# TRANSISTOR RADIO SECTION



# CHASSIS 6T2



# 391

#### SPECIFICATIONS

CIRCUIT: Superhetrodyne using six transistors and two germanium diodes

FREQUENCY RANGE: Standard broadcast band. 535 to 1600 KC.

POWER SUPPLY: This receiver is operated from power supplied by eight, 11/2 volts, "C" size, flashlight batteries.

ANTENNA: Built-In Ferro-Scope (iron core) SPEAKERS: 4" PM and 31/2" PM.

#### BATTERY REPLACEMENT

Open the cabinet by pulling with the fingers on the top rear surface of the cabinet back This releases the internal spring catch mechanism allowing the cabinet back to swing down on its hinges. The batteries are located inside the long cylindrical plastic case, at bottom of cabinet. The battery case is held in position by two spring clamps. Re-move the battery case from the cabinet by grasping it between the thumb and fingers and pulling it free of the spring clamps. Use caution when pulling out the case to prevent undue strain on the two wire leads connected to the cap.

To remove the batteries, first remove the cap from the case by pulling back the two cap retaining springs and lifting off the cap. Invert the open end of the case a few inches over a table or any convenient surface. This allows the batteries to slide out of the case. The case holds eight "C" size batteries, four in each section. This size battery is commonly used in flashlights and is readily available at drug and hardware stores.

#### TRANSISTOR PORTABLE MODEL. COLOR CHASSIS





Figure 1. Rear View of Set, Cabinet Back Opgn.

IMPORTANT: When installing batteries refer to figure 2, or the diagram on the battery case, to make sure the batteries are being installed in the case properly. When installing cap on case, check the diagram again to make sure the cap is not reversed.

RNING FIRSTALL BATT	EAKS EXACTLY AS SHOWN OR	RADIO MAY BE DAWLOF	PASITION BATTERT
CASE WITH RETRAT D	IN TOP. INSTALL BATTERIES	BITH CENTER CAPS	FACING IN THE
DIRECTIONS SHOWN	LETRAT ON BATTERT CASE MI	ST OF INSPRIED INTO	styph an covie

1		+======	▶+卻 ♠	+8 1	#36a   1
0	an an a	- diamai	nedhanin	- han	14
-	1.4		1.4	1	
- 6	1.1	INT T	11-4		

# Figure 2. Battery Case, showing Correct Method for Installing Batterles.

WARNING: TURNING SET ON EITHER AFTER INSTALLING THE BATTERIES WRONG, OR REVERSING THE CAP CAN PERMANENTLY DAMAGE THE TRANSIS-TORS AS WELL AS OTHER PARTS OF THE RADIO. If radio does not play after installing new butteries, turn off immediately, and check for improper battery installation.

When inserting the battery case in the clips in the cabinet, tip the case up at a slight angle to insure proper closure of cabinet back.

Under normal operating conditions, battery life may be in excess of 1000 operating hours.

Batteries deteriorate more rapidly in excessive heat. Therefore, do not leave this set on or near a radiator or other source of heat. Also note that all batteries will run down with age even when not in use. It is recommended that all batteries be replaced when reception becomes weak, mulfled or distorted. or radio fails to operate.

IMPORTAN'T! Run-down batteries should be removed IMMEDIATELY because the chemical action inside the cells will cause some batteries to leak when they are worn out. The acid which leaks from a run-down battery may damage parts of the set or the cabinet because of its corrosive action.

Batteries listed below, or an equivalent substitute may be used.

Burgess 1	General
Eveready	Ray-O-Vac 1LP

#### 6T2 CHASSIS MODELS 521 . 528

Batteries listed above are 11/2 volt, "C" size flashlight batteries.

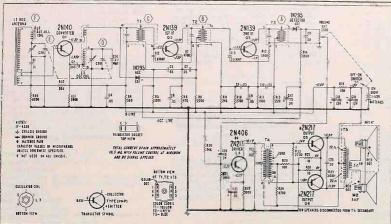
# REMOVING THE CHASSIS

- 1. Remove Tuning knob and Volume control knob by working them forward and off the shaft
- 2. Open cover on rear of cabinet.
- 3. Remove the battery case.
- 4 On the front of the cabinet, loosen the two Phillips head screws adjacent the tuning shaft.
- 5 Loosen the hex nut that secures the Volume control to front of case
- 6 Hold the printed circuit board while removing the two screws and hex nut, to prevent damage.
- 7. Gently lift the circuit board from within cabinet.

# PARTS LIST

	RESISTORS	CAPACITORS	MISCELLANEOUS CHASSIS PARTS
Sym	Description Part No.	Sym. Description Part No.	
R4	560 ohms, 14 watt	C30 8.2 mmf, 500 volts, cer, disc.	
R5	130,000 ohms. 1/2 watt. 5%	NPO temp. coeff	Nut, Hex. %-32 (mounts Volume
26	470 ohms, 1/2 watt		control) 2A 2-69-71 Palnut, K-2S (mounts handle to
27	4.700 ohms, 14 watt 60B 8-472	C31B 102.1 mmf, max ose.   Sang	case)2A 6-12-71
18	2.200 ohms, 14 watt 60B 8.222		Retainer. Nut (antenna case) 15A 1619
19	24,000 ohms, 1/2 wall, 5%		Ring, Retaining, Antenna Handle
10	2.700 ohms, 1/2 watt 50B 8-272	COILS, TRANSFORMERS, Etc.	(triangular) 1A 25-20
12	1,000 ohms, 1/2 watt		Screw
13	3,900 chms, ½ watt	Sym. Description Part No.	=2.56 x % BHMS PH (for mtg.
14	3,900 ohms, 14 watt. 60B 8-392	L1 Antenna, Rod	handle halves)
15	100 ohms, 1/2 watt	L2 Coil, Oscillator	#6-32 x % BHSTS PH (for mtg.
20	24,000 ohms, 1/2 watt, 5%	L3 Coll, Antenna Adjustment 69B 224-1 T1 Transformer, 1st IF 72C 190-4	antenna cover to antenna case)
21	5,600 ohms, 1/4 watt 60B 8-562	T2 Transformer, 2nd IF72C 190-4	to handle) 1A 201-3-70
22	1,000 ohms, 14 watt 60B 8,102	T3 Transformer, 3rd IF72C 190-6	Socket, Transistor
23	100 ohms, ½ watt60B 8-101	T4 Transformer, Driver	Spring. Cone (battery case) 19A 135
24	8.200 ohms, 1/2 watt	T5 Transformer, Output	Spring, Latch (Roto Antenna) 15A 193
25	10 ohms, 1/2 watt	M1 Speaker, 4" PM (includes	Washer, Spring, Antenna Handle4A 5-20
26	10 ohms, 1/2 watt,	output transformer T5)7SC 145-2	Washer, Flat, Antenna Handle4C 1-129-71
21	2,500 ohms. Volume control (in- cludes Off-On switch S1)	M2 Speaker, 3%" PM	
29	1,000 ohms, 54 watt	S1 Switch, Off-OnPart of R27	A LANSING COLUMN
	8,200 ohms, 14 watt 60B 8-822		CABINET PARTS
31		A REAL PROPERTY OF A REAL PROPER	Description Part No.
	36.000 ohms, 16 watt, 5%	TRANSISTORS AND DIODES	Antenna Case (with evelet)
	2,200 ohms, 1/2 watt (early	Sym. Description Part No.	Black, Models 521 and 528 A5834-2
	prod.) 60B 8-222		Antenna Cover
		Q1 Converter, PNP transistor2N140 Q2 1st IF, PNP transistor2N139	Black. Models 521 and 528
		Q3 2nd IF, PNP transistor2N139	Bearing Sleeve. Roto Antenna
	CAPACITORS	94 Driver, PNP transistor2N217 or 2N406	Cabinet (less handle, escutcheon
m.	Description Part No.	'Q5 Output, PNP transistor 2N217	and grille)
	.01 mf. 600 volts, cer. disc	*96 Output, PNP translator 2N217	Golden Charcoal, Model 521
	.005 mf, 500 volts, cer, disc	CR1 AGC, Crystal Diode 1N295	Escutcheon (mounts on cabinet front.
1	.05 mf. 30 volts, cer. disc	CR2 Detector, Crystal Diode 1N295	around the front speaker grille)
÷.,	.05 mf. 30 volts, cer. disc	" If either Q5 or Q6 needs replacing, order two	Grille, Speaker (fits on cabinet
	.05 mf, 30 volts, cer. disc	replacement transistors and specify that they	(ront)
	.05 mf, 30 volts, cer. disc	are a "Matched Pair".	Handle Half, Tongue
8	.05 mf, 30 volts, cer. disc		Black, Models 521 and 528
ε.	.05 mf. 30 volts, cer. disc		Handle Half. Groove
0	.05 mf, 30 volts, cer. dise	MISCELLANEOUS PARTS	Black, Models 521 and 528
	.05 mf, 30 volts, cer. disc	Description Part No.	Knob, Volume Control (with
2	5.6 mmf, 500 volts, ceramic,	Battery Case End Cap (bottom)	compression ring) Gray, Models 521 and 528
	NPO temp. coeff	Battery Case End Cap (bottom)	Koob, Tuning (with compression ring)
3	NPO temp. coeff	terminals) A5857	Chrome and Clear, Models 521
7	25 mf, 3 volts, elect	Battery Case, Tubular (with springs)_A5836	and 525
8	100 mf. 12 volts, elect	Bearing Plate (Roto Antenna)15A 1610	Latch Plunger, Roto Antenna
	100 mf, 12 volts, elect	Clip, Battery Case Mounting18A 10-13	Sleeve, Handle Mounting
0	10 mf, 3 volts, elect. 67B 35-6	Handle Latch Plate	Stud. Fastening (mounts handle
11	90 mf, 3 volts, elect	(mounts to case with handle)	haives)
22	.002 mf, 500 volts, cer. disc65D 10-125	Nut, Hex. 3-24 (for mtg. handle	Support, Printed Circuit Board 15A 1614
	.02 mf, 500 volts, cer. dise	to antenna)	Support Printed Circuit Board 15A 1741

F



1	VOLTA	GE	DAT	A
Itages	shown	mea	asured	w

- DC vo ith no signal, using fresh batteries.
- · Volume control at minimum; dial set a low frequency end.
- · All readings made between transistor socket terminals and B plus (ground).
- · All voltage readings are negative.

