3. Wiring Diagram, No. 350 Receiver.



STROMBERG-CARLSON TEL. MFG. CO.

MODELS 350M, 350MB
350R, 350RB, 350P
350PB, 350V, 350VB
Alignment

output control so that a signal of 50,000 to 100,000 microvolts is fed into the No. 6A8 modulator tube. Now, observe the reading of the milliammeter which is connected in series with the cathode of the No. 6F8-G oscillator control tube, and rotate the Range Switch control knob to the "Electric" position, observing whether there is any difference in the reading of the milliammeter. When this circuit is correctly adjusted, there should be no difference in the reading of the milliammeter when the Range Switch control knob is rotated from the manual tuning Standard Broadcast to the "Electric" position. If there is a difference in the reading of the milliammeter, the Range Switch control knob should be rotated from the manual tuning Standard Broadcast to the "Electric" position and vice versa, adjusting the control knob by means of the screw adjustment until the meter reading has the same value regardless of whether the Range Switch control knob is rotated to the manual tuning Standard Broadcast or "Electric" position. When this condition is obtained, the Discriminator circuit is properly adjusted.

Radio Frequency Adjustments

The alignment of the radio frequency circuits in these receivers should be very carefully made and in the order specified.

When making any aligning adjustments of these circuits, the Fidelity Control knob should be set for "Normal" operation, and the "Off-On-Bass" control knob should also be set for "Normal" operation.

Alignment of Short Wave Range (Also Referred to as "C" Range)

In aligning the radio frequency circuits for this range, replace the 0.1-microfarad capacitor which was placed in series with the test oscillator's output lead for the I. F. alignments, with a 400-ohm carbon type resistor. This lead should then be connected to the antenna binding post located on the rear of the receiver chassis. The test terminal (or low side) of the test oscillator should be connected to the ground binding post on the receiver.

1. Operate the Range Switch on the receiver chassis to the short wave ("C") range position, and set the test oscillator's frequency and the receiver's tuning dial to 16 megacycles.
2. Adjust the receiver's oscillator "C" range high frequency aligner for maximum output.
3. Adjust the antenna "C" range high frequency aligner for maximum output, at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.
4. Set the test oscillator's frequency and the receiver's tuning dial to 6 megacycles.
5. Adjust the receiver's oscillator "C" range low frequency aligner (series aligner), and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.
6. Reset both the test oscillator's frequency and the receiver's tuning dial to 16 megacycles and repeat operations Nos. 2 and 3.

Alignment of Medium Wave Range (Also Referred to "B" Range)

In aligning the radio frequency circuits for this range, use the same artificial antenna (400-ohm carbon type resistor) in series with the output terminal of the test oscillator as was used for aligning the short-wave range.

1. Operate the Range Switch on the receiver chassis to the Medium Wave ("B") range position, and set the test oscillator's frequency and the receiver's tuning dial to 5 megacycles.
2. Adjust the receiver's oscillator "B" range high frequency aligner for maximum output.
3. Adjust the antenna "B" range high frequency aligner for maximum output, and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.

Alignment of Standard Broadcast Range (Also Referred to as "A" Range)

In aligning the radio frequency circuits for this range, replace the 400-ohm carbon type resistor in series with the test oscillator's output lead with a 200-microfarad capacitor and align these circuits as follows:

1. Operate the Range Switch to the manual tuning Standard Broadcast "A" range position and set the test oscillator's frequency and the receiver's tuning dial to 1.5 megacycles.
2. Adjust the receiver's oscillator "A" range high frequency aligner for maximum output.
3. Adjust the R. F. interstage "A" range high frequency aligner for maximum output.
4. Adjust the antenna's "A" range high frequency aligner for maximum output.
5. Set the test oscillator's frequency and the receiver's tuning dial to 0.6 megacycles.
6. Adjust the receiver's oscillator "A" range low frequency aligner (series aligner) for maximum output, and at the same time rotate the gang tuning capacitor slightly back and forth through resonance until maximum output is obtained.
7. Reset both the test oscillator's frequency and receiver's tuning dial to 1.5 megacycles and repeat operations Nos. 2, 3 and 4.

Wave Trap Adjustment

In adjusting the wave trap circuit, set the Electric Tuning and Range Switch control knob to the manual tuning, Standard Broadcast position (arrow on knob pointing in direction of gold dot). Set the tuning dial to 1000 kilocycles.

Connect a 200-microfarad capacitor in series with the output terminal of the modulated test oscillator and the antenna binding post on the receiver, and the ground terminal of the test oscillator to the ground binding post on the receiver. Then, with the modulated test oscillator set at the frequency of the intermediate amplifier (455 kilocycles), supply a strong signal to the receiver and adjust the wave trap aligner until a minimum indication is obtained on the output meter.

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on these receivers, and ordinarily no readjustments are necessary. However, should it become necessary to make any readjustments, the procedure given in these instructions should be carefully followed. The preferred method of aligning these receivers is by the use of a suitable cathode ray oscillograph and frequency modulator unit in conjunction with the standard signal generator.

To accurately align circuits in these receivers, it is necessary to use a high grade signal generator capable of being modulated 30% and having an output voltage of at least 100,000 microvolts; it will also be necessary to have this output voltage controlled so that only a few microvolts may be fed into the receiver. In conjunction with the signal generator, a sensitive output meter should be used for determining the maximum signal voltage developed across the voice coil of the loud speaker. In addition to this equipment, it will be necessary when making the discriminator tuning circuit to use a milliammeter having a range of 0 to 10 milliamperes connected in series with the discriminator tuned circuit. The No. 6F8-G tube which is used in the oscillator control circuit by means of an adapter plug inserted between the tube and the socket connections by a capacitor of not longer than 15", and should be shunted at the socket connections by a capacitor of not less than 0.25 Mfd.

In order to make the aligning adjustments in an easy and satisfactory manner, it is recommended that the Stromberg-Carlson P-24008 aligning tool be used.

Before proceeding with the alignment of any circuits in these receivers, except when specifically directed, be sure that the Fidelity Control knob is set for the "Normal" position. The "Off-On-Bass" control should also be set for the "Normal" position. In making any alignment adjustments always adjust the test oscillator's output voltage to the minimum value where a good alignment may still be obtained, except when specifically directed in these instructions. Figure 1 shows the location of all the aligning capacitors or adjustments for this receiver.

Dial Adjustment

Before aligning the circuits of these receivers, the tuning dial must be properly aligned to "track" with the gang tuning capacitor. To check whether the dial is set correctly with respect to the gang tuning capacitor, rotate the "Rapid Station Selector" knob in a clockwise direction so that the gang tuning capacitor is set to its maximum capacity position. Then, with the receiver turned "on", the illuminated dial indicator line should be exactly centered over the dial alignment lines (black lines) which are located at the extreme low frequency end of the dial. If these lines do not center over the illuminated dial indicator line, loosen the two set screws located at the dial hub. Then rotate the dial so that these alignment lines are centered over the illuminated dial indicator line. The two set screws of the dial hub should then be securely tightened.

Intermediate Frequency Adjustments

The intermediate frequency used in these receivers is 455 kilocycles. Because of the necessity of obtaining the proper shape of resonance curve in a high fidelity receiver, it is recommended that unless it is absolutely essential, these I. F. adjustments be untouched. In the factory these adjustments are made using a visual system which allows the operator to see the exact shape of the resonance curve. For this reason it is best to have these adjustments made at the factory. However, in the case where this cannot be done, the following procedure should be followed:

1. Operate the Range Switch of the receiver to the manual tuning, Standard Broadcast range position, and set the tuning dial to its extreme low frequency position. Set the Fidelity control knob to its "Normal" position, and the "Off-On-Bass" control knob to its normal position.

CAUTION: Never attempt to align the R. F. or I. F. circuits of this receiver with the Fidelity control knob set at any position other than the "Normal" position and the Range Switch control knob set at the "Electric" tuning position unless specifically directed in the following paragraphs. Also, do not make any aligning adjustments of the R. F., I. F., or "Discriminator" circuits with the A. F. C. switch (which is located on rear of the chassis base) set at the "set-up" position.

2. Apply between the chassis base (or ground binding post) of the receiver and the grid of the No. 6A8 modulator tube, a modulated signal of 455 kilocycles from the signal generator, using a 0.1 mfd. capacitor in series with the connection between the output terminal of the signal generator and the grid of the No. 6A8 tube. Do not remove the chassis grid lead connecting to this tube. The ground (or low side) terminal of the signal generator should be connected to either the chassis base or the ground binding post.

3. Now, noting from Fig. 1, the alignment adjustments for the First and Second I. F. transformers, align the I. F. circuits in the following order:

Adjust the First I. F. transformer primary circuit for maximum output.

Adjust the First I. F. transformer primary circuit for maximum output.

Adjust the First I. F. transformer secondary circuit for maximum output.

Carefully make all of the above adjustments, watching carefully the output meter so that the peak reading is obtained for each adjustment. As each adjustment is made reduce the output of the test oscillator as required.

4. To adjust the Discriminator circuit proceed as follows:

Check the position of the Range Switch control knob which should be set to the manual tuning Standard Broadcast position.

CAUTION: Before adjusting this circuit be sure that the I. F. amplifier is tuned exactly to 455 kilocycles. With the signal generator still set at a frequency of 455 kilocycles, adjust the signal generator's

MODELS 235H, 235HB
235L, 235LB

STROMBERG-CARLSON TEL. MFG. CO.

Continuity Test

Continuity test chart for No. 235 Receivers.

Jan. 17, 1938.

1. Test speaker socket with speaker left out.
2. Plug speaker in speaker socket for all other tests.
3. Set A.F.C. Switch on rear of chassis base to "Operate" position for all tests unless otherwise specified.
4. Before making continuity test, disconnect one end of the spring from the Manual-Electric switch lever. Pull Manual-Electric switch lever out for "Manual" operation. Push Manual-Electric switch lever in for "Electric" operation.
- A. Operate A.F.C. switch on rear of chassis to "Set Up" position; should read 120W.

Operate A.F.C. switch on rear of chassis to "Operate" position; should read 4 M.

- B. Operate A.F.C. switch on rear of chassis to "Set Up" position; should read 550,000W.

Operate A.F.C. switch on rear of chassis to "Operate" position; should read 4 M.

- C. Operating volume control clockwise should read from "S" to 800,000W.

FOR OTHER SERVICING
DATA, SEE INDEX

Other tests not shown on chart.

Test from Electric tuning pilot lamp socket. Operate Manual-Electric switch to "Manual" position; should read "O". Operate Manual-Electric switch to "Electric" position; should read "S".

Test from main dial pilot lamp socket. Operate Manual-Electric switch to "Manual" position; should read "S". Operate Manual-Electric switch to "Electric" position; should read "O".

Test from Ant. terminal on back of chassis base. Operate range switch to "A" band; should read 8W. Operate range switch to "B" band; should read 1W. Operate range switch to "C" band; should read .5W.

Test from Grd. terminal on back of chassis base; should read "S".

Test from terminals of A.C. plug to chassis base; should read "O".

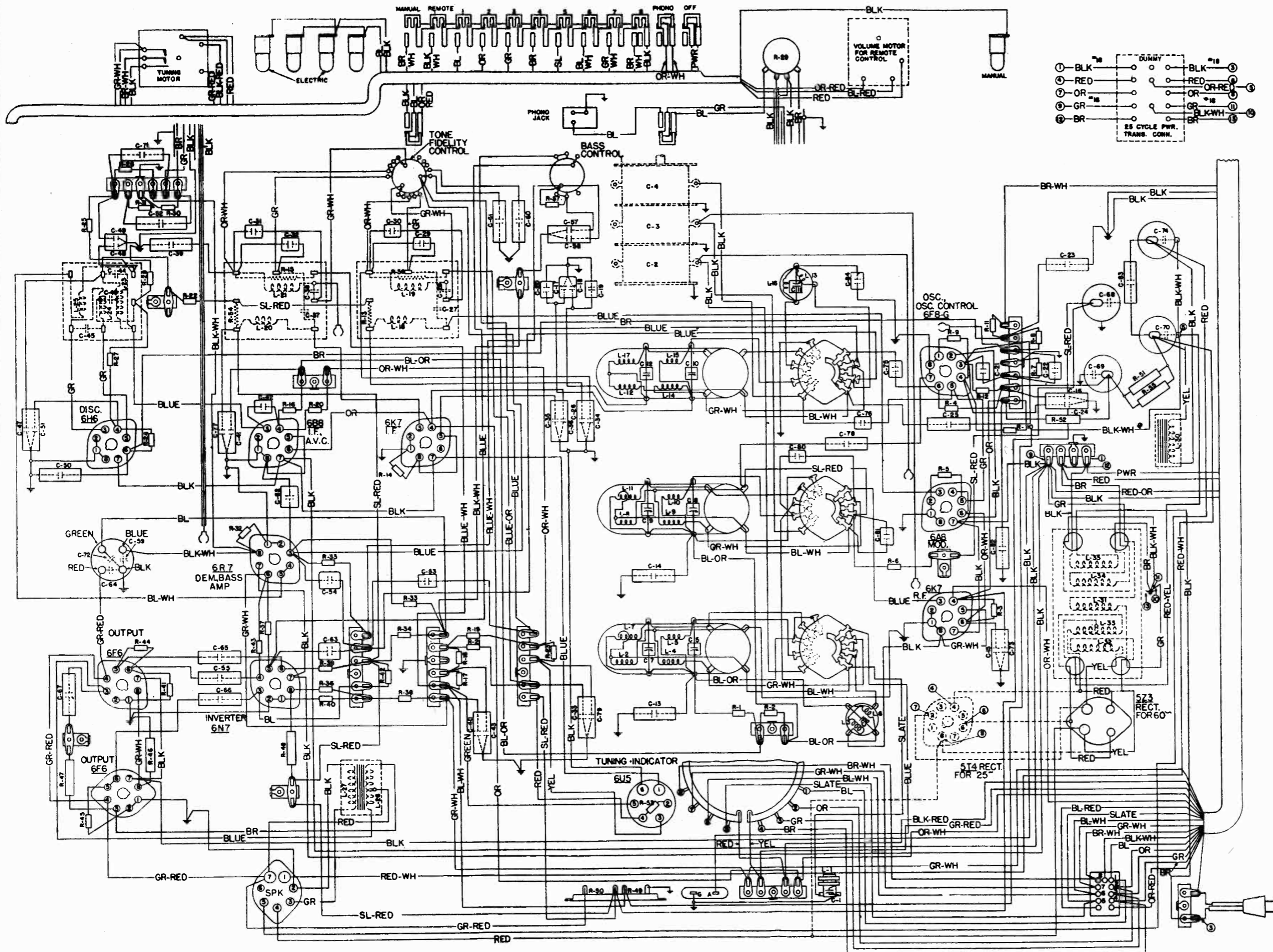
Test between terminals of AC plug; should read 8W with A.C. switch closed; should read "O" with A.C. switch open.

Test from the Stator Plates of the oscillator section of the variable capacitor (located near front of chassis) to the switch side of the .001 capacitor (located next to the "A" and "B" band series aligner).

Operate range switch to "A" band; should read 10W. Operate range switch to "B" band; should read 2W. Operate range switch to "C" band; should read 1W.

Tube	Circuit	Grid Clip	Terminals of Sockets							
			1	2	3	4	5	6	7	8
6-J-5	Osc. Control		S	S	55000W	A	B	30000W	S	2700W
6-A-8	Mod. Osc.	1.8M	S	S	11000W	55000W	55000W	20000W	S	300W
6-K-7	I.F. Amp.	3. M	S	S	12000W	150000W	400W	20000W	S	400W
6-H-6	Discrimin. Dem.		S	S	450000W	1. M	450000W	450000W	S	S
6-B-8	A.V.C. Audio	C	S	S	550000W	S	800000W	800000W	S	270W
6-F-6	Output		S	S	11000W	11000W	900000W	20000W	S	400W
6-U-5	Tuning Ind.		S	1.1M	1.5M	12000W	270W	S		
5-Y-4G	Rectifier		0	0	170W	0	200W	0	12000W	12000W
Spk.	Socket									
Output	Rear of Chas.		300000W	S	S	300000W	0	0	12000W	

STROMBERG-CARLSON TEL. MFG. CO.



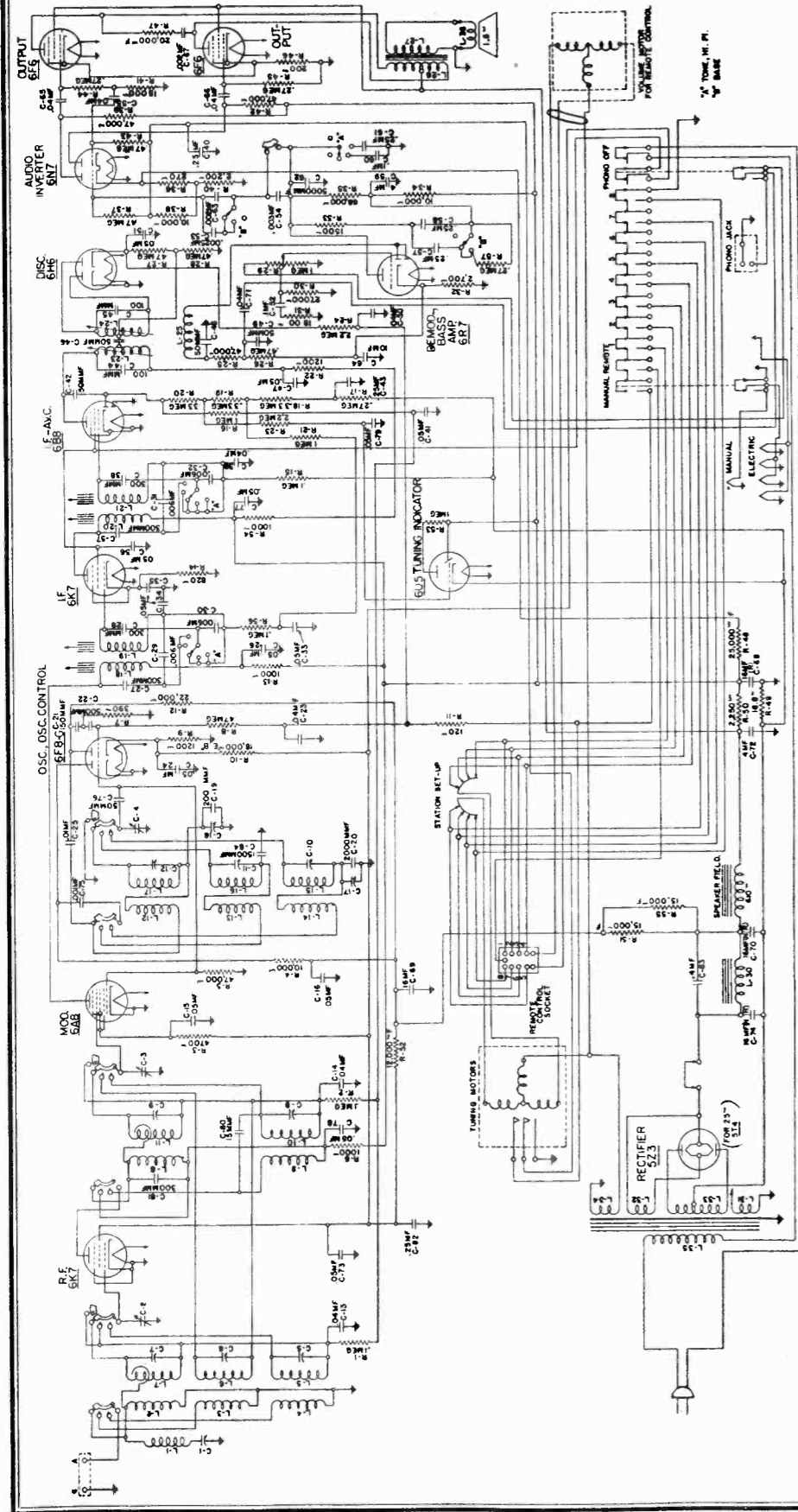
CIRCUIT DESCRIPTION

The Stromberg-Carlson No. 360 Radio Receivers are twelve tube, "Electric Tuning", adjustable high fidelity receivers with three tuning ranges. The electric tuning circuit combines a highly efficient motor and selector circuit in combination with an automatic frequency control circuit. The electric tuning circuit is arranged so that eight favorite stations located in the Standard Broadcast range may be set up for selection by means of the push buttons (local and other stations that give the best daytime and evening service should be selected).

These receivers are also equipped with a special arrangement of the Stromberg-Carlson Selector dial indicator. This design of dial arrangement enables the operator to easily identify the service and frequency range to which the range switch control knob is set by means of the yellow disc (located at the right-hand edge of the dial), which moves in a vertical direction in conjunction with the rotation of the Range Switch control knob.

These receivers are also provided with a low level bass frequency compensating circuit in conjunction with the volume control circuit so that balanced reproduction is obtained for any setting of the volume control. A separate "Bass" control is also provided to increase or decrease the response at the lower (bass) audio frequencies if this is desired.

Fig. 3. Wiring Diagram of Chassis.



For data on setting up electric tuning system and remote control see Index.

Fig. 2. Schematic Circuit of Receiver. ELECTRICAL SPECIFICATIONS

Type of Circuit..... Superheterodyne with A. C. Electric Tuning
 Tuning Ranges..... A—530 to 1700 Kc.; B—1700 to 5600 Kc.; C—5600 to 18,000 Kc.
 Number and Type of Tubes..... { 2 No. 6K7, 1 No. 6A8, 1 No. 6F8-G, 1 No. 6B8, 1 No. 6H6,
 { 1 No. 6R7, 1 No. 6N7, 2 No. 6F6, 1 No. 6U5, 1 No. 5Z3
 Voltage Rating..... 105 to 125 Volts, A. C.
 Power Frequency Rating..... 140 Watts
 Input Power Rating..... 455 Kilocycles
 Frequency of Intermediate Amplifier.....

Superheterodyne with A. C. Electric Tuning
 A—530 to 1700 Kc.; B—1700 to 5600 Kc.; C—5600 to 18,000 Kc.
 { 2 No. 6K7, 1 No. 6A8, 1 No. 6F8-G, 1 No. 6B8, 1 No. 6H6,
 { 1 No. 6R7, 1 No. 6N7, 2 No. 6F6, 1 No. 6U5, 1 No. 5Z3
 105 to 125 Volts, A. C.
 140 Watts
 455 Kilocycles

APPARATUS SPECIFICATIONS

No. 360-M Receiver..... 50 to 60 Cycles; P-29068 Chassis; P-29072 Speaker
 No. 360-MB Receiver..... 25 to 60 Cycles; P-29069 Chassis; P-29072 Speaker

See "Apparatus Specifications" 140 Watts 455 Kilocycles

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on these receivers, and ordinarily no readjustment is necessary. If it becomes necessary to make any readjustments, the procedure given in these instructions should be carefully followed. The procedure given is for the alignment of a suitable cathode ray oscillograph and frequency modulator unit in conjunction with the standard signal generator.

If the above conditions are not obtained, the signal generator should be set to exact resonance with the intermediate frequency amplifier (455 kilocycles) as mentioned in 1 above and the secondary adjustment of the Third I. F. Discriminator transformer should be rotated so zero voltage is indicated on the voltmeter connected across C-51.

Now, adjust the signal generator's frequency a slight amount (approximately 5 kilocycles) each side of 455 kilocycles, noting at the same time the reading of the voltmeter; a decrease in the signal generator's frequency (from 455 kilocycles) should make the voltmeter give an increased reading from zero and an increase in the signal generator's frequency (455 kilocycles) should make the voltmeter give a decreased indication from zero.

- Radio Frequency Adjustments**
- The alignment of the radio frequency circuits in these receivers should be very carefully made and in the order specified.
- When making any aligning adjustments of these circuits, all controls should be set at the positions mentioned for the Intermediate Frequency adjustments.
- Alignment of Short Wave Range (Also Referred to as "C" Range)**
- In aligning the radio frequency circuits for this range, replace the 0.1-microfarad capacitor which was placed in series with the test oscillator's output lead for the I. F. alignments, with a 400-ohm carbon type resistor. The test oscillator's output lead should be connected to the ground binding post on the receiver.
1. Operate the Range Switch on the receiver chassis to the short wave ("C") range position, and set the test oscillator's frequency and the receiver's tuning dial to 10 megacycles.
 2. Adjust the receiver's oscillator "C" range high frequency aligner for maximum output.
 3. Adjust the B. F. interstage "C" range high frequency aligner for maximum output and at the same time rotate the gang tuning capacitors back and forth through resonance until maximum output is obtained.
 4. Adjust the antenna "C" range high frequency aligner for maximum output, at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.
 5. Set the test oscillator's frequency and the receiver's tuning dial to 6 megacycles.
 6. Adjust the receiver's oscillator "C" range low frequency aligner (series aligner) for maximum output, and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.
 7. Reset both the test oscillator's frequency and the receiver's tuning dial to 16 megacycles and repeat operations Nos. 2, 3 and 4.

- Alignment of Medium Wave Range (Also Referred to as "B" Range)**
- In aligning the radio frequency circuits for this range, use the same artificial antenna (400-ohm carbon type resistor) in series with the output terminal of the test oscillator as was used for aligning the short-wave range.
1. Operate the Range Switch on the receiver chassis to the Medium Wave ("B") range position, and set the test oscillator's frequency and the receiver's tuning dial to 5 megacycles.
 2. Adjust the receiver's oscillator "B" range high frequency aligner for maximum output.
 3. Adjust the antenna "B" range high frequency aligner for maximum output, and at the same time rotate the gang tuning capacitor back and forth through resonance until maximum output is obtained.

- Alignment of Standard Broadcast Range (Also Referred to as "A" Range)**
- In aligning the radio frequency circuits for this range, replace the 400-ohm carbon type resistor in series with the test oscillator's output lead with a 200-micro-microfarad capacitor and align these circuits as follows:
1. Operate the Range Switch to the manual tuning Standard Broadcast "A" range position and set the test oscillator's frequency and the receiver's tuning dial to 1.5 megacycles.
 2. Adjust the receiver's oscillator "A" range high frequency aligner for maximum output.
 3. Adjust the B. F. interstage "A" range high frequency aligner for maximum output.
 4. Adjust the antenna's "A" range high frequency aligner for maximum output.
 5. Set the test oscillator's frequency and the receiver's tuning dial to 0.6 megacycles.
 6. Adjust the receiver's oscillator "A" range low frequency aligner (series aligner) for maximum output, and at the same time rotate the gang tuning capacitor slightly back and forth through resonance until maximum output is obtained.
 7. Reset both the test oscillator's frequency and receiver's tuning dial to 1.5 megacycles and repeat operations Nos. 2, 3 and 4.

Wave Trap Adjustment

In adjusting the wave trap circuit, set the Range Switch control knob to the Standard Broadcast position (arrow on knob pointing in direction of gold dot). Push the push button located under the designation "Manual On" and set the tuning dial to 1000 kilocycles.

Dial Adjustment

Before aligning the circuits of these receivers, the tuning dial must be properly aligned to "track" with the gang tuning capacitors. To check whether the dial is set correctly with respect to the gang tuning capacitors, rotate the "Manual Stations" selector knob in a clockwise direction so that the gang tuning capacitors are set to their maximum capacity position. With the gang tuning capacitors at this position, the dial pointer should be centered over the two dial alignment marks located near the extreme right-hand edge of the dial. One of these marks is a vertical line located between the standard broadcast scale, and the other mark is a small triangle mark located at the bottom of the dial. The dial pointer assembly should be loosened so that the pointer can be centered over the two marks. When this has been accomplished the screw should be securely tightened again.

Intermediate Frequency Adjustments

The intermediate frequency used in these receivers is 455 kilocycles. Because of the necessity of obtaining the proper shape of resonance curve of these stages in a high fidelity receiver, it is recommended that unless it is absolutely essential, these I. F. adjustments be untouched. In the factory these adjustments are made by means of a test oscillator and a cathode ray oscillograph. However, in the case where this cannot be done, the following procedure should be followed:

1. Push in the push button which is located under the designation, "Manual On". Operate the Range Switch on the receiver chassis to the Short Wave ("C") range position, and set the tuning dial to 10 megacycles.
2. Apply between the chassis base (or ground binding post) of the receiver and the grid of the No. 6A8 modulator tube, a modulated signal of 455 kilocycles from the signal generator, using a 0.1 mfd. capacitor in series with the connection between the output terminal of the signal generator and the grid of the No. 6A8 tube. Do not remove the chassis grid lead connecting to this tube. The ground (or low side) terminal of the signal generator should be connected to either the chassis base or the ground binding post.
3. Now, noting from Figure 1, the alignment adjustments for the First, Second, and Third I. F. Discriminator transformers, align the I. F. circuits in the following order:
 - Primary of Third I. F. Discriminator transformer for maximum output.
 - Secondary of Second I. F. transformer for maximum output.
 - Primary of Second I. F. transformer for maximum output.
 - Secondary of First I. F. transformer for maximum output.
 - Primary of First I. F. transformer for maximum output.

Adjustment of the Discriminator Circuit

Before making this circuit adjustment be sure that the I. F. amplifier and signal generator are exactly in resonance at 455 kilocycles.

All controls should be set the same as instructed for the intermediate frequency adjustments. Connect a high resistance voltmeter having a resistance of at least 1000 ohms per volt across the capacitor, C-31. The signal generator should remain connected to the grid of the No. 6A8 modulator tube in the same manner as connected when making the aligning adjustments of the intermediate frequency amplifier circuits. The signal generator's output control should be adjusted so that a signal of 10,000 microvolts is fed into the modulator tube. Under these conditions the voltmeter connected across C-31 should read

Connect a 200-micro-microfarad capacitor in series with the output terminal of the modulated test oscillator and the antenna binding post on the receiver, and the ground terminal of the test oscillator to the ground binding post on the receiver. Then, with the modulated test oscillator set at the frequency of the intermediate amplifier, 455 kilocycles, supply a fairly strong signal to the receiver and adjust the wave trap aligner until a maximum indication is obtained on the output meter.

MODELS 370M, 370MB
Socket, Trimmers
Circuit Data

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 360M, 360MB
Voltage, Socket
Trimmers

MODEL 370

CIRCUIT DESCRIPTION

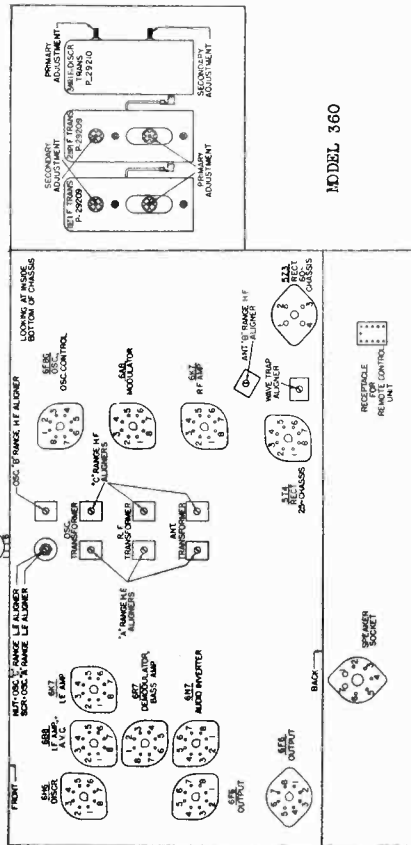
The Stromberg-Carlson No. 370 Radio Receivers are fourteen tube, "Electric Tuning", adjustable high fidelity receivers with four tuning ranges. The electric tuning circuit combines a highly efficient motor and selector circuit in combination with an automatic frequency control circuit. The electric tuning circuit is arranged so that eight favorite stations located in the Standard Broadcast range may be set up for selection by turning the tuning dial of the receiver. Other stations that give the best daytime and evening service should be selected. To properly set up the electric tuning circuit, read the "Instructions for Setting Up Electric Tuning Arrangement".

When manually tuning these receivers or when setting up the eight desired stations for electric tuning, resonance is indicated by means of the tuning indicator tube which operates on the cathode-ray principle. The strength of the signal appearing on the target of the tube is proportional to the size of the aperture appearing on the target of the dial, which moves in a vertical direction in conjunction with the rotation of the range switch knob.

These receivers are also provided with a low level bass frequency compensating circuit in conjunction with the electric tuning control circuit so that balanced reproduction is obtained for any setting of the volume control. A separate "bass" control is also provided to increase or decrease the response at the lower (bass) audio frequencies if this is desired.

These receivers are also equipped with a special arrangement of the Stromberg-Carlson, Selector dial indicator. This design of dial arrangement enables the operator to easily identify the service and frequency range to which the range switch control knob is set by means of the yellow disc (located at the right-hand edge of the dial), which moves in a vertical direction in conjunction with the rotation of the range switch control knob.

The various tubes are used in these receivers as follows: One No. 6K7 is used in the R. F. Amplifier and the other two are used in the I. F. Amplifier. The No. 6A8 tube is used as the Modulator tube and the No. 6F8-G tube is used for both Oscillator and Oscillator Control tube. One No. 6H6 tube is used as the Demodulator and Automatic Volume Control tube and the other No. 6H6 tube is used in the Discriminator circuit for Automatic Frequency control. The No. 6R7 tube is used in the Bass Amplifier and the No. 6Y5 tube is used in a tuning indicator. The No. 6X5 tube is used in the Base of the Audio Power Output Stage. The No. 6U5 tube is used in the Tuning Indicator System. The No. 5Z3 tube is the Rectifier tube of the power supply for these receivers designed for operation on a power supply having a frequency of 50 to 60 cycles; models of these receivers designed for operation on a power supply having a frequency of 25 to 60 cycles, use a No. 5T4 tube as the Rectifier tube of the power supply.



MODEL 360

Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Aligning Adjustments.

NORMAL VOLTAGE READINGS

The various values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base, with all the tubes in their respective sockets. The receiver is therefore, in operation when the measurements are made. Figure 1, shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and allowances should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-25, 0-100, 0-250, 0-500, 0-1000 volts except when an asterisk appears after any given voltage value, in which case the 500 volt scale was used, or when a double asterisk appears the 1000 volt scale was used.

Table with columns: Tube, Circuit, Heater Voltages Between Heater Terminals (Cap, 1-8), and Socket Terminal Numbers. Rows include 6K7, 6A8, 6F8-G, 6K7, 6B8, 6R7, 6H6, 6N7, 6F6, 6U5, 5Z3, and Speaker Socket.

Receiver tuned manually to 1000 Kc., no signal. A. C. voltages are indicated by italics.

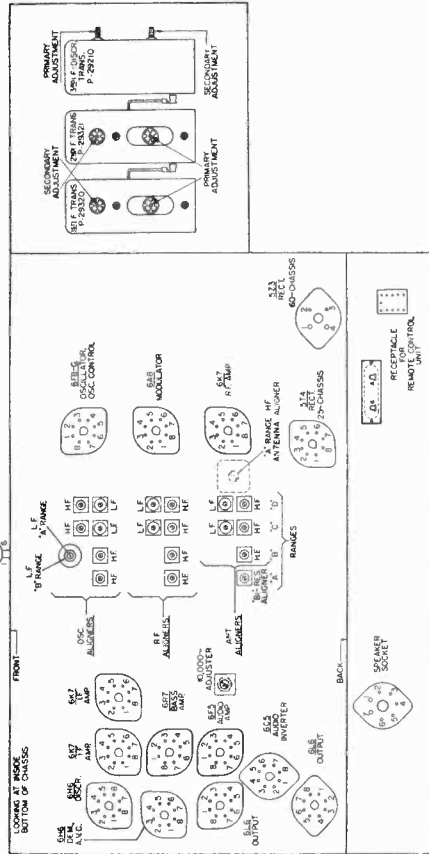


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Aligning Adjustments.

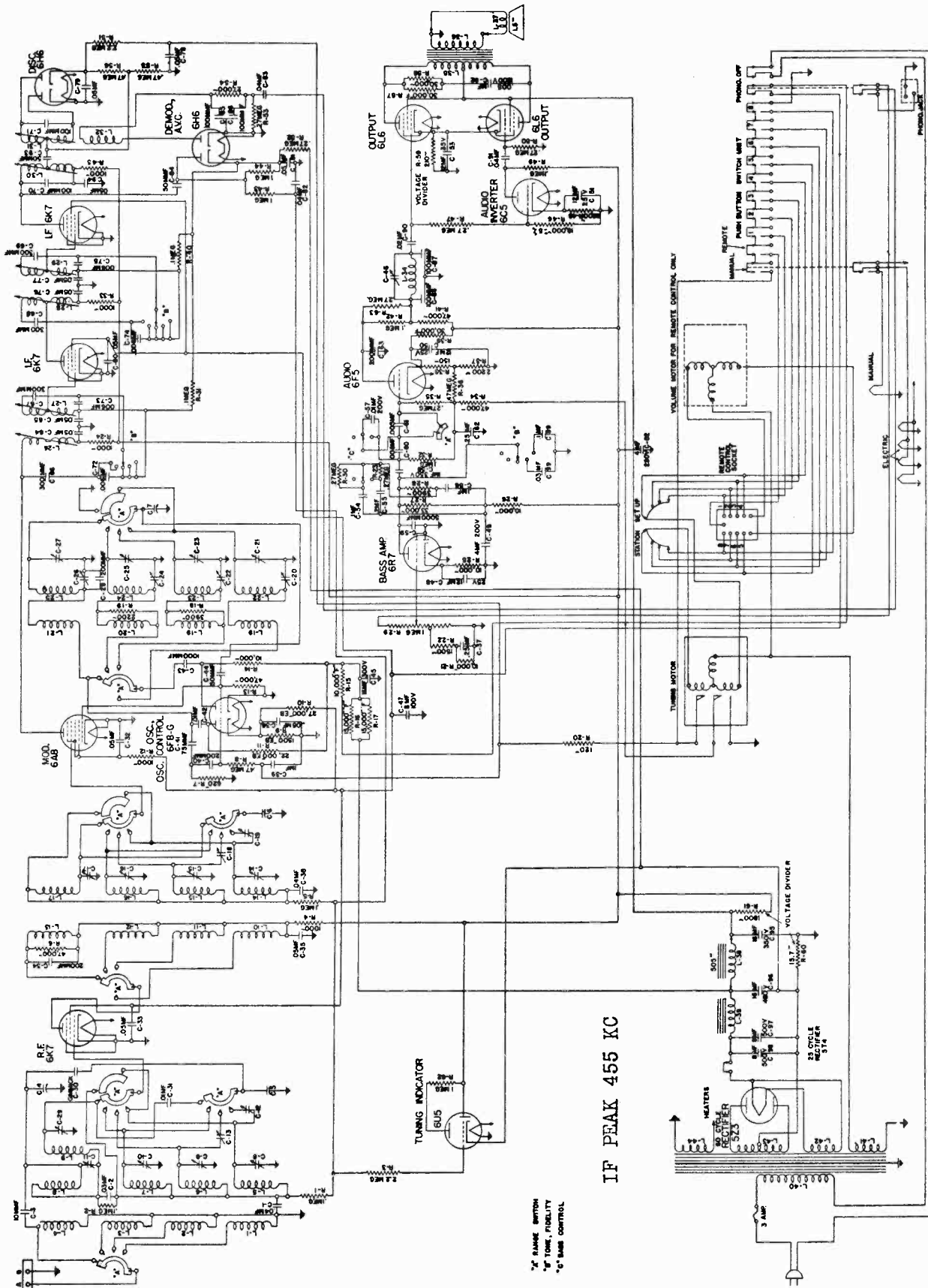


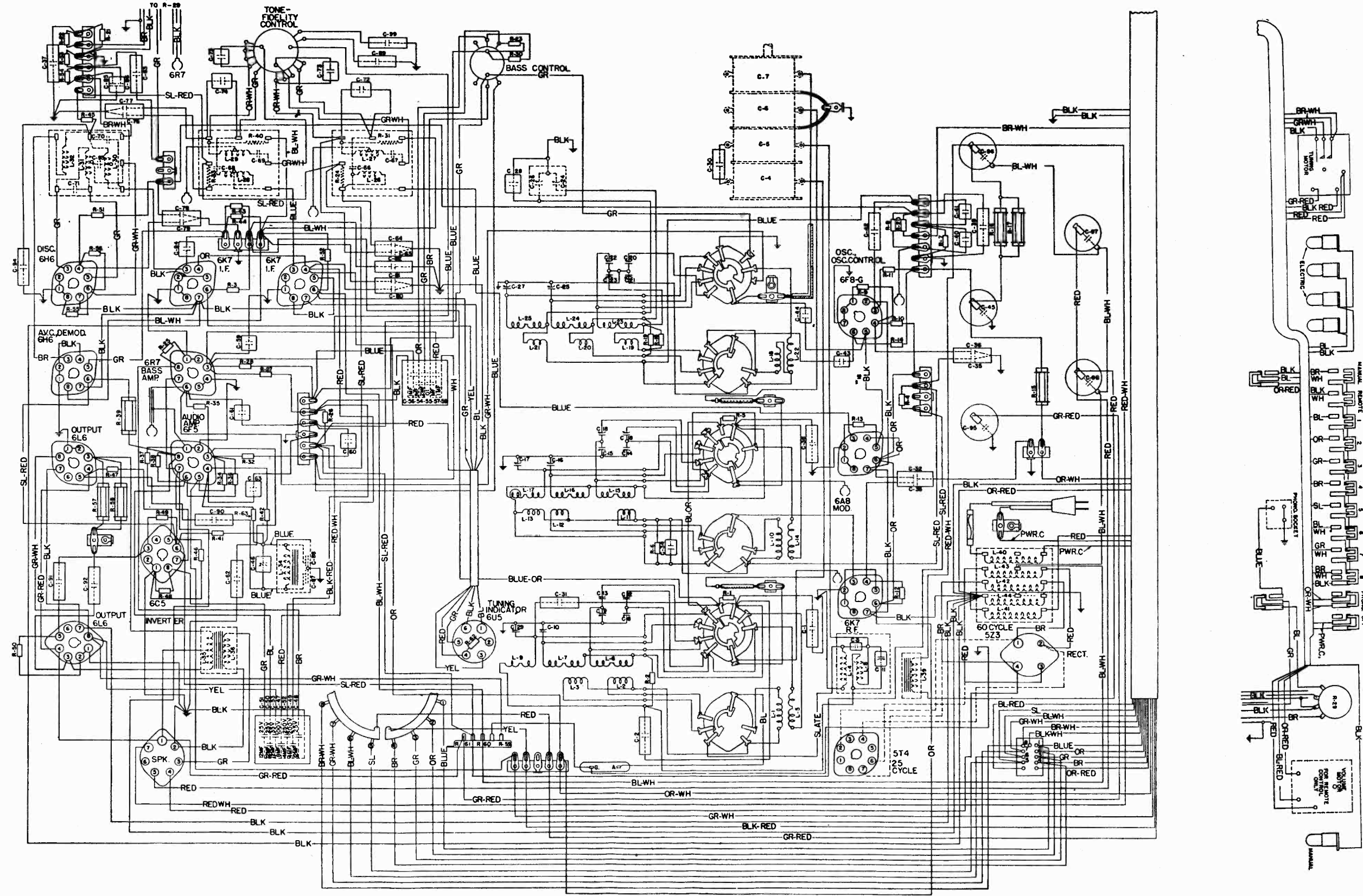
Fig. 2. Schematic Circuit of Receiver.

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 370M, 370MB
Chassis Wiring

No. 370-M Receiver 50 to 60 Cycles; P-29070 Chassis; P-29072 Speaker
No. 370-MB Receiver 25 to 60 Cycles; P-29071 Chassis; P-29072 Speaker

Voltage Rating 105 to 125 Volts, A. C.
Power Frequency Rating See "Apparatus Specifications"
Input Power Rating 155 Watts
Frequency of Intermediate Amplifier 455 Kilocycles



MODELS 370M, 370MB
STROMBERG-CARLSON TEL. MFG. CO. Alignment, Part 1

The signal generator's output control should be adjusted so that a signal of 10,000 microvolts is received at the detector tube. Under these conditions the voltmeter connected across the capacitor, C-79, should read zero.

