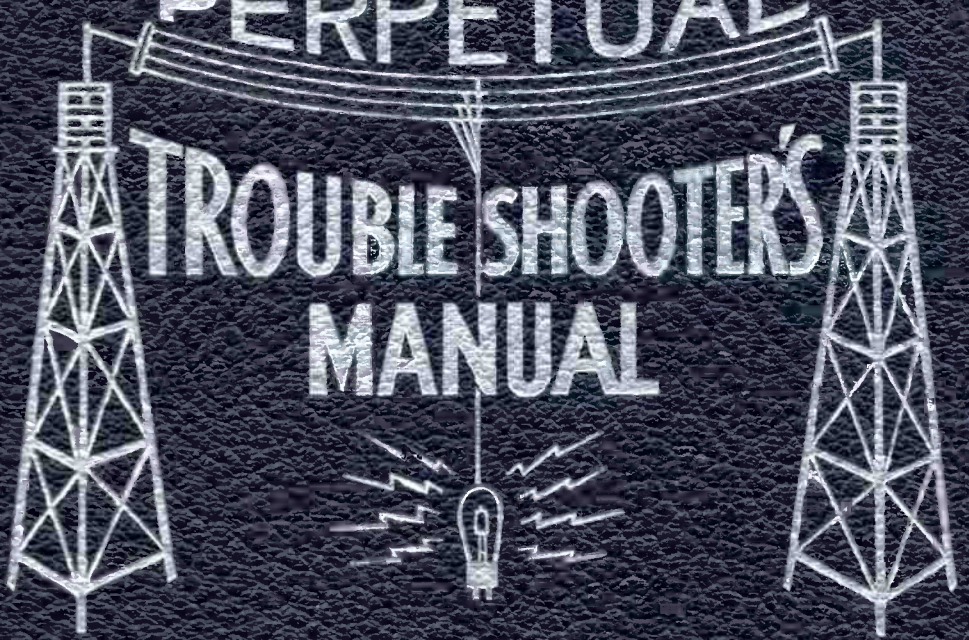
VOLUME V

PERPETUAL TROUBLE SHOOTER'S MANUAL



JOHN F. RIDER

PERPETUAL

TROUBLE SHOOTER'S MANUAL

VOLUME V

by

JOHN F. RIDER

Published by

JOHN F. RIDER

1440 Broadway **New York City**

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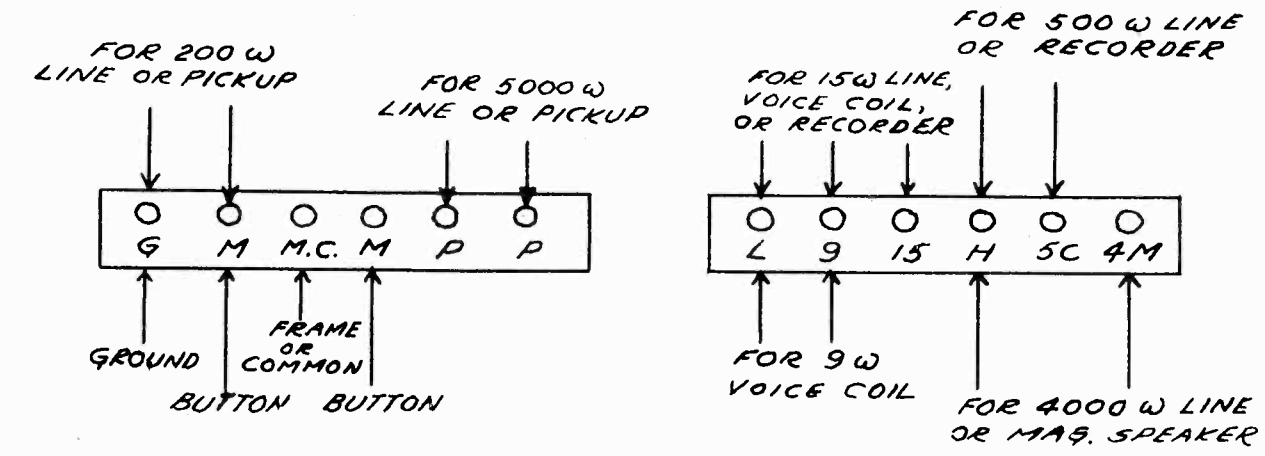
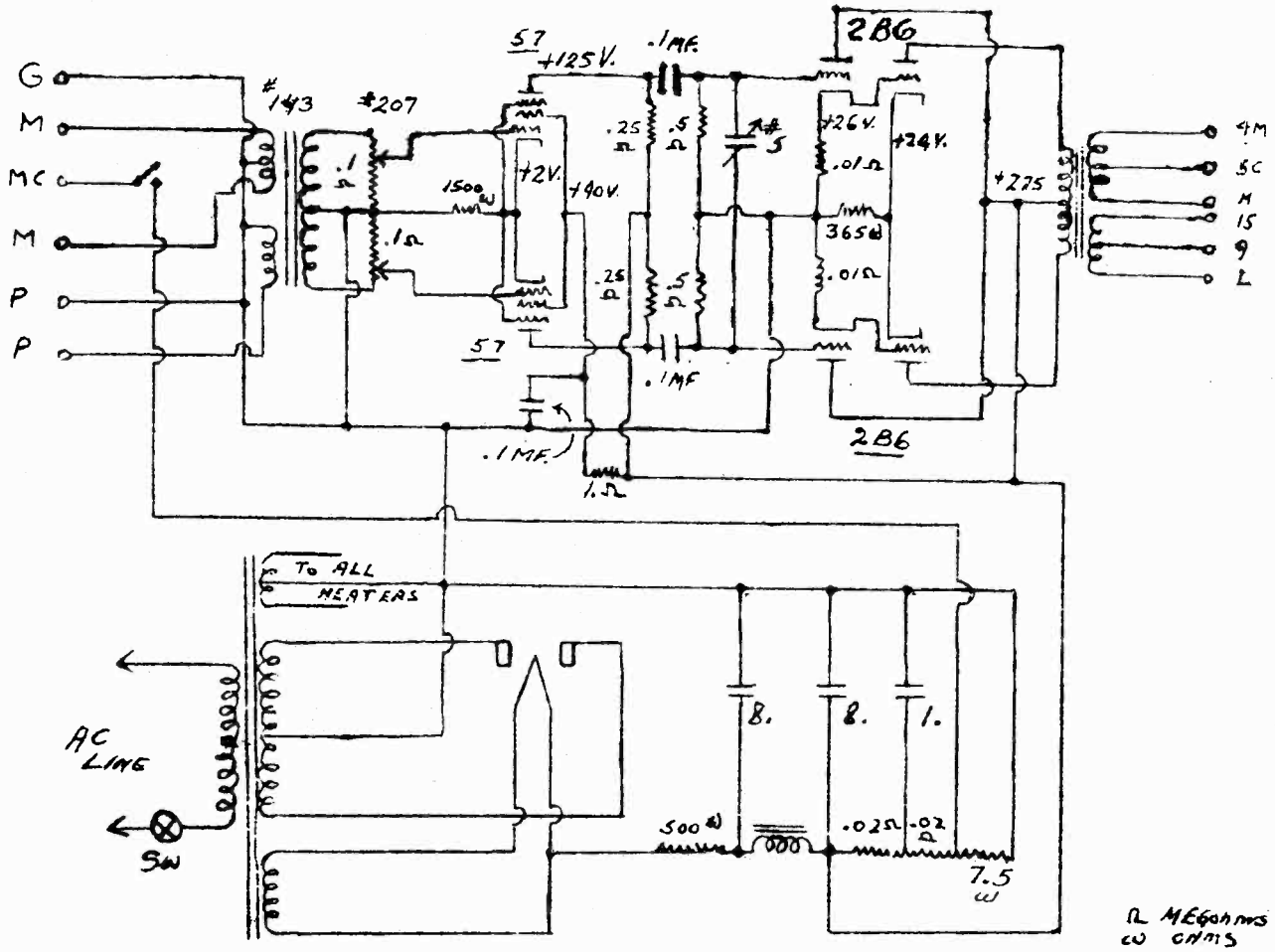
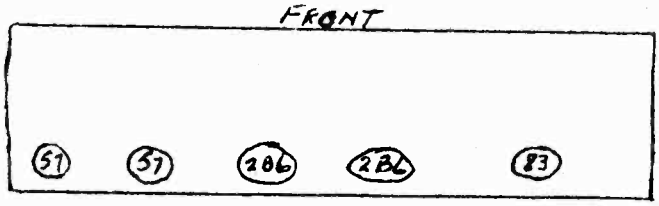
ACRATEST PRODUCTS

MODEL 108
Schematic
Layout





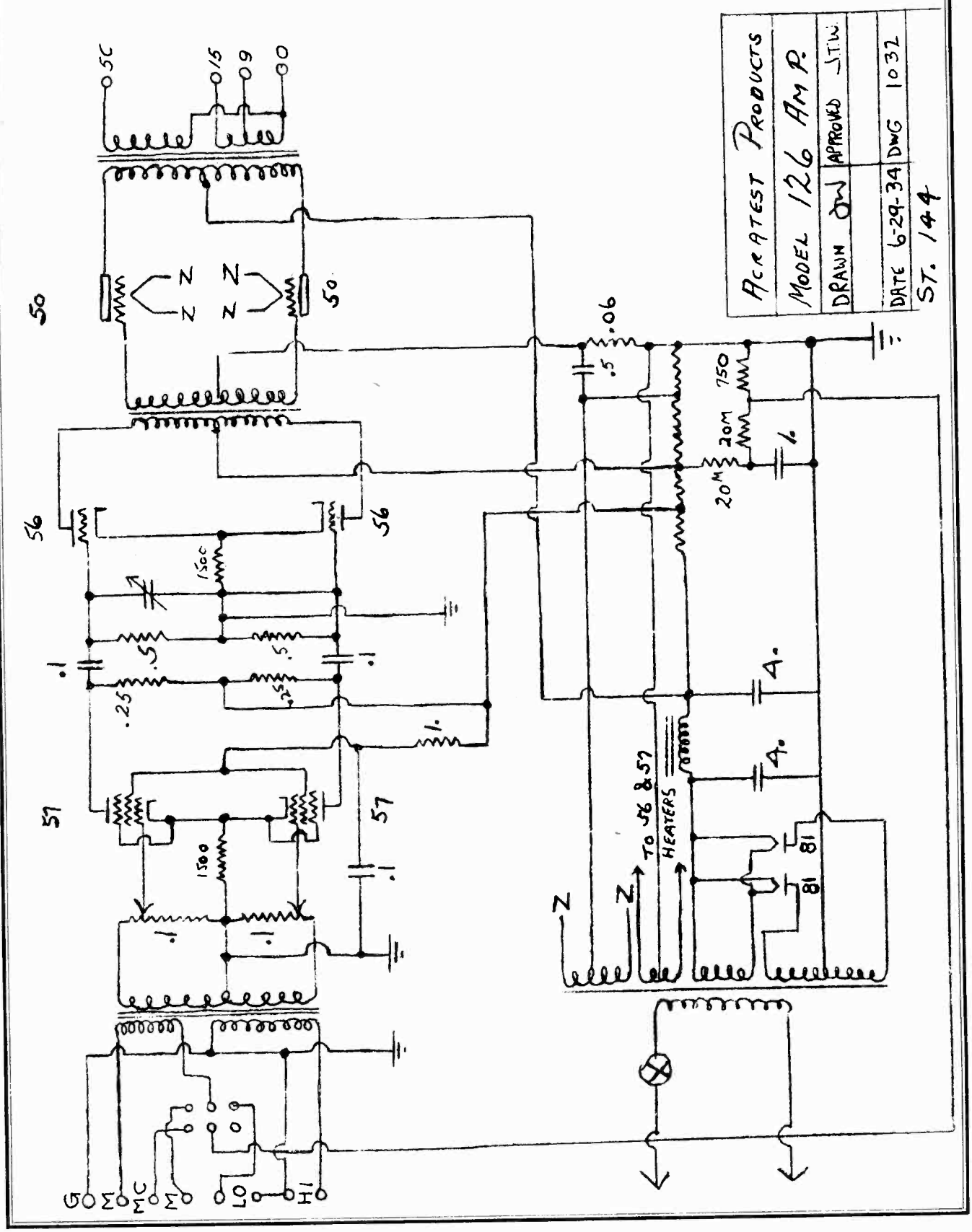


SOCKET LAYOUT

MODEL 108
AMPLIFIER

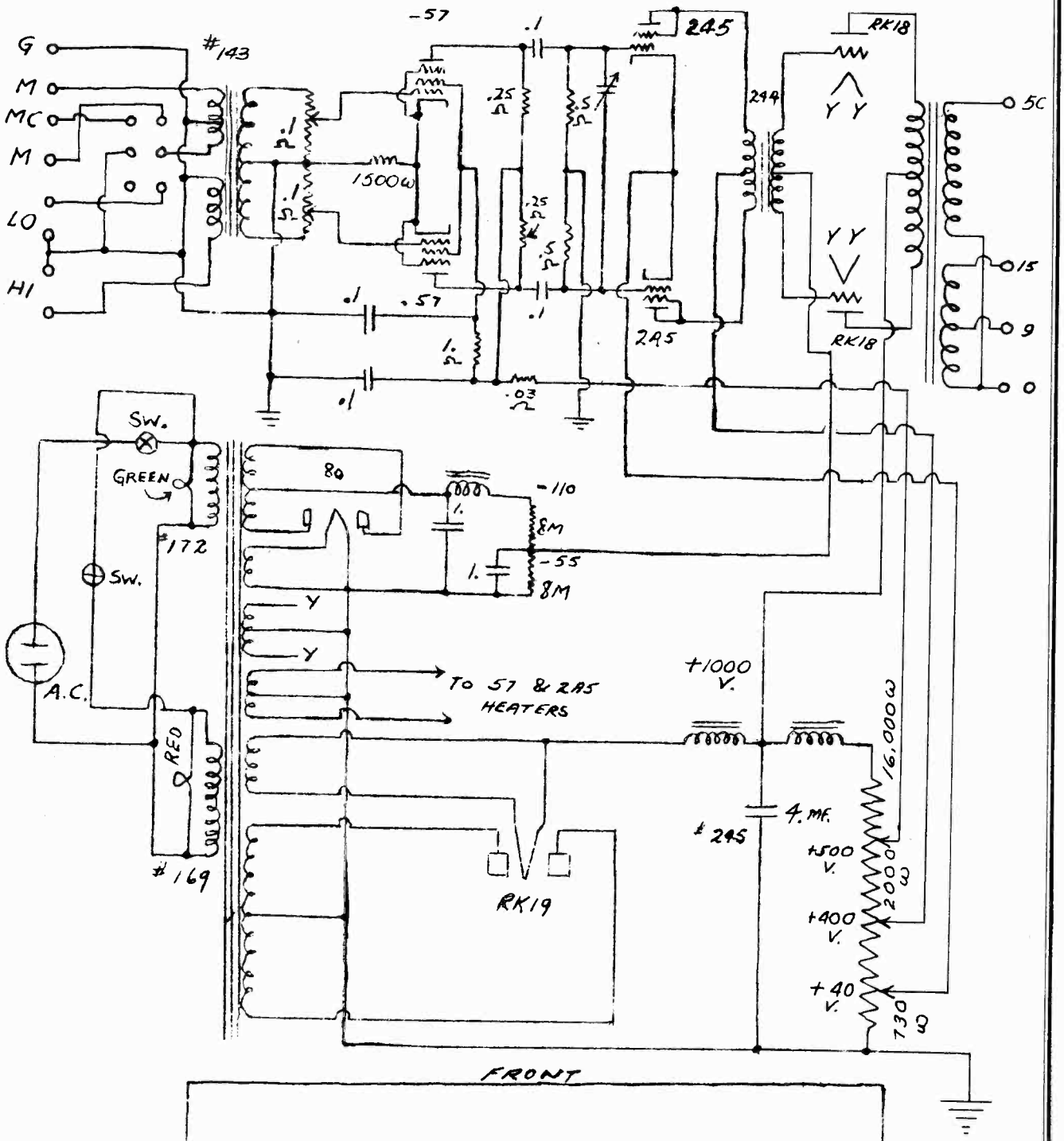
MODEL 126
Schematic

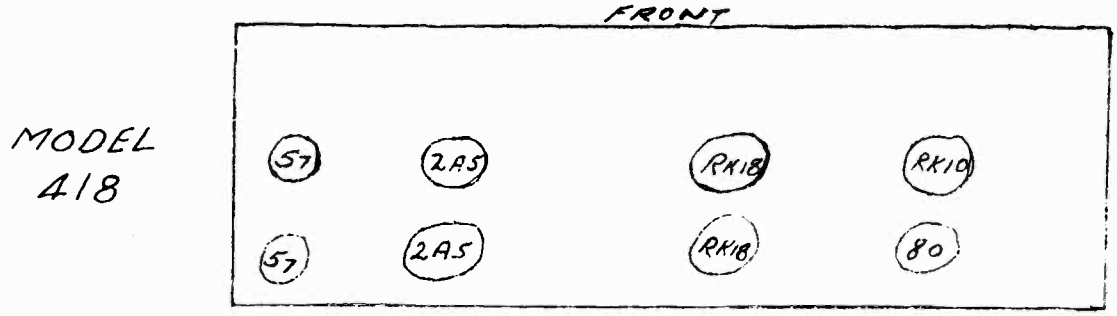
ACRATEST PRODUCTS



ACRATEST PRODUCTS

MODEL 418
Schematic
Socket Layout



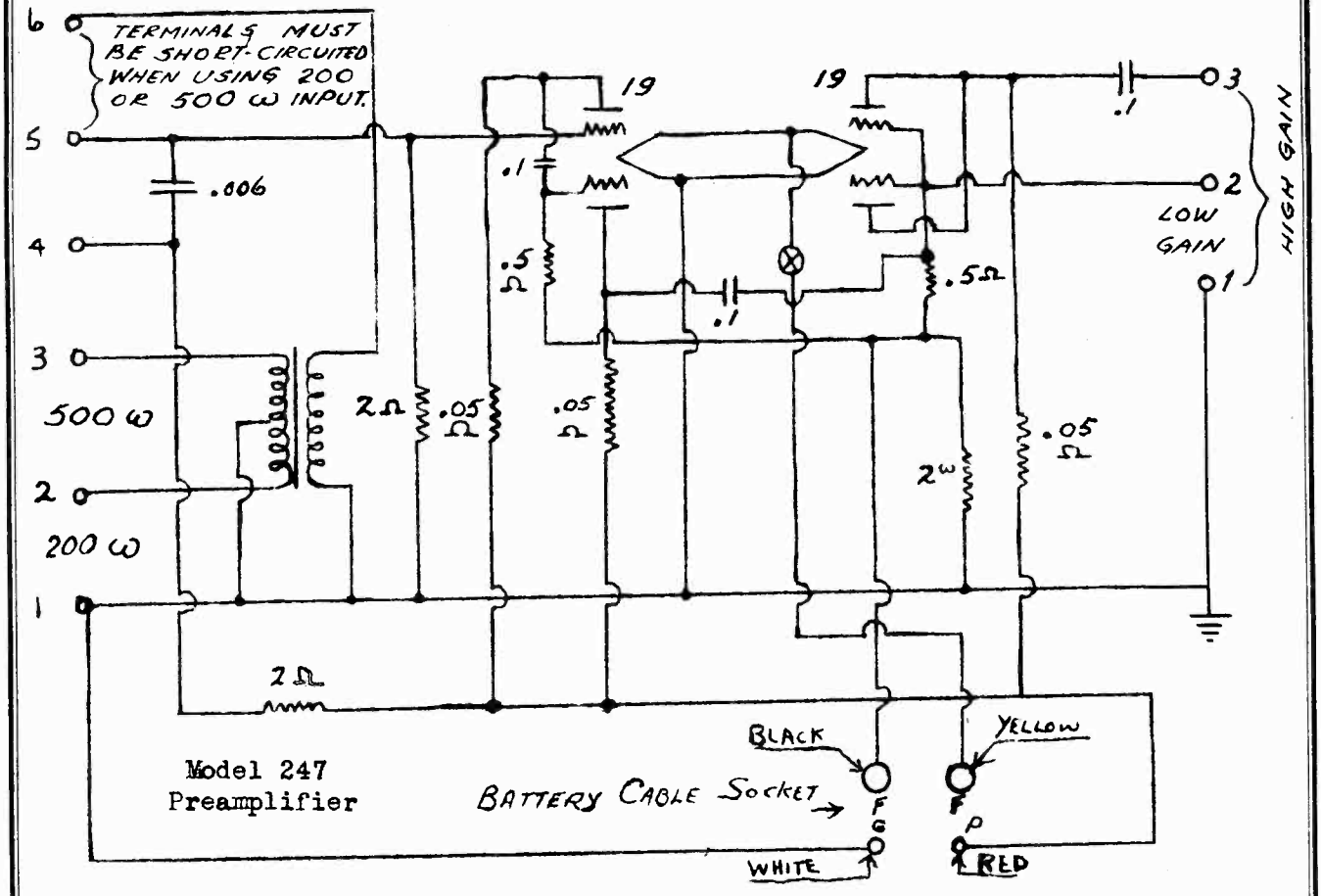


MODEL 418

TUBE SOCKET LAYOUT

MODEL 247
MODEL 739
Schematic

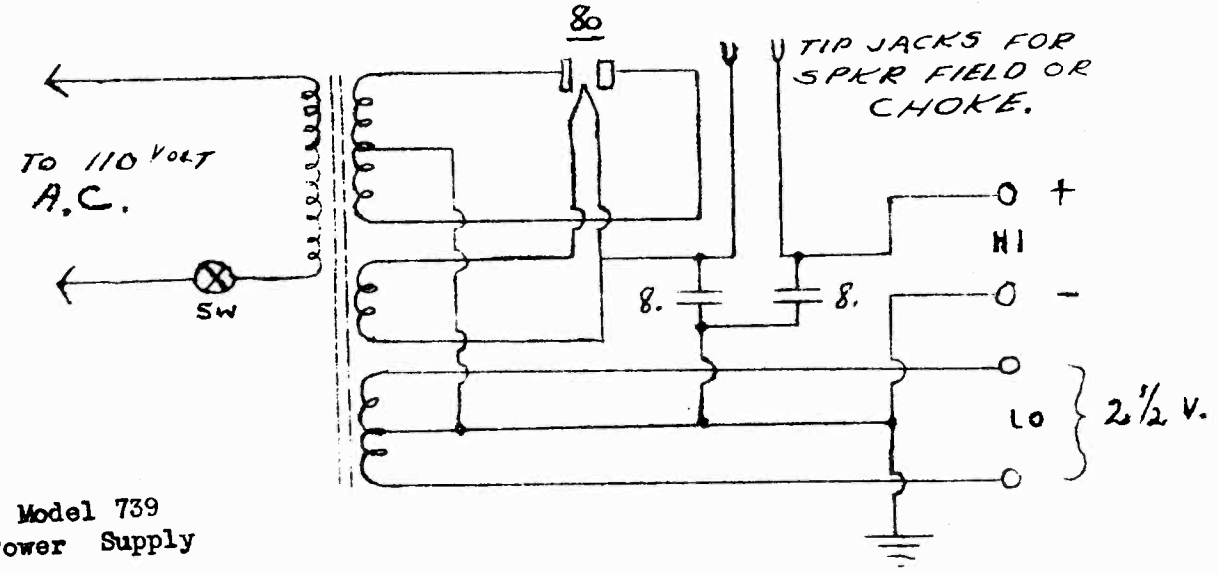
ACRATEST PRODUCTS



Model 247
Preamplifier

White = external ground, Red = B+90 - 135, Yellow = A + 3v., B-, Black = A-

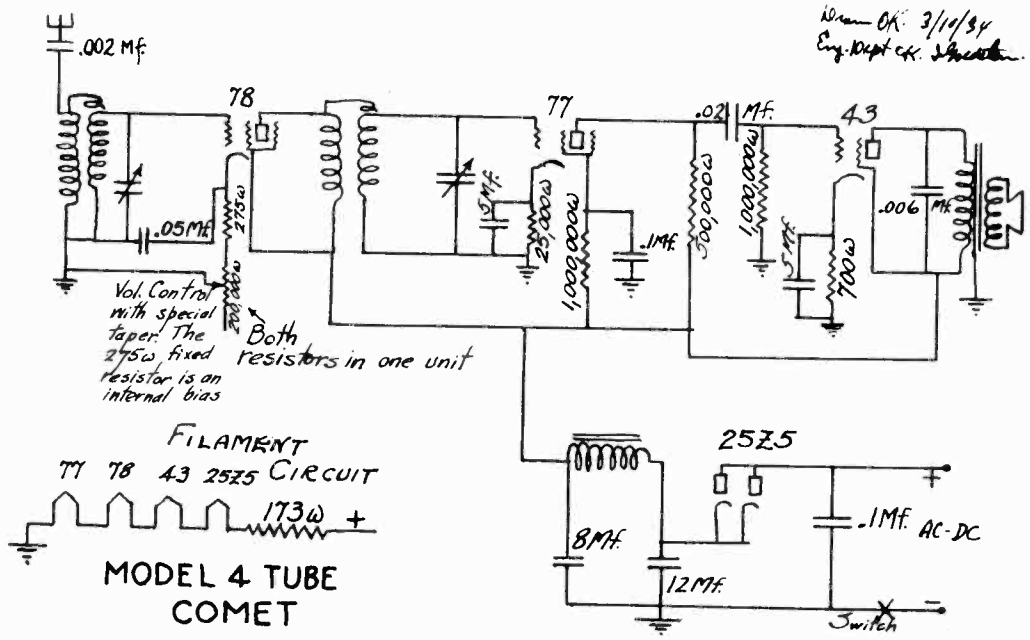
Terminals 1 & 4 = Photo -cell or condenser microphone
" 1 & 5 = Crystal mic., high imp. pickup, or radio tuner

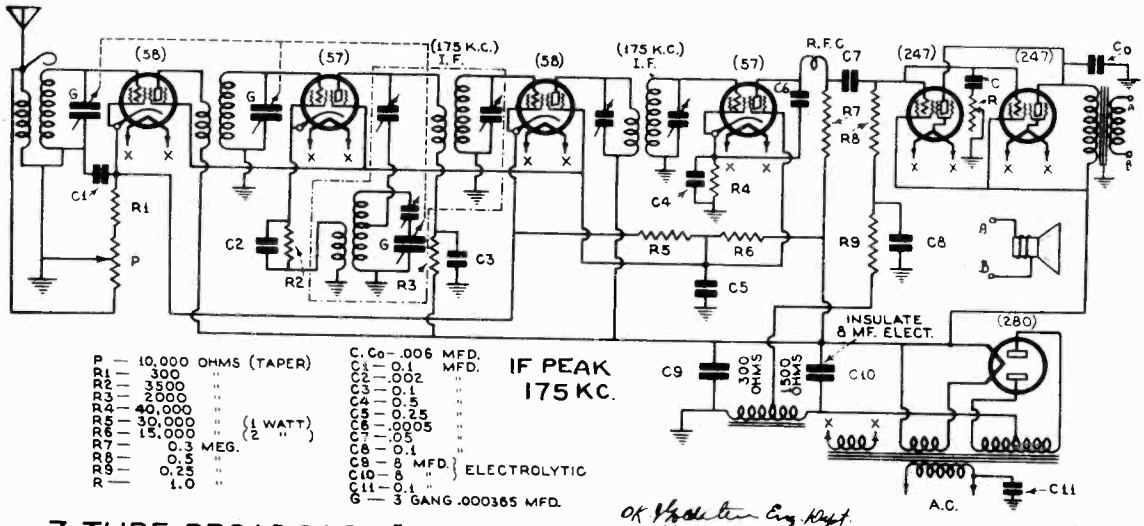


Model 739
Power Supply

AIR KING PRODUCTS CORP.

MODEL 4 Tube Comet Schematic
MODEL 7 Tube Bdc't Super. Schematic



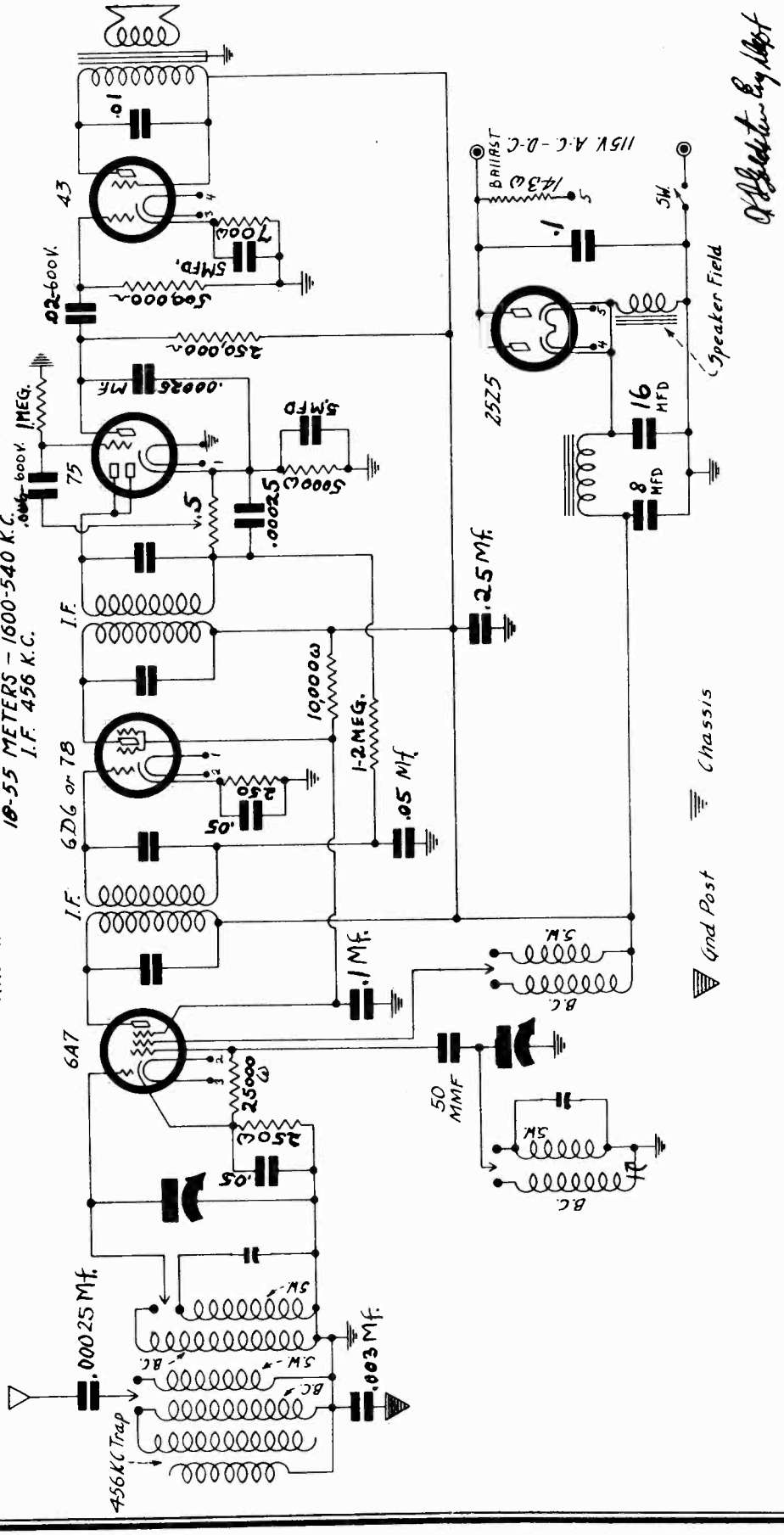


7-TUBE BROADCAST "SUPER"

OK [illegible] Eng. Dept. 4/5/37

MODEL Atlas 5 Tube
Universal All-Wave
Schematic

AIR KING PRODUCTS CORP.



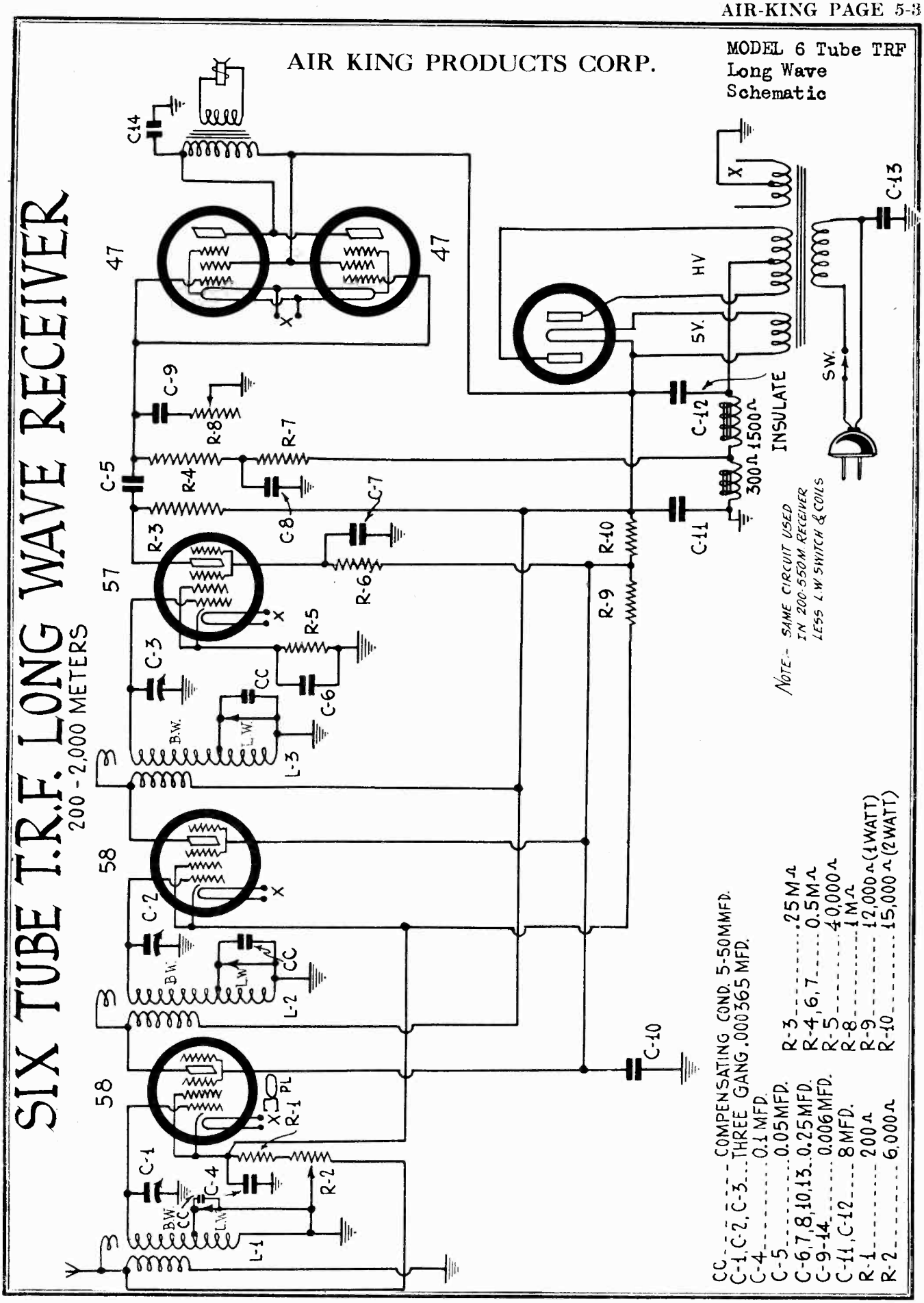
Filaments of tubes connected as indicated by numbers

SIX TUBE T.R.F. LONG WAVE RECEIVER

200 - 2,000 METERS

AIR KING PRODUCTS CORP.

MODEL 6 Tube TRF
Long Wave
Schematic

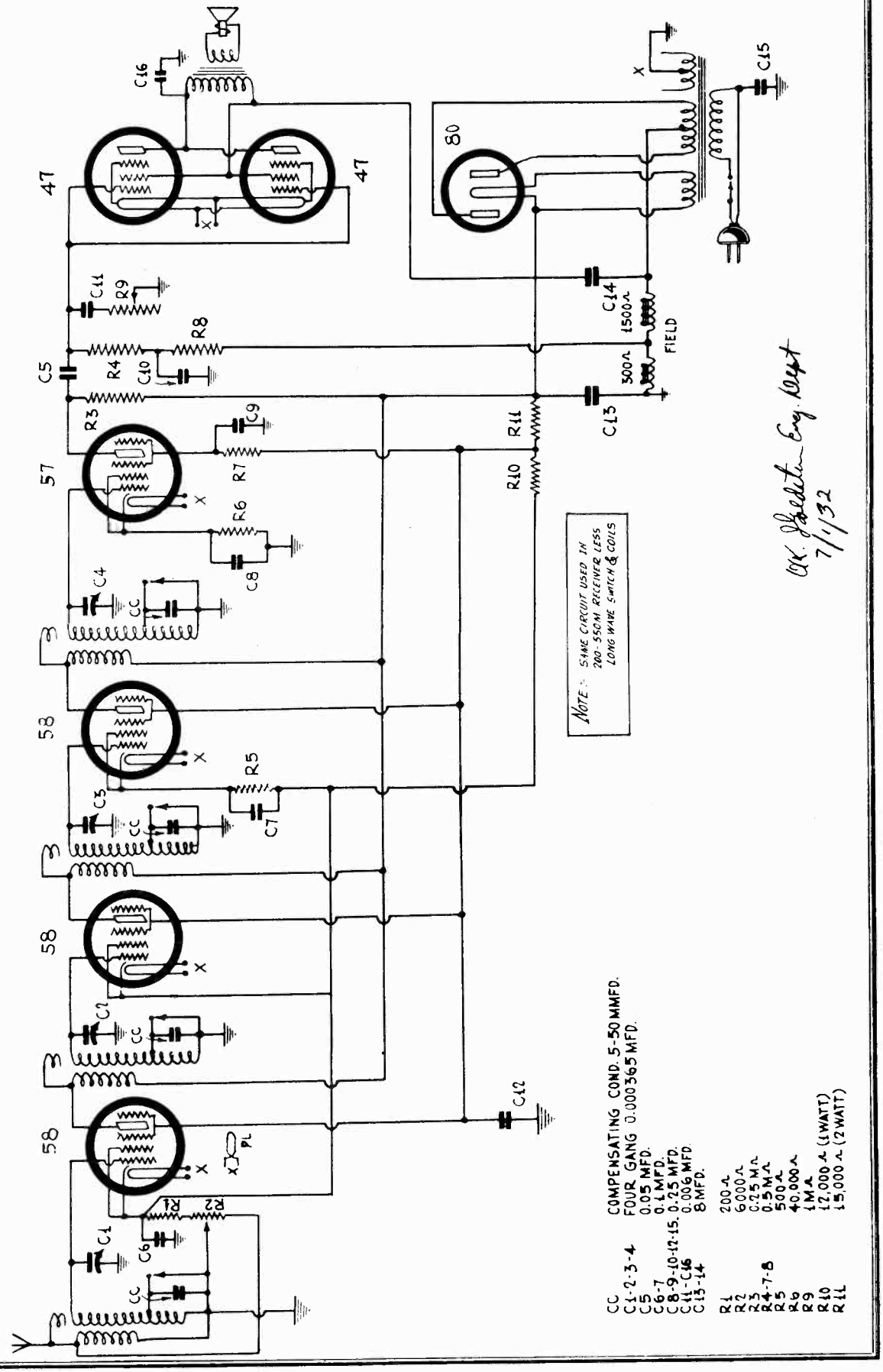


MODEL 7 Tube TRF
Long Wave
Schematic

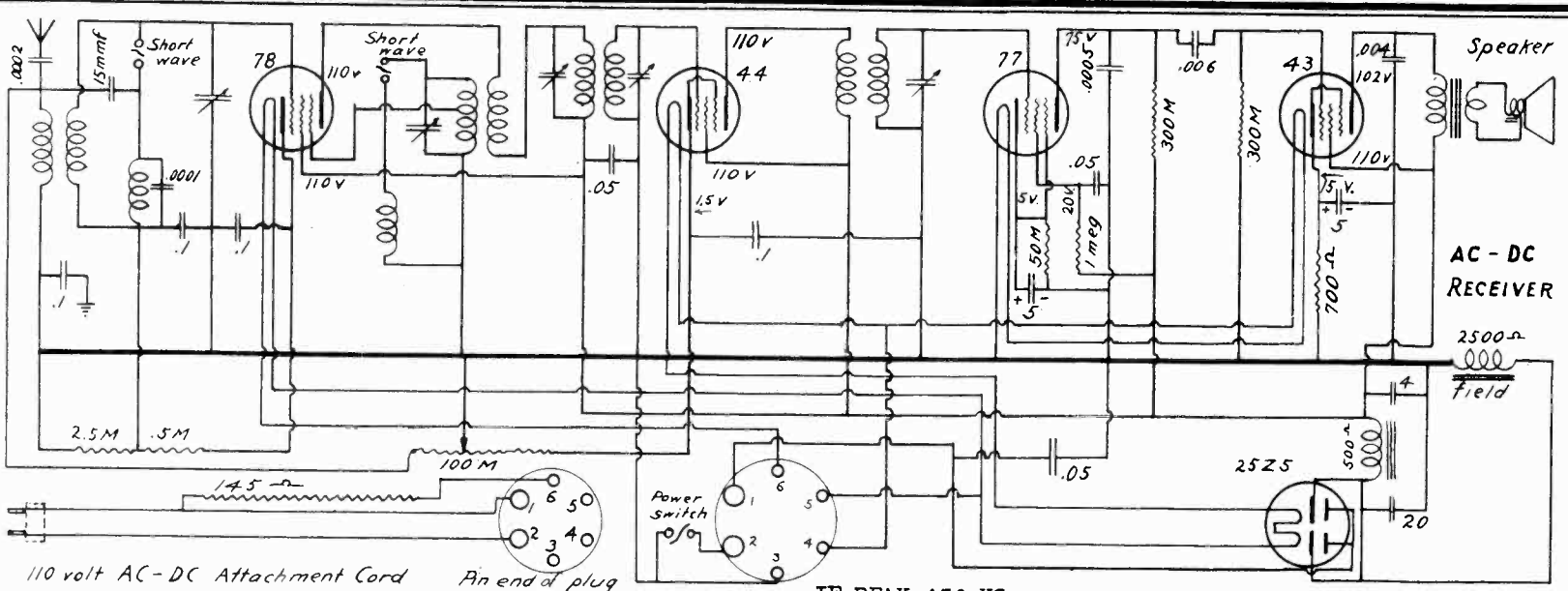
AIR KING PRODUCTS CORP.

SEVEN TUBE SUPER T.R.F LONG WAVE RECEIVER

200-2000 METERS.



CC	COMPENSATING COND. 5-50 MMFD.
C1-2-3-4	FOUR GANG 0.000365 MFD.
C5	0.05 MFD.
C6-7	0.1 MFD.
C8-9-10-12-15.	0.25 MFD.
C11-C16	0.006 MFD.
C13-14	8 MFD.
R1	200Ω
R2	6000Ω
R3	0.25 MΩ
R4-7-8	0.5 MΩ
R5	500Ω
R6	40,000Ω
R9	1 MΩ
R10	12,000Ω (1 WATT)
R11	15,000Ω (2 WATT)



OPERATING INSTRUCTIONS

Long and Short Wave

CAUTION:

This instrument is equipped for operation on 110 volts D. C. or A. C., any frequency from 25 to 133 cycles per second. Before attempting to operate on any other voltage be sure that the proper adaptors are connected and the instructions accompanying them are understood. Special adaptors can be secured from the factory at a slight extra cost. for operating this receiver on automobiles, 32 volt farm light plants and 220 volt A. C. or D. C. ALWAYS plug cord into back of set before plugging into power supply. Cord for 110 volt or 220 volt heats moderately as the cord contains resistance necessary for operation at these voltages. The 20 ft. aerial wire extending from the back of the set should be unwound, laid out along the floor or hung outside a window and is ordinarily all the aerial required. No ground connection should be used. Sometimes results are better if the tip of the antenna wire is connected to a radiator or other ground connection or to an outside aerial.

TO OPERATE:

Turn left hand knob to right as far as it will go. Wait a few moments for tubes to heat. Turn right hand knob slowly back and forth till a station is heard. Numbers on the dial correspond to kilocycle of station when one zero is added. Adjust this knob carefully to secure best tone and adjust left hand knob to volume desired. When left knob is turned entirely to left a click is heard and power is turned off. When operating on D. C. current and set fails to operate after waiting a reasonable time for tubes to heat up, reverse power supply plug.

TO RECEIVE SHORT WAVES:

Push handle of switch in rear toward end of cabinet for short wave position. Local police calls, etc., will then be heard at approximately 65 and 100 on the dial, and amateurs, etc., at various other positions. Often local conditions make short wave reception difficult unless the aerial wire is grounded or attached to outside aerial. Reception of short wave requires a good aerial and more careful adjustment of both knobs than is necessary on the broadcast band.

PHONOGRAPH:

Trace wire from cap of tube in left rear socket to where it solders to bracket in chassis. Note that a black wire connects between the adjacent bracket and chassis. Disconnect black wire at the bracket, inserting small single pole switch between wire and bracket. Solder phonograph pick-up leads to switch terminals.

SERVICE NOTES:

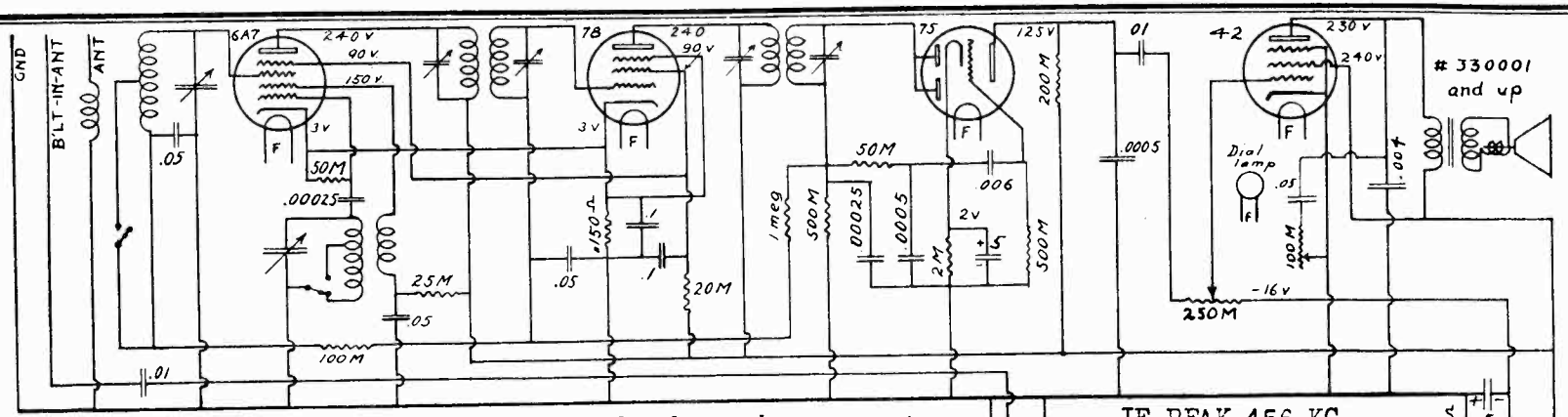
To balance set remove from cabinet. Intermediates are first balanced. Feed a 456 K. C. signal into grid of 78 tube. Adjust double and single trimmers through rear flange of chassis. Next, trim radio frequency coil by first setting tuning condenser to 1400 K. C. on dial, carefully remove from cabinet and attach test oscillator to antenna lead and feed 1400 K. C. signal to antenna coil. Adjust trimmers on tuning condenser to loudest signal.

If used in automobile, antenna stage should be trimmed to car antenna at time of installation.

MODEL F-9505
Schematic,Alignm't
MODEL F-9511
Schematic,Alignm't

ALLIED RADIO CORP.

Model F-9505



CAUTION: *Do not attempt to operate on current other than that noted on instrument*

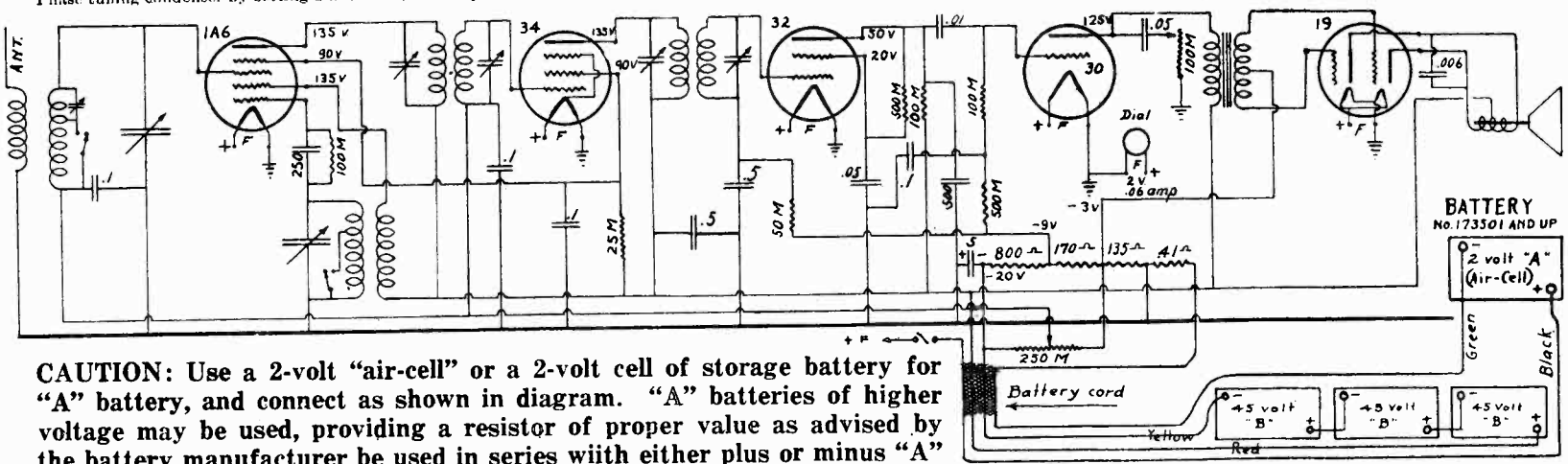
INSTALLATION: Twist "ANT" and "BLT-IN-ANT" leads together for operation without aerial. Best results, however, may be had with a good outdoor aerial especially on short wave.

SHORT WAVE: Left hand knob, when clear to left, is on Short Wave. A one-quarter inch movement to the right and it is on regular broadcast. Beyond this point it functions as a tone control.

PHONOGRAPH: Use single pole toggle switch mounted as near as possible to socket marked "75". Connect one side to green resistor with yellow dot found shunted by .00025 mica condenser and connected to black wire coming from coil can adjacent to 75 tube, connect other side of switch in series with phonograph pickup to ground.

SERVICE NOTES- Intermediate stage is carefully phased to 456 K. C. at the factory. Should rephasing be necessary feed 546 K. C. signal into grid cap of 6A7 tube and adjust double trimmers in top of coil cans to loudest signal. Phase tuning condenser by setting dial to 1400, carefully remove chassis from cabinet, feed 1400 K. C. Signal into "ANT" lead and adjust trimmers on tuning condenser to loudest signal

Model F-9511



CAUTION: Use a 2-volt "air-cell" or a 2-volt cell of storage battery for "A" battery, and connect as shown in diagram. "A" batteries of higher voltage may be used, providing a resistor of proper value as advised by the battery manufacturer be used in series wiith either plus or minus "A" lead. Use three blocks of "B" battery of 45 volts each, connected as shown in diagram.

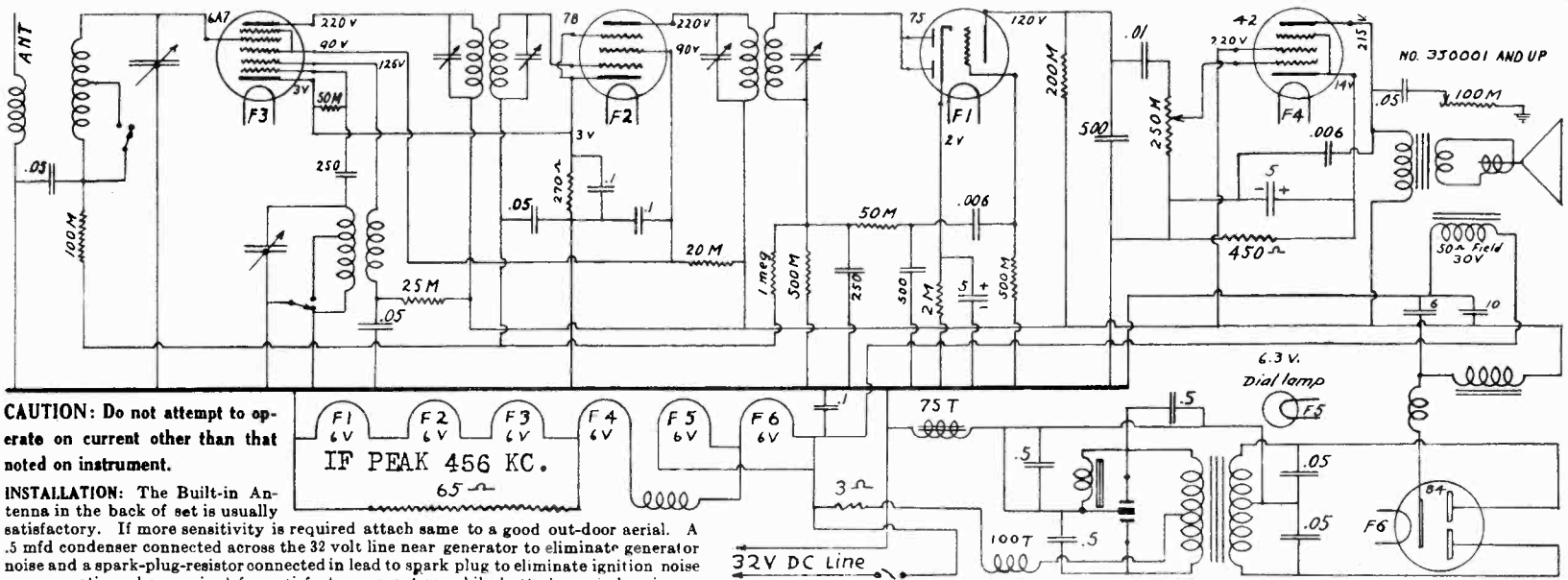
INSTALLATION: A good outdoor aerial will give best results, especially on short wave. No ground wire is usually required.

PHONOGRAPH: Use single pole toggle switch mounted as near as possible to socket marked "32." Cut black wire coming from bottom of coil can adjacent to this tube and connect across switch. Connect phonograph pickup across switch.

SERVICE NOTES: Intermediate stage is carefully phased to 456 k.c. at the factory. Should rephasing be necessary, feed 456 k.c. signal into grid cap of "1A6" tube, and adjust double trimmers in top of coil cans to loudest signal. Phase tuning condenser by setting dial to 1400 k.c., carefully remove chassis from cabinet, feed 1400 k.c. signal into antenna lead and adjust trimmers on tuning condenser to loudest signal.

ALLIED RADIO CORP.

MODEL F-9515
Schematic, Alignm't
MODEL F-9521
Schematic, Alignm't

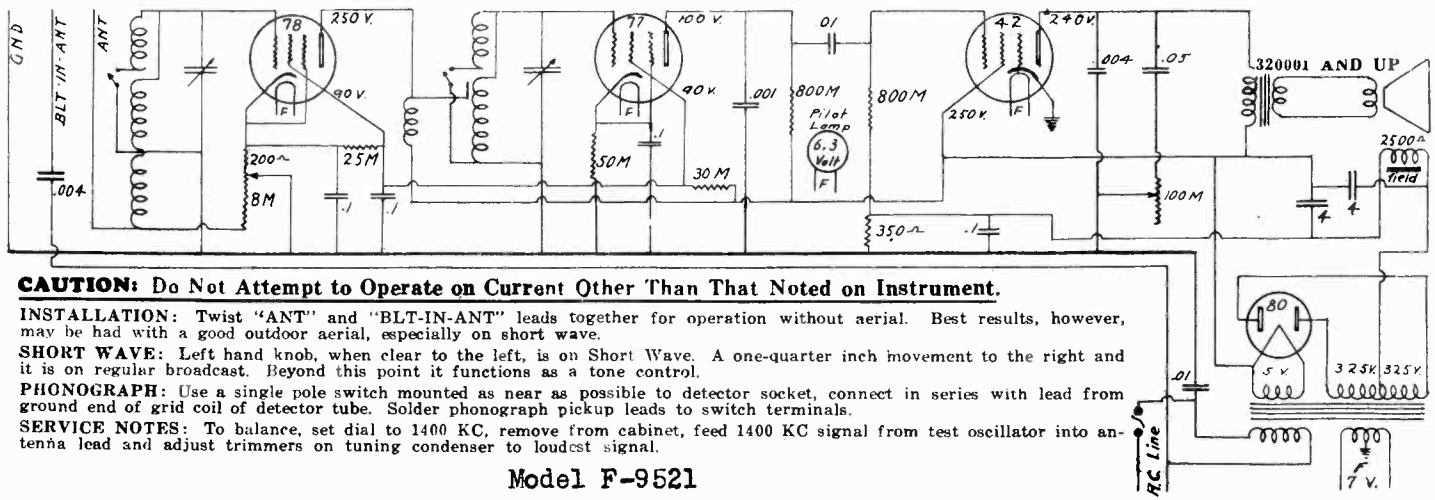


CAUTION: Do not attempt to operate on current other than that noted on instrument.

INSTALLATION: The Built-in Antenna in the back of set is usually satisfactory. If more sensitivity is required attach same to a good out-door aerial. A .5 mfd condenser connected across the 32 volt line near generator to eliminate generator noise and a spark-plug-resistor connected in lead to spark plug to eliminate ignition noise may sometimes be required for satisfactory reception while batteries are charging.

USE NO GROUND CONNECTION ON SET. **SHORT WAVE:** Left hand knob, when clear to left, is on Short Wave. A one-quarter inch movement to the right and it is on regular broadcast. Beyond this point it functions as a tone control **PHONOGRAPH:** Use single pole toggle switch mounted as near as possible to socket marked "75". Connect one side to green resistor with yellow dot found shunted by .00025 mica condenser and connected to black wire coming from coil can adjacent to 75 tube, connect other side of switch in series with phonograph pickup to ground. **SERVICE NOTES-** Intermediate stage is carefully phased to 456 K. C. at the factory. Should rephasing be necessary feed 456 K. C. signal into grid cap of 6A7 tube and adjust double trimmers in top of coil cans to loudest signal. Phase tuning condenser by setting dial to 1400, carefully remove chassis from cabinet, feed 1400 K. C. Signal into "ANT" lead and adjust trimmers on tuning condenser to loudest signal

Model F-9515



CAUTION: Do Not Attempt to Operate on Current Other Than That Noted on Instrument.

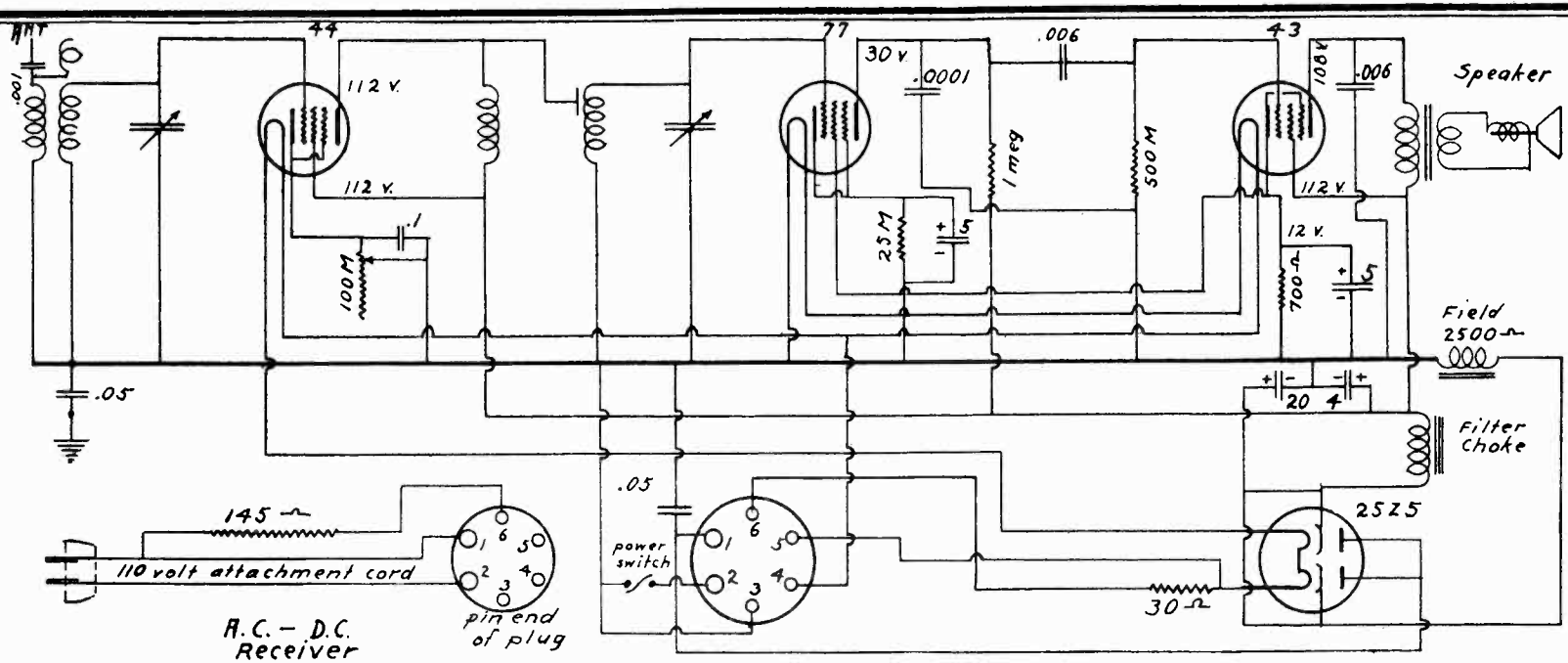
INSTALLATION: Twist "ANT" and "BLT-IN-ANT" leads together for operation without aerial. Best results, however, may be had with a good outdoor aerial, especially on short wave.

SHORT WAVE: Left hand knob, when clear to the left, is on Short Wave. A one-quarter inch movement to the right and it is on regular broadcast. Beyond this point it functions as a tone control.

PHONOGRAPH: Use a single pole switch mounted as near as possible to detector socket, connect in series with lead from ground end of grid coil of detector tube. Solder phonograph pickup leads to switch terminals.

SERVICE NOTES: To balance, set dial to 1400 KC, remove from cabinet, feed 1400 KC signal from test oscillator into antenna lead and adjust trimmers on tuning condenser to loudest signal.

Model F-9521



OPERATING INSTRUCTIONS

CAUTION:

This instrument is equipped for operation on 110 volts D. C. or A. C., any frequency from 25 to 133 cycles per second. Before attempting to operate on any other voltage be sure that the proper adaptors are connected and the instructions accompanying them are understood. Special adaptors can be secured from the factory at a slight extra cost, for operating this receiver on automobiles, 32 volt farm light plants and 200 volt A. C. or D. C. ALWAYS plug cord into back of set before plugging into power supply. Cord for 110 volt or 220 volt heats moderately, as the cord contains resistance necessary for operation at these voltages. The 20 ft. aerial wire extending from the back of the set should be unwound, laid out along the floor or hung outside a window and is ordinarily all the aerial required. No ground connection should be used. Sometimes results are better if the tip of the antenna wire is connected to a radiator or other ground connection or to an outside aerial.

TO OPERATE:

Turn left-hand knob to right as far as it will go. Wait a few moments for tubes to heat. Turn right-hand knob slowly back and forth till a station is heard. Adjust this knob carefully to secure best tone and adjust left-hand knob to volume desired. When left knob is turned entirely to left a click is heard and power is turned off. When operating on D. C. current and set fails to operate after waiting a reasonable time for tubes to heat up, reverse power supply plug.

PHONOGRAPH:

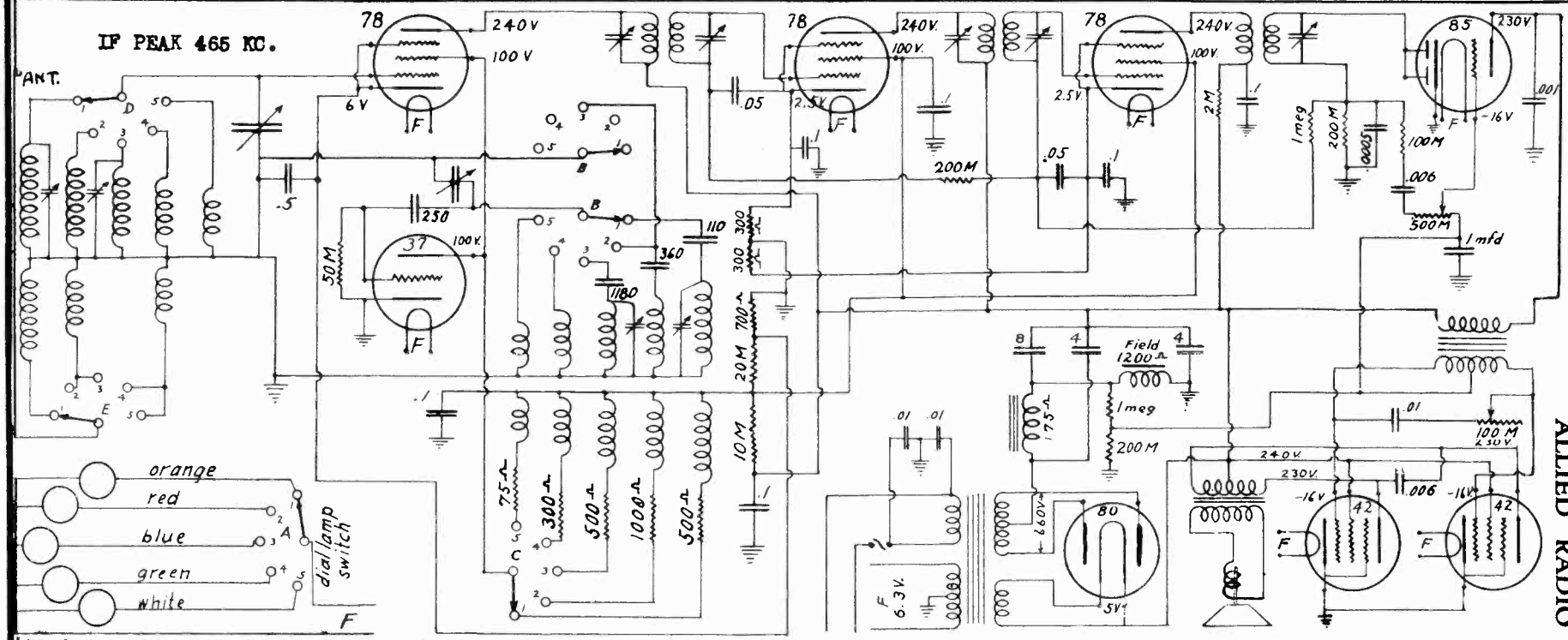
Connect pick-up leads to single pole toggle switch, which may be mounted in large hole in rear flange of set. Unsolder black wire and 5 mfd condenser from ground lug of coil on under side of chassis and resolder to one side of toggle switch. Solder other side of switch to ground lug of coil.

SERVICE NOTES:

To remove set from cabinet, disconnect from power supply, remove knobs, remove back if compact model, and unscrew the four felt headed screws on bottom of cabinet.

To balance set remove from cabinet, turn tuning condenser plates completely out, attach a test oscillator delivering 1712 K. C. to antenna of set and adjust trimmers on tuning condenser to loudest signal. Change test oscillator signal to 1400 K. C., turn tuning condenser until signal is tuned in and check trimmers again without moving tuning condenser.

If used in automobiles antenna stage should be trimmed to the car antenna at time of installation.



The built-in aerial at the back of the set usually gives satisfactory sensitivity when stretched around the edge of the floor or along the picture moulding of the room. A good outside aerial connected to the built-in aerial sometimes increases sensitivity. Power noise interferes especially with short-wave reception. If set is located where power noise is prevalent it may be necessary to install an aerial high above the street and use a "transposition" lead-in to the set. Any radio dealer can supply such an aerial kit with full instructions for installing.

CONTROL KNOBS:

The lower middle knob is for selecting the various frequency bands as indicated on the dial. The upper middle knob is tuning control. The right-hand knob is power switch and volume control and the left-hand knob is tone control.

PHONOGRAPH:

Mount a single pole toggle switch and two insulated pin jacks in the rear of the chassis near the tube socket marked "85," connect one side of the switch to one pin jack, the remaining pin jack to one outside terminal of the volume control and the remaining switch terminal to the other outside terminal of the volume control. Plug the phonograph pickup leads into the pin jacks.

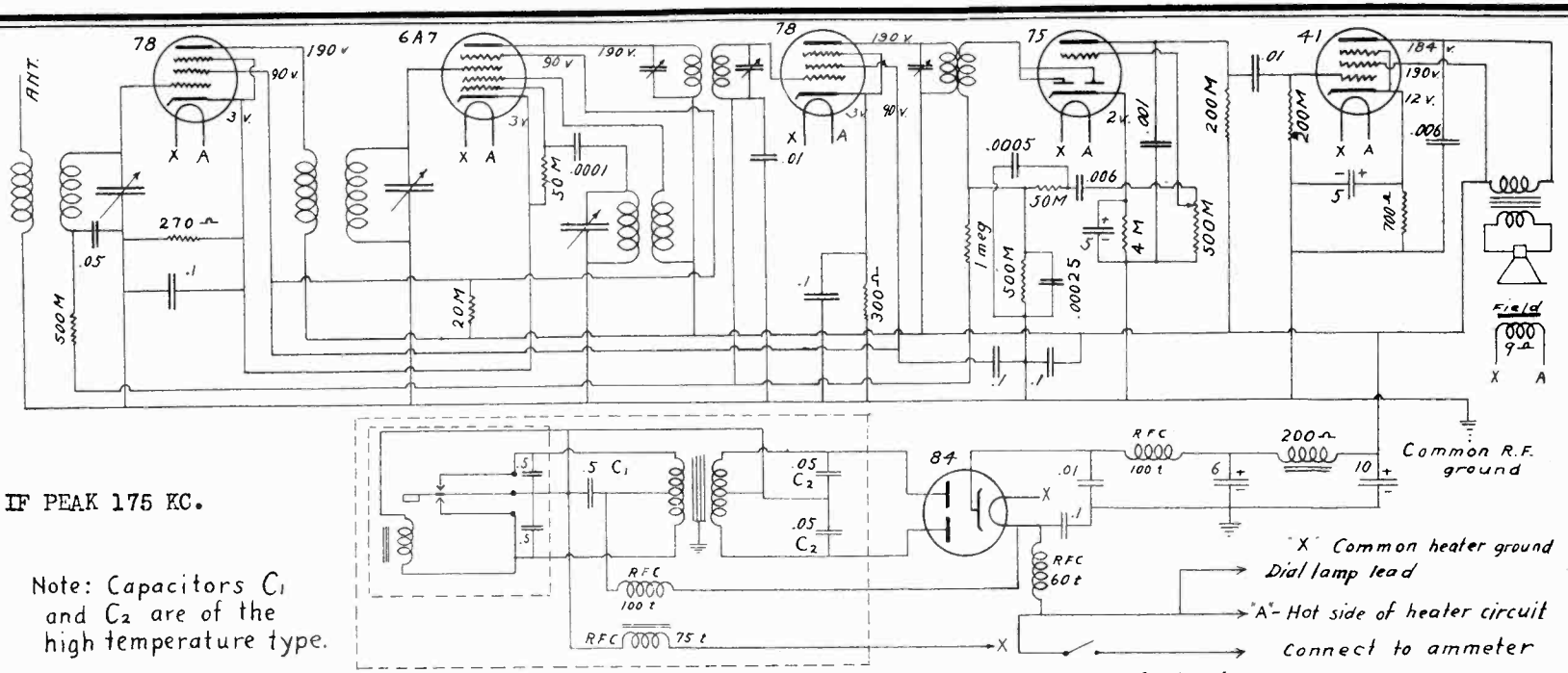
SERVICE NOTES:

The intermediate stages are carefully phased to 456 kilocycles at the factory. Should rephasing be necessary, feed a 456 kilocycle signal from a test oscillator to the grid cap of the tube marked "78," located at the rear end of the tuning condenser, then adjust the double trimmers in the top of the coil cans nearest this tube, also the single trimmer in the top of the coil can near the "85" tube, to loudest volume, being sure to keep the oscillator signal at a low volume level. In trimming the frequency bands, first set the dial to the third group of figures from the right-hand end. Trim the "red" band first by adjusting the trimmers on the top of the tuning condenser until a signal of the proper frequency applied to the built-in aerial is heard at its loudest. Next, trim the "orange" band by adjusting the three-plate trimmers, located on the underside of the chassis, to loudest volume with proper signal frequency applied to the antenna. Next, trim the "blue" band by adjusting the two-plate trimmers located adjacent to the three-plate trimmers, to loudest volume with the proper signal frequency applied to the antenna. In trimming the various bands be sure that the band switch is set to the proper band as indicated by the color of the dial lamp. Also, keep the oscillator signal to as low volume level as possible for accuracy.

NOTE: Should it be necessary to write to the factory for parts or information, always give the serial number of the set as stamped on the back of the chassis.

SHORT WAVE TIPS:

In listening for short-wave broadcast DON'T forget to consider the difference in time between the location of the broadcaster and the receiver. DON'T expect to hear a station because it is on the air, as many things govern short-wave reception. DON'T get discouraged if reception is poor one night; it may be fine the next. DON'T expect stations to tune broadly; most stations tune sharply. DON'T tune below 10,000 kilocycles (above 30 meters) for distant stations in daylight. DON'T tune above 12,000 kilocycles (below 25 meters) for distant stations after dark. DON'T expect to find stations on all parts of the dial. Short-wave stations are widely separated, except in a few instances. DON'T skim over the dial. It requires some knowledge of tuning to get good results. Tune very slowly. DON'T pass up any weak signal, as it may often be brought in stronger by careful tuning.



IF PEAK 175 KC.

Note: Capacitors C_1 and C_2 are of the high temperature type.

After the set has been unpacked, remove the four screws from bottom of cabinet, remove the front cover by carefully inserting screw driver at either side and exerting slight twisting pressure, slide chassis forward out of cabinet and inspect tubes to make sure if they are completely down in their sockets, after which replace chassis, front of cabinet and four screws as they were originally.

Determine most satisfactory mounting position on bulkhead which should be at the left hand side or directly in front of steering column. Spot the mounting bolt location and drill ½" diameter hole. Insert bolt through hole and assemble washer and nut on engine side. Hang receiver over bolt head and tighten nut.

Attach flexible shafts to control unit by first inserting shaft as far in as possible and then tighten set screws of shaft housing, being careful it is not so tight as to cause shaft to bind in housing.

Mount control unit on steering column in approximately correct position, set pointer to 530 on dial, turn upper control of receiver to extreme clockwise position, carefully place right hand shaft in position on upper receiver control and left hand shaft on lower control and tighten set screws securely.

Adjust control unit position so that shafts leave set with least amount of bend possible and fasten securely in this position. Trial of controls will show best location for smooth operation.

Attach heavy rubber covered lead to ammeter terminal.

Connect pilot light wire from control head to short black wire on set, making connection close to set, and tape up joint. Ground shield by loosening screw under nearest corner of set and connecting wire therefrom to end of shield and tighten up screw.

Disconnect ignition leads from spark plugs, attach one suppressor to top of each plug and reattach the ignition lead to free end of suppressor. Disconnect center wire from distributor head, and substitute distributor suppressor, then plug center wire into free end of suppressor.

Attach generator bypass condenser to generator frame by means of screw holding cut-out. Connect wire from condenser to generator side of cut-out switch.

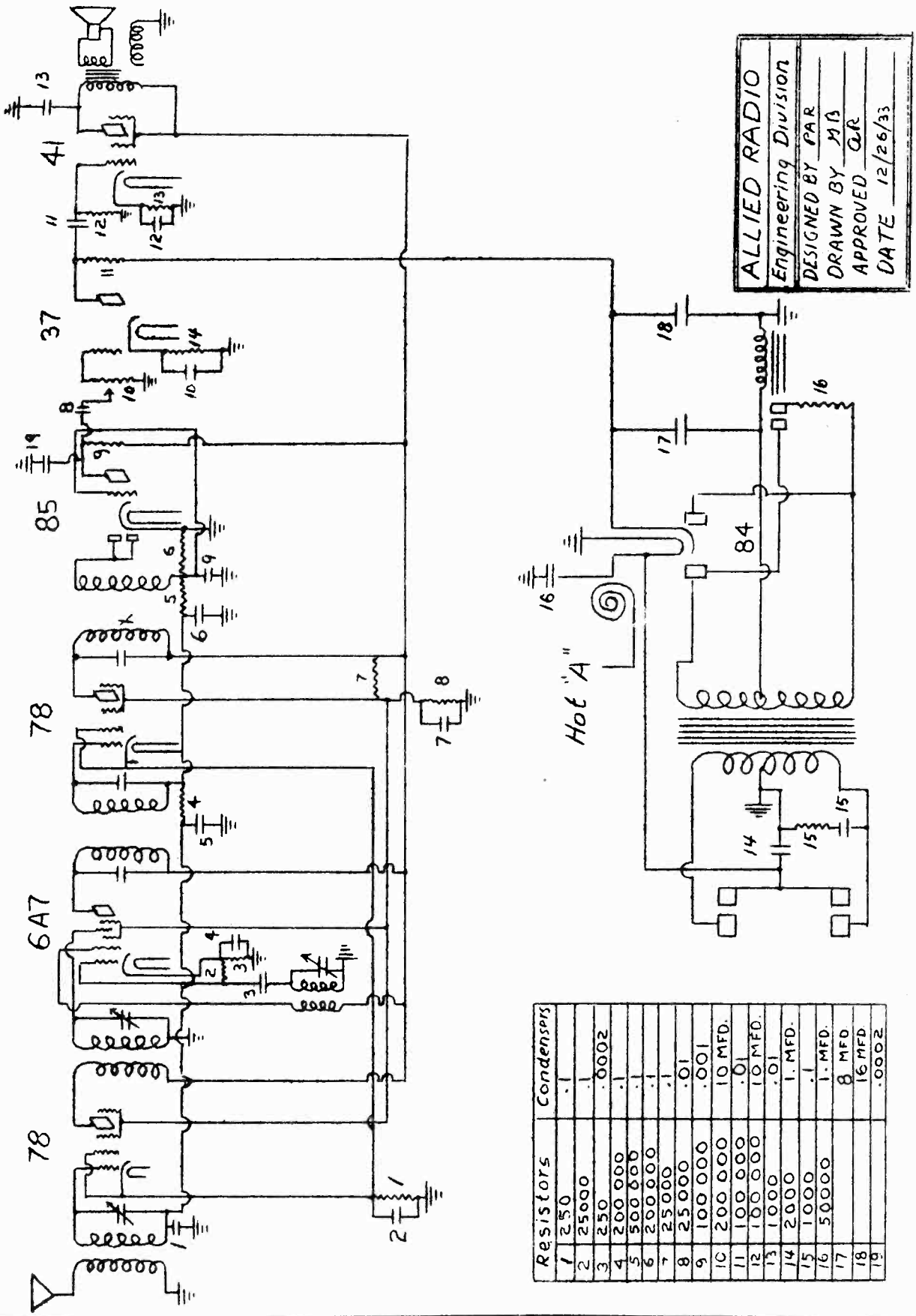
Turn left hand knob on control head to right. If connection directions have been correctly followed, dial should become illuminated immedately and the tubes reach correct operating temperature in approximately 30 seconds.

Balancing Intermediate Frequency Coils. These are peaked to 175 K. C. and are trimmed through the top of the tall cans by means of a small screwdriver and a 5-16" socket wrench. Chassis must first be removed from cabinet and signal from test oscillator fed into grid cap of the 6A7 tube.

Balancing R. F. Coils. The tuning control must first be attached to tuning condenser shaft with pointer set to 530 when tuning condenser is turned to maximum. Tune in a weak signal at its proper dial marking near 1400 and adjust first and second trimmers on variable from front of chassis for loudest signal. If signal does not come at proper dial setting carefully adjust rear trimmer on variable to shift signal to its proper location and then readjust first and second trimmers. After reinstalling set in car slightly readjust first trimmer through hole in top of cabinet.

ALLIED RADIO CORP.

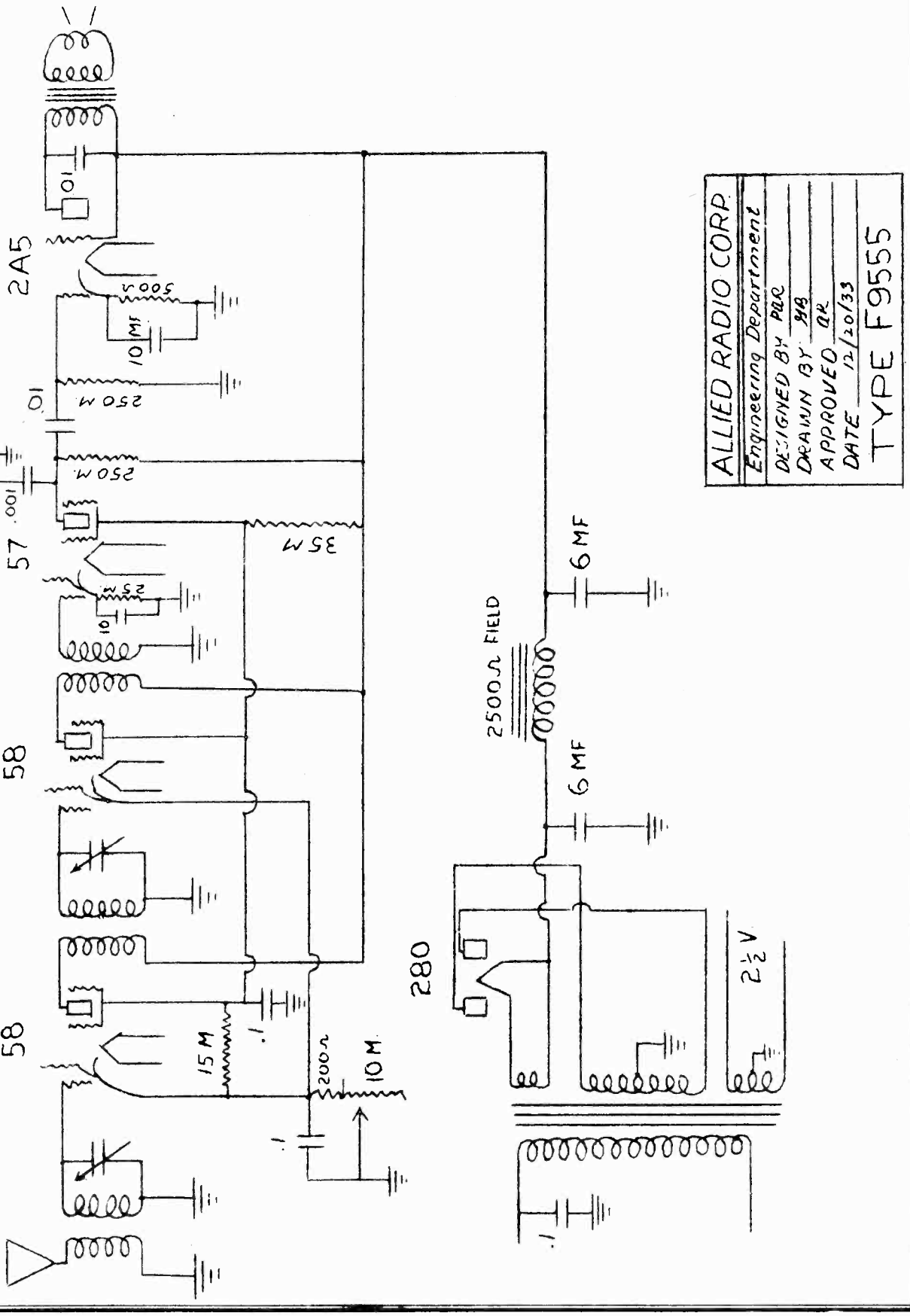
MODEL F-9551
Schematic



	Resistors	Condensers
1	250	.1
2	25000	.1
3	250	.0002
4	200 000	.1
5	500 000	.1
6	200 000	.1
7	25000	.1
8	25000	.01
9	100 000	.001
10	200 000	10 MFD.
11	100 000	.01
12	100 000	10 MFD.
13	1000	.01
14	2000	1. MFD.
15	1000	.1
16	50000	1. MFD.
17		8 MFD
18		16 MFD
19		.0002

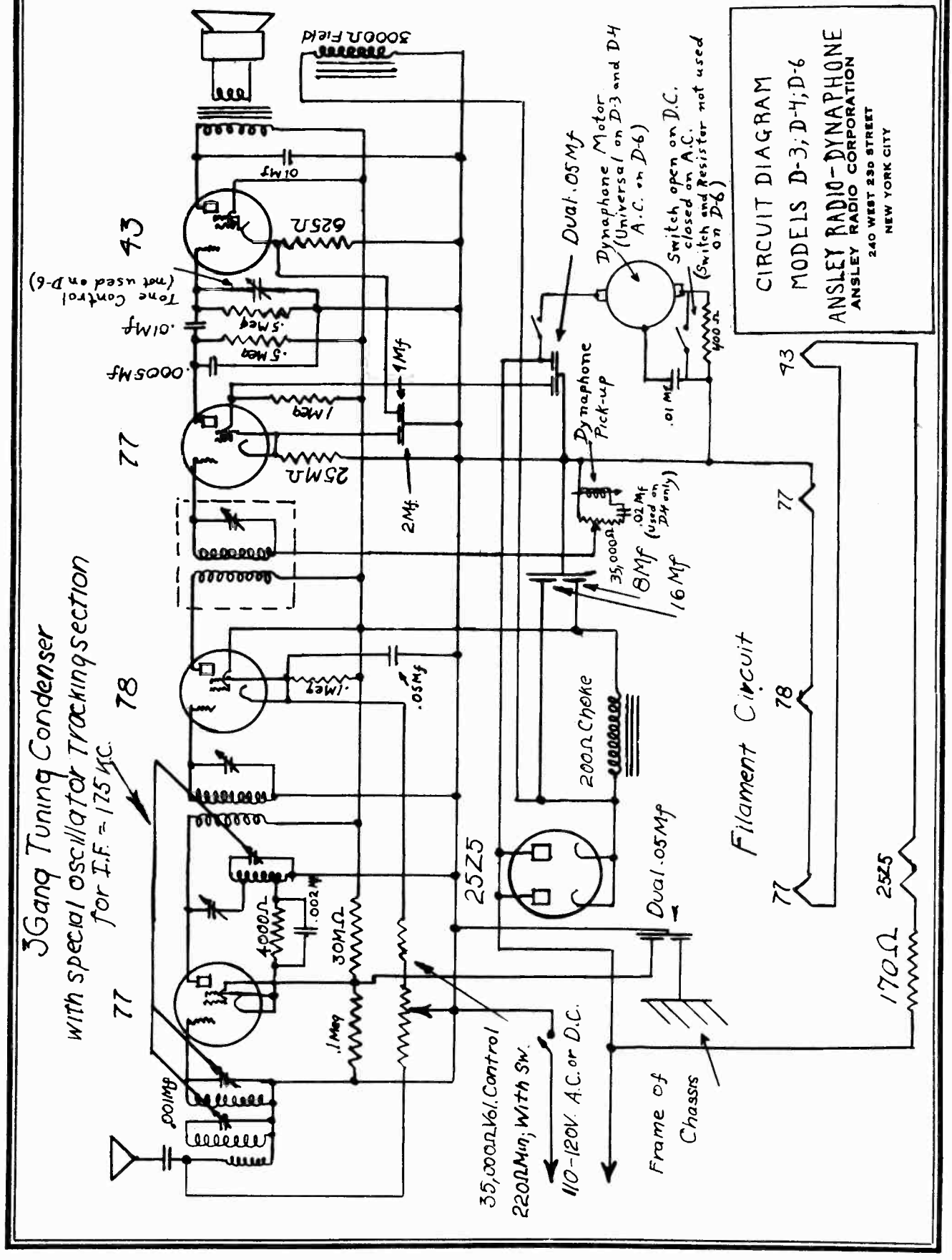
MODEL F-9555
Schematic

ALLIED RADIO CORP.



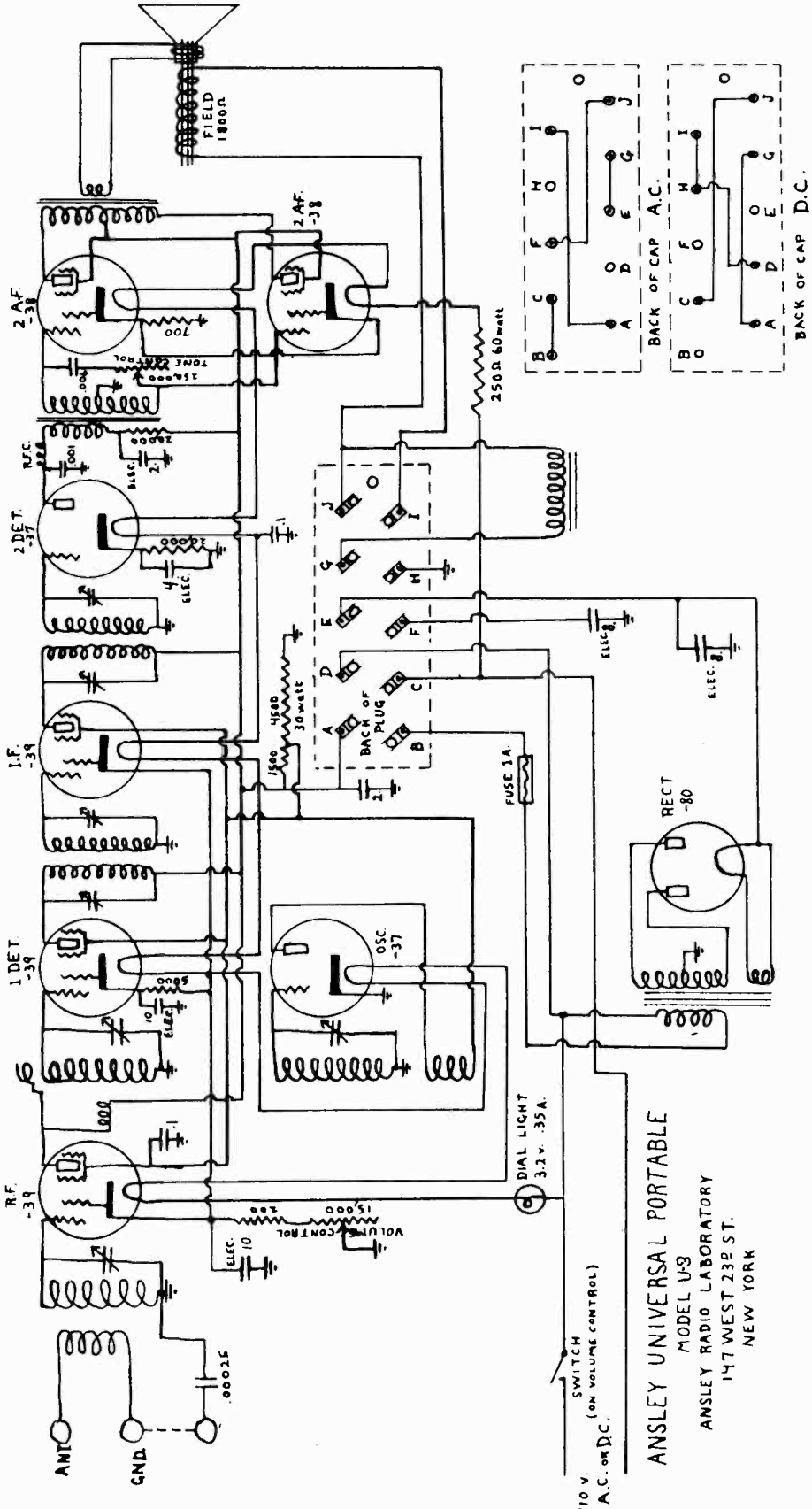
ANSLEY RADIO CORP.

MODEL D-3, D-4, D-6
Schematic



MODEL U-3
Schematic

ANSLEY RADIO CORP.

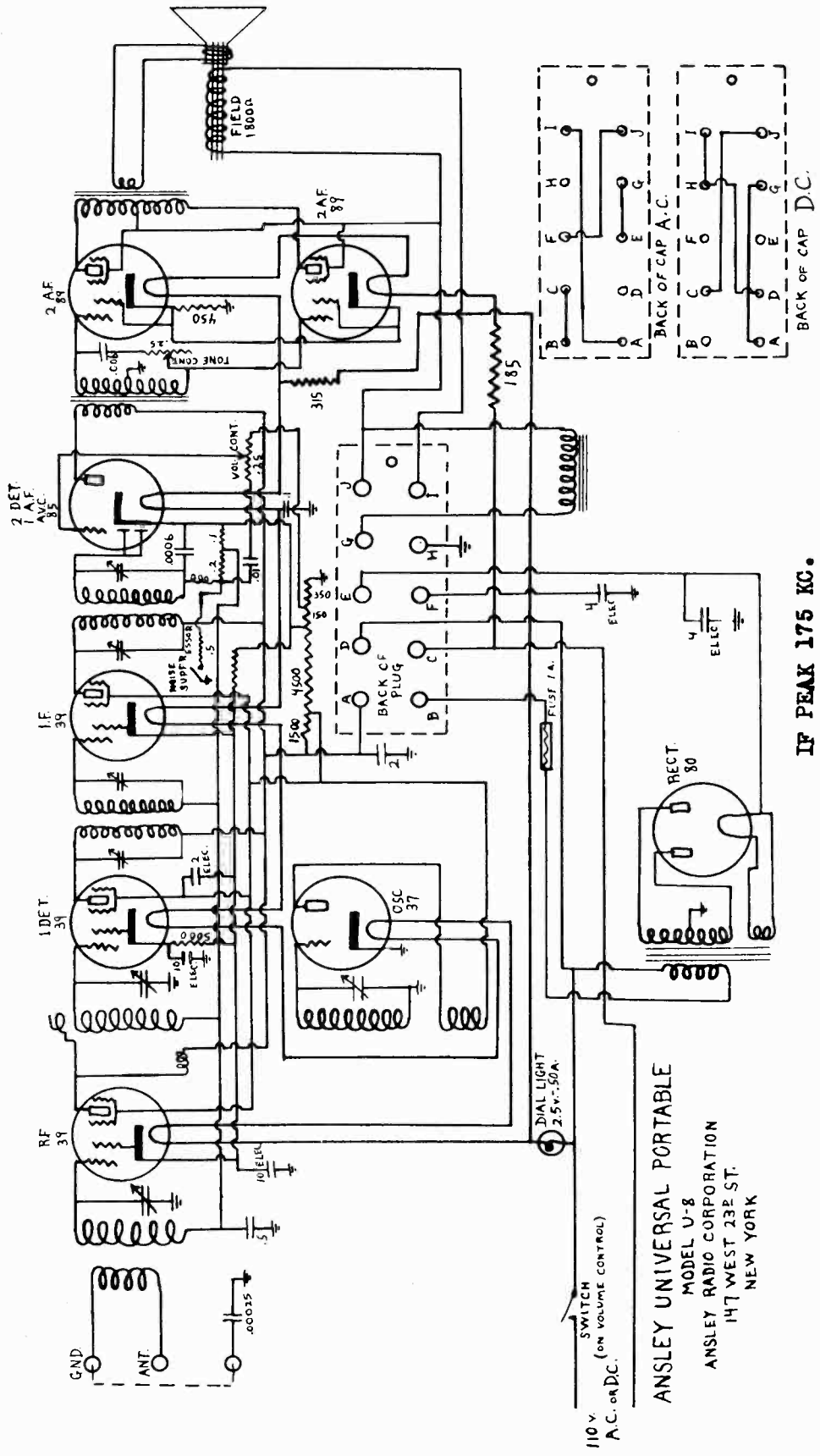


IF PEAK 175 KC.

ANSLEY UNIVERSAL PORTABLE
MODEL U-3
ANSLEY RADIO LABORATORY
147 WEST 23rd ST.
NEW YORK

MODEL U-8
Schematic

ANSLEY RADIO CORP.



ATWATER-KENT MFG. CO.

MODEL 165-Q, 525-Q
Sooket, Trimmer, Parts

MODEL 165-Q

26809	Cabinet, less screen
26679	Screen
25745	Name decalcomania
25965	Tone decalcomania
24278	Knob (tuning and volume)
25145	Knob (tone)
25022	Variable condenser
26727	Dial assembly
25692	Volume control, .5 U
25004	Volume control bracket
24327	Shield for T5
24554	Shield for T4 includes A5
36980	Tone control and police switch
25226	Shaft and blade

TRANSFORMER

Code No.	Part No.	Name of Part
T1	37080	No. 1 R. F. T.
T2	37090	No. 2 R. F. T.
T3	37110	Osc. T.
T4	37180	No. 1 I. F. T.
T5	37190	No. 2 I. F. T.
T6	37150	Input T.

RESISTORS

Code No.	Part No.	Name of Part
R1	30340	Red-blue, .1 U, 1/3-W.
R2	30390	Red-bl'k, 20,000 Ω, 1/3-W.
R3	30340	Red-blue, .1 U, 1/3-W.
R4	30380	Red-green, 3,300 Ω, 1/3-W.
R5	36430	Blue-yel., 5,000 Ω, 1/3-W.
R6	30370	Green, 2 U, 1/3-W.
R7	31970	Red-yel., .25 U, 1/3-W.
R8	30340	Red-blue, .1 U, 1/3-W.
R9	30360	Gray-blue, 1 U, 1/3-W.
R10	30320	Maroon, 10,000 Ω, 1/3-W.
R11	36240*	Wire wound, 1.03 Ω

* A No. 37120 resistor (1.03 Ω) is supplied with set for use with 3-V. dry "A" battery.

CONDENSERS

Code No.	Part No.	Name of Part
C1	31160	.05 MF, 100-V., NI
C2	31160	.05 MF 100-V., NI
C3	33930	25 MMF, 500-V.
C4	36950	730 MMF, 100-V.
C5	27630	.01 MF, 200-V., IND.
C6	27630	.01 MF, 200-V., IND.
C7	27630	.01 MF, 200-V., IND.
C8	21160	200 MMF, 450-V.
C9	29890	.005 MF, 450-V., IND.
C10	22472	7 MF, 200-V.
	34010	Multiple by-pass, J-15

TRIMMER CONDENSERS

Code No.	Part No.	Name of Part
A4	24495	Single I. F.
A5	31290	Single I. F.
A6	33080	Single I. F.

SOCKETS

Part No.	Name of Part
24494	6 prong
24492	4 prong
25196	Speaker

165-Q SPEAKER No. 37170

525-Q SPEAKER No. 39200

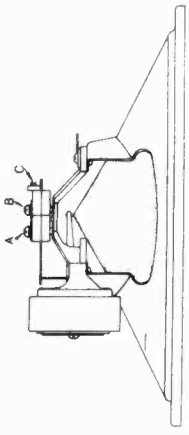
Part No.	Name of Part
26874	Cable and plug assembly (525-Q)
26755	Cable and plug assembly (165-Q)
27128	Magnet
27129	Magnet clamping plate
8188	8/32 hex. nut
9898	No. 6 lock washer
23318	No. 2 washer
27138	Clamping block top
27139	Clamping block bottom
27141	Adjusting screw, 6/32
27142	Cover plate
27143	Mounting bracket
27144	Sound unit assembly, less magnets
27145	Conehead assembly
27146	Coil
27147	Armature
27211	Mount. brackets, pair (525-Q)
27148	Spring
27149	Terminal

MODEL 525-Q

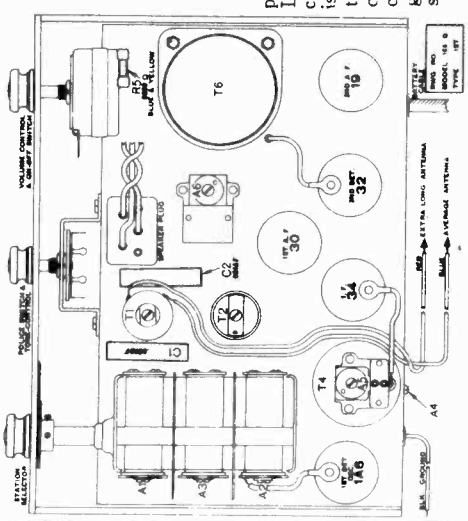
(For parts not listed below refer to Model 165-Q parts list)

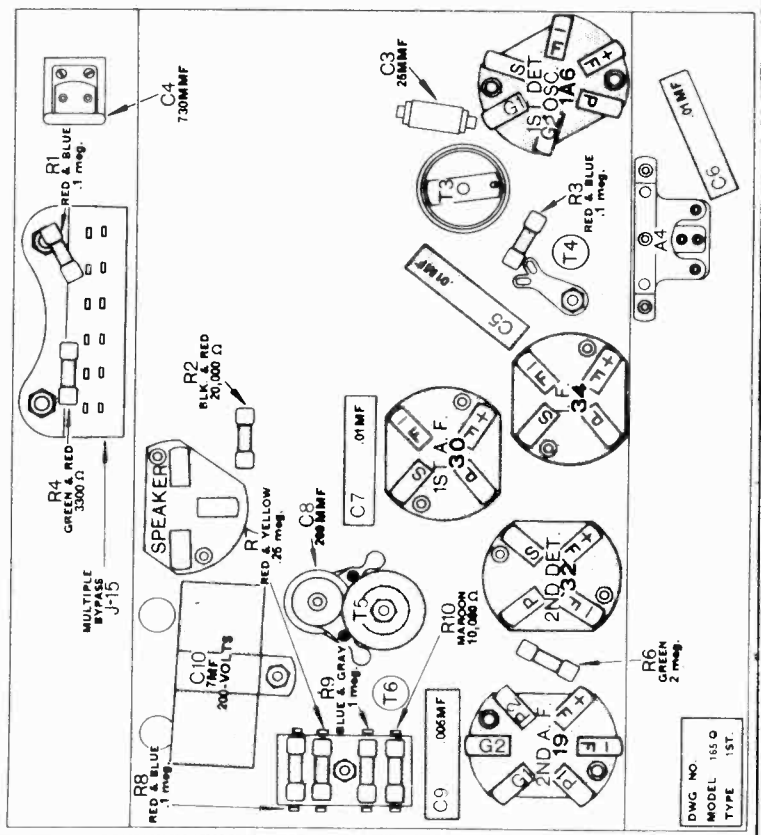
Part No.	Name of Part
26565	Variable condenser assembly
27305	Knob shaft
37450	Osc. T (T3)
26719	Dial light socket
26722	Battery cable with resistor
26519	Dial assembly
26721	Dial lamp (air cell, 2-V., 60 MILS.)
26642	Base cover
26569	Knob (tuning and volume)
26571	Knob (tone)
36250*	Wire wound, 1.15 Ω (R11)
26669	Shipping container
26545	Escutcheon nameplate
25691	Escutcheon window
26718	Volume control, .5 U
37490	Tone control switch
26573	Shaft and blade

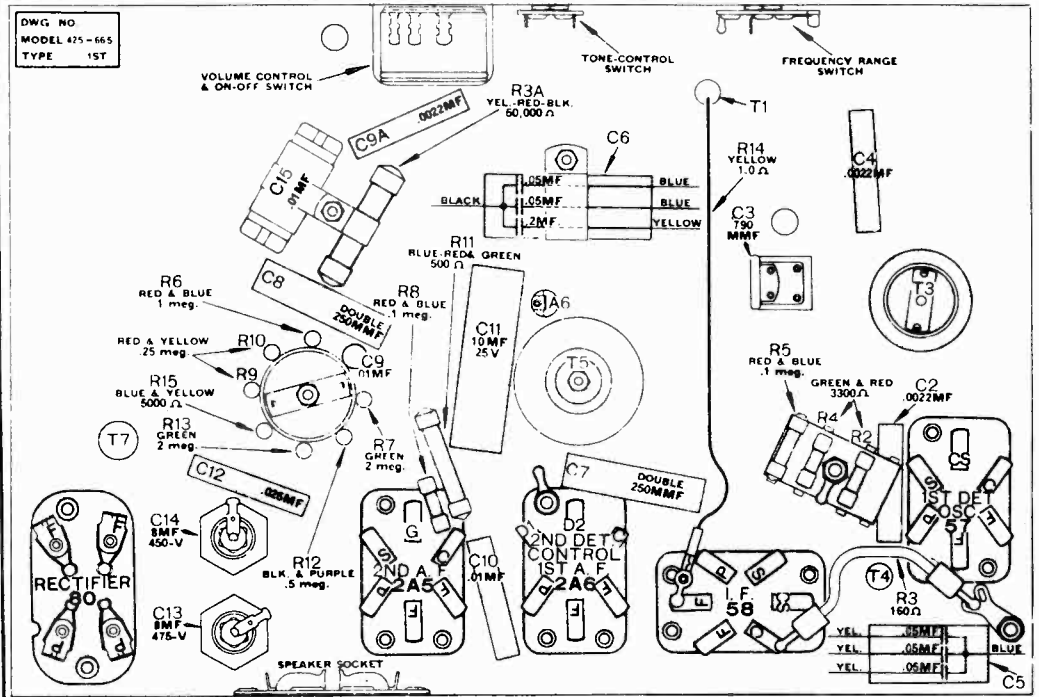
* A No. 37130 resistor (1.15 Ω) is supplied with set for use with a 3-V. dry "A" battery.

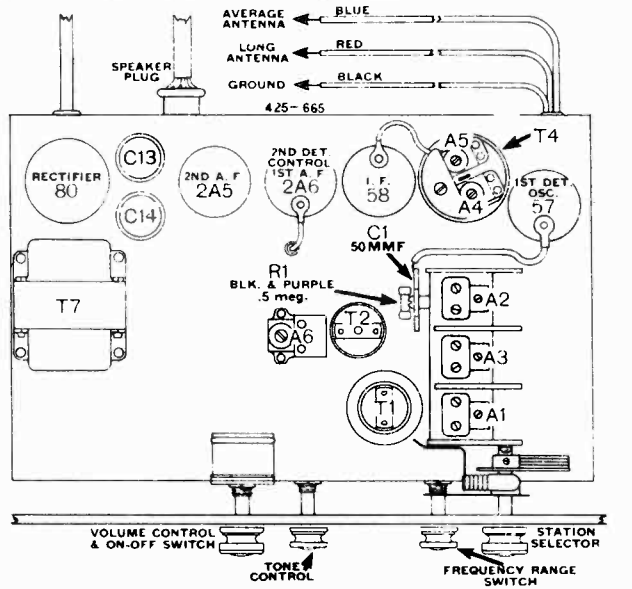


Speaker Adjustment: When adjustment is required, put the set and speaker in operation and tune in a signal. Loosen screw A and tighten B, or vice versa, in order to center the armature in the magnet gap. If the armature is not correctly centered, it may strike against one pole of the magnet and cause chattering. If the speaker overloads or chatters only on a very strong signal, turn screw C anti-clockwise: This tightens the armature movement. (In general it is not advisable to disturb the adjustment of screw C.)









The circuit of these models is similar to that used in Models 165, 185 and 525.

MODELS 425 and 665

Part No.	Name of Part
26177	Variable condenser assembly
20116	Knob shaft bracket
17961	Dial rubber
24122	Dial gear
25885	Dial assembly
15404	Dial lamp, 2.5-V.
25811	Knob, volume and tuning, 425
25812	Knob, tone and range, 425
25737	Knob, volume and tuning, 665
25738	Knob, tone and range, 665
26742	Escutcheon, 425
26774	Escutcheon, 665
30560	Tone control switch complete
24207	Shaft and blade
20096	Shaft key
24079	Volume control, .5 U
24052	Volume control bracket
37050	Range switch
26903	Shaft and blade

TRANSFORMERS

Code No.	Part No.	Name of Part
T1	37210	No. 1 R. F. T.
T2	37220	No. 2 R. F. T.
T3	37230	Osc. T.
T4	26878	No. 1 I. F. T.
T5	37590	No. 2 I. F. T.
T6	21672	Output T.
T7	25191	Power T.

RESISTORS

Code No.	Part No.	Name of Part
R1	30350	Bl'k-purple, .5 U, 1/3-W.
R2	30380	Red-green, 3300 Ω, 1/3-W.
R3	28950	Flexible, 160 Ω
R3A	34340	Yel.-red-bl'k, 50,000 Ω, 1½-W.
R4	30380	Red-green, 3300 Ω, 1/3-W.
R5	20980	Red-blue, .1 U, ½-W.
R6	30340	Red-blue, .1 U, 1/3-W.
R7	30370	Green, 2 U, 1/3-W.
R8	30340	Red-blue, .1 U, 1/3-W.
R9	31970	Red-yel., .25 U, 1/3-W.
R10	31970	Red-yel., .25 U, 1/3-W.
R11	32010	Blue-red-green, 500 Ω,
R12	30350	Bl'k-purple, .5 U, 1/3-W.
R13	30370	Green, 2 U, 1/3-W.
R14	31860	Flexible, 1 Ω
R15	36430	Blue-yel., 5000 Ω, 1/3-W.

CONDENSERS

Code No.	Part No.	Name of Part
C1	30260	50 MMF, 450-V.
C2	33660	.0022 MF, 450-V., IND.
C3	36020	790 MMF, 100-V.
C4	33660	.0022 MF, 400-V., IND.
C5	32410	.05, .05 and .05 MF, 100-V.
C6	32390	.05, .05 and .2 MF, 200-V.
C7	33630	250 MMF (double), 450-V., IND.
C8	33630	250 MMF (double), 450-V., IND.
C9	27630	.01 MF, 200-V., IND.
C9A	33660	.0022 MF, 450-V., IND.
C10	27630	.01 MF, 200-V., IND.
C11	25379	10 MF, 25-V., dry electrolytic
C12	30250	.025 MF, 450-V., NI
C13	25168	8 MF, 475-V., electrolytic
C14	26381	8 MF. 450-V. (blue)
C15	23250	.01 MF, 450-V.

TRIMMER CONDENSERS

Code No.	Part No.	Name of Part
A4, 5	30110	Double I. F.
A6	37910	Single I. F.

SOCKETS

Part No.	Name of Part
22733	6 prong
22689	4 prong rectifier
21336	4 prong speaker

MISCELLANEOUS

Part No.	Name of Part
21877	No. 1 I. F. T. shield
24327	No. 2 I. F. T. shield
22683	Tube shield
24677	Base cover
26792	Instruction and log card, F1122
24725	Shipping container

425-665 SPEAKER No. 33400

Part No.	Name of Part
18870	Field coil, 2000 Ω
21672	Output T.—(T6)
19465	Diaphragm
19789	Cable and plug
15079	Speaker plug
23657	Choke (CK1)

MODEL 217,427,667
Socket,Trimmer,Parts

ATWATER-KENT MFG. CO.

217 SPEAKER No. 36300

Part No.	Name of Part
21161	Diaphragm
18870	Field coil
21672	Output transformer
24206	Cone housing
23657	Choke coil
24064	Speaker mounting bracket
19469	Diaphragm holding segment (2 used)
24161	Diaphragm holding segment (1 used)

427-667 SPEAKER No. 33490

Parts not listed below will be found in Model 217 List.

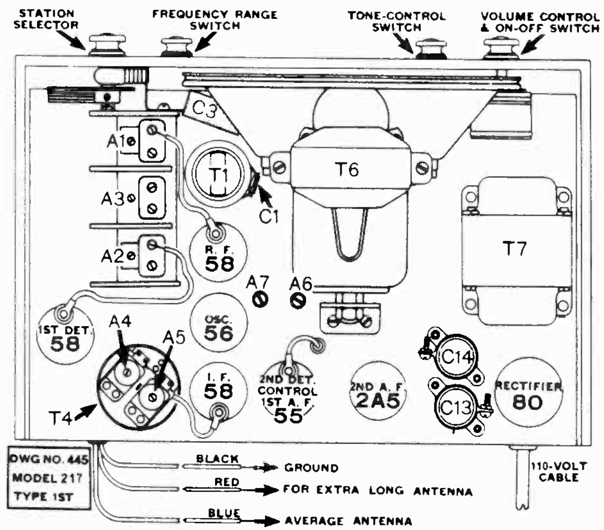
Part No.	Name of Part
19465	Diaphragm
19789	Cable and plug assembly
24705	Cone housing
19469	Diaphragm holding segment (3 used)

MODEL 667

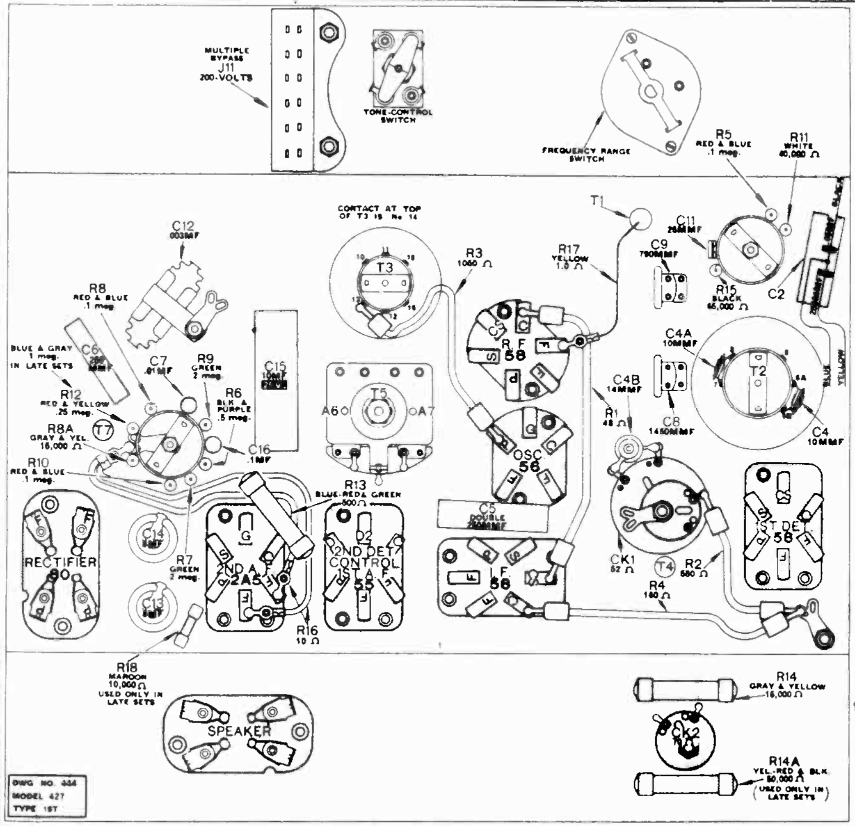
Parts not listed below will be found in Model 217 List.

Part No.	Name of Part
25864	Escutcheon name plate
24677	Bottom cover
25737	Knob—dial and volume control
25738	Knob—frequency range and tone
24725	Shipping container

MODELS 217, 427 AND 667



In Models 427 and 667, the speaker is mounted in the cabinet under the chassis. Trimmer condenser A3 is not used in some of these sets.
It is important to keep the grid lead to the 55 tube removed from the 2A5 tube.



MODEL 217

Part No.	Name of Part
24079	Volume control, .5 Ʊ

TRANSFORMERS

Code No.	Part No.	Name of Part
T1	34140	No. 1 R. F. T.
T2	34150	No. 2 R. F. T.
T3	34160	Oscillator T.
T4	25841	No. 1 I. F. T.
T5	25842	No. 2 I. F. T.
T6	21672	Output T.
T7	25728	Power T.

RESISTORS

Code No.	Part No.	Name of Part
R1	19820	Flexible, 48 Ω
R2	23780	Flexible, 550 Ω
R3	16320	Flexible, 1050 Ω
R4	28950	Flexible, 160 Ω
R5	20980	Red-blue, .1 Ʊ, ½-W.
R6	20930	Bl'k-purple, .5 Ʊ, ½-W.
R7	20940	Green, 2 Ʊ, ½-W.
R8	20980	Red-blue, .1 Ʊ, ½-W.
R8A	20960	Gray-yel., 15,000 Ω, ½-W
R9	20940	Green, 2 Ʊ, ½-W.
R10	20980	Red-blue, .1 Ʊ, ½-W.
R11	26160	White, 40,000 Ω, ½-W.
R12	20920*	Red-yel., ¼ Ʊ, ½-W.
R13	32010	Blue, red, green, 500 Ω, 1-W
R14	27220	Gray-yel., 15,000 Ω, 1½-W
R14A	34340	Yellow, red, black, 50,000 Ω, 1½-W.
R15	21040	Black, 65,000 Ω, ½-W.
R16	17077	Flexible, 10 Ω
R17	31860	1.0 Ω, yellow, flexible
R18	30320	Maroon, 10,000 Ω, 1/3-W. (used only in late sets)

* R12 is 1.0 Ʊ blue and gray number 30360 in late model sets.

CONDENSERS

Code No.	Part No.	Name of Part
C1	34470	14 MMF, 500-V.
C2	34020	.05 MF and 250 MMF, 200-V.
C3	31160	.05 MF, 100-V., NI
C4	34460	10 MMF, 500-V., black
C4A	34460	10 MMF, 500-V., black
C4B	34470	14 MMF, 500-V.
C5	33630	Double 250 MMF, 450-V., IND.
C6	33620	250 MMF, 450-V., IND.
C7	27630	.01 MF, 200-V., IND.
C8	34670	1450 MMF, 100-V.
C9	33920	790 MMF, 100-V.
C10	31530	.1 MF, 100-V., NI
C11	33930	25 MMF, 500-V.
C12	32740	.003, 500-V.
C13	25168	8 MF, 475-V., electrolytic
C14	25168	8 MF, 475-V., electrolytic
C15	25379	10 MF, 25-V., dry electrolytic
C16	31530	.1 MF, 100-V., NI
	31340	Multiple bypass, 200-V. (J11)

TRIMMERS

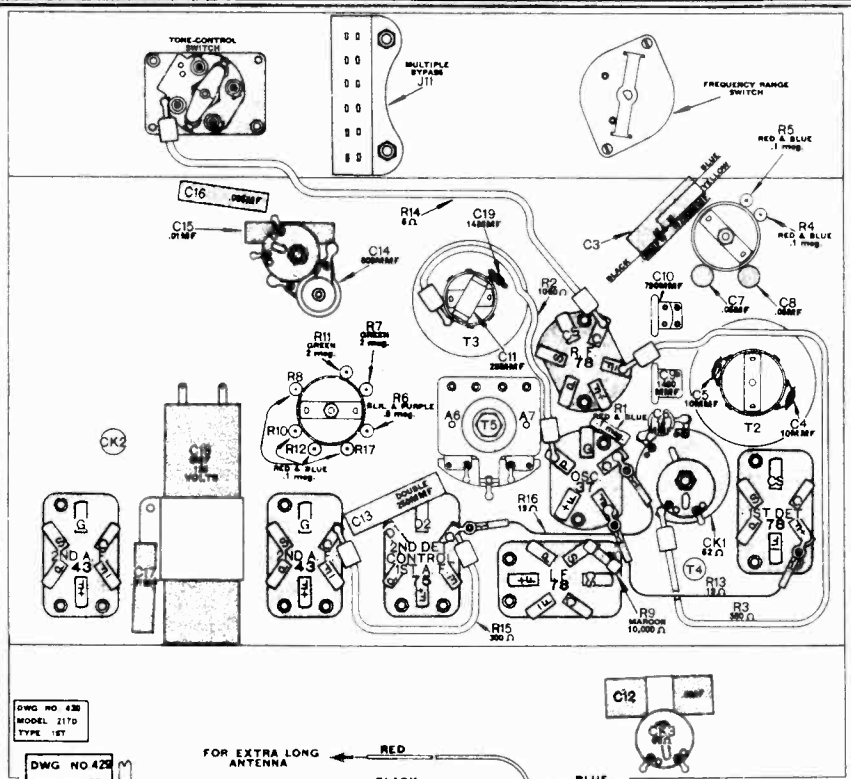
Code No.	Part No.	Name of Part
A4, 5	30110	Double I. F. trimmer
A6, 7	30630	Double I. F. trimmer

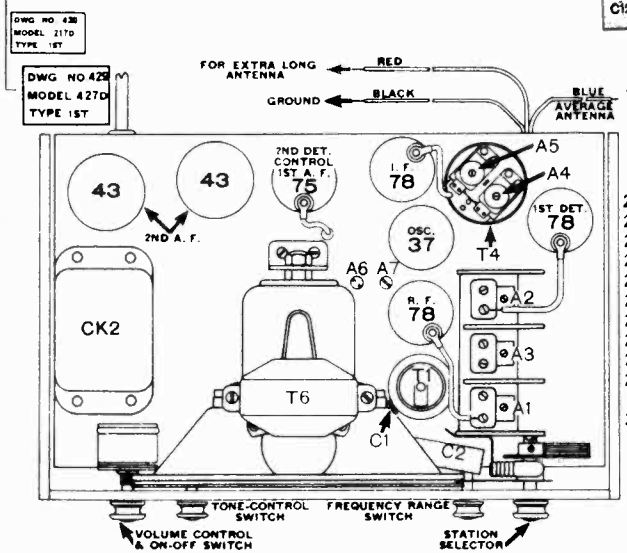
CHOKES

Code No.	Part No.	Name of Part
CK1	17015	R. F. plate choke
CK2	19210	1st detector plate choke
CK3	23657	Choke coil

SOCKETS

Part No.	Name of Part
24493	5 prong
24494	6 prong
22733	6 prong (4 used)
22689	4 prong





In Models 427-D and 667-D, the speaker is mounted in the cabinet, under the chassis.

MODEL 217-D

Part No.	Name of Part
26178	Cabinet complete
25831	Screen
25691	Escutcheon
25687	Name plate
25811	Knob—volume and tuning
25812	Knob—tone and range switch
25885	Dial plate
25672	Range switch
27092	Tone control switch, complete
24207	Tone control switch shaft and blade
26177	Variable condenser assembly
22654	No. 1 I. F. T. shield cap
24064	Speaker mounting bracket
26079	Instruction and log card, F1098
25679	Shipping container
16099	Pilot lamp, 6-V.
24079	Volume control, .5 ℧

RESISTORS

Code No.	Part No.	Name of Part
R1	30340	Red-blue, .1 ℧, 1/3-W.
R2	16320	Flexible, 1050 Ω
R3	23780	Flexible, 550 Ω
R4	20980	Red-blue, .1 ℧, ½-W.
R5	20980	Red-blue, .1 ℧, ½-W.
R6	20930	Bl'k-pur., .5 ℧, ½-W.
R7	20940	Green, 2 ℧, ½-W.
R8	20980	Red-blue, .1 ℧, ½-W.
R9	30320	Mar'n, 10,000 Ω, 1/3-W.
R10	20980	Red-blue, .1 ℧, ½-W.
R11	20940	Green, 2 ℧, ½-W.
R12	20980	Red-blue, .1 ℧, ½-W.
R13	16610	Flexible, 19 Ω
R14	26470	Flexible, 8 Ω
R15	25840	Flexible, 300 Ω
R16	16610	Flexible, 19 Ω
R17	20980	Red-blue, .1 ℧, ½-W.

CONDENSERS

Code No.	Part No.	Name of Part
C1	34470	14 MMF, 500-V., red
C2	31160	.05 MF, 100-V., NI
C3	34020	.05 MF and 250 MMF, 200-V., NI
C4	34460	10 MMF, 500-V., black
C5	34460	10 MMF, 500-V., black
C6	34470	14 MMF, 500-V., red
C7	31160	.05 MF, 100-V., NI
C8	31160	.05 MF, 100-V., NI
C9	36030	1450 MMF, 100-V.
C10	36020	790 MMF, 100-V.
C11	33930	25 MMF, 500-V.
C12	31510	.5 MF, 100-V., NI
C13	33630	Double 250 MMF, 450-V., IND.
C14	17440	500 MMF, 450-V.
C15	27630	.01 MF, 200-V., IND.
C16	29890	.005 MF, 450-V., IND.
C17	32810	.01 MF, 450-V., NI
C18	23981	8 MF, dry electrolytic, 125-V.
C19	35980	14 MMF, 500-V.
	31340	Multiple bypass condenser (J11)

CHOKES

Code No.	Part No.	Name of Part
CK1	35180	R. F. plate choke
CK2	26411	Audio filter choke
CK3	19210	1st detector plate filter choke

TRIMMERS

Code No.	Part No.	Name of Part
A4, 5	30110	Double I. F. trimmer
A6, 7	30630	Double I. F. trimmer

TRANSFORMERS

Code No.	Part No.	Name of Part
T1	35410	No. 1 R. F. T.
T2	36040	No. 2 R. F. T.
T3	35430	Oscillator T.
T4	25841	No. 1 I. F. T.
T5	25842	No. 2 I. F. T.
T6	36190	Output T. (on speaker)

217-D SPEAKER No. 37500

Part No.	Name of Part
21161	Diaphragm
35310	Field coil (70 Ω)
36190	Output T. (T6)

MODEL 427-D

(For parts not listed below refer to Model 217-D)

Part No.	Name of Part
25688	Escutcheon name plate
25691	Dial window
17816	Speaker hook
24725	Shipping container

427-D SPEAKER No. 37600

667-D SPEAKER No. 37600

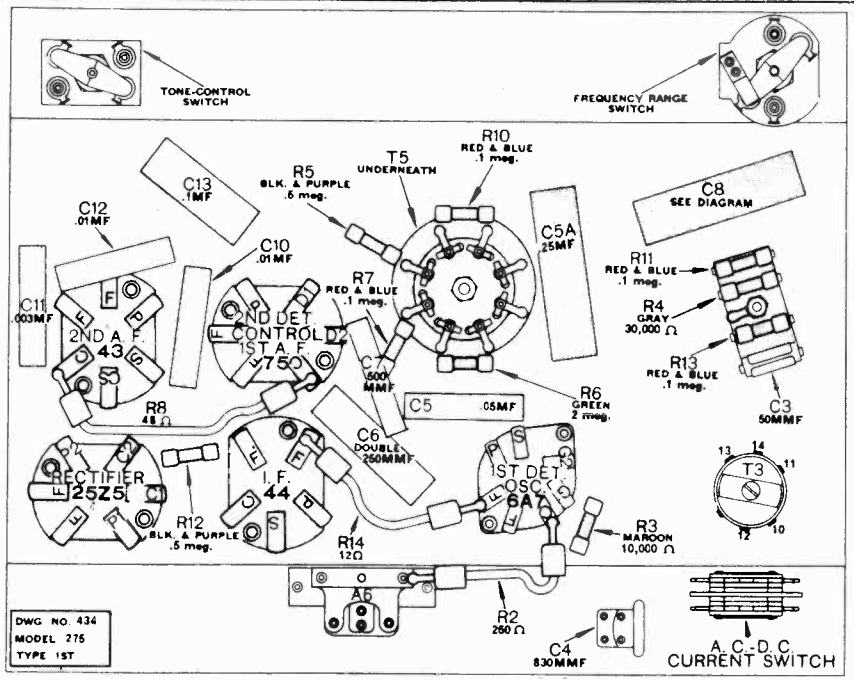
Part No.	Name of Part
22902	Cable and plug

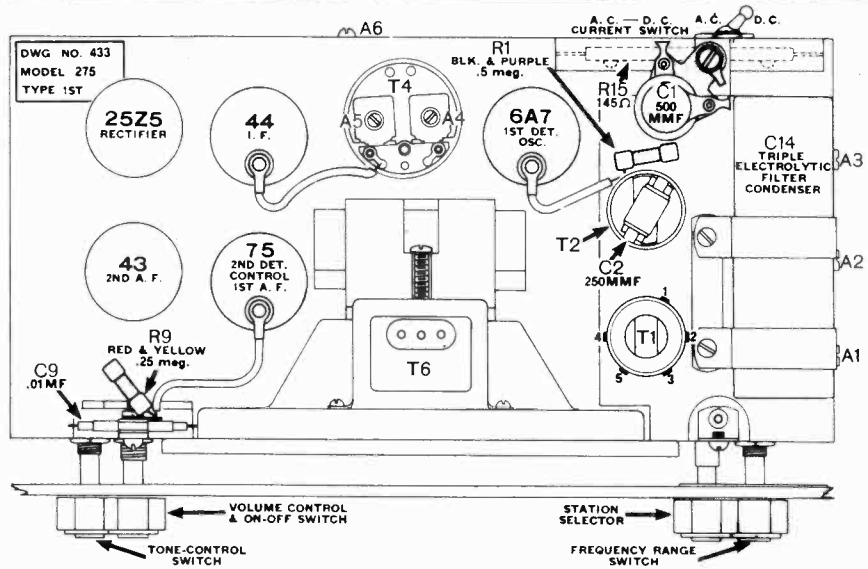
MODEL 667-D

(For parts not listed below refer to Model 217-D)

Part No.	Name of Part
25864	Escutcheon name plate
25865	Dial window
17816	Speaker hook
24725	Shipping container
25737	Knob—dial and volume
25738	Knob—tone and range

Ω = ohms. ℧ = megohms. W. = watt.
IND. = inductive. NI = non-inductive.





MODEL 275

Part No.	Name of Part
25798	Volume control, .5 U
26443	Cabinet complete
26444	Cloth screen
25865	Escutcheon window
25936	Escutcheon name plate
25814	Knob (volume and tuning)
25738	Knob (tone and range)
26283	Dial plate
24892	A. C.-D. C. switch
35560	Range switch
35630	Tone control switch
25022	Variable condenser

TRANSFORMERS

Code No.	Part No.	Name of Part
T1	35450	No. 1 R. F. T.
T2	35460	No. 2 R. F. T.
T3	35470	Oscillator T.
T4	26326	No. 1 I. F. T.
T5	35910	No. 2 I. F. T.
T6	26501	Output A. F. T.

RESISTORS

Code No.	Part No.	Name of Part
R1	30350	Bl'k-pur., .5 U, 1/3-W.
R2	31830	Flexible, 250 Ω
R3	30320	Mar'n, 10,000 Ω, 1/3-W.
R4	31840	Gray, 30,000 Ω, 1/3-W.
R5	30350	Bl'k-pur., .5 U, 1/3-W.
R6	30370	Green, 2U, 1/3-W.
R7	30340	Red-blue, .1 U, 1/3-W.
R8	19820	Flexible, 48 Ω
R9	31970	Red-yel., .25 U, 1/3-W.
R10	30340	Red-blue, .1 U, 1/3-W.
R11	30340	Red-blue, .1 U, 1/3-W.
R12	30350	Bl'k-pur., .5 U, 1/3-W.
R13	30340	Red-blue, .1 U, 1/3-W.
R14	35820	Flexible, 12 Ω
R15	31690	Iron core, 145 Ω

CONDENSERS

Code No.	Part No.	Name of Part
C1	35590	500 MMF, 450-V.
C2	33670	250 MMF, 500-V.
C3	35840	50 MMF, 500-V.
C4	35990	830 MMF, 100-V.
C5	31160	.05 MF, 100-V., NI
C5A	35930	.25 MF, 200-V., NI
C6	33630	Double 250 MMF, 450-V., IND.
C7	28130	500 MMF, 450-V., IND.
C8	35790	Multiple .05, .05, .05, .03, .1 and .2 MF, 100-V.
C9	23250	.01 MF, 450-V.
C10	27630	.01 MF, 200-V., IND.
C11	35760	.003 MF, 200-V., IND.
C12	27630	.01 MF, 200-V., IND.
C13	26660	.1 MF, 200-V., NI
C14	26158	Triple dry electrolytic 14, 8 and 8 MF

In some Model 275 sets, the oscillator grid trimmer A3 is not used.

TRIMMER CONDENSERS

Code No.	Part No.	Name of Part
A4, 5	35650	Double I. F. trimmer
A6	35610	Single I. F. trimmer

SOCKETS

Part No.	Name of Part
26111	Socket (7 prong)
24494	Socket (6 prong)
24493	Socket (5 prong)

MISCELLANEOUS PARTS

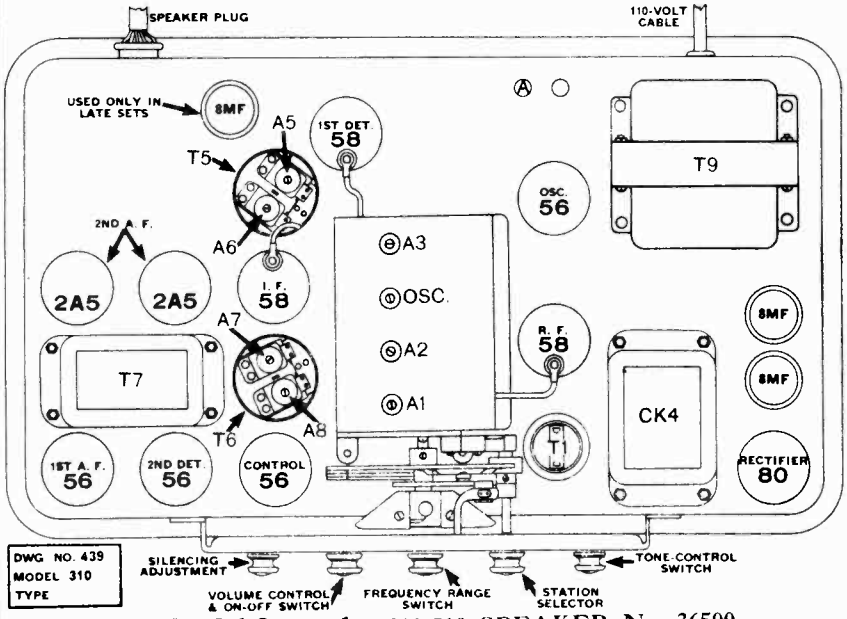
Part No.	Name of Part
26706	Vernier shaft
26707	Vernier cap
26708	Ball bearing
26709	Trimmer screw
26711	Trimmer washer
27133	Trimmer mica
26323	T4 shield
21878	Shield disc
24327	T5 shield
26137	T5 shield insulator
24727	Antenna lead and card
26059	Instruction and log card, F1097
26332	Shipping container
26284	Dial light socket
16099	Dial lamp, 6-V.
26451	Tube shield
26014	Top shield
26324	Base cover
26017	Back plate

SPEAKER

Part No.	Name of Part
26159	Speaker complete
25603	Diaphragm assembly
26501	Output transformer
26502	Field coil
26503	Choke coil (CK1)

MODEL 310,510
Socket,Trimmer,Parts

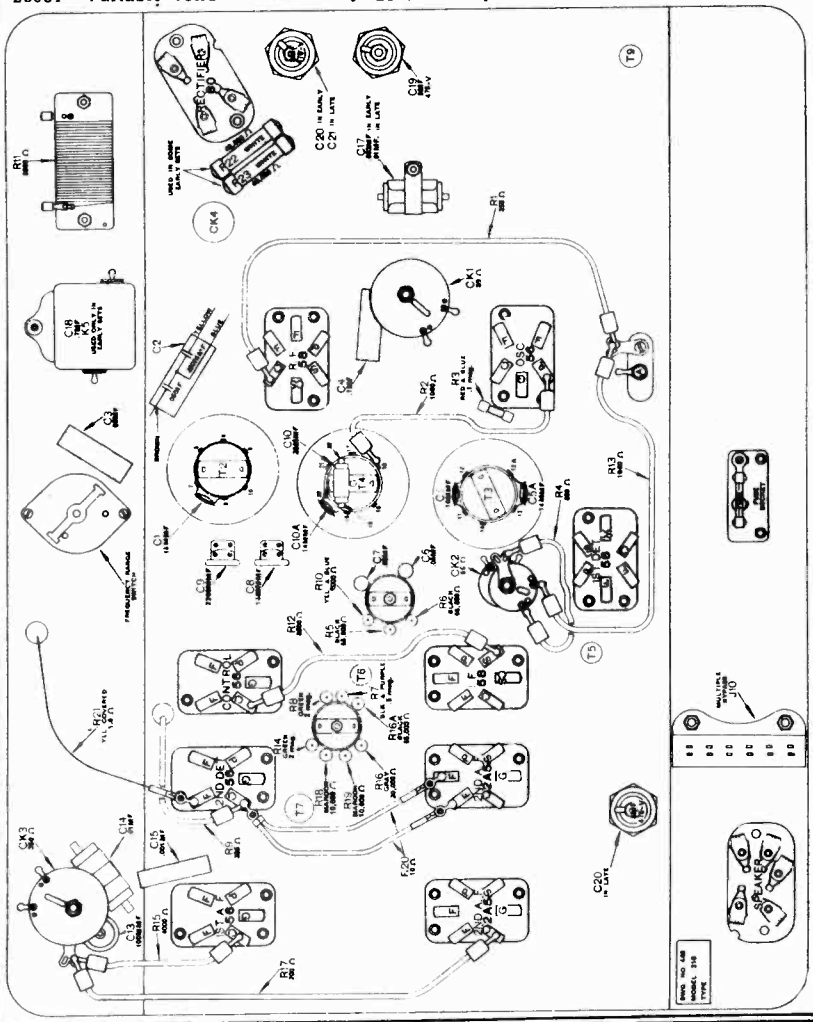
ATWATER-KENT MFG. CO.



MODEL 310 and MODEL 510

310-510 SPEAKER No. 36500

Part No.	Name of Part
25798	Volume control, .5 U
23031	Variable condenser assembly
34630	Field coil (625 Ω)
20737	Diaphragm
20657	Cable and plug assembly
21370	Output transformer



TRANSFORMERS

Code No.	Part No.	Name of Part
T1	34540	No. 1 R. F. T.
T2	34550	No. 2 R. F. T.
T3	34560	No. 3 R. F. T.
T4	34570	Oscillator T.
T5	23356	No. 1 I. F. T.
T6	23975	No. 2 I. F. T.
T7	34980	Audio input T.
T8	21370	Audio output T.
T9	25875	Power transformer used in 310 below 7750943* in 510 below 2564911*
T9	26395	Power transformer used in 310 above 7750942 in 510 above 2564910

* In a few early type sets, the power transformer is a sealed type No. 26154.

RESISTORS

Code No.	Part No.	Name of Part
R1	20050	Flexible, 355 Ω
R2	16320	Flexible, 1050 Ω
R3	30340	Blue-red, .1 U, 1/3-W.
R4	23780	Flexible, 550 Ω
R5	21040	Bl'k, 65,000 Ω, ½-W.
R6	21040	Bl'k, 65,000 Ω, ½-W.
R7	20930	Bl'k-pur., .5 U, ½-W.
R8	20940	Green, 2 U, ½-W.
R9	20050	Flexible, 355 Ω
R10	28050	Yel.-blue, 5000 Ω, ½-W.
R11	20150	Flat, wire wound, 8000 Ω
R12	24340	Flexible, 8000 Ω
R13	16320	Flexible, 1050 Ω
R14	20940	Green, 2 U, ½-W.
R15	24470	Flexible, 4000 Ω
R16	20970	Gray, 30,000 Ω, ½-W.
R16A	21040	Bl'k, 65,000 Ω, ½-W.
R17	25950	Flexible, 200 Ω
R18	20950	Maroon, 10,000 Ω, ½-W.
R19	20950	Maroon, 10,000 Ω, ½-W.
R20	17077	Filament shunt, 10 Ω
R21	31860	Flexible, 1.0 Ω
R22	28750	White, 40,000 Ω, 1½-W.
R23	28750	White, 40,000 Ω, 1½-W.