# TROUBLE SHOOTING HINTS

To simplify circuit tracing, as well as locating and identifying individual circuit components, refer to figures 3 and 4. Figure 4 is a photograph of the circuits components as they appear in their exact physical location. Figure 3 refers to the foil side of the printed wiring board. Schematic symbols illustrate what appears in approximately the same position on the reverse side of the board Use

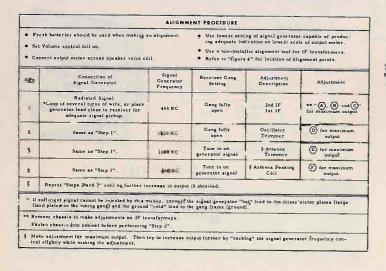
figures 3 and 4 with the schematic diagram for circuit tracing as well as voltage and resistance readings.

Refer to Service Manual S559, available from your Admiral distributor, for further general service and repair information of printed circuit wiring.

# CLEANING CABINET

To clean the cabinet use a mild solution of soap or detergent and lukewarm water. Apply the solution with a soft rag or sponge. Squeeze out thoroughly before applying to avoid any excess water from coming in contact with any of the electrical parts. Rub the surface thoroughly with the solution. Wipe with a damp cloth, and then wipe dry with a dry cloth.

CAUTION: Never use carbon tetrachloride, acetone, naphtha, alcohol, gasoline, or any commercial cleaning fluids for cleaning the cabinet.



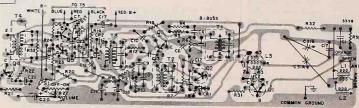
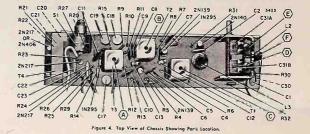


Figure 3. View of Printed Wiring Board. NOTE: Gray area represents printed wiring; black symbols and lines represent components and wiring on opposite side



OJohn F. Rider



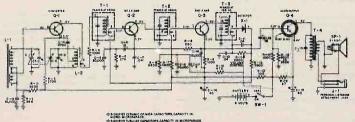
MODEL 555

CHASSIS 120457

#### GENERAL INFORMATION

Model 555 "ALL-AMERICAR" is an all transistor, pookot-size radio, using four (4) transistore, cm (1) crystal diode, and requiring only a six volt battery suppl. A rolfar-type amplifies of iouit is employed. All components are mounted on a single stoked printed circuit board which becomes accessable for repair by removal of one solution-mounting screw.

Power Supply: Four 1.5V leakproof Penlight betteries, size "A-A" RAY-O-VAG 7LP, (EVEREADY #915, #1015, or equivalent) If extra-long battery life is desired, use mercury type cells (EVEREADY Z-9, MALLORY ZM-9, or equivalent.)



**CHASSIS NO. 120457** 

# SCHEMATIC, RADIO CHASSIS 120457

# PARTIAL CHASSIS PARTS, CH. 120457

SYM	PART NO.	DESCRIPTION	SYM	PART NO.	DESCRIPTION
91	9150414, 8"	Converter	T1	720342	I.F. Transformer
93	8150423, A"	lst I.F. Amplifier	T2	720343	I.F. Transformer
93	8150439, A"	2nd I.F. Amplifier	T3	720344	I.F. Transformer
94	8150444, 8"	Audio Output	T4	734179	Audio Output Transformer
XI	917069	Detector	L2	716129	Oscillator Coll

"Replace transistors with eract type (er. 815041A).

PARTIAL CABINET PARTS LIST

PART NO.	DESCRIPTION
180190	Speaker, PM, 3"
6019280	Pointer
461073	Knob, tuning
461072	Knob, Volume
542.288	Spring, Vol. Knob

# Firestone 7 TRANSISTOR PORTABLE RADIO

STOCK NO. 4-C-40 CODE NO. 1-8-71/483

CUSTOMER OPERATING INSTRUCTIONS SERVICE MANUAL AND PARTS CATALOG

# TO OPERATE SET

To turn the set on, turn the on-off volume control clockwise (to right) until the switch click is heard. Turn the tuning control slowly to the desired station. Then turn valume control to the desired volume. For the more distant stations you may rotate the radio for clearer reception.

To turn radio off, turn the on-off volume control counter clockwise (to left) until switch click is heard.

## BATTERY INFORMATION

This unit is designed to operate on 6 11/2 volts ordinary penlite cells such as Eveready type 915 or 1015 or Burgess type "Z". For longer life, Mallory Mercury Cells Type ZM-9 or equivalent may be used.

#### TO INSTALL BATTERIES

1 Move handle to rear of set

- 2. Release clip on each side of cabinet.
- 3. Remove rear cover.
- 4. Slide bottery holder out.

5. Be sure to observe correct polority (see battery diagram) when inserting batteries so as to avoid possible damage to transistors.

IMPORTANT : WHEN REINSERTING BATTERY HOLDER THE CUTOUT MUST BE FACING UP. (SEE DIAGRAM INSIDE)

6. Replace cover and close clips.

Also it is recommended that all batteries be removed from case if receiver is to be out of use for lengthy periods.

#### EARPHONE ATTACHMENT

For private listening pleasure earphone attachment Stack No. 4-C-39 may be plugged into jack located on right hand side of receiver case,

Speakers are automatically disconnected when earphone is in use permitting you to enjoy private listenino.

For Civil Defense Broadcasts on the Conelrad plan tune to 640 KC or 1240 KC marked on tuning knob with  $\Delta$ 

> Valuable Technical Information is contained inside this booklet. Be sure to keep for future reference.

#### STOCK NO 4-C-40

# TECHNICAL SERVICE INFORMATION

Width 6-5/8", Height 4-1/8", Voice Coil Impedance.... Cabinet Dimensions Depth 2" Shipping Weight ..... 2 nounds 6 - 1% volt penlight cells Power Supply ... Battery Type Everendy 915 or 1015 or equivalent Two 3" P.M. Loud Speakers

SPECIFICATIONS 3.2 ohms at 400 cycles Power Output Tuning Ronge. 455KC Intermediate Frequency. Transistor Complement.

120 Milliwatts Standard Broadcast Band 540KC-1620KC 1 - 2Nd11 Converter 2 - 2N409 IF Amplifier

CODE NO. 1-8-71/483

1 - R-67 Det. AVC 1 - 2N405 Audio Driver

2 - 2N306 Power Amplifier

#### TO REMOVE CHASSIS

1. Remove volume control knob by pulling away from case.

2. Move handle to rear.

3. Release spring clips on each side of cabinet and remove back.

4. Remove battery holder.

- 5. Unscrew the four chassis corner mounting screws
- 6 Remove one screw holding volume control bracket.
- 7. Slide down to bottom of case and out to clear tuning knob from case.
- CAUTION: BE SURE TUNING KNOB IS COMPLETELY CLEAR OF CASE BEFORE RE-MOVING CHASSIS.

#### ALIGNMENT

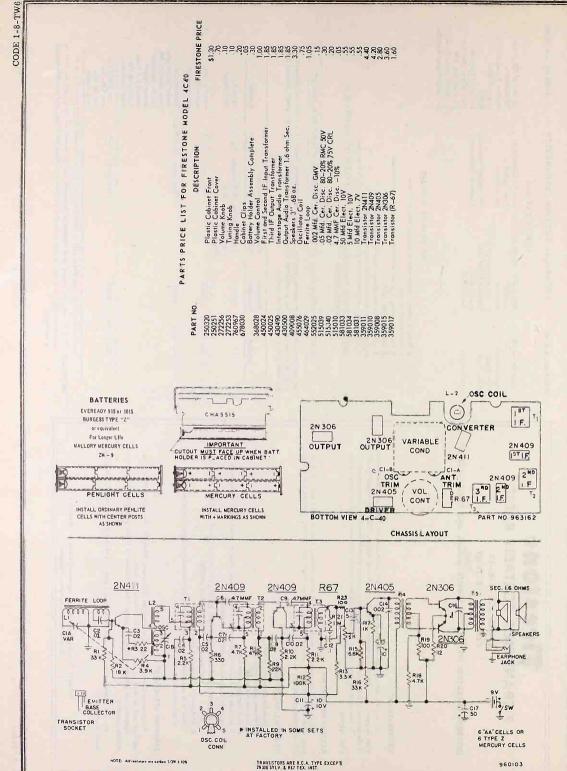
ALIGNMENT INSTRUCTIONS - READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdrive for adjusting. Use battery power. Connect Output Meter across Voice Coil of Speaker.

Function	Generator Frequency	Dummy Antenno	Generator Conn.	Adjust	Remarks
1. %F.	455KÇ	.1 Mfd Condenser in series with Gen. Lead	On Converter Base	т], т2, тз	Adjust for Mox. Output
2. Osc. Trimmer	1620KC		*Test Loop	C1-B	Variable Con- denser Set for Min- imum capocity
3. Osc. Slug	540KC		*Test Loop	L_2 Slug	Variable Con- denser Set for max imum Capacity Ad- just for Maximum Output Repeat steps 2 & 3 Tunë 1400 Kc on Var- iable Condenser
4, Ant. Trimmer	1400KC		*∎est Loop	C1-A	Tune 1400 Kc on Var. Cds. Ad- just for Max- imum Output

\* Standard Hazeltine Loop Model 1150 or 3 turns of wire about 6" diameter placed one foot from set.