If the above conditions are not obtained, the signal generator should be set to exact resonance with the Intermediate Frequency Amplifier (455 kilocycles) as mentioned in paragraph 7. The frequency of the signal generator should be adjusted until the voltmeter indicates a reading of zero. The discriminator transformer should be rotated so zero voltage is indicated on the voltmeter connected across the capacitor, C-79.

Now, adjust the signal generator's frequency a slight amount (approximately 5 kilocycles) each side of 455 kilocycles, noting at the same time the reading of the voltmeter; a decrease in the signal generator's frequency (from 455 kilocycles) should make the voltmeter give an increased reading from zero and an increase in the signal generator's frequency (455 kilocycles) should make the voltmeter give a decrease in indication from zero.

Radio Frequency Adjustments

The alignment of the radio frequency circuits in these receivers should be very carefully made and in the order specified.

When making any aligning adjustments of these circuits, all controls, with the exception of the "Manual Stations" control, should be set at the positions mentioned for the Intermediate Frequency adjustments.

Alignment of 11 to 22 Megacycles Short Wave Range (Referred to as "D" Range)

In aligning the radio frequency circuits for this range, replace the 0.1-microfarad capacitor which was placed in series with the test oscillator's frequency and the receiver's tuning dial pointer to 20 megacycles. This lead should then be connected to the antenna binding post located on the rear of the receiver chassis. The ground terminal (or low side) of the test oscillator should be connected to the ground binding post on the receiver.

- 1. Operate the Range Switch on the receiver chassis to the 11 to 22 megacycles short wave, ("D") range position, and set the test oscillator's frequency and the receiver's tuning dial pointer to 20 megacycles.
2. Adjust the receiver's oscillator "D" range H. F. aligner for maximum output.
3. Adjust the R. F. interstage "D" range H. F. aligner for maximum output.
4. Adjust the antenna "D" range H. F. aligner for maximum output.
5. Set the test oscillator's frequency and the receiver's tuning dial pointer to 11 megacycles.
6. Adjust the receiver's oscillator "D" range L. F. aligner for maximum output.
7. Adjust the R. F. interstage "D" range L. F. aligner for maximum output.
8. Adjust the antenna "D" range L. F. aligner for maximum output.
9. Repeat operations Nos. 2, 3, and 4.

Alignment of 4.8 to 11 Megacycles Short Wave Range (Referred to as "C" Range)

In aligning the radio frequency circuits for this range, use the same artificial antenna (400-ohm carbon type resistor) in series with the output terminal of the test oscillator as was used for aligning the short-wave range.

- 1. Operate the Range Switch on the receiver chassis to the 4.8 to 11 megacycles short wave, ("C") range position, and set the test oscillator's frequency and the receiver's tuning dial pointer to 10 megacycles.
2. Adjust the receiver's oscillator "C" range H. F. aligner for maximum output.
3. Adjust the R. F. interstage "C" range H. F. aligner for maximum output.
4. Adjust the antenna "C" range H. F. aligner for maximum output.
5. Set the test oscillator's frequency and the receiver's tuning dial pointer to 5 megacycles.
6. Adjust the receiver's oscillator "C" range L. F. aligner for maximum output.
7. Adjust the R. F. interstage "C" range L. F. aligner for maximum output.
8. Adjust the antenna "C" range L. F. aligner for maximum output.
9. Repeat both the test oscillator's frequency and the receiver's tuning dial pointer to 10 megacycles and repeat operations Nos. 2, 3, and 4.

Alignment of Medium Wave Range (Referred to as "B" Range)

In aligning the radio frequency circuits for this range, use the same artificial antenna (400-ohm carbon type resistor) in series with the output terminal of the test oscillator as was used for aligning the short wave range.

- 1. Operate the Range Switch on the receiver chassis to the Medium Wave ("B") range position, and set the test oscillator's frequency and the receiver's tuning dial pointer to 4.5 megacycles.
2. Adjust the receiver's oscillator "B" range H. F. aligner for maximum output.
3. Adjust the R. F. interstage "B" range H. F. aligner for maximum output.
4. Adjust the antenna "B" range H. F. aligner for maximum output.
5. Set the test oscillator's frequency and the receiver's tuning dial pointer to 1.8 megacycles.
6. Adjust the receiver's oscillator "B" range L. F. aligner for maximum output.
7. Repeat both the test oscillator's frequency and the receiver's tuning dial pointer to 1.4 megacycles and repeat operations Nos. 2, 3, and 4.

Alignment of Standard Broadcast Range (Referred to as "A" Range)

In aligning the radio frequency circuits for this range, replace the 400-ohm carbon type resistor in series with the test oscillator's output lead with a 200-micro-microfarad capacitor and align these circuits as follows:

All alignment adjustments are accurately made at the factory on these receivers, and ordinarily no readjustments are necessary. However, should it become necessary to make any readjustments, the procedure given here should be carefully followed. The preferred method of aligning these receivers is by the use of a suitable cathode ray oscillograph and frequency modulator unit in conjunction with the standard signal generator.

To accurately align circuits in these receivers, it is necessary to use a high grade signal generator capable of being modulated 30% and having an output voltage of at least 10,000 microvolts; it will also be necessary to have this output voltage controlled so that only a few microvolts may be fed into the receiver. In conjunction with the signal generator, a sensitive output meter should be used for determining the alignment. The meter developed across the voice coil of the loud speaker; in this case, the meter will be necessary when making a final adjustment of the volume control. Discriminator-tuned circuit to use a high resistance voltmeter having a resistance of at least 100,000 ohms per volt.

In order to make the aligning adjustments in an easy and satisfactory manner, it is recommended that the Stromberg-Carlson P-21608 aligning tool be used.

Before proceeding with the alignment of any circuits in these receivers, be sure that the Treble Control knob is set for the "Normal" position. The "Bass" control should also be set for the "Normal" position. In making any alignment adjustments always adjust the test oscillator's output voltage to the minimum value where a good alignment may still be obtained, except when specifically directed otherwise in these instructions. Figure 1 shows the location of all the aligning capacitors or adjustments for these receivers.

Dial Adjustment

Before aligning the circuits of these receivers, the tuning dial must be properly aligned to "track" with the gong tuning capacitors. To check whether the dial is set correctly with respect to the gong tuning capacitors, rotate the "Manual Stations" selector knob in a clockwise direction so that the gong tuning capacitors are set to their maximum capacity position. With the gong tuning capacitors at this position, the dial pointer should be centered over the two dial alignment marks located near the extreme right-hand edge of the dial. One of these marks is a vertical line located beneath the standard broadcast scale, and the other mark is a small triangle located beneath the short wave scale of the dial. If the dial pointer is not centered over these marks, the dial should be adjusted by loosening the screw which the pointer can be centered over the two marks. When this has been accomplished the screw should be securely tightened again.

Intermediate Frequency Adjustments

The intermediate frequency used in these receivers is 455 kilocycles. Because of the necessity of obtaining the proper shape of resonance curve in these stages in a high fidelity receiver, it is recommended that unless it is absolutely essential, these I. F. adjustments be untouched. In the factory these adjustments are made using a visual system which allows the operator to see the exact shape of the resonance curve. In these receivers it is best to have these adjustments made at the factory. However, in the case where this cannot be done, the following procedure should be followed:

- 1. Push in the push button which is located under the designation, "Manual On". Operate the Range Switch on the receiver to the Standard Broadcast Range position, and set the tuning dial pointer to its extreme low frequency position. Set the Treble control knob and the Bass control knob to their normal positions.
CAUTION: Never attempt to align the R. F. or I. F. circuits of this receiver with the Treble control knob set for the "Normal" position. Also, do not make any aligning adjustments under the designation, "Manual On", pushed in.
2. Apply between the chassis base (or ground binding post) of the receiver and the grid of the No. 6A8 diode tube a modulated signal of 455 kilocycles from the signal generator, using a 0.1 mfd. capacitor in series with the connection between the output terminal of the signal generator and the grid of the No. 6A8 tube. Do not remove the chassis grid lead connecting to this tube. The ground (or low side) terminal of the signal generator should be connected to either the chassis base or the ground binding post.
3. Now, noting from Figure 1, the alignment adjustments for the First, Second, and Third I. F. Discriminator transformers, align the I. F. circuits in the following order:
Secondary of Third I. F. Discriminator transformer for maximum output.
Primary of Third I. F. Discriminator transformer for maximum output.
Secondary of Second I. F. transformer for maximum output.
Primary of Second I. F. transformer for maximum output.
Secondary of First I. F. transformer for maximum output.
Primary of First I. F. transformer for maximum output.

Carefully make all of the above adjustments, watching the output meter so that the peak reading is obtained for each adjustment. As each adjustment is made reduce the output of the test oscillator as required.

Adjustment of the Discriminator Circuit

- 1. Before making this circuit adjustment be sure that the I. F. amplifier and signal generator are exactly in resonance at 455 kilocycles.
All controls should be set the same as instructed for the intermediate frequency adjustments. Connect a high resistance voltmeter having a resistance of at least 100,000 ohms per volt across the capacitor, C-79. The signal generator should remain connected to the grid of the No. 6A8 modulator tube in the same manner as connected when making the aligning adjustments of the intermediate frequency amplifier.

MODELS 360M, 360MB
Tuner Data
STROMBERG-CARLSON TEL. MFG. CO. Alignment, Part 2
Voltage, Tuner Data

After the eight favorite stations' brushes have all been positioned in the commutator's slot as mentioned in paragraphs 7, 8, and 9 above, loosen about one turn, the clamping screw of the tuning indicator. Remove the tuning indicator unit (with its clamp) from its metal bracket and allow the unit to rest on the chassis base with the end of the tuning indicator tube facing the rear of the receiver.

Repeat the operation mentioned in paragraph 7 above, for the favorite station having the highest frequency being careful to obtain exact resonance with this station by means of the tuning indicator. When resonance with this station is obtained, watch the aperture appearing on the target of the tuning indicator tube and push in the button which is located under the station's letters (dial illumination ceased) and note the reading of the tuning indicator. If the aperture of the tuning indicator changes, move the station's brush slightly to the right or left until the aperture of the tuning indicator is back to its normal position. Repeat this process until the condition is obtained where there is no change in the aperture of the tuning indicator tube when the station is switched from manual to electric tuning.

Proceed to check the settings of the adjustable station brushes for the remaining seven chosen stations according to frequency in exactly the same manner as mentioned in 11, above.

When this has been accomplished, again mount the tuning indicator unit into its proper operating position. This completes the operations necessary for setting up the eight favorite stations.

IMPORTANT: With the electric tuning system in operation, the receiver will be automatically kept in tune with any one of the eight favorite stations as long as the station is operating or provided it has no unusual fading characteristics. If a distant station which is very weak is set up in the electric tuning unit, it will be found that the automatic frequency control circuit will not hold this station if a strong signal is present in either adjacent channel. This same phenomenon will occur if two stations in adjacent channels are almost of equal signal strength, with the weakest signal fading slightly, with the stronger signal having a tendency to "pull in" when the receiver is tuned to the station which is slightly weaker and fading.

Table with columns: Tube, Circuit, Cap, Terminals of Sockets (1-6), Heater Voltages Between Heater Terminals (Socket Terminal, Volt). Rows include R. F. Amp., Modulator, Oscillator Control, 1st I. F. Amp., 2nd I. F. Amp., Demodulator and A. V. C., Discriminator, Bass Amp., Audio Amp., Audio Inv., Audio Output, Tuning Ind., Rectifier, and Speaker Socket.

Receiver tuned manually to 1000 k.c., no signal. A. C. voltages are indicated by italics.

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on these receivers, and ordinarily no readjustments are necessary. However, should it become necessary to make any readjustments, the procedure given here should be carefully followed. The preferred method of aligning these receivers is by the use of a suitable cathode ray oscillograph and frequency modulator unit in conjunction with the standard signal generator.

To accurately align circuits in these receivers, it is necessary to use a high grade signal generator capable of being modulated 30% and having an output voltage of at least 10,000 microvolts; it will also be necessary to have this output voltage controlled so that only a few microvolts may be fed into the receiver. In conjunction with the signal generator, a sensitive output meter should be used for determining the alignment. The meter developed across the voice coil of the loud speaker; in this case, the meter will be necessary when making a final adjustment of the volume control. Discriminator-tuned circuit to use a high resistance voltmeter having a resistance of at least 100,000 ohms per volt.

In order to make the aligning adjustments in an easy and satisfactory manner, it is recommended that the Stromberg-Carlson P-21608 aligning tool be used.

Before proceeding with the alignment of any circuits in these receivers, be sure that the Treble Control knob is set for the "Normal" position. The "Bass" control should also be set for the "Normal" position. In making any alignment adjustments always adjust the test oscillator's output voltage to the minimum value where a good alignment may still be obtained, except when specifically directed otherwise in these instructions. Figure 1 shows the location of all the aligning capacitors or adjustments for these receivers.

Dial Adjustment

Before aligning the circuits of these receivers, the tuning dial must be properly aligned to "track" with the gong tuning capacitors. To check whether the dial is set correctly with respect to the gong tuning capacitors, rotate the "Manual Stations" selector knob in a clockwise direction so that the gong tuning capacitors are set to their maximum capacity position. With the gong tuning capacitors at this position, the dial pointer should be centered over the two dial alignment marks located near the extreme right-hand edge of the dial. One of these marks is a vertical line located beneath the standard broadcast scale, and the other mark is a small triangle located beneath the short wave scale of the dial. If the dial pointer is not centered over these marks, the dial should be adjusted by loosening the screw which the pointer can be centered over the two marks. When this has been accomplished the screw should be securely tightened again.

Intermediate Frequency Adjustments

The intermediate frequency used in these receivers is 455 kilocycles. Because of the necessity of obtaining the proper shape of resonance curve in these stages in a high fidelity receiver, it is recommended that unless it is absolutely essential, these I. F. adjustments be untouched. In the factory these adjustments are made using a visual system which allows the operator to see the exact shape of the resonance curve. In these receivers it is best to have these adjustments made at the factory. However, in the case where this cannot be done, the following procedure should be followed:

- 1. Push in the push button which is located under the designation, "Manual On". Operate the Range Switch on the receiver to the Standard Broadcast Range position, and set the tuning dial pointer to its extreme low frequency position. Set the Treble control knob and the Bass control knob to their normal positions.
CAUTION: Never attempt to align the R. F. or I. F. circuits of this receiver with the Treble control knob set for the "Normal" position. Also, do not make any aligning adjustments under the designation, "Manual On", pushed in.
2. Apply between the chassis base (or ground binding post) of the receiver and the grid of the No. 6A8 diode tube a modulated signal of 455 kilocycles from the signal generator, using a 0.1 mfd. capacitor in series with the connection between the output terminal of the signal generator and the grid of the No. 6A8 tube. Do not remove the chassis grid lead connecting to this tube. The ground (or low side) terminal of the signal generator should be connected to either the chassis base or the ground binding post.
3. Now, noting from Figure 1, the alignment adjustments for the First, Second, and Third I. F. Discriminator transformers, align the I. F. circuits in the following order:
Secondary of Third I. F. Discriminator transformer for maximum output.
Primary of Third I. F. Discriminator transformer for maximum output.
Secondary of Second I. F. transformer for maximum output.
Primary of Second I. F. transformer for maximum output.
Secondary of First I. F. transformer for maximum output.
Primary of First I. F. transformer for maximum output.

Carefully make all of the above adjustments, watching the output meter so that the peak reading is obtained for each adjustment. As each adjustment is made reduce the output of the test oscillator as required.

Adjustment of the Discriminator Circuit

- 1. Before making this circuit adjustment be sure that the I. F. amplifier and signal generator are exactly in resonance at 455 kilocycles.
All controls should be set the same as instructed for the intermediate frequency adjustments. Connect a high resistance voltmeter having a resistance of at least 100,000 ohms per volt across the capacitor, C-79. The signal generator should remain connected to the grid of the No. 6A8 modulator tube in the same manner as connected when making the aligning adjustments of the intermediate frequency amplifier.

Operate the Range Switch on the receiver chassis to the Standard Broadcast ("A") range position and set the test oscillator's frequency and the receiver's tuning dial pointer to 1.5 megacycles.

- 2. Adjust the receiver's oscillator "A" range H. F. aligner for maximum output.
3. Adjust the R. F. interstage "A" range H. F. aligner for maximum output.
4. Adjust the Bi-tremator's aligner for maximum output.
5. Adjust the antenna's "A" range H. F. aligner for maximum output.
6. Set the test oscillator's frequency and the receiver's tuning dial pointer to 0.6 megacycles.
7. Adjust the receiver's oscillator "A" range L. F. aligner for maximum output.
8. Repeat both the test oscillator's frequency and receiver's tuning dial pointer to 1.5 megacycles and repeat operations Nos. 2, 3, 4, and 5.

Adjustment of 10 Kilocycle Audio Cut-Off Filter

The adjustment of this filter is correctly made at the factory and no additional adjustment is required.

INSTRUCTIONS FOR SETTING UP ELECTRIC TUNING SYSTEM

Before proceeding with setting up the eight favorite broadcast stations for electric tuning, it is preferable that the radio receiver be turned "on" for approximately twenty minutes. This is accomplished by simply pushing in the push button immediately below the designation, "Manual On" (indicated by illumination of the dial).

Check the position of the "Treble" control knob. When setting up or tuning in stations, this control knob should be set at the "Normal" position (pointer on knob pointing in direction of gold dot).

Set the Range switch control knob to the "Broadcast" position (pointer on knob pointing in direction of gold dot).

Remove the lists of station letters from the P-28781 package assembly which is tacked inside of the cabinet.

Remove the three screws which hold the electric tuning escutcheon plate (metal plate) to the electric tuning escutcheon. Then, remove from the escutcheon, the strip of transparent material and the strip of paper on which the eight stars are printed.

From the lists of stations, remove the call letters of the eight stations which it is desired to set up for electric tuning. These eight stations should preferably be selected and set up in the daytime so that the best service will be obtained at all times.

CAUTION: When setting up these stations it is necessary to see that the separation of these stations on the dial is sufficient to allow adjacent "Adjustable Station Brushes" to be properly located in the adjusting slot.

It will be noted that the station letters are printed on partially cut squares to facilitate ease in removing the desired station letters. In setting up these eight favorite stations, the following order should be followed:

Looking at the front of the receiver, the station letters of the station having the highest frequency should be inserted into the farthest left-hand square of the escutcheon. Then, in successive order, according to the frequency, insert the station letters of the remaining seven stations into the other seven squares of the electric tuning escutcheon; the station letters of the station having the lowest frequency being inserted into the farthest right-hand square of the escutcheon.

After the eight station call letters have been inserted into the escutcheon, the transparent strip should be replaced over the station call letters, and the escutcheon plate then fastened into its position on the electric tuning escutcheon by means of the three screws.

The tuning adjustments for the eight favorite stations can now be made, starting with the station having the highest frequency and proceeding as follows:

With the Range switch control knob set to the "Broadcast" position, and the "Manual On" button pushed in, tune the receiver in the conventional manner by means of the "Manual Stations" (Station Selector) control knob to that station having the highest frequency.

IMPORTANT: When manually tuning in a station, or when setting up a station in the electric tuning system, exact resonance with the desired station should always be obtained by observing the tuning indicator.

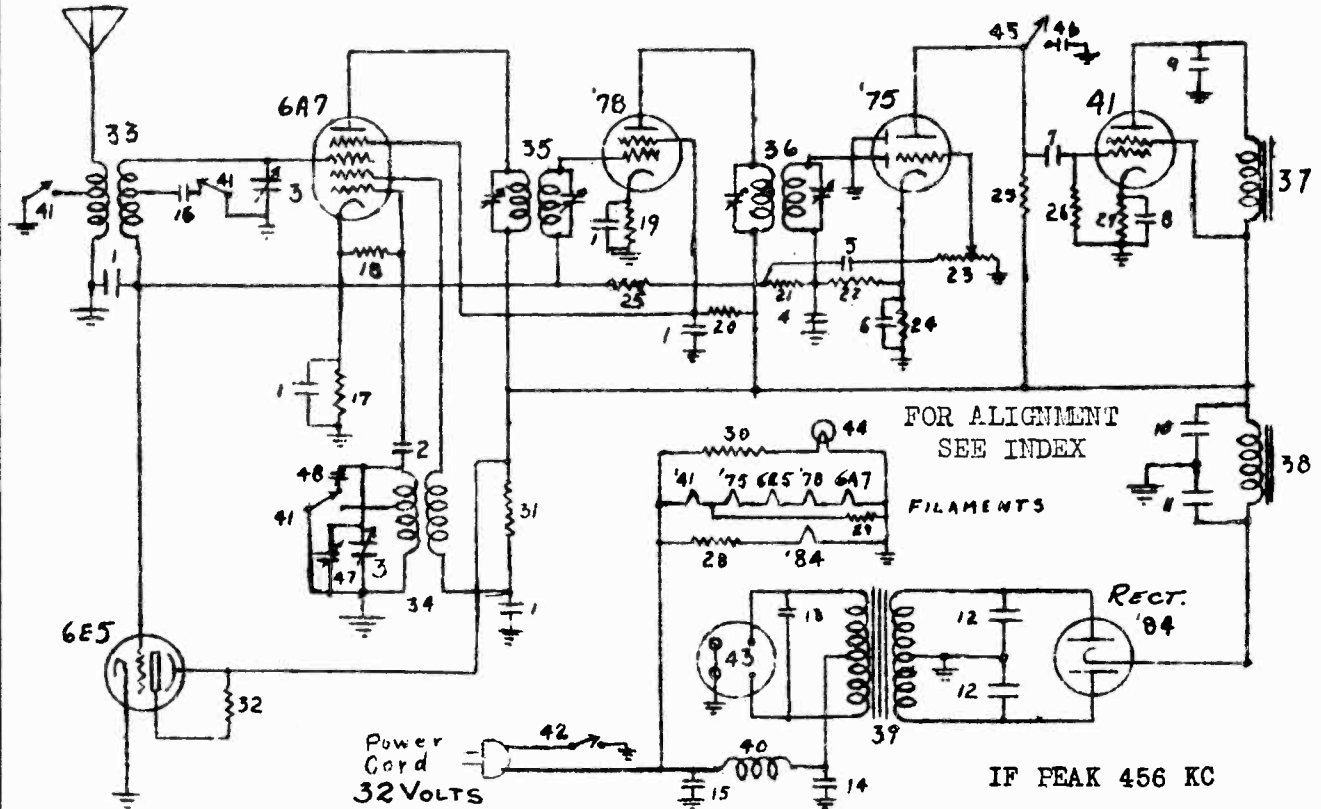
Facing the rear of the receiver, it will be observed that the commutator assembly located on the rear of the gong tuning capacitor has a calibrated dial and dial pointer. After manually tuning in the favorite broadcast station as mentioned in paragraph 7 above, the dial pointer should be set to the "Station Brush" position, which also indicates the frequency of the station having the highest frequency. The "Adjustable Station Brushes" (which is nearest to the eight frequency control knobs) should be rotated until the dial pointer is directly in line (and centered) with the end of the commutator's dial pointer.

Now, in successive order, according to frequency, proceed to set up the remaining seven favorite stations in the same manner as was mentioned in paragraphs 7 and 8 above for the favorite station having the highest frequency.

When the eight adjustable station brushes have all been set up for the eight stations, the brush nearest to the low frequency end of the commutator's dial should be set at the frequency of the station having the lowest frequency.

L'TATRO MFG. CO.

MODELS EQ-39, FQ-39
Schematic



VOLTAGES --

Plates 6A7, 78, and 41 ... 210 volts.
Plate 75 60 v.
Screen 41 210 v.
Screens 6A7 and 78 65 v.
Anode grid 6A7 160 v.

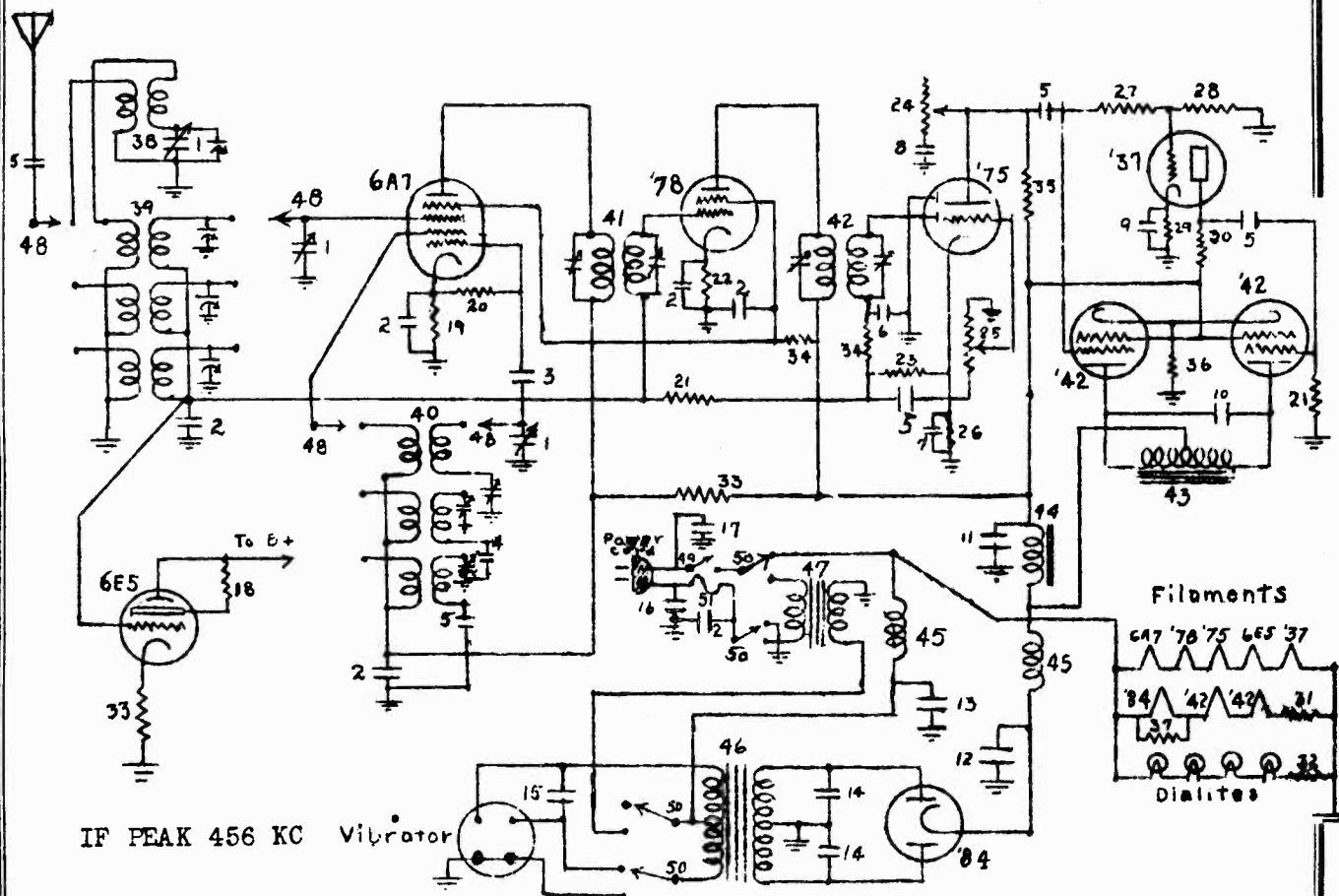
Cathodes (as measured by a 1000 ohm per volt meter)
6A7 and 78 ... 3 v.
75 1 v.
41 14v.

1	.1 mfd.	17	400 ohms	34	Oscillator coil
2	.0001 mfd.	18	50M ohms	35	I.F. Coil
3	Gang condenser	19	800 ohms	36	I.F. Coil
4	.00025 mfd.	20	50M ohms	37	Speaker
5	.01 mfd.	21	25M ohms	38	Filter choke
6	10 mfd. electr.	22	$\frac{1}{2}$ Megohm	39	Power trans.
7	.01 mfd.	23	$\frac{1}{2}$ Meg. control	40	R.F. Choke
8	10 mfd. electr.	24	10M ohms	41	Band switch
9	.01 mfd.	25	$\frac{1}{2}$ megohm	42	Power switch
10	8 mfd. electr.	26	1 megohm	43	Vibrator
11	16 mfd. electr.	27	650 ohms	44	Pilot light
12	.01 mfd. 1600 v.	28	50 ohms	45	Tone switch
13	.25 mfd.	29	200 ohms	46	.002 mfd.
14	.5 mfd	30	160 ohms	47	S.W. Padder
15	20 mfd.	31	10M ohms	48	B.C. Padder
16	.002 mfd.	32	$\frac{1}{2}$ megohm		
		33	Antenna coil		

The antenna for the Model EQ (table model) and FQ (console) should be about 100 feet long and as high as possible. No ground connection is necessary. A continuously variable tone control is used in Model FQ.

MODELS HQ-39
Schematic

L'TATRO MFG. CO.



IF PEAK 456 KC Vibrator

-- VOLTAGES--

Plates 6A7, 78, and 42's ...	200 v.	Cathode 6A7 .....	.25 v
Plate 37	50 v.	" 78	2 v.
Plate 75	30 v.	" 75 .....	.5 v
Screens 6A7 and 78	50 v.	" 37	4 v.
		" 42's	15 v.

1	Gang condenser	18	$\frac{1}{2}$ megohm	35	$\frac{1}{2}$ megohm
2	.1 mfd.	19	53 ohms	36	400 ohms
3	.0001 mica	20	25M ohms	37	33 ohms
4	.002 mfd.	21	$\frac{1}{2}$ megohm	38	Preselector coil
5	.01 mfd.	22	800 ohms	39	Antenna coil
6	.0005 mfd.	23	$\frac{1}{2}$ megohm	40	Oscillator coil
7	10 mfd. electr.	24	meg. control	41	I.F. coil
8	.005 mfd.	26	7500 ohms	42	I.F. coil
9	5 mfd. electr.	27	$\frac{1}{2}$ megohm	43	Speaker
10	.0025 mfd.	28	25M ohms	44	Filter choke
11	8 mfd. electr.	29	3500 ohms	45	R.F. choke
12	16 mfd. electr.	30	100M ohms	46	Power trans.
13	.25 mfd.	31	20 ohms	47	Stepdown trans.
14	.02 mfd.	32	50 ohms	48	Band switch
15	.25 mfd.	33	800 ohms	49	Off-on switch
16	1 mfd.	34	50M ohms	50	Power switch
17	.25 mfd.	25	$\frac{1}{2}$ meg. control	51	2 amp. fuse

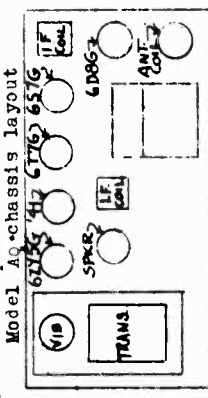
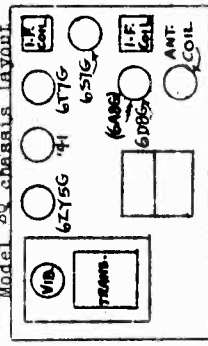
Alignment, Socket Trimmers

L'TATRO MFG. CO.

MODELS EQ-39, FQ-39
 MODEL HQ-39
 MODELS SP-67, TP-67
 MODELS AQ-69, BQ-69

MODEL EQ-39, BQ-69 ALIGNMENT PROCEDURE

Adjust IF coils to 456 KC. Switch to shortwave band; turn dial to 5 MC and adjust trimmer on the rear section of the gang condenser to maximum output. Switch to broadcast band and turn dial to 1400 KC. Adjust trimmer connected to switch to maximum output. Track antenna by adjusting trimmer on the antenna section of the gang condenser. Switch to shortwave, turn dial to 5 MC and track antenna by adjusting trimmer on top of the antenna coil.



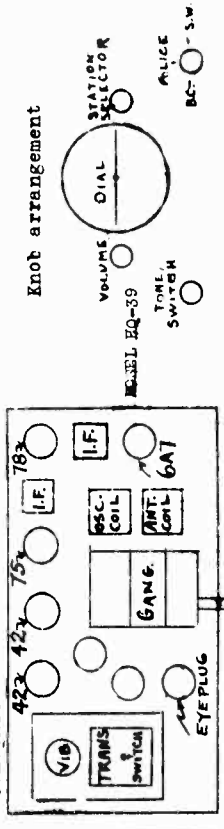
Model RE has the same circuit as the QF plus a tuning eye. The type 6AGC tube has been found to give better oscillator performance than the 6D8G and is used in all Model RE's except those built in the earlier part of the season.

Model HQ-39 may be operated on either 32 volts DC or 110 volts AC. To switch the set for 110 volt operation, the following instructions must be carried out:

1. Disconnect set from 22 volt line.
 2. Remove cover from power pack and pull out vibrator.
 3. Replace cover and fit switch lever back into slot in switch shaft.
 4. Remove screw holding lever and throw switch to right.
 5. Reset screw in hole at the right.
- If set is inoperative, check fuse. (2 amp. 250 volt. An ordinary car fuse may be substituted). The fuse protects the set from lightning as well as from line voltage overloads.

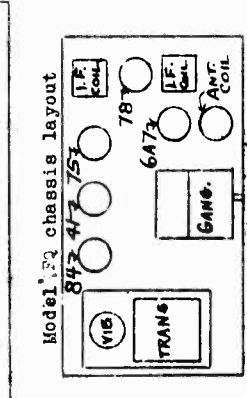
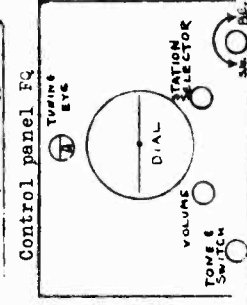
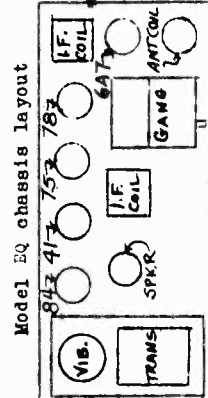
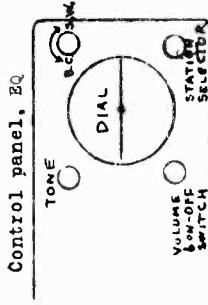
ALIGNMENT PROCEDURE

Turn dial to closed gang position and make certain that the dial needle coincides with the end of the scale. Turn dial to about midpoint and adjust IF coils to 456 KC. Switch to shortwave band, set dial needle to 15 MC and adjust bottom trimmers on antenna and oscillator coils to maximum output. Switch to police band (middle band) and set dial at 5 MC. Adjust second trimmers from the bottom to maximum output. Switch to broadcast, set dial at 1400 KC and adjust the third trimmers from the bottom. Then adjust the radder located on the front section of the gang condenser. Turn to 600 KC and adjust the top trimmer in the oscillator coil. This is the series tracking condenser.



ALIGNMENT PROCEDURE

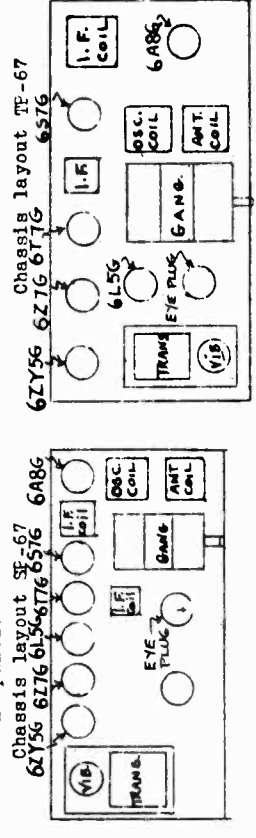
Model EQ-39 and FQ-39
 Adjust IF coils to 456 KC. Switch to shortwave band; turn dial to 5 MC and adjust trimmer on the rear section of the gang condenser to maximum output. Switch to broadcast band and turn dial to 1400 KC. Adjust trimmer connected to switch to maximum output. Track antenna by adjusting trimmer on antenna section of the gang condenser. Switch to shortwave, turn dial to 5 MC and track antenna by adjusting trimmer on top of the antenna coil.



MODEL SP-67, TP-67 ALIGNMENT PROCEDURE

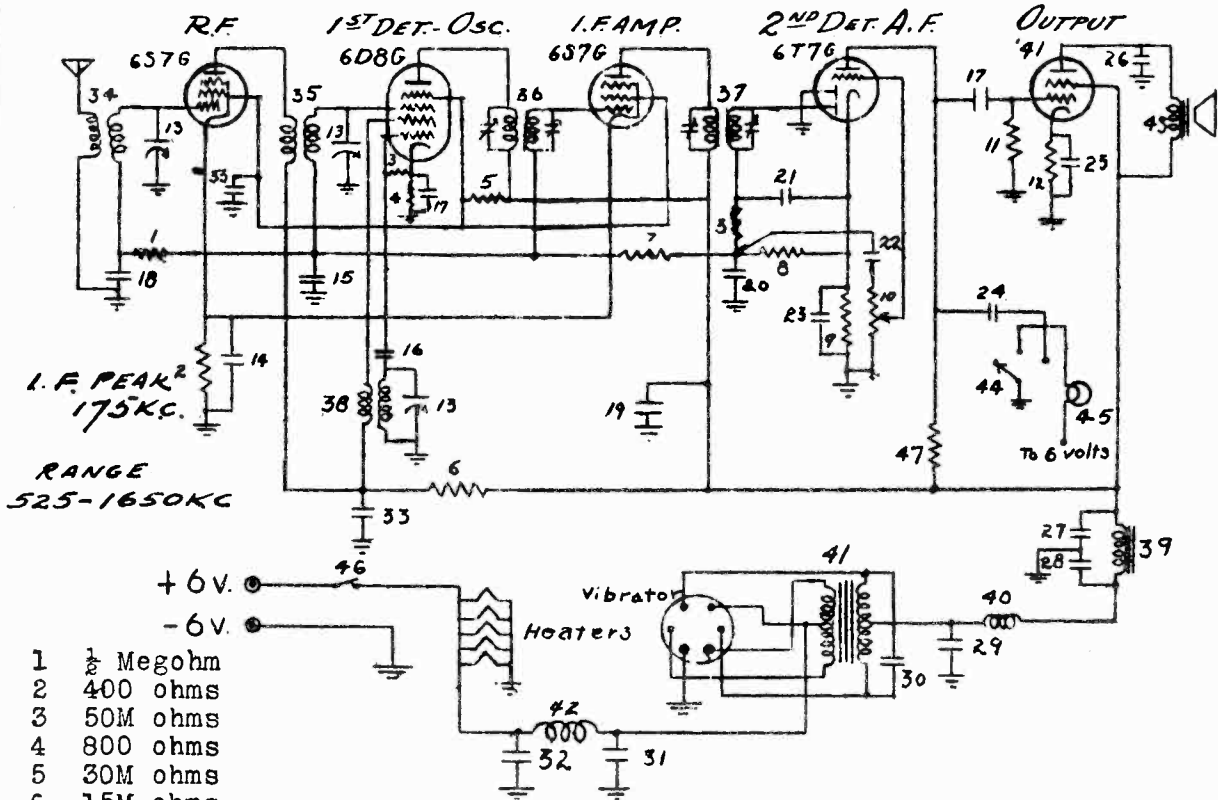
Turn dial to closed gang position to make certain that the dial needle coincides with the end of the scale. Turn dial to about midpoint and adjust the I.F. coils to 456 KC. Switch to shortwave band, set dial needle to 15 MC and adjust bottom trimmers in antenna and oscillator coils to maximum output. Switch to police band (middle band) set dial at 5 MC and adjust the second trimmers from the bottom to maximum output. Switch to broadcast, set dial at 1400 KC and adjust the third trimmers from the bottom. Then adjust the radder located on the front section of the gang condenser. Turn to 600 KC and adjust the top trimmer in the oscillator coil. This is the series tracking condenser.

The type 6AGC tube has been found to give better oscillator performance than the 6D8G and is used in present production. The switch which turns the tuning eye and dialites off and on is located on the back of the panel.

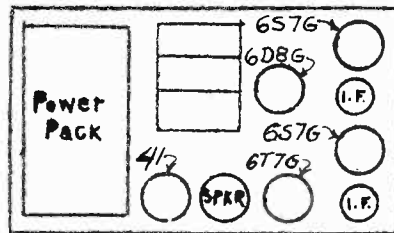


MODELS NO-65,00-65
Schematic, Socket
Trimmers, Alignment

L'TATRO MFG. CO.



- 1 1/2 Megohm
- 2 400 ohms
- 3 50M ohms
- 4 800 ohms
- 5 30M ohms
- 6 15M ohms
- 7 1 Megohm
- 8 1/2 Megohm
- 9 15M ohms
- 10 Volume control
- 11 1 Megohm
- 12 650 ohms
- 13 3 gang cond.
- 14 .10 mfd.
- 15 .01 mfd.
- 16 .0001 mfd.
- 17 .01 mfd.
- 18 .01 mfd.
- 19 .10 mfd.
- 20 .00025 mfd.
- 21 .0002 mfd.
- 22 .025 mfd.
- 23 10 mfd. electr.



- 24 .02 mfd.
- 25 10 mfd. electr.
- 26 .002 mfd.
- 27 8 mfd. electr.
- 28 8 mfd. electr.
- 29 .10 mfd.
- 30 .005 mfd.
- 31 .5 mfd.

- 32 .25 mfd.
- 33 .05 mfd.
- 34 Ant. coil
- 35 Int. coil
- 36 I.F. coil
- 37 I.F. coil
- 38 Osc. coil
- 39 Filter choke
- 40 RF Filter choke
- 41 Power trans.
- 42 RF choke
- 43 Speaker
- 44 Tone-light switch
- 45 Pilot light
- 46 Switch (with #10)
- 47 100M ohms

Alignment procedure

To adjust I.F. coils Oscillator at 175KC to grid of 6D8G tube; adjust I.F. trimmers to maximum output.

To adjust R.F. coils Set oscillator at 1400 KC connect to antenna lead, dial at 1400 KC, adjust oscillator padder located on the rear of the gang condenser, to maximum. Then adjust the two other padders on the gang condenser to maximum output.