CONDENSERS

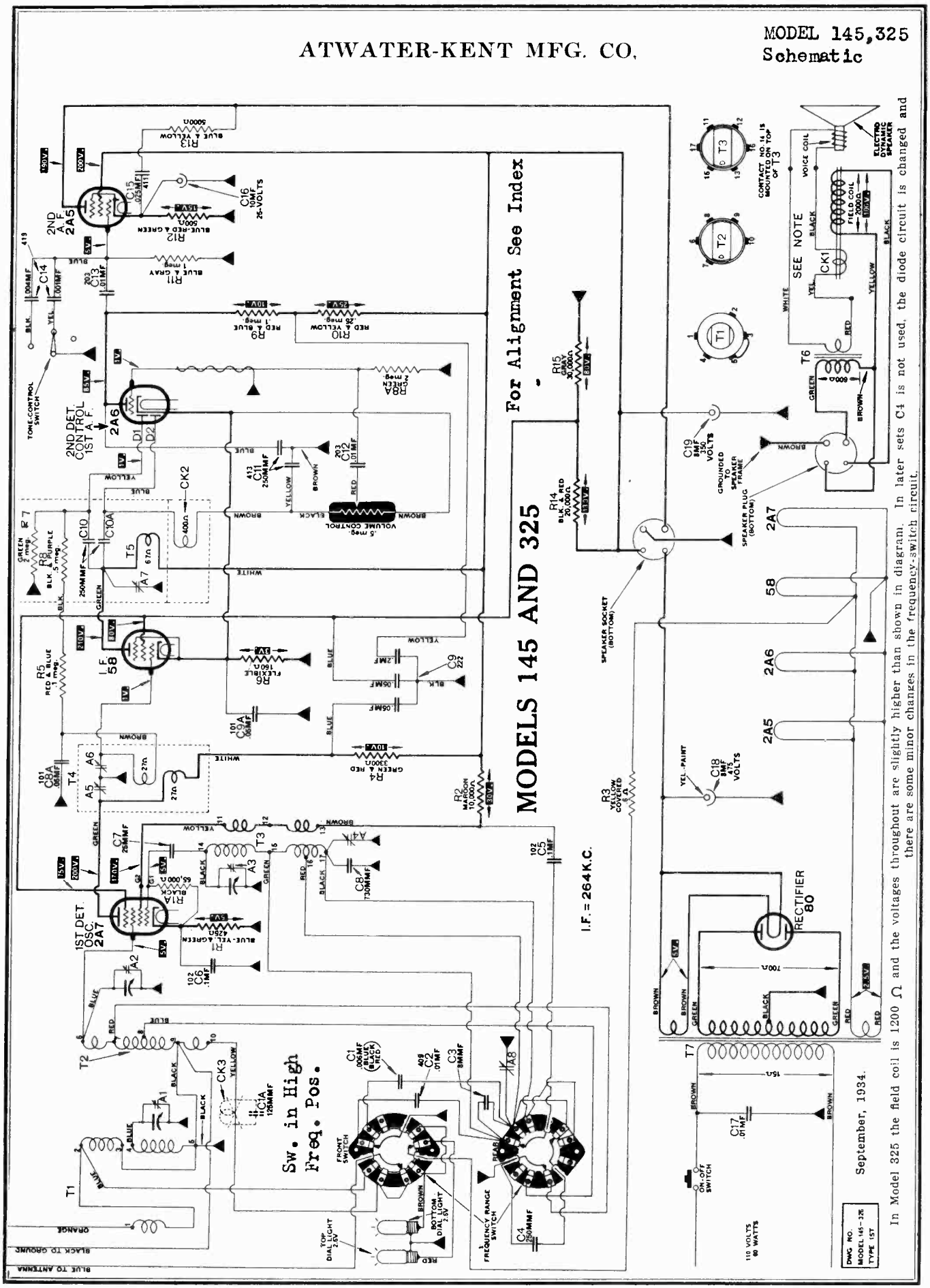
Code No.	Part No.	Name of Part
C1	36280	14 MMF, 500-V.
C2	34020	.05 and 250 MMF, 200-V., NI
C3	31160	.05 MF, 100-V., NI
C4	31530	.1 MF, 100-V., NI
C5	34460	10 MMF, 500-V.
C5A	36280	14 MMF, 500-V.
C6	31160	.05 MF, 100-V., NI
C7	31160	.05 MF, 100-V., NI
C8	34670	1450 MMF, 100-V.
C9	34680	2200 MMF, 100-V.
C10	33930	25 MMF, 500-V.
C10A	35970	14 MMF, 500-V.
C11	33670	250 MMF
C12	33670	250 MMF
C13	22220	100 MMF, 450-V.
C14	23250	.01 MF, 450-V.
C15	33640	.001 MF, 450-V.
C16	16490	B-6, 100-V.
C17	32740	.003 MF, 500-V. (early)
C17	23250	.01 MF, 450-V. (late)
C18	26620	.7 MF, 450-V. (K5)
C19	22538	8 MF, 475-V.
C20	22538	8 MF, 475-V.
C21	22538	8 MF, 475-V.
	30720	Multiple bypass, 200-V. (J10)

CHOKES

Code No.	Part No.	Name of Part
CK1	17015	R. F. plate choke
CK2	19210	1st detector choke
CK3	17390	2nd detector plate choke
CK4	26970	Filter choke unit used in 310 below 7750943 and 510 below 2564911
	36170	Filter choke unit used in 310 above 7750942 and 510 above 2564910

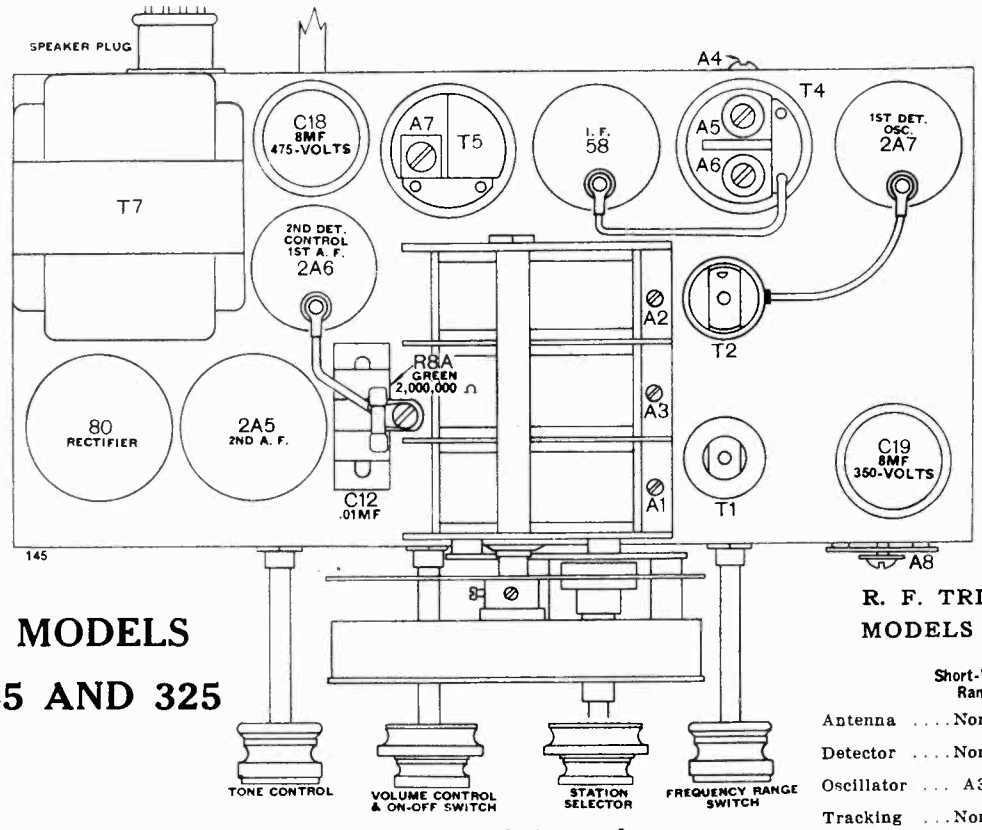
ATWATER-KENT MFG. CO.

MODEL 145,325
Schematic



MODEL 145,325
Socket,Trimmer,Chassis

ATWATER-KENT MFG. CO.



September, 1934.

MODELS 145 AND 325

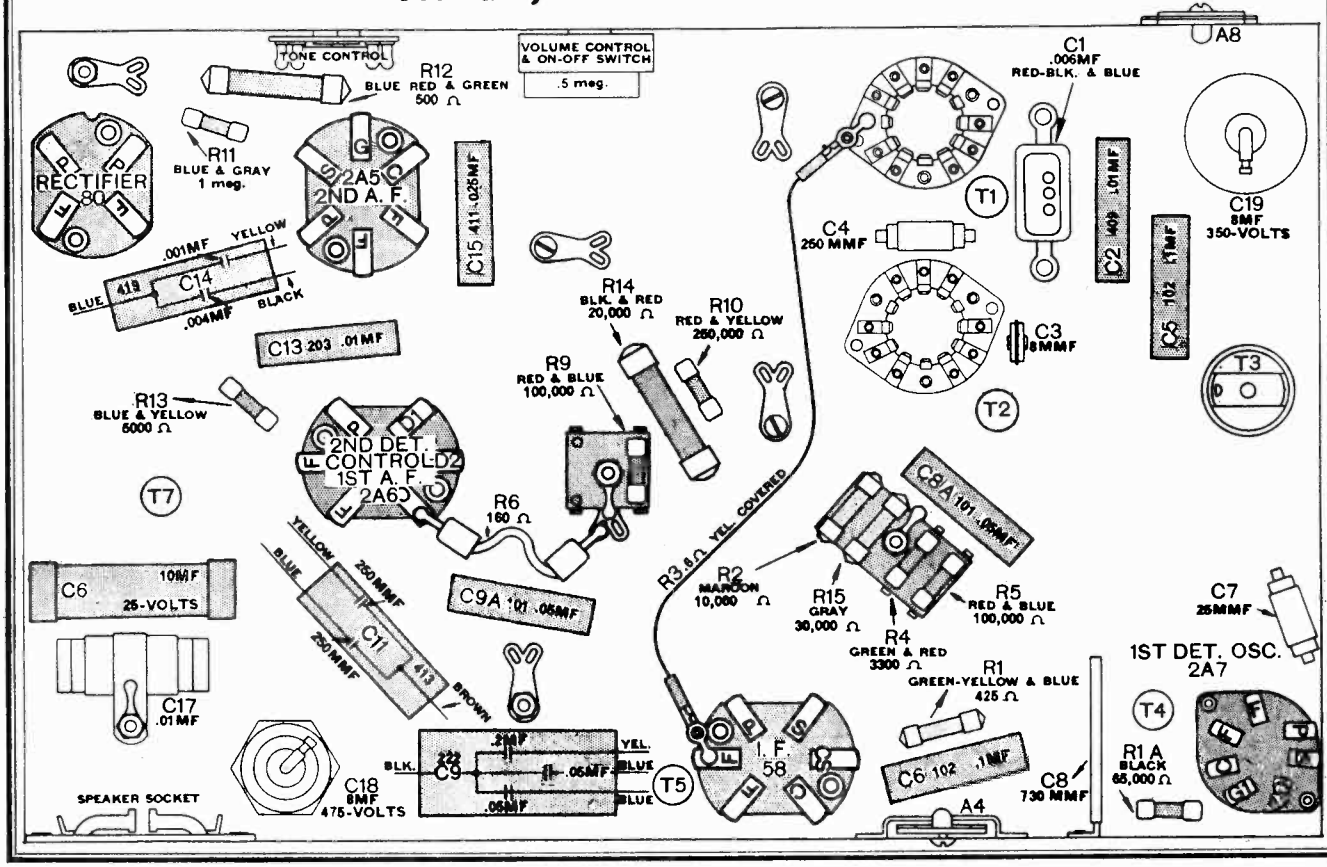
(I. F. = 264 KC.)

For Alignment Data and Parts List, see Index

R. F. TRIMMERS ON MODELS 145 AND 325

	Short-Wave Range	Police Range	Broadcast Range
Antenna	None	None	A1
Detector	None	None	A2
Oscillator	A3	None	A8
Tracking	None	None	A4

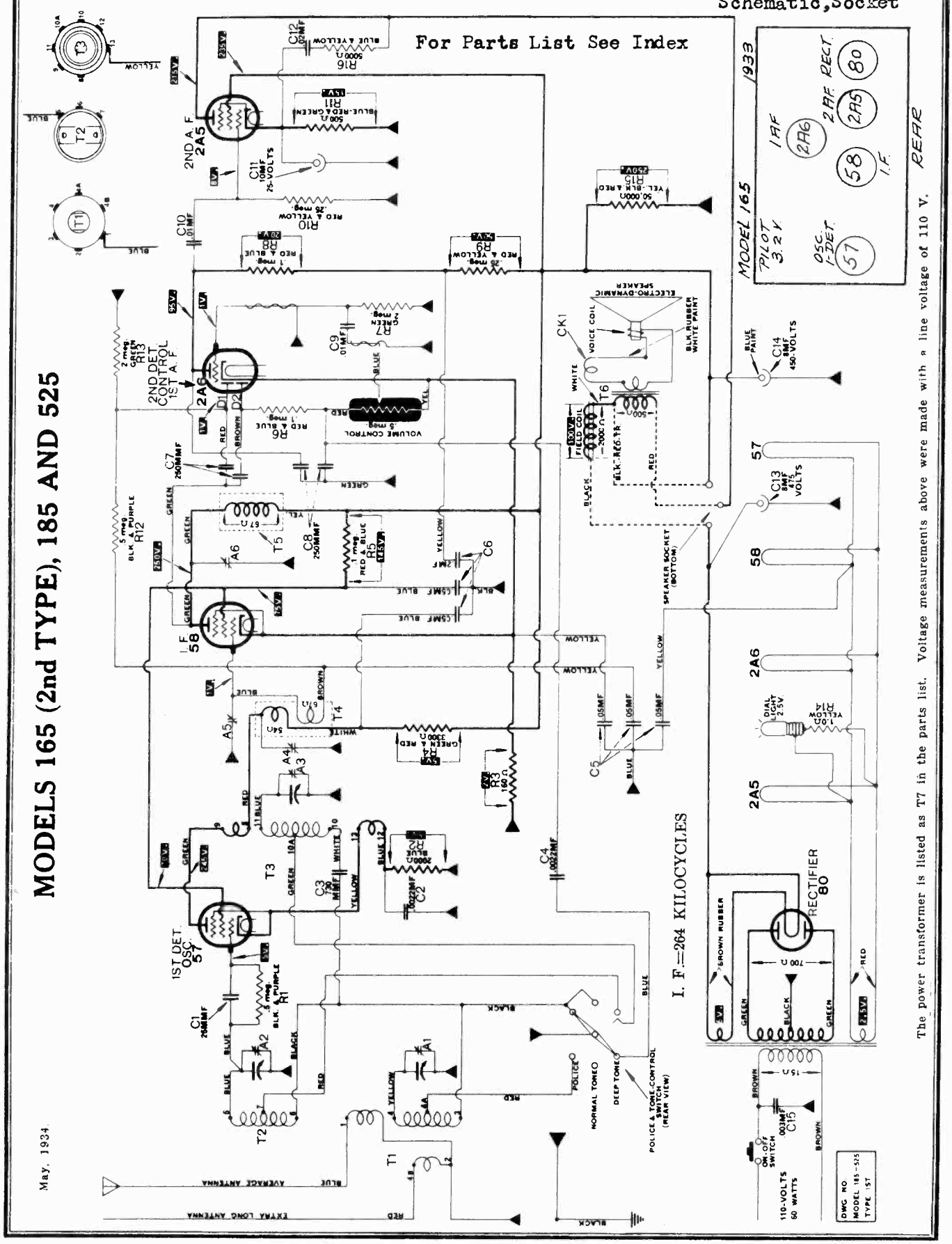
The I. F. trimmers are A5, A6 and A7.



ATWATER-KENT MFG. CO.

MODEL 165 (2nd), 185 and 525
Schematic, Socket

MODELS 165 (2nd TYPE), 185 AND 525

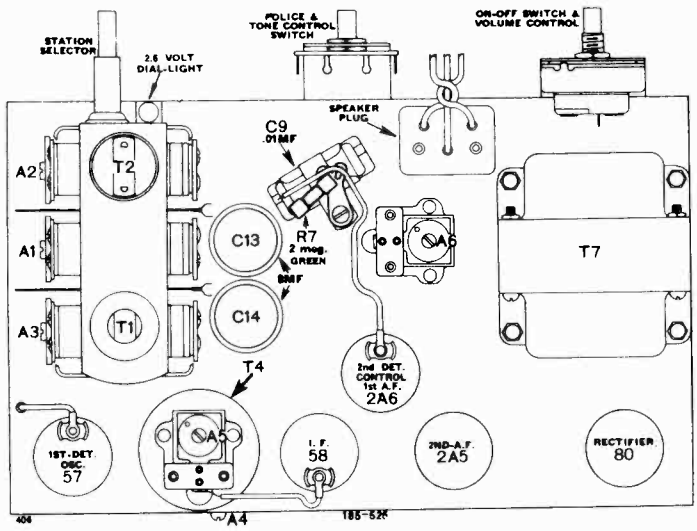


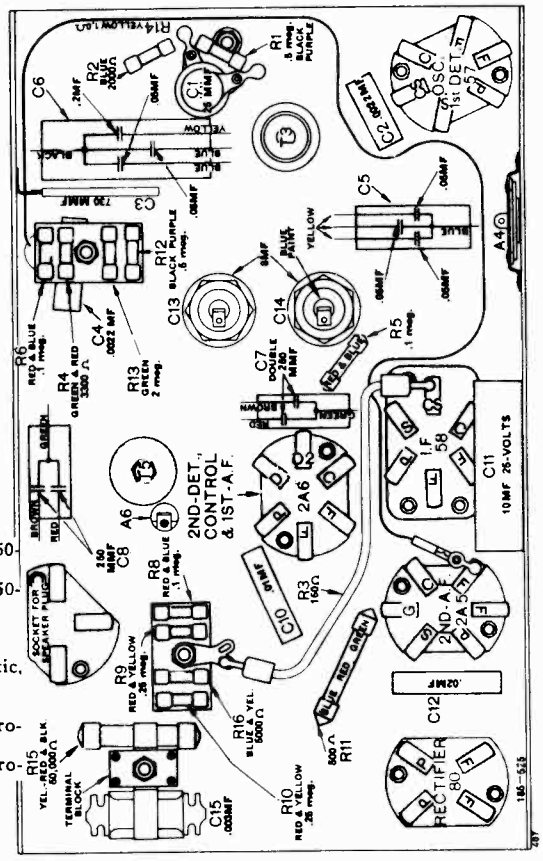
May, 1934

The power transformer is listed as T7 in the parts list. Voltage measurements above were made with a line voltage of 110 V.

MODEL 165 (2nd), 185 and 525
Socket, Trimmer, Parts

ATWATER-KENT MFG. CO.





2nd TYPE MODEL 165

Part No.	Name of Part
25309	Cabinet complete
24293	Volume control, .5 U
25022	Variable condenser
25312	Police and tone control switch complete
25311	Switch base complete
25226	Switch shaft and blade
24278	Knob volume and tuning
25145	Knob—tone
15404	Dial lamp, 2.5-V.

TRANSFORMERS

Code No.	Part No.	Name of Part
T1	33820	No. 1 R. F. T.
T2	32440	No. 2 R. F. T.
T3	32450	Osc. T.
T4	32620	No. 1 I. F. T.
T5	32630	No. 2 I. F. T.
T6	21672	Output T.
T7	25191	Power T.

RESISTORS

Code No.	Part No.	Name of Part
R1	30350	Bl'k-purple, .5 U, 1/3-W.
R2	33250	Blue, 2000 Ω, 1/3-W.
R3	28950	Flexible, 160 Ω
R4	30380	Red-green, 3300 Ω, 1/3-W.
R5	20980	Red-blue, .1 U, ½-W.
R6	30340	Red-blue, .1 U, 1/3-W.
R7	30370	Green, 2 U, 1/3-W.
R8	30340	Red-blue, .1 U, 1/3-W.
R9	31970	Red-yel., .25 U, 1/3-W.
R10	31970	Red-yel., .25 U, 1/3-W.
R11	32010	Blue-red-green, 500 Ω, 1-W.
R12	30350	Bl'k-purple, .5 U, 1/3-W.
R13	30370	Green, 2 U, 1/3-W.
R14	31860	Flexible, 1 Ω
R15	34340	Yel.-bl'k-red, 50,000 Ω, 1½-W.
R16	36430	Yel.-blue, 5000 Ω, 1/3-W.

CONDENSERS

Code No.	Part No.	Name of Part
C1	33650	25 MMF, 500-V.
C2	33660	.0022 MF, 450-V., IND.
C3	25638	730 MMF, 100-V.
C4	33660	.0022 MF, 450-V., IND
C5	32410	.05, .05 and .05 MF, 100-V., IND.
C6	32390	.05, .05 and .2 MF, 200-V., IND.
C7	33630	250 MMF (double), 450-V., IND.
C8	33630	250 MMF (double), 450-V., IND.
C9	23250	.01 MF, 450-V.
C10	27630	.01 MF, 200-V., IND.
C11	25379	10 MF, dry electrolytic, 25-V.
C12	33660	.02 MF, 200-V., IND.
C13	25168	8 MF, 475-V., electrolytic
C14	26381	8 MF, 450-V., electrolytic (blue)
C15	32740	.003 MF, 500-V.

TRIMMER CONDENSERS

Code No.	Part No.	Name of Part
A4	24495	Single I. F.
A5	24554	Single I. F. (includes I. F. shield)
A6	33080	Single I. F.

SOCKETS

Part No.	Name of Part
25196	Speaker
24492	Rectifier
24494	Small 6 prong (3 used)
22733	Large 6 prong (1 used)

MISCELLANEOUS

Part No.	Name of Part
25194	Cloth screen
25213	Cabinet feet
24323	Power T. cover (2 used)
24554	I. F. shield and trimmer, A5
19566	110-V. cable and plug
24549	Dial assembly
25745	Name decalcomania
25965	Tone decalcomania
26706	Vernier shaft
26707	Vernier cap
26708	Ball bearing
26709	Trimmer screw
26711	Trimmer washer
27133	Trimmer mica
22683	Tube shield
26671	Instruction and log card, F1109
25189	Shipping container

165-185 SPEAKER No. 34100

Part No.	Name of Part
18870	Field coil (2000 Ω)
21672	Output T.—(T6)
21161	Diaphragm
25179	Cable and plug
25308	Speaker plug (3 prong)
23657	Choke (CK1)

MODEL 185

(For parts not listed below refer to Model 165)

Part No.	Name of Part
26702	Cabinet
26602	Screen
25865	Dial window
26544	Escutcheon name plate
36580	Tone control switch complete
25814	Knob (volume and tuning)
25738	Knob (tone)
26481	Tone decalcomania
26618	Shipping container

MODEL 525

(For parts not listed below refer to Model 165)

Part No.	Name of Part
26565	Variable condenser
27305	Knob shaft
26519	Dial assembly
26569	Knob (volume and tuning)
26571	Knob (tone)
26545	Escutcheon name plate
25691	Dial window
26564	Volume control, .5 U
36590	Tone control switch complete
26669	Shipping container

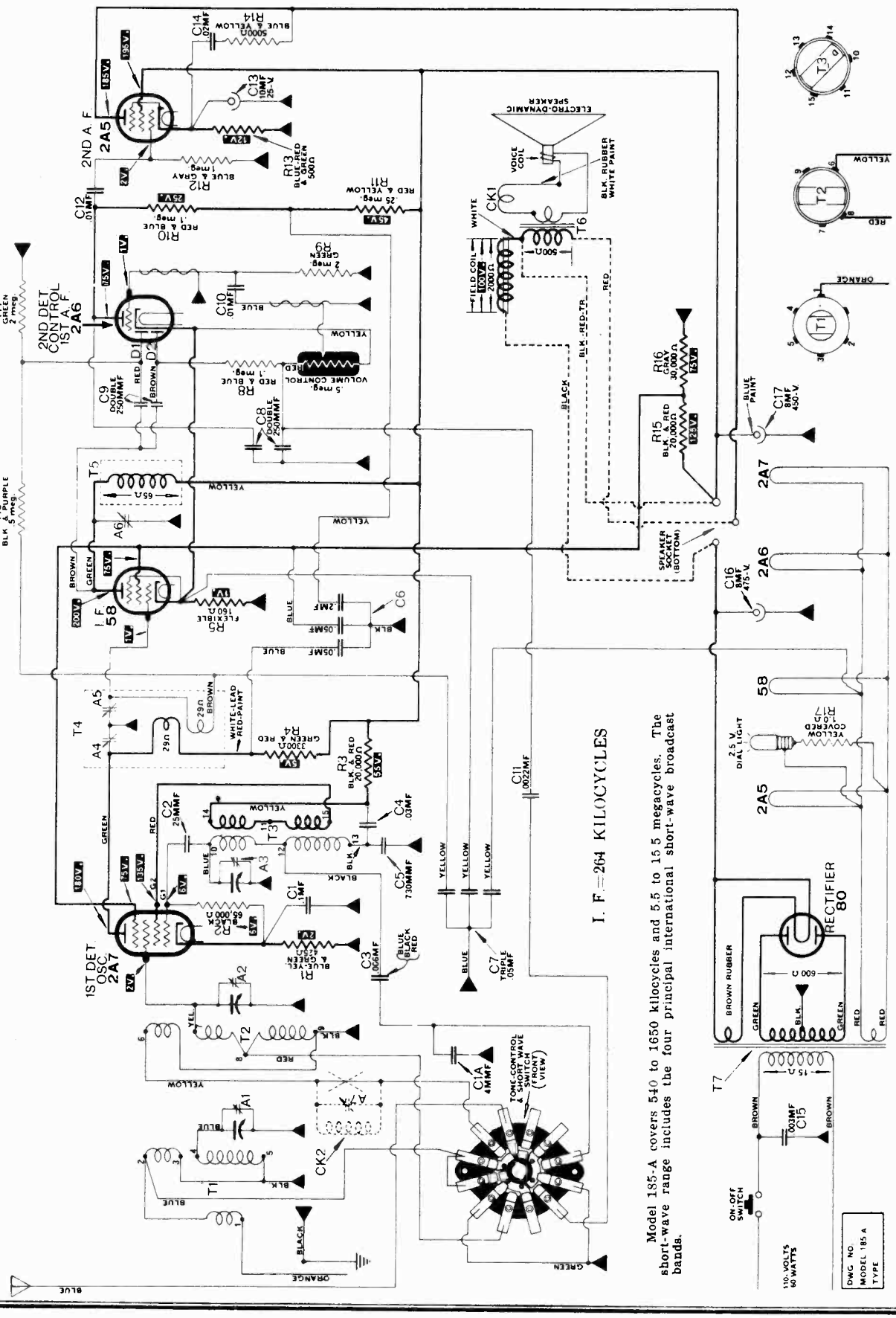
525 SPEAKER No. 38500

Part No.	Name of Part
18870	Field coil (2000 Ω)
21672	Output T.—(T6)
19465	Diaphragm
25179	Cable and plug
25308	Speaker plug (3 prong)

Ω ohms. U megohms. IND. = inductive. NI = non-inductive. W. = watt.

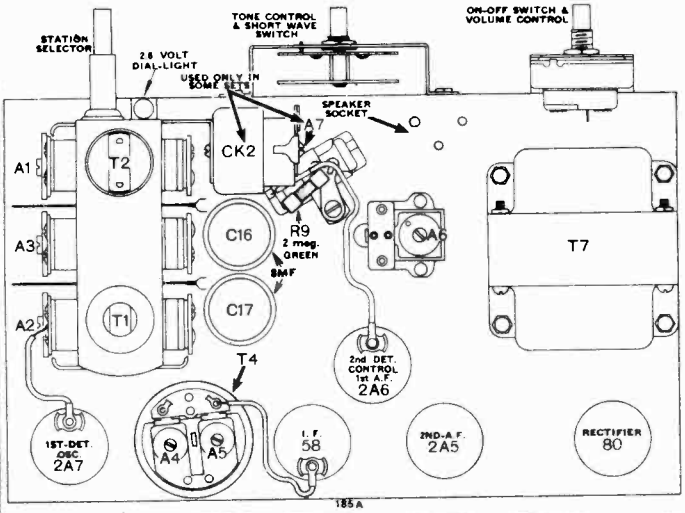
ATWATER-KENT MFG. CO.

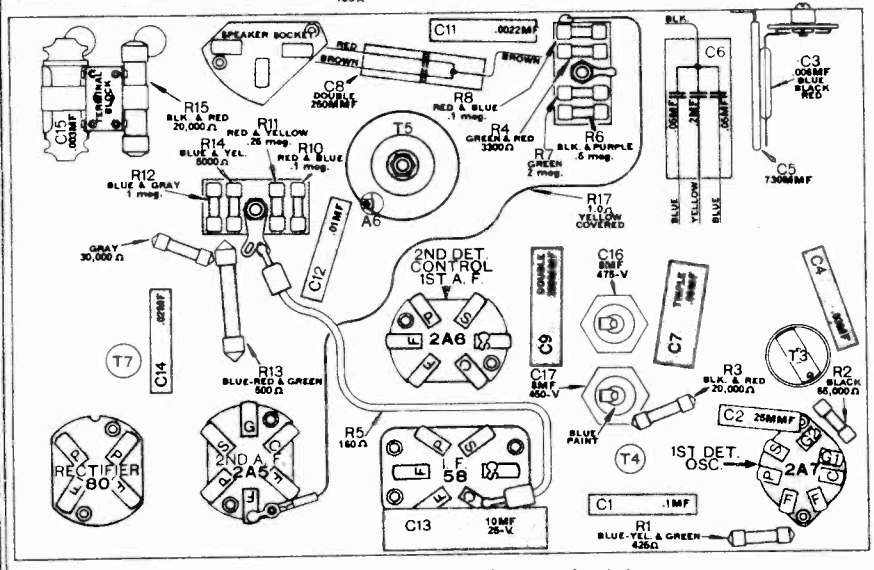
MODEL 185-A
Schematic



MODEL 185-A
Socket, Trimmer, Parts

ATWATER-KENT MFG. CO.





The 30,000 ohm resistor (gray) in the center left-hand side of this chart is R16.

MODEL 185-A

Part No.	Name of Part
27218	Cabinet less screen
26602	Screen
27186	Escutcheon name plate
25737	Knob—tuning and volume
25738	Knob—tone and range
24293	Volume control, .5 Ʊ
25022	Variable condenser assembly
27124	Tone and range switch complete
27127	Insulator for above
27122	Mounting bracket
20093	Nut

TRANSFORMERS

Code No.	Part No.	Name of Part
T1	38120	No. 1 R. F. T.
T2	38130	No. 2 R. F. T.
T3	38140	Oscillator T.
T4	27196	No. 1 I. F. T.
T5	32630	No. 2 I. F. T.
T6	21672	Output T.
T7	25191	Power T.

RESISTORS

Code No.	Part No.	Name of Part
R1	37540	Blue-yel.-green, 425 Ω, ½-W.
R2	31980	Bl'k, 65,000 Ω, 1/3-W.
R3	23120	Red-bl'k, 20,000 Ω, ¼-W.
R4	30380	Green-red, 3300 Ω, 1/3-W.
R5	28950	Flexible, 160 Ω
R6	30350	Bl'k-purple, .5 Ʊ, 1/3-W.
R7	30370	Green, 2 Ʊ, 1/3-W.
R8	30340	Red-blue, .1 Ʊ, 1/3-W.
R9	30370	Green, 2 Ʊ, 1/3-W.
R10	30340	Red-blue, .1 Ʊ, 1/3-W.
R11	31970	Red-yel., .25 Ʊ, 1/3-W.
R12	30360	Blue-gray, 1 Ʊ, 1/3-W.
R13	32010	Blue-red-green, 500 Ω, 1-W.
R14	36430	Blue-yel., 5000 Ω, 1/3-W.
R15	28030	Bl'k-red, 20,000 Ω, 1½-W.
R16	20970	Gray, 30,000 Ω, ½-W.
R17	31860	Flexible (yel. covered), 1.0 Ω

CONDENSERS

Code No.	Part No.	Name of Part
C1	31530	.1 MF, 100-V., NI
C1A	38280	4 MMF, 500-V.
C2	38070	25 MMF, 500-V.
C3	25035	.006 MF, 450-V.
C4	29530	.03 MF, 200-V., NI
C5	28060	730 MMF, 100-V.
C6	32390	.05, .05, .2 MF, 200-V., IND.
C7	32410	Triple .05 MF, 100-V., IND.
C8	33630	Double 250 MMF, 450-V., IND.
C9	33630	Double 250 MMF, 450-V., IND.
C10	23250	.01 MF, 450-V.
C11	33660	.0022 MF, 450-V., IND.
C12	27630	.01 MF, 200-V., IND.
C13	25379	10 MF, 25-V. (dry electrolytic)
C14	36420	.02 MF, 200-V., IND.
C15	32740	.003 MF, 500-V.
C16	25168	8 MF, 475-V. (electrolytic)
C17	26381	8 MF, 450-V. (blue) (electrolytic)

TRIMMER CONDENSERS

Code No.	Part No.	Name of Part
A4, 5	32880	Double I. F.
A6	33080	Single I. F.
A7	38180	Trap trimmer (used only in some models)

CHOKES

Code No.	Part No.	Name of Part
CK1	23657	Choke on speaker
CK2	27324	Trap choke (used only in some models)

SOCKETS

Part No.	Name of Part
26111	7 prong
25196	Speaker
24492	Rectifier
24494	Small 6 prong (2 used)
22733	Large 6 prong

MISCELLANEOUS

Part No.	Name of Part
27088	Tone decalcomania
24327	Shield for T5
25056	Shield for T4
24323	Power T. cover (2 used)
24327	Wave trap shield (A7)
27182	Dial assembly
15404	Pilot lamp, 2.5-V.
27179	Tuning tag, F-1135
27113	Instruction folder, F-1134
26618	Shipping container

185-A SPEAKER No. 34100

Part No.	Name of Part
18870	Field coil (2000 Ω)
21672	Output T. (T6)
21161	Diaphragm
25179	Cable and plug
25308	Speaker plug (3 prong)
23657	Choke (CK1)

Ω=ohms. Ʊ=megohms. IND.=inductive.
NI=non-inductive. W.=watt.

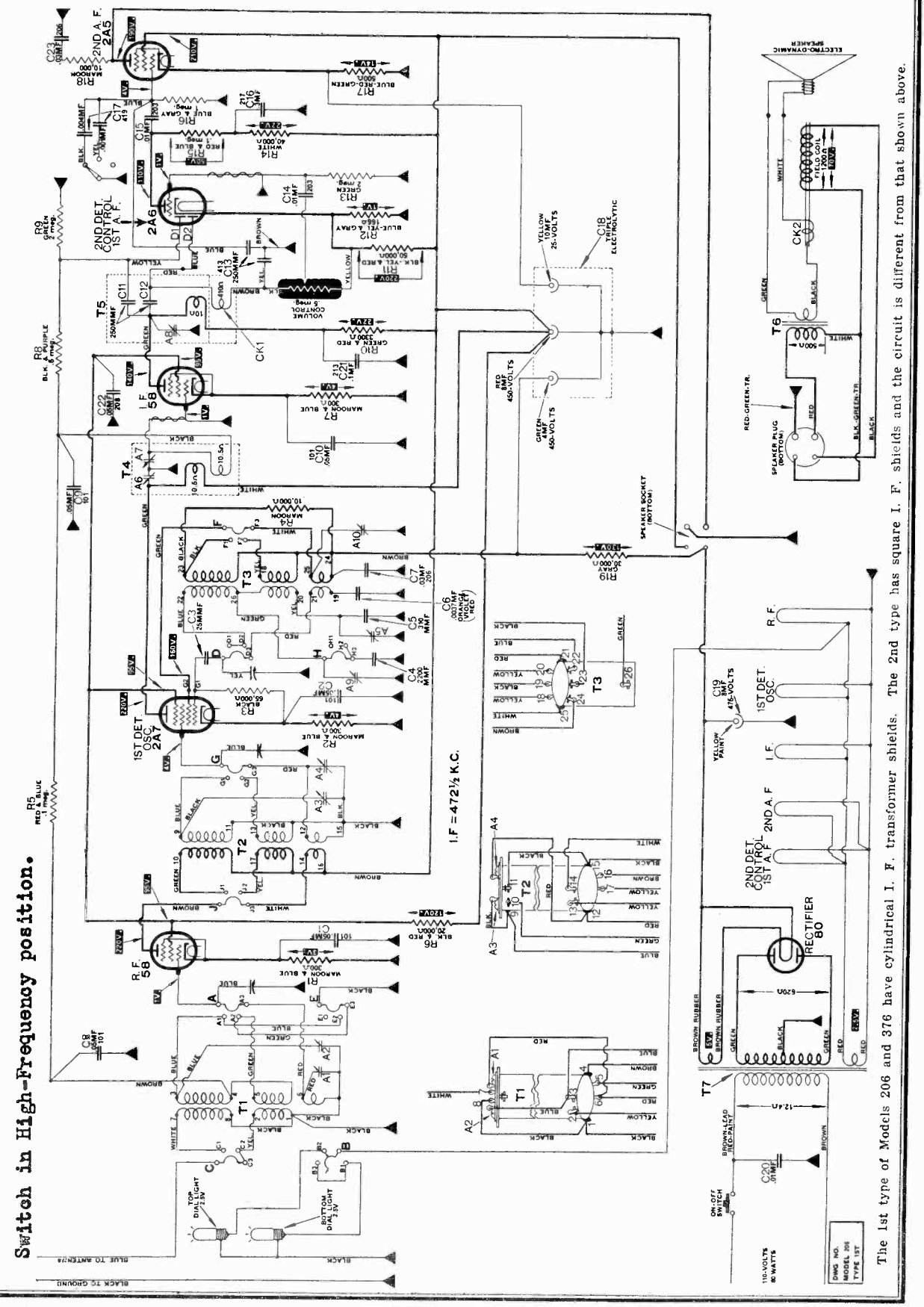
ATWATER-KENT MFG. CO.

MODEL 206,376 (1st)
Schematic

For Alignment See Index

MODELS 206 AND 376 (1st TYPE)

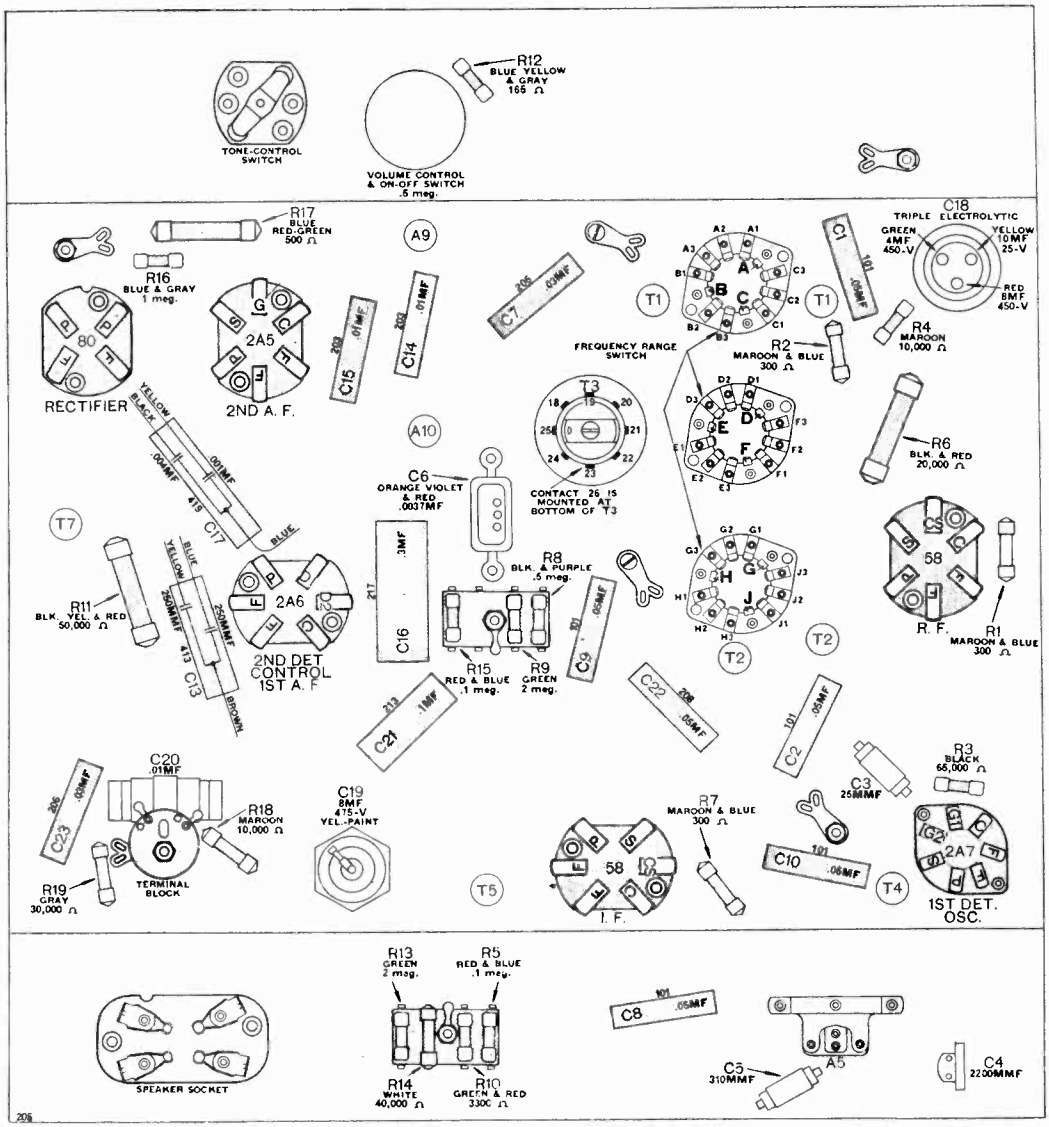
September, 1934.

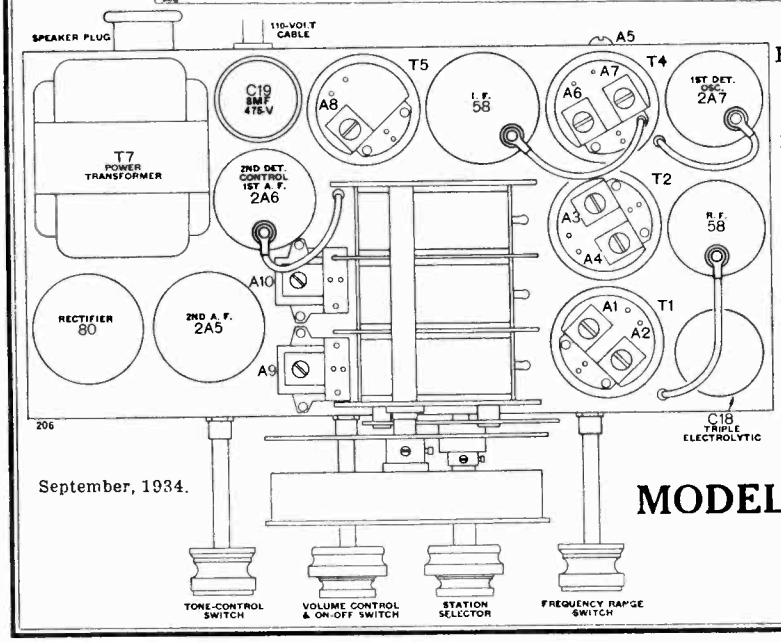


The 1st type of Models 206 and 376 have cylindrical I. F. transformer shields. The 2nd type has square I. F. shields and the circuit is different from that shown above.

MODEL 206,376 (1st)
Socket,Trimmer,Parts

ATWATER-KENT MFG. CO.





R. F. TRIMMERS ON MODELS 206 AND 376

	Short-Wave Range	Police Range	Broadcast Range
R. F.	A1	None	A2
1st-Detector	A4	None	A3
Oscillator	A10	None	A9
Tracking	None	None	A5

The I. F. trimmers are A6, A7 and A8.

For Aligmment Data and Parts List, see Index

September, 1934.

MODELS 206 and 376 (1st TYPE)

MODEL 206

28834	Cabinet less screen
27908	Screen
27944	Escutcheon and crystal assem.
27388	Crystal
27432	Var. cond. assem.
27692	Tuning gear
27514	Spacer
27959	Screw
28281	Front and back plate assem.
28594	Tuning shaft assem.
22657	Dial rubber
27574	Dial plate holder
27947	Dial pointer holder
27522	Dial pointer
27685	Dial plate
25377	Bushing under var. cond. assem.
28422	Plate under var. cond. assem.
24323	Power trans. cover
25056	I. F. T. shield (early)
27781	Osc. trans. shield
27543	R. F. T. shield
27887	R. F. T. shield insulator
40090	Pilot light assem.
27676	Pilot lamp, 2.5-V. (frosted)
27602	Range switch
25058	I. F. T. shield cover without hole
25059	I. F. T. shield cover with hole
25601	Rubber grommet
39620	Tone control switch assem.
28192	Shaft and blade for above
27425	Vol. control, .5 U
27559	Inst. folder, F-1146
27862	Shipping container

TRANSFORMERS

T1 40880	No. 1 R. F. T.
T2 41160	No. 2 R. F. T.
T3 41170	Oscillator T.
T4 *28161	No. 1 I. F. T. (EARLY)
T5 *28162	No. 2 I. F. T. (EARLY)
T6 21672	Output trans.
T7 28084	Power trans.

* Early style with cylindrical shield. In later sets No. 1 I. F. T. complete with trimmers and shield is No. 28527. No. 2 I. F. T. is No. 28528.

RESISTORS

(See table on page 19.)

CONDENSERS

(For tubular condensers see page 18.)

C3 33930	25 MMF, 500-V.
C4 40380	2200 MMF
C5 40390	360 MMF
C5 *27598	3700 MMF
C11 33670	250 MMF, 500-V.
C12 33670	250 MMF, 500-V.
C18 27592	4-8-10 MF
C19 22538	8 MF, 475-V. (yel. paint)
C20 23250	.01 MF, line cond.

* In late sets C5 is No. 27593, 5700 MMF, green, violet and red.

TRIMMERS

A1-2 39430	On T1
A3-4 39430	On T2
A5 38890	Rear of chassis on bottom

MODEL 206 (Contd.)

A6-7 32880	On T4
A8 40610	On T5
A9 40450	Next to A10
A10 39630	Front of chassis alongside of var. cond.

CHOKES

CK1 28163	On No. 2 I. F. T.
CK2 25525	On speaker

206 SPEAKER No. 41900

25525	Choke (CK2)
28345	Cable and plug
15079	Plug
21672	Output trans. (T6)
19465	Diaphragm
21260	Field coil (1200 Ω)

MODEL 376

For parts not listed below refer to Model 206.

28517	Base plate
28531	Escutcheon and crystal
27559	Inst. sheet, F-1146
28756	Shipping container

376 SPEAKER No. 41800

25525	Choke (CK2)
21260	Field coil (1200 Ω)
20737	Diaphragm
20657	Cable and plug
18582	Plug
19469	Segment

MODEL 559

27287	Var. cond. assem.
25601	Rubber grommet
27301	Washer
22649	Screw
27286	Range switch
27272	Crank arm
35380	Reflector assem.
27958	Front panel assem.
27321	Vol. control, .5 U
27314	Vol. cont. mtg. bracket
25558	Vol. cont. cover
27289	Tone cont. switch
27317	Mtg. bracket for above
38740	Sensitivity switch assem.
27628	Shaft and blade for above
27472	Antenna jumper
25913	R. F. coil shield
25056	I. F. T. shield
26255	I. F. T. shield insul.
25058	I. F. T. shield cover without hole
25059	I. F. T. shield cover with hole
18534	Fuse
27057	Bottom cover
22683	Tube shield
23743	Aux. tube shield
27334	Tone cont. cond. clamp
27249	Mica for trimmers on strips
17109	Screw for above
17064	Insul. washer for above
27072	Station directory, F-1131
27545	Inst. folder, F-1143
27683	Shipping container

MODEL 559 (Contd.)

PARTS FOR TUNING ARRANGEMENT

27469	Dial gear
27276	Pointer arm
27254	Dial pointer
27332	Counter shaft gear (lge.)
27333	Idler gear (sml.)
27259	Gear screw
27957	Broadcast pinion gear
28116	Gear frame
27294	Tuning shaft
28016	Tuning bracket
27351	Screw (5/32" dia.)
27293	Detention spring
27298	Shaft spacer
27297	Bracket holding pin

TRANSFORMERS

T1 38310	No. 1 R. F. T., broadcast
T2 38340	No. 1 H. F., 1st range
T3 38360	No. 1 H. F., 2nd range
T4 38380	No. 1 H. F., 3rd range
T5 38320	No. 2 R. F. T., broadcast
T6 38330	Oscillator T., broadcast
T7 38350	No. 2 H. F., 1st range
T8 38370	No. 2 H. F., 2nd range
T9 38390	No. 2 H. F., 3rd range
T10 27448	No. 1 I. F. T.
T11 27449	No. 2 I. F. T.
T12 27451	No. 3 I. F. T.
T13 27452	No. 4 I. F. T.
T14 38610	A. F. input trans.
T15 21370	A. F. output trans.
T16 26395	Power trans.

RESISTORS

(For tubular resistors see page 19.)

R6 33230	Flexible, 2000 Ω
R7 33210	Flexible, 670 Ω
R17 33210	Flexible, 670 Ω
R21 24340	Flexible, 8000 Ω
R22 24340	Flexible, 8000 Ω
R24 25950	Flexible, 200 Ω
R26 17077	Flexible, 10 Ω
R27 31860	Dial light res., 1.0 Ω

CONDENSERS

(For tubular condensers see page 18.)

C6 22220	100 MMF, 450-V.
C7 25661	8 MMF, 500-V.
C8 25661	8 MMF, 500-V.
C9 27391	350 MMF (orange, green and brown)
C10 27389	1250 MMF (green, red and brown)
C11 34470	14 MMF, 500 V. (red paint)
C12 27392	4000 MMF (red, blk. and yel.)
C13 34470	14 MMF, 500-V. (red paint)
C25 39340	125 MMF
C26 39340	125 MMF
C27 35290	125 MMF
C36 23250	.01 MF, line cond., 450-V.
C37 22538	8 MF, 475-V.
C38 22538	8 MF, 475-V.
C39 22538	8 MF, 475-V.

Ω = ohms. U = megohms.

PARTS LIST

MODEL 559 (Contd.)

CHOKES

CK1 17015	R. F. plate choke
CK2 19210	R. F. plate circuit choke
CK3 19210	1st det. plate circuit choke
CK4 19210	2nd I. F. plate circuit choke
CK5 19210	R. F. 1st I. F. screen choke
CK6 36180	B filter choke

TRIMMERS

28770	Single trimmer
32880	Double I. F. trimmer

SOCKETS

24494	6 prong (58)
22733	6 prong (2a5-55)
22689	4 prong
21337	5 prong
18449	Fuse

559 SPEAKER No. 36500

34630	Field coil (625 Ω)
20737	Diaphragm
20657	Cable and plug assem.
21370	Output trans.

MODEL 825

27731	Volume control, .5 U
28796	Cabinet complete
27902	Cloth screen
25865	Escutcheon window
27983	Escutcheon name plate
26283	Dial plate
24892	A. C.-D. C. switch
41050	Range switch
28805	Shaft and blade
41040	Tone control switch
28797	Shaft and blade
27593	Variable condenser

TRANSFORMERS

T1 35450	No. 1 R. F. T.
T2 35460	No. 2 R. F. T.
T3 35470	Oscillator T.
T4 26326	No. 1 I. F. T.
T5 35910	No. 2 I. F. T.
T6 26501	Output A. F. T.

RESISTORS

(For tubular resistors see page 19.)

R2 31830	Flexible, 250 Ω
R8 19820	Flexible, 48 Ω
R14 35820	Flexible, 12 Ω
R15 31690	Iron core, 145 Ω

CONDENSERS

(For tubular condensers see page 18.)

C1 35590	500 MMF, 450-V., mica
C2 33670	250 MMF, 500-V., mica

MODEL 825 (Contd.)

C3 35840	50 MMF, 500-V., mica
C4 35990	830 MMF, 100-V., mica
C9 23250	.01 MF, 450-V., paper
C14 26158	Triple dry electrolytic 14, 8 and 8 MF

TRIMMER CONDENSERS

A4, 5 35650	Double I. F. trimmer
A6 35610	Single I. F. trimmer

SOCKETS

26111	Socket (7 prong)
24494	Socket (6 prong)
24493	Socket (5 prong)

MISCELLANEOUS PARTS

26706	Vernier shaft
26707	Vernier cap
26708	Ball bearing
26709	Trimmer screw
26711	Trimmer washer
27133	Trimmer mica
26323	T4 shield
21878	Shield disc
24327	T5 shield
26137	T5 shield insulator
24727	Antenna lead and card
26284	Dial light socket
16099	Dial lamp, 6-V.
26451	Tube shield
26014	Top shield
26324	Base cover
26017	Back plate
27563	Instruction and log card, F1150
27866	Shipping container

SPEAKER

26159	Speaker complete
25603	Diaphragm assembly
26501	Output trahsformer
26502	Field coil
26503	Choke coil (CK1)

MODEL 944

28773	Cabinet, less screen
27892	Screen
25213	Foot
27487	Escutcheon name plate
27936	Dial window
27935	Dial assembly
27433	Var. cond. assem.
28089	Vernier cap
28091	Ball bearing
28092	Cap spring
28093	Spring retaining screw
28094	Tuning shaft

MODEL 944 (Contd.)

28095	Trimmer mica
25199	Pilot light socket and resistor
15404	Pilot lamp, 2.5 V.
24323	Power T. cover
28282	Side mounting angle plate
26312	C11 shield
27567	Vol. control, 20,000 Ω
27095	R. F. shield
27597	I. F. coil shield
27724	I. F. coil shield insulator
27631	Tall tube shield
26451	Short tube shield
25059	I. F. T. cover with hole
25029	Four (4) contact terminal block
28075	Eight (8) contact terminal block
27564	Instruction folder, F-1151
27861	Shipping container

TRANSFORMERS

T1 38990	No. 1 R. F. T.
T2 39010	Oscillator
T3 27486	No. 1 I. F. T.
T4 21672	Output T.
T5 25191	Power T.

RESISTORS

(For tubular resistors see page 19.)

R11 20050	Flexible, 355 Ω
R12 31860	Flexible, 1.0 Ω

CONDENSERS

(For tubular condensers see page 18.)

C3 33670	250 MMF, 500-V., mica
C4 35290	125 MMF
C11 22538	8 MF, yel. paint, 475-V.
C12 27584	4 MF, 350-V.
C14 23250	.01 MF, line cond.

TRIMMERS

A3 38660	I. F. plate trimmer
A4 36570	2nd detector trimmer
A5 39090	Rear of set

CHOKE

CK1 23657	On speaker

SOCKETS

24494	6 prong (1st det. and A. F.)
22733	6 prong (2nd det.)
24492	4 prong
25196	Speaker

944 SPEAKER No. 34100

18870	Field coil, 2,000 Ω
21672	Output trans. (T4)
21161	Diaphragm
25179	Cable and plug
25308	Plug (3 prong)
23657	Choke

Ω = ohms. U = megohms.

ATWATER-KENT MFG. CO.

MODEL 206, 376, 559, 825, 944

Parts Lists

A-K PAGE 5-15

ATWATER-KENT MFG. CO.

INSTRUCTIONS FOR CONNECTING DOUBLET ANTENNA TO RECEIVER

If the receiver is provided with doublet antenna connections (as on Atwater Kent Models 112, 318, 447, and 559), connect the transmission line as specified in the instructions for the set. (See Fig. 2.) **Do not forget to remove the jumper wire** which is used on these models between the ground terminal and one of the antenna terminals. This jumper is required when using a plain antenna, but is not used with a doublet.

On the Atwater Kent models just mentioned, the frequency-range switch on the set automatically changes the doublet to a plain antenna on the standard broadcast and police bands.

DOUBLET TRANSFORMER

For receivers which are not provided with doublet antenna connections, **it is necessary to use Atwater Kent Model "DT" Doublet Transformer,** part No. 28083. This transformer is not included in the Atwater Kent Type "D" doublet antenna kit, but can be purchased separately.

The Model "DT" doublet transformer has a convenient mounting bracket to permit mounting on the rear of cabinet. The transformer has four terminals which are clearly marked. The connections are shown in Fig. 3.

Model "DT" transformer has a two-position switch. **For short-wave broadcast reception, turn knob** on this switch so the dot is at "SW" (short wave).

For standard broadcast reception turn the knob so dot is at "BC" (broadcast).

IMPORTANT

In some cases, depending on local conditions, a better ratio of signal-to-noise may be obtained WITHOUT a ground connection to the receiver. Try it both ways, and if there is less electrical interference without the ground, leave the ground connection off. (Of course, this does not apply to the ground on the lightning arrestor, which must be connected as shown in the illustration.)

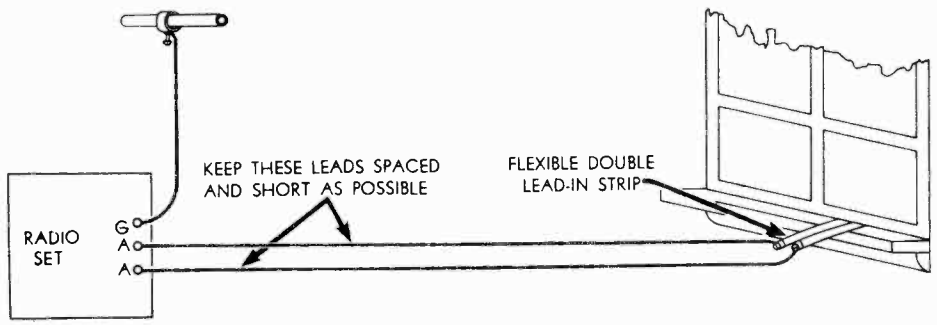


Fig. 2. How to connect the doublet transmission leads to receiver that is provided with doublet-antenna terminals, such as Atwater Kent Models 112, 318, 447, and 559. The leads to the set may be twisted for a distance of 2 or 3 feet without loss of signal strength.

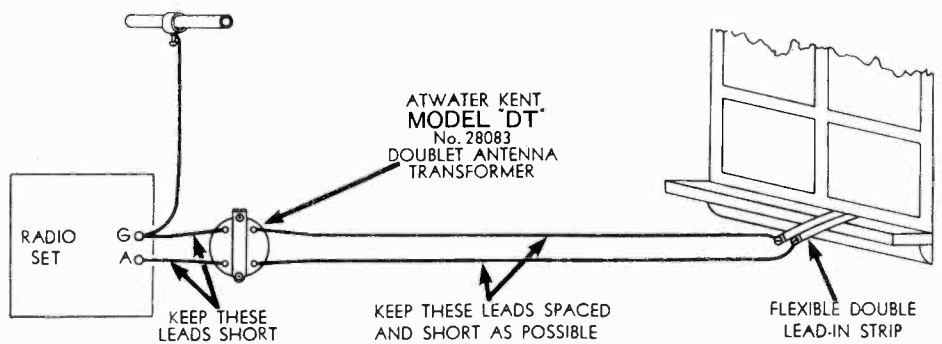
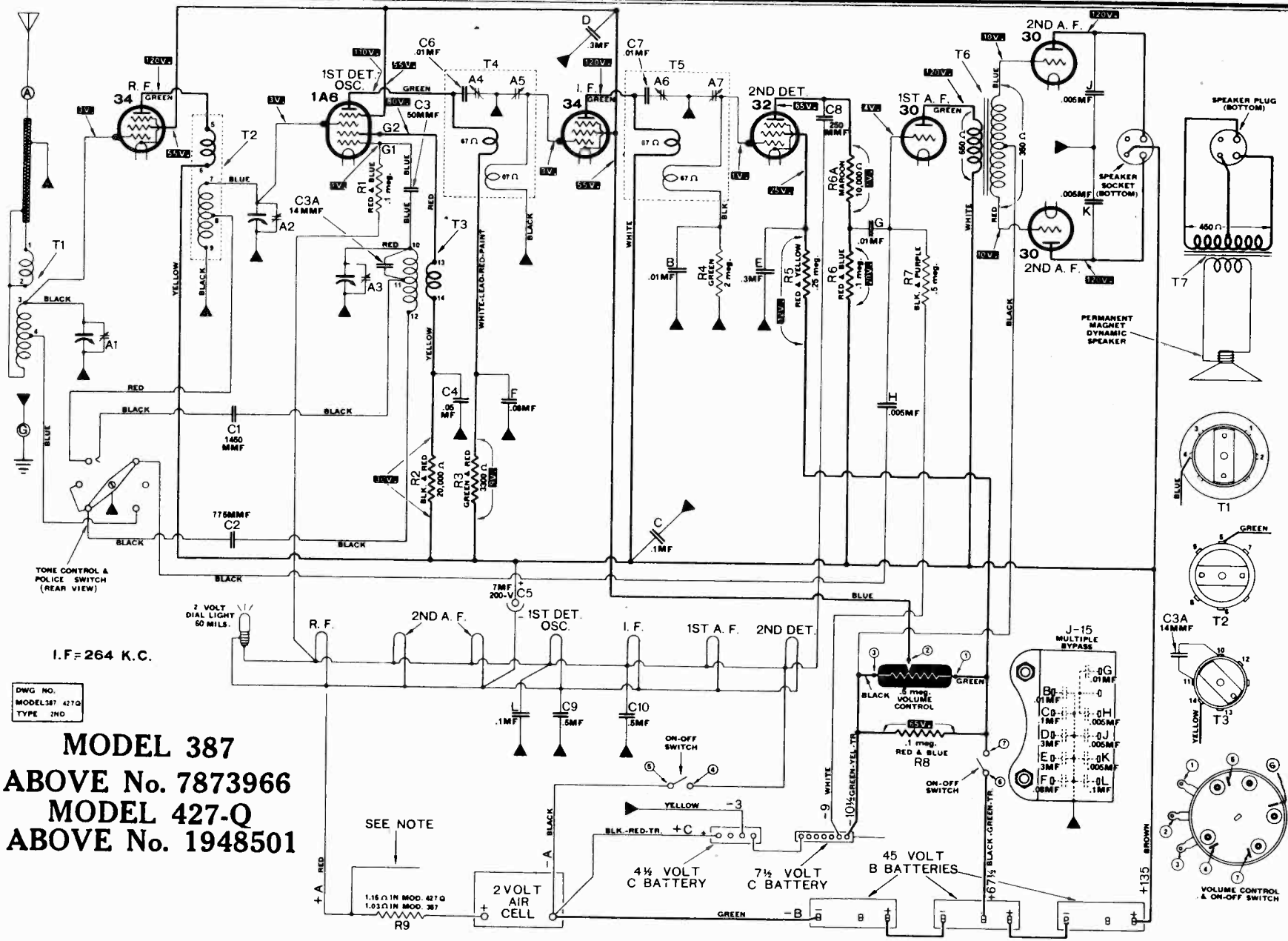


Fig. 3. For short-wave sets that are not provided for doublet-antenna connections, it is necessary to use Atwater Kent Model "DT" doublet transformer and connect it as shown in this drawing. The transformer has a bracket for attachment to the rear of cabinet, and a two-position switch to change from short-waves to standard broadcast.

ATWATER-KENT MFG. CO.
MODEL 387 Above 7873966
MODEL 427Q Above 1948501
Schematic



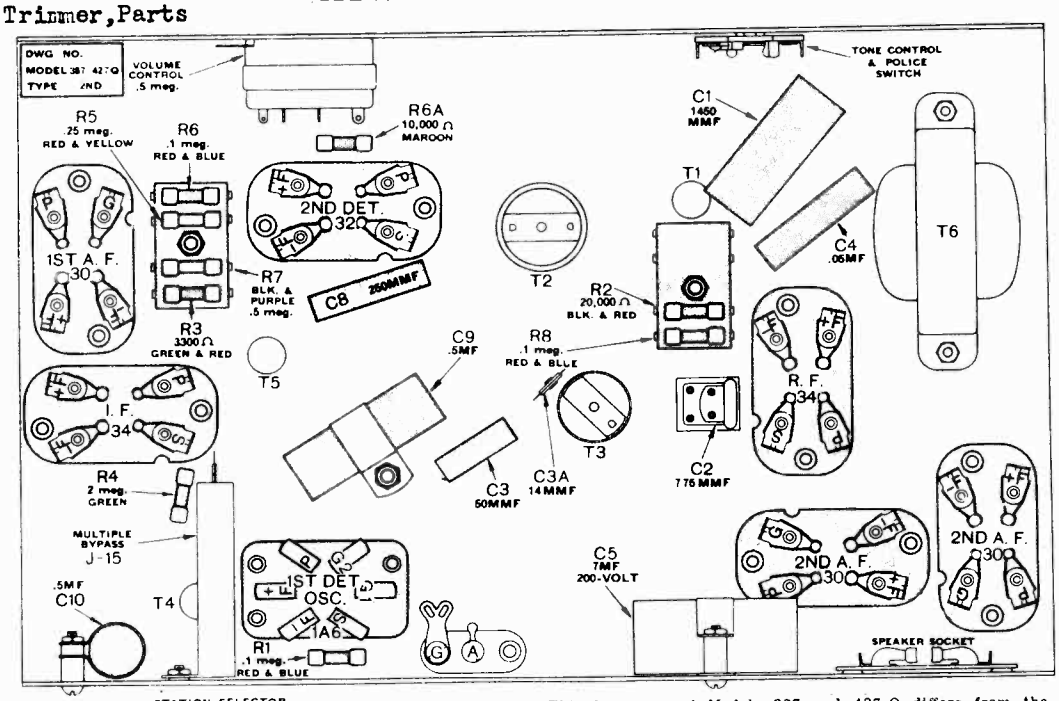
MODEL 387
ABOVE No. 7873966
MODEL 427-Q
ABOVE No. 1948501

Total "B" voltage at time measurements were made equaled 120 volts. Tube voltages are taken from —F of each tube. Resistor R9 is used with 2-volt air cell, but is not used with 2-volt storage cell. An extra resistor of the same value as R9 is used with a 3-volt dry-cell "A" battery, and is connected in series with R9.

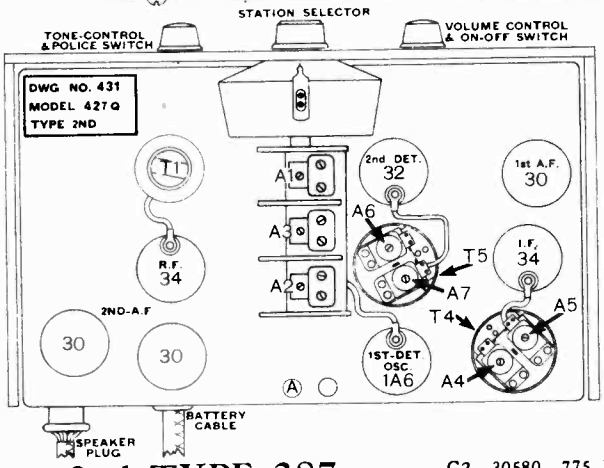
May, 1934.

MODEL 387 Above 7873966
MODEL 427Q Above 1948501
Socket,Trimmer,Parts

ATWATER-KENT MFG. CO.



This late type of Models 387 and 427-Q differs from the early type by having a police-switch circuit which permits tuning in both police bands.



2nd TYPE 387

(Above Serial No. 7873966)

2nd TYPE 427-Q

(Above Serial No. 1948501)

Part No.	Name of Part
27054	Dial assembly
26721	Dial lamp (2-V., 60 MILS.)
37830	Tone control switch complete
26337	Cabinet complete (387)
26053	Screen
25686	Escutcheon
26031	Knob—volume and tone control
25811	Knob—dial
26177	Variable condenser assembly
25692	Volume control, .5 U
25704	Battery cable
23288	Dial plate

TRIMMERS

Code No.	Part No.	Name of Part
A4, 5	30110	Double I. F. trimmer
A6, 7	30110	Double I. F. trimmer

CONDENSERS

Code No.	Part No.	Name of Part
C1	37840	1450 MMF, 100-V.
C2	30580	775 MMF, 100-V.
C3	35840	50 MMF, 500-V.
C3A	36280	14 MMF, 500-V.
C4	26820	.05 MF. 200-V., NI
C5	22472	7 MF, 200-V., dry electrolytic
C6	27630	.01, 200-V.
C7	27630	.01, 200-V.
C8	33620	250 MMF, 450-V., NI
C9	31510	.5 MF, 100-V., NI
C10	31510	.5 MF, 100-V., NI
	34010	Multiple by-pass (J15)

TRANSFORMERS

Code No.	Part No.	Name of Part
T1	37920	No. 1 R. F. T.
T2	37930	No. 2 R. F. T.
T3	37940	Oscillator T.
T4	26068	No. 1 I. F. T.
T5	26068	No. 2 I. F. T.
T6	35030	Input T.
T7	23701	Output T.

SOCKETS

Part No.	Name of Part
20237	4 prong
22733	6 prong
21336	Speaker (4 prong)

RESISTORS

Code No.	Part No.	Name of Part
R1	30340	Red-blue, .1 U, 1/3-W.
R2	30390	Bl'k-red, 20,000 Ω, 1/3-W.
R3	30380	Red-green, 3300 Ω, 1/3-W.
R4	30370	Green, 2 U, 1/3-W.
R5	31970	Red-yel., .25 U, 1/3-W.
R6	30340	Red-blue, .1 U, 1/3-W.
R6A	30320	Maroon, 10,000 Ω, 1/3-W.
R7	30350	Bl'k-purple, .5 U, 1/3-W.
R8	30340	Red-blue, .1 U, 1/3-W.
R9	36250*	Wire wound, 1.15 Ω in 427-Q
R9	36240†	Wire wound, 1.03 Ω in 387

* A No. 37130 resistor (1.15 Ω) is supplied with set for use with a 3-V. dry "A" battery.
† A No. 37120 resistor (1.03 Ω) is supplied with set for use with a 3-V. dry "A" battery.

MISCELLANEOUS

Part No.	Name of Part
21877	I. F. T. shield
22678	R. F. T. shield
22654	I. F. T. shield cap
25735	Battery cable tag, F1082
25602	Instruction and log card, F1072
25804	Shipping container
15213	Tube shield

387 SPEAKER No. 31700

Part No.	Name of Part
19465	Diaphragm
19918	Magnet assembly
23701	Output transformer, less case
23764	Cable and plug

427-Q SPEAKER No. 36400

Part No.	Name of Part
23863	Speaker cable and plug assem.

Ω = ohms. U = megohms. IND. = inductive. NI = non-inductive. W. = watt.

ACTION OF ATWATER KENT Tune ♦ O ♦ Matic

A simple diagram of the Tune-O-Matic is shown on this page. It is NOT necessary to understand the circuit details in order to set up the Tune-O-Matic, but a few notes on the mechanical action are given below for your convenience.

The tuning motor is a shaded-pole induction type. The motor shaft rotates in only one direction, and the required forward and reverse drive for the variable condenser is secured by an ingenious and simple arrangement for tipping the motor, which is pivoted for this purpose. Tipping is accomplished by a solenoid and lever.

The motor drive shaft extends between two rubber-tired wheels, one large, and one small. When the solenoid is not energized, the motor drive shaft rests against the small wheel and the resulting motion drives the variable condenser in the direction from 540 to 1600 K. C. When the solenoid is energized, the motor is tipped so that its drive shaft rests against the large wheel, and the variable condenser is then driven in the direction from 1600 to 540 K. C.

The current that energizes the solenoid is controlled by a switch (mounted above the top rear of the variable condenser). This switch opens at 1600 K. C. and closes at 540 K. C. The switch is operated by a cam on the shaft of the variable condenser.

Eight adjustable discs are mounted on the shaft of the variable condenser, which is extended out in back of the condenser. Each disc has a small insulated sector on the rim. Each disc is held by spring tension to the shaft. Normally, the discs do not move with respect to the shaft, but by holding the front gear of the variable condenser, and using a special wrench which is furnished with Model 511, each disc may be rotated on its shaft so that the insulated sector is in the desired position. Between adjacent disc there is a spacer which is keyed to the shaft. This prevents the movement of any disc other than the one moved with the wrench.

Eight contact fingers are mounted at one side of the discs, each finger contacting with the rim of its corresponding disc.

The electrical action is briefly as follows:

Assume that we have one lead of station "G" plugged in the 4:30 jack and the switch is set to automatic.

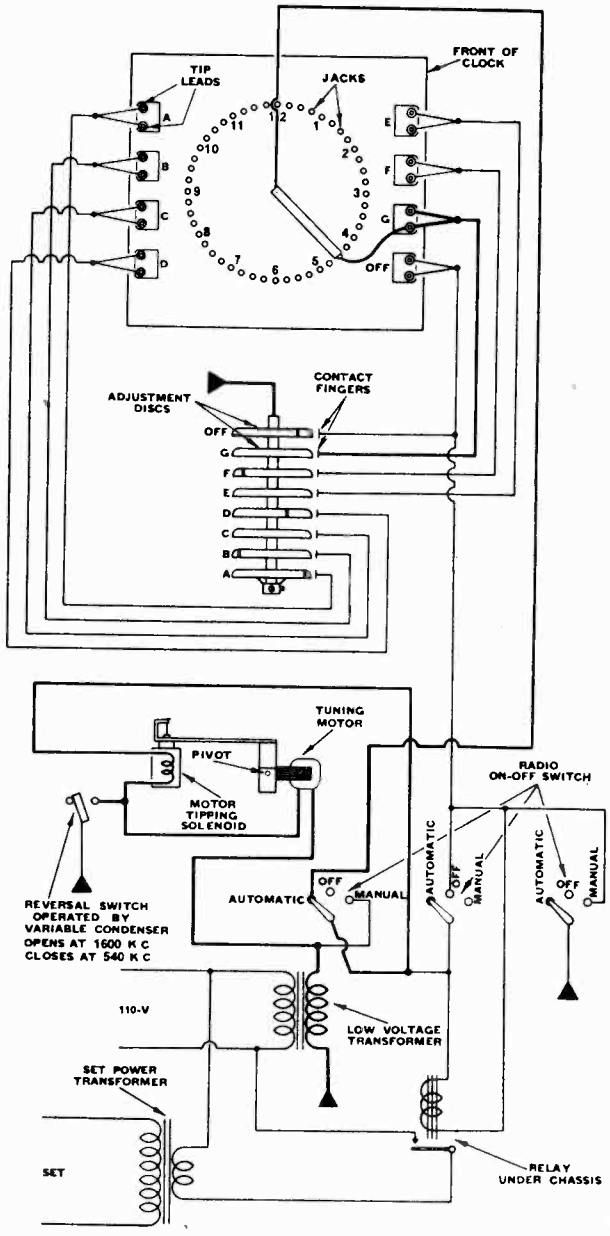
When the contact blade on the rear of the jack panel comes to the 4:30 jack, the electric circuit through the motor and solenoid is completed and the solenoid tips the motor shaft against the large rubber-tired wheel. The motor turns the variable condenser from the automatic-off position, near 1600 K. C., across the dial to the frequency of station "G".

When the motor reaches this point, the insulated sector of disc "G" has come under its contact finger and the circuit, from the finger through the disc to ground. is broken. This cuts the high-impedance relay into the motor circuit and reduces the current through the motor and solenoid to such a low value that the motor stops turning and the solenoid lever comes up, throwing the motor drive shaft against the small rubber-tired wheel which acts as a mechanical brake, bringing the motor to a dead stop on station "G". Simultaneously, the relay has completed the 110-volt circuit to the set power transformer and the set, now tuned to station "G", begins to operate.

Now plug one of the "off" leads into the 4:45 jack. When the contact finger moves off the 4:30 jack, the circuit through the relay is broken, the set is turned off, and the contact finger, now on the 4:45 jack, completes the circuit through the motor and solenoid, driving the condenser to 540 K. C., where a cam on the shaft trips the switch, thus cutting out the solenoid, and the motor tips back against the small rubber-tired wheel, driving the condenser back in the opposite direction to 1600 K. C.

Beyond the 1600 K. C. end of the dial, the cam on the variable condenser shaft again trips the switch, which opens, and the solenoid, being energized, tips the motor shaft against the large wheel, starting the condenser moving back. But at 1600 K. C. the insulated sector of the "off" disc comes under its contact finger, breaking the circuit and stopping the motor. **In the off position, NO CURRENT IS DRAWN BY THE SET;** the only current is the small amount required by the electric clock.

Inspection of the diagram will show that the jack panel is shorted out by the switch when the condenser is moving from 540 to 1600 K. C. For greatest accuracy all tuning is done while the condenser is moving from 1600 to 540 K. C.



MODEL 511 Tun-O-Matic Data

ATWATER-KENT MFG. CO.

SETTING UP THE Tune ♦ O ♦ Matic

The Tune-O-Matic mechanism should be adjusted by the dealer in his store, and not in the customer's house. If the customer indicates his choice of seven different stations, the dealer should adjust the Tune-O-Matic for these seven stations. If the choice is left to the dealer, he should select the seven strongest and most reliable stations. In any case, do not select a weak station, a station with pronounced fading habits, nor a station that has interference; such stations can be received better with manual tuning.

1. Make a list of the seven desired stations, listing them numerically by frequency, and mark the call letters of the seven stations on the station index plates at the front of the clock unit, beginning at the top of the left-hand row and working down the left hand row, then to the top of the right-hand row and working down the right-hand row. The bottom index plate on the right-hand row is marked "OFF". Each celluloid plate has two spring-return tip-jack leads. There are two leads for each of the seven stations and two "off" leads.

2. Remove the small cover at center rear of chassis. This cover is held by two screws and encloses eight adjustment discs and eight corresponding contact fingers. (The disc nearest the front of the set is the "off" disc and it is adjusted at the factory to a point beyond the 1600 K.C. end of the dial.

3. Turn the tone control extreme right (high pitch), and turn the on-off switch to the "manual" position (right). Tune in the first station on the list; we will refer to this as station "A".

4. Without disturbing the tuning, firmly grasp the dial gear at front of variable condenser in one hand and move the **rear** disc, by means of special wrench furnished with set, until the rear contact finger is on the small insulated sector of the rear disc.

The wrench is designed to fit loosely on the rim of the disc in order that it may be moved easily to any desired point on the rim. In using the wrench to move the disc, it is necessary to press against the wrench in such a way that the wrench grips the rim of the disc, and then press slowly but firmly in moving the disc.

If you have not held the dial gear securely while turning the disc, the set may have detuned slightly. (Detuning is most readily noticed when the tone control is set at high pitch). In this case retune the station carefully and readjust the rear disc.

5. Plug one of the top left-hand pair of tip leads into the jack at which the HOUR hand points or has just passed.

Note that the clock is marked in 15-minute intervals, not in minutes. Turn on the on-off switch to "automatic" (left) and tune off the station. This will cause the set to shut off and start the Tune-O-Matic motor. Allow the automatic mechanism to bring the pointer back to the station, at which point the motor will stop and the set will be turned on. After the tubes have heated and the station comes in, note whether the station is correctly tuned in. If the station is not tuned in correctly, a slight readjustment of the disc in the correct direction is necessary. Again throw the station off tune and repeat the procedure if necessary.

6. Proceed with the 2nd station as outlined in paragraphs numbered 4 and 5, above, but adjust the 2nd disc from the rear and use one of the 2nd pair from the top left row of tip leads to plug into the jack at which the hour hand points.

7. Adjust for the remaining stations in the same way, noting that the adjustment discs and the corresponding pairs of tip leads shown on page 1 of customer's instructions are as follows:

Rear disc.....(Station "A").
2nd from rear disc (Station "B").
3rd from rear disc (Station "C").
4th from rear disc (Station "D").
5th from rear disc (Station "E").
6th from rear disc (Station "F").
7th from rear disc (Station "G").
Front disc (OFF). This is set at factory.

ADDITIONAL AUTOMATIC "OFF" POSITIONS

If more than two automatic "off" positions are required, it is possible to obtain two additional "off" positions by using one of the seven station discs for this purpose.

Use the 2nd disc from the front and adjust it so its insulated sector is in the same position as the front or regular "off" disc. Mark "OFF" on the index plate directly above the regular "off" plate.

This arrangement provides selection of six different stations with four automatic "OFF" positions.

ADDITIONAL STATION LEADS

If seven good stations are not continuously available, it is necessary to double up on the good stations. Use two adjacent discs for each good station, marking the index plates to correspond.

INSTALLING ATWATER KENT REMOTE CONTROL ON MODEL 511 Tune ♦ O ♦ Matic

The Atwater Kent remote control consists of a small control box with a ten-point switch and illuminated switch dial. Seven of these ten points are used to select the seven different stations for which the Tune-O-Matic has been previously adjusted. There are **two** "off" points (one at each end of the switch movement), and one point marked "time" which restores the set to automatic time operation.

THE SWITCH ON THE CONTROL UNIT MUST BE PLACED IN THE "TIME" POSITION WHEN IT IS DESIRED TO HAVE THE SET TUNE AUTOMATICALLY.

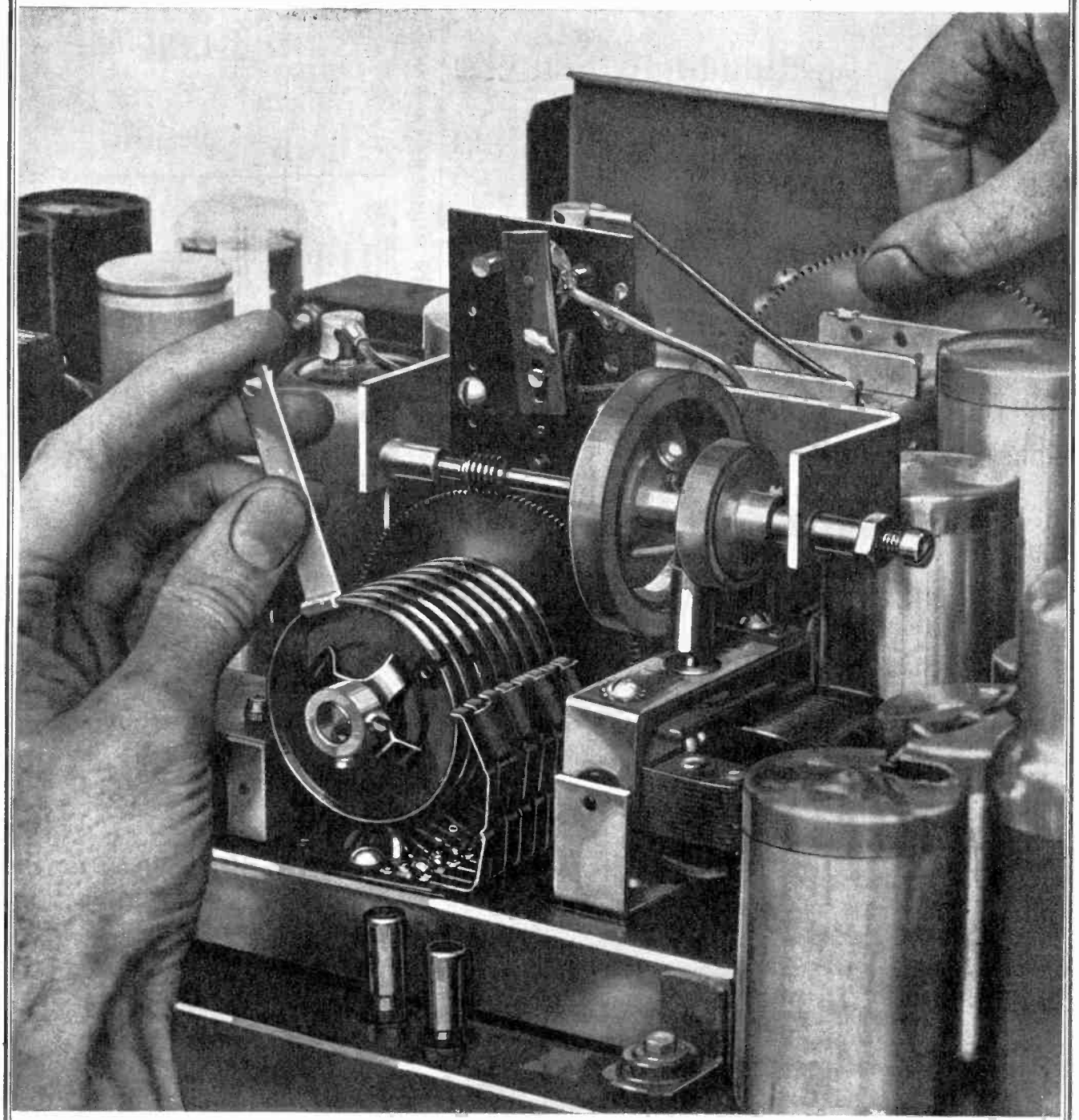
The remote control has 25 feet of cable so the control unit may be placed across the room or in an adjoining room from the set.

The other end of the remote control cable has a multi-prong socket and plug. Attach the socket to the left-rear side of the cabinet by means of the two screws furnished with the unit.

Remove the plug of the Tune-O-Matic clock unit from the socket at top-left of chassis and insert it in the socket which you have just fastened to rear of cabinet. Then insert the plug at end of remote control unit into the socket on top of chassis.

This control unit does not have a volume control, but Model 511 has a super-automatic volume control circuit which ensures constant volume level from one station to another.

SETTING UP THE Tune ♦ O ♦ Matic



ADJUSTING REAR DISC WITH SET TUNED TO STATION "A"

TUBULAR FIXED CONDENSERS
(By Part Numbers)

Part No.	Value	Type†	Voltage	Superseded by	Code No. printed on late type condensers
24509	.01 & .01	IND.	200	31190	
26550	.5	NI	200		219
26660	.1	NI	200		213
26820	.05	NI	200		208
27234	.5	NI	200	26550	
27434	.008, .03	IND.	450		417
27619	.008, .02	IND.	450		418
27630	.01	IND.	200		203
28040	.005	IND.	200		201
28130	.0005	IND.	450		402
29030	.02	NI	450		410
29530	.03	NI	200		206
29890	.005	IND.	450		408
29910	.015	NI	450		414
30240*	250 MMF	IND.	450	33620	
30250	.025	NI	450		411
30670	250 MMF	IND.	450	33620	
31140	250 MMF Double	IND.	450	33630	
31150	.3	NI	100		104
31160	.05	NI	100		101
31190	.01 & .01	IND.	200		220
31330	250 MMF Double	IND.	450	33630	
31510	.5	NI	100		105
31520	.2	NI	100		103
31530	.1	NI	100		102
31540	.001	IND.	450	33640	
31890	.05, .05, .5	IND.	100	31920	
31910	.1, .1, .2	IND.	100	31930	
31920	.05, .05, .5	IND.	100		110
31930	.1, .1, .2	IND.	100		111
32350	.05, .05, .2	IND.	200	32390	
32360	.05, .05, .05	IND.	200	32410	
32370	.0022	IND.	450	33660	
32390	.05, .05, .2	IND.	200		222
32410	.05, .05, .05	IND.	100		107
32420	.0022	IND.	450	33660	
32750	.2, .1	IND.	100		106
32760	.2, .1	IND.	100	32750	
32810	.01	NI	450		409
33620	250 MMF	IND.	450		401
33630	250 MMF Double	IND.	450		413
33640	.001	IND.	450		403
33660	.0022	IND.	450		405
34020	.05 & 250 MMF	IND.	200		221
35420	.08	NI	200		212
35760	.003	IND.	450		407
35780	.2, .1, .05, .05, .05, .3	IND.	100	35790	
35790	.2, .1, .05, .05, .05, .03	IND	100		108
35930	.25	NI	200		215
36420	.02	IND.	200		205
36440	.1, .1, .05	IND.	100		109
36450	.05, .05, .005, .005	IND.	200		223
36490	.05	NI	450		412
36650	.0015	IND.	450		404
36660	.0025	IND.	450		406
36670	.007	IND.	200		202
36680	.015	IND.	200		204
36690	.04	NI	200		207
36710	.055	NI	200		209
36720	.065	NI	200		210
36730	.07	NI	200		211
36740	.2	NI	200		214
36750	.27	NI	200		216
36760	.3	NI	200		217
36770	.4	NI	200		218
38160	.03, .015, .008	IND.	450		415
38260	.001, .004, .008	IND.	450		416
39650	.004, .001	IND.	450		419

† Condensers designated as inductive (IND.) are constructed in such a way that the current must travel through one or more turns of the tin-foil plates in order to reach the ends of the plates. Such condensers have a slight inductive effect and are primarily used as low-frequency bypasses where the effect of this slight inductance is negligible.

Condensers designated as non-inductive (NI) are constructed in such a way that the current reaches the entire area of the plates without having to pass through any turns of the plates. Non-inductive condensers are used as high-frequency bypasses.

TUBULAR FIXED CONDENSERS
(By Code Numbers)

Code No. printed on late type condensers	Part No.	Value	Type†	Voltage
101	31160	.05	NI	100
102	31530	.1	NI	100
103	31520	.2	NI	100
104	31150	.3	NI	100
105	31510	.5	NI	100
106	32750	.2, .1	IND.	100
107	32410	.05, .05, .05	IND.	100
108	35790	.2, .1, .05, .05, .05, .03	IND.	100
109	36440	.1, .1, .05	IND.	100
110	31920	.05, .05, .5	IND.	100
111	31930	.1, .1, .2	IND.	100
201	28040	.005	IND.	200
202	36670	.007	IND.	200
203	27630	.01	IND.	200
204	36680	.015	IND.	200
205	36420	.02	IND.	200
206	29530	.03	NI	200
207	36690	.04	NI	200
208	26820	.05	NI	200
209	36710	.055	NI	200
210	36720	.065	NI	200
211	36730	.07	NI	200
212	35420	.08	NI	200
213	26660	.1	NI	200
214	36740	.2	NI	200
215	35930	.25	NI	200
216	36750	.27	NI	200
217	36760	.3	NI	200
218	36770	.4	NI	200
219	26550	.5	NI	200
220	31190	.01, .01	IND.	200
221	34020	.05, 250 MMF	IND.	200
222	32390	.05, .05, .2	IND.	200
223	36450	.05, .05, .005, .005	IND.	200
224	27234	.5	NI	200
401	33620	250 MMF	IND.	450
402	28130	.0005	IND.	450
403	33640	.001	IND.	450
404	36650	.0015	IND.	450
405	33660	.0022	IND.	450
406	36660	.0025	IND.	450
407	35760	.003	IND.	450
408	29890	.005	IND.	450
409	32810	.01	NI	450
410	29030	.02	NI	450
411	30250	.025	NI	450
412	36490	.05	NI	450
413	33630	250 MMF Double	IND.	450
414	29910	.015	NI	450
415	38160	.03, .015, .008	IND.	450
416	38260	.001, .004, .008	IND.	450
417	27434	.008, .03	IND.	450
418	27619	.008, .02	IND.	450
419	39650	.004, .001	IND.	450

* In models where No. 30240 is used as a diode coupling condenser and mounted inside an I. F. transformer assembly, use No. 33670 (small mica type) for replacement. The No. 33620 condenser, which normally supersedes No. 30240, is too large for mounting inside the I. F. transformer shield.

SMALL BUTTERFLY CONDENSERS
(500 Volts)
(Illustration is full size)

Part No.	Color	Angle Between Lugs	Rated Capacity
25661	Green	180°	8 MMF
34460	Bl'k	77°	10 MMF
34470	Red	123°	14 MMF
36220	Blue	123°	7 MMF
36230	Blue	123°	7 MMF
38280	Gray	123°	4 MMF

1/3, 1/2, 1, and 2 WATT TUBULAR RESISTORS
(When replacing a tubular resistor, use a resistor of the same value and size)

These four illustrations are full size.

Resistance in Ohms	Identifying Color	1/3 Watt Size	½ Watt Size	1 Watt Size	2 Watt Size
165	Blue, Gray and Yellow	41330	——	——	——
200	Blue, Yellow and Red	——	37690	——	——
300	Maroon and Blue	——	37530	——	31490
425	Blue, Yellow and Green	——	37540	——	——
500	Blue, Red and Green	39790	——	32010	——
1,100	Black, Red and Blue	31480	——	——	——
1,500	Black and Green	37710	——	——	——
2,000	Blue	33250	——	——	——
2,500	Gray, Red and Green	39130	——	——	——
3,300	Green and Red	30380	26410	19346	——
4,000	Green and Blue	——	——	18049	——
5,000	Blue and Yellow	36430	28050	——	——
6,000	Purple	——	——	20151	28770
7,500	Yellow	——	——	15544	——
10,000	Maroon	30320	20950	15545	27210
12,500	Purple and Yellow	——	——	15941	——
15,000	Gray and Yellow	——	20960	22211	27220
	Gray and Green	——	——	21784	——
20,000	Black and Red	30390	23120	15891	28030
30,000	Gray	31840	20970	15285	29710
40,000	White	——	26160	16724	28750
50,000	Black, Yellow and Red	30330	——	22407	34340
65,000	Black	31980	21040	15592	——
100,000	Red and Blue	30340	20980	16282	28760
150,000	Black and Yellow	——	——	28864	——
250,000	Red and Yellow	31970	20920	19581	——
500,000	Black and Purple	30350	20930	19649	——
800,000	Red and Gray	——	23130	20223	——
900,000	Green and Yellow	——	23170	——	——
1,000,000	Blue and Gray	30360	21050	——	——
2,000,000	Green	30370	20940	15892	——

PARTS NUMBERS OF KNOBS

Model No.	Vol. Control knob	Station Selector, dial or tuning knob	Tone control knob	Frequency range switch knob	Silencing switch knob
112	27728§	27728§	27494§	27358§	26571‡
145	27496‡	24278* / 27498†	27495§	26569§	
206	27496‡	24278* / 27498†	27495§	26569§	
318	27728§	27728§	27494§	27358§	26571‡

Model No.	Vol. Control knob	Station Selector, dial or tuning knob	Tone control knob	Frequency range switch knob	Silencing switch knob
325	27496‡	24278* / 27498†	27495§	26569§	
447	27728§	27728§	27494§	27358§	26571‡
511	26569§	26569§	27495§	26571‡	27495§
559	27728§	27728§	27494§	27358§	26571‡
825	27493‡	27493‡	26571‡	26571‡	
944	27493‡	27493‡			

CABINET PARTS FOR CONSOLE SETS

25925	Wing nut
21142	Washer
27704	Clamp (small)
25742	Clamp (large)
25746	Clamp bolt

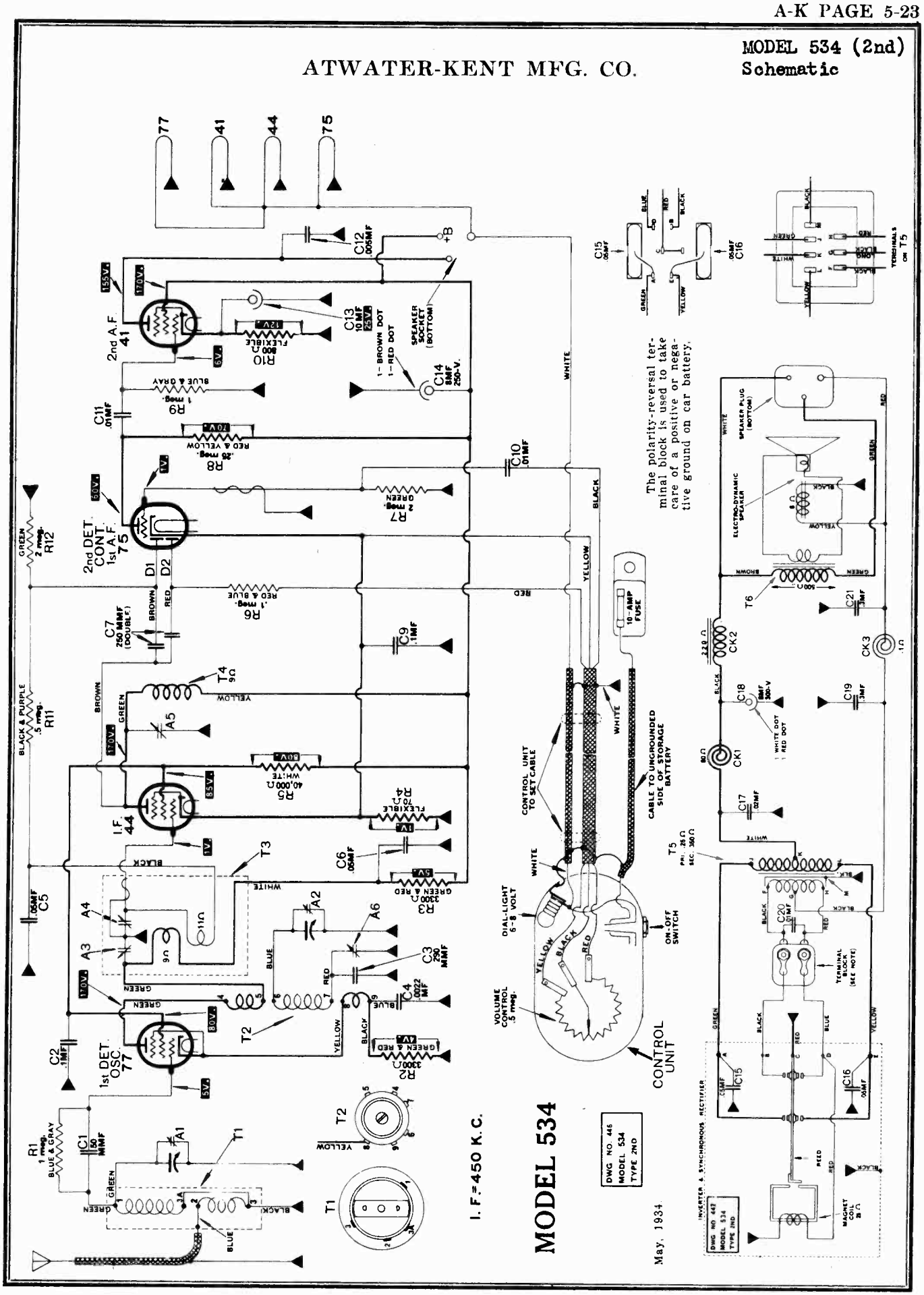
COMPACT CABINET AND SCREEN NUMBERS

Model Number	Cabinet Less Screen	Cabinet With Screen	Screen
135 Z		28831	27908
145	28839		27906
206	28834		27908
206-D	28834		27908
447	28026		27904
465-Q		28832	27907
768-Q		28629	27904
825		28796	27902
944	28773		27892

* No. 24278 single knob (front). † No. 27498 single knob (back). ‡ No. 28114 knob spring, .012 thk. § No. 28115 knob spring, .015 thk.

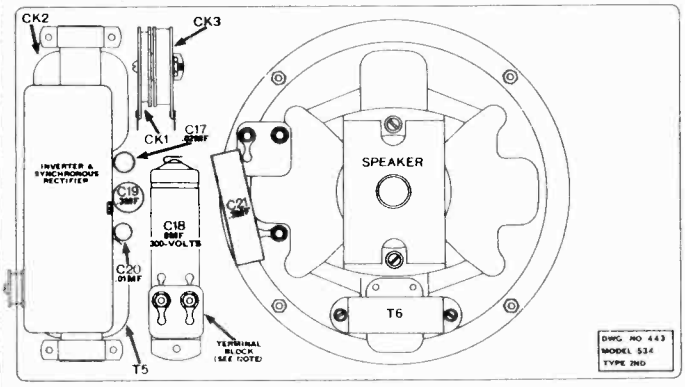
ATWATER-KENT MFG. CO.

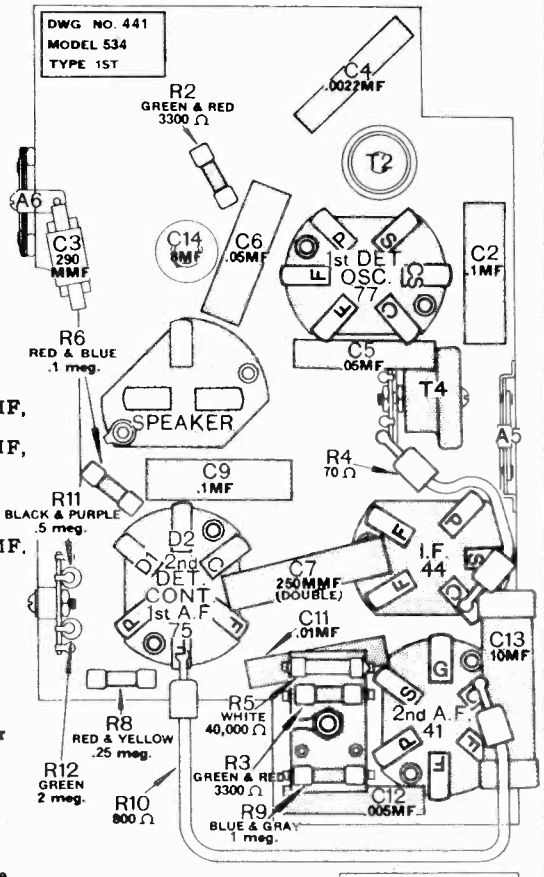
MODEL 534 (2nd) Schematic

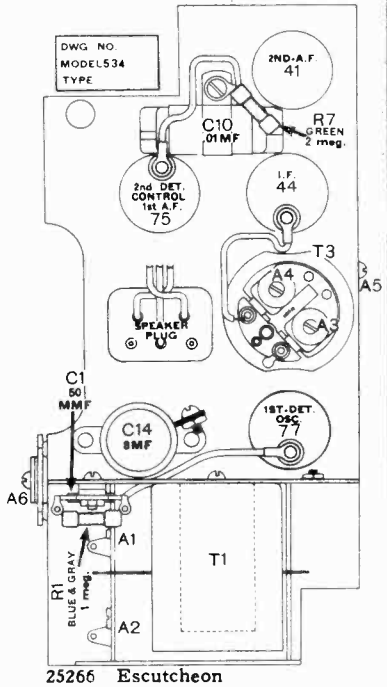


MODEL 534 (2nd)
Socket, Speaker, Parts
Trimmers

ATWATER-KENT MFG. CO.







MODEL 534

Part No.	Name of Part
25655	Set container
25653	Container cover
25475	Wire screen
25482	Set mounting bolt, 2½" x ⅜"
24486	Nut, ⅜"
24485	Lockwasher, ⅜"
21143	Plug suppressor
21144	Distributor suppressor
23260	Generator condenser, 1 MF, 200-V.
23520	Ignition filter
25509	Shield for No. 1 R. F. T.
25441	Shielded grid lead and cap
25287	Variable condenser assembly
25406	Station selector clamp
25519	Antenna cable, 24"
21126	Control pulley
21127	Control pulley spring
25851	Spring centering ring

TRANSFORMERS

Code No.	Part No.	Name of Part
T1	33710	No. 1 R. F. T.
T2	33720	Oscillator T.
T3	25651	No. 1 I. F. T.
T4	33790	No. 2 I. F. T.
T5	25371	Power T.
T6	25606	Output T.

RESISTORS

Code No.	Part No.	Name of Part
R1	30360	Blue-gray, 1 U, 1/3-W.
R2	30380	Red-green, 3300 Ω, 1/3-W.
R3	30380	Red-green, 3300 Ω, 1/3-W.
R4	15820	Flexible, 70 Ω
R5	26160	White, 40,000 Ω, ½-W.
R6	30340	Red-blue, .1 U, 1/3-W.
R7	30370	Green, 2 U, 1/3-W.
R8	31970	Red-yellow, ¼ U, 1/3-W.
R9	30360	Blue-gray, 1 U, 1/3-W.
R10	20120	Flexible, 800 Ω
R11	30350	Bl'k-purple, .5 U, 1/3-W.
R12	30370	Green, 2 U, 1/3-W.

CONDENSERS

Code No.	Part No.	Name of Part
C1	30260	50 MMF, letter E stamped on washer, 450-V.
C2	31530	.1 MF, 100-V., NI
C3	33680	290 MMF, 100-V.
C4	33660	.0022 MF, 450-V., IND.
C5	31160	.05 MF, 100-V., NI
C6	26820	.05 MF, 200-V., NI
C7	33630	Double 250 MMF, 450-V., IND.
C9	31530	.1 MF, 100-V., NI
C10	23250	.01 MF, 450-V.
C11	27630	.01 MF, 200-V., IND.
C12	28040	.005 MF, 200-V., IND.
C13	25379	Dry electrolytic, 10 MF, 25-V.
C14	25385	Dry electrolytic, 8 MF, 250-V.
C15	33070	.05 MF, 450-V.
C16	33070	.05 MF, 450-V.
C17	29030	.02 MF, 450-V., NI
C18	25384	Dry electrolytic, 8 MF, 300-V.
C19	31150	.3 MF, 100-V., NI
C20	27630	.01 MF, 200-V., IND.
C21	31150	.3 MF, 100-V., NI

TRIMMER CONDENSERS

Code No.	Part No.	Name of Part
A3, 4	32880	Double I. F. trimmer
A5	24495	Single I. F. trimmer
A6	31870	Single trimmer

CHOKES

Code No.	Part No.	Name of Part
CK1	17015	R. F. "B" filter choke
CK2	33450	A. F. filter choke
CK3	23530	R. F. "A" filter choke

SOCKETS

Part No.	Name of Part
24493	5 prong
25196	3 prong
24494	6 prong
23147	Fuse

POWER UNIT SUPPLY

Part No.	Name of Part
25595	Vibrator assembly
25563	Connector card, female
25564	Connector card and bracket, male
25344	Insulator (fish paper)

MISCELLANEOUS PARTS

Part No.	Name of Part
21406	Fuse, 10 amp.
25658	Shipping container
20976	Lockswitch key

REMOTE CONTROL UNIT

Part No.	Name of Part
33430	Remote control unit complete
21496	Volume control, .5 U
21325	Volume control knob
24169	Dial knob
21491	Lockswitch
21407	Dial lamp (6-8 volts, ¼ amp.)
25483	Remote control unit to set cable, 4'
26179	Station selector cable, 4' 11"
26181	Station selector cable sheathing, 4'
25492	Shielded lead to ungrounded side of battery, 6' 6"
25266	Escutcheon
26173	Dial

534 SPEAKER

Part No.	Name of Part
25534	Speaker complete
25603	Conehead assembly
25605	Field coil, 8 Ω
25606	Output transformer (T6)
25403	Speaker cable and plug
25652	Cloth cover

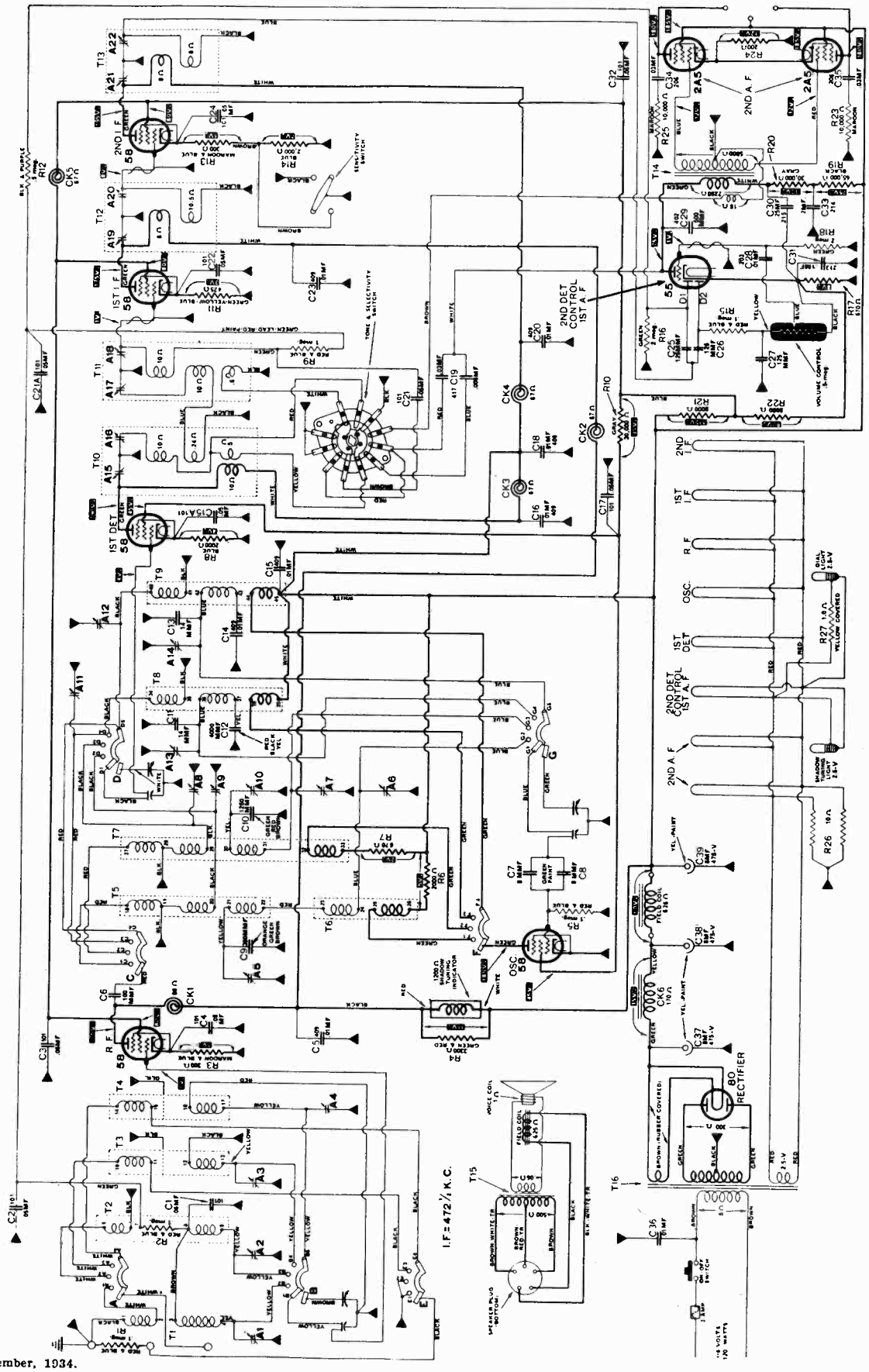
ATWATER-KENT MFG. CO.

MODEL 559
Schematic

MODEL 559

Switch in highest frequency position

For Alignment See Index

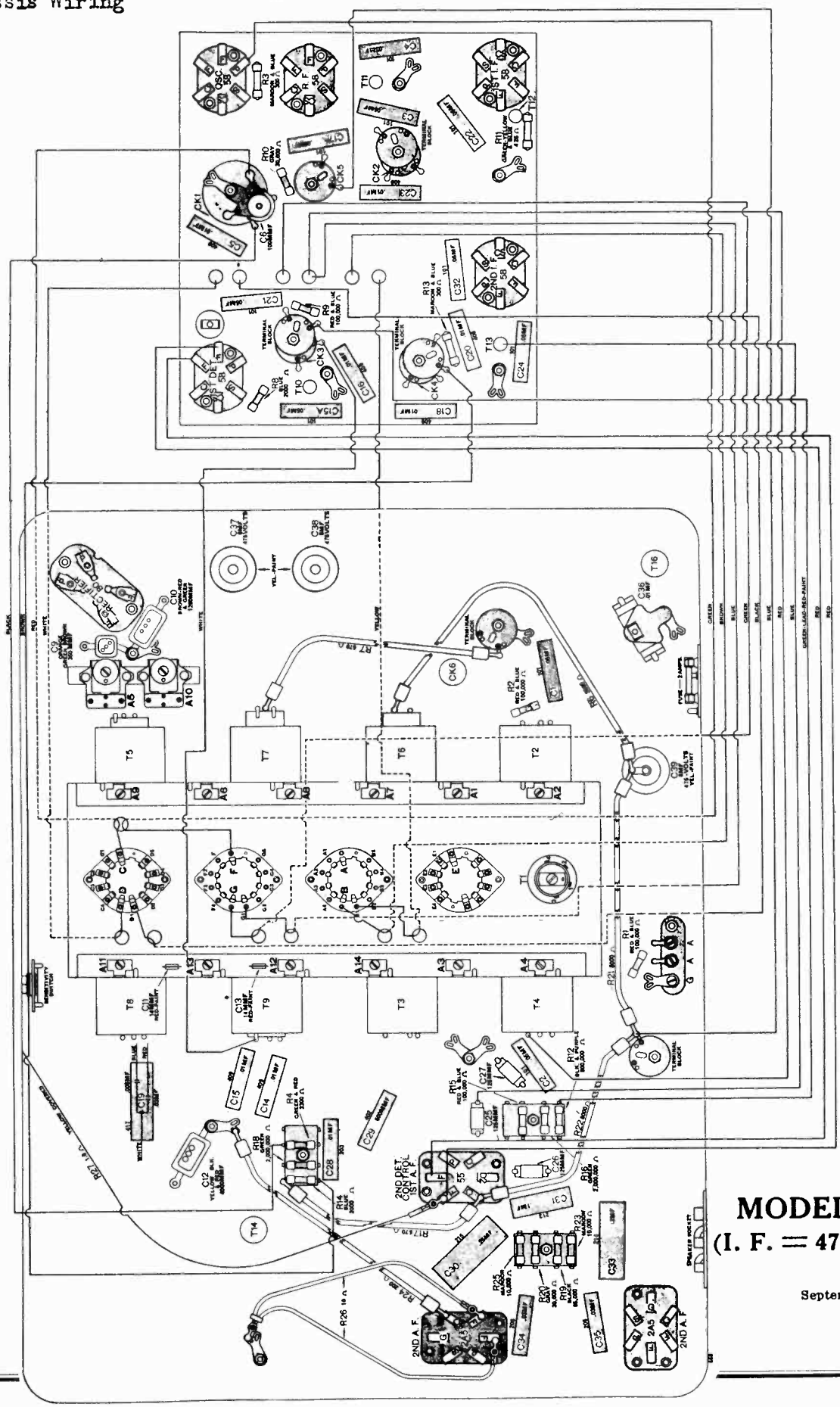


Voltage measurements were made with sensitivity switch at "local." The R. F. and I. F. circuit of Model 112 is the same as Model 559.

September, 1934.

MODEL 559
Chassis Wiring

ATWATER-KENT MFG. CO.



Switch in highest frequency position

This view shows the connections between the top unit and the main base.

For Alignment Data, Socket Layout and Parts List, See Index

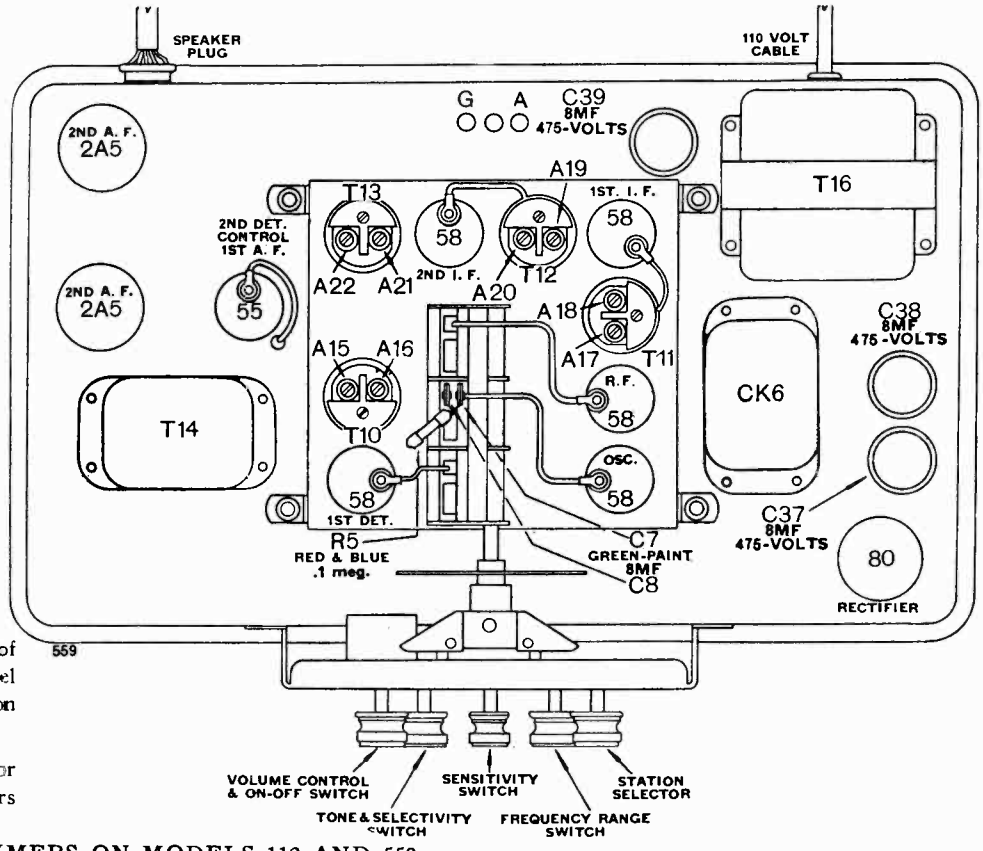
MODEL 559
(I. F. = 472½ KC.)

September, 1934.

ATWATER-KENT MFG. CO.

MODEL 559
Socket, Trimmers
Alignment Notes (1)
Balancing Gadget

TOP VIEW MODEL 559



The location of trimmers on Model 112 is the same on Model 559.

Refer below for names of trimmers on these models.

R. F. TRIMMERS ON MODELS 112 AND 559

	10-18 MC Range	4-10 MC Range	1.5-4 MC Range	540-1600 KC Range
R. F.	A4	A3	A2	A1
1st-Detector	A12	A11	A8	A9
Oscillator	A14	A13	A7	A6
Tracking	None	None	A10	A5

The I. F. trimmers are A15 to A22, inclusive.

ADJUSTING TRIMMER CONDENSERS

EQUIPMENT.

1. OSCILLATOR. The oscillator should extend from the lowest I. F. frequency (125 KC in Atwater Kent sets) to at least 18 MC. The oscillator should have a good attenuator and should be well shielded. If the oscillator is not well shielded, it may be difficult to peak the pre-selector trimmers on some models, owing to pick-up by the 1st-detector grid circuit. In general, it is advisable to connect an .00025MFD fixed condenser in series with the oscillator pick-up lead at the antenna terminal of the set.

2. OUTPUT METER. Use a sensitive output meter and keep the radio volume control turned on full volume. This is necessary to minimize the effect of the automatic-volume-control action of the set which would otherwise prevent sharp peaking of the trimmers.

3. BALANCING UNIT. Build two of the Type "A" balancing units and one of the I. F. coupling units shown on right. These are required for correct adjustment of Atwater Kent super-heterodynes. The Type "B" balancing unit, also described, is used on earlier models of Atwater Kent sets.

4. Use a non-metallic screw driver for adjustment of the trimmers.

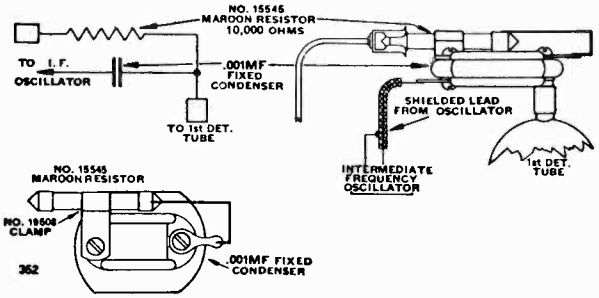


Fig. 1. I. F. Coupling unit.

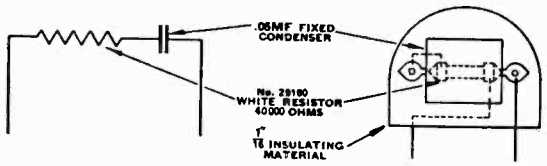


Fig. 2. Balancing unit "A."

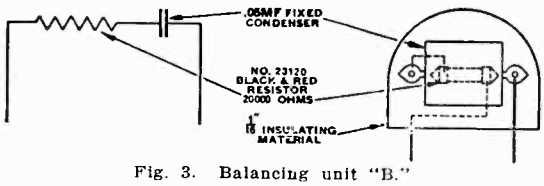


Fig. 3. Balancing unit "B."

MODEL 112,559
Alignment
MODEL 145,325
Alignment
General Alignment

ATWATER-KENT MFG. CO.

ADJUSTING TRIMMER CONDENSERS (Contd.)

GENERAL NOTES.

1. Do not make any trimmer adjustments and do not disturb the dial gear or the dial indicator adjustments unless absolutely necessary.

2. With all-wave sets, it is very desirable to use a test oscillator that extends to 18 MC (18,000 KC). If you attempt to use harmonics of a broadcast oscillator, you are likely to use the wrong harmonic and set the trimmers incorrectly.

3. When using a test oscillator, you will experience "double-spot" or image reception, particularly on the highest frequency range of the set. The double-spot point is twice the I. F. frequency below the correct point. For instance, if a set has an I. F. frequency of 472½ kilocycles, and you are tuning in an 18 MC signal, the double-spot or image will be twice 472½ or 945 KC (.94 MC) below 18. In such a case you will hear the signal at 18 MC and also at 17.06 MC. In properly aligned sets of six tubes or more, the image should be weaker than the desired signal.

4. Because of the facts mentioned in paragraphs 2 and 3 above, it is very desirable, wherever possible, first to check the short-wave dial calibration and determine how far, and in what direction, the readings are "off." This should be done on actual reception of short-wave stations of known frequency. This pre-checking will assist you in selecting the correct harmonic (in case you are using a broadcast oscillator), and it will also minimize possibility of confusing the correct signal and the image signal.

5. On oscillator trimmers there may be two different settings at which the signal is received. Always use the *first* of these two positions as you screw the trimmer in from a loose or minimum-capacity position. THIS IS IMPORTANT.

6. On sets with a combined oscillator and 1st-detector tube, tune the set to a quiet point near 1,000 KC while adjusting the I. F. trimmers.

OSCILLATOR GOVERNS DIAL ACCURACY.

It is essential to understand definitely that in a super-heterodyne the dial calibration depends on the oscillator circuit of the set, providing that the I. F. trimmers are correctly aligned. The pre-selector (R. F. and 1st-detector) trimmers do not affect the dial calibration but simply affect sensitivity.

If the dial calibration of one or more of the frequency ranges of the set is "off", check the oscillator trimmer, the oscillator tracking condenser and tracking trimmer, and the oscillator transformer for the particular range or ranges in question.

The oscillator **trimmer** is used to adjust the **high-frequency** end of the particular range.

The oscillator **tracking condenser** adjusts the **low-frequency** end of the particular range.

In Atwater Kent sets the fixed tracking condenser on the broadcast range (and in some models also on the police range) is shunted with an adjustable tracking trimmer condenser. The adjustable tracking trimmer condenser is not used on the high-frequency ranges.

The adjustment of the trimmers for the high-frequency and low-frequency end of a particular range is slightly interlocking. For example, assume that the broadcast range of a set is off calibration. First turn the tuning knob so the dial pointer is at 1500 KC and, using a 1500 KC signal, peak the broadcast oscillator trimmer. Then turn the set to 560 KC and, using a 560 KC signal, peak the oscillator broadcast tracking trimmer for maximum output. This adjustment will have slightly affected the previous adjustment at 1500 KC so it will be necessary to repeat the adjustment at 1500 KC and also possibly at 560 KC.

If adjustment of the oscillator trimmer and the oscillator tracking trimmer does not correct the dial readings, it may be necessary to replace the fixed oscillator tracking condenser or the oscillator transformer for that particular range.

Naturally, the I. F. trimmers should be checked, and adjusted if necessary, before any attempt is made to align the R. F. or oscillator trimmers.

GENERAL PROCEDURE.

First check the I. F. trimmers. If reception is satisfactory and the dial calibration is correct on the broadcast range, it is safe to assume that the I. F. trimmers are correctly adjusted.

If the dial calibration is "off" (or the set is weak) on only one range, adjust the trimmers for that range only. If this does not correct the trouble, inspect the resistors, condensers, transformers, and switch contacts associated with that particular range.

In checking a set, do not disturb the position of the wiring any more than necessary.

MODELS 112 AND 559

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector tube by means of the I. F. coupling unit shown in Fig. 1. Adjust the I. F. oscillator to 472½ KC. Connect a sensitive output meter to the set. Use the weakest possible oscillator signal that will give a reading on the output meter with the radio volume control on full. Put **tone control in 2nd-position from right.**

Put balancing unit A (shown in Fig. 2) across trimmer A21 and peak A22.

Put unit A across A22 and peak A21.

Put unit A across A19 and peak A20.

Put unit A across A20 and peak A19.

Put one unit A across A17 and another unit A across A15; peak A18 and A16.

Put one unit A across A18 and another unit A across A16; peak A17 and A15.

In case of instability while adjusting A21 and A22, place an extra balancing unit A across A18.

Remove the I. F. coupling unit and the balancing units and seal the trimmer screws.

R. F. TRIMMERS.

Connect an R. F. oscillator to the antenna and ground terminals of the set. Use the weakest possible signal to give a reading on the output meter. Loosen the trimmer screws for the frequency range or ranges that are to be re-adjusted.

10 to 18 MC range. Tune oscillator exactly to 18 MC and turn tuning knob of set so indicator is at 18 MC mark. Adjust trimmers A14, A4 and A12 for peak output.

4 to 10 MC range. Tune oscillator exactly to 10 MC and turn set to 10 MC mark on the 4 to 10 MC range. Peak trimmers A13, A3 and A11.

1.5 to 4 MC range. Tune oscillator to 4 MC and turn set to the 4 MC mark on the 1.5 to 4 MC scale. Peak trimmers A7, A2 and A8. Tune oscillator to 1.5 MC and, with set at 1.5, peak A10. Repeat adjustments on A7 and A10 if necessary.

Broadcast range. Tune oscillator and set to 1500 KC. Peak trimmers A6, A1 and A9. Tune oscillator to 560 KC and turn set to the 560 KC mark. Peak A5. Repeat adjustments on A6 at 1500 and A5 at 560 if necessary.

MODELS 145 AND 325

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector tube by means of the I. F. coupling unit shown in Fig. 1. Adjust the I. F. oscillator to 264 KC. Connect a sensitive output meter to the set. Use the weakest possible oscillator signal that will give a reading on the output meter with the radio volume control on full. Turn the set to a quiet point near 1000 KC.

Peak trimmer A7, A6 and A5. Remove the I. F. coupling unit and seal the trimmer screws.

DIAL POINTER ADJUSTMENT.

With the variable condenser all the way in, the dial pointer should be set at 535 KC.

R. F. TRIMMERS.

Connect an R. F. test oscillator to the antenna and ground terminals of set. Use the weakest possible oscillator signal. Loosen the trimmer screws.

Short-wave range. Oscillator at 15 MC, and set turned to 15 MC mark, peak trimmer A3

Police range. There are no trimmer adjustments for this range.

Broadcast range. Oscillator at 1500 KC and dial pointer at 1500 KC mark, peak trimmers A8, A2 and A1. Tune oscillator and set to 560 KC. Peak A4. Repeat adjustments on A8 at 1500 KC and A4 at 560 KC if necessary.

MODELS 206 AND 376 (1st type)

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector tube by means of the I. F. coupling unit shown in Fig. 1. Adjust the oscillator to 472½ KC. Use the weakest possible signal that will give a reading on the output meter with the radio volume control on full.

Turn the set to a quiet point near 1000 KC.

Peak trimmers A8, A7 and A6 for maximum output. Remove the I. F. coupling unit and seal the I. F. trimmers.

DIAL POINTER ADJUSTMENT.

With the variable condenser rotor completely meshed, the dial pointer should be set at 535 KC.

R. F. TRIMMERS.

Connect a suitable R. F. oscillator to the antenna and ground terminals of set.

Broadcast range. Oscillator at 1500 KC and dial pointer at 1500 KC mark, adjust trimmers A9, A2 and A3. Tune oscillator and set to 560. Peak A5. Repeat adjustments on A9 at 1500 KC and A5 at 560 KC if necessary.

Police range. There are no trimmer adjustments for this range.

Short-wave range. With oscillator at 15 MC and set turned to 15 MC, peak trimmers A10, A1 and A4.

MODELS 318 AND 447

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector tube by means of the I. F. coupling unit shown in Fig. 1. Adjust oscillator to 472½ KC. Connect a sensitive output meter to the set. Use the weakest possible oscillator signal that will give a reading on the output meter with the radio volume control on full.

Put balancing unit A (shown in Fig. 2) across trimmer A19 and peak A20.

Put unit A across A20 and peak A 19.

Put unit A across A17 and peak A18.

Put unit A across A18 and peak A17.

Put unit A across A15 and peak A16.

Put unit A across A16 and peak A15.

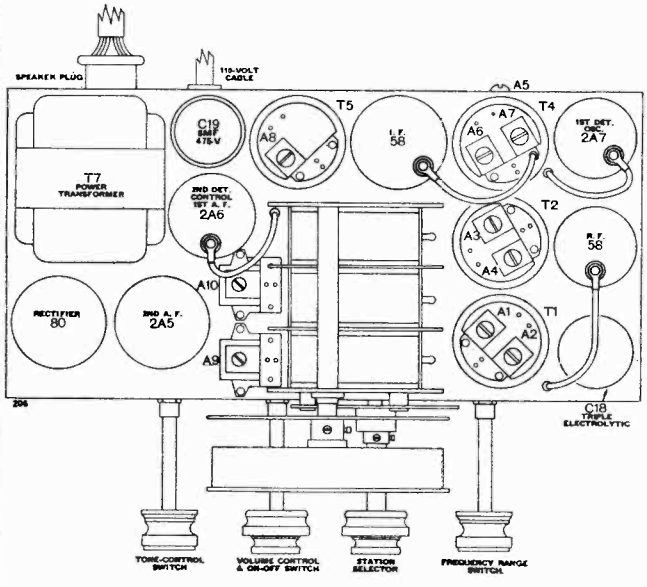
Remove the I. F. coupling unit and balancing unit and seal the I. F. trimmers.

R. F. TRIMMERS.

Connect an R. F. test oscillator to the antenna and ground terminals of set. Use the weakest possible oscillator signal that will give a reading on the output meter. Loosen the trimmer screws for the frequency range or ranges that are to be re-adjusted.

12 to 22.5 MC range. Oscillator at 18 MC, dial pointer at 18 MC, peak trimmers A13, A4 and A8.

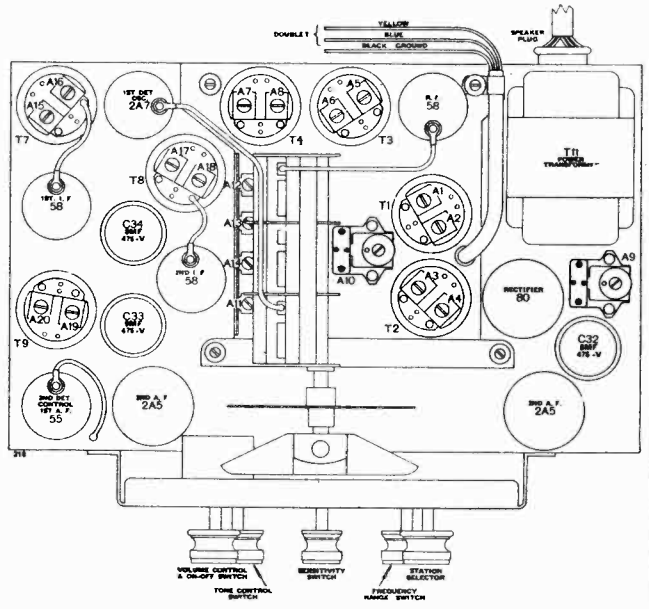
4.6 to 12.2 MC range. Oscillator at 12 MC, dial pointer at 12 MC, peak trimmers A14, A2 and A6 for maximum output.



R. F. TRIMMERS ON MODELS 206 AND 376

	Short-Wave Range	Police Range	Broadcast Range
R. F.	A1	None	A2
1st-Detector	A4	None	A3
Oscillator	A10	None	A9
Tracking	None	None	A5

The I. F. trimmers are A6, A7 and A8.



R. F. TRIMMERS ON MODELS 318 AND 447

	12-22.5 MC Range	4.6-12.2 MC Range	1.6-4.6 MC Range	540-1600 KC Range
R. F.	A4	A2	A3	A1
1st-Detector	A8	A6	A7	A5
Oscillator	A13	A14	A12	A11
Tracking	None	None	A10	A9

The I. F. trimmers are A15 to A20, inclusive.

MODEL 944
Alignment
MODEL 145,325
Parts List

ATWATER-KENT MFG. CO.

ADJUSTING TRIMMER CONDENSERS (Contd.)

1.6 to 4.6 MC range. Oscillator at 4 MC and dial pointer at 4 MC, peak trimmers A12, A3 and A7. Tune oscillator to 1.7 MC, and with dial pointer at 1.7, peak A10. Repeat adjustments on A12 at 4 MC and A10 at 1.7 MC if necessary.

Broadcast range. Oscillator at 1500 KC and dial pointer at 1500 KC mark, peak trimmers A11, A1 and A5. Tune oscillator to 560 KC, turn dial pointer to 560 KC mark, and peak A9. Repeat adjustments on A11 at 1500 KC and A9 at 560 KC if necessary.

MODEL 944

I. F. TRIMMERS.

Connect an I. F. test oscillator to the 1st-detector-by means of the I. F. coupling unit shown in Fig. 1. Adjust the I. F. oscillator to 450 KC. Connect a sensitive output meter to the set. Use the weakest possible oscillator signal that will give a reading on the output meter, with the condenser A5 turned well out in counter-clockwise direction (when facing rear of chassis). Peak the I. F. trimmers A3 and A4 for maximum output. Now turn the regenerative control condenser "in" (clockwise from rear of chassis) until a "squeal" or audio howl indicating oscillation of the I. F. stage, then back off about one-quarter turn, or until the audio howl stops. The adjustments of the I. F. trimmers should again be checked for peak—*i. e.*, the peaking procedure and adjustment of the regenerative condenser should be repeated until maximum output is obtained.

R. F. TRIMMERS.

Check the dial setting by turning the gang condenser to maximum position and observing, by means of steel scale held vertically over the condenser shaft axis, whether the 540 KC mark on the dial is perpendicular to a line along the top of the condenser frame in back of the dial. Connect an R. F. oscillator to the antenna and ground terminals of the set. Use the weakest possible signal to give a reading on the output meter. Loosen the trimmer screws. Tune the oscillator to 1500 KC and turn the tuning knob of the set to a dial mark half way between 140 and 150 and perpendicular to a line along the top of the condenser frame. (Determined as explained in setting dial at 540 KC.) Peak the trimmers A1 and A2 for maximum output. Retune oscillator and set to 1100 KC and check regenerative condenser A5 adjustment for maximum sensitivity—*i. e.*, one-quarter turn below audio howl. If oscillation occurs at any other point on the dial after the above adjustments, it will be necessary to again turn back a fraction of a turn on the condenser A5.

Note.—1st-detector grid clip must be inside of shield can when adjusting the R. F. trimmers.

PARTS LIST

MODEL 145

28839		Cabinet less screen
27906		Screen
27945		Escutcheon and crystal assem.
27388		Crystal
27431		Var. cond. assem.
27692		Tuning gear
27574		Dial plate holder
27947		Dial pointer holder
27522		Dial pointer
27535		Pointer screw
27523		Dial plate
24323		Power trans. cover
25056		I. F. T. shield
27485		Range switch
19566		110 V. cable
40090		Pilot light assem.
28827		Dial lamp socket
26526		Ferrule and bushing
26524		Spring
22683		Tube shield
28281		Front and back plate assem.
28594		Tuning shaft assem.
22657		Dial rubber and bushing
25058		I. F. T. shield cover
25059		I. F. T. shield cover (hole)
27676		Pilot lamp, 2.5 V. (frosted)
27425		Vol. control, .5 ℧
39620		Tone control switch assem.
28192		Shaft and blade for above
27562		Inst. sheet, F-1149
27867		Shipping container

TRANSFORMERS

T1	39820	No. 1 R. F. T.
T2	39830	No. 2 R. F. T.

MODEL 145 (Contd.)

T3	39840	Oscillator T.
T4	27789	No. 1 I. F. T.
T5	27791	No. 2 I. F. T.
T6	28621	Output T.
T7	25191	Power T.

RESISTORS

(For tubular resistors see page 19.)

R6	28950	Flexible, 160 Ω

CONDENSERS

(For tubular condensers see page 18.)

C1	25035	.006 MF, blue, blk. and red
C3	27650	8 MMF
C4	33670	250 MMF, 500-V., mica
C7	33930	25 MMF
C8	39660	730 MMF
C10	33670	250 MMF, 500-V., mica
C10A	33670	250 MMF, 500-V., mica
C18	22538	8 MF, 475 V.
C19	27585	8 MF, 350 V.

TRIMMERS

A4	39630	Rear
A5,6	32880	T4
A7	36570	T5
A8	38890	Front

CHOKES

CK1	28623	On speaker
CK2	40140	R. F. choke

MODEL 145 (Contd.)

SOCKETS

24494		6 prong
24492		4 prong
21336		Speaker
26111		7 prong

MODEL 145 SPEAKER

42100		Complete speaker
28619		Diaphragm assem.
28621		Output trans. (T6)
28622		Field coil
28623		Choke coil (CK1)

MODEL 325

(For parts not listed below refer to Model 145.)

27985		Bottom plate
27946		Escutcheon and crystal assem.
28535		Dial plate
40140		R. F. choke (CK2)
27865		Shipping container

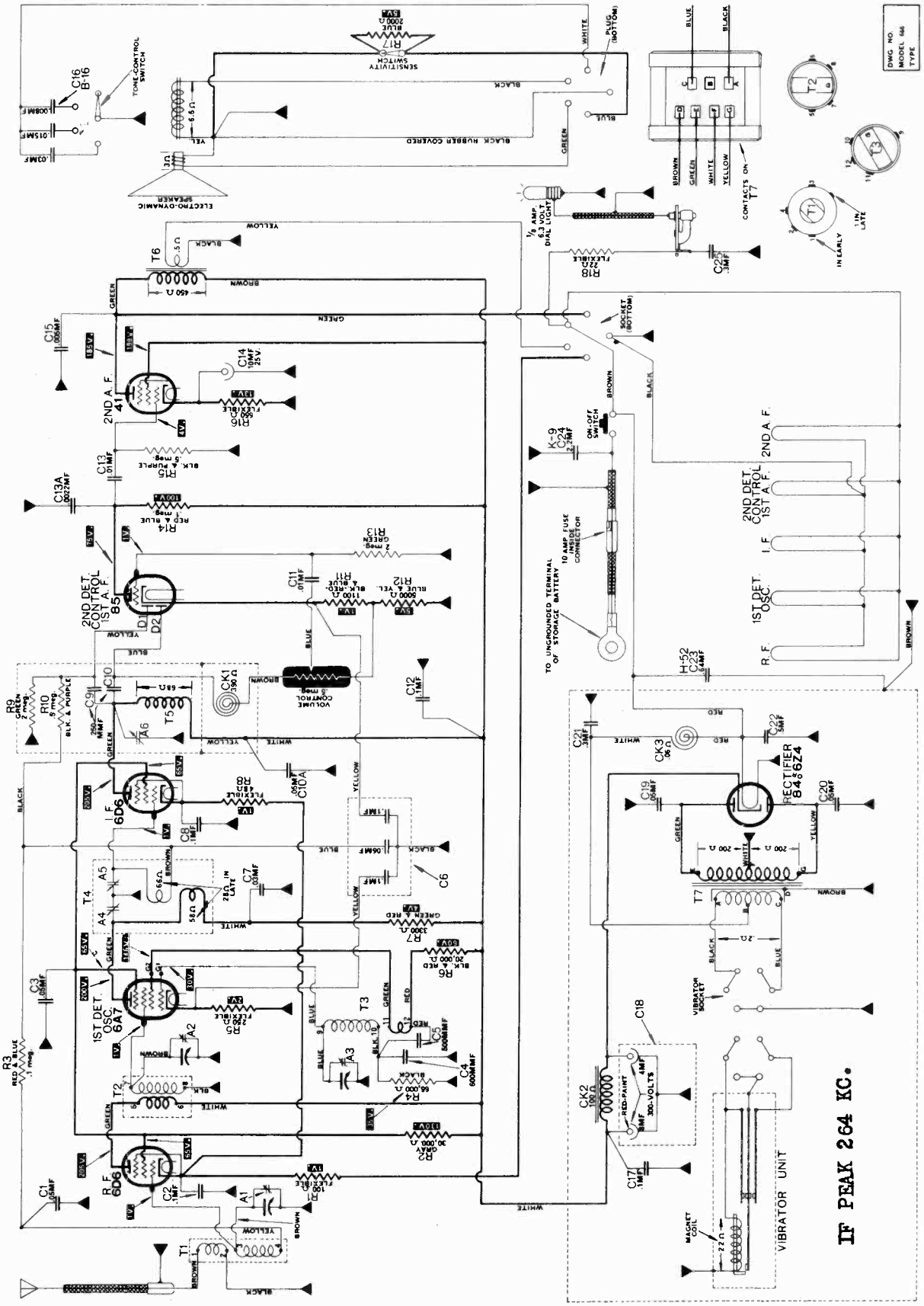
MODEL 325 SPEAKER 41800

27661		Cone housing
25525		Choke (CK1)
21260		Field coil
20737		Diaphragm
20657		Cable and plug assem.
18582		Plug only
19469		Segment

Ω=ohms. ℧=megohms.

MODEL 666
Schematic

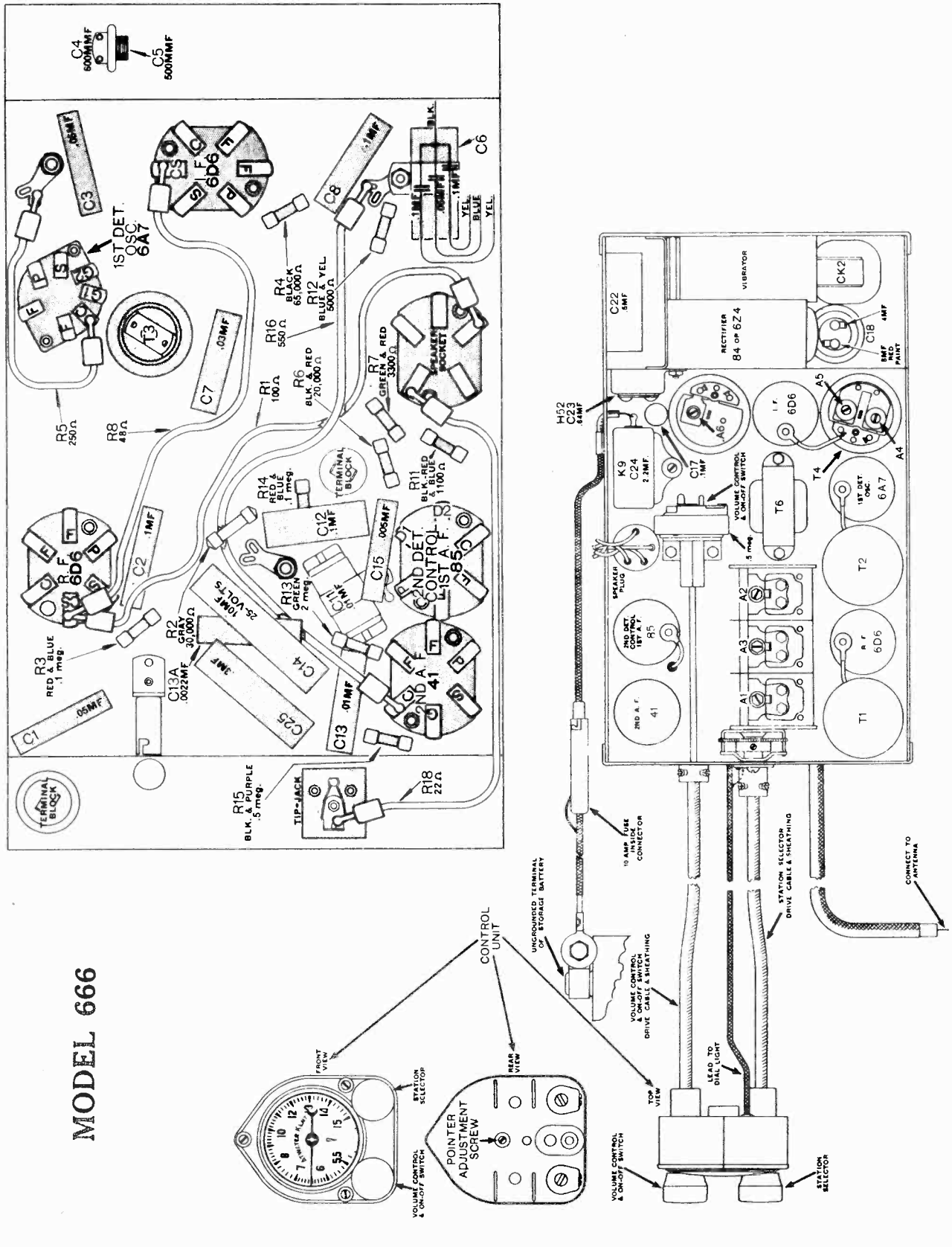
ATWATER-KENT MFG. CO.



May, 1934

MODEL 666
Socket, Trimmer
Parts Layout

ATWATER-KENT MFG. CO.



MODEL 666

ATWATER-KENT MFG. CO.