IMPORTANT: DO NOT make resistance measurements in transistor circuits unless all transistors are first removed from their sockets. Failure to do this will result in false indications and possible damage to transistors.



DJohn F. Rider



PRELIMINARY SERVICE DATA

	SPECIFICATIONS				
CAB INET:	Plastic, P745A, Ebony P746A, Ant. White and Turquoise				
ELECTRICAL RATING:	4.5 Volts D. C.				
BATTERIES:	Carbon Pen-Light Cells: (3) Eveready #015, #915, or (3) Burgess Z, #930, or (3) Maltory M15 Mercury Cells: (3) Eveready E9, or (3) Hallory ZM9				
OPERATING FREQUENCIES:	Tuning Range 540 - 1600KC: IF Frequency 455KC				
TRANSISTOR COMPLEMENT:	TR1         Osc., Conv.         2N164A         or         2N168A           TR2         1st.         1.F.         2N94           TR3         2nd.         1.F.         2N169           TR4         Audio Ampl.         2N265         7R5           Audio Output         2N24LA				
GERMANIUM DIODES:	D1 AVC 1N87 D2 Audio Bias Rectfier 1N87				

GENERAL INFORMATION

The models P745A and P746A are all transistor battery operated pocket portable radios.

An earphone jack for private listening is pro-vided on the speaker end of the receiver. When the the carphone is plugged in, the speaker is automatically silenced.

TO REMOVE CIRCUIT BOARD. I. Remove cabinet back by twisting a coin in the two slots provided along bottom of the cabinet. slots provided along bottom of the cabinet. To observe corrections were possible for a second to be a second to

3. Remove the two scraws that secure circuit board any contact with ground and all component leads. to speaker. (SEE COMPONENT WIRING DIAGRAM FOR MOUNTING SCRAW FOSTITONS). REPLACEMENT OF COMPONENTS

Swing circuit board out of cabinet front. Leave all connecting leads attached to volume control and tuning capacitor.

#### TO REMOVE TUNING CAPACITOR

Follow steps 1 and 2 as above.

- Portow sceps I and 2 as above.
   Remove tuning knob by unscrewing the thumbscrew in its center in a counterclockwise direction.
   Remove the flat head screws located under tuning
- knoh

TO	PPMOUP	VOT IMP	CONTROL

Follow steps 1 through 3 as above.

Remove on-off volume knob by unscrewing the screw 2 in the center of the knob

3. Remove hex nut from volume control shaft.

- 4. Move tuning capacitor slightly and lift out volume control.
  - TROUBLESHOOTING
- A check of the battery condition and total current drain of the receiver should be made first. All current measurements are made at quiescence with n-the receiver turned on, volume control at maximum, tuning gang closed, and with no signal conditions.

The total receiver current drain is 15 to 20 s. This is measured by inserting a milliammeter series with the batteries.

S-P745A COVERS MODELS P745A

P746A

series with the patteries. If an excessive total current drain is recorded, individual collector current readings of each insistor should be checked. An excessive current ding may mean a shorted transistor; no current indicate that a transistor or associated cuit components are defective.

A single-edge razor blade is a satisfactory tool cutting the copper circuit wiring, so that a liammeter can be inserted in series with the break measure the current flow. After each current check completed, solder the cut carefully to complete the cuit again.

#### NO RECEPTION:

- Check battery voltage and battery contacts. Check on-off switch.
- Check all antenna lead connections.
- Check coil L2. FAK AUDTO:
- Check battery voltage for 4.5 volta.
- Check battery current.
- Check transistor collector currents.
- Check alignment. INTERMITTENT :
- 1. Check battery contacts for corrosion.

Check solder connections on dip-soldered side of circuit board.

Intermittent audio, motorboating, and poor reception is frequently caused by poor battery contact. The battery terminals should be cleaned with emery cloth to insure positive electrical contact.

#### TRANSISTOR REPLACEMENT

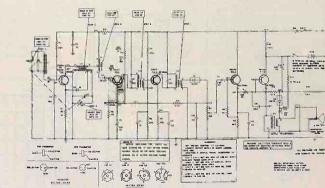
When replacing a defective transistor, be sure to observe correct lead positions, as shown on the

After removing a defective part, clean the mounting holes of all solder; replacement part can then be inserted more easily and a better solder connection can be accomplished. Apply a soldering iron just long enough to heat the terminal to remove the component. Too much heat may damage a component.

# PRELIMINARY REPLACEMENT PARTS LIST - P745A, P746A.

T. NO.	SYNBOL	DESCRIPTION	PRICE	
		CAPACITORS		
RS-1378 RS-1022	CA, B, C, D C1, 3 C2, 7 C4	Tuning Capacitor .01mf., 450V .01mf., 50V. 150mmf., 300V.	4,15	
RS-1462	C5 C6, 9	8mf., 6 V	1.65	
RS-1024		.05mf., 50V	.50	
RS-1463 RS-1460	C16 C11,12,14,15	32mf., 6V 3mf., 6V	1.45	

CAT. NO.	SYMBOL	DESCRIPTION	PRICE	CAT. NO.		PRICE
		POTEHTIOMETER			CABINET & APPEARANCE ITEMS	
n-RS-1379	R12, S1	Volume Control TOk, & Sw. COILS TRANSFORMERS	2.75	n-RB-1058 (Assemb,)	Cabinet Front, (Ebony), P745A Cabinet Back, (Ebony)	
n-RS-1372 n-RS-1373 n-RS-1374	T4 L2 T1	Transformer, Audio Output Coil, Osciliator Transformer, 1st. 1.F			Insert, Decorative	5.50
n-RS-1375 n-RS-1376 n-RS-1380	T2 T3 L1	Transformer, 2nd. 1.F Transformer, 3rd. 1.F Antenna	2.10	n-RB-1062 (Assemb.)	Cabinet Front (Ant.White), P746A Cabinet Back (Turquoise) Insert, Decorative	3.3
RS-1195		MISCELLANEOUS		n-RS-1362	Plate, Grille	ڌ.
-RS-1195 (Assemb.)	Battery Battery Contact	e receptacle and nut Tube Support tube Spring		n-RS-1363 n-RS-1364 n-RS-1365	Knob (Tuning) Thumbscrew (Tuning Knob) Insert, Decorative Strip, Decorative	
	Cover, Washer,	r, Spring Contact	.85	n-RS-1366 n-RS-1358	Knob, Volume, Ebony, P745A Knob, Volume, Turq., P746A	.1:
n-RS-1368 n-RS-1369 n-RS-1377	Battery Cover,	(2) 04x3/8, type 25) Contact Spring & Retainer Battery Contact	.15	All Parts	es Items Not Previously Catalogued. Not Listed By Catalog Number Are Con- tems, Obtainable From Radio Parts Job e Sugested List Prices and Subject T Change Without Notice.	bers

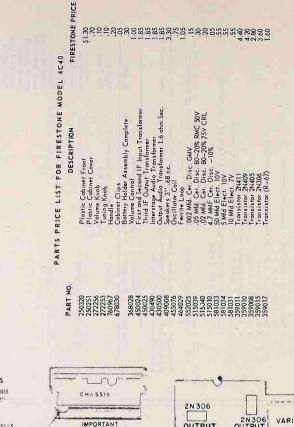


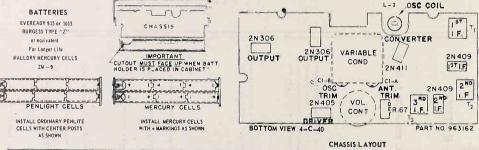


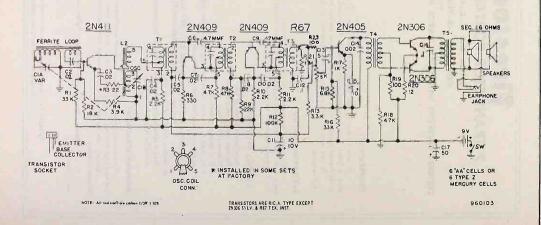
COMPONENT WIRING DIAGRAM

# RADIO PAGE 25-2 FIRESTONE









DJohn F. Rider



PRELIMINARY SERVICE DATA

	SPECIFICATIONS						
CAB INET :	Plastic, P745A, Ebony P746A, Ant. White and Turquoise						
ELECTRICAL RATING:	4.5 Volts D. C.						
BATTERIES:	Carbon Pen-Light Cells: (3) Everendy #1015, #915, or (3) Burgess Z, #930, or (3) Mallory M15 Mercury Cells: (3) Everendy E9, or (3) Mallory ZM9						
OPERATING FREQUENCIES:	Tuning Range 540 - 1600KC. IF Frequency 455KC						
TRANSISTOR COMPLEMENT:	Th1         Osc. Conv.         2N164A or         2N168A           Th2         1st.         1.F.         2N94           Th3         2nd.         1.F.         2N169           Th4         Audio Ampl.         2N265         Audio Output         2N261A						
GERMANIUM	DL AVC 1N87 D2 Audio Bias Rectfier 1N87						

GENERAL INFORMATION

The models P745A and P746A are all transistor battery operated pocket portable radios.

An earphone jack for private listening is pro-vided on the speaker end of the receiver. When the earphone is plugged in, the speaker is automatically silenced.

TO REMOVE CIRCUIT BOARD. Remove cabinet back by twisting a coin in the two Remove cabinet back by Luisting a cost as interpret of the second 3. Remove the two scrave that secure circuit board any contact with ground and all component leads. to speaker. (SEE COMPONENT WIRING DIAGRAM FOR

MOUNTING SCREW POSITIONS).

tunin, capacitor.

# TO REMOVE TUNING CAPACITOR

Follow steps 1 and 2 as above.