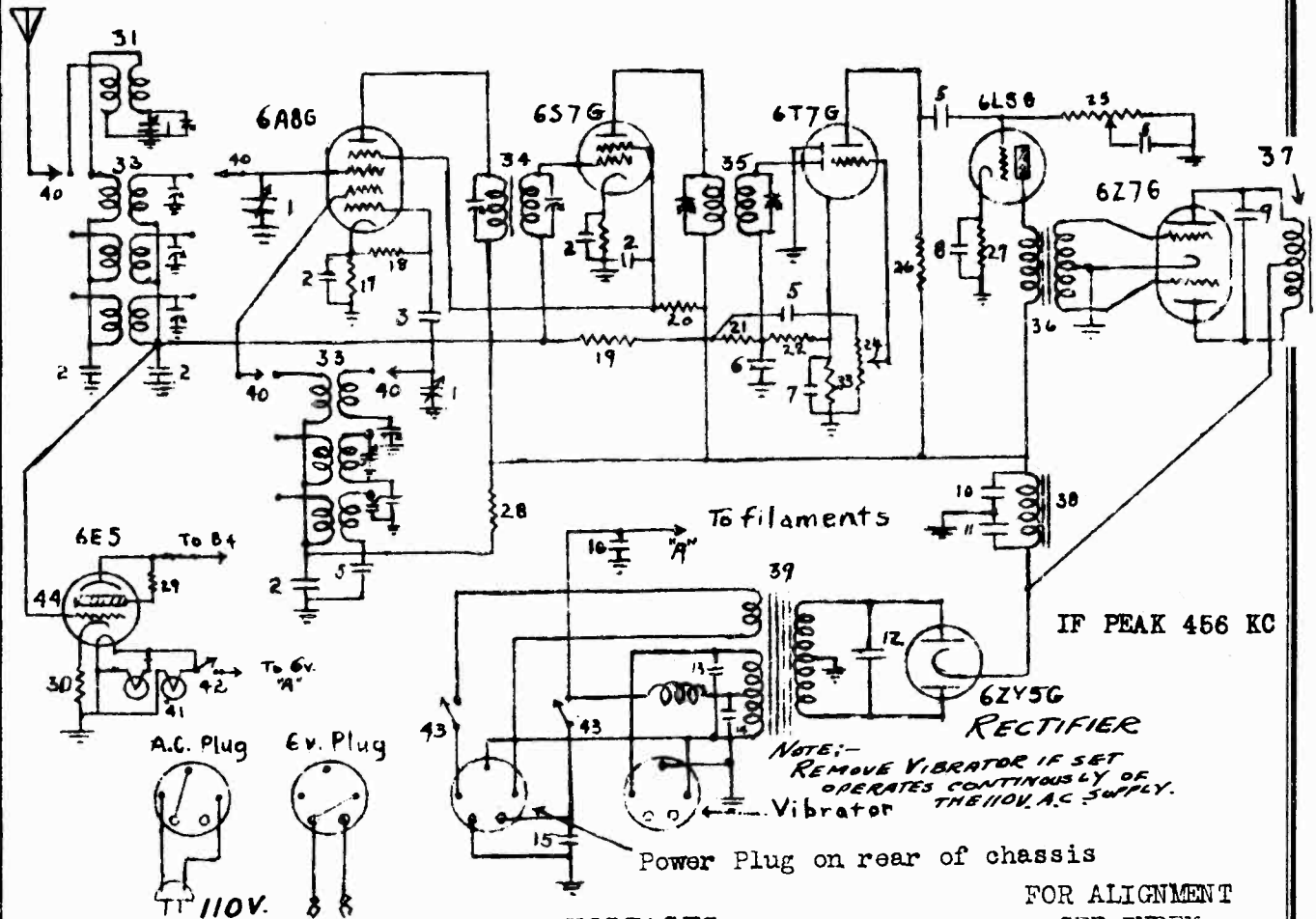
Voltages: (As measured by a 1000 ohm per volt meter)

B + 140 - 150 volts	Cathode voltages
Anode grid 6D8G 60-70 v.	6S7G's 2 volts
Plate RF 6S7G 60-70 v.	6D8G 2.5 volts
Screens 6D8G & 6S7G 50-60 v.	6T7G 1 volt
	41 11 volts

Voltages on the Model NO(table model) are somewhat lower than the above. Some changes in circuit constants in sets built prior to Aug. 1937, will be found. "Motorboating" on this set can be corrected by separating the grid leads on the gang condenser as far as possible.

L'TATRO MFG. CO.

MODELS SP-67, TP-67
Schematic



IF PEAK 456 KC

6Z5G RECTIFIER

NOTE: - REMOVE VIBRATOR IF SET OPERATES CONTINUOUSLY OF THE 110V. A.C. SUPPLY.

Power Plug on rear of chassis

FOR ALIGNMENT SEE INDEX

-- VOLTAGES --

Plates 6A8G, 6S7G, 6L5G, 6Z7G	Cathodes: 6A8G and 6S7G	1.5 v.
and oscillator grid of 6A8G	6T7G	.5 v.
Plate 6T7G	6L5G	5 v.
Screens 6A8G and 6S7G		40 v.

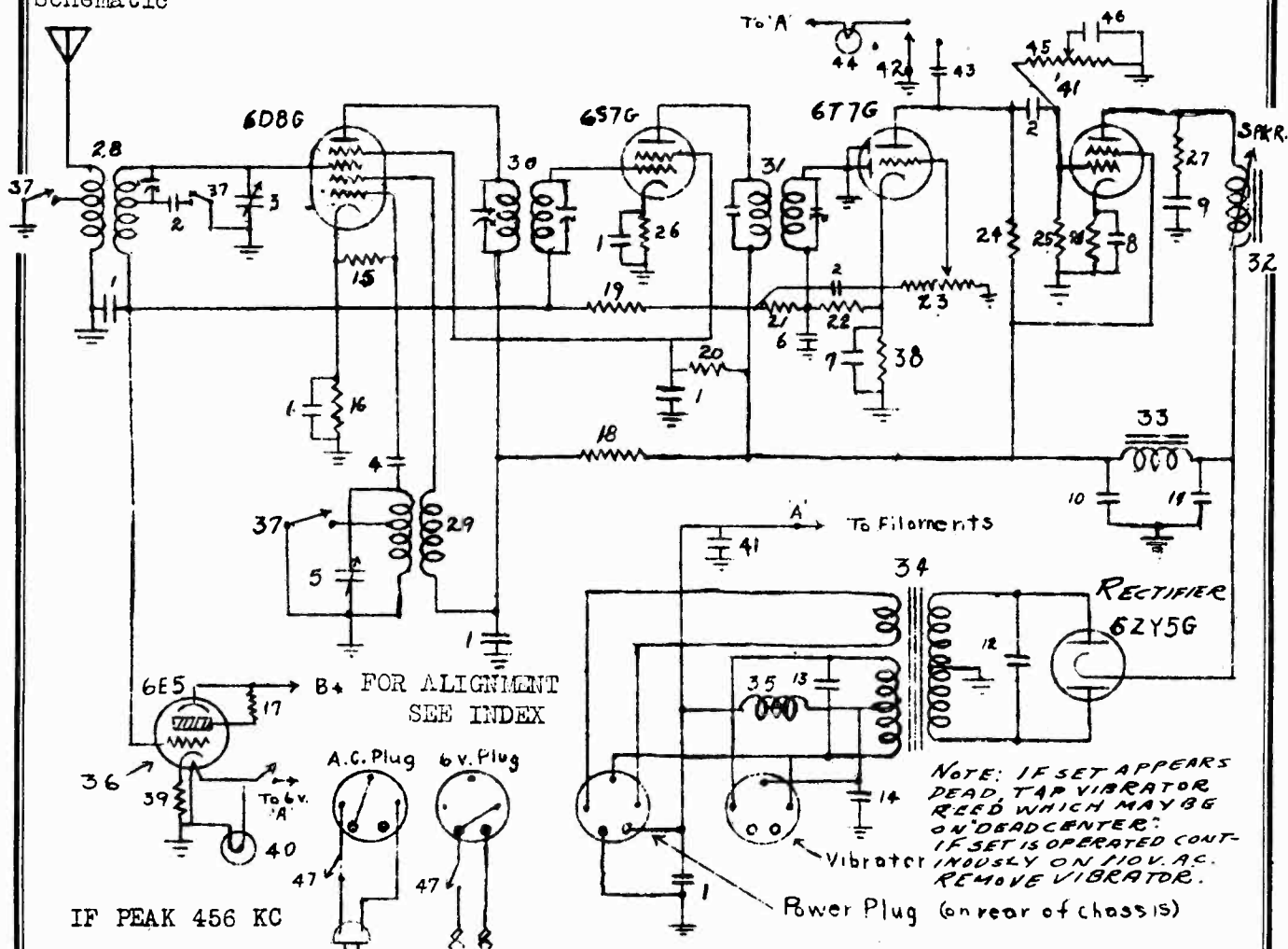
Voltages when set is on AC are higher.

1	Gang condenser	16	.25 mfd.	31	Preselector coil
2	.10 mfd.	17	400 ohms	32	Antenna coil
3	.00025 mfd	18	25M ohms	33	Oscillator coil
4	.002 mfd.	19	1 megohm	34	Iron core I.F.
5	.01 mfd.	20	50M ohm	35	I.F. coil
6	.00025 mfd.	21	25M ohm	36	Input trans.
7	10 mfd. electr.	22	1/2 megohm	37	Speaker
8	5 mfd. electr.	23	5M ohms	38	Filter choke
9	.0025 mfd.	24	1/2 meg. control	39	Power trans.
10	8 mfd. electr.	25	Tone control	40	Band switch
11	16 mfd. electr.	26	1/4 megohm	41	Pilot lights
12	.005 mfd. 1600 v.	27	1500 ohms	42	Tuning eye and dialite switch
13	10 mfd. electr.	28	10M ohms	43	Power switch
14	.5 mfd.	29	1/2 megohm.	44	Tuning eye
15	.10 mfd.	30	1500 ohms		

The TP-67 is a console model; the SP-67 is a table model. The antenna should be as high as possible and about 100 feet long. A good ground is essential for good reception. The blue wire from the set is the antenna lead. If the set is to be operated on 110 volts continuously, the vibrator should be removed.

MODELS AQ-69, BQ-69
Schematic

L'TATRO MFG. CO.



NOTE: IF SET APPEARS DEAD, TAP VIBRATOR REED WHICH MAY BE ON 'DEAD CENTER'. IF SET IS OPERATED CONTINUOUSLY ON 110V. AC. REMOVE VIBRATOR.

IF PEAK 456 KC

110 V. AC. — VOLTAGES —

Plates 6D8G, 6S7G, and 41	150 volts	Cathode 6D8G	0.5 volt
Plate 6T7G	50 volts	" 6S7G	1.5 volt
Screens 6D8G and 6S7G	50 volts.	" 6T7G	0.5 volt
		" 41	13 volts

- When set is on AC, voltages will be somewhat higher.
- | | | |
|------------------------|---------------------|----------------------------------|
| 1 .1 mfd. | 18 1500 ohms | 35 RF choke |
| 2 .01 mfd. | 19 1/2 Megohm | 36 Tuning eye |
| 3 Ant. section of gang | 20 50M ohms | 37 Band switch |
| 4 .0002 mfd. | 21 25M ohms | 38 7500 ohms |
| 5 Osc. section of gang | 22 1/2 Megohm | 39 650 ohms |
| 6 .0002 mfd. | 23 1/2 Meg. control | 40 Pilot light |
| 7 10 mfd electr. | 24 1/2 Megohm | 41 .5 mfd. |
| 8 5 mfd. electr. | 25 1 Megohm | 42 Tone-light switch |
| 9 .002 mfd. | 26 800 ohms | 43 .0025 mfd. |
| 10 8 mfd. electr. | 27 10M ohms | 44 Pilot light |
| 11 16 mfd. electr. | 28 Ant. coil | 45 Tone control |
| 12 .005 mfd. 1600 v. | 29 Osc. coil | 46 .005 mfd. |
| 13 10 mfd. 50 v. | 30 I.F. coil | 47 Power switch |
| 14 .5 mfd. | 31 I.F. coil | 48 Tuning eye and dialite switch |
| 15 50M ohms | 32 Speaker | |
| 16 400 ohms | 33 Filter choke | |
| 17 1/2 Megohm | 34 Power trans. | |

Items 36, 45 and 46 are used in Model BQ only. Items 42, 43 and 44 are used in Model AQ only.

TRANSFORMER CORP. OF AMER.

MODEL TC-31
Schematic
Alignment

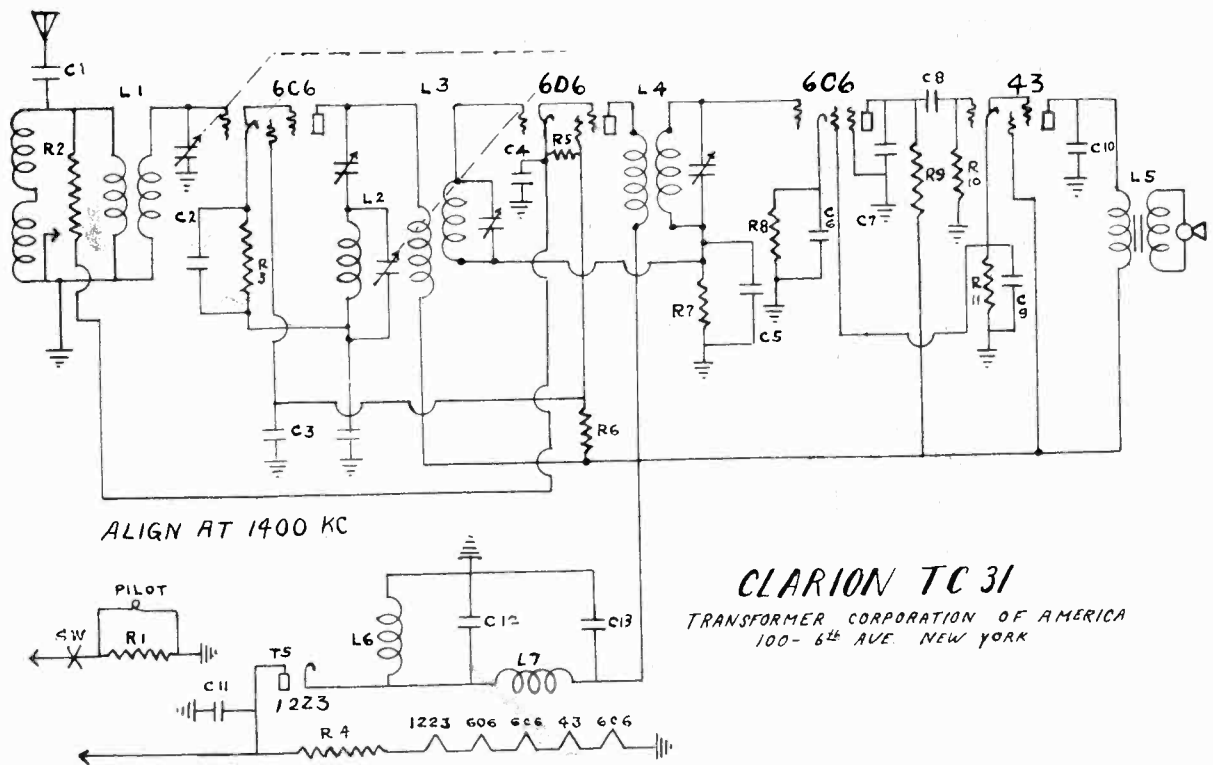
SERVICE SUGGESTIONS

CIRCUIT: The receiver uses a superhet circuit. The tubes used are: type 6C6 as oscillator and modulator, a type 6D6 in the I.F. stage, a type 6C6 as second detector and audio amplifier and a type 43 output tube. The I.F. is 456 K.C.

ALIGNING THE SET: Only in rare cases will it be found necessary to adjust any trimmers. If the volume is low, everything else should be checked before attempting to align the set. The only case where the fault is in the alignment is when both low volume and poor selectivity are present. To align the I.F.: set the test oscillator to 456 K.C. and connect it to the grid of the first 6C6 tube and adjust the upper screw on the first I.F. transformer and the screw on the second I.F. (small round can) for maximum output. Now set the test oscillator to 1400 K.C. The signal should come in between 15 and 20 on the dial. Adjust the two trimmers on the tuning condenser for maximum output. Check at 600 K.C. The lower trimmer on the first I.F. transformer is the oscillator coupling condenser and should not be changed.

Price and Parts List for Clarion TC-31

Stock No.	Code No.	Description	Price
TPE2010	L1	Antenna Coil	\$.95
TPE2020	L2	Oscillator coil	.95
TPE2030	L3	First I. F.	1.50
TPE2040	L4	Second I. F.	1.50
TPE2050	L5	Speaker Transformer	4.50
TPE2060	L6	Speaker Field	1.25
TPE2070	L7	Choke	.25
TPE2080	R1	Pilot shunt	1.10
TPE2090	R2&SW	Volume control and switch	1.10
TPE2100	R3	7500 ohm carbon resistor	.19
TPE2110	R4	Filament resistor 200 ohms	1.10
TPE2120	R5	50,000 ohm carbon resistor	.19
TPE2130	R6	10,000 ohm carbon resistor	.19
TPE2140	R7	500,000 ohm carbon resistor	.19
TPE2150	R8	25,000 ohm carbon resistor	.19
TPE2160	R9	300,000 ohm carbon resistor	.19
TPE2170	R10	500,000 ohm carbon resistor	.19
TPE2180	R11	750 ohm carbon resistor	.14
TPE2190	C1	.1 mfd. paper condenser	.14
TPE2200	C2	.002 mfd. paper condenser	.14
TPE2210	C3	.1 mfd. paper condenser	.14
TPE2220	C4	.1 mfd. paper condenser	.14
TPE2230	C5	.1 mfd. paper condenser	.14
TPE2240	C6	10 mfd. electrolytic condenser	.70
TPE2250	C7	.001 mfd. paper condenser	.13
TPE2260	C8	.05 mfd. paper condenser	.14
TPE2270	C9	10 mfd. electrolytic condenser	.70
TPE2280	C10	.006 mfd. paper condenser	.15
TPE2290	C11	.05 mfd. paper condenser	.14
TPE2290	C12	16 mfd. electrolytic condenser	.90
TPE2300	C13	8 mfd. electrolytic condenser	.60
TPE2310		1/3 watt carbon resistor any value	.19



CLARION TC 31
TRANSFORMER CORPORATION OF AMERICA
100-6th AVE NEW YORK

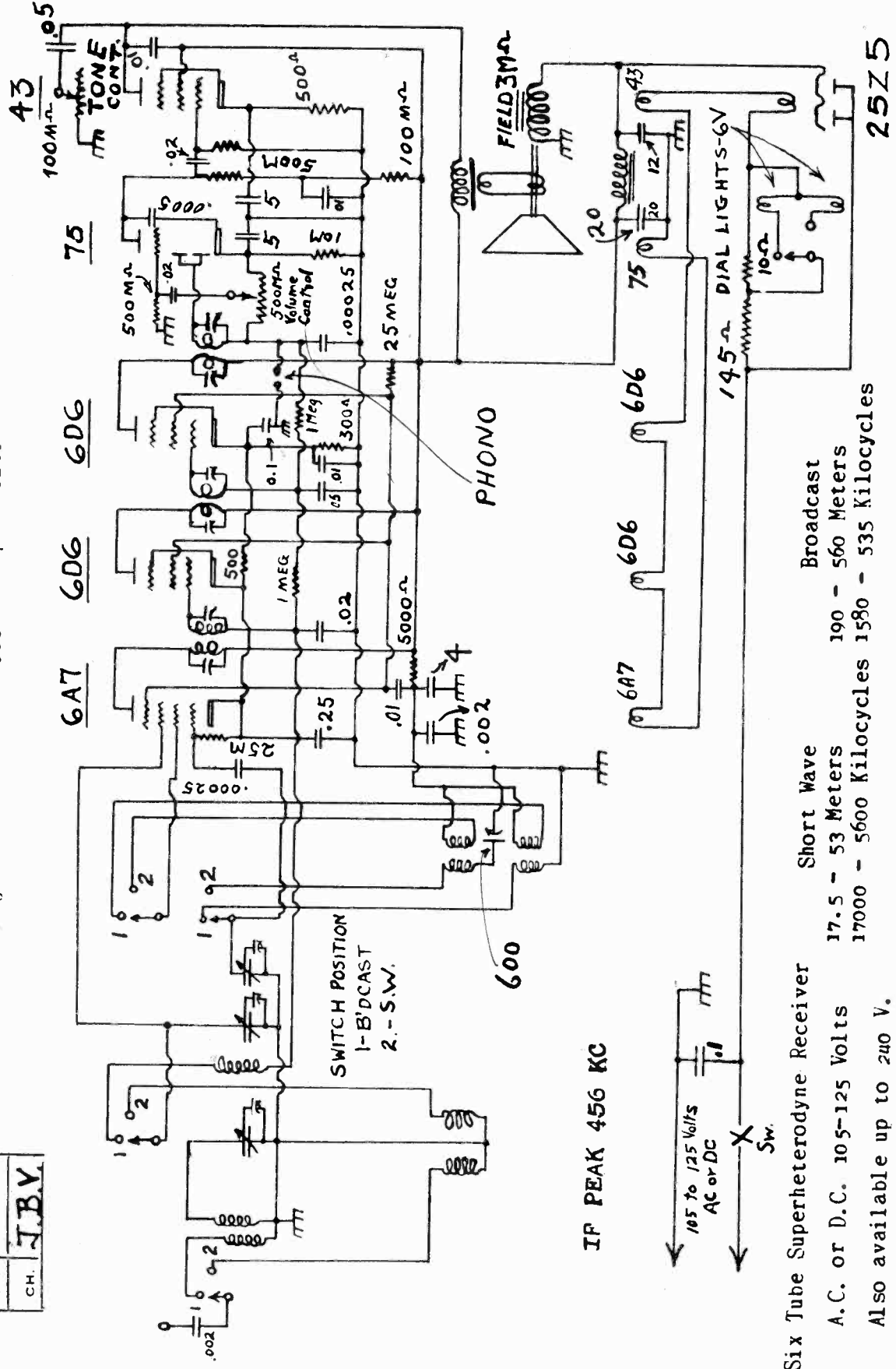
MODEL TC36
Schematic

TRANSFORMER CORP. OF AMERICA

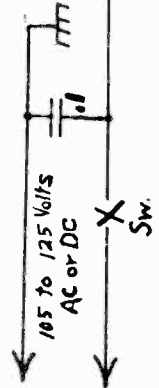
VOLTAGE READINGS:

Readings should be taken with volume control fully on. Use a D.C. Voltmeter having a resistance of 1000 ohms per volt.

DATE	10-14-34
DR.	J.P.S.
TR.	
CH.	J.B.V.



IF PEAK 456 KC



Six Tube Superheterodyne Receiver

A.C. or D.C. 105-125 Volts
Also available up to 240 V.

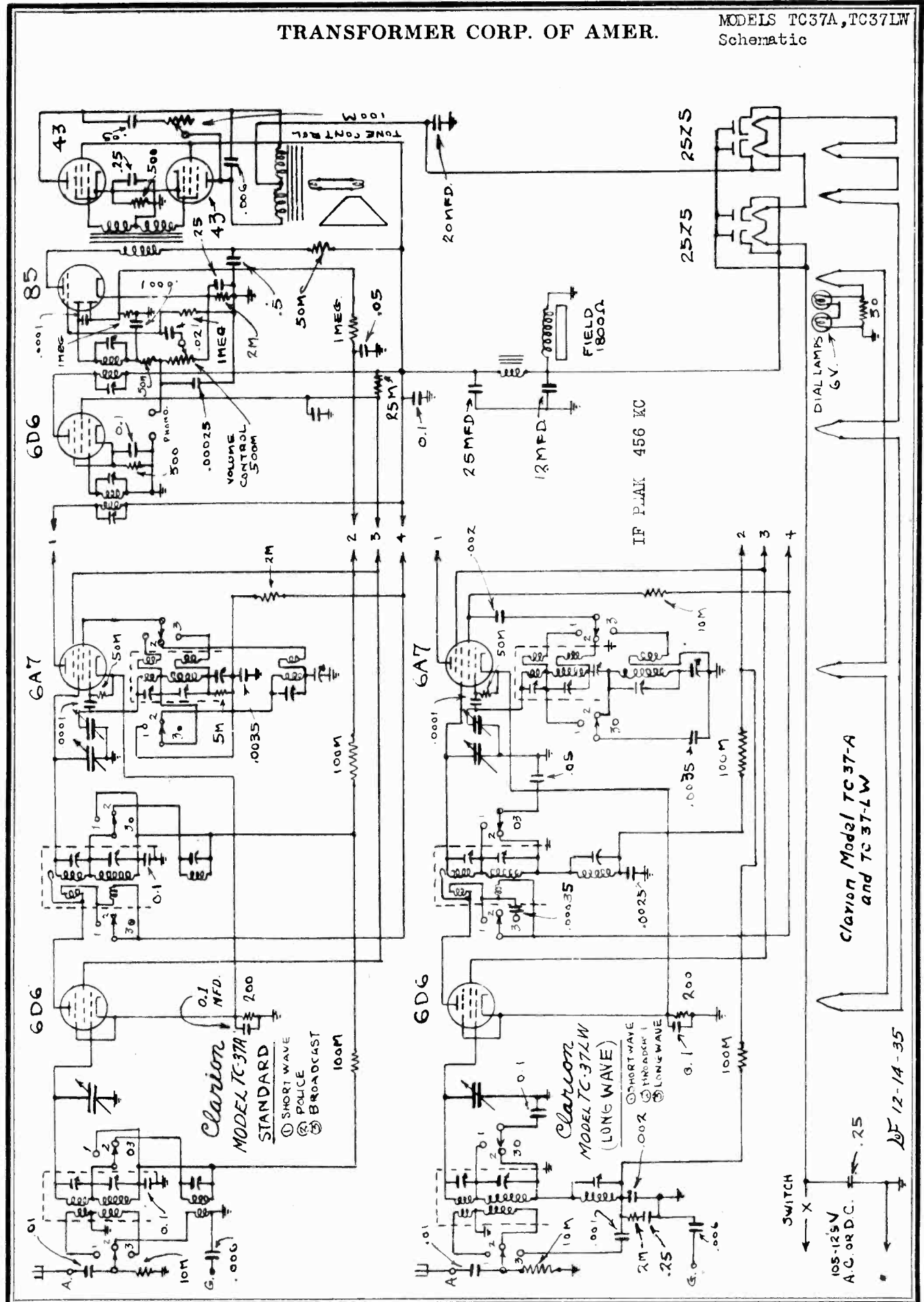
Short Wave
17.5 - 53 Meters
17000 - 5600 Kilocycles

Broadcast
190 - 560 Meters
1580 - 535 Kilocycles

25Z5

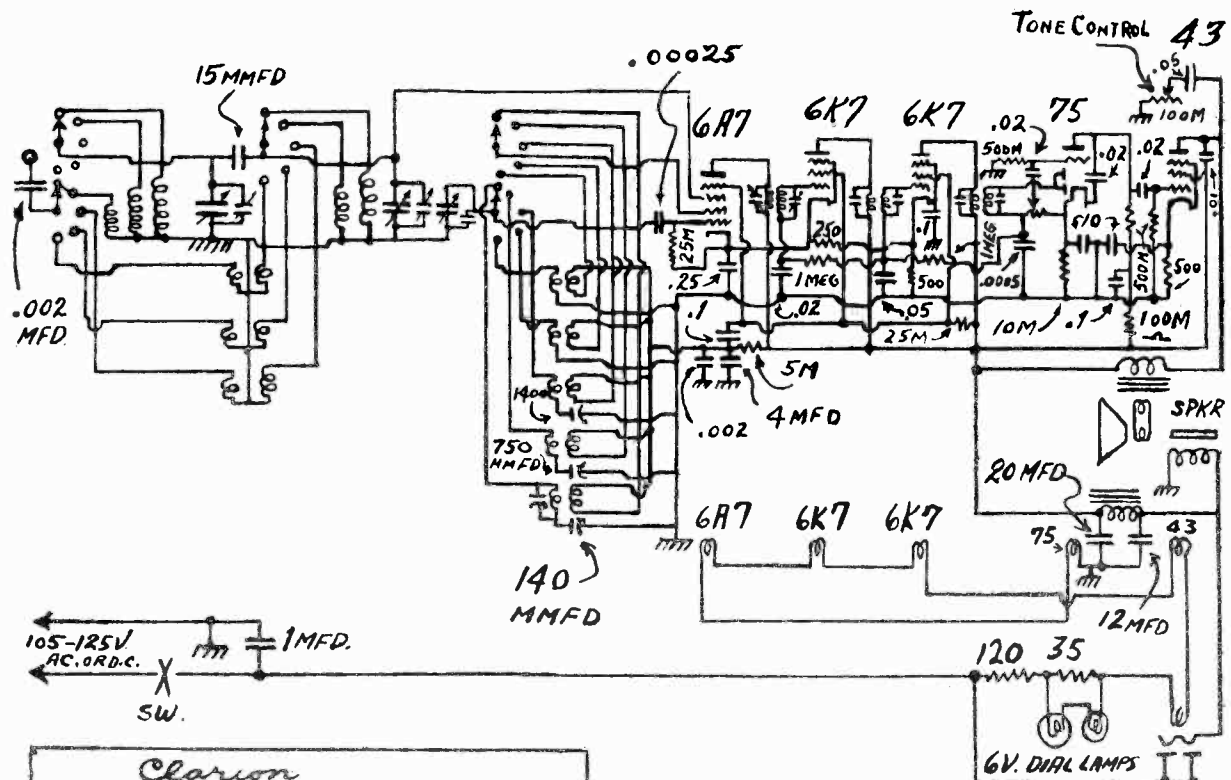
TRANSFORMER CORP. OF AMER.

MODELS TC37A, TC37LW
Schematic



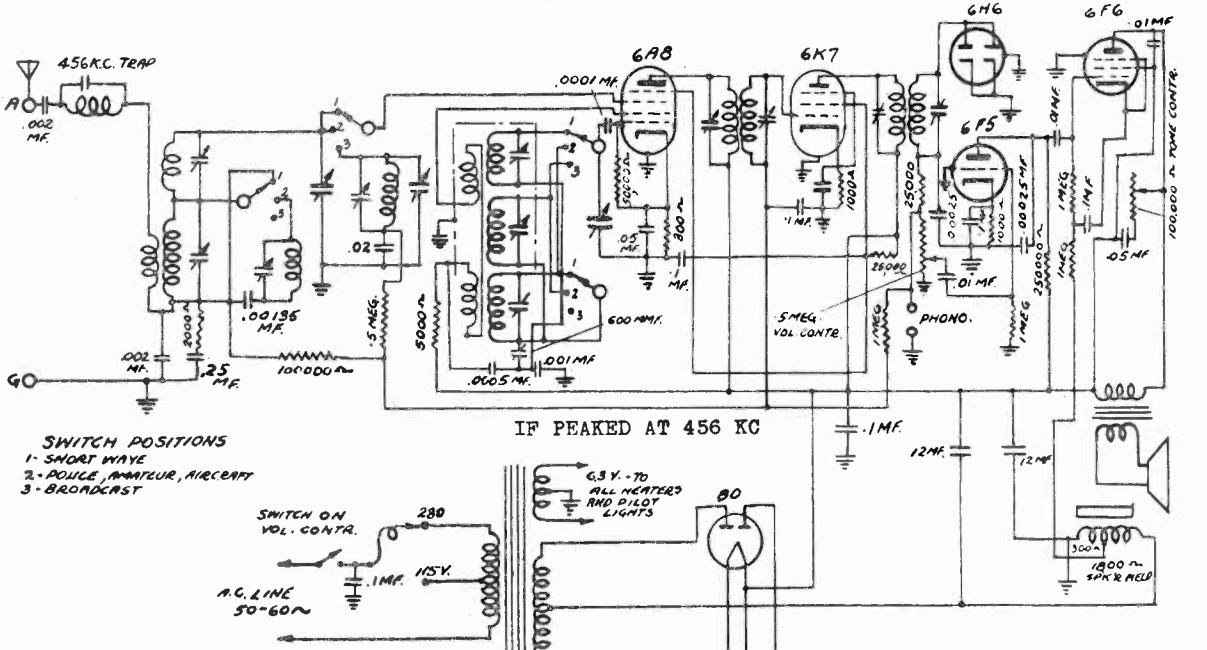
MODEL TC66
 MODELS TC75, TC76
 Schematics

TRANSFORMER CORP. OF AMER.



Clarion
MODEL TC-66
 TRANSFORMER CORPORATION OF AMERICA
 100-6TH AVE NEW YORK, N.Y.
 1-20-36

IF PEAK
 456 KC
 2525



SWITCH POSITIONS
 1- SHORT WAY
 2- POLICE, AMATEUR, AIRCRAFT
 3- BROADCAST

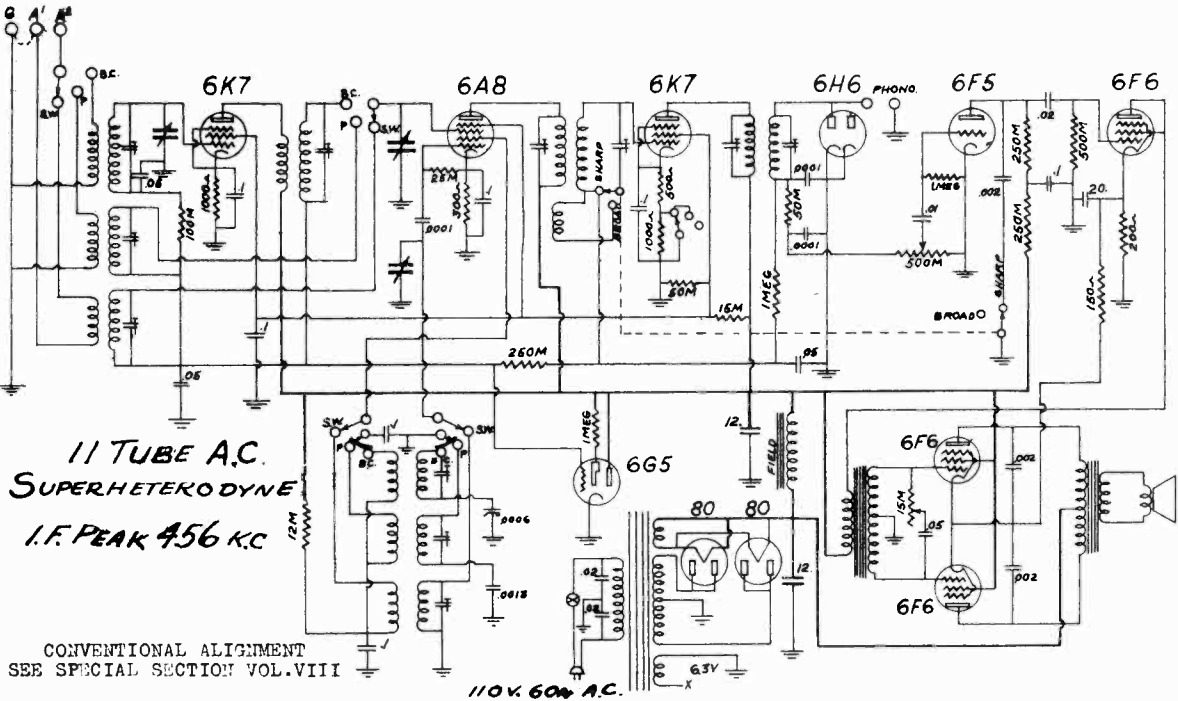
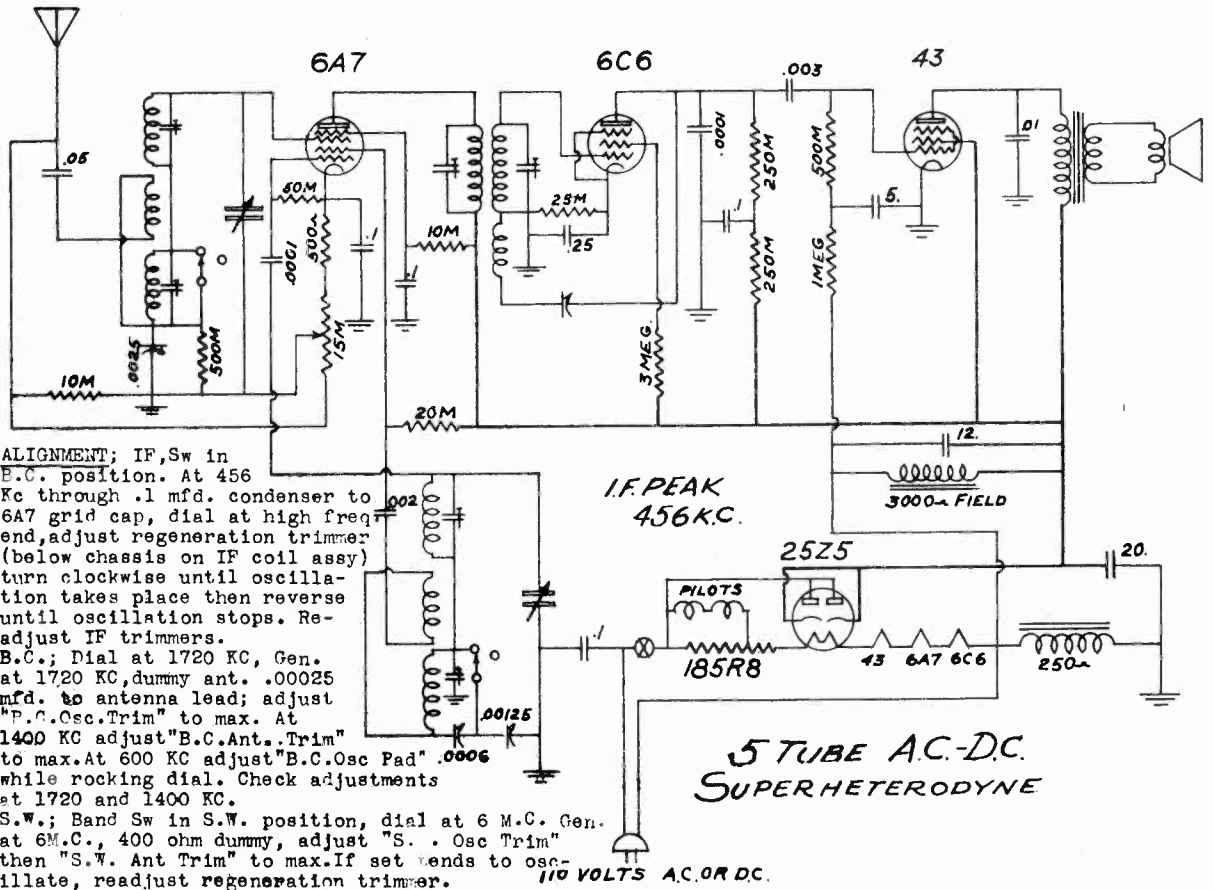
Clarion
MODELS TC-75 & TC-76
 6TUBE 3 BAND A.C. SUPERHETERODYNE

TRANSFORMER CORP. OF AMERICA
 100 SIXTH AVE. NEW YORK, N.Y.
 DRAWN BY LF 12-13-35

Schematic
Alignment

TRAV-LER RADIO & TELEVISION CORP. MODEL 11-Tube A-C Superhets.

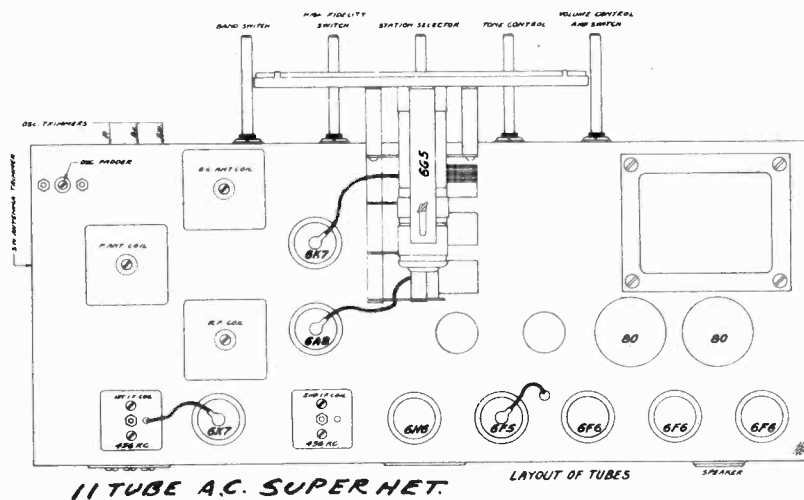
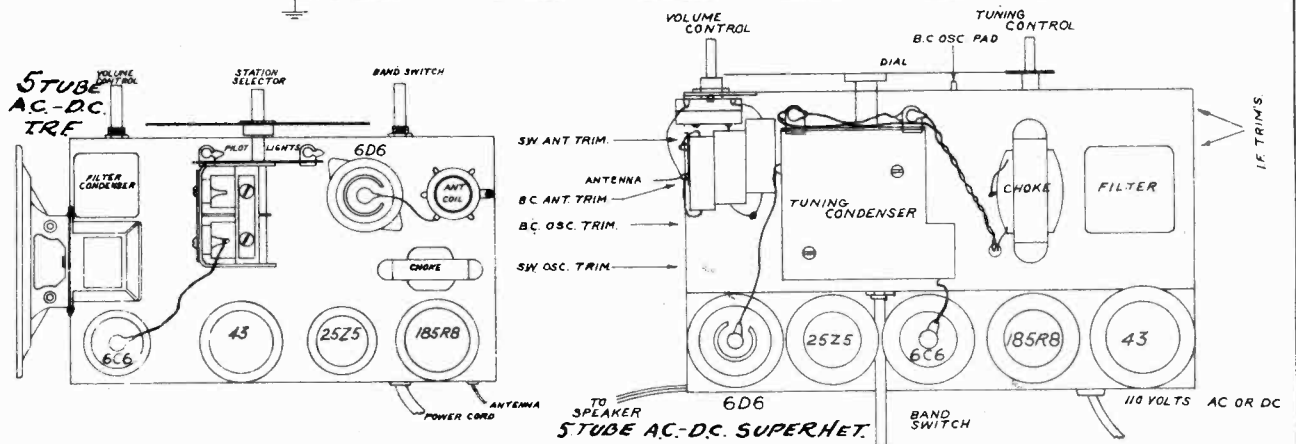
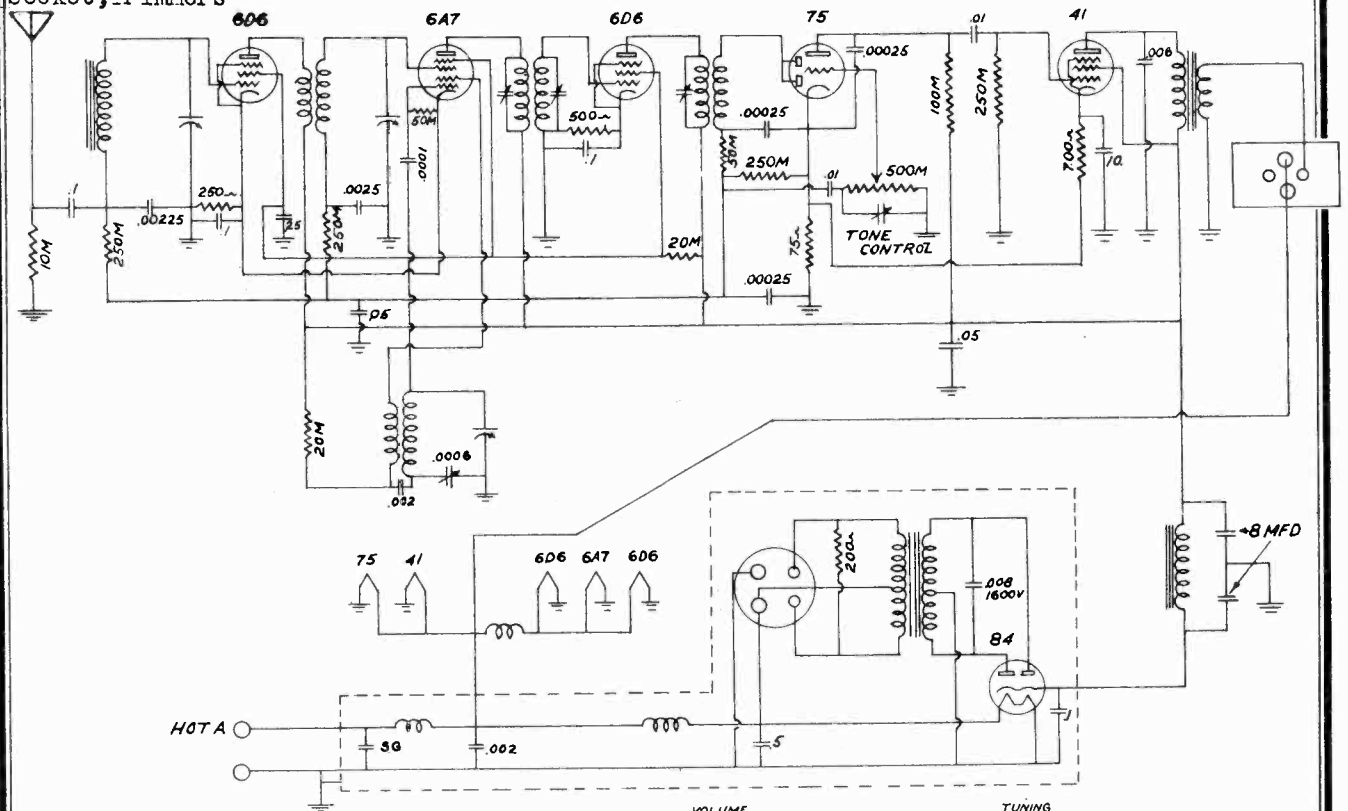
MODEL 5-Tube AC-DC



MODEL 5-Tube AC-DC TRF TRAV-LER RADIO & TELEVISION CORP.
MODEL 5-Tube AC-DC Superhet
MODEL 11-Tube A-C Superhet.
Socket, Trimmers

MODEL 6-Tube Auto
Schematic

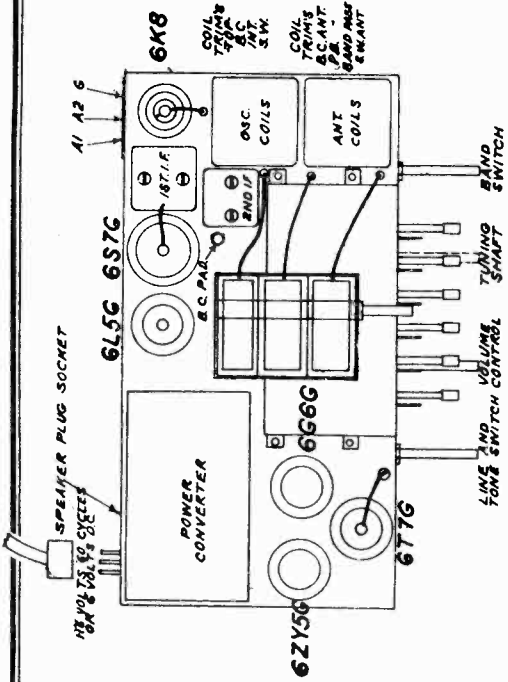
6 TUBE AUTO SET I.F. = 262 K.C.