MODEL 666

Part No.	Name of Part
27052	Set container complete, less lid
27033	Set container lid
26523	Rubber gasket
26549	Tuning cable bushing
26036	Inner plate for above
25482	Bolt 2½" x ⅜"
24485	Lockwasher ⅜"
24486	Nut ⅜"
26462	Variable condenser assembly
26589	Shield for No. 1 R. F. T. (early short)
27095	Shield for No. 1, 2 R. F. T. (late long)
26591	Shield for No. 2 R. F. T. (early short)
26072	I. F. T. shield
26505	Volume control, .5 U
26033	Volume control bracket
26039	Coupling
23260‡	Generator condenser
24540	Tone control switch complete
22297	Switch shaft and blade
13664	Sensitivity switch
26127	Knob (tone)
26598	Cloth
26983	Wire screen

‡ In late 666 a No. 38270 tubular condenser is supplied.

TRANSFORMERS

Code No.	Part No.	Name of Part
T1*	38010	No. 1 R. F. T. (late type)
T2*	38020	No. 2 R. F. T. (late type)
T3	37890	Oscillator T
T4*	27096	No. 1 I. F. T. (late type)
T5	26593	No. 2 I. F. T.
T6	26982	Output T.
T7	26291	Power T.

* Below Serial No. 8148331 T1 is part No. 35680, T2 is part No. 35690, T4 is part No. 26592.

RESISTORS

R1	20040	Flexible, 100 Ω
R2	20970	Gray, 30,000 Ω, ½-W.
R3	30340	Red-blue, .1 U, 1/3-W.
R4	31980	Bl'k, 65,000 Ω, 1/3-W.
R5	31830	Flexible, 250 Ω
R6	30390	Red-bl'k, 20,000 Ω, 1/3-W.
R7	30380	Red-green, 3300 Ω, 1/3-W.
R8	19820	Flexible, 48 Ω
R9	30370	Green, 2 U, 1/3-W.
R10	30350	Bl'k-purple, .5 U, 1/3-W.
R11	31480	Bl'k-red-blue, 1100 Ω. 1/3-W.
R12	36430	Yel.-blue, 5000 Ω. 1/3-W.
R13	30370	Green, 2 U, 1/3-W.
R14	30340	Red-blue, .1 U, 1/3-W.
R15	30350	Bl'k-purple. .5 U, 1/3-W.
R16	23780	Flexible, 550 Ω
R17	33250	Blue, 2000 Ω. 1/3-W.
R18	16840	Flexible, 22 Ω

CONDENSERS

Code No.	Part No.	Name of Part
C1	31160	.05 MF, 100-V., NI
C2	31530	.1 MF, 100-V., NI
C3	26820	.05 MF, 200-V., NI
C4	36460	600 MMF, 100-V.,
C5	36510	500 MMF, 500-V.
C6	36440	.1, .1, .05, 100-V., I
C7	29530	.03 MF, 200-V, NI
C8	31530	.1 MF, 100-V.
C9	33670	250 MMF, 500-V.
C10	33670	250 MMF, 500-V.
C10A	26820	.05 MF, 200-V., NI
C11	23250	.01 MF, 450-V.
C12	26660	.1 MF, 200-V., NI
C13	32810	.01, 450-V., NI
C13A	33660	.0022 MF, 450-V., IND.
C14	25379	10 MF, 25-V.
C15	28040	.005 MF, 200-V., IND.
C16*	30270	.008, .015, .03 MF (B16)
C17	26660	.1 MF, 200-V., NI
C18	26995	4 MF-8 MF, 300-V.
C19	36490	.05 MF, 450-V., NI
C20	36490	.05 MF, 450-V., NI
C21	31150	.3 MF, 100-V., NI
C22	31510	.5 MF, 100-V., NI
C23	36480	.64 MF, H 52, 200-V.
C24	37760	2.2 MF, 100-V., K9
C25	31150	.3 MF, 100-V., NI

* In late 666 this condenser is No. 38160, using clamps Nos. 27208 and 27209.

TRIMMERS

Code No.	Part No.	Name of Part
A4, 5	32880	Double I. F. trimmer
A6	36570	Single I. F. trimmer

CHOKES

Code No.	Part No.	Name of Part
CK1	26594	2nd det. plate choke, 390 Ω
CK2	27011	"B" filter choke, 100 Ω
CK3	36630	"A" filter choke, .06 Ω

SOCKETS

Part No.	Name of Part
24493	5 prong
24494	6 prong, 85 and 41
27023	6 prong, R. F. and I. F.
26111	7 prong
26572	Tip jack

POWER UNIT ASSEMBLY

(Miscellaneous parts)

Part No.	Name of Part
26986	Vibrator socket (6 prong)
26985	Rectifier socket (5 prong)
27005	Vibrator
26997	Container
26761	Lid for above
25408	Oval head screw
15648	Filister head screw
26046	Mounting bracket (T7)

MISCELLANEOUS

Part No.	Name of Part
27034	Instruction folder F-1127
21406	Fuse 10A
26451	I. F. tube shield (short)
27042	85 tube shield (long)

SPEAKER

Part No.	Name of Part
26851	Speaker, less cable
26826	Conehead assembly
26827	Field coil, 6.5 Ω
26559	Cable and plug assembly

REMOTE CONTROL HEAD

(Same as used on Model 815

The last figure in the model number indicates the number of tubes; for instance, Model 165 has 5 tubes; Model 310 has 10 tubes, etc. The letter "Q" indicates battery operation; the letter "D" indicates D. C. operation.

All models listed below have tone control, and all models with exception of 387, 427Q, 165Q and 525Q have automatic volume control. All models have dynamic speakers, with exception of 165Q and 525Q, which have special magnetic speakers.

CABINET DESCRIPTION	MODEL NUMBER	POWER SUPPLY	PART NO. COMPLETE	PART NO. SPEAKER	WATTAGE	SHADOW TUNING	SILENCING ADJUSTMENT	FREQUENCY RANGE	INTERMEDIATE FREQUENCY	TUBES								
										R. F.	1ST DET.	OSCILLATOR	I. F.	2ND DET.	CONTROL	1ST A. F.	2ND A. F.	3RD A. F.	RECTIFIER
Compact, arch top	165	110V, 60C	34000	34100	60	NO	NO	540-1712†	264	..	57		58	—2A6—			2A5	..	80
Compact, arch top	165Q	Battery	38700	37170	††	NO	NO	540-1712†	264	..	1A6		34	32		30	19	..	..
Compact, modern	185	110V, 60C	38300	34100	60	NO	NO	540-1712†	264	..	57		58	—2A6—			2A5	..	80
Compact, modern	185A	110V, 60C	40000	34100	60	NO	NO	540-1700‡‡	264	..	2A7		58	—2A6—			2A5	..	80
Compact, arch top	217	110V, 60C	35500	36300	70	NO	NO	540-3200	264	58	58	56	58	—55—			2A5	..	80
Compact, arch top	217D	110V, D.C.	36900	37500	45	NO	NO	540-3200	264	78	78	37	78	—75—			43 (2)	..	..
Compact, modern	275	110V*	36200	26159	50	NO	NO	540-1750*	264	..	6A7		44	—75—			43	..	25Z5
Console, rounded front	310	110V, 60C	35900	36500	120	YES	YES	540-3200	130	58	58	56	58	56	56	56	2A5 (2)	..	80
Compact, arch top	387	Battery	35200	31700	**	NO	NO	550-1500**	264	34	1A6		34	32		30	30 (2)	..	..
Console	425	110V, 60C	39500	33400	60	NO	NO	540-3200	264	..	57		58	—2A6—			2A5	..	80
Console	427	110V, 60C	35600	33400	70	NO	NO	540-3200	264	58	58	56	58	—55—			2A5	..	80
Console	427D	110V, D.C.	37000	37600	45	NO	NO	540-3200	264	78	78	37	78	—75—			43 (2)	..	..
Console	427Q	Battery	35800	36400	**	NO	NO	550-1500**	264	34	1A6		34	32		30	30 (2)	..	..
Console, modern	510	110V, 60C	36000	36500	120	YES	YES	540-3200	130	58	58	56	58	56	56	56	2A5 (2)	..	80
Console	525	110V, 60C	38400	38500	60	NO	NO	540-1712†	264	..	57		58	—2A6—			2A5	..	80
Console	525Q	Battery	39100	39200	††	NO	NO	540-1712†	264	..	1A6		34	32		30	19	..	..
Single unit, remote control	534	6V (Auto)	35100	25534	4A	NO	NO	540-1500	450	..	77		44	—75—			41	..	..
Console, modern	665	110V, 60C	39600	33400	60	NO	NO	540-3200	264	..	57		58	—2A6—			2A5	..	80
Single unit, remote control	666	6V (Auto)	39900	26851	6A	NO	NO	540-1500	264	6D6	6A7		6D6	—85—			41	..	6Z4
Console, modern	667	110V, 60C	36100	33400	70	NO	NO	540-3200	264	58	58	56	58	—55—			2A5	..	80
Console, modern	667D	110V, D.C.	37100	37600	45	NO	NO	540-3200	264	78	78	37	78	—75—			43 (2)	..	..
Console***	711J or T	110V, 60C	36600	36700	150	YES	YES	540-23MC	472½	58	58	58	58 (2)	—55—			56 (2)	2A3 (2)	5Z3
Console, modern	711R	110V, 60C	36800	36700	150	YES	YES	540-23MC	472½	58	58	58	58 (2)	—55—			56 (2)	2A3 (2)	5Z3
Console***	788J or T	110V, 60C	39300	39400	70	YES	YES	540-23MC	472½	58	58	58	58 (2)	—2A6—			2A5	..	80
Console, modern	788R	110V, 60C	39700	39400	70	YES	YES	540-23MC	472½	58	58	58	58 (2)	—2A6—			2A5	..	80
Console	808A	110V, 60C	34600	34500	70	YES	NO	540-20MC	472½	58	58	58	58 (2)	—2A6—			2A5	..	80
Single unit, remote control	816	6V (Auto)	37400	26851	5A	NO	NO	540-1500	264	39‡	6A7		39‡	—85—			41 (2)	..	..
Single unit, remote control	926	6V (Auto)	39000	26851	6A	NO	NO	540-1500	264	39‡	6A7		39‡	—85—			41 (2)	..	..
Separate speaker, remote control	936	6V (Auto)	38800	38900	6A	NO	NO	540-1500	264	39‡	6A7		39‡	—85—			41 (2)	..	..

* Model 275 may be used on 110 Volts, 25-60 cycles, or 110 Volts, D. C. It has a police switch to tune in the 2400-kilocycle police band.

† Has police switch to tune in the 2400-kilocycle police band.

** The "B" consumption of Models 387 and 427Q is from 20 to 27 milliamperes depending on signal strength and volume level. (25 milliamperes is average.) Late Models 387 and 427Q have a police switch for both police bands.

†† The "B" consumption of Models 165Q and 525Q is from 16 to 25 milliamperes depending on signal strength and volume level. (22 milliamperes is average.)

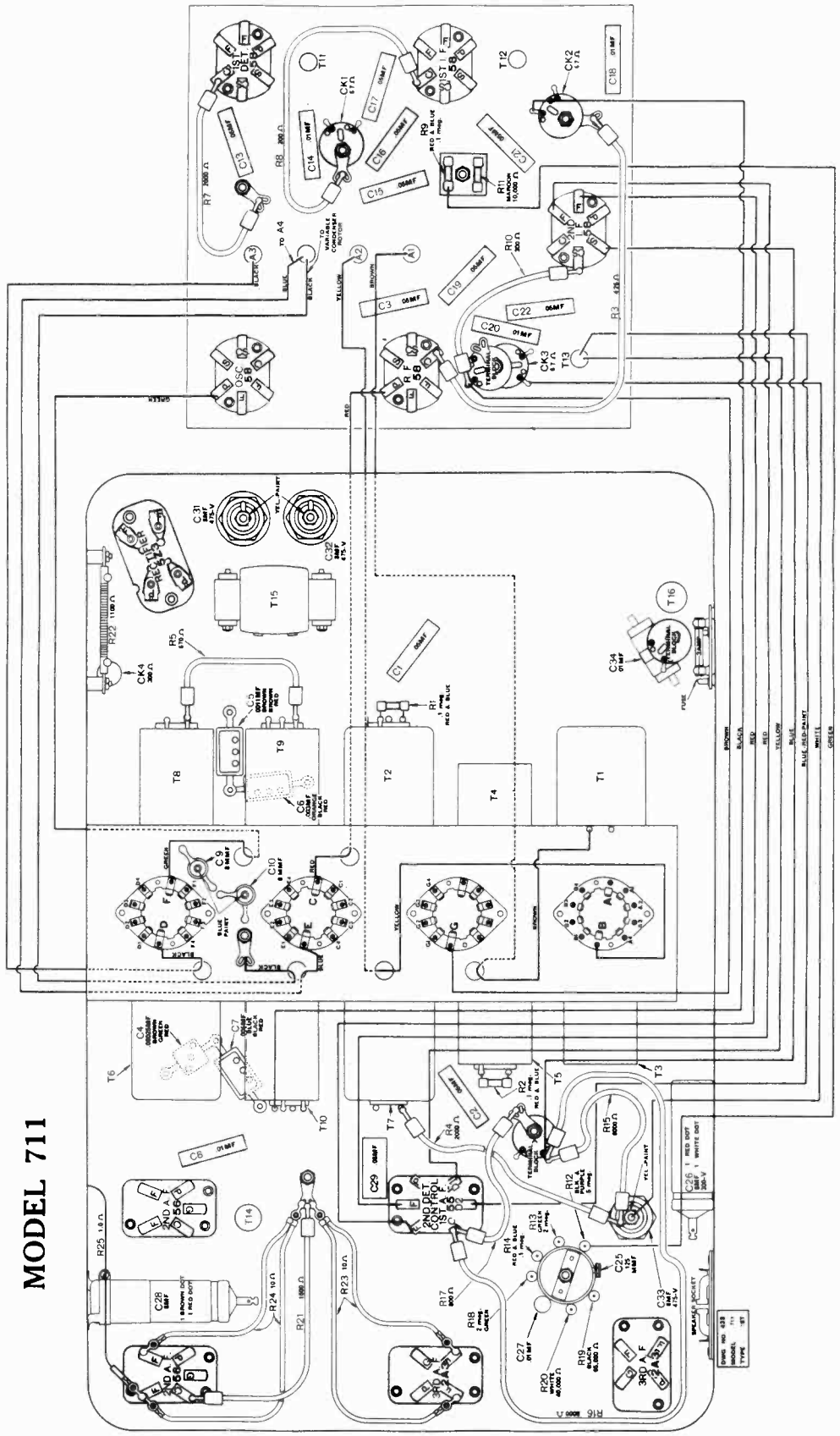
*** The J cabinet is rounded-front. The T cabinet has doors.

‡ Late 816 926 and 936 utilize 6D6 tubes instead of 39 tubes for R. F. and I. F.

‡‡ Model 185A also covers the short-wave range of 5.5 to 15.5 megacycles, which includes the four principal international short-wave broadcast bands.

MODEL 711
Chassis Wiring

ATWATER-KENT MFG. CO.

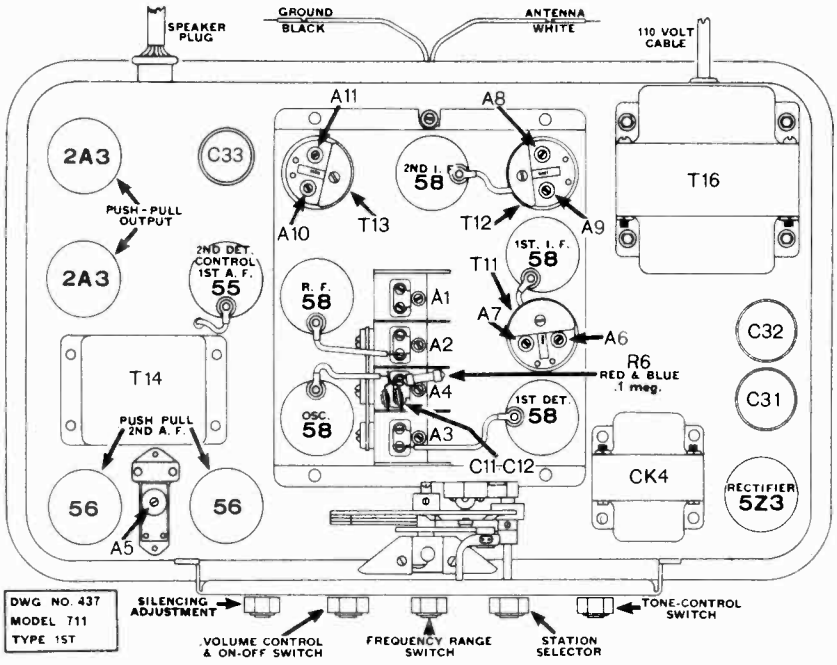


This bottom chart shows all connections between the upper tube base and the main base.

In late 711, the R. F. bias resistor R3 is grounded at the front ground lug (near C13) instead of as shown, in order to reduce tendency to oscillation.

MODEL 711
Socket, Trimmers
Parts List

ATWATER-KENT MFG. CO.



MODEL 711

Part No.	Name of Part
26441†	Front panel complete with escutcheon
25923	Escutcheon
25737	Knob—volume and station selector (711R)
25738	Knob—tone and silencing adjustment (711R)
27003†	Knob—range switch (711R)
25145	Knob—tone and silencing adjustment (711T-J)
25811	Knob—volume and station selector (711T-J)
27002†	Knob—range switch (711T-J)
25924†	Dial plate
25689	Shadow tuning indicator
25839	Range switch
34520	Tone control switch complete
25846	Variable condenser assembly

† The range switch, knob and dial in late Model 711 sets have colored dots. Only the late type knobs, dials and panel assemblies are furnished for service.

25798	Volume control, .5 U
26338	Silent tuning adjustment, 14,000 Ω

TRANSFORMERS

Code No.	Part No.	Name of Part
T1	34830	No. 1 R. F. T.
T2	34840	No. 2 R. F. T.
T3	34870	No. 1 H. F., 1st range
T4	34890	No. 1 H. F., 2nd range
T5	34920	No. 1 H. F., 3rd range
T6	34850	No. 3 R. F. T.
T7	34860	Oscillator T.
T8	34880	No. 2 H. F., 1st range
T9	34910	No. 2 H. F., 2nd range
T10	34930	No. 2 H. F., 3rd range
T11	26251	No. 1 I. F. T.
T12	25503	No. 2 I. F. T.
T13	25503	No. 3 I. F. T.
T14	35350	Audio T. unit
T15	26207	Output T.
T16	26257	Power T.

RESISTORS

Code No.	Part No.	Name of Part
R1	30340	Red-blue, .1 U, 1/3-W.
R2	30340	Red-blue, .1 U, 1/3-W.
R3	17380	Flexible, 425 Ω
R4	33230	Flexible, 2000 Ω
R5	33210	Flexible, 670 Ω
R6	20980	Red-blue, .1 U, ½-W.
R7	21030	Flexible, 2000 Ω
R8	25950	Flexible, 200 Ω
R9	30340	Red-blue, .1 U, 1/3-W.
R10	25840	Flexible, 300 Ω
R11	30320	Mar'n, 10,000 Ω, 1/3-W.
R12	20930	Bl'k-pur., .5 U, ½-W.
R13	20940	Green, 2 U, ½-W.
R14	20980	Red-blue, .1 U, ½-W.
R15	24340	Flexible, 8000 Ω
R16	24340	Flexible, 8000 Ω
R17	20120	Flexible, 800 Ω
R18	20940	Green, 2 U, ½-W.
R19	21041	Bl'k, 65,000 Ω, ½-W.
R20	26160	White, 40,000 Ω, ½-W.
R21	20380	Flexible, 1500 Ω
R22	19180	Iron core, 1100 Ω
R23	17077	Flexible, 10 Ω, white-bl'k tracer
R24	17077	Flexible, 10 Ω, white-bl'k tracer
R25	31860	Flexible, 1.0 Ω, yellow

CONDENSERS

Code No.	Part No.	Name of Part
C1	31160	.05 MF, 100-V., NI
C2	31160	.05 MF, 100-V., NI
C3	31160	.05 MF, 100-V., NI
C4	25032	.00025 MF, 450-V.
C5	25837	.0011 MF, 450-V.
C6	25034	.003 MF, 450-V.
C7	25035	.006 MF, 450-V.
C8	32810	.01 MF, 450-V.
C9	36220	8 MMF, 500-V.
C10	36220	8 MMF, 500-V.
C11	25661	8 MMF, 500-V.
C12	25661	8 MMF, 500-V.
C13	31160	.05 MF, 100-V., NI
C14	32810	.01 MF, 450-V., NI
C15	31160	.05 MF, 100-V., NI
C16	31160	.05 MF, 100-V., NI
C17	31160	.05 MF, 100-V., NI
C18	32810	.01 MF, 450-V., NI
C19	31160	.05 MF, 100-V., NI
C20	32810	.01 MF, 450-V., NI
C21	31160	.05 MF, 100-V., NI
C22	31160	.05 MF, 100-V., NI
C23	35290	125 MMF, 500-V.
C24	35290	125 MMF, 500-V.
C25	26670	125 MMF, 500-V.
C26	25384	8 MF, 300-V.
C27	27630	.01 MF, 200-V.
C28	25385	8 MF, 250-V.
C29	35420	.08 MF, 200-V., NI
C30†	29690	Tone control condenser (B15)
C31	22528	8 MF, 475-V.
C32	22538	8 MF, 475-V.
C33	22538	8 MF, 475-V.
C34	23250	01 MF, 450-V.

† In late sets this condenser is No. 38260.

CHOKES

Code No.	Part No.	Name of Part
CK1	19210	1st detector plate filter choke
CK2	19210	1st I. F. plate filter choke
CK3	19210	2nd I. F. plate filter choke
CK4	25894	Audio filter choke

TRIMMER

Code No.	Part No.	Name of Plate
A5	20190	Single I. F. trimmer
A6, 7	32880	Double I. F. trimmer
A8, 9	32880	Double I. F. trimmer
A10, 11	32880	Double I. F. trimmer

SOCKETS

Part No.	Name of Part
22733	6 prong, lower base
22734	5 prong, lower base
22689	Rectifier socket
22735	4 prong, lower base
21336	Speaker, 4 prong
18449	Fuse socket
24494	6 prong, upper base

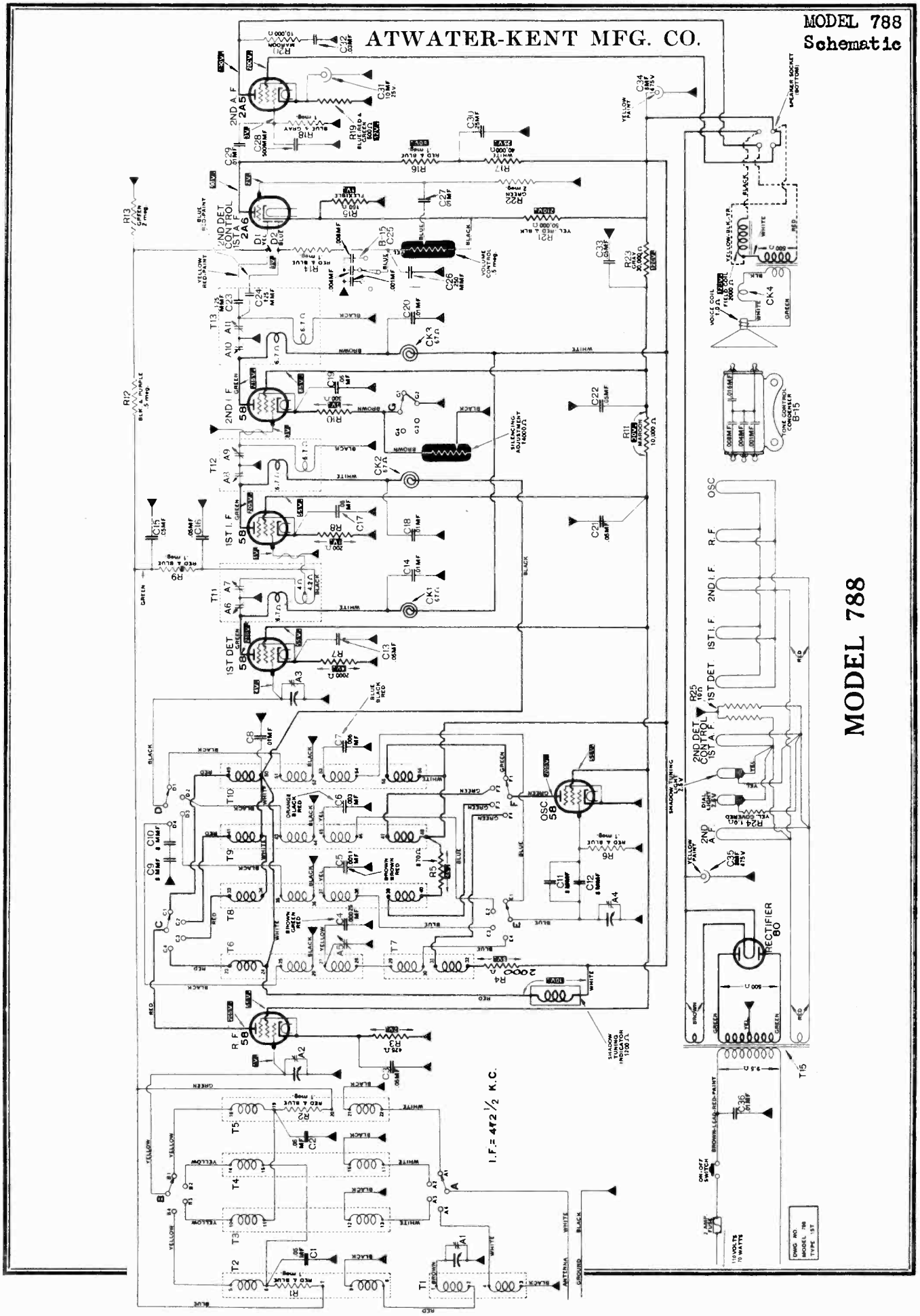
MISCELLANEOUS

Part No.	Name of Part
25059	I. F. T. shield cap (with hole)
25058	I. F. T. shield cap (without hole)
22865	Bottom plate
22683	Tube shield
26255	I. F. T. shield insulator
25056	I. F. T. shield
25906	Filter choke cover
25758	Power T. cover
26254	Power T. insulator
35280	Dial light socket and reflector
15404	Dial lamp (2.5-V.)
26793	Instruction folder, F1123
26237	Shipping container
26218	Shields for T1, 2, 6, 7
26217	Shields for T8, 9, 10
26216	Shields for T3, 4, 5
27072	Wave guide, F1131
23774	Fuse 3A
26934	Tuning inst. tag, F1124

711 SPEAKER No. 36700

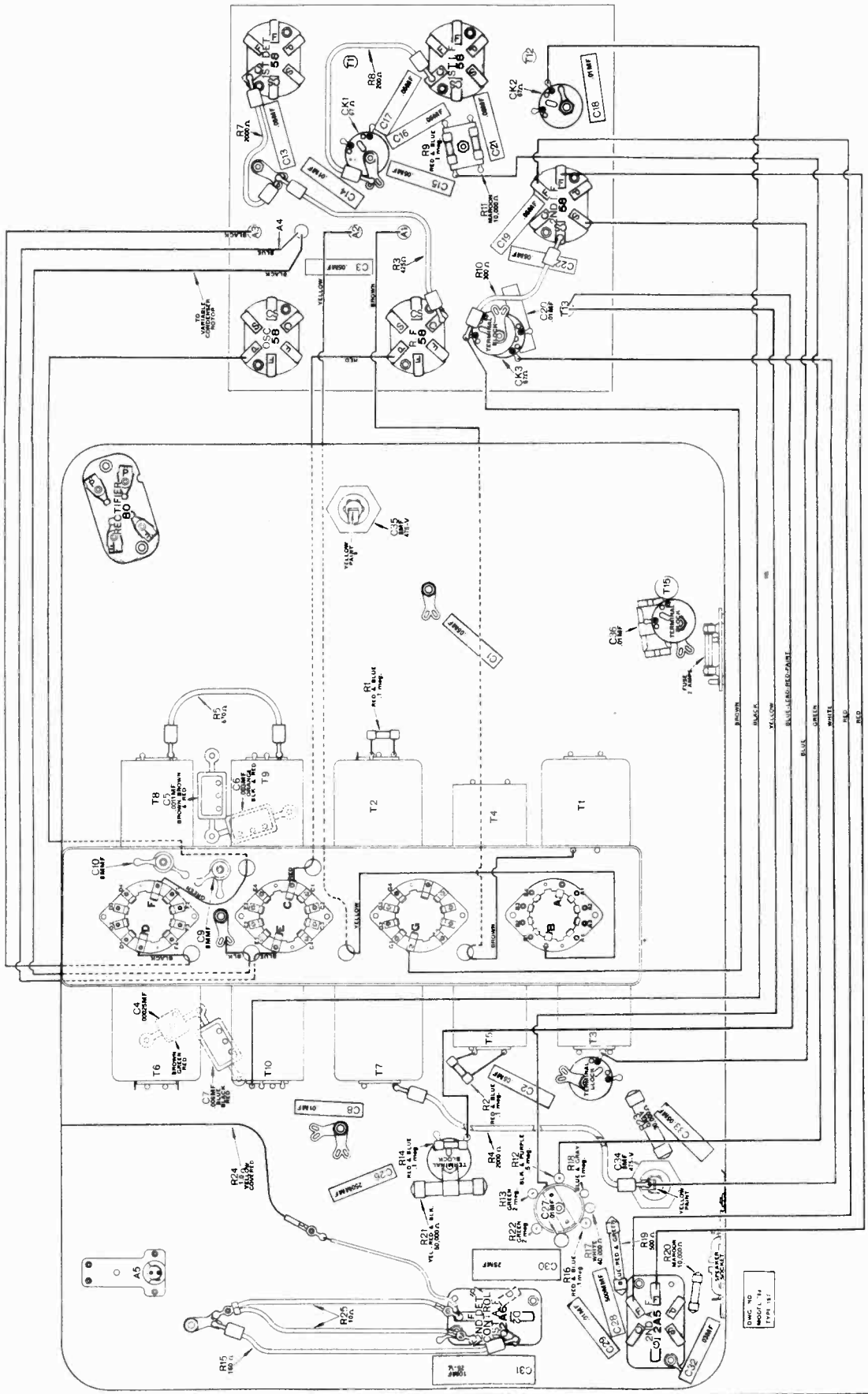
Part No.	Name of Part
26243	Diaphragm
23668	Cable and plug
35080	Field coil (325 Ω)
15079	Speaker plug

Ω = ohms. U = megohms. IND. = inductive. NI = non-inductive. W. = watt.



MODEL 788
Chassis Wiring

ATWATER-KENT MFG. CO.

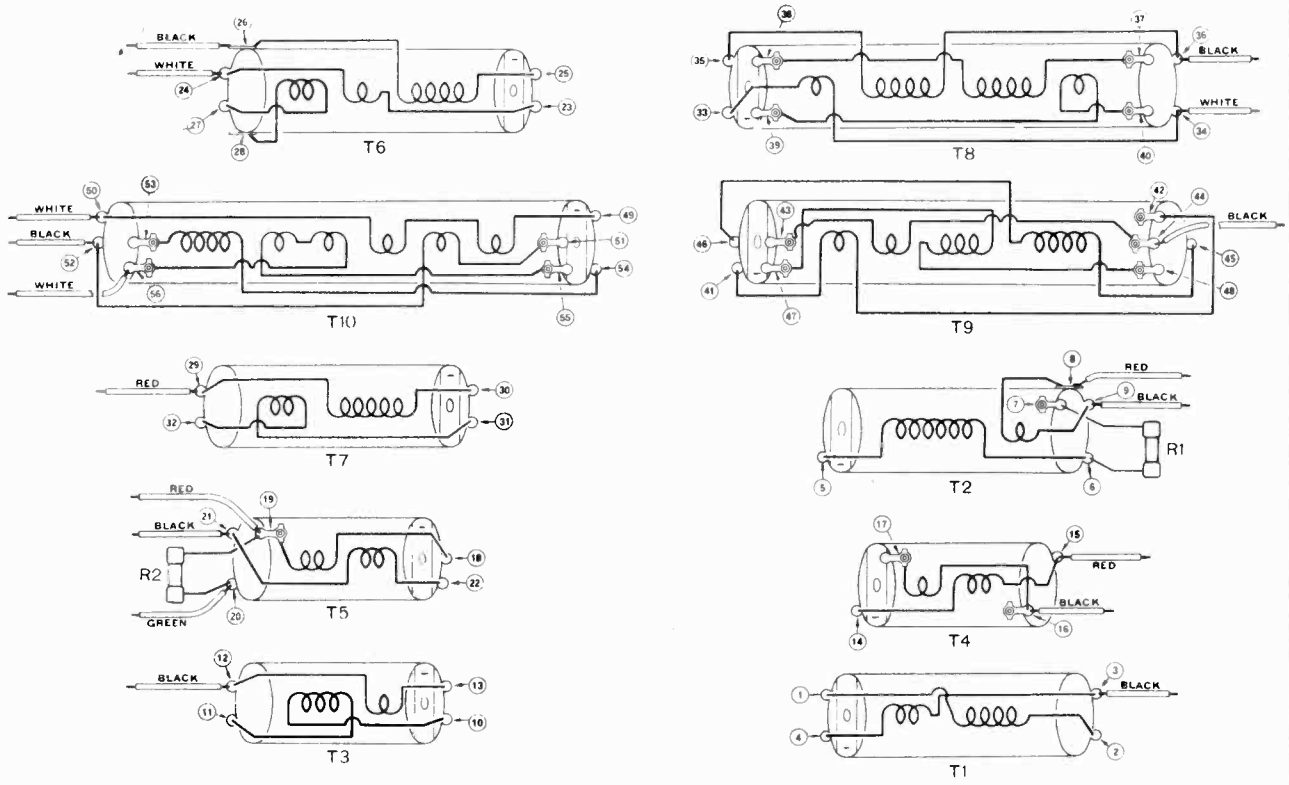


MODEL 788

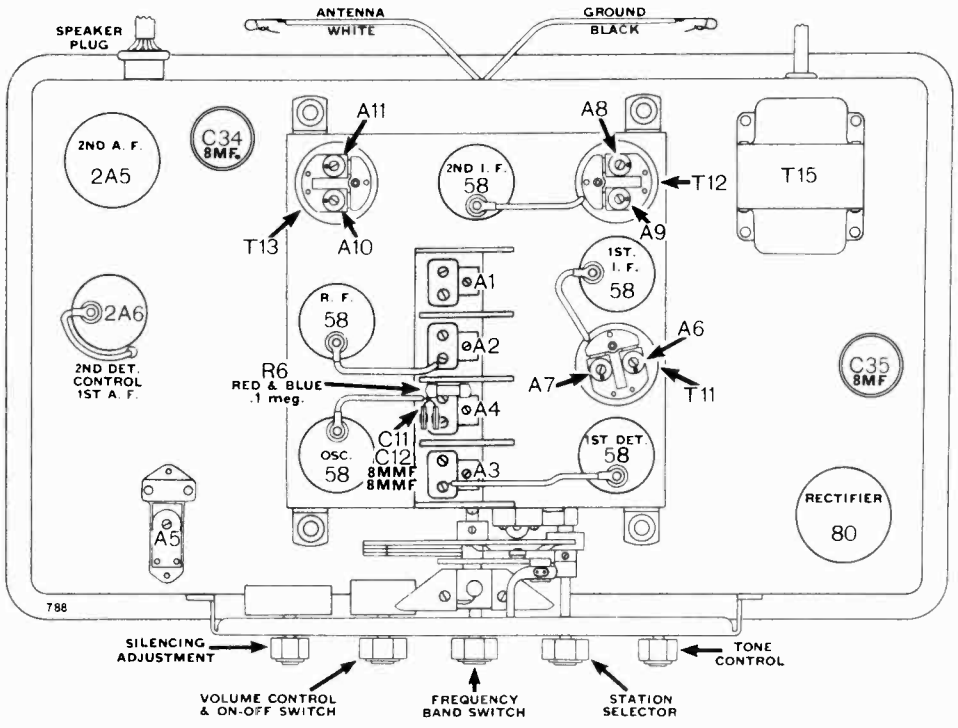
MODEL 711,788
R.F. Transformers
MODEL 788,Trimmers

ATWATER-KENT MFG. CO.

MODELS 711 AND 788 R. F. TRANSFORMERS



MODEL 788



MODEL 788
Parts List

ATWATER-KENT MFG. CO.

MODEL 788

Part No.	Name of Part
27238*	Front panel complete with escutcheon
26775	Escutcheon
25737	Knob—volume and station selector (788R)
25738	Knob—tone and silencing adjustment (788R)
27003*	Knob—range switch (788R)
25145	Knob—tone and silencing adjustment (788R)
25811	Knob—volume and station selector (788T)
27002*	Knob—range switch (788T)
25924*	Dial plate
25839	Range switch
25689	Shadow tuning indicator
27245	Shadow tuning indicator screen
34520	Tone control switch complete
26339	Shaft and blade
25846	Variable condenser assembly
25798	Volume control, .5 U
26338	Silent tuning adjustment, 14,000 Ω

* The range switch knob and dial in late Model 788 sets have colored dots. Only the late type knobs, dials and panel assemblies are furnished for service.

TRANSFORMERS

Code No.	Part No.	Name of Part
T1	34830	No. 1 R. F. T.
T2	34840	No. 2 R. F. T.
T3	34870	No. 1 H. F. coil, 1st range
T4	34890	No. 1 H. F. coil, 2nd range
T5	34920	No. 1 H. F. coil, 3rd range
T6	34850	No. 3 R. F. T.
T7	34860	Oscillator T.
T8	34880	No. 2 H. F. coil, 1st range
T9	34910	No. 2 H. F. coil, 2nd range
T10	34930	No. 2 H. F. coil, 3rd range
T11	26251	No. 1 I. F. T.
T12	25503	No. 2 I. F. T.
T13	25503	No. 3 I. F. T.
T14	21672	Output T.
T15	25221	Power T.

RESISTORS

Code No.	Part No.	Name of Part
R1	30340	Red-blue, .1 U, 1/3-W.
R2	30340	Red-blue, .1 U, 1/3-W.
R3	17380	Flexible, 425 Ω
R4	33230	Flexible, 2000 Ω
R5	33210	Flexible, 670 Ω
R6	20980	Red-blue, .1 U, ½-W.
R7	21030	Flexible, 2000 Ω
R8	25950	Flexible, 200 Ω
R9	30340	Red-blue, .1 U, 1/3-W.
R10	25840	Flexible, 300 Ω
R11	30320	Mar'n, 10,000 Ω, 1/3-W.
R12	20930	Bl'k-purple, .5 U, ½-W.
R13	20940	Green, 2 U, ½-W.
R14	30340	Red-blue, .1 U, 1/3-W.
R15	28950	Flexible, 160 Ω
R16	20980	Red-blue, .1 U, ½-W.
R17	26160	White, 40,000 Ω, ½-W.
R18	30360	Blue-gray, 1 U, 1/3-W.
R19	32010	Blue-red-green, 500 Ω, 1-W.
R20	20950	Maroon, 10,000 Ω, ½-W.
R21	34340	Yel.-red-bl'k, 50,000 Ω, 1½-W.
R22	20940	Green, 2 U, ½-W.
R23	29710	Gray, 30,000 Ω, 1½-W.
R24	31860	Flexible, 1.0 Ω
R25	17077	Flexible, 10 Ω

CONDENSERS

Code No.	Part No.	Name of Part
C1	31160	.05 MF, 100-V., NI
C2	31160	.05 MF, 100-V., NI
C3	31160	.05 MF, 100-V., NI
C4	25032	.00025 MF, 450-V.
C5	25837	.0011 MF, 450-V.
C6	25034	.003 MF, 450-V.
C7	25035	.006 MF, 450-V.
C8	32810	.01 MF, 450-V.
C9	27650	8 MMF, 500-V.
C10	27650	8 MMF, 500-V.
C11	25661	8 MMF, 500-V.
C12	25661	8 MMF, 500-V.
C13	31160	.05 MF, 100-V., NI
C14	32810	.01 MF, 450-V., NI
C15	31160	.05 MF, 100-V., NI
C16	31160	.05 MF, 100-V., NI
C17	31160	.05 MF, 100-V., NI
C18	32810	.01 MF, 450-V., NI
C19	31160	.05 MF, 100-V., NI
C20	32810	.01 MF, 450-V., NI
C21	31160	.05 MF, 100-V., NI
C22	31160	.05 MF, 100-V., NI
C23	35290	125 MMF, 500-V.
C24	35290	125 MMF, 500-V.
C25†	29690	.001-.004-.008-.016 MF (B15)
C26	33620	250 MMF, IND.
C27	27630	.01 MF, 200-V., NI
C28	28130	500 MMF, 450-V., IND.
C29	27630	.01 MF, 200-V., NI
C30	35930	.25 MF, 200-V., NI
C31	25379	10 MF, 25-V.
C32	29530	.03 MF, 200-V., NI
C33	31160	.05 MF, 100-V., NI
C34	22538	8 MF, 475-V.
C35	22538	8 MF, 475-V.
C36	23250	.01 MF, 450-V.

† In late sets this condenser is No. 38260.

CHOKES

Code No.	Part No.	Name of Part
CK1	19210	1st detector plate filter choke
CK2	19210	1st I. F. plate filter choke
CK3	19210	2nd I. F. plate filter choke
CK4	25525	Choke on speaker

TRIMMERS

Code No.	Part No.	Name of Part
A5	20190	Single I. F. trimmer
A6, 7	32880	Double I. F. trimmer
A8, 9	32880	Double I. F. trimmer
A10, 11	32880	Double I. F. trimmer

SOCKETS

Part No.	Name of Part
22733	(6 prong) lower base
22689	Rectifier socket
21336	Speaker (4 prong)
18449	Fuse socket
24494	(6 prong) upper base

MISCELLANEOUS

Part No.	Name of Part
25059	I. F. T. shield cap (with hole)
25058	I. F. T. shield cap (without hole)
22865	Bottom plate
22683	Tube shield
26255	I. F. T. shield insulator
18534	Fuse 2A
25056	I. F. T. shield
24323	Power T. cover
25469	Power T. insulator
35380	Dial light socket and reflector
26793	Instruction folder, F-1123
26237	Shipping container
27072	Wave guide, F-1131
26934	Tuning inst. tag, F-1124

788 SPEAKER No. 39400

Part No.	Name of Part
20737	Diaphragm
26804	Cable and plug
18870	Field coil
15079	Speaker plug
25525	Choke (CK4)

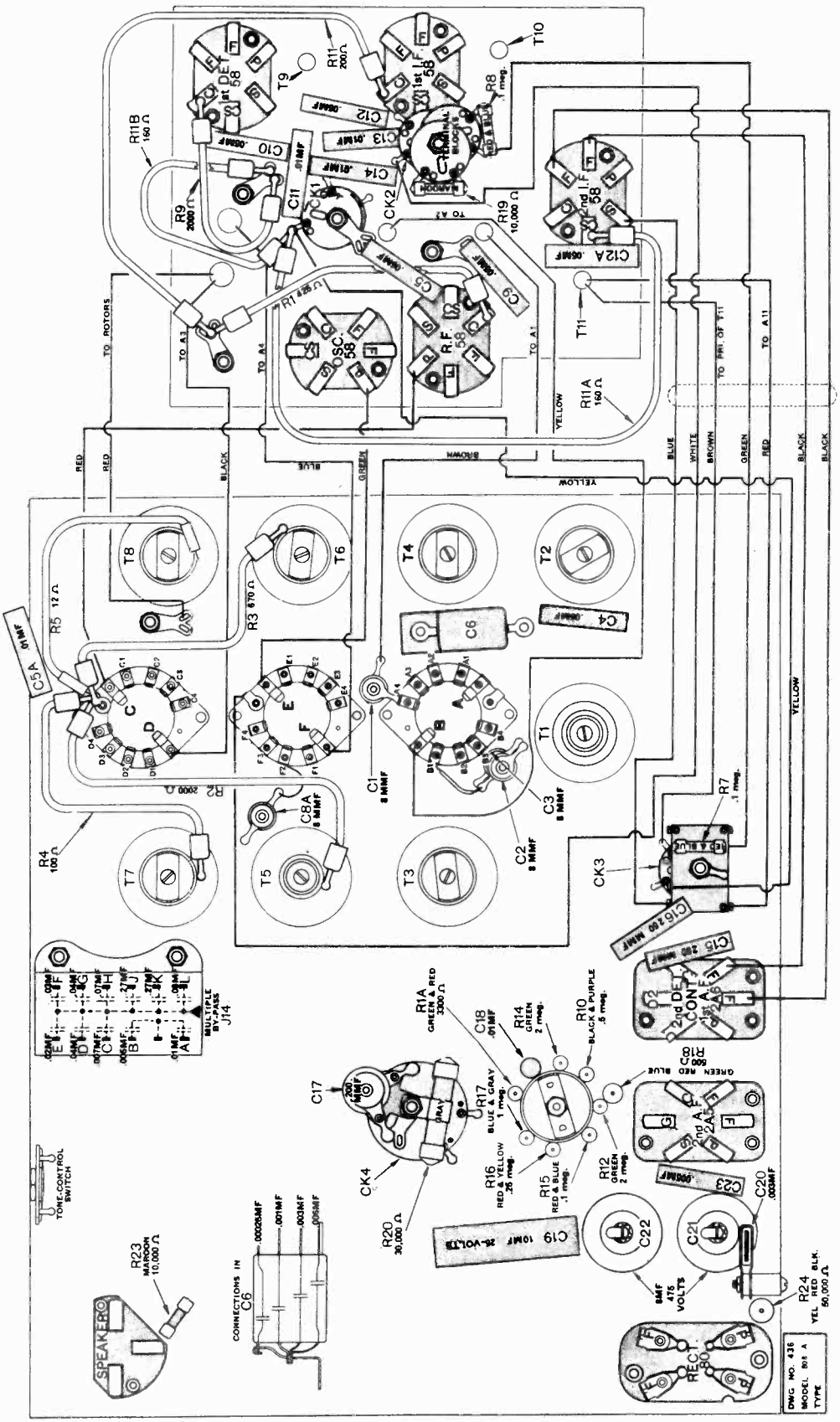
Ω = ohms. U = megohms. IND. = inductive. NI = non-inductive. W. = watt.

MODEL 808-A
Chassis Wiring

ATWATER-KENT MFG. CO.

MODEL 808-A

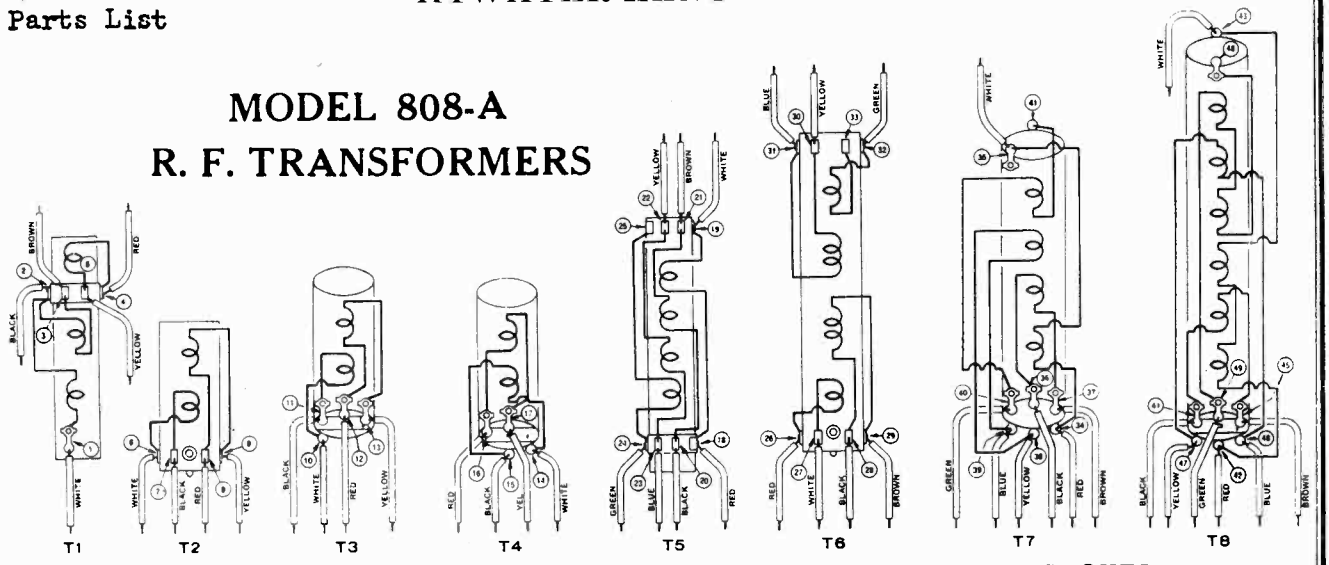
There are three types of quality filter in the plate of the 2A6.
The first type used an .007-MF condenser.
The second type used an .005-MF condenser.
The third type uses resistor R23 in series with .03-MF.



MODEL 808-A
R.F.Transformers
Parts List

ATWATER-KENT MFG. CO.

MODEL 808-A
R. F. TRANSFORMERS



May. 1934

MODEL 808-A

Part No.	Name of Part
24079	Volume control, .5 U
25689	Shadow tuning indicator
15404	Shadow tuning lamp, 2.5-V.
25871	Shadow tuning plate
25736	Knob—tone and frequency
25811	Knob—volume and tuning
24889	Range switch
25023	Variable condenser assembly
30560	Tone control switch
24207	Tone control switch shaft and blade
25144	Dial plate
25273	Dial plate assembly

TRANSFORMERS

Code No.	Part No.	Name of Part
T1	32650	No. 1 broadcast coil
T2	32670	No. 1 H. F. coil, 1st range
T3	32690	No. 1 H. F. coil, 2nd range
T4	32720	No. 1 H. F. coil, 3rd range
T5	32660	No. 2 broadcast coil
T6	32680	No. 2 H. F. coil, 1st range
T7	32710	No. 2 H. F. coil, 2nd range
T8	32730	No. 2 H. F. coil, 3rd range
T9	26135	No. 1 I. F. T. (tapped secondary)
T10	25503	No. 2 I. F. T. (less trimmer)
T11	25503	No. 3 I. F. T. (less trimmer)
T12	21672	Output T.
T13	25221	Power T.

RESISTORS

Code No.	Part No.	Name of Part
R1	17380	Flexible, 425 Ω
R1A	26410	Red-green, 3300 Ω, ½-W.
R2	33230	Flexible, 2000 Ω
R3	33210	Flexible, 670 Ω
R4	33220	Flexible, 100 Ω
R5	33240	Flexible, 12 Ω
R6	20980	Red-blue, .1 U, ½-W.
R7	20980	Red-blue, .1 U, ½-W.
R8	20980	Red-blue, .1 U, ½-W.
R9	21030	Flexible, 2000 Ω
R10	20930	Bl'k-purple, .5 U, ½-W
R11	25950	Flexible, 200 Ω
R11A	28950	Flexible, 160 Ω
R11B	28950	Flexible, 160 Ω
R12	20940	Green, 2 U, ½-W.
R14	20940	Green, 2 U, ½-W.
R15	20980	Red-blue, .1 U, ½-W.
R16	20920	Red-yellow, 250,000 Ω, ½-W.
R17	30360	Blue-gray, 1 U, 1/3-W.
R18	32010	Blue-red-green, 500 Ω, 1-W.
R19	20950	Maroon, 10,000 Ω, ½-W.
R20	29710	Gray, 30,000 Ω, 1½-W.
R21	17077	Flexible, 10 Ω
R22	31860	Flexible, 1 Ω
R23	20950	Maroon, 10,000 Ω, ½-W.
R24	34340	Yel.-red-bl'k, 50,000 Ω, 1½-W.

CONDENSERS

Code No.	Part No.	Name of Part
C1	27650	8 MMF, 500-V.
C2	27650	8 MMF, 500-V.
C3	27650	8 MMF, 500-V.
C4	31160	.05 MF, 100-V., NI
C5	31160	.05 MF, 100-V., NI
C5A	32810	.01 MF, 450-V., NI
C6	32480	Tracking cond. assembly
C7	27650	8 MMF, 500-V.
C8	27650	8 MMF, 500-V.
C8A	27650	8 MMF, 500-V.
C9	31160	.05 MF, 100-V., NI
C10	31160	.05 MF, 100-V., NI
C11	32810	.01 MF, 450-V., NI
C12	31160	.05 MF, 100-V., NI
C12A	31160	.05 MF, 100-V., NI
C13	32810	.01 MF, 450-V., NI
C14	32810	.01 MF, 450-V., NI
C15	33620	250 MMF, 450-V.
C16	33620	250 MMF, 450-V.
C17	21160	140-220 MMF, 450-V.
C18	27630	.01 MF, 200-V., IND
C19	25379	10 MF, 25-V., dry elec.
C20	32740	.003 MF, 500-V.
C21	22538	8 MF, 475-V.
C22	22538	8 MF, 475-V.
C23	29890	.005 MF, 450-V., IND.
	33060	Multiple by-pass cond.

CHOKES

Code No.	Part No.	Name of Part
CK1	19210	1st detector plate choke
CK2	19210	1st I. F. plate choke
CK3	19210	2nd I. F. plate choke
CK4	17015	2nd det. plate choke

TRIMMER CONDENSERS

Code No.	Part No.	Name of Part
A5	20190	Single trimmer
	32880	Double I. F. trimmer

SOCKETS

Part No.	Name of Part
25196	Speaker
22689	Rectifier
22733	6 prong, lower base
24494	6 prong, upper base

MISCELLANEOUS PARTS

Part No.	Name of Part
22683	Tube shield
25056	I. F. shield
25057	Coil shields
25059	I. F. shield cover (with hole)
25058	I. F. shield cover (without hole)
25929	Inst. and log card, F-1086
25428	Shipping container
24323	Power T. cover

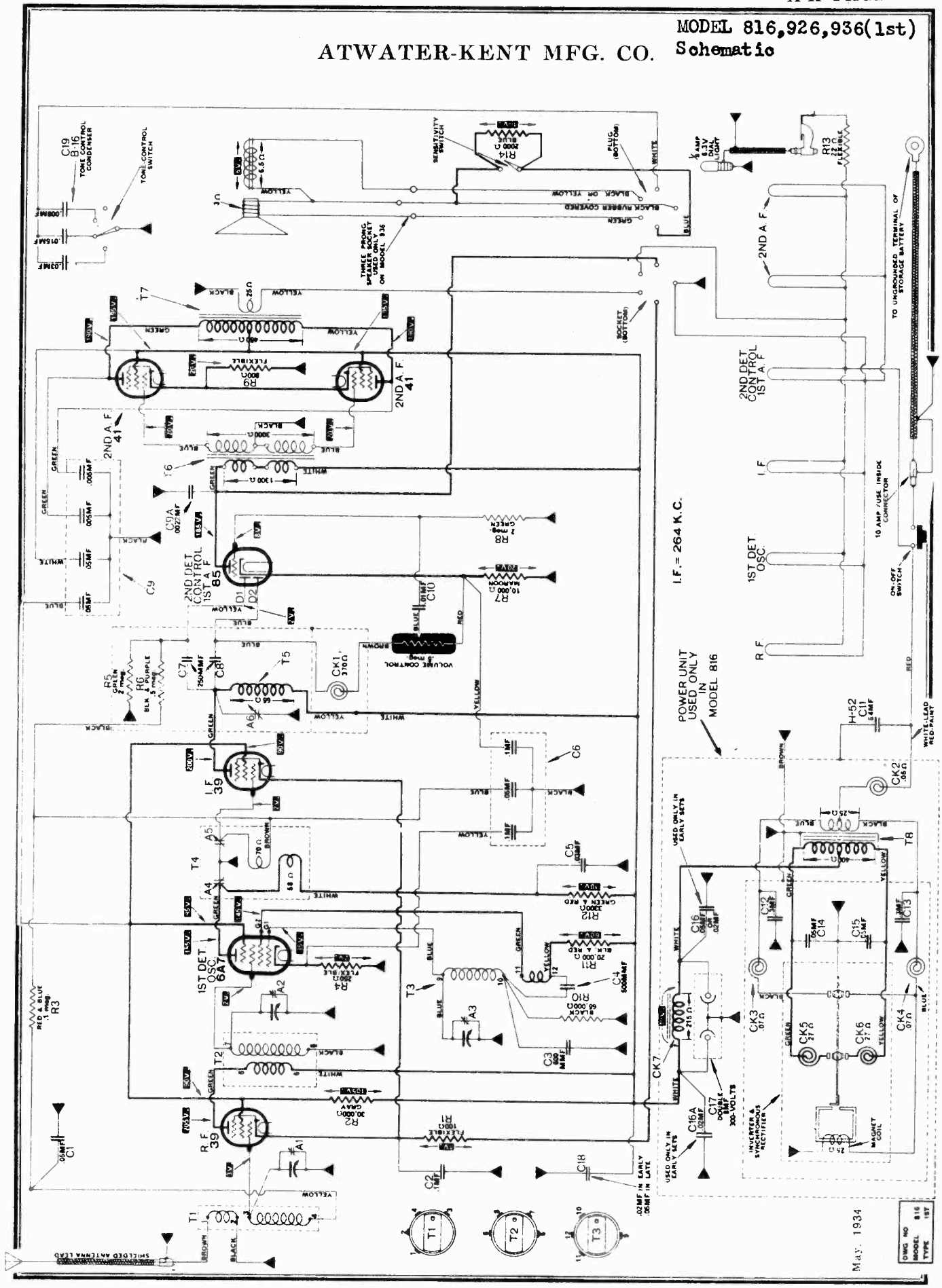
808-A SPEAKER No. 34500

Part No.	Name of Part
20737	Diaphragm
18870	Field coil, 2000 Ω
21672	Output T. (T12)
25405	Cable and plug

Ω = ohms. U = megohms. IND. = inductive.
NI = non-inductive. W. = watt.

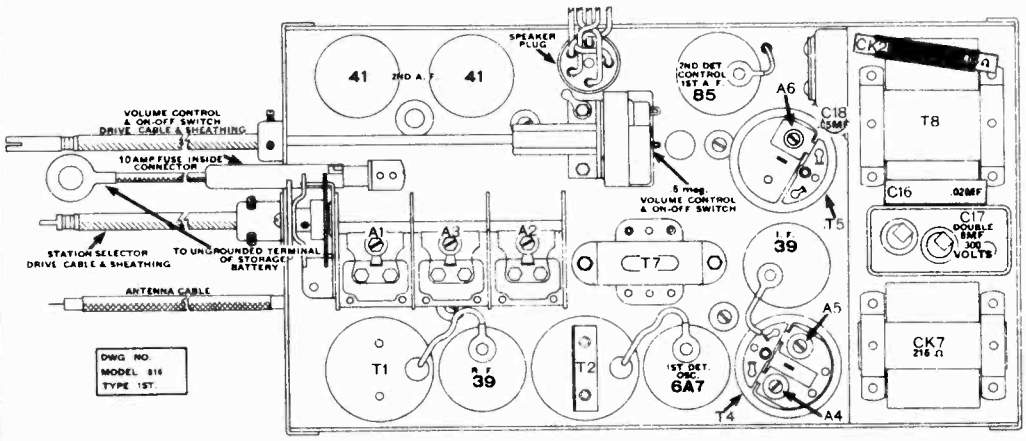
ATWATER-KENT MFG. CO.

MODEL 816,926,936(1st)
Schematic



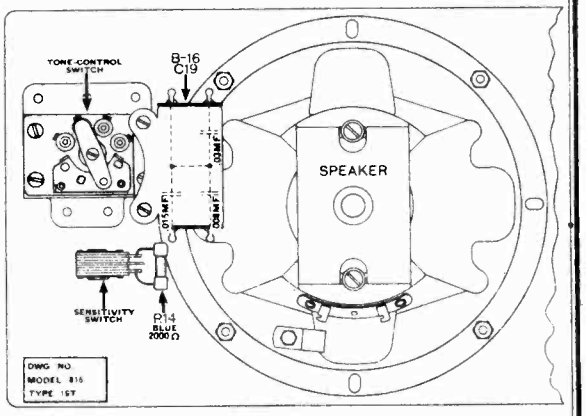
MODEL 816,926,936 (1st)
Socket,Trimmers,Parts,
Power Unit Schematic

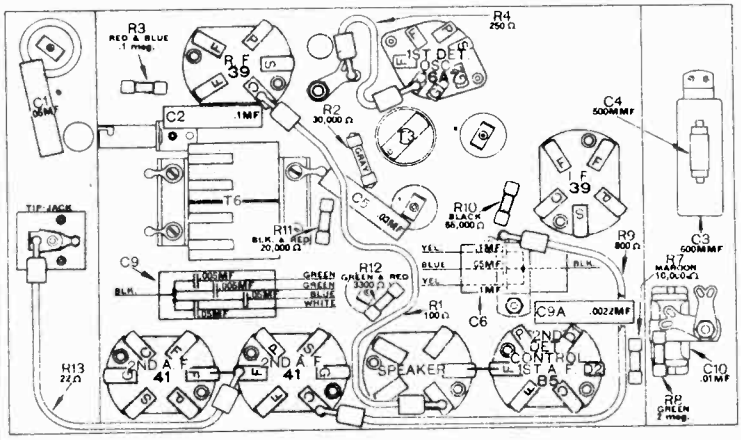
ATWATER-KENT MFG. CO.



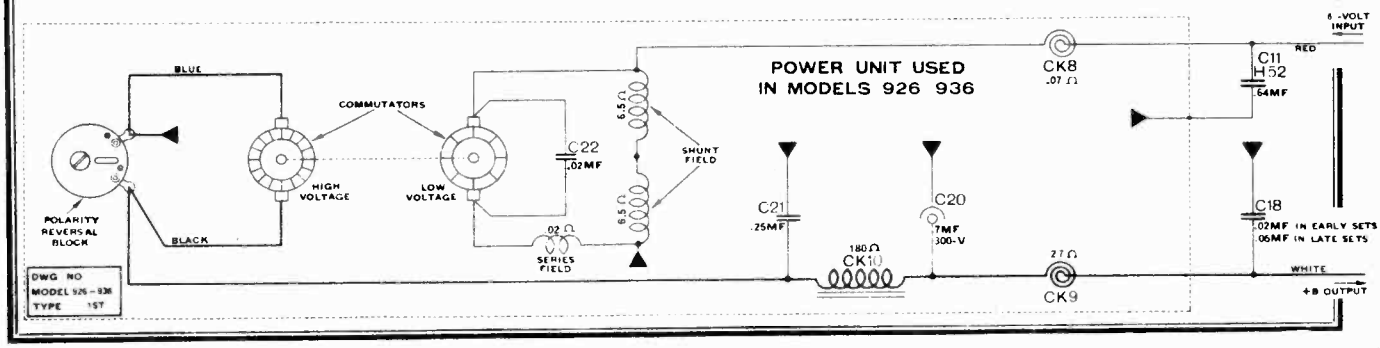
In late type sets, the "A" battery cable is brought out the top side, near the speaker plug.

1st TYPES OF MODELS 816, 926 AND 936





Model 936 has a separate speaker which plugs into a three-prong socket on the inside of lid of set container.



MODEL 816

(Below Serial No. 1121818)

Part No.	Name of Part
26586*	Set container complete, less lid
26496	Set container lid (bl'k)
26549	Tuning cable bushing
26036	Inner plate for above
26102	Polarity reversal cover
26096	Sound insulators (felt)
26452	Lid mounting bracket
26128	Thumbscrew
19455	Mounting washer
26462	Variable cond. assembly
25478	Grommet for var. cond.
26072	Shield for No. 1 I. F. T.
26538	Insulator for above shield
26589	Shield for No. 1 R. F. T.
26591	Shield for No. 2 R. F. T.
25818	Clamp for No. 36440 cond.
26505	Volume control, .5 U
26033	Volume control bracket
26039	Volume control coupling
24540	Tone control switch
26127	Knob for above
13664	Sensitivity switch
21143	Plug suppressor
21144	Distributor suppressor
23260	Generator cond., 1 MF, 200-V.

* When ordering cabinet, specify brown or black

TRANSFORMERS

Code No.	Part No.	Name of Part
T1	35680	No. 1 R. F. T.
T2	35690	No. 2 R. F. T.
T3	35710	Oscillator T.
T4	26592	No. 1 I. F. T.
T5	26593	No. 2 I. F. T.
T6	26606	Audio input T.
T7	26478	Audio output T.
T8	26291	Power T.

RESISTORS

Code No.	Part No.	Name of Part
R1	20040	Flexible, 100 Ω
R2	20970	Gray, 30,000 Ω, ½-W.
R3	30340	Red-blue, .1 U, 1/3-W.
R4	31830	Flexible, 250 Ω
R5	30370	Green, 2 U, 1/3-W.
R6	30350	Bl'k-purple, .5 U, 1/3-W.
R7	30320	Mar'n, 10 000 Ω, 1/3-W.
R8	30370	Green, 2 U, 1/3-W.
R9	20120	Flexible, 800 Ω
R10	31980	Bl'k, 65,000 Ω, 1/3-W.
R11	30390	Red-bl'k, 20,000 Ω, 1/3-W.
R12	30380	Red-green, 3300 Ω, 1/3-W.
R13	16840	Flexible, 22 Ω
R14	33250	Blue, 2000 Ω, 1/3-W.

CONDENSERS

Code No.	Part No.	Name of Part
C1	31160	.05 MF, 100-V., NI
C2	31530	.1 MF, 100-V., NI
C3	36460	600 MMF, 100-V. (mica)
C4	36510	500 MMF, 500-V. (mica)
C5	29530	.03 MF, 200-V., NI
C6	36440	.1, .05, .1 MF, 100-V., IND.
C7	33670	250 MMF, 500-V.
C8	33670	250 MMF, 500-V.
C9	36450	.05, .05, .005, .005 MF, 200-V., IND.
C9A	33660	2200 MMF, 450 V., IND.
C10	23250	.01 MF, 450-V.
C11	36480	.64 MF, H-52, 200-V.
C12	31150	.3 MF, 100-V., NI
C13	31150	.3 MF, 100-V., NI
C14	36490	.05 MF, 450-V., NI
C15	36490	.05 MF, 450-V., NI
C16*	36490	.05 MF 450-V., NI
C16A	29030	.02 MF, 450-V., NI
C17	26092	8 MF-8 MF, 300-V. (electrolytic)
C18**	36880	.02 MF, 450-V., NI
C19	30270	Tone control cond. (B-16)

* C16 is .02 MF, 450-V., NI 29030 in some of these sets.

** C18 is .05 MF, 200-V., NI 26820 in later sets.

TRIMMERS

Code No.	Part No.	Name of Part
A4, 5	37960	Double I. F. trimmer
A6	36570	Single I. F. trimmer

CHOKES

Code No.	Part No.	Name of Part
CK1	26594	2nd detector plate choke
CK2	36630	R. F. "A" filter choke
CK3	36610	R. F. "A" filter choke
CK4	36610	R. F. "A" filter choke
CK5	36620	R. F. "B" filter choke
CK6	36620	R. F. "B" filter choke
CK7	25416	A. F. "B" filter choke

POWER UNIT ASSEMBLY

Part No.	Name of Part
26863	Vibrator
26854	Rubber (2)
26855	Rubber (1)
26061	Inside vibrator container
26062	Lid for above
2652*	Grommet
2608*	Tubular condenser clamp
26663	Middle container body
26091	Middle container lid
26136	Vibrator lid insulator
26664	Outer container body
26665	Outer container lid

SPEAKER

Part No.	Name of Part
26851	Speaker less cable
26826	Cone head assembly
26827	Field coil, 6.5 Ω
26559	Speaker cable and plug

MISCELLANEOUS PARTS

Part No.	Name of Part
21878	Disc shield, No. 2 I. F. T.
26578	Disc (insul.) for No. 2 I. F. T.
21406	Fuse, 10 amp.

REMOTE CONTROL HEAD

26646	Remote control head complete with mounting parts (less cables)
26893	Pointer gear (fibre)
26894	Spring washer
26108	Mounting strap and bushing
26884	Head assembly
26892	Pointer and shaft
26886	Screw No. 4—36 x ¼
26888	Cork gasket
26889	Dial assembly
26891	Diffusing strip
26107	Mounting bracket
26528	Screw ¼—20 x ½
26104	Assem. vol. cont. cable, 35 in.
26105	Assembled tuning cable, 31 in.
26109	Key
26887	Glass
27118	Lamp (6-8-V., ⅛A), green
26895	Gear shaft assembly
26896	Tuning knob
27312	Tuning knob spring
26897	Key knob
26898	Screw No. 10—32 x ¼ F. H. cup pt.
26899	Shielded wire (dial lite lead)
26901	Wire clamp
26531	Screw ¼—20 x ⅞
24082	Wire tip
27059	Steering column mounting bracket assembly
26107	Mounting bracket (column type)
26531	Column clamp screw
26108	Column clamp
21141	Lockwasher
26528	Mounting screw
26943	Panel mounting bracket assem.
26944	Mounting bracket (panel type)
26945	Wing screws
26946	Flat head screws
26947	Felt pad

EXTRA LENGTH ASSEMBLED CABLES

27114	Assem. vol. cont. cable, 3½ ft.
27115	Assembled tuning cable, 3½ ft.
27016	Assem. vol. cont. cable, 11 ft.
27017	Assembled tuning cable, 11 ft.

MODEL 926

(Below Serial No. 8276401)

Model 926 speaker and chassis is identical to Model 816, but the 926 uses a genemotor power unit

POWER UNIT MODELS 926 and 936

Part No.	Name of Part
26093	Power unit container
26942	Lid for above
36610	R F "A" filter choke (CK8)
36620	R F "B" filter choke (CK9)
22359	A F "B" filter choke (CK10)
26864	7 MF, 300-V., dry electrolytic (C20)
35930	.25 MF, 200-V., NI (C21)
36420	.02 MF, 200-V., IND. (C22)

GENEMOTOR No. 26734

Part No.	Name of Part
26964	Motor end bracket assembly
26965	Generator end bracket assembly
26966	Generator brushes assembly
26967	Motor brushes assembly
26968	Field coils and field core assembly
26969	Field coils set
26971	Armature
26972	Ball bearing
26973	Motor mounting bracket
26974	Rubber bumpers
26975	Steel studs 4⅝" x 8/32 thd.
26976	Hex. iron nuts—cadmium plated
26977	Ground lug
26978	2⅝" long—No. 18 extra flexible bare ground lead
27043	Field core assembly
27044	Shunt field (2 leads)
27045	Shunt and series field (4 leads)

MODEL 936

(Below Serial No. 4542201)

Model 936 chassis is identical to Model 816, but the 936 uses a genemotor power unit (listed above), and a separate speaker (listed below).

Part No.	Name of Part
26806	Lid
25196	Socket (3 prong)
26831	Cable and plug assembly (5 wire)
21963	Tone control knob

936 SPEAKER No. 38900

Part No.	Name of Part
26822	Diaphragm
30710	Field coil
26823	Cable and plug assembly (3 wire)

Ω = ohms. U = megohms. IND. = inductive. NI = non-inductive. W. = watt.

DATA FOR CURRENT MODELS

The last figure in the model number indicates the number of tubes; for instance, Model 145 has 5 tubes; Model 511 has 11 tubes, etc. The letter "Q" indicates battery operation; the letter "D" indicates D. C. operation; the letter "Z" indicates 32-volt operation.

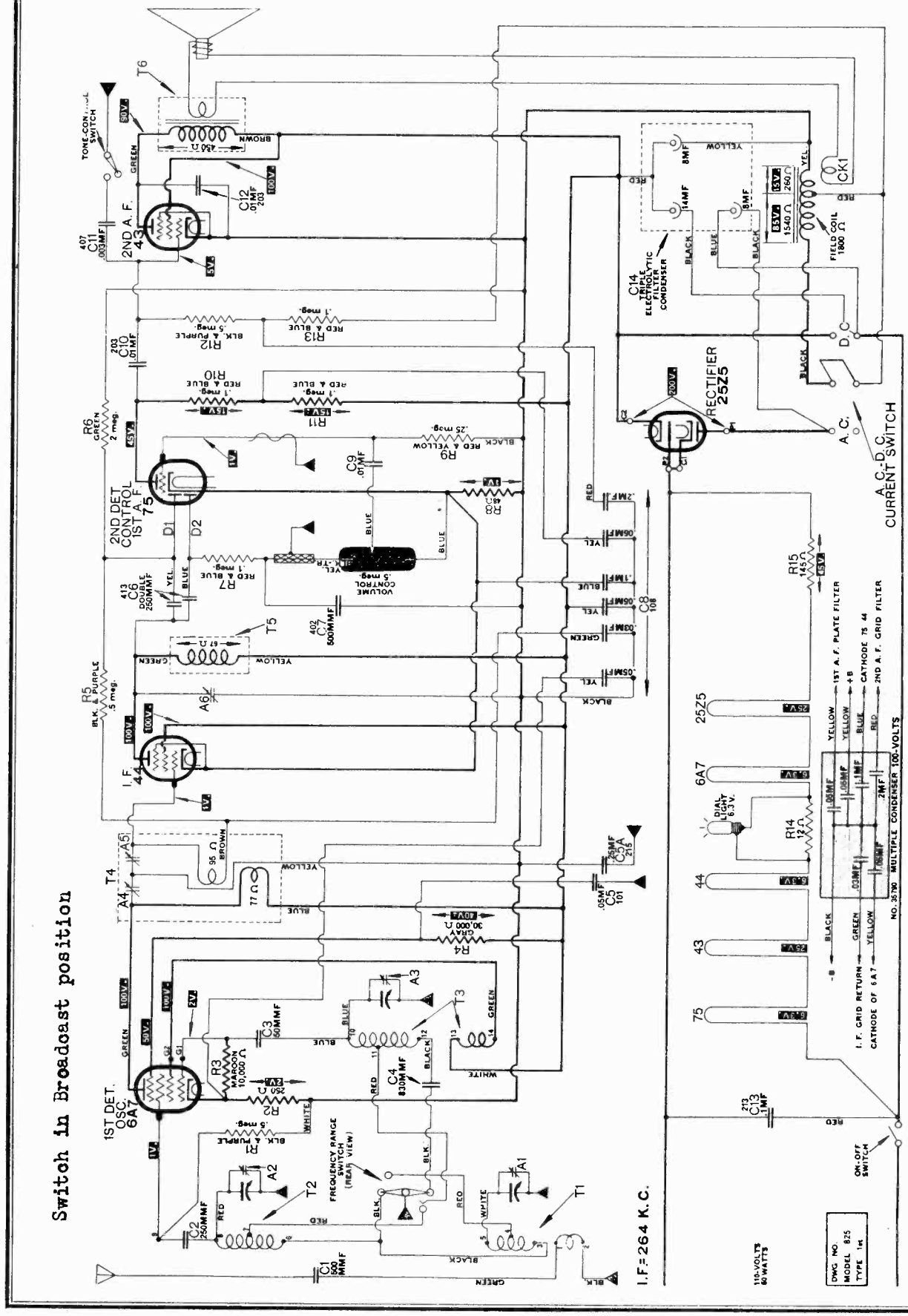
All models listed below have tone control, and all models with exception of 465Q and 655Q have automatic volume control. All models have dynamic speakers, with exception of battery sets, which have special magnetic speakers.

MODEL	TYPE	CABINET	POWER SUPPLY	I. F. FREQUENCY	PART NO. SPEAKER	LINE WATTS	OUTPUT WATTS	SHADOW TUNING	SILENCING ADJUSTMENT	FREQUENCY RANGE	TUBES									
											R. F.	1ST DET.	OSCILLATOR	I. F.	2ND DET. AVC.	1ST A. F.	2ND A. F.	3RD A. F.	4TH A. F.	RECTIFIER
112	All Wave	Console	110V, 60C	472½	36700	150	15	YES	YES	540-18000	58	58	58	58(2)	—2B7—		56	56(2)	2A3(2)	5Z3
145	Standard and Short Wave	Compact	110V, 60C	264	42100	60	3.3	NO	NO	540-1600 1.6-4.8 5.3-16	..	—2A7—		58	—2A6—		2A5	..	..	80
206	Standard and Short Wave	Compact	110V, 60C	472½	41900	80	3.3	NO	NO	540-1600 1.6-5.0 5.7-15.5	58	—2A7—		58	—2A6—		2A5	..	..	80
318	All Wave	Console	110V, 60C	472½	41600	120	6.6	YES	YES	540-22500	58	—2A7—		58(2)	—55—		2A5(2)	..	..	80
325	Standard and Short Wave	Console	110V, 60C	264	41800	60	3.3	NO	NO	540-1600 1.6-4.8 5.3-16	..	—2A7—		58	—2A6—		2A5	..	..	80
376	Standard and Short Wave	Console	110V, 60C	472½	43700	80	3.3	NO	NO	540-1600 1.6-5.0 5.7-15.5	58	—2A7—		58	—2A6—		2A5	..	..	80
447	All Wave	Compact	110V, 60C	472½	41700	90	3.3	YES	YES	540-22500	58	—2A7—		58(2)	—2A6—		2A5	..	..	80
511*	Standard and Short Wave	Console	110V, 60C	472½	36700	150	15	YES	NO	540-1600 5.5-15.5	58	—2A7—		58(2)	—2B7—		56	56(2)	2A3(2)	5Z3
559	All Wave	Console	110V, 60C	472½	36500	120	6.6	YES	YES	540-18000	58	58	58	58(2)	—55—		2A5(2)	..	..	80
944	Broadcast	Compact	110V, 60C	450	34100	45	2.0	NO	NO	540-1720	..	—57—		..	57		2A5	..	..	80
465Q	Standard and Short Wave	Compact	2V	264	42900	**	1	NO	NO	540-1600 1.6-4.8 5.3-16	..	—1C6—		34	32	30	19	..	..	..
655Q	Standard and Short Wave	Console	2V	264	43200	**	1	NO	NO	540-1600 1.6-4.8 5.3-16	..	—1C6—		34	32	30	19	..	..	..
768Q	All Wave	Compact	2V	472½	43100	††	1	NO	NO	540-22500	..	—1C6—		34(2)	-30-	32	30	30(2)	..	..
978Q	All Wave	Console	2V	472½	43200	††	1	NO	NO	540-22500	..	—1C6—		34(2)	-30-	32	30	30(2)	..	..
206D	Standard and Short Wave	Compact	110V, DC	472½	43500	45	2	NO	NO	540-1600 1.6-5.0 5.7-15.5	78	—6A7—		78	—85—		43(2)	..	..	..
376D	Standard and Short Wave	Console	110V, DC	472½	43600	45	2	NO	NO	540-1600 1.6-5.0 5.7-15.5	78	—6A7—		78	—85—		43(2)	..	..	..
135Z	Standard and Short Wave	Compact	32V	264	42700	40	2	NO	NO	540-1600 1.6-4.8 5.3-16	..	—6A7—		78	—75—		43	..	..	6Z4
215Z	Standard and Short Wave	Console	32V	264	42800	40	2	NO	NO	540-1600 1.6-4.8 5.3-16	..	—6A7—		78	—75—		43	..	..	6Z4
825	AC-DC	Compact	110V,AC-DC	264	26159	50	1.0	NO	NO	540-1720†	..	—6A7—		39	—75—		43	..	..	25Z5

* Model 511 has automatic tuning. † Has switch to tune in the 2400 kilocycle police band. ** "B" drain, 22 MA. †† "B" drain, 25 MA.

MODEL 825 AC-DC
Schematic

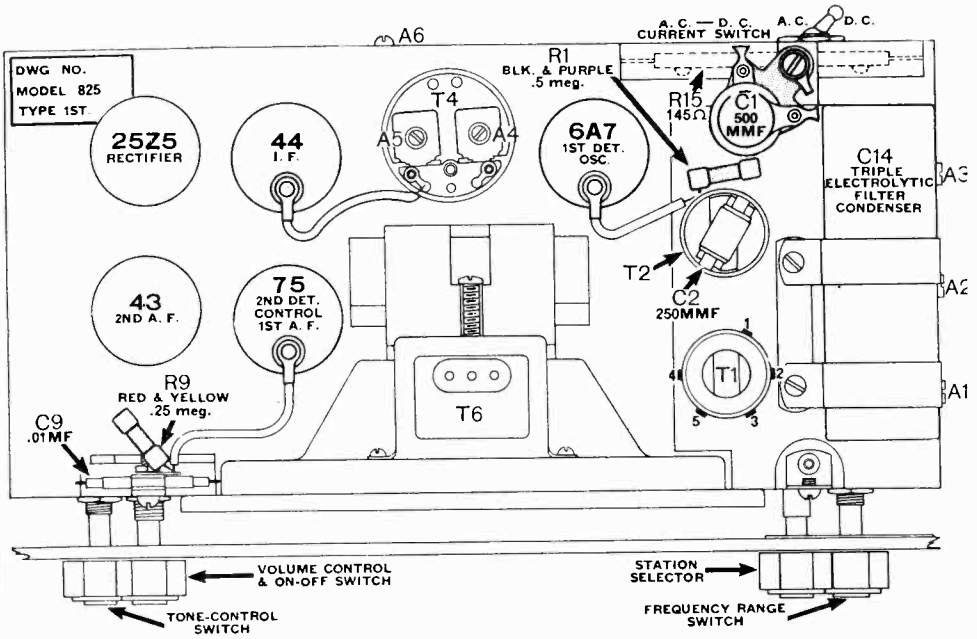
ATWATER-KENT MFG. CO.



MODEL 825 AC-DC
Socket, Trimmers
Parts Layout

ATWATER-KENT MFG. CO.

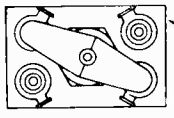
MODEL 825 (A. C.—D. C.)

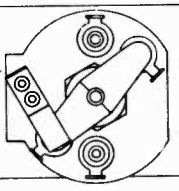


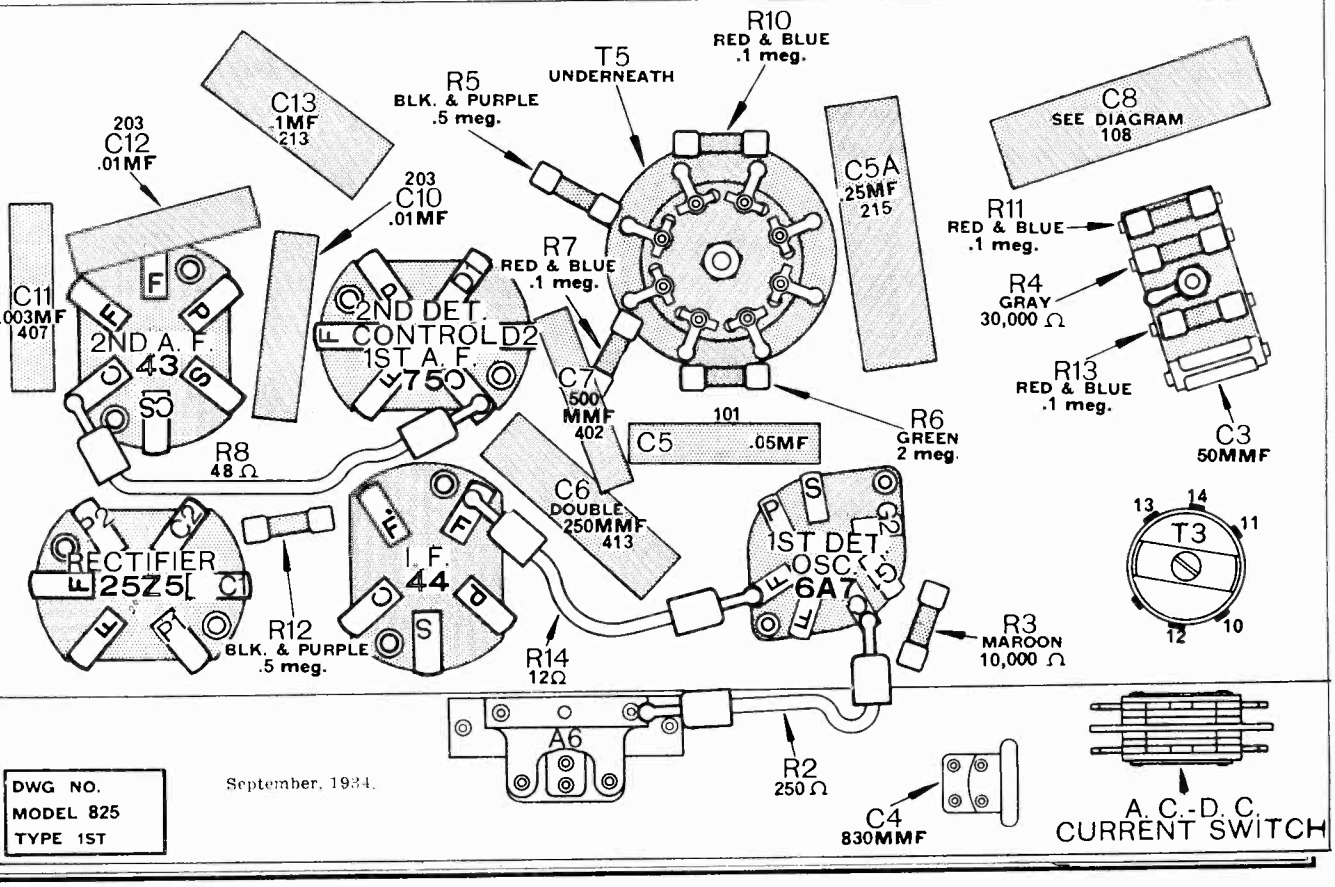
(I. F. = 264 KC.)

Trimmers A1, A2 and A3 are adjusted at 1500 KC.

A4, A5 and A6 are adjusted at 264 KC.





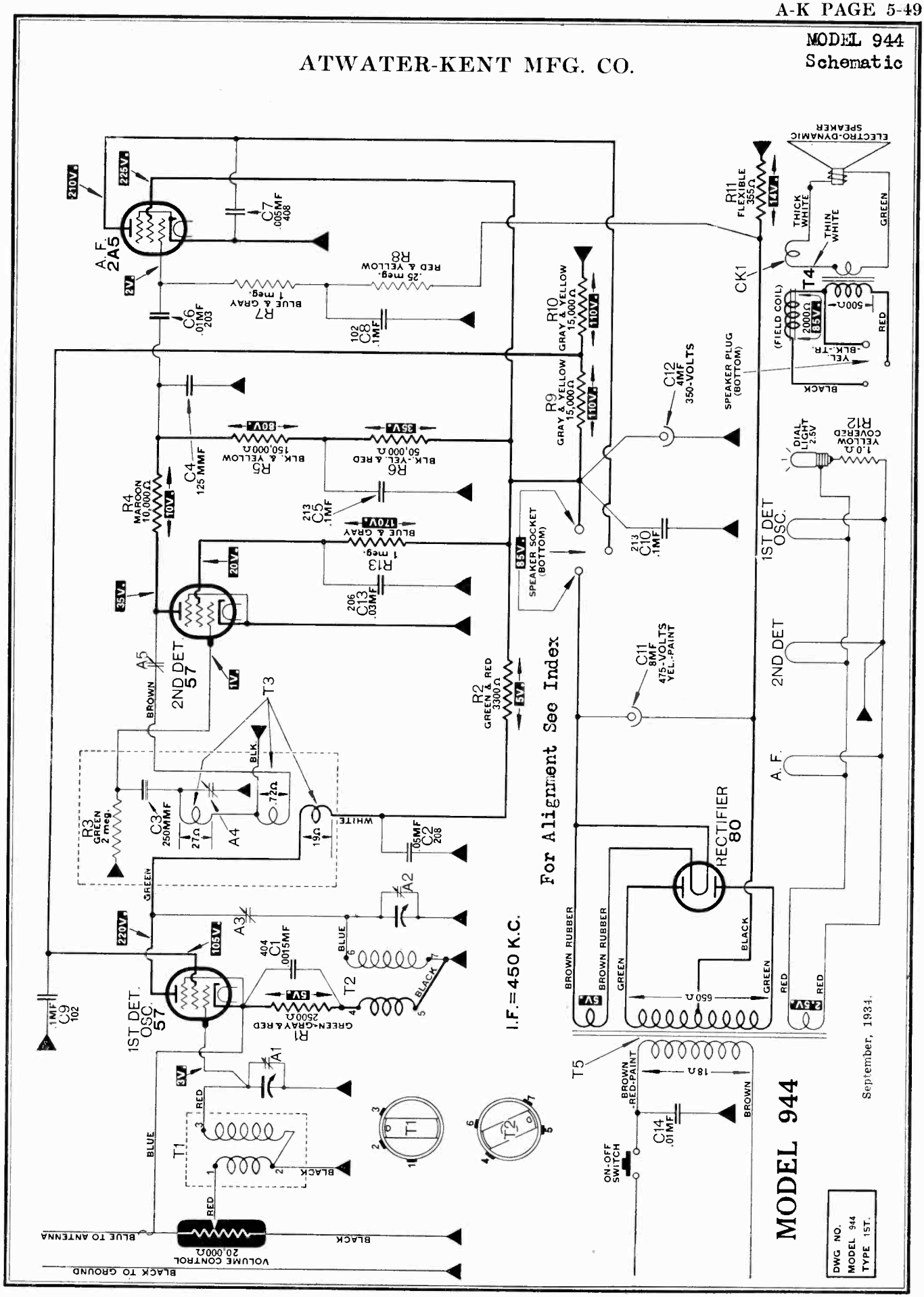


DWG NO.
MODEL 825
TYPE 1ST

September, 1934.

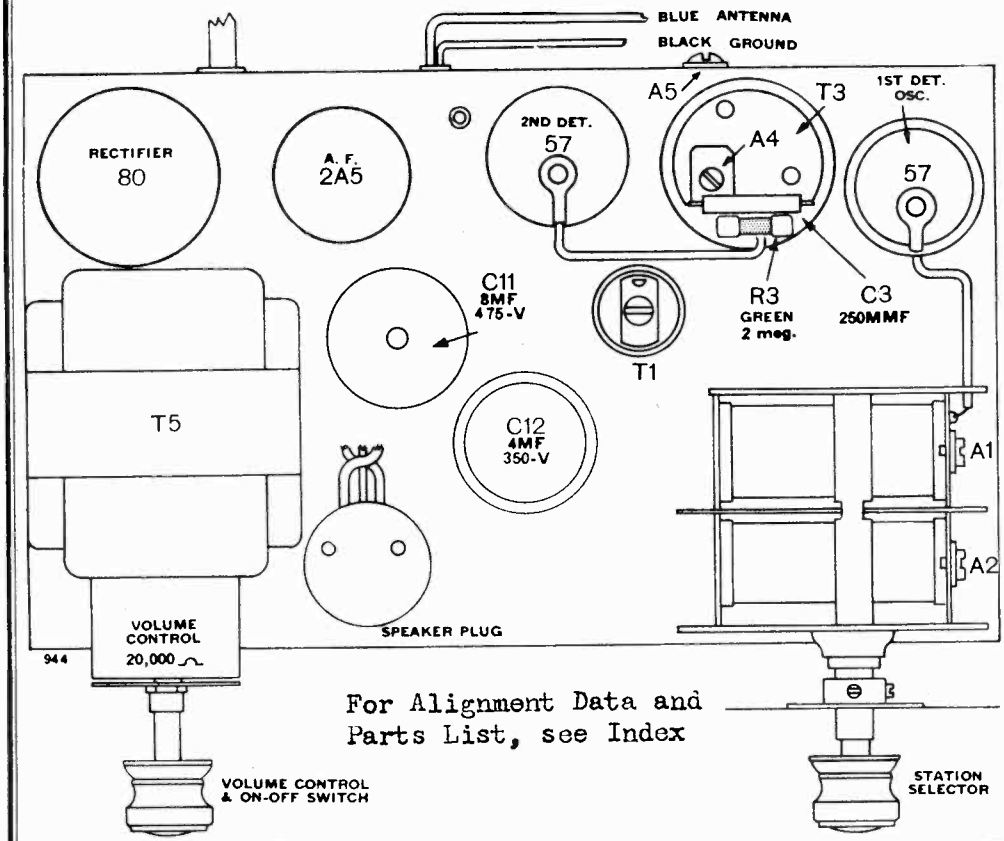
MODEL 944
Schematic

ATWATER-KENT MFG. CO.



MODEL 944
Socket, Trimmers
Parts Layout

ATWATER-KENT MFG. CO.



Trimmers A1 and A2 are adjusted at 1500 KC.

Trimmers A3 and A4 are adjusted at 450 KC.

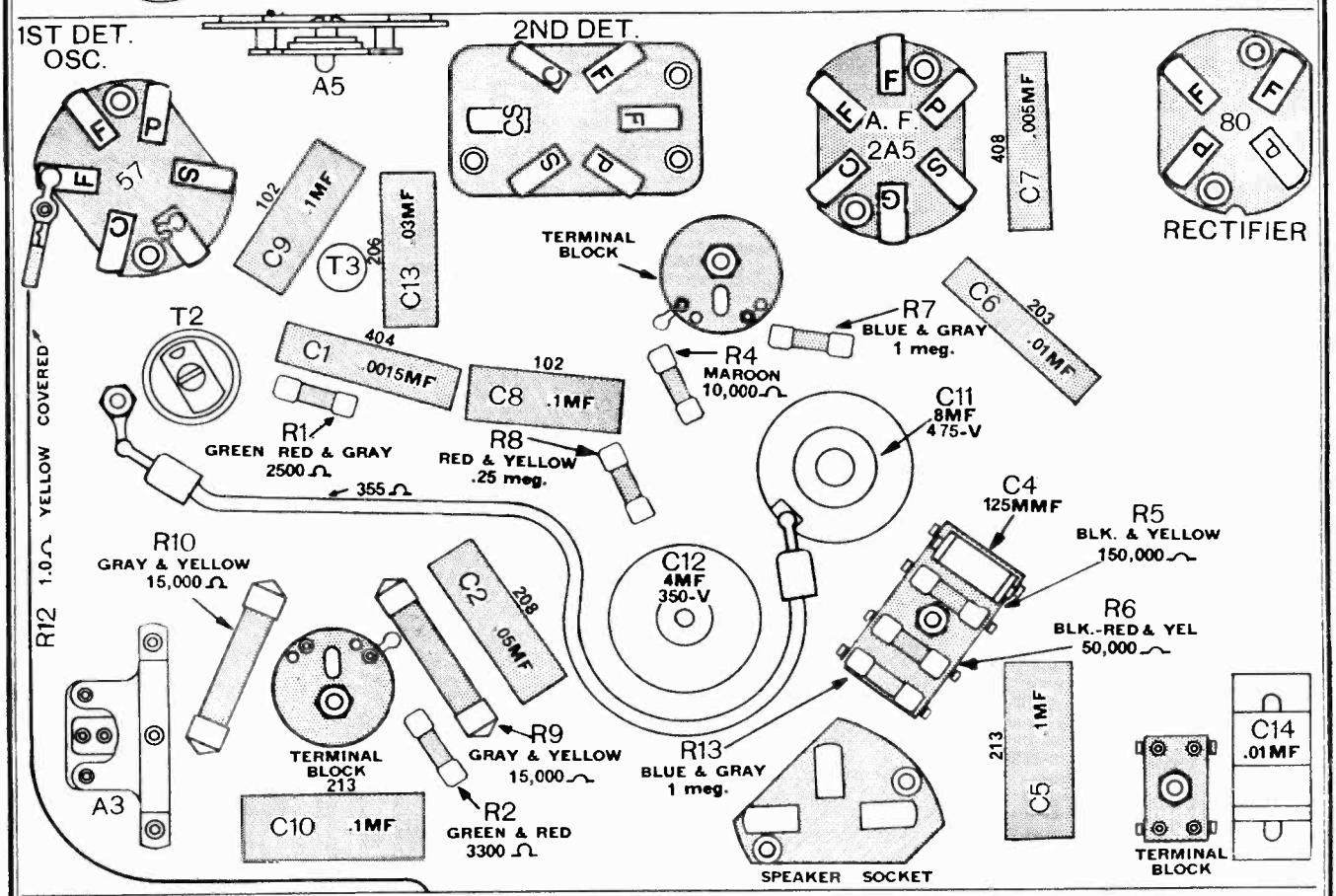
Trimmer A5 controls sensitivity, and is adjusted in accordance with instructions at about 1100 KC.

(I. F. = 450 KC.)

MODEL 944

944
September, 1934.

For Alignment Data and Parts List, see Index



MODEL 346, B-6
Schematic, Socket
Alignment

AUDIOLA RADIO CO.

Six Tube Auto Radio

This receiver is a six tube superheterodyne using the most modern circuit design and tubes. Tubes used are: one 6D6 R.F. Amplifier; one 6A7 combination 1st detector and oscillator; one 6D6 I.F. Amplifier; a 75 diode detector with delayed A.V.C. and one stage audio; one 41 power output tube; and one 84 rectifier tube.

In the installation of this receiver there are a few important fundamental principles to adhere to:

(1) Avoid having any battery wires in close relation to the high voltage spark coil or plug wires.

(2) The antenna must be routed over the most quiet location. Interference will often go through the antenna shielding if touching brake, accelerator, or steering column rods. The lead in must be shielded up to the antenna and the shield bonded to the set chassis. In many installations the antenna shield must also be bonded to the chassis of the car where the shield turns up to the top.

(3) If the chassis has to be removed from housing, be certain to tighten the three screws on the bottom when replacing the chassis.

(4) After installation is completed, adjust antenna trimmer on some distant station around 1400 to 1500 K.C. turn in either direction for loudest signal. The antenna trimmer is directly under the serial number on the top of the set. The front cover screws must always be tight.

(5) The gang condenser control (tuning) must run very freely and have not less than 1/32 of an inch end play.

Shield antenna lead-in and bond the shield to frame at center post. If antenna comes down front post, shield as high as possible and also ground the shield to dash.

In case of antenna pick-up, use heavy "A" choke and double condenser as in diagram #1.

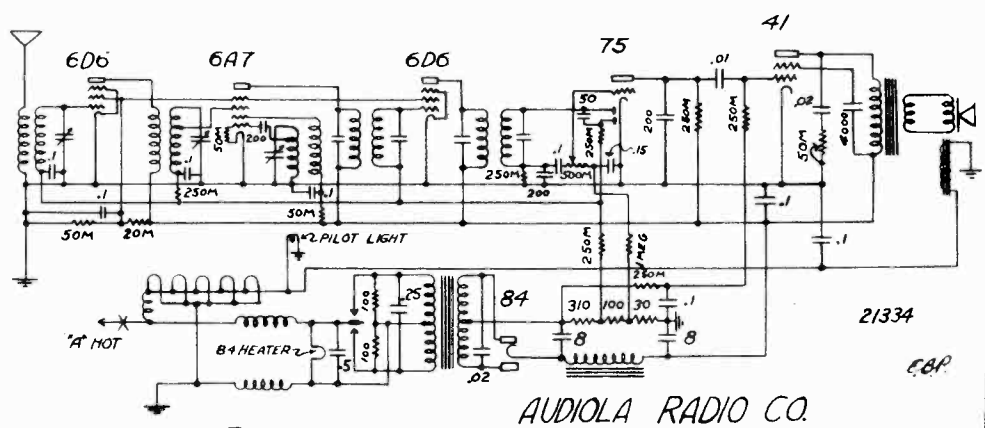
In case of chassis pick-up, separate primary and high tension ignition wires, shield and ground the shield at both ends.

In Chevrolets, it is sometimes necessary to shield the floorboards on the right hand side and ground with floorboard screws.

In Ford V8 shield primary and "A" lead to generator separately and ground shields to spark plug housing brackets as in diagram #2.

In case of floating power, bond center bolt on Audiola set to motor block.

346

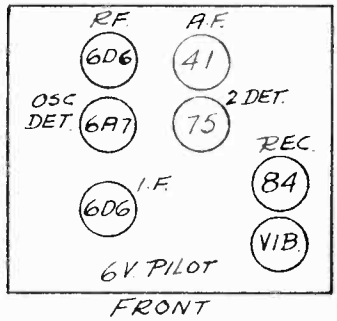


AUDIOLA RADIO CO.
CHICAGO, ILL.

IF PEAK 177.5 KC.

MODEL B-6 IS SAME AS 346, EXCEPT MODEL B-6 HAS NO TONE CONTROL

MODEL 346 1934



SPECIAL INSTRUCTIONS FOR ELIMINATING INTERFERENCE

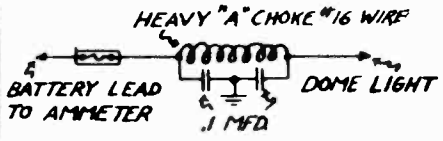


DIAGRAM #1

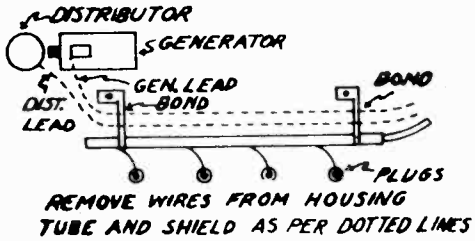


DIAGRAM #2

MODEL 347
Schematic, Socket
Alignment

AUDIOLA RADIO CO.

Seven Tube Auto Radio

This receiver is a seven tube superheterodyne using the most modern circuit design and tubes. Tubes used are: one 6D6 R.F. Amplifier; one 6A7 combination 1st detector and oscilator; one 6D6 I.F. Amplifier; an 85 diode detector with delayed A.V.C. and one stage audio; two 41 power output tubes and one 84 rectifier tube.

In the installation of this receiver there are a few important fundamental principles to adhere to:

(1) Avoid having any battery wires in close relation to the high voltage spark coil or plug wires.

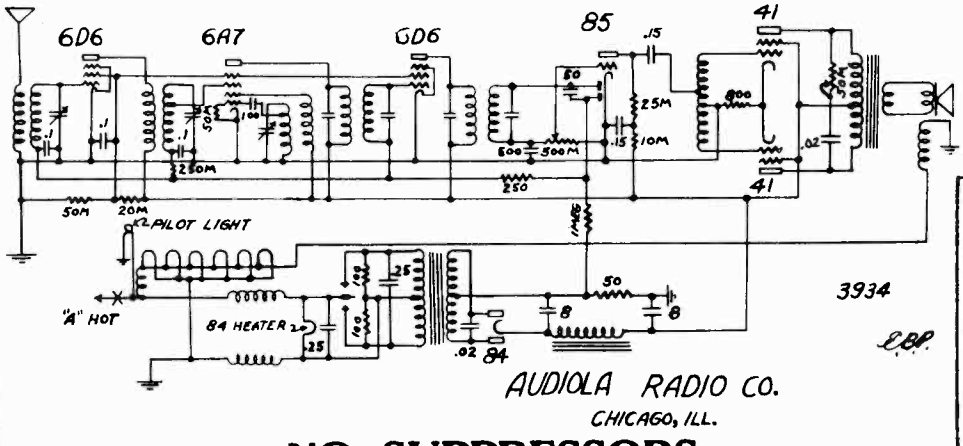
(2) The antenna must be routed over the most quiet location. Interference will often go through the antenna shielding if touching brake, accelerator, or steering column rods. The lead in must be shielded up to the antenna and the shield bonded to the set chassis. In many installations the antenna shield must alsc be bonded to the chassis of the car where the shield turns up to the top.

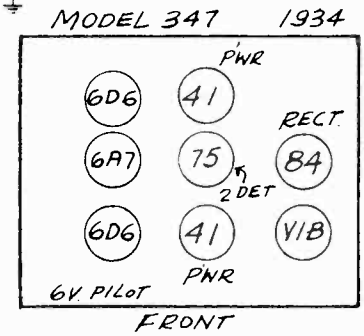
(3) If the chassis has to be removed from housing, be certain to tighten the three screws on the bottom when replacing the chassis.

(4) After installation is completed, adjust antenna trimmer on some distant station around 1400 to 1500 K.C. turn in either direction for loudest signal. The antenna trimmer is directly under the serial number on the top of the set. The front cover screws must always be tight.

(5) The gang condenser control (tuning) must run very freely and have not less than 1/32 of an inch end play.

347





NO SUPPRESSORS

AudiolA is first to develop an auto radio that eliminates motor noise without the use of spark plug suppressors.

This is an important engineering advancement in the auto radio art. We are pleased to have made this contribution to the radio industry.

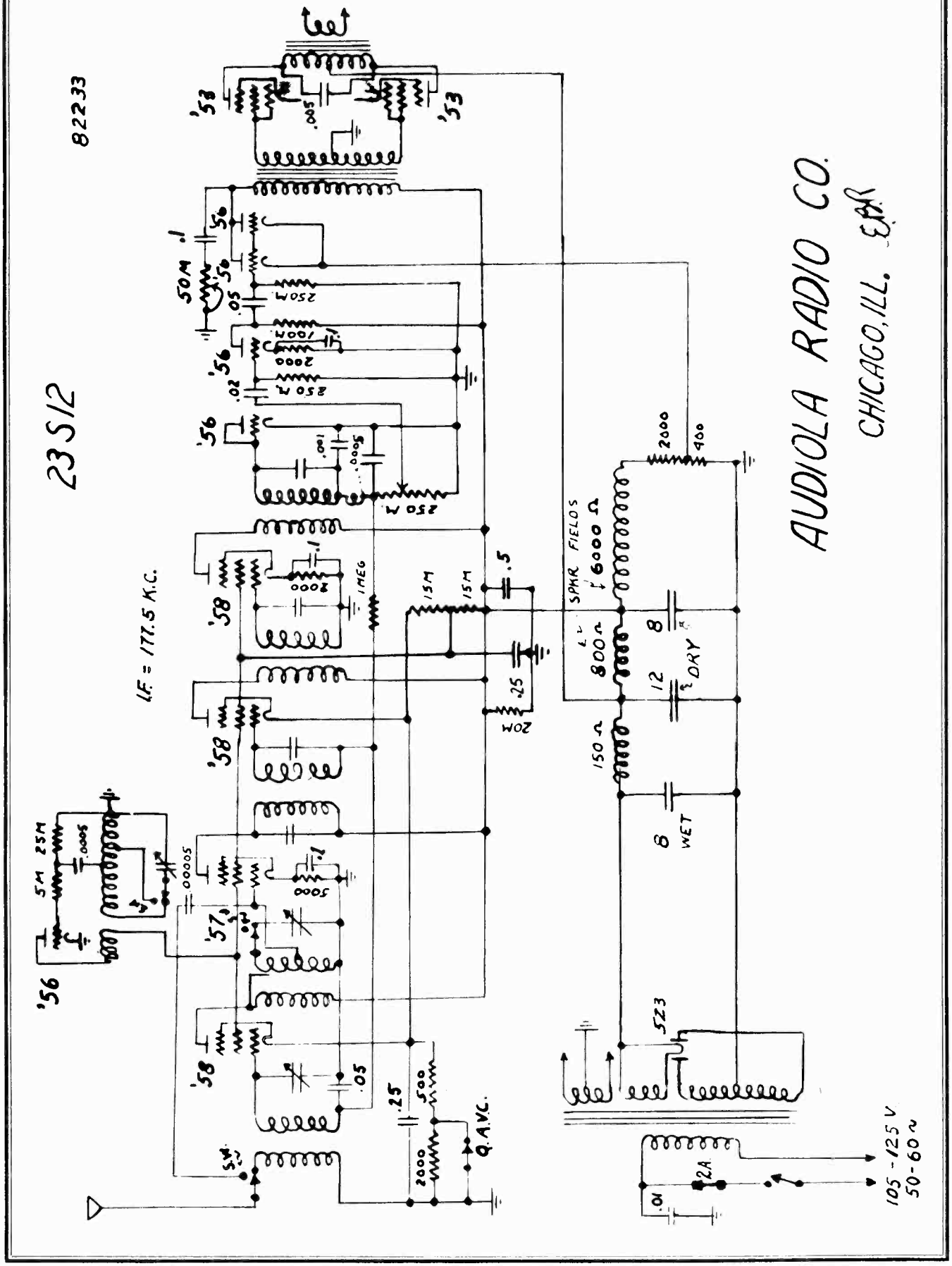
It is important that you understand this new pioneering development.

We have successfully installed the AudiolA auto radio without spark plug suppressors, and eliminated all motor noise and other noise, from every car that we have tried. This has covered almost every make and model of automobile.

For Elimination of Interference data, see Model 346.

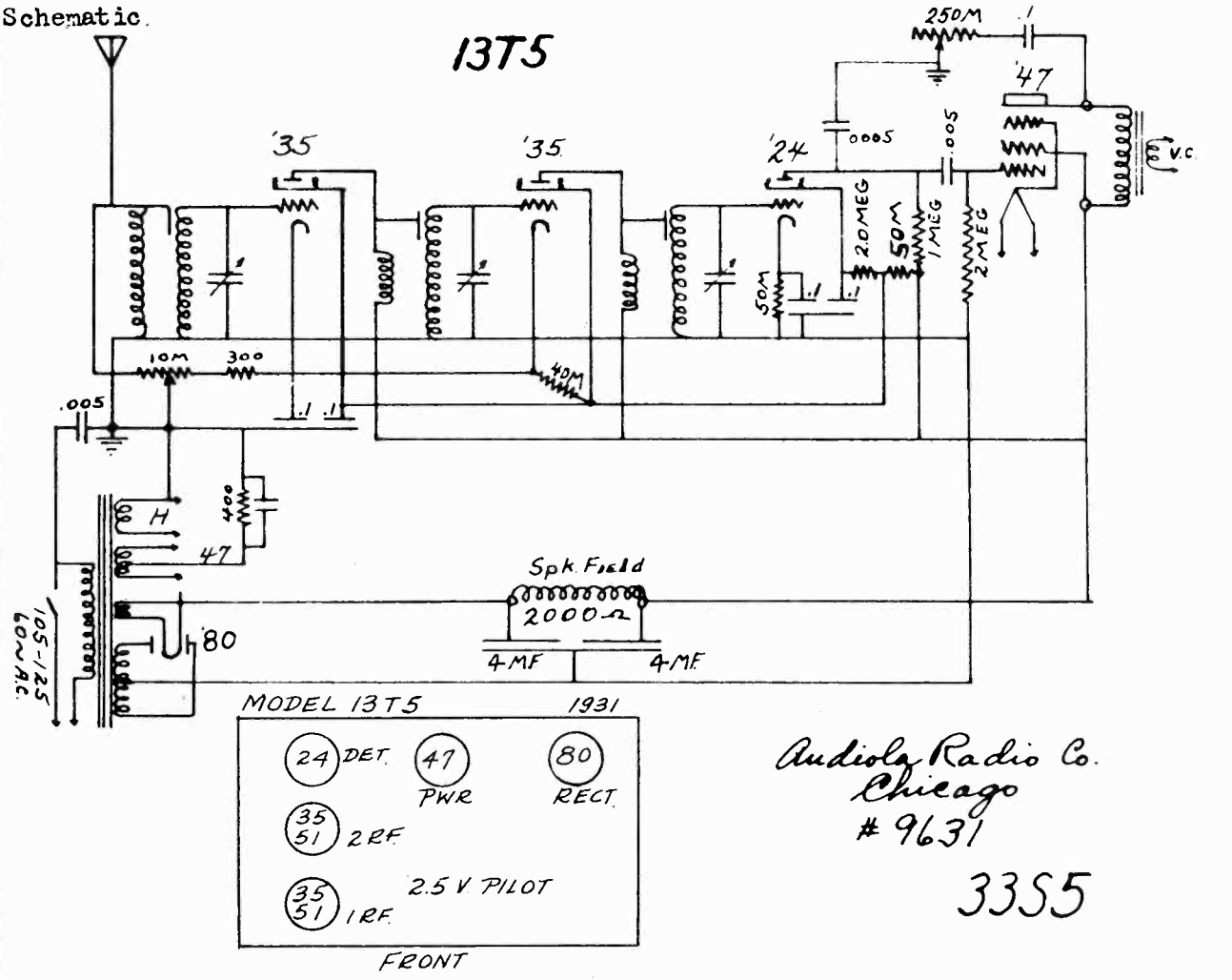
AUDIOLA RADIO CO.

MODEL 23-S-12 (Revised)
Schematic



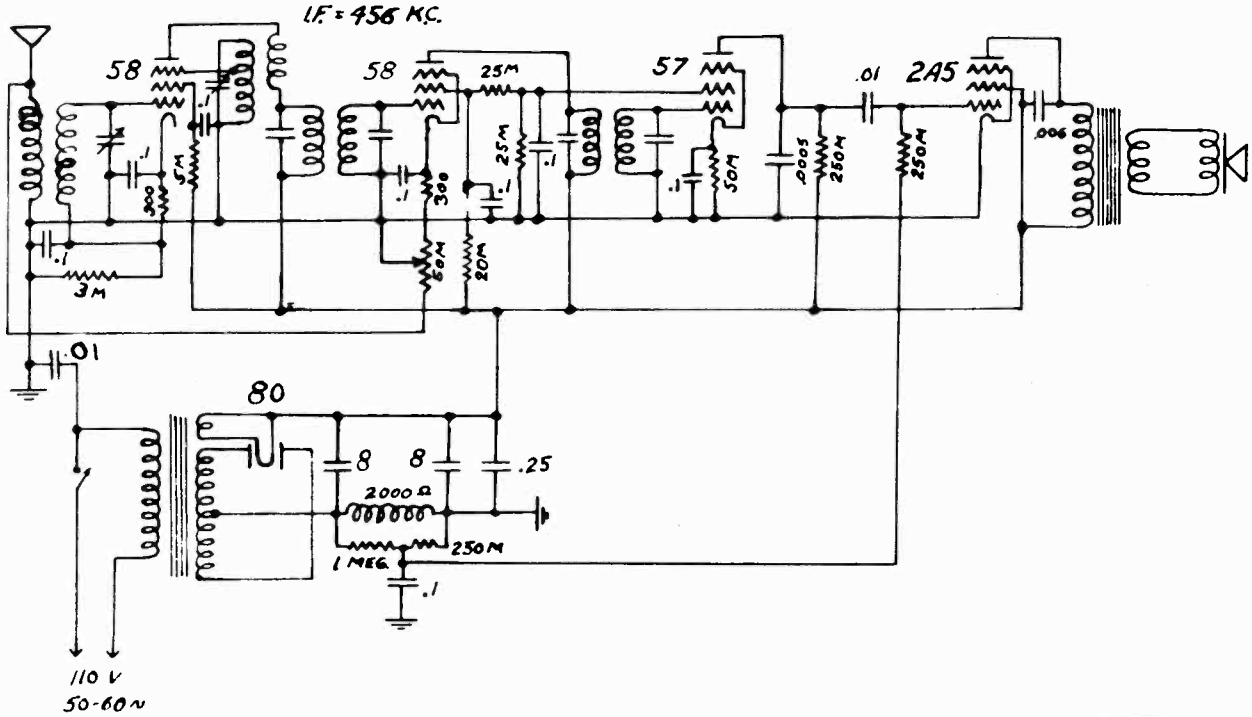
MODEL 13-T-5
Schematic, Socket
MODEL 33-S-5 (Revised)
Schematic.

AUDIOLA RADIO CO.



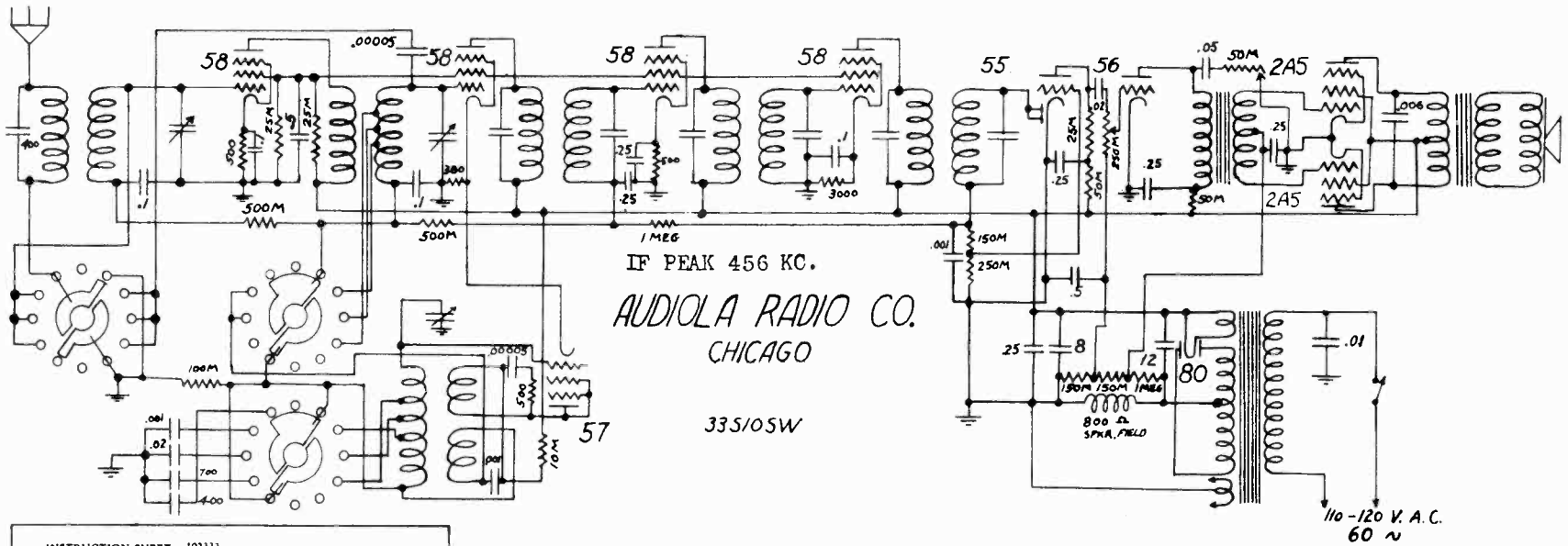
Audiola Radio Co.
Chicago
#9631

3355



AUDIOLA RADIO CO.

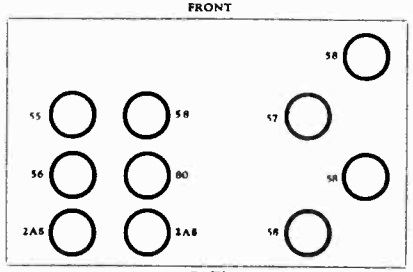
MODEL 33-S-10 SW
Schematic, Socket
Alignment



INSTRUCTION SHEET- 102333

10 TUBE SHORT-WAVE SUPERHETERODYNE

FRONT



BACK

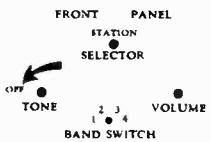
A. C. - 60 CYCLES
105 - 125 VOLTS

RED WIRE - ANTENNA
BLACK WIRE - GROUND

USE GOOD OUTSIDE AERIAL AND GROUND

10 TUBES REQUIRED

1 - 55
1 - 56
1 - 57
4 - 58
2 - 2A5
1 - 80



OPERATING INSTRUCTIONS FOR TEN TUBE SHORT WAVE SUPERHETERODYNE

A drawing is included showing correct placement and type of tubes.

This receiver covers a frequency range of 540 to 20,000 kilocycles (555 to 15 meters) by the use of four overlapping wave bands, each selected by means of the band switch as indicated.

When the band switch is in extreme left position, set covers band No. 1, which is the broadcast band, and subsequent positions cover the other three bands.

Band No. 1 readings may be converted to kilocycles by adding two ciphers (multiplying by 100). Bands Nos. 2, 3, and 4 are calibrated in megacycles and may be converted into kilocycles by adding three ciphers (multiplying by 1000).

Too much emphasis cannot be placed on the desirability of tuning the set extremely slowly when tuning on bands Nos. 2, 3, and 4. Due to extreme sharpness and selectivity in these positions, stations would be otherwise passed by unless the tuning operation is done slowly. The foregoing is especially true when "tuning in" weak and far-distant stations.

Under the right conditions of time, location, and weather, one may reasonably expect to tune in distant or foreign stations. We do not make unsubstantiated claims that it is possible to tune in foreign stations at will.

There is very little "static" in the short wave bands, but due to the extreme sensitivity, all sorts of electrical disturbances may be heard if conditions are not correct. Even the ignition system of a passing car may impair reception. Practice proper handling and tuning of the short wave bands and you will be rewarded with many interesting and entertaining broadcasts.

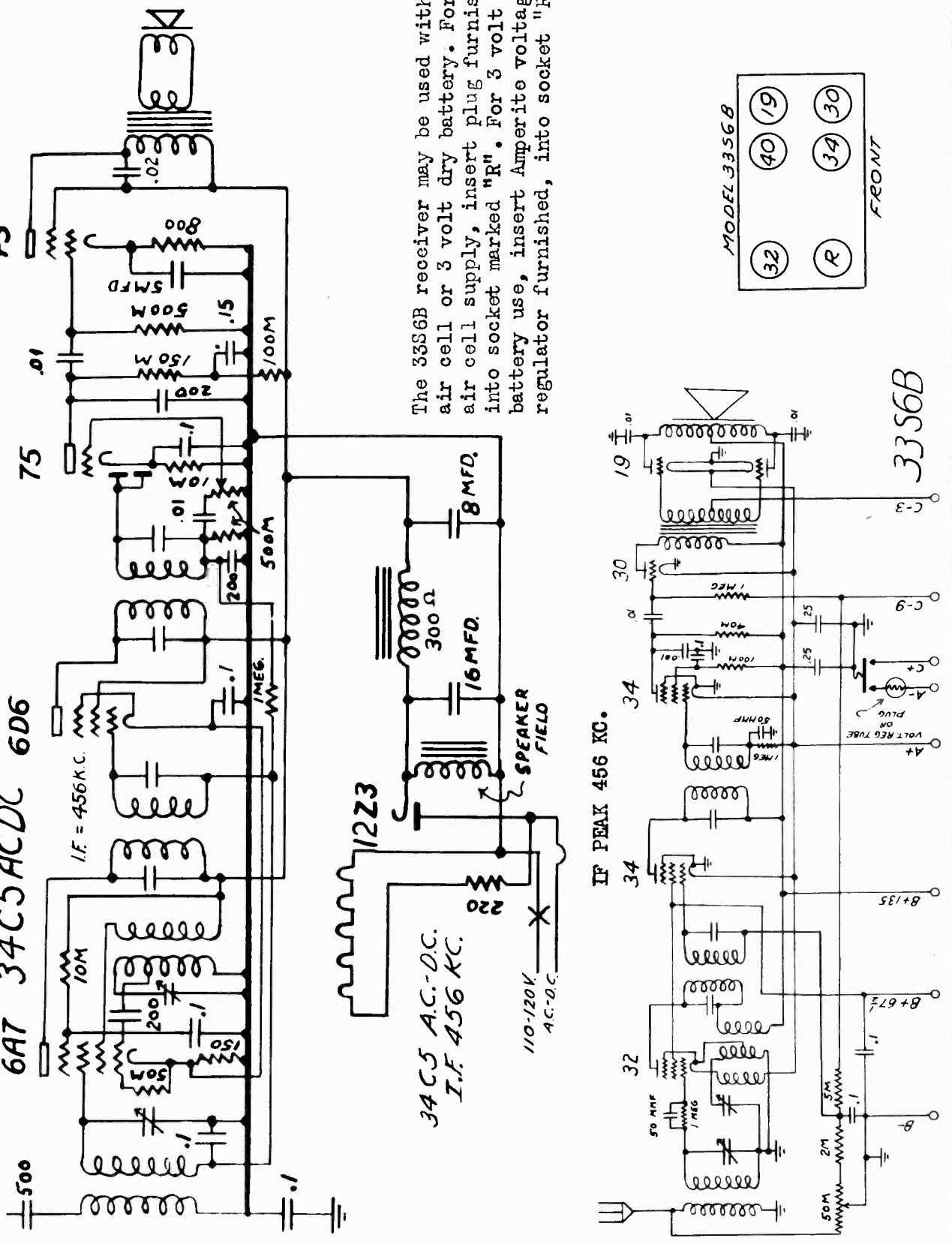
Always bear in mind the difference in time in different parts of the world when tuning for foreign stations. For example, when it is seven o'clock in the evening in Chicago, it is two o'clock in the morning in most of Europe.

The majority of reliable United States and Canadian short wave broadcasting stations may be found around 6 and 7 (6000 and 7000 kilocycles) on band No. 3, and around 9 and 10 (9000 and 10,000 kilocycles) on band No. 4.

A good aerial and good ground are necessary if the best results are to be secured.

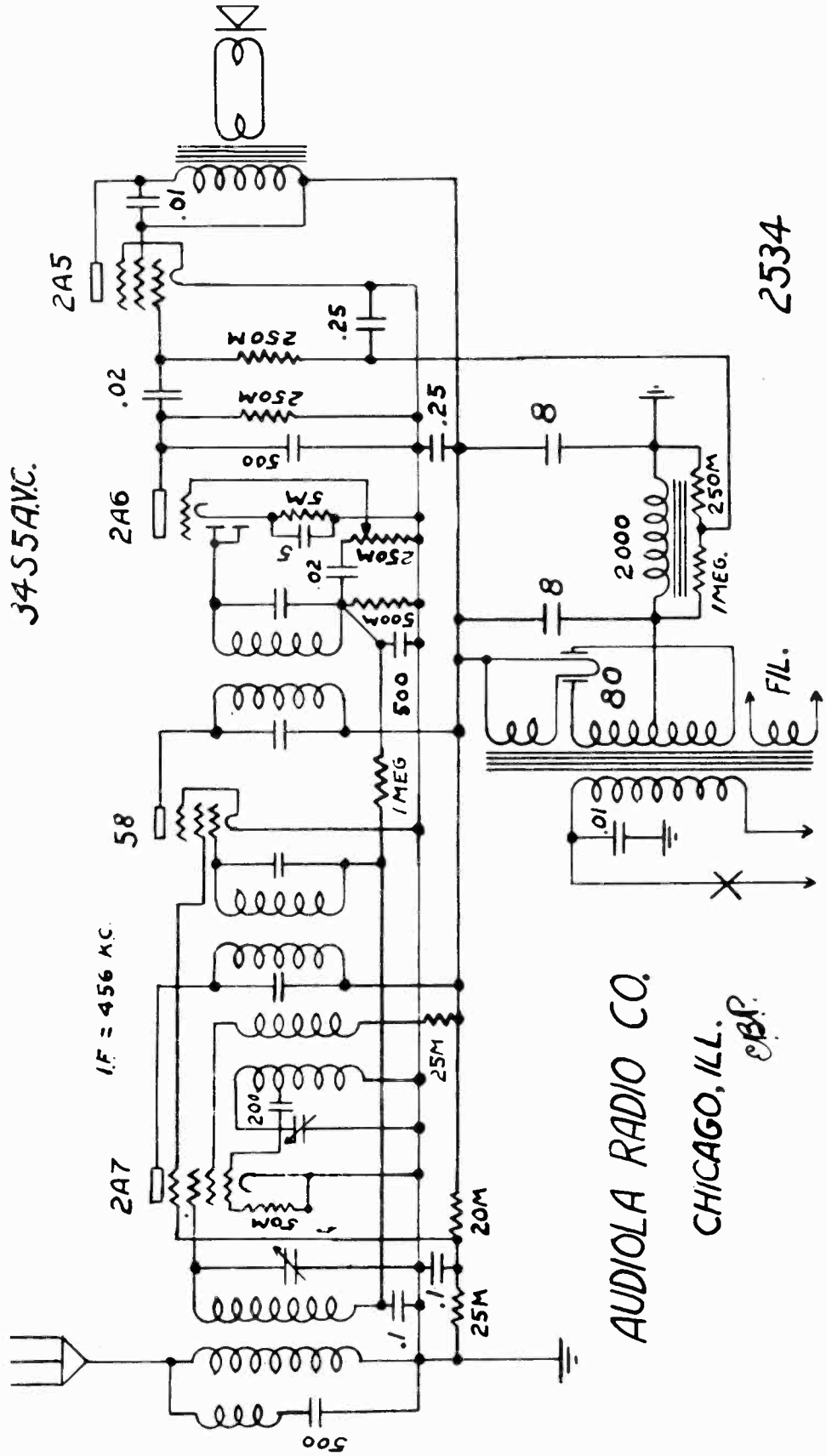
MODEL 33-S-6B
Schematic, Socket
MODEL 34-C-5 AC-DC
Schematic

AUDIOLA RADIO CO.



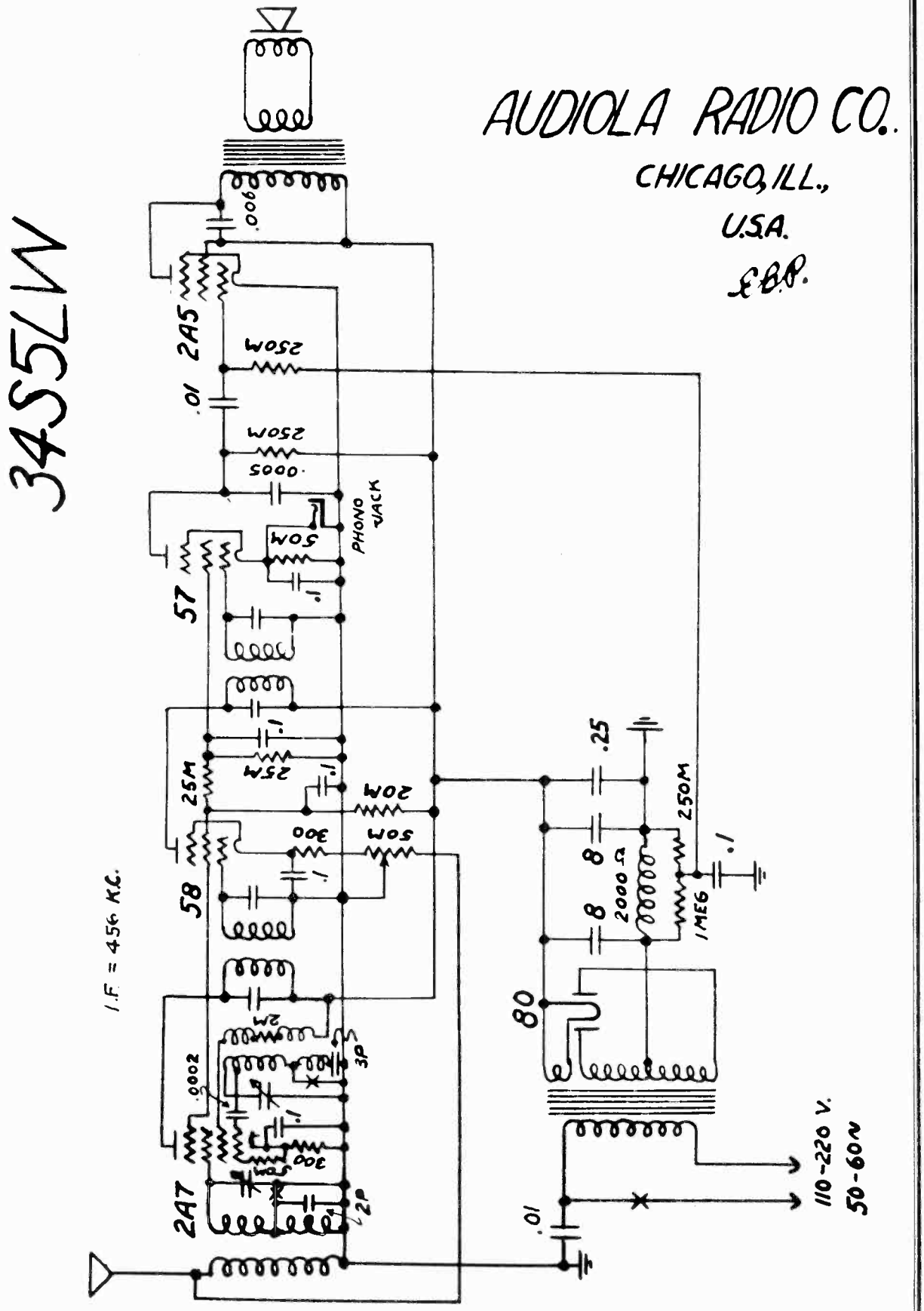
MODEL 34-S-5 AVC
Schematic

AUDIOLA RADIO CO.



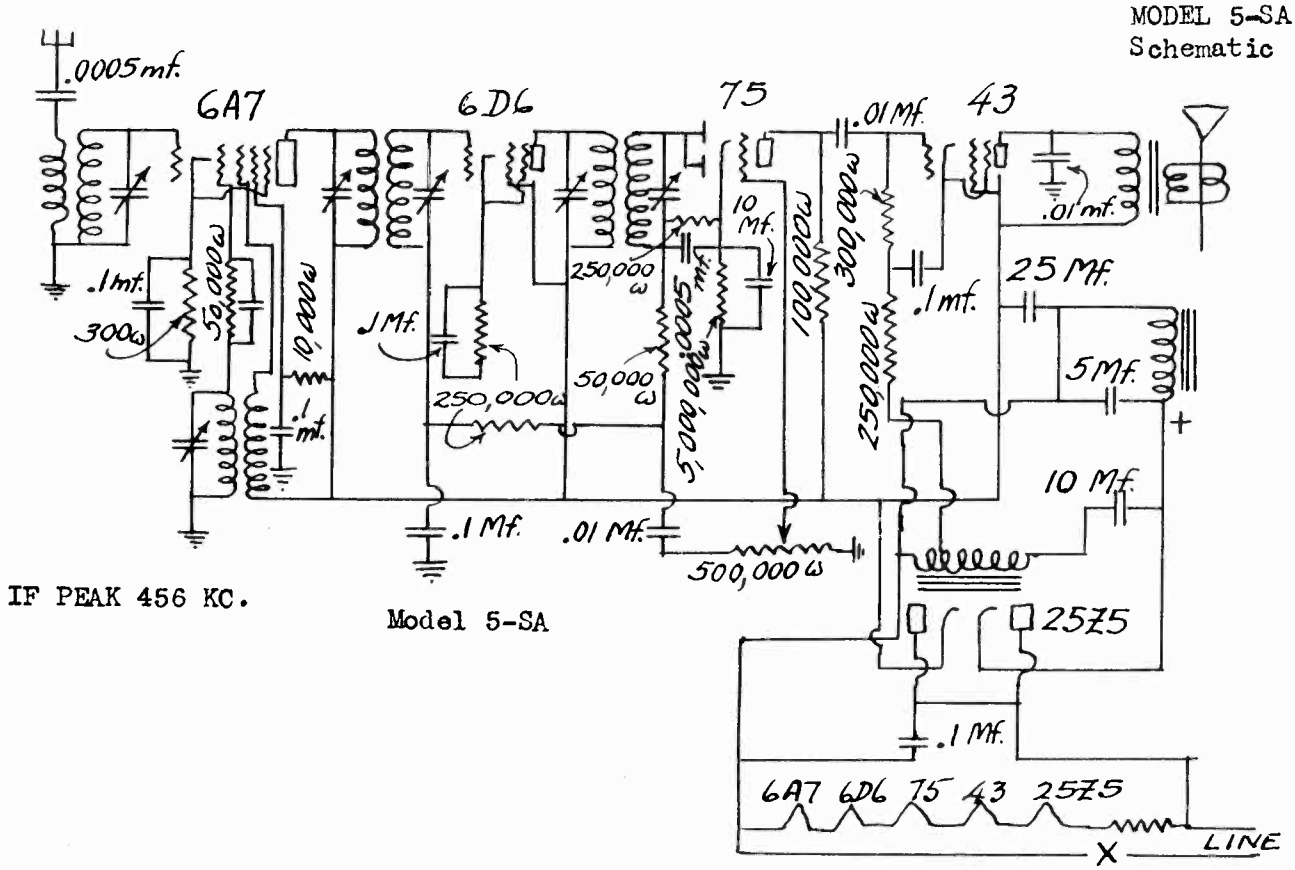
MODEL 34-S5-LW
Schematic

AUDIOLA RADIO CO.



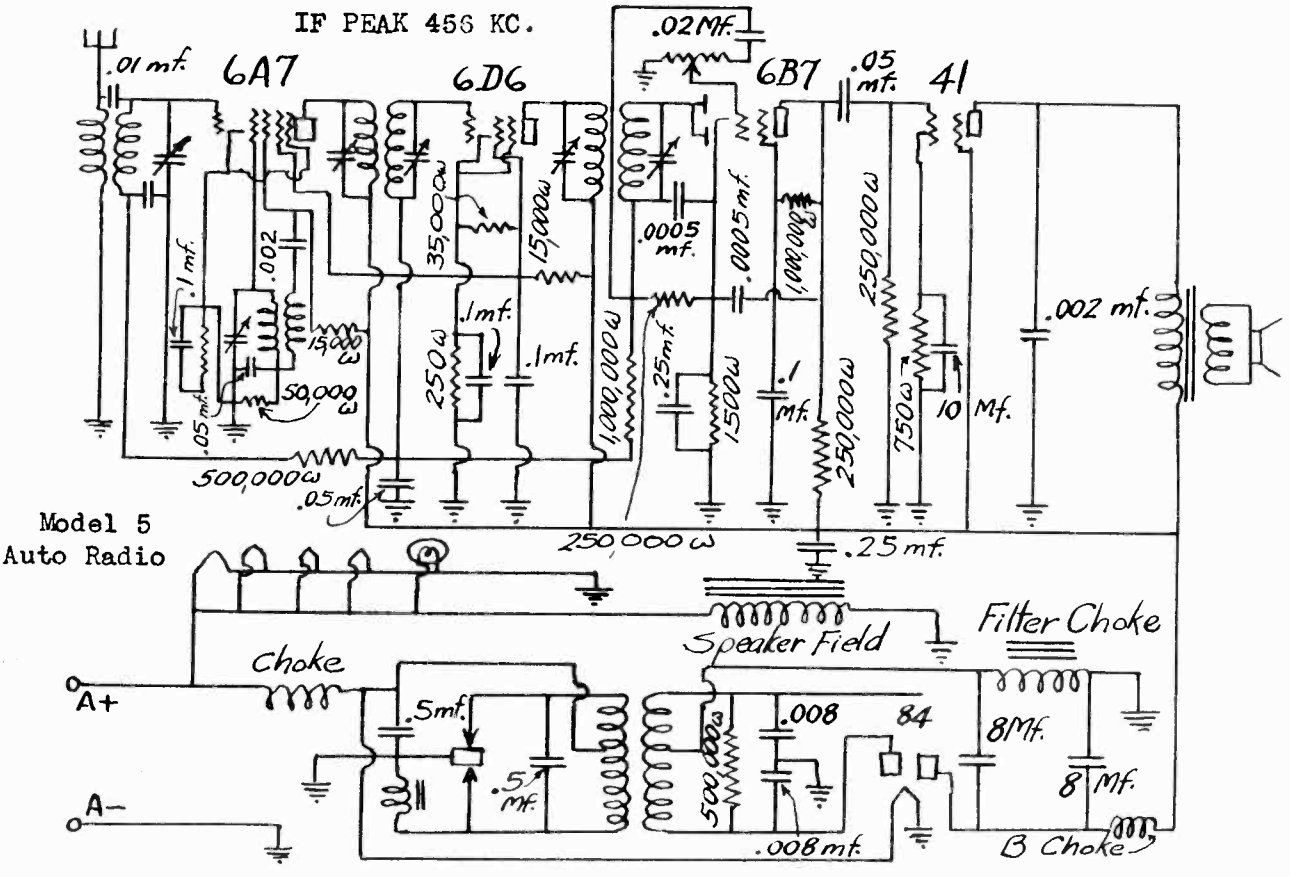
AUTOCRAT RADIO CORP.

MODEL 5
Schematic
MODEL 5-SA
Schematic



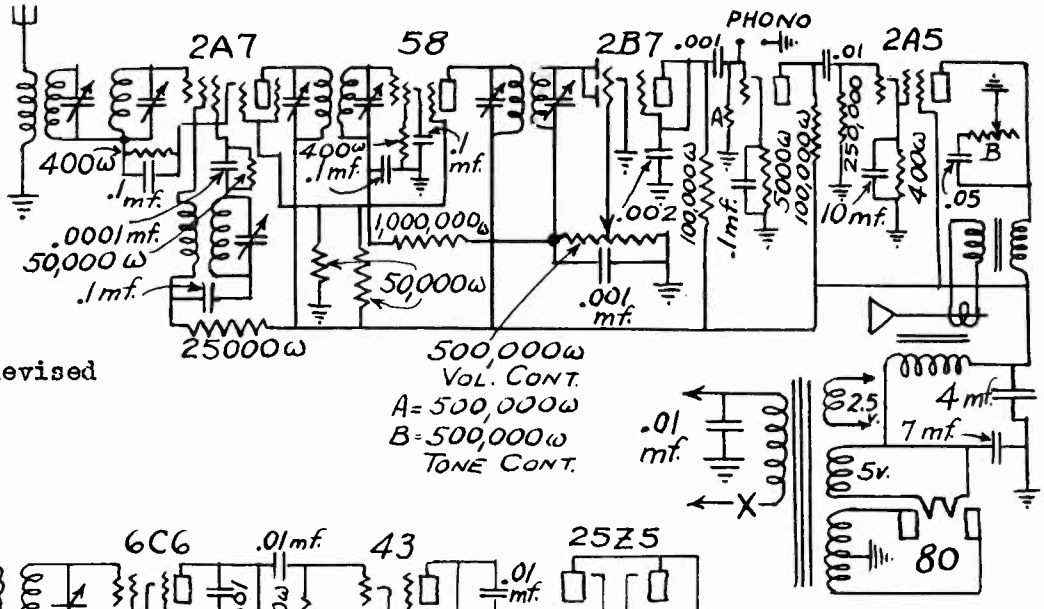
IF PEAK 456 KC.

Model 5-SA

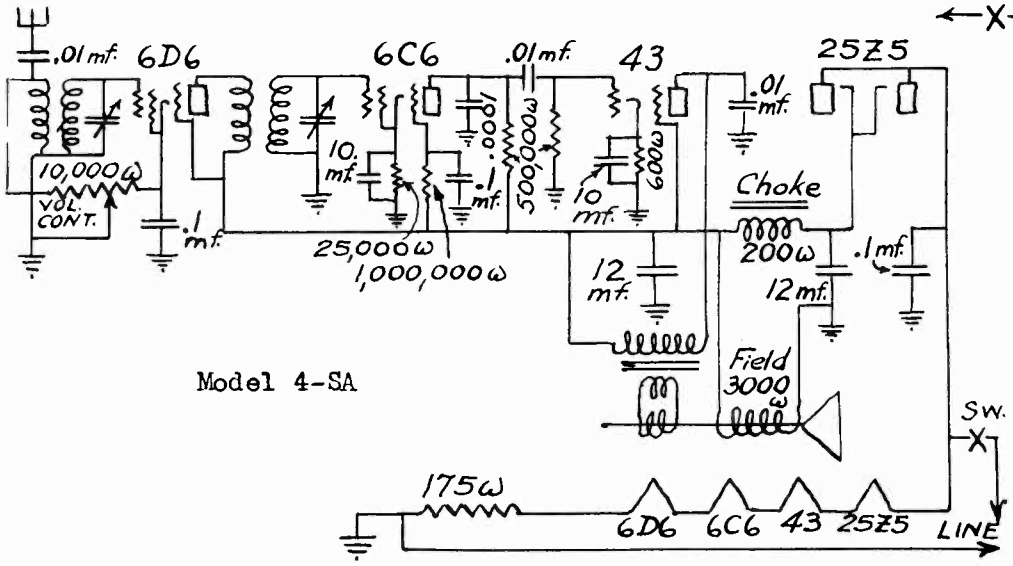


MODEL 4-SA
Schematic
MODEL 6 (Revised)
MODEL 6-D-32
Schematic

AUTOCRAT RADIO CORP.