Remove tuning knob by unscrewing the thumbscrew in its center in a counterclockwise direction.

3. Remove the flat head screws located under tuning

knob.

#### TO REMOVE VOLUME CONTROL

1. Follow steps 1 through 3 as above.

- Remove on-off volume knob by unscrewing the screw
- in the center of the knob. 3. Remove hex nut from volume control shaft.
- Move tuning capacitor slightly and lift out volume control.

TROUBLE SHOOT ING

A check of the battery condition and total current drain of the receiver should be made first. All current measurements are made at quiescence with n-R the receiver turned on, volume control at maximum, tuning gang closed, and with no signal conditions.

The total receiver current drain is 15 to 20 This is measured by inserting a milliammeter 18. series with the batteries.

S-P745A COVERS MODELS P745A

P746A

If an excessive total current drain is recorded, e individual collector current readings of each ansistor should be checked. An excessive current ading may mean a shorted transistor; no current ill indicate that a transistor or associated icuit components are defective.

A single-edge razor blade is a satisfactory tool or cutting the copper circuit wiring, so that a illiammeter can be inserted in series with the break measure the current flow. After each current check completed, solder the cut carefully to complete the rcuit again.

#### NO RECEPTION:

- Check battery voltage and battery contacts. Check on-off switch.
- Check all antenna lead connections.
- Check coil L2. WEAK AUDIO:
- Check battery voltage for 4.5 volts.
- Check battery current,
- Check transistor collector currents.
- Check alignment.
- INTERMITTENT: 1. Check battery contacts for corrosion

CAT

Check solder connections on dip-soldered side of 2 circuit board.

Intermittent audio, motorboating, and poor reception is frequently caused by poor battery contact. The battery terminals should be cleaned with emery cloth to insure positive electrical contact.

#### TRANSISTOR REPLACEMENT

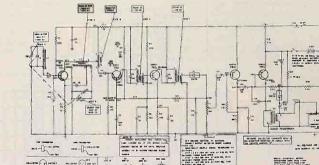
When replacing a defective transistor, be sure

#### REPLACEMENT OF COMPONENTS

4. Swing circuit board out of cabinet front. Leave After removing a defective part, clean the all connecting leads attached to volume control and mounting holes of all solder; replacement part can runn, capacitor. then be inserted more easily and a better solder connection can be accomplished. Apply a soldering iron just long enough to heat the terminal to remove the component. Too much heat may damage a component.

i. 190.	SYMBOL	DESCRIPTION	PRICE
100.00		CAPACITORS	
RS-1378 S-1022	CA, B, C, D C1, 3	Tuning Capacitor .01mf., 450V	4.15
3-1022	C2, 7 C4	.01mf., 50V. 150mmf., 300V.	
RS-1462		8mf., 6V 390mmf., 300V.	1.65
RS-1024	C10,17,19 C18	.05mf., 50V	.50
RS1453	C16	32mf., 6V	1.45
RS-1460		3mf., 6V	1,10

CAT. NO.	SYMBOL	DESCRIPTION	PRICE	CAT, NO.	DESCRIPTION	PRICE
		POTENTIONETER			CABINET & APPEARANCE ITEMS	
n-RS-1379	R12,51	Volume Control 10k, & Sw.	2.75	n-RB-1058 (Assemb.)	Cabinet Front, (Ebony), P745A Cabinet Back, (Ebony)	
n-RS-1372 n-RS-1373 n-RS-1374	L2	Transformer, Audio Output Coil, Oscillator Transformer, 1st. I.F	2.10		Insert, Decorative	3.30
n-RS-1375 n-RS-1376 n-RS-1380		Transformer, 2nd. I.F Transformer, 3rd. I.F Antenna	2,10		Cabinet Front (Ant.White), F746A Cabinet Back (Turquoise) Insert, Decorative Strip, Decorative	3.31
RS-1195		MISCELLANEOUS	1 10	n-RS-1362	Plate, Grille	.3
RS-1195 -RS-1357 (Assemb.)	Battery Battery Contact Retaine Cover,	e receptacle and nut Tube Support spring spring Contact Battery Contact		n-RS-1362 n-RS-1363 n-RS-1364 n-RS-1365 n-RS-1366 n-RS-1358	Knob (luning) Insert, Decorative. Strip, Decorative. Knob, Volume, Ebony, P745A Knob, Volume, Turq., P746A	
n-RS-1368 n-RS-1369 h-RS-1377	Screws, Battery Cover,	Plain	.15	All Parts	ces Items Not Previously Catalogued. Not Listed By Catalog Number Are Co. Items, Obtainable From Radio Parts Jo re Suggested List Prices and Subject Change Without Hotice.	bbers



PRAMETON STOR



COMPONENT WIRING DIAGRAM



# (a) Carbon Pen-light cells; 2 Eveready #915 or 2 Mallory M15, or 2 Burgess #Z (b) Mercury Cells; 2 Eveready #E9 or BATTERIES: Mallory #ZM9 (c) Rechargeable Cells;2 Gould-National nickel-cadmium, AA cells, supplied with GE charger kit. TUNING RANGE: 540 - 1620 KC IF FREQUENCY : 455 KC POWER OUTPUT: Undistorted 100 Milliwatts Maximum 130 Milliwatts with 3 volts input.

TO REMOVE CHASSIS FROM CASE

Remove the end cap on the speaker end of the radio the same as you would to change the batteries. Do not unsolder the wire attached to the end cap, but unsolder the wire from the chassis bracket to the case.

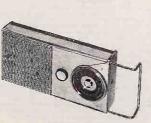
 With a pair of longnose phiers, straighten the metal tab holding the speaker grille in place. CAT. NO. SYN Remove the speaker grille by folding it toward the handle end of the case. 4. Using care, pull out the speaker and unsolder th

4. Using care, pull out the speaker and unsolder the two Meads. 5. Remove the volume knob by pulling it off. Turn n-RC2-261 [2] the scree in the center of the turing knob in a n<sup>-163-1459</sup> [2]. counterlocksize direction to remove it, then pull n<sup>-162-105</sup> [A0-136] u-RA-1360[1] off the tuning knob. 6. Remove the two screws by the speaker hole and n-RCW-3309 C Nearby the handle.
 Take out the screw near the tuning shaft hole, also the screw on the end cap, handle end.
 Slide the chassis toward the handle end about 1/2 n-RCW-3310 C n-RCW-3311 C -RS-1335 n-RS-1336 n-RCW-3312 C inch to gain access to the loop connections. Unsolder the 3 loop connections. Be sure to observe lead color coding.
 Continue to slide the chassis out in this din-RCW-3313 C rection. Let the end cap with the wire attached follow the chassis through the case. n-86-1154 .R NOTE: Do not remove the loop unless it is found to be defective as this will affect the alignment of the a-KS-1315

receiver Earphone jack catalogue number RJS+230 has a small mounting stud and RS=1195 has a large mounting

Small mounting scue and no 119 nes a large mounting stud. If it becomes necessary to replace the ear h-RLC147 T1 phone jack, replace with jack having the same size h-RLL-072 L1 stud. Jack SS-1195 also has a third terminal which m-RTL-211 T2 is ground, cut this terminal off to prevent it from shorting out any adjacent components. n-RS-1334 T2

Intermittent battery contacts will cause motorboaring, intermittent audio and poor reception. Check n=RTL-212 T3 the positive battery contact spring to be certain it is making firm contact with the battery. If the set n=RS-1333 T3 contains Gould National rechargeable batteries, contains Goud Mational recargesize Batteries, examine the positive battery caps for corrosion; if a RTL-213 T4 corrosion is evident, polish battery contacts with a RTL-210 T5 enery cloth. Some rechargesize batteries have a brass haRTL-206 T6 cap over the positive contact. Discard this cap and check for corrosion on the positive battery contact.



P7158-P7168 P715-P716

120K 120K

4.7K 4.7K

68K N R

1000 1800

68 120 RLO

100 000

220 330 R12 05

200 200

200 200

.001 .00

R

R9

Rll

are

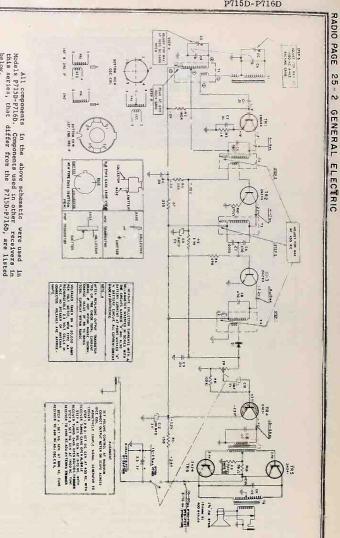
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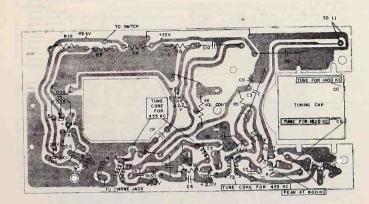
that

REPLACEMENT PARTS LIST

BOL	DESCRIPTION	PRICE
	CAPACITORS	
	Elect. Cap. 8MFD 3V	
0	Elect. Cap. 3MFD 3V	1.45
2	Elect. Cap. 100MFD 3V	1.10
,B,C,I	Tuning Gang	5.15
,2	+ .01 MFD	.20
4,9,11		
13	.02MFD	. 35
5,6	200MMF	.40
5	.360MMF P715D, P716D	.55
6	.330MMF P715D, P716D	.55
7	.001MFD	.20
7	.0005MFD P715D, P716D	.25
8	470MMF	.70
-	RESISTORS	
-10	120 ohms, Cur. Var.	
	P715A, B P716A, B	.35
-10	50 ohms. Cur. Var.	
2	P715D, P716D	.50
	COILS & TRANSFORMERS	ally raile
_	Oscillator Coil	1.30
	Loop	1.40
	I. F. Trans. 1st.	
	P715A, B P716A, B	1.65
	I. F. Trans. 2nd.	1
	P715D, P716D I. F. Trans, 2nd.	2.15
	PI. F. Trans, 2nd.	1
	P715A, B P716A, B	1.35
	I. F. Trans. 2nd.	
	P715D, P716D	1.75
	I. F. Trans. 3rd	1.65
	Driver Transformer Output Transformer	3.65