MODEL 6-Tube
 Batt. or A-C
 MODEL 8-Tube
 Batt. or A-C

TRAV-LER RADIO & TELEVISION CORP.

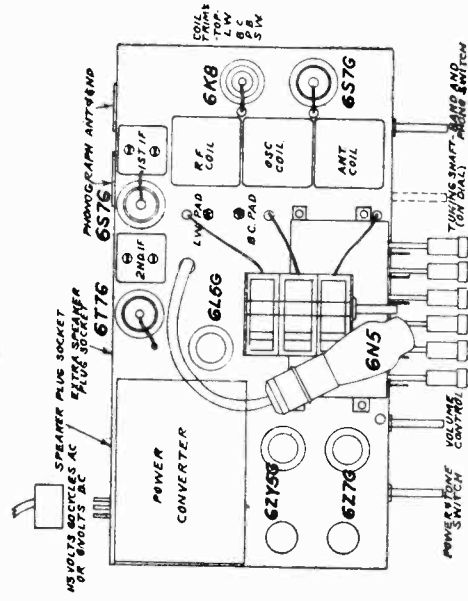
Schematics
 Socket
 Trimmers



6 Tube Battery or A. C. Operated Receiver

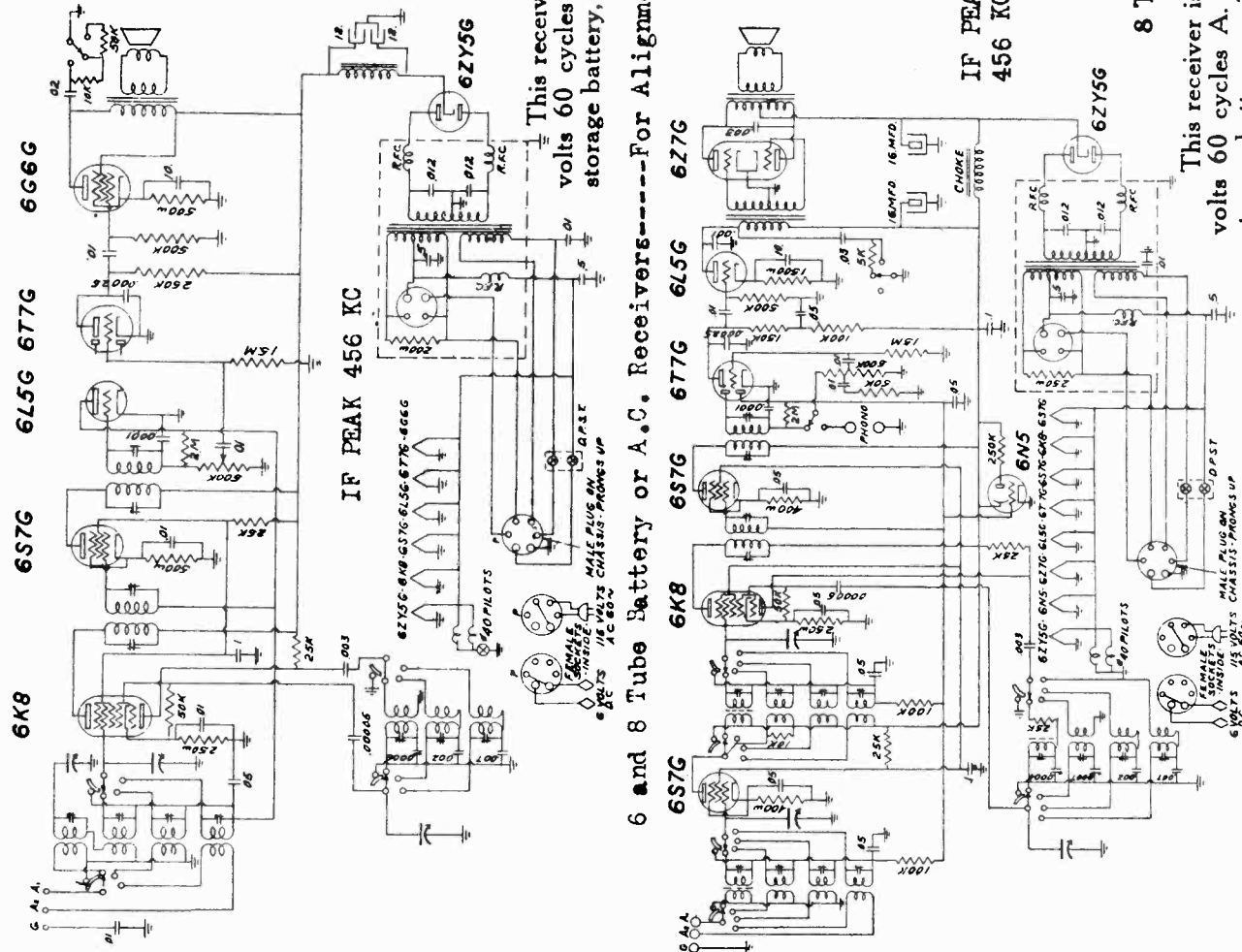
This receiver is designed to operate on a 6 volt storage battery, or 115 volts 60 cycles A. C. only. The special model will operate on a 6 volt storage battery, or 220 volts 60 cycle A. C. only.

6 and 8 Tube Battery or A.C. Receivers-----For Alignment and Tuner Data, See Index.



8 Tube Battery or A. C. Operated Receiver

This receiver is designed to operate on a 6 volt storage battery, or 115 volts 60 cycles A. C. only. The special model will operate on a 6 volt storage battery, or 220 volts 60 cycle A. C. only.

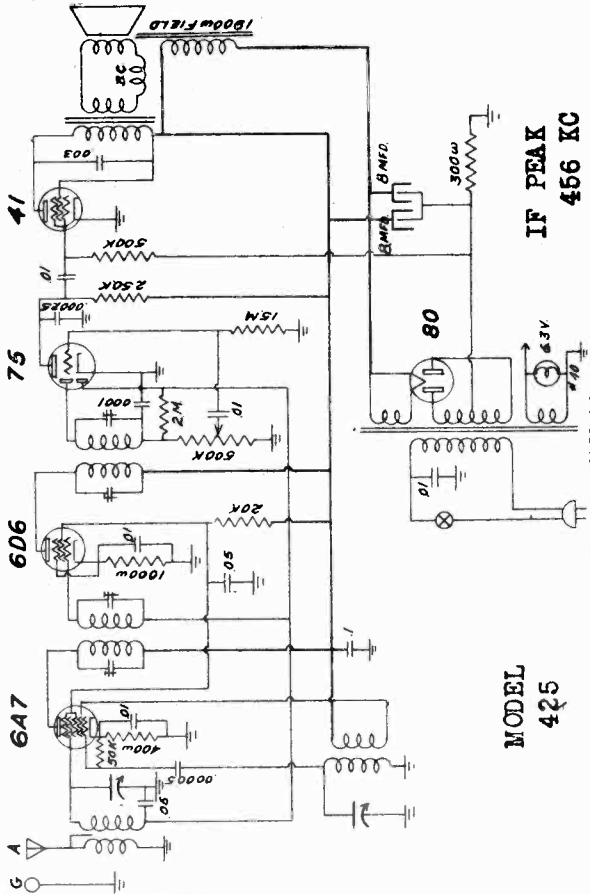


IF PEAK
 456 KC

Schematics
Alignment

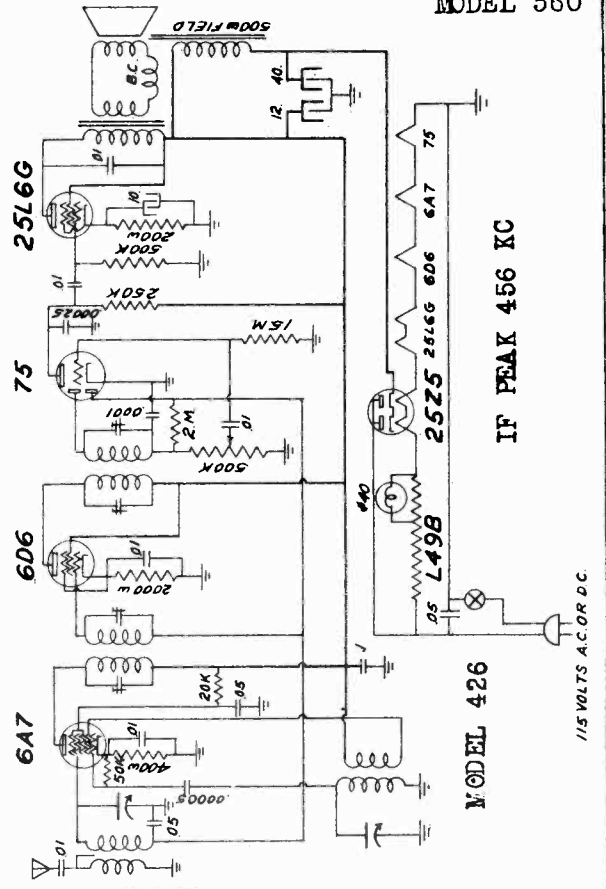
TRAV-LER RADIO & TELEVISION CORP.

- MODEL 415
- MODEL 425
- MODEL 426
- MODEL 560



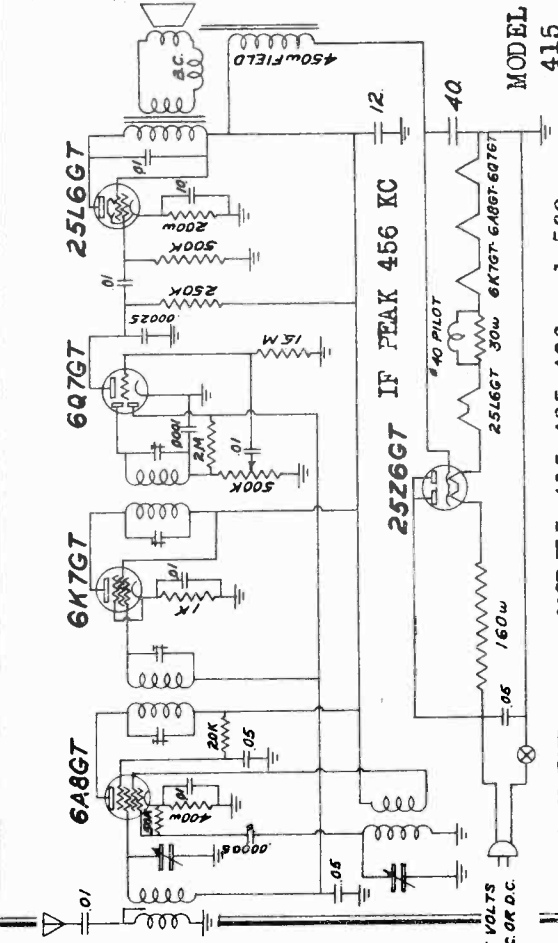
MODEL 425

115 VOLTS 60 CYCLES A.C.



MODEL 426

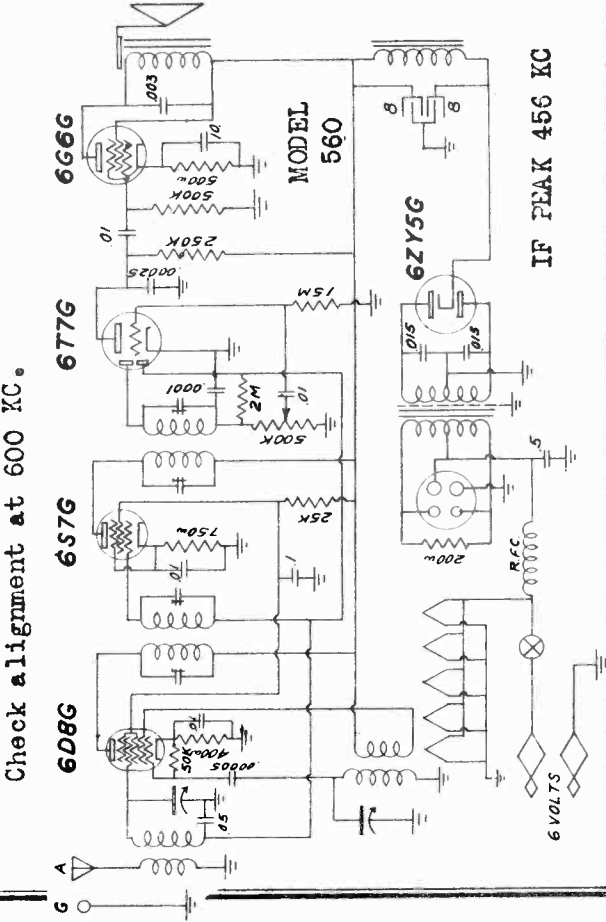
115 VOLTS A.C. OR D.C.



MODEL 415

ALIGNMENT: -----
 I.F. Set dial at 1720, adjust at 456 KC.
 B.C. Dummy antenna .0002 mfd. condenser, adjust oscillator trimmer at 1720 KC.
 Adjust antenna trimmer at 1400 KC.
 Check alignment at 600 KC.

FOR OTHER DATA
SEE INDEX



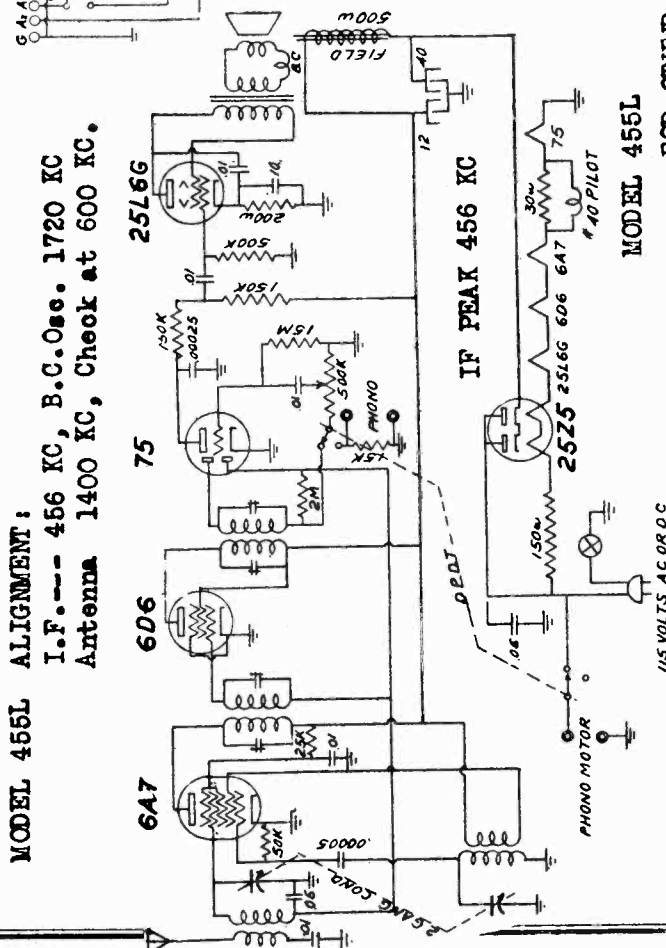
MODEL 560

6 VOLTS

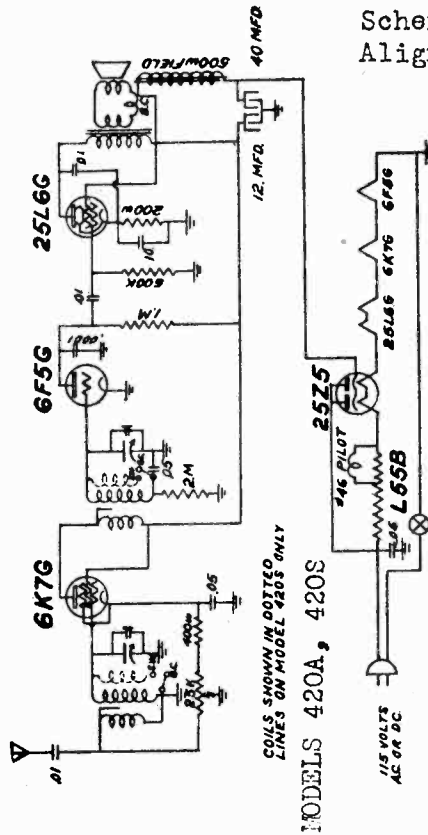
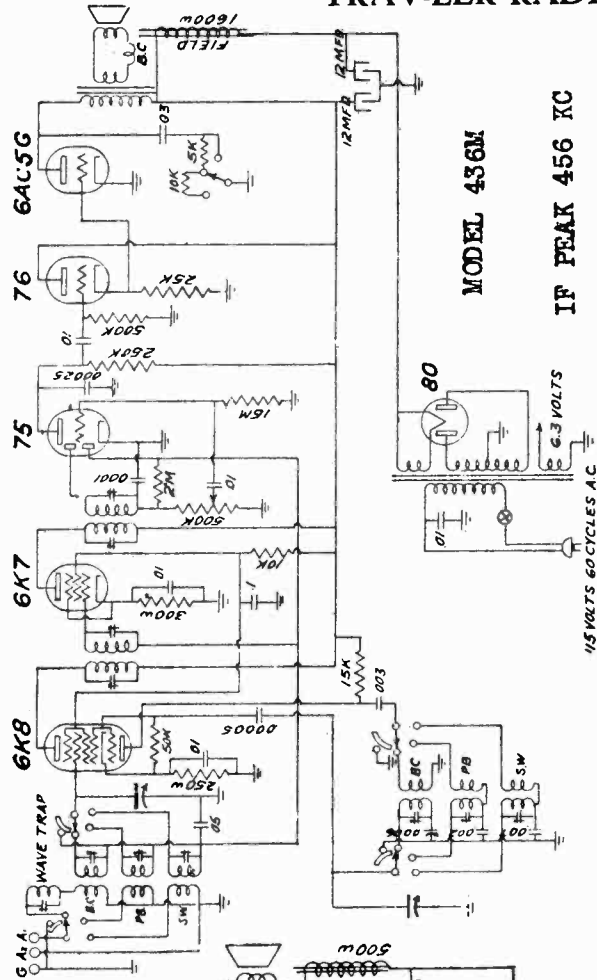
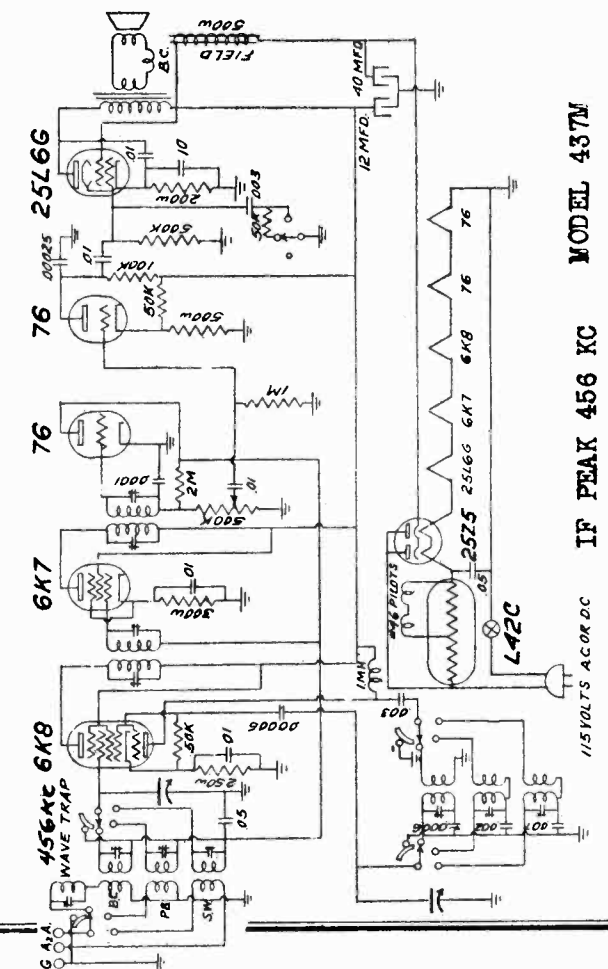
TRAV-LER RADIO & TELEVISION CORP.

MODELS 420A, 420S
 MODEL 436M
 MODEL 437M
 MODEL 455L
 Schematics
 Alignment

MODEL 455L ALIGNMENT:
 I.F. --- 456 KC, B.C. Osc. 1720 KC
 Antenna 1400 KC, Check at 600 KC.



FOR OTHER DATA, SEE INDEX.



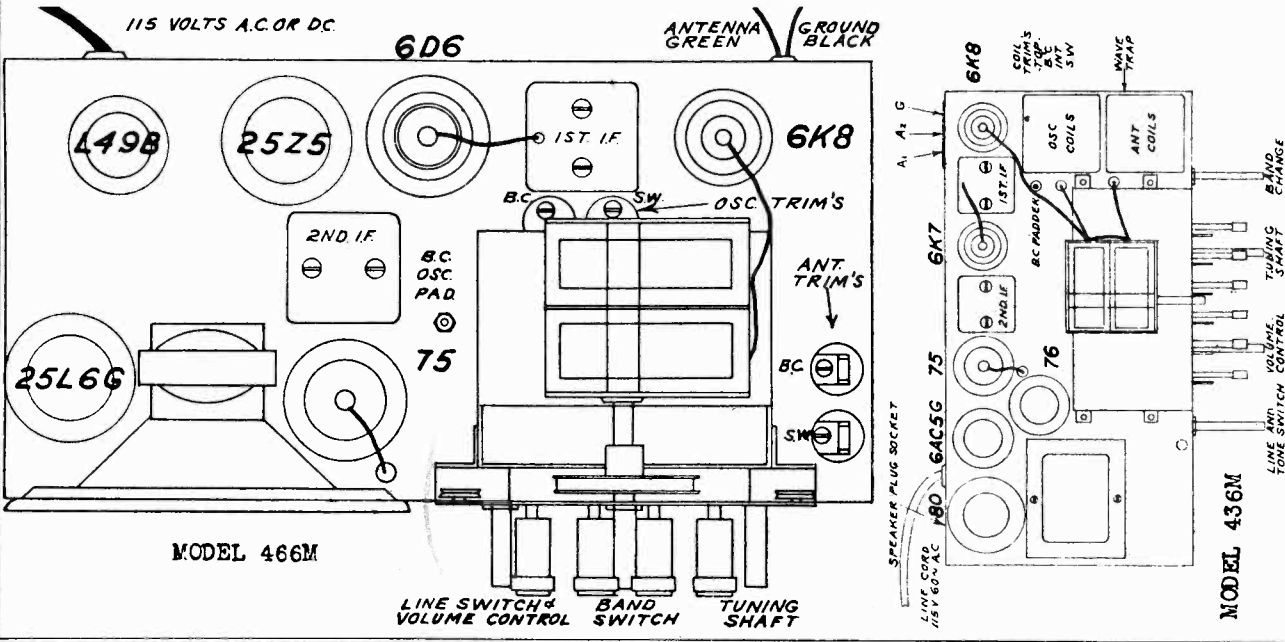
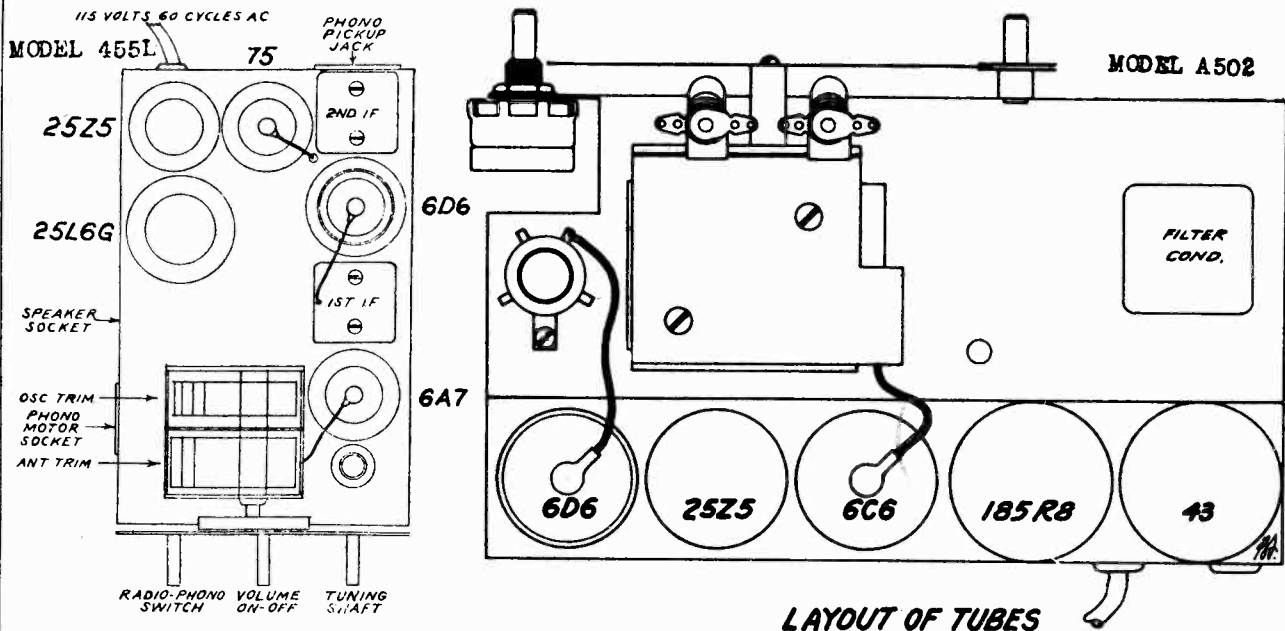
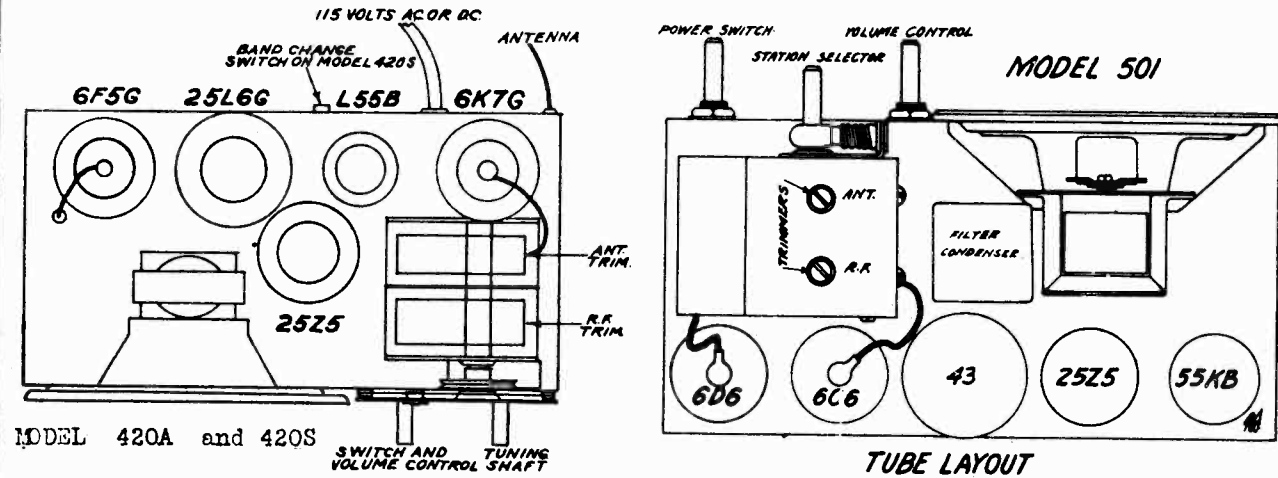
MODEL 420A (1 BAND) ALIGNMENT:
 R.F. Trimmer --- 1750 KC
 Ant. Trimmer --- 1400 KC
 Check at 600 KC.

MODEL 420S 2 BAND ALIGNMENT:
 R.F. Trimmer --- 1560 KC
 Ant. Trimmer --- 1400 KC
 SW Band --- No adjustment.

MODEL 501
 MODEL A502
 Socket, Trimmers

TRAV-LER RADIO & TELEVISION CORP.

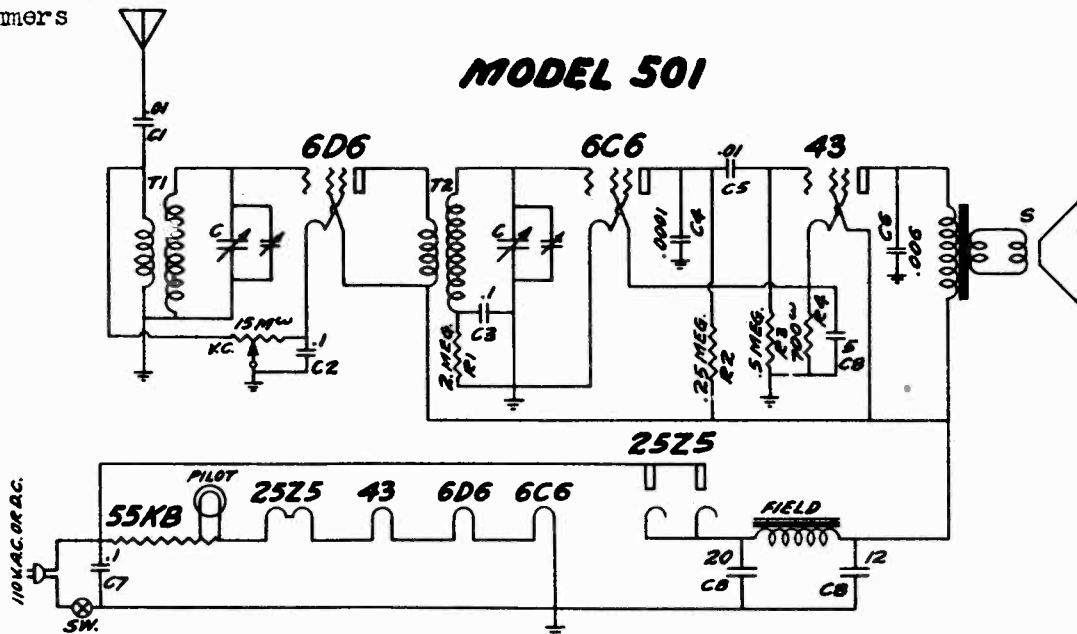
MODELS 420A, 420E
 MODEL 436M
 MODEL 455L
 MODEL 466M



MODEL 501
Schematic
MODEL 645E
Schematic, Socket
Trimmers

TRAV-LER RADIO & TELEVISION CORP.

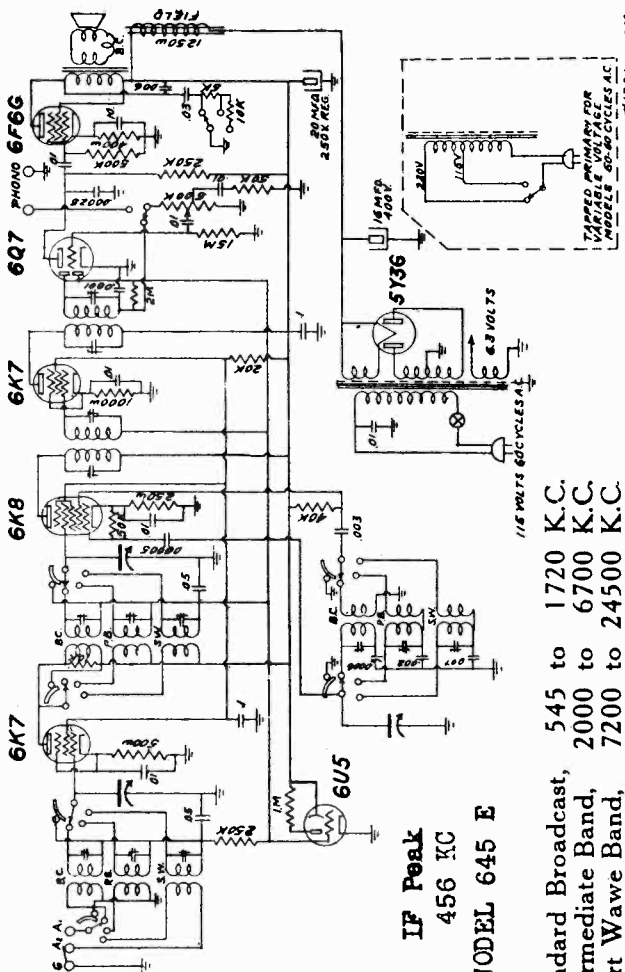
MODEL 501



SUPPLY VOLTAGE

This receiver operates from any 110 volt light socket of any frequency AC or straight DC. When operating on a DC socket, the plug may have to be reversed in the socket to obtain the correct polarity, as it will work only in one position on DC current.

FOR OTHER DATA, SEE INDEX



IF Peak

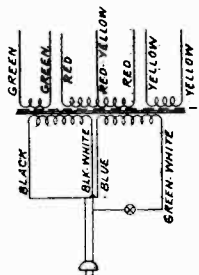
456 KC

MODEL 645 E

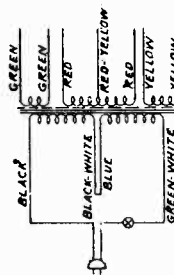
Standard Broadcast, 545 to 1720 K.C.
Intermediate Band, 2000 to 6700 K.C.
Short Wave Band, 7200 to 24500 K.C.

WIRE DIAGRAM FOR MODEL 645E
UNIVERSAL POWER TRANSFORMER

FOR 115 VOLTS 50 OR 60 CYCLES AC



FOR 230 VOLTS 50 OR 60 CYCLES AC



MODEL 645 E

CURRENT SUPPLY

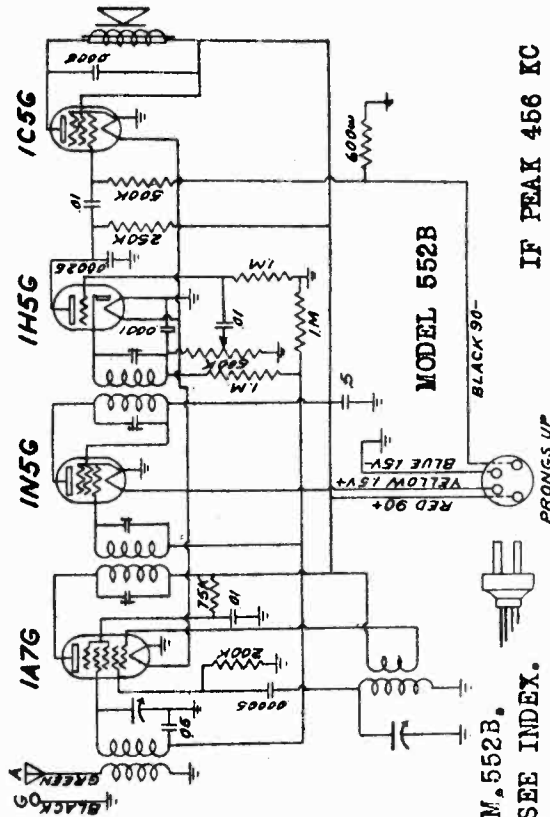
The current supply switch at the rear of the chassis must be set to 115 or 230 volts to correspond to the available current and should never be changed while that current is being used! Be absolutely sure this switch is set right before you plug in the radio. If it is set for 115 volts and 230 volts is used, the transformer will burn out.

Schematics
Alignment

TRAV-LER RADIO & TELEVISION CORP.

MODEL 536M
MODEL 539M
MODEL 552B

ALIGNMENT: MODELS 536M, 539M, 552B.
I.F. TRIMMERS----- 456 KC.
B.C. OSC. TRIMMERS--1720 KC.
ANT. TRIMMERS----1400 KC.
CHECK ALIGNMENT AT 600 KC.



SUBSTITUTE POWER SUPPLY FOR ABOVE RECEIVER

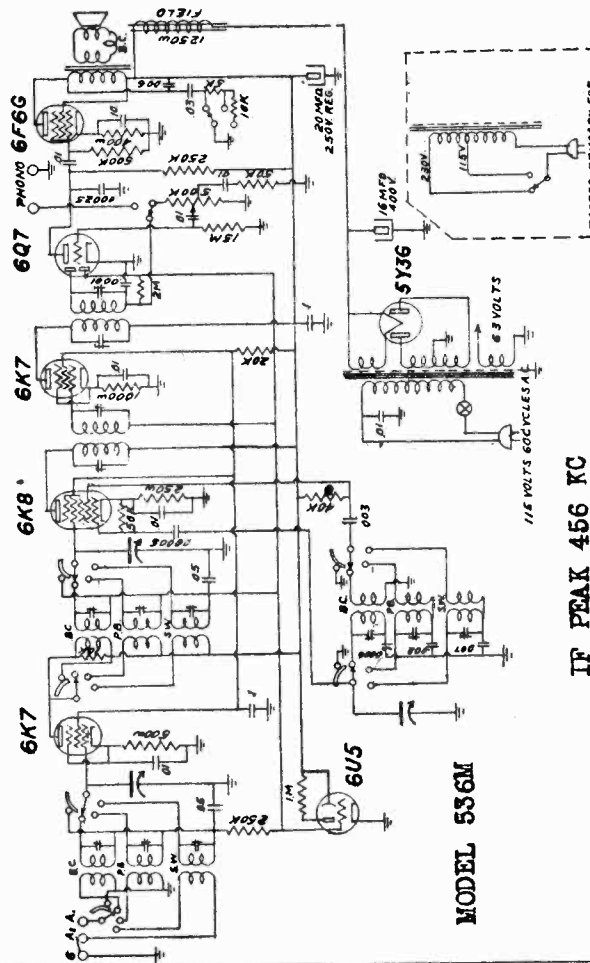
THIS RADIO IS DESIGNED TO OPERATE FROM A SINGLE, COMMON, PLUG-IN UNIT

SUBSTITUTES MAY BE USED FOR 'A' BATTERIES, SINGLE 1.5 VOLT CELLS

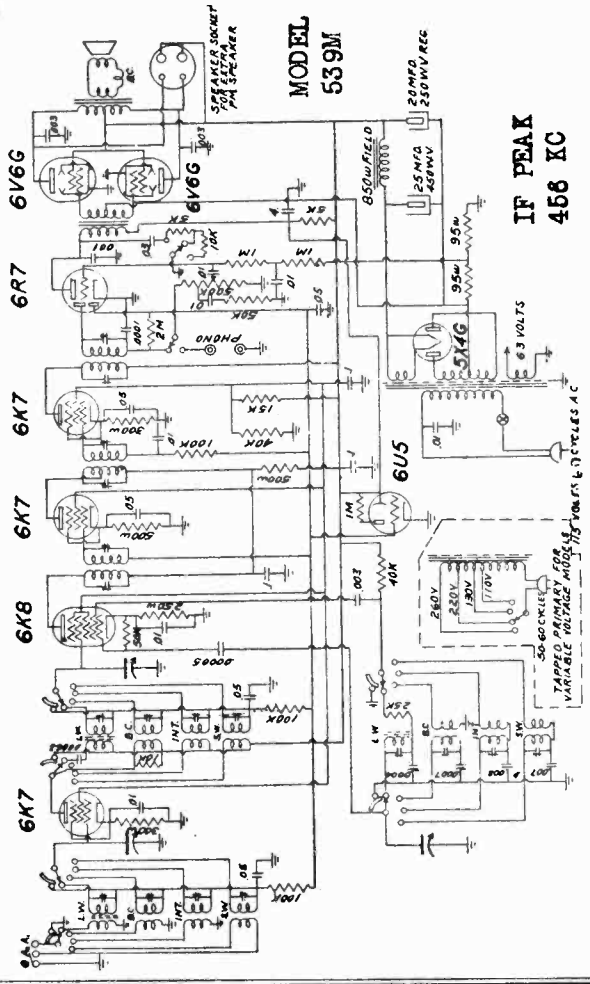
OR SEVERAL 1.5 VOLT CELLS MAY BE USED IN PARALLEL CONNECTION

FOR 'B' BATTERIES, TWO 45 VOLT UNITS MAY BE USED, CONNECTED IN SERIES

MODEL 552B



MODELS 536M, 539M, 552B.
FOR OTHER DATA, SEE INDEX.



MODEL 6-Tube Auto
Voltage, Socket
Trimmers, Alignment
MODELS 6-, 8-Tube Batt.
or A-C Sets

TRAV-LER RADIO & TELEVISION CORP.

MODELS 436M, 437M
MODELS 465M, 466M
Alignment, Tuner

MODEL 536M
MODEL 645E
MODEL 539M
Alignment
MODELS 425, 426
Tuner Data

ALIGNMENT: 8 TUBE BATTERY OR A.C. and MODEL 539M.

I. F. ALIGNMENT

From a good signal generator, connect the proper leads, one to the radio chassis, the other thru a .1 mfd. condenser to the grid cap of the 6K8 with the set's grid lead still in place. Set the radio dial to 1720 K.C. and the signal generator to 456 K.C. With the set's volume control full on, increase the generator output until the signal is heard in the radio speaker. Adjust the I.F. trimmers for maximum output, starting with the third I.F. and working back. Decrease the generator output as the speaker output increases.

LONG WAVE ALIGNMENT

Connect the signal generator lead thru a .0002 mfd. condenser as dummy antenna, to terminal "A1," with the metal strip connected across A2 and G. Set the dial and generator to 362 K.C. and adjust the L.W. oscillator trimmer for maximum output. Align the L.W. RF and ANT trimmers at 320 K.C. Align the L.W. oscillator pad for maximum output at 200 K.C. by adjusting the dial and padder together. Check the alignment again at 320 K.C.