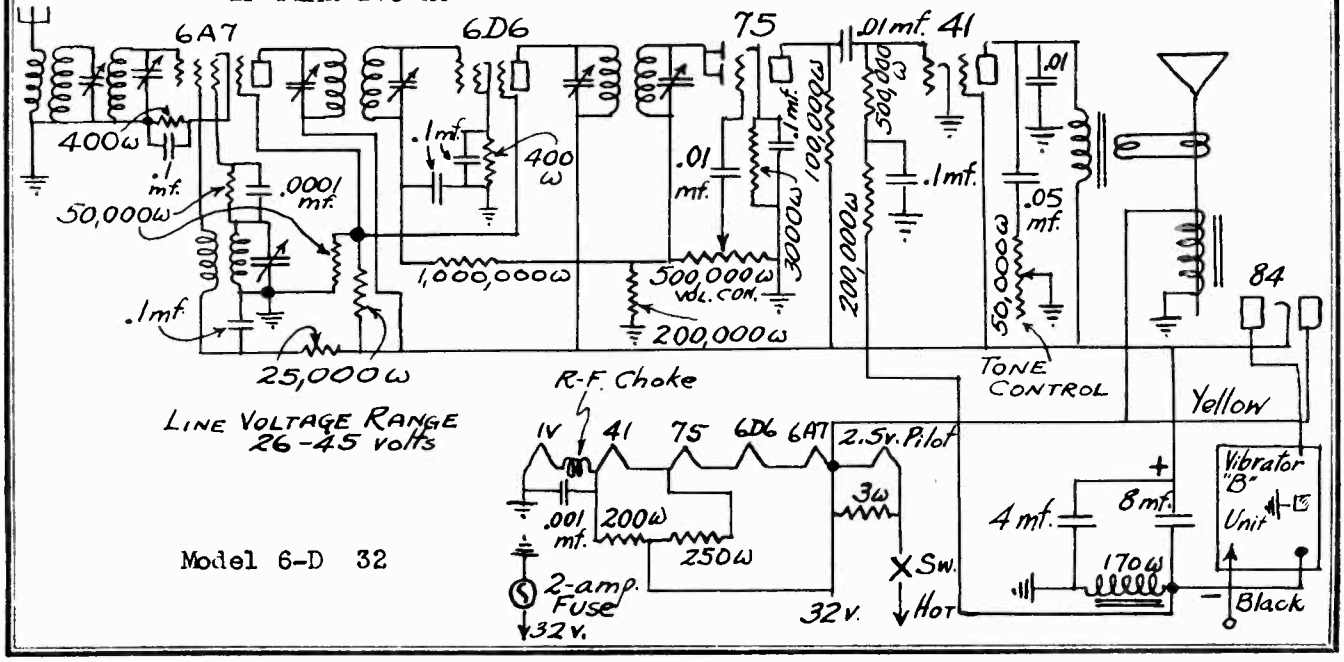


Model 6 Revised



Model 4-SA

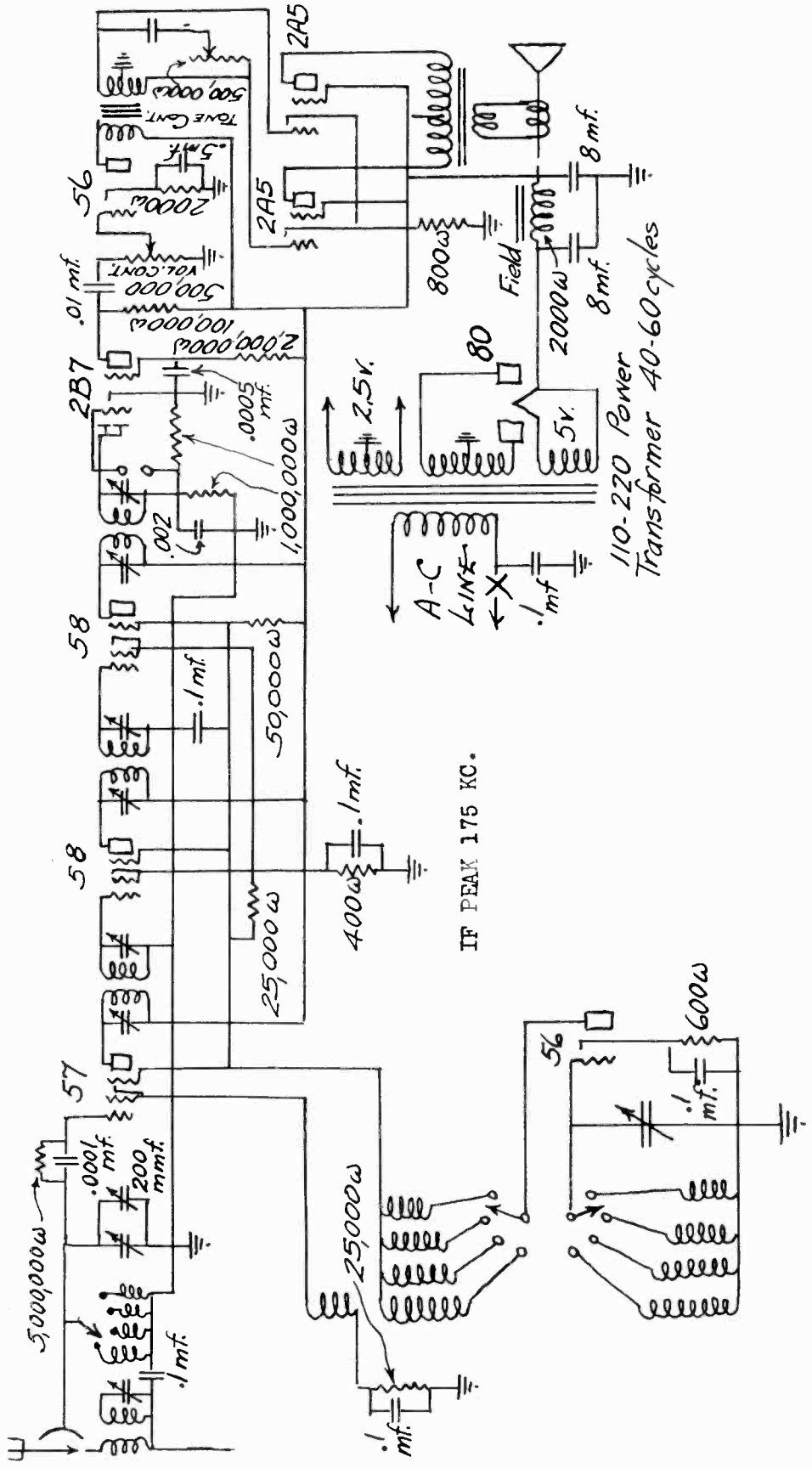
IF PEAK 175 KC.



Model 6-D 32

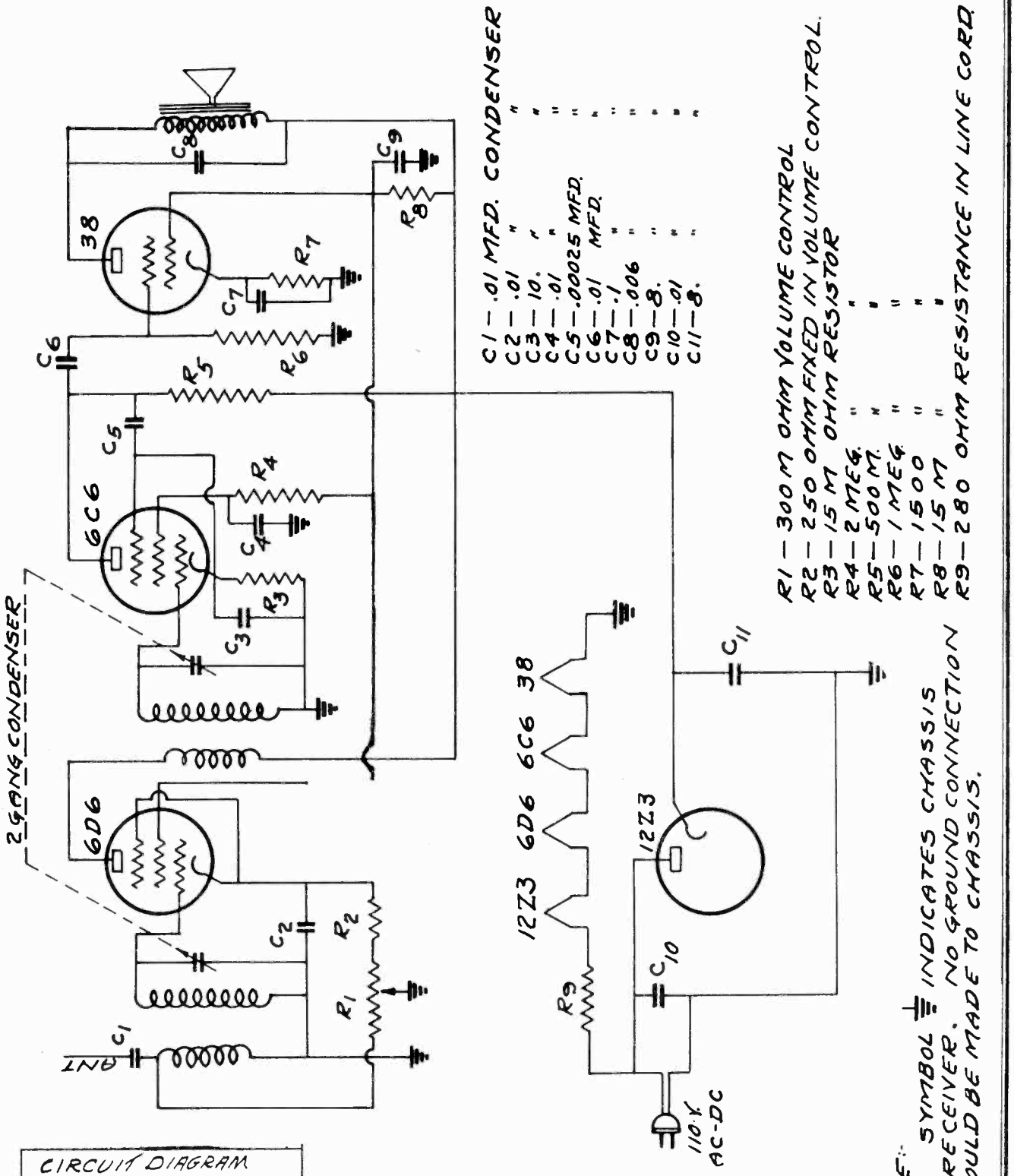
MODEL 90-SL
Schematic

AUTOCRAT RADIO CORP.



MODEL 38
Schematic

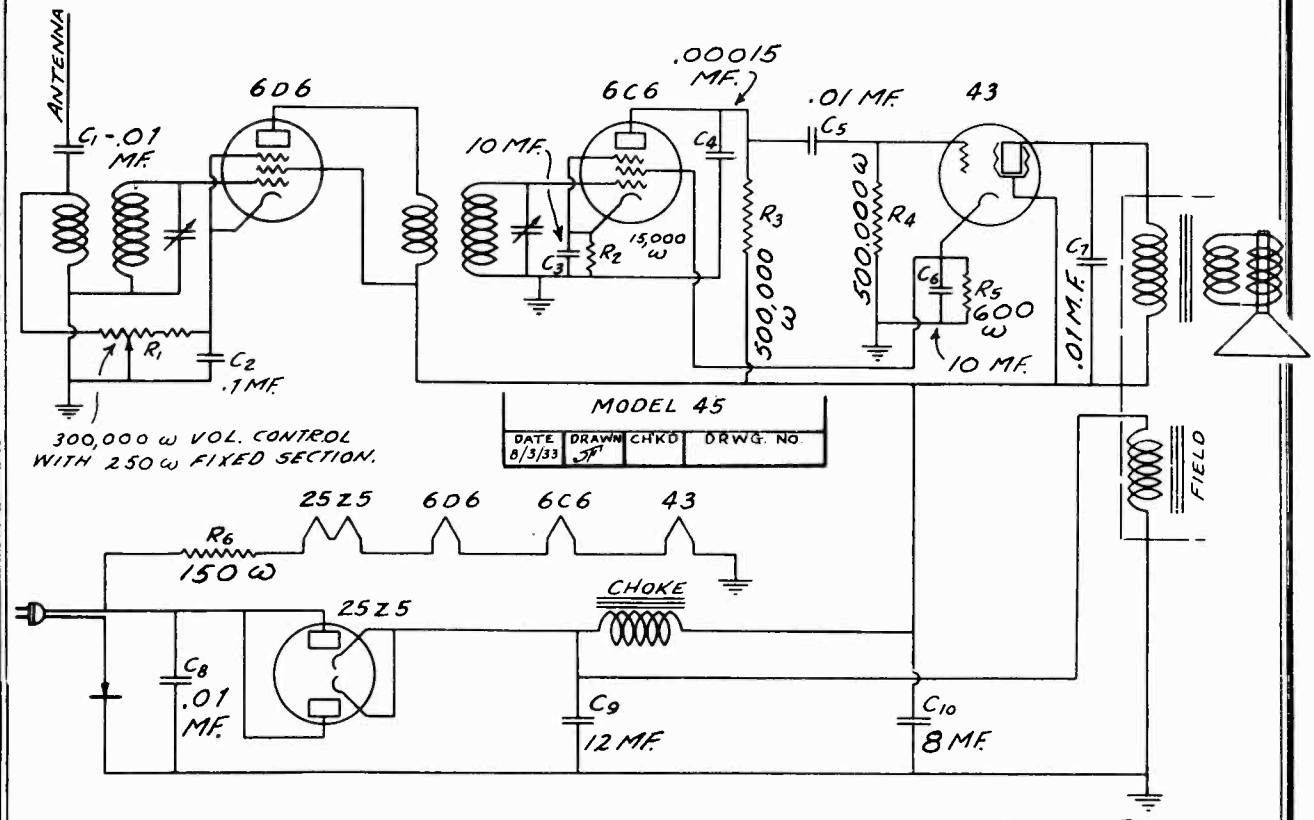
BALKEIT RADIO CO.

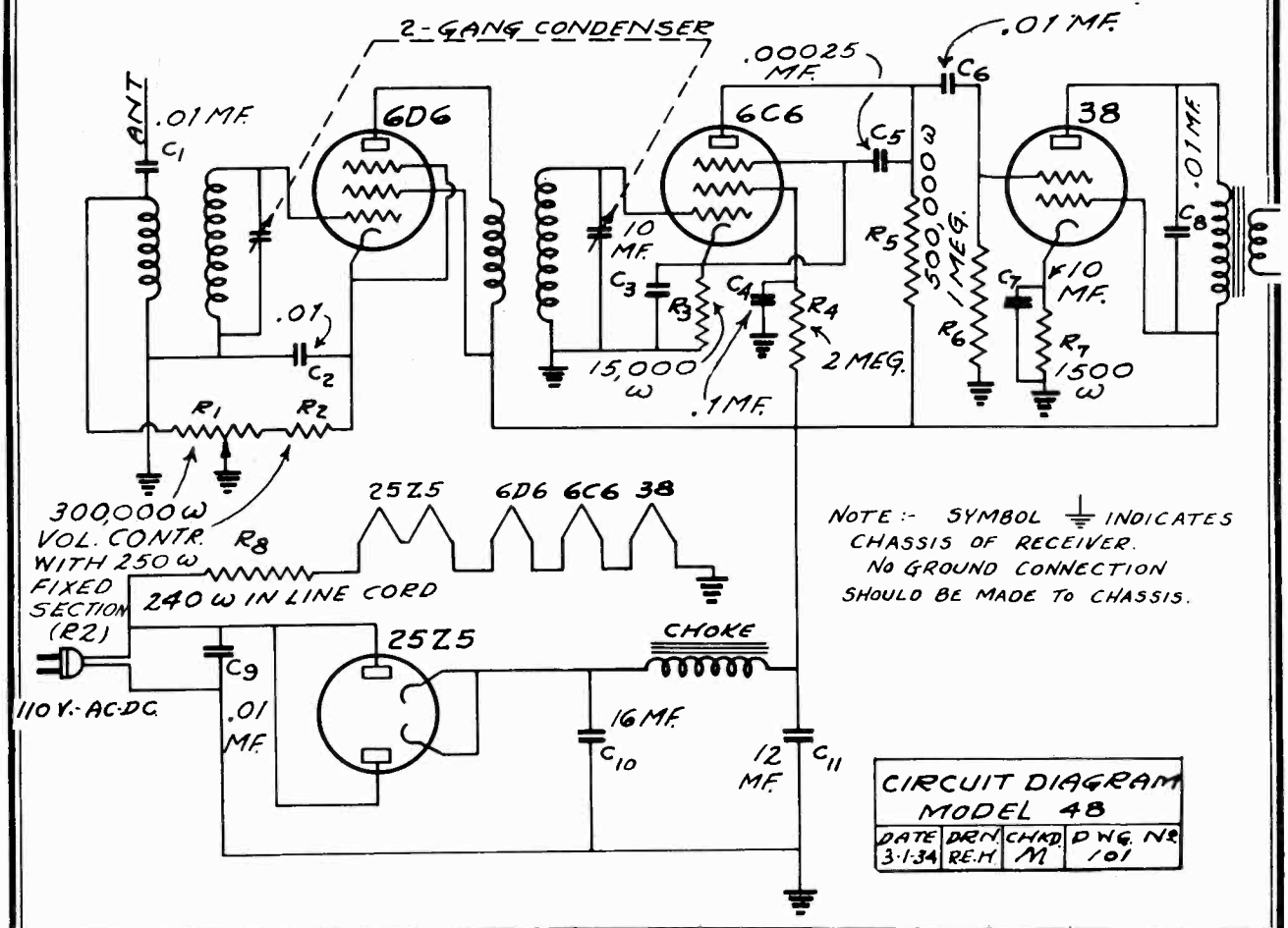


CIRCUIT DIAGRAM
Model 38

MODEL 45
MODEL 48
Schematics

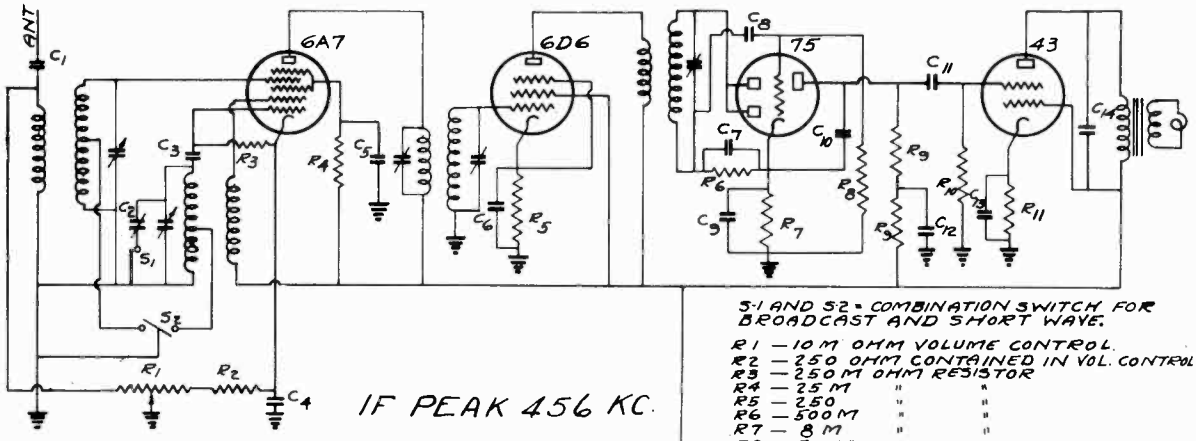
BALKEIT RADIO CO.





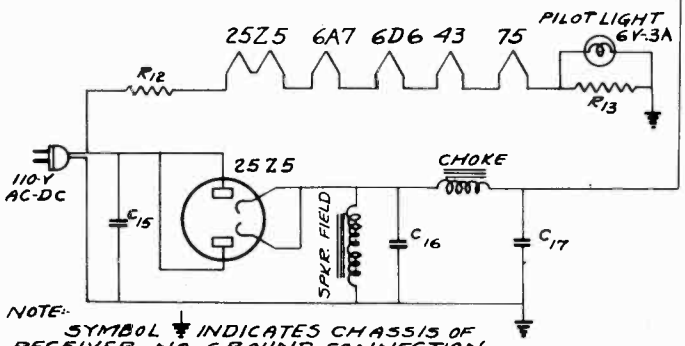
BALKEIT RADIO CO.

MODEL 59
MODEL 69
Schematics



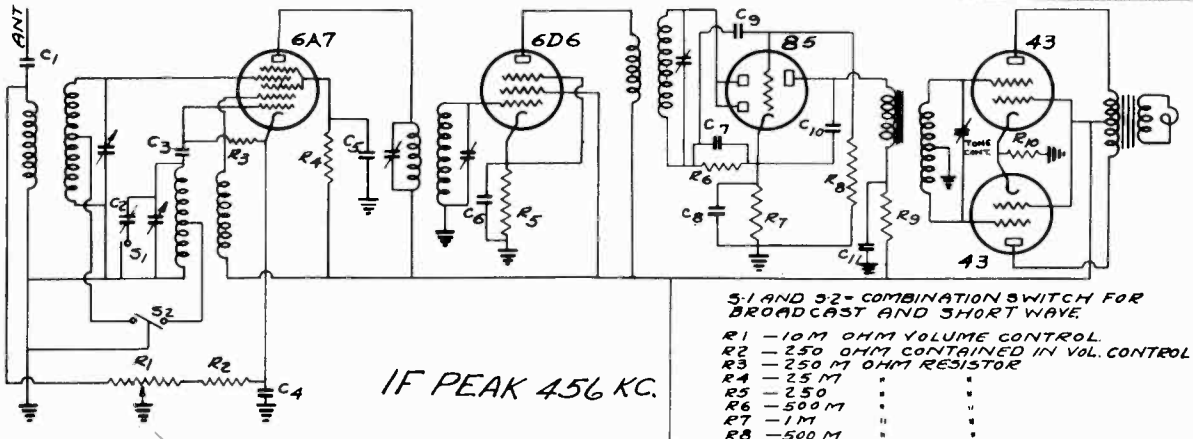
S-1 AND S-2 = COMBINATION SWITCH FOR BROADCAST AND SHORT WAVE.

R1 — 10 M OHM VOLUME CONTROL.
R2 — 250 OHM CONTAINED IN VOL. CONTROL
R3 — 250 M OHM RESISTOR
R4 — 25 M " "
R5 — 250 " "
R6 — 500 M " "
R7 — 8 M " "
R8 — 500 M " "
R9 — 250 M " "
R10 — 1 MEG. " "
R11 — 600 " "
R12 — 150 " "
R13 — 20 " "



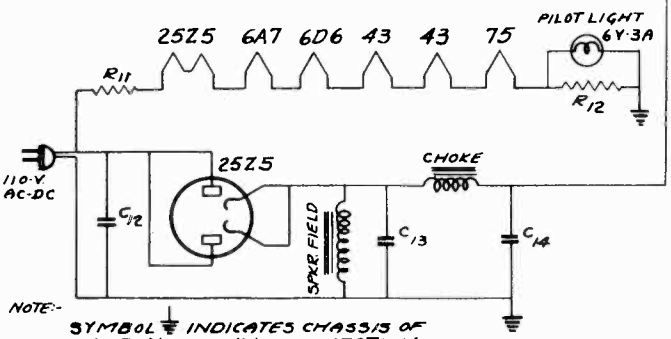
C1 — .00025 MF. CONDENSER (PAD.)
C2 — 75 MMFD.
C3 — .00025 MFD.
C4 — .01 " "
C5 — .1 " "
C6 — .1 " "
C7 — .00025 " "
C8 — .1 " "
C9 — 10 " "
C10 — .0005 " "
C11 — .1 " "
C12 — .1 " "
C13 — 10 " "
C14 — .006 " "
C15 — .01 " "
C16 — 20 " "
C17 — 20 " "

CIRCUIT DIAGRAM MODEL 59			
DATE 3-1-34	DRN REH	CHKD M	DWG NO. 103



S-1 AND S-2 = COMBINATION SWITCH FOR BROADCAST AND SHORT WAVE.

R1 — 10 M OHM VOLUME CONTROL.
R2 — 250 OHM CONTAINED IN VOL. CONTROL
R3 — 250 M OHM RESISTOR
R4 — 25 M " "
R5 — 250 " "
R6 — 500 M " "
R7 — 1 M " "
R8 — 500 M " "
R9 — 50 M " "
R10 — 400 " "
R11 — 60 OHM RESISTANCE IN LINE CORD.
R12 — 20 OHM RESISTOR



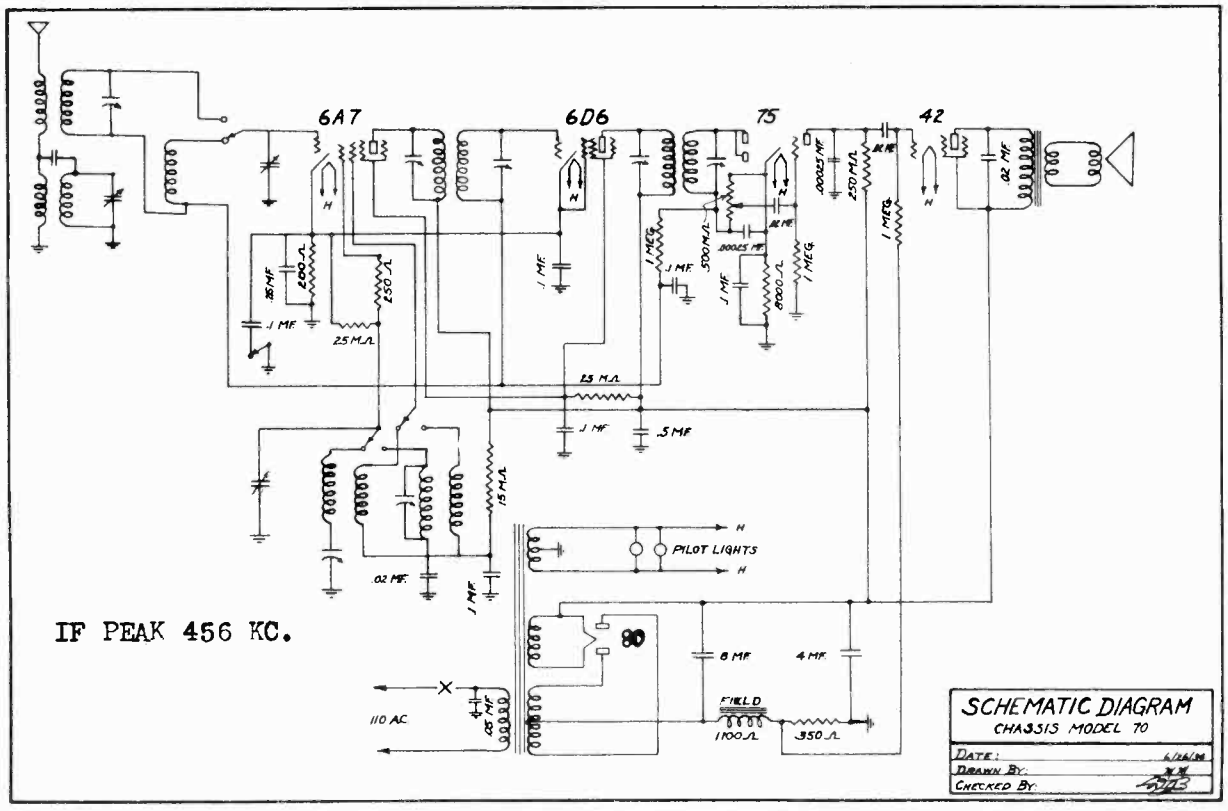
C1 — .00025 MF. CONDENSER (PAD)
C2 — 75 MMFD. " "
C3 — .00025 MFD. " "
C4 — .01 " "
C5 — .1 " "
C6 — .1 " "
C7 — .00025 " "
C8 — 10. " "
C9 — .1 " "
C10 — .0005 " "
C11 — 3. (150 V) " "
C12 — .1 " "
C13 — 20. " "
C14 — 20. " "

CIRCUIT DIAGRAM MODEL 69			
DATE 3-2-34	DRN REH	CHKD M	DWG NO. 102

MODEL 60,70
Scheratic, Parts

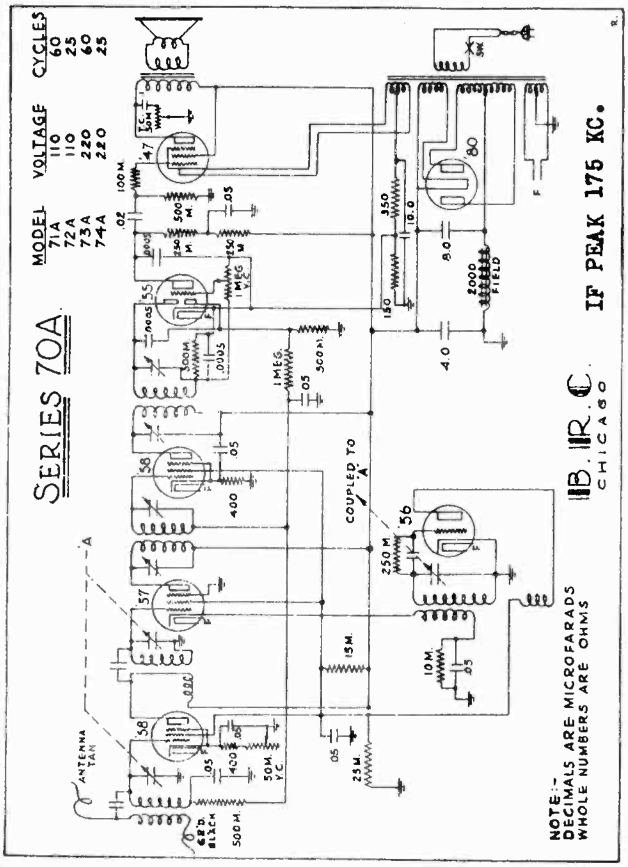
BALKEIT RADIO CO.

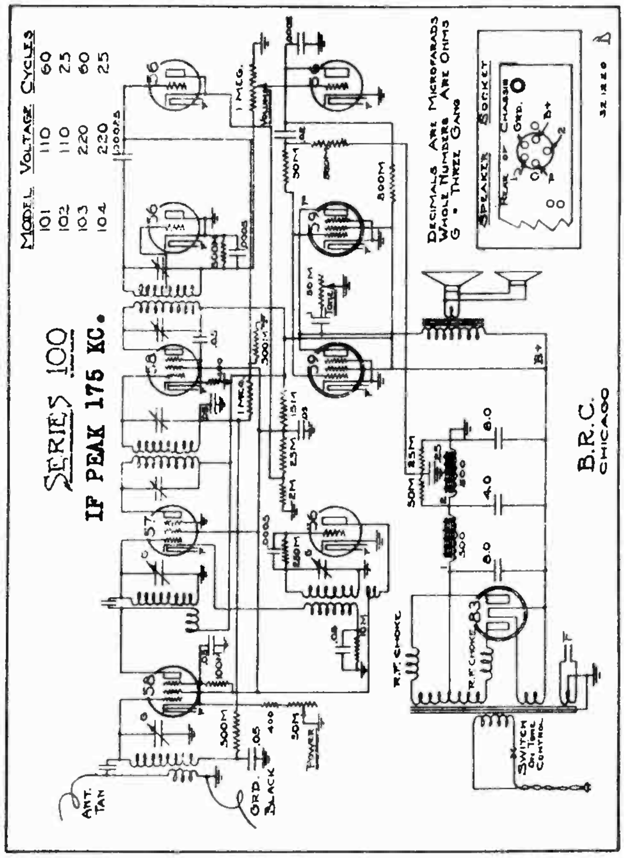
PART NO.	DESCRIPTION	LIST PRICE
701	FILTER CONDENSER	2.40 EACH
702	.1 BY-PASS CONDENSER	.14 "
703	.05 " "	.14 "
704	.02 " "	.14 "
705	.25 " "	.18 "
706	.5 " "	.35 "
707	.00025 " "	.20 "
708	1-WATT RESISTOR	.20 "
709	MISCELLANEOUS RESISTORS(SPECIFY VALUES)(SEE DIAGRAM.	.20 "
717	350 OHM POWER RESISTOR	.30 "
718	VOLUME CONTROL	1.25 "
719	SHORT WAVE AND BROADCAST SWITCH	.75 "
720	OSCILLATOR COIL 456 KC	.90 "
723	CORD AND PLUG	.50 "
733	POWER TRANSFORMER	4.25 "
738	3-GANG CONDENSER	4.50 "
739	1ST I F TRANSFORMER	2.10 "
740	2ND I F TRANSFORMER	2.10 "
741	PRE SELECTOR COIL	1.25 "
745	PILOT LAMP	.25 "
749	TRIMMER	.20 "
751	KNOB (LARGE)	.20 "
751-A	KNOBS	.15 "
754	PILOT LIGHT SOCKET	.15 "
758	SPEAKER	6.00 "
758-A	SPIDER AND VOICE COIL	.40 "
758-B	6" DIAPHRAM	.30 "
762	S.W. OSCILLATOR COIL	.60 "
763	ANTENNA S.W. OSCILLATOR COIL	.60 "
767	DIAL DRIVE DISC	.60 "
768	CELLULOID DRIVE DISC	.50 "
769	DIAL FACE	.60 "
777	DIAL POINTER	.12 "
779	CONVEX DIAL CRYSTAL	.30 "

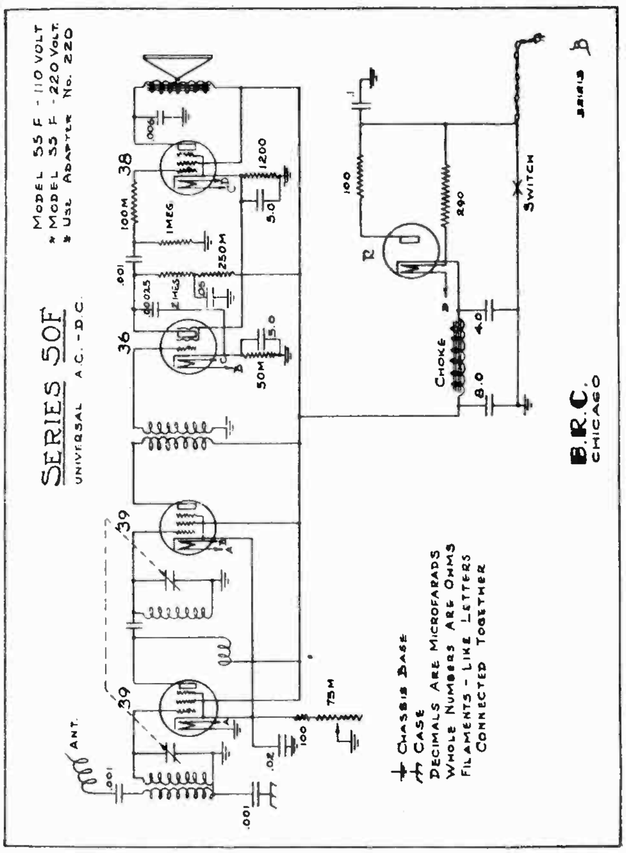


BELMONT RADIO CORP.

MODEL 50-F
MODEL 70-A
MODEL 100
Schematics

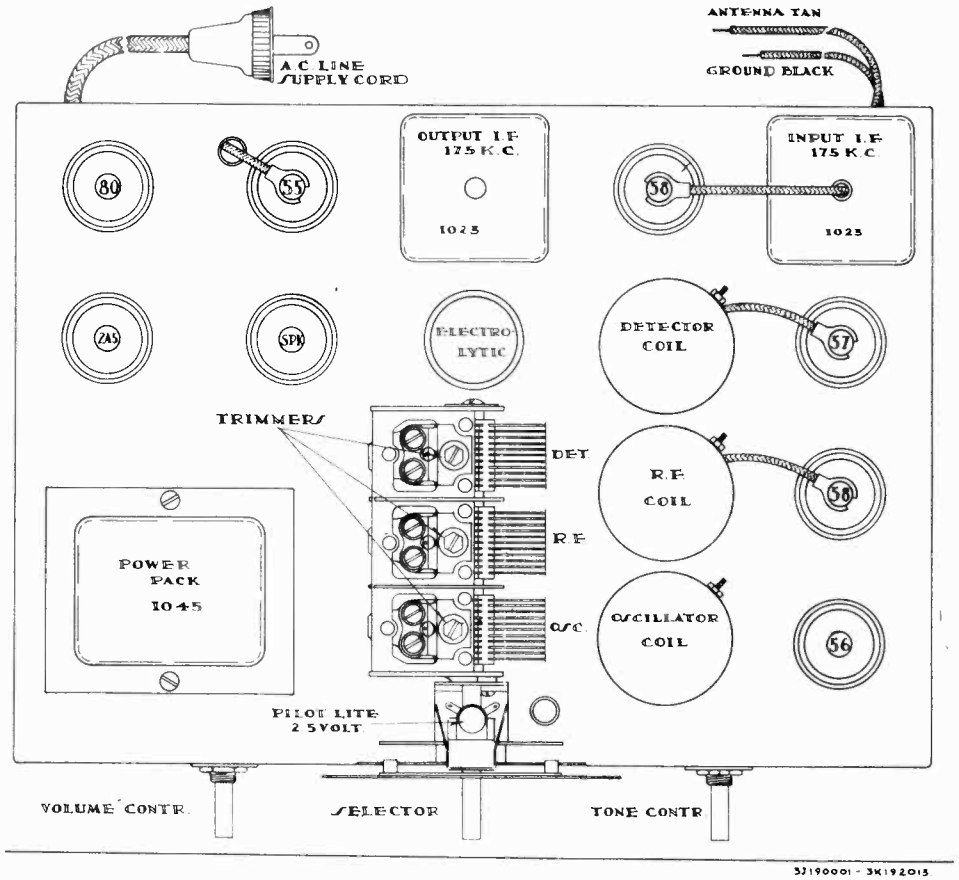




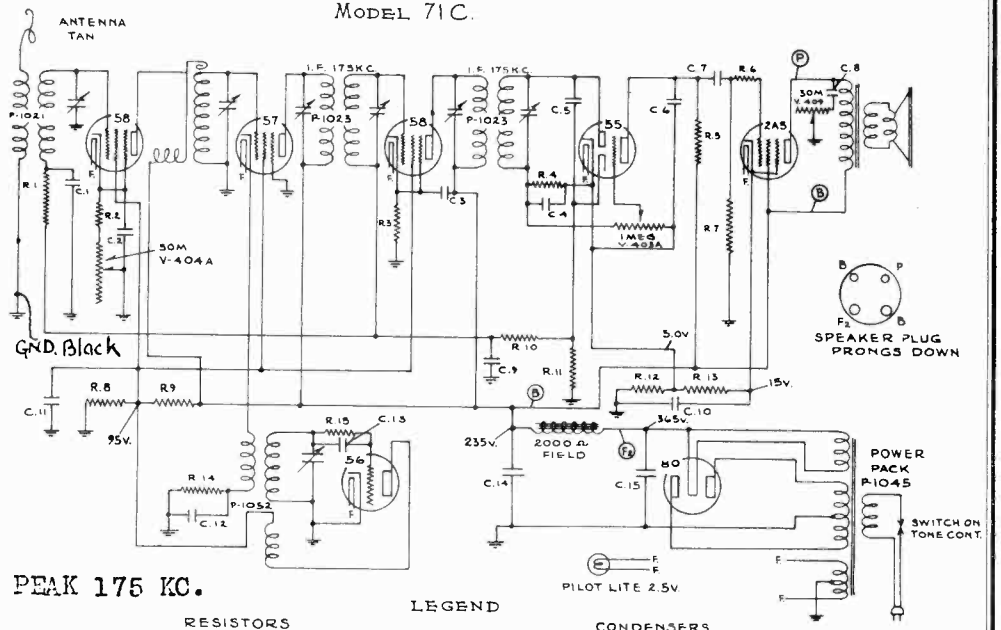


MODEL 71-C
Schematic, Socket Alignment

BELMONT RADIO CORP.



MODEL 71C.



IF PEAK 175 KC.

SERVICE NOTES

To peak I.F. transformers connect oscillator (set at 175 KC) to grid of 57 first detector and (Black) ground wire. Adjust four trimmers from bottom of chassis (one nut and one screw on each transformer trimmer) to resonance (maximum deflection on an output meter connected across the primary of the speaker input transformer).

Connect an oscillator in series with a 200 MMFD condenser to the Tan (Antenna) wire and Black (ground) wire, with the oscillator set at 1720 KC and the variable condenser at its minimum position (extreme right of its rotation) adjust trimmer of oscillator (front) section of variable condenser to resonance. Set oscillator to 1400 KC and rotate variable condenser until signal is tuned in, then adjust ANT. and R.F. trimmers (center and rear sections of condenser) to resonance. Check output at 1200, 1000, 800, and 600 Kilocycles, bend plates of center and rear sections of variable condenser only if necessary.

LEGEND

RESISTORS

Nº	VALUE	Nº	VALUE
R.1 :-	500M	R.9 :-	15M *
R.2 :-	400	R.10 :-	1MEG.
R.3 :-	400	R.11 :-	500M
R.4 :-	500M	R.12 :-	150 *
R.5 :-	250M	R.13 :-	300 *
R.6 :-	100M	R.14 :-	10M
R.7 :-	500M	R.15 :-	250M
R.8 :-	25M *		

NUMBERS PREFIXED BY P OR V ARE PARTS.
* R.8, R.9, R.12 & R.13 IN ONE UNIT P-1049
* C.10, C.14, & C.15 " " " P-1047

CONDENSERS

Nº	VALUE	Nº	VALUE
C.1 :-	.05	C.9 :-	.05
C.2 :-	.05	C.10 :-	12.0MF. *
C.3 :-	.05	C.11 :-	.05
C.4 :-	500MMF.	C.12 :-	.05
C.5 :-	500MMF.	C.13 :-	500MMF.
C.6 :-	500MMF.	C.14 :-	4.0MF. *
C.7 :-	.02	C.15 :-	8.0MF. *
C.8 :-	.1		

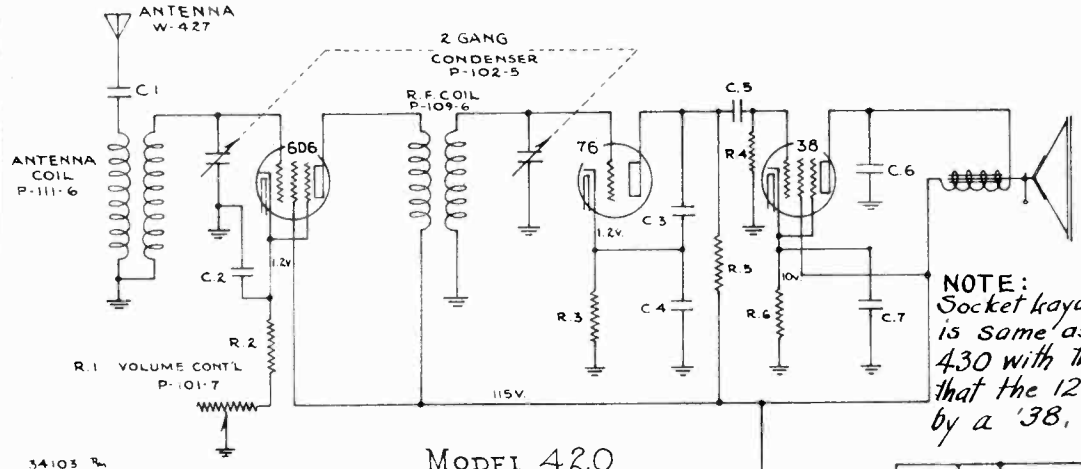
VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL, WITH 119 VOLTS A.C. LINE.

33219

MODEL 430
Schematic, Socket

BELMONT RADIO CORP.

MODEL 420
Schematic, Socket



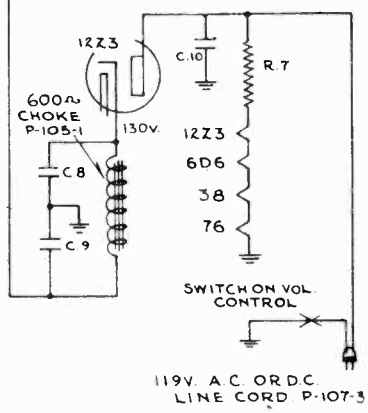
NOTE: Socket layout of Model 420 is same as that of Model 430 with the exception that the 12A5 is replaced by a '38.

34103 Rm

MODEL 420

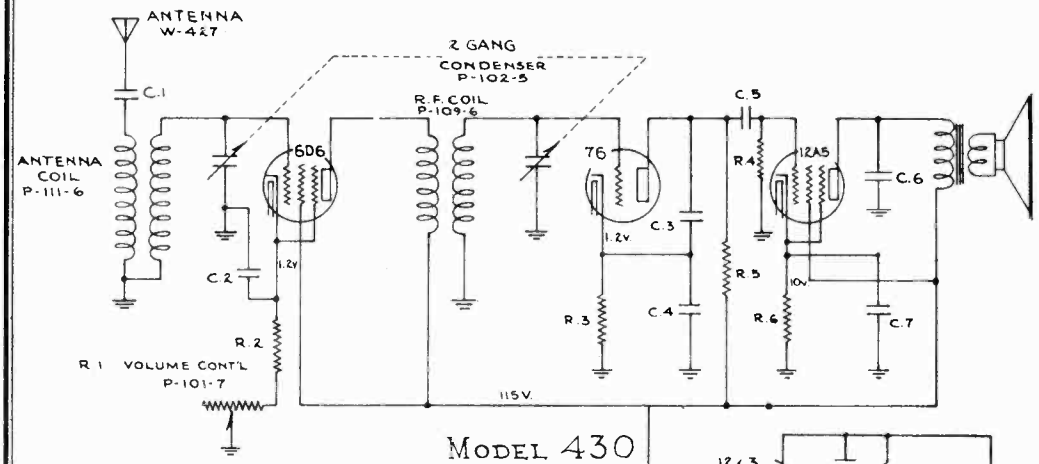
No	VALUE
R.1 :-	75M VOL. CONT'L. MAX. R.
R.2 :-	100 VOL. CONT'L. MIN. R.
R.3 :-	50M 1/3W. 20V.
R.4 :-	500M 1/3W. 20V.
R.5 :-	250M 1/3W. 50V.
R.6 :-	1100 1/3W. 10V.
R.7 :-	260Ω 0.300 AMP. IN CORD

No	VALUE
C.1 :-	.0005 MICA
C.2 :-	.05 X 200V.
C.3 :-	.001 MICA
C.4 :-	8 MFD.
C.5 :-	.003 X 600V.
C.6 :-	.005 X 600V.
C.7 :-	8 MFD.
C.8 :-	8 MFD.
C.9 :-	8 MFD.
C.10 :-	.05 X 400V.



119V. A.C. OR D.C.
LINE CORD P-107-3

CONDENSERS IN BY-PASS BLOCK P-145-1 :- C.2, C.5, C.6, C.10.
CONDENSERS IN ONE UNIT :- C.4, C.7, C.8, C.9. - P-119-1
NUMBERS PREFIXED BY LETTERS ARE PART NUMBERS.
VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND,
VOLUME ON FULL.

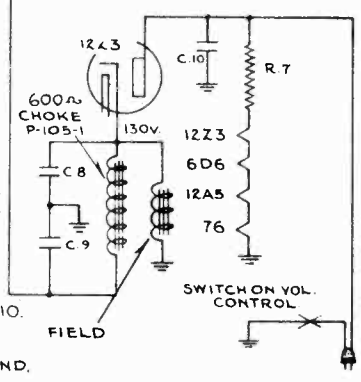


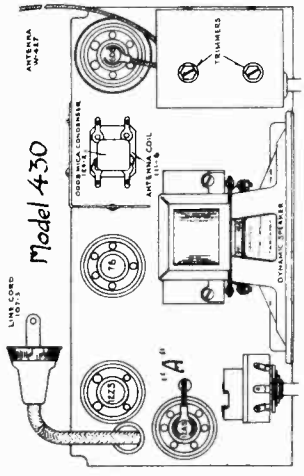
"A" This replaced by a '38 in Model 420.

MODEL 430

No	VALUE
R.1 :-	75M VOL. CONT'L. MAX. R.
R.2 :-	100 VOL. CONT'L. MIN. R.
R.3 :-	50M 1/3W. 20V.
R.4 :-	500M 1/3W. 20V.
R.5 :-	250M 1/3W. 50V.
R.6 :-	1100 1/3W. 10V.
R.7 :-	260Ω 0.300 AMP. IN CORD

No	VALUE
C.1 :-	.0005 MICA
C.2 :-	.05 X 200V.
C.3 :-	.001 MICA
C.4 :-	5 MFD.
C.5 :-	.003 X 600V.
C.6 :-	.005 X 600V.
C.7 :-	5 MFD.
C.8 :-	8 MFD.
C.9 :-	16 MFD.
C.10 :-	.05 X 400V.





34103 Rm

CONDENSERS IN BY-PASS BLOCK P-145-1 :- C.2, C.5, C.6, C.10.
CONDENSERS IN ONE UNIT :- C.4, C.7, C.8, C.9. P-119-3
NUMBERS PREFIXED BY LETTERS ARE PART NUMBERS.
VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND,
VOLUME ON FULL.

MODEL 420,430
Alignment

BELMONT RADIO CORP.

SERVICE MANUAL FOUR TUBE T.R.F. RECEIVERS

105-115 Volts Alternating (any cycles) or Direct Current - 40 Watts

530 - 1720 Kilocycles

Both of the above models are four tube T.R.F., two gang receivers, the principle difference being that model 420 is equipped with a permanent magnet speaker and the model 430 with an electro dynamic speaker.

The tube complement of model 420 is as follows:

1 - Type 6D6 - remote cut-off pentode as an R.F. amplifier.
1 - Type 76 - triode as a detector.
1 - Type 38 - pentode as an output tube.
1 - Type 12Z3 - high vacuum rectifier.

The tube complement of model 430 is as follows:

1 - Type 6D6 - remote cut-off pentode as an R.F. amplifier.
1 - Type 76 - triode as a detector.
1 - Type 12A5 - pentode output tube.
1 - Type 12Z3 - high vacuum rectifier.

SERVICE NOTES

Should it ever become necessary to check alignment or re-align these receivers, the correct procedure is as follows:

Before any adjustments are made, the chassis must be removed from the cabinet. To do this it is necessary to pull off the volume and selector knobs, remove the back of the cabinet and the four screws which fasten the chassis to the base of the cabinet.

FREQUENCY ALIGNMENT:

1. Disconnect antenna wire from lug on antenna coil to which it is attached and connect in its place, in series with a 50 mmfd. condenser, a test oscillator. With this oscillator set at 1400 kilocycles and the R.F. (front trimmer) opened as far as possible, trim the antenna (rear) trimmer to resonance with oscillator (maximum deflection on an output meter connected across the two leads of the PM speaker on the model 420 and across the primary of the speaker input transformer on the model 430).
2. Check tracking at 1200-1000-800-600-530 kilocycles, bending plates only if absolutely necessary.
3. Re-set oscillator to 1712 kilocycles, tuning oscillator by rotating variable condenser for a check to ascertain if receiver tunes to 1712.

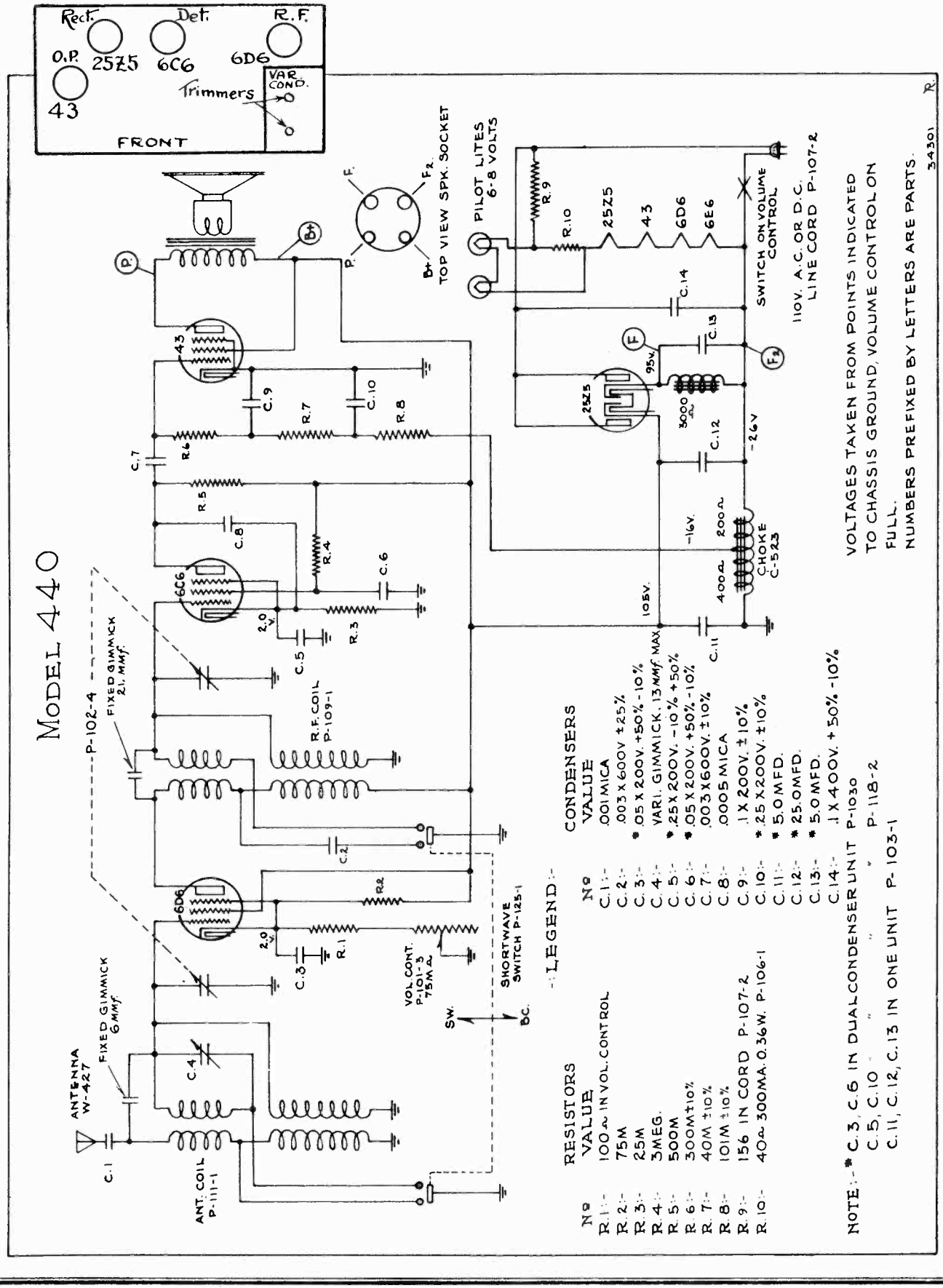
NOTES:

If trouble is experienced in getting receiver tuned down to 1712, look for the following:

That the green grid and black ground wires connected to the antenna coil are well separated from each other and that both the green leads to the grid cap and the antenna are clear of the tube shield (this reduces to a minimum the external capacity of the antenna coil).

BELMONT RADIO CORP.

MODEL 440
Schematic, Socket



-:LEGEND:-

RESISTORS		CONDENSERS	
No	VALUE	No	VALUE
R.1 :-	100 Ω IN VOL. CONTROL	C.1 :-	.001 MICA
R.2 :-	75M	C.2 :-	.003 X 600V ±25%
R.3 :-	25M	C.3 :-	* .05 X 200V. +50% -10%
R.4 :-	3MEG.	C.4 :-	VARI. GIMMICK. 13 MMF. MAX
R.5 :-	500M	C.5 :-	* .25 X 200V. -10% +50%
R.6 :-	300M ±10%	C.6 :-	* .05 X 200V. +50% -10%
R.7 :-	40M ±10%	C.7 :-	.003 X 600V. ±10%
R.8 :-	10M ±10%	C.8 :-	.0005 MICA
R.9 :-	156 IN CORD P-107-2	C.9 :-	.1 X 200V. ±10%
R.10 :-	40Ω 300MA. 0.36W. P-106-1	C.10 :-	* .25 X 200V. ±10%
		C.11 :-	* 5.0 MFD.
		C.12 :-	* 25.0 MFD.
		C.13 :-	* 5.0 MFD.
		C.14 :-	.1 X 400V. + 50% -10%

NOTE :- * C.3, C.6 IN DUAL CONDENSER UNIT P-1030
C.5, C.10 " " P-118-2
C.11, C.12, C.13 IN ONE UNIT P-103-1

VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND, VOLUME CONTROL ON FULL.
NUMBERS PREFIXED BY LETTERS ARE PARTS.

34301

MODEL 440
Alignment

BELMONT RADIO CORP.

105-115 Volts Alternating (any cycles) or Direct Current - 40 Watts.

530-1500 Kilocycles - 1500-4000 Kilocycles

SERVICE NOTES

Should it be at any time necessary to rebalance this set, the correct procedure is as follows:

BROADCAST BAND ALIGNMENT:

Remove chassis from cabinet by pulling off volume, selector and wave changing switch knobs, removing back and four screws which hold chassis in cabinet, replace knobs and disconnect antenna wire from coil.

1. Set wave changing switch in broadcast position by rotating in clockwise (right) direction.
2. With gang condenser in its minimum capacity position, plates entirely out of mesh, extreme left of its rotation, and with volume control full on, make the following adjustments:
   (a) Connect an oscillator set at 1500 kilocycles in series with a 50 mmfd. condenser to the antenna terminal of the coil (from which antenna lead has been removed) and to ground (chassis), adjust both antenna and R.F. trimmers of the variable condenser to resonance (maximum deflection on an output meter connected across the primary of the speaker input transformer).
   (b) Reset oscillator to 1400 kilocycles, adjust variable condenser to pick up oscillator and re-align antenna trimmer (rear section of variable condenser) to resonance.
   (c) Check output at 1200-1000-800-600 kilocycles. Bend plates only at 1200 and 1000 kilocycles to increase output, and then only if necessary. No bending is necessary at 600 or 800 kilocycles.

SHORT WAVE BAND ALIGNMENT:

1. Set wave changing switch in counter-clockwise (left) position.

2. With oscillator adjusted to 3700 kilocycles, adjust the condenser mounted on top of the antenna coil and consisting of a center piece of heavy enameled copper wire about which is wrapped a spiral of a smaller enameled copper wire, with your fingers sliding the spiral to and fro until maximum output is attained, as indicated by maximum deflection on the output meter.
3. Next reset oscillator to 1550 kilocycles and adjust slip coil at the bottom of antenna coil assembly until maximum output is obtained (this coil is wound on a paper tube which has been slipped over the dowel on which the other coils are wound). Seal this slip coil with wax after making adjustment.
4. Now reset oscillator to 3700 kilocycles and readjust the condenser previously adjusted, as explained in 1. On completing this readjustment, seal the adjustment by dropping some wax in the hole of the terminal strip at the top of the antenna coil assembly where the spiral enameled wire passes through the strip. Do not put wax on the spiral wire, as this will change the capacity of this small condenser.

NOTES

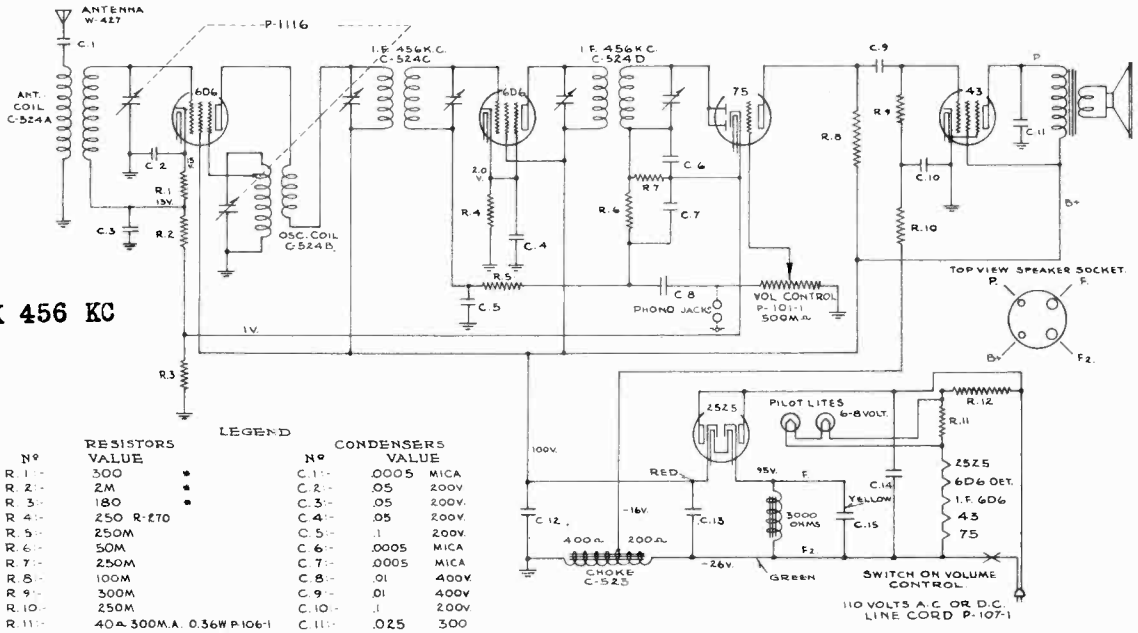
When making these adjustments with the small condenser at the top of the coil and with the slip coil at the bottom of the antenna assembly, keep the receiver tuned to the generator at all times by gently rocking the variable condenser to and fro.

In order to replace pilot lights, it is necessary to remove the chassis. These lamps are connected in series, if one of them burns out the other one will not light. They are 6-8 volt, .15 ampere lamps.

BELMONT RADIO CORP.

MODEL 540

MODEL 540
Schematic, Socket
Alignment, Parts



IF PEAK 456 KC

LEGEND

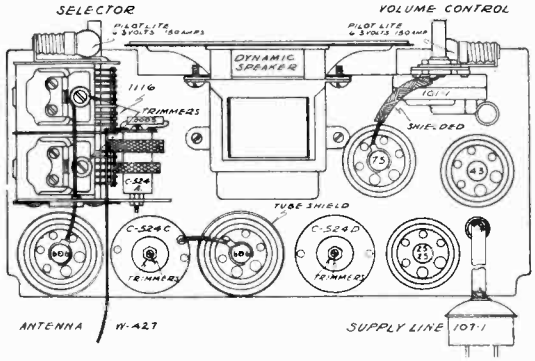
RESISTORS

Nº	VALUE	
R.1	300	*
R.2	2M	*
R.3	180	*
R.4	250 R-270	
R.5	250M	
R.6	50M	
R.7	250M	
R.8	100M	
R.9	300M	
R.10	250M	
R.11	40Ω 300M.A. 0.36W P-106-1	
R.12	126 IN CORD P107-1	

CONDENSERS

Nº	VALUE	
C.1	.0005	MICA
C.2	.05	200V.
C.3	.05	200V.
C.4	.05	200V.
C.5	.1	200V.
C.6	.0005	MICA
C.7	.0005	MICA
C.8	.01	400V.
C.9	.01	400V.
C.10	.1	200V.
C.11	.025	300
C.12	5.0 MFD.	C-525D
C.13	25.0 MFD.	*
C.14	.1	400V.
C.15	5.0 MFD	*

NOTE:-
* R.1, R.2 & R.3 IN ONE UNIT PART NUMBER R-268.
* C.13 AND C.15 IN ONE UNIT PART NUMBER C-525-C
NUMBERS PREFIXED BY LETTERS ARE PARTS.
VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL MEASURED ON A.C. CURRENT.



Part No.	Description
101-1	Volume Control with Switch
106-1	40 Ohm Resistor-10%
107-1	126 Ohm Special Cord and Plug
C-523	600 Ohm Choke
C-524A	Antenna Coil
C-524B	Oscillator Coil
C-524C	Input I.F. Transformer
C-524D	Output I.F. Transformer
C-525C	5-25 Mfd. Electrolytic Condenser
C-525D	5 Mfd. Electrolytic Condenser
R-268	2480 Ohm Resistor
R-270	250 Ohm Wire Wound Resistor

SERVICE NOTES

Should it be at any time necessary to rebalance this set, the correct procedure is as follows:

1. Volume control on full during all alignment.
2. Variable condenser in minimum capacity position, plates open, at start of all aligning.

I.F. ALIGNMENT

1. To peak I.F. transformers, connect oscillator set at 456 kilocycles to the grid of the 6D6 tube directly in back of the variable condenser and adjust the trimming condensers of the I.F. transformers to resonance (Maximum deflection on an output meter connected across the primary of the speaker input transformer).

   Each I.F. trimmer has two adjustments, one nut and one screw, both of which are adjustable from the top.

BROADCAST BAND ALIGNMENT

1. Disconnect antenna wire and connect oscillator in series with a 75 mmfd. condenser to the antenna coil. With the variable condenser set at its minimum capacity position, at the extreme right of its rotation, and with an oscillator output adjusted to 1720 kilocycles, adjust trimmer of oscillator section of variable condenser (rear section) to resonance (maximum deflection on an output meter connected across the primary of the speaker input transformer). Next adjust the trimmer condenser of the front section of the variable condenser to resonance.
2. Check alignment at 1400-1200-1000-800-600-530 kilocycles, bending the slotted plates of the front section of the variable condenser only if absolutely necessary.

MODEL 575
Schematic,
Alignment

BELMONT RADIO CORP.

Service Notes

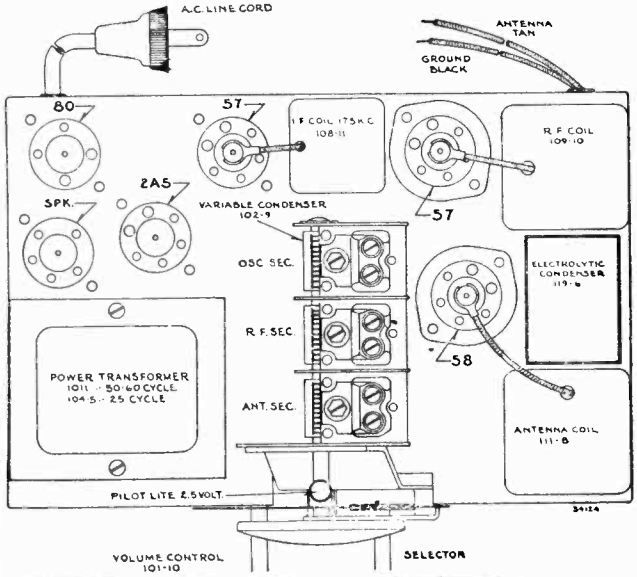
Voltages taken from different points of circuit to chassis are measured with volume control full on, using a voltmeter having a resistance of 1000 ohms per volt. These voltages are indicated on the schematic circuit diagram.

Part No. 145-2

Common Black to Brown	—.003	x 600 Volts
Common Black to Green	—.1	x 200 Volts
Common Black to Red	—.1	x 200 Volts
Common Black to Orange	—.25	x 200 Volts
Blue to Blue	—.05	x 400 Volts

Part No. 145-3

Common Black to Brown	—.1	x 200 Volts
Common Black to Green	—.05	x 200 Volts
Common Black to Orange	—.05	x 200 Volts
Common Black to Yellow	—.05	x 200 Volts



Aligning I. F. Transformer

1. With volume control full on, at extreme right of its rotation, and with variable condenser at its maximum capacity position (extreme right of its rotation) make the following adjustments:

(a) Connect an external oscillator adjusted to 175 kilocycles, in series with a .1 mfd. condenser, to the control grid cap of the type 57 tube located between the R. F. coil (part numbers 109-10) and the I. F. transformer (part number 108-11) and chassis.

(b) Adjust trimming condensers of I. F. transformer (part number 108-11) to resonance. See top view of chassis. Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or between the plate and screen terminals of the type 2A5 tube, by means of an adapter. Maximum deflection of the meter indicates resonance. Care must be taken to use only enough signal to give a readily readable output, as excessive input will result in overload and a false resonance point.

NOTE: The two trimmer condensers which tune the primary and secondary of the I. F. transformer are adjusted by set screws accessible from the back of the chassis.

Aligning R. F. and Oscillator Circuits

1. Connect the external oscillator set at 1720 kilocycles and in series with a 200 Mfd. condenser, between the antenna (tan) and ground (black) leads.

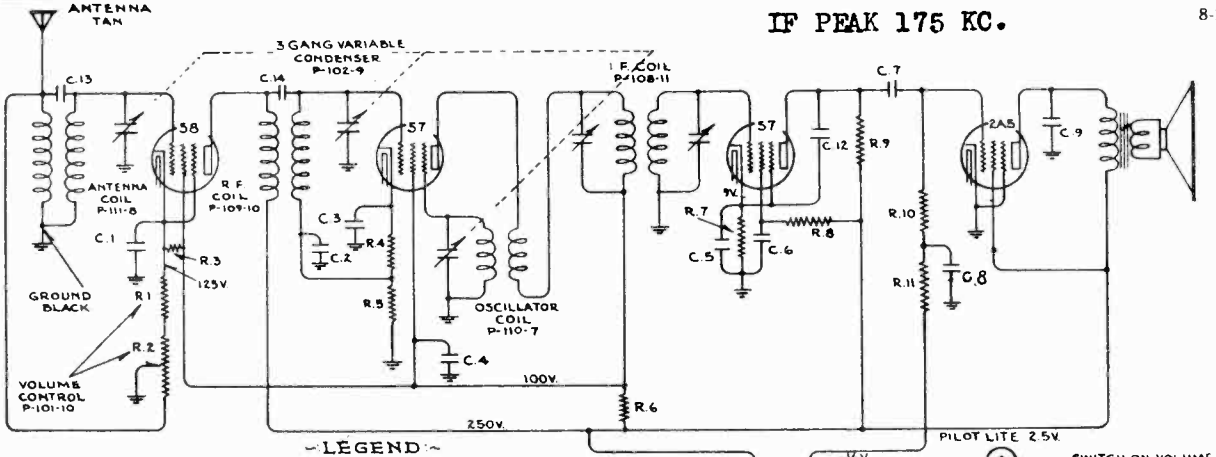
(a) With volume control full on and variable condenser plates in minimum capacity position, plates entirely out of mesh (extreme left of its rotation), adjust trimmer of rear oscillator section of variable condenser to resonance.

(b) Shift external oscillator frequency from 1720 to 1400 kilocycles, pick up signal by rotating variable condenser and peak R. F. (center) and antenna (front) section trimmers of variable condenser to resonance.

(c) Check tracking at 1500, 1200, 1000, 800, 600 and 530 kilocycles by changing external oscillator frequency and rotating variable condenser to pick up signal. Adjust slotted end plates of R. F. (center) and antenna (front) sections to increase output, if necessary. DO NOT BEND OSCILLATOR PLATES.

IF PEAK 175 KC.

8-1-34



~LEGEND~

CONDENSERS

Nº	VALUE
C.1	.05X200V.
C.2	.05X200V.
C.3	.05X200V.
C.4	.1X200V.
C.5	.25X200V.
C.6	.1X200V.
C.7	.05X200V.
C.8	.1X200V.
C.9	.003X600V.
C.10	8.0MFD X 400V.
C.11	8.0MFD X 400V.
C.12	.001 MICA.
C.13	10-44f GIMMICK
C.14	4-44f GIMMICK

RESISTORS

Nº	VALUE
R.1	100
R.2	75M
R.3	50M 1/3W.
R.4	450
R.5	5M
R.6	19M
R.7	50M 1/3W.
R.8	1MEG. 1/3W.
R.9	250M 1/3W.
R.10	200M 1/3W.
R.11	300M 1/3W.

~NOTE~

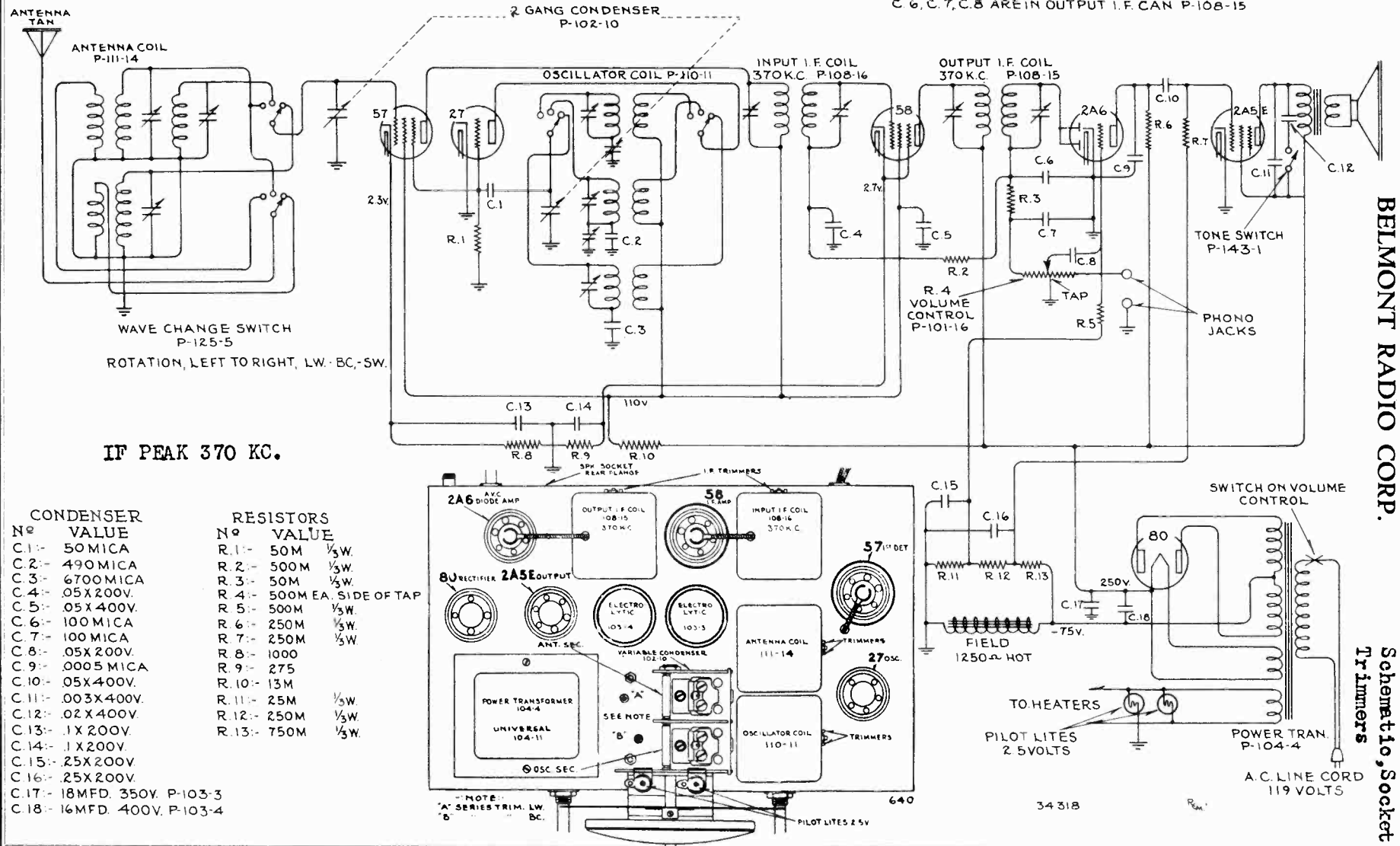
CONDENSERS C.10, C.11 IN ONE UNIT P-119-6.
CONDENSERS C.1, C.2, C.3, C.4 IN ONE UNIT P-145-3
RESISTORS R.4, R.5, IN ONE UNIT P-106-10
NUMBERS PREFIXED BY LETTER 'P' ARE PART NUMBERS.
PHRASE GIMMICK IS A WIRE WOUND AROUND ANOTHER WIRE.
VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND, VOLUME CONTROL ON FULL.
CONDENSERS C.5, C.6, C.7, C.8, C.9 IN ONE UNIT P-145-2.

CHASSIS ARE SOMETIMES EQUIPPED WITH UNIVERSAL TRANSFORMERS FOR OPERATION ON 40 AND 60 CYCLES AND WITH PRIMARY TAPS FOR 108, 125, 150, 220 AND 250 VOLTS (SEE INSTRUCTIONS) AND ALSO SOMETIMES EQUIPPED WITH 25 CYCLE TRANSFORMERS. SPECIAL AND UNIVERSAL PRIMARIES.

Standard Broadcast Band 200-585 Meters.
Long Wave Band 1000-2150 Meters.
Short Wave Band 19,25-52 Meters.

MODEL 640

-:NOTE:-
CONDENSERS C.11, C.12 IN DUAL UNIT.
" C.15, C.16 " " "
" C.4, C.14 " " "
RESISTORS R.8, R.9, R.10 IN ONE UNIT. P-106-13
NUMBERS PREFIXED BY LETTER 'P' ARE PART Nos
VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL.
RESISTORS, R.2, R.3, R.5 AND CONDENSERS, C.6, C.7, C.8 ARE IN OUTPUT I.F. CAN P-108-15



CONDENSER

No	VALUE
C.1	50 MICA
C.2	490 MICA
C.3	6700 MICA
C.4	.05 X 200V.
C.5	.05 X 400V.
C.6	100 MICA
C.7	100 MICA
C.8	.05 X 200V.
C.9	.0005 MICA
C.10	.05 X 400V.
C.11	.003 X 400V.
C.12	.02 X 400V.
C.13	.1 X 200V.
C.14	.1 X 200V.
C.15	.25 X 200V.
C.16	.25 X 200V.
C.17	18 MFD. 350V. P-103-3
C.18	16 MFD. 400V. P-103-4

RESISTORS

No	VALUE	
R.1	50M	1/3 W.
R.2	500M	1/3 W.
R.3	50M	1/3 W.
R.4	500M EA. SIDE OF TAP	
R.5	500M	1/3 W.
R.6	250M	1/3 W.
R.7	250M	1/3 W.
R.8	1000	
R.9	275	
R.10	13M	
R.11	25M	1/3 W.
R.12	250M	1/3 W.
R.13	750M	1/3 W.

BELMONT RADIO CORP.
MODEL 640
Schematic, Socket Trimmers

MODEL 640
Alignment

BELMONT RADIO CORP.

SERVICE NOTES

Voltages taken from different points of the circuit are measured with a voltmeter having a resistance of 1000 ohms per volt and are made between the points indicated and the chassis pan. These voltages are indicated on the circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

ALIGNMENT:

No aligning adjustments should be made until the set has been thoroughly checked for all other possible causes of trouble, such as poor installations, low line voltages, defective tubes, condensers and resistors.

ALIGNING I.F. TRANSFORMERS:

1. With volume control full on, at extreme right of its rotation, and with wave changing switch in the long wave position, extreme left of its rotation, and with variable condenser at its minimum capacity position, extreme left of its rotation, plates entirely out of mesh, adjust the I.F. transformers, parts number 108-15 and 108-16, in the following manner:
   (a) Connect an external oscillator which has been adjusted to 370 kilocycles, in series with a .1 mfd. condenser to the control grid cap of the type 57 first detector tube (see diagram and chassis).
   (b) Adjust trimming condensers of both I.F. transformers (parts number 108-15 and 108-16) to resonance. Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between plate and screen terminals of type 2A5E output tube Maximum defleotion of the meter indicates resonance. Care should be taken to use only enough signal to give a readily readable output.

   Note: The two adjustments on each transformer are accessible through holes in the transformer cans from the back of the chassis.

LONG WAVE BAND ALIGNMENT:

1. Shift frequency of external oscillator to 1000 meters and connect in series with a 200 mmfd. condenser to the tan antenna wire and the black ground wire, set wave changing switch to extreme left of its rotation and variable condenser at its minimum capacity position, extreme left of its rotation, plates entirely out of mesh.
   (a) Adjust long wave shunt trimmers of antenna coil, part number 111-14 and oscillator coil, part number 110-11 to resonance (these adjustments are located nearest to the chassis and each of these coils are adjustable from side of the chassis).
   (b) Shift frequency of external oscillator to 2000 meters, rotate variable condenser to pick up signal.
   (c) Adjust series trimmer to resonance. This adjustment is accessible from top of the chassis between the variable condenser and the power transformer and is marked "A" on top view of chassis.

BROADCAST BAND ALIGNMENT:

1. Set wave changing switch in the broadcast, center, position and re-set external oscillator to 196 meters (1530 kilocycles), set variable condenser at its minimum capacity position, extreme left of its rotation
   (a) Adjust oscillator shunt trimmer, upper adjustment part number 110-11, to resonance.
   (b) Re-set external oscillator to 214 meters (1400 kilocycles), rotate variable condenser to pick up signal, adjust shunt trimmer of antenna coil, upper adjustment part number 111-14, to resonance.
   (c) Re-set external oscillator to 542 meters (550 kilocycles), rotate variable condenser to pick up signal and adjust oscillator series trimmer (between condenser and transformer, marked "B" on diagram) to resonance.

SHORT WAVE BAND ALIGNMENT:

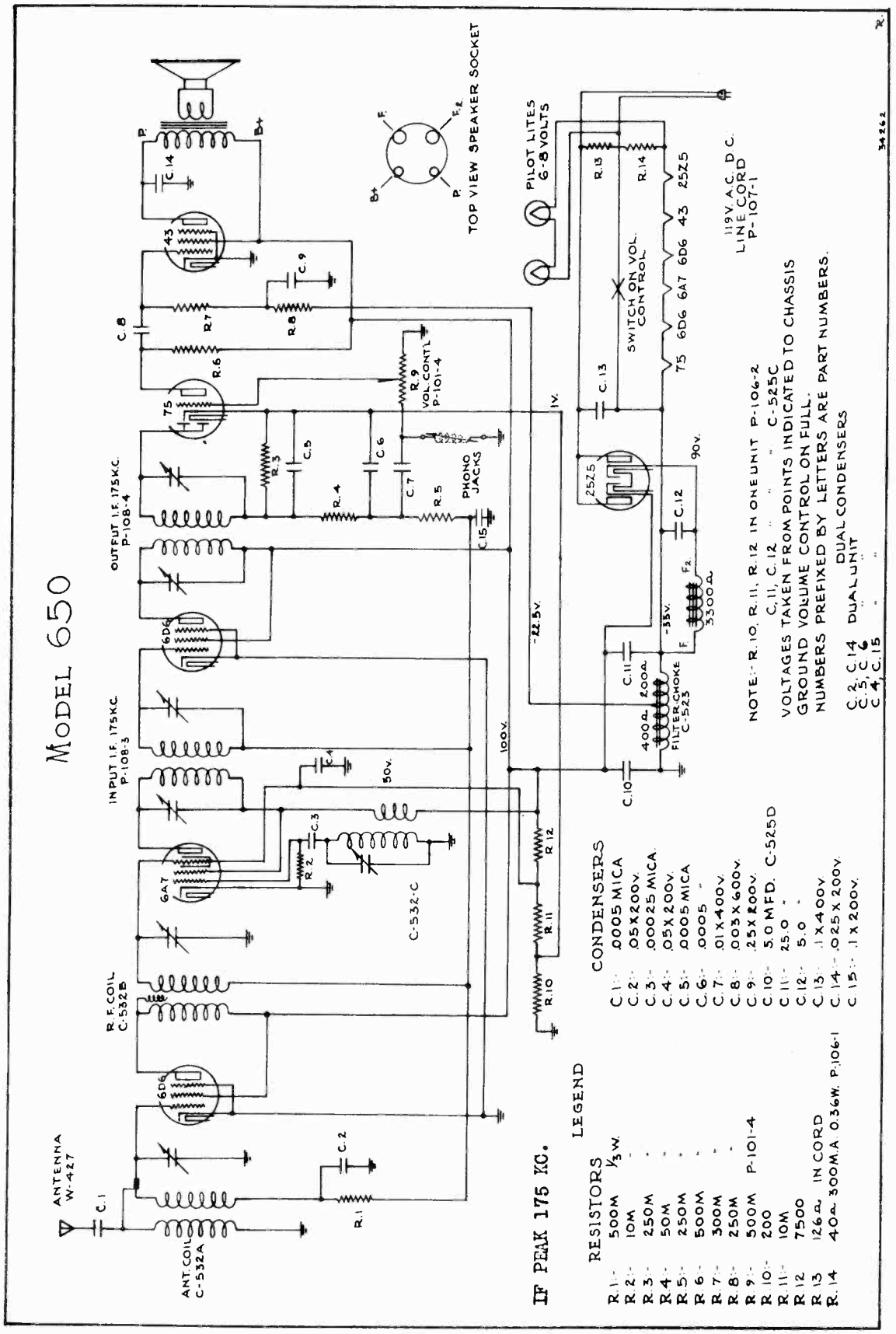
1. Set wave changing switch in the short wave position, extreme right of its rotation, and change external oscillator frequency to 20 meters (15 megacycles), connect oscillator in series with a 300 ohm resistor to tan antenna wire and black ground wire.
   (a) Adjust variable condenser with selector knob so that pointer is opposite the 20 meter calibration on the dial. Adjust center trimmers of oscillator coil, part number110-11 and antenna coil part number 111-14, to resonance. These adjustments are accessible from side of the chassis.

NOTES:

Should the planetary vernier dial drive mechanism fail to function properly, it will probably be found to be due to a cracked or broken compression spring. This drive may be dis-assembled by removing the two screws which fasten it to the dial bracket. The part number of the compression spring is 112-31, All of the other dial parts are hardened and should cause no trouble.

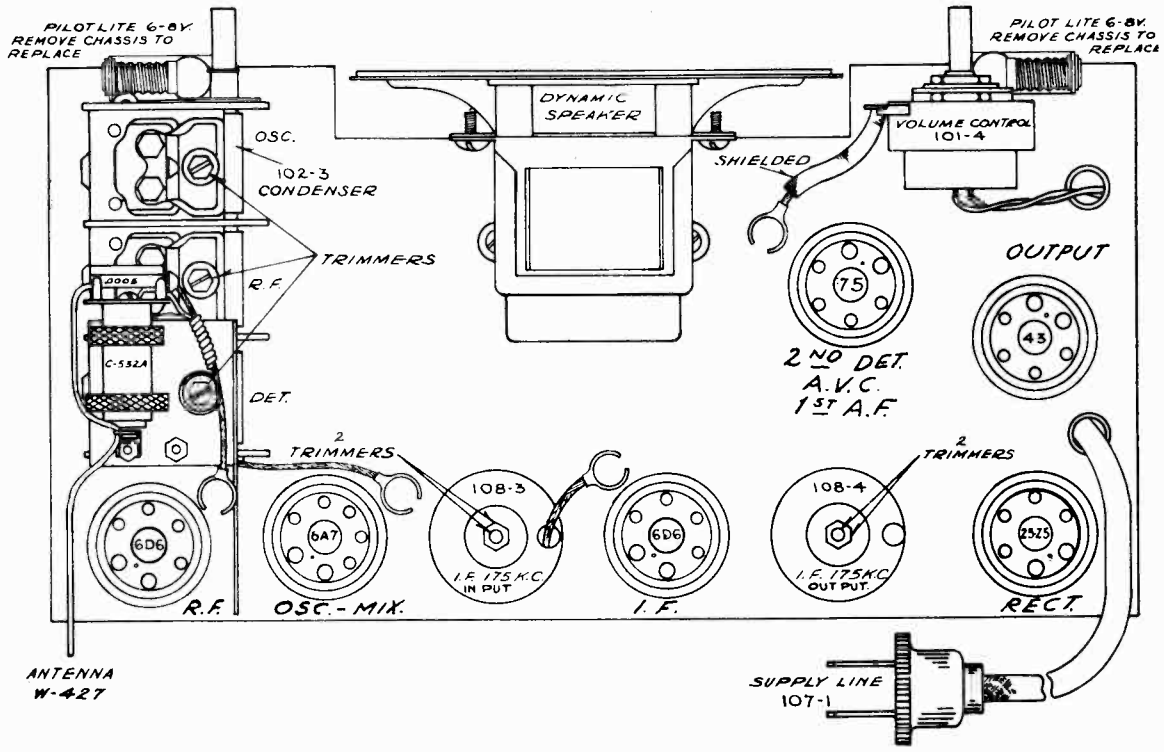
BELMONT RADIO CORP.

MODEL 650
Schematic



MODEL 650
Socket, Alignment

BELMONT RADIO CORP.



Before attempting any adjustment, the chassis must be removed from the cabinet. This is accomplished by pulling off the volume and selector knobs, removing the back and the four screws which fasten the chassis to the cabinet.

I.F. ALIGNMENT:

1. With volume control on full, at the extreme right of its rotation, and with variable condenser at its maximum capacity position (extreme left of its rotation) make the following adjustments:
   (a) Connect an oscillator set at 175 kilocycles in series with a .1 mfd. condenser to the control grid (cap at top of type 6A7 oscillator first detector tube).
   (b) Adjust trimming condensers of both input and output I.F. transformers, parts number 108-3 and 108-4, (see top view of chassis) to resonance. Use as a resonance indicator an output meter connected across the primary of the speaker input transformer. Maximum deflection on the meter indicates resonance.

Note: Each I.F. transformer trimmer has two adjustments, one nut and one screw, both of which are adjustable from the top.

FREQUENCY ALIGNMENT:

1. Disconnect antenna wire from lug on antenna coil to which it is attached and connect to this lug, in series with a 50 mmfd. condenser, an oscillator which has been set at 1720 kilocycles.
2. Adjust trimmer condenser of the oscillator section of variable condenser (the shaft end section) to resonance with oscillator (maximum deflection on an output meter).
3. Change input oscillator to 1400 kilocycles and pick up signal by rotating variable condenser, then adjust trimmers of antenna and R.F. detector sections of variable condenser (center and rear respectively) to resonance with oscillator.
4. Check tracking at 1200-1000-800-600-530 kilocycles by setting oscillator at these frequencies and picking it up by rotating variable condenser. Bend slotted plates of condenser only if necessary.

NOTES:

The pilot lights are connected in series. Should one burn out, the other will not light. To replace them it is necessary to remove chassis from cabinet. The lamps used are 6-8 volts, .15 amperes.

Voltages from chassis to different points are indicated on the schematic circuit diagram and should be measured with a volt meter having a resistance of 1000 ohms per volt.

If receiver fails to function at the low frequencies, the trouble is apt to be a defective 6A7 tube. The remedy of course, is to replace the 6A7. They sometimes fail to oscillate on the lower frequencies.

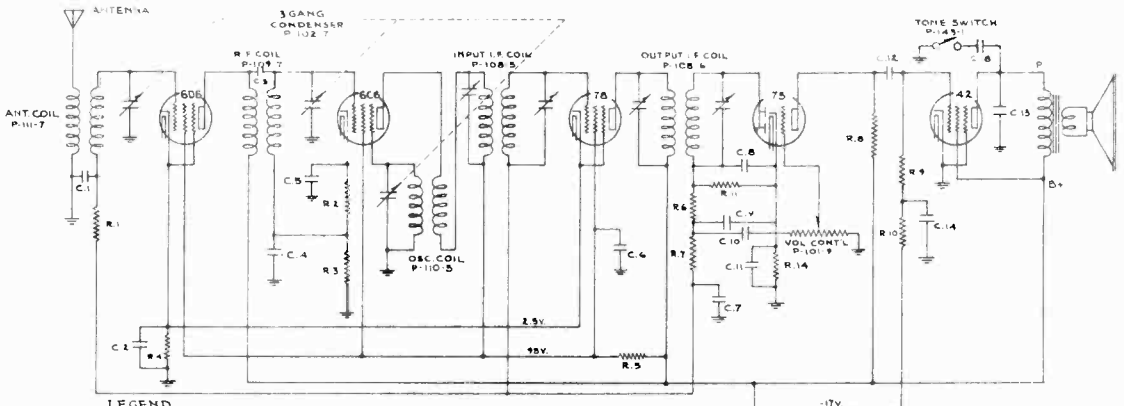
BELMONT RADIO CORP.

MODEL 670
Schematic
Socket, Trimmers

Vibrators can be reconditioned at a cost of $5.00 each, if the old unit is returned.

All resistors are RMA color coded - specify value and/or resistor number (per schematic diagram) and model number.

MODEL 670

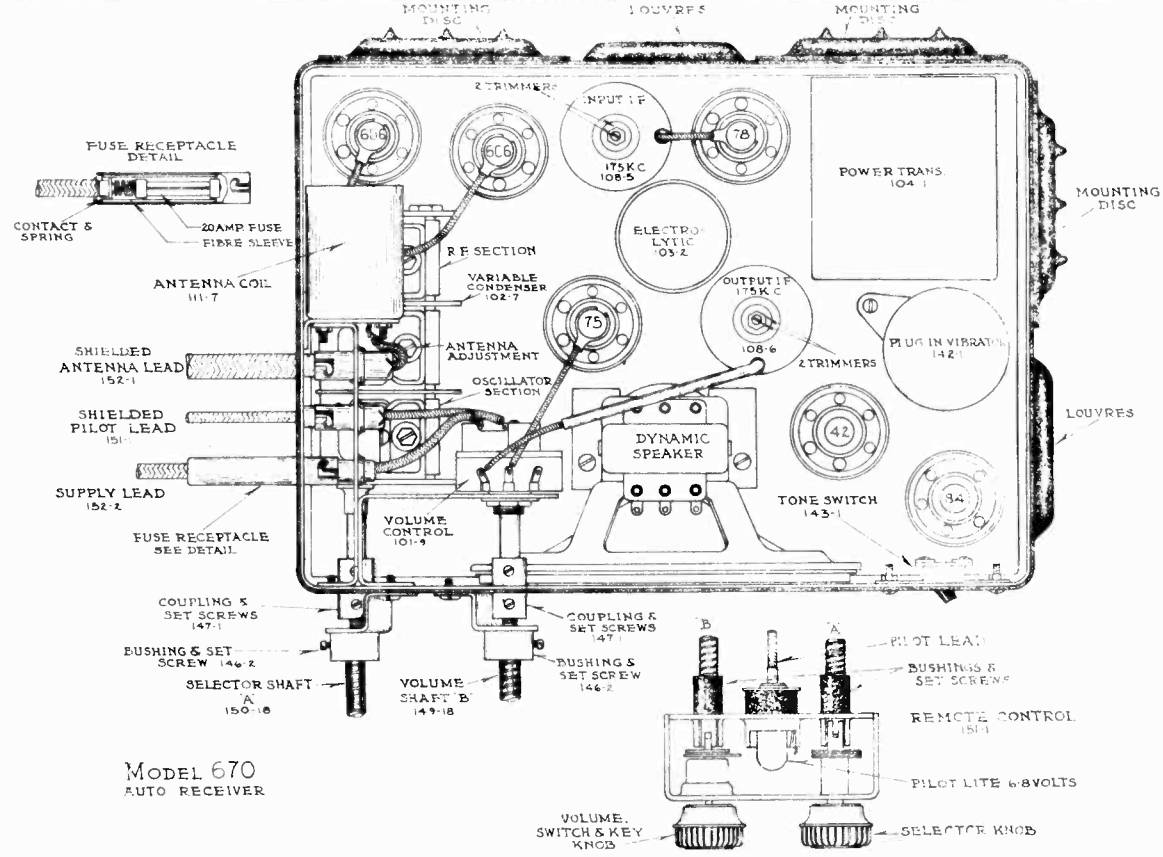


LEGEND

RESISTORS		CONDENSERS	
№	VALUE	№	VALUE
R 1 -	250M 1/2W	C 1 -	.05 X 200V
R 2 -	450Ω	C 2 -	.1 X 200V
R 3 -	3M	C 3 -	11.5 mf GIMMICK
R 4 -	150Ω	C 4 -	.05X200V
R 5 -	1.9M	C 5 -	.05X200V.
R 6 -	50M 1/2W	C 6 -	.1 X 200V
R 7 -	250M 1/2W	C 7 -	.1 X 200V.
R 8 -	250M 1/2W	C 8 -	.0005 MICA
R 9 -	200M 1/2W	C 9 -	.0005 MICA
R 10 -	300M 1/2W	C 10 -	.01 X 400V
R 11 -	250M 1/2W	C 11 -	20MFD X 20V
R 12 -	100Ω	C 12 -	.01 X 400V.
R 13 -	100Ω	C 13 -	.005X600V.
R 14 -	4M 1/2W	C 14 -	.1 X 200V
VAR. RES. STOR - 500M (VOL. CONT'L)		C 15 -	1MFD X 120V
		C 16 -	8MFD X 350V
		C 17 -	8MFD X 350V
		C 18 -	.01 X 400V
		C 19 -	.02 X 1000V
		C 20 -	1MFD X 120V
		C 21 -	.002 MICA

NOTE -
NUMBERS PREFIXED BY LETTERS ARE PART NUMBERS.
VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL.
THE PHRASE GIMMICK MEANS A WIRE WOUND AROUND ANOTHER WIRE.
RESISTORS IN ONE UNIT, P-106-3, - R. 2, 3, 4, 5.
CONDENSERS IN ONE UNIT, P-105-2 C. 16, 17.
CONDENSERS IN DUAL UNIT - C. 2, 7.
CONDENSERS IN DUAL UNIT - C. 5, 6.
RESISTORS AND CONDENSERS IN OUTPUT F. CAN P-108-6, - C. 8, 9, 10 AND R. 6, 7, 11.
CONDENSER, C. 1, IN ANT. COIL CAN P-111-7.

IF PEAK 175 KC.



MODEL 670
AUTO RECEIVER

MODEL 670
Alignment
Service Notes

BELMONT RADIO CORP.

ELIMINATION OF MOTOR NOISE: (Cont'd)

In some few cases, such as Buicks, it is necessary to use screw type suppressors. Cut lead about two inches from distributor and screw one end of suppressor into the wire attached to distributor, screw wire from coil into other end of suppressor.

Generator capacitor, number 148-1, is connected to generator side of cutout. The ground side of capacitor can befastened to the generator housing under the same screw that holds the relay housing to generator. In some cases, an additional capacitor, number 148-1, (obtainable from your dealer) must be installed between the battery side of ignition coil and the car frame.

If after connecting suppressors and condensers as outlined above there is still motor noise, make the following tests:

Shield high tension leads.

Bond flexible shaft leads, such as free wheeling, which run close to distributor, radiating ignition interference which is picked up by the antenna inside of car.

Cars using wooden floor boards, place a grounded copper screen under toe board.

Excessive gap between distributor rotor and high tension contacts, replace with a special radio rotor arm or build up end with solder and dress end with file so that its original shape is retained. The rotor should not brush or wipe the contacts, but should just clear them.

In some cases, such as V-8 Ford, it is necessary to pull battery and primary leads out of special tube which houses high tension leads, shield and ground these leads. Also on V-8 Fords it is necessary to install a capacitor at primary terminal of coil housing.

Additional suppressors can be obtained from your dealer.

The ignition system of car must be kept in good condition.

Fouled plugs or plugs with improperly adjusted gaps will affect the operation of receiver as well as of the automobile. Burned or poorly adjusted braker points will also impair the performance. It is advisable to advance the generator charging rate in order to compensate for the additional drain of the receiver on car storage battery.

It is sometimes necessary to connect a condenser (148-3) between the hot side of the dome light switch and ground.

BALANCING SET TO ANTENNA:

When this set has been installed and is ready for operation, it may be found necessary (depending on antenna) to balance set to this antenna. This is accomplished as follows:

With the receiver tuned to a very weak station, about 130 to 140 (1300 to 1400 kilocycles) on the dial, adjust the antenna trimmer with a screw driver until maximum volume is attained. To reach the antenna trimmer remove the plug button from the top of the case.

****
SERVICE NOTES
****

Should it ever be necessary or desirable to re-align this receiver, the proper method is as follows:

Adjustments can be made with the receiver mounted in the cabinet, being necessary only to remove the top cover.

I.F. ALIGNMENT:

1. With variable condenser at its maximum capacity position and with volume control full on, connect in series with a .1 mfd. condenser, an oscillator set at 175 kilocycles to the grid cap of the 606 tube.
2. Adjust trimming condensers of both input and output I.F. transformers, parts number 108-5 and 108-6 (see top view of chassis) to resonance with oscillator, as indicated on an output meter connected across the primary terminals of the speaker input transformer. Maximum deflection on the meter indicates resonance

Note: Each I.F. transformer trimmer has two adjustments, one nut and one screw, both of which are adjust able through the top of the can.

FREQUENCY ALIGNMENT:

1. Attach oscillator connected in series with a 200 mmfd. condenser to the antenna lead and with the variable condenser at its minimum capacity position (extreme right of its rotation) and with an oscillator set at 1550 kilocycles, adjust condenser trimmer of oscillator section (shaft end) to resonance.
2. Re-set oscillator to 1400 kilocycles, rotate variable condenser to pick up signal, adjust antenna and R.F. trimmers to resonance.
3. Check alignment at 1200-1000-800-600-530 kilocycles by setting oscillator to these frequencies and picking up signal by rotating condenser.
4. Bend slotted plates of antenna and R.F. sections only if necessary. UNDER NO CIRCUMSTANCES BEND PLATES OF OSCILLATOR SECTION.

NOTES:

Voltages from chassis to different points are indicated on schematic circuit diagram, and should be measured with a volt meter having a resistance of 1000 ohms per volt.

Failure to operate, noisy or weak reception, may be due to defective tubes or poor contact between cap on top of tube and grid clip.

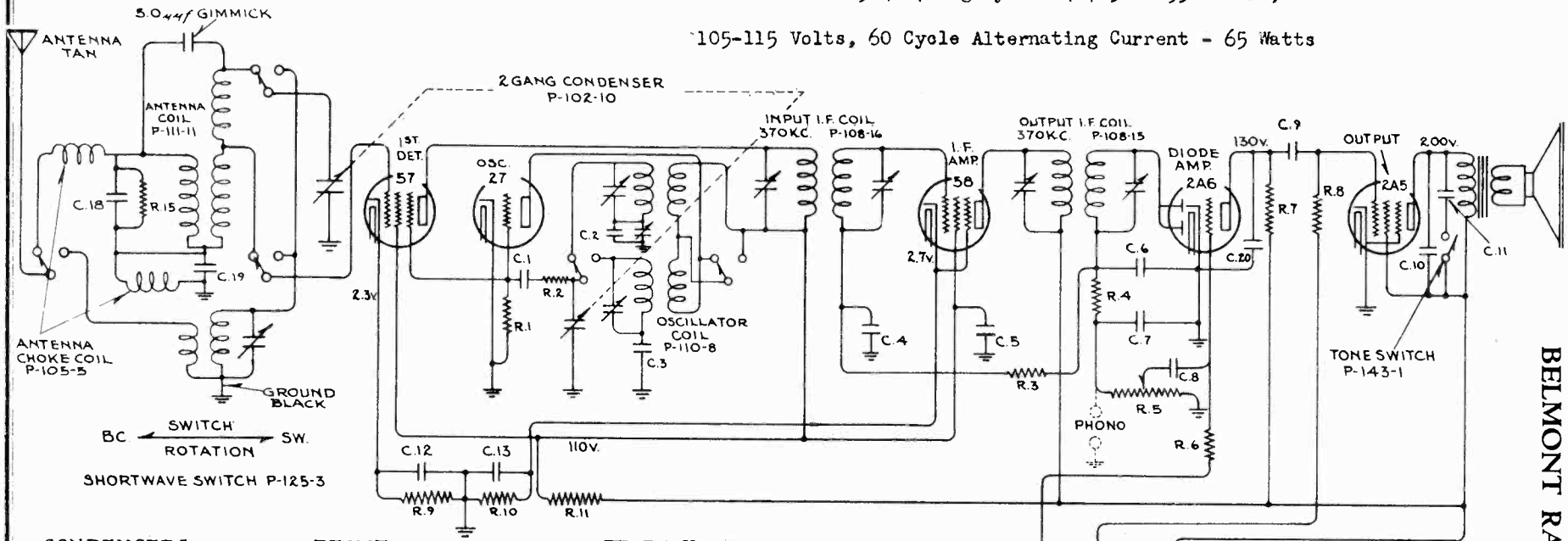
Tubes may be checked by replacing with another tube which is known to be good.

If fuse blows out frequently, and insulating sleeve has been properly placed over fuse, the trouble probably is in the vibrator and vibrator should be replaced.

NEVER ATTEMPT TO ADJUST VIBRATOR POINTS.

Standard Broadcast Band 530-1720 Kilocycles
Short Wave Band 5.4-17 Megacycles (17.5 to 55 Meters)

105-115 Volts, 60 Cycle Alternating Current - 65 Watts



IF PEAK 370 KC.

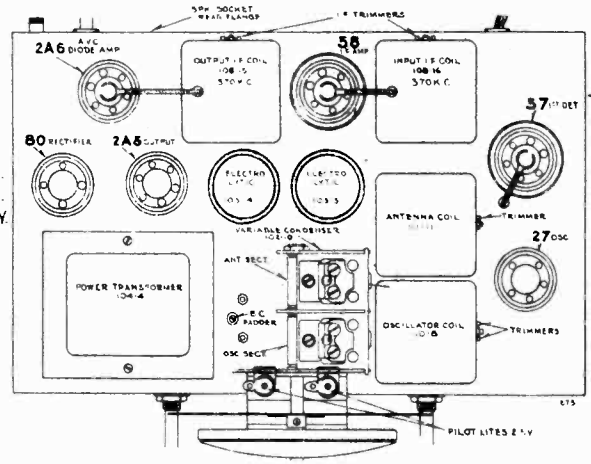
CONDENSERS

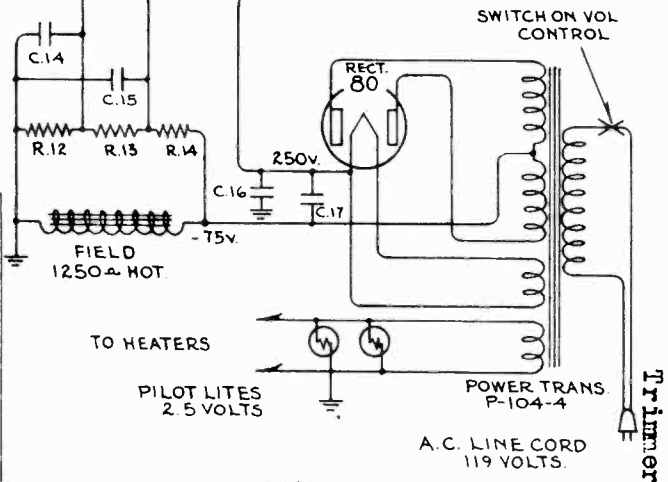
Nº	VALUE
C.1	50 MICA
C.2	490 MICA
C.3	5M MICA
C.4	.05 X 200V.
C.5	.05 X 400V.
C.6	100 MICA
C.7	100 MICA
C.8	.05 X 200V.
C.9	.05 X 400V.
C.10	.003 X 400V.
C.11	.02 X 400V.
C.12	.1 X 200V.
C.13	.1 X 200V.
C.14	.25 X 200V.
C.15	.25 X 200V
C.16	18 MFD. 350V. P-103-3
C.17	16 MFD 400V. P-103-4
C.18	120 μμf.
C.19	.01 μμf.
C.20	.0005 MICA.

RESISTORS

Nº	VALUE	
R.1	50M.	1/3W.
R.2	50	1/3W.
R.3	500M	1/3W.
R.4	50M	1/3W.
R.5	500M	VOLUME CONTROL P-101-11
R.6	500M	1/3W.
R.7	250M	1/3W.
R.8	250M	1/3W.
R.9	1000	
R.10	275	
R.11	13M	
R.12	25M	1/3W
R.13	250M	1/3W.
R.14	750M	1/3W.
R.15	10M	1/3W.

NOTE:
CONDENSERS C.10, C.11 IN DUAL UNIT.
" C.14, C.15 " " "
" C.13, C.4 " " "
RESISTORS R 9, R.10, R.11 IN ONE UNIT P-106-13
NUMBERS PREFIXED BY LETTER "P" ARE PART NUMBERS.





34265

VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND. VOLUME CONTROL ON FULL
RESISTORS, R.3, 4, & 6, CONDENSERS C.6, 7, & 8 ARE IN OUTPUT I.F. CAN, P-108-15

BELMONT RADIO CORP.

MODEL 675
Schematic, Socket
Trimmers

MODEL 675
Alignment

BELMONT RADIO CORP.

SERVICE NOTES

Voltages taken from different points of the circuit are measured with a voltmeter having a resistance of 1000 ohms per volt and are made between the points indicated and the chassis pan. These voltages are indicated on the circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

ALIGNMENT:

No aligning adjustments should be made until the set has been thoroughly checked for all other possible causes of trouble, such as poor installations, low line voltages, defective tubes, condensers and resistors.

ALIGNING I.F. TRANSFORMERS:

1. With volume control full on, at the extreme right of its rotation, and with wave selector switch in the broadcast position, extreme left of its rotation, and with variable condenser at its minimum capacity position, extreme left of its rotation, plates entirely out of mesh, adjust the I.F. transformers (parts number 108-15 and 108-16) in the following manner:
   (a) Connect an external oscillator which has been adjusted to 370 kilocycles, in series with a .1 mfd. condenser to the control grid cap of the type 57 first detector tube (see diagram and chassis).
   (b) Adjust trimming condensers of both I.F. transformers (Parts number 108-15 and 108-16) to resonance. Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between plate and screen terminals of type 2A5 output tube. Maximum deflection of the meter indicates resonance. Care should be taken to use only enough signal to give a readily readable output.

   Note: The two adjustments on each transformer are accessible through holes in the transformer cans from the back of the chassis.

BROADCAST BAND ALIGNMENT:

1. Shift frequency of external oscillator to 535 kilocycles and connect in series with a 200 mmfd. condenser to the tan antenna wire and the black ground wire.
   (a) Set the variable condenser in its maximum capacity position, extreme right of its rotation.
   (b) Adjust the broadcast oscillator series trimmer to resonance with oscillator. This trimmer is located between the gang condenser and the power transformer (see top view).
2. Shift frequency of external oscillator to 1712 kilocycles and set variable condenser in its minimum capacity position, extreme left of its rotation, plates entirely out of mesh.
   (a) Adjust the broadcast oscillator shunt trimmer to resonance. This adjustment is the top adjustment in the oscillator coil can, part number 110-8.

SHORT WAVE BAND ALIGNMENT:

1. Set the wave changing switch in the short wave position, extreme right of its rotation, and change external oscillator frequency to 15 megacycles.
   (a) Adjust variable condenser with selector knob so that pointer is opposite the 15 megacycle calibration on the dial.
   (b) Adjust the short wave oscillator shunt trimmer to resonance with the signal (use extreme care and make certain that you do not adjust to resonance with the image instead of the signal). This trimmer is the bottom trimmer (closest to the chassis) on the oscillator coil, part number 110-8, and is accessible from the side of the chassis.
   (c) Adjust the short wave antenna trimmer to resonance (single trimmer in antenna can, part number 111-11, accessible from the side of the chassis, between type 27 and 57 tubes).

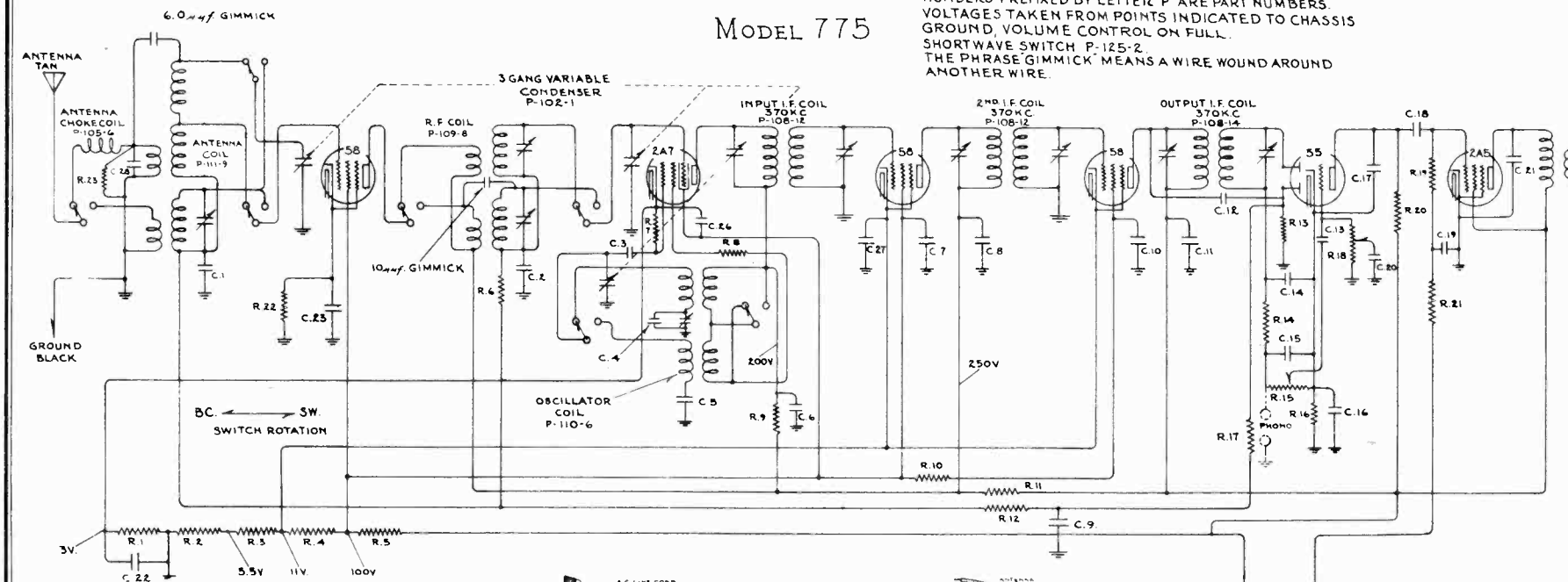
NOTES:

Should the planetary vernier dial drive mechanism fail to function properly, it will probably be found to be due to a cracked or broken compression spring. This drive may be dis-assembled by removing the two screws which fasten it to the dial bracket. The part number of the compression spring is 112-31. All of the other dial parts are hardened and should cause no trouble.

IF PEAK 370 KC.

MODEL 775

~ NOTE ~
CONDENSERS C.8, C.11 ARE IN ONE UNIT P-1064
" C.22, C.23 " " " " P-1059
RESISTORS R.1, R.2, R.3, R.4, R.5 IN ONE UNIT P-106-12
NUMBERS PREFIXED BY LETTER 'P' ARE PART NUMBERS.
VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND, VOLUME CONTROL ON FULL.
SHORTWAVE SWITCH P-125-2.
THE PHRASE 'GIMMICK' MEANS A WIRE WOUND AROUND ANOTHER WIRE.

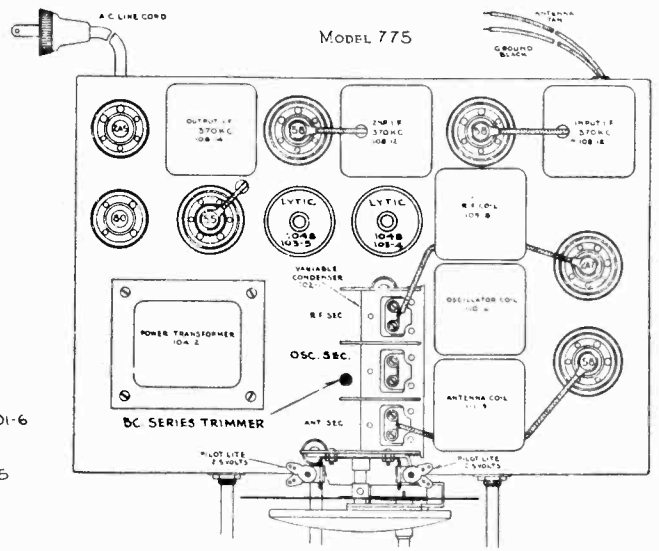


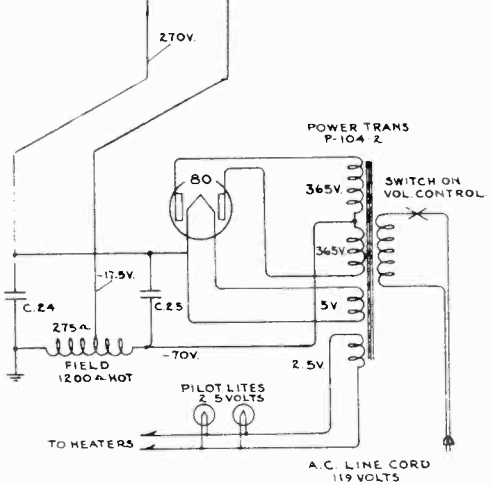
CONDENSERS

Nº	VALUE
C.1	.05×200V.
C.2	.05×200V.
C.3	.00025 MICA
C.4	.0006 MICA
C.5	.003 MICA
C.6	.05×400V.
C.7	.25×200V.
C.8	.1×400V.
C.9	.01×400V.
C.10	.1×200V.
C.11	.1×400V.
C.12	.00002 MICA
C.13	.05×200V.
C.14	.00025 MICA
C.15	.00025 MICA
C.16	20MFD. 20V. P-119-5
C.17	.0005 MICA
C.18	.05×400V.
C.19	.25×200V.
C.20	.01×400V.
C.21	.01×400V.
C.22	.1×200V.
C.23	.1×200V.
C.24	16 MFD. 350V. PEAK P-103-4
C.25	8 MFD. 500V. PEAK P-103-5
C.26	.05×200V.
C.27	1.0×120V.
C.28	120 μμf.

RESISTORS

Nº	VALUE
R 1	300Ω
R 2	400Ω
R 3	300Ω
R 4	10MΩ
R 5	13MΩ
R 6	100M. 1/3W
R 7	50M. 1/3W
R 8	400 1/3W
R 9	5M. 1/3W
R 10	2M. 1/3W
R 11	1M 1/3W
R 12	100M 1/3W.
R 13	1 MEGOHM
R 14	50M 1/3W.
R 15	500M VOLUME CONTROL P-101-6
R 16	20M 1/3W
R 17	500M 1/3W
R 18	500M TONE CONTROL P-101-5
R 19	250M 1/3W
R 20	250M 1/3W.
R 21	250M 1/3W.
R 22	250Ω 1/3W.
R 23	10M 1/3W.





3-1-14

REVISED 4-20-34

BELMONT RADIO CORP.

MODEL 775
Schematic, Socket
Trimmers, Parts

MODEL 775
Alignment

BELMONT RADIO CORP.

SERVICE NOTES

Should it ever become necessary or desirable to re-align this receiver, procedure is as follows:

Before making any adjustments, the chassis should be removed from the cabinet. This is accomplished by removing the four bolts which anchor it to the base of the cabinet and removing the knobs from the front of the cabinet, chassis can then be slipped out.

To properly align this receiver, especially the short wave band, it is essential that the oscillator used have good stability and include an attenuator in addition to covering the frequencies required. An output meter must be used to indicate resonance. It may be connected across the primary of the speaker input transformer.

I.F. ALIGNMENT:

1. With volume control full on, at extreme right of its rotation, and with variable condenser at its maximum capacity position (plates entirely in mesh) and with band selector switch in broadcast position, left (counter-clockwise), make the following adjustments:
   (a) Connect an oscillator set at 370 kilocycles in series with a .1 mfd. condenser to the control grid of the first detector (cap at top of 2A7 tube), and connect the ground side of the test oscillator to the ground lead of the set (black wire).
   (b) Adjust trimming condensers of all three I.F. transformers, part number 108-12 input I.F., 108-12 second I.F. and 108-14 output I.F. to resonance.
2. Adjustments are provided on each transformer and are accessible from the back of the chassis (see top view of chassis).

BROADCAST BAND FREQUENCY ALIGNMENT:

1. With volume control full on and the gang condenser set to its minimum capacity:
   (a) Re-set test oscillator to 1712 kilocycles.
   (b) Adjust broadcast oscillator shunt trimmer to resonance. This trimmer is the one nearest the top of the oscillator coil and can assembly, part number 110-6.
   (c) Re-set test oscillator to 1400 kilocycles and shift the test oscillator lead from grid cap of the oscillator tube to the grid cap of the R.F. tube (type 58).
   (d) Tune the gang condenser to resonance with the test signal (1400 k.c.)
   (e) Adjust the R.F. tuned circuit to resonance by bending adjustable condenser plate of the R.F. (rear) section of the gang condenser.
   (f) Shift test oscillator lead to the antenna lead (tan wire) and substitute a 200 mmfd. condenser for the .1 mfd. condenser which is in series with the test lead.
   (g) Adjust the antenna tuned circuit to resonance by bending the adjustable condenser plate of the antenna (front) section of the gang condenser.
   (h) Turn the gang condenser to maximum capacity.
   (i) Adjust the broadcast series trimmer (located to the left of the gang condenser and accessible through the top of the chassis) to resonance with the test oscillator, with the test oscillator set at 535 kilocycles.
   (j) Check alignment at 1400, 1000 and 800 kilocycles, bending plates of the R.F. (rear) and antenna (front) sections of the variable condenser if necessary. DO NOT BEND PLATES OF OSCILLATOR (CENTER) SECTION UNDER ANY CIRCUMSTANCES.

SHORT WAVE BAND FREQUENCY ALIGNMENT:

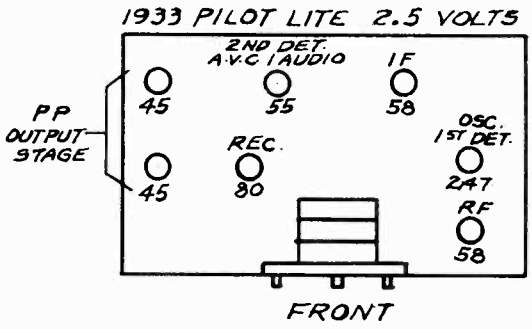
1. Turn the band selector switch to the short wave position, right (clockwise) position.
   (a) Adjust input oscillator to 15 megacycles and attach to grid of first detector (cap at top of 2A7 tube).
   (b) Adjust short wave oscillator shunt trimmer to the oscillator signal. Be careful that you don't adjust it to the image. This adjustment is the one closest to the chassis on the side of the oscillator coil and can assembly, part number 110-6.
   (c) Move the signal generator clip to the grid of the first R.F. tube (type 58).
   (d) Adjust short wave R.F. trimmer to resonance. Adjusting screw is located on side of R.F. coil and can assembly, part number 109-8.
   (e) Connect oscillator in series with a 200 mmfd. condenser to the tan antenna lead and black ground lead and adjust short wave antenna trimmer to resonance (adjustment on side of antenna coil and can assembly, part number 111-9).
   (f) Check sensitivity at 6 megacycles.

NOTES:

Should the planetary vernier dial drive mechanism fail to function properly, it will probably be found to be due to a cracked or broken compression spring. This drive may be dis-assembled by removing the two screws which fasten it to the dial bracket. The part number of the compression spring is 112-31. All of the other dial parts are hardened and should cause no trouble.

MODEL 750
Alignment, Socket

BELMONT RADIO CORP.



SERVICE MANUAL SEVEN TUBE SUPERHETERODYNE WITH A.V.C. AND SHORT WAVE

105-115 Volts Alternating Current, 50-60 Cycles, 80 Watts. 530-1720 Kilocycles - 1700-4500 Kilocycles.

SERVICE NOTES

Should it be at any time necessary to rebalance this set, the correct proceedure is as follows:

1. Volume and tone controls on full during all alignment.
2. Squelch switch in "no squelch" position (counter-clockwise (left) rotation) during all alignment.
3. Adjust variable squelch control on rear flange of chassis to maximum counter-clockwise (left) position.
4. Set variable condenser in minimum capacity position (plates open) at the start of all aligning.

I.F. ALIGNMENT

The intermediate frequency of model 750 is 175 kilocycles, and is aligned as follows:

1. Connect oscillator (set at 175 kilocycles) to I.F. grid (second 58 tube) and adjust both trimmers of second I.F. transformer (underneath chassis) to resonance (maximum deflection on an output meter connected across the primary of the speaker input transformer).
2. Connect oscillator output to converter grid (2A7 tube) and adjust both trimmers of first I.F. transformer to resonance. Under no conditions touch the trimmers of the second I.F. transformer after adjusting them (see No. 1).

The four trimmers of the two I.F. transformers are all adjusted from the bottom of the chassis (one nut and one screw adjustment on each I.F. transformer trimmer).

BROADCAST BAND ALIGNMENT

Wave changing switch in clockwise (right) position.

1. Connect an oscillator in series with a 200 mmfd. condenser to the Tan (antenna) lead and Black (ground) lead. With the oscillator set at 1720 kilocycles and the variable condenser at its minimum position (extreme right of its rotation), adjust trimmer of oscillator (rear) section to resonance.
2. Change oscillator to 1400 kilocycles, rotate variable to this frequency and adjust R.F. and antenna trimmers (center and front trimmers respectively) to resonance. Do not touch the oscillator trimmer.
3. Check tracking at the following points only: 1200-1000-800-600-534 kilocycles. NOTE: This receiver will be slightly out of track at 534 kilocycles - do not bend plates in an attempt to track it at this frequency. Rotor plates of condensers should not be bent, except if absolutely necessary, and then only on the center and front sections.

SHORT WAVE BAND ALIGNMENT

Wave changing switch in counter-clockwise (left) position.

1. The frequency range of this short wave band is approximately 1700 to 4500 kilocycles.
2. Peak short wave antenna coil to resonance with oscillator set at 1720 kilocycles by slipping primary.
3. Check for sensitivity at the following frequencies only: 1720 and 3700 kilocycles - under no conditions touch trimmers or plates of variable condenser while checking short wave band.

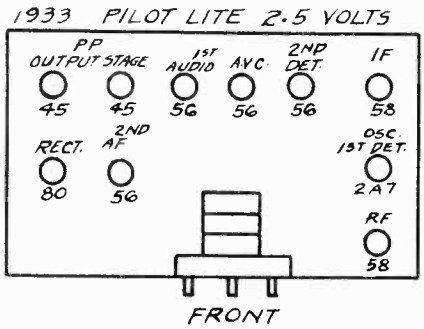
NOTES:

For failure to operate over both bands, check 2A7 tube and connections to and contacts of wave changing switch.

Condenser shaft to which pointer is attached is rotated by means of a celluloid dial attached to the condenser shaft and a bronze friction drive assembly, to which is attached the selector knob. Should this drive ever slip or become rough, it can be adjusted for smooth operation by sliding the bronze washer drive assembly either closer to the variable shaft or farther away from it in the slot in which it is mounted, to insure smooth operation.

MODEL 1050
Alignment, Socket

BELMONT RADIO CORP.



SERVICE MANUAL TEN TUBE SUPERHETERODYNE WITH A.V.C., SQUELCH AND SHORT WAVE

105-115 Volts Alternating Current, 50-60 Cycles, 105 Watts. 530-1720 Kilocycles - 1700-4500 Kilocycles.

SERVICE NOTES

Should it be at any time necessary to rebalance this set, the correct proceedure is as follows:

1. Volume and tone controls on full during all alignment.
2. Squelch switch in "no squelch" position (counter-clockwise (left) rotation) during all alignment.
3. Adjust variable squelch control on rear flange of chassis to maximum counter-clockwise (left) position.
4. Set variable condenser in minimum capacity position (plates open) at the start of all aligning.

I.F. ALIGNMENT

The intermediate frequency of model 1050 is 175 kilocycles, and is aligned as follows:

1. Connect oscillator (set at 175 kilocycles) to I.F. grid (second 58 tube) and adjust both trimmers of second I.F. transformer (underneath chassis) to resonance (maximum deflection on an output meter connected across the primary of the speaker input transformer).
2. Connect oscillator output to converter grid (2A7 tube) and adjust both trimmers of first I.F. transformer to resonance. Under no conditions touch the trimmers of the second I.F. transformer after adjusting them (see No. 1).

The four trimmers of the two I.F. transformers are all adjusted from the bottom of the chassis (one nut and one screw adjustment on each I.F. transformer trimmer).

BROADCAST BAND ALIGNMENT

Wave changing switch in clockwise (right) position.

1. Connect an oscillator in series with a 200 mmfd. condenser to the Tan (antenna) lead and Black (ground) lead. With the osc llator set at 1720 kilocycles and the variable condenser at its minimum position (extreme right of its rotation), adjust trimmer of oscillator (rear) section to resonance.
2. Change oscillator to 1400 kilocycles, rotate variable to this frequency and adjust R.F. and antenna trimmers (center and front trimmers respectively) to resonance. Do not touch the oscillator trimmer.
3. Check tracking at the following points only: 1200-1000-800-600-534 kilocycles. NOTE: This receiver will be slightly out of track at 534 kilocycles - do not bend plates in an attempt to track it at this frequency. Rotor plates of condensers should not be bent, except if absolutely necessary, and then only on the center and front sections.

SHORT WAVE BAND ALIGNMENT

Wave changing switch in counter-clockwise (left) position.

1. The frequency range of this short wave band is approximately 1700 to 4500 kilocycles.
2. Peak short wave antenna coil to resonance with oscillator set at 1720 kilocycles by slipping primary.
3. Check for sensitivity at the following frequencies only: 1720 and 3700 kilocycles - under no conditions touch trimmers or plates of variable condenser while checking short wave band.

Tun-a-lite. VISUAL TUNING CHECK

The visual tuning indicator (tun-a-lite tube) is mounted horizontally on the front of the variable condenser assembly and its operation in this respect can be checked as follows:

1. Normally there will be a small continuous glow in the base of the tube when no signal is being received.
2. With a strong oscillator input at 1000 kilocycles, the tun-a-lite should glow to approximately the end of the bulb, varying slightly with different tun-a-lites. If the glow "travel" is short, or none at all, remove the tun-a-lite tube and check its socket connections and contacts. If the tube still fails to indicate satisfactorily, replace the tube.

SQUELCH CHECK

The tun-a-lite tube is also used for noise suppression between stations. Its operation can be checked as follows:

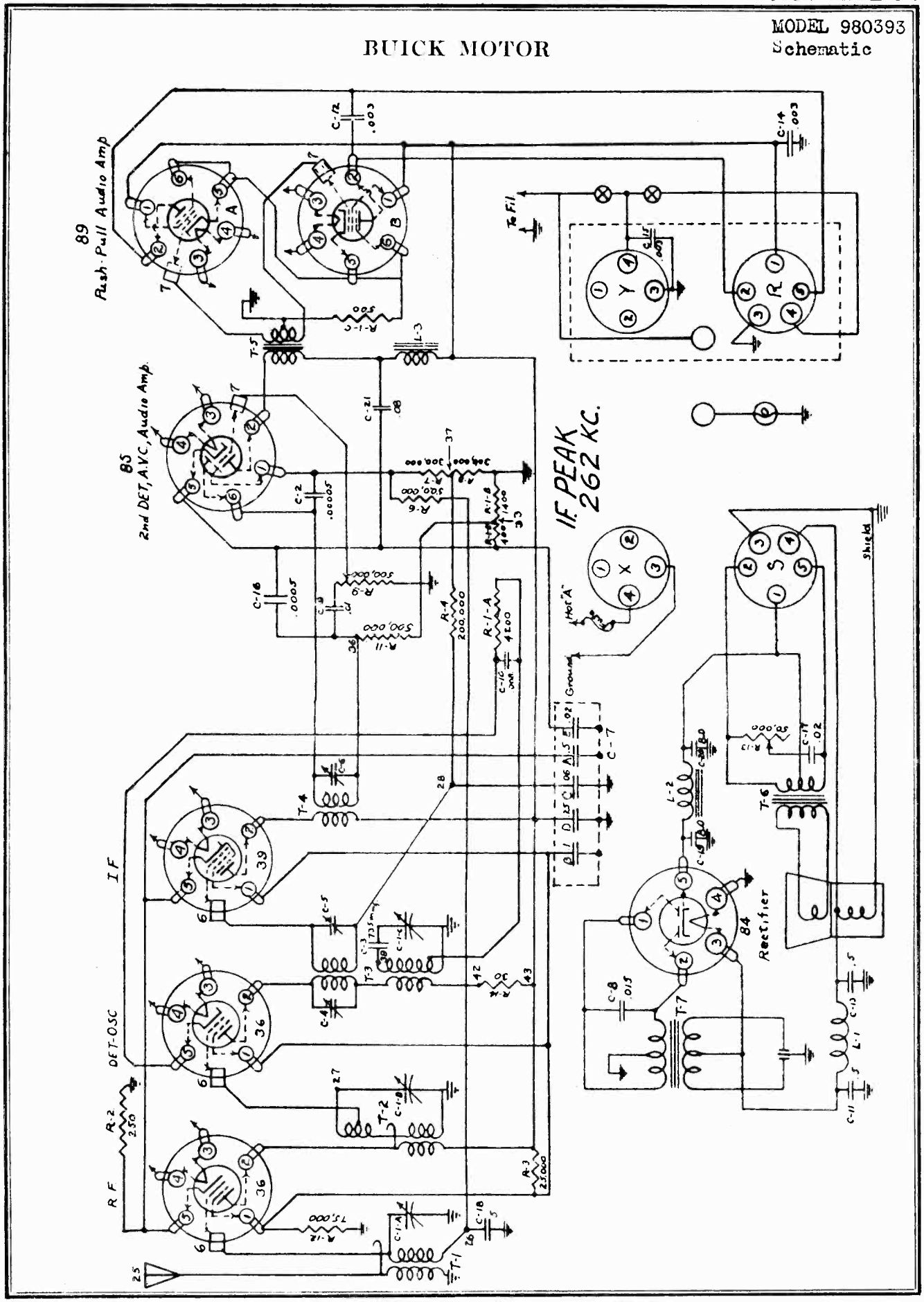
1. Squelch switch adjusted to squelch (clockwise (right) position).
2. Disconnect oscillator, connect antenna, tune set to a position where no signal is received. Noise level at this position should be quite high.
3. Rotate set screw of squelch control on rear flange of chassis, and at some point the noise should cease and the set sound "dead", indicating that the tun-a-lite is squelching and eliminating between station noise.

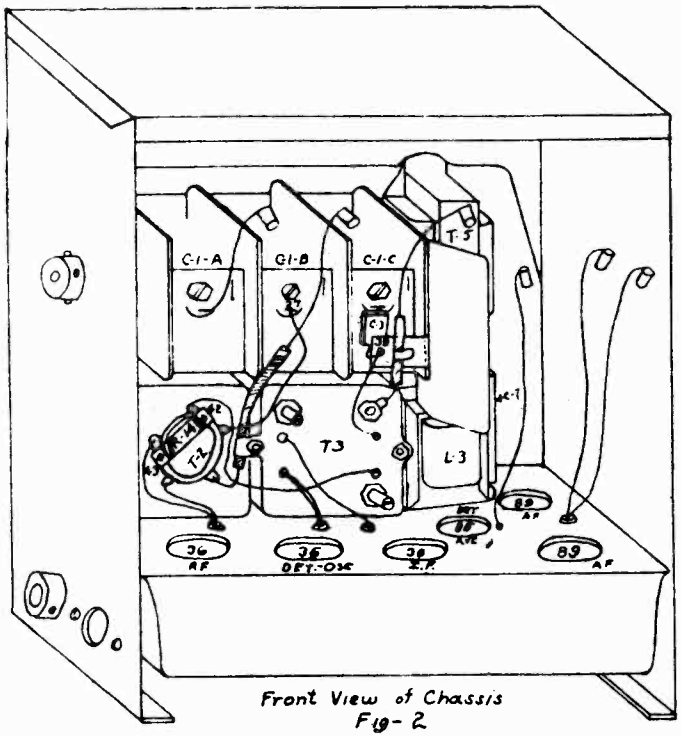
NOTES: For failure to operate over both bands, check 2A7 tube and connections to and contacts of wave changing switch.

Condenser shaft to which pointer is attached is rotated by means of a celluloid dial attached to the condenser shaft and a bronze friction drive assembly, to which is attached the selector knob. Should this drive ever slip or become rough, it can be adjusted for smooth operation by sliding the bronze washer drive assembly either closer to the variable shaft or farther away from it in the slot in which it is mounted, to insure smooth operation.

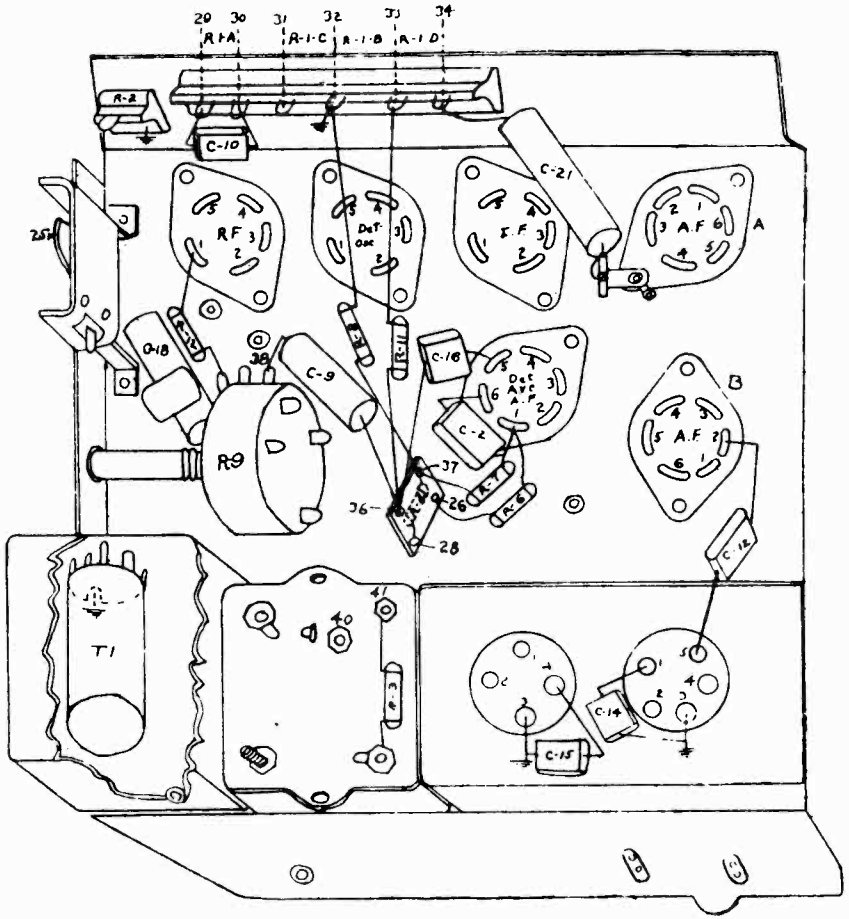
BUICK MOTOR

MODEL 980393
Schematic





Front View of Chassis
Fig- 2



Parts Location

Tube	Screen Contact #1	Plate Contact #2	Heater Contact #3	Heater Contact #4	Cathode Contact #5	Gnd. Contact #6
236 RF	85	165	0	6.0	2.1	
236 Osc.	85	165	0	6.0	6.0	
239 IF	85	165	0	6.0	2.1	
85 Det.	0-A.V.C.	125	0	6.0	7.5	.2 Det.
A-89 AF	165	160	6.0	0	30.0	30.0
B-89 AF	165	160	0	6.0	30.0	30.0
84 Rect.	3.5	3.5	0	6.0	180	

PEAKING ADJUSTABLE CONDENSERS

The complete Condenser Aligning Kit is now available under part No. 1207804. This kit contains all the small parts which are necessary for the proper aligning of the condensers on the U.M.S., B-O-P. and Chevrolet Radio Receivers.

All of the adjustable condensers, commonly called trimmer condensers, are very accurately adjusted at the factory and will not need any further adjustment unless a coil or I. F. transformer is changed or the adjustments are tampered with in the field.

DO NOT attempt to change the setting of any of the trimmer condensers unless it is definitely known that adjustment is necessary, and an accurate test oscillator and a screw driver (with fibre handle) are available. Using a standard metal screw driver for this purpose will not give accurate adjustment

Proceed as follows:

A. Disconnect the antenna lead-in from the chassis.

B. Ground the antenna terminal on the chassis to the frame of the chassis.

C. Set "test oscillator" to 262 kilocycles. Some oscillators are not equipped with a frequency of 262 K.C. but do have a frequency of 130 K.C. In this case, the second harmonic of 130 K.C., namely 260 K.C., may be used.

D. Connect the output leads of the test oscillator to the grid of the 1st Detector tube and to ground (frame of the chassis) Leave grid cap in place.

E. Connect an output meter across the plates of the type 89 tubes. If the output meter is not protected, place a .1 mfd. condenser in series with the meter.

F. Turn the tuning condenser rotor to minimum capacity (rotor plates out of stator places).

G. Adjust I. F. Trimmers in the following order, in each case leaving the trimmer set for maximum output as shown by the output meter* (See note

* C-4, Plate circuit of 1st Det.
C-5, Grid circuit of I. F. Amp.
C-6, Diode Input circuit.

* See Fig 2. and 3 for location of condensers.

H. Remove connection grounding the antenna (reverse of instructions under B)

I. Insert the Calibration Block, Part No. 1206418, between the center (2nd R. F.) condenser and the rear of the chassis as follows: Lay the block on the bench with the largest flat side down and the cut-out edge toward the operator. Pick up the block between the first and second fingers of the hand so that the side having the beveled and cut-out edges faces the knuckles of the hand, and the fingers are as close to the beveled corners as is possible. Insert the hand in the case over the center tuning condenser (condenser plates fully closed) and place the Block between the condenser bracket and the chassis back, with the largest face of the Block flat against the back of the chassis. The Block will fit quite tightly and the left side must rest against the shield between the 1st and 2nd R.F. condensers in order to clear the condenser wiper spring.

J. Attach the test oscillator to antenna terminal and ground (frame) of the chassis. (Ant. on test oscillator to Ant. on chassis and ground on test oscillator to frame of chassis.)