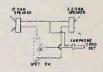






	REPLAC	EMENT PARTS	LIST (CONT	'D.)	
CAT. NO.	DESCRIPTION	LIST PRICE	CAT. NO.	DESCRIPTION	LIST PRICE
	CABINET & APPEARANCE ITEMS			MISCELLANEOUS ITEMS	
n-RAC-213 n-RAC-215 n-RAC-105 n-RAC-103 n-RAV-1040 n-RAV-1041 n-RDK-635 n-RS-1009 n-RS-1010 n-RHY-087 n-RIG-018	Right End Cap. Los Cover, A. Speaker Cover, Gold, Pli5A, B. D. Speaker Cover, Gold, Pli5A, B. D. Speaker Cover, Platd, Pli6A, B. Cobinet V/Lagherette (Black) Pli5A, B. D. Cobinet V/Lagherette (Black) Pli6A, B. D. Tuning Dial. Leatherette Pli6A, B. D(Black) Handle Speaker Casket.	75 . 1.05 . 1.30 D 1.30 	n-RAD-233 n-RAD-234 n-RS-1227 n-RHS-194 n-RHS-195 m-RJJ-019 RJS-230 n-RMS-398 m-RMS-399 p-RS-1195 RED-001	Bracker, Right End. Bracker, Fhone & Charg. Jec Bracker, Jube Sreaport, Jube Sreaport, Screw, Jule Tunhon, Screw, Juft End Pastner. Jack, Charging, Jack, Charging, Battery Contact. Ring, Compression. Jack, Earphone, Small Mrg. St Syring, Battery Contact. Ring, Compression. Jack, Earphone, Jange Mg. S	k20 ring .22 04 15 25 25 25 25 25 25 25 25 25 25 20 ud .90 04 
n-RDK-636 n-ROP-043	Volume Control Knob Speaker.		and all mo	e following test hook-up for dels with earphone jacks, t	o eliminate
	POTENTIOMETER		soldering a	nd unsoldering of external spe	aker,
n-RRC-420	2K Volume Control & Sw	. 1.90			

All resistors not cataloged are common carbon types obtainable from radio parts jobbers. Refer to schematic for symbols and values,



#### TRANSISTOR SUBSTITUTIONS

Column 1 lists all pransistors originally used in G. 5. models PDLA, B G scitzeredta C. 5. models PDLA, B G scitzeredta nores of the state substitutions for all these tran-sitors by stages. Some transistors in Column 2 as marked with asterisk have a higher beta; they must be trated as regular replacements were in the past, that is, special attention should be given to correct bising for satisfictory performance.

Model P715B - 2N217 (RCA) units in driver and output stages can be replaced by 2N192 or 2N324\* as driver and 2N241 or 2N321 as output, only if resistance values in receiver are as follows:

R8-240K ohms R9-1800 ohms R10-120 ohms

	COLUMN 1	COLUMN 2
OSC.	2N168A 2N164A	2N16BA or 2NI64A*
1. <i>f</i> .	2N165 2N169 2N292 2N293	2N169 or 2N165* 2N313* 2N314*
dr lver	2N191 2N192 2N324* 2N323	2N192 or 2N324*
OUTPUT	2N241 2N321*	2N241A or 2N321*

ELECTRIC RADIO PAGE 25-S

GENERAL

G	E	N	E	R	A	L	36	1.1	some	C	ļ	R	C
						SER	VICE MAN	UAI	1				

FOR

TRANSISTOR RADIO RECEIVERS

(840-1600 KC., 488 KC., I-F.)

Supersedes Service Note S-P750A

	SPECIFICATIONS
CABINET:	Leather - P750A, Ginger
ELECTRICAL	3 Batteries: Eveready #950, or A100,
RATING:	Burgess #2R, or equivalent
POWER	Undistorted: 225 milliwatts
OUTPUT:	Maximum: 350 milliwatts

#### GENERAL INFORMATION

The model P750A, is an all transistor battery operated portable radio with leather cabinet. The B+ is supplied by three 1/2 volt flashight type batteries producing the total B+ of 4.5 volta. Use saddlesomp to clean the leather portion of the cabinet.

CHASSIS REMOVAL 1. Remove knobs. 2. Remove the batteries. 3. Remove the 5 screws holding chassis to the cabinet. Lift circuit board out from circuit board springs. (When replacing chassis, slide the antenna edge of circuit board under circuit board holder retaining clips.)

#### TROUBLESHOOTING

drain of the receiver should be made first. current measurements are made at quiescence with current measurements are made at quiescence with the receiver turned on, volume control at maximum, tuning gang closed, and with no signal conditions. The total receiver current drain is 16 to 18 mile.

This is measured by inserting a milliammeter in series with the batteries.

If an excessive total current drain is recorded, the individual collector currents of each transistor to the inductance effect caused by the proximity of should be checked. An excessive current reading may mean a shorted transistor; no current will indicate the peak operating condition will be noticed. that a transistor or associated circuit component the cabinet and silvet in will be noticed. is defective.

A single-edge razor blade is a satisfactory tool for cutting the copper circuit wiring so that a milliammeter can be inserted in series with the break to measure the current flow. After each current check is completed, solder the cut carefully to complete the circuit again.

#### NO RECEPTION :

- 1. Check battery voltage and battery contacts.
- 2 Check on-off switch.
- 3. Check all antenna lead connections. Check coil 12.
- WEAK AUDIO:
- 1. Check battery voltage for 4.5 volts.
- Check battery current.
- 3 Check transistor collector currents.
- 4. Check alignment.
- INTERMITTENT .
- 1. Check battery contacts for corrosion.
- Check solder connections on dip-soldered side of circuit board.

Intermittent audio, motorboating, and poor reception is frequently caused by poor battery contact.



ER-S-P750A

C MITTER

COVERS

MODEL

P750A

#### P750A

Remove batteries and bend both the contact springs A check of battery condition and total current and holding springs inward to increase their tension. All Oxidation may occur on the contacts of the batteries the themselves. This tends to insulate the batteries from the battery contact springs, and increas electrical resistance. The terminals on the increase batteries should be cleaned to insure positive electrical contact.

After the set has been aligned and placed in the cabinet, recheck the antenna trimmer at 1500 KC. Due the speaker when the cabinet is closed, a change. in Open component the cabinet and slightly adjust the trimmer, then close the cabinet and recheck again, continue the procedure until the proper operating performance is attained.

#### TRANSISTOR REPLACEMENT

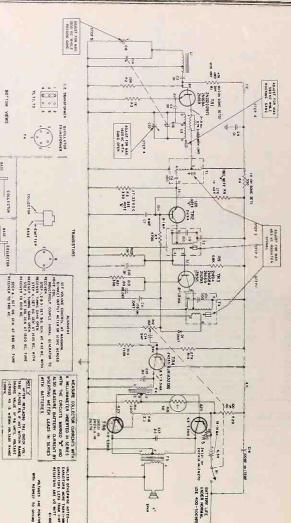
When measuring voltages at the transistor lead terminals, be sure to observe correct voltage polarities as shown on the schematic

When replacing a defective transistor, be sure to observe correct lead positions, as shown on schematic diagram in outline form.

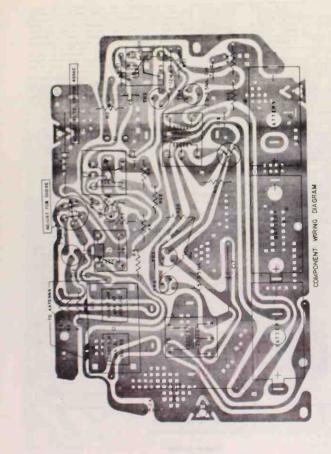
#### REPLACEMENT OF COMPONENTS

After removing a defective part, clean the mounting holes of all solder; the replacement part can then be inserted more easily and a better solder connection can be accomplished. Apply a soldering iron just long enough to heat the terminal to remove the component. Too much heat may damage a component.

RIS is a thermistor (temperature compensating resistor) and regulates the current flow to the output transistors. After replacing R15, allow it to reach ambient temperature before turning the radio on.