BROADCAST BAND ALIGNMENT

Using the .0002 mfd. condenser as dummy antenna, adjust the B.C. oscillator trimmer at 1720 K.C. Align the RF and ANT trimmers at 1400 K.C. Align the B.C. oscillator padder at 600 K.C. by adjusting the dial and padder together. Check the alignment again at 1400 K.C.

INTERMEDIATE BAND ALIGNMENT

Using a 400 ohm resistor as dummy antenna, adjust the Intermediate Band oscillator trimmer at 6.7 M.C. and the R.F. and Antenna trimmers at 6 M.C.

Check for alignment at 2.2 M.C.

SHORT WAVE BAND ALIGNMENT

Using the 400 ohm resistor as dummy antenna, adjust the S.W. oscillator trimmer at 24.5 M.C. and the R.F. and Antenna trimmers at 22 M.C.

Check for alignment at 8 M.C.

NOTICE

If a Standard All Wave dummy Antenna is available, it should be used in place of the .0002 mfd. condenser, and the 400 ohm resistor.

On all bands the oscillator trimmers are adjusted with the variable condenser full open.

ALIGNMENT: MODELS 6Tube Battery or A.C., 437M, 436M, 466M, 465M, 536M, and 645E.

NOTE: No intermediate band on Models 465M and 466M.

I.F. From a good signal generator, connect the proper leads, one to the radio chassis, the other thru a .1 mfd. condenser to the grid cap of the 6K8 with the set's grid lead still in place. Set the radio dial to 1720 K.C. and the signal generator to 456 K.C. With the set's volume control full on, increase the generator output until the signal is heard in the radio speaker. Adjust the I.F. trimmers for maximum output, decreasing the generator output as the speaker output increases.

B.C. 1. Connect the signal generator lead thru a .0002 mfd. condenser as dummy antenna to the "A1" terminal, with the metal strip connected across A2 and G. Set the signal generator and radio dial to 1720 K.C. and adjust the B.C. oscillator trimmer for maximum output.

2. Set the signal generator and radio dial to 1400 K.C. and adjust the B.C. R.F. and ANT. trimmers for maximum output.

3. Set the signal generator to 600 K.C. and the radio dial to approximately 600 K.C., and adjust the B.C. oscillator padder for maximum output by adjusting dial and pad together.

Check the alignment again at 1400 K.C.

I.W. Connect the signal generator lead thru a 400 ohm resistor as dummy antenna to A1. Set the dial and generator to 6700 K.C. and adjust the P.B. oscillator trimmer for maximum output. Adjust the R.F. and ANT. trimmers at 6000 K.C. and check for alignment at 2200 K.C.

S.W. Still using the 400 ohm resistor as dummy antenna, adjust the S.W. oscillator trimmer at 24.5 M.C. on dial and generator. Adjust the R.F. and ANT. trimmers at 22 M.C. and check for alignment at 8 M.C.

ALIGNMENT: 6 TUBE AUTO RADIO

1. Set variable condenser with rotor plates in open position. Set signal generator to 200 kc., connect generator lead to grid cap of 6A7 using a .1 mfd. condenser as a dummy antenna. Rotate oscillator trimmer until signal is picked up. Set generator at 1400 kc., pick up signal by rotating variable condenser then adjust RF and antenna trimmers for maximum signal, reducing generator output as speaker signal increases. Set signal generator to 600 kc., rotate variable condenser to pick up signal then adjust for maximum sensitivity by rotating oscillator padder while rotating variable condenser.

2. Set signal generator to 1620 kc., connecting generator lead to antenna lead on set using a .00025 condenser as dummy antenna. Rotate oscillator trimmer until signal is picked up. Set generator at 1400 kc., pick up signal by rotating variable condenser then adjust RF and antenna trimmers for maximum signal, reducing generator output as speaker signal increases. Set signal generator to 600 kc., rotate variable condenser to pick up signal then adjust for maximum sensitivity by rotating oscillator padder while rotating variable condenser.

3. Recheck alignment adjustments at 1620 and 1400 kc.

PUSH BUTTONS; MODELS 6 and 8 Tube Battery or A.C., 425, 426, 436M, 437M, 465M and 466M.

Six Push Button Station Selectors are incorporated in this receiver. Each button may be adjusted to select any station or frequency in the Broadcast Band. To adjust each button, perform the following operations:

1. Tune in a desired station with the Selector knob, watching the eye for the narrowest shadow.

2. Twist the Push button you want set up for this station, to the left about one full turn to loosen the mechanism.

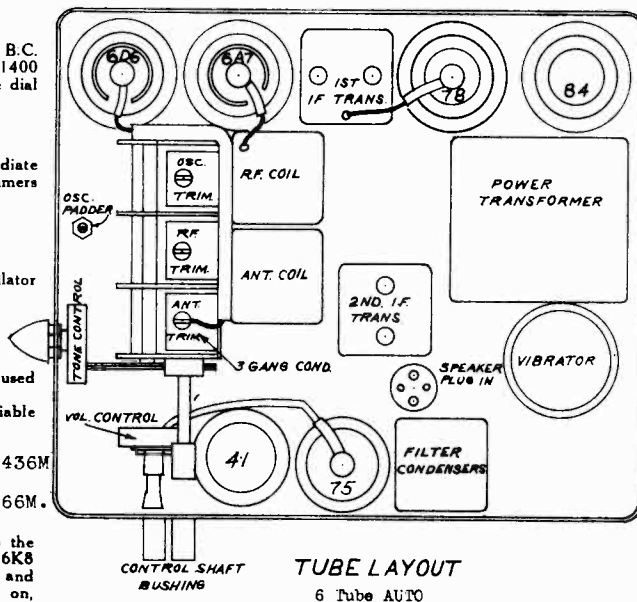
3. Push this Push Button in as far as it will go, while holding the Selector knob firmly so the station will not be detuned.

4. With the Push Button pressed all the way in, twist it to the right until it is tight, and then release it.

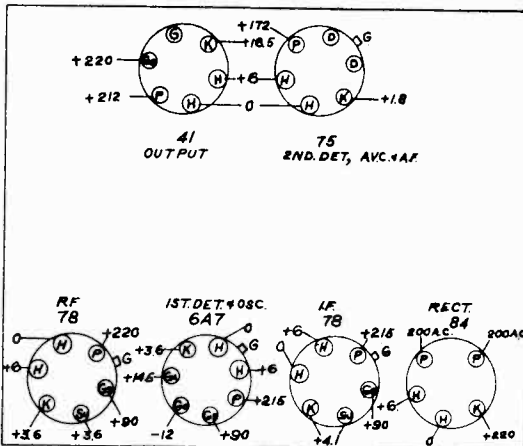
Follow this procedure with the other five Push Buttons, setting each for a different station.

Now, when any button is pushed, the station for which that button is set should become perfectly tuned in. If it is not tuned in perfectly, repeat the above procedure until satisfactory results are obtained.

Select the Call Letter Tabs to correspond to the stations the Push Buttons are set up for, and insert them in the places provided above each button.



VOLTAGE DATA 6 TUBE AUTO RADIO

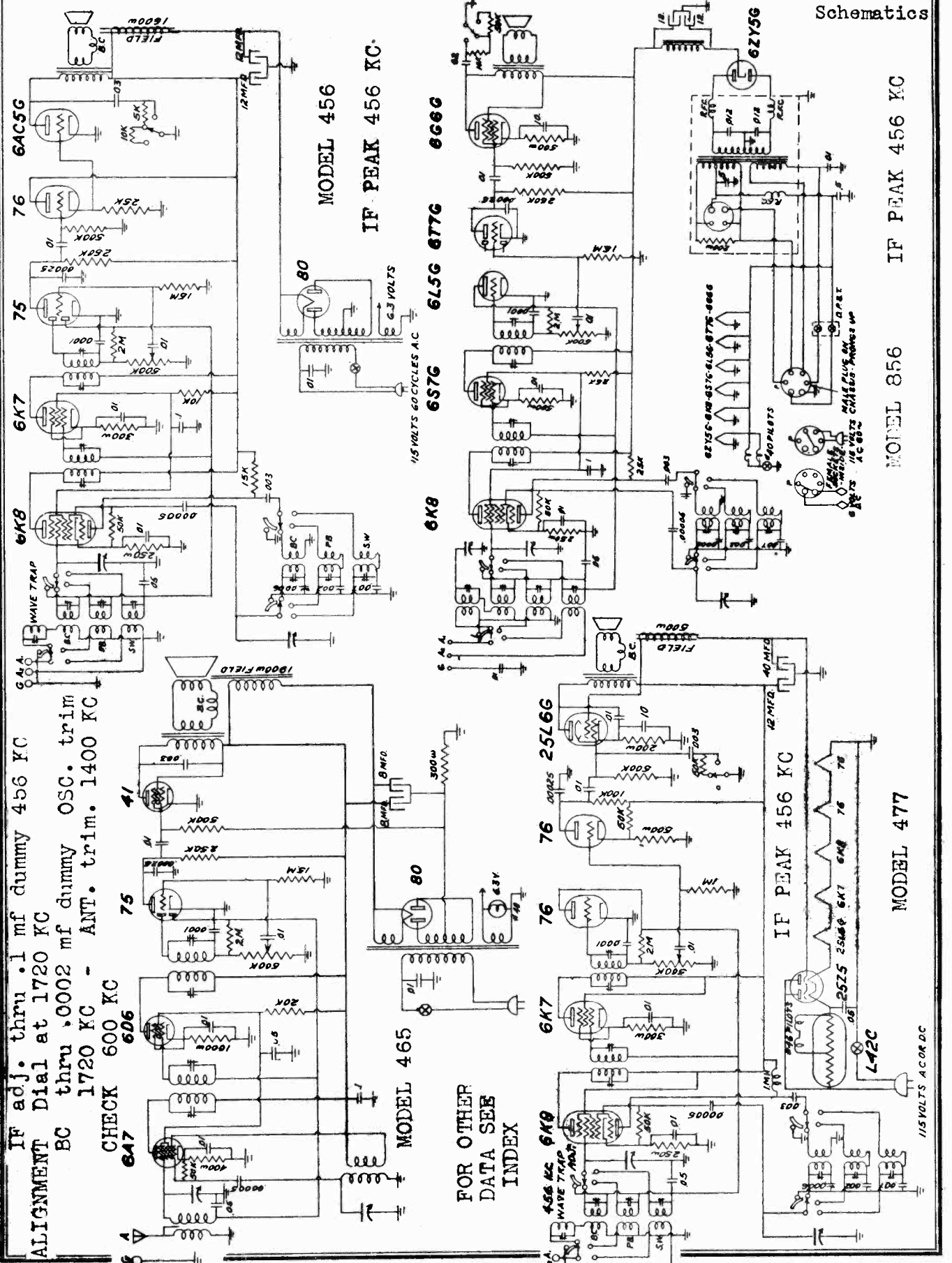


Bottom view of 6-tube auto set showing socket positions and voltages from socket terminals to ground. All voltage measurements taken with volume control at maximum and with no signal applied. Use volt-meter of 1000 ohms per volt.

MODEL 465
Schematic, Alignment

ULTRAMAR MFG. CORP.

MODEL 456
MODEL 477
MODEL 856
Schematics

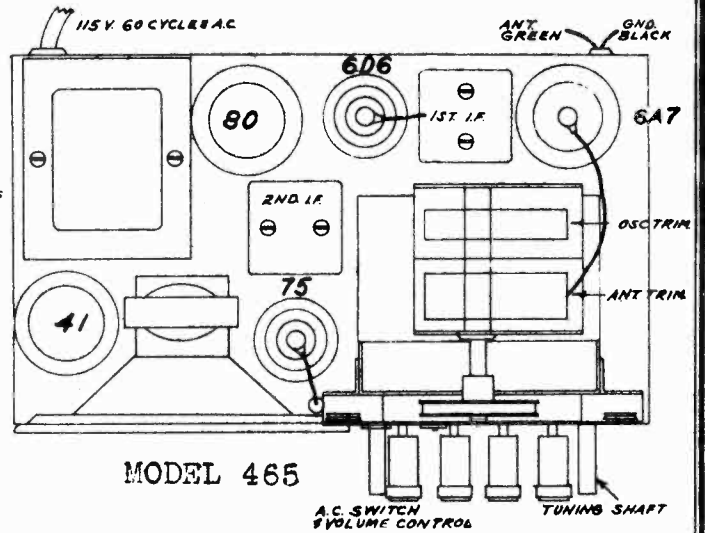
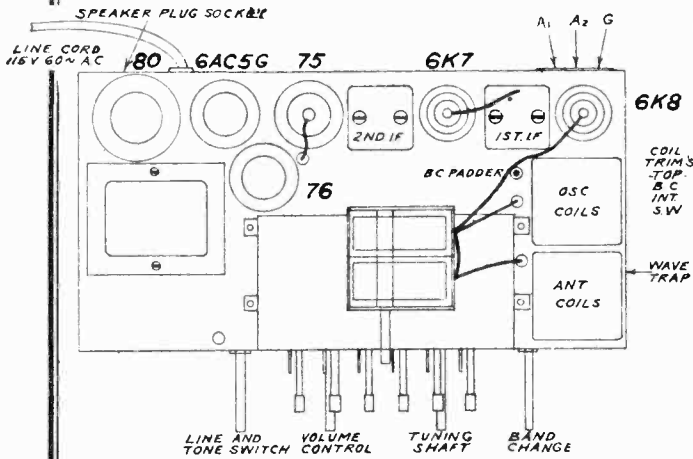


MODEL 456
 MODEL 465
 MODEL 477

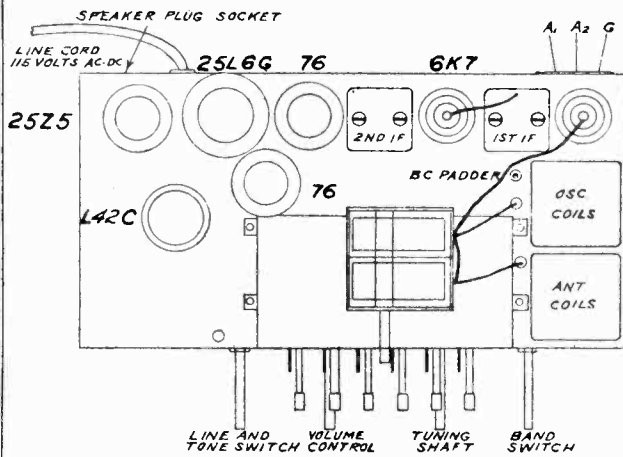
ULTRAMAR MFG. CORP.

MODEL 856
 MODEL 877
 MODEL 889
 Socket, Trimmers

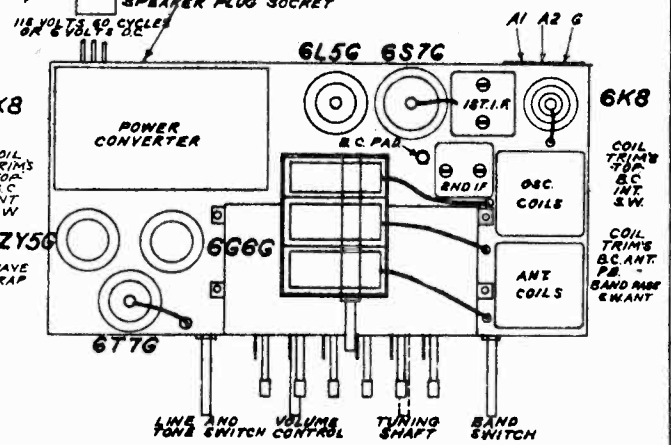
MODEL 456



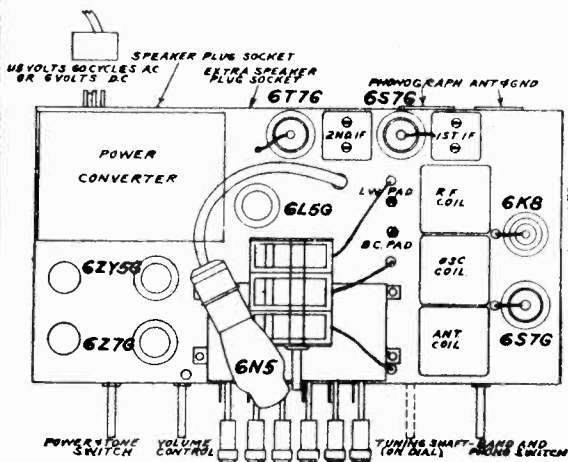
MODEL 477



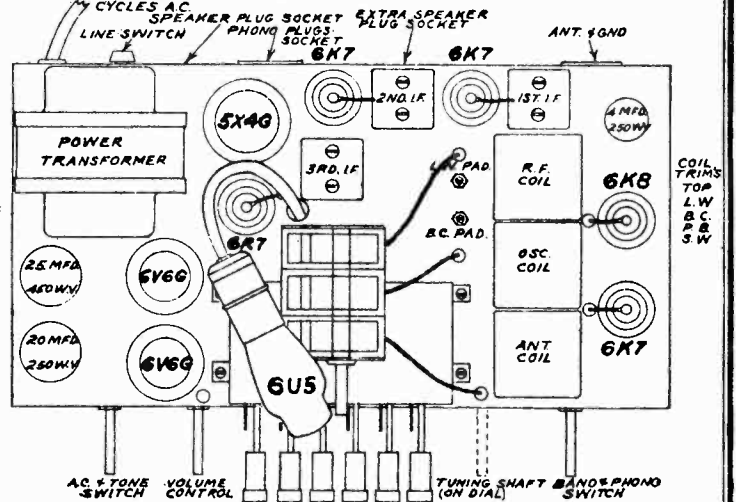
MODEL 856



MODEL 877



MODEL 889



MODELS 306, 316

Schematic, Socket
Trimmers, Alignment
MODEL 487 MODEL 465
Alignment Tuner Data

ULTRAMAR MFG. CORP.

MODEL 456 MODEL 477
MODEL 856 MODEL 877
MODEL 889
Alignment, Tuner

MODELS 877 & 889

TECHNICAL INSTRUCTIONS

A good output meter should be used in all alignment adjustments.

I. F. ALIGNMENT

From a good signal generator, connect the proper leads, one to the radio chassis, and the other thru a .1 mfd. condenser to the grid cap of the 6K8, with the tube's grid lead still in place. Set the radio dial to 1720 K.C. and the signal generator to 456 K.C. With the set's volume control full on, increase the generator output until the signal is heard in the radio speaker. Adjust the I. F. trimmers for maximum output, decreasing the generator output as the radio output increases.

LONG WAVE ALIGNMENT

Connect the signal generator lead thru a .0002 mfd. condenser as dummy antenna, to the "A1" terminal, with the metal strip connected across A2 and G. Set the dial and generator to 362 K. C. and adjust the oscillator trimmer for maximum output. Align the L.W., R.F. and antenna trimmers at 320 K.C.

Align the L.W. oscillator padder at 200 K.C. by adjusting the dial and padder together. Check the alignment again at 320 K.C.

BROADCAST BAND ALIGNMENT

Using the .0002 mfd. condenser as dummy antenna, adjust the B.C. oscillator trimmer at 1720 K.C. for maximum output. Align the R.F. and antenna trimmers at 1400 K.C. Align the B.C. oscillator padder at 600 K.C. by adjusting the dial and padder together. Check the alignment again at 1400 K.C.

INTERMEDIATE BAND ALIGNMENT

Using a 400 ohm resistor as dummy antenna, adjust the Intermediate Band oscillator trimmer at 6.7 M.C. and the R.F. and Antenna trimmers at 6 M.C.

Check for alignment at 2.2 M.C.

SHORT WAVE BAND ALIGNMENT

Using the 400 ohm resistor as dummy antenna, adjust the S.W. oscillator trimmer at 24.5 M.C., and the R.F. and Antenna trimmers at 22 M.C. Check for alignment at 8 M.C.

MODELS 487, 456, 477, & 856

TECHNICAL INSTRUCTIONS

A good output meter should be used in all alignment adjustments

I. F. ALIGNMENT

From a good signal generator connect the proper leads, one to the radio chassis, the other thru a .1 mfd. condenser to the grid cap of the 6K8, with the set's grid lead still in place. Set the radio dial to 1720 kilocycles and the signal generator to 456 K.C. With the set's volume control "full on," increase the generator output until the signal is heard in the radio speaker. Adjust I. F. trimmers for maximum output, decreasing the generator output as the speaker output increases.

B. C. ALIGNMENT

1. Connect the signal generator lead thru a .0002 mfd. condenser as dummy antenna to the "A1" terminal, with the metal strip connected across A2 and G. Set the signal generator and radio dial to 1720 K.C. and adjust the B.C. oscillator trimmer for maximum output.

2. Set the signal generator and radio dial to 1400 K.C. and adjust the B.C. R.F. and ANT. trimmers for maximum output.

3. Set the signal generator to 600 K.C. and the radio dial to approximately 600 K.C., and adjust the B.C. oscillator padder for maximum output by adjusting dial and pad together.

Check the alignment again at 1400 K.C.

INTERMEDIATE BAND ALIGNMENT

Connect the signal generator lead thru a 400 ohm resistor as dummy antenna to A1. Set the dial and generator to 6700 K.C. and adjust the P.B. oscillator trimmer for maximum output. Adjust the R.F. and ANT. trimmers at 6000 K.C. and check for alignment at 2200 K.C.

SHORT WAVE ALIGNMENT

Still using the 400 ohm resistor as dummy antenna, adjust the S.W. oscillator trimmer at 24.5 M.C. on dial and generator. Adjust the R.F. and ANT. trimmers at 22 M.C. and check for alignment at 8. M.C.

MODELS 456, 465, 477, 856, 877 & 889

PUSH BUTTON OPERATION

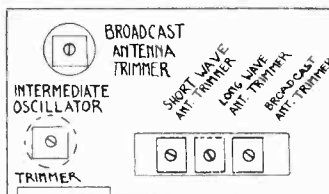
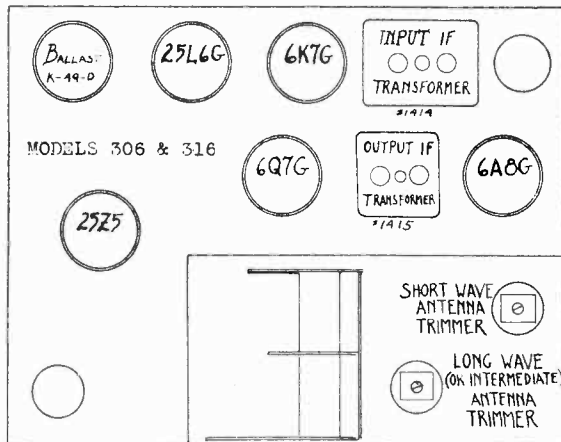
Six Push Button Station Selectors are incorporated in this receiver. Each button may be adjusted to select any station or frequency in the Broadcast Band. To adjust each button, perform the following operations:

1. Tune in a desired station with the Selector knob.
2. Twist the Push Button you want set up for this station, to the left about one full turn to loosen the mechanism.
3. Push this button in as far as it will go, while still holding the Selector knob firmly so the station will not be detuned.
4. With the button pressed all the way in, twist it to the right until it is tight and then release it.

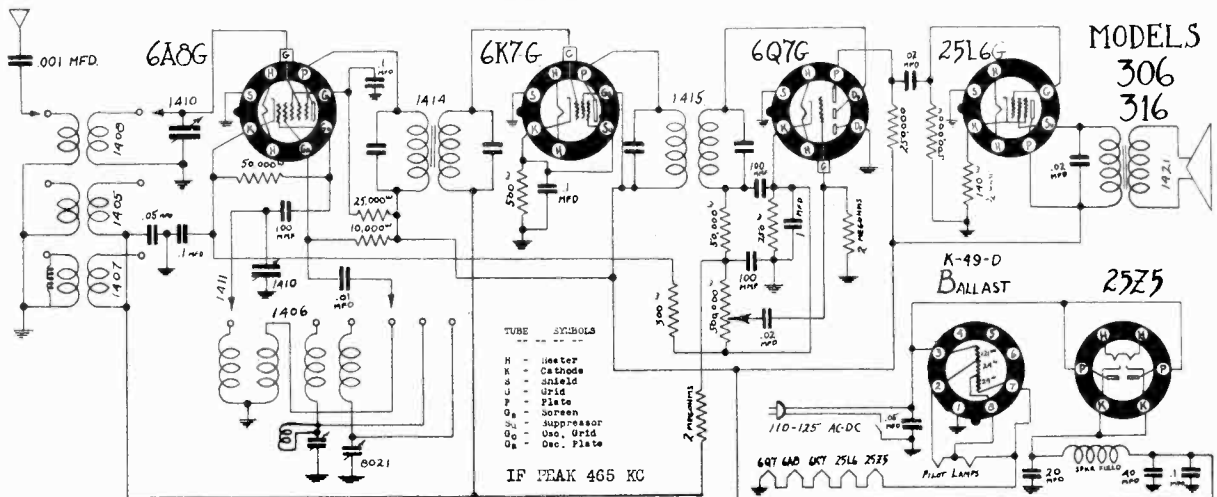
Follow this procedure with the other five buttons, setting each for a different station.

Now, when any Push Button is pressed, the station for which that button is set, should appear perfectly tuned in. If it is not perfectly tuned, repeat the above procedure until satisfactory results are obtained.

Select the Call Letter Tabs to correspond to the stations the buttons are set for, and insert them in places provided above each button.



ALIGNMENT
ALIGN IF TRANSFORMERS AT 465 KILOCYCLES.
ALIGN BAND B AT 1600 KC. (216 METERS) - BY ADJUSTING BC ANTENNA AND BC OSCILLATOR TRIMMERS. ADJUST BC PADDER AT 500 METERS.
ALIGN BAND A AT 20 METERS BY ADJUSTING SW ANTENNA AND SW OSCILLATOR TRIMMERS.
ALIGN BAND C FOR MODEL 306 AT 5 MEGACYCLES BY ADJUSTING INTERMEDIATE ANTENNA AND OSCILLATOR TRIMMERS FOR MAXIMUM RESPONSE.
ALIGN BAND C FOR MODEL 316 AT 900 METERS BY ADJUSTING LW ANTENNA AND OSCILLATOR TRIMMERS. ADJUST LW PADDER AT 1800 METERS.
MAKE ALL ADJUSTMENTS FOR MAXIMUM RESPONSE ON OUTPUT METER--USING SIGNAL GENERATOR.



MODEL R663 Delco
Socket, Trimmers
Alignment, Chassis

UNITED MOTORS SERVICE, INC.

MODELS R664 to R669
Alignment

1. Aligning I-F Stages at 262 Kilocycles

- (a) Connect the ground lead of the Signal Generator to the chassis case. Connect the signal lead of the Signal Generator to the grid cap of the 6AG8 tube, through a .1 mfd. condenser, leaving the tube's grid clip in place.
- (b) Connect output meter from plate of 6V7G (R663, 6, 7) tube to ground.
- (c) Set Signal Generator to exactly 262 kilocycles and turn volume control on full.

(d) Turn condenser gang to a position where no squeals or beat notes can be noticed, also so that when the tuning condenser is rotated within narrow limits there is no appreciable change in output.

(e) Adjust trimmers A-B-C-D through the cut-outs on the side of the chassis (illus. 13 & 14, Fig. 4) carefully for maximum output.

(f) Repeat adjustments of I-F trimmers A-B-C-D with as low an output from the Signal Generator as possible, for more accurate alignment.

2. Aligning at 1530 Kilocycles

- (a) Leave Signal Generator leads connected the same as for I-F adjustments.
- (b) Turn tuning condenser plates all the way out and against high frequency stop.
- (c) Set Signal Generator to exactly 1530 kilocycles and adjust oscillator trimmer "G" (Fig. 3) on middle section of condenser gang carefully for maximum output.

3. Aligning at 1400 Kilocycles

- (a) Remove signal lead of Signal Generator from grid cap of 6A8G tube and connect to antenna terminal of receiver through a .0002 mfd. mica condenser.
- (b) Set the Signal Generator to 1400 kilocycles and tune the receiver to this signal.
- (c) Adjust the parallel trimmers "F" and "H" (Fig. 3) of the condenser gang carefully for maximum output. Do not disturb the 1530 kilocycle adjustment of the middle section of the condenser gang.

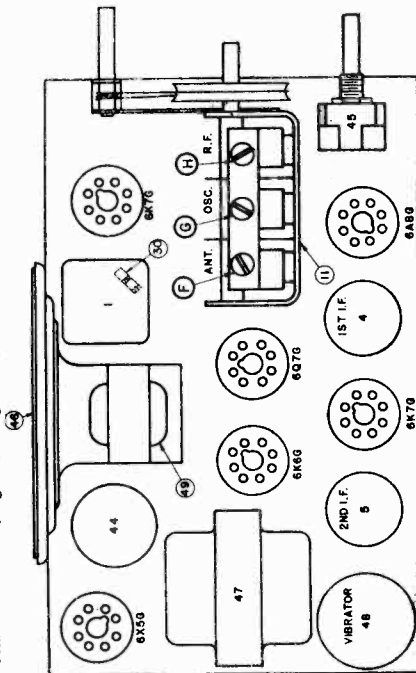
4. Aligning at 600 Kilocycles

- (a) Set Signal Generator to approximately 600 kilocycles and turn condenser gang plates until this signal is tuned in with maximum output.
- (b) Adjust trimmer "E" on Delco Syncro-Tuning condenser (illus. 12, Fig. 4) located next to antenna receptacle on bottom of chassis, rocking gang condenser plates back and forth through the signal until maximum output is obtained. (It will be necessary to re-adjust this condenser to the car antenna upon installation of the set.)

(c) Repeat adjustments made under--"Aligning at 1400 K.C."

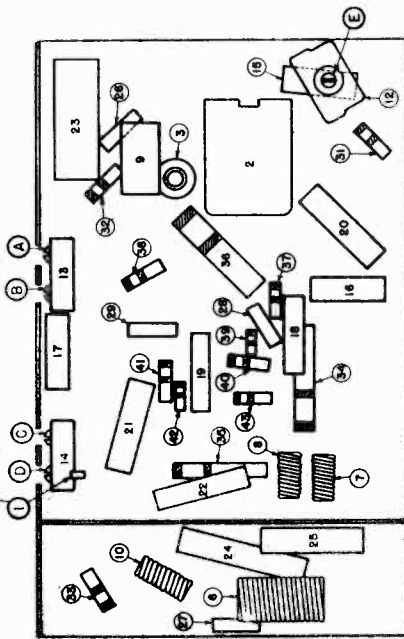
5. Checking I-F Band Spread

The Model 165 Cathode Ray Oscillograph should be used to check the I-F band spread after completing the "Alignment Procedure". Slight adjustment of the I-F stages may be found necessary in order to obtain a symmetrical selectivity curve. Connect Cathode Ray from connection "I" (Fig. 4) to ground.



MODEL R663 FIG. 3--PARTS LAYOUT--Top View

CONNECT CATHODE RAY AT THIS POINT & AT GRD.



MODEL R663 FIG. 4--PARTS LAYOUT--Bottom View

ALIGNMENT FOR MODELS R663, R664, R665, R666, R667, R668, and R669.

NOTE:-- FIGURE REFERENCES IN THE TEXT REFER TO FIGURES SHOWN WITH EACH MODEL.

Model R-664, illus. 12, 13, 14

Model R664, illus. 11, Fig 4

UNITED MOTORS SERVICE, INC.

MODEL R664 Delco
Schematic
Change

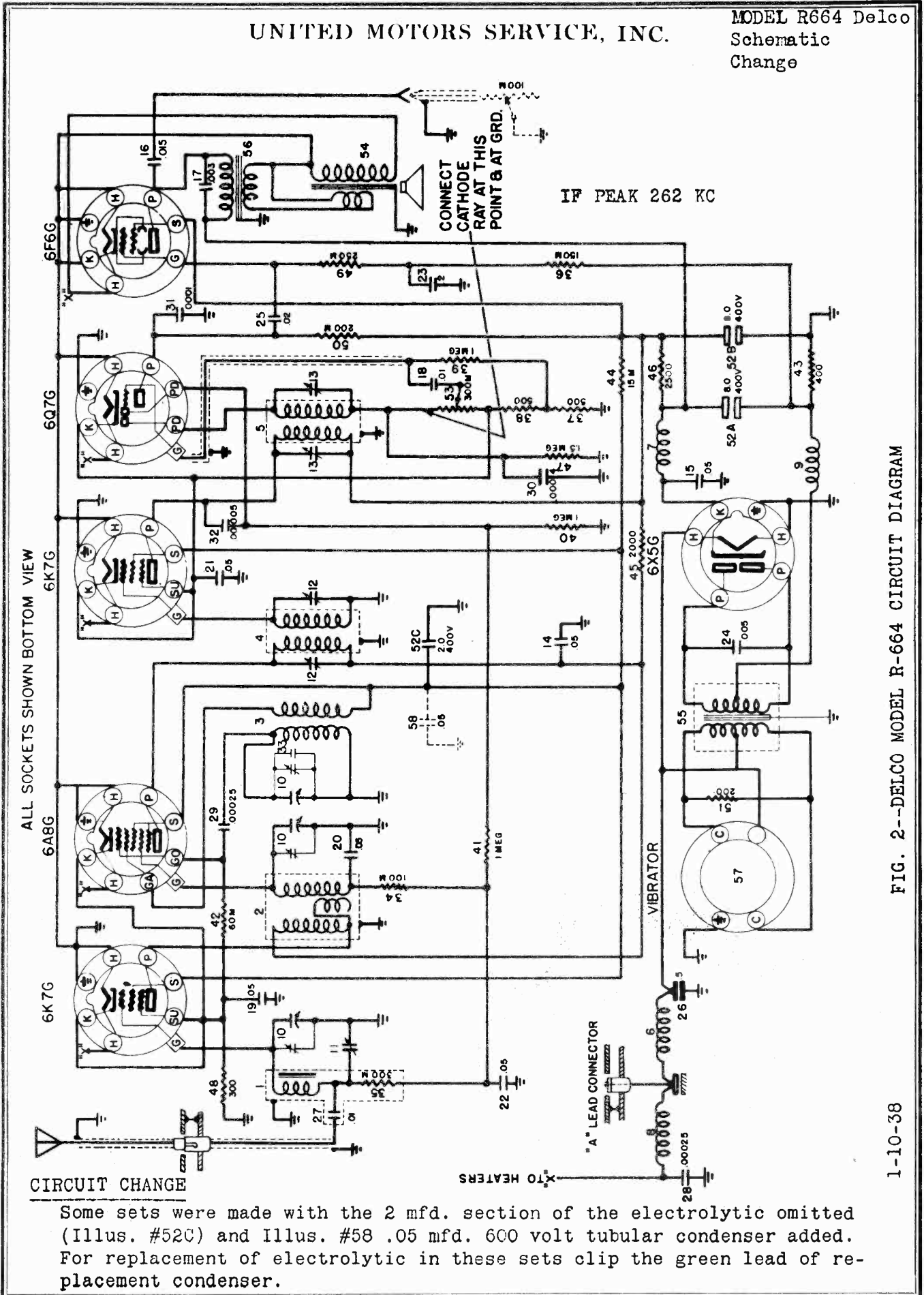


FIG. 2--DELCO MODEL R-664 CIRCUIT DIAGRAM

1-10-38

Voltages

DELCO R665

VOLTAGE READINGS BETWEEN SOCKET TERMINALS AND GROUND WITH D.C. VOLTMETER HAVING RESISTANCE OF 1000Ω PER VOLT. ALL READINGS TAKEN WITH 5.6 FILAMENT VOLTAGE AT TUBES.

CURRENT DRAIN WITHOUT SPEAKER 4.9 AMPERES
 B SUPPLY DRAIN APPROX. 42 M.A.

* THIS READING IS TAKEN BETWEEN NEGATIVE SIDE OF 300 OHM RESISTOR (ILLUS. NO. 50) AND GROUND.

DELCO R668, R669

VOLTAGE READINGS BETWEEN SOCKET TERMINALS AND GROUND WITH D.C. VOLTMETER HAVING RESISTANCE OF 1000Ω PER VOLT. ALL READINGS TAKEN WITH 5.6 FILAMENT VOLTAGE AT TUBES.

CURRENT DRAIN WITH SPEAKER 7 AMPERES
 B SUPPLY DRAIN APPROX. 49 M.A.

* THIS READING IS TAKEN BETWEEN NEGATIVE SIDE OF 300 OHM RESISTOR (ILLUS. NO. 50) AND GROUND.

DELCO R664

VOLTAGE READINGS BETWEEN SOCKET TERMINALS AND GROUND WITH D.C. VOLTMETER HAVING RESISTANCE OF 1000Ω PER VOLT. ALL READINGS TAKEN WITH 5.6 FILAMENT VOLTAGE AT TUBES.

CURRENT DRAIN WITHOUT SPEAKER 4.9 AMPERES
 B SUPPLY DRAIN APPROX. 42 M.A.

* THIS READING IS TAKEN BETWEEN NEGATIVE SIDE OF 400 OHM RESISTOR (ILLUS. NO. 43) AND GROUND.

DELCO R666, R667

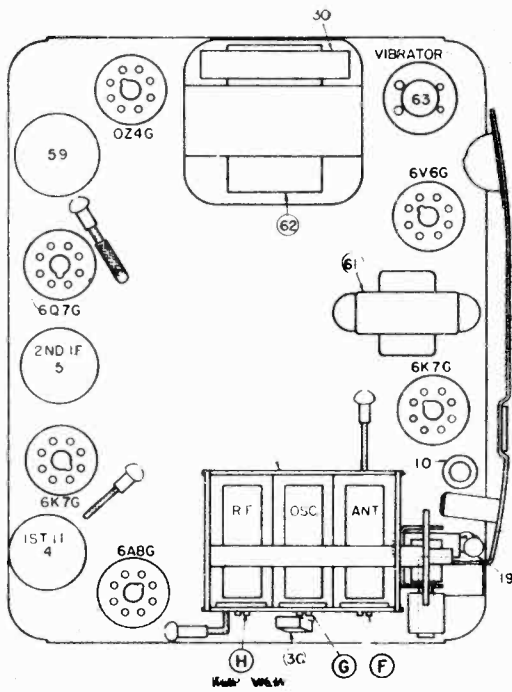
VOLTAGE READINGS BETWEEN SOCKET TERMINALS AND GROUND WITH D.C. VOLTMETER HAVING RESISTANCE OF 1000Ω PER VOLT. ALL READINGS TAKEN WITH 5.6 FILAMENT VOLTAGE AT TUBES.

CURRENT DRAIN WITHOUT SPEAKER 4.9 AMPERES.
 B SUPPLY DRAIN APPROX. 42 M.A.

* THIS READING IS TAKEN BETWEEN NEGATIVE SIDE OF 300 OHM RESISTOR (ILLUS. NO. 53) AND GROUND.

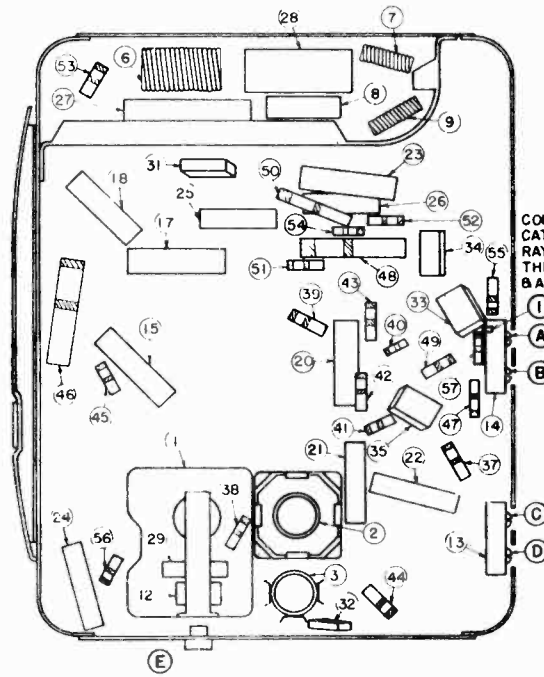
UNITED MOTORS SERVICE, INC.

MODEL R664 Delco
 MODEL R665 Delco
 Socket, Trimmers
 Chassis



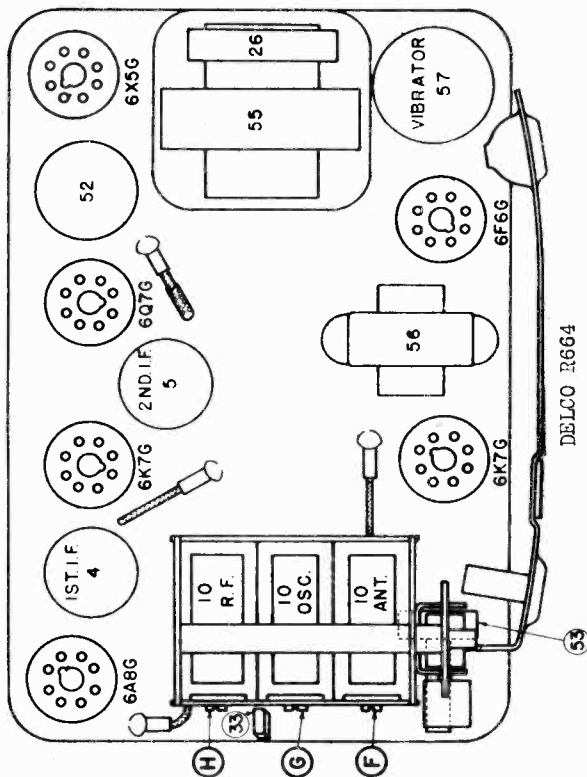
DELCO R665

FIG. 3--PARTS LAYOUT--Top View



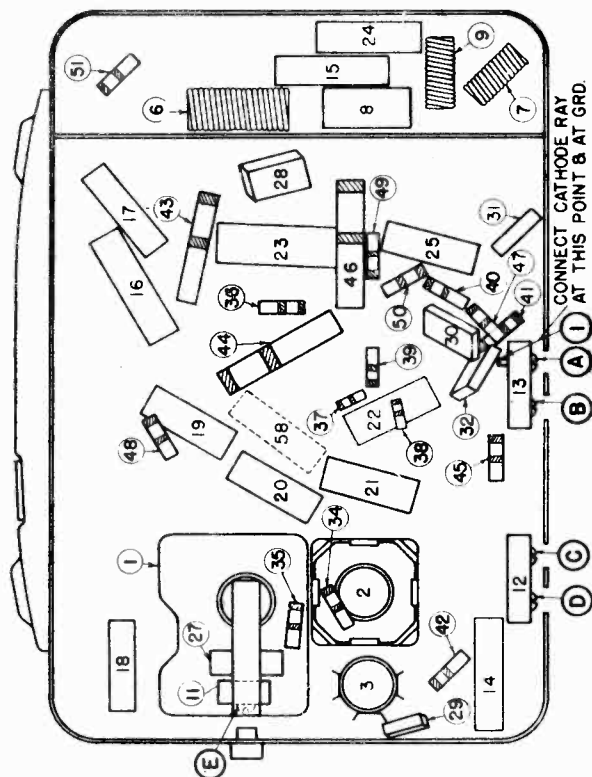
DELCO R665

FIG. 4--PARTS LAYOUT--Bottom View



DELCO R664

FIG. 3--PARTS LAYOUT--Top View



DELCO R664

FIG. 4--PARTS LAYOUT--Bottom View

MODEL R665 Delco
Schematic

UNITED MOTORS SERVICE, INC.