K. Set test oscillator at 1400 K.C.

L. Open tuning condenser until it stops against the Calibration Block

M. Place Tube Shield in position around 236 Det.-Osc. tube. Adjust the trimmer condensers on the tuning condenser to maximum output, as measured by the output meter, in the following order:

C-1-C--Oscillator trimmer
C-1-B--2nd R. F. trimmer
C-1-A--1st R. F. trimmer

*NOTE: To insure sharp peaking of all trimmers, set the oscillator output below the point of start of A.V.C. action. Set the output of the oscillator so that it is less than half the maximum output available.

LOCATING TROUBLES ISOLATED BY VOLTAGE TESTS

The voltmeter tests of the chassis merely serve to isolate the defect in some particular stage of the circuit. The actual fault must be located, in that stage, by means of a point-to-point check of the resistance values of the defective stage.

NOTE: All tubes should be removed from the chassis before making these tests, unless they are known to be good tubes.

Description of incorrect voltage		Test from	To	Correct reading (in OHMS)	Part or parts probably causing incorrect voltage
A. No filament voltage at any socket	1.	Hot "A" lead	X4	Zero	Fuse or green lead
	2.	Y4	RF #4	*Zero	Switch
	3.	Y4	R #4	Zero	Switch
	4.	Y4	Gnd.	#Open	C-15
	5.	S4	"	6	Speaker field
B. No plate voltage at any socket	1.	Rect. #5	Gnd.	Open	C-19; C-20
	2.	" "	S-1	350	L-2
	3.	R-1	Gnd.	100,000	C-14; C-7-D; C-7-B; R-3; R-12
C. 89 sockets	1.	S-1	S-5	425	Output Trans. Pri.
(a) Plate volts	2.	S-1	S-2	225	" " "
	3.	R-2	R-5	Open	C-12
(b) Screen "	1.	R-1	89 #1 (A)	Zero	Defective wiring
	2.	R-2	89 #1 (B)	"	" "
(c) Cathode volts	1.	Gnd.	89 #5 (B)	500	R-1-C
(d) Suppressor grid volts	1.	Gnd.	89 #5 (B)	500	R-1-C
D. 85 Socket					
(a) Plate volts	1.	R-1	85 #2	9,500	L-3; T-5
(b) A.V.C. and Det. plate V.	1.	34	Gnd.	1,800	R-1-B; R-1-D
	2.	34	85 #6	500,000	R-11; T-4; C-9
	3.	85 #6	85 #1	1,000,000	R-7; R-8; R-1-B; R-11; C-2; C-9
(c) Cathode volts	1.	Gnd.	85 #5	1,800	R-1-B; R-1-D; C-7-E
E. 39 IF socket					
(a) Plate volts	1.	IF #2	41	52	T-4 Pri.
	2.	41	Gnd.	100,000	C-1-D; R-3; R-12
(b) Screen volts	1.	IF #1	41	25,000	R-3
	2.	IF #1	Gnd.	100,000	R-3; R-12; C-1-D; C-7-B
(c) Cathode volts		IF #5	Gnd.	250	R-2; C-7-A

* Switch on # Switch off

Description of incorrect voltage		Test from	To	Correct reading (in ohms)	Part or parts probably causing incorrect voltage
F. 36 Osc. socket					
(a) Plate volts	1.	Osc. #2	42	36	T-3
	2.	42	43	30	R-14
(b) Screen volts	1.	Osc. #1	41	25,000	R-3
	2.	Osc. #1	Gnd.	100,000	R-3; R-12; C-7-D C-7-B
(c) Cathode	1.	Osc. #5	Gnd.	4,200	R-1-A; C-10; T-3
G. 36 F. socket					
(a) Plate volts	1.	RF #2	43	75	T-2
(b) Screen volts	1.	RF #1	41	25,000	R-3
	2.	RF #1	Gnd.	100,000	R-3; R-12; C-7-D; C-7-B
(c) Cathode	1.	RF #5	Gnd.	250	R-2; C-7-A
H. Speaker					
(a) Weak		S-4	Gnd.	6	Speaker field
(b) Distorted	1.	S-1	S-5	200	T-6 Trans.
	2.	S-1	S-2	225	T-6 Trans.
	3.	S-2	S-5	425	T-6; C-17; R-13
I. Inoperative power unit					
(a) Vibrator operates					
1. Check 84 tube					
2. Rect. #1		Rect. #2		350	T-7 Sec; C-8
3. Rect. #1		Gnd.		175	T-7 Sec; C-8
4. Rect. #5		Gnd.		Open	C-14; C-20
5. Rect. #5		S-1		350	L-2
(b) Vibrator inoperative					
1. S-4		Gnd.		6	C-11; C-13; Vibrator
2. S-4		Rect. #3		2	L-1

NOTE--It will be necessary to disconnect one lead of all condensers, which have one terminal grounded, in order to test them accurately.

MODEL 980393
Test Data

BUICK MOTOR

SPECIAL TESTS

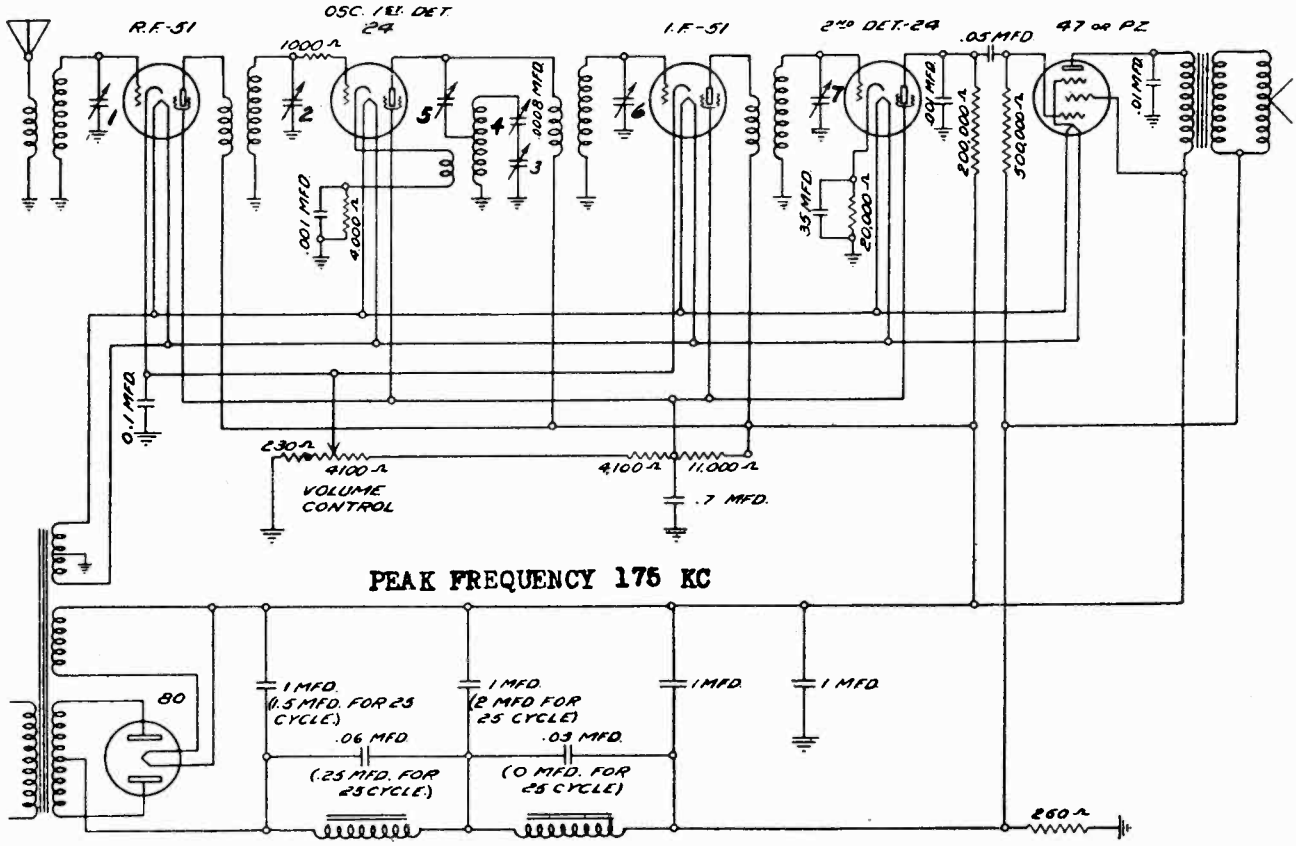
These tests cover all parts of the circuit which are not shown up as defective by the voltage tests

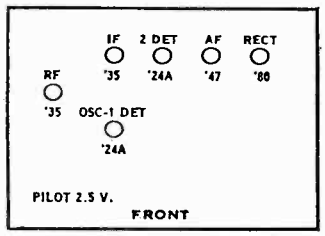
	Test from	To	Correct resistance in ohms	Probable location of trouble if incorrect reading is obtained
1.	Ground (frame)	25	32	T-1 Antenna coil Pri
2.	236 RF #6	26	6	T-1 " " Sec
3.	236 Osc. #6	27	2.5	T-2 RF coil Sec.
4.	236 Osc. #6	Gnd	4	T-2 RF " "
5.	239 Osc. #6	28	50	T-3 IF " "
6.	Ground	29	1	T-3 Osc. coil
7.	"	35	4	T-3 " "
8.	85 Det. #6	36	28	T-4 IF coil Sec.
9.	28	37	200,000	R-4 Resistor
10.	85 Det. #1	26	500,000	R-6
11.	85 Det. #1	37	300,000	R-7
12.	37	Grd.	300,000	R-8
13.	33	36	500,000	R-11
14.	85 Det. #7	Grd.	0-500,000	Vol.Control (Rotate)
15.	89 AF #7 (a)	Grd.	4,000	T-5 Input Trans. Sec
16.	89 AF #7 (b)	Gnd.	4,500	T-5 " " "
17.	36	38	Open	C-9
18.	85 Det. #1	85 Det. #6	1,100,000	R-11; R-1-B;R-8;R-7
19.	39	(Tuning Cond. (stator plates	Open	C-3
20.	Voice coil lead	Input trans. lead	2	Defective voice coil or Input Trans. Sec.

NOTE--Disconnect the voice coil lead at one of its terminals on the lower side of the input transformer and test from the end of the disconnected lead to the terminal from which it came

BULOVA WATCH COMPANY

MODEL 600,601,605,610
Schematic,Voltage
Socket





READING TAKEN WITH WESTON MODEL 565 ANALYZER

MODEL No. CUSTOMER BY

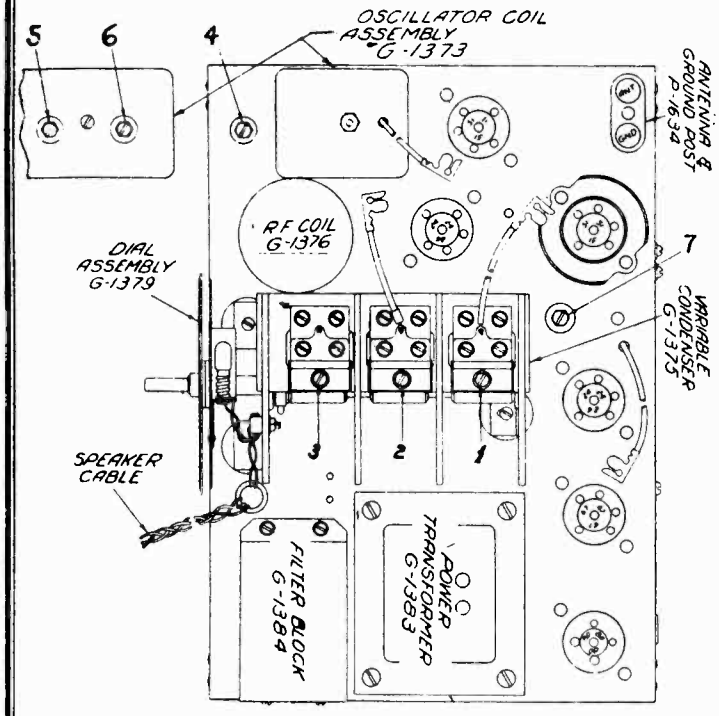
No.	Stage	Type Tube	"A" Volts	"B" Volts	Cont. Grid Volt	Cath. Volts	S. G. Volts	Ip Norm.
1	R. F.	51	2.15	235	2.4	2.5	80.	5.0
2	Autodyne	24	2.15	225	5.0	6.0	75.	3.0
3	I. F.	51	2.15	230	2.4	2.5	75.	4.0
4	2nd Det.	24	2.15	104	10.	15.	65.	0.6
5	Audio	47	2.25	250	16	0	260	30.
6	Rect.	80	4.4					57.5

Line Voltage 115. Order of Test: 1 Rect., 2 Power, 3 Det., Etc.
Volume Control Position, Full On.

NOTE: Since resistance tolerances in the sets are plus or minus 10% and tubes may vary over 20%, your readings may disagree with the above by plus or minus 30%.

MODEL 600,601,605,610
Trimmers,Alignment

BULOVA WATCH COMPANY



READJUSTING TRIMMERS

Number 1 is the antenna trimmer.

Number 2 is the gang condenser trimmer tuning the grid of the Super-autodyne.

Number 3 is the gang condenser trimmer tuning the plate (or oscillator of the super-autodyne).

Number 4 is the oscillator padding trimmer.

Number 5 is the Super-autodyne plate trimmer.

Number 6 is the I. F grid trimmer.

Number 7 is the second detector grid trimmer.

To readjust the trimmer, it will be necessary that a good design of 175 k. c. oscillator be employed, and that a dependable broadcast test oscillator be on hand so that stages handling intermediate frequency, and those handling radio frequency can be thoroughly checked. It is advisable to use a bakelite screwdriver when making any of these adjustments.

First, connect the 175 k. c. oscillator output leads from the control grid cap of the super-autodyne tube to ground. Do not remove any of the tubes from the sockets, and it is not necessary to disconnect the grid cap clip from the tube. Reset trimmers numbers 5, 6 and 7 for maximum output. While this test oscillator is working into the intermediate frequency stages, no adjustment of the tuning condenser on the receiver will have any effect, inasmuch as the intermediate frequency stage is fixed tuned.

If your test oscillator is properly designed, it will supply exactly 175 k. c., and when trimmers number 5, 6 and 7 are set for maximum output, they will be correctly adjusted and should be sealed.

Next, disconnect the 175 k. c. test oscillator and connect to the antenna binding post of the receiver, the output lead from your broadcast test oscillator, or tune in a broadcast signal around 1400 k. c., then reset trimmers numbers 2 and 1 respectively for maximum output. This adjustment will track the super-autodyne grid circuit of the R. F. stage.

To check the calibration of the receiver, whether it be high or low, trimmer number 3 should be reset until a station of known nigh frequency is brought in on the correct dial marking with peak volume. If your broadcast test oscillator is accurately calibrated, it might be used in place of the broadcasting station signal. In this adjustment, a broadcast station or test oscillator signal at about 1400 k. c. should be chosen. The setting of the trimmer at 1400 k. c. is more critical than it would be at 600 k. c.; calibration, therefore more accurate.

The next adjustment is important and not easily explained in writing, so pay close attention to the following instruction. We will now balance the oscillator to the r. f. and first detector stages.

Tune the external broadcast test oscillator and the receiver both to 600 k.c., then slowly increase or decrease the capacity of No. 4 (oscillator padding trimmer), at the same time and continuously tuning back and forth across the signal with the receiver tuning condenser gang. The output meter needle will now be swinging up and down in step with the variation in tuning. Watch the peak of this swinging closely and readjust No. 4 trimmer until the swinging needle reaches its highest peak.

Retune the receiver and broadcast test oscillator to 1400 k.c. and re-check trimmer No. 3 to make sure that the adjustment of No. 4 has not thrown the receiver out of calibration. If it has, then readjust No. 3 until the calibration is correct, (as previously explained), and check on trimmers No. 2 and No. 1, to make sure that the adjustment of No. 4 has not reduced the sensitivity.

Cadillac and La Salle

MOTOR CAR RADIO

SERIES 06W — 1933-34

CADILLAC MOTOR CAR COMPANY — DETROIT, MICHIGAN

Description

The new 06W Series Auto Radio Receivers are made up in three units: the chassis unit, speaker—"B" eliminator unit and control unit. The control unit is mounted to the instrument panel, while the speaker — "B" eliminator unit and chassis are mounted on the dash. Current to operate the chassis and "B" eliminator is obtained from the automobile storage battery. Two flexible shafts mechanically connect the control unit to the chassis. One of these is for the volume control and switch, while the other is for the tuning mechanism. A roof antenna is used.

In this manual are covered detailed instructions for the installation of each part and information for completing and maintaining the installation. The following tools are required: portable electric drill, screw drivers, pliers, a heavy soldering iron, hack saw, files, small wrenches, and cutters.

Before making the installation it is suggested that this manual be completely read.

Mounting the Chassis

Before mounting the chassis read the articles on "Mounting the Control Unit" and "Attaching the Flexible Drive Shafts." Hold the control unit in position or mount it in place temporarily, so that the position of the flexible shafts can be determined.

The chassis is mounted in back of the dash at the left side, as shown in Fig. 1. It should be mounted in such a way that the tuning condenser flexible drive shaft to the control unit will be in substantially a straight line as shown in Figs. 1 and 2. The chassis is mounted with the anchor bushings in which the flexible shafts go, facing the control unit, and with the cover at the bottom. It is secured to the dash by means of the dash mounting plate, see Fig. 4. In some of the earlier models it will be necessary to move the cut-out box to a higher location in order to mount the chassis.

First drill the three mounting holes required for the dash mounting plate. The location and size of these holes is shown in Fig. 3. A template for drilling these holes is supplied with the set. Three 4" square head mounting bolts are supplied. Take two of these, which will be used for the upper part of the mounting plate and screw on nut "A" (see Fig. 4). The nut should be just far enough away from the head of the bolt to permit the bracket of the mounting plate to slip down as shown in the illustration. Then put on nut "B" and the washer, after which the two bolts can be put through the dash, with the shanks extending into the engine compartment, as shown in Fig. 4. A washer, lockwasher, and nut are then put on these bolts from the front of the dash to hold them in place.

The distance "X" between nuts "A" and "B" determines how far out the chassis is mounted from the dash. When there is a lot of apparatus in back of the dash, such as wires, tubing, etc., the chassis will have to set out far enough to clear it. However, in practically all models of Cadillac and LaSalle cars, there is no interfering apparatus and therefore the distance "X" will be zero.

Then put a washer on the third mounting bolt and put this bolt through the lower mounting hole with the head on the engine side of the dash, as shown in the illustration. Put on a washer, lockwasher, and nut "D" and tighten it up. Then put on nut "E" with a washer as shown. Nut "E" should be screwed down until it is about 1/4" from nut "D," when distance "X," as explained above, is zero.

Next secure the dash mounting plate to the chassis box by means of the four chassis mounting screws. The four mounting screws on the broad side of the chassis box are used. As explained above the cover of the box is at the bottom.

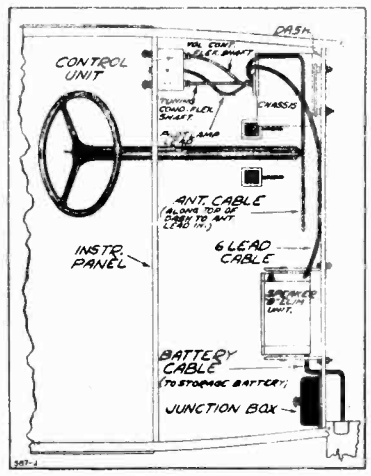


Fig. 1—General Installation—Top View

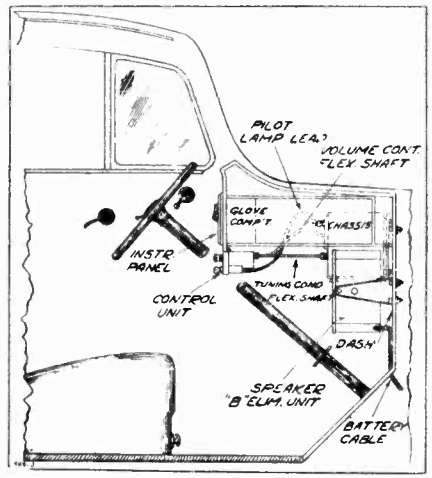


Fig. 2—General Installation—Side View

All the tubes should be in the sockets, the antenna trimmer adjusted (as explained later) and the flexible shafts connected before the chassis is permanently installed. Complete information on the latter procedure is contained in the article on attaching the flexible drive shafts.

The four mounting screws pass through the four slots in the mounting plate (Fig. 3). After they are in place and tight, the dash mounting plate with chassis attached is slipped over the three mounting bolts. The two upper brackets on the plate slip down in back of nut "A" as shown in Fig. 4 and the slot at the bottom of the plate slips over the shank of the lower mounting bolt in back of nut "E." The plate will then hang with the bottom farther away from the dash than the top. A washer, lockwasher, and nut "F" are then put on the lower mounting bolt. Nut "F" is screwed on until the mounting plate is tight up against the washer in back of nut "E." In this position, the bracket at the top of the mounting plate should butt up against nut "A" and be tight. Also the mounting plate will be approximately parallel with the dash.

Mounting the Control Unit

The control unit is mounted to the instrument panel as shown in Figs. 1 and 2. In the 1932 and 1933 models there are two holes on the flange at the bottom of the instrument panel on the left side, which line up with the two holes on the mounting lugs of the control unit. In the earlier models, it will be necessary to drill these holes. Two 1/4" holes with centers 4 7/8" apart are required. The best location for these holes is at a point where the tuning condenser flexible drive shaft to the chassis will be in substantially a straight line (see Figs. 1 and 2).

Before mounting the control unit permanently attach the flexible shafts, as explained in the next article, and attach the pilot lamp plate to the bottom of the unit, as explained in the article on "Completing the Wiring Connections."

Mounting the Speaker-"B" Eliminator

The speaker-"B" eliminator is mounted on the back of the dash by means of two brackets, as shown in Fig. 5. The best location is at the right side of the dash under the glove compartment as shown in Figs. 1 and 2. It should be mounted with the brackets at the side as shown in (A) Fig. 5, and with the inner bracket mounting holes as indicated in (B) Fig. 5. The box is mounted with the tone control knob at the upper left, as shown in Fig. 1. The grilled portion of the box at the front should face the listener.

In some of the older models which have a hot water heater mounted at the right side of the dash, it will be necessary to mount the speaker-"B" eliminator unit at the center of the dash. In those models which have the coil mounted on the dash, it will be necessary to move the coil to the engine compartment, as explained in the article "Suppression of

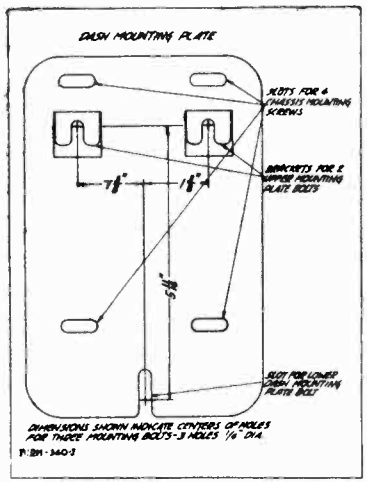


Fig. 3—Dash Mounting Plate

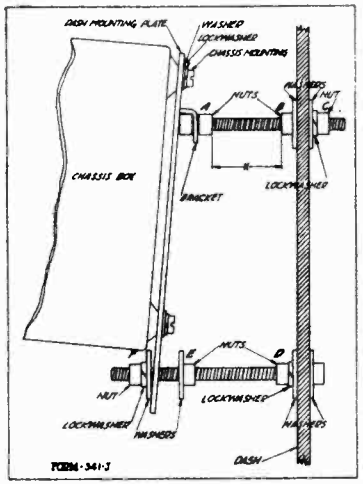


Fig. 4—Details of Chassis Mounting on Dash

Ignition and Generator Noise," before this can be done.

In Fig. 5 (B) is shown how the brackets may be mounted vertically if space does not permit their being mounted horizontally, as is the case in some cars.

After the position of the speaker is decided on, drill the four $\frac{1}{8}$" holes required for the bracket mounting bolts. A template for the mounting holes is supplied with the receiver. The holes are arranged in a rectangle. The centers of the holes, the small dimension are 2½" apart and the long dimension 10" apart. Four ¼" x 3" mounting bolts, nuts and lock washers and two reenforcement plates are provided. The mounting bolts are put through the bracket and the dash with the shanks extending into the engine compartment. The reenforcement plates are then put on, one being used for each bracket, after which the lockwashers and nuts are then put on.

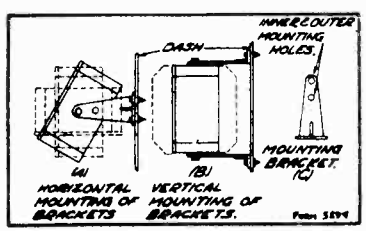


Fig. 5—Method of Mounting Speaker

Attaching the Flexible Drive Shafts

After the chassis is temporarily mounted and the position of the control unit is known, the flexible shafts may be attached. Remove the chassis from the mounting bolts to make the connection.

Two flexible shafts are supplied with the Cadillac and La Salle auto receiver, one 9" and one 12" long. The 9" shaft is the tuning condenser flexible shaft and is put on in substantially a straight line, as shown in Figs. 1 and 2. The 12" shaft is the volume control shaft. This shaft bends upward from the control unit, as shown in Fig. 2.

The distance between the instrument panel and the dash varies in Cadillac and La Salle cars. In some cars the flexible shaft lengths of 9" and 12" supplied with the receiver are too long. For that reason, these shafts (inside portion) are squared for a length of 3" at one end. The shaft may then be cut at any point along the squared portion to whatever length is required. It should be cut with a three-cornered file or the edge of a grinding wheel. *Do not use a hack saw.* The casing, which is 1½" shorter, must be cut to correspond. This should be tinned first at the point to be cut and may then be cut with a hack saw.

After the length and position of the shafts is decided on, remove the chassis and mounting plate from the mounting bolts. As the shafts are already secured at the control unit (if they have not been taken out to cut), it is necessary only to secure them at the chassis end. Before attaching the shafts, see if the set is in working order. Put the 8-prong socket in place on the chassis and operate the set with the cover off.

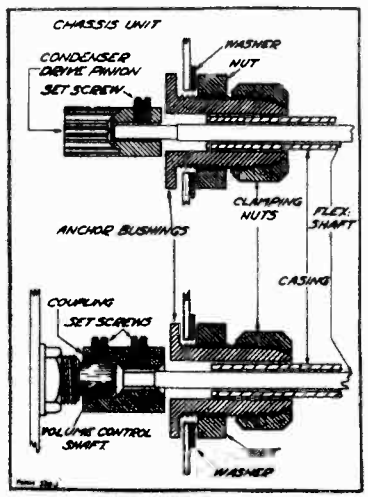


Fig. 6—Details of Flexible Drive Shaft Connections

In Fig. 6 is shown a cross-sectional view of the flexible drive shaft connections at the chassis end. First check the centering of the volume control anchor bushing by eye. The center of the bushing should be in a line with the center of the volume control coupling. In case the center of the bushing is not in line or the shaft turns hard, loosen the nut which holds the bushing in place. Then insert the shaft in the coupling and tighten the set screws as explained below. This will center the bushing and the nut may then be tightened.

Next, take the tube cover plate off. This is the large plate held on the chassis box by 5 screws. Extend the volume control flexible shaft and casing several inches through the hole in the anchor bushing of the tube cover plate so that the plate will be on the casing and out of the way. Turn the volume control coupling counter-clockwise until the switch is snapped to the off position. Lock the receiver on the control unit and turn the volume control knob counter-clockwise until it is in the locked position. Then loosen both set screws in the volume control coupling and insert the flexible shaft in the coupling (see Fig. 6). Tighten the outer set screw first on *one of the four flat faces* of the flexible shaft and then tighten the inner set screw. Then again temporarily hang the chassis on the mounting bolts. Next, check the operation of the switch, volume control and lock. The switch should be off when the volume control knob is in the locked position. It may be necessary to loosen the inner set screw and do a slight amount of adjusting until the proper setting is obtained.

Next, slide the tube cover plate into position and fasten it in place by means of the five screws. Then tighten down the clamping nut on the volume control shaft casing but *do not tighten this nut excessively.*

To attach the tuning condenser flexible shaft, first check the centering of the anchor bushing by eye as was explained above. Then extend the tuning condenser flexible shaft into the hole at the center of the tuning condenser drive pinion. With the rotor plates completely in mesh, turn the dial gear in the control unit until it is at the low frequency end stop. The set screw may then be tightened and the clamping nut secured on the casing as was explained above. In some instances, it may be necessary to loosen the set screw of the large gear on the tuning condenser rotor shaft and adjust the setting of this gear in order to get an accurate calibration.

Antenna

As the Cadillac and LaSalle cars come equipped from the factory with built-in antennas, the antenna portion of the installation is very simple. The lead-in wire from the antenna will be found behind the right cowl pad at the top edge.

If any installations are made in cars which do not have a roof antenna, one will have to be put in. The roof antenna is by far the most satisfactory type and should be used in all cases except in sport models, in which case a plate antenna under the car may be used.

Completing the Wiring Connections

Antenna Cable

Bring the antenna cable of the receiver in the most direct manner possible to the lead-in from the antenna and connect it to the latter. Keep it as high as possible and as far away from any car wiring as possible. Care should be taken not to have the antenna wire come in contact with the shield wires. Ground the pigtail of the antenna cable shield at the antenna end. The pigtail of this shield at the chassis end is grounded.

The shielded antenna lead from the receiver is not long enough to reach to the column at which the antenna lead-in comes down. If motor noise is experienced, cover the exposed portion of the lead-in wire with loom and braided shield from the point where it leaves the column to the point of connection to the antenna lead of the receiver. Connect the two wires together and connect the two shields together, care being taken that no strand of the shield touches the antenna wire.

CADILLAC

MODEL 06W
Schematic, Socket
Alignment

Battery Cable and Six Lead Cable

As shown in Figs. 1 and 2, the battery cable is brought down the dash, through a hole in the dash and thence over to the battery. It passes through the raised portion of the battery compartment cover.

The lug on the lead marked "positive" is connected to the positive side of the battery and the lug on the negatively marked lead is connected to the negative side of the battery. Ground the pigtail of the shield by screwing the No. 6 Parker Kalon screw through the end of the pigtail and through the hole in the lug which is grounded.

The six-lead cable between the chassis and the speaker—"B" eliminator is usually brought over along the dash as shown in Fig. 1.

Pilot Lamp

Before the control unit is permanently mounted, complete the pilot lamp connections. The pilot lamp cable is attached to the eight-prong socket. At the end of this cable is the pilot lamp socket and clip, the latter being attached to an angle bracket. This bracket is to be screwed to the pilot lamp plate which will be found in the bag of parts. A ¼" 6-32 binding head screw, nut and lockwasher are provided for this purpose. The bracket is put on the pilot lamp plate in such a way that the leads will come out at the back of the control unit. The pilot lamp plate is then screwed to the bottom of the control unit by means of the lug on each side of the plate.

Trying Out the Set and Adjusting

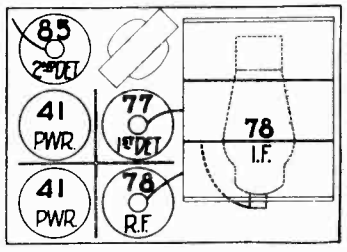


Fig. 7—Location of Tubes

After the wiring has all been completed and before the chassis is permanently installed, try out the set and adjust the antenna trimmer condenser.

To adjust the antenna trimmer, tune in a weak signal between 1200 and 1400 KC with the volume control about three-quarters on. On one end of the chassis box is a small metal plate. Remove the two screws which hold this plate in place. Directly under the hole in the chassis box is the antenna trimmer condenser screw. Turn this adjusting screw up or down until maximum output is obtained.

The location of the tubes is shown in Fig. 7.

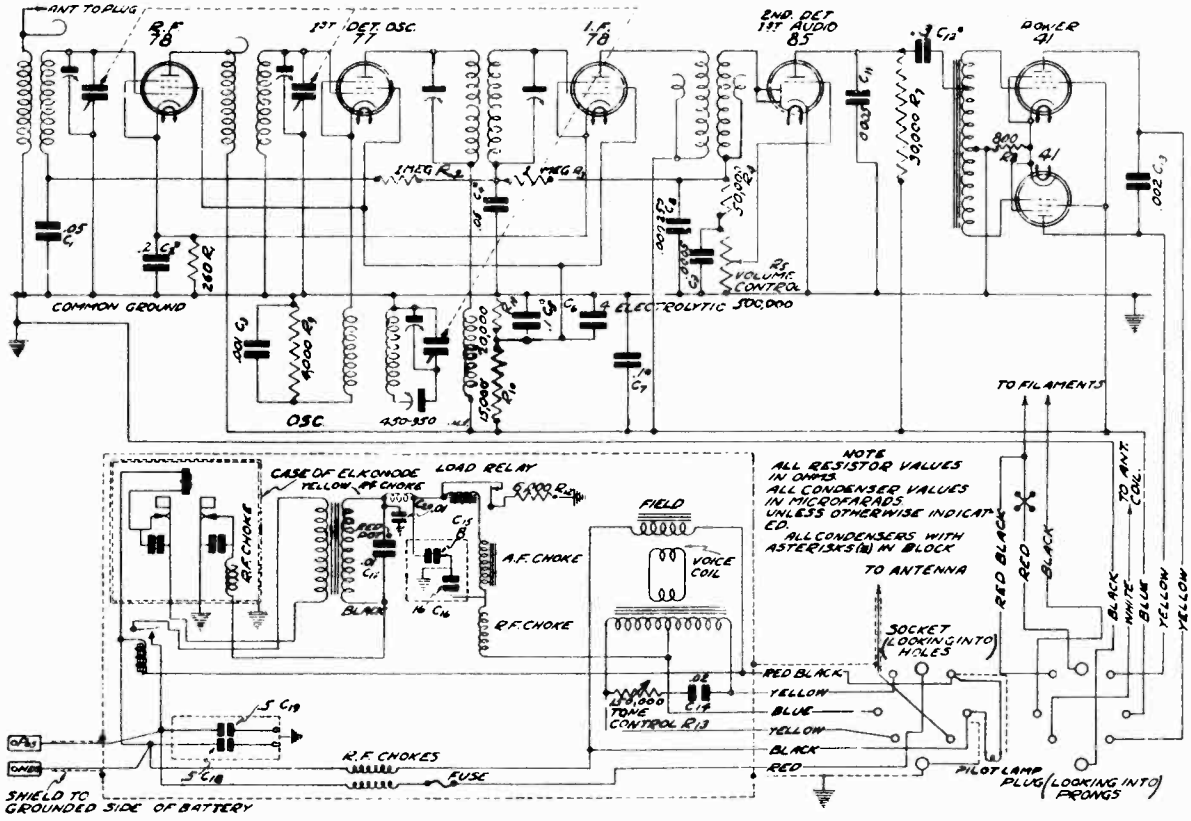


Fig. 9—Schematic Circuit Diagram

IF PEAK 262 KC.

MODEL 06W
Parts List

CADILLAC

Replacement Parts for Series 06W Receivers

"S" Type — Black Finish

"R" Type — Maroon Finish

CHASSIS PARTS

Part No.	Description
P-1763	No. 85 Tube Socket
P-1761	No. 77 Tube Socket
P-1762	No. 78 Tube Socket
P-1665	No. 41 Tube Socket
P-1760	8-Prong Male Plug
P-50581	Tuned Impedance Transformer
P 20546	Pinion Compression Spring
P-20544	Pinion Mtg. Bracket
P-20586	Cond. Drive Pinion
P-20585-A	Cond. Drive Gear
P-1568-A	Tube Shield Assembly
P-10263	3/8 Long Tube Bumper (Rubber)
P-10210	5/8 Long Tube Bumper (Rubber)
P-30417	Volume Control Coupling Unit
P-5094	2nd I. F. Coil and Can Assembly Complete
P-5063	1st I. F. and Oscillator Coil and Can Assembly Complete
P-5069	Complete R. F. Coil and Can Assembly
P-5064	Antenna R. F. Transformer only
P-5065	Interstage R. F. Transformer only
P-20516	6-32 Wing Nuts for Chassis Cover—Black
P-20737	6-32 Wing Nuts for Chassis Cover—Red

Resistors

(In Chassis)

Part No.	Code No.	Resistance	Type
P-B90962	R1	260 ohm	Carbon
P-A90948	R2	1 Megohm	Carbon
P-A90948	R3	1 Megohm	Carbon
P-A90941	R4	50,000 ohm	Carbon
P- 91061	R5	500,000 ohm	Volume Control and Switch
P-B91047	R7	30,000 ohm	Carbon
P-B90964	R8	800 ohm	Carbon
P-A90947	R9	4,000 ohm	Carbon
P-B91020	R10	15,000 ohm	Carbon
P-B90950	R11	20,000 ohm	Carbon

(In Speaker—"B" Eliminator)

P-98001	R12	6,000 ohm	Vit. Enamel
P-91013	R13	150,000 ohm	Tone Control

Condensers

(In Chassis)

Part No.	Code No.	Capacity	Voltage	Type
P-80946	C1	.05	mfd. 200 V.	Tubular
P-80821	C3	.001	mfd. 600 V.	Molded
P-80965	C6	4.0	mfd. 150 V.	Electrolytic
P-80919	C8	.00025	mfd. 600 V.	Moulded
P-80945	C9	.0005	mfd. 600 V.	Moulded
P-80855	C11	.0005	mfd. 600 V.	Moulded
P-80808-A	C13	.002	mfd. 600 V.	Moulded
P-80903-J	C2	0.2	mfd.	Block
	C4	.05	mfd.	
	C5	0.1	mfd.	
	C7	0.1	mfd.	
	C12	0.3	mfd.	
P-1539	600 K. C. Tracking Condenser			
P-80938	Three-Gang Variable Condenser			

(In Speaker—"B" Eliminator)

P-80940	C14	.02	mfd. 400 V.	Tubular
P-80939	C15	8.0	mfd. 225 V.	Electrolytic Block
	C16	16.0	mfd. 225 V.	
P-80953	C17	.01	mfd. 160 V.	Metal Case
P-80941	C18	0.5	mfd. 15 V.	Metal Case
	C19	0.5	mfd. 15 V.	
P-80872	C20	.01	mfd. 600 V.	Tubular

SPEAKER "B" ELIMINATOR PARTS

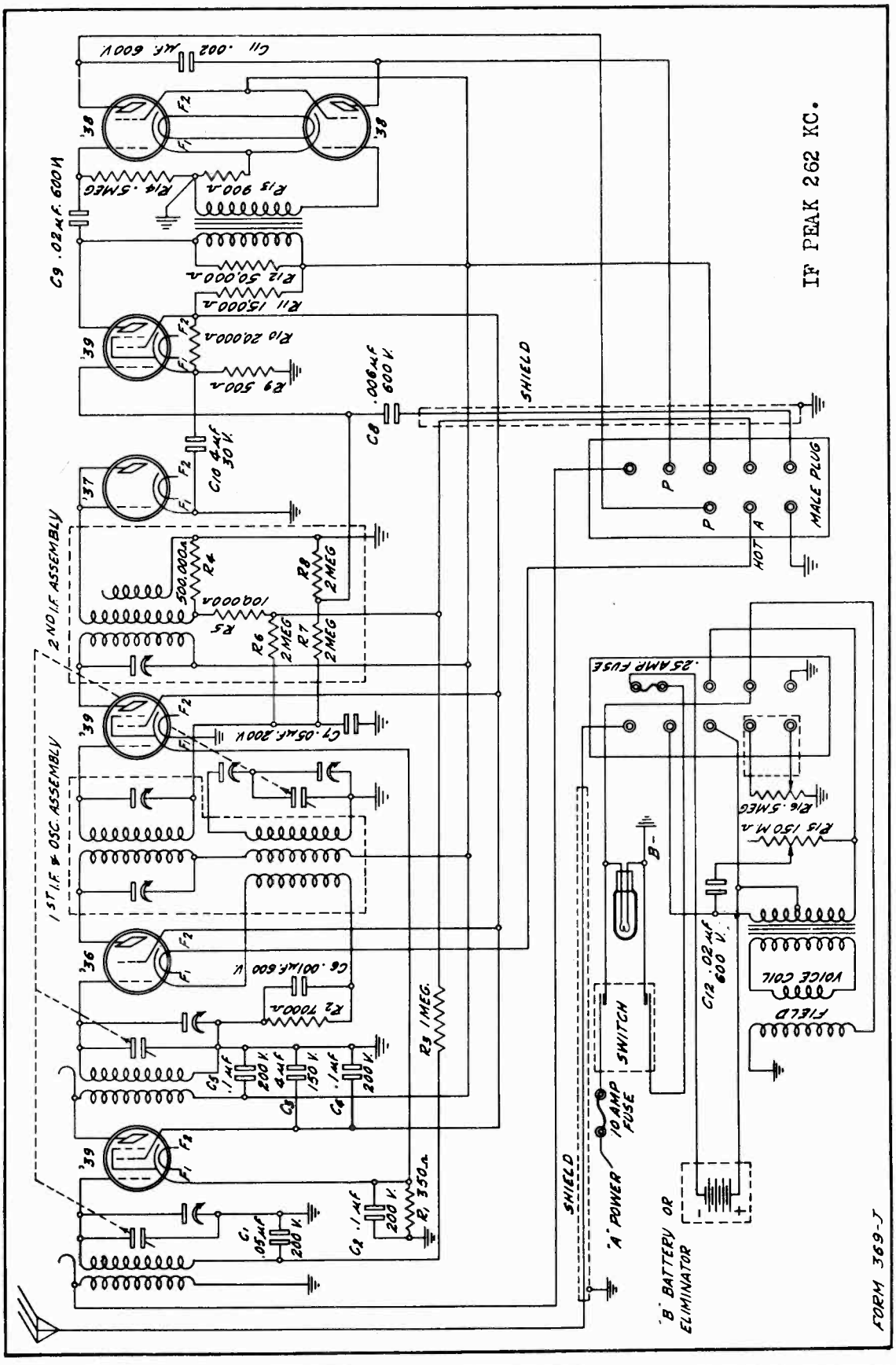
Part No.	Description
P-50582	Power Transformer Assembly
P-50583	"B" Choke Assembly—Iron Core
P-5089	"B" Choke—Air Core (2 Used)
P-5090	Dual "A" Choke—Air Core
P-1765	Dual Vibrator Elkonode
P-1766	Five-Prong Socket
P-1767	On-Off Relay
P-1768	Automatic Load Relay
P-70737	"A" Cable and Lugs
P-70748	Six-Lead Cable, Antenna Cable, Pilot Lamp Cable and Eight-Prong Socket Assembly, Complete
P-1624	10 Amp. Fuse—Size No. 3AG Fuse Block
P-1771	6-Inch Speaker—S Type Set
P-1772	8-Inch Speaker—R Type Set
P-1790	5-Lug Terminal Strip

CONTROL UNIT PARTS

Part No.	Description
P-20534	Dial Gear
P-20537	Dial Retaining Washer
P-30387-A	Worm Drive Gear
P-30378	Anchor Bushing
P-30384	Anchor Bushing Clamping Nut
P-30385	Anchor Bushing Hex. Nuts
P-1848	Lock Assembly
P-30435	Keys
P-20724-A	Lever
P-20725	Ribbon Tension Spring
P-1562	Knobs—S Type Set
P-1855	Knobs—R Type Set
P-1610	Flexible Shaft 9¾ Inch
P-1611	Flexible Shaft 12¾ Inch
P-1849	Dial Strip
P-30437	Volume Control Drive Shaft
P-30390	Drive Shaft
P-1563-A	6-8 Volt Pilot Lamp
P-1871	Pilot Lamp Socket and Clamp

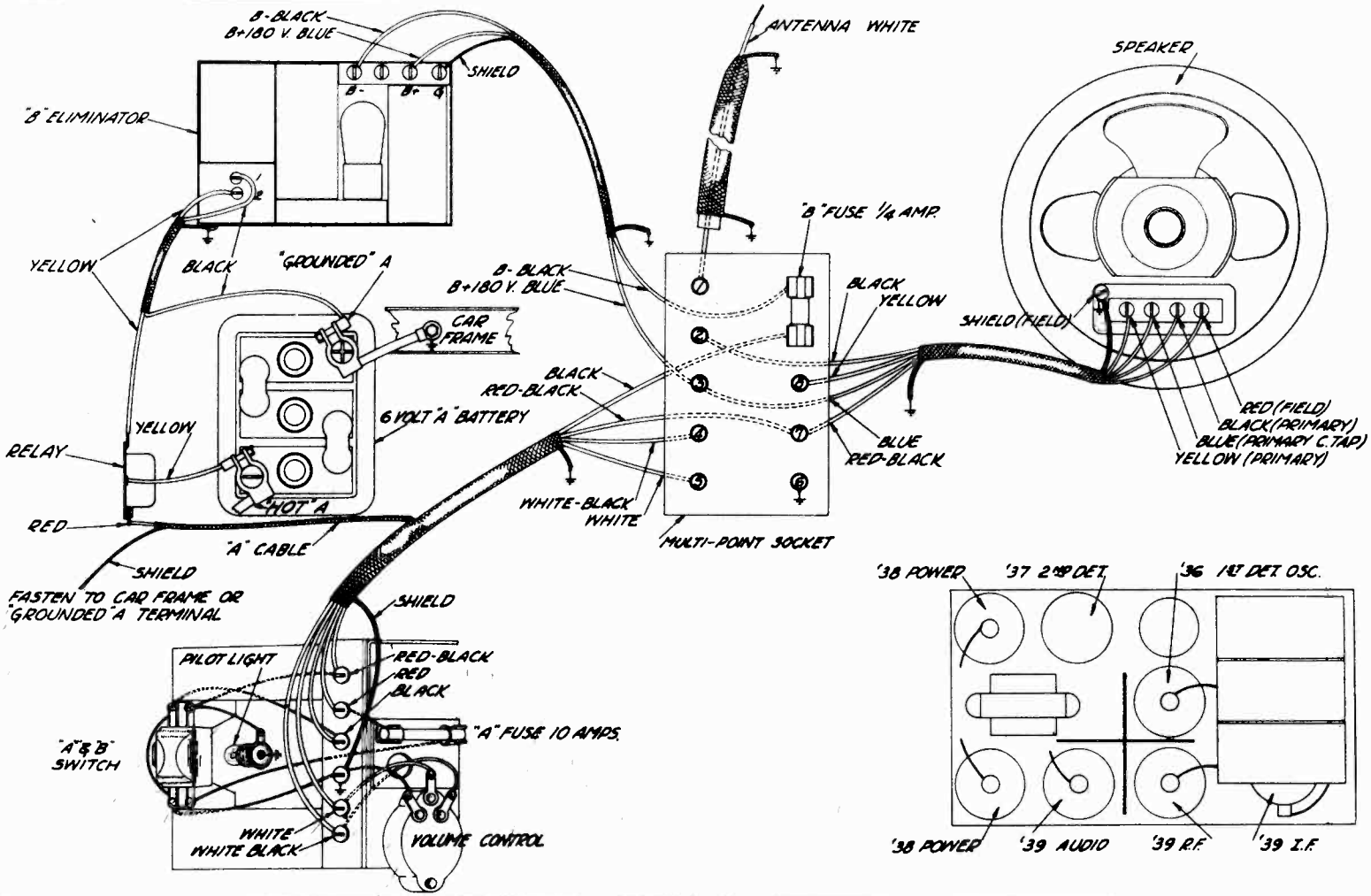
CADILLAC

MODEL 2721 (072)
Schematic



MODEL 2721 (072)
Voltage, Socket
Assembly Diagram

CADILLAC



Type of Tube	*Function*	*Across Heater*	*Plate to Cathode*	*Screen to Cathode*	*Grid to Cathode*	*Normal Plate MA*
'39	R. F.	6.	177	80	3	3.6
'36	1st Det.	6.	173	76	7(1)	.9(1)
'39	I. F.	6.	177	80	3	3.6
'37	2nd Det.	6.	0		0	0
'39	1st Audio	6.	157	77	3.7	3.0
'38	Output	6.	160	162	15.5	7.5

(1) Will vary with dial setting.

NOTE: All bias voltages must be read from cathode to ground.

Power Units

The "A" battery and "B" eliminator or "B" batteries may not be delivering the correct voltages to the set due to a defect in the units themselves, or to a defect in the wiring, connecting plug, or any of the associated apparatus.

CAUTION — In the installation manual it was stated that the voltages should not be read by removing the cable head and reading them at the multi-post socket. The reason for this is that when the lock switch is turned off with the cable head removed the inductive surge caused by the speaker field may burn out the pilot lamp.

Also, as the voltages are not read under load conditions, a true picture is not obtained of the actual operating voltages.

However, the service technician equipped with the proper apparatus can read the voltages at the cable head in accordance with the instructions as given below. By the method as explained, load conditions are simulated, thus permitting actual working voltages to be read.

If "A" or "B" voltages are not read at the multi-post socket, it will be necessary to check the voltages at the unit in question. If the voltages at the "A" battery and "B" eliminator or "B" battery are O. K., then there is an open in the wiring or connections at some point. Disconnect the wiring from the "A" or "B" unit and "ring through" the leads to the cable head with the continuity meter.

In the case of no "B" voltage, take off the cover of the "B" eliminator and see if the tube is lighted. If the tube is not lighted, see if there is voltage at the "A" supply terminal strip. Should there be no voltage at the latter point, it may be due to the fact that the relay is not contacting, thus causing no power to be supplied to the "B" eliminator.

To Read Power Supply Voltages at Cable Head

Turn off the lock switch and remove the cable head from the chassis.

The following parts are required:

3—Phone tips or prongs taken from an old tube base.

1—Resistor for the "A" circuit as indicated in Fig. 1.

1—Resistor for the "B" circuit as indicated in Fig. 1.

Place these resistors in a wooden box or insulated mounting of some kind, with rubber covered leads extending out of the box. Note that the ground leads of the two resistors are common.

Solder the phone tips to the ends of the three leads.

Then insert the tips in the multi-post socket as shown in Fig. 1.

Turn on the lock switch.

Read the "A" voltage between terminals 6 and 7.

Read the "B" voltage between terminals 3 and 6, using a high resistance voltmeter.

CAUTION—In all of the above procedure great care should be taken not to ground the A+ or B+ to the car frame, chassis, cable, or any other ground.

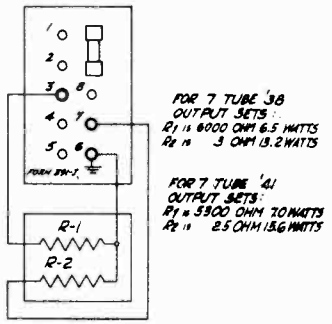


Fig. 1. Using Resistors for Load

The above readings are made under load conditions and indicate that proper power is being supplied to the receiver as far as the multi-post socket.

A very handy method of applying these resistors to the multi-point socket is to mount them in an insulated unit or plug with three prongs extending out and arranged in the shape of contacts three, six and seven in the above diagram. This unit could then be plugged in the correct terminals very easily.

TESTING AND REPAIRING CHASSIS

If all accessories are found, upon test, to be in working order, it will be necessary for the service technician to check the chassis over.

The most convenient place to test and repair a chassis is on a service shop bench. In the case of the auto set, however, it is advisable to do part of the testing in the car, due to the fact that the power units, speaker, control unit and cables are installed in the car and cannot be conveniently taken out for use in testing the receiver. Of course, if a duplicate set of parts are available, then all of the testing can be done on the bench.

Reading Voltages at Sockets

One of the first checks to be made is that of reading the voltages at the sockets. A good percentage of all the circuits in the chassis are involved, and a radically incorrect reading at any point will give a clue as to where the trouble may lie. In the installation manual and in this supplement there is a voltage chart showing all of the voltages and plate currents.

As stated above, the best place to check the voltages would be on a service shop bench, but as this involves removal of the other units and cables, it will be quickest in most cases to make the readings in the car.

In most cases, it will be necessary to remove the chassis either from its mounting on the steering column or from the mounting plate on the dash in order to satisfactorily check the voltages at the sockets. The procedure is as follows:

Turn off the lock switch.

Take off the cable head by removing the five screws.

Take the chassis off of the mounting and lay it on the floor board, on a board, or on a wood box, wherever is the most convenient. This can be done if sufficient slack was left in the wiring cables at the time of installation.

In some instances, it will be necessary to disconnect the flexible drive shaft and casing at one end in order to get the chassis out far enough. In other cases, it might be advisable to take off the control unit entirely to get the chassis off far enough.

It is advisable to take the chassis out of the box, although this is not absolutely necessary. If the chassis is taken out, an inspection of the wiring and parts can be made. If the chassis is not taken out, a long plug and external socket arrangement, such as is provided with a set analyzer, or the plug as described below, will be necessary.

In either case, re-insert the multi-point plug in the socket. Be sure to push the plug all the way in, to insure contact on all prongs.

Then turn on the lock switch.

CAUTION—If the chassis is taken out of the box, be sure to keep it on a dry wood or other insulated location in the front compartment of the auto. Great care should be taken to prevent an A+ or B+ point on the chassis from coming in contact with a ground, such as the car frame, levers, cable shields, etc.

A thousand-ohm-per-volt meter of 0—250 volt range is required for the plate and screen voltages. Lower ranges will be necessary for the grid and heater voltages. It is not necessary to have a high resistance meter for the heater or "A" battery reading.

Two of the sockets are partially covered under the chassis by the bypass condenser block. If the voltages are read under the chassis, at the bottom of the socket, by means of test leads and prods, it is necessary to make top socket contacts for these two tubes or else use the plug method as described.

A handy method of reading the voltages on an auto set is to make a plug about 5" long with an old five-prong tube base at the bottom and a five-prong socket at the top. The five lines are then brought out at the top to binding posts or other terminals which can be reached with the tips of the test prods on the leads from a voltmeter. By providing a link in the plate line, screen line, or other lines, as desired, the current flowing in these circuits can be easily read by opening the link and connecting a milliammeter in place of the link. An extension lead should be made for the control grid line.

Continuity Tests

The auto chassis is very compactly built and when "ringing it through" for servicing, considerable time might be spent in tracing through the wiring. For that reason, we are including in this supplement the complete wiring diagram.

After the chassis has been removed from the box and before making the continuity tests, make a careful inspection of all exposed wiring and soldered connections for opens, grounds, shorts and faulty connections. Then proceed to make continuity tests through the various circuits, using as a guide the wiring diagram, Fig. 3.

Make the continuity tests in an orderly manner, starting with the R. F. and working through the I. F. into the audio system. An exception to this is when there is an indication as to where the trouble is, in which case, time may be saved by starting the tests at the part or circuit in question.

In "ringing through" the various circuits in the chassis, take into consideration the amount of resistance in the circuit and also whether there is an external closed circuit around the one under test. Most service men at the present time use direct reading ohmmeters as continuity meters and in this way check for continuity while at the same time determining the resistance of the circuit. To see whether there is an external closed circuit, reference should be made to the schematic circuit diagram, in the installation manual.

When making continuity tests which are across the electrolytic condensers, the positive test prod must be on the positive lead. This is due to the fact that the anodes of the electrolytic condensers must be kept at a positive potential. If the anode is made negative, the condenser will pass current considerably more readily than if it is positive and the reading will be different than the standard reading which should be obtained.

Alignment of Tuning Condensers

The condensers are aligned at the factory with signal generators and output meters and the receiver will not, as a general rule, lose its alignment unless mishandled or tampered with. When the tuning condensers are out of alignment, the receiver may tune broadly, it may be low in volume all over the band, or a lack of volume on certain parts of the broadcast band may be noticed.

Broad tuning is most frequently caused by misalignment of the intermediate frequency tuning condensers. It may also be caused by mistracking between the oscillator and R. F. condensers.

Lack of volume at certain points of the dial is generally caused by mistracking between the R. F. and oscillator condensers. This occurs generally at the high frequency end and may be corrected by adjustment of the oscillator 1400 K. C. trimmer condenser. In a few instances, lack of volume at certain parts of the dial may be caused by R. F. condenser misalignment. If this occurs at the high frequency end, the condition may be corrected by the adjustment of the R. F. trimmer condensers. If the set is weak at both ends of the dial, mistracking between the R. F. and oscillator condensers is generally the cause and may be corrected by adjustment of both 600 K. C. and 1400 K. C. trimmers, as explained below.

Low volume all over the band is generally due to I. F. condenser misalignment.

CAUTION—We do not recommend that realignment be attempted unless other possible causes of faulty operation have first been investigated and unless the service technician has the proper equipment. Realignment by anyone other than a qualified radio service technician is not advisable, as one not experienced in the work is almost certain to get into difficulty and throw the set completely out of alignment.

A local and accurately calibrated signal generator as well as an output indicating meter are absolutely essential for correct alignment. This signal generator must provide a signal at the broadcast frequencies of 550 to 1500 K.C. and in addition a signal of 262 K.C. for the intermediate frequency. The broadcast band signals of the signal generator must be accurately known, as the dial scale of the receiver is calibrated in kilocycles. The intermediate frequency of the signal generator likewise must be accurate in order to align the I. F. stages at 262 K.C. A non-metallic screwdriver is necessary.

As in the case of reading the voltages at the sockets, the best place to realign the chassis would be on the service shop bench. However, to avoid removal of the other units and cables, realignment may be done in the car, in the front compartment, on a box, wood board, or other insulated location. The chassis must be removed from the box.

The complete procedure for realignment and retracking is as follows:

Aligning Intermediate Condensers—First align the intermediate condensers. The adjusting screws of the first I. F. primary and secondary trimmer condensers are on the porcelain base of this assembly at the side of the '39 I. F. socket. The adjusting screw of the second I. F. primary trimmer is reached through the hole near the base of the can of this assembly.

One of the best ways of reading the output is by means of a rectifier type meter. This meter, if of low range is connected across the secondary of the output transformer in the speaker. If it is of high range, it may be connected across the primary of the transformer in series with a large condenser to prevent the flow of D.C. plate current through the meter. In either method of connection, opening the voice coil of the speaker will give a better deflection on the output meter.

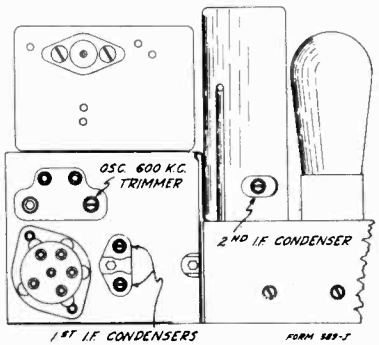


Fig. 2. Location of Intermediate and 600 K. C. Trimmer Condensers

First set the signal generator for a signal of exactly 262 K.C. The rotor of the tuning condenser should be completely out to avoid interference from the oscillator. Remove the grid cap from the grid connection of the '36 first detector tube. Connect the antenna lead from the signal generator to the grid of the '36 first detector. Connect the ground lead of the signal generator to the chassis sub-panel or ground at any convenient point.

Attenuate the signal from the signal generator so as to prevent the levelling-off action of the A. V. C. Using the non-metallic screwdriver, adjust the first I. F. primary and secondary trimmer condensers and the second I. F. trimmer condenser adjusting screws until maximum output is indicated on the output meter.

After all three have been adjusted the first time, go over them again and check the setting for maximum output.

If when alignment has been completed, the output is satisfactory at 600 K.C. and 1400 K.C., but is low in the center of the broadcast band, the intermediate condensers have probably been lined up at some frequency other than 262 K.C. Have the frequency of the 262 K.C. signal generator checked and if it is more than 3 K.C. off, either way, it should be re-calibrated.

Aligning R. F. and Oscillator Condensers—Before aligning and tracking the oscillator and R. F. condensers, connect the flexible drive shaft to the control unit and to the chassis. As explained in the service manual, the dial scale should be at the low frequency end stop when the rotor is completely in mesh. Then turn the station selector knob until the dial scale is at 1400 K.C. The tuning condenser will then be correctly set for the 1400 K.C. signal.

Set the signal generator for a signal of exactly 1400 K.C. The signal input from the signal generator should now be made to the antenna lead. Put the grid cap of the '36 first detector tube back in place.

Then adjust the three trimmer condensers on the tuning condenser for maximum output. Adjust the oscillator section trimmer first. (Section farthest from drive gear.)

The next step is to adjust the oscillator 600 K.C. trimmer condenser. The adjusting screw on this condenser will be seen over the '39 I. F. socket. Set the signal generator for a signal of 600 K.C. and turn the tuning condenser rotor until the output meter shows maximum deflection. Then, using the non-metallic screwdriver, adjust the 600 K.C. trimmer condenser screw, rocking the rotor back and forth at the same time, until maximum output is obtained.

Next, set the signal generator for a signal of 1400 K.C. and check the adjustment of the tuning condenser trimmers at this frequency for maximum output. The tuning condenser should then be properly aligned.

Parts List for No. 072 Series Receivers (38 Output)

CHASSIS PARTS

Part No.	Description
P-1529	No. 37 Tube Socket (Long Lug)
P-1531	No. 39 Tube Socket (Long Lug)
P-1555	No. 36 Tube Socket (Short Lug)
P-1556	No. 39 Tube Socket (Short Lug)
P-1530	No. 38 Tube Socket (Long Lug)
P-1532	Multi-Point Plug
P-1543	Multi-Point Socket
P-5053	First I. F. & Oscillator Assembly, Complete with Trimmer Condensers and Can
P-5022	Second I. F. Transformer Assembly, Complete with Trimmer Condenser, Resistors and Can
P-5054	Antenna & Interstage R. F. Transformer, Complete with Can
P-5055	Antenna R. F. Transformer Only
P-5056	Interstage R. F. Transformer Only
P-1539	Oscillator 600 K. C. Tracking Condenser
P-1615	Condenser Drive Gear with Set Screw
P-30395	Drive Pinion Gear with Set Screw
P-20544	Bracket for Pinion Bearing
P-20545	Bearing for Drive Pinion
P-1092	Grid Cap and Wire
P-10232	Long Rubber Bumper for Tubes
P-10233	Short Rubber Bumper for Tubes
P-20516	6-32 Wing Nuts (for chassis cover)
P-20543	Chassis Box
P-20542	Chassis Box Cover
P-50550	Audio Transformer

Resistors

Part No.	Code No.	Resistance	Type
P-A-90953	R-1	350 ohms	Carbon
P-A-90979	R-2	7,000 ohms	Carbon
P-A-90948	R-3	1 Megohm	Carbon
P-A-90929	R-4	500,000 ohms	Carbon
P-A-90912	R-5	100,000 ohms	Carbon
P-A-90949	R-6	2 Megohm	Carbon
P-A-90949	R-7	2 Megohm	Carbon
P-A-90949	R-8	2 Megohm	Carbon
P-A-91025	R-9	500 ohms	Carbon
P-B-90950	R-10	20,000 ohms	Carbon
P-B-91020	R-11	15,000 ohms	Carbon
P-A-90941	R-12	50,000 ohms	Carbon
P-A-91022	R-13	000 ohms	Carbon
P-A-90929	R-14	500,000 ohms	Carbon
P- 91013	R-15	0-150,000 ohms	Tone Control
P- 91026	R-16	0-500,000 ohms	Volume Control

Condensers

Part No.	Code No.	Capacity	Voltage	Type
P-80902-D	C-1	.05	mfd., 200 V.	Electrolytic Cond. Block
	C-3	4.0	mfd., 150 V.	
	C-10	4.0	mfd., 30 V.	
P-20909-D	C-2	.1	mfd., 200 V.	Bypass Cond. Block
	C-4	.1	mfd., 200 V.	
	C-5	.1	mfd., 200 V.	
	C 9	.02	mfd., 600 V.	
	C-7	.05	mfd., 200 V.	
P-80822	C-8	.006	mfd., 600 V.	Moulded
P-80821	C-6	.001	mfd., 600 V.	Moulded
P-80808	C-11	.002	mfd., 600 V.	Moulded
P-80907	C-12	.02	mfd., 600 V.	Metal Can (In Speaker Case)
P-80912-C	Three-Gang Condenser			

CONTROL UNIT PARTS

P-91026	R-16 Volume Control
P-1624	10 Ampere Fuse
P-1614	Lock Switch
P-1563	8 Volt Pilot Lamp
P-1562	Control Knob
P-1621	Pilot Lamp Socket & Cover Assembly
P-1618	Celluloid Dial Strip
P-20537	Dial Retaining Washer
P-20534	Dial Drive Gear
P-30390	Drive Shaft
P-30387	Worm Drive Gear

SHIELDED CABLES

P-70723	Shielded Antenna Cable
P-70730	Shielded Control Cable
P-70731	Shielded Speaker Cable
P-70732	Shielded "B" Supply Cable

CADILLAC

MODEL 2722 (072-A)
Voltage, Parts List
Special Notes

No. 072A Series Receivers (41 Output)

The form 375J Installation Manual and foregoing service supplement cover the 072 Series (38 output) receivers. The copy in general is applicable to the 072A Series (41 output) as the sets differ only in the audio amplifier.

In Fig. 4 is shown the schematic circuit diagram of the 072A set. The schematic circuit diagram of the 072 set is shown in Fig. 1 of the Form 375J Installation Manual. By looking at the two circuits the similarity as well as the points of difference can be noted.

On this page is given an explanation of the parts which are different in the 41 output set, a supplement to the chassis parts list covering the new parts used, and a complete voltage chart for the receiver.

Differences in 072A Chassis

In comparing the No. 072 Series (38 output) receivers with the No. 072-A Series (41 output) the following parts changes in the chassis have been made:

R-2 changed from 7,000 ohms to 6,000 ohms.

R12 changed from 50,000 ohms to 25,000 ohms.

R-13 changed from 900 ohms to 800 ohms.

R-14, as shown in the old schematic circuit diagram (Fig 1 in the installation manual) is not used in the new receiver.

C-9 is changed from a .02 mfd. condenser to a .25 mfd. condenser.

The No. 38 sockets are changed to No. 41 sockets.

A new audio transformer is used.

No. "B" fuse is used with the No. 072-A series receiver.

Voltage Chart for 072A Receivers

Type of Tube	*Function*	*Across Heater*	*Plate to Cathode*	*Screen to Cathode*	*Grid to Cathode*	*Normal Plate MA*
'39	R. F.	6.	177	80	3	3.6
'36	1st Det.	6.	173	76	6	.7
'39	I. F.	6.	177	80	3	3.6
'37	2nd Det.	6.	0		0	0
'39	1st Audio	6.	88	88	4	3.0
'41	Output	6.	159	162	15	9

NOTE.—Read bias voltages from cathode to ground.

Supplementary Parts List for 072A Receivers

New Parts Used in the 072A (41 Output) Series Receivers

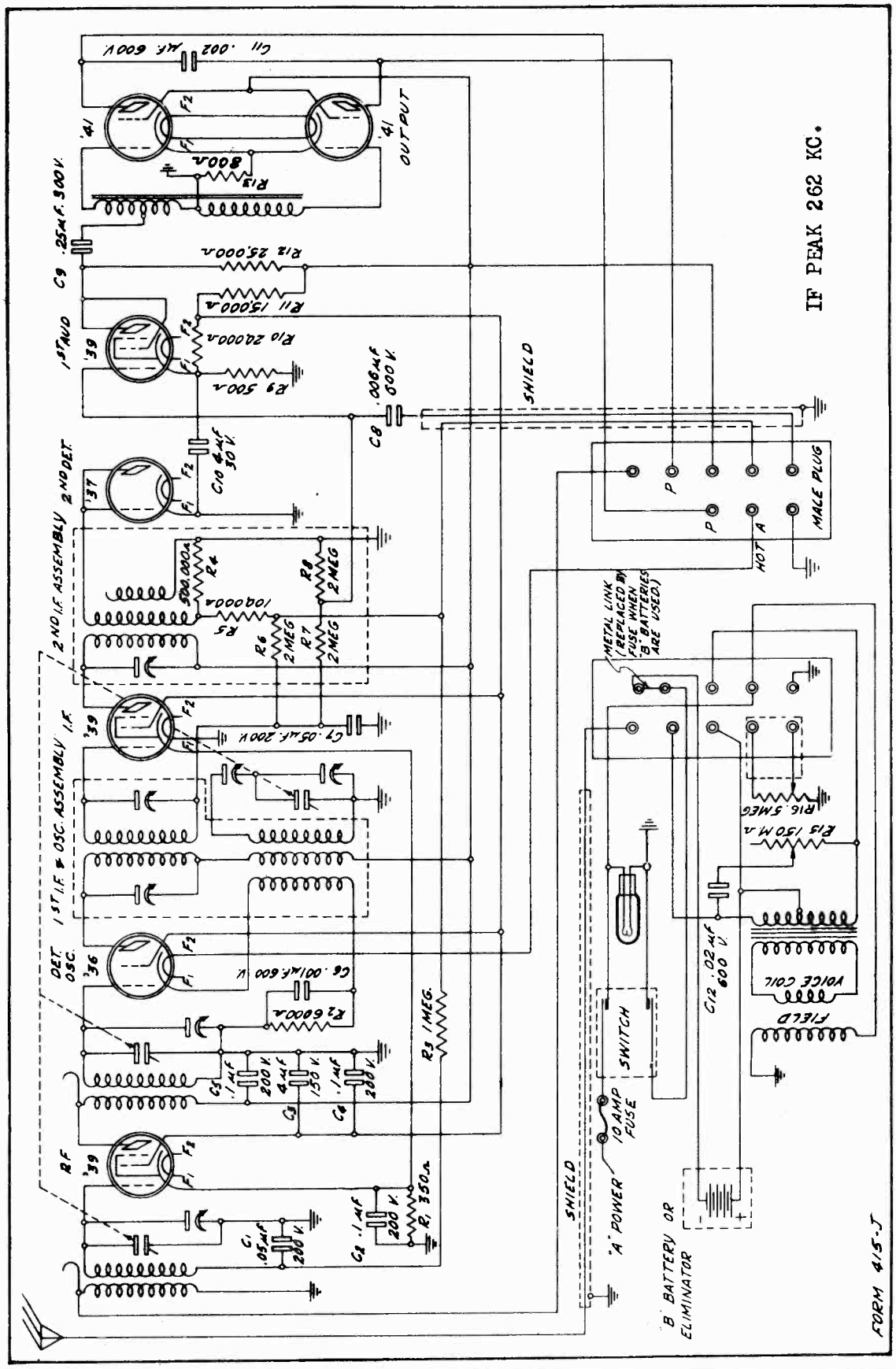
Part No.	Description
P-A-91029	R-2 — 6,000 ohm Carbon Resistor.....
P-A-91038	R-12—25,000 ohm Carbon Resistor.....
P-A-91023	R-13— 800 ohm Carbon Resistor.....
P-50559	Audio Transformer .....
P-1665	No. 41 Sockets .....
P-80903-F	C-2 — .1 mfd., 200 V. C-4 — .1 mfd., 200 V. C-5 — .1 mfd., 200 V. C-9 — .25 mfd., 600 V. C-7 — .05 mfd., 200 V. Bypass Cond. Block

Parts Shown in 072 List Not Used in 072A Series Receivers

Part No.	Description
P-A-90979	R-2 — 7,000 ohm Carbon Resistor....
P-A-90941	R-12— 50,000 ohm Carbon Resistor....
P-A-91022	R-13— 900 ohm Carbon Resistor....
P-A-90929	R-14—500,000 ohm Carbon Resistor....
P-50550	Audio Transformer .....
P-1530	No. 38 Socket .....
P-80903-D	C-2 — .1 mfd., 200 V. C-4 — .1 mfd., 200 V. C-5 — .1 mfd., 200 V. C-9 — .02 mfd., 600 V. C-7 — .05 mfd., 200 V. Bypass Cond. Block

MODEL 2722 (072-A)
Schematic

CADILLAC



CADILLAC

MODEL 2721, 2722
Chassis wiring

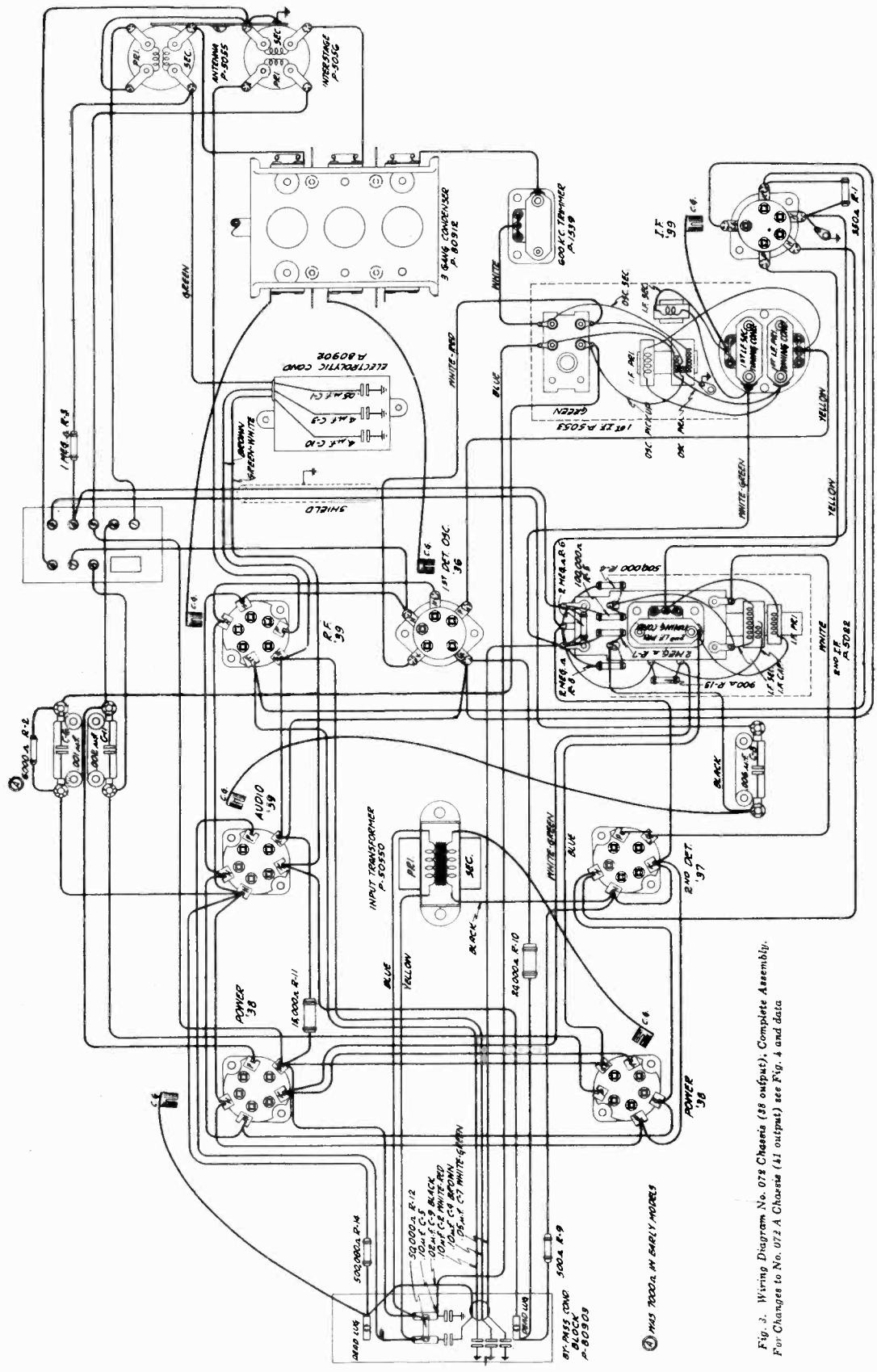
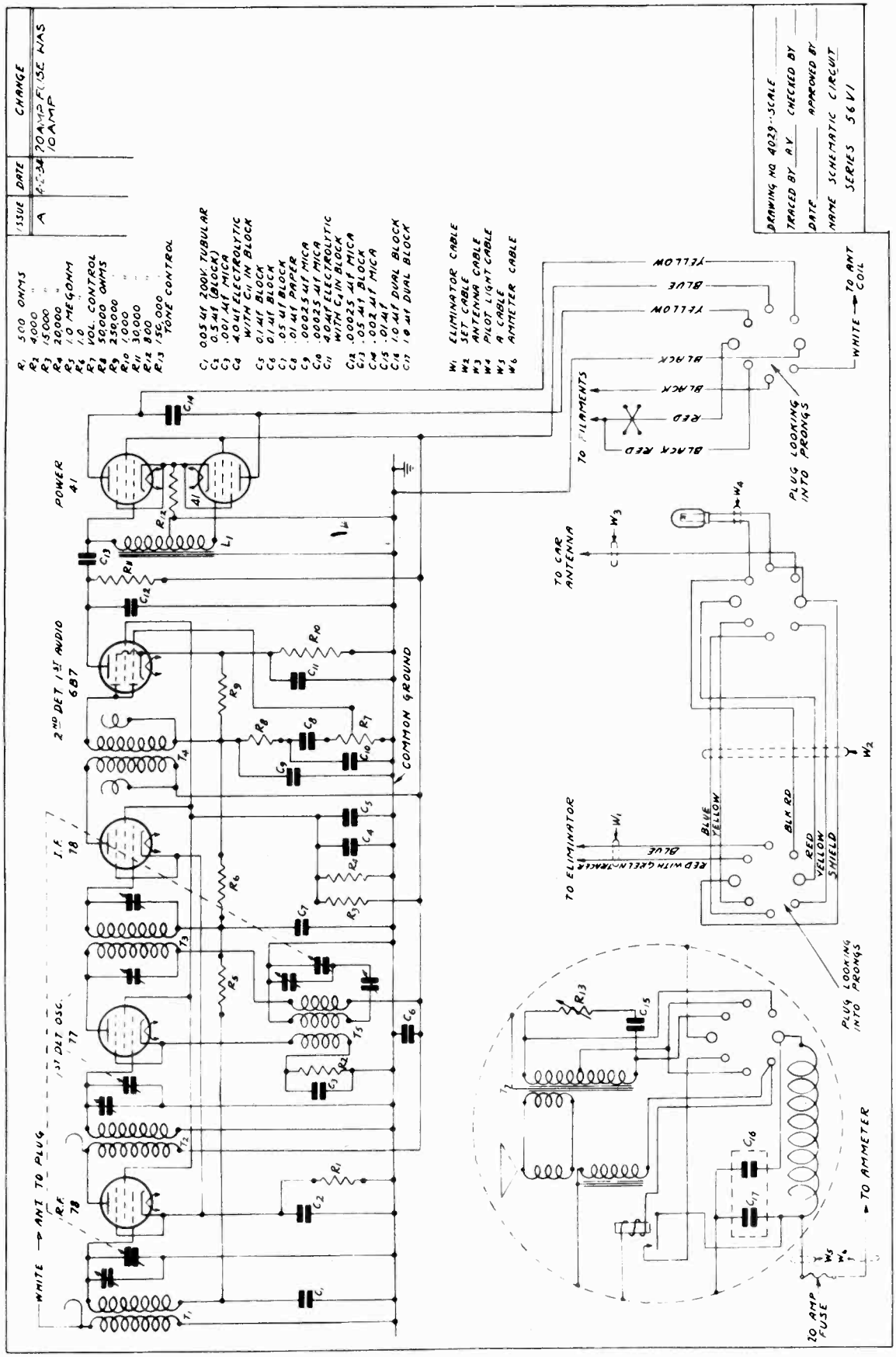


Fig. 3. Wiring Diagram No. 072 Chassis (38 output). Complete Assembly. For Changes to No. 072 A Chassis (41 output) see Fig. 4 and data

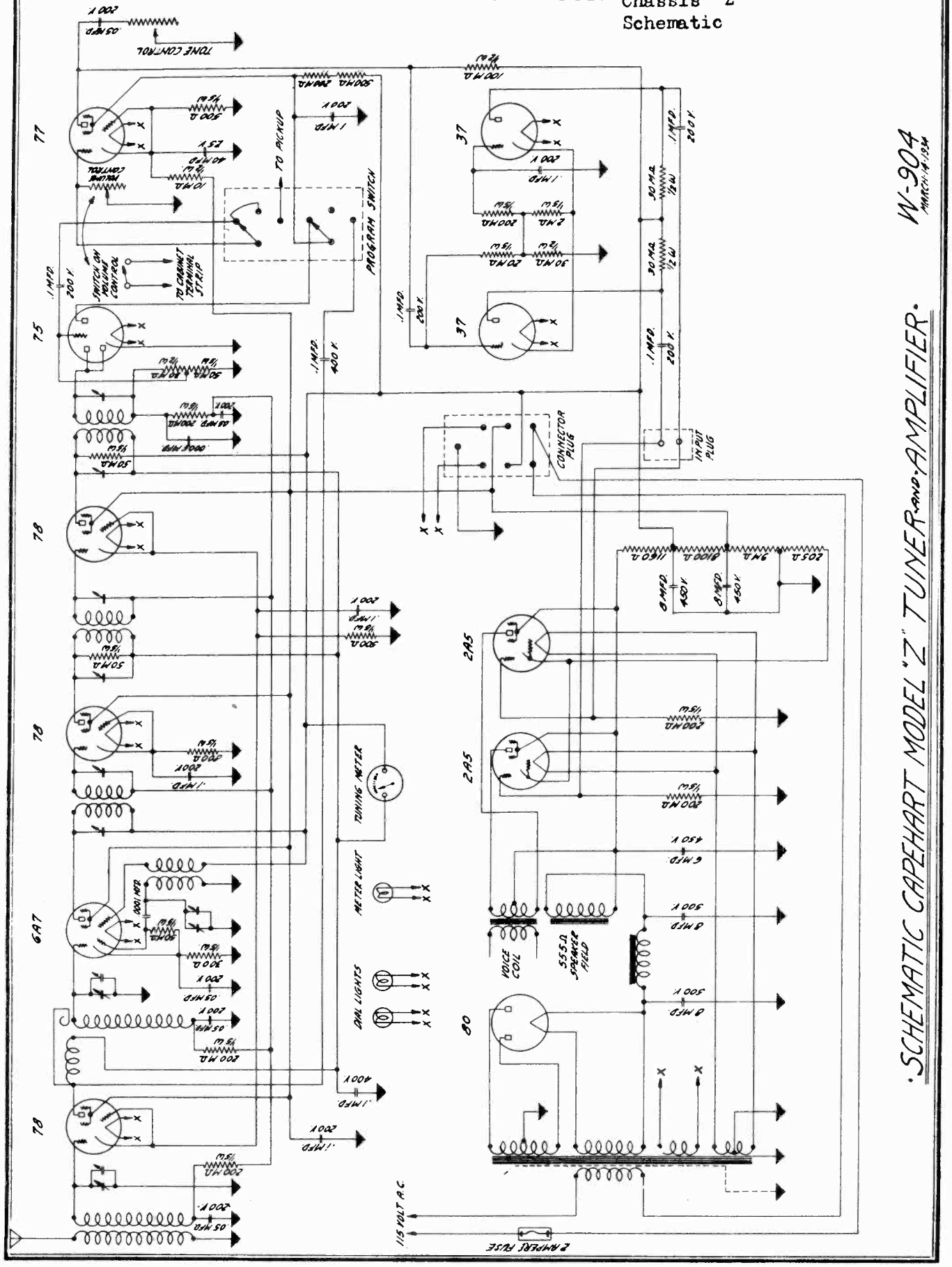
MODEL 56V1
Schematic

CADILLAC



CAPEHART CORPORATION

MODELS 103, 104 Cosmopolitan
Chassis "Z"
Schematic

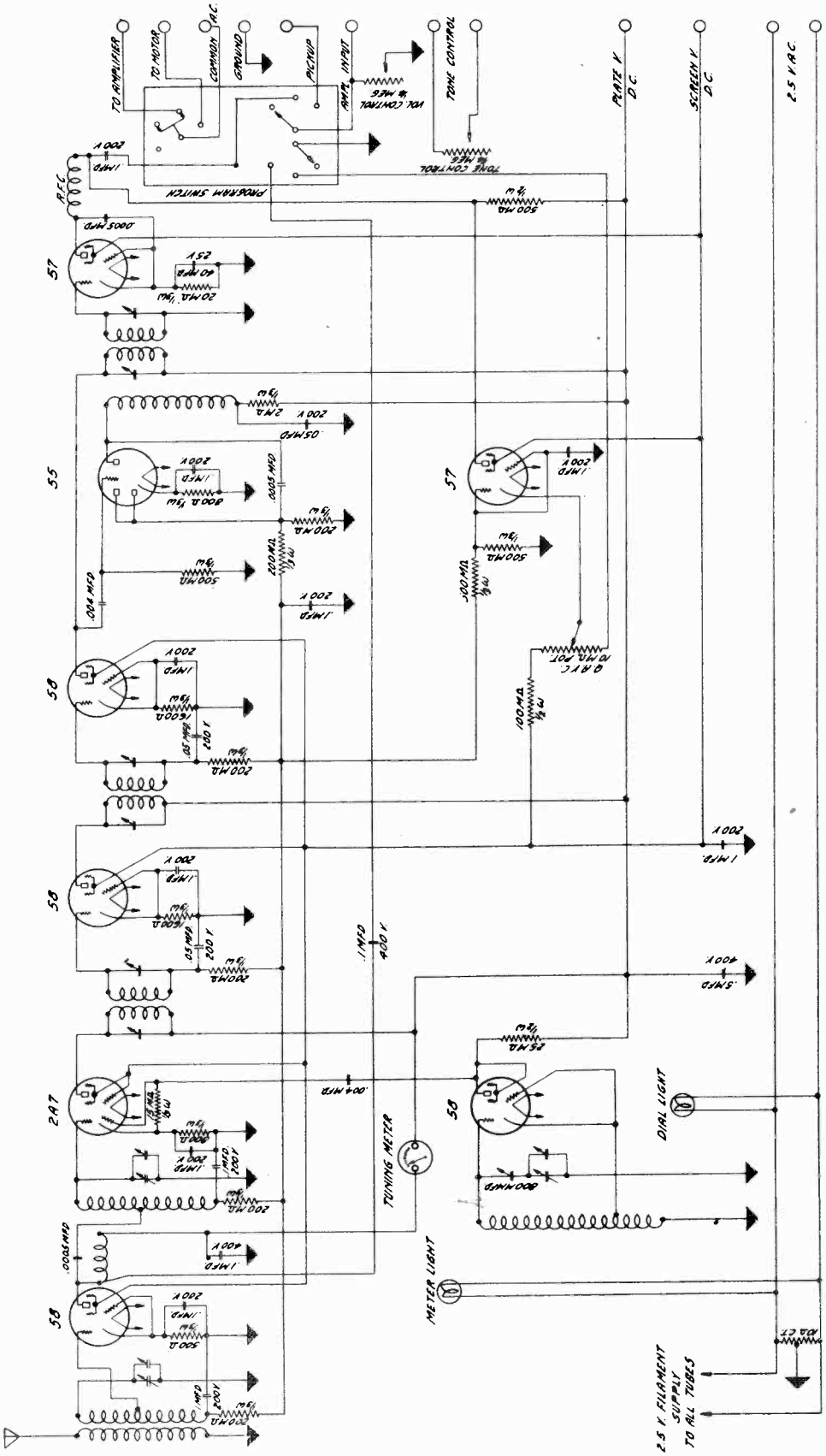


W-904
MARCH 14, 1934

"SCHEMATIC CAPEHART MODEL "Z" TUNER AND AMPLIFIER.

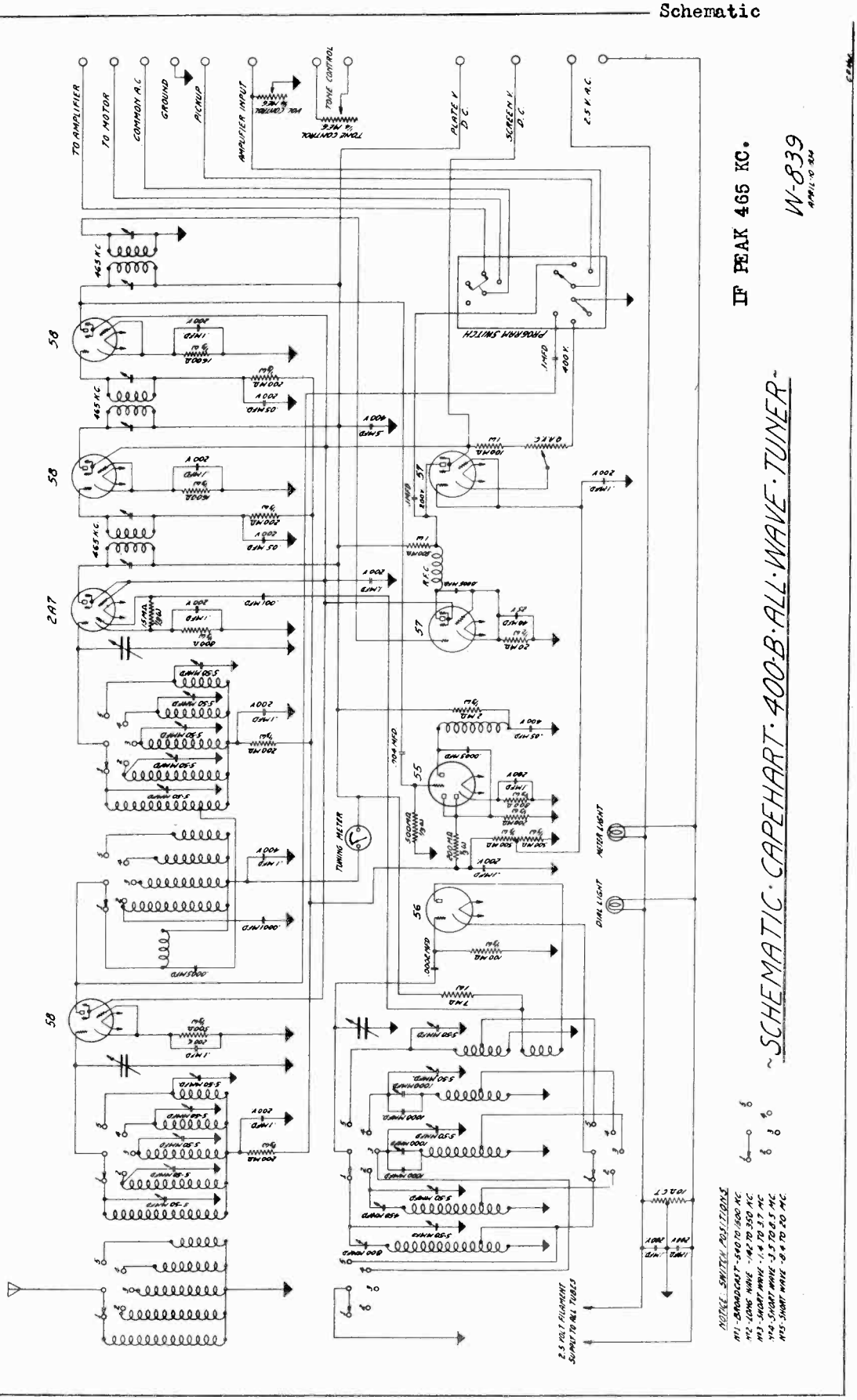
MODELS 400-B, 402-B
404-B Tuner
Schematic

CAPEHART CORPORATION



CAPEHART CORPORATION

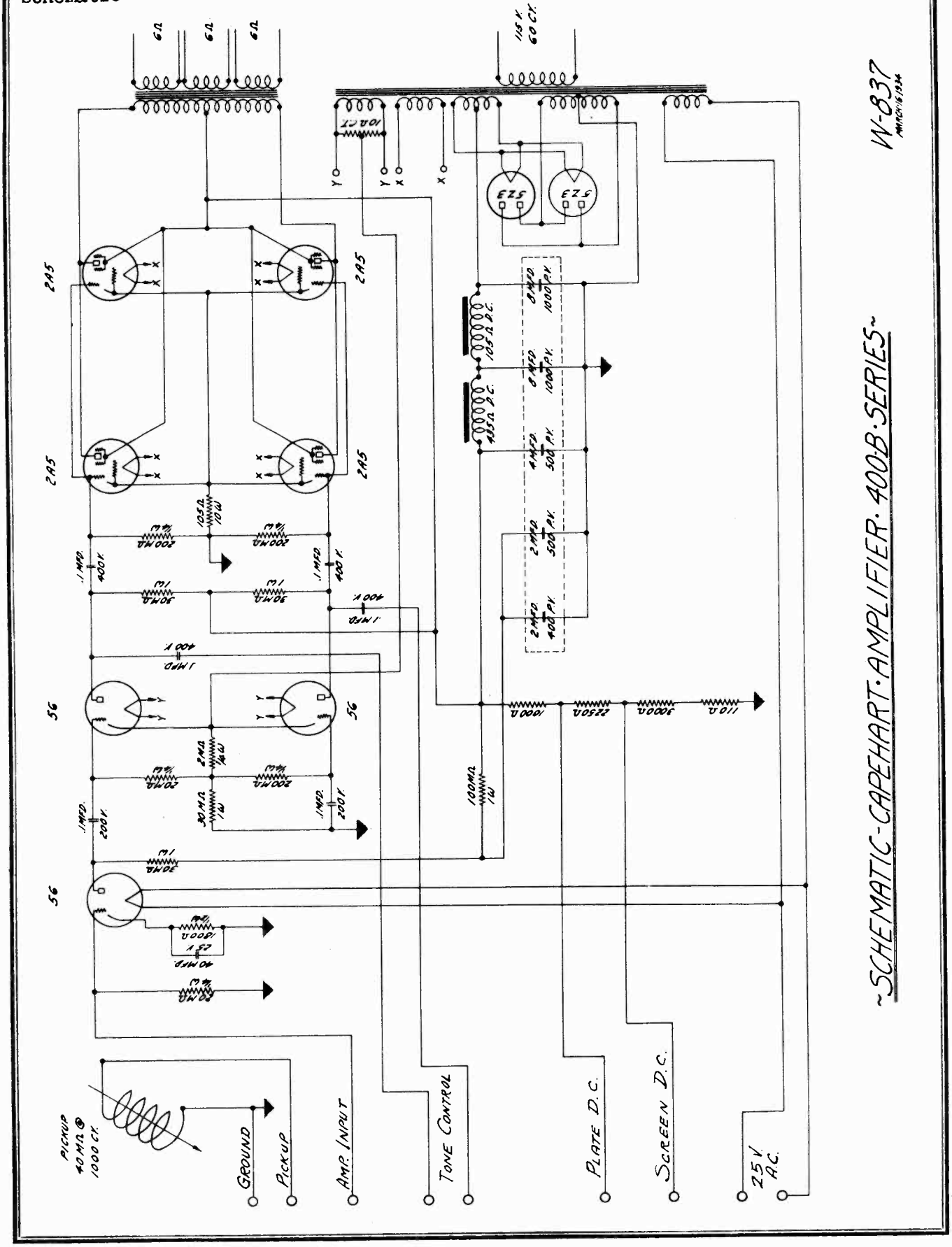
MODELS 400-B, 402-B
404-B A.W. Tuner
Schematic



MODELS 400-B, 402-B
404-B Amplifier

CAPEHART CORPORATION

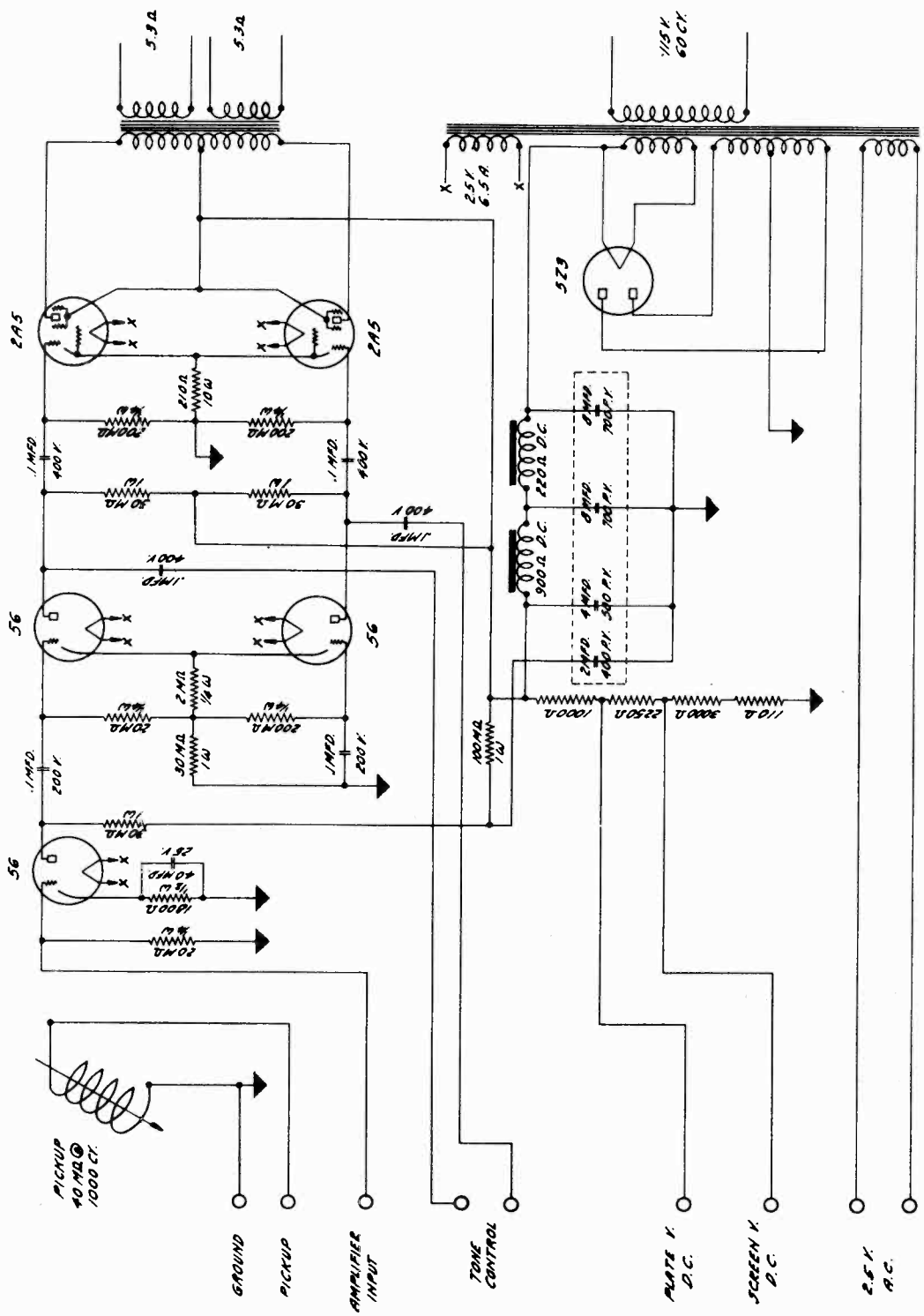
Schematic



CAPEHART CORPORATION

MODEL "Standard"
Amplifier
Schematic

W-838



SCHEMATIC - CAPEHART STANDARD AMPLIFIER

COLONIAL RADIO CORP.

General Alignment
Image Frequency Data

GENERAL NOTES ON ALIGNMENT

In the service notes on ALIGNMENT PROCEDURE, directions are to couple the test oscillator to the receiver. Since test oscillators of different makes vary considerably in their design and construction, it is not possible to give specific instructions for coupling any particular test oscillator to the receiver. However, the following general method can be applied with practically any test oscillator.

Most test oscillators have two output leads. One of them is the "hot" lead and the other the ground lead. The ground lead should be connected directly to the receiver chassis, except in the case of AC-DC receivers. The connection then should be made through a .1 mfd condenser since the chassis of such receivers is above ground potential. If the test oscillator has only one lead, this information about the ground lead may be disregarded.

As mentioned in all of the service notes, for IF alignment the test oscillator should be connected through a .1 mfd. condenser directly to the control grid cap of the IF or Translator tubes. It is important to leave the grid clip attached to the cap and to leave the tube shields in place. The oscillator tube of the receiver also should be in its socket.

For RF alignment, whether broadcast or short wave, the "hot" lead of the test oscillator should be coupled to the antenna lead of the receiver. The exact means of coupling will depend upon several factors. Among them are the power of the test oscillator, the sensitivity of the receiver, and the extent to which the receiver is out of alignment. If the test oscillator is quite powerful and the receiver one of high sensitivity, merely placing the test oscillator lead parallel to, and several inches away from the receiver's antenna lead may provide sufficient coupling. In some cases it may be necessary to bring the leads very close to each other, or it may even be necessary to twist the antenna lead and the oscillator lead together for several inches. (Of course, the two leads must be separated by their insulation and not make metallic contact.) As the receiver is brought into alignment, thereby increasing its sensitivity, it will be possible to decrease the amount of coupling between the test oscillator lead and the antenna lead. (Move the leads further apart.) Always use the lowest amount of coupling that still will provide a signal strong enough for working purposes. If the test oscillator has a variable control for its power output, it is better to turn this control to its high position and decrease the signal input to the receiver by decreasing the amount of coupling between the test oscillator and the receiver's antenna lead. This procedure will insure the greatest possible accuracy in alignment.

When adjusting the oscillator trimmer condenser, set the variable condenser to the frequency or condenser position indicated in the Service Notes. Do not change this position while adjusting the trimmer. However, when adjusting the antenna or translator trimmers, the proper method is to continually "rock" the variable condenser a degree or two both sides of the alignment frequency and, at the same time, adjust the trimmer.

PREVENTING ADJUSTMENT AT THE IMAGE FREQUENCY

When adjusting trimmers for short wave alignment, it sometimes will be found that a peak can be obtained at two different positions of the trimmer. Only one of these peaks is the correct one to use. The other is the image response. The proper procedure follows.

Oscillator Trimmer:

Screw the oscillator trimmer all the way in (maximum capacity). Then reduce the capacity until a peak is reached. Now continue to reduce the capacity until a second peak is reached. Almost always, this second peak is considerably louder than the first one. The first peak is the image frequency adjustment, and must be avoided.

Antenna and Translator Trimmers:

Screw the trimmers all the way in and then reduce capacity until a peak is reached. If the capacity is reduced still further, a second peak will be obtained. However, the correct setting is the first one, the one using the greater amount of capacity. Note that this is exactly opposite to the procedure for the oscillator trimmer.

MODEL 150,164,182
Supplementary Data

COLONIAL RADIO CORP.

SUPPLEMENTARY SERVICE NOTES

MODELS 150 - 164 - 182

MODEL 150

Certain improvements have been incorporated in the Model 150 auto receivers since the Instruction Booklets and Service Manuals for this model were printed. For the most part these improvements facilitate removal of the chassis from its case when necessary.

1. The permanently connected shielded antenna lead has been replaced with one using a bayonet and socket type of connection.

2. In order to eliminate the necessity for going through the operation of polarity changing in the field, some of the sets are shipped with the polarity connection correct for positive grounded batteries and others for negative grounded batteries. The shipping cartons are stencilled to indicate the polarity connection of the set.

3. The vibrator unit has been improved and it is suggested that a couple of them be carried in stock to replace any that may break down in service. Defective units should be returned to the Colonial Radio Corp., 254 Rano St., Buffalo, N.Y., for replacement.

4. Any letters appearing after Model 150, on the chassis or carton, have no significance. All changes and improvements were incorporated in all of the chassis before being shipped.

MODELS 164 AND 182

As mentioned on Page 138 of the Service Manual, drive cable grounding springs (Part #R-10165), were supplied in later production of Model 164 and 182. When these springs are used, it makes no difference whether an insulated or an uninsulated tip drive cable is used for the tuning condenser, and two brass tip cables are supplied when the grounding springs are included in the original package. Accordingly, if the grounding springs are used, all reference to the insulated tip drive cable in the Instruction Leaflets and in previous Service Manuals may be disregarded.

Two types of speakers have been used on the Model 164. They can be told apart by the fact that one type has a patent notice sticker pasted under the output transformer. Should parts of this speaker need replacement, return the entire speaker. The list of replacement parts for the other type speaker follows:

Part No.	Description	Price
S-9967-A	Speaker - Complete	$8.28
S-9988-A	Speaker cone and voice coil	1.38
S-10152	Speaker field coil	1.65
S-9994	Speaker clamping ring	.05
S-9968	Speaker eyelets	10 for .03
S-10144-A	Speaker transformer	1.28

Two types of set screws for binding the flexible drive cables and casings have been used in the Model 164 and 182 remote controls. One is a 6/32 X 1/8" screw, Part #R-5386, price - .01. The other is 8/32 X 3/16", Part #R-6498, price - .02. It is suggested that a small stock of both of these screws be carried.

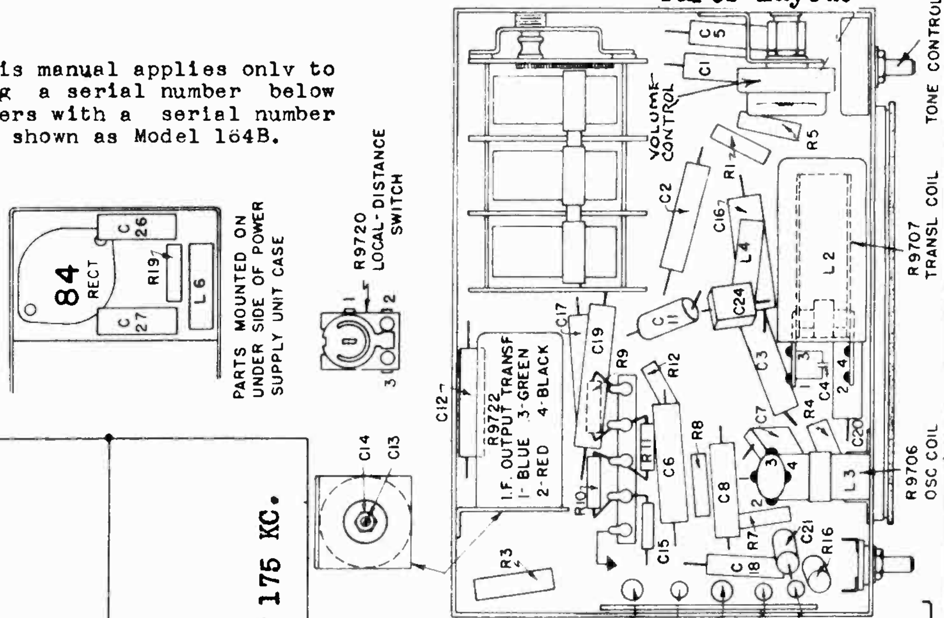
INTERFERENCE ELIMINATION

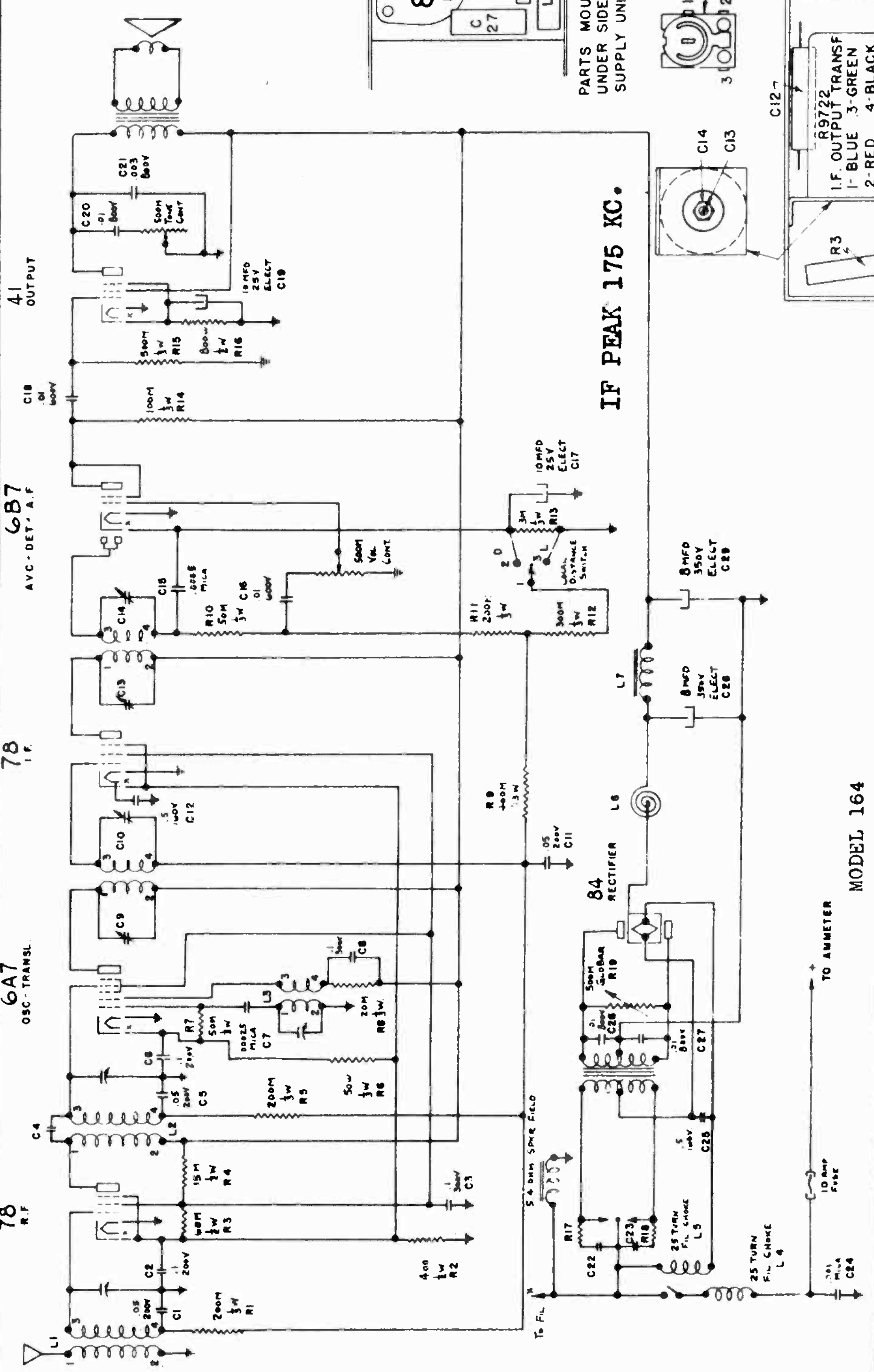
Occasionally a car is encountered in which the "dirt" at the ammeter is exceptionally great. To remedy a condition of this sort, solder a .001 mfd mica condenser, (Part #R-6759), from the fuse container shell to a point about an inch away, on the ammeter end of the "A" lead. Wrap tape around the condenser and lead to protect them.

COLONIAL RADIO CORP.

MODEL 164
Schematic, Voltage
Parts Layout

NOTE: This manual applies only to receivers having a serial number below 50600. Receivers with a serial number above 50600 are shown as Model 164B.





TUBE	PLATE VOLTAGE	SCREEN VOLTAGE	PLATE M.A.	SCREEN M.A.
78 - RF	230	100	4.5	1
78 - IF	230	100	4.5	1
6B7 - AVC-Det-AF	65	65	1.25	.4
41 - Output	205	215	20	3.25
6A7 - Osc-transl.	Ep=230v; Eg#2=135v; Eg#3&#5=100v; Ip=4ma; Ig#2=3ma; Ig#3&#5=3.2ma.			
84 - Rect.	20 m.a. per plate	Total battery drain=6.2 amperes.		

MODEL 164
Remote Control Data
Alignment Data

COLONIAL RADIO CORP.

THE REMOTE CONTROL UNIT

As mentioned in the Instruction Booklet, the flexible drive shaft with the black, insulated tongue at its end, MUST be used for the condenser drive. The insulation is to prevent ignition noise pick up by the cable from being fed into the tuning condenser. Failure to observe these instructions will result in motor noise.

The pilot light switch, in the remote control unit, works coincidentally with the set switch in the chassis. Flickering of the pilot light may be due to poor contact between the phosphorbronze spring and the rotating drum. Bending of the spring and sandpapering of the drum will correct the condition.

To gain access to the switch, procede as follows:

1. Disconnect the flexible cables from the remote control unit and remove the unit from the steering column.

2. Remove the outer shell from the unit by bending up the tabs.

3. Pull the pointer off of its shaft and then remove the dial.

4. Remove the three flat head screws holding the cover and remove the cover, exposing the mechanism.

The illustration shows how to replace the pointer drive cable. Note that the end of the cable coming from the clamped end of the spring passes OVER the other end of the cable. Also note that when the large pulley is set into place, the spring is diametrically opposite the drive pulley.

When replacing the pointer, turn the Station Selector shaft clockwise to its limit and set the pointer one division to the right of the bottom center line. Then when the shaft is turned all the way counter clockwise, the pointer will stop one division to the left of the center line.

Failure of the set switch and the remote control switch and lock to coincide in their operation will be caused by movement of the cables or of the control unit, after the synchronizing adjustment has been made. To secure simultaneous action of the two switches again, it will be necessary to disconnect the cable, turn the set switch to its "Off" position with a screw driver, turn the Volume Control knob in the control unit to its "Off" position with the key out, and then securely tighten the cable coupling and set screws. If the control unit is not moved then, the operation of the two switches will remain in synchronism.

The pilot light is accessible for replacement when the single screw at the back of the case is removed.

POWER SUPPLY UNIT

The plate supply unit is of the vibrating reed type with rectifier tube. No attempt should be made to repair the vibrator proper. Return it to your distributor for repair or replacement. The unit can be pulled out of its case when the five terminal screws are loosened.

It is very important that the proper polarity connection be made. For cars with the negative battery terminal grounded, the blue lead should be connected to the terminal nearest the outside of the case. For cars with grounded positive terminal, the positions of the blue and black leads are interchanged so that the black lead is connected to the outside terminal. Failure to observe these instructions will cause damage to the vibrator in a very few minutes of operation.

R17, R18, C22 and C23 are part of the assembly of the vibrator proper. C25, C26, C27, L6 and R19 are all mounted within the power supply case. R19 is a resistor whose value varies with the voltage applied to it. When the receiver is first turned on, the output voltage tends to become very high until the tubes heat sufficiently to draw their normal load. Under this condition, the value of R19 drops to a comparatively low value, loading the transformer sufficiently to prevent damage. As the tubes become heated, tending further to lower the voltage, the resistance of R19 increases greatly so that it no longer constitutes a load on the power supply.

THE IF TUNING ADJUSTMENTS

When peaking the IF stages, use a low enough output from the test oscillator to render the AVC action inoperative. The screw adjusts the primary tuning condenser;the nut adjusts the secondary, as shown in the illustrations.

THE RF TUNING ADJUSTMENTS

There are three holes at the back of the chassis through which the condenser trimmers are accessible. The unit nearest the control end of the chassis is the RF unit. The next one is the translator and the last one the oscillator.

Any trouble with oscillation will be due to proximity between grid and plate leads of the RF and IF stages. Moving the leads apart will correct the trouble.

COLONIAL RADIO CORP.

MODEL 164
Vibrator Data
Noise Data

The following chart will be helpful for making tests of the power supply unit. A continuity meter or ohmmeter may be used.

VIBRATOR UNIT ONLY

TEST	PROPER EFFECT	TROUBLE IF IMPROPER EFFECT IS HAD
Between brass contact adjusting screws. (With piece of paper inserted between contact points.)	Reading	Open transformer primary.
Grey lead to either red lead	Approx. 400 ohms	Open or shorted transformer secondary.
Blue and black leads, (with paper out.)	Reading	Contact points not making contact.

POWER SUPPLY (With Vibrator Disconnected)

Fahnstock clip to switch	Reading	Open fuse or open L4
Fahnstock clip to ground (With tubes out of sockets.)	Approx. 5. ohms	Open field coil
84 cathode to ground	Approx. 75 M ohms	If low res. reading, shorted C28 or C29. If no reading, open L6, L7, R2 or R4

REMEDIES FOR UNUSUAL NOISE CONDITIONS

If a condition is met in which the installation of standard suppressor equipment still leaves objectionable noise, proceed as follows:

1. Ground the antenna shield to the case by jamming a Parker-Kalon screw between the shield and the case.

2. Bond the bulkhead to the nearest point on the motor.

3. Disconnect the high tension lead running from the coil to the center of the distributor. Disconnect it both at the coil end and at the distributor end. Turn the ignition switch on and turn the motor over with the hand crank. If clicks are heard as the distributor breaker makes and breaks contact, interference comes from this source.

Additional capacity should NOT be put across the breaker points as it will interfere with the proper operation of the coil. (A condenser, connected across the points, is built into all distributors.) Rewire the entire low tension ignition system, using shielded low tension ignition cable which must be well grounded. Do not run the wiring along side of other wiring, but keep it separate, and if possible, along the car chassis channels.

4. If the trouble still persists, it may be necessary to use shielded high tension cable from the distributor to the coil. The shielding must be well grounded.

5. Very often the interference is fed into the antenna through the dome light wiring. This can be determined by disconnecting the dome light lead from the ammeter. If an improvement results, by-pass the dome light at the point where it enters the corner post.

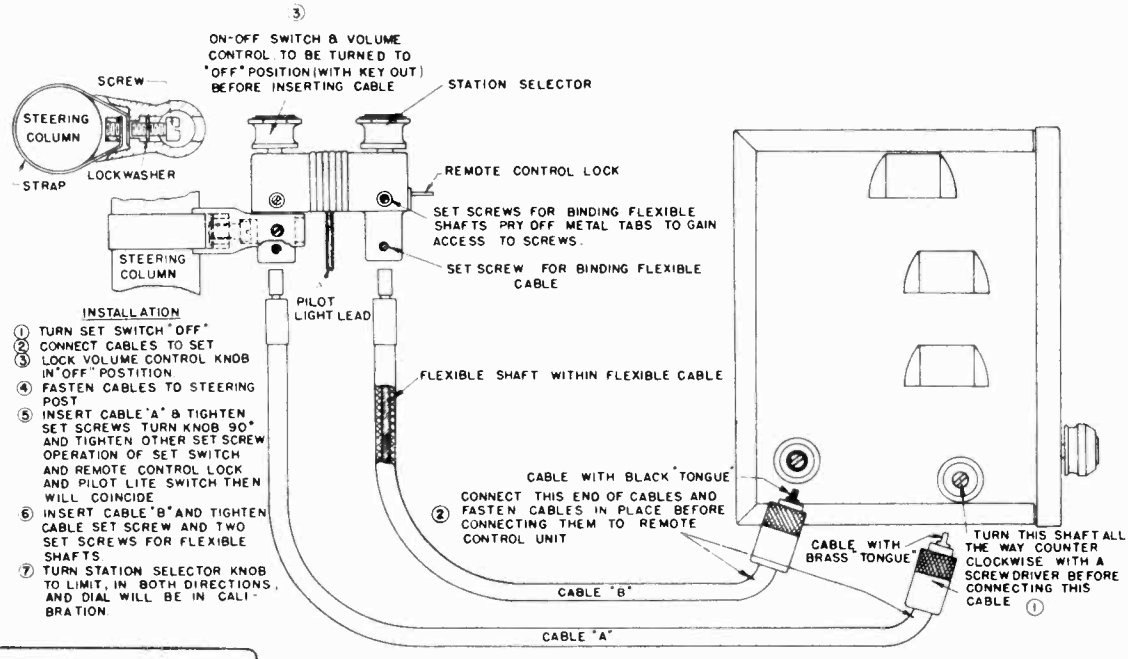
6. Metal windshield tubing, gas and oil lines sometimes have to be bonded to the bulkhead with heavy copper braid.

7. In some cars the high tension coil or leads come very close to the motor side of the floor board. As a result, interference is picked up by the occupant's body and transferred to the car antenna. Trouble of this sort is manifested by noisy reception ONLY when a person is sitting in the car. It can be remedied by tacking a grounded metal plate or screen to the motor side of the floor board, or by placing a grounded screen between the floor matting and the floor board.

It should be understood that it practically never is necessary to apply ALL these remedies. How many of them are needed will depend on the particular car and installation.

MODEL 164
Socket, Assembly, Speaker

COLONIAL RADIO CORP.

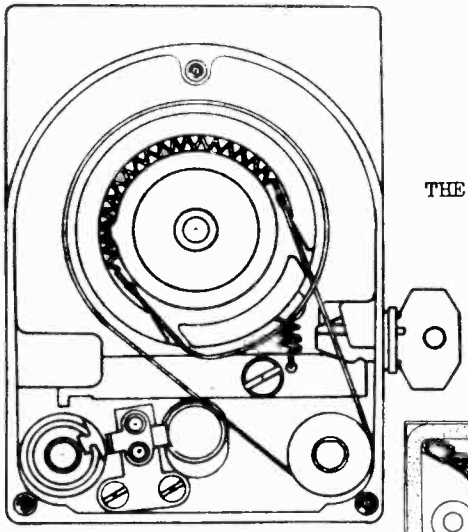


INSTALLATION

① TURN SET SWITCH "OFF"
② CONNECT CABLES TO SET
③ LOCK VOLUME CONTROL KNOB IN "OFF" POSITION
④ FASTEN CABLES TO STEERING POST
⑤ INSERT CABLE "A" & TIGHTEN SET SCREWS TURN KNOB 90° AND TIGHTEN OTHER SET SCREW OPERATION OF SET SWITCH AND REMOTE CONTROL LOCK AND PILOT LITE SWITCH THEN WILL COINCIDE
⑥ INSERT CABLE "B" AND TIGHTEN CABLE SET SCREW AND TWO SET SCREWS FOR FLEXIBLE SHAFTS
⑦ TURN STATION SELECTOR KNOB TO LIMIT, IN BOTH DIRECTIONS, AND DIAL WILL BE IN CALIBRATION

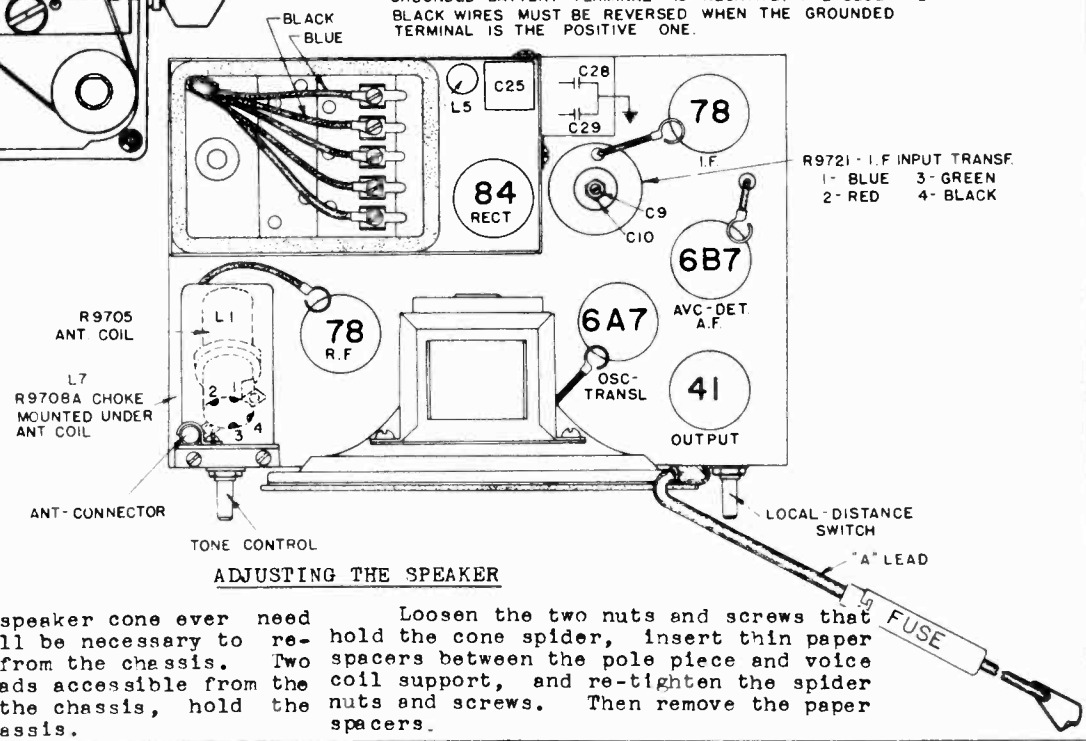
IMPORTANT

IF THE REMOTE CONTROL UNIT IS MOVED AFTER THE CABLE ADJUSTMENTS HAVE BEEN MADE, IT WILL BE NECESSARY TO READJUST IN ORDER TO MAINTAIN PROPER CALIBRATION AND OPERATION OF THE PILOT LIGHT, SWITCH AND LOCK.



THE REMOTE CONTROL MECHANISM

THE CONNECTIONS ILLUSTRATED ARE CORRECT ONLY IF THE GROUNDED BATTERY TERMINAL IS NEGATIVE. THE BLUE AND BLACK WIRES MUST BE REVERSED WHEN THE GROUNDED TERMINAL IS THE POSITIVE ONE.



ADJUSTING THE SPEAKER

Should the speaker cone ever need centering, it will be necessary to remove the speaker from the chassis. Two screws, their heads accessible from the under side of the chassis, hold the speaker to the chassis.

Loosen the two nuts and screws that hold the cone spider, insert thin paper spacers between the pole piece and voice coil support, and re-tighten the spider nuts and screws. Then remove the paper spacers.

MODEL 164-B
Above # 50600
Schematic, Parts

COLONIAL RADIO CORP.

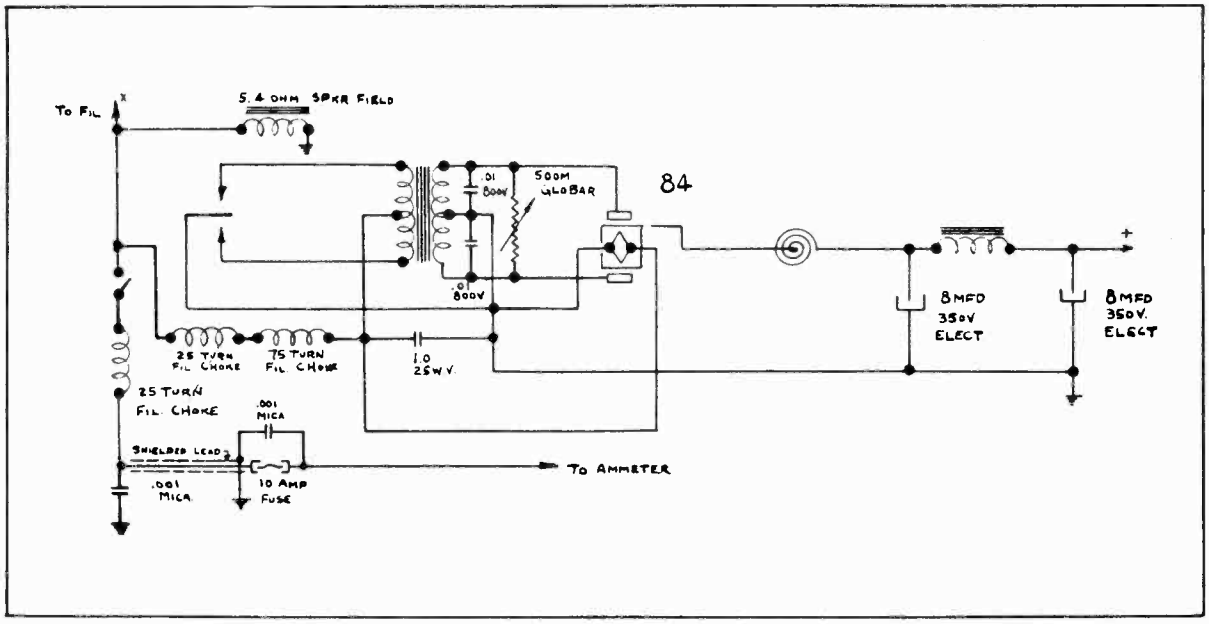
SERVICE NOTES

MODEL 164B

This manual applies to receivers having a serial number above 50600.

A different power supply unit is employed in these receivers, using a plug-in type of vibrator, making replacement of it very simple. Its construction is such that no attention need be paid to polarity. Accordingly, provision for changing polarity is omitted from this model.

The schematic of the chassis is the same as that shown in Fig. 76, Page 136, for the Model 164. The revised schematic for the power supply unit is shown in Fig. 82.



PART NO.	DESCRIPTION
R-6381	Clip - Grid
R-6381-AR	Clip - Grid with shielded lead
R-9705	Coil - Antenna
R-9706	Coil - Oscillator
R-9707	Coil - Translator
R-9577-A	Condenser - Variable
R-9144	Condenser - 10 Mfd. 25 volt
R-9743	Condenser - Electrolytic, dual 8 Mfd.
R-9032	Condenser - .5 Mfd. 160 volt
R-8581	Condenser - .1 Mfd. 300 volt
R-8286	Condenser - .1 Mfd. 200 volt
R-8920	Condenser - .05 Mfd. 200 volt
R-7070	Condenser - .01 Mfd. 600 volt
R-9776	Condenser - .01 Mfd. 800 volt
R-6461	Condenser - .003 Mfd. 800 volt
R-6759	Condenser - .001 Mfd. Mica
R-6760	Condenser - .0005 Mfd. Mica
R-4592	Condenser - .00025 Mfd. Mica
R-8030	Condenser - 1 Mfd. noise suppressor
R-10025	Condenser - .5 Mfd. noise suppressor
R-9711	Control - Tone
R-9710	Control - Volume
R-9717	Connector - Fuse container
R-7688	Fuse - 10 Amp.
R-9733	Instruction leaflet
R-8870-A	Lead - Antenna shielded
R-9578-A	Lead - "A", with clip
R-7228	Resistor - 500 M ohms, 1/3 watt carbon
R-6710	Resistor - 400 M ohms, 1/3 watt carbon
R-9777	Resistor - 300 M ohms, 1/3 watt carbon
R-6638	Resistor - 200 M ohms, 1/3 watt
R-7586	Resistor - 100 M ohms, 1/3 watt
R-9725	Resistor - 60 M ohms, 1/2 watt
R-6637	Resistor - 50 M ohms, 1/3 watt
R-6640	Resistor - 20 M ohms, 1/3 watt
R-7291	Resistor - 15 M ohms, 1/2 watt
R-8972	Resistor - 3 M ohms, 1/3 watt
R-7441	Resistor - 800 ohms, 1/2 watt
R-6436	Resistor - 400 ohms, 1/2 watt
R-6632	Resistor - 50 ohms, 1/3 watt
R-9745	Resistor - 500 M Globar (R 19)
R-9959	Ring - Felt (speaker)
R-9589-A	Shield - Ant. coil
R-9591	Shield - Translator coil
R-9360	Shield - Tube
R-8253	Socket - 5 Prong
R-8092	Socket - 6 Prong
R-8072	Socket - 7 Prong
S-9718-A	Speaker
R1-8018	Suppressor - Spark plug
R2-8018	Suppressor - Distributor
R-9720	Switch - Sensitivity
R-9721-A	Transformer - IF input
R-9722-A	Transformer - IF output
R-9581	Tube - Rubber, var. cond. mtg.
R-9723	Vibrator
R-9044-A	Choke (L4)
R-9044-B	Choke (L5)
R-9033	Choke (L6)
R-9708-A	Choke (L7)
R-9741	Clip - "A" lead

MODEL 164,182
Service Data

COLONIAL RADIO CORP.

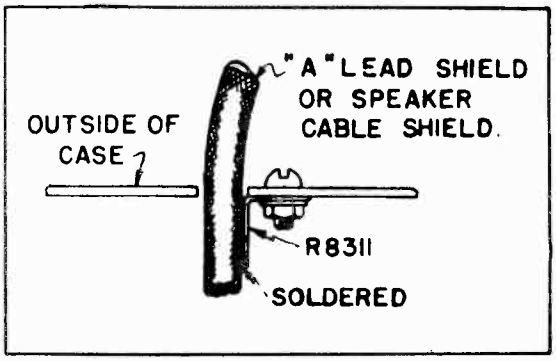
NOTES ON IGNITION INTERFERENCE ELIMINATION FOR MODELS 164 AND 182

The following changes should entirely eliminate ignition interference in instances where difficulty of this sort has been experienced.

SHORTENING THE SHIELD GROUNDING PIGTAIL

The Model 164 has a pigtail soldered to the "A" lead shield, with its other end clamped under one of the acorn nuts. The Model 182 has, in addition, a similar pigtail on the speaker cable shield. These pigtails should be removed and a shorter ground provided as follows:

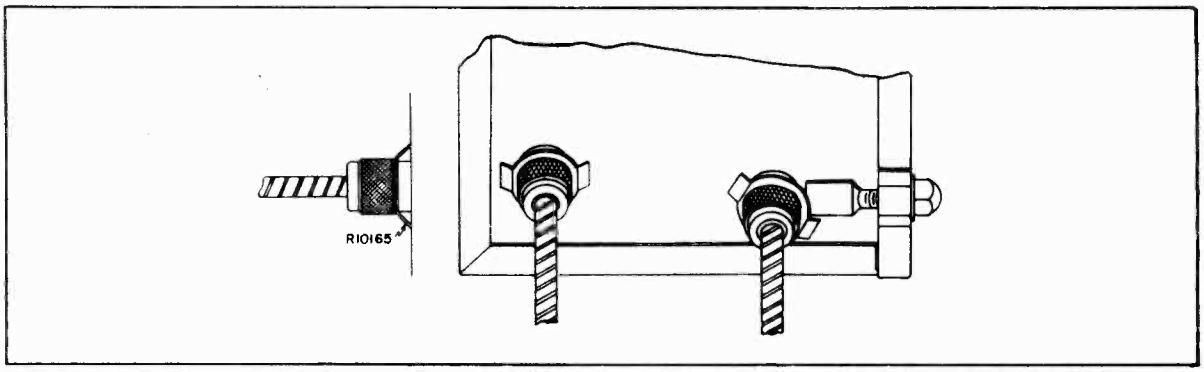
Drill a hole in the case immediately alongside the point where the shields come through the case. Fasten a large soldering lug (R-8311) to the inside of the case by means of a nut and screw passed through the drilled holes and solder the shields to the lugs.



GROUNDING THE SHIELD CABLES AND ANTENNA

To completely eliminate any pickup by the drive cables, grounding springs (Part R10165) are put between the collar on both flexible cable couplings and the case. It will be necessary to scrape away the paint on the case, under the springs, so that they can make good contact with the case.

In cars having an intense interference field near the antenna shield, further improvement can be had by soldering an Antenna Shield Grounding Clip to the antenna shield. (Part No. R-10166). The clip makes contact with the case at the point where the shield enters the case. Sandpaper the case to insure good contact.



INSTRUCTIONS FOR SHORTENING THE DRIVE CABLES

1. Remove the split sleeve from the chassis end of the cable casing.

2. Heat the chassis end of the cable until the solder melts, permitting removal of the brass sleeve. Then take the cable out of its casing.

3. Determine the point where the cable is to be cut and clean it thoroughly with fine sandpaper. Tin this point thoroughly.

4. Cut the casing 5/8"shorter than the length desired for the cable. Replace the split sleeve.

5. Put the cable back in the shortened casing. Slide the brass sleeve along the cable to the tinned portion and solder it there. Do not let it bind against the end of the casing. Then cut the cable at the end of the sleeve with a fine toothed hacksaw.

If the cables are cut in the foregoing manner, there can be no difficulty from unravelling of the strands since the soldered sleeve holds them.

COLONIAL RADIO CORP.

MODEL 182

The COLONIAL Model 182 is a six tube superheterodyne automobile radio receiver. The circuit is shown in block form in Fig. 78 and schematically in Fig. 80.

A 78 RF tube feeds the incoming signal to the 6A7 translator-oscillator. The 175 kc output of this tube is amplified by the pentode portion of the 6F7 tube and then fed to the 6B7. This tube provides AVC, diode detection and, together with the triode portion of the 6F7, furnishes audio amplification for input of the 41 push-pull output stage. The speaker is a separate 8" dynamic. A dynamotor furnishes the plate supply, drawing its power from the car's battery.

THE AVC AND SENSITIVITY CONTROL CIRCUITS

The 175 kc output of the 6F7 IF stage is impressed between the cathode and diode plates of the 6B7, in series with R12, R13, R14. The diode current flowing causes a voltage drop across these resistors. Only the drop across R12 is used for AVC. Since the grid returns of the 6A7, 78 and 6F7 are connected to R12, the negative bias across it is impressed upon the grids of these tubes. Increases in signal strength are offset by decreases in tube amplification resulting from this increased negative grid bias. The effect is to tend to maintain the output of the 6F7 IF at a constant value.

Residual bias for the tubes is furnished by R2. In addition, the residual bias and therefore the tube amplification is affected by the setting of the Local-Distance switch. When the switch lever is on contact #2, the drop across R15, due to the plate current of the 6B7, bucks the residual from R2, decreasing the total negative bias and increasing tube amplification. In the "Local" position, contact #1, only the residual from R2 is applied to the tube grids.

Be sure the sensitivity control is either FULL clockwise or FULL counter clockwise. If allowed to remain half way between the two positions, R 15 will be shorted, removing the 6B7 bias.

The volume control shunts R12 and R13 for audio frequencies. Accordingly, any desired amount of the audio component across R12 and R13 can be picked off by the moveable arm of the volume control and fed to the control grid of the pentode portion of the 6B7.

When peaking the IF transformers, use a low enough output from the test oscillator to render the AVC action inoperative.

THE RF TUNING ADJUSTMENTS

There are three holes at the back of the chassis through which the condenser trimmers are accessible. The unit nearest the control end of the chassis is the RF unit. The next one is the translator and the last one the oscillator.

THE 6F7 PHASE CHANGER CIRCUIT

In any push-pull circuit, the instantaneous voltage on the grid of one of the tubes must be opposite in polarity to the voltage on the other tube's grid. Ordinarily, this polarity difference or phase change is accomplished by the push-pull input transformer. In the Model 182, it is accomplished as follows:

At some particular instant the polarity of the signal voltage on the 6B7 plate will be negative. This negative voltage is coupled through C18 to the control grid of one of the 41's. This signal voltage on the 6B7 plate also causes a drop (audio frequency) across C17, R16, R10, and C27, with the polarities becoming increasingly negative toward C27. Accordingly, the control grid of the triode portion of the 6F7 is driven in a positive direction by the drop across R10 and C27. This causes the plate current to increase, which is to say that the plate becomes more positive. This positive potential is coupled through C19 to the grid of the other 41 tube. The result, then, is that the grid of one 41 is going in a positive direction while the other is going negative.

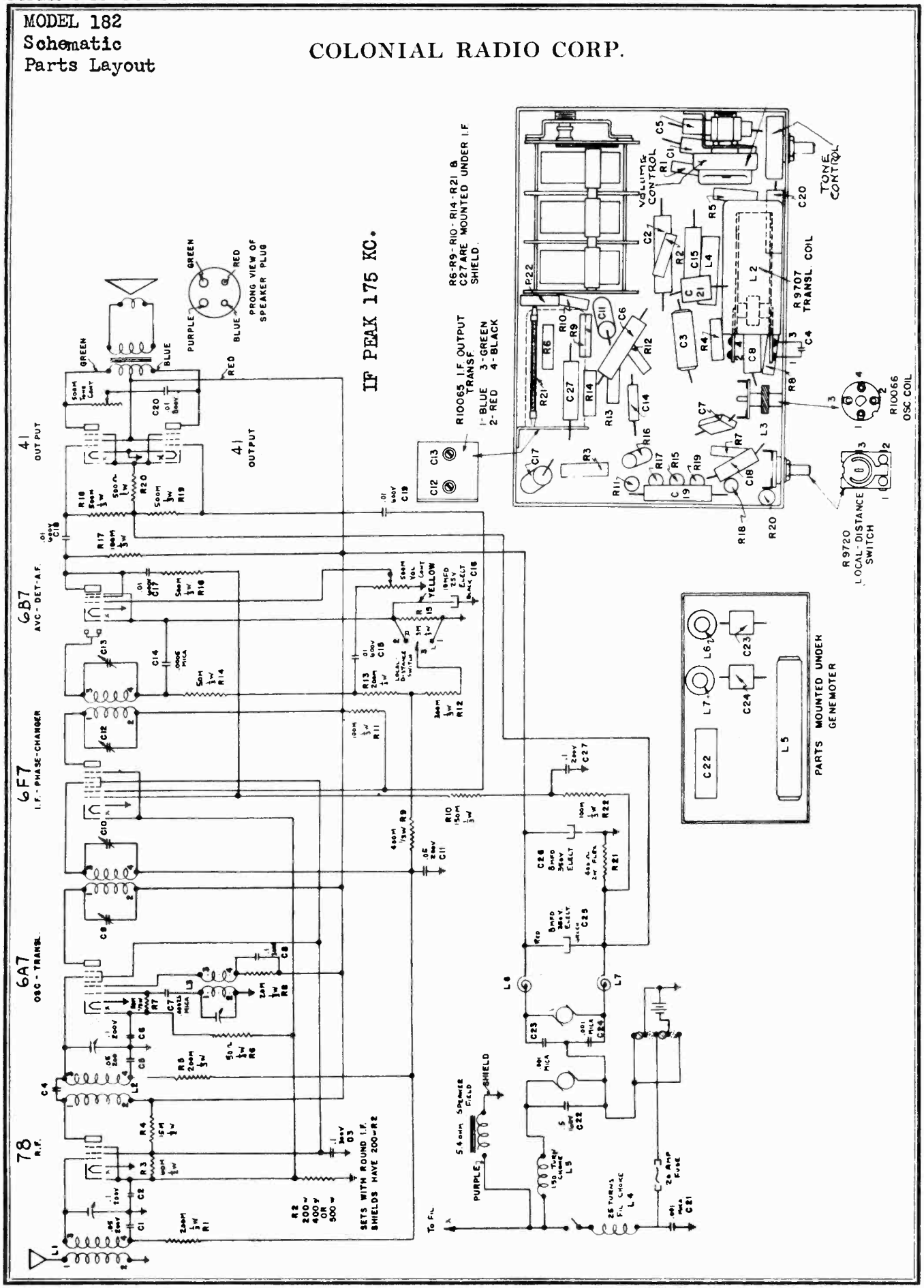
THE POWER SUPPLY UNIT

The plate supply unit is of the rotating dynamotor type. To remove it, take out the three Parker-Kalon screws at the bottom edge of the dynamotor housing and then take out the two screws holding the metal can type of condenser to the housing. The housing and dynamotor then can be loosened from the chassis. Unsoldering the leads under the dynamotor and removing the four screws that hold the dynamotor to the housing case permits complete removal of the dynamotor. After considerable use, the dynamotor commutator may need cleaning. Use the finest sandpaper. NEVER USE EMERY CLOTH.

If the receiver is set up on the bench, outside of its case, be sure to connect a wire from the speaker cable to the chassis, to complete the speaker field circuit.

MODEL 182
Schematic
Parts Layout

COLONIAL RADIO CORP.