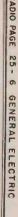


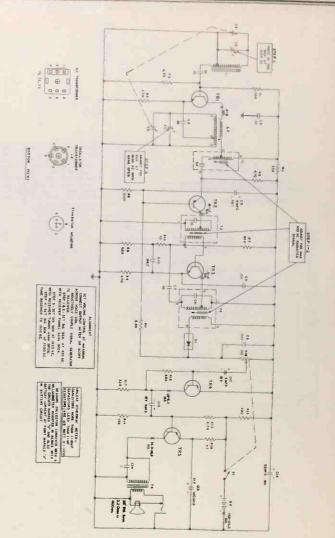
CJohn F. Rider



			RE	PLACEMENT P	ANTS LIST	
CAT. NO.	SYNBOL	DESCR LIPTEON	PRICE	CAT. NO.	DESCRIPTION	PRICI
		CAPACITORS			NTECELLANEOUS	
*-85-1423 RS-1022 RCE-725 RS-1024	(10,15 C7	Capacitor, Tuning .01mf.,450v	.30 1.65 .50	RB-1057 RS-1186 RS-1386 RS-1341 *-RS-1341 *-RS-1342	Spaaker, 4". Clamp, Antenne Clip, IF Meg. Clip, Battery (Pos. End), 41 Clamp & Hivet. Clamp & Rivet. Battery (Neg. End), 41 Battery Clamp Holder, 4129	th
		RESISTORS		-RS-1344	Clamps & Rivets Bracket, Antenna (R.H.)	.40
*-RS-1355	R15	50 ohns, thermistor	.50	*=RS-1345 RHC=095	Bracket, Antenna (L.H.) Ring, Tubular	
		POTENTIONETER		RMS=272	Ring, Compression (for Knob)	
a-RS-1347	812,51	Control, Volume 10% & SH.	1.85		CARENET & APPEARANCE ITENS	
		COLLS & TRANSPORNERS		*-KB-1059 *-RS-1381	Cabinet (Leather) Grille, Nameplate, & Medalli	Lon
-RS-1348 -RS-1349 +RS-1350 +RS-1351 +RS-1351 +RS-1353 +RS-1356	11 11 11 11 11 11	Transformer, ist. 1.F Transformer, Ind. 1.F Transformer, Jrd. 1.F Coil, Oscillator Transformer, Input Transformer, Output Antenna.	1.75	*-RS-1382 *-RS-1383 *-RS-1384 *-RS-1385 *-RS-1419	Nameplate. Medallion. Knob, Direct Tuning Enob, Volume. Enob, Vernier Tuning	
		TRANSISTORE & DIODES	-			
RS-1531 R5-1533 RS-1538 RS-1547 RS-1547 RS-1544 RS-1546 RS-1546 RSD-001	191, 783 182, 183 183 183 184	2H212/1297 (on some sets). 2H1684 (on some sets) 2H1694 (on some sets) 2H594 (D13 on some sets) 2H5153 (on some sets) 2H5293 (on some sets) 2H5293 (on some sets) 2H5294 (D13 208 2H524 (D14 2H270) or 2H321 1H57. D1646 DESector	3.15	41 Rar Ltm	Denotes Parts Not Previously of Li Not Listed By Gatalog Mumb- me, Ostainsble Prom Radio Par Ars Suggested List Prices An Change Without Notice.	ers Are Common ta Jobbers,

# MODEL P755A





#### GENERAL CELECTRIC ER-6-P755 COVERS SERVICE MANUAL

FOR TRANSISTOR RADIO RECEIVERS

(\$40-1600 KC. 455 KC. 1.F.) SUPERSEDES S-P755

- SPECIFICATIONS					
CABINET:	P755 Grey				
ELECTRICAL RATING:	9 Volts D. C. (Bottery Pack)				
BATTERIES:	Mallery M1605, Eveready 266 or Burgess M5				
OFERATING PREQUENCIES:	540 - 1600 MC 455 KC I. F.				
POWER OUTPUT:	Undistanted 50 MM Maximum 80 MM				

TO REMOVE CIRCUIT BOARD

Remove screw from the cabinet back. Insert a coin in either slot on the cabiner 2

botton and twist to remove the cabinet back. 3. Remove serve holding cuming dial.

Remove 3 acress under tuning dial to release

tuning gang from cabinet front. 5. Remove 3 bezhead screws and one 11/32" sut (bottom center of circuit board) holding circuit board to bosses on cabinet front.

#### TO REMOVE VOLUME CONTROL

- 1. Remove cabinet back.
- 2. Remove has bead screw from center of volume control inch. 3.
- Remove chassis.
- Remove pal mut holding volume control to cabinet CAT front boss.

# TO RENOVE SPEAKER

- 1. Remove cabinet back
- Remove chassis.
- Unsolder speaker wires. 6. Remove clips holding speaker to cabinet front.

# TROUBLE SHOOTING

A check of battery current drain will indicate +-RS if a receiver is operating properly, To measure the current drain, remove cabinet back, unsnap ground section of battery terminal and swing away from battery. Connect millizometer between battery terminal .... and battery contact. +-RS

The cotal current drain should be between 19.0 +-BS. and 24.0 ms. The current drain is measured with no-\*-RS-1584 wignel-conditions (tuning gang closed) and volume \*-RS-1585 \*-RS-1588 control at maximum,

If an excessive current drain is recorded, the individual collector current readings should be checked on each transistor. Current drain is an important indication of the transistor operating conditions. The proper current values for each transistor are shown on the schematic. An excessive current reading may mean a shorted transistor and no current will indicate that the transistor is open.

*-RS-138/	RIB	Vol. Cont. 10K & Sw	1,80
		COILS & TRANSFORMERS	-
*-RS-1581 *-RS-1582 *-RS-1583 *-RS-1584 *-RS-1585 *-RS-1588	T4 T1 T2 T3 L2 L1	Output Transformer IF Transformer lst IF Transformer 2pd IF Transformer 3rd Oscillator Coil Antenns	2.55 2.05 2.30 2.15 .90 2.35
		TRANSISTORS	
RS-1530 RS-1539 RS-1532 RS-1543 RS-1548	TR1 TR2 TR3 TR4 TR5	2N194A (Sylvania) 2N135 (General Electric) 2N233A (Sylvania) 2N406 (RCA)	3.20 3.30 1.95 2.35 2.40

OJohn F. Rider

A "heat sink" is placed around the output transistor (THS) and the heat is transferred to the output transformer case wis the flackble shifts. It is important that this "heat sink" be in place at all times. If it becomes necessary to replace TS remove it from the circuit board and alide the "heat sink" off of the top of the transistor. When in-stalling a new transistor is the theat sink" over the top of the new transistor body as this will spring it out of shape.

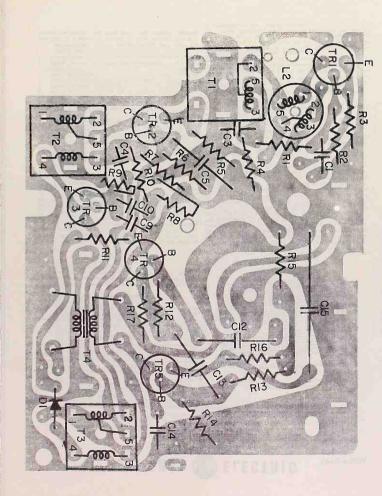
MODEL

P755A

boase on calinet front. 5. Fold numing gang and circuit board out of cabinet the top of the new transistor. Do not try to snap the front reward the volume control end. It is not "heat sink" around the transistor body as this will necessary to remove volume control to repair the spring it out of shape. Intermittent sudio, motorboating, and poor Intermittent sudio, motorboating, and poor reception is frequently caused by poor battery

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		REPLACEMENT PARTS LIST	
CAT. NO.	SYMBOL	DESCRIPTION	PRICE
		CAPACITORS	
*-RS-1590 *-RS-1591 *-RS-1592 *-RS-1593 *-RS-1586	C16 C15 C5 C12,13 CA,B,C,D	65MF @ 15V. Electrolytic 100MF @ 15V. Electrolytic 8MF @ 10V. Electrolytic 5MF @ 12V. Electrolytic Tuming Capacitor.	1.10 1.25 1.10 1.10 3.85
		POTENTIOMETER	-
*-RS-1587	R18	Vol. Cont. 10K & Sw	1,80
		COILS & TRANSFORMERS	
*-RS-1581 *-RS-1582	T4 T1	Output Transformer IF Transformer 1st IF Transformer 2nd	2.55

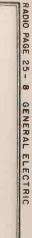


	PA	RTS LIS	T (CONT'D)		
GAT. NO.	DESCRIPTION	PRICE	GAT. NO.	DESCRIPTION	PRIC
Δ-RS-18 <b>11</b> RS-1195 RS-1363 *-RS-1578 *-RS-1580 *-RS-1589 *-RS-1594 *-RB-1083	MISCELLANEOUS Crystal Dlode, (vas REDOOM) Jack, Earphone Screw, Tuning Knob Bail, Mandle Screw, Cabinet Lock Battery Contect Aasem Clip, U Type Speaker 3.2 otms 3 1/2"	.90 .40 .05 .10 .35	*-RS-1573 *-RS-1574 *-RS-1575 *-RS-1576 *-RS-1577	CASINET & APPEARANCE ITEMS Cabinet Front, Back, Crille, Insert Tosert and Comparison of Crille, Association Knob, Yolume	4.95 .50 .35 1.20 .35 .60

Prices Are Suggested List Prices And Are Subject To Change Without Notice.

All Parts Not Cataloged Are Common Items, Obtainable From Radio Parts Sobbers.

 $^n\Delta^n$  Denotes part used in former radio/phono models. You may have it stocked under number shown in parenthesis. Please change your records to the new number with two-letter prefix.





(540-1600 KC., 488 KC., I-P.) Supersedes Service Note S-P760A

	SPECIFICATIONS
CABINET:	Plastic - Beige, P760A; Green, P761A
ELECTRICAL	4 Batheries; Eveready #950 or A100,
RATING:	Burgess #2R, or equivalent
POWER	Undistorted: 80 millivatts
OUTPUT:	Maximum: 150 millivatts

#### CENTRAL INFORMATION

The models P760A and P761A are all transistor battery operated portable radios. The B+ is supplied by four 1 1/2 volt flash -

light type batteries producing the total B+ of 6 volts. CHASSIS REMOVAL

Remove both knobs. 2. Remove the 4 batteries. Remove cabinet retainer strap. 4. Unsolder the

two leads on the speaker. 5. Unscrew the 7 screws holding chassis to cabinet.

#### TROUBLE SHOOTING

#### A check of battery conditions and total current drain of the receiver should be made first. All current measurements are made at quiescence with the receiver turned on, volume control at maximum, tuning gang closed, and with no-signal conditions.

The total receiver current drain is 58 to 57 mils, emery cloth to insure positive electrical contact. This is neasured by inserting a milliameter in After the set has been aligned and placed in series with the batteries.

If an excessive total current drain is recorded, the individual collector currents of each transistor should be checked. An excessive current reading may mean a shorted transistor; no current will indicate that a transistor or associated circuit components are defective.