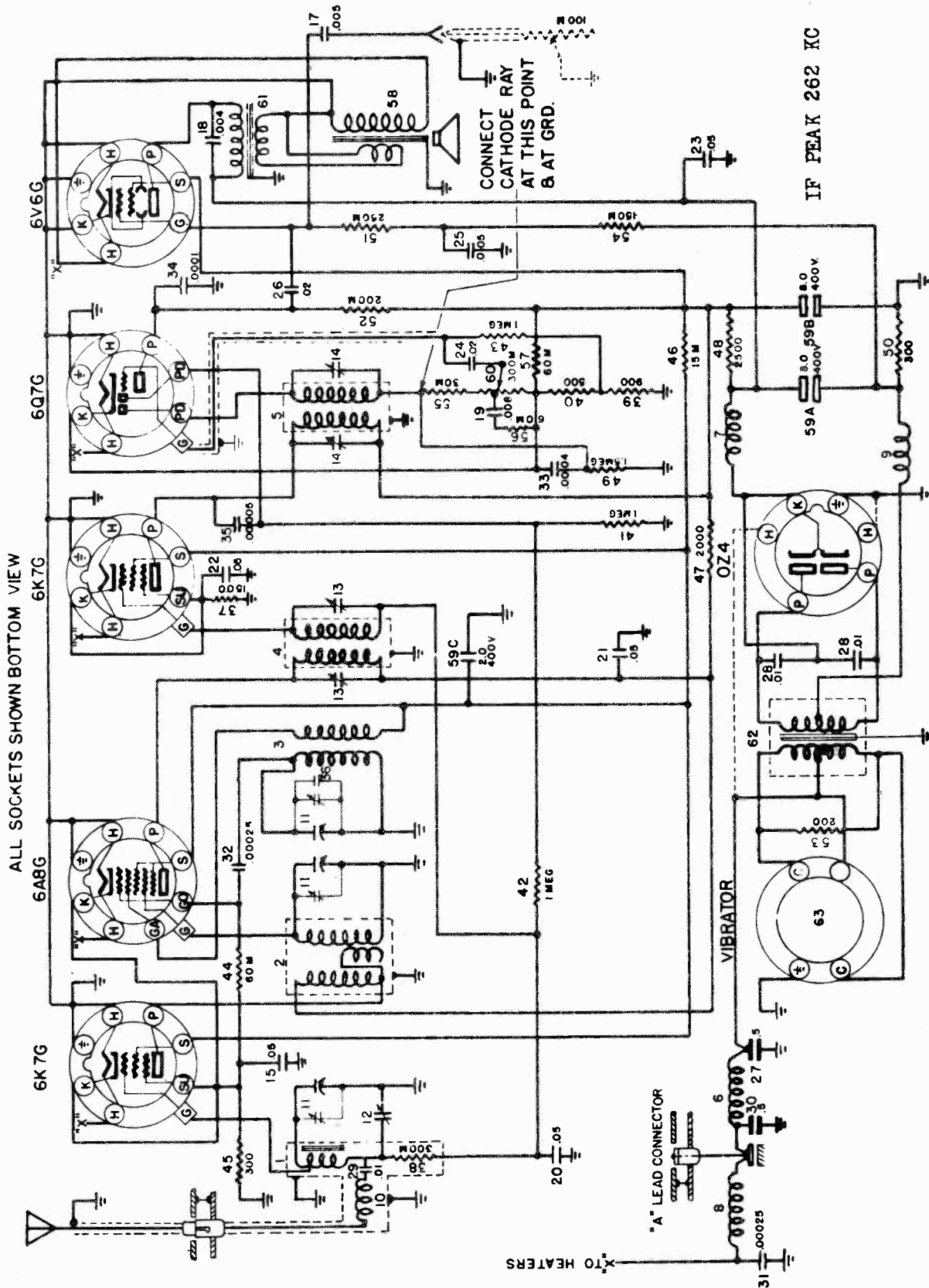


FIG. 2--DELCO MODEL R-665 CIRCUIT DIAGRAM

1-10-38

MODELS R667, R669 Delco
Delco-Matic Tuner
Schematic, Parts

UNITED MOTORS SERVICE, INC.

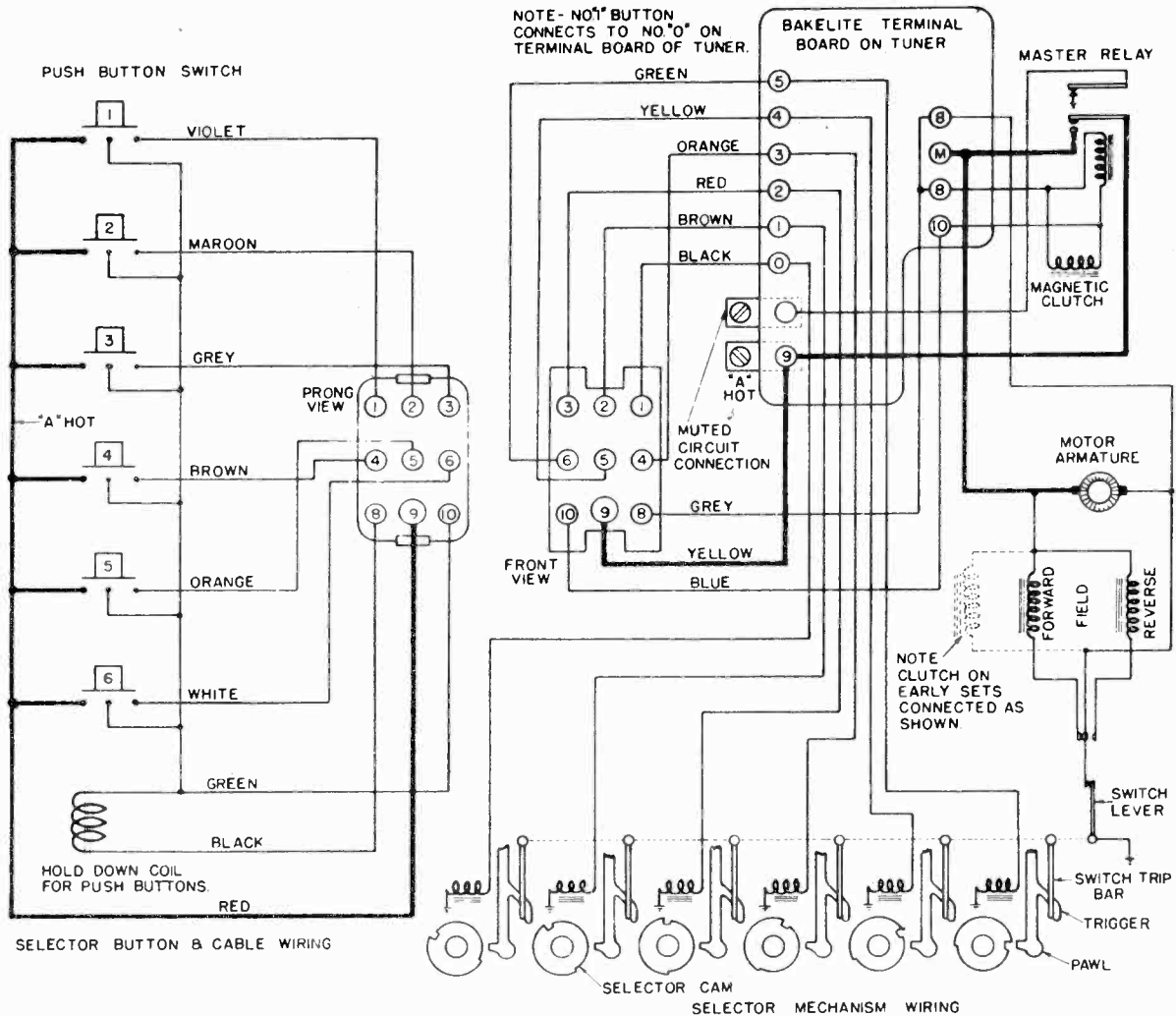


FIG. 1--CIRCUIT DIAGRAM--DELCO-MATIC TUNER

Part No.	Part Name	Description	Part No.	Part Name	Description
*1880010	Switch	Motor reversing	134530	Nut	Pivot screw locking
122159	Screw	Switch mounting	7234957	Gear	Large drive
1880007	Lever	Switch contact assy.	7234768	Washer	Mounting
147460	Screw	Switch lever set screw	7234769	Screw	Mounting
7234714	Bracket	Mounting	7232713	Spacer	Rubber mounting
132892	Screw	Mounting bracket	138530	Washer	#8 int. shakeproof
1880065	Spring	Trip bar	7234745	Shaft	Condenser drive--flex.
7235711	Spring	Pawl	1880122	Control	Push button--complete
1880049	Screw	Long pivot			
1880066	Screw	Short pivot			

* For replacement only on late sets having metal stops between switch contact blades.

UNITED MOTORS SERVICE, INC. Delco-Matic Tuner
 MODELS R667, R669 Delco
 Parts Layouts

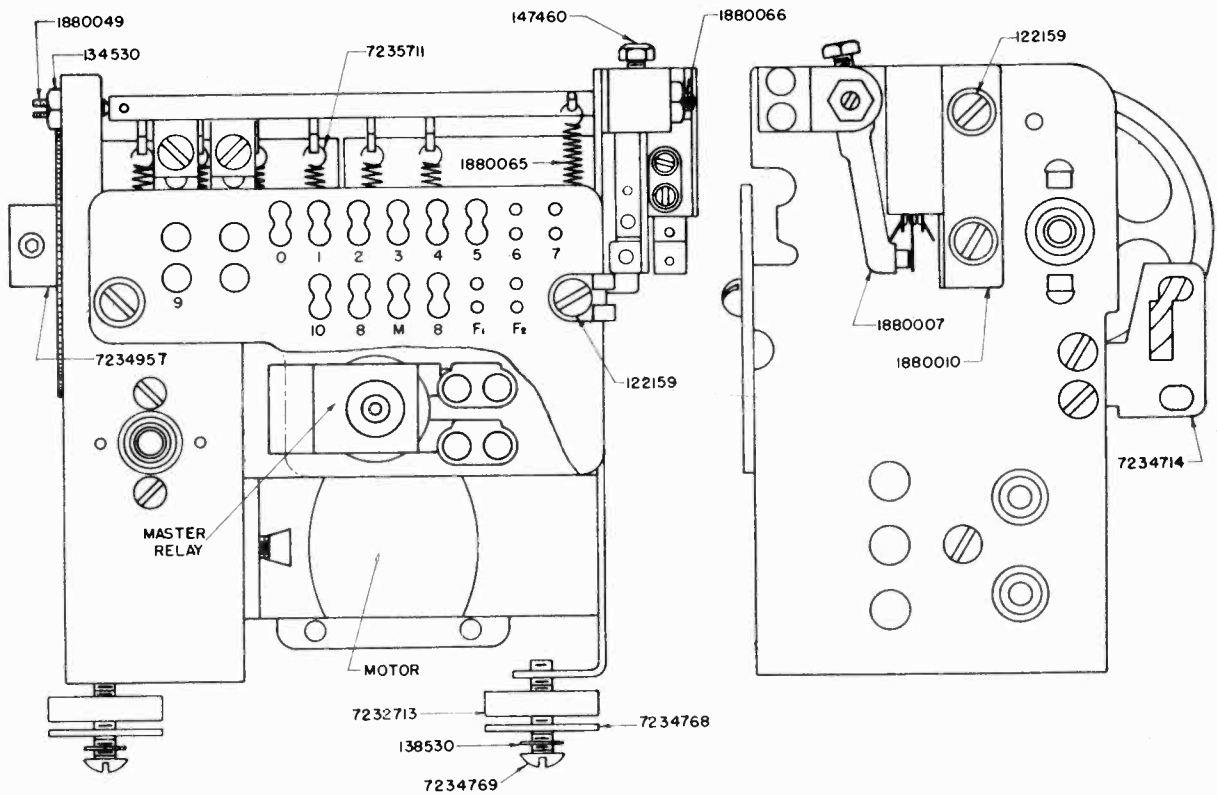


FIG. 2--PARTS LAYOUT--DELCO-MATIC TUNER

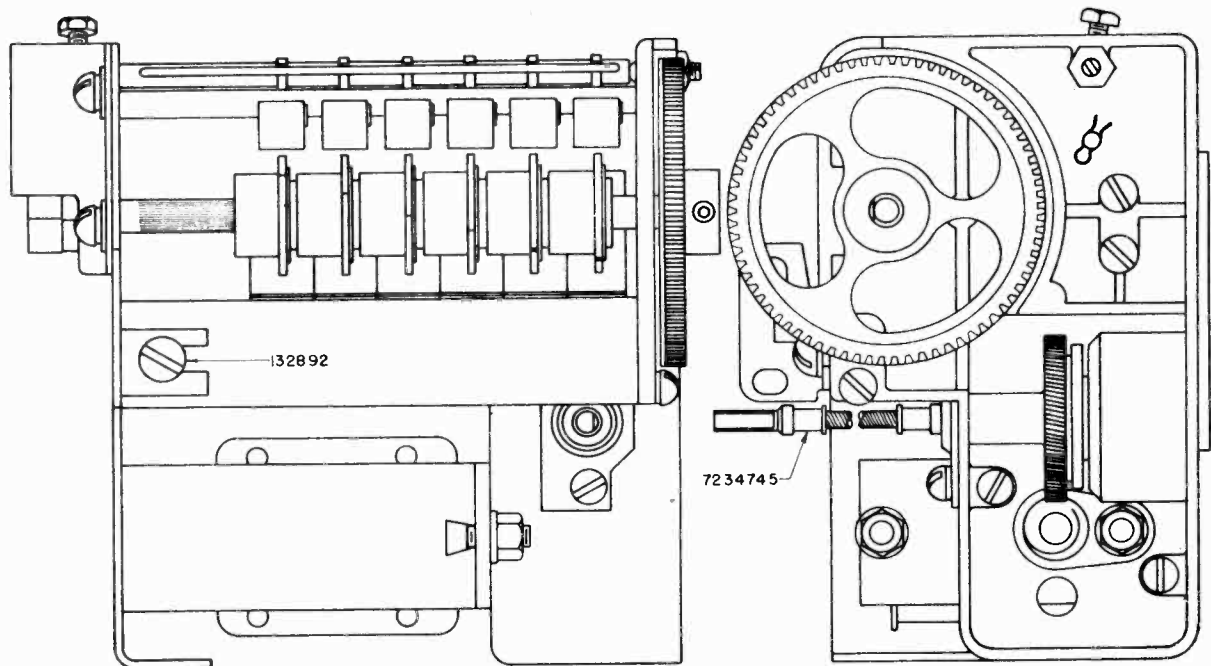


FIG. 3--PARTS LAYOUT--DELCO-MATIC TUNER

MODELS R667, R669

Delco-Matic Tuner

UNITED MOTORS SERVICE INC.

Operating and Service

Notes, Part 1

GENERAL: The Delco Model R-667 is a six tube, two unit auto radio with "Delco-Matic" Flash tuning. The service parts and alignment procedure are identical to the Delco Model R-666,

The Delco Model R-669 is a seven tube, two unit auto radio with "Delco-Matic" Flash tuning. The service parts and alignment procedure are identical to the Delco Model R-668,

SETTING UP "DELCO-MATIC" TUNER

- (a) Press a button and allow the selector mechanism to come to rest.
- (b) Continue to hold the button down, and tune in the desired station by manual control.
- (c) Release button, and set up remaining buttons in the same manner.

When the button is held down after the mechanism has come to rest, the pawl is held in the cam slot, locking the cam in position. The cam is allowed to slip on its shaft during the manual tuning process, by a clutch spring which is a part of the cam shaft assembly.

OPERATION OF "DELCO-MATIC" TUNER

The "Delco-Matic" Tuner is a motor driven mechanical device for tuning in stations quickly and silently by remote push button control. When a button is depressed, a relay coil pulls a corresponding pawl against a selector cam (Fig. 1). At the same time, a hold down coil in the control head holds the button down until the cycle of operation is complete. A trigger on the pawl presses against a switch operating trip rod, which in turn operates the power switch. The degree of movement of the trip rod, which is controlled by a high and low side on the selector cam, determines the direction of motor rotation. When the cam is rotated to a position where the pawl drops into the selector cam slot, the degree of movement of the trip rod opens the ground contact on the power switch which cuts the current to the motor and magnetic clutch and releases all relays.

1. PUSH BUTTON HEAD

The push buttons in the control head complete the circuit for the operation of the hold-down magnet, master relay and the corresponding station selector magnet. The buttons are held down magnetically until released by the "cut-off" switch on the tuner unit, actuated by the station selector pawl dropping into the slot in the selector cam.

2. STATION SELECTOR PAWLS

The station selector pawls are magnetically operated and controlled directly from the contacts in the push-button head. Upon pressing a button in the control head, a circuit is closed, energizing a station selector magnet coil which pulls a corresponding pawl down on a station selector cam. The pawl rides on the cam until it drops into the cam slot and cuts the motor off and releases all relays.

3. STATION SELECTOR CAMS

The station selector cams are circular discs with high and low sides for operation of the motor reversing switch and a stop slot for operation of the motor cut-off switch. Six of these cams are provided on a shaft, each with a friction clutch which allows the cam to be slipped on the shaft in setting the cam on the desired station.

4. REVERSING AND CUT-OFF SWITCH

The reversing and cut-off switch is a combination switch actuated by the trigger on the station selector pawl. The reversing switch causes the motor to run in the right direction for direct to the station tuning and the cut-off switch cuts the motor off when a station is tuned in, and also releases the push-button hold-down magnet and the magnetic clutch.

The forward and reverse positions of the reversing switch are dependent upon whether the station pawl is pulled against the high or low side of the station selector cam. The cut-off switch is actuated when the pawl drops into the cam slot as a station is tuned in.

5. MAGNETIC CLUTCH

The magnetic clutch consists of an electro magnet and two iron discs which are held together magnetically when the field is energized. One of the discs is coupled to the motor and the other to the condenser gang.

The clutch is designed to cut the motor driving power from the tuning condenser gang at the same instant the pawl drops into the cam slot and actuates the motor cut off switch.

6. MASTER RELAY

The master relay is controlled directly from the push-button head and the purpose is to allow the motor current to be fed directly to the motor rather than through the push-button circuits. A set of "mute" contacts are provided along with the "A" power contacts for muting the audio system of the set while the motor is driving the tuning mechanism.

SERVICE PROCEDURE

The logical procedure to employ in servicing the automatic tuner will depend to a large extent upon the nature of the trouble encountered and

whether the tuner is partially or totally inoperative. However, in most cases the solution to the trouble will be found by checking the below points in the order named:

1. TUNING CONTROL and CABLE
2. BATTERY VOLTAGE AT TUNER
3. STATION SELECTOR PAWLS
4. PUSH BUTTON HEAD
5. REVERSING AND CUT-OFF SWITCH

The tuning control and tuning cable should be checked along with the battery voltage at the "A" terminal on tuner before removing chassis or push button head from car for servicing on the bench. Make all checks on bench with a tuning control connected to the tuner for proper loading. Detailed procedure for checking the above points is as follows:-

Checking Tuning Control and Cables

In order for the automatic tuner to operate properly it is necessary that the tuning control be free from kinks and binds, so as not to impose an excessive load on the tuner motor. Turn tuning control knob manually and note if drag is excessive or if any kinks or binds are apparent. If trouble is evident, disconnect flexible tuning cable from chassis case bushing and turn tuning knob to determine whether trouble is in set or tuning control. If trouble is in set, a careful check of the large die-cast gears should be made for proper meshing.

Checking Battery Voltage at "A" Terminal on Tuner

The magnets, relays and the motor in the automatic tuner have been designed to operate satisfactorily on voltages as low as 4.5 volts measured at the "A" terminal on the tuner unit with the motor running. Low battery voltages will cause erratic operation of the tuner.

BEFORE ATTEMPTING ANY TUNER REPAIRS, FIRST MEASURE THE "A" VOLTAGE AT THE LARGE "A" TERMINAL ON THE TUNER UNIT WITH THE TUNER MOTOR OPERATING. In order to allow the motor to run long enough to get an accurate reading before it cuts off, set two cams which appear to be working normally at opposite ends of the dial and press corresponding buttons, reading meter carefully while motor is running. If voltage is lower than 4.5 volts, check all connectors and terminals for poor contact. Measure voltage at car ammeter with set load only. This should be 5.5 volts or more.

NOTE: In testing these automatic tuners on UMS Radio Test Panels, it is very important that proper voltage be available for test, otherwise incorrect diagnosis of the trouble will be made. A heavy duty battery and a Power Unit should be used. Also, all connections should be clean and heavy "A" supply leads used for connecting sets to "A" supply terminals. On the #652 Test Panel it is recommended that all automatic tuner tests be made using the power supply terminals on the left side of the panel. This will give a slightly higher "A" voltage to test.

Checking Station Selector Pawls

In most instances a visual inspection will determine if the station selector pawls are operating satisfactorily. A check can be made by simply pressing the push buttons and noting if the corresponding pawls pull down against the selector cam. Failure of the pawl to operate may be caused by excessive spring tension on the pawl spring, open selector magnet circuit or low voltage.

To reduce spring tension on pawl spring, unhook top end of spring with a pair of long nose pliers and stretch spring slightly. Be careful not to stretch spring too far or pawl will have a tendency to stick in the cam slot when a station is tuned in.

Voltage measured at selector magnet coil terminals on bakelite terminal board should not be less than 4.5 volts.

Checking Push Button Head

The push button head is working normally when the following actions take place.

1. Buttons should stay down magnetically when pressed, until station is tuned in or pawl drops in cam slot.
2. Corresponding station pawl in tuner should pull down against cam.
3. Both the button pressed and its corresponding station pawl in the tuner should release when a station is tuned in or when the pawl drops into cam slot.

It should be noted that buttons will not release unless tuner motor is operating and station pawl trips the cut-off switch.

If push button head does not function as covered above and a duplicate head (Part #1880122) is not available for substitution, make complete check of head as follows with push button cable plug disconnected from receiver-chassis.

UNITED MOTORS SERVICE, INC. Delco-Matic Tuner Service Notes, Part 2

TESTING PUSH BUTTON HEAD

A. MECHANICAL TEST OF PUSH BUTTON HEAD:

- (a) Disconnect push button control plug from receiver chassis.
- (b) Press buttons down and release slowly. Note if any button or buttons have a tendency to stick or do not extend out the full distance when released. Failure of a button to release to the full extent will cause the station selector pawl to stick in the cam slot when a station is tuned in (See Paragraph "C").
- (c) If sticking buttons are encountered, remove the mechanism from the die-cast head, removing the back cover plate and taking out the four round head screws. A small burr on either the small bakelite insulators or the push-button shaft, or in the push button holes in the die-casting or wires touching the button shafts will cause the buttons to stick. Removal of the burrs with fine sandpaper will eliminate this sticking.

NOTE: Do not hold the control head in an inverted position when removing mechanism from case.

B. CHECKING MAGNET FOR HOLD-DOWN

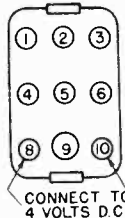


FIG. 5--CONTROL CABLE PLUG Facing Plug

- (a) Remove control cable plug from receiver chassis.
- (b) Connect 4 volts D.C. across prongs #8 and #10 as shown.
- (c) Press buttons one at a time, interrupting battery circuit to release button after each test.
- (d) If none of the buttons will stay down when pressed, make continuity check across prongs #8 and #10 for open circuit in hold down magnet or cable wiring.

(e) If one or two buttons will not stay down when pressed, first check to see if any wires are caught behind button shafts. If not, then remove mechanism from die-cast head and check for excessive spring tension in switch contact springs or the button shaft kick-out spring.

C. CHECKING PUSH BUTTON SWITCH CONTACTS:

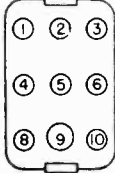


FIG. 6--CONTROL CABLE PLUG Facing Plug

- (a) The switches in the control head start to make contact during the first 1/8" of downward travel. It is, therefore, important that the buttons extend out the full distance when released by the hold down magnet, as covered in the "Mechanical Test of Push-Button Head".

- (b) The switch contacts may be checked by applying 4 volts D.C. across the prongs 8 and 9, pressing each button under test, and interrupting the circuit after each test. Check remaining contacts similarly as follows:

Press Button No.	Apply 4 volts D.C. across--
1	Prong #8 and 1
2	" 8 " 2
3	" 8 " 3
4	" 8 " 4
5	" 8 " 5
6	" 8 " 6

It will be noted that if the switch contacts are making proper contact and all preceding checks made, the hold down magnet in the head will be energized as each button is pressed.

Checking the Reversing and Cut-Off Switch

Proper operation of the switch mechanism on the tuner is of vital importance. Erratic action of the tuner due to low battery voltage very often results in the trouble being erroneously diagnosed as switch trouble. It is therefore important that all other points be checked first for possible causes of the trouble before attempting any adjustments to the switching mechanism.

There are four positions of the switch mechanism, "normal", "pawl on high side of cam", "pawl on low side of cam" and "pawl in slot". Figures 7 to 10 illustrate the exact position of the switch contacts in each of the four switch positions. These contacts can be checked visually by observing their

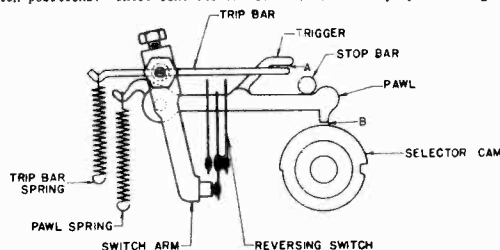


FIG. 7--NORMAL POSITION

action under actual operating conditions or by disconnecting the "A" power and duplicating the position by pressing the pawls down against the cams manually. Before making any adjustments it should first be definitely known that an adjustment is necessary.

In the normal position it will be noted that one set of reversing contacts are closed and that the ground contact on the switch arm is making contact. Also, there should be a slight gap ("A" on Fig. 7) between the trigger and the trip bar to prevent any movement of the switch arm when the pawl is pressed against the high side of the cam.

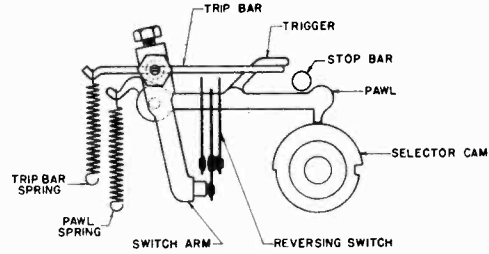


FIG. 8--PAWL ON HIGH SIDE OF CAM

In this position the contacts should be in exactly the same position as in the "normal position". The trigger rests against the trip bar but there should not be sufficient movement of the trip bar to open the normally closed reversing contacts at any point on the high side of the cam.

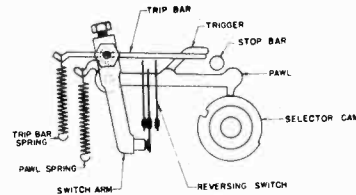


FIG. 9--PAWL ON LOW SIDE OF CAM

In this position the pawl is riding on the low side of the cam and a complete change has taken place in the reversing switch. The set of contacts which were normally closed when the pawl was riding on the high side of the cam have opened and the other set of contacts are now closed. The ground contact on the switch arm remains closed.

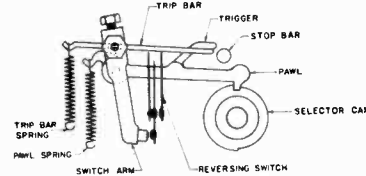


FIG. 10--PAWL IN SLOT

It will be noted in this position that the set of contacts which are closed when the pawl is riding on the low side of the cam remain closed and the ground contact on the switch arm which has remained closed through each of the three previous positions is now open.

SWITCH ADJUSTMENTS

In the case where not more than two or three cams are not working satisfactorily, individual adjustments can be made to the station selector pawls by bending the small trigger arms up or down with a pair of pliers, to obtain proper action of the reversing and cut-off switches.

In making these adjustments it is very important that the triggers be adjusted so that they do not open the reversing contacts normally closed when the pawl is riding on the high side of the cam. Also, there should be a slight gap in the ground contact on the cut-off switch arm when the pawl drops to the bottom of the cam slot. This ground gap should be kept as small as possible, retaining sufficient clearance so that the contacts will remain open when the condenser gang is turned from one end of its travel to the other, with the station pawl holding the cam stationary.

In cases where the switching mechanism does not operate satisfactorily on any cam, a careful check should be made of the switch trip bar to see that it does not move the switch lever when the pawls are pressed against the high side of the cams.

DO NOT CHANGE POSITION OF EITHER THE REVERSING SWITCH OR SWITCH ARM AS SPECIAL EQUIPMENT IS REQUIRED TO OBTAIN ACCURATE ALIGNMENT OF THESE PARTS.

The normal position of the phosphor bronze switch springs with the switch arm pulled back should be as shown in Fig. 10 illustrating the switch position with the pawl in the cam slot.

If a complete test of the tuning mechanism indicates that it cannot be repaired or adjusted as outlined, a replacement of the complete chassis should be made in accordance with Mr. C. D. Wymer's letter of April 11, 1938, Subject--"Service Policy--Delco Auto Radio Models R-667 and R-669 Automatic Tuners".

MODELS R668, R669 Delco
Schematic, Socket
Trimmers, Chassis

UNITED MOTORS SERVICE, INC.

ALL SOCKETS SHOWN BOTTOM VIEW

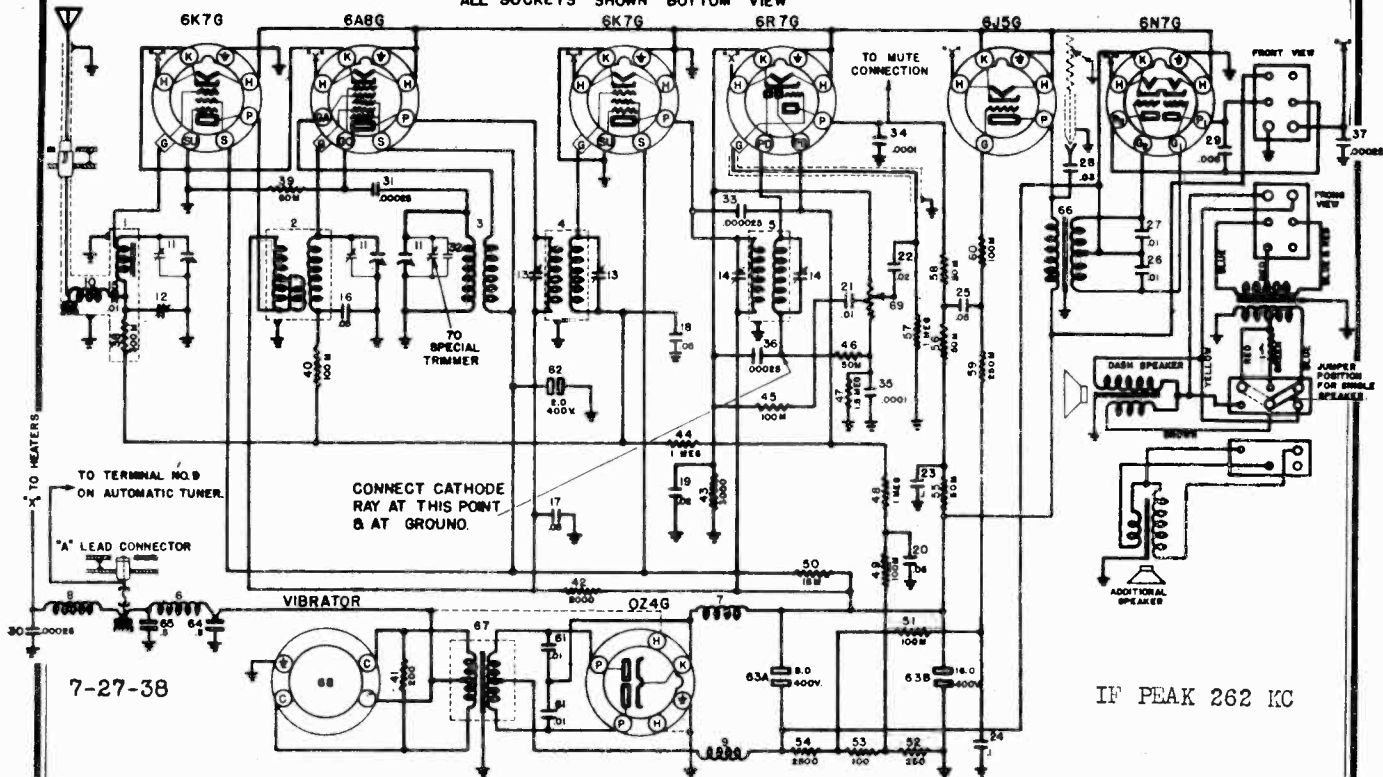


FIG. 2--DELCO MODEL R-668-9 CIRCUIT DIAGRAM

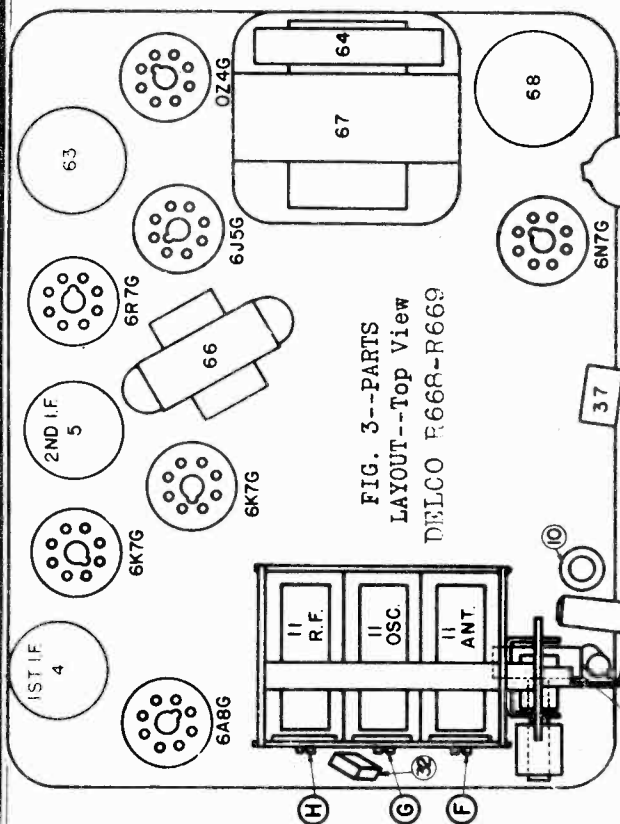


FIG. 3--PARTS LAYOUT--Top View
DELCO R668-R669

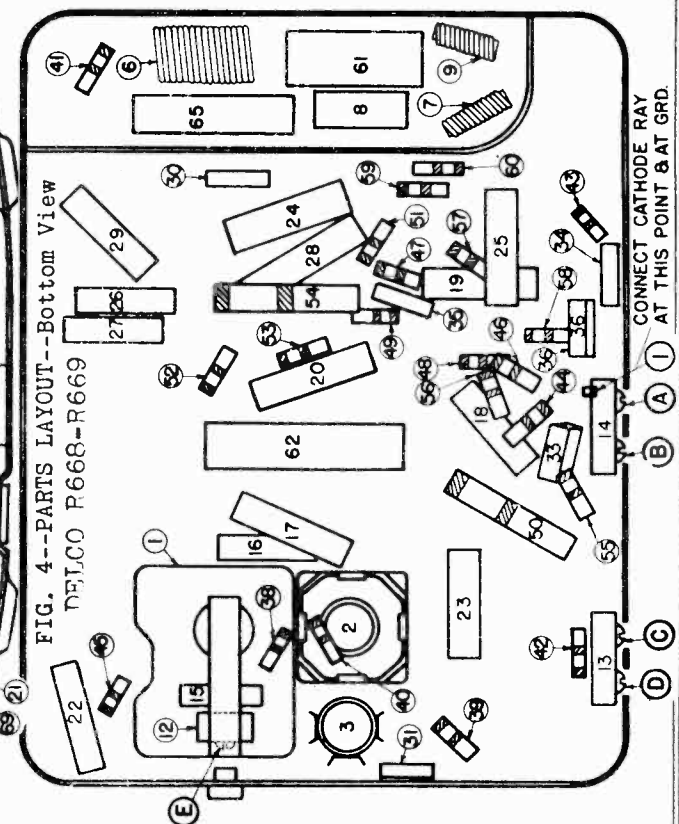
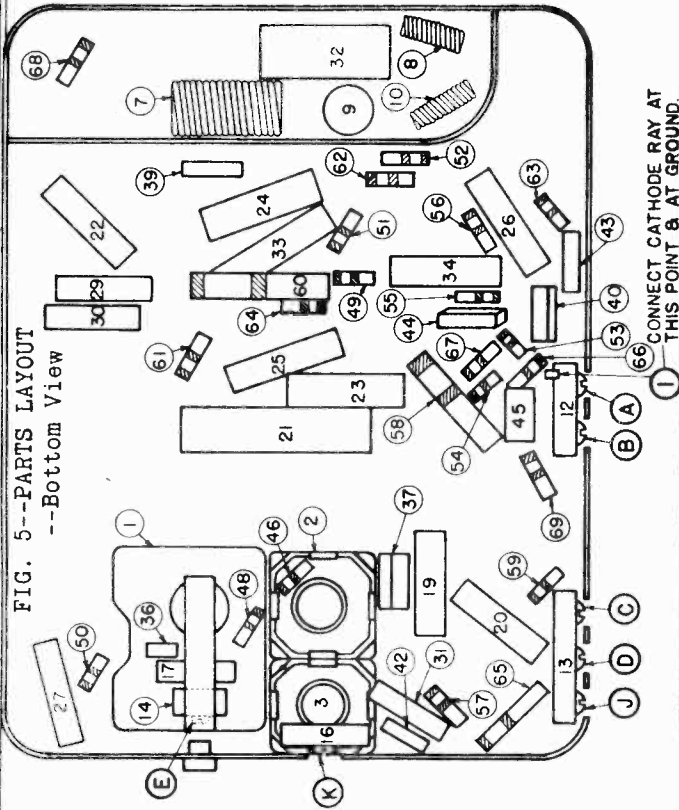


FIG. 4--PARTS LAYOUT--Bottom View
DELCO R668-R669

MODEL R673 Delco
Voltage, Socket
Trimmers, Chassis

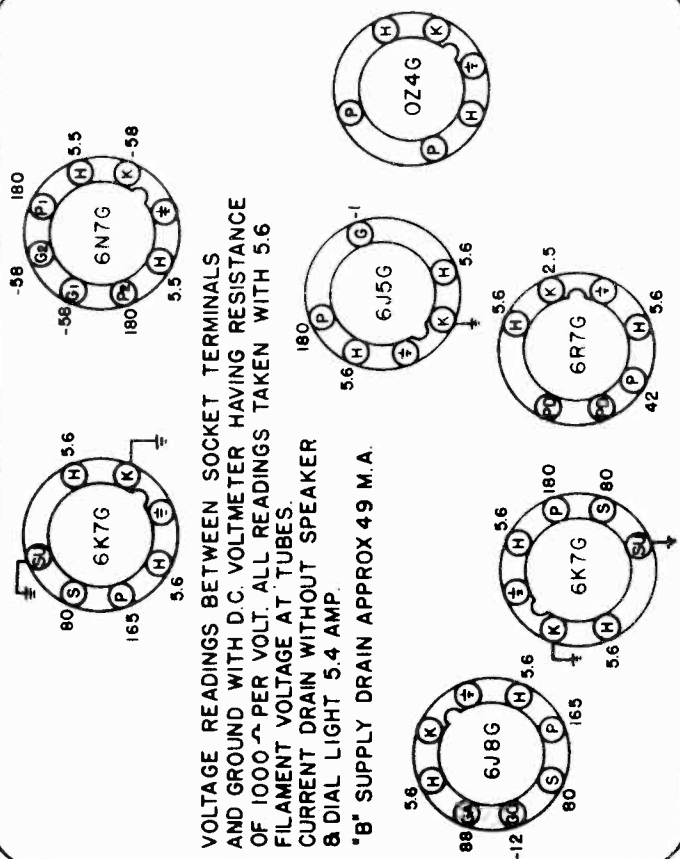
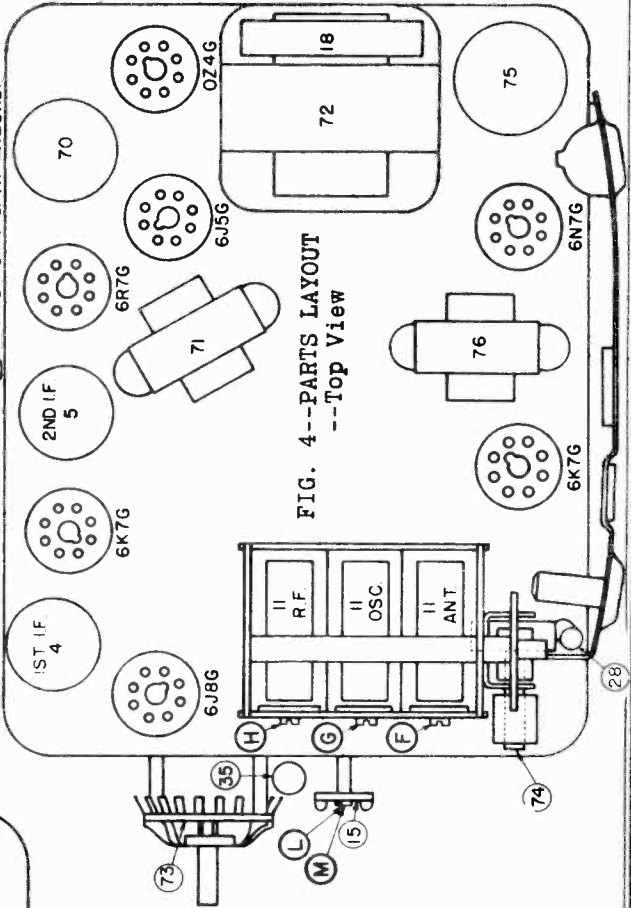
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FIG. 5--PARTS LAYOUT
--Bottom View



CONNECT CATHODE RAY AT THIS POINT & AT GROUND.

FIG. 4--PARTS LAYOUT
--Top View



VOLTAGE READINGS BETWEEN SOCKET TERMINALS AND GROUND WITH D.C. VOLTMETER HAVING RESISTANCE OF 1000 Ω PER VOLT. ALL READINGS TAKEN WITH 5.6 FILAMENT VOLTAGE AT TUBES. CURRENT DRAIN WITHOUT SPEAKER & DIAL LIGHT 5.4 AMP. "B" SUPPLY DRAIN APPROX 49 M.A.

FIG. 1--TUBE SOCKET VOLTAGES

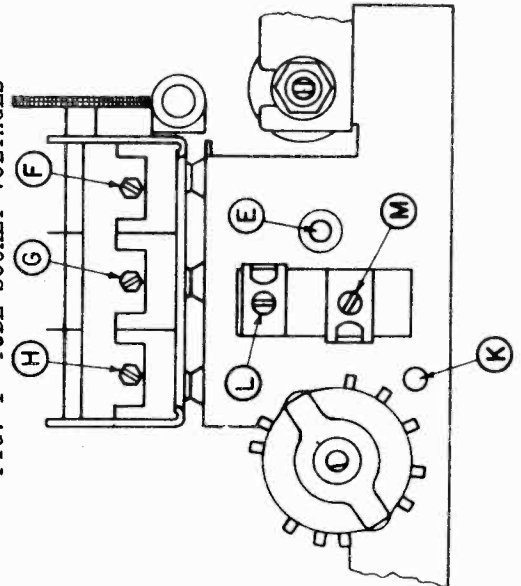


FIG. 2--TRIMMER LOCATIONS

UNITED MOTORS SERVICE, INC.