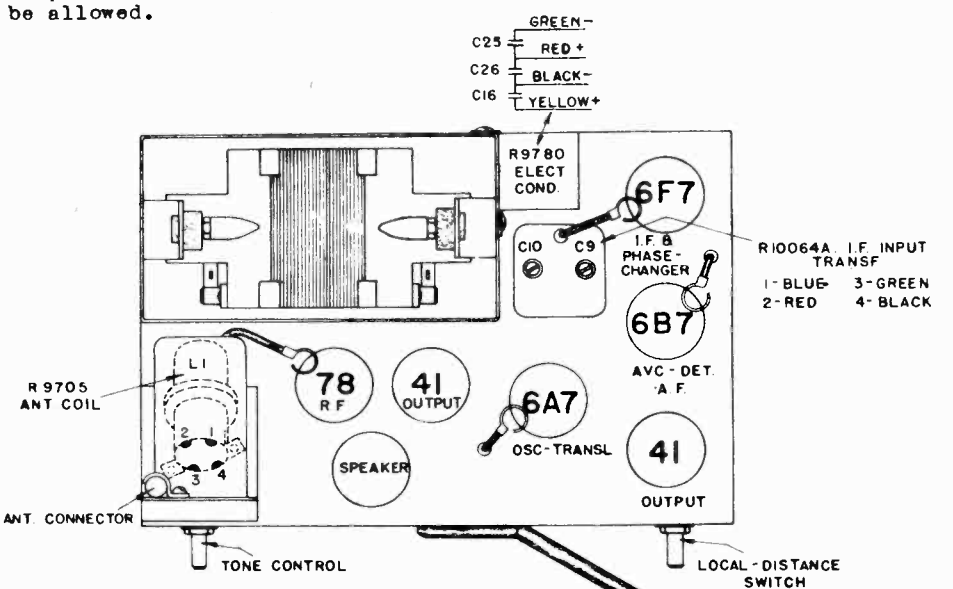
COLONIAL RADIO CORP.

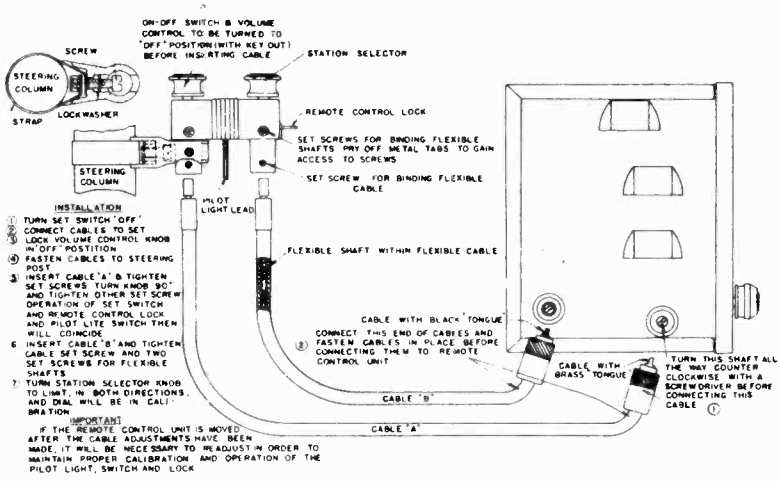
MODEL 182
Voltage, Socket
Trimmer, Assembly

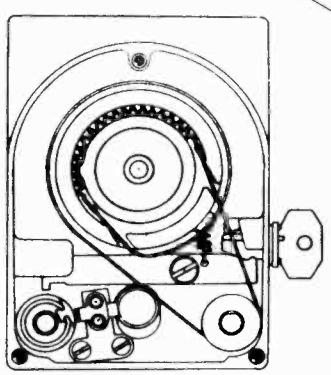
TUBE VOLTAGE AND CURRENT CHART

TUBE	PLATE VOLTAGE	SCREEN VOLTAGE	PLATE M. A.	SCREEN M.A.
78 - RF	200	95	8	2.25
6B7 - AVC-Det-AF	60	60	1.25	.3
41- Output	205	208	14	2.5
6A7 - Osc-Transl.	Ep=200v; Eg#2=125v; Eg#3&#5=95v; Ip=3.5ma; Ig#2=3ma; Ig#3&#5=3.5ma;			
6F7 - IF & AF	Ep=200v; Eg#2=75v; Eg#3&#5=95v; Ip=5ma. Ig#2=3ma; Ig#3&#5=1ma.			

Care should be used when taking readings with a set analyzer as the capacity of the cables may cause circuits to oscillate, giving rise to erratic readings. Usually, touching the finger to grid or plate is sufficient to stop oscillation. If an analyzer is not used, the voltage readings can be taken with a 1000 ohms per volt voltmeter, from the cathode to the respective elements of each tube. Ordinarily, a 20% deviation from the chart value may be allowed.







THE REMOTE CONTROL MECHANISM - MODEL 182

MODEL 182
Remote Control Data
Parts List

COLONIAL RADIO CORP.

THE REMOTE CONTROL UNIT

As mentioned in the Instruction Booklet, the flexible drive shaft with the black, insulated tongue at its end, MUST be used for the condenser drive. The insulation is to prevent ignition noise pick up by the cable from being fed into the tuning condenser. Failure to observe these instructions will result in motor noise.

The pilot light switch, in the remote control unit, works coincidentally with the set switch in the chassis. Flickering of the pilot light may be due to poor contact between the phosphor-bronze spring and the rotating drum. Bending of the spring and sandpapering of the drum will correct the condition.

To gain access to the switch, procede as follows:

1. Disconnect the flexible cables from the remote control unit and remove the unit from the steering column.

2. Remove the outer shell from the unit by bending up the tabs.

3. Pull the pointer off of its shaft and then remove the dial.

4. Remove the three flat head screws holding the cover and remove the cover, exposing the mechanism.

The illustration shows how to replace the pointer drive cable. Note that the end of the cable coming from the clamped end of the spring passes OVER the other end of the cable. Also note that when the large pulley is set into place, the spring is diametrically opposite the drive pulley.

When replacing the pointer, turn the Station Selector shaft clockwise to its limit and set the pointer one division to the right of the bottom center line. Then when the shaft is turned all the way counter clockwise, the pointer will stop one division to the left of the center line.

Failure of the set switch and the remote control switch and lock to coincide in their operation will be caused by movement of the cables or of the control unit, after the synchronizing adjustment has been made. To secure simultaneous action of the two switches again, it will be necessary to disconnect the cable, turn the set switch to its "Off" position with a screw driver, turn the Volume Control knob in the control unit to its "Off" position with the key out, and then securely tighten the cable coupling and set screws. If the control unit is not moved then, the operation of the two switches will remain in synchronism.

The pilot light is accessible for replacement when the single screw at the back of the case is removed.

REPLACEMENT PARTS LIST

R-6552	Board - Resistor
R-10082	Book - Instruction
R-9588	Bushing - Rubber, Genemotor mtg.
R-9044-A	Choke - L4
R-9757	Choke - L6 & L7
R-10116-A	Choke - L5
R-9741	Clip - "A" Lead
R-6381	Clip - Grid
R-9705	Coil - Antenna
R-10066	Coil - Oscillator
R-9707	Coil - Translator
R-9577-A	Condenser - Variable
R-9780	Condenser - Triple electrolytic
R-8030	Condenser - 1 Mfd. noise suppressor
R-10025	Condenser - .5 Mfd. noise suppressor
R-9032	Condenser - .5 Mfd. 160 volts
R-8286	Condenser - .1 Mfd. 200 volts
R-8581	Condenser - .1 Mfd. 300 volts
R-7354	Condenser - .05 Mfd. 200 volts
R-7070	Condenser - .01 Mfd. 600 volts
R-9776	Condenser - .01 Mfd. 800 volts
R-6759	Condenser - .001 Mfd. Mica
R-6760	Condenser - .0005 Mfd. Mica
R-4592	Condenser - .00025 Mfd. Mica
R-9711	Control - Tone (500 M ohms)
R-9710	Control - Volume (500 M ohms)
R-9717	Connector - (and fuse container)
R-9751	Fuse - 20 Amp.
R-9587	Genemotor
R-9744	Grommet - "A" lead
R-7692	Knob - Tone & sensitivity controls
R-8870-A	Lead - Antenna
R-8219	Nut - Acorn cover
R-9719	Nut - Set mounting
R-7228	Resistor - 500 M ohms, 1/3 watt carbon
R-6710	Resistor - 400 M ohms, 1/3 watt carbon
R-9777	Resistor - 300 M ohms, 1/3 watt carbon
R-6638	Resistor - 200 M ohms, 1/3 watt carbon
R-9778	Resistor - 150 M ohms, 1/3 watt carbon
R-7586	Resistor - 100 M ohms, 1/3 watt carbon
R-9725	Resistor - 60 M ohms, 1/2 watt carbon
R-6637	Resistor - 50 M ohms, 1/3 watt carbon
R-6640	Resistor - 20 M ohms, 1/3 watt carbon
R-7291	Resistor - 15 M ohms, 1/2 watt carbon
R-8972	Resistor - 3 M ohms, 1/3 watt carbon
R-10142	Resistor - 500 ohms, 1/3 watt carbon
R-9779	Resistor - 500 ohms, 1 watt carbon
R-6632	Resistor - 50 ohms, 1/3 watt carbon
R-8419	Resistor - 400 ohms, flexible
R-10056	Screw - Polarity changer
R-9589-A	Shield - Antenna coil
R-9591	Shield - Translator coil
S-9590-AC	Speaker - Complete
S-7776-B	Speaker cone & voice coil
S-9767-A	Speaker terminal board
S-9770-A	Speaker cable & plug
S1-9768-AC	Speaker case

COLONIAL RADIO CORP.

SERVICE NOTES

MODEL 602

The COLONIAL Model 602 is a 12 tube, four wave band superheterodyne embodying such features as AVC, sensitivity control, tone control, neon visual tuning indicator, and twin speakers. The circuit is shown in block form in Fig. 85 and schematically in Fig. 86.

A 56 tube is used in the oscillator circuit. A 6A7 serves as an electron coupled translator. Its 175 kc output is amplified by the two 78 IF stages and then fed to the 37 detector, which is used as a diode. Two 37 AF tubes comprise a push-pull input stage to drive the push-pull 2A3H output stage. A 6B7 tube is used in the AVC stage, a 6B7 in the neon visual tuning circuit, and an 83V is the rectifier. The speakers are both moving coil dynamics. One is a 12" and the other an 8".

The incoming signal is fed to the translator control grid through coils L1 and L2 for the broadcast range, L3 for the next range, L4 for the next and L5 for the highest frequency range. L6 is the broadcast oscillator coil. L7 is the oscillator for the next range. L8 is the next, and L9 the one for the highest frequency range. C1 is the broadcast antenna coil trimmer. C3 is the broadcast translator coil trimmer. C2 is the translator trimmer for the first high frequency range. C4 the one for the next range, and C5 is the translator trimmer for the highest frequency range. C6 is the broadcast range oscillator trimmer. C7 is the trimmer for the first high frequency range, C8 the one for the next range, and C9 is the trimmer for the highest frequency oscillator coil. C10 is the padder for the low frequency end of the broadcast range, C11 the one for the next range, C12 for the next and C13 is the padder for the highest frequency oscillator coil.

The location of the coils and condensers is shown in the Service Illustrations. The numbering and lettering corresponds to that used in the Schematic.

6B7 TUNING LIGHT CIRCUIT

The 6B7 tuning light circuit is shown schematically in Fig. 83. A portion of the IF signal voltage, that existing across condenser A, is stepped up and impressed on the diode part of the 6B7 by means of the sharply tuned transformer, T, which is wound with Litz wire. The rectified signal current flows through the 1 megohm resistor from point (1) to point (2) so that point (2) is negative with respect to point (1). The control grid of the 6B7 is connected to point (2) and the cathode to point (1). As the signal is tuned in, the voltage across the 1 megohm resistor increases, increasing the negative control grid bias on the 6B7, thereby cutting down its plate current. The reduced plate current means a decreased voltage drop across the 130 M ohm resistor, making available a greater voltage across the neon tuning flasher. When the signal is properly tuned in, the plate current of the 6B7 is sufficiently decreased to permit the neon lamp to light. Until a signal is tuned in, the plate current of the 6B7 causes sufficient drop across the 130 M ohm resistor to prevent the neon bulb from lighting. The sharply tuned transformer insures that voltage is not applied to the diode part of the 6B7 until the station is accurately tuned in.

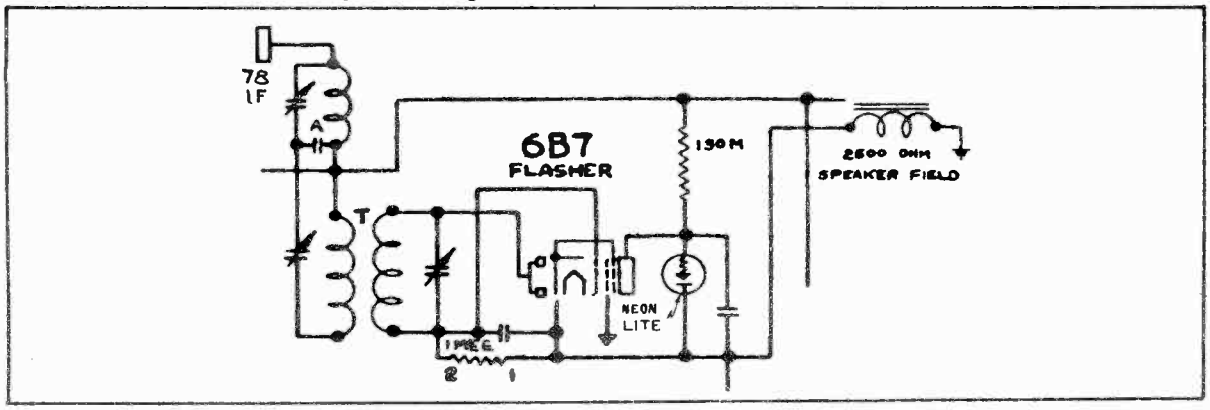


FIG. 83. THE NEON TUNING LIGHT CIRCUIT

MODEL 602
Circuit Data

COLONIAL RADIO CORP.

6B7 AVC CIRCUIT

The AVC circuit is shown schematically in Fig. 84.

If there were no plate current through the 6B7, its cathode would be negative with respect to diode plate (A) by the amount of the voltage drop across the 2500 ohm speaker field. However, because of the 6B7 plate current and consequent voltage drop across the 50 M ohm resistor, the cathode potential of the 6B7 is raised so that it is approximately 15 volts positive to diode plate (A).

A portion of the IF signal is fed through C1 to diode plate (B). The resulting current, flowing through R1 creates a voltage drop across it with point (1) positive with respect to point (2). This voltage is impressed through R2 onto the control grid of the 6B7. This increased negative control grid bias decreases the plate current and the voltage drop across R3. As a consequence, the cathode bias with respect to ground decreases. This is equivalent to saying that diode plate A becomes positive with respect to the cathode. Current therefore flows from diode plate (A) to the cathode, creating a voltage drop across R4 with point (3) positive with respect to point (4). Since the grid returns of the translator and IF stages are connected to point (4), the voltage drop across R4 is impressed on the control grids of these tubes. This negative bias, which varies in step with the strength of the signal, controls the amplification of these tubes. An increase in signal strength is offset by a decrease in tube amplification so that the output of the IF stage tends to remain at a constant value. Because the cathode is 15 volts positive with respect to diode plate (A) the AVC action is delayed until the received signal is strong enough to cause diode plate (A) to go positive with respect to the cathode. In this way the full sensitivity of the receiver is maintained for stations too weak to give full output from the receiver.

Residual bias for the first IF tube is supplied by the 15 M ohm variable cathode resistor, which serves as a sensitivity control. Set owners should be instructed not to increase the sensitivity any further than necessary for satisfactory reception. Unnecessarily high sensitivity will result in unwanted between-station-noise.

When peaking the IF stages, use a low enough output from the test oscillator to render the AVC action inoperative.

To peak the tuning flasher transformer, tune in a station whose strength is just about sufficient to operate the neon light. Then try retuning it very accurately by ear. If the flasher transformer is off calibration, the light will go out when the station is accurately tuned. With the station accurately tuned in, adjust the transformer tuning condensers until the neon bulb lights.

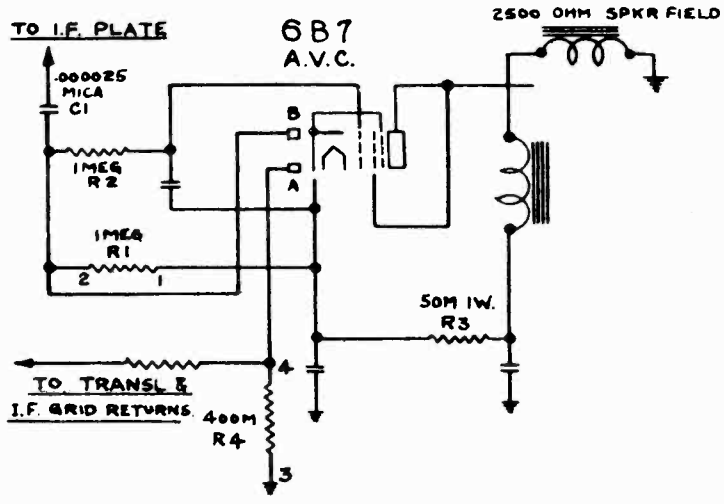


FIG. 84. THE AVC CIRCUIT - MODEL 602

MODEL 602
Schematic

COLONIAL RADIO CORP.

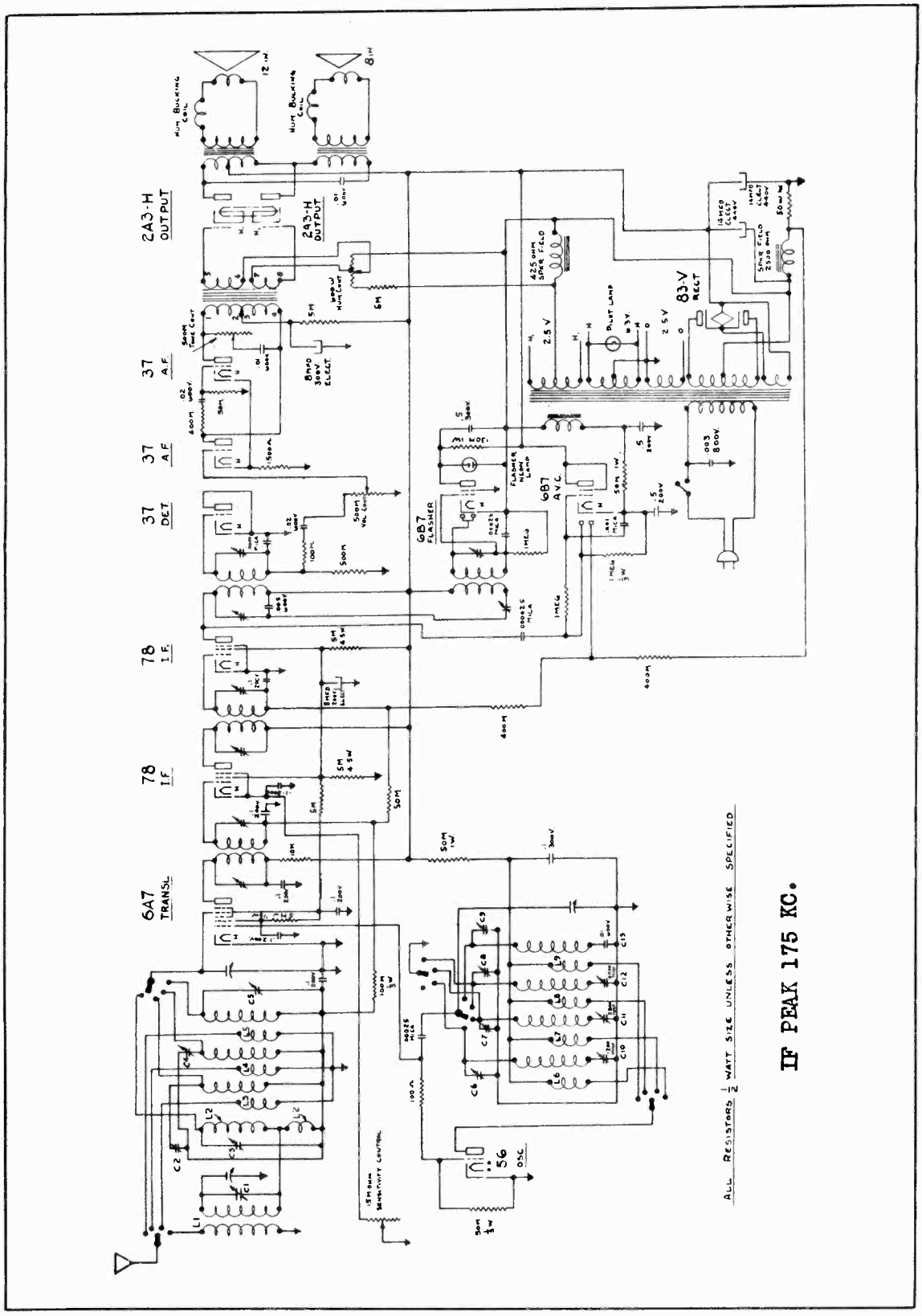
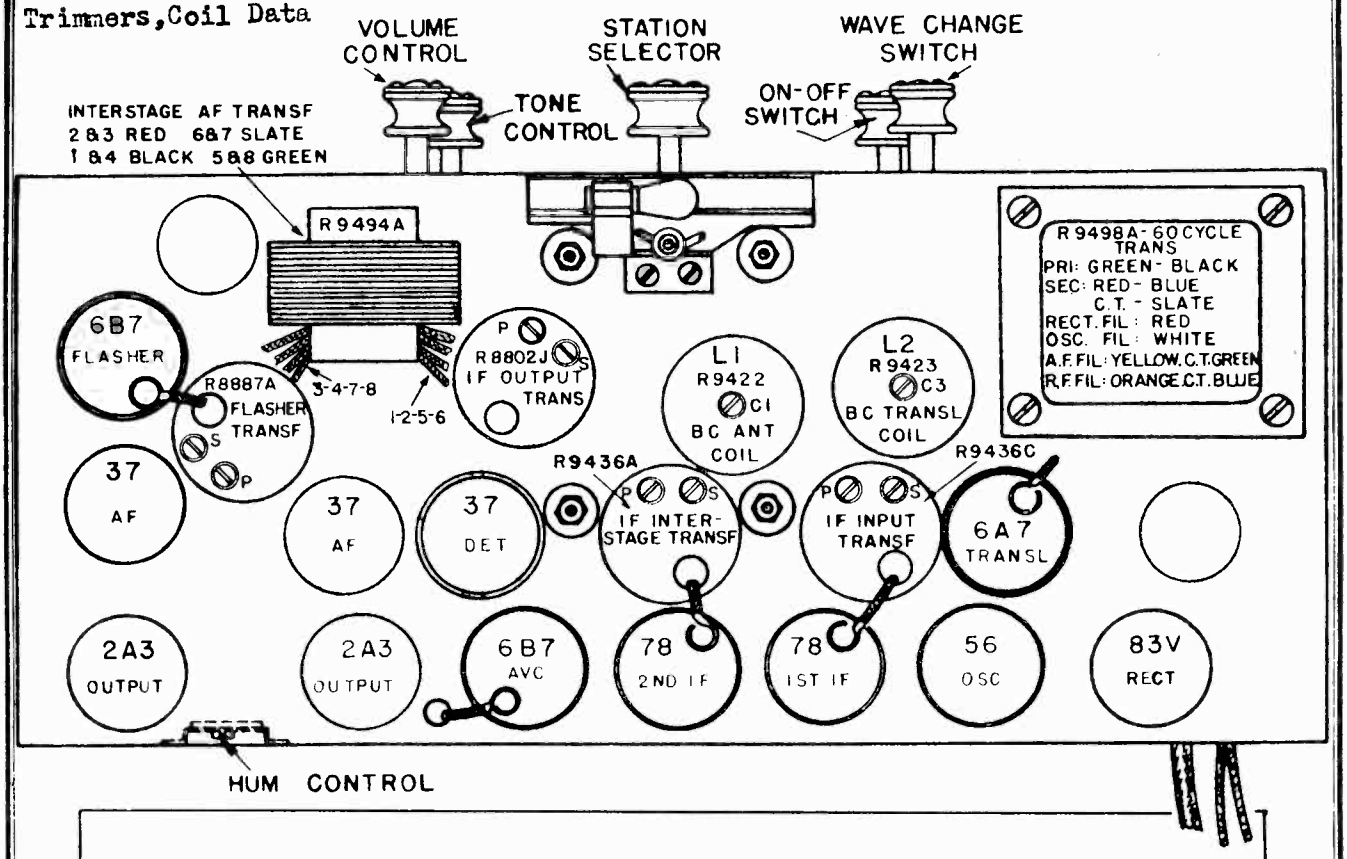
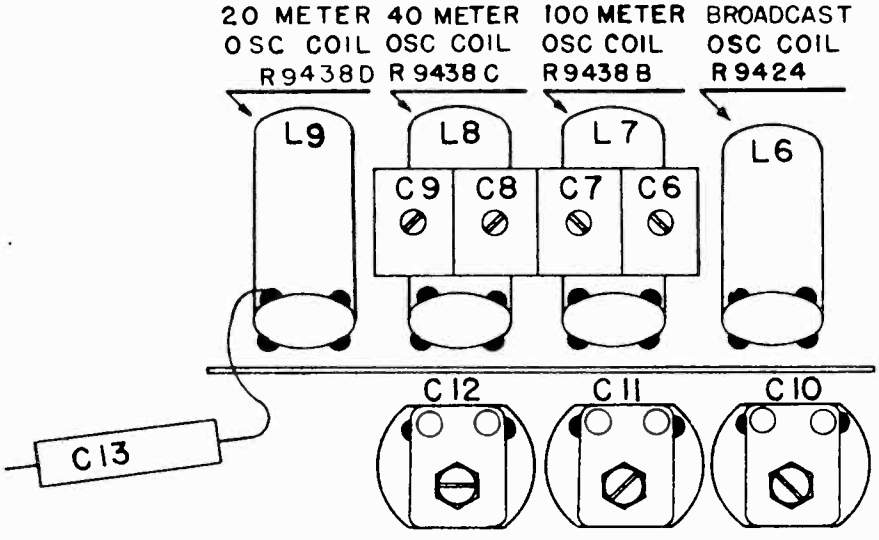


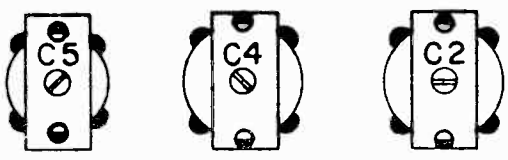
FIG. 86. THE SCHEMATIC - MODEL 602

MODEL 602
Socket Layout
Trimmers, Coil Data

COLONIAL RADIO CORP.







L5 R 9438A 20 METER TRANSL COIL

L4 R 9437B 40 METER TRANSL COIL

L3 R 9437A 100 METER TRANSL COIL

MODEL 602
Voltage, Alignment

COLONIAL RADIO CORP.

HUM ADJUSTMENT

There is a hum adjustment to be turned with an insulated handle screwdriver, at the rear of the chassis, under the type 2A3H tubes. With the volume control all the way off, turn the hum adjustment to the point of minimum hum. If this point appears to be beyond the end of the control, interchange the positions of the 2A3H tubes. If a balance still cannot be had, the 2A3H tubes must be replaced by ones more nearly matched in their characteristics.

ALIGNMENT

BROADCAST

Disconnect the antenna and connect a .00025 mfd. condenser between the sets antenna and ground leads, to take the place of the normal antenna capacity. Adjust the test oscillator to a frequency near the high frequency end of the broadcast range and couple the oscillator to the receiver antenna lead. With the wave switch in the broadcast position, set the dial accurately to the test oscillator's frequency. Then peak C1, C3, and C6.

Retune the test oscillator and the receiver to a frequency near the low frequency end of the broadcast range. Peak C10.

100 METER RANGE

Turn the wave switch to the first high frequency range. Adjust the test oscillator to a frequency near the high frequency end of this range. Turn the dial to this frequency and peak C7 and C2. Then change the test oscillator's frequency to the low frequency end of the range and peak C11.

40 METER RANGE

Turn the wave switch to the next high frequency range. Adjust the test oscillator to a frequency near the high frequency end of this range. Turn the dial to this frequency and peak C8 and C4. Then change the test oscillator's frequency to the low frequency end of the range and peak C12.

20 METER RANGE

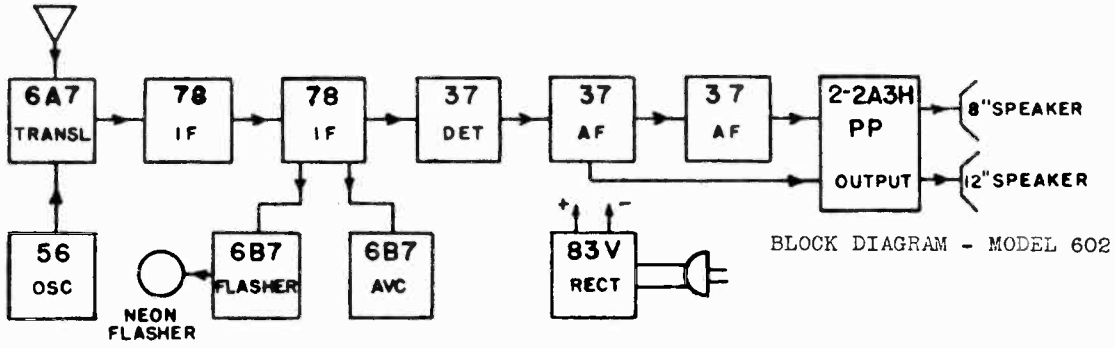
Turn the wave switch to the highest frequency range. Adjust the test oscillator to a frequency near the high frequency end of this range. Turn the dial to this frequency and peak C9 and C5. The padder for this range, C13, is fixed.

TUBE	PLATE VOLTAGE	SCREEN VOLTAGE	PLATE M. A.	SCREEN M. A.
56 - Osc.	70		4	
78 - 1st. IF	215	110	8	1.5
78 - 2nd. IF	215	110	8	1.5
37 - AF	165		4	
37 - AF	165		4	
2A3H - Output	265		60	
6B7 - AVC	60	60	4	1
6B7 - Flasher	7 - No. sig. 90 - With sig.			
83V - Rect	DC volts = 350. Plate current = 87ma. per plate.			
6A7 - Transl	Ep = 180; Eg#2 = 80; Eg#3 & #5 = 95. Ip = 4ma; Ig#2 = 2ma; Ig #3 & #5 = 4ma.			

Readings taken with 1000 ohms per volt voltmeter, sensitivity control on full, no signal received. Care must be used if measurements are made with an analyzer since the capacity of the cables may cause circuits to oscillate, giving rise to erratic readings. Usually, touching the finger to grid or plate is sufficient to stop oscillation. If an analyzer is not used, voltage readings can be made from cathode to the respective elements of each tube. Ordinarily, a 20% deviation from the chart value may be allowed.

MODEL 602
Parts List

COLONIAL RADIO CORP.



BLOCK DIAGRAM - MODEL 602

PART NO	DESCRIPTION
R9315	Bezel - Sensitivity control
R5509A	Board - Terminal
R8297A	Board - Terminal, double
R8308A	Board - Terminal, triple
R8900B	Board - Terminal, 5 terminals
R9341	Cabinet
R9521	Card - Operating
R7011A	Clip - Antenna and ground leads
R6381	Clip - Grid
R9422	Coil - Antenna, broadcast
R9423	Coil - Translator, broadcast
R9437A	Coil - Translator, short wave, 100 meter band
R9437B	Coil - Translator, short wave, 40 meter band
R9438A	Coil - Translator, short wave, 20 meter band
R9424	Coil - Oscillator, broadcast
R9438B	Coil - Oscillator, short wave, 100 meter band
R9438C	Coil - Oscillator, short wave, 40 meter band
R9438D	Coil - Oscillator, short wave, 20 meter band
R8776A	Coil - Choke
R9414	Condenser - Variable
R9494A	Condenser - Variable, complete with drive assembly and dial
R9425	Condenser - Padding, 700 mmf.
R9426	Condenser - Padding, 1200 mmf.
R9427	Condenser - Trimmer, 4 gang
R9428	Condenser - Trimmer, 25 mmf.
R6565	Condenser - Tuning, IF output trans
R8824	Condenser - IF tuning
R7236	Condenser - 14 mfd. electrolytic
R9344	Condenser - 8 mfd. 300 volts
R8748	Condenser - 8 mfd. 200 volts
R8826	Condenser - .5 mfd. 300 volts
R8825	Condenser - .5 mfd. 200 volts, dual
R6138	Condenser - .1 mfd. 300 volts
R6444	Condenser - .1 mfd. 200 volts
R6761	Condenser - .02 mfd. 600 volts
R9429	Condenser - .01 mfd. 600 volts
R7070	Condenser - .01 mfd. 600 volts
R6954	Condenser - .005 mfd. 600 volts
R9431	Condenser - .0045 mfd. 600 volts
R6461	Condenser - .003 mfd. 800 volts
R6933	Condenser - .002 mfd. 600 volts
R6760	Condenser - .005 mfd. mica
R6759	Condenser - .001 mfd. mica
R4592	Condenser - .00025 mfd. mica
R4303	Condenser - .0001 mfd. mica
R8711	Condenser - .000025 mfd. mica
R7240	Control - Sensitivity
R6570	Control - Tone and volume
R7566	Cord - Extension
R9433A	Dial and indicator
R9412	Escutcheon
R9442	Instructions
R8520	Knob - Sensitivity control
R9314	Knob - Large
R9312	Knob - Small
R9443	Knob - Small with dot
R2288	Lamp - Pilot
R8830	Lamp - Neon flasher
R5346B	Lead - Antenna
R5345D	Lead - Ground
R9436	Transformer - IF input and interstage, coils and core only
R9436C	Transformer - IF input, complete less shield
R9436A	Transformer - IF interstage, complete less shield
R8802	Transformer - IF output, coils and core only
R8802J	Transformer - IF output, complete less shield
R8887	Transformer - Tuning flasher, coils and core only
R8687A	Transformer - Tuning flasher, complete less shield
R8769A	Transformer - Interstage audio
R8778A	Transformer - Power, 60 cycle
R5823	Resistor - 1 megohm, 1/2 watt carbon
R7585	Resistor - 1 megohm, 1/3 watt carbon
R6179	Resistor - 500 M ohm, 1/2 watt carbon
R5822	Resistor - 400 M ohm, 1/2 watt carbon
R8828	Resistor - 130 M ohm, 1 watt carbon
R7586	Resistor - 100 M ohm, 1/3 watt carbon
R5819	Resistor - 100 M ohm, 1/2 watt carbon
R4354	Resistor - 50 M ohm, 1 watt carbon
R6637	Resistor - 50 M ohm, 1/3 watt carbon
R6445	Resistor - 50 M ohm, 1/2 watt carbon
R6152	Resistor - 10 M ohm, 1/2 watt carbon
R6510	Resistor - 5 M ohm, 1/2 watt carbon
R7226	Resistor - 5 M ohm, 1/3 watt carbon
R8829	Resistor - 1500 ohm, 1/2 watt carbon
R6976	Resistor - 100 ohm, 1/2 watt carbon
R9081	Resistor - 50 ohm, 1 watt carbon
R9062	Resistor - 600 ohm, variable hum adjuster
R8886	Resistor - Candohm
R9484	Screw - Sensitivity control bezel mounting
R7359	Screw - Escutcheon
R6652A	Shaft - Dial drive assembly
R7320	Shield - Bottom chassis
R9415A	Shield - Coil
R7235	Shield - Electrolytic condenser
R8803A	Shield - IF transformer
R5322	Shield - Tube top
R5323A	Shield - Tube bottom
R8366	Socket - 4 prong
R8367	Socket - 5 prong
R8368	Socket - 6 prong
R8369	Socket - 7 prong
S8762C	Speaker - 12", complete
S7606A	Speaker 12" cone and voice coil
S8792	Speaker 12" field coil
S7416	Speaker plug
S8793A	Speaker 12" transformer
S8763C	Speaker - 8", complete
S7776C	Speaker 8" cone and voice coil
S8569	Speaker 8" field coil
S7414	Speaker plug
S8798AC	Speaker 8" transformer
R9411	Sticker - License tube layout, 60 cycle
R6964	Switch - "Off-On"
R9435	Switch - Wave

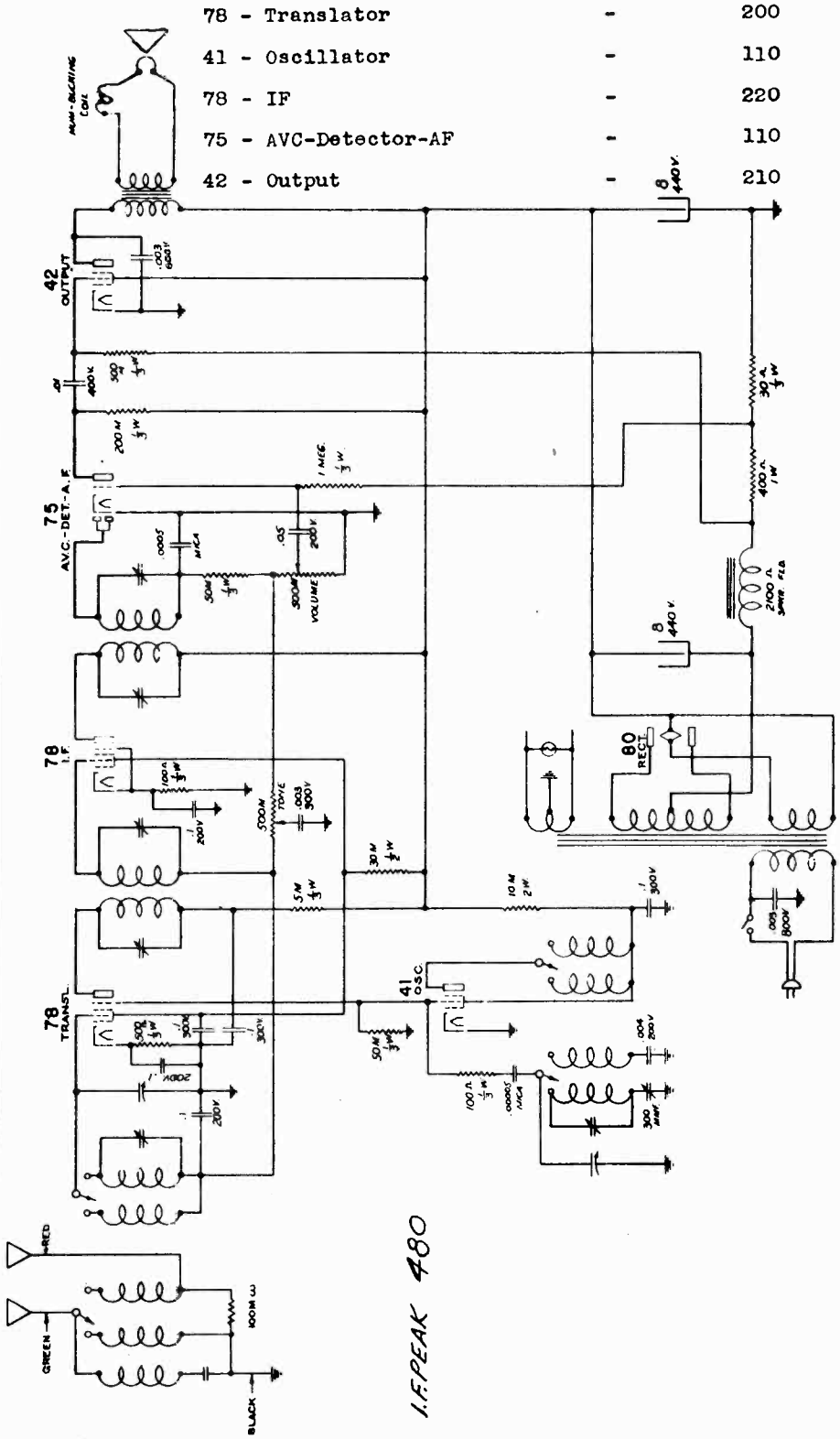
COLONIAL RADIO CORP.

MODEL 603
Voltage Schematic
Interference Data

TUBE VOLTAGE CHART

All readings are to be taken between the chassis and the respective element of each tube.

TUBE		PLATE	SCREEN
78 - Translator	-	200	90
41 - Oscillator	-	110	110
78 - IF	-	220	90
75 - AVC-Detector-AF	-	110	
42 - Output	-	210	220

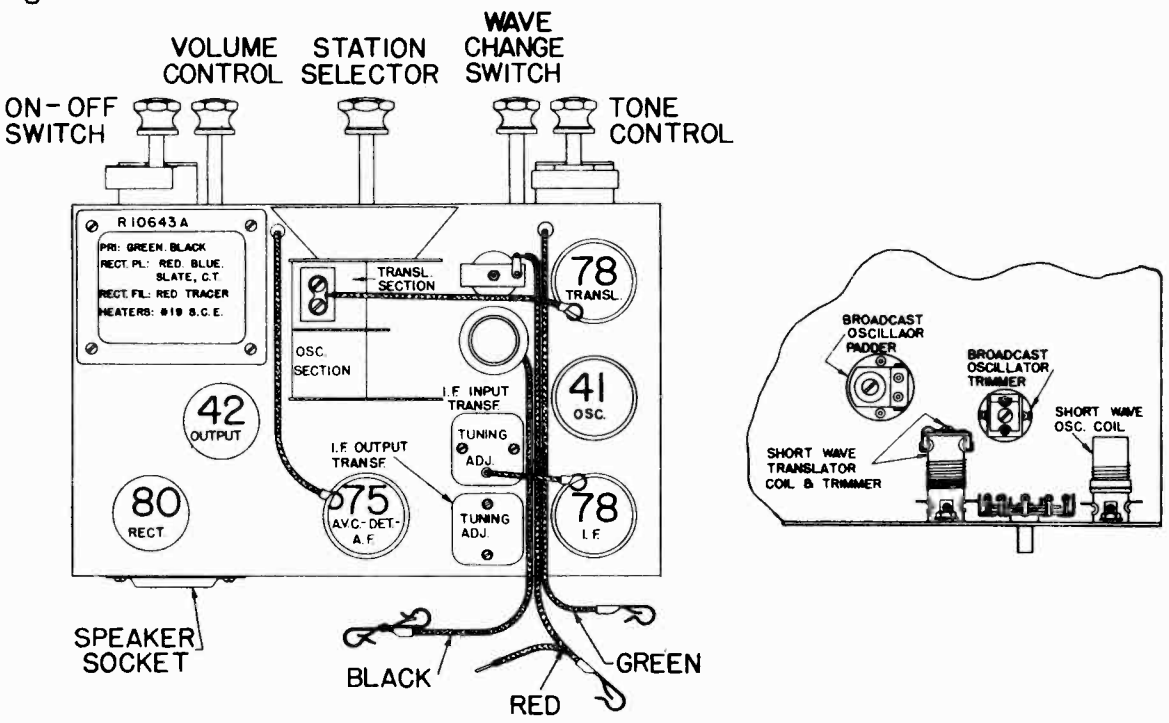


In order to prevent interference from code stations, when the receiver is located near the coast, a wave trap is incorporated in the antenna circuit. Although this trap is shown in the schematic as a coil with a series condenser, actually it consists of two multi-layer coils wound on top of each other with one end of each coil left unconnected. The distributed capacity between the coils is represented by the condenser in the schematic. The design of the coil is such that the combination of distributed capacity and inductance is resonant at about 600 meters, which is the frequency used by ships and also is very near the IF frequency of the receiver.

The voltage drop created across the 500 M ohms of the Volume Control, due to the diode current of the 75 tube, is used for AVC voltage.

MODEL 603
Socket Layout
Trimmers
Alignment

COLONIAL RADIO CORP.



ALIGNMENT PROCEDURE

The IF Stages:

1. Connect the low scale of the output meter across the loud speaker voice coil.

2. Connect the ground lead of the test oscillator to the receiver chassis.

3. Connect the other lead of the test oscillator in series with a .1 mfd. condenser to the grid of the 78 IF tube. Leave the grid clip attached to the cap and the tube shield in place.

4. Set the test oscillator to 480 kc and tune the IF output transformer. The locations of the tuning adjustments are shown in the Service Illustration.

5. Change the test oscillator connection to the control grid of the 78 Translator tube and adjust the IF input transformer.

6. Repeat the adjustments to secure greater accuracy.

Always use as low an output as possible from the test oscillator in order to render the AVC action of the set inoperative.

RF Alignment (Broadcast):

1. Couple the test oscillator to the green antenna lead, leaving the antenna connected.

2. Set the test oscillator to 1660 kilocycles.

3. Screw the oscillator padder condenser to approximately three quarters of its maximum capacity.

4. Turn the variable condenser plates all the way out. Then adjust the oscillator trimmer for maximum output.

5. Set the test oscillator to 1400 kc and tune in its signal. Then adjust the translator trimmer, mounted on the variable condenser section nearer the dial, for maximum output.

6. Set the test oscillator to 600 kc and tune in its signal. Then slowly rotate the variable condenser back and forth a degree or two and, at the same time, adjust the padder until maximum output is obtained.

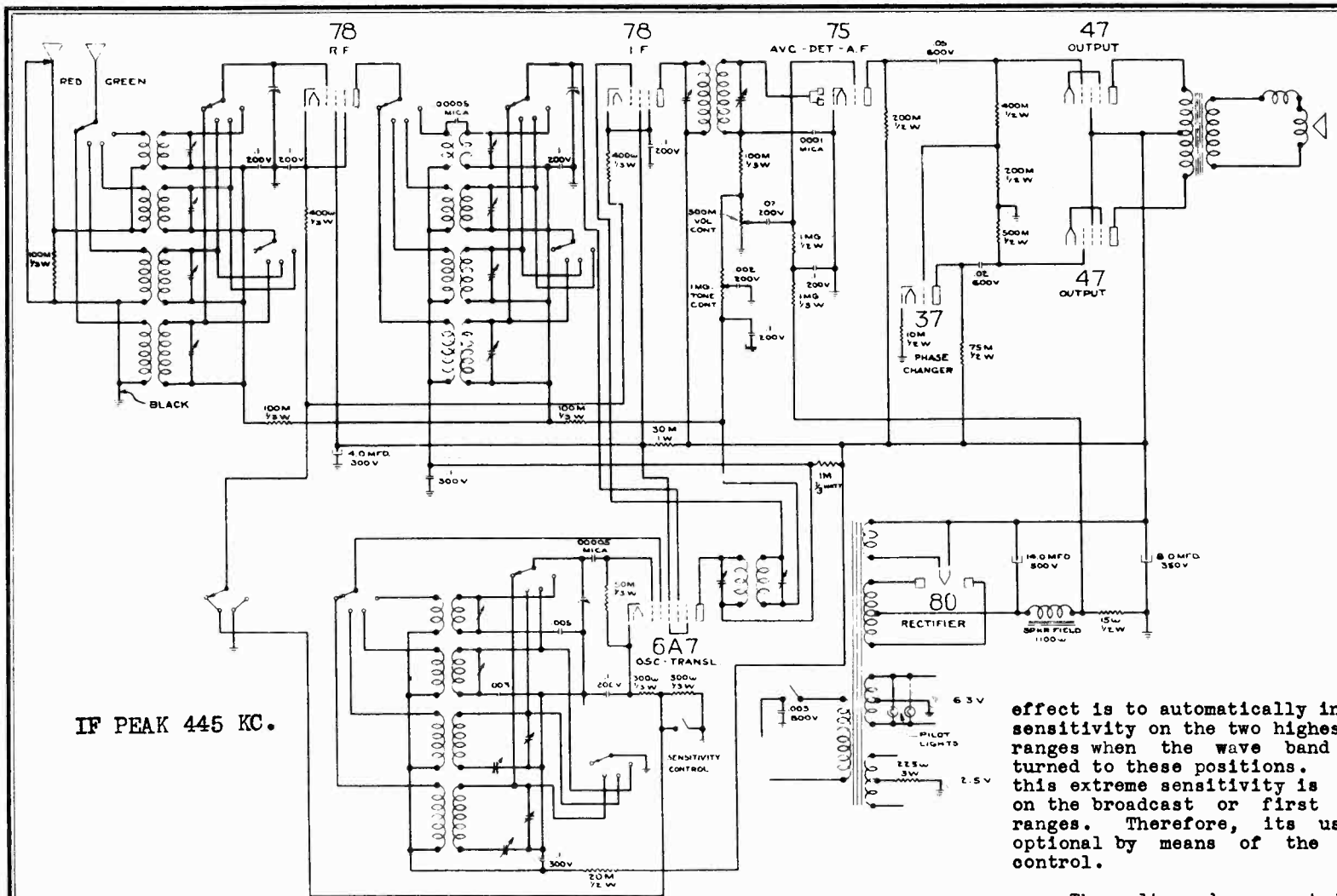
7. Repeat the 1660 kc and 1400 kc adjustments.

Always use as low an output from the test oscillator as possible.

Short Wave Alignment:

1. Leave the test oscillator coupled to the green antenna lead as for broadcast alignment.

2. Set the test oscillator to 15 megacycles and tune in its signal. Then adjust the trimmer, mounted on the short wave translator coil, for maximum output.



IF PEAK 445 KC.

The knob operating the "On - Off" switch also acts as a sensitivity control when it is turned all the way to the right. In this position the 500 ohm resistor in the cathode circuit of the 6A7, is shorted out. When the wave band switch is in either the broadcast or first short wave range positions, the cathodes of the 78 RF and IF tubes are returned to this 500 ohm resistor. Therefore, when this resistor is shorted, the control grid bias on the 6A7 and 78 tubes is reduced, thereby increasing the sensitivity of the receiver. When the wave band switch is in positions "C" or "D", the cathode returns of the 78 tubes are connected to ground instead of to the 500 ohm resistor so that the sensitivity control then only affects the bias of the 6A7 tube. The effect is to automatically increase the sensitivity on the two highest frequency ranges when the wave band switch is turned to these positions. Ordinarily, this extreme sensitivity is not needed on the broadcast or first short wave ranges. Therefore, its use is made optional by means of the sensitivity control.

The voltage drop created across the 500 M ohms of the Volume Control, due to the diode current of the 75 tube, is used for AVC voltage.

The triode portion of the 75 AVC-Detector-AF tube, in conjunction with the 37 Phase Changer tube, acts as a push-pull input stage to the 47 push-pull output stage. The use of the 37 Phase Changer tube eliminates the need for a push-pull input transformer.

MODEL 604
Voltage, Alignment

COLONIAL RADIO CORP.

The IF Stages:

1. Connect the low scale of the output meter across the loud speaker voice coil.

2. Connect the ground lead of the test oscillator to the chassis.

3. Connect the other lead of the test oscillator, through a .1 mfd condenser, to the control grid of the 78 IF tube. The grid clip should be left attached to the cap and the tube shield must be in place.

4. Set the test oscillator to 445 kc and tune the IF output transformer. The locations of its tuning adjustments are shown in the Service Illustration.

5. Change the test oscillator connection to the control grid cap of the 6A7 tube and tune the IF input transformer.

6. In order to secure greater accuracy repeat the adjustments, starting with the IF output transformer.

Always use as low an output as possible from the test oscillator in order to render the AVC action of the set inoperative.

RF Alignment; Band "A" (Broadcast):

1. Couple the output of the test oscillator to the antenna lead of the set, with the antenna connected.

2. Set the test oscillator to 1520 kilocycles.

3. Turn the variable condenser plates all the way out. Then adjust the #1 oscillator trimmer for maximum output. The locations of all of the trimmers are shown in the Service Illustrations.

4. Set the test oscillator to 1400 kc and tune in its signal. Then adjust the #1 antenna trimmer and the #1 translator trimmer for maximum output.

5. Set the test oscillator to 600 kc and tune in its signal. Then slowly rotate the variable condenser back and forth a degree or two and, at the same time, adjust the #1 oscillator padder for maximum output.

6. Repeat the 1520 kc and 1400 kc adjustments for greater accuracy.

Band "B":

1. Leave the test oscillator coupled to the antenna lead as for broadcast band alignment.

2. Set the test oscillator to 4250 kilocycles.

3. Turn the variable condenser plates all the way out. Then adjust the #2 oscillator trimmer for maximum output.

4. Set the test oscillator to 4000 kc and tune in its signal. Then adjust the #2 antenna trimmer and the #2 translator trimmer for maximum output.

5. If turns have been shifted, repeat the 10 megacycle and the 9 megacycle adjustments, since they will have been affected by shifting of the turns.

Band "D":

1. Set the test oscillator to 19 megacycles.

2. Turn the variable condenser plates all the way out. Then adjust the #4 oscillator trimmer for maximum output.

3. Set the test oscillator to 18 megacycles and tune in its signal. Then adjust the #4 antenna trimmer and the #4 translator trimmer for maximum output.

4. Set the test oscillator to 9 megacycles and tune in its signal. If necessary, shift turns on the antenna and translator coils to secure maximum sensitivity. Be sure to cement the turns in place.

5. If turns have been shifted, repeat the 19 megacycle and 18 megacycle adjustments since they will have been affected by shifting of the turns.

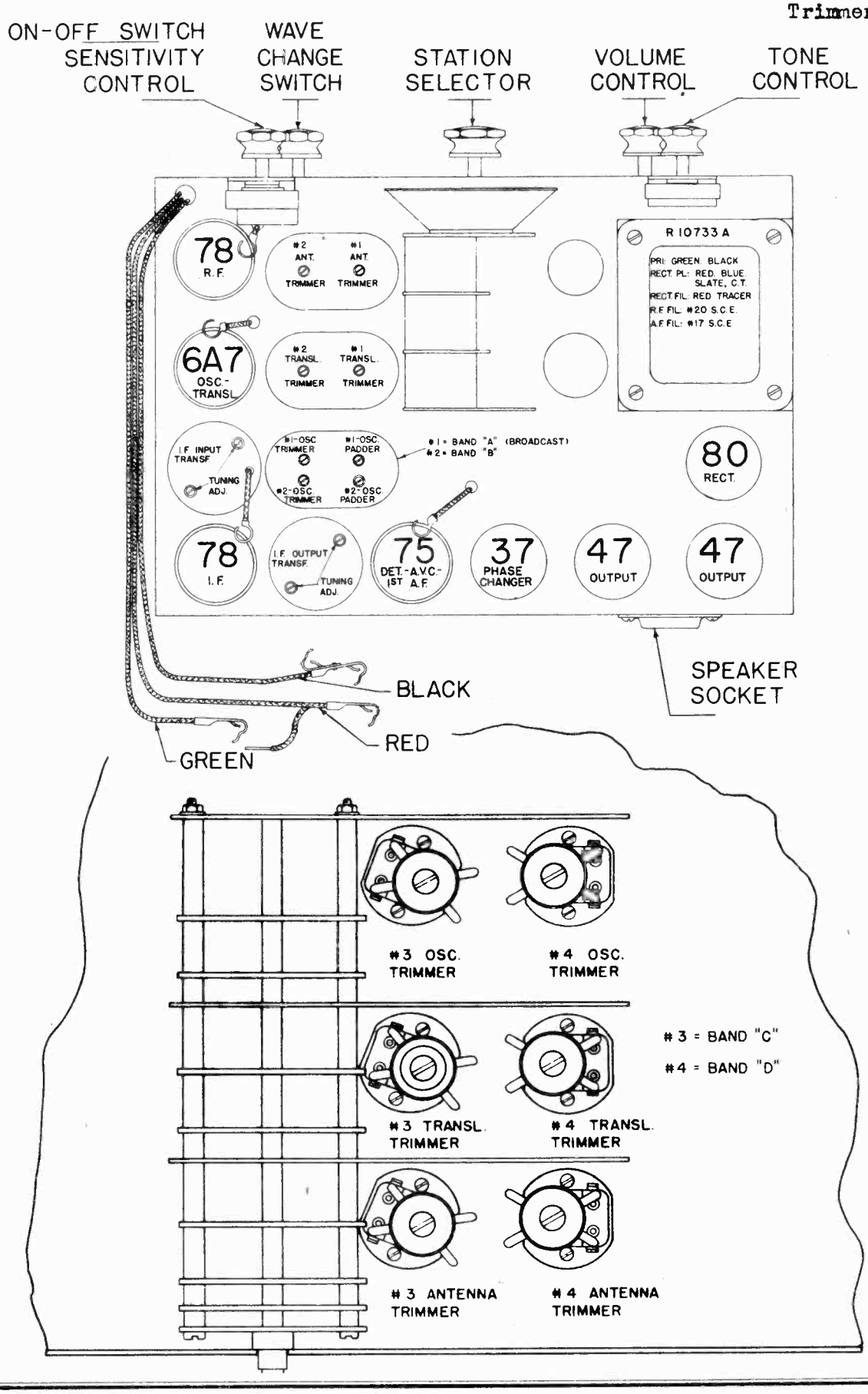
TUBE VOLTAGE CHART

All readings are to be taken between the chassis and the respective element of each tube.

TUBE	PLATE	SCREEN	OSC. SECTION PLATE	CATHODE
78 - RF	220	90		3.1
6A7 - Osc-Transl	220	90	160	2.6
78 - IF	235	90		3
75 - AVC-Det-AF	75			0
37 - Phase Changer	125			9
47 - Output	230	235		16

MODEL 604
Socket Layout
Trimmer Data

COLONIAL RADIO CORP.



MODEL 604
Parts List

COLONIAL RADIO CORP.

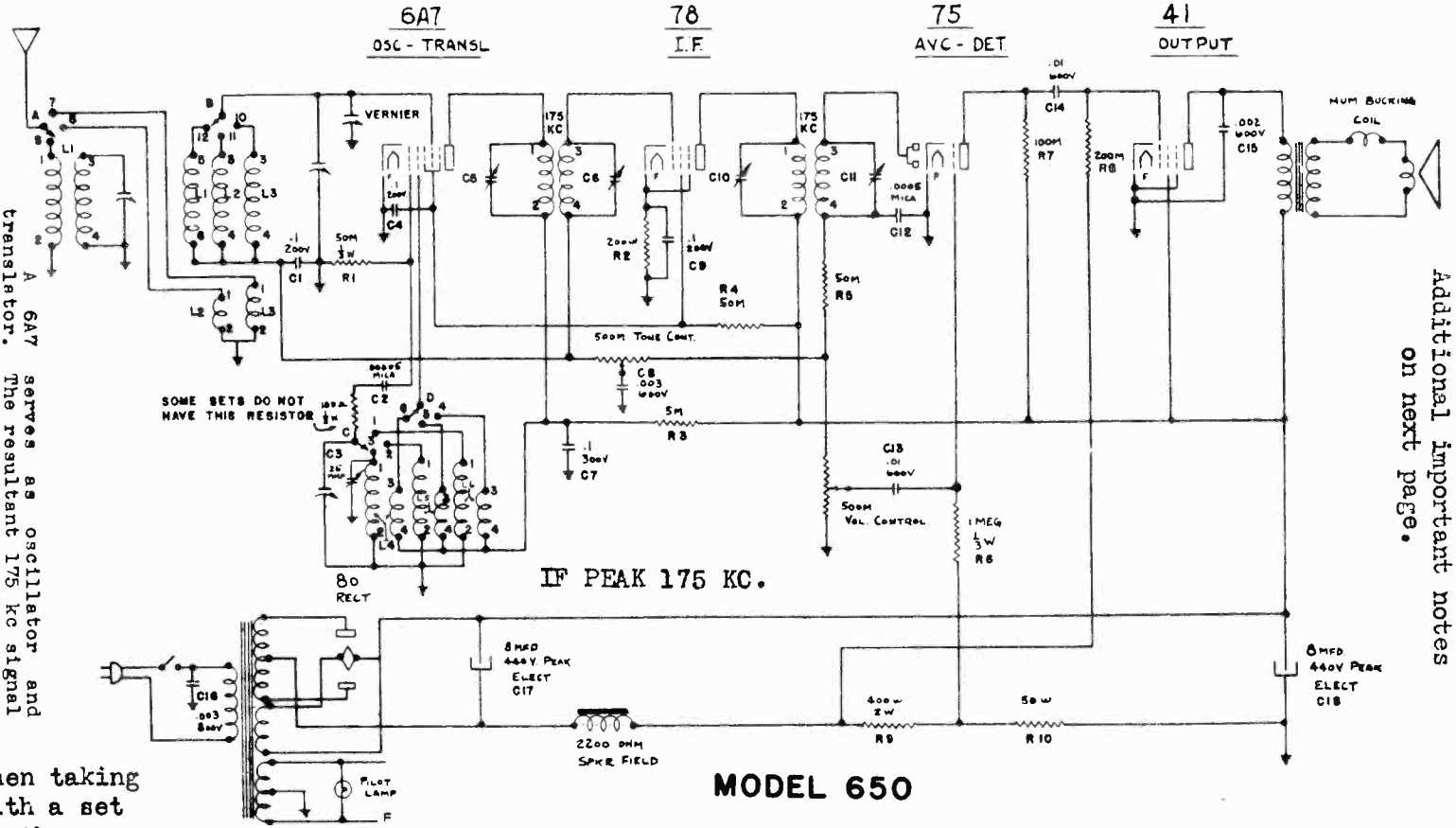
REPLACEMENT PARTS AND PRICE LIST

PART NO.	DESCRIPTION	PRICE
R8297A	Board - Terminal, double	.04
R8308A	Board - Terminal, triple	.05
R9446A	Board - Terminal, 4 terminals	.06
R8900A	Board - Terminal, 5 terminals	.08
R10741	Cabinet	23.33
R10765	Card - Operating	.07
R7011A	Clip - Red and green antenna leads	.04
R7011B	Clip - Double, black ground lead	.08
R11043	Clip - Grid	.01
R10731	Coil - Antenna, broadcast	.68
R10730	Coil - Oscillator, broadcast	.35
R10732	Coil - Translator, broadcast	.75
R10729	Coil - Choke	.19
R6973K	Coil - Antenna, short wave, #2 range	.82
R10993A	Coil - Antenna, short wave, #3 range	.56
R10993D	Coil - Antenna, short wave, #4 range	.56
R6973M	Coil - Oscillator, short wave, #2 range	.75
R10993C	Coil - Oscillator, short wave, #3 range	.65
R10993F	Coil - Oscillator, short wave, #4 range	.64
R6973L	Coil - Translator, short wave, #2 range	.83
R10993B	Coil - Translator, short wave, #3 range	.56
R10993E	Coil - Translator, short wave, #4 range	.42
R10735	Condenser - Variable	4.04
R10735B	Condenser - Variable with drive assembly	6.20

R7236	Condenser - 14 mfd. electrolytic	1.47
R8488	Condenser - 8 mfd. electrolytic	.99
R9237	Condenser - 4 mfd. electrolytic	.87
R9426	Condenser - Padding, 1200 mmf.	.49
R10884	Condenser - 475 mmf. padding	.36
R10737	Condenser - Padding, 75 mmf.	.28
R10197	Condenser - Trimmer, 25 mmf.	.15
R10736	Condenser - Trimmer, double, 35 mmf.	.26
R6444	Condenser - .1 mfd. 200 volts	.17
R6138	Condenser - .1 mfd. 300 volts	.20
R9145	Condenser - .05 mfd. 600 volts	.22
R6761	Condenser - .02 mfd. 600 volts	.18
R6629	Condenser - .02 mfd. 200 volts	.16
R6954	Condenser - .005 mfd. 600 volts	.17
R10738	Condenser - .003 mfd. 800 volts in metal case	.21
R10739	Condenser - .003 mfd. 600 volts	.14
R6933	Condenser - .002 mfd. 600 volts	.16
R4303	Condenser - .001 mfd. mica	.25
R10794	Condenser - .00005 mfd. mica	.20
R10740	Control - Tone, 1 megohm	.71
R10648	Control - Volume, 500 M ohms	.71
R7566	Cord - AC line	.56
R10429A	Dial diffusing disk	.98
R7585	Resistor - 1 megohm, 1/3 watt carbon	.18
R5823	Resistor - 1 megohm, 1/2 watt carbon	.20
R6179	Resistor - 500 M ohms, 1/2 watt carbon	.20
R5822	Resistor - 400 M ohms, 1/2 watt carbon	.20
R5830	Resistor - 200 M ohms, 1/2 watt carbon	.20
R7586	Resistor - 100 M ohms, 1/3 watt carbon	.18
R6210	Resistor - 75 M ohms, 1/2 watt carbon	.20
R6637	Resistor - 50 M ohms, 1/3 watt carbon	.18
R6689	Resistor - 30 M ohms, 1 watt carbon	.20
R5821	Resistor - 20 M ohms, 1/2 watt carbon	.20
R6152	Resistor - 10 M ohms, 1/2 watt carbon	.20
R6636	Resistor - 1 M ohms, 1/3 watt carbon	.18
R10142	Resistor - 500 ohms, 1/3 watt carbon	.18
R10078	Resistor - 400 ohms, 1/3 watt carbon	.18
R10621	Resistor - 300 ohms, 1/3 watt carbon	.18
R10751	Resistor - 225 ohms, 3 watt, flexible	.16
R10752	Resistor - 15 ohms, 1/2 watt, flexible	.11
R10639	Ring - Glass clamping	.02
R10484	Rubber - Tube, chassis mounting	10 for .06
R10488	Rubber - Washer, chassis mounting	.05
R10445A	Shaft - Dial drive	.21
R10753A	Shield - Coil	.27
R10754A	Shield - Oscillator coil	.24
R10440	Shield - Tube top	.09
R10441	Shield - Tube cap	.05
R8395	Shield - Tube base	.03
R7235	Shield - Electrolytic condenser	.04
R8315	Socket - 4 prong	.07
R8253	Socket - 5 prong	.08
R8367	Socket - 5 prong, speaker	.08
R8092	Socket - 6 prong	.09
R8072	Socket - 7 prong	.10
S10721A	Speaker - 8"	9.97
R10755A	Switch - Wave	4.19

COLONIAL RADIO CORP.

MODEL 650
Schematic, Voltage
Notes



Additional important notes on next page.

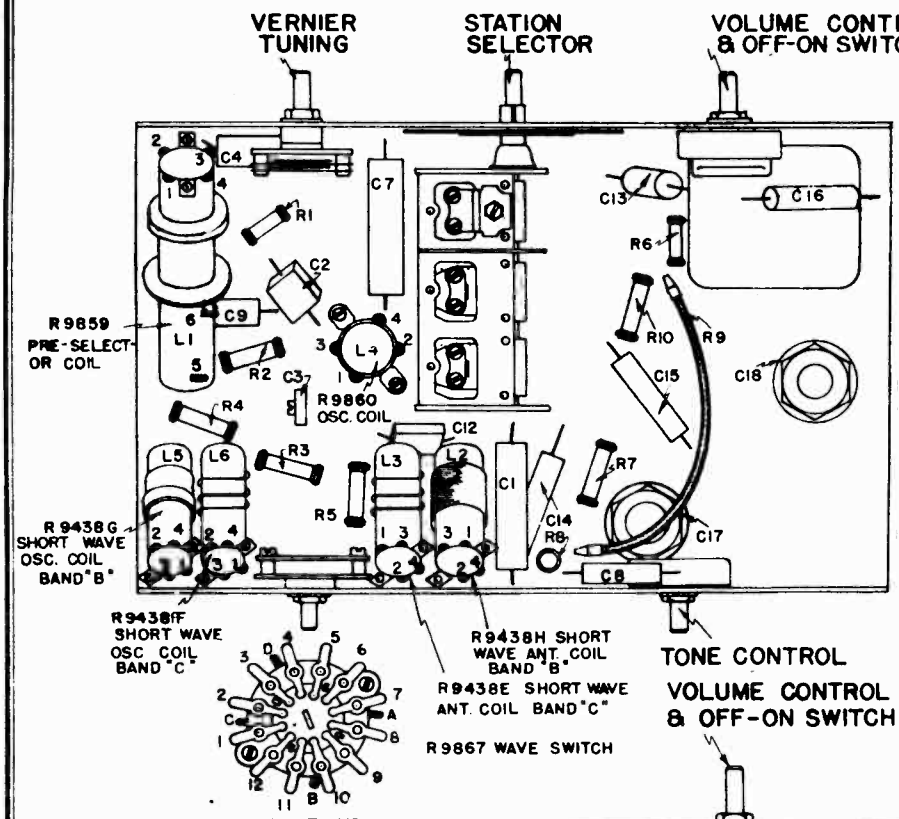
A 6A7 serves as oscillator and translator. The resultant 175 kc signal in its plate circuit is amplified by the 78 IF stage and then coupled to the 75 tube. This tube functions as diode detector, AVC, and 1st audio. Its audio output is fed to the 41 output pentode and then to the dynamic loudspeaker. An 80 rectifier completes the tube complement.

Use care when taking readings with a set analyzer as the capacity of the cables may cause circuits to oscillate, giving rise to erratic readings. Usually touching grid or plate with finger will stop oscillations. If an analyzer is not used, readings should be made with a 1000 ohms per volt voltmeter from cathode to the respective elements of each tube. Ordinarily, a 20% deviation from the chart values may be allowed.

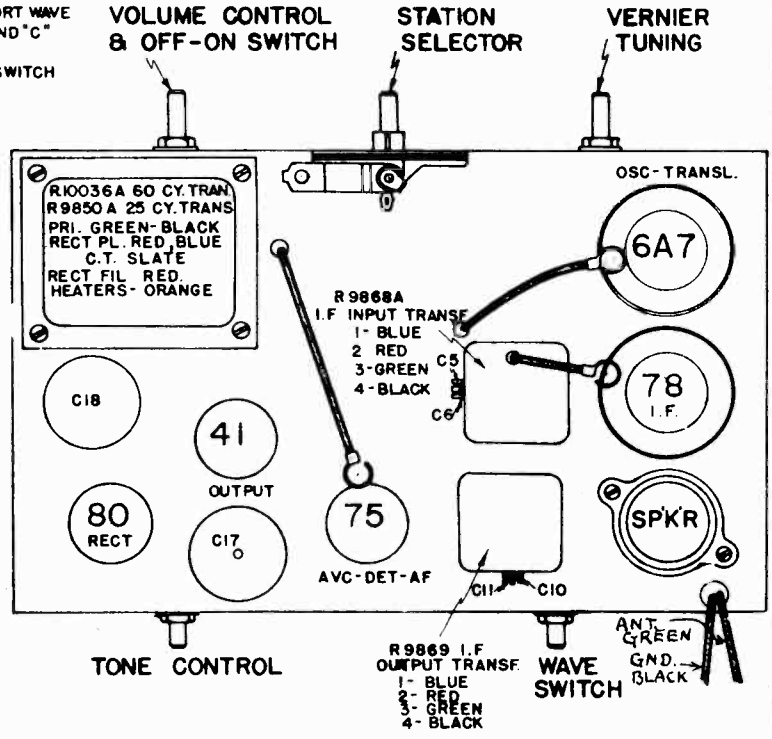
TUBE	PLATE VOLTAGE	SCREEN VOLTAGE	PLATE M.A.	SCREEN M. A.
78 - IF	190	65	4.5	1
75 - AVC-Det-AF	130		.3	
41 - Output	175	190	18.5	3
6A7 - Osc-Transl.	Ep=160v.; Eg#2=160v.; Eg#3&5=65v.; Ip=3m.a.; Ig#2=2.25m.a.; Ig#3&#5=1.7m.a.			
80 - Rectifier	Max d.c. voltage=285v. Plate current=17 m.a. per plate			

MODEL 650
Parts Layout, Notes
Socket, Trimmers

COLONIAL RADIO CORP.



A vernier tuning condenser, with its knob on the front panel, is connected across the translator section of the ganged tuning condenser. Through its manipulation, it is possible to bring the circuits into perfect alignment at any frequency setting, thereby greatly increasing the sensitivity and short wave performance of the receiver. When the dot on the vernier knob is at its upper center position, the condenser is set at half capacity. Customers should be instructed to turn the knob either side of this normal position, when tuning, as described in the Instruction Leaflet accompanying the receiver.



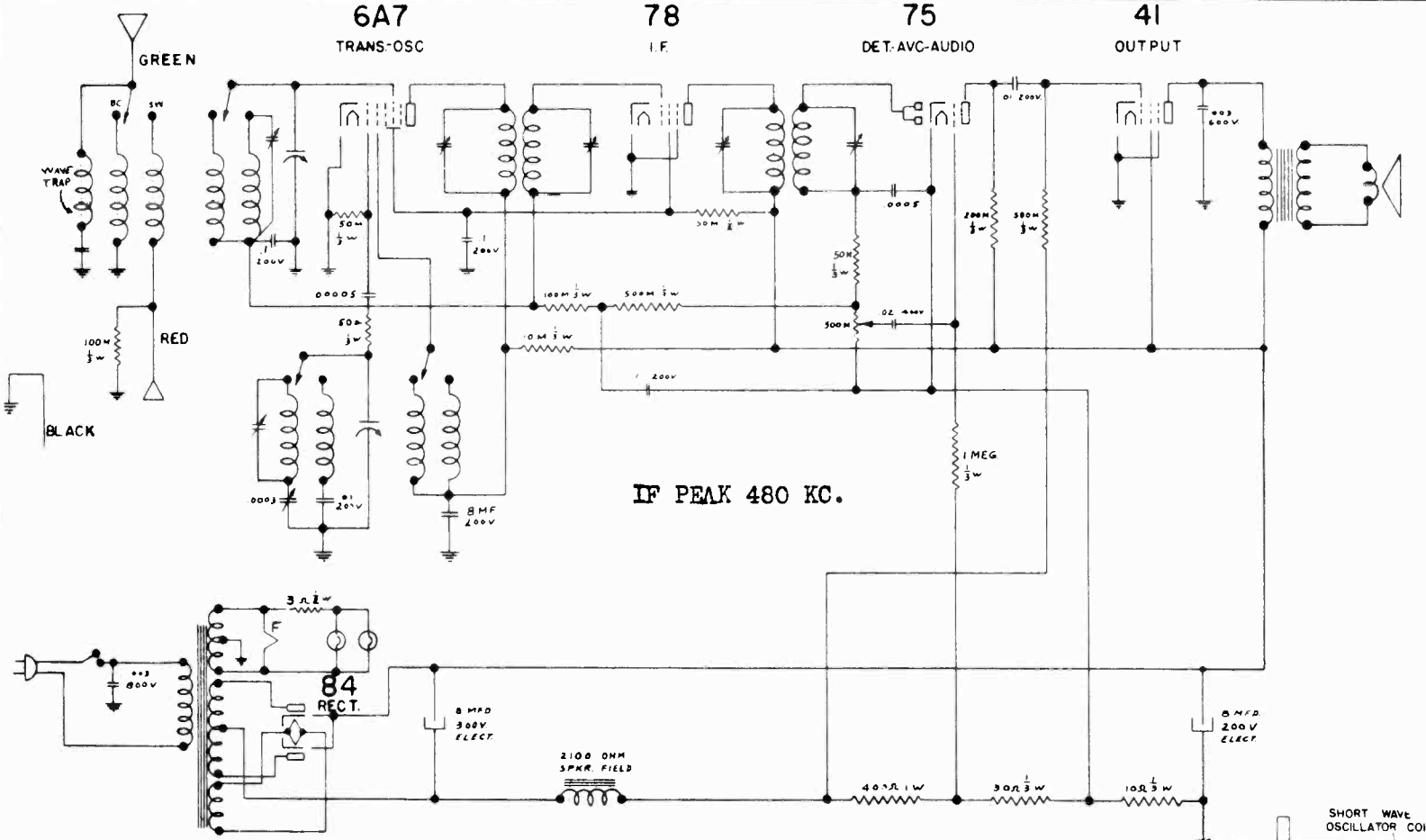
PART NO.	DESCRIPTION
R-9859	Coil - Pre-Selector
R-9860	Coil - Oscillator
R-9438E	Coil - Ant. S.W.
R-9438F	Coil - Osc. S.W.
R-9438G	Coil - Ant. S.W.
R-9438H	Coil - Osc. S.W.
R-9851	Condenser - Tuning
R-9428	Condenser - Trimmer
D-4758P	Condenser - 8 Mfd. electrolytic
R-7236	Condenser - .4 Mfd. electrolytic
R-6444	Condenser - .1 Mfd. 200 V.
R-6138	Condenser - .1 Mfd. 300 V.
R-9429	Condenser - .01 Mfd. 600 V.
R-7681	Condenser - .003 Mfd. 600 V.
R-10096	Condenser - .003 Mfd. 800 V.
R-6933	Condenser - .002 Mfd. 600 V.
R-6760	Condenser - .0005 Mfd. Mica
R-8621	Condenser - .00005 Mfd. Mica
R-9852	Condenser - Vernier
R-9865	Control - Tone, 500 M ohm
R-6571	Control - Volume, 500 M ohm
R-9866	Pointer - Dial
R-7585	Resistor - 1 Meg. 1/3 watt carbon
R-5830	Resistor - 200 M ohms, 1/2 watt carbon
R-5819	Resistor - 100 M ohms, 1/2 watt carbon
R-6445	Resistor - 50 M ohms, 1/2 watt carbon
R-6637	Resistor - 50 M ohms, 1/3 watt carbon
R-6510	Resistor - 5 M ohms, 1/2 watt carbon
R-6276	Resistor - 200 ohms, 1/2 watt carbon
R-9858	Resistor - 50 ohms, 1/2 watt carbon
R-8562	Resistor - 400 ohms, flexible

Some of these receivers have a 14 mfd. first filter condenser, others an 8 mfd. one. Either may be used for replacement purpose.

The trimmer condenser on the preselector section of the ganged condenser should be adjusted at about 1500 kc. The oscillator trimmer, C3, should be adjusted so that the set is tuned to 2000 kc when the ganged condenser is at its minimum capacity setting. Adjustments should be made with the Vernier at its half capacity setting.

COLONIAL RADIO CORP.

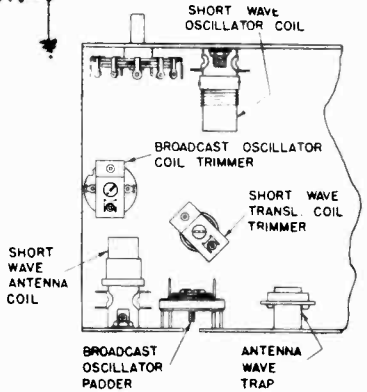
MODEL 651
Schematic, Voltage
Trimmer Data



All readings are to be taken between the chassis and the respective element of each tube.

TUBE	PLATE	SCREEN	OSCILLATOR SECTION GRID	OSCILLATOR SECTION PLATE	CONTROL GRID
6A7 - Osc-Transl -	140	60	-1.6	140	-.3
78 - IF -	185	60			-1.5
75 - AVC-DET-AF -	85				-.4
41 - Output -	175	185			-.45

NOTE: All control grid readings are lower than the actual applied voltage due to high series resistance in the circuit.



MODEL 651
Socket Layout
Alignment, Trimmers

COLONIAL RADIO CORP.

In order to prevent interference from code stations when the receiver is located near the coast, a wave trap is incorporated in the antenna circuit. Although this trap is shown in the schematic as a coil with a series condenser, actually it consists of two multilayer coils wound on top of each other with one end of each coil left unconnected. The distributed capacity between the coils is the condenser shown in the schematic. The design of the coil is such that the combination of distributed capacity and inductance is resonant at about 600 meters which is the frequency used by ships and also is very near the IF frequency of the receiver.

The 75 AVC-Detector-AF Circuit:

The IF signal existing at the IF output transformer secondary is impressed between the diode plates and the cathode of the 75 tube, in series with the 500 M ohms of the volume control and the 50 M ohm resistor. Diode current flows, creating a voltage drop across these resistances. Only the drop across the volume control resistance is used for AVC voltage. The control grid returns of the 6A7 and 78 tubes are connected through filter resistors to one end of the volume control. This end is negative with respect to the other end of the control so that the voltage drop across it, due to the diode current, is impressed as negative bias on the control grids of the 6A7 and 78 tubes. Any increase in signal strength increases the 75 diode current, increases the voltage drop across the volume control, and so increases the negative bias of the 6A7 and 78 tubes with a resultant decrease in tube amplification. Since increases in signal strength are offset by decreases in tube amplification, the input to the detector tends to remain at a constant value.

Any desired portion of the audio component across the volume control may be picked up by the movable arm of the control and fed through the .02 mfd. condenser to the triode section of the 75 tube. It is there amplified and then coupled to the 41 output tube.

The IF Stages:

1. Connect the output meter (low scale) across the loud speaker voice coil.

2. Connect the ground lead of the test oscillator to the chassis.

3. Connect the other lead of the test oscillator, in series with a .1 mfd. condenser, to the grid of the 78 IF tube, leaving the grid clip attached to the cap.

4. Set the test oscillator to 480 kc and tune the IF output transformer. The locations of the tuning adjustments are shown in the Service Illustration.

5. Change the test oscillator connection to the grid of the 6A7 tube and adjust the IF input transformer.

6. Repeat the adjustments to secure greater accuracy.

Always use as low an output as possible from the test oscillator in order to render the AVC action of the set inoperative.

RF Alignment: (Broadcast)

1. Couple the test oscillator to the green antenna lead, leaving the antenna connected.

2. Set the test oscillator to exactly 1640 kc.

3. With the variable condenser plates open all the way Turn the dial pointer to exactly 1640 kc and adjust the broadcast oscillator trimmer for maximum output.

4. Set the test oscillator to 1400 kc and tune in its signal. Then adjust the trimmer on the variable condenser for maximum output.

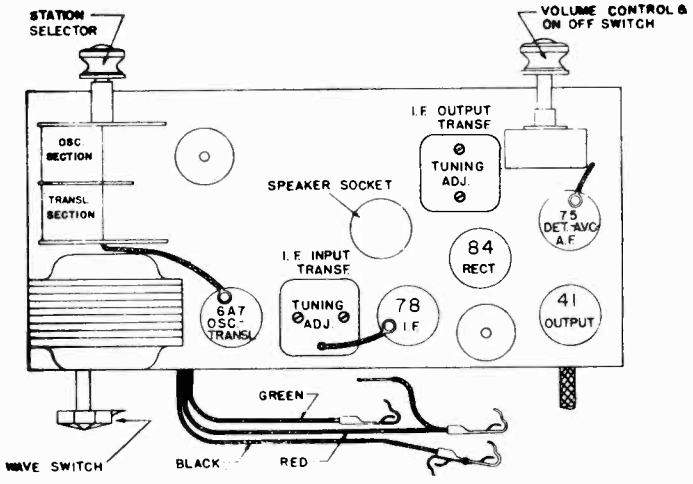
5. Set the test oscillator to 600 kc and tune in its signal. Then slowly rotate the variable condenser back and forth a degree or two and, at the same time, adjust the padder until maximum output is obtained.

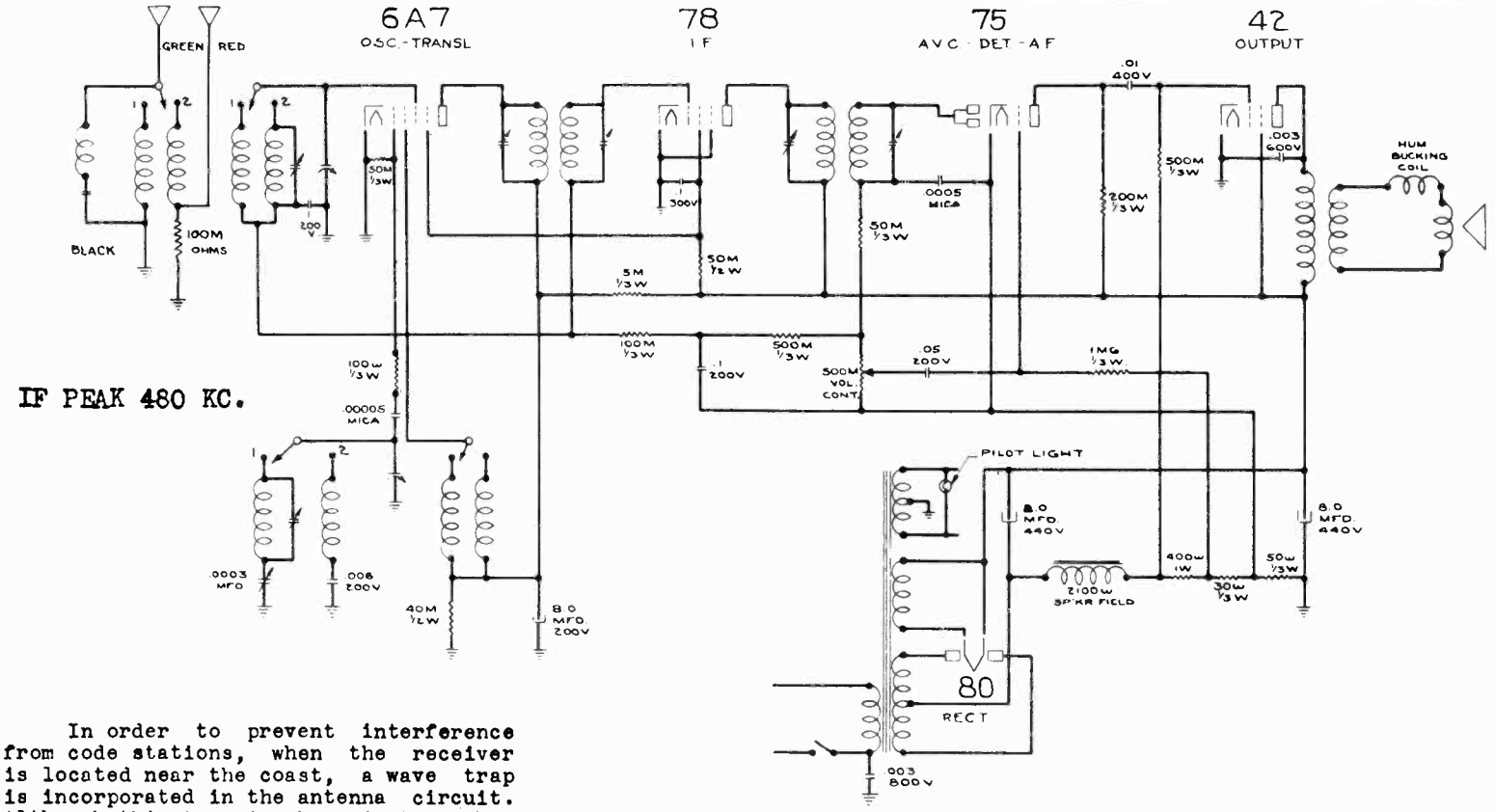
6. Since the adjustments are interacting to an extent, it is advisable to repeat the entire operation.

Always use as low an output from the test oscillator as possible.

Short Wave Alignment:

Set the test oscillator to 15 megacycles and tune in its signal. Then adjust the trimmer on the short wave translator coil for maximum output.





In order to prevent interference from code stations, when the receiver is located near the coast, a wave trap is incorporated in the antenna circuit. Although this trap is shown in the schematic as a coil with a series condenser, actually it consists of two multi-layer coils wound on top of each other with one end of each coil left unconnected. The distributed capacity between the coils is represented by the condenser in the schematic. The design of the coil is such that the combination of distributed capacity and inductance is resonant at about 600 meters, which is the frequency used by ships and also is very near the IF frequency of the receiver.

The voltage drop created across the 500 M ohms of the Volume Control, due to the diode current of the 75 tube, is used for AVC voltage.

TUBE VOLTAGE CHART

All measurements are to be taken between the chassis and the respective element of each tube.

TUBE		PLATE	SCREEN	OSC.SECTION PLATE
6A7 - Osc-Transl	-	190	70	190
78 - IF	-	220	70	
75 - AVC-Det-AF	-	100		
42 - Output	-	210	220	

MODEL 652
Socket Layout
Trimmer Data
Alignment

COLONIAL RADIO CORP.

ALIGNMENT PROCEDURE

The IF Stages:

1. Connect the low scale of the output meter across the loud speaker voice coil.

2. Connect the ground lead of the test oscillator to the receiver chassis.

3. Connect the other lead of the test oscillator, in series with a .1 mfd. condenser, to the grid of the 78 IF tube. Leave the grid clip attached to the cap and the tube shield in place.

4. Set the test oscillator to 480 kc and tune the IF output transformer. The locations of the tuning adjustments are shown in the Service Illustration.

5. Change the test oscillator connection to the grid of the 6A7 tube and adjust the IF input transformer.

6. Repeat the adjustments to secure greater accuracy.

Always use as low an output as possible from the test oscillator in order to render the AVC action of the set inoperative.

RF Alignment (Broadcast):

1. Couple the test oscillator to the green antenna lead, leaving the antenna connected.

2. Set the test oscillator to 1650 kilocycles.

3. Screw the oscillator padder condenser to approximately three quarters of its maximum capacity.

4. Turn the variable condenser plates all the way out. Then adjust the oscillator trimmer for maximum output.

5. Set the test oscillator to 1400 kc and tune in its signal. Then adjust the translator trimmer, mounted on the variable condenser section nearer the dial, for maximum output.

6. Set the test oscillator to 600 kc and tune in its signal. Then slowly rotate the variable condenser back and forth a degree or two and, at the same time, adjust the padder until maximum output is obtained.

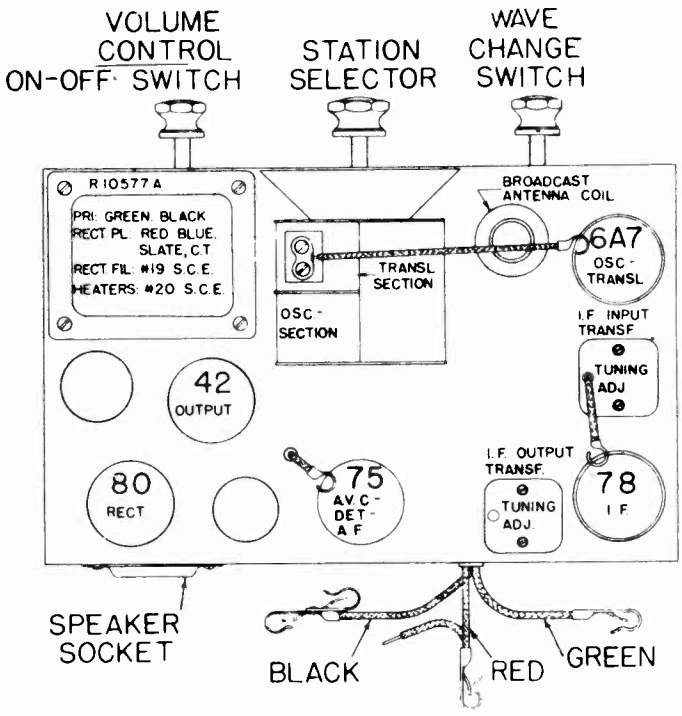
7. Repeat the 1650 kc and 1400 kc adjustments.

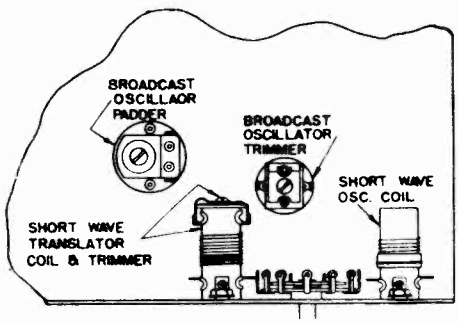
Always use as low an output from the test oscillator as possible.

Short Wave Alignment:

1. Leave the test oscillator coupled to the green antenna lead as for broadcast alignment.

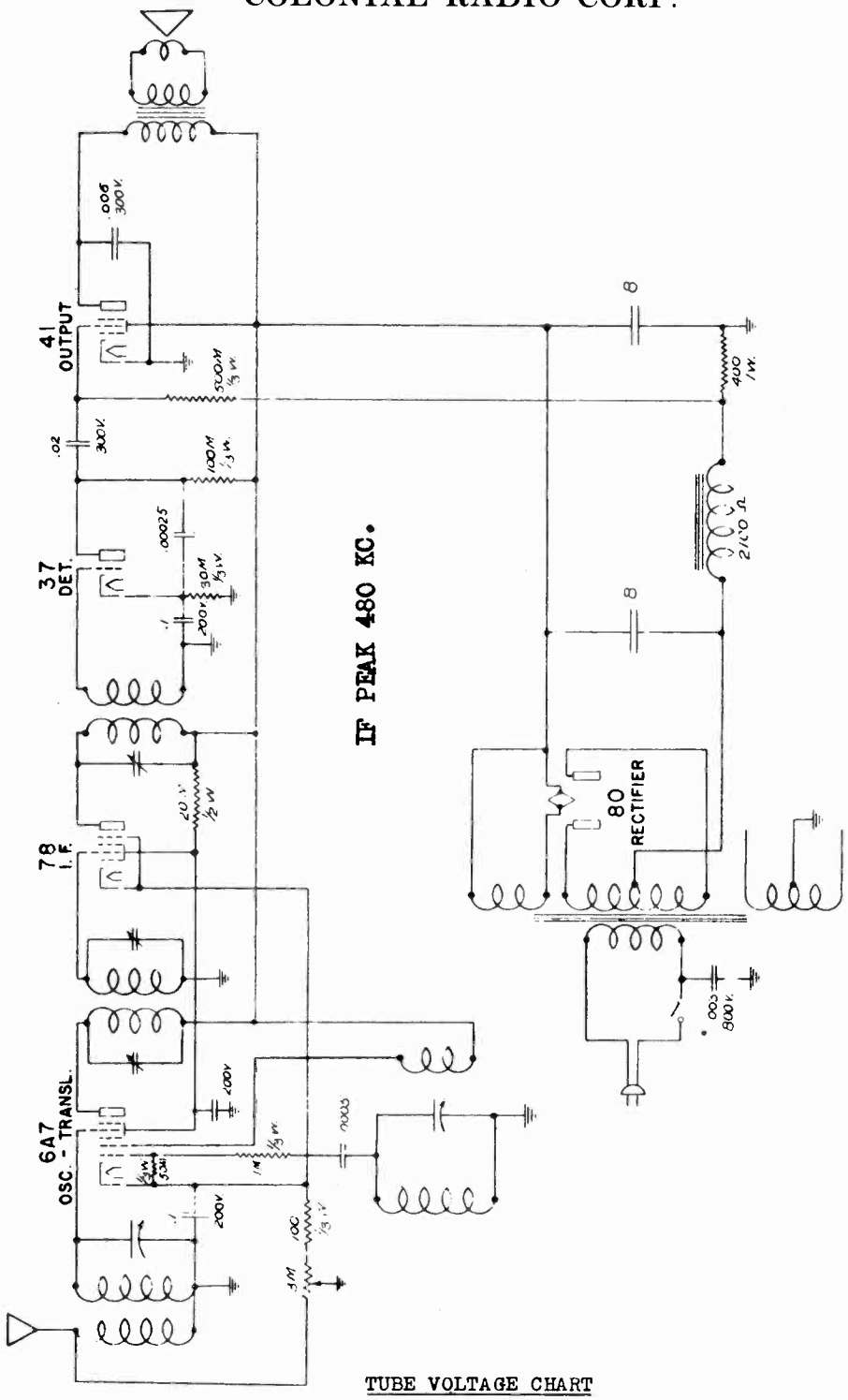
2. Set the test oscillator to 15 megacycles and tune in its signal. Then adjust the trimmer, mounted on the short wave translator coil, for maximum output.





MODEL 653
Schematic,
Voltage

COLONIAL RADIO CORP.



TUBE VOLTAGE CHART

All readings are to be taken between the chassis and the respective element of each tube.

TUBE	PLATE	SCREEN	OSC.SEC. PLATE	OSC.SEC. GRID	CATHODE
6A7 - Osc-Transl -	200	95	200	-.3	2.2
78 - IF -	200	95			2.2
37 - Detector -	62				30
41 - Output -	190	200			0

ALIGNMENT PROCEDURE

The IF Stages:

1. Connect the low scale of the output meter across the loud speaker voice coil.

2. Connect the ground lead of the test oscillator to the chassis.

3. Connect the other lead of the test oscillator, in series with a .1 mfd. condenser, to the grid of the 78 IF tube, leaving the grid clip attached to the cap.

4. Set the test oscillator to 480 kc, and adjust the IF output transformer tuning condenser. This condenser is mounted on the IF output transformer terminal board under the chassis, about two inches behind the variable condenser.

5. Change the test oscillator connection to the grid of the 6A7 tube and adjust the IF input transformer. The locations of its tuning adjustments are shown in the Service Illustration.

6. Repeat the adjustments to secure greater accuracy.

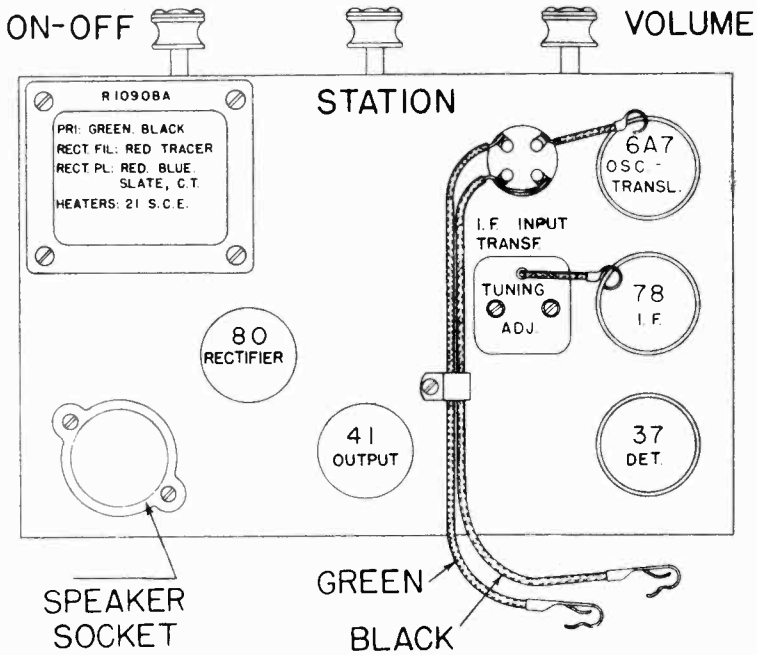
RF Alignment:

1. Couple the test oscillator to the green antenna lead, leaving the antenna connected.

2. Set the test oscillator to 1750 kilocycles.

3. Turn the variable condenser plates all the way out. Then adjust the trimmer on the oscillator section of the variable condenser for maximum output. The oscillator section is the one furthest from the dial, as shown in the Service Illustration.

4. Set the test oscillator to 1400 kc and tune in its signal. Then adjust the trimmer on the translator section of the variable condenser for maximum output.

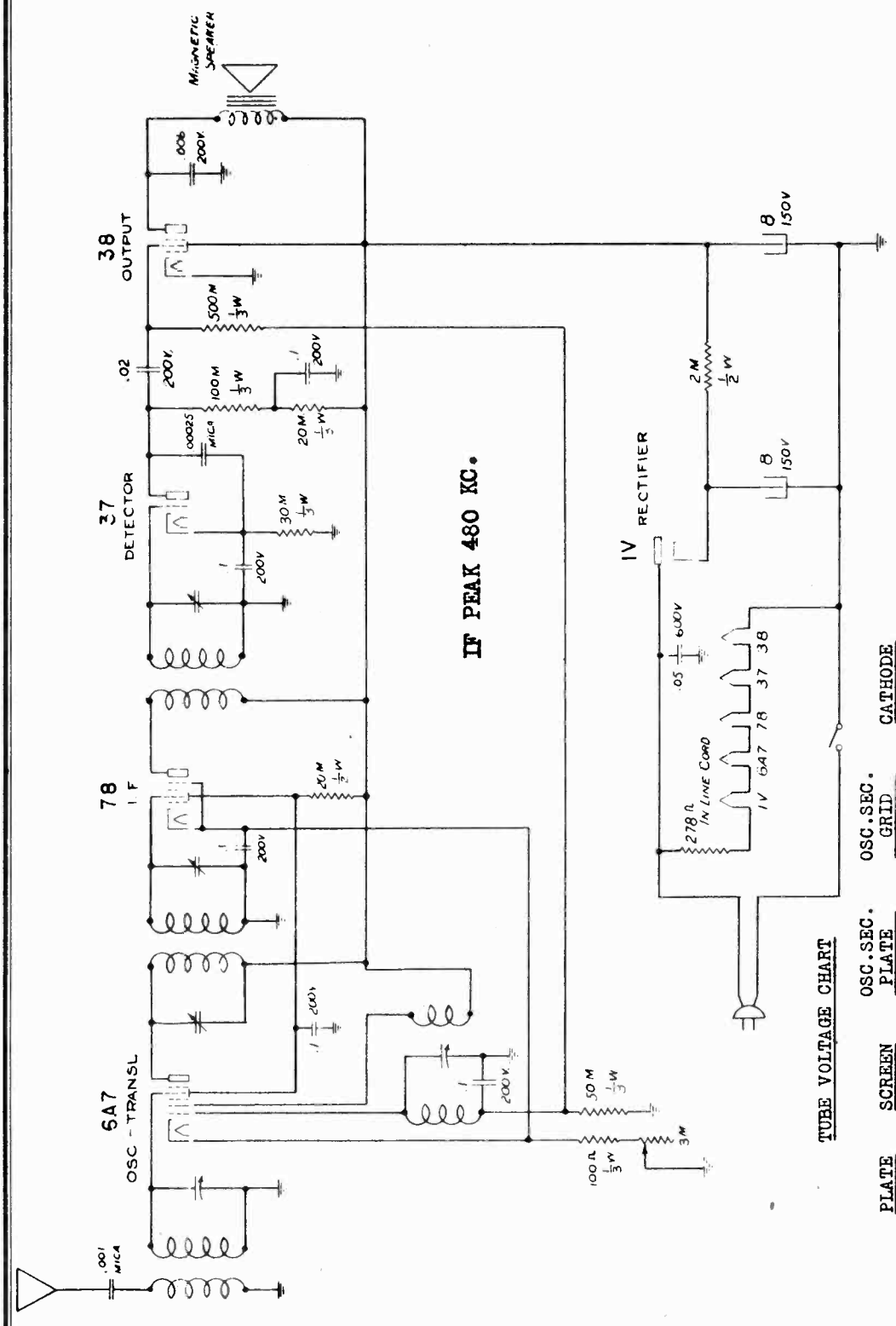


REPLACEMENT PARTS

PART NO.	DESCRIPTION
R10632	Coil - Antenna
R10633	Coil - Oscillator
R10620	Condenser - Variable
R10197	Condenser - Second IF, transformer tuning
D4758P	Condenser - Electrolytic 8 mfd.
R6444	Condenser - .1 mfd. 200 volts
R9818	Condenser - .02 mfd. 400 volts
R10609	Condenser - .006 mfd. 400 volts
R10096	Condenser - .003 mfd. 800 volts
R6760	Condenser - .0005 mfd. mica
R4592	Condenser - .00025 mfd. mica
R7228	Resistor - 500 M ohms, 1/3 watt carbon
R7586	Resistor - 100 M ohms, 1/3 watt carbon
R6637	Resistor - 50 M ohms, 1/3 watt carbon
R6110	Resistor - 30 M ohms, 1/3 watt carbon
R5821	Resistor - 20 M ohms, 1/2 watt carbon
R6636	Resistor - 1 M ohms, 1/3 watt carbon
R6436	Resistor - 400 ohms, 1/2 watt carbon
R8922	Resistor - 100 ohms, 1/3 watt carbon
R10630A	Transformer - IF input
R10631A	Transformer - IF output
R10908A	Transformer - Power

COLONIAL RADIO CORP.

MODEL 654
Schematic
Voltage



TUBE VOLTAGE CHART

TUBE	PLATE	SCREEN	OSC.SEC. PLATE	OSC.SEC. GRID	CATHODE
6A7 - Osc-Transl -	100	45	100	-.1	.8
78 - IF -	100	45			.8
37 - Detector -	55				-3.5
38 - Output -	95	100			0
1V - Rectifier -					135

All readings are to be taken between the chassis and the respective element of each tube.

MODEL 654
Alignment, Socket
Trimmers, Parts

COLONIAL RADIO CORP.

The COLONIAL Model 654 is a five tube, broadcast superheterodyne, designed for operation from either AC or DC power supply. The tubes and their functions are:

6A7 - Oscillator-Translator
78 - IF
37 - Detector
38 - Output
1V - Rectifier

Since the tube heaters are in series, if any one tube burns out, none will light. However, it is necessary to replace only the burned out tube. The others then will light. The full line voltage will appear across the heater prongs of a socket in which there is a burned out tube.

ALIGNMENT PROCEDURE

The IF Stages:

1. Connect the high scale (about 100 volts) of the output meter across the loud speaker terminals.

2. Connect the ground lead of the test oscillator to the chassis through a .1 mfd. condenser.

3. Connect the other lead of the test oscillator, in series with a .1 mfd. condenser, to the grid of the 78 IF tube, leaving the grid clip attached to the cap.

4. Set the test oscillator to 480 kc. and tune the IF output transformer. This transformer is mounted under the chassis and has a single bakelite base tuning condenser mounted on its terminal board. There is but one tuning adjustment for this transformer, since only the transformer secondary is tuned.

5. Change the test oscillator connection to the grid of the 6A7 tube and adjust the IF output transformer. The locations of its tuning adjustments are shown in the Service Illustration.

6. Repeat the adjustments to secure greater accuracy.

RF Alignment:

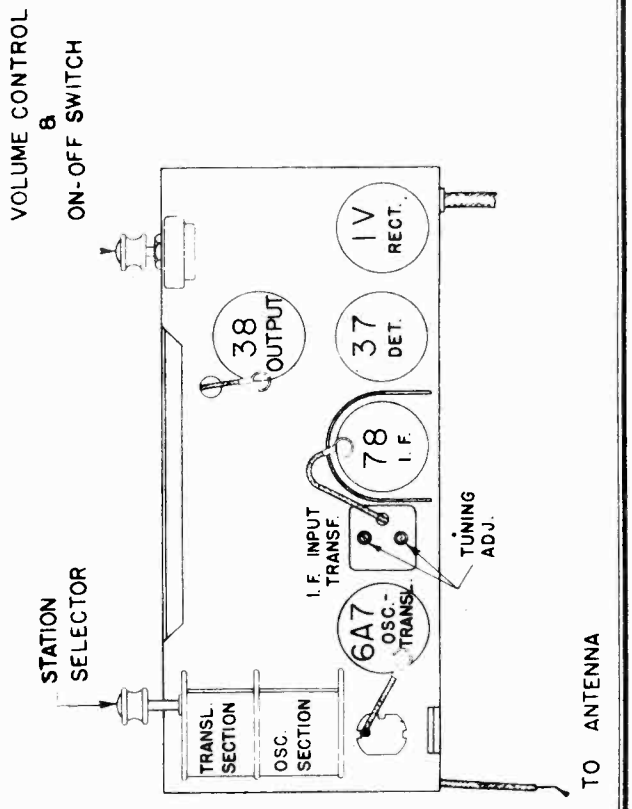
1. Couple the test oscillator to the green antenna lead, leaving the antenna connected.

2. Set the test oscillator to 1750 kilocycles.

3. Turn the variable condenser plates all the way out. Then adjust the trimmer on the oscillator section of the variable condenser for maximum output. The oscillator section is the one furthest from the dial, as shown in the Service Illustration.

4. Set the test oscillator to 1400 kc and tune in its signal. Then adjust the trimmer on the translator section of the variable condenser for maximum output.

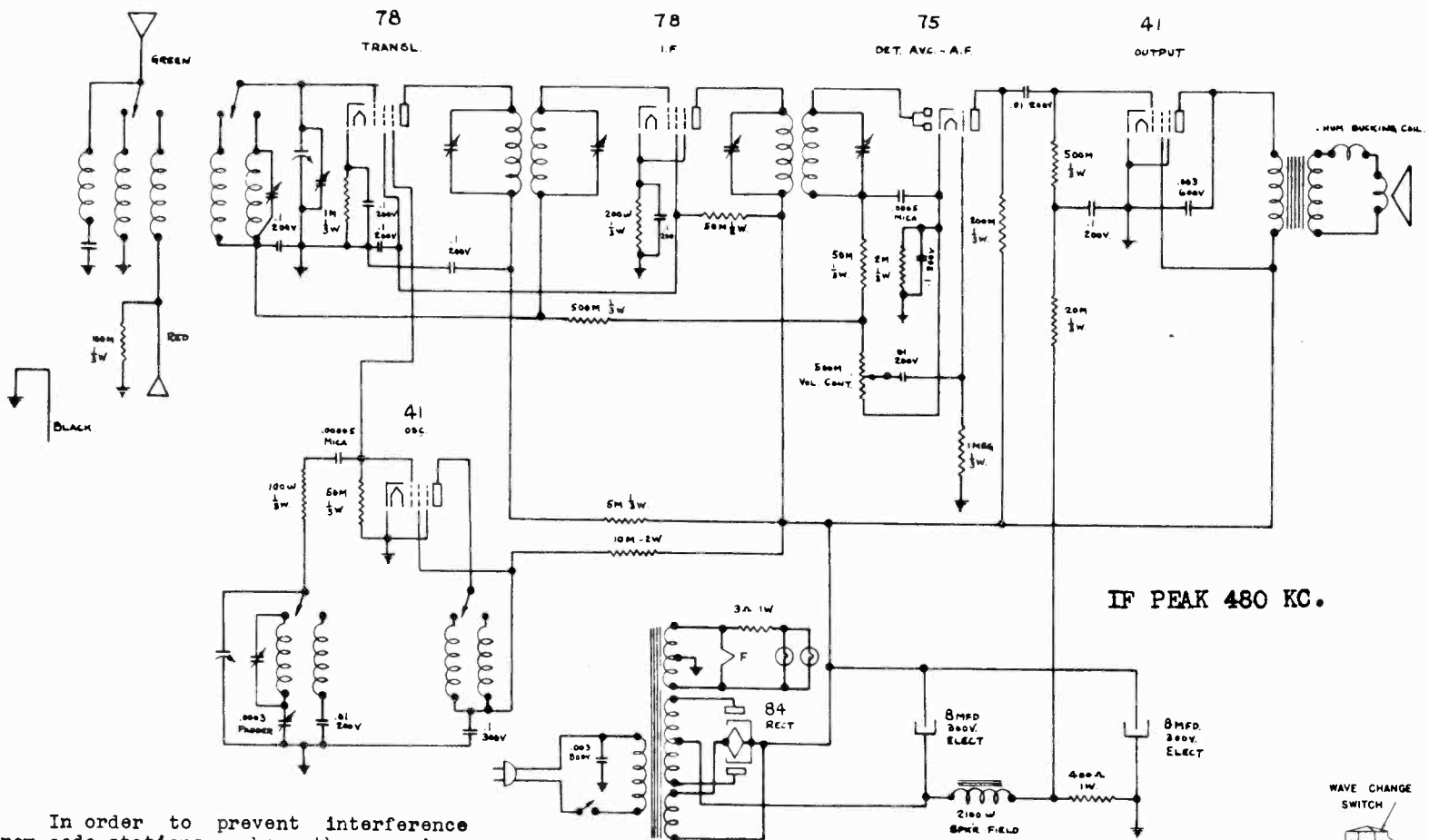
PART NO.	DESCRIPTION
R8297A	Board - Terminal, double
R8308A	Board - Terminal, triple
R10690	Cabinet
R11043	Clip - Grid
R10632	Coil - Antenna
R10633	Coil - Oscillator
R8960	Condenser - Variable
R10689	Condenser - Dry electrolytic
R10197	Condenser - Trimmer
R6444	Condenser - .1 mfd. 200 volts
R9145	Condenser - .05 mfd. 600 volts
R6629	Condenser - .02 mfd. 200 volts
R10893	Condenser - .006 mfd. 200 volts
R6759	Condenser - .001 mfd. mica
R4592	Condenser - .00025 mfd. mica
R8059	Control - Volume, 3 M ohms
R10685	Cord - Power supply
R10692	Escutcheon - Station selector
R8663	Escutcheon - Volume control
R10691	Instruction leaflet
R8664	Knob with pointer
R7228	Resistor - 500 M ohms, 1/3 watt carbon
R7586	Resistor - 100 M ohms, 1/3 watt carbon
R6637	Resistor - 50 M ohms, 1/3 watt carbon
R6110	Resistor - 30 M ohms, 1/3 watt carbon
R6640	Resistor - 20 M ohms, 1/3 watt carbon
R5821	Resistor - 20 M ohms, 1/2 watt carbon
R6073	Resistor - 2 M ohms, 1/2 watt carbon
R8922	Resistor - 100 ohms, 1/3 watt carbon
R8315	Socket - 4 prong
R8253	Socket - 5 prong
R8092	Socket - 6 prong
R8072	Socket - 7 prong
S10694	Speaker
R10687A	Transformer - IF input
R10631A	Transformer - IF output



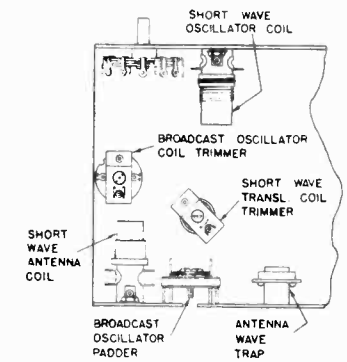
COLONIAL RADIO CORP.

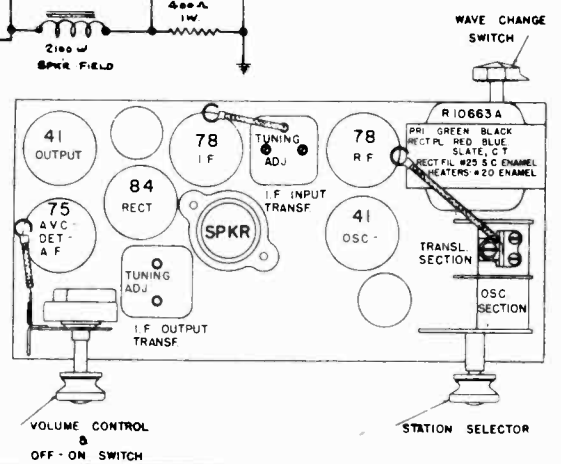
MODEL 655

Schematic, Notes
Trimmers, Socket
Parts Layout,



In order to prevent interference from code stations, when the receiver is located near the coast, a wave trap is incorporated in the antenna circuit. Although this trap is shown in the schematic as a coil with a series condenser, actually it consists of two multilayer coils wound on top of each other with one end of each coil left unconnected. The distributed capacity between the coils is represented by the condenser in the schematic. The design of the coil is such that the combination of distributed capacity and inductance is resonant at about 600 meters, which is the frequency used by ships and also is very near the IF frequency of the receiver.





MODEL 655
Voltage
Alignment

COLONIAL RADIO CORP.

ALIGNMENT PROCEDURE

The IF Stages:

1. Connect the output meter (low scale) across the loud speaker voice coil.

2. Connect the ground lead of the test oscillator to the chassis.

3. Connect the other lead of the test oscillator, in series with a .1 mfd. condenser, to the grid of the 78 IF tube, leaving the grid clip attached to the cap.

4. Set the test oscillator to 480 kc and tune the IF output transformer. The locations of the tuning adjustments are shown in the Service Illustration.

5. Change the test oscillator connection to the grid of the 78 translator tube and adjust the IF input transformer.

6. Repeat the adjustments to secure greater accuracy.

Always use as low an output as possible from the test oscillator in order to render the AVC action of the set inoperative.

RF Alignment (Broadcast):

1. Screw the oscillator padding condenser to about three quarters of its maximum capacity.

2. Couple the test oscillator to the green antenna lead, leaving the antenna connected. Set the test oscillator to 1610 kc.

3. Turn the variable condenser plates all the way out. Then adjust the oscillator trimmer for maximum output. Some of these sets have a trimmer on the oscillator section of the variable condenser as well as one mounted on the broadcast oscillator coil. In others, the adjusting screw has been removed from the trimmer on the variable condenser and only the trimmer on the oscillator coil used. It will be found that in sets using both condensers, that maximum output cannot be reached even though one of the trimmers is screwed all the way in, making it necessary to use the other trimmer. In effect, both trimmers are in parallel when the Wave Switch is in the broadcast position.

4. Set the test oscillator to 1400 kc. and tune in its signal. Then adjust the trimmer on the translator section of the variable condenser for maximum output.

5. Set the test oscillator to 600 kc. and tune in its signal. Then slowly rotate the variable condenser back and forth a degree or two and, at the same time, adjust the padder until maximum output is obtained.

6. Since the adjustments are interacting to an extent, it is advisable to repeat the entire operation.

Always use as low an output from the test oscillator as possible.

Short Wave Alignment:

Set the test oscillator to 15 megacycles and tune in its signal. Then adjust the trimmer on the short wave translator coil for maximum output.

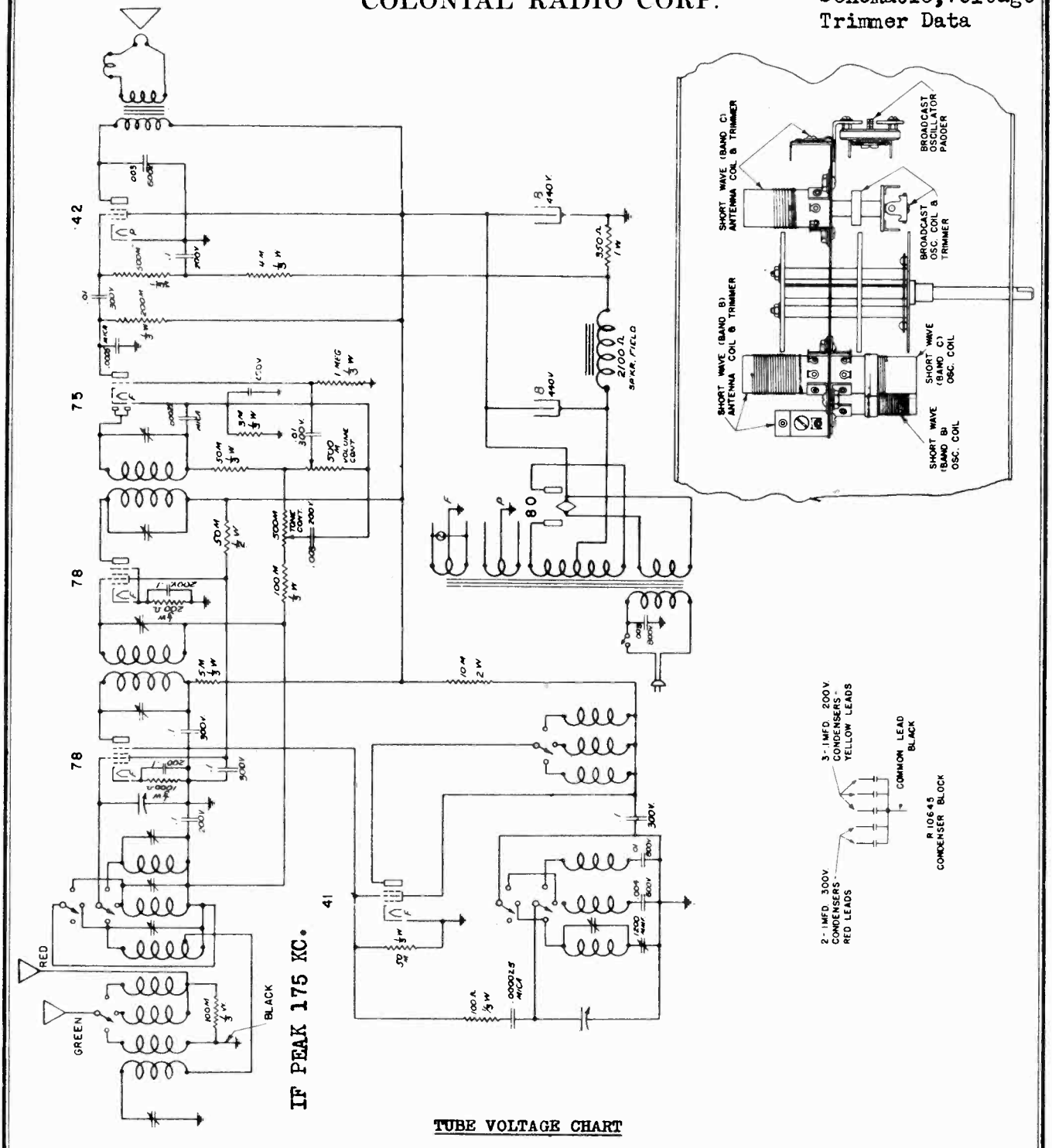
TUBE VOLTAGE CHART

All readings are to be taken between the chassis and the respective element of each tube.

TUBE		PLATE	SCREEN	CATHODE
78 - Translator	-	160	60	2.5
41 - Oscillator	-	75	75	0
78 - IF	-	170	60	1
75 - AVC-Det-AF	-	70		.6
41 - Output	-	160	170	0
84 - Rectifier	-			170

COLONIAL RADIO CORP.

MODEL 656
Schematic, Voltage
Trimmer Data



TUBE VOLTAGE CHART

All readings are to be taken between the chassis and the respective element of each tube.

TUBE		PLATE	SCREEN	CATHODE
78 - Translator	-	200	65	3.2
41 - Oscillator	-	105	105	
78 - IF	-	220	65	.5
75 - AVC-Det-AF	-	65		.75
42 - Output	-	210	220	

MODEL 656
Alignment

COLONIAL RADIO CORP.

ALIGNMENT PROCEDURE

The IF Stages:

1. Connect the low scale of the output meter across the loud speaker voice coil.

2. Connect the ground lead of the test oscillator to the chassis.

3. Connect the other lead of the test oscillator, in series with a .1 mfd condenser, to the control grid of the 78 IF tube, leaving the grid clip attached to the cap.

4. Set the test oscillator to 175 kc and tune the IF output transformer. The locations of its tuning adjustments are shown in the Service Illustration.

5. Change the test oscillator connection to the grid of the 78 translator tube and tune the IF input transformer.

Always use as low an output as possible from the test oscillator in order to render the AVC action of the set inoperative.

6. Repeat the procedure in order to secure greater accuracy.

RF Alignment (Broadcast Band):

1. Set the test oscillator to 1650 kilocycles.

2. Couple the output of the oscillator to the antenna lead of the set, with the antenna connected.

3. Turn the variable condenser plates all the way out. With the wave band selecting switch in position "A", tune the oscillator trimmer for maximum output. The position of this trimmer is shown in the Service Illustration.

4. Set the test oscillator to 1400 kc and adjust the antenna and translator trimmers. The antenna trimmer is the one on the variable condenser section nearest the dial. The translator trimmer is accessible through the hole in the top of the translator coil shield as shown in the Service Illustration.

5. Set the test oscillator to 600 kc and tune in its signal. Then slowly rotate the variable condenser back and forth a degree or two and, at the same time, adjust the broadcast oscillator padder for maximum output. The location of this padding condenser is shown in the Service Illustration.

6. Repeat the 1650 kc and 1400 kc operations. Then repeat the 600 kc padding operation.

Always use an output from the test oscillator low enough to render the AVC action inoperative.

Short Wave (Band "B") Alignment:

1. Leave the test oscillator coupled to the antenna lead as for broadcast alignment.

2. Set the test oscillator to 5000 kc. and tune in its signal. Screw the short wave (Band "B") antenna coil trimmer all the way in (maximum capacity). Then reduce the trimmer capacity until the output reaches a peak. A second peak may be obtained when the trimmer capacity is reduced still further. However, the correct position in which to leave the trimmer is the one using the maximum capacity, that is, with the trimmer condenser plates most nearly in a closed position.

3. Set the test oscillator to 1800 kc. and tune in its signal. If necessary, turns may be shifted on the short wave antenna coil to secure maximum output. If turns are shifted, it will be necessary to repeat the trimmer adjustment at 5000 kc.

Short Wave (Band "C") Alignment:

1. Leave the test oscillator coupled to the antenna lead as before.

2. Set the test oscillator to 15 megacycles.

3. With the wave band selecting switch in position "C", tune the receiver to 15 megacycles.

4. Screw the short wave (Band "C") antenna coil trimmer all the way in (maximum capacity). Then reduce the trimmer capacity until the output reaches a peak. A second peak may be obtained, when the trimmer capacity is reduced still further. However, the correct position in which to leave the trimmer is the one using the maximum capacity, that is with the trimmer condenser plates most nearly in a closed position.

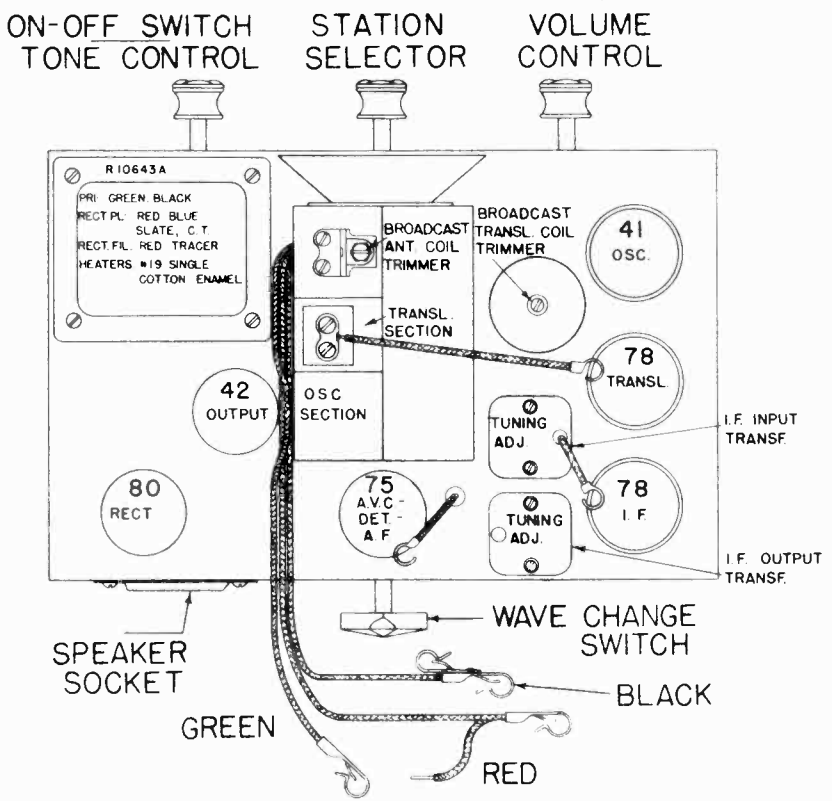
5. Set the test oscillator to 6 megacycles and tune in its signal. If necessary, turns may be shifted on the short wave (Band "C") antenna coil to secure maximum output. If turns are shifted. it will be necessary to repeat the trimmer adjustment at 15 megacycles.

As mentioned in the instructions for this receiver, either a conventional type antenna or a doublet can be used. If a doublet is used, the wave band selecting switch automatically changes connections on the broadcast band so that the doublet acts as a conventional antenna. Examination of the schematic will reveal that all three sections of the variable condenser are used only when the wave band selecting switch is in the BROADCAST position. In the short wave positions, "B" and "C", the variable condenser section nearest the dial is disconnected.

The 500 M ohms of the volume control is used to supply AVC voltage by utilizing the drop across it, due to the diode current of the 75 tube.

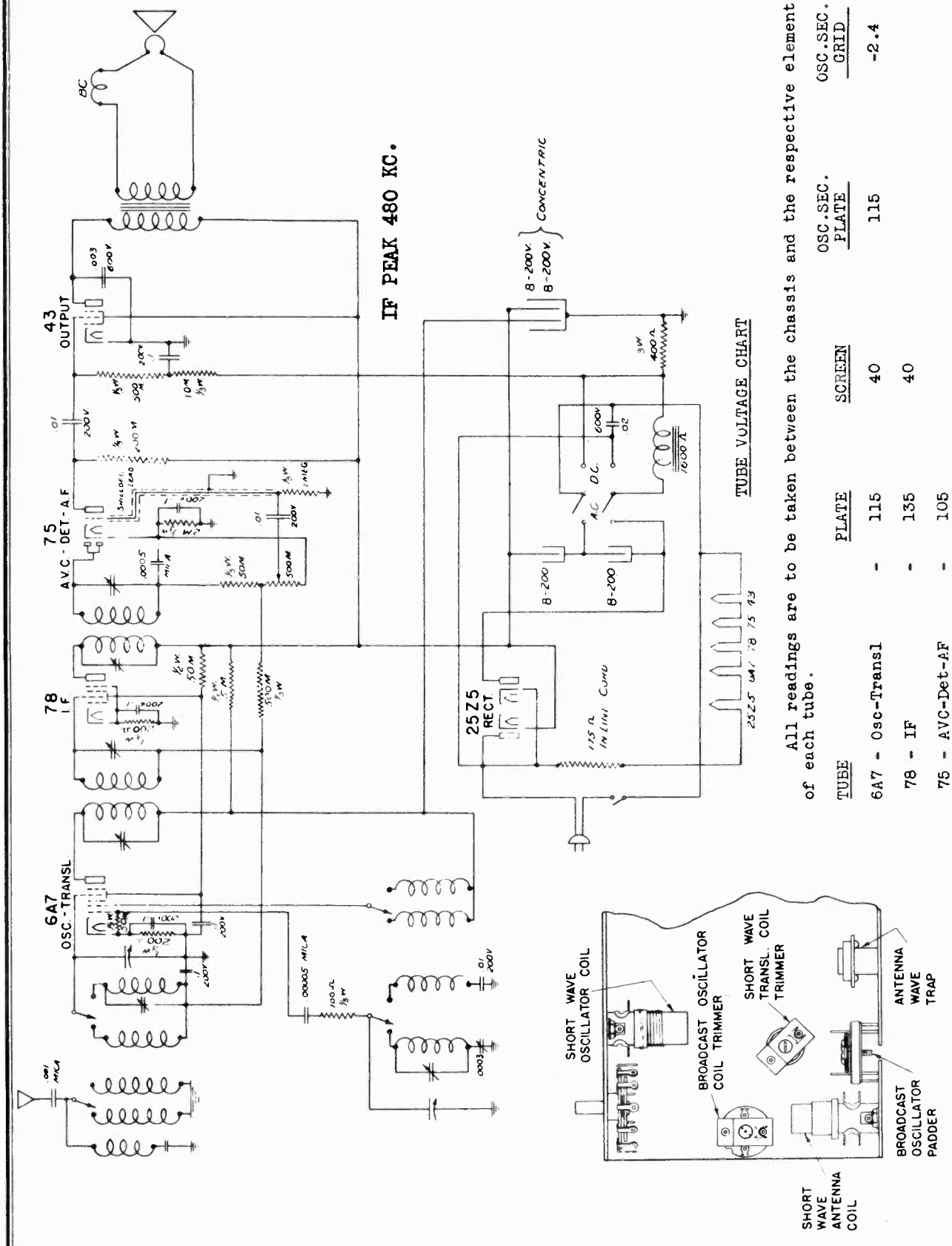
REPLACEMENT PARTS AND PRICE LIST — MODEL 656

PART NO.	DESCRIPTION
R10638	Coil - Antenna, broadcast
R10883	Coil - Oscillator, broadcast
R10642	Coil - Translator, broadcast
R10926A	Coil - Antenna, short wave, Band "C"
R10926B	Coil - Antenna, short wave, Band "B"
R10926C	Coil - Oscillator, short wave, Band "C"
R10926E	Coil - Oscillator, short wave, Band "B"
R11014	Collar - Stop, wave switch
R10644	Condenser - Variable
R10644A	Condenser - Variable, with drive assembly
D4758P	Condenser - 8 mfd. electrolytic
R9426	Condenser - Padding, 1200 mmf.
R10197	Condenser - Trimmer, 25 mmf.
R10645	Condenser - Block
R6444	Condenser - .1 mfd. 200 volts
R6138	Condenser - .1 mfd. 300 volts
R10647	Condenser - .01 mfd. 600 volts
R6462	Condenser - .01 mfd. 300 volts
R10646	Condenser - .004 mfd. 600 volts
R10096	Condenser - .003 mfd. 800 volts, in metal case
R7681	Condenser - .003 mfd. 600 volts
R10495	Condenser - .003 mfd. 200 volts
R6760	Condenser - .0005 mfd. mica
R8297A	Board - Terminal, double
R8308A	Board - Terminal, triple
R10658	Cabinet
R10930	Card - Operating
R7011A	Clip - Red and green antenna leads
R7011B	Clip - Black ground lead
R11043	Clip - Grid
R4592	Condenser - .00025 mfd. mica
R8711	Condenser - .000025 mfd. mica
R10742	Control - Tone, 500 M ohms with switch
R10648	Control - Volume, 500 M ohms
R7585	Resistor - 1 megohm, 1/3 watt carbon
R7228	Resistor - 500 M ohm, 1/3 watt carbon
R6638	Resistor - 200 M ohm, 1/3 watt carbon
R7586	Resistor - 100 M ohm, 1/3 watt carbon
R6637	Resistor - 50 M ohm, 1/3 watt carbon
R6445	Resistor - 50 M ohm, 1/2 watt carbon
R10465	Resistor - 10 M ohm, 2 watt carbon
R7226	Resistor - 5 M ohm, 1/3 watt carbon
R8972	Resistor - 3 M ohm, 1/3 watt carbon
R6636	Resistor - 1 M ohm, 1/3 watt carbon
R10652	Resistor - 350 ohm, 1 watt carbon
R7227	Resistor - 200 ohm, 1/3 watt carbon
R8922	Resistor - 100 ohm, 1/3 watt carbon
R10656B	Transformer - IF input
R10657A	Transformer - IF output
R10643A	Transformer - Power
R8366	Socket - 4 prong, speaker
R8315	Socket - 4 prong
R8092	Socket - 6 prong
R10549	Socket - Pilot light
R10702	Speaker
R10655A	Switch - Wave



MODEL 657
Schematic, Voltage
Trimmers

COLONIAL RADIO CORP.



All readings are to be taken between the chassis and the respective element of each tube.

TUBE	PLATE	SCREEN	OSC.SEC. PLATE	OSC.SEC. GRID
6A7 - Osc-Transl	- 115	40	115	-2.4
78 - IF	- 135	40		
75 - AVC-Det-AF	- 105			
43 - Output	- 125	135		

In order to prevent interference from code stations, when the receiver is located near the coast, a wave trap is incorporated in the antenna circuit. Although this trap is shown in the schematic as a coil with a series condenser, actually it consists of two multilayer coils wound on top of each other with one end of each coil left unconnected. The distributed capacity between the coils is represented by the condenser in the schematic. The design of the coil is such that the combination of distributed capacity and inductance is resonant at about 600 meters, which is the frequency used by ships and also is very near the IF frequency of the receiver.

The 75 AVC-Detector-AF Circuit:

The IF signal existing at the IF output transformer secondary is impressed between the diode plates and the cathode of the 75 tube, in series with the 500 M ohms of the Volume Control and the 50 M ohm resistor. Diode current flows, creating a voltage drop across these resistances. Only the drop across the Volume Control resistance is used for AVC voltage. The control grid returns of the 6A7 and 78 tubes are connected through filter resistances to one end of the Volume Control. This end is negative with respect to the other end of the control so that the voltage drop across it, due to the diode current, is impressed as negative bias on the control grids of the 6A7 and 78 tubes. Any increase in signal strength increases the 75 diode current, increases the voltage drop across the Volume Control, and so increases the negative bias of the 6A7 and 78 tubes with resultant decrease in tube amplification. Since increases in signal strength are offset by decreases in tube amplification, the input to the detector tends to remain at a constant value.

Any desired portion of the audio component across the Volume Control may be picked off by the movable arm of the control and fed through the .01 mfd. condenser to the triode section of the 75 tube. It is there amplified and then coupled to the 43 output tube.

ALIGNMENT PROCEDURE

The IF Stages:

1. Connect the output meter (low scale) across the loud speaker voice coil.

2. Connect the ground lead of the test oscillator to the chassis.

3. Connect the other lead of the test oscillator, in series with a .1 mfd. condenser, to the grid of the 78 IF tube, leaving the grid clip attached to the cap.

4. Set the test oscillator to 480 kc and tune the IF output transformer. The locations of the tuning adjustments are shown in the Service Illustration.

5. Change the test oscillator connection to the grid of the 6A7 tube and adjust the IF input transformer.

6. Repeat the adjustments to secure greater accuracy.

Always use as low an output as possible from the test oscillator in order to render the AVC action of the set inoperative.

RF Alignment (Broadcast):

1. Couple the test oscillator to the green antenna lead, leaving the antenna connected.

2. Set the test oscillator to 1660 kilocycles.

3. Turn the variable condenser plates all the way out. Then adjust the oscillator trimmer for maximum output. Some of these sets have a trimmer on the oscillator section of the variable condenser as well as one mounted on the broadcast oscillator coil. In others, the adjusting screw has been removed from the trimmer on the variable condenser and only the trimmer on the oscillator coil used. It will be found that in sets using both condensers, that maximum output cannot be reached even though one of the trimmers is screwed all the way in, making it necessary to use the other trimmer. In effect, both trimmers are in parallel when the Wave Switch is in the broadcast position.

4. Set the test oscillator to 1400 kc. and tune in its signal. Then adjust the trimmer on the translator section of the variable condenser for maximum output.

5. Set the test oscillator to 600 kc. and tune in its signal. Then slowly rotate the variable condenser back and forth a degree or two and, at the same time, adjust the padder until maximum output is obtained.

6. Since the adjustments are interacting to an extent, it is advisable to repeat the entire operation.

Always use as low an output from the test oscillator as possible.

Short Wave Alignment:

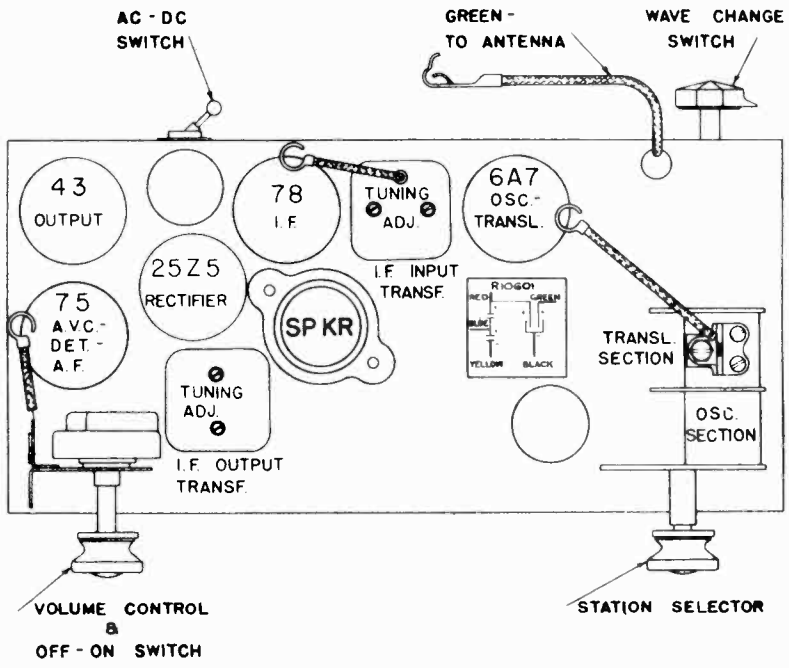
Set the test oscillator to 15 megacycles and tune in its signal. Then adjust the trimmer on the short wave translator coil for maximum output.

HUM BALANCE

There is an Isolantite base condenser mounted under the chassis immediately below the volume control. This condenser is used to minimize hum. With the set detuned and the volume control on full, adjust this condenser until the point affording minimum hum is found.

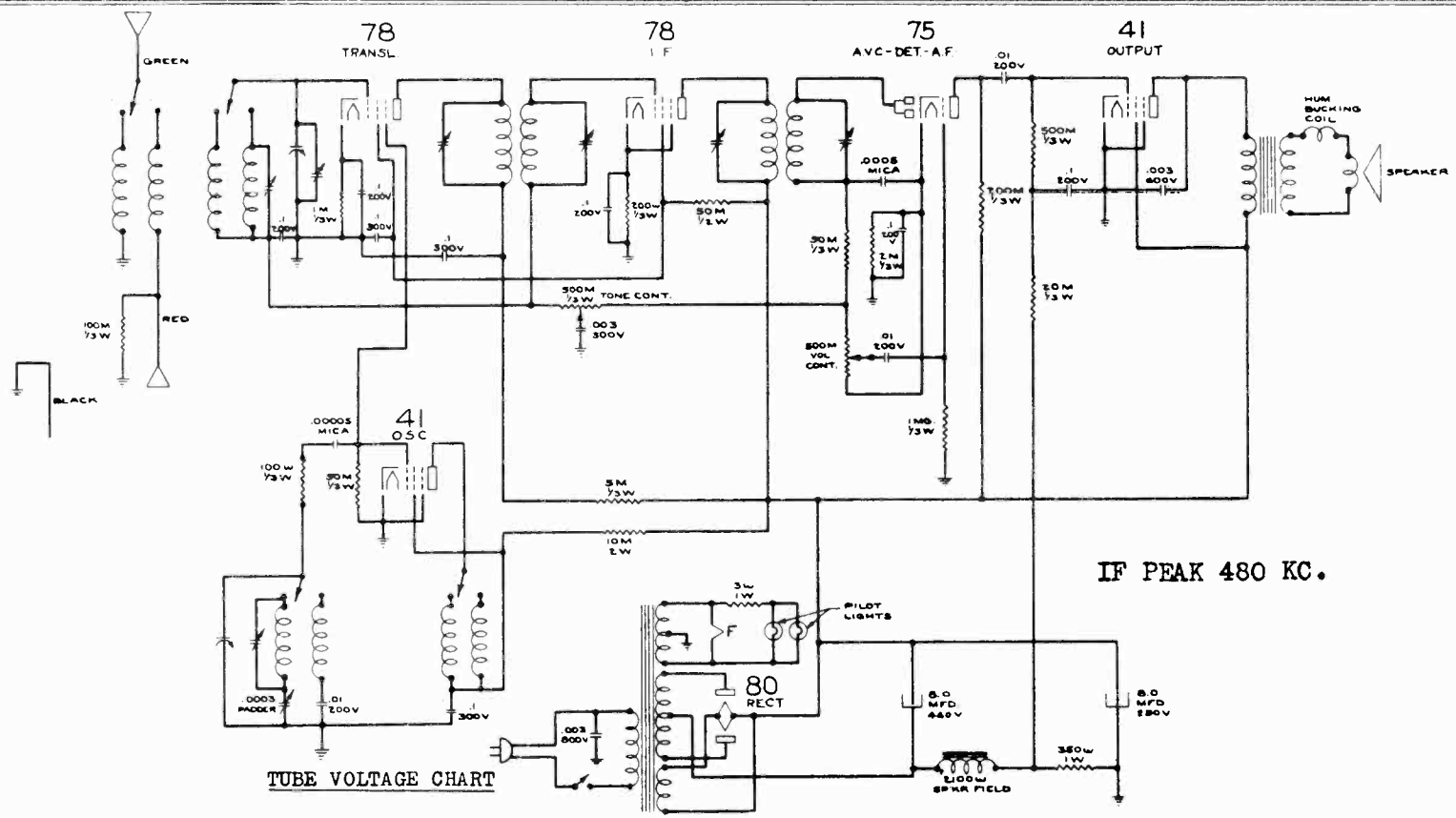
MODEL 657
Socket Layout
Trimmers
Parts List

COLONIAL RADIO CORP.