A single-edge razor blade is a satisfactory tool for cutting the copper circuit wiring so that a williammeter can be inserted in series with the break to measure the current flow. After each current check is completed, solder the cut carefully to complete the circuit again.

- Check battery voltage and battery contacts. Check on-off switch.
- Check all antenna lead connections.
- Check coil L2.
- WEAK AUDIO:
- Check battery voltage for 6 volts.
- Check battery current. 7
- Check transistor collectof currents. Check alignment.

OJohn F. Rider

- INTERMITTENT:
- Check battery contacts for corrosion. Check solder connections on dip-soldered side of circuit board.

Intermittent sudio, motorbosting, and poor reception is frequently caused by poor battery contact. Remove batteries and bend both the contact springs



#### P760A, P761A

and holding springs inward to increase their tension. Oxidation may occur on the contacts of the batteries. This tends to insulate the batteries from the battery contact springs, and increase electrical resistance. The terminals on the batteries should be cleaned with

After the set has been aligned and placed in the cabinet, recheck the antenna trimmer at 1500 KC. Due to the inductance effect caused by the proximity of the speaker when the cabinet is closed, a change in the peak operating condition will be noticed. Open the cabinet and slightly adjust the trimmer, then close the cabinet and recheck again, continue the procedure until the proper operating performance is sttained.

#### TRANSISTOR REPLACEMENT

When measuring voltages at the transistor lead terminals, be sure to observe correct voltage polarities as shown on the schematic.

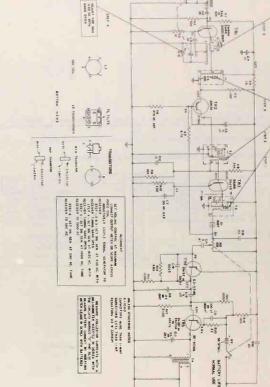
When replacing a defective transistor, be sure to observe correct lead positions, as shown on the sche-matic diagram in outline form. When replacing TR2. mount carefully so that the transistor casing does not touch other circuit components.

#### REPLACEMENT OF COMPONENTS

After removing a defective part, clean the mounting holes of all solder; the replacement part can be inserted more easily and a better solder connection can be accomplished. Apply a soldering iron just long enough to heat the terminal to remove the components

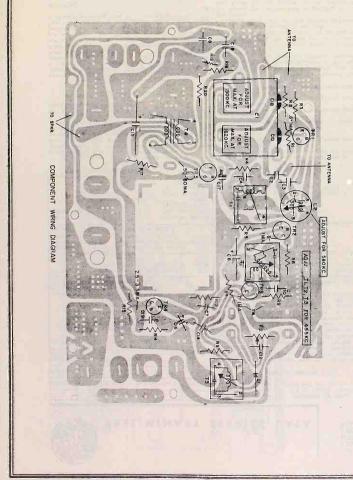
enough to heat the terminal to remove the components Too much heat may damage a component. After completing a soldering operation, inspect and clean the plated circuit of any excess solder that may short or bridge across nearby copper plated wiring. After replacing Cl2, "dress" capacitor so that it

is parallel to the chassis board.



3.

1.1.1



		REPLAC	EMENT F	ARTS LIST		
CAT. NO.	SYMBOL	DESCRIPTION	PRICE	EA NO.	DESCRIPTION	PRICE
		CAPACITORS	an in the		MISCELLANEOUS	
*-RS-1346	C1 C2,3,4,10 C6 C7,12 C8,17 C14, 18 C15 C16 C19	Capacitor, Tuning Olmf., 450V. 8mf., 10V. .05mf., 450V. .047mf., or .05mf., 450V. 5mf., 10V. 100mf., or 200mf., 3V. .22mf., 100V. .0033mf., 450V.	3.55	RS-1320 *-RS-1341 *-RS-1342 *-RS-1344 *-RS-1345 *-RS-1393	Clamp, Antenna. Clip, 1. F. Battery Clip & Clamp (Pos.) (Right Cent. Batt.). Battery Clip & Clamp (Neg.) (Left Center Batt.). Bracket, Antenna, (L.H.). Bracket, Antenna, (L.H.). Clip (Pos.) (Left Battery).	.1" .0 .3 .3 .3 .9 .7 .2
	cc	ILS AND TRANSFORMERS		*-RS-1394 *-RS-1395	Clip & Clamp (Pos.) (Right Batt.). Clip (Neg.) (Right Battery)	.3
*-RS-1424 *-RS-1425 *-RS-1426 *-RS-1427 *-RS-1427 *-RS-1428	T1 T2 T3 L2 T4	Transformer, 1st. I.F Transformer, 2nd. I.F Transformer, 3rd. I.F Coil, Oscillator Transformer, Output Antenna.	1.45 1.30 2.65	*-RS-1396 *-RS-1456 *-RB-1057 RHC-095 RMS-272	Clip & Clamp (Weg.) (Left Batt.) Button, Wall Hanger Speaker 4" (Speaker Mtg.) Ring, Compression (For Knobs) CABINET AND APPEARANCE ITEMS	.3 .4 5.4 .10
		POTENTIOMETER	No. 5	*-RB-1060	Cabinet Front, Beige (P760A))	1
RS-1347	R12, S1 "TR	Control, Volume, 10K & Sw. ANSISTORS AND DIODES	1, 85	(Assemb.)	Cabinet Back, Beige Grille Pad. Grille Cabinet Clasp (2)	4.5(
RS-1533 RS-1538 RS-1531 RS-1539 RS-1537 RS-1541	TR1 TR1, TR3 TR1 TR2 TR3 TR4	2N168A (on some sets) 2N169 (TR1 on some sets) 2N212/1297 (on some sets). 2N135 or 4_JX1A813 2N293 or 2JX14 2N192 or 2JX14		*- <u>RB-1061</u> (Assem <u>b</u> .)	Cabinet Hinge (2)	4.50
RS-1542 RED-001	TR5 D1	2N270,2N321 or 2N241A 1N87, Diode Detector	3.20 1.90	RS-1069 RS-1071 RS-1075 *-RS-1390 *-RS-1391	Knob, Tuning Knob, Volume Cabinet Clasp Grille Handle & Decorative Strip	.7 .8 .0 .7 1.0

All Parts Not Listed By Catalog Numbers Are Common Items, Obtainable From Parts Jobbers.

MODELS P765A, B, P766A, B

RADIO



# PRELIMINARY SERVICE DATA

	SPECIFICATIO	NS		
CABINET :	P765A,B Gold/ Beige-P766A,B Plaid/Black			
DIMENSIONS:	6 21/23"x 3 15/32"x 1 7/32"			
ELECTRICAL RATING:	2 1/2 to 3 Volts	DC		
BATTERIES:	(a) Carbon Pen-Hight cells: 2 Evercedy (915, or 2 Burgess & or 2 Mallory MIS (b) Marcury Cells: 2 Evercedy #59, or 2 Mallory & 249 (c) Nickel Cadaium Cells: RECHARCEABLE CELLS 2 Gould & AA. The rechargeshe cells are packed with the rechargeshe carrying case accessory.			
OPERAT ING FREQUENCIES:	ing range 540-1620KC 1F Amplifier 455 KC.			
POWER OUTPUT	Undistorted - 100 Milliwatts Maximum - 130 Milliwatts, with 3 volts input.			
SPEAKER	2 3/4" PM 15 Ohm	s @ 400 Cycles		
P715C & P15A CHARGER:	Input 110 Volts A Output: See dias	AC 2.5 Watts gram page 2		
TRANSISTOR COMPLEMENT :	OSC. CONVa I.F. I.F. Germanium Diode I Driver Audio Output Audio Output	2N164A or 2N168A 2N293 or 2N314 2N293 or 2N314 2N293 or 2N314 1N87 2N191 or 2N323 2N241 2N241		

#### GENERAL INFORMATION

This receiver is of standard superheterodyne design, using a ferrite-core antenna loop. Conventional IF circuitry is used except in the 3. Conventional if circuity is used except in the state second stage where a capacity divider is employed. A 4, germanium diode is used as a detector ahead of the driver stage. Two 2N241 transistors are used in a INT Class B push-pull circuit in the output stage.

The charging unit uses a step-down transformer and a diode in a half wave rectifier circuit to charge 2. the nickel cadmium batteries.

#### TRANSISTORS REPLACEMENT

Transistors are hermetically sealed and relatively stable, it is advisable to make a complete 1. Remove the end cap on the speaker end of the component check before a transistor is replaced. If radio the same as you would to change the batteries. a transistor is suspected to be at fault, it can be Do not unsolder the wire attached to the end cap, but removed and checked on the G. E. transistor tester, unsolder the wire from the chassis bracket to the Model 4JTLAI which is available from your G. E. tube case. distributor. Use care when replacing the transistor, 2. With a pair of longnose pliers, straighten the making sure its leads are in the correct holes on the metal tab holding the speaker grille in place. circuit board. See the phantom diagram for correct 3. Remove the speaker grille by folding it up and positioning, Use care when soldering as excessive toward the opposite end of the case. heat will damage the transistors and printed board. 4. Using care, pull out the speaker and unsolder the A 35 watt soldering iron is recommended.

#### ALTONMENT .

To effect a proper flignment on this receiver, off the tuning knob. the same procedure is used as an ordinary superhet- 6. Take out the screw near the tuning shaft hole,

attery voltage before alignment in order to obtain aximum sensitivity. The RF signal input should be ept at a minimum to avoid AVC action.

#### TROUBLE SHOOTING HINTS

S-P765

COVERS MODELS P765A B

P766A,B

Total battery drain used by the receiver will live an indication of whether the transistors are perating normally. This current check is made at uiescence. This means the volume control should be 1 the way open, the tuning gang all the way closed, id with no signal or noise being picked up.