MODEL R673 Delco
Alignment

1. Aligning I-F Stages at 262.5 Kilocycles
 - (a) Connect the ground lead of the Signal Generator to the chassis case. Connect the signal lead of the Signal Generator to the grid cap of the 6J8C tube, through a .1 mfd. condenser, leaving the tube's grid clip in place.
 - (b) Connect output meter across plates of 6N7G tube.
 - (c) Set Signal Generator to exactly 262.5 kilocycles and turn volume control on full.
 - (d) Turn condenser gang to a position where no squeals or beat notes can be noticed, also so that when the tuning condenser is rotated within narrow limits there is no appreciable change in output.
 - (e) Adjust trimmers A, B, C & D through the cut-outs on the side of the chassis (illus. 12 & 13, Fig. 5) carefully for maximum output.
 - (f) Repeat adjustments of I-F trimmers A, B, C & D with as low an output from the Signal Generator as possible, for more accurate alignment.
 2. Aligning at 5000 Kilocycles
 - (a) Turn band switch to police band (clockwise).
 - (b) Leave Signal Generator leads connected the same as for I-F adjustments.
 - (c) Turn tuning condenser plates all the way out and against high frequency stop.
 - (d) Set Signal Generator to exactly 5000 kilocycles and adjust oscillator trimmer "G" (Fig. 4) carefully for maximum output, being careful to peak the signal received with trimmer screw out at minimum capacity.
 3. Aligning at 1530 Kilocycles
 - (a) Turn band switch to broadcast band (counter clockwise).
 - (b) Set Signal Generator to 1530 kilocycles and leave the tuning condenser against high frequency stop.
 - (c) Adjust oscillator trimmer "I" (Fig. 4) for maximum output.
 4. Aligning at 600 Kilocycles
 - (a) Connect Signal Generator leads to 6K7G, R-F grid, leaving the grid clip in place.
 - (b) Set Signal Generator to 600 kilocycles and tune the receiver to this signal.
 - (c) Adjust oscillator padder condenser "K" (Fig. 5) rocking gang condenser plates back and forth through the signal until maximum output is obtained.
 - (d) Remove signal generator lead from 6K7G tube clip and connect to the antenna terminal through a .0002 mfd. condenser.
 - (e) Adjust antenna series condenser "E" (Fig. 5) for maximum output.
5. Aligning at 1400 Kilocycles
 - (a) Set Signal Generator at 1400 kilocycles.
 - (b) Tune set to this signal and adjust R-F trimmer "H" (Fig. 4) and antenna trimmer "M" (Fig. 4) to maximum output.
 6. Aligning at 4000 Kilocycles
 - (a) Turn band switch to police band.
 - (b) Set Signal Generator to 4000 kilocycles and tune receiver to this signal.
 - (c) Adjust police band antenna trimmer "F" (Fig. 4) for maximum output.
 7. Aligning at 1800 Kilocycles
 - (a) Set Signal Generator at 1800 kilocycles and tune receiver to this signal.
 - (b) Adjust oscillator padder condenser "J" (Fig. 5) rocking gang condenser plates back and forth through the signal until maximum output is obtained.
 - (c) Close gang and check to see if tuning range extends to 1600 kilocycles.
 8. Realigning at 1400 Kilocycles
 - (a) Turn band switch to broadcast band.
 - (b) Set Signal Generator to 1400 kilocycles.
 - (c) Tune set to this signal and adjust R-F trimmer "H" and antenna trimmer "M" to maximum output (Fig. 4).
 9. Realigning at 600 Kilocycles
 - (a) Check alignment of antenna series condenser "E" (Fig. 5) for maximum output.
 10. Checking I-F Band Spread

The Model 165 Cathode Ray Oscillograph should be used to check the I-F band spread after completing the "Alignment Procedure". Slight adjustment of the I-F stages may be found necessary in order to obtain a symmetrical selectivity curve. Connect Cathode Ray from connection "I" (Fig. 3) to ground.

MODELS R1134, R1135
R1139 Delco
Schematic, Voltage

UNITED MOTORS SERVICE, INC.

Socket, Trimmers
Chassis

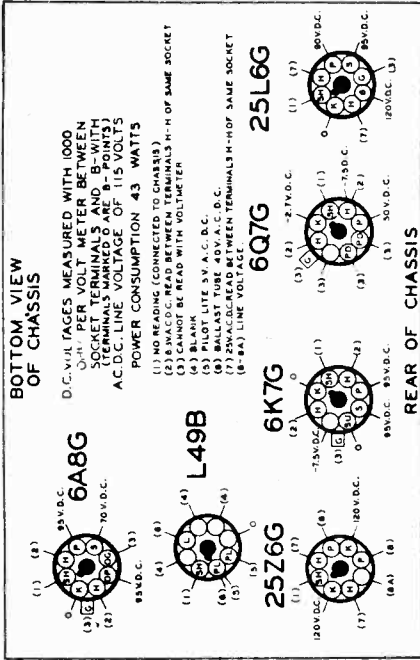


FIG. 1--TUBE SOCKET VOLTAGES

3-6-39

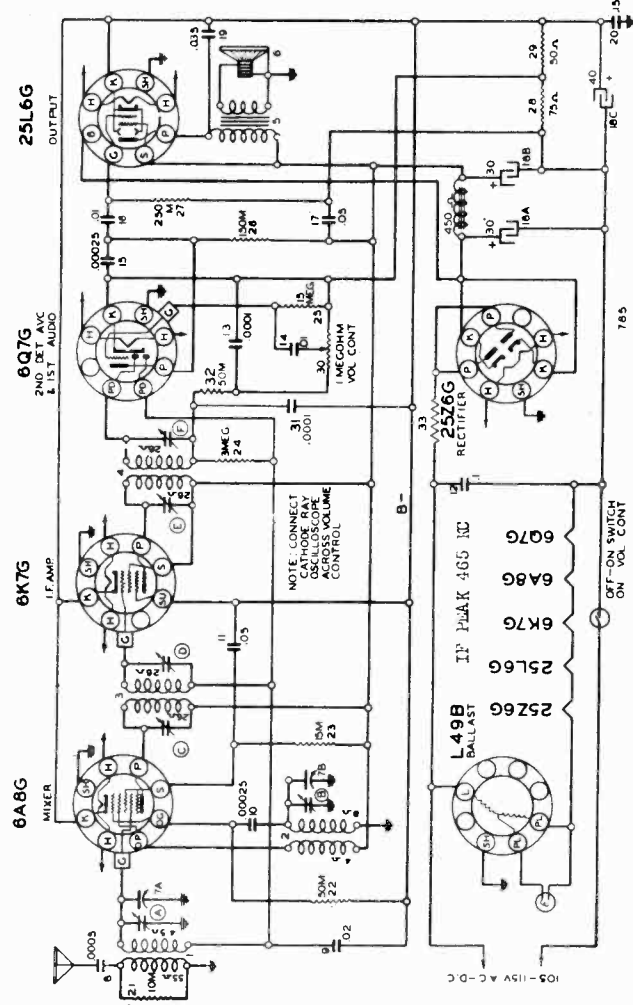


FIG. 2--DELCO MODELS R-1134-35-39 CIRCUIT DIAGRAM

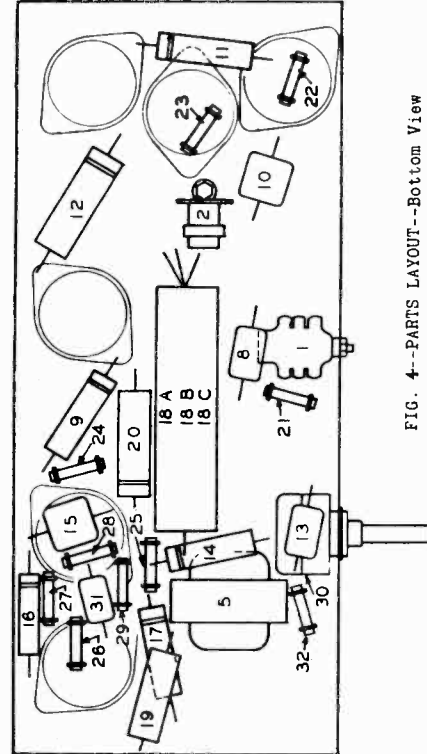
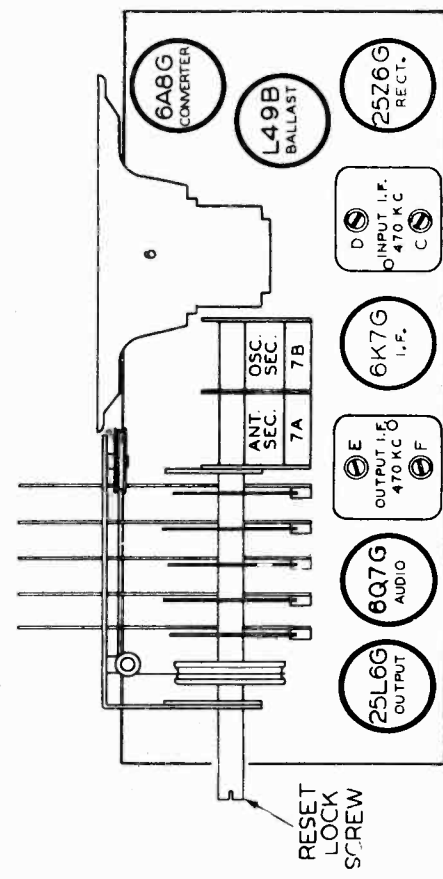


FIG. 4--PARTS LAYOUT--Bottom View

MODEL R3215 Delco
Alignment

UNITED MOTORS SERVICE, INC.

MODELS R1134, R1135
R1139 Delco
Alignment, Tuner

SETTING UP AUTOMATIC TUNING DELCO MODELS R-1134-35-39 HOME RADIO

1. Loosen RESET LOCK SCREW in center of tuning knob.
2. Press any one of the automatic tuner levers all the way down. Stations may be set up in any sequence desired.
3. Hold the lever down firmly and tune set to station desired. When desired station is clearly tuned in, release the lever and follow same procedure until all levers have been set up.
4. Rotate the tuning knob to the right (clockwise) as far as it will turn and firmly tighten RESET LOCK SCREW.

DELCO MODELS R-1134-35-39 CIRCUIT ALIGNMENT

1. Aligning I-F Stages at 465 Kilocycles
 - (a) Connect the ground lead of the signal generator in series with a .1 mfd. condenser to B- (pin #8 on 25L6G tube). Connect the signal lead of the signal generator to the grid cap of the 6A8G tube, leaving grid clip in place.
 - (b) Connect the output meter across the plate (pin 3) and screen (pin 4) of the 25L6G output tube.
 - (c) Set signal generator to exactly 465 kilocycles and turn volume control on full.
 - (d) Turn the rotor plates of the condenser gang all the way out of mesh and against the high frequency stop.
 - (e) Adjust the trimmers (E-F) on the second I-F coil and then the trimmers on the first I-F coil (O-D Fig. 3) carefully for maximum output.
 - (f) Repeat adjustments of the four I-F trimmers with as low an output from the signal generator as possible, for more accurate alignment.

2. Aligning at 1720 Kilocycles

- (a) Leave ground lead of signal generator connected to B- through a .1 mfd. condenser as before. Connect the signal lead of signal generator through a .0001 mfd. condenser to the antenna terminal.
- (b) Turn tuning condenser plates all the way out and against high frequency stop.
- (c) Set signal generator to exactly 1720 kilocycles and adjust oscillator trimmer (7B Fig. 3) carefully for maximum output, being careful to peak the signal with trimmer screw out or at minimum capacity.

3. Aligning at 1400 Kilocycles

- (a) Set signal generator to 1400 kilocycles and turn condenser gang plates until this signal is tuned in with maximum output.
- (b) Adjust the antenna trimmer (7A Fig. 3) for maximum output. Do not disturb the 1720 kilocycle adjustment of the oscillator trimmer.

DELCO MODEL R-3215 CIRCUIT ALIGNMENT

1. Aligning I-F Stages at 455 Kilocycles

- (a) Attach the ground lead of the signal generator to the chassis ground post. Connect the other lead to the grid cap of the 6K9 tube through a .02 mfd. series condenser. DO NOT REMOVE GRID CLIP.
- (b) Set the signal generator to EXACTLY 455 kilocycles and turn receiver volume control on full.
- (c) Peak each of the 2nd I-F coil trimmers, 2A & 2B, (illus. 2, Fig. 3).
- (d) Peak each of the 1st I-F coil trimmers, 1A & 1B, (illus. 1, Fig. 3).
- (e) To assure most accurate trimmer setting repeat above adjustments several times always using lowest possible signal generator output consistent with readable output meter scale deflection.

2. Aligning "American Broadcast" 1730-540 Kilocycle Band

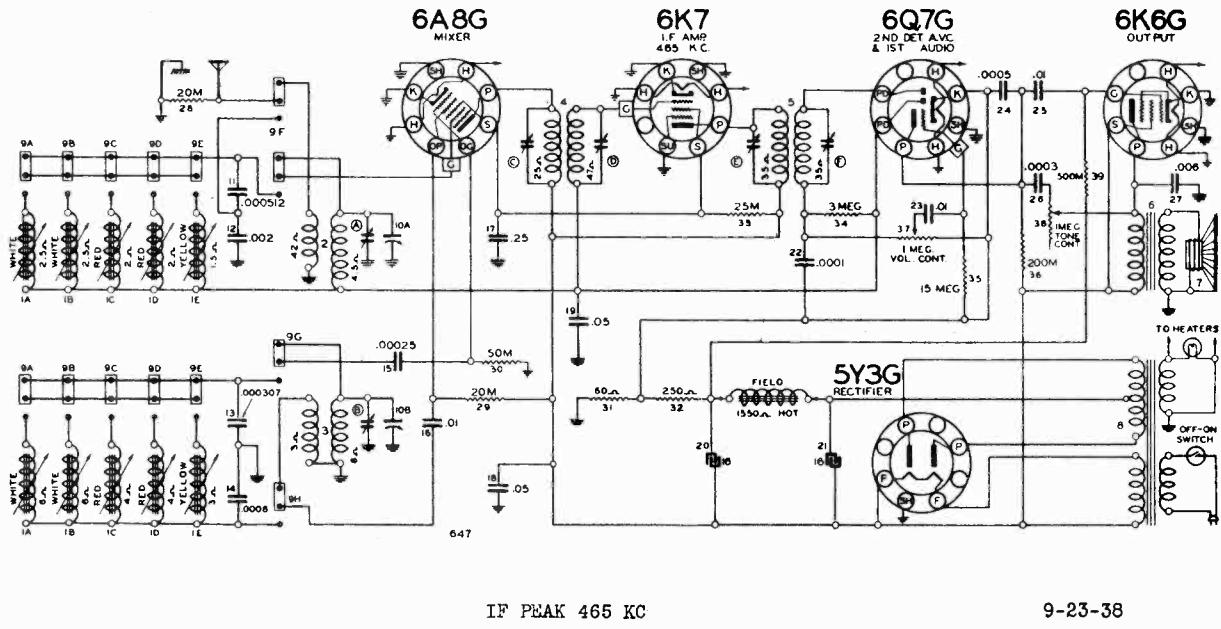
- (a) Connect signal generator antenna lead to receiver antenna terminal through a .00025 mfd. condenser, and the other signal generator lead to ground terminal.
- (b) Adjust band selector switch for operation on 1730-540 kilocycle band.
- (c) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the needle does not point exactly to the last line move needle to correct position.
- (d) Set signal generator frequency and receiver dial to EXACTLY 1730 kilocycles, and bring in 1730 kilocycle signal generator signal to maximum output by adjusting 1730 kilocycle oscillator trimmer, (illus. 7C Fig. 4).
- (e) Set signal generator frequency and receiver dial to approximately 600 kilocycles. Then while rocking gang condenser slightly to right and left, adjust 600 kilocycle oscillator padder (illus. 6, Fig. 3) for maximum output.
- (f) Padder (illus. 8, Fig. 3) for maximum signal response.

3. Aligning "Foreign Short Wave" 5.8-18.1 Megacycle Band

- (a) Place band selector switch for operation on 5.8-18.1 megacycle band, tune receiver dial and set signal generator frequency to EXACTLY 18.1 megacycles.
- (b) Adjust 18.1 megacycle oscillator trimmer (illus. 7B, Fig. 4) to bring in 18.1 megacycle test signal to maximum output. If more than one peak is noticed, back off trimmer to minimum capacity, then screw down the trimmer (add capacity) until the second peak is tuned in.
- (c) Tune receiver dial and set signal generator frequency to EXACTLY 15 megacycles.
- (d) While rocking gang condenser slightly to right and left, adjust 15 megacycle antenna trimmer (illus. 7A, Fig. 4) for maximum 15 megacycle test signal response.

MODEL R1140 Delco
Schematic, Socket
Trimmers, Chassis

UNITED MOTORS SERVICE, INC.



IF PEAK 465 KC

9-23-38

FIG. 2--DELCO MODEL R-1140 CIRCUIT DIAGRAM

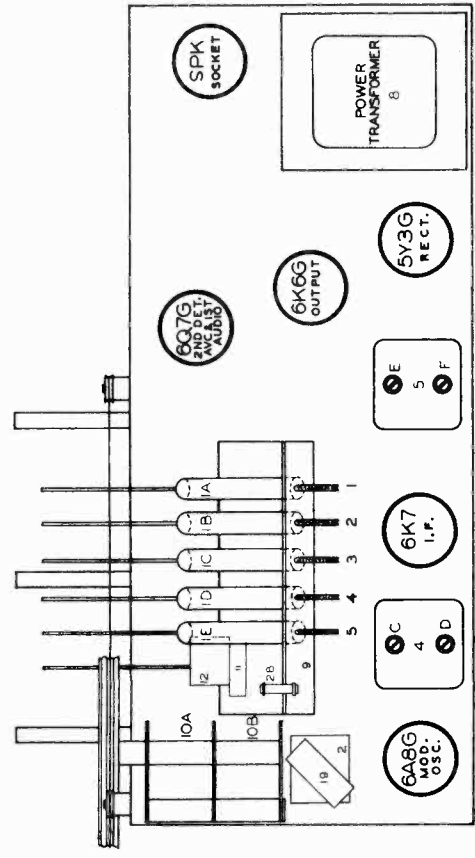


FIG. 3--PARTS LAYOUT--Top View

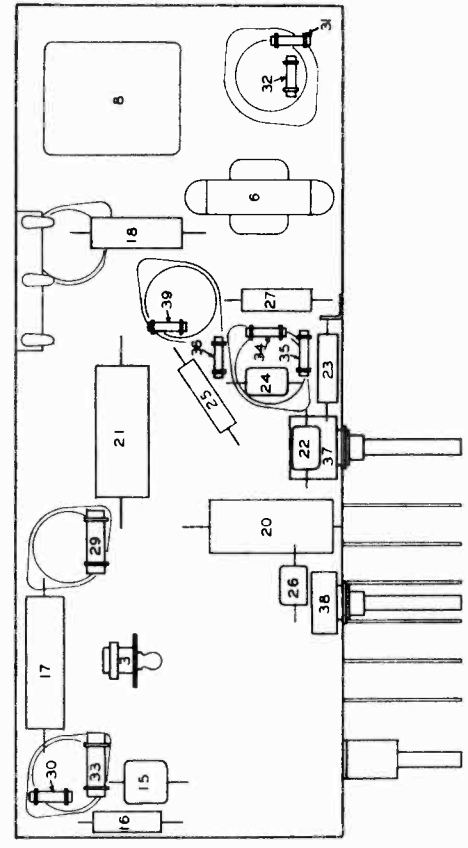


FIG. 4--PARTS LAYOUT--Bottom View

UNITED MOTORS SERVICE, INC.

MODEL R1140 Delco
Voltage, Alignment
Tuner Data

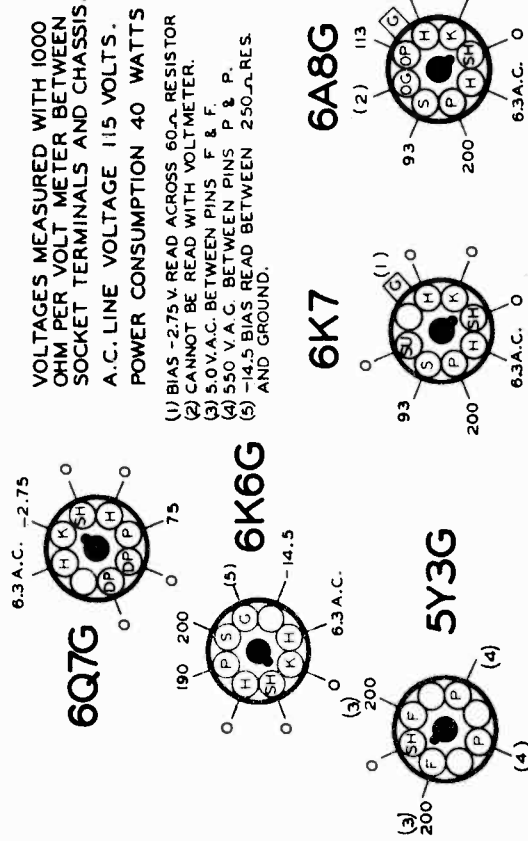
- (f) Adjust the trimmers on the second I-F coil (illus. 5, Fig. 3) and then the trimmers on the first I-F coil (illus. 4, Fig. 3) carefully for maximum output.
- (g) Repeat adjustments of the four I-F trimmers with as low an output from the signal generator as possible, for more accurate alignment.

2. Aligning at 1400 Kilocycles

- (a) Connect the signal lead of signal generator through a .0001 mfd. condenser to the antenna terminal. Connect ground lead of signal generator to chassis.
- (b) Set signal generator to 1400 kilocycles.
- (c) Turn tuning condenser plates until test scale dial is at the 1400 kilocycles position as noted from the reference mark you made on the front support bracket.
- (d) Adjust oscillator trimmer (illus. 10B, Fig. 3) carefully for maximum output, being careful to peak the signal received with trimmer screw out at minimum capacity.
- (e) Adjust the antenna trimmer (illus. 10A, Fig. 3) for maximum output with as low an output from the signal generator as possible, for more accurate alignment.
- (f) After completing the alignment procedure, the alignment should be checked with the cathode ray oscillograph. Connect the oscillograph across the volume control.

BOTTOM VIEW OF CHASSIS

FIG. 1--TUBE SOCKET VOLTAGES
Bottom View



REAR OF CHASSIS

GENERAL: The Delco Model R-1140 is a 5 tube, 110 volt A.C. superheterodyne automatic electric tuning receiver with a 6" dynamic speaker. Tuning is accomplished by means of the conventional manual control or by push button switches which control adjustable permeability tuned coils. Tuning range is from 550 to 1720 kilocycles. Five push buttons are used for automatic tuning, a sixth for switching from automatic to manual tuning.

The function of each button is, left to right:

1. Automatic tuning 550-800 K.C.
2. Automatic tuning 800-1100 K.C.
3. Automatic tuning 1100-1400 K.C.
4. Automatic tuning 1400-1720 K.C.
5. Automatic tuning 975-1560 K.C.
6. Switch-Manual to automatic tuning

SETTING UP AUTOMATIC ELECTRIC TUNING

Setting up the stations is accomplished by means of a single adjustment for each button, accessible from the rear of the chassis.

1. Turn on the set, and allow 15 minutes for the set to "warm up" before setting the station adjustment screws for the push buttons.
2. Press button #6 and tune in the desired station by means of the manual tuning control.
3. Press one of the buttons #1 to #5 which range corresponds to the station frequency and, with a small screw driver adjust screw on back of chassis corresponding to button pressed until the same station is accurately tuned in.
4. Press button #6, changing from "Push Button" to "Dial Tuning" to ascertain that the same program is heard for both.
5. Moisten and insert the call letters of the station on the front of the button.
6. Repeat the operation for the other buttons.

CIRCUIT ALIGNMENT

For alignment purposes, a test scale is stamped on the inside of the dial drum on the condenser shaft. Before starting alignment procedure, turn the rotor plates of the condenser gang all the way out of mesh and against the high frequency stop and make an indicating mark on the front support bracket in line with the high frequency mark on test scale for future reference.

1. Aligning I-F Stages at 465 Kilocycles
 - (a) Connect the ground lead of the signal generator to the chassis frame.
 - (b) Connect the signal lead of the signal generator to the grid cap of the 6A8G tube through a .1 mfd. condenser, leaving grid clip in place.
 - (c) Connect the output meter across the plate (pin 3) and screen (pin 4) of the 6K6G output tube.
 - (d) Press #6 button (Dial Tuning), turn the volume control on full and the tone control to extreme clockwise (treble) position.
 - (e) Set the signal generator to exactly 465 kilocycles and turn the rotor plates of the condenser gang all the way out of mesh and against the high frequency stop.

UNITED MOTORS SERVICE, INC.

MODEL R1141 Delco
Voltage, Socket
Trimmers, Chassis

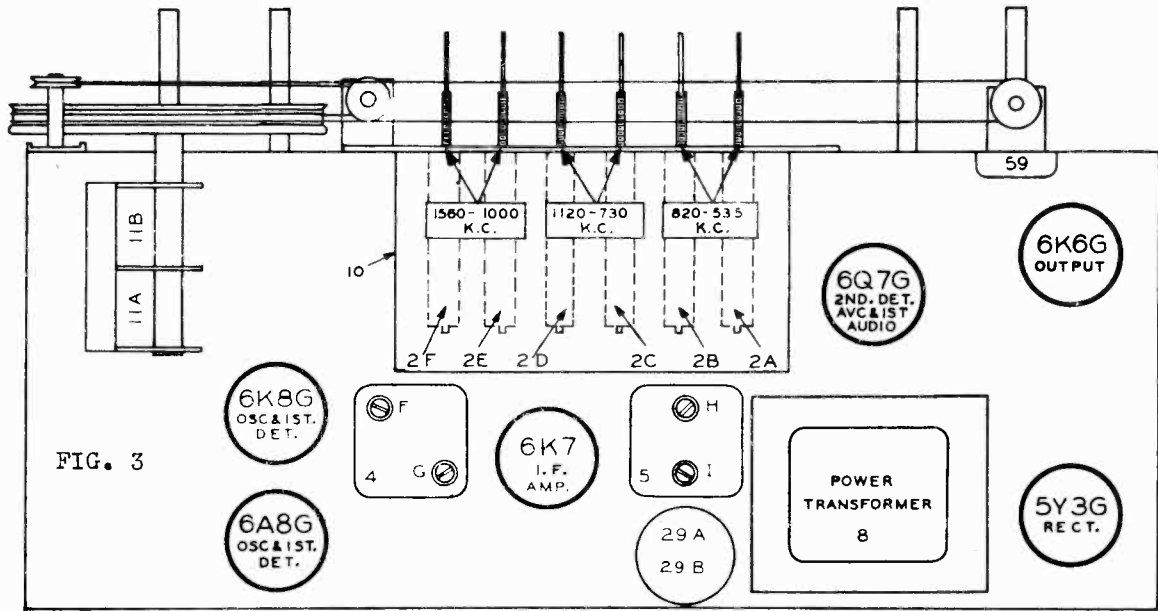


FIG. 3

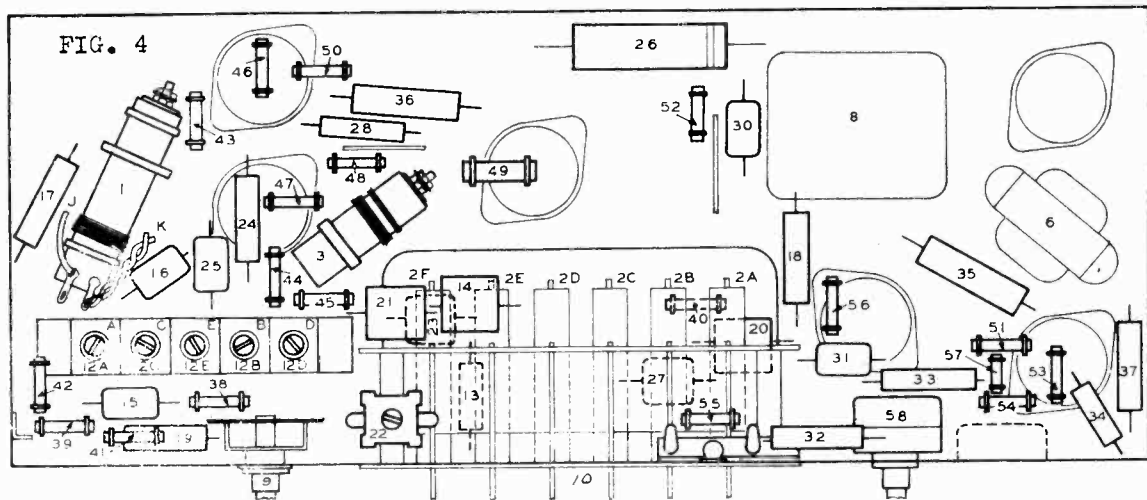
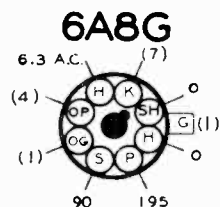
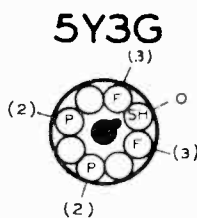
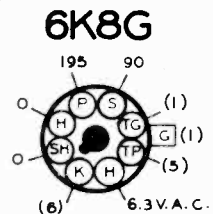
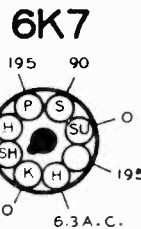
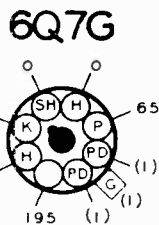
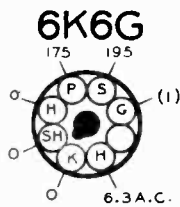


FIG. 4

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT METER BETWEEN SOCKET TERMINALS AND CHASSIS. A.C. LINE VOLTAGE 115 VOLTS. POWER CONSUMPTION 50 WATTS



- (1) CANNOT BE READ WITH VOLTMETER
- (2) 650 V. A.C. READ ACROSS TERMINALS P&P
- (3) 5 V. A.C. READ ACROSS TERMINALS F&F
- (4) 155 V. IN PUSH BUTTON OPERATION
- (5) 130 V. IN MANUAL OPERATION
- (6) O IN MANUAL OPERATION
- (7) O IN PUSH BUTTON OPERATION

REAR OF CHASSIS

MODELS R1141, R1142, R1143

Alignment, Tuner

UNITED MOTORS SERVICE, INC.

MODEL R1144 Delco

Tuner Data

MODELS R1141, R1142, R1143 and R1144

SETTING UP AUTOMATIC ELECTRIC TUNING

Setting up the push buttons for pre-selected stations is accomplished by means of a single adjustment for each button, accessible from the front of the cabinet. These screw driver adjustments are made through the small openings in the escutcheon, in which the call letter tabs are placed.

1. Turn the set "on" and set the band change switch to the broadcast manual (center) position and allow about 15 minutes to warm up.
2. Tune in the desired station by means of the manual tuning control.
3. Press one of the buttons which most conveniently covers the frequency of the stations, turn the band change switch to the automatic (left hand) position and, with a small screw driver, adjust the screw directly above the button, until the station is tuned in accurately.
4. Turn the band change switch back to the center position to check the accuracy of the adjustment.
5. Insert the call letters of the station in the opening and cover with the celluloid tab provided.
6. Repeat the operation for the other buttons.

ALIGNMENT FOR MODELS R1141, R1142, and R1143.

NOTE: FIGURE REFERENCES IN THE TEXT REFER TO FIGURES SHOWN WITH EACH MODEL.

1. Aligning I-F Stages at 465 Kilocycles

- (a) Connect the ground lead of the signal generator to the chassis frame.
- (b) Connect the signal lead of the signal generator to the grid cap of the 6AG6 tube through a 1.0 mfd. condenser, leaving the grid clip in place. *6AG6 (R1143)*
- (c) Connect the output meter across the plate and screen of the 6F6G tube.
- (d) Press a button, turn the band change switch to the automatic (left hand) position, volume control on full, and the tone control in the treble position. *R1143 Use #10 Button; Volume Fully Open*
- (e) Set the signal generator to exactly 465 kilocycles and adjust the trimmers on the second I-F coil (illus. 5, Fig. 3) and the first I-F coil (illus. 4, Fig. 3) for maximum output. Use as low a signal from the signal generator as will give a readable indication on the output meter. DO NOT REALIGN THE I-F COILS IN THE MANUAL (CENTER) POSITION (MODEL R1144 ONLY).
- (f) After completing the Alignment Procedure, the alignment should be checked with the Model 165 Cathode Ray Oscilloscope. Connect the oscilloscope across the volume control. *FOR R1143, Adjust #40 Control Knob.*

2. Aligning at 17 Megacycles

- (a) Remove the signal lead of the signal generator from the grid of the 6AG6 and connect to the antenna terminal of the receiver through a 400 ohm resistor. *R1143 (6AG6)*
- (b) Turn the band change switch to the short wave (right hand) position. *FOR R1143 - Press #8 Button (Manual Tuning)*
- (c) Set the signal generator to exactly 17 megacycles and rotate the variable section of the condenser gang to indicate 17 megacycles on the test scale. *R1142 (ILLUS. 12D, FIG. 4) R1141 R1141, R1143 (ILLUS. B, FIG. 3) - R1143*
- (d) Adjust the oscillator trimmer condenser (illus. B, Fig. 4) for maximum output. *R1141, R1143 (ILLUS. B, FIG. 3) - R1143*
- (e) Adjust the antenna trimmer (illus. A, Fig. 4) while rocking the condenser gang back and forth through the signal, until maximum output is obtained. *FOR MODEL R1142, SEE (ILLUS. 12A, FIG. 4)*
- (f) Increase the signal from the signal generator and check for image frequency response. If the image does not fall at approximately 1630 megacycles, repeat section 2.

3. Aligning at 1735 Kilocycles (MODELS R1141, R1142 ONLY)

- (a) Remove the 400 ohm resistor and connect the signal lead of the signal generator to the antenna terminal of the receiver through a .0002 mfd. mica condenser.

3. Aligning at 5 Megacycles MODEL R1143 ONLY

- (a) Press #9 button (Intermediate wave--manual tuning).
- (b) Set the signal generator to exactly 5 megacycles and rotate the variable section of the condenser gang to indicate 5 megacycles on the test scale.
- (c) Adjust the oscillator trimmer condenser (illus. G, Fig. 3) for maximum output.
- (d) Adjust the antenna trimmer condenser (illus. C, Fig. 3) for maximum output.

4. Aligning at 1690 Kilocycles MODEL R1143 ONLY

- (a) Remove the 400 ohm resistor and connect the signal lead of the signal generator to the antenna terminal of the receiver through a .0002 mfd. mica condenser.
- (b) Press #10 button (Broadcast--manual tuning).
- (c) Turn the variable plates of the condenser gang completely out of mesh and against the high frequency stop.
- (d) Adjust image trimmer (illus. E, Fig. 3) two turns up from tight.
- (e) Set the signal generator to exactly 1690 kilocycles.
- (f) Adjust the oscillator trimmer condenser (illus. H, Fig. 3) for maximum output.
- (b) Turn the band change switch to the broadcast Manual (center) position.

- (c) Turn the variable plates of the condenser gang completely out of mesh and against the high frequency stop.
- (d) Set the signal generator to exactly 1735 kilocycles.

4. Aligning at 1400 Kilocycles

- (a) Set the signal generator to approximately 1400 kilocycles.
- (b) Rotate the variable plates of the condenser gang until the signal is tuned in with maximum output.
- (c) Adjust the antenna trimmer (illus. C, Fig. 4) for maximum output. *MODEL R1141 ONLY FOR MODEL R1142 (ILLUS. 12B, FIG. 4) R1143 (ILLUS. D, FIG. 3)*

5. Aligning at 600 Kilocycles

- (a) Set the signal generator to approximately 600 kilocycles.
- (b) Rotate the variable plates of the condenser gang until the signal is tuned in. *FOR R1143-SEE (ILLUS. F, FIG. 3) FOR R1142-SEE (ILLUS. 12C, FIG. 4) FOR R1141*
- (c) Adjust the oscillator series condenser (illus. D, Fig. 4) while rocking the condenser gang back and forth through the signal until maximum output is obtained.

6. Aligning for Image Frequency Response

- (a) Set the signal generator at 2100 kilocycles. *FOR R1143 AT 1930KC.*
- (b) Rotate the variable plates of the condenser gang until the image of this signal is tuned in at 1170 kilocycles. *FOR R1143 AT 1000KC.*
- (c) Adjust the two-wire capacitor (illus. K, Fig. 4) by twisting, until a minimum output is obtained. *FOR R1143-SEE (ILLUS. F, FIG. 3)*
- (d) Set the signal generator at 2630 kilocycles.
- (e) Rotate the variable plates of the condenser gang until the image of this signal is tuned in at 1700 kilocycles.
- (f) Adjust the single wire capacitor (illus. J, Fig. 4) by moving it either toward or away from the coil winding until a minimum output is obtained.

NOTE: R1143 IS CHECKED ONLY AT 1930KC. THEN READJUST AT 1690KC.

7. Repeat Sections 4 and 5 for Maximum Output

8. Repeat Section 6 for Minimum Output

9. Repeat Section 2 (e) for Maximum Output

MODEL R1142 Delco
 Socket, Trimmers
 Chassis

UNITED MOTORS SERVICE, INC.

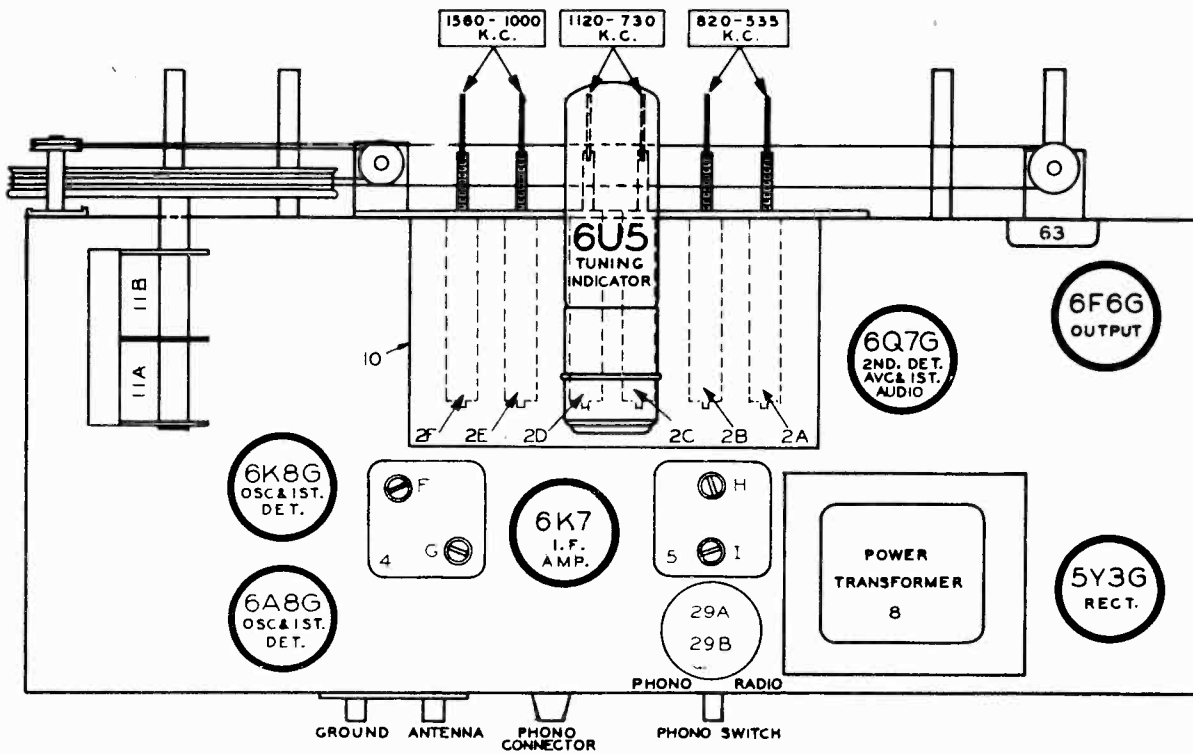


FIG. 3--PARTS LAYOUT--Top View

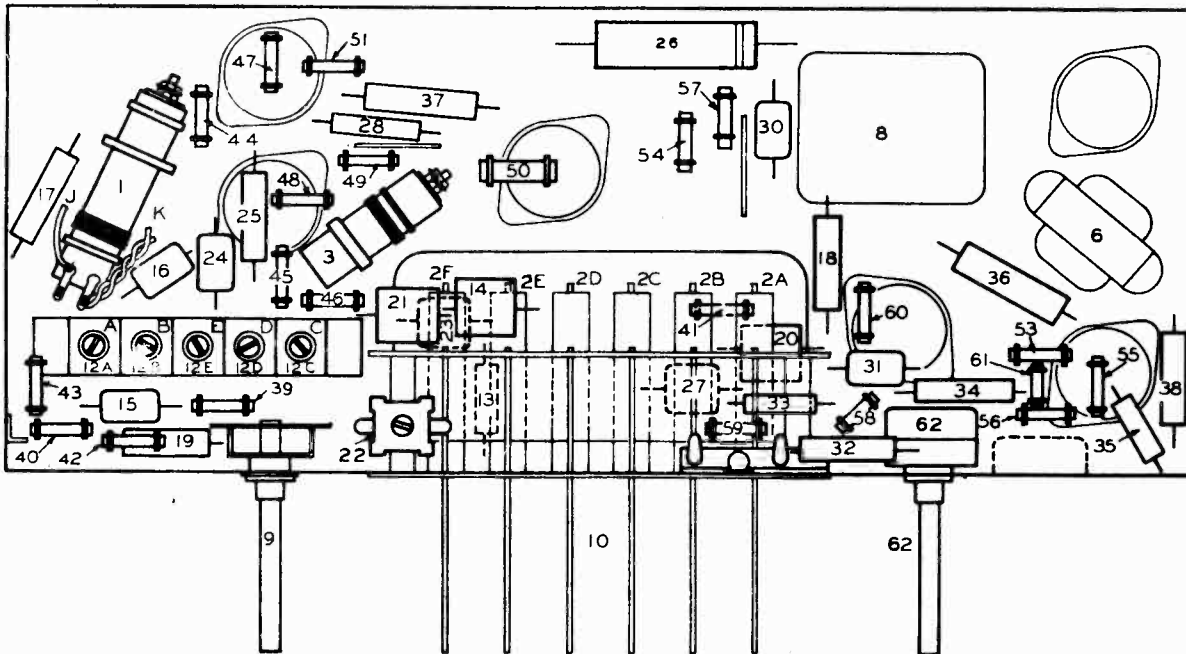


FIG. 4--PARTS LAYOUT--Bottom View

MODEL R1143 Delco
Socket, Trimmers
Voltage, Chassis

UNITED MOTORS SERVICE, INC.