REPLACEMENT PARTS AND PRICE LIST

PART NO.	DESCRIPTION	PRICE
R8297A	Board - Terminal, double	.04
R8308A	Board - Terminal, triple	.05
R10859	Cabinet	5.58
R7011A	Clip - Antenna and ground leads	.04
R11043	Clip - Grid	.01
R10198	Coil - Antenna	.56
R10199	Coil - Oscillator	.35
R9565	Coil - Antenna wave trap	.36
R9829D	Coil - Antenna, short wave	.73
R9829C	Coil - Oscillator, short wave	1.01
R10605	Condenser - Variable	2.82
R10605A	Condenser - Variable, with pilot light bracket assembly	3.42
R10601	Condenser - Electrolytic, dry, block	3.89
R10197	Condenser - Trimmer, 25 mmf.	.15
R9975	Condenser - Padding, 325 mmf.	.37
R6444	Condenser - .1 mfd. 200 volts	.17
R8301	Condenser - .1 mfd. dual, 200 volts	.32
R6761	Condenser - .02 mfd. 600 volts	.18
R8432	Condenser - .01 mfd. 200 volts	.16
R7681	Condenser - .003 mfd. 600 volts	.16
R6759	Condenser - .001 mfd. mica	.25
R6760	Condenser - .0005 mfd. mica	.20
R8621	Condenser - .00005 mfd. mica	.20
R7585	Resistor - 1 megohm, 1/3 watt carbon	.18
R7228	Resistor - 500 M ohms, 1/3 watt carbon	.18
R6638	Resistor - 200 M ohms, 1/3 watt carbon	.18
R6637	Resistor - 50 M ohms, 1/3 watt carbon	.18
R6445	Resistor - 50 M ohms, 1/2 watt carbon	.20
R7587	Resistor - 10 M ohms, 1/3 watt carbon	.18
R7226	Resistor - 5 M ohms, 1/3 watt carbon	.18
R6634	Resistor - 2 M ohms, 1/3 watt carbon	.18
R7227	Resistor - 200 ohms, 1/3 watt carbon	.18
R8922	Resistor - 100 ohms, 1/3 watt carbon	.18
R8562	Resistor - 400 ohms, 3 watt, flexible	.21
R9360	Shield - Tube	.09
R8366	Socket - 4 prong	.07
R8092	Socket - 6 prong	.09
R8072	Socket - 7 prong	.10
R8445	Socket - Pilot light	.19
R10600A	Speaker	5.37
R8076	Switch - AC-DC	.93
R10207	Switch - Wave	.59
R10208A	Transformer - IF input	1.51
R10209	Transformer - IF output	1.49



All readings are to be taken between the chassis and the respective element of each tube.

TUBE		PLATE	SCREEN	CATHODE
78 - Translator	-	200	85	3
41 - Oscillator	-	100	100	0
78 - IF	-	220	85	.6
75 - AVC-Det-AF	-	85		.4
41 - Output	-	215	220	0

The voltage drop created across the 500 M ohms of the volume control, due to the diode current of the 75 tube, is used for AVC voltage.

POWER TRANSFORMER COLOR CODE

PRIMARY: Green. Black.

RECTIFIER PLATE: Red. Blue. Slate, center tap.

RECTIFIER FILAMENT: #19 single cotton enamel with red tracer.

HEATERS: #19 single cotton enamel.

MODEL 658
Alignment, Trimmers
Socket Layout

COLONIAL RADIO CORP.

ALIGNMENT PROCEDURE

The IF Stages:

1. Connect the low scale of the output meter across the loud speaker voice coil.

2. Connect the ground lead of the test oscillator to the receiver chassis.

3. Connect the other lead of the test oscillator, in series with a .1 mfd. condenser, to the grid of the 78 IF tube. Leave the grid clip attached to the cap and the tube shield in place.

4. Set the test oscillator to 480 kc and tune the IF output transformer. The locations of the tuning adjustments are shown in the Service Illustration.

5. Change the test oscillator connection to the control grid of the 78 translator tube and adjust the IF input transformer.

6. Repeat the adjustments to secure greater accuracy.

Always use as low an output as possible from the test oscillator in order to render the AVC action of the set inoperative.

RF Alignment (Broadcast):

1. Couple the test oscillator to the green antenna lead, leaving the antenna connected.

2. Set the test oscillator to 1660 kilocycles.

3. Screw the oscillator padder condenser to approximately three quarters of its maximum capacity.

4. Turn the variable condenser plates all the way out. Then adjust the oscillator trimmer for maximum output.

5. Set the test oscillator to 1400 kc and tune in its signal. Then adjust the translator trimmer, mounted on the variable condenser section nearer the dial, for maximum output.

6. Set the test oscillator to 600 kc and tune in its signal. Then slowly rotate the variable condenser back and forth a degree or two and, at the same time, adjust the padder until maximum output is obtained.

7. Repeat the 1660 kc and 1400 kc adjustments.

Always use as low an output from the test oscillator as possible.

Short Wave Alignment:

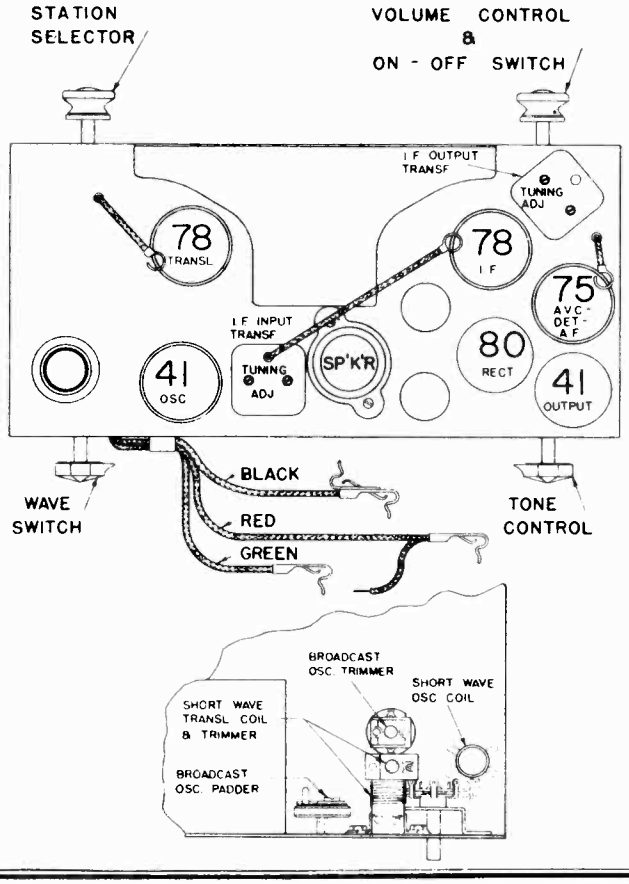
1. Leave the test oscillator coupled to the green antenna lead as for broadcast alignment.

2. Set the test oscillator to 16 megacycles and tune in its signal. Then adjust the trimmer condenser, mounted on the short wave translator coil, for maximum output.

In order to reduce the distributed capacity and thereby extend the high frequency limit of the receiver, the grid and plate leads to the oscillator coil and oscillator socket must be kept out in the open and as far removed from the metal of the chassis as possible.

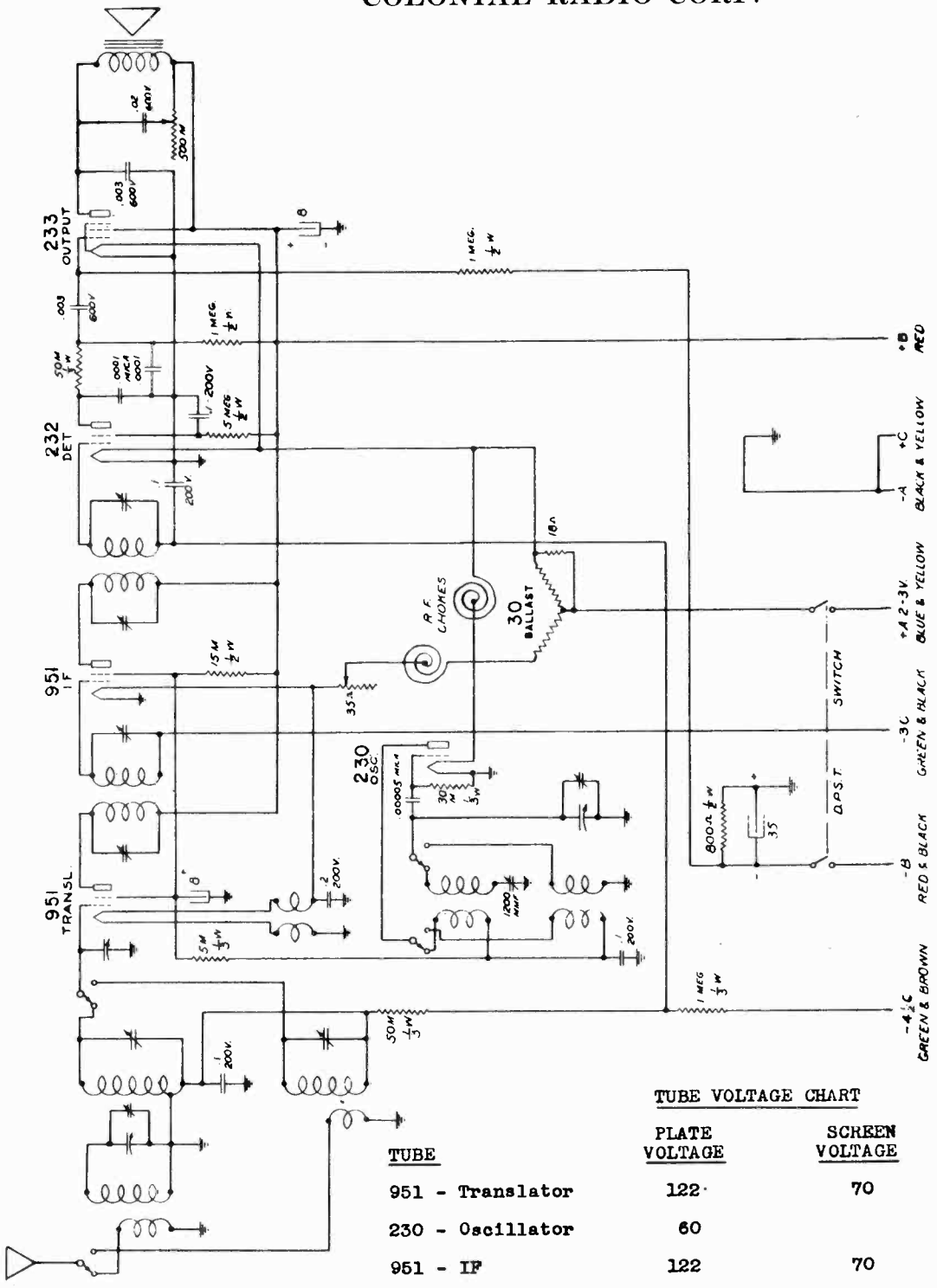
TUBE REPLACEMENT

There are two wood screws inside the cabinet, at the upper rear corners. These are used to secure the cabinet top, for shipping purposes only. They can be easily removed if the rear panel of the cabinet is taken off. Once removed, they need not be replaced. To remove the cabinet top then, for tube replacement, take out the single screw at the top center of the rear panel and push the top up and off.



MODEL 659
Schematic, Voltage

COLONIAL RADIO CORP.



IF PEAK 480 KC.

TUBE VOLTAGE CHART

TUBE	PLATE VOLTAGE	SCREEN VOLTAGE	CONTROL GRID VOLTAGE
951 - Translator	122	70	-.1
230 - Oscillator	60		-.6
951 - IF	122	70	-.8
232 - Detector	22.5*	5*	-.1
233 - Output	115	122	-.1

NOTE: All control grid readings are lower than the actual applied voltage due to high series resistance in the circuit.

* - Indicates low reading due to high series resistance in circuit.

All readings are to be taken between the chassis and the respective element of each tube.

MODEL 659
Alignment, Parts
Socket, Trimmers

COLONIAL RADIO CORP.

ALIGNMENT PROCEDURE

The IF Stages:

1. Connect the output meter across the loud speaker terminals. The high scale (about 100 volts) of the meter should be used.

2. Connect the ground lead of the test oscillator to the chassis.

3. Connect the other lead of the test oscillator, in series with a .1 mfd. condenser, to the control grid of the IF tube, leaving the grid clip attached to the cap.

4. Set the test oscillator to 480 kc. and tune the IF output transformer. The locations of the tuning adjustments are shown in the Service Illustration.

5. Change the test oscillator connection to the grid of the translator tube and tune the IF input transformer.

6. Repeat the adjustments to secure greater accuracy.

Always use as low an output as possible from the test oscillator in order to render the AVC action of the set inoperative.

RF Alignment: (Broadcast)

1. Set the test oscillator to exactly 1600 kc.

2. Couple the output of the oscillator to the antenna lead of the set, with the antenna connected.

3. Turn the dial pointer to exactly 1600 kc. and adjust the oscillator trimmer for maximum output. The oscillator trimmer is on the variable condenser section furthest from the dial. Condenser plates are at minimum capacity

4. Set the test oscillator to 1400 kc. and tune in its signal. Then adjust the translator and antenna trimmers for maximum output. The translator trimmer is accessible through the hole in the top of the translator coil shield as shown in the Service Illustration. The antenna trimmer is the one on the variable condenser section nearest the dial.

5. Set the test oscillator to 600 kc. and tune in its signal. Then slowly rotate the variable condenser back and forth a degree or two and, at the same time, adjust the padder until maximum output is obtained.

6. Repeat the 1600 kc. and 1400 kc. adjustments.

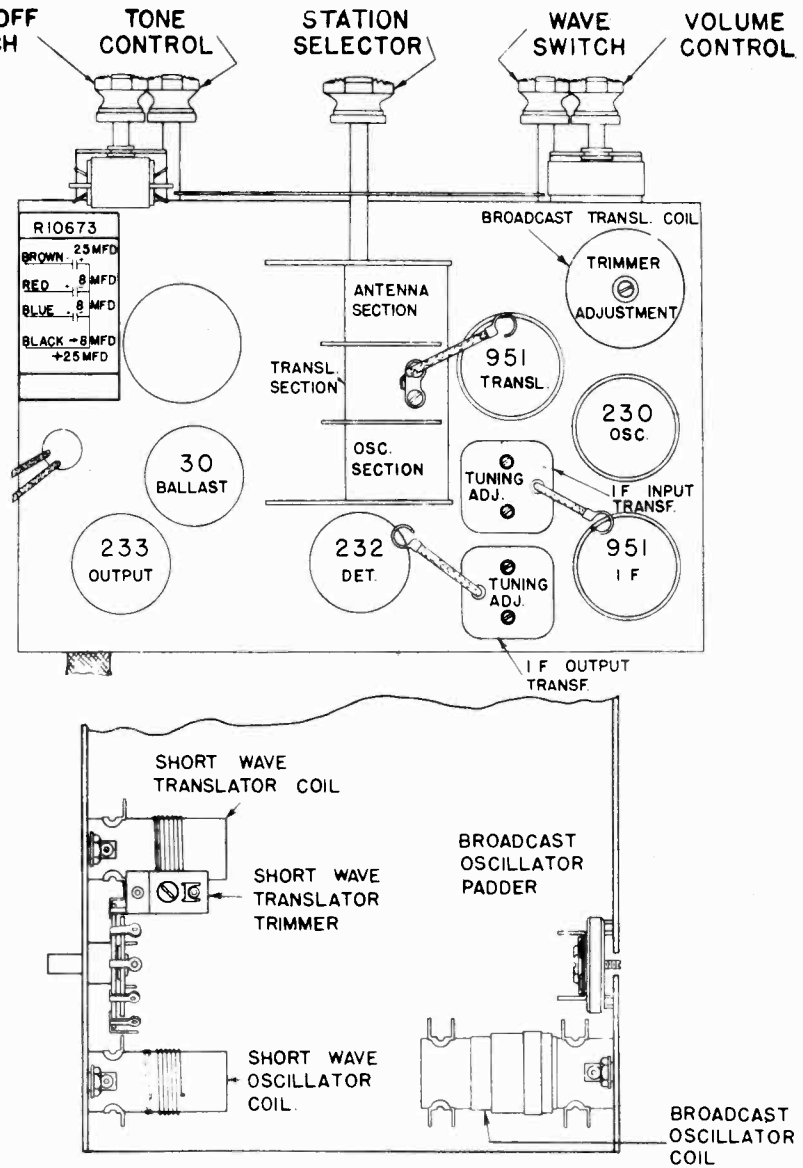
Short Wave Alignment:

1. Set the test oscillator to 15 megacycles and tune in its signal.

2. Adjust the short wave translator trimmer for maximum output.

3. If necessary, shift the end turns (enamelled wire) of the short wave translator coil to secure accurate alignment and maximum output. Do this at 6000 kc.

4. Re-adjust the translator trimmer at 15 megacycles.



REPLACEMENT PARTS AND PRICE LIST

PART NO.	DESCRIPTION
R8363	Resistor - 5 megohms, 1/2 watt carbon
R5823	Resistor - 1 megohm, 1/2 watt carbon
R7585	Resistor - 1 megohm, 1/3 watt carbon
R6637	Resistor - 50 M ohms, 1/3 watt carbon
R6110	Resistor - 30 M ohms, 1/3 watt carbon
R7291	Resistor - 15 M ohms, 1/2 watt carbon
R7226	Resistor - 5 M ohms, 1/3 watt carbon
R7441	Resistor - 800 ohms, 1/2 watt carbon
R10598	Resistor - 18 ohms, 1/2 watt, flexible
R10670	Coil - Antenna, broadcast
R10674	Coil - Oscillator, broadcast
R10671	Coil - Translator, broadcast
R10931A	Coil - Antenna, short wave
R10931B	Coil - Oscillator, short wave
R10672	Condenser - Variable
R10672B	Condenser - Variable, complete with dial and drive assembly
R10673	Condenser - Electrolytic, block
R9426	Condenser - Padding
R10197	Condenser - Trimmer
R6380	Condenser - .2 mfd. 200 volts
R6444	Condenser - .1 mfd. 200 volts
R6761	Condenser - .02 mfd. 600 volts
R7681	Condenser - .003 mfd. 600 volts
R4303	Condenser - .0001 mfd. mica
R8621	Condenser - .00005 mfd. mica
R10716A	Transformer - IF input
R10717	Transformer - IF output

MODEL 103
Voltage, Parts List

CROSLEY RADIO CORP.

Model 103

Specifications

Model 103 is a five tube superheterodyne designed for operation from a six volt automobile storage battery. The "B" voltage is furnished by a Crosley Syncronode. The intermediate frequency used is 181.5 kc.

Tubes and Voltage Limits

The following are the tubes and voltages measured with the receiver in operating condition but with no signal to the antenna, and with a battery voltage of 6.3 volts. All voltages are measured from tube contact to chassis with a 300 volt D. C. voltmeter (1000 ohms per volt).

Tube	Position	Plate	Screen Grid	Cathode	Supp. Grid	Filament
78	R. F. Amplifier	210	100	2	2	6.3
78	Oscillator Modulator	210	100	28	0	6.3
6B7	I. F. Amplifier and Diode Detector	210	100	2.5		6.3
78	Audio Amplifier	50	20	2.0	2	6.3
41	Output	195	210	16.0		6.3

Voltage limits are plus or minus 15% of values given.

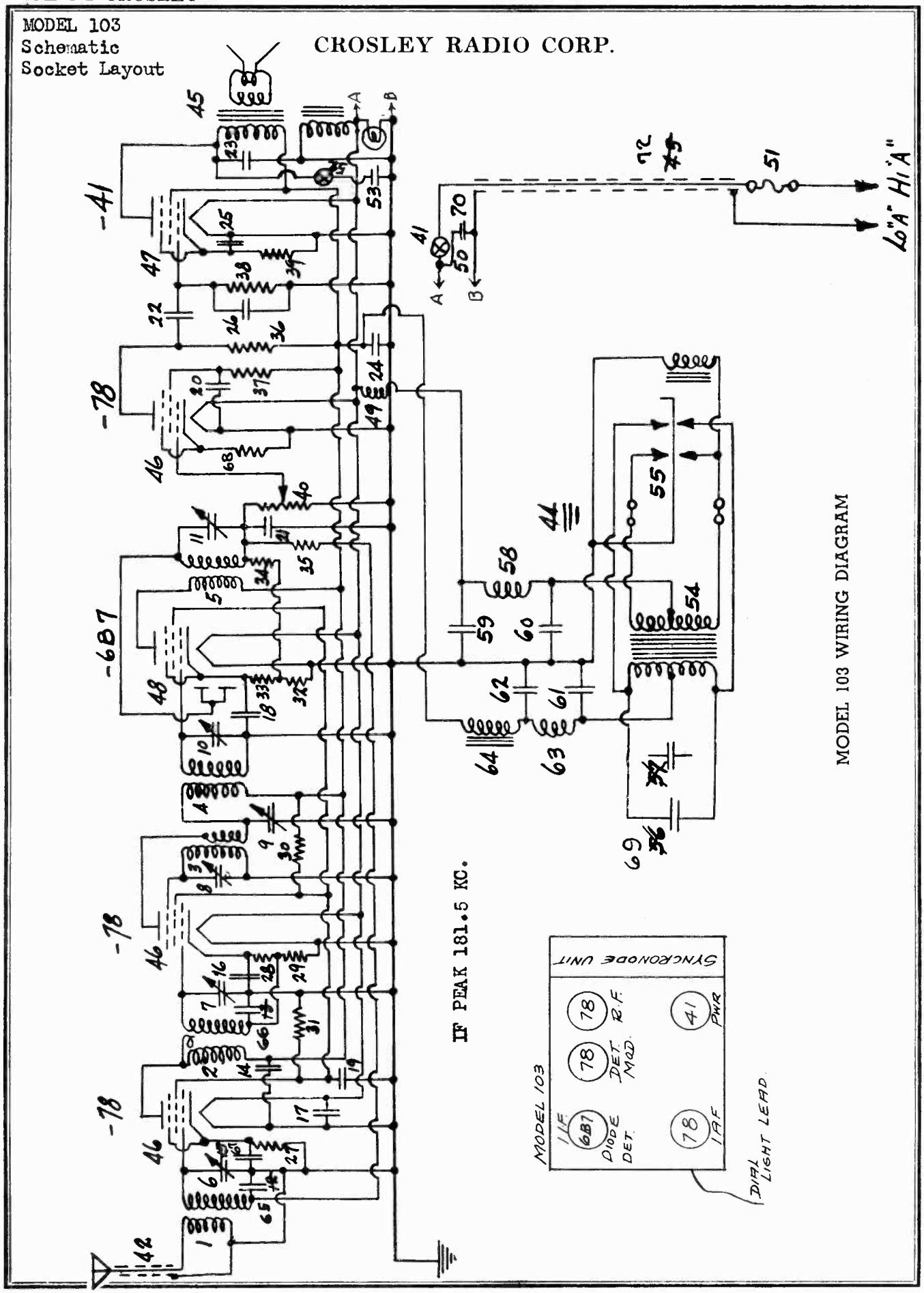
PARTS LIST—MODEL 103

INSTRUCTIONS FOR ORDERING—Give part number, description of part, and serial number of receiver on which part is to be used. If article wanted is not listed separately, then that part of complete assembly containing this article should be ordered. Goods shipped on open account to Crosley Wholesale Distributors only. Cash must accompany Dealer and Consumer orders. Prices are subject to the usual trade discounts, and are subject to change without notice.

Qty.	Part No.	Description	Item	List Each
		RECEIVER CHASSIS		
1	G48-28807	Seven Prong Socket 6B7	48	.10
1	G22-28807	Six Prong Socket 41	47	.10
3	G39-28807	Six Prong Socket 78	46	.10
1	W-27981	Tube Shield Base		.05
1	W-27328	Tube Shield		.10
1	G21-24995	Antenna Coil	1	.40
1	G25-24996	Oscillator Coil	3	.40
1	G7-25968	Radio Frequency Coil	2	.50
1	G1-25444	I. F. Transformer (1st)	4	.75
1	G3-25445	I. F. Transformer (2nd)	5	.75
4	W-25200	Coil Socket		.05
3	W-25024	Coil Shield (Large)		.10
1	W-25025	Coil Shield (Small)		.10
1	G1-29551	Coil Shield Assembly		.15
1	W-29263	Coil Bracket		.05
5	W-24360	Insulating Washer		.05
5	W-21541B	Coil Retaining Ring		.05
1	L-29783	Variable Condenser Gang	6, 7, 8	3.25
1	G1-29302	Coupling Assembly		.40
1	W-30436	Volume Control & Switch	40, 41	1.10
2	G2-25948	I. F. Trimmer Condenser	9, 11	.30
1	W-25008	I. F. Condenser Blade	10	.05
1	W-25584	Mica		.05
1	R-80	Screw		.05
1	W-28069B	Adjusting Nut		.05
1	W-24865	Washer		.05
1	W-25450B	Insulating Washer		.05
1	W-25007B	Insulating Washer		.05
1	W-25446	Bakelite Washer		.05
1	O-4	Flat Washer		.05
1	M-20	Rivet		.05
1	G4-28067	"A" Choke	49	.35
2	21454	Resistor 1 megohm	34, 35	.15
1	23785	Resistor 500,000 ohm	37	.15
1	21875	Resistor 100,000 ohm	36	.15
2	22514	Resistor 750 ohm	39, 68	.15
1	W-30127	Resistor 450 ohm	28	.15
1	W-21237	Resistor 60,000 ohm	31	.15
1	W-25357	Resistor 75 ohm	33	.10
1	W-21455	Resistor 300,000 ohm	38	.15
1	31094	Resistor 4,500 ohm	71	.15
2	W-21964	Resistor 165 ohm	27, 32	.15
1	23616	Resistor 15,000 ohm	30	.15
1	W-26571	Condenser .005 Mfd	21	.15
1	W-23142	Condenser .02 Mfd	22	.20
1	W-30419	Condenser 8-8 Mfd	24, 25	1.40
1	W-23635	Condenser .06 Mfd	23	.20
2	W-20389	Condenser .00005 Mfd	26, 70	.25
1	W-23615	Condenser .05 Mfd	14	.15
1	W-25438	Condenser .1-.1 Mfd	19, 20	.25
2	W-24049A	Condenser .1 Mfd	17, 18	.15
4	W-27203	Condenser .02 Mfd	16, 65, 66, 67	.15
		MODEL 409 SYNCRONODE	44	
1	L-30424	Cover		.50
1	C-30455	Chassis		.50
1	L-29160	Vibrator Assembly	55	4.50
1	G2-28067	"A" Choke Assembly	58	.35
1	G7-28065	Power Transformer	54	2.25
1	G1-24234	R. F. Choke Assembly	63	.15
1	G7-28069	Filter Choke	64	1.45
1	W-29808	Condenser 12 Mfd	62	1.35
1	W-30367	Condenser .25 Mfd	60	.30
1	W-30366	Condenser .5 Mfd	59	.50
1	W-23142	Condenser .02 Mfd. (400 v.)	61	.20
1	W-30984	Condenser .02 Mfd. (800 v.)	69	.30
4	W-29314	Rubber Sleeve (to Mount Sync.)		.05
1	W-20264	Terminal Board		.15
		MODEL 353-3C SPEAKER	45	
1	G2-29529	Cone Assembly		2.50
1	W-29777	Field Coil		1.00
1	G4-24628	Transformer Assembly		1.40
		MISCELLANEOUS		
1	L-30452	Receiver Case		.65
1	C-30450	Cover		.25
1	C-30451	Bottom		.25
1	L-28034	Remote Control		4.11
1	W-28102A	Clamp Spring		.15
8	W-20070	Suppressor (Spark Plug)		.50
1	W-20071	Suppressor (Dist. Head)		.50
3	W-29754	Elim. Condenser		.45
1	W-25784	Tennaflex		1.50
1	W-29323	Mounting Bolt		.10
1	W-29324	Mounting Washer		.05
1	7961	Mntg. Shakeproof Washer		.05
1	W-29325	Mounting Nut		.05
2	W-30739	No. 8x⅛ P. K. Screw (Top & Bottom)		.05
4	W-30739	No. 8x⅛ P. K. Screw (Chassis to case)		.05
30	W-31050	No. 8x¼ P. K. Screw (Case)		.05
4	W-31070	6-32x½ Screw (Speaker)		.05
4	W-24074	Elastic Stop Nut (Speaker)		.05
4	O-6	Flat Washer (Speaker)		.05
3	W-20800	Shakeproof Washer (Spr.)		.05
1	W-4562	Solder Lug (Speaker)		.05
1	G1-25891	Antenna Wire		.75
1	W-28010	Antenna Wire Shield	42	.25
1	W-31100	"A" Cable & Fuse Assem.	72	.55
1	W-31102	Fuse Carrier only		.10
1	W-20106	Fuse Carrier Cap		.05
1	W-20110	Spring		.05
2	W-20107	Washer		.05
1	W-31103	10 Ampere Fuse		.10
66"	W-31101	Wire		.03 Ft.
1	W-31076	Lug		.05
1	W-26156A	Switch	52	.30
1	W-23191	Condenser .01 Mfd	53	.25
1	W-29298	Grill Cloth		.15
1	B-29309	Mounting Plate		.20
		REMOTE CONTROL		
1	G8-25868	Drive Shaft Assem. (V. C.)		1.65
1	G9-25868	Drive Shaft Assem. (Dial)		1.55
1	G1-28035	Strap Assembly		.15
1	W-28029B	Column Bracket		.20
1	G4-26317	Bracket Assem.		.30
1	W-29316A	Gear Dial		.30
1	W-4907	Spring Washer		.05
1	G5-23472	Knob		.10
1	G1-28036	Key Knob		.20
1	B-26307D	Housing		.80
1	W-28025C	Cover		.50

MODEL 103
Schematic
Socket Layout

CROSLEY RADIO CORP.



MODEL 169
Voltage, Parts List

CROSLEY RADIO CORP.

Model 169

Specifications

Model 169 is a four-tube superheterodyne designed for operation from AC electric circuits. It uses an intermediate frequency of 456 kc.

Tubes And Voltage Limits

The following are the tubes and voltages measured with the receiver in operating condition but with no signal to the antenna circuit, and with a line voltage of 117.5 volts (235 for a 220 volt receiver). All voltages, except filament, are measured from tube contact to chassis with a 500 volt (1000 ohms per volt) DC voltmeter. Filament voltages are measured with a low range AC voltmeter.

Tube	Position	Plate	Screen Grid	Cathode	Supp. Grid	Filament
58	Oscillator-modulator	165	82	22	0	2.5
6F7	I. F. Detector	165	82	2	0	2.5
2A5	Output	158	165	10		2.5
80	Rectifier	295				4.9

Voltage limits are plus or minus 10% of values given.

PARTS LIST—MODEL 169

INSTRUCTIONS FOR ORDERING—Give part number, description of part, and serial number of receiver on which part is to be used. If article wanted is not listed separately, then that part of complete assembly containing this article should be ordered. Goods shipped on open account to Crosley Wholesale Distributors only. Cash must accompany Dealer and Consumer orders. Prices are subject to the usual trade discounts, and are subject to change without notice.

* Figures in 2nd last column refer to parts shown in diagram.

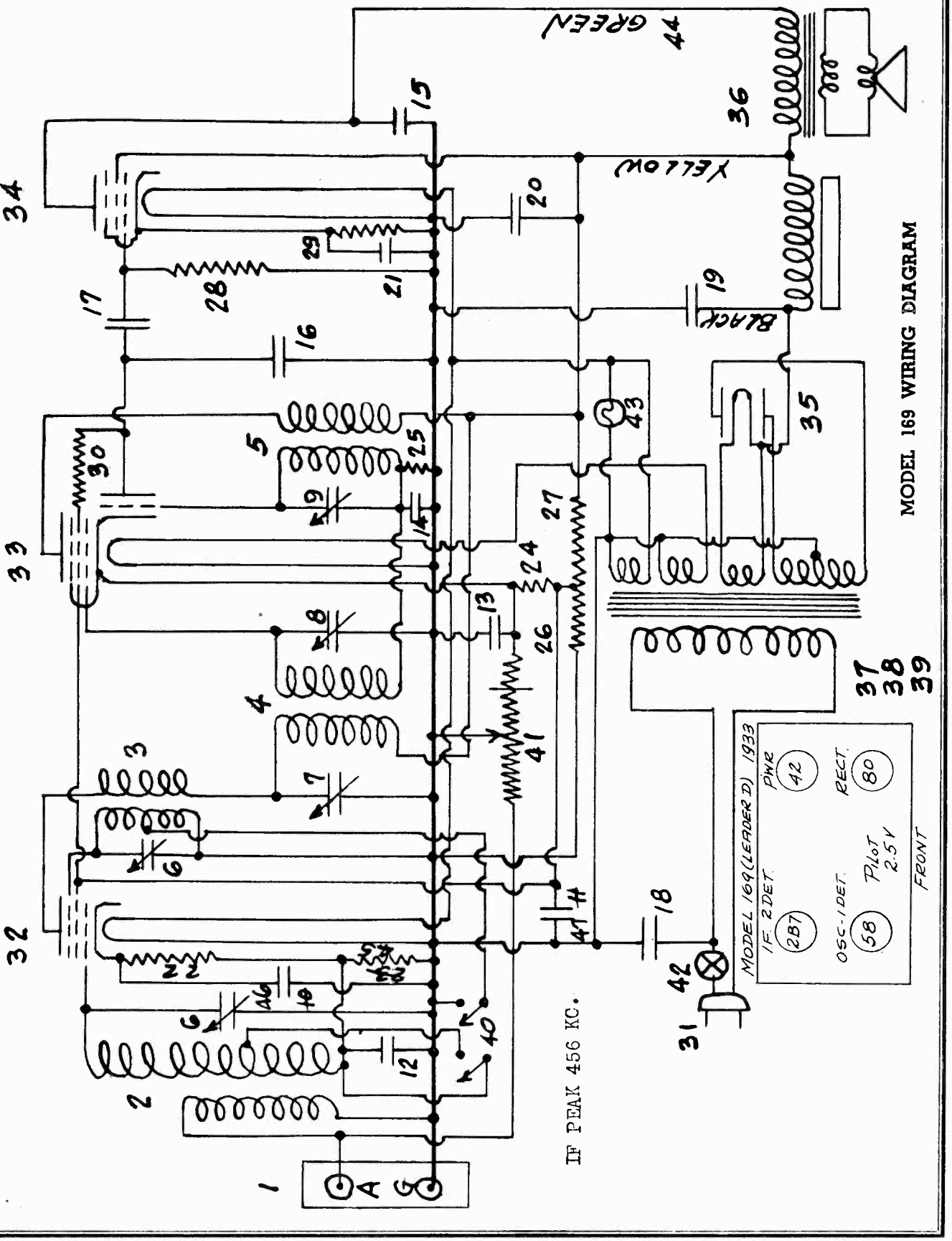
Qty.	Part No.	Description	*	List Price Each
1	G20-24995	Antenna Coil	2	.65
1	G17-24996	Oscillator Coil	3	.80
1	G7-25444	First I. F. Transformer	4	.60
1	G9-25445	Second I. F. Transformer	5	.50
1	W25024	Coil Shield (Large)		.10
3	W25025	Coil Shield (Small)		.10
4	W25200	Coil Socket		.05
2	W26891	Insulating Washer		.05
2	W24360	Insulating Washer		.05
4	W21541B	Coil Retaining Ring		.05
1	W28959	Wave Change Switch	40	.80
1	W27425	Variable Condenser Gang	6	2.75
1	G1-27812	Dial Light Assem.	43	.20
1	G5-25050	Dial Assem.		.40
1	G2-25948	Variable I. F. Condenser (1st I. F. Pri.)	7	.30
1	G10-25948	Variable I. F. Condenser (2nd I. F. Sec.)	9	.15
1	W27548	Adjustable I. F. Cond. Blade (1st I. F. Sec.)	8	.05
1	W25584	Mica		.05
1	R-80	Screw		.05
1	W26069B	Adjusting Nut		.05
1	W24865	Metal Washer		.05
1	W25450B	Insulating Washer		.05
1	W25007B	Insulating Washer		.05
1	W25446	Bakelite Washer (Large)		.05
1	0-4	Washer		.05
1	M-20	Rivet		.05
1	W20264	A. G. Terminal	1	.15
1	G24-27456	Socket -58	32	.10
1	G49-27456	Socket -6F7	33	.10
1	G43-27456	Socket -2A5	34	.10
1	G6-27456	Socket -80	35	.10
2	W-26010	Tube Shield Base		.05
1	W-27328	Tube Shield (6F7)		.10
1	B-26009	Tube Shield (58)		.10
1	B-21491	AC Cable & Plug	31	.25
1	W31009A	Speaker Cable	44	.25
1	W26573B	Volume Control & Switch	41-42	1.00
2	G1-23472	Knobs		.10
1	G1-28500	Power Transf. 110 volt, 60 cy.	37	2.25
1	G2-28500	Power Transf. 110 volt, 25 cy.	38	3.00
1	G3-28500	Power Transf. 220 volt, 25 cy.	39	3.25
		FILTER & BYPASS CONDENSERS		
1	W27204	Condenser .02-.02 Mfd.	12-13	.25
1	W24049	Condenser .1 Mfd.	14	.15
1	W23191	Condenser .01 Mfd.	15	.25
1	W25537	Condenser .001-.03 Mfd.	16-17	.30
1	W29592	Condenser .003 Mfd.	18	.20
2	W27203	Condenser .02 Mfd.	46-47	.15
1	W29150	Condenser 6 -7 -8 Mfd.	19-20	
			21	2.90
		RESISTORS		
1	W25937	Resistor 275 ohm	22	.15
1	24990	Resistor 25,000 ohm	24	.20
1	21454	Resistor 1 megohm	25	.15
1	W28471	Resistor 25000-8500 ohm	26-27	.45
2	23785	Resistor 500,000 ohm	28-30	.15
1	W25521	Resistor 450 ohm	29	.15
1	31094	Resistor 4500 ohm	45	.15

SPEAKER PARTS * 36

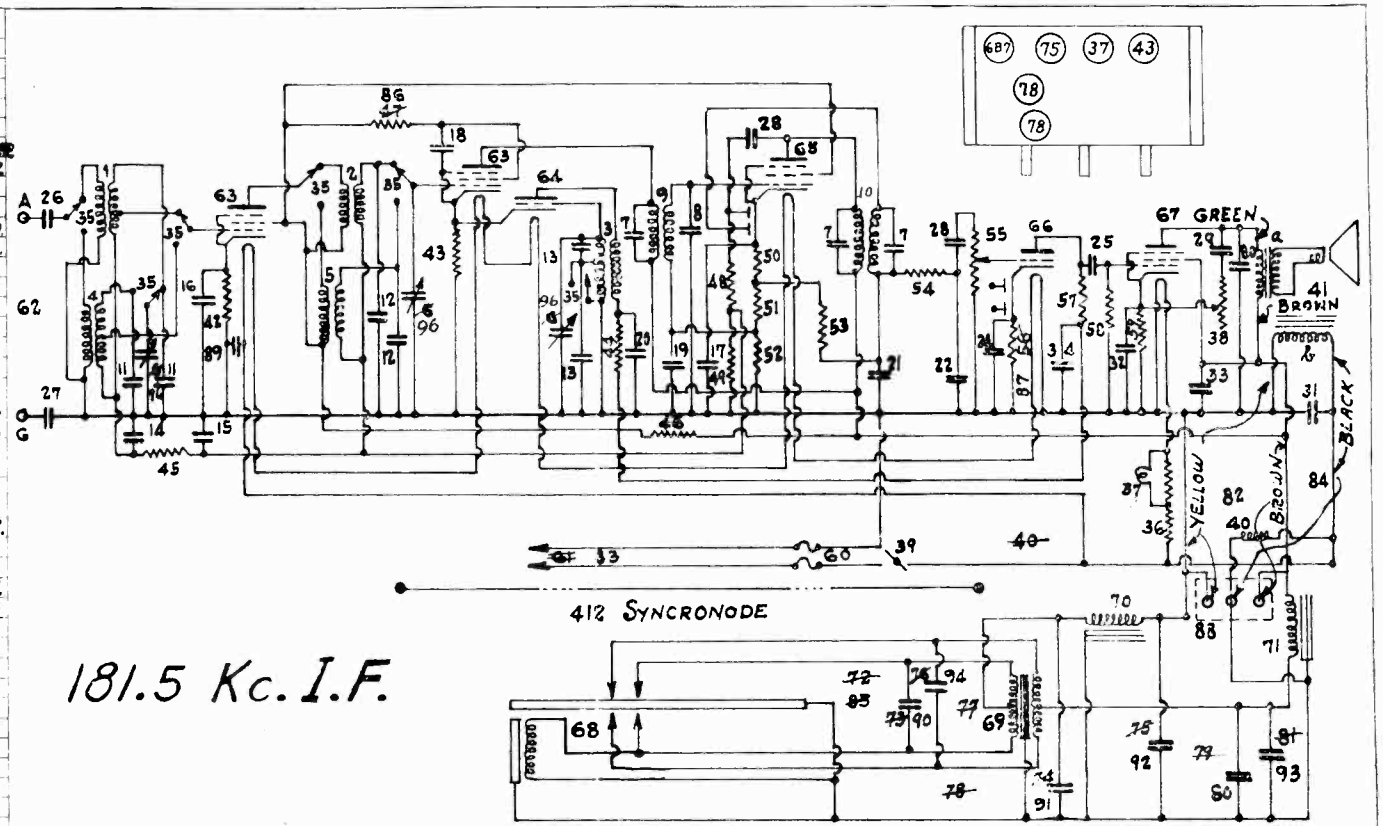
	Magnavox 342-2M Spec. 1300	Jensen 342-2J Spec. 2617		
1	28761	29434	Cone & Voice Coil Assem.	2.00
1	28763	29436	Field Coil	1.10
1	28764	29437	Transformer	1.25

MODEL 169
Schematic
Socket Layout

CROSLEY RADIO CORP.



1	G7-24995	1st A.F. ANT. TRANS.
2	G2-25968	1st A.F. R.F. TRANS.
3	G18-24996	OSCILLATOR Coil
4	G4-24915	Hi. F. ANT. TRANS.
5	G5-25960	Hi. F. R.F. TRANS.
6	~~G1-25444~~	~~VARIABLE COND.~~
7	G1-25440	I.F. TUNING CONDENSER
8	W-25008A	I.F. TUNING CONDENSER
9	G1-25444	1st I.F. TRANS.
10	G6-25444	2nd I.F. TRANS.
11	G1-29600	ANT. TRANS. TRIM. COND.
12	G1-29699	R.F. TRANS. TRIM. COND.
13	G1-29699	OSC. COIL TRIM. COND.
14	W-27204	0.02 MFD. 200V.
15		0.02 MFD. 200V.
16	W-27204	0.02 MFD. 200V.
17		0.02 MFD. 200V.
18	W-27203	0.02 MFD. 200V.
19	W-27203	0.02 MFD. 200V.
20	W-27203	0.02 MFD. 200V.
21	W-26152A	0.00015 MFD. 400V.
22		0.0001 MFD. 400V.
23	W-23142	0.02 MFD. 400V.
24	W-24784	0.25 MFD. 200V.
25	W-23615	0.05 MFD. 400V.
26	W-28635	0.006 MFD. 400V.
27	W-27688	0.1 MFD. 400V.
28	W-27540	0.0005 MFD. 400V.
29	W-25517A	0.05 MFD. 400V.
30		0.008 MFD. 400V.
31	W-24049	0.1 MFD. 200V.
32		8 MFD. 25V.
33	W-30568A	18 MFD. 250V.
34		8 MFD. 250V.
35	B-30569-C	6P. D.T. SWITCH
36	W-30574	12 W. 18 W.
37	W-4099 B	6.3V. DIAL LIGHT
38	W-25948B	TONE CONTROL
39		S.P.S.T. SWITCH
40	G2-28067	FILTER CHOKE
41	30591 A	338 D.R. SPEAKER
42	W-25937	275 Ω
43	W-30127	450 Ω
44	21876	10,000 Ω
45	23785	500,000 Ω
46	W-23013	2000 Ω
47	26690	4500
48	26577	3 MEG.
49	26577	3 MEG.
50	W-21964	165 Ω
51	W-21962	165 Ω
52	W-25937	275 Ω
53	21454	1 MEG.
54	23785	500,000 Ω
55	W-25666B	LEVEL CONTROL
56	26690	4500 Ω
57	21455	300,000 Ω
58	23785	500,000 Ω
59	B-23907	750 Ω
60	W-7983-A	3 AMP. FUSE
61	B-21491-A	CORD & PLUG
62	G7-26719	ANT.-GND. TERM.



95	G20-25948	I.F. TUNING CONDENSER	99		
96	G10-33002	VARIABLE CONDENSER	100		
97			101		
98			102		
63	G39-27456	18 SOCKET	79	W-28682	0-1 MFD 200V.
64	G12-27456	37 SOCKET	80	W-28978B	12 MFD. 150V.
65	G48-27456	687 SOCKET	81	W-30367	0.25 MFD. 160V.
66	G41-27456	75 SOCKET	82	W-28980	A+B SUPPLY CABLE
67	G30-27456	43 SOCKET	83	B-30375-A	CORD + PLUG
68	L-28949	VIBRATOR ASSEM.	84	W-31007	SPEAKER CABLE
69	G2-28065	POWER TRANS.	85	W-29810 A	.01 MFD. 300 V.A.C.
70	G5-28168	"A" FILTER CHOKE	86	31094	4500 Ω
71	G2-28069	"B" FILTER CHOKE	87	31094	4500 Ω
72	W-28066B	0.01 MFD 600V.A.C.	88	G2-31128	SYN. TERM. BOARD
73	W-29012	2.5 MFD. 30V.	89	W-20707	.0005 MFD. MICA
74		12 MFD. 40V	90	W-31404	.5 MFD. 300V.
75	W-28682	0-1 MFD. 200V.	91	W-31403-A	.12 MFD. 40V
76	W-28622	0-1 MFD. 200V.	92	W-30366	.5 MFD
77		0-1 MFD. 200V.	93	W-30366	.5 MFD.
78	W-23012-A	18 Ω	94	W-29810	.01 MFD 800 V. A.C.

A	ITEM 61 REPLACED BY 83 8-29-33 CWW	S-342	
B	ITEM 56 MARKED 300,000Ω THRU ERROR 9-20-33	3505	
C	ITEM 84 ADDED. ITEM 41 WAS 30591 10-11-33 RC B	3518	N
D	ITEM 72 REPLACED BY 85 ITEM 95 CHANGED TO 99	3519	M
E	ITEM 47 REPLACED BY 86 10-24-33 CWW.	3523	L
F	ITEM 88 ADDED 11-7-33 CWW	3529	K
G	ITEM 89 ADDED 11-21-33 CWW	3536	J
H	401 SYNCRONODE REPLACED WITH 412 12-21-33 CWW	S-457	H
J	POSITION OF ITEM 40 CHANGED	S-465	G
K	ITEM 94 ADDED 1-17-34 CWW	S-478	F
L	ITEM 80 CHG'D TO "B" 4-11-34 CWW. ITEMS 32 33 34 91 CHG'D TO A 4-17-34 CWW.	S-526	E
M	ITEM 7 REPLACED BY ITEM 95 4/17/34 CWW	S-530	D
N	ITEM 6 REPLACED BY ITEM 96 4/17/34 CWW	3596	C B A

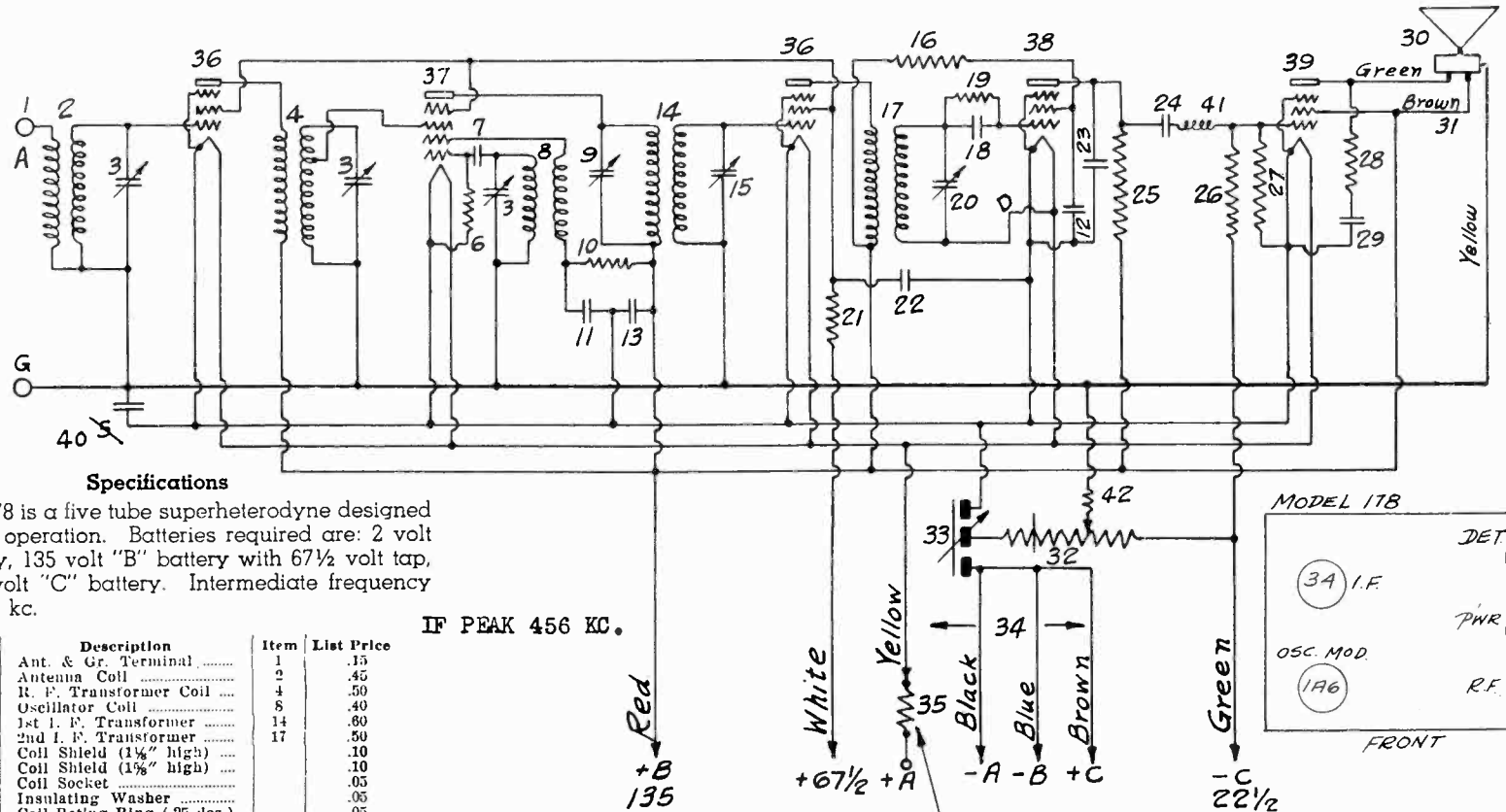
THE CROSLEY RADIO CORPORATION, CINCINNATI, OHIO

119 WIRING DIAGRAM

APPROVED 8-18-33 DATE 8-12-33 DWG NO. B-30570

MODEL 178
Schematic, Voltage
Parts List, Socket

CROSLEY RADIO CORP.



MODEL 178 WIRING DIAGRAM

Specifications

Model 178 is a five tube superheterodyne designed for battery operation. Batteries required are: 2 volt "A" battery, 135 volt "B" battery with 67½ volt tap, and 22½ volt "C" battery. Intermediate frequency used is 456 kc.

Part No.	Description	Item	List Price		FILTER & BY PASS CONDENSERS		
LW20264	Ant. & Gr. Terminal	1	.15				
G10-24995	Antenna Coil	2	.45				
G8-25968	R. F. Transformer Coil	4	.50				
G13-24996	Oscillator Coil	8	.40				
G7-25444	1st I. F. Transformer	14	.60				
G9-25445	2nd I. F. Transformer	17	.50				
W25025A	Coil Shield (1⅛" high)		.10				
W25024A	Coil Shield (1⅝" high)		.10				
W25200	Coil Socket		.05				
W24360	Insulating Washer		.05				
W21541B	Coil Ret'ng Ring (.25 doz.)		.05				
B28974	Tuning Condenser gang	3	3.25				
G11-25050	Dial Drive Assembly		.30				
G2-25948	I. F. Tuning Condenser	9	.30				
W27548	I. F. Tuning Cond. Blade	15	.05				
W25584	Mica Insulator		.05				
R80	Screw		.05				
W26069B	Adjusting Nut		.05				
W24865	Metal Washer (Round)		.05				
W25450B	Insulating Washer (Small)		.05	W5382	0.00025 Mfd. Cond.	7-18	.15
W25007B	Insulating Washer (Small)		.05	W25438	0.1-0.1 Mfd. 200 V. Cond.	11-12	.25
W25446	Bakelite Washer (Large)		.05	W24784	0.25 Mfd. 200 V. Cond.	13	.20
O4	Washer		.05	W30321	1.0 Mfd. 160 V. Cond.	22	.55
M20	Rivet		.05	W25537	0.001-0.03 Mfd. 400 V. Cond.	23-24	.30
G13-25948	I. F. Tuning Condenser	20	.15	W26559	0.006 Mfd. 200 V. Cond	29	.15
G31-27456	-34 Socket	36	.10	W30366	0.5 Mfd. 160 V. Cond.	40	.50
G55-27456	-1A6 Socket	37	.10				
G10-27456	32 Socket	38	.10		**RESISTORS**		
G30-27456	33 Socket	39	.10				
W20973A	Tube Shield Base		.05	W21875	100,000 Ohm Resistor	6-42	.15
				W22196	20,000 Ohm Resistor	10	.15
W26974B	Tube Shield		.10	W21454	1 Megohm Resistor	16-26	.15
B30542A	Battery Cable	34	.70	W26577	3 Megohm Resistor	19-27	.15
W27933	Speaker Cable	31	.10	W21452	1,100 Ohm Resistor	21	.15
W27939B	Vol. Control & Switch	32-33	1.10	W23403	150,000 Ohm Resistor	25	.15
G1-24234	R. F. Choke	41	.30	W24814	7,000 Ohm Resistor	28	.20
G1-23472	Knobs		.10	G2-23300	53 Ohm (Air Cell) Resistor	35	.15
B27818	Bottom		.20	336-3B	Speaker		5.33

Tube	Position and Use	Voltages Plate	Screen Grid	Control Grid	Filament
34	RF Amplifier	135	67.5	4.0	2.0
1A6	Oscillator	95	5		
	Modulator	135	67.5	4.0	2.0
34	IF Amplifier	135	67.5	4.0	2.0
32	Detector	50	15	0	2.0
33	Output	135	135	8.0	2.0

Voltage limits are plus or minus 10% of values given.

MODEL 179
Voltage, Parts List

CROSLEY RADIO CORP.

Model 179

Specifications

Model 179 is a seven tube superheterodyne designed for operation from AC electric circuits. The intermediate frequency used is 181.5 kc.

Tubes and Voltage Limits

The following are the tubes and voltages measured from tube contact to chassis with the receiver in operating condition but with no signal to the antenna circuit, and with a line voltage of 117.5 volts (235 volts for 220 volt receivers). All voltages, except filament, are measured with a 500 volt (1000 ohms per volt) DC voltmeter. Filament voltages are measured with a low range AC voltmeter.

Tube	Position and Use	Plate	Voltages Screen Grid	Cathode	Supp. Grid	Filament
58	RF Amplifier	260	125	3	3	2.5
58	Oscillator-modulator	260	125	34	0	2.5
58	IF Amplifier	260	125	4	4	2.5
56	Diode detector	0		0		2.5
56	AF Amplifier	50		4		2.5
2A5	Output	250	260	16.5		2.5
80	Rectifier	355				

Voltage limits are plus or minus 10% of values given.

PARTS LIST—MODEL 179

INSTRUCTIONS FOR ORDERING—Give part number, description of part, and serial number of receiver on which part is to be used. If article wanted is not listed separately, then that part of complete assembly containing this article should be ordered. Goods shipped on open account to Crosley Wholesale Distributors only. Cash must accompany Dealer and Consumer orders. Prices are subject to the usual trade discounts, and are subject to change without notice.

* Figures in 2nd last column refer to parts shown in diagram on page 18.

Qty.	Part No.	Description	* Item	List Each
1	G7-24995	Low. F Antenna Coil	2	.60
1	G14-24995	Hi F Antenna Coil	3	.45
2	G1-29699	Ant. R. F. Coil Trimmer Cond.	10-11 12-13	.20
1	G9-25968	Low F. R. F. Coil	64	.50
1	G5-25968	Hi F. R. F. Coil	5	.55
1	G21-24996	Oscillator Coil	6	.60
1	G1-25444	1st I. F. Trans. Coil	7	.75
1	G1-25948	1st I. F. Prim. 2nd I. F. Prim. 2nd I. F. Sec. Trimmer Cond. Assem.	14-15 16	.60
1	W25008A	1st I. F. Sec. Trimmer Cond. Blade	17	.05
1	R80	Screw		.05
1	W26069B	Adjusting Nut		.05
1	W24865	Metal Washer (round)		.05
1	W25446	Bakelite Washer (large)		.05
1	W25450B	Insulating Washer (small)		.05
1	W25007	Insulating Washer (small)		.05
1	M20	Rivet		.05
1	W25584	Mica Insulator		.05
1	G6-25444	2nd I. F. Trans. Coil	8	.80
7	W25200	Coil Sockets		.05
5	W25024A	Coil Shield (1⅝" high)		.05
3	W25025A	Coil Shield (1⅛" high)		.10
7	W21541B	Retainer Ring (.25 doz.)		.05
4	W24360	Square Hole Ins. Washer		.05
3	W26891	Semi-Cir. Hole Ins. Wash.		.05
1	C30704	Var. Tun. Cond Gang	9	3.50
1	G3-27134	Dial Light Socket Assem.		.15
1	G25-25751	Dial Assembly		.90
1	B29787	Dial Cover (celluloid)		.30
1	B30569B	6 P. D. T. Switch	33	1.90
1	LW-20264	Ant.-Gnd. Terminal	1	.15
1	G6-27456	-80 Socket	51	.10
3	G24-27456	-58 Socket	52-53 54	.10
2	G18-27456	-56 Socket	55-56	.10
1	G43-27456	2A5 Socket	57	.10
3	W26010	Tube Shield Base		.05
3	B26009C	Tube Shield		.10

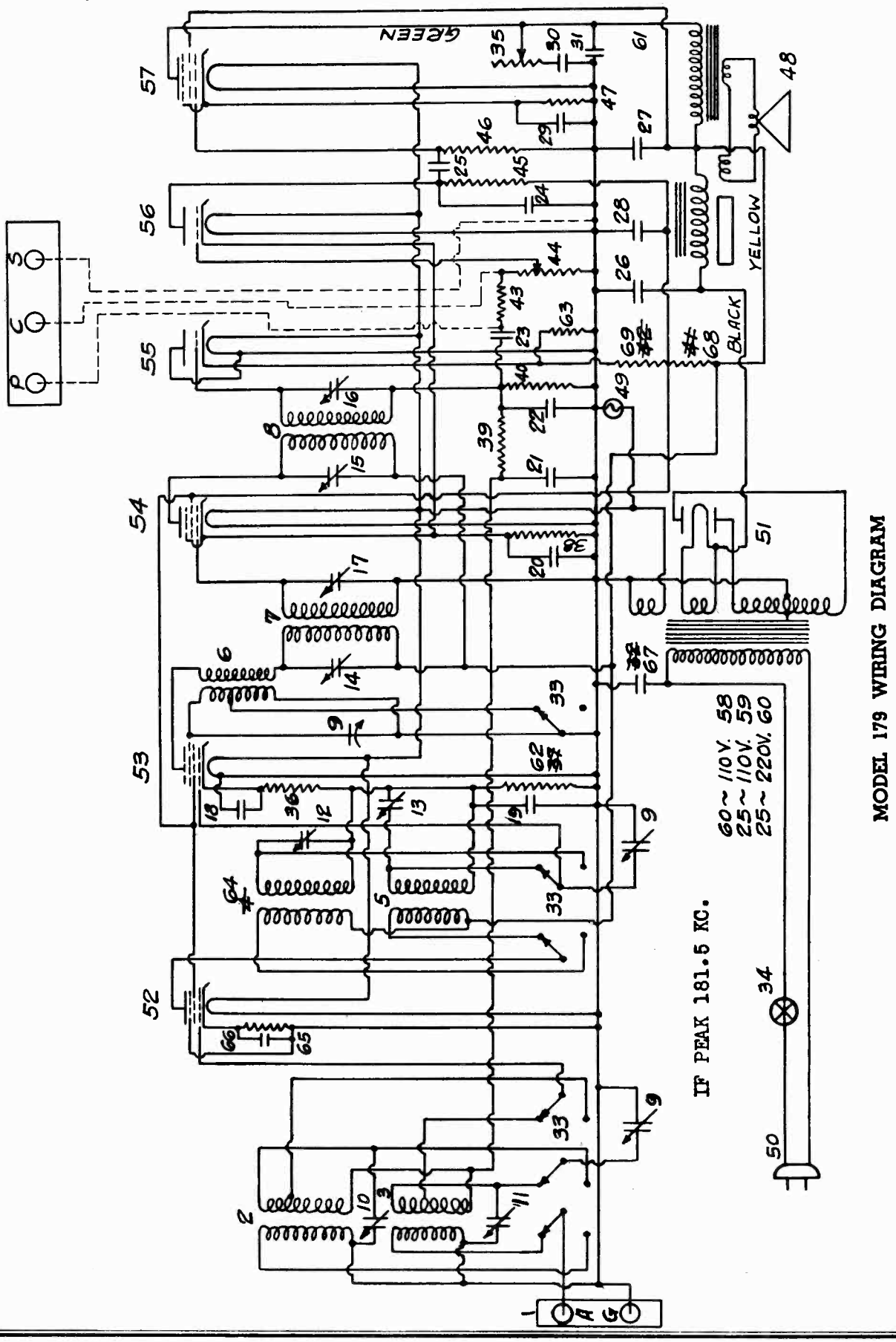
Qty.	Part No.	Description	* Item	List Each
1	B31335A	Tube & Cond. Shield		.20
1	B21491A	Cable & Plug	50	.50
1	W25594B	Tone Control & Switch	34-35	1.10
1	W25666B	Level Control (volume)	44	.90
4	G1-23472	Knob		.10
1	W31157A	Knob (Moderne)		.10
3	W31585A	Knob (Moderne)		.10
1	W31463	Escutcheon		.25
3	S27	Escutch. Screws (.25 doz.)		.05
1	W31009	Speaker Cord	61	.15
		POWER TRANSFORMERS		
1	G17-23559	Power Trans. 60 Cy. 110 V.	58	3.25
	G18-23559	Power Trans. 25 Cy. 110 V.	59	4.75
	G19-23559	Power Traus. 25-60 Cy. 220 V.	60	4.75
		FILTER & BYPASS CONDENSERS		
2	W27204	.02-.02 Mfd. 200 Volt	18-19 20-21	.25
1	W25969A	.00017-.03 Mfd. 400 Volt	22-23	.25
1	W25537A	.001-.03 Mfd. 400 Volt	24 25	.30
1	W26194B	12. Mfd. 475 Volt	26	1.25
1	W29150A	7.-6.-8. Mfd. 450-400-25 Volt	27-28 29	2.60
1	W25517A	.05-.008 Mfd. 400 Volt	30-31	.30
1	W27203	.02 Mfd. 200 Volt	66	.15
1	W30805	.01 Mfd. 400 Volt	67	.20
		Resistors		
3	W25937	275 Ohms	36-38 65	.15
1	W26577	3 Megohm	39	.15
1	W21454	1 Megohm	40	.15
2	W23785	500000 Ohm	43-46	.15
1	W23403	150000 Ohm	45	.15
1	W25521	450 Ohm	47	.15
1	W31094	4500 Ohm	62	.15
1	W30127	450 Ohm	63	.15
1	W28471	8500-2500 Ohms (Canddem)	68-69	.45
1	C30719A	Chassis Bottom		.50

312-4 MAGNAVOX SPEAKER SPEC. 939

Qty.	Part No.	Description	List Each
1	27307	Cone & Voice Coil Assem.	3.00
1	29197	Field Coil	1.75
1	29199	Transformer	1.75

MODEL 179
Schematic

CROSLEY RADIO CORP.



MODEL 179 WIRING DIAGRAM

MODEL 180
Voltage, Parts List

CROSLEY RADIO CORP.

Model 180

Specifications

Model 180 is a ten tube superheterodyne designed for operation from AC electric circuits. It uses an intermediate frequency of 181.5 kc.

Tubes and Voltage Limits

The following are the tubes and voltages measured from tube contact to chassis with the receiver in operating condition but with no signal to the antenna circuit, and with a line voltage of 117.5 volts (235 for 220 volt receivers). All voltages, except filament, are measured with a 500 volt (1000 ohms per volt) d. c. voltmeter. Filament voltages are measured with a low range a. c. voltmeter.

Tube	Position and Use	Voltages			
		Plate	Screen Grid	Cathode	Filament
58	Modulator	270	112	5.5	2.5
58	RF Amplifier	270	112	3.5	2.5
56	Oscillator	50		5.5	2.5
58	IF Amplifier	270	112	3.7	2.5
56	Diode	0		0	2.5
56	AF Amplifier	50		3.0	2.5
56	Phase Inverter	50		3.0	2.5
Two 2A5	Output	260	270	17.5	2.5
80	Rectifier	360			4.8

All voltage limits are plus or minus 10% of values given.

PARTS LIST—MODEL 180

INSTRUCTIONS FOR ORDERING—Give part number, description of part, and serial number of receiver on which part is to be used If article wanted is not listed separately, then that part of complete assembly containing this article should be ordered. Goods shipped on open account to Crosley Wholesale Distributors only. Cash must accompany Dealer and Consumer orders. Prices are subject to the usual trade discounts, and are subject to change without notice.

* Figures in 2nd last column refer to parts shown in diagram

Qty.	Part No.	Description	* Item	List Price
1	LW20264	Antenna & Ground Terminal	1	.15
1	G14-24995	Antenna Coil (High Freq.)	2	.45
1	G7-24995	Antenna Coil (Low Freq. Broadcast)	3	.60
1	G5-25968	Interstage Coil (H. F.)	7	.50
1	G9-25968	Interstage Coil (Low F. Broad.)	8	.50
1	G18-24996	Oscillator Coil	9	.40
1	G5-24065	1st I. F. Transformer	18	.90
1	G10-24065	Diode Feeding Transformer	19	1.00
1	G3-31267	Coil Shield Assembly		.15
3	W25200	Coil Sockets		.05
2	W25024A	Coil Shield (1⅝" high)		.10
1	W25025A	Coil Shield (1⅛" high)		.10
5	W21541B	Retainer Rings (.25 doz.)		.05
3	W26891	Insulating Washer (Semi-Cir. Hole)		.05
2	W24360	Insulating Washer (Square Hole)		.05
1	B30569C	6 P. D. T. Switch	4	1.90
1	C31356	Var. Cond. Gang	5-6	4.00
1	G25-25751	Dial Drive Assembly		.90
1	G3-27134	Dial Light Bracket		.15
1	W28878A	Condenser Shield Assembly		.10
1	G15-25948	I. F. Tuning Condenser	76	.40
1	G3-25948	I. F. Tuning Condenser	17	.40
3	G24-27456	58 Socket	55-56	
			57	.10
4	G18-27456	56 Socket	58-59	
			60-61	.10
2	G43-27456	2A5 Socket	62-63	.10
1	G6-27456	80 Socket	64	.10
5	W26010	Tube Shield Base		.05
3	B26009C	Tube Shield (58 tube)		.10
2	W26231B	Tube Shield (56 tube)		.10
1	B21491B	Cord & Plug	54	.50
1	W25666B	Volume Control	26	.90
1	W25594B	Tone Control & Switch	41-42	1.10
1	G1-24628	Filter Choke	48	1.25
3	W22300	Knob		.15
1	W24556	Knob		.15
3	W31585B	Knob (Moderne)		.10
1	W31157B	Knob (Moderne)		.10
1	C23613B	Bottom		.10
1	C28477D	Back		.30
1	C26200G	Tube & Condenser Shield		.30
1	W31942	Speaker Cable	69	.35
		POWER TRANSFORMER		
1	G33-25669	Power Trans. 110 V. 60 Cy.	51	6.00
	G34 25669	Power Trans. 110 V. 25 Cy.	52	9.00
	G35-25669	Power Trans. 220 V. 25 to 60 Cy.	53	9.00
		FILTER & BY PASS CONDENSERS		
1	W25438	0.1-0.1 Mfd. 200 Volt	13-14	.25
1	W27932	0.0001 Mfd. 200 Volt	20	.15
1	W26559	0.006 Mfd. 200 Volt	23	.15
2	W23615	0.05 Mfd. 400 Volt	31-35	.15
1	W26571	0.005 Mfd. 200 Volt	43	.15
3	W27203	0.02 Mfd. 200 Volt	66	
			74-75	.15
1	W31052	0.05-0.004 Mfd. 400 Volt	72-73	.25
1	B30059A	8.-8.-8. Mfd. 250, 450, 450 V.	45-46	
			47	3.00
1	W26194B	12. Mfd. 475 Volt	49	1.25
		RESISTORS		
1	W23403	150000 Ohm	71	.15
2	W25937	275 Ohm	12-70	.15
1	W21965	375 Ohm	15	.15
1	W21454	1 Megohm	21	.15
4	W21455	300000 Ohm	22-23	
			36-37	.15
1	W26577	3 Megohm	24	.15
1	W28589	350 Ohm	25	.15
1	W31361	11000-7000 Ohm	28-29	.45
1	W21453	40000 Ohm	33	.15
1	W22873	220 Ohm	34	.15
1	W31093	2700 Ohm	37	.15
1	W21237A	60000 Ohm	38	.15
1	W4921C	10000 Ohm	65	.25
1	W26578	5 Megohm	68	.15

SPEAKER PARTS (8" Speaker)

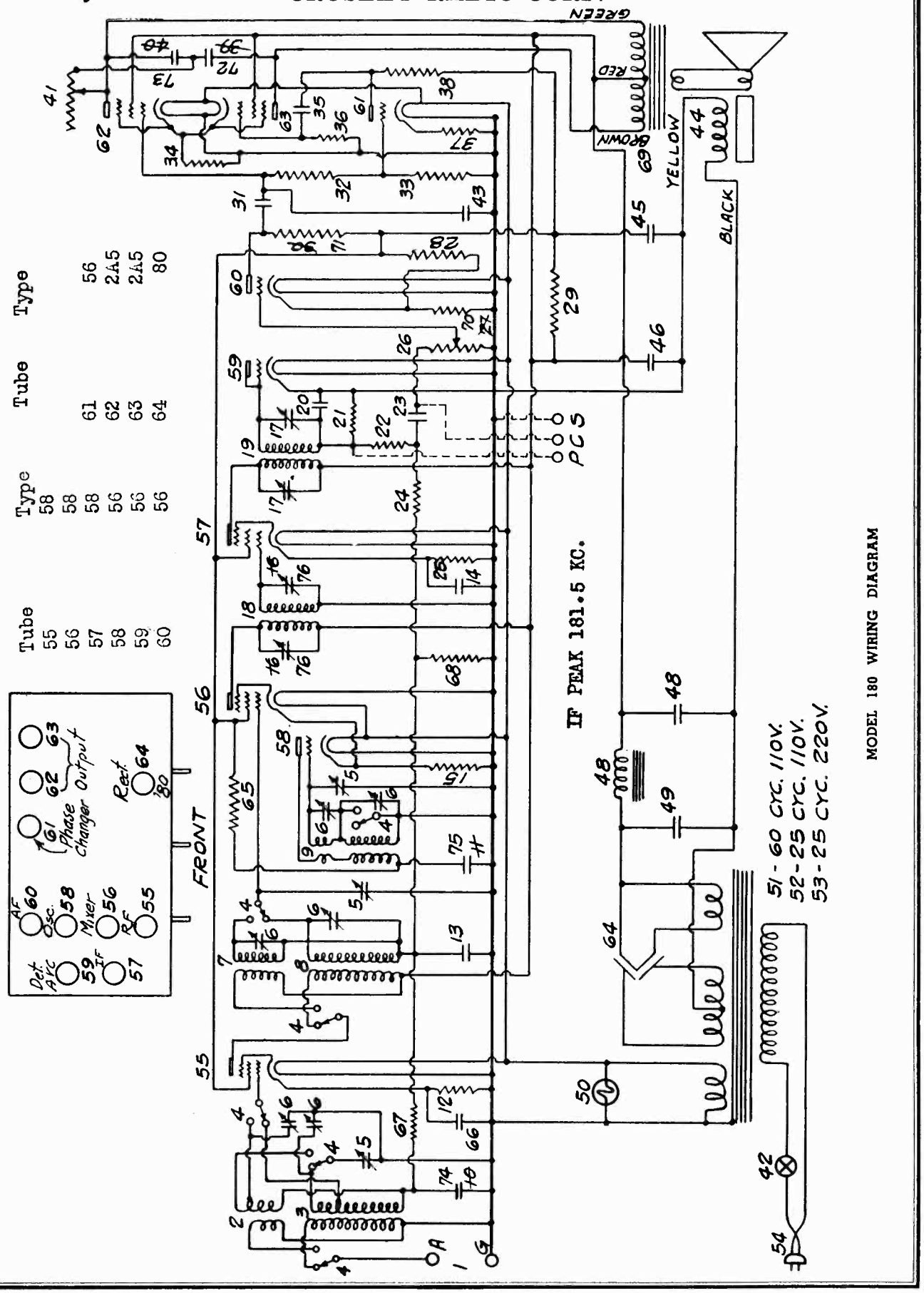
	Magnavox 317-4M Spec. 1104	Rola 317-4R		
1	27307	31090	Cone & Voice Coil Assembly	3.00
1	27797	31091	Field Coil	2.15
1	27798	31092	Transformer	1.65

SPEAKER PARTS (10" Speaker)

	Magnavox 317-5M Spec. 935	Rola 317-5R		
1	27661	31086	Cone & Voice Coil Assembly	3.65
1	27797	31087	Field Coil	2.15
1	29658	31088	Transformer	1.65

MODEL 180
Schematic, Socket

CROSLEY RADIO CORP.



Tube	Type
55	58
56	58
57	58
58	56
59	56
60	56

Tube	Type
61	56
62	2A5
63	2A5
64	80

CROSLEY RADIO CORP.

MODEL 181
Voltage, Parts List

Model 181

Specifications

Model 181 is a six tube superheterodyne designed for operation from AC electric circuits. The intermediate frequency used is 456 kc.

Tubes and Voltage Limits

The following are the tubes and voltages measured from tube contact to chassis with the receiver in operating condition but with no signal to the antenna circuit, and with a line voltage of 117.5 volts (235 volts for 220 volt receivers). All voltages, except filament, are measured with a 500 volt (1000 ohms per volt) DC voltmeter. Filament voltages are measured with a low range AC voltmeter.

Tube	Position and Use	Plate	Voltages: Screen Grid	Cathode	Supp. Grid	Filament
2A7	Oscillator	165		-9.5		
	Modulator	240	110	2.5		2.45
58	IF Amplifier	236	110	0		2.45
56	Diode Detector and AVC					2.45
58	AF Amplifier	52	27	0		2.45
2A5	Output	222	240	0		2.45
80	Rectifier	330				4.8

Chassis to B- 93 volts.

Bias voltages are obtained by a resistor divider shunting the speaker field which is in B- circuit, from rectifier to chassis.

IF Amplifier bias (Grid to B-) 28 volts.
AF Amplifier bias (Grid to B-) 12 volts.
Output bias (Grid to B-) 18 volts.

PARTS LIST—MODEL 181

INSTRUCTIONS FOR ORDERING—Give part number, description of part, and serial number of receiver on which part is to be used. If article wanted is not listed separately, then that part of complete assembly containing this article should be ordered. Goods shipped on open account to Crosley Wholesale Distributors only. Cash must accompany Dealer and Consumer orders. Prices are subject to the usual trade discounts, and are subject to change without notice.

* Figures in 2nd last column refer to parts shown in diagram on page 18.

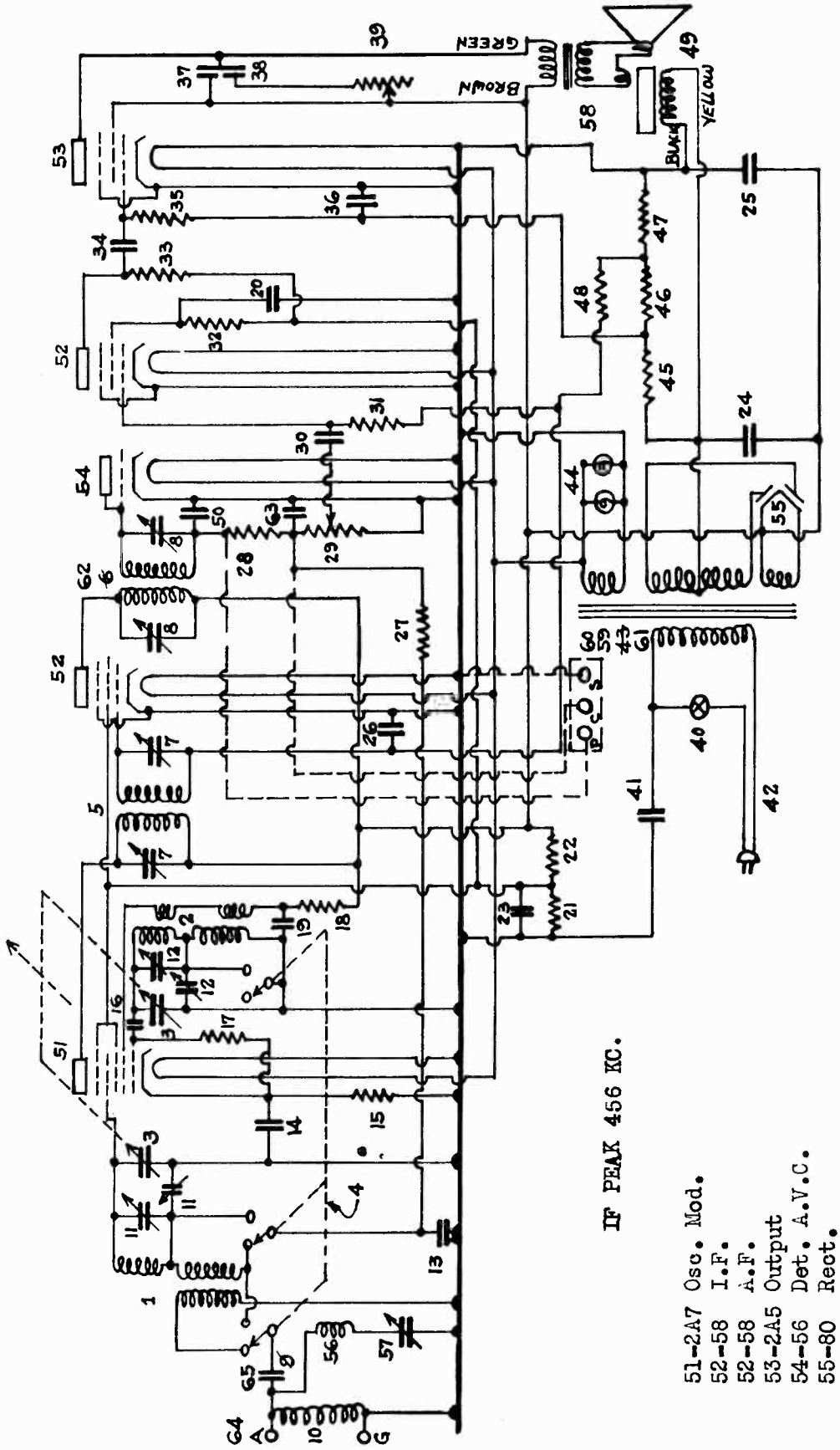
Qty.	Part No.	Description	* Item	List Each
1	G23-24995	Antenna Coil	1	.60
1	G28-24996	Oscillator Coil	2	.65
2	G7-29699	Ant. and Oscillator Coil, Trimmer Condenser	11, 12	.30
1	G2-30795	First I. F. Transformer	5	.55
1	G2-30795	Second I. F. Transformer	62	.55
2	W30027	Coil Shield		.15
2	W30802	Coil Shield		.15
4	W25200	Coil Socket		.05
4	W30026	Retainer Ring		.05
2	W30845	Insulating Washer		.05
2	W30877	Insulating Washer		.05
1	W30744A	No. 3 P. D. T. Change Sw.	4	.85
1	B30769A	Variable Tuning Condenser Assm.	3	2.35
1	G4-27812	Dial Light Socket		.20
1	G9-25050	Dial Assembly		.30
1	G1-30070	V. C. Dial Assembly		.30
2	G14-25948	I. F. Condenser	7, 8	.30
1	W25008	Condenser Blade	57	.05
1	R80	Screw		.05
1	W26069B	Adjusting Nut		.05
1	W24865	Metal Washer		.05
1	W25450B	Insulating Washer		.05
1	W25007	Insulating Washer		.05
1	W25446	Bakelite Washer		.05
1	O-4	Flat Washer		.05
1	M-20	Rivet		.05
1	G1-26719	A. G. Terminal	10	.15
2	G5-24234	R. F. Choke Assm	56, 64	.45
1	G56-27975	2A7 Socket	51	.10
2	G24-27975	58 Socket	52	.10
1	G43-27975	2A5 Socket	53	.10
1	G18-27975	56 Socket	54	.10
1	G6-27975	80 Socket	55	.10
4	W27981	Tube Shield Base		.05
1	W26231B	Tube Shield		.10
1	W27328A	Tube Shield		.10
2	B26009C	Tube Shield		.10
1	B30375	AC Cord and Plug	42	.45
1	W30836	Tone Control and Switch	39, 40	1.10
1	W30610C	Level Control (volume)	29	.70
2	W31225	Knobs (large)		.10
2	W31224	Knobs (small)		.10
2	W30463	Escutcheons		.25
6	S-27	Escutcheon Screws		.05
1	W31007	4 Lead Speaker Cord	58	.15
		POWER TRANSFORMERS		
1	G4-30745	Power Trans. 110 V. 60 Cy.	61	3.50
1	G2-30745	Power Trans. 110 V. 25 Cy.	59	4.75
1	G3-30745	Power Trans. 220 V.	60	4.75
		FILTER & BY PASS CONDENSERS		
1	W30325	0.003 Mfd. 200 Volt	9	.20
1	W27204	.02-.02 Mfd. 200 Volt	13, 14	.25
1	W30741	.00025 Mfd. 1000 Volt	16	.15
1	W25474	.1-.1 Mfd. 400 Volt	19, 20	.40
1	W30059A	8.-8.-8. Mfd. 250 V.-450 V.-450 V.	23, 24	
			25	3.00
1	W24049	.1 Mfd. 200 Volt	26	.15
2	W27203	.02 Mfd. 200 Volt	30, 34	.15
1	W30321	1. Mfd. 160 Volt	36	.55
1	W25517	.008-.05 Mfd. 400 Volt	37, 38	.30
1	W30805	.01 Mfd. 400 Volt	41	.20
2	W27932	.0001 Mfd. 200 Volt	50, 63	.15
1	W26571	.05 Mfd. 200 Volt	65	.15
		RESISTORS		
1	W25937	275 Ohms	15	.12
3	W21875	100000 Ohms	17, 33	
			46	.15
1	W5370A	20000 Ohms	18	.24
1	W25970	15000-10000 Ohms	21, 22	.40
1	W26577	3 Megohm	27	.15
1	W21237A	60000 Ohms	28	.15
1	W21454	1 Megohm	31	.15
4	W23785	500000 Ohms	32, 35	
			45, 48	.15
1	W22196	20000 Ohms	47	.15

SPEAKER PARTS

Magnavox 354-4M	Crosley 354-4C		
Spec. 952			
27307	G1-31184	Cone Assem.	3.00
27455	W31445	Field Coil	1.50
27461	G8-24628	Transformer	1.25

MODEL 181
Schematic

CROSLEY RADIO CORP.



MODEL 181 WIRING DIAGRAM

MODEL 182
Parts List

CROSLEY RADIO CORP.

Specifications

Model 182 is a five tube superheterodyne designed for operation from AC or DC electric circuits. The intermediate frequency used is 456 kc.

Tubes and Voltage Limits

The following are the tubes and voltages measured from tube contact to negative line (B -) with the receiver in operating condition but with no signal to the antenna circuit (antenna coiled up), and with a line voltage of 117.5 volts, 60 cycle a. c. All voltages except filament, are measured with a 500 volt (1000 ohms per volt) d. c. voltmeter. Filament voltages are measured with a low range AC voltmeter.

PARTS LIST—MODEL 182

INSTRUCTIONS FOR ORDERING—Give part number, description of part, and serial number of receiver on which part is to be used. If article wanted is not listed separately, then that part of complete assembly containing this article should be ordered. Goods shipped on open account to Crosley Wholesale Distributors only. Cash must accompany Dealer and Consumer orders. Prices are subject to the usual trade discounts, and are subject to change without notice.

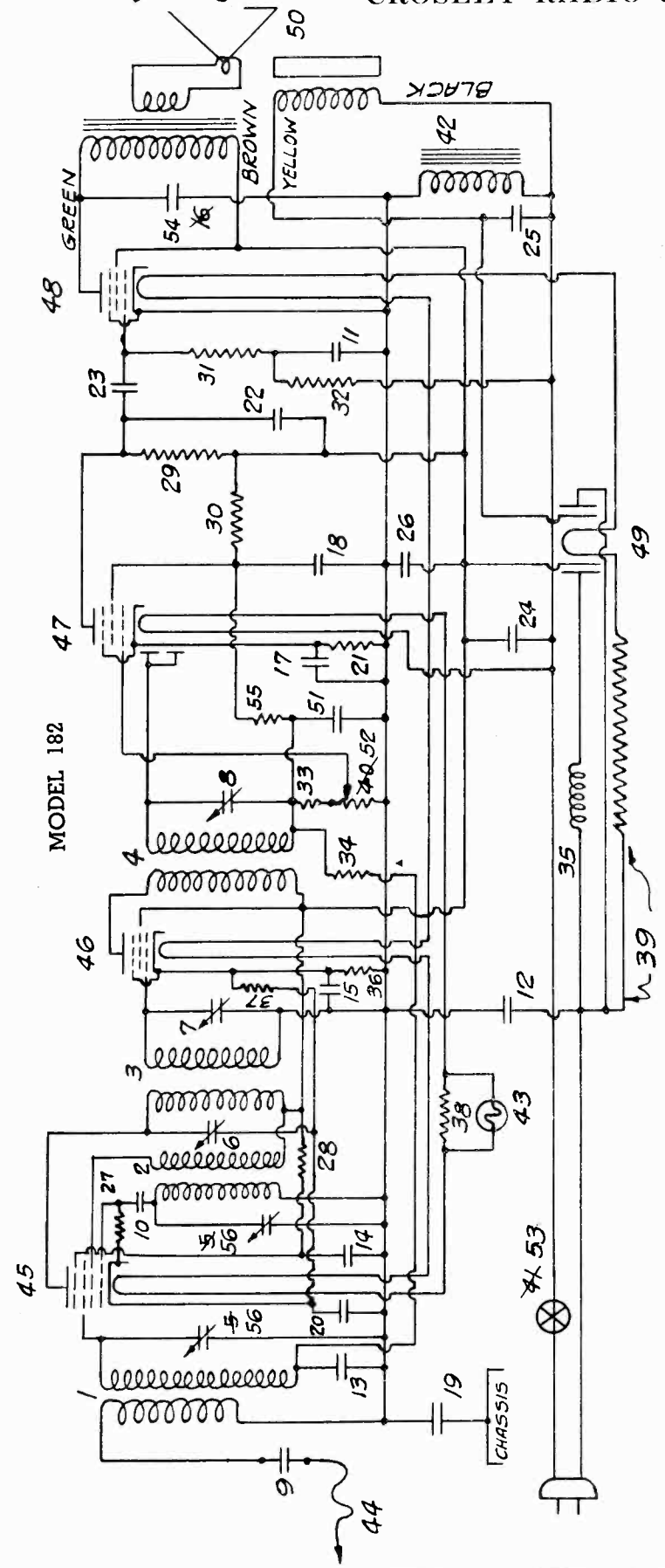
* Figures in 2nd last column refer to parts shown in diagram on page 18.

Qty.	Part No.	Description	* Item	List Each
1	G24-24995	Antenna Coil	1	.45
1	G29-24996	Oscillator Coil	2	.40
1	B31582A	Tuning Condenser Gang	56	2.50
1	W29537B	Condenser Cover		.05
1	G2-30795	1st I. F. Transformer	3	.55
1	G14-25948	I. F. Trimmer Condensers	6-7	.30
1	G10-25445	2nd I. F. Transformer	4	.40
1	G9-25948	Trimmer Condenser	8	.35
3	W25025A	Coil Shield		.10
1	W30802	Coil Shield		.15
4	W25200A	Coil Socket		.05
1	W30026	Retainer Ring		.05
3	W21541B	Retainer Ring		.05
1	W30877A	Insulating Washer		.05
3	W24360	Insulating Washer		.05
1	W31204	Level Control & Switch	52-53	.90
1	G2-27812	Dial Light Bracket Assem.		.15
1	G47-27975	6A7 Socket	45	.10
1	G39-27975	78 Socket	46	.10
1	G48-27975	6B7 Socket	47	.10
1	G30-27975	43 Socket	48	.10
1	G51-27975	25Z5 Socket	49	.10
2	W31210	Tube Shield Ring		.05
2	W31212	Tube Shield Half		.05
2	W31213	Tube Shield Half (with slot)		.05
4	W31211	Tube Shield Clip		.05
1	B30957B	120 Ohm Resistance Cable (A. C. Cord & Plug)	39	.80
1	W29784B	Antenna Roll	44	.30
1	G1-28859	Filter Choke	42	1.15
1	G1-24234	A. F. Choke	35	.30
		FILTER & BY-PASS CONDENSERS		
1	W30325	0.003 Mfd 200 Volt	9	.20
1	W26571	0.0005 Mfd. 400 Volt	10	.15

Qty.	Part No.	Description	* Item	List Each
1	W24784	0.25 Mfd. 200 Volt	11	.20
1	W30324	0.02-0.02 Mfd. 400 Volt	12-13	.30
1	W27204	0.02-0.02 Mfd. 200 Volt	14-15	.25
1	W25438	0.1-0.1 Mfd. 200 Volt	18-19	.25
1	W27203	0.02 Mfd. 200 Volt	20	.15
1	W30322	0.00017-0.006 Mfd. 200 Volt	22-23	.30
1	W7847A	0.0001 Mfd.	51	.15
1	W31219	0.023 Mfd. 200 Volt	54	.15
1	W26870A	6. Mfd. 25 Volt	17	.65
1	W30962	25.-8. Mfd. 125 Volt	24-25	2.00
1	W30963	16. Mfd. 110 Volt	26	1.25
		RESISTORS		
1	W27503	1400 Ohms	21	.15
2	W21237A	60000 Ohms	27-33	.15
1	W21453	40000 Ohms	28	.15
1	W23403	150000 Ohms	29	.15
2	W23785	500000 Ohms	30-31	.15
1	W21455	300000 Ohms	32	.15
1	W21454	1 Megohm	34	.15
1	W21964	165 Ohm	36	.15
1	W25357	75 Ohm	37	.10
1	W30539	26.7 Ohm	38	.20
1	W26577	3 Megohm	55	.15
		SPEAKER PARTS		
1	G1-29529	Cone & Voice Coil Assem.		2.00
1	31214	Field Coil		1.25
1	G6-29535	Transformer		1.10
	W28735	Black Knob		.10
	W28736	Green Knob		.10
	W30028	Brown Knob		.10
	W31600	Wooden Knob		.10
	W31812	Dial Pointer		.05
	W28608	Bottom		.25

MODEL 182
Schematic, Voltage

CROSLEY RADIO CORP.



Tube	Position and Use	Plate	Screen Grid	Control Grid	Cathode	Supp. Grid	Filament
6A7	Oscillator	120		—8	3		6.5
	Modulator	120	50		2.5	2.5	6.5
78	IF Amplifier	120	120		3	3	6.5
6B7	Diode and AF Amplifier	20	30		0		25.1
43	Output	115	120	*—20	120		25.1
25Z5	Rectifier						

Voltage limits are plus or minus 15% of values given.
On DC operation, voltages are approximately 90% of those given above.
* Output bias voltage is obtained by using drop across filter choke which is 20 volts.

CROSLEY RADIO CORP.

MODEL 184
Voltage, Parts List

Model 184

Specifications

Model 184 is a four-tube superheterodyne designed for operation from AC electric circuits. It uses an intermediate frequency of 456 kc.

Tubes and Voltage Limits

The following are the tubes and voltages measured with the receiver in operating condition but with no signal to the antenna circuit, and with a line voltage of 117.5 volts (235 for a 220 volt receiver). All voltages, except filament, are measured from tube contact to chassis with a 500 volt (1000 ohms per volt) DC voltmeter. Filament voltages are measured with a low range AC voltmeter.

Tube	Position	Plate	Screen Grid	Cathode	Supp. Grid.	Filament
58	Oscillator-modulator	165	82	22	0	2.5
6F7	I. F. & Detector	165	82	2	0	2.5
2A5	Output	158	165	10		2.5
80	Rectifier	295				4.9

Voltage limits are plus or minus 10% of values given.

PARTS LIST—MODEL 184

INSTRUCTIONS FOR ORDERING—Give part number, description of part, and serial number of receiver on which part is to be used. If article wanted is not listed separately, then that part of complete assembly containing this article should be ordered. Goods shipped on open account to Crosley Wholesale Distributors only. Cash must accompany Dealer and Consumer orders. Prices are subject to the usual trade discounts, and are subject to change without notice.

* Figures in 2nd last column refer to parts shown in diagram on page 18.

Qty.	Part No.	Description	*	List Price
1	W20264	Ant.-Grd. Terminal	1	.15
1	G28-24995	Antenna Coil	44	.65
1	G12-24996	Oscillator Coil	3	.40
1	G7-25444	1st I. F. Transformer	4	.60
1	G9-25445	2nd I. F. Transformer	5	.50
1	W25024	Coil Shield (Large)		.10
3	W25025	Coil Shield (Small)		.10
4	W25200	Coil Socket		.05
4	W26891	Insulating Washer		.05
4	W21541B	Coil Retaining Ring		.05
1	B31784	Variable Condenser Gang		2.75
1	G15-25050	Dial Assem.		.40
1	G2-25948	1st I. F. Prim. Trim. Cond.	7	.30
1	G10-25948	2nd I. F. Prim. Trim. Cond.	9	.15
1	W27548	1st I. F. Sec. Trim. Cond. (Adjustable Blade Only)	8	.05
1	W25584	Mica		.05
1	R80	Screw		.05
1	W26069B	Adjusting Nut		.05
1	W24865	Metal Washer		.05
1	W25450B	Insulating Washer		.06
1	W25007B	Insulating Washer		.05
1	W25446	Bakelite Washer (Large)		.05
1	O4	Washer		.05
1	M20	Rivet		.05
1	G24-27456	Socket -58	32	.10
1	G49-27456	Socket 6-F-7	33	.10
1	G43-27456	Socket 2-A-5	34	.10
1	G6-27456	Socket -80	35	.10
2	W26010	Tube Shield Base		.05

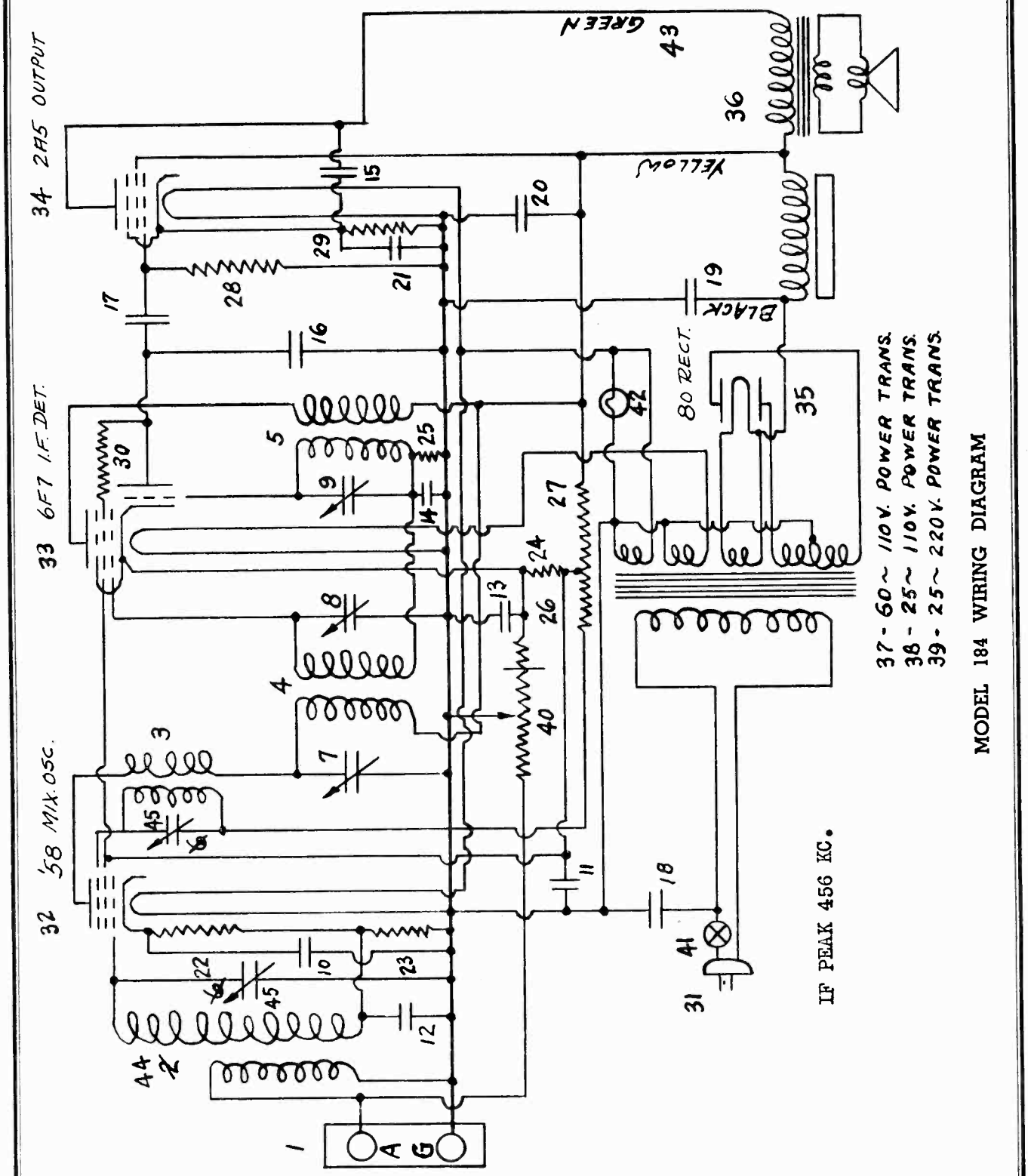
Qty.	Part No.	Description	*	List Pr
1	W27328A	Tube Shield (6F7)		.10
1	B26009C	Tube Shield (58)		.10
1	B21491B	A. C. Cable & Plug	31	.25
1	W31009	Speaker Cable	43	.25
1	W20573B	Volume Control & Switch	40-41	1.00
1	G1-23472	Knobs		.10
1	G1-28500	Power Trans. 110 V. 60 Cy.	37	2.25
	G2-28500	Power Trans. 110 V. 25 Cy.	38	3.00
	G3-28500	Power Transformer 220 V.	39	3.25
		FILTER & BY PASS CONDENSERS		
1	W27204	.02-.02 Mfd. 200 V. Cond.	12-13	.25
1	W24049A	.1 Mfd. 200 V. Condenser	14	.15
1	W23191A	.01 Mfd. 400 V. Condenser	15	.25
1	W25537A	.001-.03 Mfd. 400 V. Cond.	16-17	.30
1	W20592A	.003 Mfd. 400 V. Condenser	18	.20
2	W27203	.02 Mfd. 200 V. Condenser	10-11	.15
1	W29150A	7.-6.-8. Mfd. 450-400-25 V. Filter Condenser	21	2.90
		RESISTORS		
1	W25937	275 Ohm Resistor	22	.15
1	W31094	4500 Ohm Resistor	23	.15
1	W24990	25000 Ohm Resistor	24	.20
1	W21454	1 Megohm	25	.15
1	W28471	25000-8500 Ohm Resistor	26-27	.45
1	W23785	500000 Ohm Resistor	28-30	.15
1	W25521	450 Ohm Resistor	29	.15

SPEAKER PARTS * 36

	Magnavox 324-2M Spec. 1300	Jensen 342-2J Spec. 2617		
1	28761	29434	Cone & Voice Coil Assem.	2.00
1	28763	29436	Field Coil	1.10
1	28764	29437	Transformer	1.25

MODEL 184
Schematic

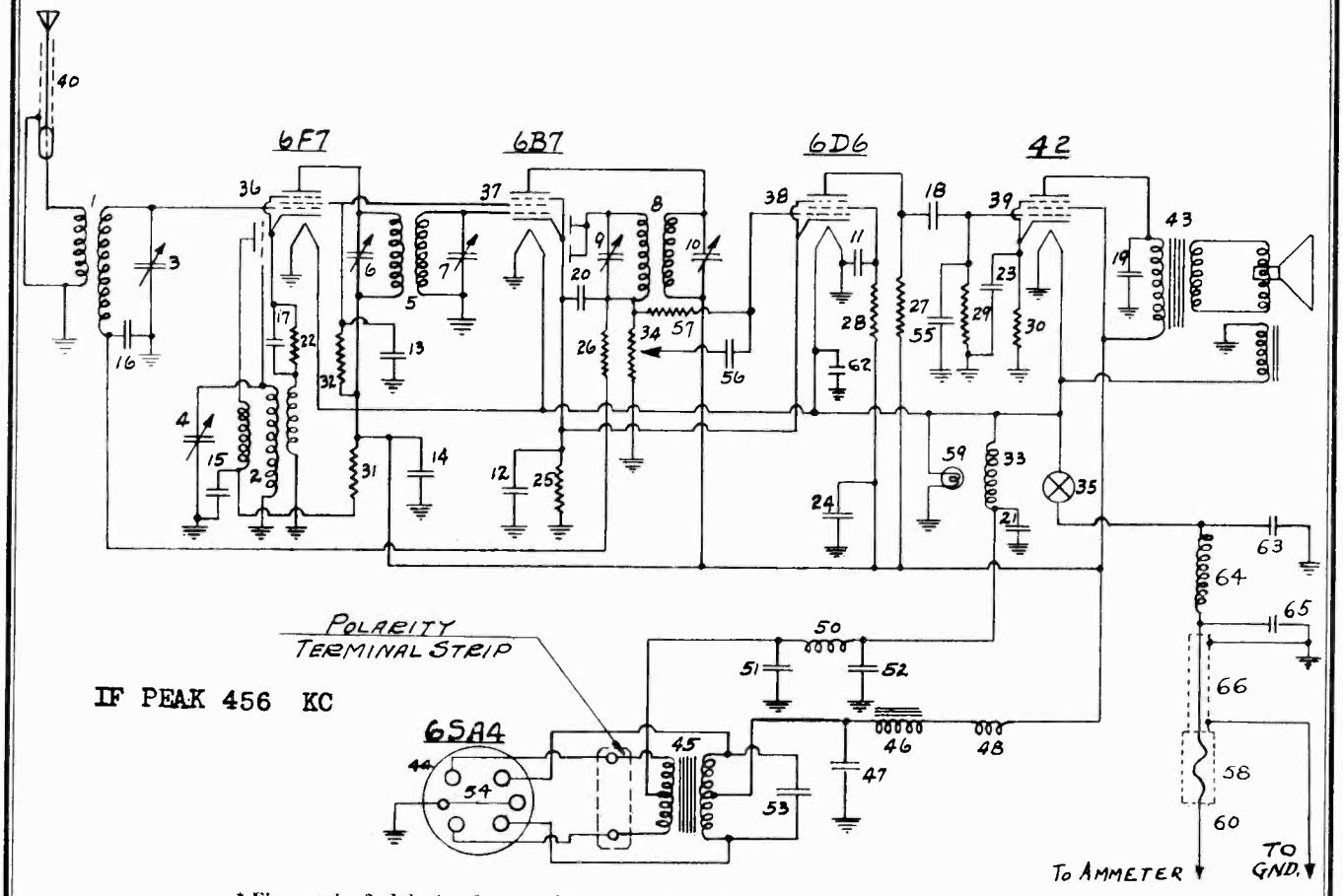
CROSLEY RADIO CORP.



MODEL 184 WIRING DIAGRAM

CROSLEY RADIO CORP.

MODEL 4A1
Schematic, Parts List



* Figures in 2nd last column refer to parts shown in wiring diagram of Model 4A1

Qty.	Part No.	Description	* Item	List Each
1	G9-32000	Antenna Coil	1	.60
1	G8-32002	Osc. Coil		.45
1	W32728	Washer (Ant. Coil Shield Base)		.05
1	W30802	Coil Shield (Ant.)		.15
1	W30026	Retaining Ring (Ant.)		.05
1	W25200	Coil Socket (Osc.)		.05
1	W25025A	Coil Shield (Osc.)		.10
1	W26891	Insulating Washer (Osc.)		.05
1	W21541B	Retaining Ring (Osc.)		.05
1	L32698	Variable tuning Cond. Gang	3-4	5.50
1	G7-32004	Ist I. F. Trans. Coil and Tuning Condensers	5-6-7	1.85
1	G8-32004	2nd I. F. Trans. Coil and Tuning Condensers	8-9-10	1.75
1	W32712B	Level Control and Power Switch	34-35	1.10
1	W32739A	level Control Bracket		.10
1	G49-27975	6F7 Socket	36	.10
1	G48-27975	6B7 Socket	37	.10
1	G75-27975	6D6 Socket	38	.10
1	G25-27975	42 Socket	39	.10
1	G81-27975	6SA4 Socket	54	.10
1	LB32037	6SA4 Syncrotube	44	5.00
2	W27981A	Tube Shield Base		.05
2	W30964	Tube Shield (6B7 & 6F7)	36-37	.10
1	G1-32769	Power Transformer	45	2.75
1	G11-24628	"B" Filter Choke	46	1.10
1	G1-32755	R. F. "B" Choke	48	.15
1	G6-28067	R. F. "A" Choke	50	.30
1	G4-28067	"A" Choke	33	.35
1	B32783	Antenna Lead	40	.45
1	G1-25891	Antenna Wire		.90
1	G5-31701	"A" Cable Assem.	60	.25
1	G7-31701	"A" Lead Assem. & Choke Assem.	61	1.40
1	W32757	12 Amp. Fuse	58	.10
		BY-PASS & FILTER CONDENSERS		
1	W32711A	0.1-0.1-0.05-0.05 Mfd. 200 Volt	11-12	
3	W32780A	0.05 Mfd. 400 Volt	13-14 15-18	1.00
1	W32779A	0.02 Mfd. 200 Volt	56 16	.15 .15

Qty.	Part No.	Description	* Item	List Each
2	W32781A	0.1 Mfd. 200 Volt	17-62	.15
1	W32782A	0.01 Mfd. 400 Volt	19	.15
3	W32741	.0005 Mfd. (Mica)	20-21 55	.15
2	W30366	.05 Mfd. 160 Volt	51-52	.50
1	W32762	0.005 Mfd. 1000 Volt	53	.65
1	W30419A	8-8. Mfd. 25 Volt-250 Volt	23-24	1.80
1	W32759	8. Mfd. 300 Volt	47	1.50
		RESISTORS		
1	W21452	1100 Ohms	22	.15
1	W28589	350 Ohms	25	.10
2	21454	1 Megohm	26-57	.15
1	21875	100000 Ohms	27	.15
2	23785	500000 Ohms	28-29	.15
1	W25521	450 Ohms	30	.15
2	32331	55000 Ohms (½ Watt)	31-32	.15
		CASE		
1	L32730	Case		1.70
1	B32714A	Bottom Cover		.25
1	B32720B	Top Cover		.25
1	W32717A	Control Window		.10
1	B32718A	Control Window Cover		.30
1	W32724	Knob		.10
1	W32725A	Knob (Key)		.20
1	W32723A	Mounting Bracket (Front)		.10
1	C32742	Mounting Bracket (Rear or Bulkhead)		
1	W32787A	3" Mounting Bolt		.05

Qty.	Part No.	Description	Doz.	Ea.
1	W32788	7/16 Washer	.10	.05
1	W32789	7/16 x 14 Thr. Nut	.15	.05
3	W32734	5/16 x 24 Hex. Hd. Mtg. Bolt	.10	.05
5	W24235	5/16 Shakeproof Washer	.10	.05
1	W6849	5/16 Washer (Black Oxide)	.10	.05
4	W6133	5/16 x ¾ Washer	.15	.05
1	W12131	7/16 Std. Lockwasher	.15	.05
1	W33436	¼-20 x ¾ Rd. Hd. Screw	.15	.05
	W31625A	Distributor Suppressor	.40	
	W33165	Spark Plug Suppressor	.40	
	W29754B	.5 Mfd. Cond. (Eliminator)	.45	
1	33-B	Speaker 43	4.00	

MODEL 4A1
Alignment, Voltage

CROSLEY RADIO CORP.

Alignment Procedure . . .

To align the receiver at intermediate frequency it is necessary that there be available a suitable modulated oscillator capable of adjustment to 456 Kc. with good accuracy. This oscillator should have an attenuator so that the strength of the oscillator output can be adjusted. Connect the high side of the output of the modulated oscillator, which has been adjusted to 456 Kc. to the control grid connection on the top of the 6F7 tube through an .02 mfd. series condenser. The low side of the oscillator is to be connected to the receiver chassis. Set the output of the oscillator to a convenient level and adjust the I. F. transformer condensers for maximum signal output. To make this adjustment it is necessary that a standard 5/16" (across flat) hexagon socket wrench be used for the upper condenser, and a small screw driver fitting inside of the nut hole for adjustment of the lower condenser. Always make this I. F. adjustment very carefully and go over the adjustment several times to be sure that the peak has been reached. To align a receiver at broadcast radio frequency, it is necessary that an adjustable oscillator having frequencies of 1400 and 600 Kc. together with a suitable attenuator and dummy antenna be available. Set the oscillator at 1400 Kc. and connect the high side of the oscillator to the receiver antenna terminal through a .0002 mfd. (dummy antenna) condenser. Turn the tuning control of the receiver to 140 on the dial. Now adjust the oscillator shunt trimmer which is located on the front section of the gang condenser until the signal is heard best. Without changing the gang condenser setting, adjust the antenna trimmer located on the rear section of the gang condenser. It is necessary that these adjustments be gone over several times until no further improvements can be made. Always work with the weakest possible signal from the modulated oscillator for best accuracy. Now rotate the dial until it reads 60 and set the modulated oscillator at approximately 600 Kc. The approximate sensitivity of the receiver may be checked here and it is possible that by slight bending of the gang condenser plates some improvement may be made. It is very essential, however, that this bending of plates be done with extreme care and by someone who is experienced in this operation.

Automatic Volume Control Circuit . . .

Diode voltage is developed across resistor 34 which is the level control. This voltage is fed back through isolating resistor, part No. 26, to the grid return of the antenna coil, part No. 1, thereby exerting automatic volume control voltage on the pentode section of the 6F7 oscillator modulator. No AVC voltage is impressed on the 6B7 I. F. amplifier because in so doing serious distortion might result. AVC voltage is also impressed on the 6D6 A. F. amplifier by means of coupling resistor 57.

Method of Biasing . . .

Both the pentode and triode section of the 6F7 oscillator modulator obtain their bias from the cathode resistor, part No. 22. The 6B7 I. F. amplifier section obtains its bias from the cathode resistor, part No. 25. Bias for the 6D6 A. F. amplifier is also obtained from resistor No. 25, while the bias for the output type 42 is obtained from resistor part No. 30.

Analysis of Signal Channel . . .

The signal enters at the antenna lead-in terminal through the bayonet socket and then goes to the antenna coil, part No. 1. There is optionally offered a wave trap to be used with this receiver when it is operated in the neighborhood of commercial code stations using frequencies in the region of 456. This wave trap prevents these code stations from riding on through and being amplified by the intermediate frequency amplifier. The signal is tuned by the rear section of the gang condenser, part No. 3, and then impressed on the pentode grid of the 6F7. The 6F7 triode section is equipped with a conventional oscillator circuit tuned by the front section of the gang condenser, part No. 4. The oscillator output is impressed on the cathode of the 6F7 through a pickup coil. The output therefore of the 6F7 pentode section is intermediate frequency which is impressed on the first I. F. transformer, part No. 5. This I. F. transformer is double tuned. The signal is then fed to the grid of the pentode section of the 6B7 I. F. amplifier which tube has a double tuned output I. F. transformer, part No. 8, in its plate circuit. This amplified output is impressed on the two diodes of the 6B7 in parallel and diode voltage is developed across level control, part No. 34. The DC component of this voltage is fed forward through resistor 57 to the grid of the 6D6 A. F. amplifier, but the audio frequency component is fed from the level control contact arm through coupling condenser 56 to the grid of the 6D6 A. F. amplifier. In this way a bias depending on the strength of the signal is impressed on the grid of the 6D6 A. F. amplifier while the actual audio frequency voltage is determined by the setting of the level control. The amplified audio frequency output of the 6D6 is fed through coupling condenser No. 18 to the grid of the 42 output tube and is then amplified and fed to the speaker part No. 43. Condenser No. 19 serves to keep the impedance of the output system more nearly constant.

Type	Where Used	Ef	Ep	Eg	Ek	Esg	Eposc	Esup
6F7	Osc. Mod.	6.0	230	0	8	100	60	—
6B7	I.F. and Diode	6.0	230	0	3	100	—	—
6D6	A.F.	6.0	60	0	3	25	—	3
42	Output	6.0	220	0	16	230	—	—

All voltages are plus or minus 10% and measured to chassis with 500 volt 1000 ohm per volt voltmeter. Battery voltage 6 volts.

CROSLEY RADIO CORP.

MODEL Fiver Jr.(5M3)
Voltage, Notes
Alignment

General Description . . .

Chassis 5M3 is used in the Fiver Jr. It is a low-priced but highly efficient 5-tube superheterodyne receiver covering the frequency range of 535-1750 Kc. The intermediate frequency is 456 Kc.

Tubes Used and Their Function . . .

The tubes used are 6D6 oscillator modulator, 6D6 I. F. amplifier, 76 detector, 42 output, and 80 rectifier.

The tube voltages are shown in the table below:

Type	Where Used	Ef	Ep	Eg	Ek	Esg	Esup
6D6	Osc-Mod.	6.3	235	29	32	120	0
6D6	I. F.	6.3	235	0	3	120	3
76	Detector	6.3	80	0	10	—	—
42	Output	6.3	225	0	18	235	—
80	Rectifier	4.9	—	—	310	—	

All voltages are measured to chassis voltages and are plus or minus 10%. All DC are voltages measured to chassis at 117.5 volt line with 1000 ohms per volt, 250-volt voltmeter. Power demand 50 watts, 110 volts, 60 cycles.

Method of Biasing . . .

Referring to the circuit diagram, it will be seen that the 6D6 oscillator modulator tube has a more or less complex biasing system. This is because resistor No. 22 in the cathode circuit creates a bias for the input section of the tube, while resistors 22 and 23 in series create the bias for the suppressor grid oscillator section. The 6D6 I. F. amplifier obtains its bias from the volume control, part No. 40. There is a fixed limiting resistance in this volume control so that at the full volume position there is still the bias indicated in the voltage chart, and as the volume is reduced, the bias on the 6D6 I. F. amplifier increases. The 76 detector obtains its bias from the cathode resistor, part No. 24, while the 42 output tube obtains its bias from its cathode resistor, part No. 29.

Volume Control Circuit . . .

As explained above, as the volume control is backed off of the maximum sensitivity position, cathode bias is inserted in the 6D6 I. F. amplifier circuit. At the same time, resistor 40, being connected across the antenna and ground, tends to short circuit the antenna circuit. Thus, reduction in sensitivity is obtained simultaneously by reducing the gain in the I. F. amplifier and reducing the effectiveness of the antenna.

Analysis of Signal Channel . . .

Starting with the antenna, the signal is fed through the antenna coil, part No. 2, and tuned by the radio frequency section of the gang condenser, part No. 6. The signal is then impressed on the control grid of the 6D6 oscillator modulator. This tube is so connected that the combination cathode, suppressor grid, and plate of the 6D6 tube form a conventional triode oscillator. The oscillator frequency is determined by the setting of the gang condenser oscillator section, part No. 6, in conjunction with oscillator coil, part No. 3. The plate shape of the oscillator section of the gang condenser is such that a constant I. F. frequency of 456 Kc. is present at the primary terminals of the first I. F. transformer, part No. 4. This I. F. transformer is double tuned and the I. F. signal is then impressed on the grid of the 6D6 I. F. amplifier. The amplified output of this tube is impressed on the second I. F. transformer, part No. 5, which is single tuned, with condenser part No. 9. To prevent overload being serious in the 76 detector circuit, resistor No. 25 is used so that when grid current is drawn the bias on the tube increases very rapidly. In the plate circuit of the 76 detector there is present in addition to the normal DC plate current, both intermediate frequency and audio frequency. The intermediate frequency is bypassed by condenser No. 16, while the audio frequency is passed on to the output tube grid through condenser No. 17. The grid circuit of the output tube is completed through resistor No. 28. The amplified audio output of the type 40 tube is, of course, fed to the speaker in the usual manner.

Power Supply System . . .

The power supply system consists of a transformer, part No. 37, for 110-volts, 60 cycles, part No. 38 for 110-volt 25 cycles, and part No. 39 for 220 volts, a type 80 rectifier tube, electrolytic condenser part No. 19, the speaker field as a filter choke, and electrolytic condenser part No. 20.

Alignment Procedure . . .

To align the I. F. amplifier, it is necessary that there be available a suitable modulated oscillator capable of adjustment to 456 Kc. with good accuracy. This oscillator should have an attenuator, so that the strength of the oscillator output can be adjusted. Connect the high side of the output of the modulated oscillator, which has been adjusted to 456 Kc. to the control grid connection on the top of the 6D6 oscillator modulator tube through an .02 Mfd. series condenser. The low side of the oscillator is to be connected to the receiver chassis. Set the output of the oscillator to a convenient level and adjust the three I. F. tuning condensers located on the top of the chassis for maximum signal output. To make this adjustment, it is necessary that a standard ¼" (across flats) hexagon socket wrench be used. The wrench is preferably insulated. Always make these adjustments very carefully and go over

MODEL Fiver Jr.(5M3)
Schematic, Socket
Parts List

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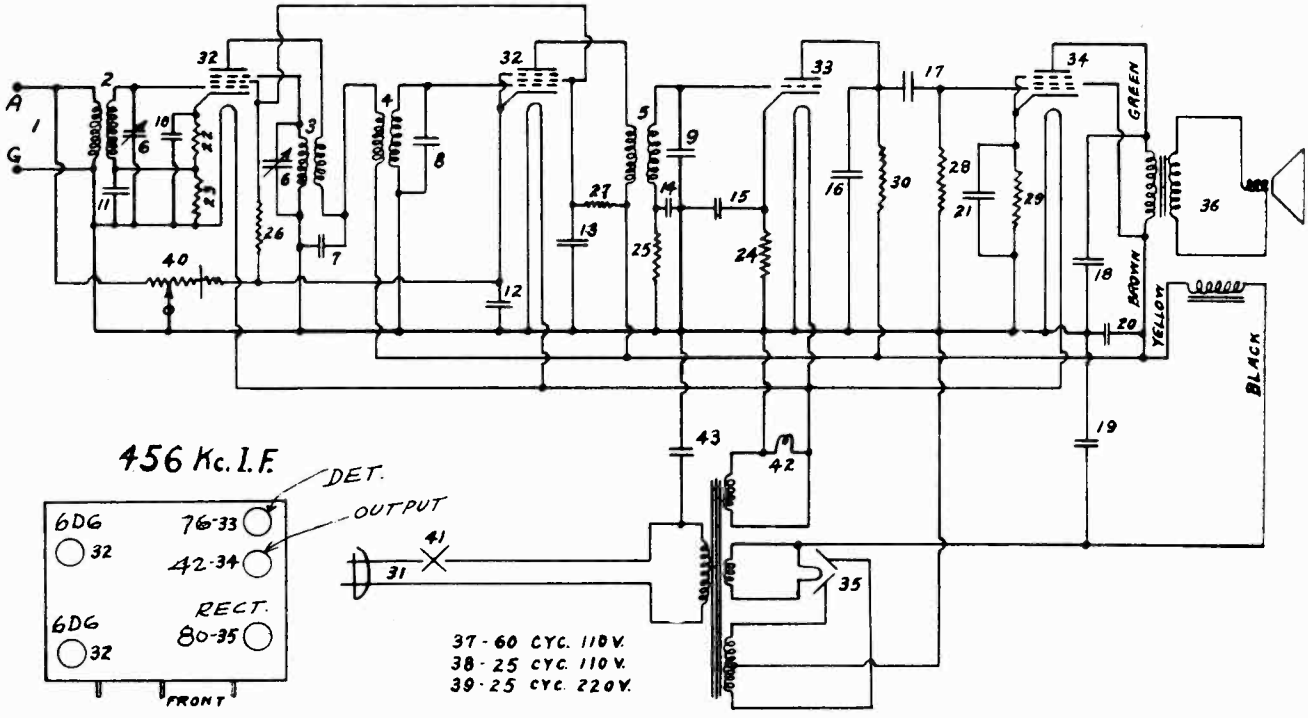

them several times to be sure that the peak has been reached.

To align the receiver at radio frequency it is necessary that an adjustable oscillator having frequencies of 1400 and 600 Kc. together with a suitable attenuator and dummy antenna be available. Set the modulated oscillator to 1400 Kc. and connect the high side of the oscillator to the receiver antenna terminal through a .0001 (dummy antenna) condenser and the low side to receiver chassis. Now, with dial set at 140, adjust the gang condenser oscillator trimmer, which is in the rear section of the gang until the signal is heard best. Then adjust the R. F. trimmer, which is in the front section of the gang condenser, for maximum signal. The set is now aligned at 1400 Kc. and by setting the modulated oscillator to 600 Kc., the set may be rechecked at this point. It will be sometimes found that a slight bending of the gang condenser plate will help the sensitivity at 600 Kc. This operation should be done very carefully so that no short circuiting of the condenser plates result.

PARTS LIST—MODEL 5M3

* Figures in 2nd last column refer to parts shown in wiring diagram of Model 5M3

Qty.	Part No.	Description	* Item	List Each
1	G7-32000	Antenna Coil	2	.35
1	G6-32002	Osc. Coil	3	.40
1	G3-32004	1st I. F. Trans. Coil	4	.55
1	G4-32004	2nd I. F. Trans. Coil	5	.55
4	W25200	Coil Socket		.05
2	W25024A	Coil Shield		.10
2	W25025A	Coil Shield		.10
4	W26891	Insulating Washer		.05
4	W21541B	Retaining Ring		.05
1	G3-33001	Tuning Condenser Gang	44	2.25
1	G19-25050	Dial Assem.		.35
1	G12-27812	Dial Light Brkt Assm.		.20
1	G2-25948	1st I. F. Primary Tuning Cond.	7	.30
1	W27548	1st I. F. Sec. Tuning Cond. Adj. Blade	8	.05
1	W25008A	2nd I. F. Sec. Tuning Cond. Adj. Blade	9	.05
2	W31472	First Blade		.05
2	W25584	Mica Insulator		.05
2	W26069B	Adjusting Nut		.05
2	W25446	Bakelite Washer		.05
2	W24865	Metal Washer		.05
2	W25450B	Insulating Washer		.05
2	W25007B	Insulating Washer		.05
2	O-4	Flat Washer		.05
2	M-20	Rivet (.120x7/32) Tubular		.05
2	R80	4-36x¾ Rd. Hd. Mach. Screw		.05
1	W26573B	Vol. Control & Line Switch	40-41	1.10
2	G75-27456	6D6 Socket	32	.10
1	G80-27456	76 Socket	33	.10

Qty.	Part No.	Description	* Item	List Ea
1	G25-27456	42 Socket	34	.10
1	G6-27456	80 Socket	35	.10
2	W26010	Tube Shield Base (6D6)		.10
2	B26009C	Tube Shield		.05
1	B21491C	Cable & Plug	31	.50
1	G5-28500	Power Trans. 60 cy. 110 V.	37	3.00
	G6-28500	Power Trans. 25 cy. 110 V.	38	4.00
	G7-28500	Power Trans. 25 cy. 220 V.	39	4.00
1	LW-20264	Ant.-Gnd. Terminal	1	.15
		FILTER & BY-PASS CONDENSERS		
1	W25537A	0.001-0.03 Mfd. 400 V.-400 V.	16-17	.30
1	W23191A	0.01 Mfd. 400 V.	18	.25
1	W30805	0.01 Mfd. 400 V.	43	.20
1	W28622	0.1-0.1 Mfd. 200 V.-200 V.	45-46	.25
2	W28623	0.02-0.02 Mfd. 200 V.-200 V.	47-48	.25
1	W29150B	8.-6.-12. Mfd. 450 V.-450 V.-25 V.	49-50 19-20 21	2.60
		RESISTORS		
1	W25937	275 Ohm	22	.15
1	31094	4500 Ohm	23	.15
1	21237A	60000 Ohm	24	.15
1	21454	1 Megohm	25	.15
1	W27120	25000-8500 Ohm	26-27	.40
1	23785	500000 Ohm	28	.15
1	W23907	750 Ohm	29	.20
1	21455	300000 Ohm	30	.15
2	W32352	Knob		.10

MODEL Deluxe Fiver-L-B
(Chassis 5V1)
Voltage,Data,Parts List

CROSLEY RADIO CORP.

General Description . . .

Chassis 5V1 is used in the DeLuxe Fiver and DeLuxe Fiver Lowboy. It is a 5-tube 3-gang automatic volume control dual band receiver. The frequency bands are 535 to 1720 Kc. and 1650 to 4500 Kc. The intermediate frequency is 181.5 Kc., the use of which insures adequate selectivity.

Tubes Used and Their Function . . .

The tubes used are 6A7 oscillator-modulator, 6D6 I. F. amplifier, 6B7 diode and audio frequency amplifier, 42 output, and 80 rectifier. The tube voltages are shown in the table below:

Type	Where Used	Ef	Ep	Eg	Ek	Esup	Eg-osc	Ep-osc
6A7	Osc-Mod.	6.5	240	0	3	0	-15	125
6D6	I. F.	6.5	240	-3.5	0	0	—	—
6B7	Diode-AF	6.5	30	-3.5	0	—	—	—
42	Output	6.5	230	-18	0	—	—	—
80	Rectifier	5.1	—	—	240	—	—	—

All voltages are plus or minus 10%. All DC voltages are measured to chassis at 117.5 line with 1000 ohms per volt 250-volt voltmeter. Power demand is 50 watts at 110 volts 60 cycles.

Method of Biasing . . .

Referring to the circuit diagram, it will be seen that the input section of the 6A7 oscillator modulator obtains its bias from the cathode resistor, part No. 30, while the oscillator section of the same tube gets its bias from the grid leak and condenser combination, in which part No. 31 is the grid leak and part No. 12 is the grid condenser. Bias for the remainder of the tubes is obtained from the voltage divider network connected across the speaker field, which also is the filter choke. Resistors 41, 42 and 43 form its voltage divider network, and the bias voltage applied to the 6D6 I. F. amplifier is that voltage drop across resistor 41. The audio frequency amplifier section of the 6B7 tube obtains its bias from the drop across resistor 41. The grid circuit is completed through volume control part No. 29. The output tube bias is the drop across the combined resistors 41 and 42, completed, of course, through resistors 39 and 56.

Automatic Volume Control Circuit . . .

Automatic volume control voltage is generated across resistor 34 and is fed back through filter resistor 33 to the 6A7 control grid via the switch and second secondary in the preselector system. No automatic volume control is exerted on the I. F. amplifier stage, which is the 6D6, because in so doing there is a serious danger of introducing distortion.

Analysis of Signal Channel . . .

The signal enters at the antenna terminal and when the switch is thrown to the broadcast position flows through the antenna coil primary. In the first secondary circuit it is tuned by means of one section of the gang condenser, part No. 5, and then due to the inductive coupling between the first secondary and the second secondary, signal is fed over to this latter coil where it is tuned by another section of the gang condenser, part No. 5. This signal is impressed on the grid of the oscillator modulator tube. The oscillator section of this tube is tuned by the specially-shaped third section of the gang condenser, part No. 5, in conjunction with oscillator coil, part No. 2. The frequency of the oscillator is such that a constant intermediate frequency of 181.5 kilocycles is present in the plate circuit of the first detector or oscillator-modulator tube. This intermediate frequency signal is fed to the first I. F. transformer, part No. 3, which transformer is double tuned. The signal is then fed to the grid of the 6D6 I. F. amplifier and then the amplified output is fed to the second I. F. transformer. part No. 4, which transformer is also double tuned. The I. F. signal is then impressed on the diode plates in parallel. In this stage there is developed across resistor 34 a DC diode voltage, an audio frequency voltage, and some intermediate frequency. The audio frequency and intermediate frequency signals pass through coupling condenser, part No. 20, but the filter resistor, part No. 35, excludes most of the intermediate frequency so that mostly audio frequency is present across resistor 29, the volume control. This audio frequency is then amplified through the pentode section of the 6B7 tube and the amplified audio output is fed through coupling condenser 18 to the grid of the output tube type 42. The output of the type 42 tube is fed to the speaker in the conventional manner. Resistor 56 in the grid circuit of the output tube acts as a further filter for whatever intermediate frequency might still be present and also tends to suppress distortion at extremely loud volume. Condenser part No. 16 is connected across the speaker transformer and tends to hold the impedance of the speaker load more constant at the higher audio frequencies.

For the high frequency band the signal channel is slightly different in that the first section of the preselector is not used. Instead the signal is fed directly over to the second secondary through coupling condenser part No. 10. The switch is now connected into the tap on the second secondary so that part of this secondary acts as an antenna primary and the balance as the high fre-

PARTS LIST—MODEL 5V1

* Figures in 2nd last column refer to parts shown in wiring diagram of Model 5V1

FILTER & BY-PASS CONDENSERS

1	B30059C	8-8-8 Mfd. 250 V. 450 V. 450 V.	23-24	
			25	3.00
2	W30321A	1. Mfd. 160 V.	14-68	.55
1	W27668	0.0001 Mfd.	10	.15
1	W26571	0.0005 Mfd. 400 V.	12	.15
1	W30323	0.01 Mfd. 200 V	16	.15
1	W25537A	0.001-0.03 Mfd. 400 V.-400 V.	17-18	.30
1	W30322A	0.00017-0.006 Mfd. 200 V. 200 V.	19-20	.30
1	W30805	0.01 Mfd. 400 V.	55	.20
2	W28621	0.02 Mfd. 200 V.	60-61	.15
1	W29271A	0.02-0.02 Mfd. 400 V. 400 V.	63-64	.25

RESISTORS

1	W25937	275 Ohms	30	.15
1	21237A	60000 Ohms	31	.15
1	21876	10000 Ohms	32	.15
1	26577	3 Megohm	33	.15
4	23785	500000 Ohms	34-36	
			38-43	.15
2	21455	300000 Ohms	35-56	.15
2	21875	100000 Ohms	37-42	.15
1	W31883	8500-25000 Ohms	39-40	.55
1	24990	25000 Ohms	41	.20
1	W23013	2000 Ohms	69	.15
3	W32352	Knobs		.10

MODEL Deluxe Fiver,L-B
(Chassis 5V1)
Schematic,Alignment
Socket Layout

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quency secondary. The oscillator coil is tapped in the usual manner simply to reduce inductance.

Power Supply System . . .

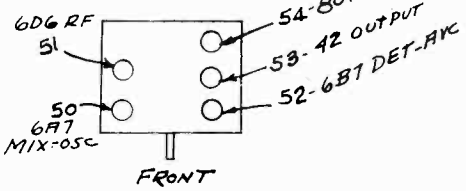
The power supply system consists of a transformer part No. 45 for 110 volts 60-cycle, part No. 46 for 110 volts 25-cycle, part No. 47 for for 220 volts, a rectifier tube type 80, the speaker field as the filter choke, and filter condensers parts 24 and 25. In this circuit the filter choke is included in the negative leg of the power supply system, because in so doing it is possible to use the drop across the filter choke for biasing, and eliminates the use of a large bypass condenser on the cathode of the output tube, type 42. At the same time, better audio quality for the lower notes is obtained than with the ordinary bypass condenser circuit.

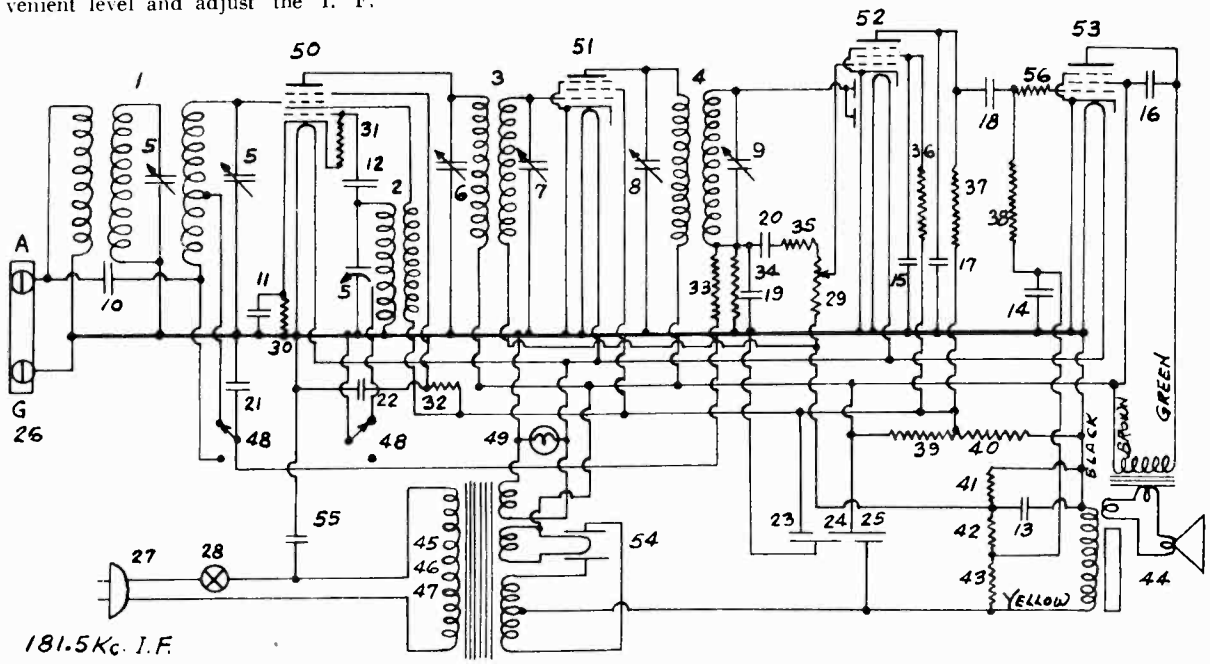
Alignment Procedure . . .

To align the I. F. amplifier, it is necessary that there be available a suitable modulated oscillator capable of adjustment to 181.5 Kc. with good accuracy. This oscillator should have an attenuator so that strength of the oscillator output can be adjusted. Connect the high side of the output of the modulated oscillator, which has been adjusted to 181.5 Kc. to the control grid connection on the top of the 6A7 tube, through an .02 Mfd. series condenser. The low side of the oscillator is to be connected to the receiver chassis. Set the output of the oscillator to a convenient level and adjust the I. F. transformer condensers, three of which are located on top of the chassis and one in the rear of the chassis, for maximum signal output. To make this adjustment, it is necessary that a standard ¼" (across flats) hexagon socket wrench be used. This wrench should be insulated. Always make these I. F. adjustments very carefully and go over the adjustments several times to be sure that the peak has been reached.

To align the receiver at broadcast frequencies it is necessary that an adjustable oscillator having frequencies of 1400 and 600 Kc. together with a suitable attenuator and dummy antenna be available. Set the oscillator to 1400 Kc. and connect the high side of the oscillator to the receiver antenna terminal through a .0001 (dummy antenna) condenser. Turn the tuning control of the receiver to 140 on the dial. Now adjust the oscillator trimmer on the gang condenser (the oscillator section is in the rear of the gang) until the signal is heard best. Without changing the gang condenser setting, adjust the remaining two sections of the gang condenser. The gang condenser adjustment may be accomplished with an ordinary screwdriver. It is necessary that these adjustments be gone over several times until no further improvement can be made. Always work with the weakest possible signal from the modulated oscillator for best accuracy. The performance of the receiver may now be checked at 600 Kc. by setting the modulated oscillator to 600 Kc. and the receiver dial to that point around 60, which gives best reception. Sometimes it is possible to make a slight improvement in the performance at this point by bending some of the gang condenser plates slightly. This operation should be done very carefully so that no short circuiting of the condenser plates results.

The receiver may be checked in the higher frequency band if a modulated oscillator, capable of covering frequencies of 1700 to 4000 is available. It is not necessary, however, to align the receiver at these frequencies because if the receiver is properly aligned at broadcast frequencies it will be in alignment at the higher frequencies.





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MODEL 50,50 LB (5H1)
Voltage,Data

General Description . . .

Chassis 5H1 is used in the Model Fifty and Model Fifty Lowboy. It is a 5-tube short wave and broadcast chassis employing the latest superheterodyne circuit, in which has been incorporated a high efficiency tuned radio frequency stage for both short wave and broadcast. The frequency ranges covered are 535 to 1750 Kc., which is the normal broadcast band and the lower frequency police band, and 5700 to 15500 Kc., which is the short wave or high frequency band. The intermediate frequency is 456 Kc. and while there is only one intermediate frequency stage, adequate selectivity is obtained through the use of very high efficiency I.F. transformers, in addition to the three-gang condenser.

Tubes Used and Their Function . . .

The tubes used are 6F7 radio frequency amplifier and audio frequency amplifier, 6A7 oscillator modulator, 6B7 intermediate frequency amplifier and diode detector, 42 output tube and type 80 rectifier. The tube voltages are shown in the table below:

Type	Where Used	Ef	Ep	Eg	Ek	Esg	Esup	Epl	Egl
6F7	R.F.-A.F.	6.5	250	—3.5	0	125	—	35	—3.5
6A7	Osc.-Mod.	6.5	250	—3.5	0	125	—	190	—15.0
6B7	I.F.-Diode	6.5	250	—3.5	0	125	—		
42	Output	6.5	230	—18	0	250			
80	Rectifier	5.1							

All voltages are plus or minus 10%. All D.C. voltages measured to chassis at 117.5 volt line with 1000 ohms per volt, 250-volt voltmeter. Power demand 50 watts, 110 volts, 60 cycles.

Method of Biasing . . .

Referring to the circuit diagram attached, it will be seen that the bias for the pentode section of the 6F7 tube is obtained from the drop across resistor No. 52. Resistors Nos. 52, 53 and 54 form a voltage divider network across the speaker field, which field also acts as a filter choke. The tap between resistors Nos. 52 and 53 may be followed through resistors Nos. 48 and 47 and thence to the grid return of the 6F7 pentode section. The cathode of the 6F7 returns to the ground, as does also the lower end of resistor No. 52, therefore the drop across resistor No. 52 is impressed on the grid of the pentode section of the 6F7 tube. The grid of the pentode section of the 6F7 returns, of course, through the band change switch. The same condition exists for the grid section of the 6A7 tube. The 6A7 also obtains its bias from the drop across resistor No. 52 but in this case this voltage is fed through resistor No. 48 only and then to the grid return of the 6A7 tube. The oscillator section of the 6A7 obtains its bias, of course, from the grid leak and condenser combination, resistor No. 56 being the low frequency grid leak and resistor No. 57 being the high frequency grid leak. The bias for the pentode section of the 6B7 tube is also obtained from the voltage drop across resistor No. 52 but in this case this voltage is not fed through any filter resistor. Now returning to the triode section of the 6F7, which section is an audio amplifier, it will be found that the bias for this section is also obtained from the drop across resistor No. 52 and through volume control part No. 70. The bias for the output tube type 42, must be greater than that for the other tubes and it is generated due to the drop across resistors 52 and 53 in series and is fed through the grid leak, part No. 51.

Automatic Volume Control Circuit . . .

Automatic volume control voltage is developed in the diode circuit across resistors 35, 47 and 48. Since resistor 48 returns to the junction between resistors 52 and 53, a delay voltage is supplied and this voltage is equal to the drop across resistor 52. The audio frequency diode resistor is part No. 49 and it will be noted that it returns directly to ground which is the same point that the low potential end of resistor 52 returns. Automatic volume control is exerted on the 6F7 pentode section which is the radio frequency stage. While the full diode voltage is that drop across resistors 35, 47 and 48 in series, only the voltage across 47 and 48 is impressed on the radio frequency amplifier. In a similar manner automatic volume control is exerted on the 6A7 control grid and this voltage is obtained from the drop across resistor 48. No automatic volume control is exerted on the intermediate frequency amplifier stage, which is the 6B7, because in so doing there is serious danger of introducing distortion.

Analysis of Signal Channel . . .

Starting with the antenna, the signal enters switch contacts, part No. 21, at which point, depending upon the position of the switch, it will flow either to the broadcast or short wave antenna coil primary, parts Nos. 1 and 2 respectively. Tuning is accomplished by the first section of the gang condenser, part No. 20, connected in the secondary circuit of the antenna coil. The signal is then impressed on the radio frequency pentode grid of the 6F7 tube and is amplified by the tube. The output of the 6F7 tube goes into the primary of the inter-stage radio frequency transformer, part Number 3 or 4, depending on whether the switch is connected to the low or high frequency position. The secondaries of the interstage coils are again tuned by another section of the gang condenser, part No. 20, and the signal is then impressed on the control grid of the 6A7 oscillator modulator tube. The oscillator section of the 6A7 tube uses the oscillator coils 5 and 6 for the low

and high frequency bands respectively, and the oscillator is tuned by the third section of the gang condenser, part No. 20. In this tube the frequency of the signal is changed from radio frequency to 456 Kc., the intermediate frequency. The signal passes from the plate of the 6A7 tube to the first intermediate frequency transformer, part No. 7, and the primary and secondary of this transformer are both tuned to obtain maximum selectivity. The output of the secondary of the transformer is impressed on the control grid of the 6B7 tube in which the intermediate frequency signal is amplified and fed to the second intermediate frequency transformer, part No. 10, which transformer is also tuned in both the primary and secondary circuits. The signal is now impressed directly on the audio frequency diode, in the 6B7 tube and through condenser No. 27 on the automatic control diode of the same tube. In the audio frequency diode the signal is converted from intermediate frequency to audio frequency which audio frequency is present across resistor 49 and condensor 46. There is also a direct current voltage and some intermediate frequency also present here. The audio frequency signal is separated from the direct current voltage by condenser 45 and whatever intermediate frequency there may be left in this circuit is filtered by resistor 50 and the remaining pure audio frequency voltage is impressed across volume control, part No. 70. Adusting the position of the arm of this volume control applies greater or less audio frequency voltage on the grid of the triode section of the 6F7. This triode is used as an audio frequency amplifier. The plate of this tube is connected to the audio coupling resistor, part No. 58, and the audio frequency voltage is coupled to the grid of the output tube, type 42, through condenser 32. The grid circuit of the output tube is completed through resistor 51. The amplified audio output is impressed across the speaker transformer in the speaker assembly, part No. 59.

Power Supply System . . .

The power supply system consists of a transformer, part No. 67, for 110-volt 60-cycle, part No. 68 for 110-volt 25-cycle, and part No. 69 for 220-volt 25-60 cycle, a rectifier tube type 80, the speaker field as a filter choke, wet electrolytic condenser part No. 39, and dry electrolytic condenser part No. 38. In this particular circuit the filter choke is included in the negative leg of the power supply system, because in so doing it is possible to use the drop across the filter choke for biasing, and eliminate the use of a large bypass condenser on the cathode of the output tube, type 42. At the same time, better audio quality for the lower notes is obtained than with the ordinary bypass condenser circuit.

Alignment Procedure . . .

To align the I. F. amplifier it is necessary that there be available a suitable modulated oscillator capable of adjustment to 456 Kc. with good accuracy. This oscillator should have an attenuator so that the strength of the oscillator output can be adjusted. Connect the high side of the output of the modulated oscillator which has been adjusted to 456 Kc. to the control grid connection on the top of the 6A7 tube through an .02 mfd. series condenser. The low side of the oscillator to be connected to the receiver chassis. Set the output of the oscillator to a convenient level and adjust the I. F. transformer condensers for maximum signal output. To make this adjustment it is necessary that a standard 5/16 inch (across flats) hexagon socket wrench be used for the upper condenser, and a small screwdriver fitting inside of the nut hole for adjustment of the lower condenser. Always make this I.F. adjustment very carefully and go over your adjustment several times to be sure that the peak has been reached.

To align the receiver at broadcast radio frequency it is necessary that an adjustable oscillator having frequencies of 1400 and 600 Kc., together with a suitable attenuator and dummy antenna, be available. Set the oscillator at 1400 Kc., and connect the high side of the oscillator to the receiver antenna terminal through a .0002 (dummy antenna) condenser. Turn the tuning control of the receiver to 140 on the dial. Now adjust the oscillator broadcast shunt trimmer indicated on the diagram attached and located under the chassis until the signal is heard best. Without changing the gang condenser setting, adjust the antenna and radio frequency broadcast trimmers for maximum signal. It is necessary that these adjustments be gone over several times until no further improvements can be made. Always work with the weakest possible signal from the modulated oscillator for best accuracy. Now rotate the dial until it reads 60 and set the modulated oscillator to approximately 600 Kc. Adjust the modulated oscillator carefully until maximum response is obtained. Now readjust the oscillator series trimmer located on the side of the chassis as shown on the diagram attached for maximum signal. It is sometimes advisable to move the main dial back and forth slightly about 60 on the dial during the course of this adjustment if a still greater signal is obtainable.

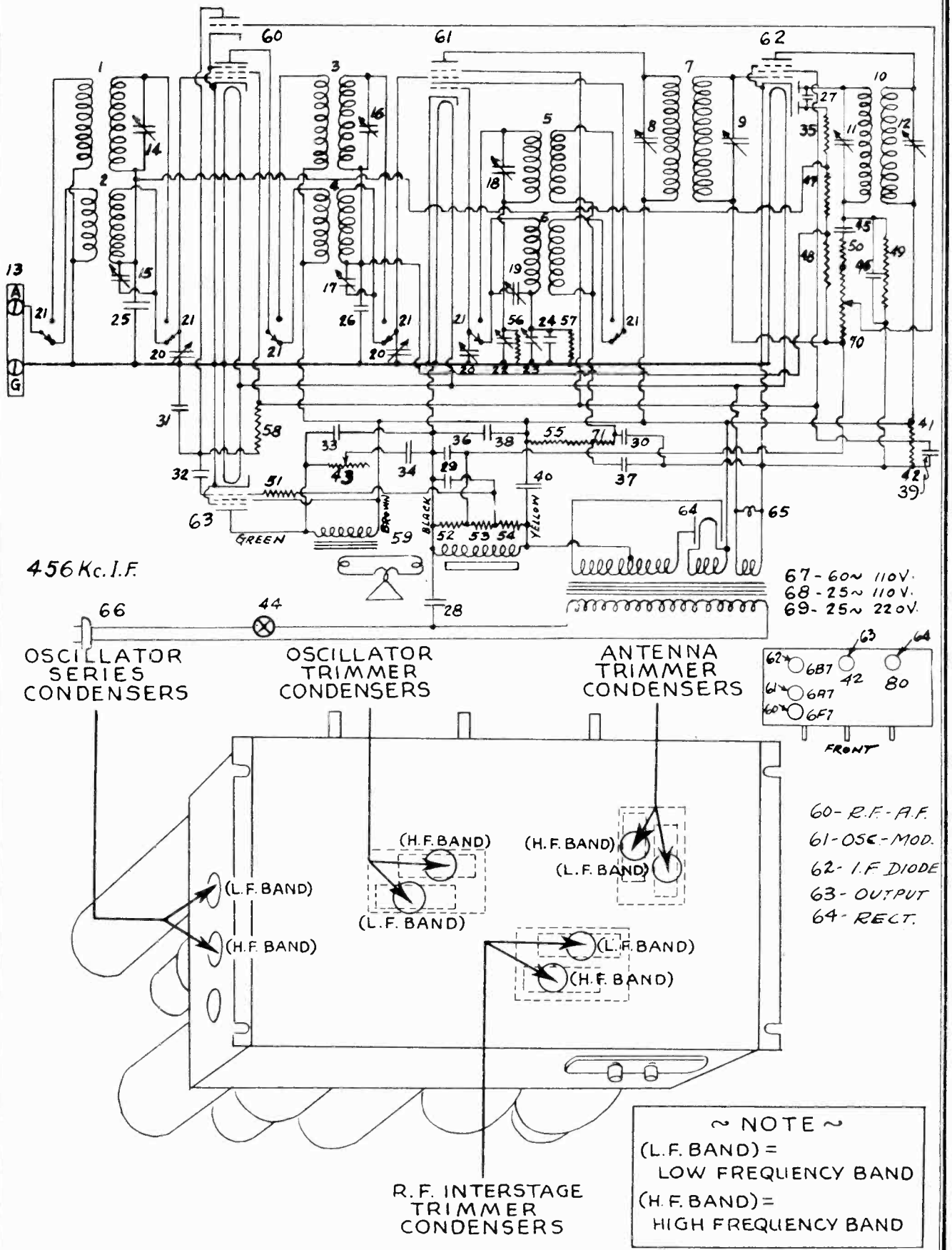
To align the set in the high frequency or short wave band, it is necessary that a modulated oscillator be available for frequencies of 6000 and 15000 Kc. The procedure for this band is similar to the broadcast band except that a 750 ohm midget carbon resistor is used for the dummy antenna instead of the .0002 condenser. Set the modulated oscillator to 15,000 Kc. and the receiver dial to 15. Adust the oscillator shunt trimmer for the high frequency band to maximum signal. Now adjust the antenna and interstage R.F. trimmers for maximum signal, making sure to go over the adjustment several times so that no further improvement can be made. Now set the modulated oscillator to approximately 6000 Kc. and the receiver dial to 6. Readjust the modulated oscillator slightly for maximum signal and then adjust the oscillator series trimmer for the high frequency band for best signal, making whatever slight adjustments in the tuning control are necessary to bring in maximum signal.

Tuning Receiver In High Frequency Band . . .

Due to the tremendously greater number of transmitter channels covered in the high frequency band, the receiver is endowed with a much greater apparent selectivity. For this reason, if the receiver is tuned carelessly, many high frequency stations will be missed or passed over without hearing them. It is very necessary that the receiver be tuned slowly and that extreme care be exercised in final adjustment of the receiver to the center of the carrier after a high frequency station is received.

CROSLEY RADIO CORP.

MODEL 50, 50 LB (5H1)
Schematic, Trimmers



MODEL 50,(5H1),51,(5C2)
Parts List

CROSLEY RADIO CORP.

INSTRUCTIONS FOR ORDERING—Give part number, description of part, and serial number of receiver on which part is to be used. If article wanted is not listed separately, then that part of complete assembly containing this article should be ordered. Goods shipped on open account to Crosley Wholesale Distributors only. Cash must accompany Dealer and Consumer orders. Prices are subject to the usual trade discounts, and are subject to change without notice.

PARTS LIST—MODEL 5C2

* Figures in 2nd last column refer to parts shown in wiring diagram of Model 5C2

Qty.	Part No.	Description	* Item	List Each
1	G1-32000	Antenna Coil	2	1.10
1	G2-32003	1st I. F. Trans. Coil	53	.70
1	G1-32003	Diode Feeding Trans.	52	.80
2	W25200A	Coil Socket		.05
2	W25024A	Coil Shield		.10
2	W21541B	Retainer Ring		.05
2	W26891	Insulating Washer		.05
1	G5-33002	Variable Tuning Condenser Gang	62	3.75
1	W31812	Dial Pointer		.05
1	G2-27817	Dial Light Bracket Assm.		.15
1	G3-33006	1st I. F. Prim. & Sec. Trimmer Cond.	58-59	.30
1	G4-33006	2nd I. F. Prim. & Sec. Trimmer Cond.	60-61	.50
1	W32242	Vol. Control & Line Switch	50-51	1.00
or	W31204	Vol. Control & Line Switch	16-15	1.00
1	G49-27975	6F7 Socket	44	.10
1	G39-27975	78 Socket	45	.10
1	G48-27975	6B7 Socket	46	.10
1	G30-27975	43 Socket	47	.10
1	G51-27975	25Z5 Socket	48	.10
2	W32360	Tube Shield Base		.05
2	W31212	Tube Shield (Half)		.05
2	W31213	Tube Shield (Slotted Half)		.05
2	W31210	Tube Shield Ring		.05
1	B30957B	Resistor Cable & Plug (120 Ohms)	19	.70
1	W31765	Antenna	1	.20
1	G2-28859	Filter Choke	41	1.25
		FILTER & BY-PASS CONDENSERS		
1	W31992	10.-8.-25.-16. Mfd. 25 V.-125 V.-125 V.-100 V.	37-38	
			39-40	3.50
1	W30325	0.003 Mfd. 200 V.	25	.20
1	W25516	0.25-0.25 Mfd. 200 V.-200 V.	30-31	.40
1	W27668	0.0001 Mfd.	32	.15
1	W30322A	0.00017-0.006 Mfd. 200 V.-200 V.	34-35	.30
			36	.15
			63	.15
			64-65	.25
1	W29271A	0.02-0.02 Mfd. 400 V.-400 V.	66-67	.25
1	W29010A	0.25 Mfd. 200 V.	68	.20
		RESISTORS		
1	W28589	350 Ohms	6	.10
1	W27503	1400 Ohms	7	.10
1	W24537	60 Ohms	8	.10
1	W30539	26.7 Ohms	9	.20
1	21237A	60000 Ohms	10	.15
1	21454	1 Megohm	11	.15
1	26578	5 Megohm	12	.15
2	23785	500000 Ohms	13-17	.15
1	23403	150000 Ohms	14	.15
1	21455	300000 Ohms	18	.15
1	W22514	750 Ohms	56	.15
1	24990	25000 Ohms	57	.20
		CABINET AND SPEAKER		
	4D	Cabinet Assembly		5.47
1	W33139	Dial Plate		.15
1	W33140	Vol. Control Plate		.15
1	W28723	Bull's Eye		.05
1	W29023	Bezel		.05
1	W33164	Grille Cloth		.10
1	B33167A	Baffle		.10
1	W33168	Back Cover		.50
1	W33143	Knob		.10
1	W33144	Knob		.10
1	G5-31692	Speaker & Plate Assm.		4.50
1	G1-29529	Cone & Voice Coil		2.00
1	G6-29535	Transformer		1.10
1	W31214	Field Coil		1.25
4	W28742	Speaker Mounting Screws (Chrome)		.05

PARTS LIST—MODEL 5H1

* Figures in 2nd last column refer to parts shown in wiring diagram of Model 5H1

Qty.	Part No.	Description	* Item	List Each
1	G3-32000	Antenna Coil (Low Freq.)	1	.45
1	G1-32002	Antenna Coil (High Freq.)	73	.50
1	G2-32001	R. F. Coil (L. F.)	3	.55
1	G1-32001	R. F. Coil (H. F.)	4	.15
1	G2-32002	Osc. Coil (L. F.)	5	.40
1	G1-32002	Osc. Coil (H. F.)	6	.50
1	G9-32004	1st I. F. Trans. and Trimmer Condensers	7-8	
			9	1.60
1	G10-32004	2nd I. F. Trans. and Trimmer Condensers	10-11	
			12	1.60
1	G10-33009	L. F. & H. F. Ant. Trimmer Condensers	14-15	.35
1	G9-33009	L. F. & H. F. R. F. Trimmer Cond.	16-17	.30
1	G8-33009	L. F. Osc. Trimmer Cond.	18	.25
1	G2-33007	L. F. & H. F. Osc. Series Trimmer Cond.	22-23	1.25
1	G7-33002	Variable Tuning Condenser Gang	74	4.00
1	G20-25050	Dial Assm.		.60
6	W25200	Coil Shield Socket		.05
3	W30802	Coil Shield		.15
2	W25025A	Coil Shield		.10
1	W25024A	Coil Shield		.10
3	W26891	Insulating Washer (L. F. and R. F. & Osc. Coils)	1-3	
			5	.05
3	W21541B	Retaining Ring	1-3-5	.05
3	W30026	Retaining Ring	2-4-6	.05
1	G13-27812	Dial Light Bracket Assm.		.20
1	W25594B	Tone Control & Line Switch	43-44	1.10
1	W25666B	Level Control (Volume)	70	.90
1	B32285	6 Pole D. T. Switch	21	1.30
1	B30375A	Cord & Plug	66	.45
1	G16-26719	Ant.-Gnd. Terminal	75	.15
1	G49-27456	6F7 Socket	60	.10
1	G47-27456	6A7 Socket	61	.10
1	G48-27456	6B7 Socket	62	.10
1	G25-27456	42 Socket	63	.10
1	G6-27456	80 Socket	64	.10
3	W26010	Tube Shield Base		.05
3	W27328A	Tube Shield (6F7, 6A7, 6B7)		.10
1	G6-30745	Power Trans. 60 cy. 110 V.	67	3.75
1	G7-30745	Power Trans. 25 cy. 110 V.	68	5.25
1	G-830745	Power Trans. 25 cy. 220 V.	69	5.25
		FILTER & BY-PASS CONDENSERS		
1	W29097C	8.-8.-8. Mfd. 450 V.-450 V.-250 V.	37-38	
			39	2.85
1	W26194B	12. Mfd. 475 V.	40	1.25
1	W30321A	1. Mfd. 160 V.	29	.55
1	W32304	0.0014 Mfd. 300 V.	24	.30
1	W32380	0.05 Mfd. 200 V.	25	.20
1	W32379	0.02 Mfd. 200 V.	26	.15
1	W27540	0.0005 Mfd. 400 V.	27	.15
1	W30805	0.01 Mfd. 400 V.	28	.20
1	W32378	0.01 Mfd. 400 V.	30	.15
1	W25537A	0.001-0.03 Mfd. 400 V.-400 V.	31-32	.30
1	W25517	0.008-0.05 Mfd. 400 V.-400 V.	33-34	.30
1	W24784	0.25 Mfd. 200 V.	36	.20
1	W30322	0.006-0.00017 Mfd. 200 V.-200 V.	45-46	.30
		RESISTORS		
2	26577	3 Megohm	35-48	.15
2	21454	1 Megohm	47-49	.15
1	W31883	8500-25000 Ohm	41-42	.55
3	23785	500000 Ohm	50-51	
			54	.15
1	21875	100000 Ohm	53	.15
1	21876	10000 Ohm	55	.15
1	21237A	60000 Ohm	56	.15
1	21453	40000 Ohm	57	.15
1	23403	150000 Ohm	58	.15
1	24814	7000 Ohm	71	.20
1	24990	25000 Ohm	72	.20
1	W31007A	Speaker Cord (4 Wire)		.25
3	W32352	Knob		.10
1	W32353	Knob		.10
1	W31463	Escutcheon		.25
3	S-27	Escutcheon Screws (.10 doz.)		.05

MODEL 51 (5C2)
Voltage, Data

CROSLEY RADIO CORP.

General Description . . .

Chassis 5C2 is used in the Model 51. It is a 5-tube AC-DC superheterodyne receiver employing a 3-gang condenser, Automatic Volume Control and electro-dynamic speaker. The frequency range is 535-1750 Kc. The intermediate frequency is 181.5. Use of this low intermediate frequency assures very good selectivity.

Tubes Used and Their Function . . .

The tubes used are 6F7, Oscillator-modulator, 78 I. F. amplifier, 6B7 diode and audio frequency amplifier, 43 output, and 25Z5 rectifier. The tube voltages are shown in the table below:

Type	Where Used	Ef	Ep	Eg	Ek	Esg	Esup	Ep-osc
6F7	Osc-Mod.	6.5	100	0	5	100	—	100
78	I. F.	6.5	100	0	3	100	3	—
6B7	Diode-AF	6.5	15	0	1	15	—	—
43	Output	27	96	-20	0	100	—	—
25Z5	Rectifier	27	—	—	100	—	—	—

All voltages are plus or minus 10%. All DC voltages are measured to -B at 117.5 volt line with 1000 ohms per volt, 250-volt voltmeter. Power demand 50 watts, 110 volts, 60 cycles. Voltages on other frequencies and DC will vary slightly from the above table.

Method of Biasing . . .

Referring to the circuit diagram it will be seen that the 6F7 Pentode section obtains its bias from the cathode resistor part No. 5. The oscillator section obtains the major portion of its bias from the grid leak and condenser combination in which part No. 55 is the grid leak and 54 the grid condenser. The 78 I. F. amplifier obtains its bias from the cathode resistor, part No. 6. Bias for the 6B7 audio amplifier is obtained from cathode resistor part No. 7. The effect of this circuit is that a slight bucking bias is applied to the diode section, but a very weak signal soon overcomes this bias and the diode then acts as though there were no bias resistor. The pentode audio amplifier section, however, makes use of this initial bias in resistor No. 7 and after signal is applied, depending on the strength of the signal, a varying amount of bias will be applied to accommodate the signal from the AVC circuit. Bias for the output tube, type 43, is obtained from the drop across the filter choke, part No. 41. and whatever hum component there is remaining is filtered through resistor 18 and bypass condenser 30.

Automatic Volume Control Circuit . . .

Automatic volume control voltage is developed in the diode circuit across resistor 10 in series with volume control, parts No. 15 or 50. This voltage is fed back through filter resistor No. 11 to the control grid return of the 6F7 modulator section. No automatic volume control is exerted on the intermediate frequency amplifier, type 78 tube, because in so doing there is a serious danger of introducing distortion.

Analysis of Signal Channel . . .

Starting with the antenna, part No. 1, which is a self-attached reel of wire in the case of this receiver, the signal flows through condenser part No. 25. The purpose of this condenser is to insulate the antenna from the balance of the set, so that if it should touch any devices having voltage on them, neither the receiver nor the device will be burned out. The signal then feeds into the primary of the first preselector coil and is transferred to the first secondary and tuned with one section of the gang condenser, part No. 20. This first secondary coil is coupled inductively to the second secondary coil, which coil is tuned by another section of the gang condenser part No. 20. The output of this double-tuned preselector circuit is fed to the grid of the 6F7 modulator section. The oscillator section of the 6F7 is tuned with the third section of the gang condenser, part No. 20, in conjunction with coil part No. 2, all of these coils bearing the same part number, since they are mounted on one continuous core. The shape of the oscillator section of the gang condenser is such that a constant intermediate frequency of 181.5 is generated when the signal is applied and this intermediate frequency is present across the primary of the first I. F. transformer, part No. 53. This I. F. transformer is double tuned by condensers 21 and 22 respectively, and the signal is then applied to the grid of the 78 I. F. amplifier. The amplified I. F. output is then fed to the second I. F. transformer, part No. 52, which transformer is also double tuned. This then goes to the diode plates connected in parallel. As mentioned above, the diode resistor is a combination of fixed resistor part No. 10 and the volume control part No. 15 or 50. All of the diode voltage developed is used for automatic volume control, while only that portion of the combination DC diode voltage and audio frequency voltage across the volume control is fed to the grid of the 6B7 audio frequency amplifier. Due to the fact that some intermediate frequency is present in this circuit, and it is necessary to eliminate it, this is done in the plate circuit of the 6B7 amplifier with bypass condenser, part No. 34. The audio frequency voltage is fed over to the grid of the type 43 output tube thru coupling condenser 35, while the grid circuit of this tube is completed thru resistors 17 and 18. The amplified output of this tube is, of course, fed to the speaker in the usual manner. A very important part of the audio frequency amplifier

MODEL 51 (5C2)
Schematic, Alignment

CROSLEY RADIO CORP.

is resistor, part No. 13, connected between plate of the type 43 output tube and the screen of the type 6B7 audio amplifier. Naturally some audio frequency is fed through this resistor, as well as the direct current voltage which supplies the screen. However, at the screen of the 6B7 is located a bypass condenser, part No. 33, so that the higher audio frequencies do not affect the screen of this tube, while the lower audio frequencies are not bypassed, and the effect, therefore, is a regenerative one so far as the lower audio frequencies are concerned. The result of this circuit is that in spite of the very small proportions of the cabinet and speaker a desirable amount of lower notes are reproduced by the set.

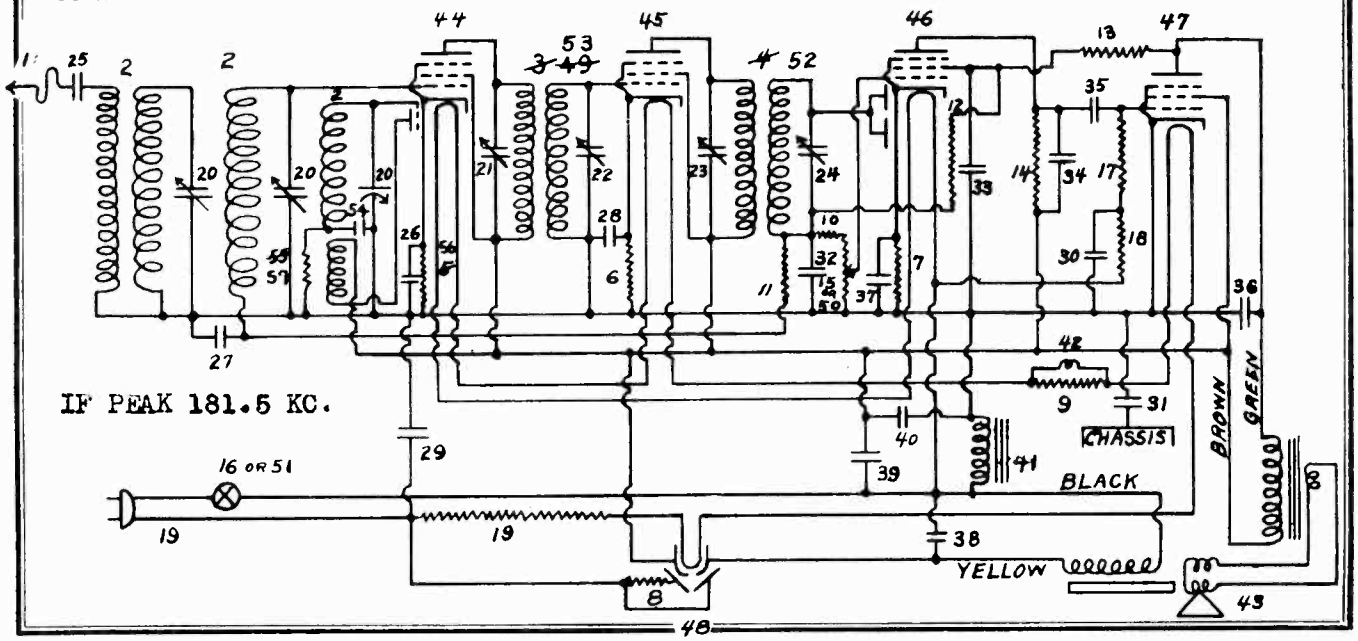
Power Supply System . . .

Since this is an AC-DC receiver, no power transformer is used. To supply the filament of the tubes a series resistor, part No. 19, is used to drop the voltage to the required amount, while the plate voltage supply is obtained from the 25Z5 rectifier. This rectifier has two plates and two cathodes, all of which are separated from each other. It is therefore possible to use one plate and cathode to supply the plates of the remaining tubes and the other plate and cathode to supply the speaker field. In so doing much smoother operation is obtained and less hum results. The speaker field supply is filtered with condenser No. 38. The signal plate supply is filtered with condensers No. 39 and 40, in conjunction with choke, part No. 41.

Alignment Procedure . . .

To align the I. F. amplifier, it is necessary that there be available a suitable modulated oscillator capable of adjustment to 181.5 Kc. with good accuracy. This oscillator should have an attenuator, so that strength of the oscillator output can be regulated. Connect the high side of the output of the modulated oscillator, which has been adjusted to 181.5 Kc. to the receiver antenna wire, as close to where it enters the cabinet as possible, through an .02 Mfd. series condenser. The low side of the oscillator is to be connected to the receiver chassis. It will be found that the best way to make this connection to the antenna wire is with a sharp, pointed prod, so that the insulation on the antenna wire is not permanently damaged. The unused dead end portion of the antenna wire should be rolled up on its reel. With the oscillator set to a convenient level, adjust the four I. F. transformer tuning condenser adjustment nuts available through the front flange of the chassis for maximum signal output. To make these adjustments, it is necessary that a standard ¼" (across flats) hexagon socket wrench be used for the adjustment nut. The wrench should be insulated. It may be necessary to move the tuning dial slightly for best results. Always make these I. F. adjustments very carefully and go over the adjustments several times to be sure that the peak has been reached.

To align the receiver at broadcast frequency, it is necessary that an adjustable oscillator, having frequencies of 1400 and 600 Kc. together with a suitable attenuator and dummy antenna be available. Set the oscillator at 1400 Kc. and turn the tuning control of the receiver to 140 on the dial. Connect the high side of the oscillator to the receiver antenna through a .0001 Mfd. (dummy antenna) condenser. Now adjust the oscillator section trimmer on the gang condenser (the oscillator section is the rear-most section of the gang) until the signal is heard best. Then adjust the remaining two R. F. trimmers on top of the gang condenser for best signal. It is necessary that these adjustments be gone over several times until no further improvement can be made. Always work with the weakest possible signal from the modulated oscillator for best accuracy. The set is now aligned at 1400 Kc. and by adjusting the modulated oscillator to 600, the set may be rechecked at this point. It will sometimes be found that a slight bending of the gang condenser plates will help the sensitivity at 600 Kc. This operation should be done with extreme care, however, so that no short circuiting of the condenser plates results.



CROSLEY RADIO CORP.

MODEL Dual Sixty (6V2)
Dual Sixty LB
Voltage, Data

CHASSIS 6V2

General Description . . .

Chassis 6V2 is used in the Dual Sixty and Dual Sixty Lowboy. It is a 6-tube 3-gang automatic volume control dual range receiver. The chassis has a continuously variable tone control. The frequency bands covered are 535 to 1700, and 1650 to 4500 Kc. The intermediate frequency is 181.5 Kc., the use of which insures adequate selectivity.

Tubes Used and Their Function . . .

The tubes used are type 58 R. F. amplifier, type 2A7 oscillator modulator, type 58 I. F. amplifier, type 55 diode and A. F. amplifier, type 2A5 output, and type 80 rectifier. The tube voltages are shown in the table below:

Type	Where Used	Ef	Ep	Eg	Ek	Esg	Ep-osc	Eg-osc
58	R. F.	2.5	225	0	3	120	—	—
2A7	Osc.-Mod.	2.5	225	0	3.5	120	175	-15
58	I. F.	2.5	225	-4	0	120	—	—
55	Diode-AF	2.5	40	-4	0	—	—	—
2A5	Output	2.5	210	-18	0	225	—	—
80	Rectifier	4.9	330AC	—	225	—	—	—

All voltages are plus or minus 10%. All DC voltages are measured to chassis at 117.5 line with 1000 ohms per volt, 250-volt voltmeter. Power demand is 60 watts at 110 volts 60 cycles.

Method of Biasing . . .

Referring to the circuit diagram, it will be seen that the bias for the R.F. tube is obtained from the cathode bias resistor, part No. 29. The bias for the input section of the type 2A7 oscillator modulator is obtained from cathode bias resistor, part No. 30, while the oscillator section obtains its bias from the grid leak and condenser combination in which part No. 15 is the grid condenser and part No. 35 the grid leak. The remainder of the tubes are shunt biased. The bias voltages are obtained from a voltage divider network connected across the speaker field, which field acts as a filter choke connected in the negative leg of the power supply. Referring to the diagram, it will be seen that the grid return of the I.F. amplifier tube, type 58, is connected to the junction point between resistors 34 and 46.

The other side of resistor 46 returns to ground so that the voltage drop across resistor 46 is the bias on the I.F. amplifier grid. This same bias voltage is used for the type 55 audio amplifier section, but in this case it is fed through volume control part No. 42. In the case of the output tube, type 2A5, the voltage developed across resistors 34 and 46 is fed through resistor 40 to the grid of this tube.

Automatic Volume Control Circuit . . .

In the broadcast band automatic volume control is exerted on the 58 R.F. amplifier, but in the high frequency band automatic volume control is used on the 2A7 oscillator modulator. The automatic volume control voltage is developed across resistor 36 and fed back to filter resistor, part No. 37, directly to the grid return of the high frequency antenna coil, part No. 4, and then to a switch contact in the secondary circuit of the broadcast antenna coil. When the switch is thrown to the broadcast band (down in the circuit diagram) the automatic volume control voltage goes through the switch, part No. 45, to the grid of the R.F. amplifier through the antenna coil secondary, part No. 2. With the switch thrown in the high frequency position (up in the circuit diagram), the automatic volume control voltage is fed through the secondary of the high frequency antenna coil, part No. 4, and then to the switch, part No. 45, to the grid of the oscillator modulator tube, type 2A7.

Analysis of Signal Channel . . .

The signal enters at the antenna terminal and depending on the position of the switch, part No. 45, is transferred either to the broadcast antenna coil or the high frequency antenna coil, parts No. 2 and No. 4 respectively. In the broadcast band the signal is tuned with one section of the gang condenser, part No. 8, and fed to the grid of the 58 R. F. amplifier. The broadcast antenna coil is tapped, as indicated in the diagram, for the purpose of improving the image ratio. The effect of this tap is to produce an unsymmetrical selectivity characteristic, so that at the point of the normal image response, approximately 360 Kc. higher, this unsymmetrical selectivity curve tends to attenuate the image signal very materially. The amplified R.F. output of this tube is fed to the interstage transformer, part No. 3, the secondary of this transformer being tuned by another section of the gang condenser, part No. 8. The signal then goes to the control grid of the 2A7 oscillator modulator. The oscillator section of this tube is tuned by the third section of the gang condenser, which has specially-shaped plates, also indicated as part No. 8. The frequency of the oscillator is such that a constant intermediate frequency of 181.5 Kc. is present in the plate circuit of the 2A7 oscillator modulator tube. The I.F. output of the oscillator modulator tube is impressed on the first I.F. transformer, part No. 6, which transformer is double tuned. The output of this transformer is impressed on the grid of the type 58 I.F. amplifier. The amplified output of the type 58 I.F. amplifier is impressed on the second I.F. transformer, part No. 7, which transformer is also double-tuned. The I.F. signal is then impressed on the diode plates of the type 55 tube connected in parallel. In this stage there is developed across resistor 36, a DC diode voltage, an audio fre-

MODEL Dual Sixty (6V2)
Alignment, Trimmers

CROSLEY RADIO CORP.

quency voltage, and some intermediate frequency. The audio and intermediate frequency signals pass through the coupling condenser, part No. 19 but the filter resistor, part No. 38, excludes most of the intermediate frequency remaining so that only audio frequency is present across the volume control, part No. 42. The audio frequency is amplified through the triode section of the 55 and then fed through coupling condenser 21 to the grid of the type 2A5 output tube. The slight amount of intermediate frequency remaining at this point is filtered through bypass condenser No. 20. The power audio output of the 2A5 is then fed to the speaker in a conventional manner. Condenser 22 is permanently connected across the speaker to hold its impedance at a more nearly constant value at higher audio frequency, while condenser 23 and variable resistor 43 form a tone control combination.

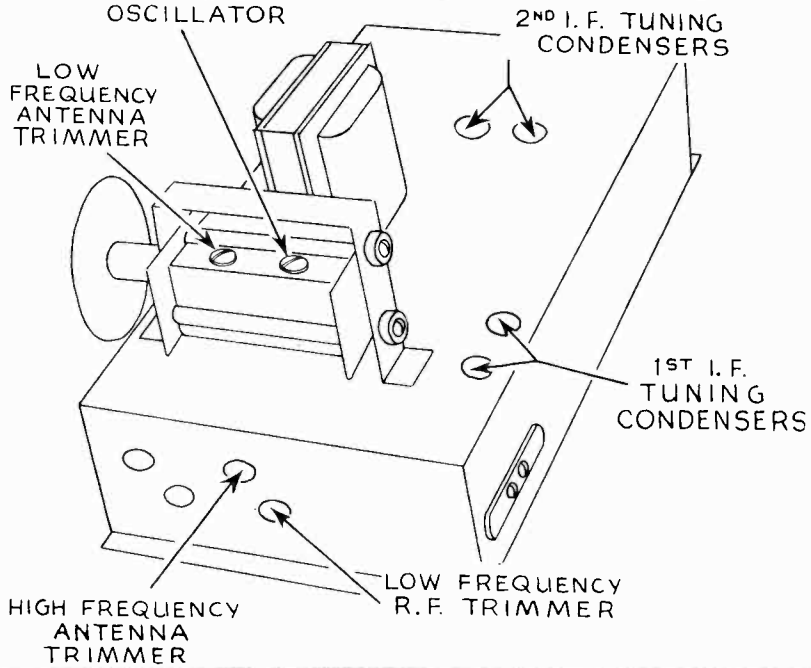
Power Supply System . . .

The power supply system consists of a transformer, part No. 51, for 110 volts, 60 cycles, part No. 52 for 110 volts 25 cycles, and part No. 53 for 220 volts, a type 80 rectifier tube, the speaker field as the filter choke, and the electrolytic filter condensers, part Nos. 25 and 26. In this circuit the filter choke (speaker field) is included in the negative leg of the power supply system, because in so doing it is posible to use the drop across the filter choke for biasing, and eliminate the use of a large bypass condenser in the cathode of the output tube. type 2A5. At the same time, better audio quality for the lower notes is obtained than with ordinary bypass condenser circuits.

Alignment Procedure . . .

To align the I.F. amplifier, it is necessary that there be available a suitable modulated oscillator capable of adjustment to 181.5 Kc. with good accuracy. This oscillator should have an attenuator so that the strength of the oscillator output can be adjusted. Connect the high side of the output of the modulated oscillator which has been adjusted to 181.5 Kc. to the control grid connection on the top of the 2A7 tube, through an .02 Mfd. series condenser. The low side of the oscillator is to be connected to the receiver chassis. Set the output of the oscillator to a convenient level and adjust the I.F. transformer tuning condenser, all four of which are accessible from the top of the chassis for maximum signal output. To make this adjustment it is necessary that a standard ¼" (across flats) hexagon socket wrench be used. The wrench is preferably insulated. Always make these I.F. adjustments very carefully and go over the adjustments several times to be sure that the peak has been reached. To align the receiver at broadcast frequencies, it is necessary that an adjustable oscillator having frequencies of 1400 and 600 Kc., together with a suitable attenuator and dummy antenna be available. Set the oscillator to 1400 Kc. and connect the high side of the oscillator to the receiver antenna terminal through a .0002 Mfd. (dummy antenna) condenser. Turn the tuning control of the receiver to 140 on the dial and adjust the oscillator trimmer on the top of the gang condenser as indicated in the diagram until the signal is heard best. Without changing the gang condenser setting, adjust the R.F. trimmer, which is also on top of the gang, and the antenna trimmer for the broadcast band, located as indicated in the diagram on the side of the chassis, for maximum signal. It is necessary that these adjustments be gone over several times until no further improvement can be made. Always work with the weakest possible signal from this modulated oscillator for best accuracy. The performance of the receiver may now be checked at 600 Kc. by setting the modulated oscillator to 600 and the receiver to that point around 60 which gives best reception. Sometimes it is possible to make a slight improvement in the performance at this point by bending some of the gang condenser plates slightly. This operation should be done very carefully so that no short circuiting of the condenser plates results.

To align the receiver in the higher frequency band it is necessary that a modulated oscillator, capable of adjustment to frequencies of 1700 and 4000 Kc. be available. Set the oscillator to 4000 Kc. and throw the wave change switch to the high frequency band. Adjust the receiver in the neighborhood of 4.0 on the dial until maximum signal is heard. Now adjust the short wave antenna trimmer located on the side of the chassis as indicated in the diagram for best signal. The receiver may now be re checked at 1700 Kc. by setting the oscillator at 1700 and the receiver dial at 1.7.



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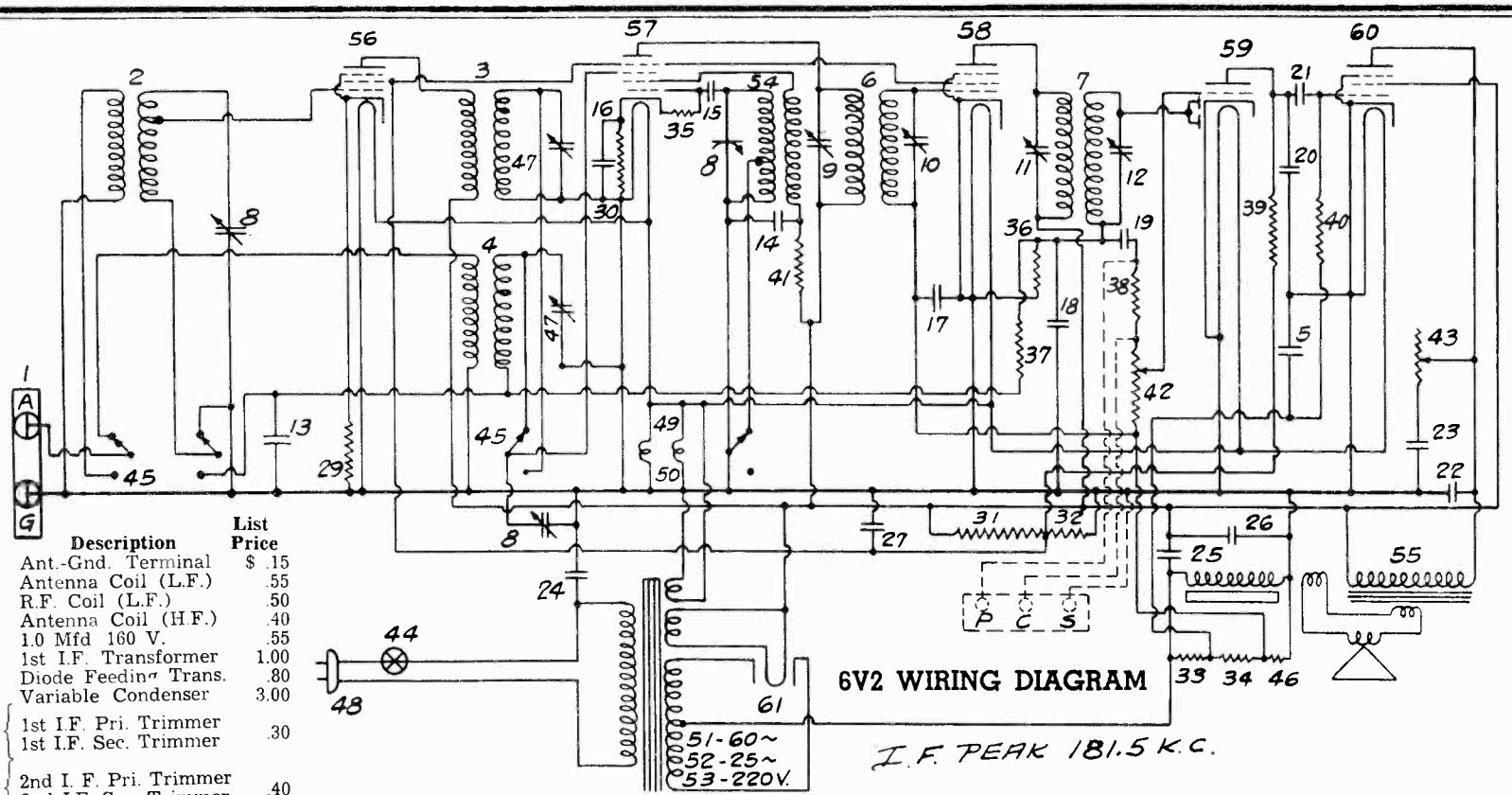
MODEL Dual Sixty (6V2)
Dual Sixty LB
Schematic, Parts List



Item	* Part No.	Description	List Price
1	G1-26719	Ant.-Gnd. Terminal	$ .15
2	G30-24995	Antenna Coil (L.F.)	.55
3	G10-25968	R.F. Coil (L.F.)	.50
4	G31-24995	Antenna Coil (H.F.)	.40
5	W-30321	1.0 Mfd 160 V.	.55
6	G4-30795	1st I.F. Transformer	1.00
7	G6-25444	Diode Feeding Trans.	.80
8	B-31877	Variable Condenser	3.00
9	G14-25948	1st I.F. Pri. Trimmer 1st I.F. Sec. Trimmer	.30
10			
11	G3-25948	2nd I. F. Pri. Trimmer 2nd I F. Sec. Trimmer	.40
12			
13	W-30324	0.02 Mfd. 400 V. 0.02 Mfd. 400 V.	.30
14			
15	W-26571	0.0005 Mfd. 400 V.	.15
16	W-27203	0.02 Mfd. 200 V.	.15
17	W-24784	0.05 Mfd. 200 V.	.20
18	W-30322A	0.00017 Mfd. 200 V. 0.006 Mfd. 200 V.	.30
19			
20	W-22537A	0.001 Mfd. 400 V. 0.03 Mfd. 600 V.	.30
21			
22	W-31052	0.004 Mfd. 400 V. 0.05 Mfd. 400 V.	.35
23			
24	W-30805	0.01 Mfd. 400 V.	.20
25	B-30059-B	8 Mfd. 450 V.	3.00
26		8 Mfd. 450 V.	
27		8 Mfd. 250 V.	
28			
29	W-25937	275 Ohms	.15

Item	* Part No.	Description	List Price
30	W-25937	275 Ohms	.15
31	W-31883	3500 Ohms 25,000 Ohms	.50
32			
33	23785	500,000 Ohms	.15
34	21875	100,000 Ohms	.15
35	21237-A	60,000 Ohms	.15
36	23785	500,000 Ohms	.15
37	26577	3 Meg.	.15
38	23785	500,000 Ohms	.15
39	23403	150,000 Ohms	.15
40	23785	500,000 Ohms	.15
41	21876	10,000 Ohms	.15
42	W-30610-D	Level Control	.70
43	W-30836	Tone Control S. P. S. T. Switch	1.10
44			
45	B-31878	4 P. D. T. Switch	1.00

Item	* Part No.	Description	List Price
46	22199-A	25,000 Ohms	.15
47	G7-29699	R.F. Trimmer Cond.	.30
48	B-30375-A	Cord & Plug	.45
49	W-22221	2.5 V. Dial Light	.10
50	W-22221	2.5 V. Dial Light	.10
51	G4-30745	60 Cy. Power Trans.	3.50
52	G2-30745	25 Cy. Power Trans.	4.75
53	G3-30745	220 V. Power Trans.	4.75
54	G33-24996	Oscillator Coil	.60
55	354-4	Speaker	6.67
56	G24-27975	58 Socket	.10
57	G56-27975	2A7 Socket	.10
58	G24-27975	58 Socket	.10
59	G29-27975	55 Socket	.10
60	G43-27975	2A5 Socket	.10
61	G6-27975	80 Socket	.10

MODEL Sixty-One (6H2)
Sixty-One LB
Voltage, Notes

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CHASSIS 6H2

General Description . . .

Chassis 6H2 is used in the Model Sixty-one and Model Sixty-one Lowboy. It is a 6 tube short wave and broadcast chassis employing the latest superheterodyne circuit, in which has been incorporated a high efficiency tuned radio frequency stage for both short wave and broadcast. The frequency ranges covered are 535 to 1750 Kc., which is the normal broadcast band and the lower frequency police band, and 5700 to 15500 Kc., which is the short wave or high frequency band. The intermediate frequency is 456 Kc. and while there is only one intermediate frequency stage, adequate selectivity is obtained through the use of very high efficiency I.F. transformers, in addition to the three-gang condenser.

Tubes Used and Their Function . . .

The tubes used are 6D6 radio frequency amplifier, 6A7 oscillator modulator, 6B7 intermediate frequency amplifier and diode detector, 76 audio frequency amplifier, 42 output tube and type 80 rectifier. The tube voltages are shown in the table below:

Type	Where Used	Ef	Ep	Eg	Ek	Esg	Esup	Epl	Egl
6D6	R.F.	6.5	250	0	-3.5	125	—	—	—
6A7	Osc.-Mod.	6.5	250	0	-3.5	125	—	190	-15.0
6B7	I.F.-Diode	6.5	250	0	-3.5	125	—	—	—
76	A.F.	6.5	35	0	-3.5	—	—	—	—
42	Output	6.5	230	-18	0	250	—	—	—
80	Rectifier	5.1							

All voltages are plus or minus 10%. All D.C. voltages measured to chassis at 117.5 volt line with 1000 ohms per volt, 250-volt voltmeter. Power demand 60 watts, 110 volts, 60 cycles.

Method of Biasing . . .

Referring to the circuit diagram attached it will be seen that the bias for the 6D6 R.F. tube is obtained from the drop across cathode resistor No. 45. The input section of the 6A7 also obtains its bias from the drop across cathode resistor No. 41. The oscillator section of the 6A7 obtains its bias, of course, from the grid leak and condenser combination, resistor No. 42 being the grid leak. The bias for the pentode section of the 6B7 tube is also obtained from the voltage drop across resistor No. 45 but is not fed through the filter resistor. The 76 audio amplifier bias is also obtained from the drop across resistor No. 45. The bias for the output tube type 42, due to the drop across resistor 54, is fed through the grid leak, part No. 50.

Automatic Volume Control Circuit . . .

Automatic volume control voltage is developed in the diode circuit across resistors 44 and 46. A delay voltage is supplied and this voltage is equal to the drop across resistor 45. The audio frequency diode resistor is part No. 47 and it will be noted that it returns directly to resistor 45. Automatic volume control is exerted on the 6D6 which is the radio frequency stage. While the full diode voltage is that drop across resistors 44 and 46 in series, only the voltage across 46 is impressed on the radio frequency amplifier. In a similar manner automatic volume control is exerted on the 6A7 control grid and this voltage is obtained from the drop across resistor 46. No automatic volume control is exerted on the intermediate frequency amplifier stage, which is the 6B7, because in so doing there is serious danger of introducing distortion.

Analysis of Signal Channel . . .

The signal enters at terminals A1, A2, and G. These three terminals are provided to permit the use of a doublet antenna with transposed lead-in and no ground if desired. With such an antenna, the two lead-in wires are connected to A1 and A2 and the strap between A2 and G is open circuited. If it is desired to operate the receiver with simply a conventional antenna and ground, connect A2 and G together and to the ground wire. The conventional antenna is connected to the A1 terminal.

The signal enters switch contacts, part No. 74, at which point, depending upon the position of the switch, it will flow either to the broadcast or short wave antenna coil primary, parts Nos. 2 and 3 respectively. Tuning is accomplished by the first section of the gang condenser, part No. 10, connected in the secondary circuit of the antenna coil. The signal is then impressed on the 6D6 tube and is amplified. The output of the 6D6 tube goes into the primary of the inter-stage radio frequency transformer, part Nos. 4 or 5, depending on whether the switch is connected to the low or high frequency position. The secondaries of the inter-stage coils are again tuned by another section of the gang condenser, part No. 10, and the signal is then impressed on the control grid of the 6A7 oscillator modulator tube. The oscillator section of the 6A7 tube uses the oscillator coils 6 and 7 for the low and high frequency bands respectively, and the oscillator is tuned by the third section of the gang condenser, part No. 10. In this tube the frequency of the signal is changed from radio frequency to 456 Kc., the intermediate frequency. The signal passes from the plate of the 6A7 tube to the first intermediate frequency transformer, part No. 8, and the primary and secondary of this transformer are both tuned to obtain maximum selectivity. The output of the secondary of the transformer is impressed on the control grid of the 6B7 tube in which the intermediate frequency signal is amplified and fed to the second intermediate frequency transformer, part No. 9, which transformer is also tuned in both the pri-

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mary and secondary circuits. The signal is now impressed directly on the audio frequency diode, in the 6B7 tube and through condenser No. 40 on the automatic control diode of the same tube. In the audio frequency diode the signal is converted from intermediate frequency to audio frequency which audio frequency is present across resistor 47 and condenser 26. There is also a direct current voltage and some intermediate frequency present here. The audio frequency signal is separated from the direct current voltage by condenser 27 and whatever intermediate frequency there may be left in this circuit is filtered by resistor 48 and the remaining pure audio frequency voltage is impressed across volume control, part No. 58. Adjusting the position of the arm of this volume control applies greater or less audio frequency voltage on the grid of the 76. This triode is used as an audio frequency amplifier. The plate of this tube is connected to the audio coupling resistor, part No. 49, and the audio frequency voltage is coupled to the grid of the output tube, type 42, through condenser 29. The grid circuit of the output tube is completed through resistor 50. The amplified audio output is impressed across the speaker transformer in the speaker assembly, part No. 70.

Power Supply System . . .

The power supply system consists of a transformer, part No. 71, for 110-volt 60-cycle, part No. 72 for 110-vole 25-cycle, and part No. 73 for 220-volt 25-60 cycle, a rectifier tube type 80, the speaker field as a filter choke, wet electrolytic condenser part No. 36, and dry electrolytic condenser Part No. 37. In this particular circuit the filter choke is included in the negative leg of the power supply system, because in so doing it is possible to use the drop across the filter choke for biasing, and eliminate the use of a large bypass condenser on the cathode of the output tube, type 42. At the same time, better audio quality for the lower notes is obtained than with the ordinary bypass condenser circuit.

Alignment Procedure . . .

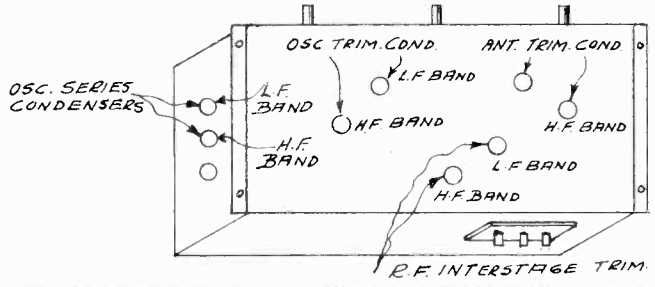
To align the I. F. amplifier it is necessary that there be available a suitable modulated oscillator capable of adjustment to 456 Kc. with good accuracy. This oscillator should have an attenuator so that the strength of the oscillator output can be adjusted. Connect the high side of the output of the modulated oscillator which has been adjusted to 465 Kc. to the control grid connection on the top of the 6A7 tube through an .02 mfd. series condenser. The low side of the oscillator to be connected to the receiver chassis. Set the output of the oscillator to a convenient level and adjust the I. F. transformer condensers for maximum signal output. To make this adjustment for I.F. transformers in a round shield it is necessary that a standard 5/16 inch (across flats) hexagon socket wrench be used for the upper condenser, and a small screwdriver fitting inside of the nut hole for adjustment of the lower condenser. A screwdriver only will adjust the I.F. transformers in a square shield. Always make this I.F. adjustment very carefully and go over your adjustment several times to be sure that the peak has been reached.

To align the receiver at broadcast radio frequency it is necessary that an adjustable oscillator having frequencies of 1400 and 600 Kc., together with a suitable attenuator and dummy antenna, be available. Set the oscillator at 1400 Kc., and connect the high side of the oscillator to the receiver antenna terminal through a .0002 mfd. (dummy antenna) condenser. Turn the tuning control of the receiver to 140 on the dial. Now adjust the oscillator broadcast shunt trimmer indicated on the diagram and located under the chassis until the signal is heard best. Without changing the gang condenser setting, adjust the antenna and radio frequency broadcast trimmers for maximum signal. It is necessary that these adjustments be gone over several times until no further improvements can be made. Always work with the weakest possible signal from the modulated oscillator for best accuracy. Now rotate the dial until it reads 60 and set the modulated oscillator to approximately 600 Kc. Adjust the modulated oscillator carefully until maximum response is obtained. Now adjust the oscillator series trimmer located on the side of the chassis as shown on the diagram attached for maximum signal. It is sometimes advisable to move the main dial back and forth slightly about 60 on the dial during the course of this adjustment if a still greater signal is obtainable.

To align the set in the high frequency or short wave band, it is necessary that a modulated oscillator be available for frequencies of 6000 and 15000 Kc. The procedure for this band is similar to the broadcast band except that a 750 ohm midget carbon resistor is used for the dummy antenna instead of the .0002 condenser. Set the modulated oscillator to 15,000 Kc. and the dial to 15. Adjust the oscillator H.F. shunt trimmer until the signal is heard best. Now adjust the antenna and interstage H.F. trimmers for maximum signal, making sure to go over the adjustment several times so that no further improvement can be made. Now set the modulated oscillator to approximately 6000 Kc. and the receiver dial to 6. Readjust the modulated oscillator slightly for maximum signal and then adjust the oscillator series trimmer for the high frequency band for best signal, making whatever slight adjustments in the tuning control are necessary to bring in maximum signal.

Tuning Receiver In High Frequency Band . . .

Due to the tremendously greater number of transmitter channels covered in the high frequency band, the receiver is endowed with a much greater apparent selectivity. For this reason, if the receiver is tuned carelessly, many high frequency stations will be missed or passed over without hearing them. It is very necessary that the receiver be tuned slowly and that extreme care be exercised in final adjustment of the receiver to the center of the carrier after a high frequency station is received.



~ NOTE ~
(L.F. BAND) = LOW FREQUENCY BAND
(H.F. BAND) = HIGH FREQUENCY BAND

MODEL Sixty-One (6H2)
Sixty-One LB
Schematic, Parts List
Socket Layout

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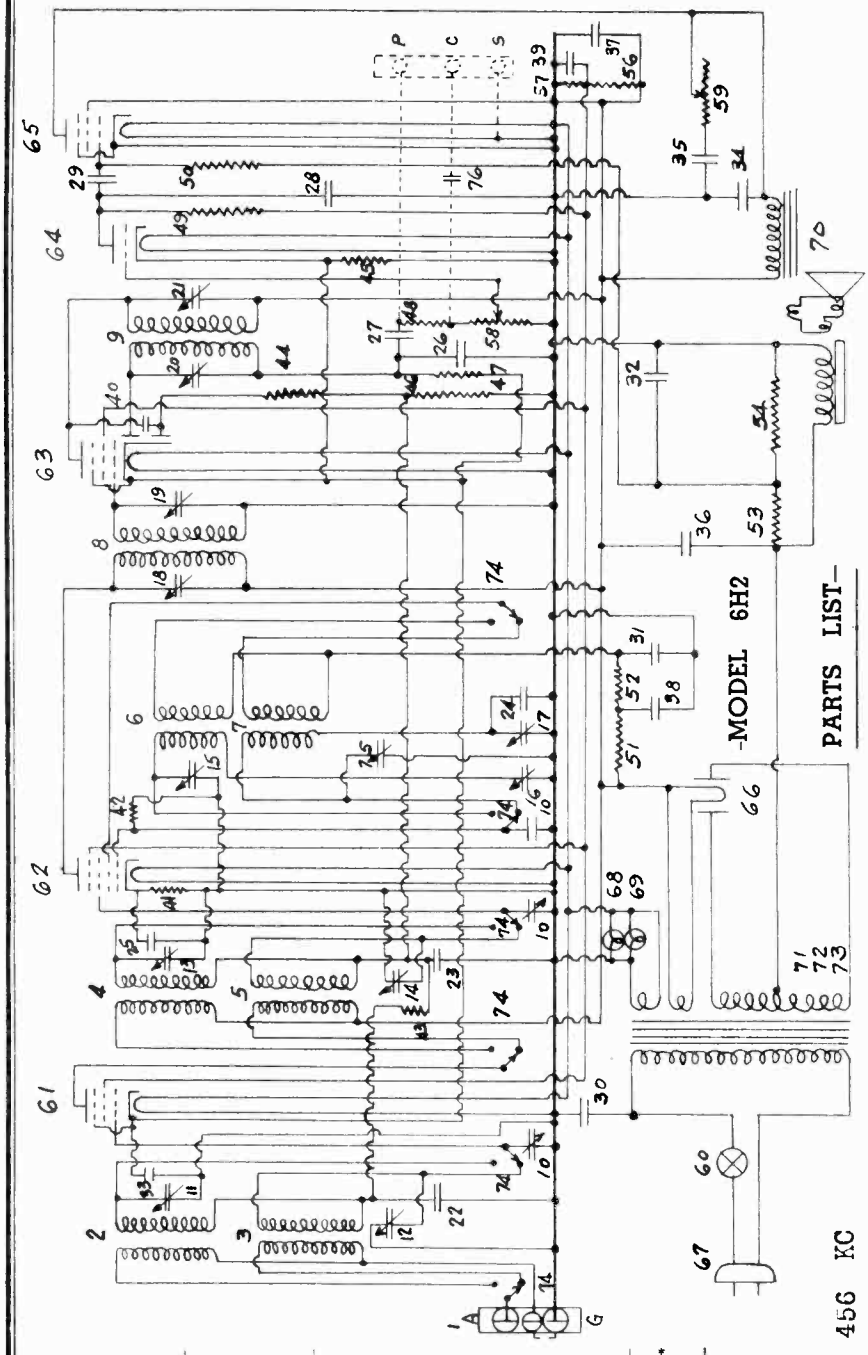


PARTS LIST

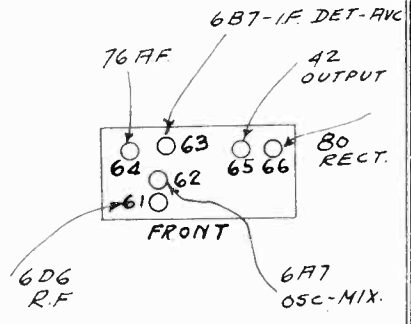
* Figures in 2nd last column refer to parts shown in wiring diagram of Model 6H2

Qty.	Part No.	Description	* Item	List Each
1	G3-32000	Antenna Coil (Low Freq.)	2	.45
1	G1-32002	Antenna Coil (High Freq.)	3	.50
1	G2-32001	R. F. Trans. Coil (L. F.)	4	.55
1	G1-32001	R. F. Trans. Coil (H. F.)	5	.65
1	G2-32002	Oscillator Coil (L. F.)	6	.40
1	G1-32002	Osc. Coil (H. F.)	7	.50
1	G9-32004	1st I. F. Trans. (With Trimmers)	8-18 19	1.60
1	G10-32004	2nd I. F. Trans. (With Trimmers)	9-20 21	1.60

Qty.	Part No.	Description	* Item	List Each
1	B30375A	Cable & Plug	67	.45
1	W28552	Level Control (Volume) (3 Megohms)	58	.75
2	G4-27134	Dial Light Brkt Assm.		.20
1	W25594B	Tone Control (80000 Ohm) & Line Switch	59-60	1.10

RESISTORS				
350 Ohms (Flexible)	41	.10		
40000 Ohms	42	.15		
500000 Ohms	43-48 50-53	.15	1	W29007C
3 Megohms	44-46	.15	1	W26194B
100 Ohms (Flexible)	45	.10	1	W30321
1 Megohm	47	.15	3	W32379
150000 Ohms	49	.15		
10000 Ohms	51	.15	1	W32304
7000 Ohms	52	.20	1	W30322A
120000 Ohms	54	.15		
8500-25000 Ohms	56-57	.55	1	W25537A
Knob		.10	1	W30805
Knob		.10	1	W32378
Speaker Cord (4 Lead)		.25	1	W24784
Dial Glass		.10	1	W25517
Dial Glass Retainer		.05	1	W27540
Escutcheon Gasket		.05		
Escutcheon Screws (.10 doz)		.05		

FILTER & BY-PASS CONDENSERS			
.8-.8-.8 Mfd. 450 V.-450 V.-250 V.	37-38	39	2.85
12 Mfd. 475 V.	36		1.25
1 Mfd. 160 V.	32		.55
0.02 Mfd. 200 V.	22-23	25	.15
0.0014 Mfd.	25	24	.30
0.00017-0.006 Mfd. 200 V.-200 V.	26-27	28-29	.30
0.001-0.03 Mfd. 400 V.-400 V.	30		.20
0.01 Mfd. 400 V.	31		.15
0.01 Mfd. 400 V.	33		.20
0.25 Mfd. 200 V.	34-35		.30
0.008-0.05 Mfd. 400 V.-400 V.	40		.15
0.0005 Mfd. 400 V.			



MODEL 72,72 LB (7H2)
Voltage,Data

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CHASSIS 7H2

General Description . . .

Chassis 7H2 is used in the Model 72 and 72 Lowboy. It is a seven-tube short wave and broadcast chassis employing the latest superheterodyne circuit, in which has been incorporated a high efficiency tuned radio frequency stage for both short wave and broadcast. The frequency ranges covered are 535 to 1750 Kc., which is the regular broadcast band and lower frequency police band, and 5700 to 15500 Kc. which is the short wave or high frequency band. The intermediate frequency is 456 Kc. Two stages of I. F. are used to assure adequate selectivity. A special friction type 80:1 drive is used to make tuning as smooth and easy as possible. Instead of the customary tuning knob, a special fishing-reel type of crank is provided so that the tuning can be spun quickly from one end of the dial to the other. With the high ratio drive employed, this would be quite laborious if a conventional knob were used for tuning.

Tubes Used and Their Function . . .

The tubes used are type 58 R. F. amplifier, type 2A7 oscillator modulator, type 58 first I. F. amplifier, type 58 second I.F. amplifier, type 2B7 diode detector and audio amplifier, type 2A5 output tube and type 80 rectifier. The tube voltages are shown in the table below:

Type	Where Used	Ef	Ep	Eg	Ek	Esg	Ep-osc.
58	RF	2.5	225	0	3	100	
2A7	Osc. Mod.	2.5	225	0	3	100	150
58	1st IF	2.5	225	0	4.5	100	
58	2nd IF	2.5	225	0	4.5	100	
2B7	Diode AF	2.5	50	0.5	0	22	
2A5	Output	2.5	215	2.0	0	225	
80	Rectifier	4.9	—	—	225	—	

Voltage Across Speaker Field, — 120.

All d. c. voltages are plus or minus ten percent. All voltages measured to chassis at 117.5 volt line with 1000 ohms per volt, 500-volt voltmeter. Power demand 75 watts at 110 volts 60-cycle.

Method of Biasing . . .

Referring to the circuit diagram attached, it will be seen that the bias for the first type 58 tube is obtained from the resistor, part No. 78, in the cathode circuit of this tube. Bias for the type 2A7 is obtained in a similar manner from cathode resistor, part No. 19. The oscillator section of the 2A7 obtains its bias, of course, from the grid leak and condenser combination, resistor 20 being for the broadcast or low frequency band and resistor 23 for the short wave or high frequency band. Bias for both I. F. tubes is obtained in the broadcast band from cathode resistor, part No. 34. In the high frequency band it is desired that the sensitivity of the set be improved, so bias resistor No. 31 is connected in shunt to resistor No. 34 so that the I. F. amplification is thereby increased when the set is switched to the short wave or high frequency band. The result of this circuit arrangement is that the set has substantially the same sensitivity in both broadcast and short wave bands, in spite of the fact that the radio frequency coils in the short wave band cannot possibly be as efficient as they are in the broadcast band. The next two tubes employ shunt instead of self biasing. Resistors 55, 56 and 57 form a voltage divider network connected across the speaker field, which also is the filter choke. The most negative point of this voltage divider network is the end of resistor 57 which connects to the speaker field, while the positive end of the network is that end of resistor 55 which connects to the type 2B7 and 2A5 cathodes. It will therefore be seen that the negative grid bias for the type 2B7 audio frequency amplifier section is obtained at the junction point between resistors 55 and 56. The voltage obtained at this point has some hum present and it is therefore necesary that it be fed through the hum filter resistor, part No. 43, and thence through the grid circuit completing resistor, part No. 41, to the type 2B7 grid. Bias for the output tube, type 2A5 is obtained at the junction point between resistors 56 and 57 and fed through the grid circuit completing resistor to the grid of the 2A5 output tube. It is therefore seen that the bias fed to the output tube is necessarily larger than that fed to the 2B7, since it is the drop across two resistors, while that fed to the 2B7 is the drop across only one resistor.

Automatic Volume Control Circuit . . .

Automatic volume control is developed in the diode circuit across volume control resistor, part No. 39. This voltage is picked off at the junction between resistor 38 and the volume control, part No. 39, and fed through isolating resistor, part No. 75, to the grid return circuit of the 2A7 tube. The same point is also fed to the grid return of the first type 58 I.F. amplifier. From this point there is connected an additional isolating resistor, part No. 27, and from there to the type 58 R.F. amplifier grid return. No automatic volume control is exerted on the second intermediate frequency amplifier type 58 tube because in so doing there is serious danger of introducing distortion.

Analysis of Signal Channel . . .

Starting with the antenna, the signal enters switch contact indicated as part No. 1, and depending on

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which position the switch happens to be in, flows either to the short wave antenna coil primary or to the broadcast antenna coil primary, parts No. 2 and No. 3 respectively. It is to be noted that a resistor, part No. 77, is connected across the broadcast antenna coil primary for the purpose of securing better alignment. The secondary of the antenna coil is tuned with a section of the gang condenser, part No. 14, and the signal is then impressed on the grid of the type 58 R.F. amplifier. The amplified output of the tube follows through the switch and into the primary of broadcast or high frequency interstage coil, depending on the switch position. The output of the secondary of the interstage coil is tuned with another section of the gang condenser, part No. 14, and fed to the control grid of the type 2A7 modulator oscillator tube. The oscillator section of this tube is automatically connected at the same time the switch is thrown so that the frequency of the oscillator is controlled by the third section of the gang condenser, part No. 14, so as to give a constant intermediate frequency of 456 Kc. in the plate circuit of the type 2A7 modulator oscillator. This intermediate frequency is now fed into the primary of the first I.F. transformer, part No. 29, and thence to the secondary of the same transformer. This transformer is tuned in both primary and secondary circuits to obtain maximum selectivity. The output of transformer No. 29 is fed to the first type 58 I.F. amplifier and the output of this tube then goes to the second I.F. transformer, part No. 33, which I.F. transformer is also double tuned. The signal then follows to the grid of the second type 58 I.F. amplifier whose output is in turn fed to the primary of a single tuned diode type I.F. transformer, part No. 35. The tuned secondary circuit of the diode transformer feeds the two diode plates of the type 2B7 connected in parallel. The diode resistor is a combination of part No. 38 and volume control No. 39 connected in series, but only that portion of the diode voltage developed across part No. 39 is used. The reason for this connection is that smoother action is obtained without regeneration. Both audio frequency and direct current are present across resistor No. 39 and, to separate out the direct current, condenser, part No. 40, is used to couple the audio frequency over to the grid of the type 2B7 audio frequency amplifier. Resistor No. 41 completes the grid circuit of this tube. The amplified audio frequency in the plate circuit of the 2B7 is fed through coupling condenser, part No. 47 into the grid of the type 2A5 output tube, which grid circuit is completed with resistor No. 48. The plate circuit of the output tube is connected to the speaker transformer in the customary manner. Condenser No. 50 is used to match the impedance of the output tube and speaker-more closely at higher audio friequencies, while condenser No. 51 and variable resistor No. 52 form the tone control.

Power Supply System . . .

The power supply system consists of a transformer, part No. 63, for 110-volt 60-cycle, part No. 64 for other uses, a rectifier tube type 80, the speaker field as a filter choke, wet electrolytic condenser, part No. 60, and dry electrolytic condenser, part No. 8. In this particular circuit the filter choke is included in the negative leg of the power supply system, because in so doing it is possible to use the drop across the filter choke for biasing, and eliminate the use of a large bypass condenser in the cathode of the output tube, type 2A5. At the same time better audio quality for the lower notes is obtained than with the ordinary bypass condenser circuit. The Universal transformer, part No. 64, is a special transformer originally developed for export use, but because of its enthusiastic reception it has been incorporated in this chassis. The primary of the transformer is equipped with four voltage taps clearly marked so that the set can be made to operate from 90 to 265 volts in four steps. The transformer operates on any frequency from 25 to 100 cycles.

Alignment Procedure . . .

To align the I.F. amplifier it is necessary that there be available a suitable modulated oscillator capable of adustment to 456 Kc. with good accuracy. This oscillator should have an attenuator so that the strength of the oscillator output can be regulated. Be sure that the band change switch is thrown to the low frequency or broadcast band position. Connect the high side of the output of the modulated oscillator, which has been adjusted to 456 Kc. to the control grid connection on the top of the 2A7 tube through an .02 Mfd. series condenser. The low side of the oscillator is to be connected to the receiver chassis. Set the output of the oscillator to a convenient level and adjust the I.F. transformer condensers for maximum signal output. The first and second I.F. transformer tuning condensers are located on the left-hand side of the chassis, while the diode tuning condenser is located under the chassis as indicated in the diagram attached. To make these adjustments. it is necessary that a standard ¼" (across flats) hexagon socket wrench be used for the adjustment nut. The wrench is preferably insulated. Always make this I.F. adjustment very carefully and go over the adjustments several times to be sure that the peak has been reached.

To align the receiver at broadcast frequency, it is necessary that an adjustable oscillator having frequencies of 1400 and 600 Kc., together with a suitable attenuator and dummy antenna be available. Set the oscillator at 1400 Kc. and connect the high side of the oscillator to the receiver antenna terminal through a .0002 (dummy antenna) condenser. Turn the tuning control of the receiver to 140 on the dial. Now adjust the oscillator broadcast shunt trimmer, indicated on the diagram as "oscillator trimmer condenser L.F. band" and located under the chassis, until the signal is heard best. Without changing the gang condenser setting, adjust the antenna and radio frequency broadcast trimmers, also located under the chassis and indicated in the diagram attached for maximum signal. It is necessary that these adjustments be gone over several times until no further improvement can be made. Always work with the weakest possible signal from the modulated oscillator for best accuracy. Now rotate the dial until it reads 60 and set the modulated oscillator to approximately 600 Kc. Adjust the modulated oscillator carefully until maximum response is heard. Now adjust the oscillator series trimmer for the low frequency band located under the chassis as shown in the diagram for maximum signal. It is sometimes advisable to move the main dial back and forth slightly about 60 on the dial during the course of this adustment if a still greater signal is obtainable.

MODEL 72,72 LB (7H2)
Alignment, Parts List

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To align the set in the high frequency or short wave band, it is necessary that a modulated oscillator be available for frequencies of 6000 and 15000 Kc. The procedure for this band is similar to the broadcast band, except that a 750 ohm midget carbon resistor is used for the dummy antenna instead of the .0002 condenser. Set the modulated oscillator to 15000 Kc. and the receiver dial to 15. Adjust the oscillator trimmer condenser under the chassis to maximum signal. Now adjust the antenna and interstage trimmers for maximum signal, making sure to go over the adjustment several times so that no further improvement can be made. Now set the modulated oscillator to approximately 6000 Kc. and the receiver to 6. Readjust the modulated oscillator slightly for maximum signal and then adjust the high frequency band oscillator series trimmer for best signal, making whatever slight readjustments in the tuning control are necessary to bring in maximum signal.

Tuning Receiver In High Frequency Band . . .

Due to the tremendously greater number of transmitter channels covered in the high frequency band, the receiver is endowed with a much greater apparent selectivity. For this reason, if the receiver is tuned carelessly, many high frequency stations will be missed or passed over without hearing them. It is very necessary that the receiver be tuned slowly and that extreme care be exercised in final adujstment of the receiver to the center of the carrier after a high frequency station is located and received.

INSTRUCTIONS FOR ORDERING—Give part number, description of part, and serial number of receiver on which part is to be used. If article wanted is not listed separately, then that part of complete assembly containing this article should be ordered. Goods shipped on open account to Crosley Wholesale Distributors only. Cash must accompany Dealer and Consumer orders. Prices are subject to the usual trade discounts, and are subject to change without notice.

PARTS LIST—MODEL 7H2

* Figures in 2nd last column refer to parts shown in wiring diagram of Model 7H2

Qty.	Part No.	Description	* Item	List Each	Qty.	Part No.	Description	* Item	List Ea
1	G1-32002	Antenna Coil (H. F.)	81	.50	3	B26009	Tube Shield (58 Tube)		.10
1	G3-32000	Antenna Coil (L. F.)	3	.45	2	W28632	Tube Shield (2A7-2B7)		.10
1	G1-32001	R. F. Coil (H. F.)	11	.65	1	B21491A	Cord & Plug	66	.50
1	G2-32001	R. F. Coil (L. F.)	12	.55					
1	G2-32002	Osc. Coil (L. F.)	16	.40			FILTER & BY-PASS CONDENSERS		
1	G1-32002	Osc. Coil (H. F.)	17	.50					
1	G1-32004	1st I. F. Trans.	29	.50	1	W26194B	12. Mfd. 475 V. Condenser	60	1.25
1	G1-32004	2nd I. F. Trans.	33	.50	1	W29097C	8.-8.-8. Mfd. 450 V.-450 V.-250 V. Condenser	8-9 10	2.85
1	G2-32004	3rd I. F. Trans. (Diode)	35	.50					
1	W31386	Coil Shield Bracket		.05	1	W32380	0.05 Mfd. 200 V. Condenser	18	.20
6	W25200	Coil Socket		.05	1	W25435	0.003 Mfd. 400 V.	24	.15
3	W30802	Coil Shield		.15	3	W24049	0.1 Mfd. 200 V.	30-42	
2	W25025A	Coil Shield		.10				44	.15
1	W25024A	Coil Shield		.10	1	W27932	0.0001 Mfd. 200 V.	37	.15
3	G1-24064	Coil Shield	29-33		1	W27216	0.05 Mfd. 200 V.	47	.15
			35	.15	1	W30321	1.0 Mfd. 160 V.	49	.55
6	W26891	Insulating Washer		.05	1	W31052	0.004-0.05 Mfd. 400 V.-400 V.	50-51	.30
3	W21541B	Retaining Ring	3-12		1	W30805	0.01 Mfd. 400 V.	62	.20
			16	.05	1	W32304	0.0014 Mfd.	74	.30
3	W30026	Retaining Ring	81-11		2	W28621	0.02 Mfd. 200 V.	83-85	.15
			17	.05	1	W28619	0.006 Mfd. 200 V.	84	.15
1	G1-33008	Ant. Tuning Condenser	86	.35	1	W32379	0.02 Mfd. 200 V.	6	.15
1	G1-33008	R. F. Tuning Condenser	87	.35					
1	G2-33000	Osc. Tuning Condenser	80	.30			RESISTORS		
1	G7-33006	I. F. Condenser	88-89	1.25	2	W25937	275 Ohm	19-78	.15
2	G6-33006	1st & 2nd I. F. Condensers	90-91	.90	1	W21237A	60000 Ohm	20	.15
1	G1-33005	3rd I. F. Condenser	92	.25	1	W21453	40000 Ohm	23	.15
1	G13-33002	Variable Tuning Condenser Gang	82	4.00	2	W21876	10000 Ohm	25-26	.15
					1	W21455	300000 Ohm	27	.15
1	G1-32086	Dial Drive Assm.		2.75	2	W22514	750 Ohm	31-34	.15
2	G4-27134	Dial Light Bracket Assm.	61	.20	2	W23403	150000 Ohm	38-56	.15
2	W32128A	Light Diffuser		.10	3	W21454	1 Megohm	41-43	
2	W32244	Light Diffuser Retainer		.05				57	.15
1	B32147A	7 Pole D. T. Switch	1	1.35	2	W23785	500000 Ohm	45-48	.15
1	W32062	Level (Volume) Control (1 Meg.)	39	.80	1	W21875	100000 Ohm	46	.15
					1	W22831	15000 Ohm	55	.15
1	W32063	Tone Control & Switch	52-53	1.20	1	W31361	7000-11000 Ohms	58-59	.45
1	G16-26719	Ant.-Gnd. Terminal	93	.15	1	W26577	3 Megohm	75	.15
1	G5-30745	Power Trans. 60 cy. 110 V.	63	3.75	1	W31094	4500 Ohm	77	.15
	G36-25669	Power Trans. 25 cy. 110-220 V.	64-65	9.00	1	W31007A	Speaker Cord (4 Lead)	76	.25
					3	W32352	Knob		.10
3	G24-27975	58 Socket	67-69		1	G1-32067	Crank Assm.		.50
			70	.10	1	W32127A	Dial Glass		.10
1	G56-27975	2A7 Socket	68	.10	1	W32126A	Dial Glass Retainer		.05
1	G46-27975	2B7 Socket	71	.10	1	B32125B	Escutcheon		1.00
1	G43-27975	2A5 Socket	72	.10	1	W23880A	Thumb Screw		.05
1	G6-27975	80 Socket	73	.10	1	B32172	Tube & Cond. Shield		.10
5	W21981	Tube Shield Base		.05	1	C32149	Bottom		.25

MODEL 72,72 LB (7H2)
Schematic, Trimmers
Socket Layout

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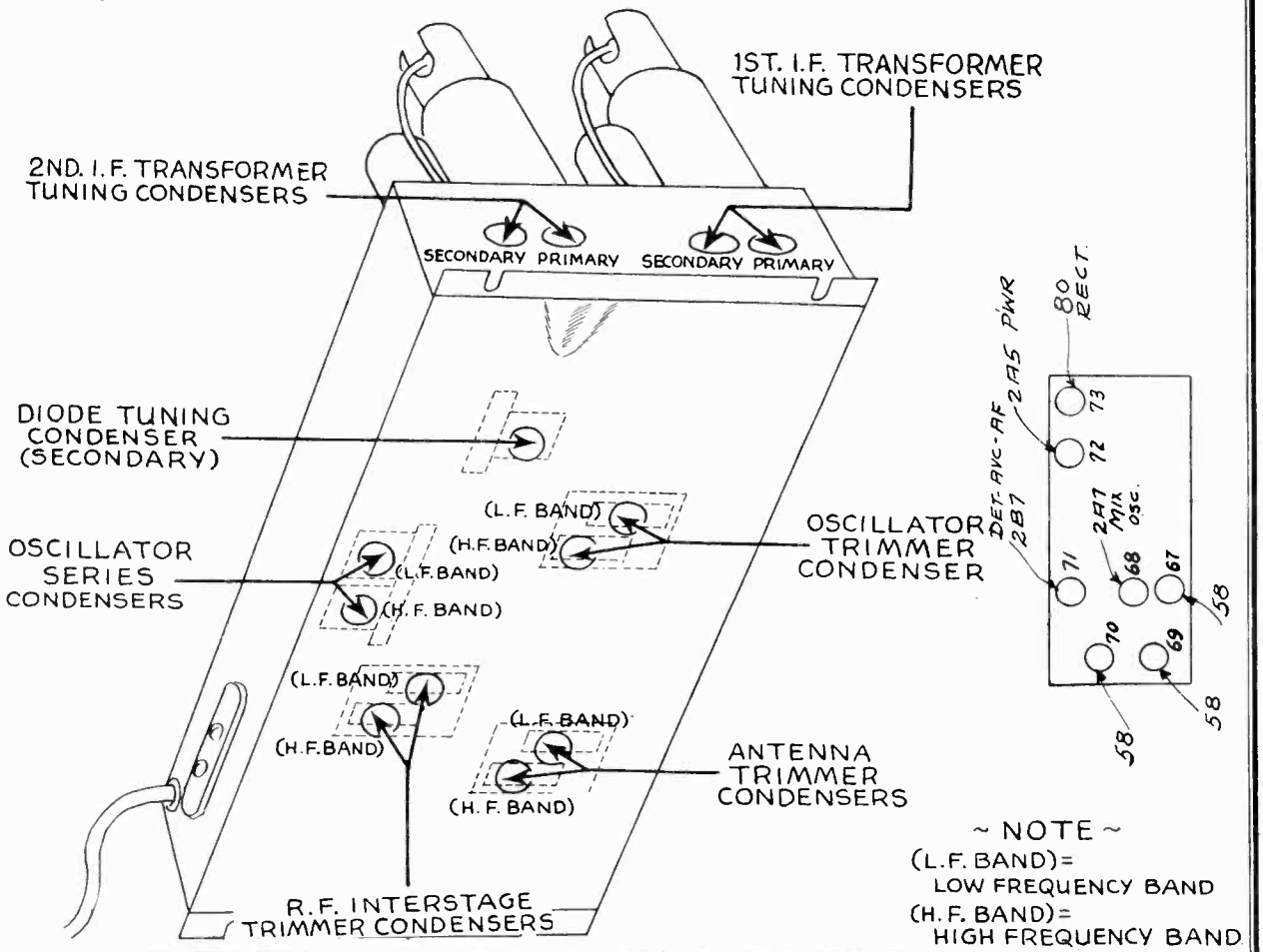
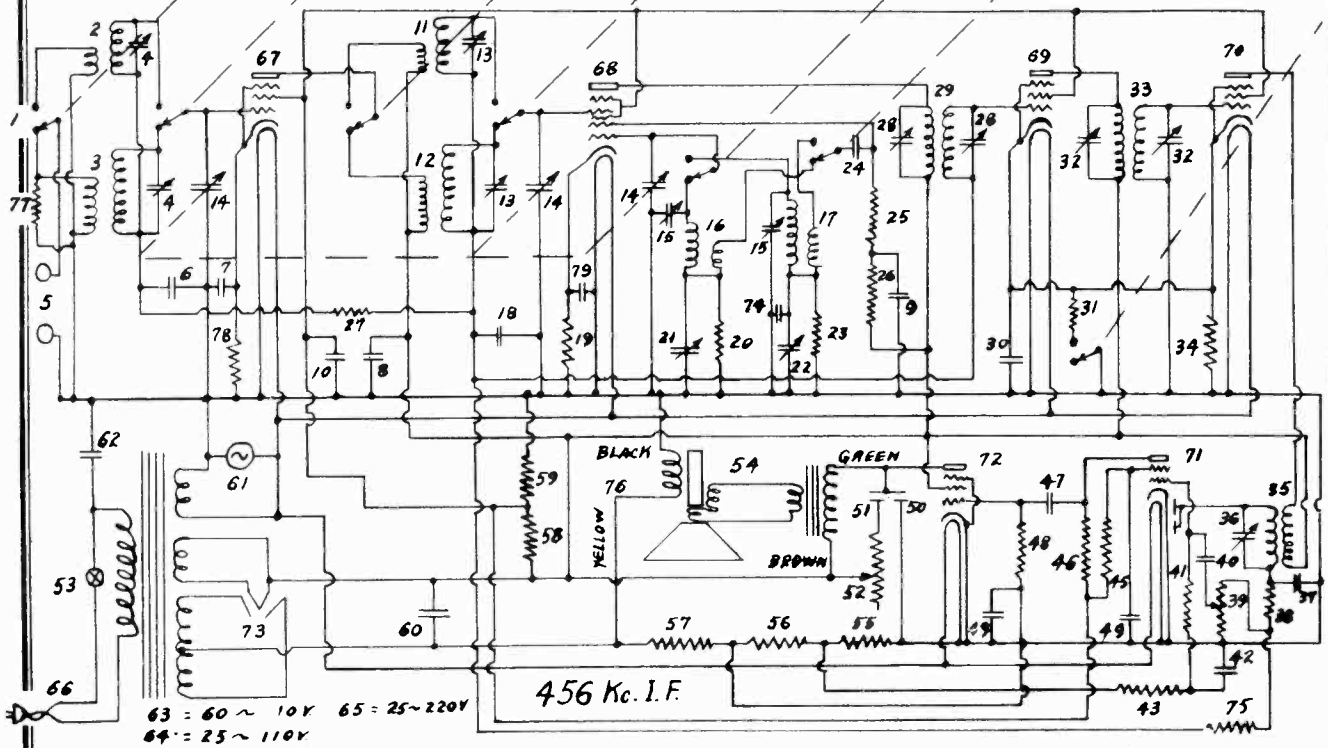


~ NOTE ~
(L.F. BAND)= LOW FREQUENCY BAND
(H.F. BAND)= HIGH FREQUENCY BAND



MODEL 72,72 LB (7H3)
Voltage, Data

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CHASSIS 7H3

General Description . . .

Chassis 7H3 is used in the Models 72 and 72 Lowboy. It is a 7-tube, short-wave and broadcast chassis, employing the latest superheterodyne circuit in which has been incorporated a high efficiency tuned radio frequency stage for both short wave and broadcast. The major difference bewteen chassis 7H3 and its predecessor, chassis 7H2, lies in the addition of a broad A.V.C. Circuit to chassis 7H3 and the further use of A.V.C. on the first audio amplifier. The frequency ranges covered are 535 to 1735 Kc., which is the regular broadcast band and the lower frequency police band, and 5700 to 15,500 Kc., which is the short wave or high frequency band. The intermediate frequency is 456 Kc. Two stages of I.F. are used to assure adequate selectivity. A special friction-type 80-1 drive is used to make tuning as smooth and easy as possible. Instead of the customary tuning knob, a special fishing reel type of crank is provided so that the tuning can be spun quickly from one end of the dial to the other. With the high ratio drive employed, this would be quite laborious if a conventional knob were used for tuning.

Tubes Used and Their Function . . .

The tubes used are—type 6D6 R.F. amplifier, type 6A7 oscillator modulator, type 6B7 first I.F. amplifier and AVC Diode, type 6D6 second I.F. amplifier, type 6F7 A.F. Diode and AVC A.F. amplifier, type 42 output, and type 80 rectifier. The tube voltages are shown in the table below:

Type	Where Used	Ef	Ep	Eg	Ek	Esg	Ep-Osc
6D6	R.F.	6.5	225	—	0	100	—
6A7	Osc.-Mod.	6.5	225	—	(10LF) (0HF)	100	150
6B7	1st I.F. & A.V.C. Diode	6.5	225	0.3	0	100	—
6D6	2nd I.F.	6.5	225	—	2.0	100	—
6F7	Diode & I.F.	6.5	30	.5	0	22	—
42	Output	6.5	215	2.0	0	225	—
80	Rectifier	4.9	—	—	225	—	—

105 volts across speaker field.

All DC voltages are plus or minus 10%. All DC voltages are measured to chassis at 117.5 volt line, with 1000 ohms per volt, 500 volt voltmeter. Power demand is 75 watts at 110 volts 60 cycles.

Method of Biasing . . .

Referring to the circuit diagram it will be seen that the 6D6 R.F. amplifier obtains its bias from the voltage drop across resistor 55. Resistors 55, 56 and 57 form a voltage divider network connected in shunt with the speaker field, which field is in the negative leg of the power supply system. The most positive point of the network is where resistor 55 is connected to chassis, and the most negative point on the network is where resistor 57 connects to the center tap on the power transformer secondary. The grid return of the 6D6 R.F. amplifier follows through isolating resistor part No. 27, and thence through a second group of resistors, parts Nos. 75, 78, 80, down to the junction point between resistors 55 and 56. The 6A7 input section obtains its bias through isolating resistor No. 7 and then through resistor 80 to the same point, namely the junction between resistors 55 and 56. The oscillator section of the 6A7 obtains its bias from the usual grid leak and condenser arrangement in which part No. 20 is the grid leak for the low frequency band and part No. 23 for the high frequency band. Bias for the 6B7 first amplifier, is obtained from the drop across resistor 55, while the bias for the 6D6 second I.F. amplifier is obtained at the same point but through resistors 75, 78 and 80. The 6F7 pentode section, which is used as an audio amplifier, obtains its fixed bias from resistor 55, but there is also a varying bias, depending on the signal strength applied due to the diode voltage drop across the level control, part No. 39. In this case, resistors 65 and 41 form a voltage divider network so that the diode voltage developed is split up in their ratio. The type 42 output tube obtains its bias from the combined drop across resistors 55 and 56 in series, this circuit being completed through grid resistor No. 48.

Automatic Volume Control Circuit . . .

Automatic Volume Control voltage is generated in the diode of the 6B7 first I.F. amplifier. This diode is fed from the second I.F. transformer and the A.V.C. voltage is developed across resistors 78 and 80, after the signal voltage has become sufficiently large to overcome the initial bias across resistor 55. Automatic volume control voltage is fed both forward and back in the circuit of this 7H3 receiver. The full voltage is fed to the 6D6 R.F. amplifier through isolating resistor 75 and 27, while that part of the voltage developed across resistor 80 only is fed through isolating resistor No. 7 to the 6A7 input grid. The 6B7 pentode section does not have any AVC exerted on it because if this were done some distortion might result. The 6D6 second I.F. amplifier has the full voltage exerted on it through isolating resistor 75. It will be noted that in this stage the AVC voltage is sent forward instead of back through the circuit. The first audio amplifier, type 6F7 also has AVC exerted on it. In this case, the grid and plate of the 6F7 triode section are used as a diode and diode voltage is developed across resistors 38 and 39 in series. Resistors 65 and 41 form a voltage divider network so that a portion of this diode voltage is fed onto the input grid of the 6F7 pentode section.

MODEL 72,72 LB (7H3)
Alignment, Data

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Analysis of Signal Channel . . .

The signal enters at the terminals A1, A2 and G. These three terminals are provided to permit the use of a doublet antenna with transposed lead-ins and no ground connection, if desired. With such an antenna the two lead-in wires are connected to A1 and A2, and the wire strapped between A2 and G is open-circuited. If it is desired to operate the receiver with simply a conventional antenna and ground, connect A2 and G together and to the ground wire. The conventional antenna is connected to the A1 terminal.

The signal flows either to the short wave antenna coil primary or to the broadcast antenna coil primary, parts No. 2 and No. 3 respectively. It is to be noted that a resistor, part No. 77, is connected across the broadcast antenna coil primary for the purpose of securing better alignment. The secondary of the antenna coil is tuned with a section of the gang condenser, part No. 14, and the signal is then impressed on the grid of the type 6D6 R. F. amplifier. The amplified output of the tube follows through the switch and into the primary of broadcast or high frequency interstage coil. The output of the secondary of the interstage coil is tuned with another section of the gang condenser, part No. 14, and fed to the control grid of the type 6A7 modulator oscillator tube. The oscillator section of this tube is automatically connected at the same time the switch is thrown so that the frequency of the oscillator is controlled by the third section of the gang condenser, part No. 14, so as to give a constant intermediate frequency of 456 Kc. in the plate circuit of the type 6A7 modulator oscillator. This intermediate frequency is now fed into the primary of the first I. F. transformer, part No. 29, and thence to the secondary of the same transformer. This transformer is tuned in both primary and secondary circuits to obtain maximum selectivity. The output of transformer No. 29 is fed to the type 6B7 first I. F. amplifier and the output of this tube then goes to the second I. F. transformer, part No. 33, which I. F. transformer is also double tuned. The signal then follows to the grid of the type 6D6 second I. F. amplifier whose output is in turn fed to the primary of a double tuned diode type I. F. transformer, part No. 35. The tuned secondary circuit of the diode transformer feeds the triode grid and plate of the type 6F7 connected in parallel. The diode resistor is a combination of part No. 38 and volume control No. 39 connected in series, but only that portion of the diode voltage developed across part No. 39 is used. The reason for this connection is that smoother action is obtained without regeneration. Both audio frequency and direct current are present across resistor No. 39. Condenser, part No. 40, is used to couple the audio frequency over to the pentode grid of the type 6F7 audio frequency amplifier. Resistor No. 41 completes the grid circuit of this tube. The amplified audio frequency in the plate circuit of the 6F7 is fed through coupling condenser, part No. 47 into the grid of the type 42 output tube, which grid circuit is completed with resistor No. 48. The plate circuit of the output tube is connected to the speaker transformer in the customary manner. Condenser No. 50 is used to match the impedance of the output tube and speaker more closely at higher audio frequencies, while condenser No. 51 and variable resistor No. 52 form the tone control.

Power Supply System . . .

The power supply system consists of a transformer, part No. 63, for 110-volt 60-cycle, part No. 64 for other uses, a rectifier tube type 80, the speaker field as a filter choke, wet electrolytic condenser, part No. 60, and dry electrolytic condenser, part No. 8. In this particular circuit the filter choke is included in the negative leg of the power supply system, because in so doing it is possible to use the drop across the filter choke for biasing, and eliminate the use of a large bypass condenser in the cathode of the output tube, type 42. At the same time better audio quality for the lower notes is obtained than with the ordinary bypass condenser circuit. The Universal transformer, part No. 64, is a special transformer originally developed for export use, but because of its enthusiastic reception it has been incorporated in this chassis. The primary of the transformer is equipped with four voltage taps clearly marked so that the set can be made to operate from 90 to 265 volts in four steps. The transformer operates on any frequency from 25 to 100 cycles.

Alignment Procedure . . .

To align the I. F. amplifier it is necessary that there be available a suitable modulated oscillator capable of adjustment to 456 Kc. with good accuracy. This oscillator should have an attenuator so that the strength of the oscillator output can be regulated. Be sure that the band change switch is thrown to the low frequency or broadcast band position. Connect the high side of the output of the modulated oscillator, which has been adjusted to 456 Kc. to the control grid connection on the top of the 6A7 tube through an .02 Mfd. series condenser. The low side of the oscillator is to be connected to the receiver chassis. Set the output of the oscillator to a convenient level and adjust the I. F. transformer condensers for maximum signal output. The first and second I. F. transformer tuning condensers are located on the left-hand side of the chassis, while the diode transformer tuning condensers are located on the top of the tall I. F. transformer as indicated in the diagram attached. To make these adjustments, it is necessary that a standard ¼" (across flats) hexagon socket wrench be used for the adjustment nuts and a small screw driver for the slot. The tools are preferably insulated. Always make these I. F. adjustments very carefully and go over the adjustments several times to be sure that the peak has been reached.

To align the receiver at broadcast frequency, it is necessary that an adjustable oscillator having frequencies of 1400 and 600 Kc., together with a suitable attenuator and dummy antenna be available. Set the oscillator at 1400 Kc. and connect the high side of the oscillator to the A1 receiver antenna terminal through a .0002 (dummy antenna) condenser. Be sure that there is a connection between A2 and G. Turn the tuning control of the receiver to 140 on the dial. Now adjust the oscillator broadcast shunt trimmer, indicated on the diagram as "oscillator trimmer condenser L. F. band" and located under the chassis, until the signal is heard best. Without changing the gang condenser setting, adjust the antenna and radio frequency broadcast trimmers, also located under the chassis and indicated in the diagram attached for maximum signal. It is necessary that these adjustments be gone over several times until no further improvement can be made. Always work with the weakest possible signal from the modulated oscillator for best accuracy. Now rotate the dial until it reads 60 and set the modulated oscillator to approximately 600 Kc. Adjust the modulated oscillator carefully until maximum response is heard. Now adjust the oscillator series trimmer for the low frequency band located

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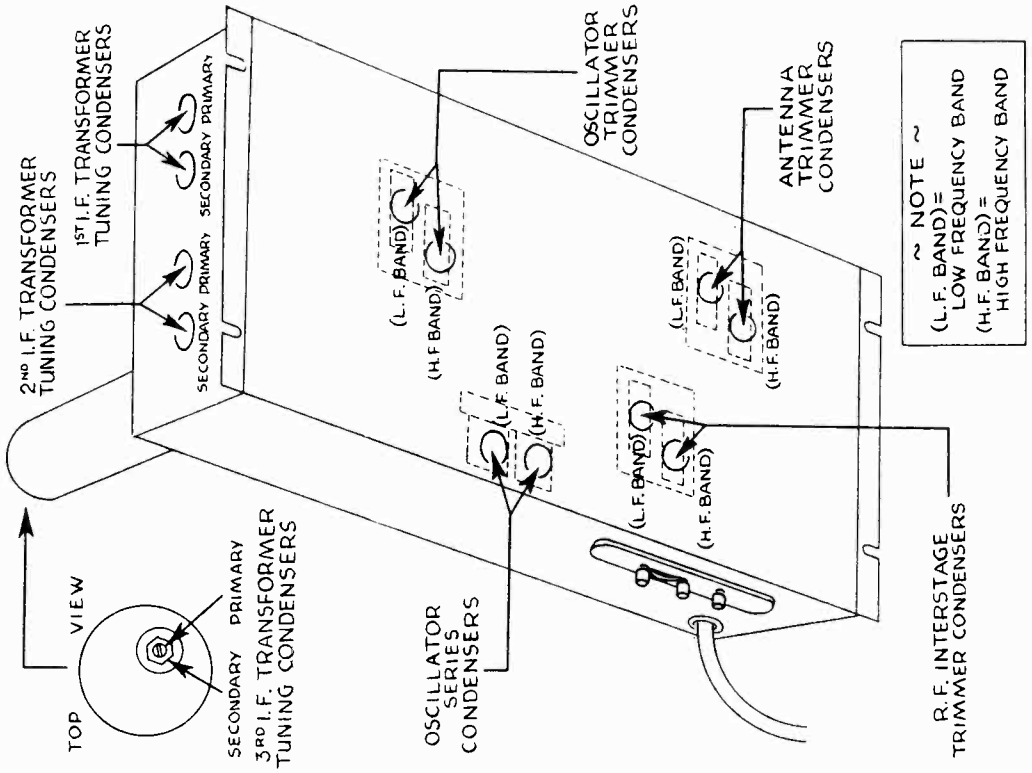
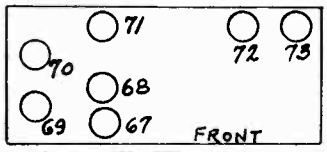
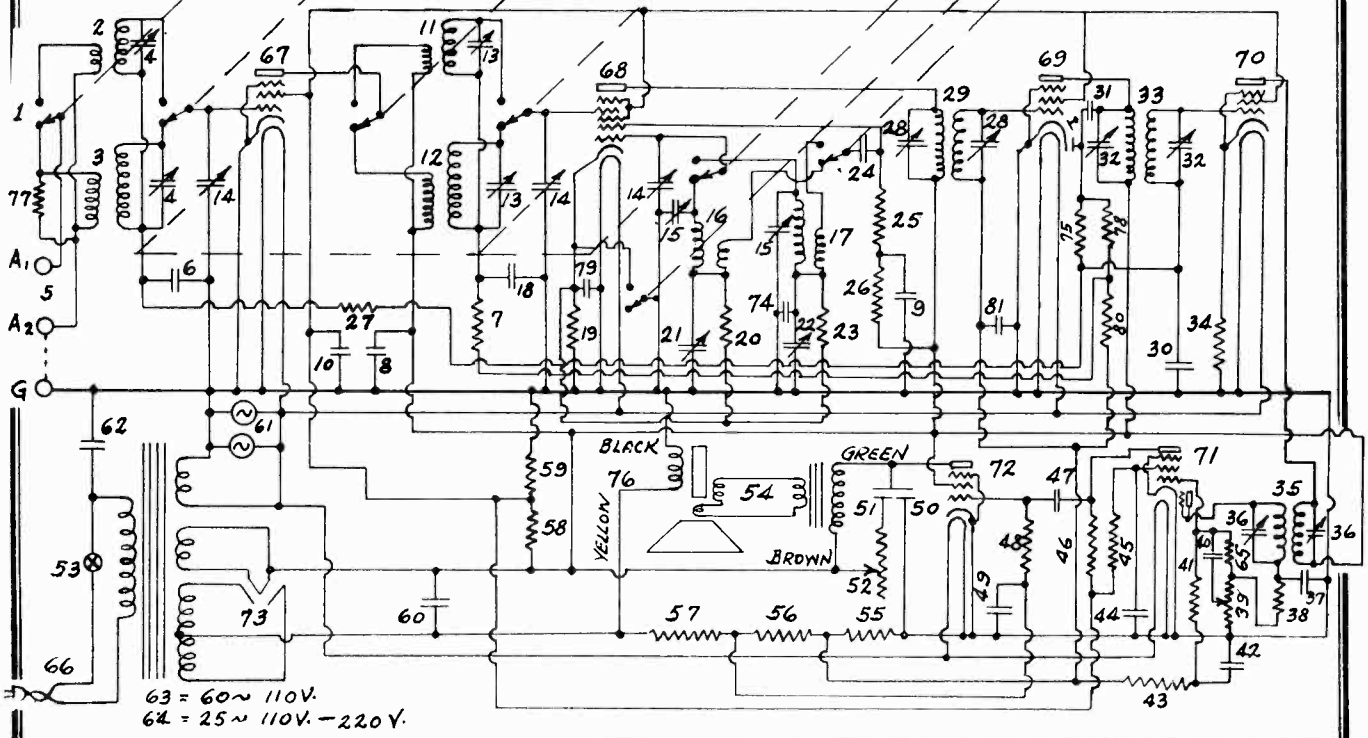
MODEL 72,72 LB (7H3)
Schematic, Trimmers
Socket Layout





456 Kc. I.F.

67- 6D6
68- 6A7 OSC.
69- 6B7 I.F. AND DIODE
70- 6D6
71- DIODE AND 1ST A.F.
72- 42 OUTPUT
73- 80 RECTIFIER



MODEL 72,72 LB (7H3)
Parts List

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under the chassis as shown in the diagram for maximum signal. It is sometimes advisable to move the main dial back and forth slightly about 60 on the dial during the course of this adjustment if a still greater signal is obtainable.

To align the set in the high frequency or short wave band, it is necessary that a modulated oscillator be available for frequencies of 6000 and 15000 Kc. The procedure for this band is similar to the broadcast band, except that a 750 ohm midget carbon resistor is used for the dummy antenna instead of the .0002 condenser. Set the modulated oscillator to 15000 Kc. and the receiver dial to 15. Adjust the oscillator trimmer condenser under the chassis to maximum signal. Now adjust the antenna and interstage trimmers for maximum signal, making sure to go over the adjustment several times so that no further improvement can be made. Now set the modulated oscillator to approximately 6000 Kc. and the receiver to 6. Readjust the modulated oscillator slightly for maximum signal and then adjust the high frequency band oscillator series trimmers for best signal, making whatever slight readjustments in the tuning control are necessary to bring in maximum signal.

Tuning Receiver In High Frequency Band . . .

Due to the tremendously greater number of transmitter channels covered in the high frequency band, the receiver is endowed with a much greater apparent selectivity. For this reason, if the receiver is tuned carelessly, many high frequency stations will be missed or passed over without hearing them. It is very necessary that the receiver be tuned slowly and that extreme care be exercised in final adjustment of the receiver to the center of the carrier after a high frequency station is located and receiver.

PARTS LIST—MODEL 7H3

* Figures in 2nd last column refer to parts shown in wiring diagram of Model 7H3

Qty.	Part No.	Description	* Item	List Each
1	G1-32002	Antenna Coil (H. F.)	2	.50
1	G3-32000	Antenna Coil (L. F.)	3	.45
1	G1-32001	R. F. Coil (H. F.)	11	.65
1	G2-32001	R. F. Coil (L. F.)	12	.55
1	G2-32002	Osc. Coil (L. F.)	16	.40
1	G1-32002	Osc. Coil (H. F.)	17	.50
1	G1-32004	1st I. F. Trans.	29	.50
1	G1-32004	2nd I. F. Trans.	33	.50
1	G6-32004	3rd I. F. Trans. (Diode) & Trimmer Condensers	35-36	1.90
1	W31386	Coil Shield Bracket		.05
6	W25200	Coil Sockets		.05
3	W30802	Coil Shield		.15
2	W25025A	Coil Shield		.10
1	W25024A	Coil Shield		.10
2	G1-24064	Coil Shield	29-33	.15
5	W26891	Insulating Washer		.05
3	W21541B	Retaining Ring	3-12-16	.05
3	W30026	Retaining Ring	11-2-17	.05
1	G1-33008	Ant. Trimmer Condenser	4	.35
1	G1-33008	R. F. Trimmer Condenser	13	.35
1	G14-33009	Osc. Trimmer Condenser	15	.30
1	G12-33006	L. F. & H. F. Osc. Trimmer Cond. (Series)	21-22	1.00
1	G6-33006	1st I. F. Trimmer Cond.	28	.90
1	G6-33006	2nd I. F. Trimmer Cond.	32	.90
1	G18-33002	Variable Tuning Condenser Gang	14	4.00
1	G1-32086	Dial Drive Assm.		2.75
2	G4-27134	Dial Light Brkt Assm.	61	.20
2	W32128A	Light Diffuser		.10
2	W32244	Light Diffuser Retainer		.05
2	G75-27975	6D6 Socket (R. F. & 2nd I. F.)	67-70	.10
1	G47-27975	6A7 Socket (Osc.)	68	.10
1	G48-27975	6B7 Socket (I. F. & Diode)	69	.10
1	G49-27975	6F7 Socket (Diode & 1st A. F.	71	.10
1	G25-27975	42 Socket (Output)	72	.10
1	G6-27975	80 Socket (Rectifier)	73	.10
5	W27981	Tube Shield Base		.05
3	W28632	Tube Shield (6A7-6B7-6F7)		.10
2	B26009	Tube Shield (6D6 Tube)		.10
1	G9-30745	Power Transformer 60 cy. 110 V.	63	4.25
	G39-25669	Power Transformer 25 cy. 110-220 V.	64	9.00
1	B32147A	7 P. D. T. Switch	1	1.35
1	G16-26719	Ant.-Gnd. Terminal	5	.15
1	W32062	Level Control (Volume) 1 Megohm	39	.80
1	W32063	Tone Control & Line Switch	52-53	1.20
1	B21491A	Cord & Plug	66	.50

FILTER & BY-PASS CONDENSERS

1	W29097C	8.-8.-8. Mfd. 450 V.-450 V.-250 V.	8-9	
			10	2.85
1	W26194B	12. Mfd. 475 V.	60	1.25
1	W30321	1. Mfd. 160 V.	49	.55
1	W32379	0.02 Mfd. 200 V.	6	.15
1	W32380	0.05 Mfd. 200 V.	18	.20
1	W25435	0.003 Mfd. 400 V.	24	.15
2	W27216	0.05 Mfd. 200 V.	30-47	.15
1	W31937	0.0001 Mfd.	31	.15
1	W27932	0.0001 Mfd. 200 V.	37	.15
1	W28619	0.006 Mfd. 200 V.	40	.15
2	W24049	0.1 Mfd. 200 V.	42-44	.15
1	W31052	0.004-0.05 Mfd. 400 V.-400 V.	50-51	.30
1	W30805	0.01 Mfd. 400 V.	62	.20
1	W32304	0.0014 Mfd.	74	.30

RESISTORS

3	26577	3 Megohm	7-41-75	.15
1	W27503	1400 Ohm	19	.10
1	21237A	60000 Ohm	20	.15
1	21453	40000 Ohm	23	.15
1	21876	10000 Ohm	25-26	.15
1	21455	300000 Ohm	27	.15
1	W25937	275 Ohm	34	.15
1	23403	150000 Ohm	38	.15
3	21454	1 Megohm	43-57	
			78	.15
2	23785	500000 Ohm	45-48	.15
1	21875	100000 Ohms	46	.15
1	33390	30000 Ohms	55	.15
1	23403	150000 Ohms	56	.15
1	W31361	7000-11000 Ohms	58-59	.40
1	26578	5 Megohm	65	.15
1	31094	4500 Ohms	77	.15
1	W31007A	Speaker Cord	76	.25
1	W32127A	Dial Glass		.10
1	W32126A	Dial Glass Retainer		.05
1	B32125B	Escutcheon		1.00
3	W32352	Knob		.10
1	G1-32067	Crank Assm.		.50
1	B32172	Tube & Cond. Shield		.10
1	W23880A	Thumb Screw		.05
1	C32149	Bottom		.25

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TECHNICAL DATA PERTAINING TO CHASSIS 8H1

General Description . . .

Chassis 8H1 is used in the Model 80-AW and Model 80-AW Lowboy. It is an 8-tube all-wave receiver, covering the band of 540-24000 Kc., in four steps. Other features are an 80 to 1 ratio drive mechanism with special fishing reel type of control, airplane type dial, push-pull pentode output, doublet antenna terminals, and tone control. Two stages of double-tuned I. F. amplification, making a total of six tuned I. F. circuits are used to insure adequate selectivity. A tuned radio frequency stage is used in all frequency bands. The automatic volume control is of the broad type to obtain smoothest possible operation.

Tubes Used and Their Function . . .

The tubes used are type 6D6 R. F. amplifier, type 6A7 oscillator modulator, type 6D6 first I. F. amplifier, type 6B7, second I. F. amplifier, AVC diode and AF diode, type 6F7 first AF pentode amplifier, and triode phase inverter, two type 42 push-pull output and type 80 rectifier. The normal tube voltages are as indicated in the table below:

Type	Where Used	Ef	Ep	Eg	Ek SW-BC	Esg	Epx	Egx
6D6	R.F.	6.3	250	0	3	100	—	—
6A7	Osc.-Mod.	6.3	250	0	3	100	220	0 to −10
6D6	1st I. F.	6.3	250	0	7-21	100	—	—
6B7	2nd I. F. and Diode	6.3	250	0	3	100	—	—
6F7	A.F. and Phase Inv.	6.3	140	0	4	35	70	0
42	Output	6.3	240	0	16	250	—	—
80	Rectifier	5.0	—	—	350	—	—	—

All voltages are plus or minus 10%. All DC voltages are measured with 117 5 volts AC line and with a 500-volt 1000-ohms-per-volt DC voltmeter. Power demand is 100 watts.

Method of Biasing . . .

The type 6D6 R. F. amplifier obtains its normal bias from the cathode resistor, part No. 39. The bias for the input section of the 6A7 oscillator modulator is obtained from the cathode resistor, part No. 40. The oscillator bias is obtained from the grid leak and condenser combination in which part No. 29 is the grid leak and part 50 the grid condenser. The type 6D6 first I. F. amplifier obtains its bias from the cathode resistor, part No. 41, for all bands except No. 4, the broadcast band. When the switch is thrown to the band No. 4 position, auxiliary resistor, part No. 95, is inserted in series with part No. 41. It is the purpose of this auxilary resistor to reduce the gain of the receiver at broadcast frequencies, because if full sensitivity were used the receiver would be entirely too sensitive in the broadcast band. The bias for the 6B7 second I. F. amplifier input section, is obtained from the cathode resistor, part No. 42, which resistor also furnishes the delay voltage for the AVC system. The variable mu pentode AF amplifier and phase inverter, type 6F7, obtains its bias from resistor No. 36, while the output tubes obtain their bias from the resistor No. 43.

Automatic Volume Control Circuit . . .

The automatic volume control diode in the 6B7 is fed from the plate of this tube through coupling condenser, part No. 51. Diode voltage is developed across resistors 32 and 33 after the signal has become sufficiently strong to overcome the initial bias generated in resistor 42. The voltage across resistor 32 is that part which is used for AVC purposes. Following the circuit diagram, it will be seen that the AVC voltage flows through isolating resistor No. 27 to the grid return of the high frequency interstage coil, part No. 8, and then to the input grid of the 6A7 oscillator modulator. In the other three bands, the AVC voltage is fed through the additional isolating resistor, part No. 26, to the grid return and then to the input grid of the 6A7. AVC voltage is also fed from resistor 27 through isolating resistor 24 to the grid return of the highest frequency antenna coil, part No. 4, and then to the grid of the 6D6 R. F. amplifier. For the other bands the AVC voltage is fed through additional resistor 25 to the grid returns. At this point AVC voltage is also fed to the grid return of the 6D6 first I. F. amplifier. This receiver also has AVC on the audio system, but this AVC voltage is obtained from the audio diode, which diode is also in the 6B7 tube. In this case, the diode is fed from the secondary of the last I. F. transformer, part No. 20, and diode voltage is developed across resistors 28, 46 and 34 in series. That portion across resistors 34 and 46 is fed to the input grid of the pentode section of the 6F7 tube. This voltage will vary in magnitude, depending on the setting of the level control, part No. 46, but there is always a residual amount which is that voltage developed across resistor 34.

Analysis of Signal Channel . . .

The signal enters at the terminals A1, A2 and G. These three terminals are provided so that it is possible to use either a doublet or a conventional type of antenna with the receiver. When a doublet antenna is used, connect the two lead-in wires to A1 and A2 respectively, and a ground may or may not be connected to the G terminal, as desired. With this connection it is important that the strap between A2 and G termin-

als be removed. In using a conventional type of antenna be sure that the strap is connected between terminals A2 and G. Connect the ground wire to either the A2 or G terminal and the antenna wire to the A1 terminal.

The path of the signal then depends on the position of switch No. 14. It will be seen that the signal may be made to enter antenna coil primaries, part Nos. 1, 2, 3 and 4, for bands Nos. 4, 3, 2 and 1, respectively. The shunting resistor, part No. 23, across the broadcast antenna coil primary is for the purpose of producing better alignment. Each secondary is provided with a trimmer condenser, and the output of the secondary goes through the section of the switch indicated in the wiring diagram just above the gang condenser, part No. 13. The remaining coils not in use are short circuited by another section of the switch. It will also be seen that still another section of the switch is used to insert an additional bias resistor, part No. 95, in series, with part No. 41, so that the receiver operates with higher bias on the I. F. amplifier, type 6D6, when the switch is thrown to the broadcast band No. 4. After tuning with a section of the gang condenser, part No. 13, the signal is impressed on the grid of the 6D6 R. F. amplifier and the amplified output of this tube then goes through another section of switch 14 to the primaries of the interstage coils designated as parts 5, 6, 7 and 8. Separate trimmer condensers are there provided for each of the secondaries and the signal flows through switch 14 to the grid of the 6A7 oscillator modulator tube after tuning with a section of the gang condenser, part No. 13. An additional section of the band change switch is used to short-circuit the coils not in use. The oscillator coils are designated as parts 9, 10, 11 and 12 respectively, they being provided with separate shunt trimmers for all bands and separate series trimmers for tracking in all bands except the highest frequency band No. 1, in which case the series condenser is fixed. Both the primary and secondary of the oscillator coils are switched with separate sections of the band change switch, and the unused secondaries are short-circuited with another section. In the 6A7 oscillator modulator the signal is converted into the I. F. frequency of 456 Kc., and then fed to the primary of the first I. F. transformer, part No. 18. Here it is double-tuned and fed to the grid of the first I. F. amplifier, type 6D6. The output of this tube goes to the second double-tuned I. F. transformer, No. 19, and then to the grid of the second I. F. amplifier, type 6B7. The output transformer for this tube, part No. 20, is double tuned. The voltage developed across the primary of this transformer is fed to one of the diodes through coupling condenser part No. 51 for AVC purposes. In this way the AVC channel is not quite as sharp as the signal channel and a very desirable stabilizing effect is produced. The tuned secondary output is fed to the other diode in the 6B7 tube and diode voltage is developed across the series combination of resistors 28, 46 and 34, of which part No. 46 is the level control. Since resistor 34 is bypassed there is no audio or intermediate frequency present across this resistor, it being used only for the purpose of furnishing a residual bias to the AF amplifier section of the 6F7 tube. To insure stability, that portion of the voltage across resistor 28 is not used. The audio voltage across part No. 46, however, is fed directly to the grid of the 6F7 pentode section. The audio frequency voltage is amplified and the amplified output of the 6F7 pentode section is present across resistor 35. It is fed through coupling condenser 64 to the grid of one of the type 42 output tubes. The grid circuit of this tube is completed through resistors 38 and 31 in series but that portion of the audio frequency voltage present across resistor 31 only is fed to the triode section of the 6F7. The output of this triode section is present across resistor 37. The characteristics of the tube and circuit constant are so adjusted that the voltage across resistor 35 and the voltage across resistor 37 are equal to each other but 180 degrees out of phase, so that when the output of the triode section is fed to the grid of the second push-pull output type 42 amplifier, which grid circuit is completed through resistor 38, the output stage functions as a normal push-pull amplifier. The power output of the type 42 tubes is fed to the speaker transformer in the speaker assembly, part No. 77, in the conventional manner. Condenser 66 across the plates of the two output tubes serves to keep the impedance more constant at all frequencies, while the combination of rheostat 47 and condensers 65 and 92 make up the tone control.

Power Supply System . . .

The power supply system is made up of a power transformer, part No. 80, for 110-volt 60-cycle, and part No. 81 for other voltages and frequencies, a type 80 rectifier tube, first filter condenser part No. 67, filter choke part No. 79, second filter condenser part No. 68, second filter choke made up of the speaker field in assembly 77 and the third filter condenser part No. 69. This power supply system is conventional and requires no further explanation.

Alignment Procedure . . .

To align the I. F. amplifier it is necessary that there be available a suitable modulated oscillator capable of adjustment to 456 Kc. with good accuracy. This oscillator should have an attenuator so that the strength of the oscillator output can be regulated. Be sure that the band change switch is thrown to the high frequency or No. 1 band position. Connect the high side of the output of the modulated oscillator, which has been adjusted to 456 Kc. to the control grid connection on the top of the 6A7 tube through an .02 Mfd. series condenser. The low side of the oscillator is to be connected to the receiver chassis. Set the output of the oscillator to a convenient level and adjust the I. F. transformer condensers for maximum signal output. These I. F. transformer condensers are accessible on the top of the three tall I. F. transformer cans. To make these adjustments it is necessary that a standard 5/16" (across flats) hexagon socket wrench be used for the upper condensers, and a small screwdriver fitting inside of the nut hole for the adjustment of the lower condenser. Always make these I. F. adjustments very carefully and go over them several times to be sure that the peak has been reached.

To align the receiver at broadcast frequencies, it is necessary that an adjustable oscillator having the frequencies of 1400 and 600 Kc. together with a suitable attenuator and dummy antenna be available. Set the oscillator at 1400 Kc. and connect the high side of the oscillator to the receiver antenna terminal through a .0002 (dummy antenna) condenser. Turn the tuning control of the receiver to 140 on the dial and throw the band change switch to range No. 4. Now adjust the oscillator broadcast shunt trimmer on the end of the coil assembly in the topmost front position as indicated on the diagram until the signal is heard best. Without changing the gang condenser setting, adjust the antenna and radio frequency broadcast trimmers in this same top row for maximum signal. Sometimes it is advisable to readjust the dial slightly because the oscilla-

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tor is somewhat affected by the R. F. adjustment. It is necessary that these adjustments be gone over several times until no further improvement can be made. Always work with the weakest possible signal from the modulated oscillator for best accuracy. Now rotate the dial until it reads 60 and set the modulated oscillator to approximately 600 Kc. Adjust the modulated oscillator carefully until maximum response is heard. Now adjust the oscillator series trimmer condenser for the broadcast band, located in the third hole from the front on the chassis end flange, indicated in the diagram, until maximum response is heard. It is sometimes advisable to move the main dial back and forth slightly about 60 on the dial during the course of this adjustment if a still greater signal is obtainable.

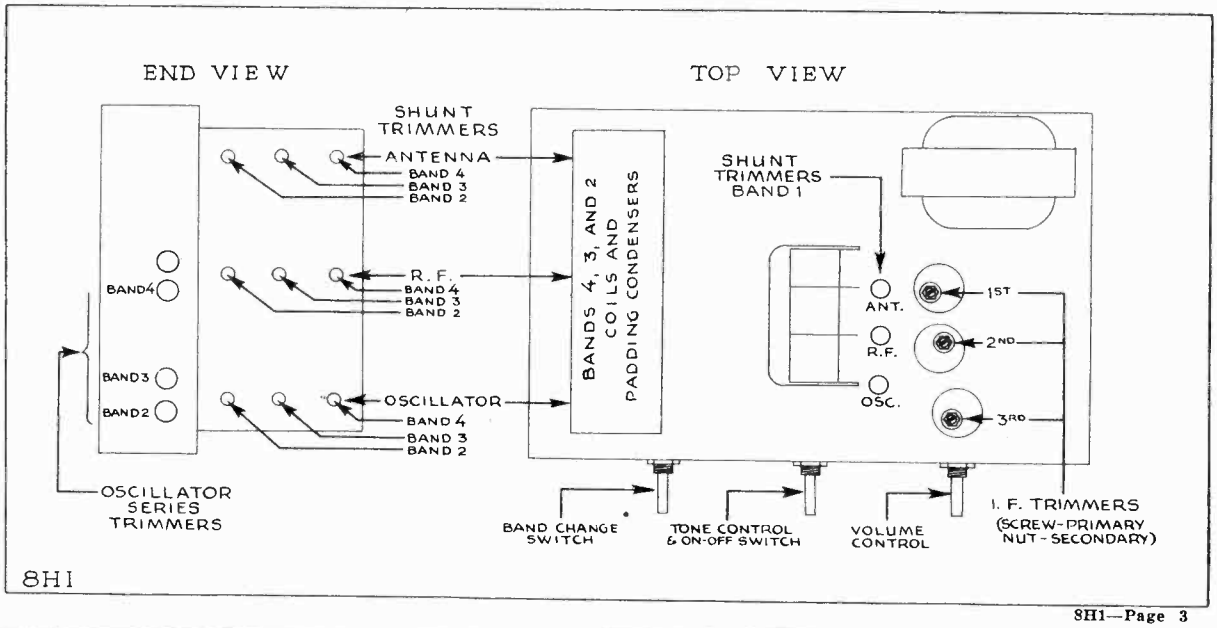
The same procedure is used for the remaining three bands except that the dummy antenna condenser is replaced by a 750-ohm midget carbon resistor. The shunt padding condensers for band No. 3 are located in the middle row on the end of the coil assembly, while the series padding condenser for band No. 3 is the second from the front on the receiver end flange. To align the receiver in band No. 3 it is necessary that a modulated oscillator and suitable attenuator be available, with frequencies of 1700 and 4000 Kc. Set the dial at 4 and the modulated oscillator to 4000 Kc. Adjust the oscillator shunt trimmer, which is the front condenser on the coil shield assembly in the middle row for maximum signal. Then adjust the remaining two condensers in the middle row for maximum signal, making what slight adjustments may be necessary if the oscillator is slightly detuned by the R. F. adjustment. Then set the modulated oscillator to approximately 1700 Kc., and the receiver dial to 1.7. Adjust the modulated oscillator slightly until the signal is heard best and then adjust the oscillator series trimmer located on the receiver end flange (the second from the front) for maximum signal. Make whatever slight readjustments are necessary in the dial to bring this signal in best.

To align the receiver in band No. 2, the bottom row of trimmer condensers on the coil shield assembly are used. An oscillator capable of adjustment to 4500 and 10,000 Kc. is necessary. Set the oscillator at approximately 10,000 and the receiver dial to 10. Adjust the oscillator shunt trimmer condenser, which is the front condenser in the lower row, for maximum signal. Then adjust the remaining two condensers in the lower row, making whatever slight readjustment of the dial is necessary to bring the signal in best. Set the dial of the receiver to 4.5 and the modulated oscillator to 4500 Kc. Now adjust the oscillator series trimmer condenser for this band, which is the frontmost one on the receiver on the chassis end flange, for maximum signal, making whatever slight dial readjustments are necessary.

The aligning condensers for band No. 1 are located directly under and to the right of the gang condenser. To align the receiver in this band, it is necessary that a modulated oscillator and attenuator for a frequency of 22,000 Kc. be available. Set the modulated oscillator to 22,000 Kc. and the receiver dial to 22. Adjust the oscillator shunt trimmer, which is the frontmost of the three trimmer condensers available from the top of the chassis, for maximum signal. Now adjust the remaining two trimmer condensers also available from the top of the chassis, and make whatever slight dial adjustments are necessary to bring the signal in best. There is no series trimmer condenser for this band but the alignment may be checked by setting the modulated oscillator to approximately 11,000 Kc. and tuning it in on the receiver dial. It should come in at about 11 on the dial.

Tuning Receiver In High Frequency Band . . .

Due to the tremendously greater number of transmitter channels covered in the high frequency band, the receiver is endowed with a much greater apparent selectivity. For this reason, if the receiver is tuned carelessly, many high frequency stations will be missed or passed over without hearing them. It is very necessary that the receiver be tuned slowly and that extreme care be exercised in final adjustment of the receiver to the center of the carrier after a high frequency station is located and received.



MODEL 8OAW, 8OAW LB
Schematic (8H1)
Socket Layout
Parts List

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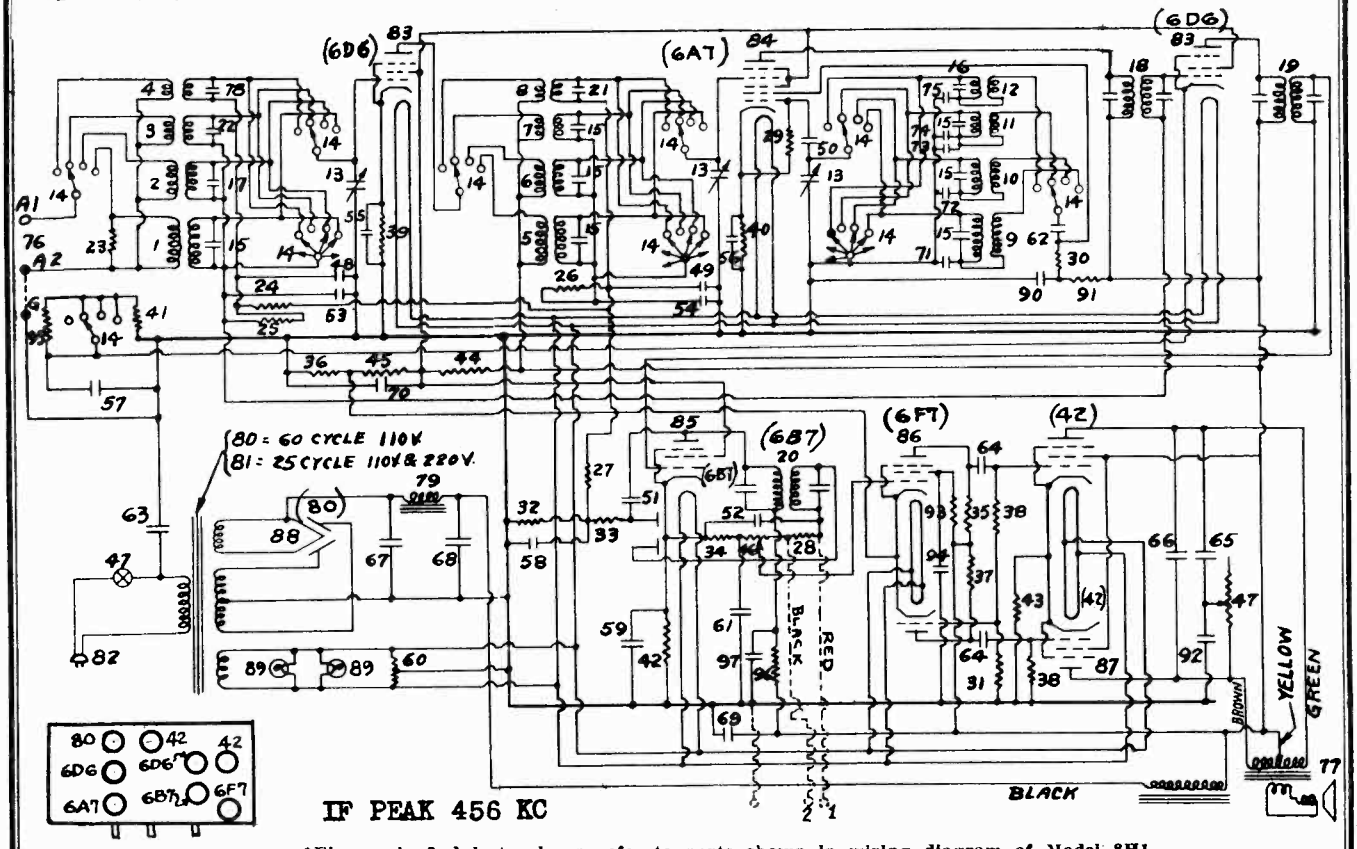


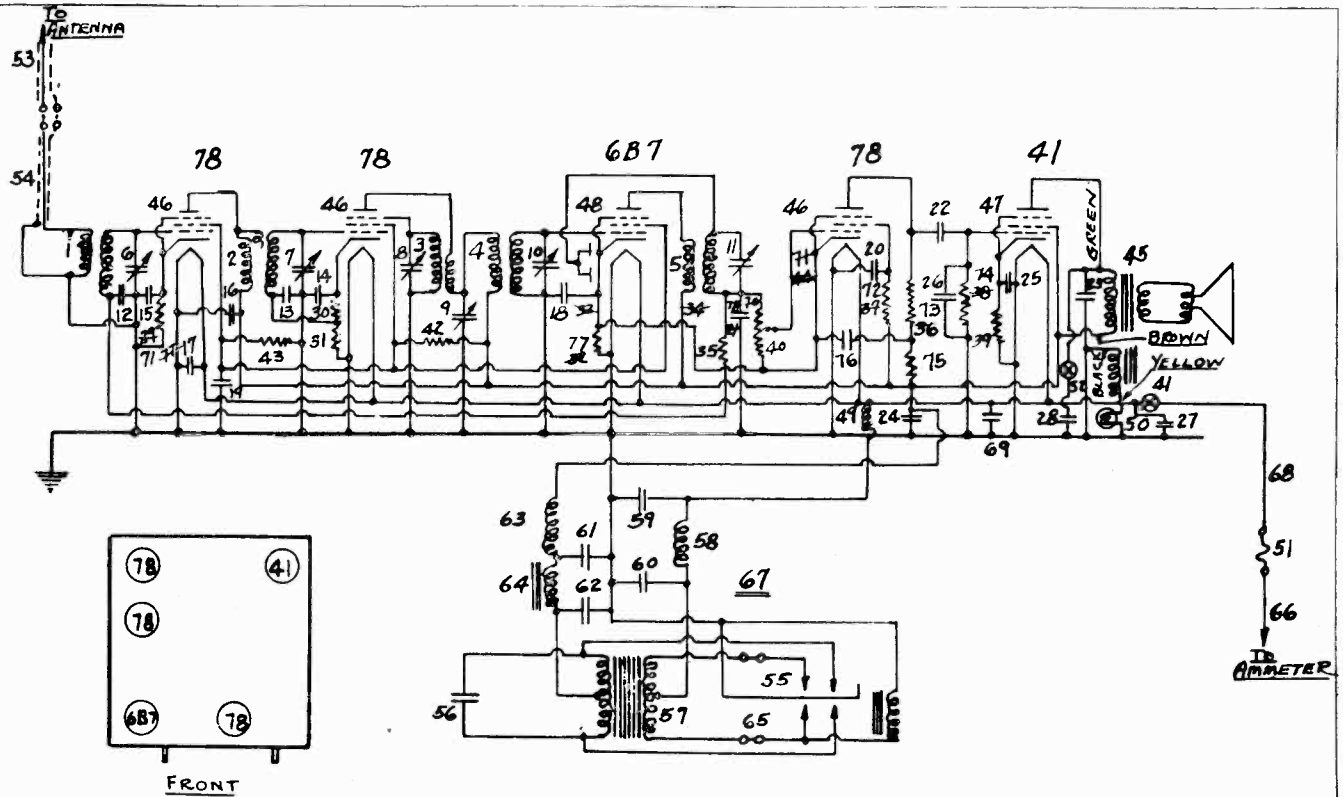
*Figures in 2nd last column refer to parts shown in wiring diagram of Model 8H1

Qty.	Part No.	Description	* Item	List Each
1	G3-32000	Antenna Coil (Broadcast) ..	1	.45
1	G4-32000	Ant. Coil (1500-4000 Kc.)	2	.40
1	G5-32000	Ant. Coil (4000-10000 Kc.)	3	.60
1	G6-32000	Ant. C. (10000-24000 Kc.)	4	.55
1	G2-32001	Inter. Coil (Broadcast)	5	.55
1	G8-32001	Inter. Coil (1500-4000 Kc.)	6	.50
1	G3-32001	In. Coil (4000-10000 Kc.)	7	.60
1	G4-32001	In. Coil (10000-24000 Kc.)	8	.60
1	G2-32002	Osc. Coil (Broadcast)	9	.40
1	G3-32002	Osc. Coil (1500-4000 Kc.)	10	.40
1	G4-32002	Os. Coil (4000-10000 Kc.)	11	.50
1	G5-32002	Os. C. (10000-24000 Kc.)	12	.55
1	W33378	Level Control (Volume)	46	.75
1	W32063	Tone Control & Line Switch	47	1.20
1	G16-26719	Ant. Gnd. Terminal	76	.15
1	B21491C	A. C. Cord & Plug	82	.50
2	G75-27975	Socket 6D6	83	.10
1	G2-33070	Socket 6A7	84	.10
1	G48-27975	Socket 6B7	85	.10
1	G49-27975	Socket 6F7	86	.10
2	G25-27975	Socket 42	87	.10
1	G6-27975	Socket 80	88	.10
1	W33072	Socket Cushion.....	84	.05
2	W33071	Washer.....	84	.05
1	W33073	Tube Shield Base.....	84	.10
2	W28632A	Tube Shield.....	84-85	.10
2	B28009D	Tube Shield	83	.10
3	W27981A	Tube Shiled Base	83-85	.05
2	W32744	Socket Insulator.....	86-87	.05
1	G37-25669	Power Trans. 60 Cy. 110 V.	80	6.50
	G38-25669	Power Trans. 25 Cy. 110-120 Volt	81	9.00
1	G1-24628	Filter Choke	79	1.25
1	G12-32004	1st Tuned I. F. Trans.....	18	1.90
1	G5-32004	2nd Tuned I. F. Trans....	19	1.90
1	G6-32004	3rd Tuned I. F. Trans.	20	1.90
	G7-33009	Parallel Padding Cond.	15	.15
	G5-33009	Parallel Padding Cond.	17	.15
	G17-33009	Parallel Padding Condenser	100	.15
	G2-33008	Parallel Padding Condenser	99	.15
	G11-33009	Parallel Padding Cond.	21	.15
	G6-33009	Parallel Padding Cond.	16	.15
	G2-33006	Padding Condenser	72-73	1.90
	G14-33006	Padding Condenser	98	.45
1	B32196B	Band Change Switch.....	14	2.50
1	G18-32002	Tuning Condenser Gang	13	4.00

Qty.	Part No.	Description	* Item	List
		FILTER & BY-PASS CONDENSERS		
	W26194B	12 M.F.D. 475 VOLT	67	1.25
1	W29007C	8.-8.-8. Mfd. 450-450-250 Volts	68-69	2.85
			70	
1	W32258	8. Mfd. 300 Volts.....	90	1.20
1	W30321	1. Mfd. 160 Volts.....	61	.55
1	W32278	0.001 Mfd.....	48-49	.30
2	W30741	0.00025 Mfd.	50	.15
1	W32226	0.0005 Mfd.....	51	.15
1	W31937	0.0001 Mfd	52	.15
1	W32379	0.02 Mfd. 200 Volt	53-54	.15
2	W28621	0.02 Mfd. 200 Volt	55-56	
			57-58	
			59	.15
5	W23635	0.006 Mfd.	62	.20
1	W23191A	0.01 Mfd. 400 Volt	63-97	.25
2	W23615	0.05 Mfd. 400 Volt	64	.15
1	W31052	0.05-0.004 Mfd. 400-400 Volt	65-66	.30
1	W32279	0.00085 Mfd.....	74	.20
1	W32332A	0.000791 Mfd.....	75	.30
1	W30270	0.001 Mfd.	92	.15
1	W28142	0.02 Mfd. 400 Volt	94	.20
		RESISTORS		
1	21455	4500 Ohms	23	.15
1	31094	300000 Ohms	24-25	
			26-27	.15
4	23785	500000 Ohms	28-38	
3			93	.15
1	21875	100000 Ohms	29	.15
2	24814	7000 Ohms	30-91	.20
2	21237A	60000 Ohms	31-35	.15
2	26577	3 Megohms	32-33	.15
1	21876	10000 Ohms	34	.15
2	W30127	450 Ohms (Flexible)	36-42	.15
1	23403	150000 Ohms	37	.15
2	W25937	275 Ohms (Flex.)	39-40	.15
2	W22514	750 Ohms (Flex.)	41-96	.15
1	W22873	220 Ohms	43	.15
1	W32301	10000-15000 Ohms	44-45	.45
1	W32337	10-10 Ohms	60	.25
1	22831	15000 Ohms	95	.15

CROSLEY RADIO CORP.

MODEL 5A1
Schematic, Socket
Parts List



1	G26-24995	ANTENNA COIL				
2	G7-28968	R.F. COIL				
3	G25-24996	OSCILLATOR COIL				
4	G1-25444	1ST I.F. COIL				
5	G3-25445	2ND I.F. COIL				
6	L-29783	ANT. TUNING COND.				
7		R.F. TUNING COND.				
8		OSC. TUNING COND.				
9	G2-25948A	I.F. PRI. TUNING COND.				
10	W-25008-A	I.F. SEC. TUNING COND.				
11	G2-25948	DIODE TRANS. TUN. COND.				
12	W-27203	0.02 MFD.	200V			
13	W-27203	0.02 MFD.	200V			
14	W-27203	0.02 MFD	200V			
15	W-27203	0.02 MFD.	200V			
16	W-23615	0.05 MFD.	400V			
17	W-24049 A	0.1 MFD	200V			
18	W-24049 A	0.1 MFD.	200V			
19	W-25438	0.1 MFD.	200V			
20		0.1 MFD.	200V			
21	~~W-26571~~	~~0.0008 MFD.~~	~~600V~~			
22	W-23142	0.02 MFD.	400V			
23	W-23191-A	0.01 MFD	400V			
24	W-30419-A	8 MFD.	250V			
25		8 MFD.	25V			
26	W-20389	.00005	(MICA)			
27	W-20389	.00005	(MICA)			
28	W-23191-A	0.01 MFD.	400V.			
29	~~W-21454~~	~~1 MEG~~				
30	W-30127	450 Ω				
31	W-27086	6400 Ω				
32	W-25937	275 Ω				
33	W-28357	75 Ω				
34	21454	1-MEG				
35	21454	1-MEG				
36	~~W-21454~~	~~100,000 Ω~~				
37	~~W-20386~~	~~500,000 Ω~~				
38	~~W-21454~~	~~300,000 Ω~~				
39	W-23907	75Ω				
40	W-30436	LEVEL CONTROL				
41		S.P.S.T. SWITCH				
42	W-26525D	15000 Ω				
43		25000 Ω				
44	~~W-22614~~	~~750 Ω~~				
45		353-3 SPEAKER				
46	539-28807	78 SOCKET				
47	S28-28807	41 SOCKET				
48	S48-28807	6B7 SOCKET				
49	S4-28067	"A" CHOKE				
50	W-4099A	6V. DIAL LIGHT				
51	W-31103	10 AMP "A" FUSE				
52	W-26156-A	S.P.S.T. SWITCH				
53	D-31296A	ANTENNA LEAD				
54	W-31702	ANTENNA LEAD CONNECTOR				
55	W-29160	VIBRATOR ASSEM.				
56	W-31632	0.01 MFD. 1000 V.				
57	G1-31618	POWER TRANS.				
58	2-28067	"A" CHOKE				
59	W-30366	0.5 MFD	160 V.			
60	W-30368	0.5 MFD.	160 V			
61	W-23142	0.02 MFD.	400V.			
62	W-31631-B	12 MFD.	300V.			

63	G1-24234	R.F. CHOKE ASSEM.		79		
64	G10-24628	FILTER CHOKE ASSEM.		80		
65	G11-26719	POLARITY REVERSING TERMINAL		81		
66	G1-31701	"A" CABLE ASSEM.		82		
67	L-31629	413 SYNCRONODE		83		
68	G2-31701	"A" CABLE ASSEM		84		
69	W-20389	.0005 MFD (MICA)		85		
70	~~W-20387~~	~~.0005 MFD.~~	~~600V~~	86		
71	W-21452	1100 Ω		87		
72	21454	1 MEGOHM		88		
73	23403	150,000 Ω		89		
74	23785	500,000 Ω		90		
75	21287-A	60,000 Ω		91		
76	W-23615	.05 MFD	400 VOLTS	92		
77	W-28589	350 Ω		93		
78	W-32607	.0005 MFD	200V.	94		

RECORD OF CHANGES

		Change No.
A	ITEM 69 ADDED. ITEM 62 CHGD TO "A" 1-2-34 ITEM 21 & 22 PASSED BY ITEM 70 2-7-34 CGF 1-14-34	3559
B	ITEMS 42 & 43 CHANGED TO "A"	3563
C	ITEMS 29-30-37-38 & 44 DELETED 3-7-34 ITEMS 71-72-73-74-75-76 & 77 ADDED 4-11-34	3570
D	ITEM 62 CHGD TO "B"	3576
E	ITEMS 42 & 43 TO "B" ITEM 70 REPLACED WITH ITEM 78	3585

THE CROSLEY RADIO CORPORATION, CINCINNATI, OHIO

5A1 WIRING DIAGRAM

APPROVED C G FELIX | DATE 1-24-33 | SHARPER | DWG NO. B-31760