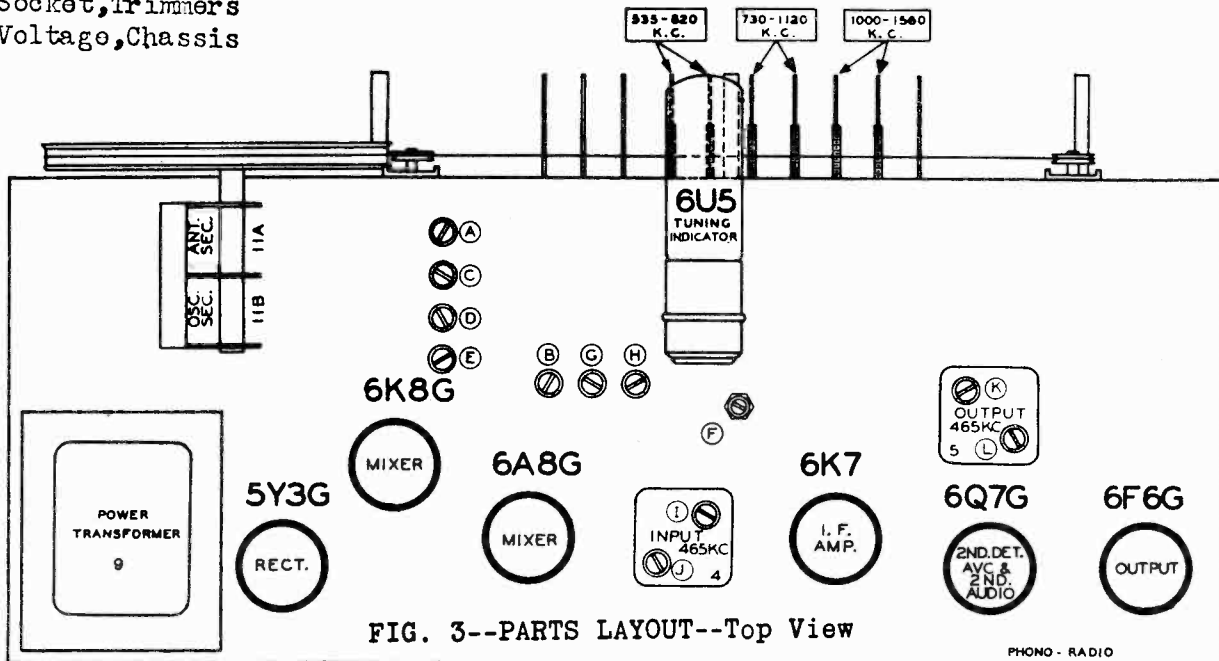


FIG. 3--PARTS LAYOUT--Top View

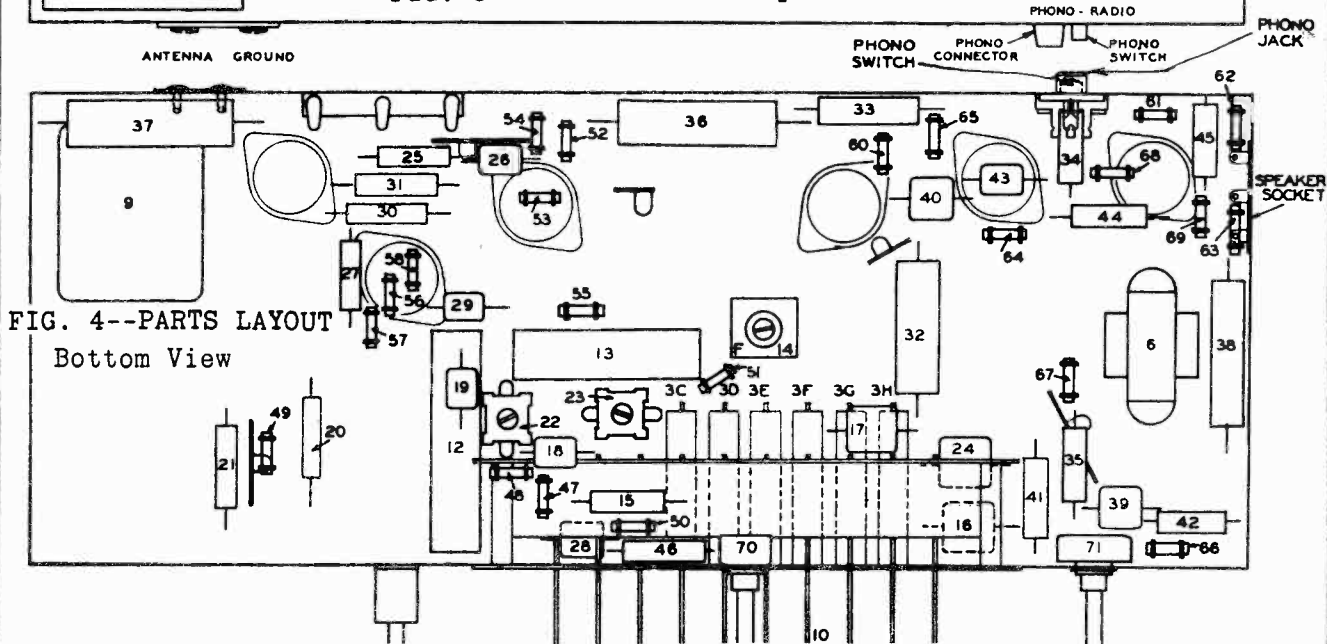


FIG. 4--PARTS LAYOUT
Bottom View

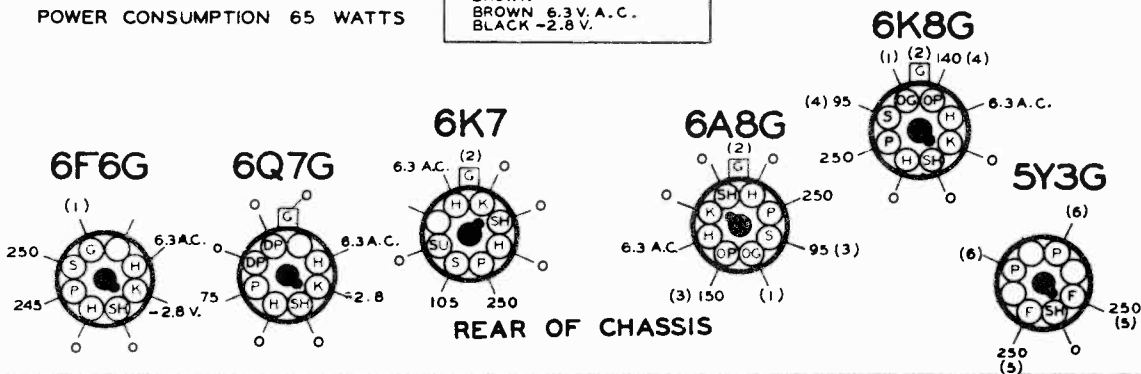
FIG. 1--TUBE SOCKET VOLTAGES

VOLTAGES MEASURED WITH 1000 OHM PER VOLT METER BETWEEN SOCKET TERMINALS AND CHASSIS.
A.C. LINE VOLTAGE 115 VOLTS.
POWER CONSUMPTION 65 WATTS

BOTTOM VIEW OF CHASSIS

TUNING EYE VOLTAGES AT CHASSIS END OF CABLE.
RED 250 V.
GREEN 0
BROWN 0
BROWN 6.3 V. A.C.
BLACK -2.8 V.

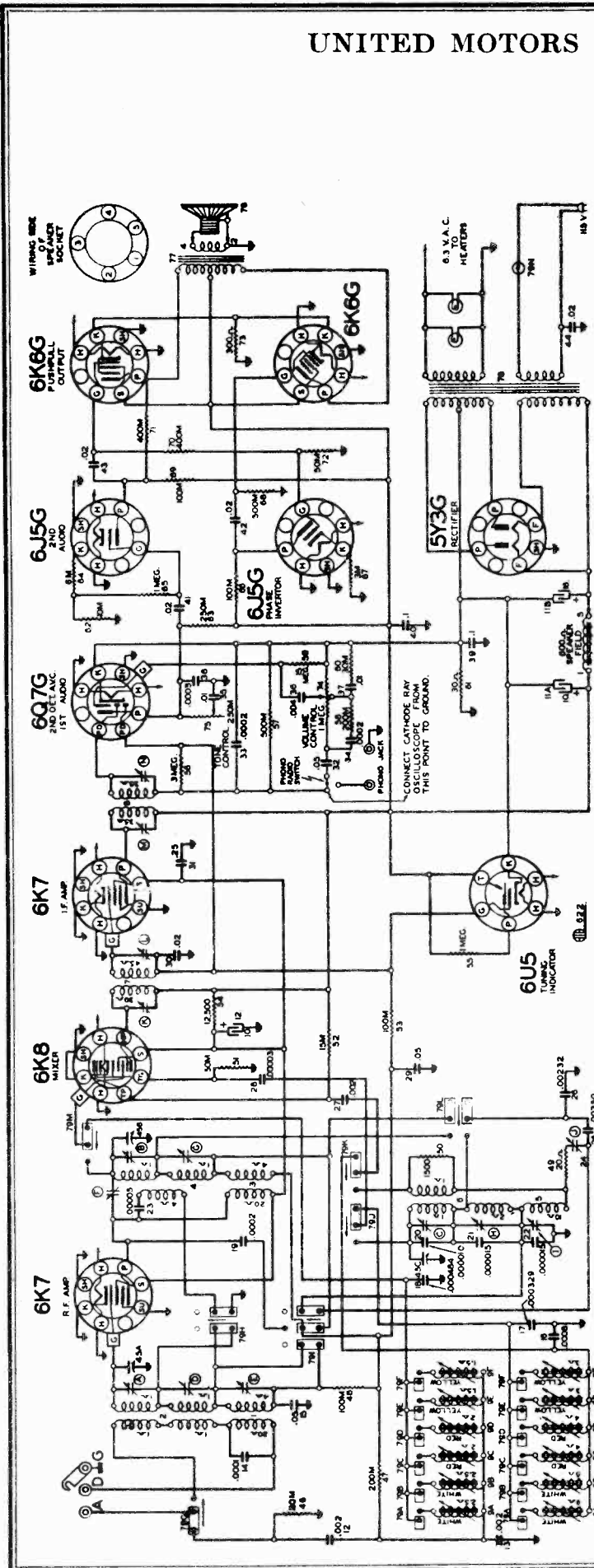
- (1) CANNOT BE READ WITH A VOLT METER
- (2) BIAS 2.8V. AS READ ACROSS RESISTOR 61
- (3) CAN BE READ ONLY WHEN PUSH BUTTONS 2 TO 7 ARE "IN"
- (4) CAN BE READ ONLY WHEN PUSH BUTTONS 8, 9, & 10 ARE "IN"
- (5) HEATER VOLTAGE 5.0V. A.C. ACROSS PINS F & F
- (6) 750 V. A.C. AS READ ACROSS PINS P & P.



REAR OF CHASSIS

UNITED MOTORS SERVICE, INC.

MODEL R1144 Delco
Schematic, Notes



FOR TUNER
SEE INDEX

9-2-38

GENERAL: The Delco Model R-1144 is a ten tube, A.C., three band super-heterodyne receiver with a 12" dynamic speaker. Tuning is accomplished by means of the conventional manual control or by push button switches which controlled adjustable permeability tuned coils. Band switching is accomplished by the same series of switches which are, left to right:

1. Off Switch
2. Broadcast Band (Manual Tuning) 535-1690 K.C.
3. Intermediate Band (Manual Tuning) 1660-5500 K.C.
4. Short Wave Band (Manual Tuning) 5.3 - 18.0 M.C.
5. Broadcast Band (Automatic Tuning) 980 - 1560 K.C.10.
6. Broadcast Band (Automatic Tuning) 980 - 1560 K.C.
7. Broadcast Band (Automatic Tuning) 700 - 1100 K.C.
8. Broadcast Band (Automatic Tuning) 700 - 1100 K.C.
9. Broadcast Band (Automatic Tuning) 520 - 830 K.C.
10. Broadcast Band (Automatic Tuning) 520 - 830 K.C.

A phono switch and connector are mounted on the rear flange of the chassis and may be used in conjunction with a crystal pickup without a matching transformer. The switch must be in the "radio" position during the alignment procedure.

MODEL R1144 Delco
 Socket, Trimmers
 Voltage, Chassis

UNITED MOTORS SERVICE INC.

TUBE LAYOUT

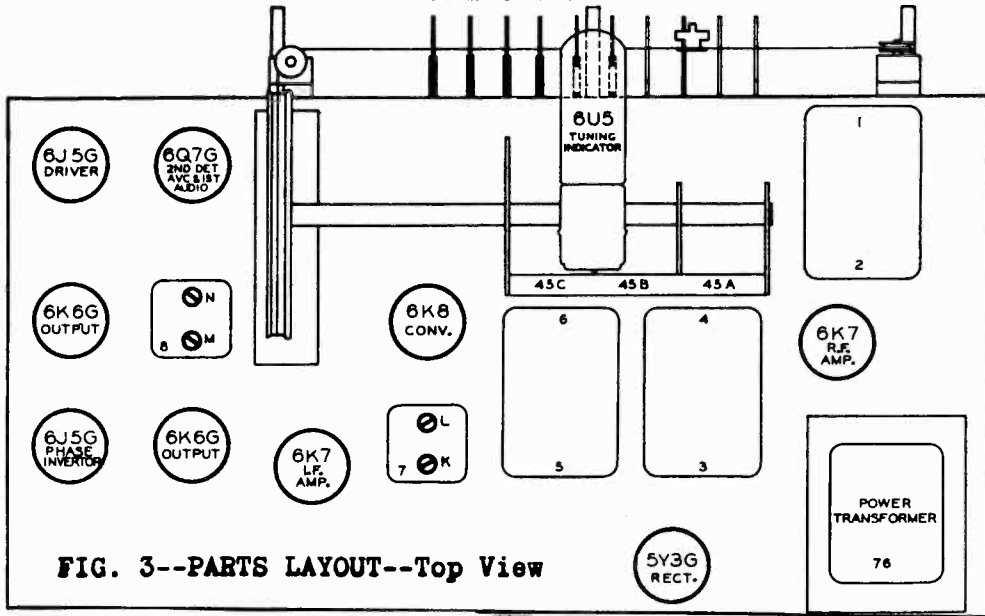


FIG. 3--PARTS LAYOUT--Top View

9-2-38

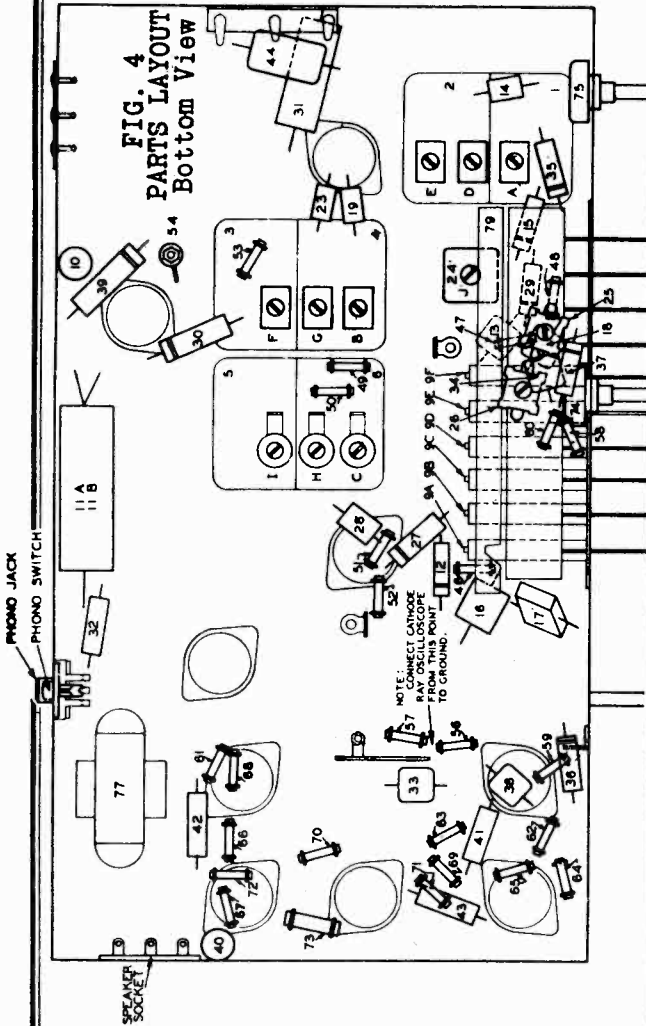


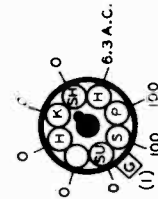
FIG. 4
 PARTS LAYOUT
 Bottom View

BOTTOM VIEW
 OF CHASSIS

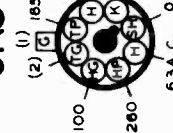
VOLTAGES MEASURED WITH 1000 OHM PER VOLT METER BETWEEN SOCKET TERMINALS AND CHASSIS.
 A.C. LINE VOLTAGE 115 VOLTS.
 POWER CONSUMPTION 85 WATTS

TUBE SOCKET VOLTAGES
 -FIG. 1

6K7



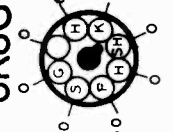
6K8



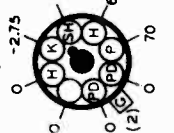
6K6G



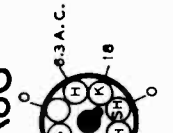
6J5G



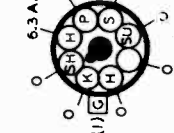
6Q7G



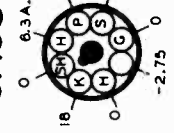
6K6G



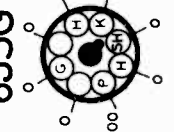
6K7



6K6G

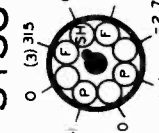


6J5G



REAR OF CHASSIS

5Y3G



UNITED MOTORS SERVICE, INC.

MODEL R1144 Delco
 MODEL R1145 Delco
 Alignment

ALIGNMENT MODEL R1144

ALIGNMENT MODEL R1145

1. Aligning I-F Stages at 465 Kilocycles

1. Aligning I-F Stages at 465 Kilocycles

- (a) Connect the ground lead of the signal generator to the chassis frame.
- (b) Connect the signal lead of the signal generator to the grid cap of the 6K8 tube through a .1 mfd. condenser, leaving the grid clip in place.
- (c) Connect the output meter across the plates of the 6K6G tube.
- (d) Press #2 button (Broadcast:Manual), turn the volume control on full and the tone control on treble and turn the variable plates of the condenser gang completely out of mesh and against the high frequency stop.
- (e) Set the signal generator to exactly 465 kilocycles and adjust the trimmers on the second I-F coil (Illus. N&M, Fig. 3) and the first I-F coil (Illus. K&L, Fig. 3) for maximum output. Use as low a signal from the signal generator as will give a readable indication on the output meter.
- (f) After completing the Alignment Procedure, the alignment should be checked with the Model 165 Cathode Ray Oscillograph. Connect the oscillograph from point (Fig. 4) to ground.

- (a) Connect the ground lead of the signal generator to the chassis frame.
- (b) Connect the signal lead of the signal generator to the grid cap of the 6K8G tube through a .1 mfd. condenser, leaving the grid cap clip in place.
- (c) Connect the output meter from the plate of the 6AC5G tube to B plus.
- (d) Turn the rotor plates of the gang condenser to a point where no whistles or beat notes are heard.
- (e) Set the signal generator to exactly 465 kilocycles.
- (f) Adjust the trimmers on the first I-F coil (Illus. G & H, Fig. 3) and the second I-F coil (Illus. I & J, Fig. 3) for maximum output.
- (g) After completing the alignment procedure, the alignment should be checked with a cathode ray oscillograph. Connect the oscillograph from the high side of the volume control to ground.

2. Aligning at 1690 Kilocycles

2. Aligning at 1750 Kilocycles.

- (a) Disconnect the signal lead of the signal generator from the grid of the 6K8 and connect to the antenna terminal of the receiver through a .002 mfd. mica condenser.
- (b) With the controls set as before, adjust the broadcast oscillator trimmer for maximum output (Illus. I, Fig. 4).

- (a) Remove the signal lead of the signal generator from the grid of the 6K8G and connect to the antenna terminal of the receiver through a .0002 mfd. mica condenser.
- (b) Set the signal generator to exactly 1750 kilocycles.
- (c) Turn the rotor plates of the gang condenser completely out of mesh and against the high frequency stop.

3. Aligning at 1400 Kilocycles

3. Aligning at 1500 Kilocycles

- (a) Set the signal generator to approximately 1400 kilocycles.
- (b) Rotate the variable section of the condenser gang until the signal is tuned in with maximum output.
- (c) Adjust the antenna trimmer (Illus. E, Fig. 4) and R-F trimmer (Illus. F, Fig. 4) for maximum output.

- (d) With the band change switch in the Broadcast position, adjust the oscillator trimmer condenser (Illus. F, Fig. 3) for maximum output.

4. Aligning at 600 Kilocycles

4. Aligning at 600 Kilocycles

- (a) Set the signal generator to approximately 600 kilocycles.
- (b) Rotate the variable section of the condenser gang until this signal is tuned in with maximum output.
- (c) Adjust the oscillator series condenser (Illus. J, Fig. 4) while rocking the condenser gang back and forth through the signal, until maximum output is obtained.

- (a) Leave the signal generator leads connected as before.
- (b) Set the signal generator to 1500 kilocycles.
- (c) Rotate the variable plates of the gang condenser until this signal is tuned in with maximum output.
- (d) Adjust the antenna trimmer (Illus. A, Fig. 3) for maximum output.

5. Aligning at 17. Megacycles

5. Aligning at 17 Megacycles

- (a) Remove the .0002 mfd. condenser and connect the signal lead of the signal generator to the antenna trimmer of the receiver through a 400 ohm resistor.
- (b) Press #4 button (Short Wave Band:Manual).
- (c) Set the signal generator to exactly 17. megacycles and rotate the variable section of the condenser gang to indicate 17. megacycles on the test scale.
- (d) Adjust the oscillator trimmer condenser (Illus. C, Fig. 4) for maximum output.
- (e) Adjust the R-F trimmer condenser (Illus. B, Fig. 4) and antenna trimmer (Illus. A, Fig. 4) while rocking the condenser gang back and forth through the signal, until maximum output is obtained.
- (f) Increase the signal output from the signal generator and check for image frequency. If the image does not fall at approximately 1650 megacycles, repeat section 5.

- (a) Set the signal generator to 600 kilocycles.
- (b) Rotate the variable plates of the gang condenser until this signal is tuned in with maximum output.
- (c) Adjust the oscillator padder condenser (Illus. C, Fig. 3) while rocking the rotor plates back and forth through the signal until maximum output is obtained.

6. Aligning at 5. Megacycles

6. Aligning at 6 Megacycles

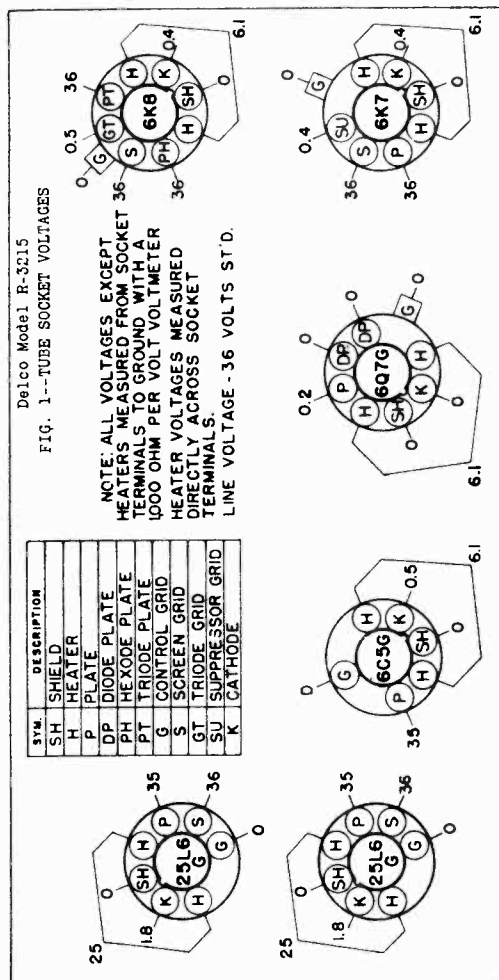
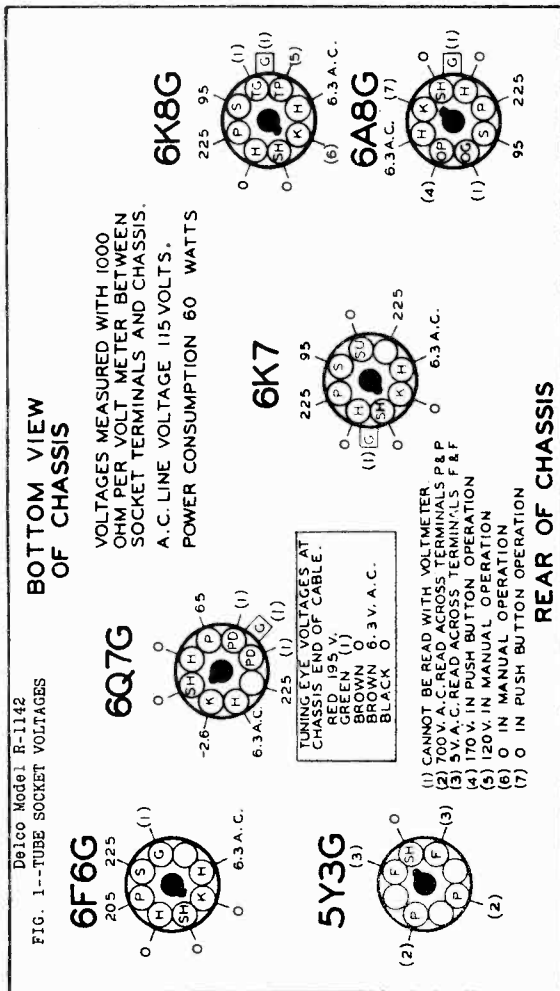
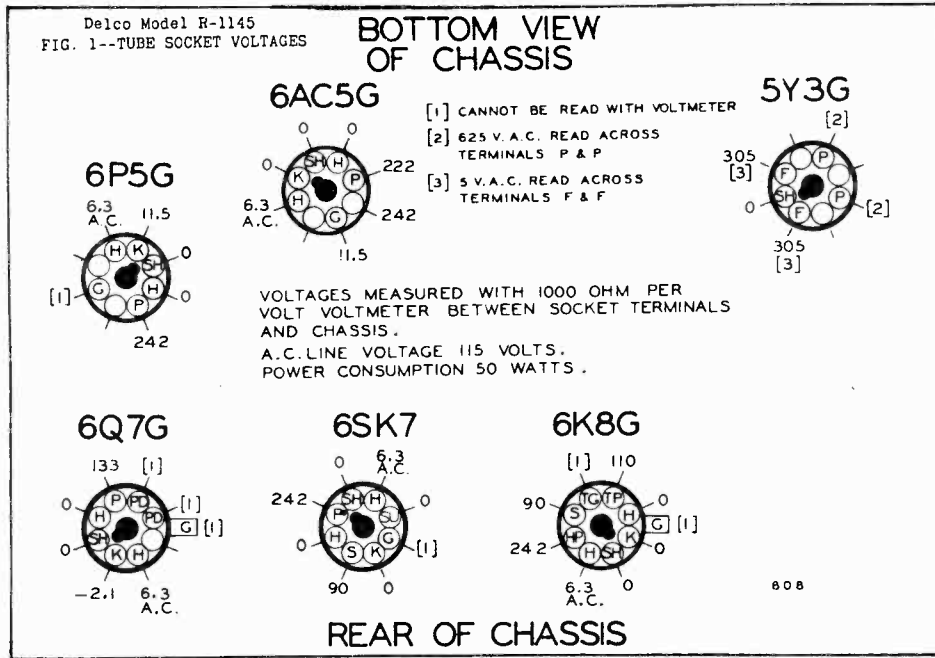
- (a) Press #3 button (Medium Wave Band:Manual).
- (b) Set the signal generator to exactly 5. megacycles and rotate the variable section of the condenser gang to indicate 5. megacycles on the test scale.
- (c) Adjust the oscillator trimmer condenser (Illus. H, Fig. 4) R-F trimmer (Illus. G, Fig. 4) and antenna trimmer (Illus. D, Fig. 4) for maximum output.

- (a) Set the signal generator to 6 megacycles.
- (b) Turn the rotor plates of the gang condenser until this signal is tuned in with maximum output.
- (c) Adjust the oscillator padding condenser (Illus. D, Fig. 3) while rocking the rotor plates back and forth through the signal until maximum output is obtained.

7. Repeat Sections 2, 3 and 4.

MODEL R1142 Delco
 MODEL R1145 Delco
 MODEL R3215 Delco
 Voltage

UNITED MOTORS SERVICE INC.



MODEL R1145 Delco
 Socket, Trimmers
 Chassis

UNITED MOTORS SERVICE, INC.

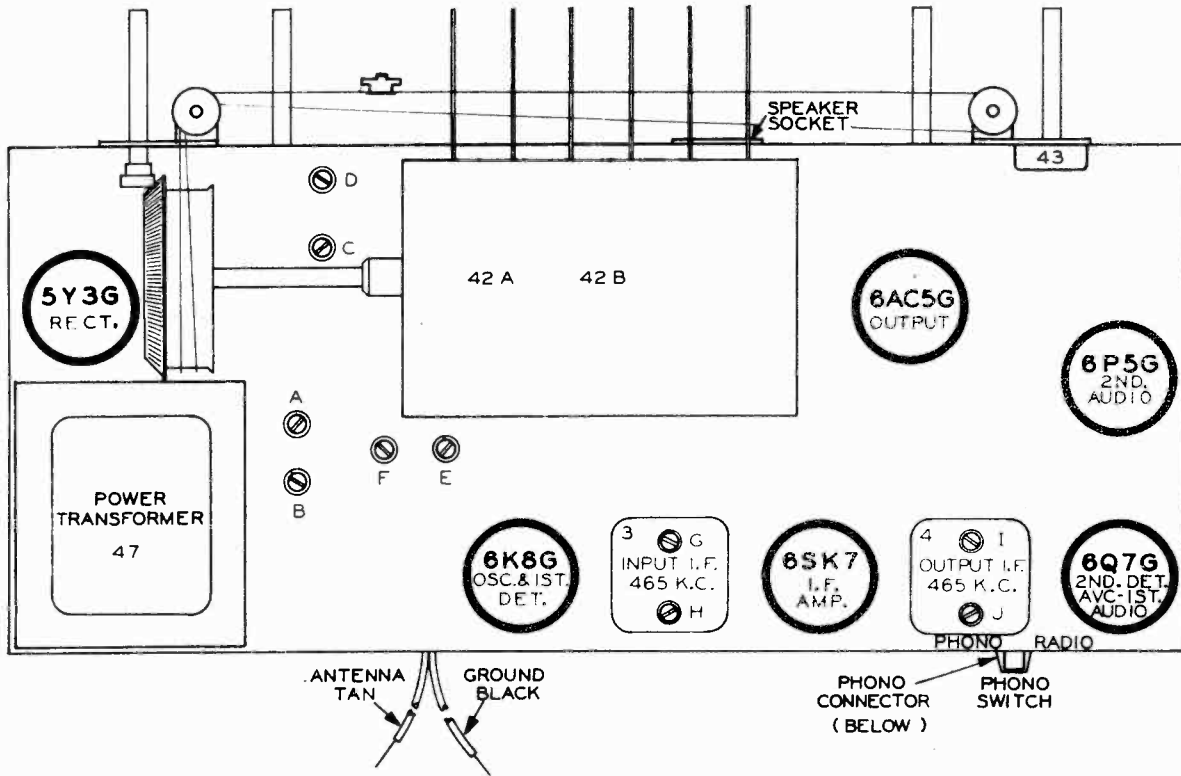


FIG. 3--PARTS LAYOUT--Top View

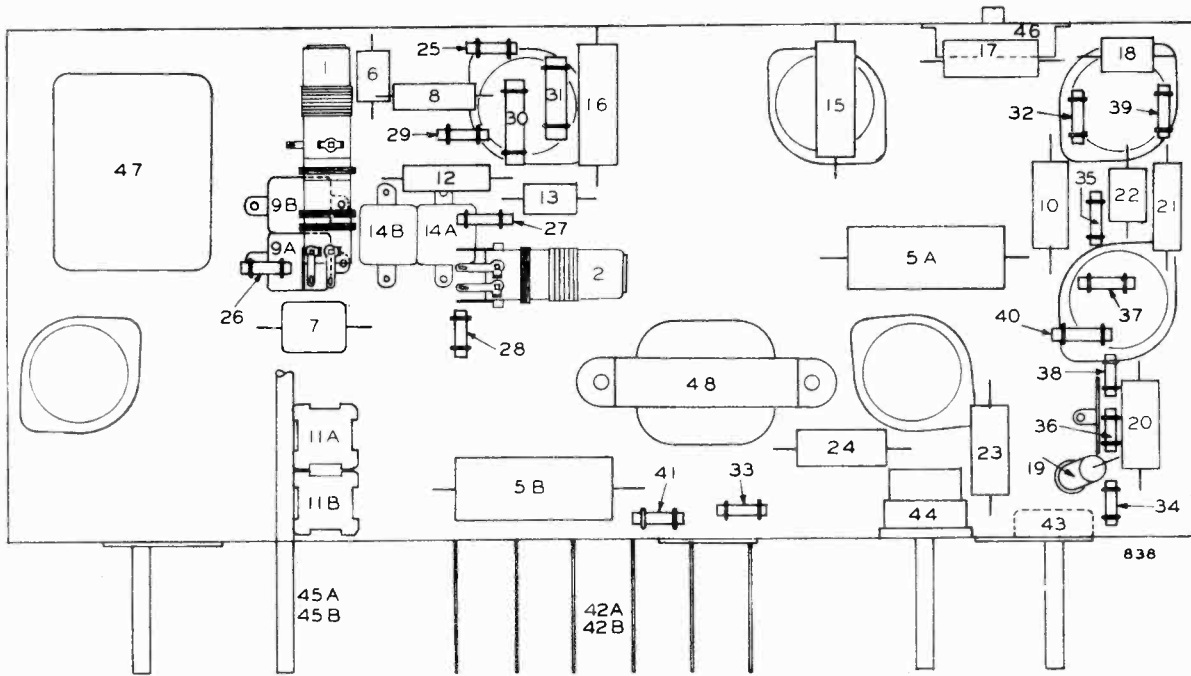
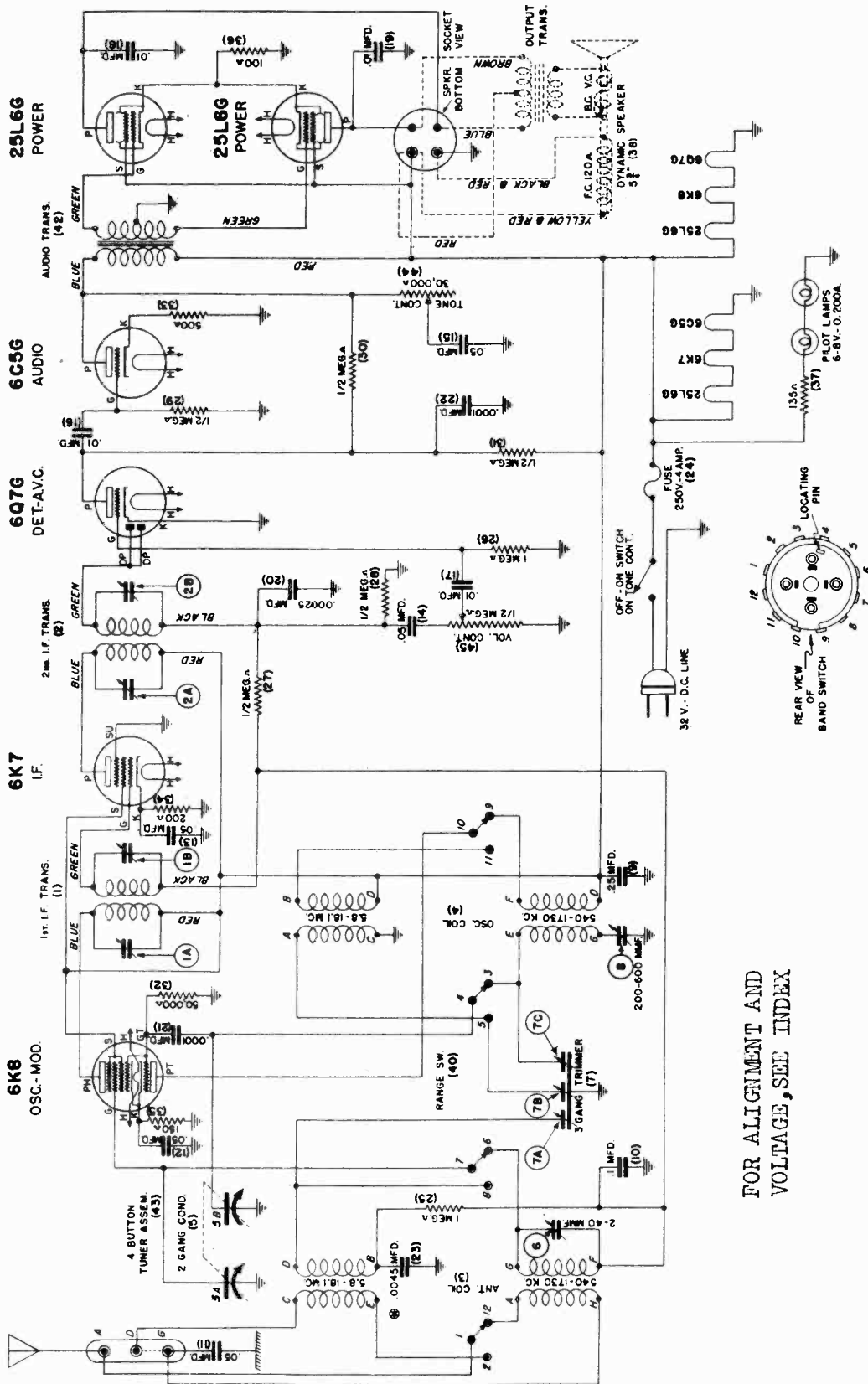


FIG. 4--PARTS LAYOUT--Bottom View

UNITED MOTORS SERVICE, INC.

MODEL R3215 Delco Schematic



FOR ALIGNMENT AND VOLTAGE, SEE INDEX

FIG. 2--DELCO MODEL R-3215 CIRCUIT DIAGRAM

GENERAL: The Delco Model R-3215 is a six tube, two band, 32 volt radio with A.V.C. and tone control.

3-24-39

MODEL R3215 Dolco
 Socket, Trimmers
 Chassis

UNITED MOTORS SERVICE, INC.

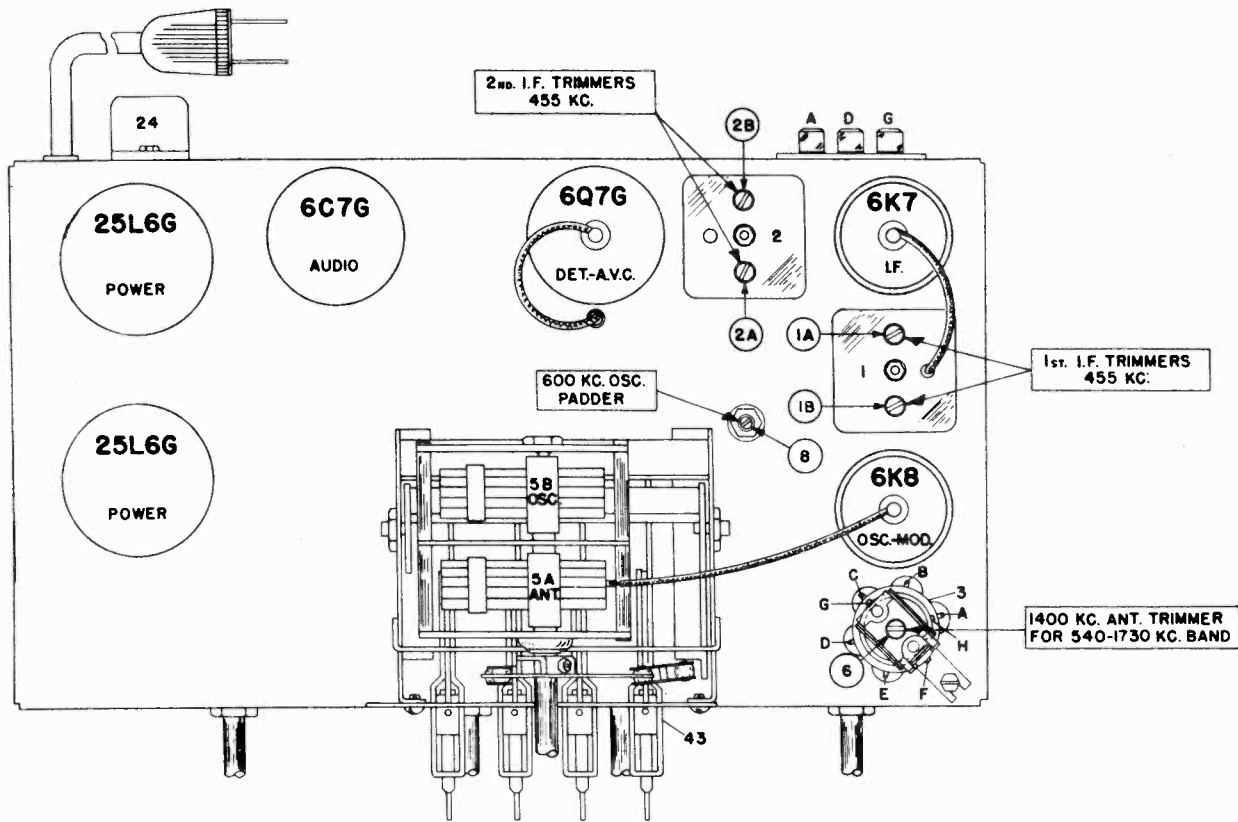
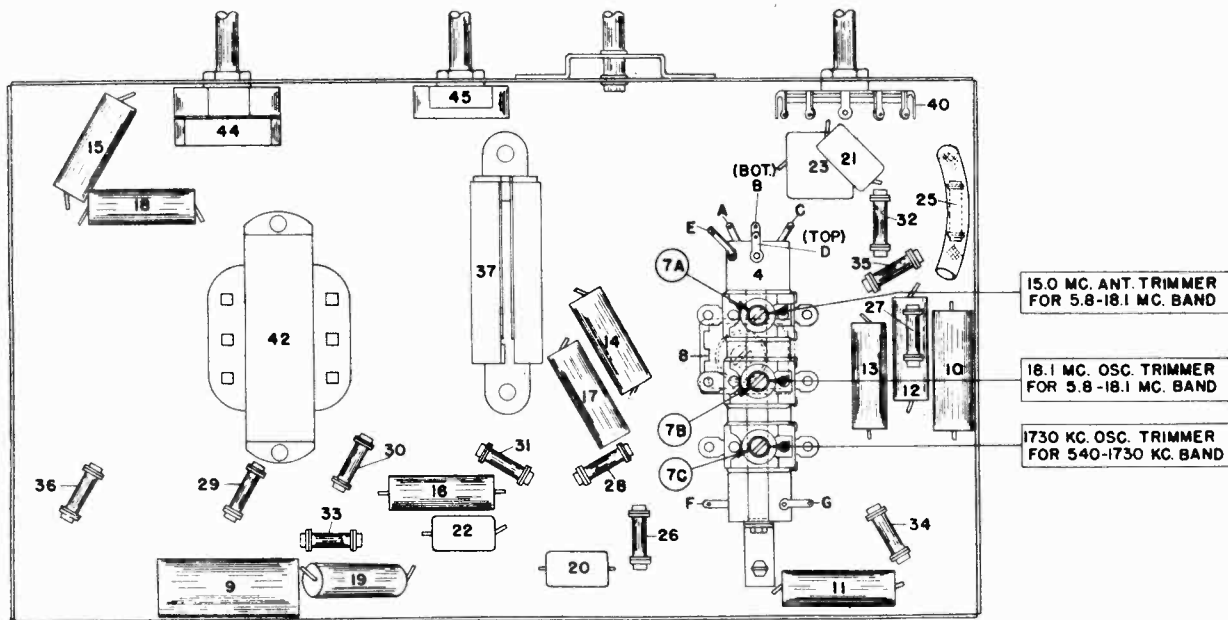


FIG. 3--PARTS LAYOUT--Top View



3-24-39

FIG. 4--PARTS LAYOUT--Bottom View