With the radio controls set accordingly, a urrent flow check between the battery end cap and ne negative end of the battery should indicate operly operating transistors. If excessive total urrent is noted when this check is made, individual arrent checks should be made at the collector section the suspected transistors.

We are including in the schematic of this radio e proper current ranges found at the various check pints. A properly operating stage should not vary rom these readings. An excessive current reading ill likely mean a shorted transistor. If no current an be read, this will indicate an open transistor or ther component in the circuit.

#### AD:

- Check batteries. Check speaker by substituting earphones.
- Check earphone jack.
- Check for broken antenna leads.

- Check battery voltage-Gould batteries 2.5 volts; Carbon or Mercury batteries 3 volts.
- Check R. F. alignment.
- Check I. F. alignment.

#### DISTRUCTION

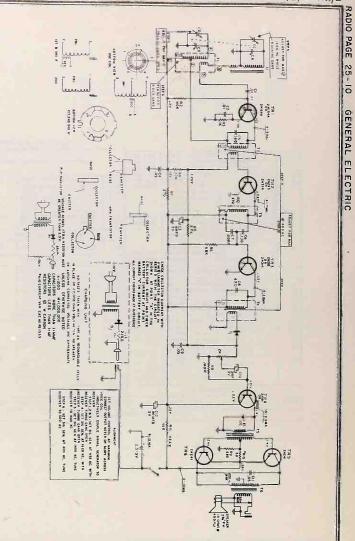
- Check battery connection on end cap for corosion. 1.
- Check battery voltages (same as for weak.) Check I. F. alignment.
- Check output transistors for proper match.
- INTERMITTENT :
- 1. Check positive battery contact for good contact to battery.
- Check Phillips screw holding tuning gang to circuit board.
- Check solder connections on circuit board.

#### TO REMOVE CHASSIS FROM CASE

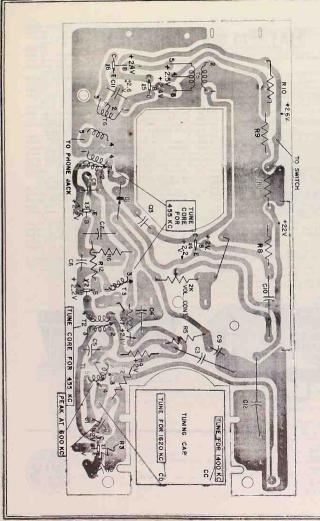
two leads.

5. Remove the volume knob by pulling it off. Turn the screw in the center of the tuning dial in a counterclockwise direction to remove it, then pull

erodyne electron tube set. It is advisable to check also the screw on the end cap tuning dial end.



CJohn F. Rider

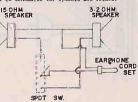


7. Slide the chassis toward the tuning dial end about CAT. NO. 1/2 inch to gain access to the loop connections. 8. Unsolder the 3 loop connections. Be sure to

observe lead color coding. 9. Continue to slide the chassis out in this dir-ection. Let the end cap with the wire attached follow the chassis through the case.

		g and unsoldering speakers.			CABINET & APPEARANCE ITEMS	
CAT. NO.	SYMBOL	DESCRIPTION	PRICE	n-RS-1357	Right End Cap	.60
		CAPACITORS		RAC-214	Loop Cover	.75
n-RS-136 <u>1</u> n-RS-1434	C1,2 C4,9,11 C13 C5 C6 C7 C8	.01 MFD 450V .05MFD 50V .02 MFD 100V 360 MMF 300V .0005 MFF 300V .0005 MFD 50V 470 MMF 30V	4.20	RAC-102 RAG-103 RAV-1040 RAV-1040 n-RS-1358 RS-1009 RS-1010	Speaker Cover P765, A.B. Speaker Cover P765A, B. Cabiner, W.Leatherette, P765A, B. Tuning Dial. Leatherette P765A, P765B. Leatherette P765A, P765B. Leatherette P765A, P765B. Casker, Speaker. Knob, Volume Control. Speaker.	1.30 1.30 5.40 5.40 .70 .10 1.0 7.6 7.6
		POTENTIOMETER	1	Battery	chargers, model P15A & P715C, are avail	ağı
RRC-420	21	Vol. Con. & Sw	1.90	for use	with this receiver, as an accessory	
2010 - 19 - 19 ATT.		COILS & TRANSFORMERS			CHARGING BOX PARTS	
RLC-147 RLL-0 2 RS-13% RS-(133 RTL-21 RTL-210 RID-206	L1 T2 T3 T4 T5	Oscillator Coil Loop I.F. Transformer 1st I.F. Transformer 2nd J.F. Transformer 3rd Driver Transformer Output Transformer	1.40 2.15 1.75 1.65 3.65	RAF-009 RAH-007 RB-1035 RAU-475 RJB-083 RJP-068 RTC-006	Case, Charger 7715C. Terminal Strip, 7715C & P15A. Charging Plug P715C & P15A. Transformer, 7715C & P15A.	.50 .60 17.8 4.50 .0 .10 2.80 .90
	h	RESISTORS		RWL-043 RS-1008		4.2
RS-1355	R10	50 OHMS Current Var	,50	RS-1199 RS-1111	Identification Plate P715C	.30
471	alotona on	d canacitors not cataloged		RS-1198 RS-1200		.3

All resistors and capacitors not cataloged are common types obtainable from radio parts jobbers. Refer to schematic for symbols and values.



RAD-231 Bracket, Rt. end P765A, P766A...... RHM-043 "C" Washer P765B, P766B..... The chassis through the case.
 NOTE: Do not remove the loop unless if is found to be defactive, as this will affect the alignment of the receiver.
 When repairing the chassis out of the cablet, there is a loop attached which clisinates the removal of the strength o RS-1227 Tube, Battery.....

PRICE

.10

.15

.20 .20 .04 .45 .25 .25 .01 .90

.05 .25

DESCRIPTION

MISCELLANEOUS ITEMS

RAG-103	Speaker Cover P766A, B	1.30
RAV-1040	Cabinet, W/Leatherette, P765A,B	5.40
RAV-104	Cabinet, W/Leatherette, P766A, B	5.40
-RS-1358	Tuning Dial	.70
RS-1009	Leatherette P765A, P765B	.10
RS-1010	Leatherette P766A, P766B	.10
RS-1359	Strap, Carrying Asem	1.05
RIG-018	Gasket, Speaker	.20
RDK-636	Knob, Volume Contrel	.35
RS-1039	Speaker	7.65
RS-1433	Bracket, Phono & Charging Jack P765B	1
	P766B	.35
RAF-009	CHARGING BOX PARTS	
	Trim Strip P715C	.50
RAH-007	Trim Strip P715C Charger Housing P715C	.60
	Trim Strip P715C Charger Housing P715C Case, Charging P15A	.60
RAH-007 RB-1035 RAU-475	Trim Strip P715C Charger Housing P715C Case, Charging P15A Case, Charger P715C	.60 17.85 4.50
RAH-007 RB-1035 RAU-475 RJB-083	Trim Strip P715C Charger Housing P715C Case, Charging P15A. Case, Charger P715C. Terminal Strip, P715C & P15A	.60 17.85 4.50 .05
RAH-007 RB-1035 RAU-475 RJB-083 RJP-068	Trim Strip P715C Charger Housing P715C Case, Charging P15A. Case, Charger P715C. Terminal Strip, P715C & P15A Charging P1ug P715C & P15A	.60 17.85 4.50 .05 .10
RAH-007 RB-1035 RAU-475 RJB-083 RJP-068 RTC-006	Trim Strip P715C Charger Housing P715C. Case, Charging P13A. Case, Charger P715C. Terminal Strip, P715C & P15A. Charging Plug P715C & P15A. Transformer, P715C & P15A.	.60 17.85 4.50 .05 .10 2.80
RAH-007 RB-1035 RAU-475 RJB-083 RJP-068 RJP-068 RTC-006 RWL-043	Trim Strip P715C. Charger Housing P715C. Case, Charging P15A. Case, Charger P715C. Terminal Strip, P715C & P15A. Charging P105C & P15A. Transformer, P715C & P15A. Transformer, P715C & P15A. Dever Cord P715C & P15A.	.60 17.85 4.50 .05 .10 2.80 .90
RAH-007 RB-1035 RAU-475 RJB-083 RJP-068 RTC-006 RWL-043 RS-1008	Trim Strip P715C Charger Houring P715C. Case, Charger P15C. Case, Charger P715C. Terminal Strip, P715C & P15A. Charging Plug P715C & P15A. Charging Plug P715C & P15A. Power Cord P715C & P15A. 1 Ntckel Cod. Battery.	.60 17.85 4.50 .05 .10 2.80 .90 4.25
RAH-007 RB-1035 RAU-475 RJB-083 RJP-068 RTC-006 RWL-043 RS-1008 RS-1199	Trim Strip P715C. Charger Housing P715C. Case, Charger P715C. Case, Charger P715C. Case, Charger P715C. Charging Plug P715C & P15A. Charging Plug P715C & P15A. Power Cort 9715C & P15A. 1 Nickel Cad. Battery. Charging Plug Assem. P715C & P15A.	.60 17.85 4.50 .05 .10 2.80 .90 4.25 1.00
RAH-007 RB-1035 RAU-475 RJB-083 RJP-068 RTC-006 RWL-043 RS-1008 RS-1199 RS-1111	Trim Strip P715C. Charger Housing P715C. Case, Charger P15C. Case, Charger P715C. Terminal Strip, P715C & P15A. Charging Plug P715C & P15A. Transformer, P715C & P15A. Power Cord P715C & P15A. 1 Nickel Cad. Battery. Charging Plug Assem. P715C & P15A. Charging Plug Assem. P715C & P15A.	.60 17.85 4.50 .05 .10 2.80 .90 4.25 1.00 .30
RAH-007 RB-1035 RAU-475 RJB-083 RJP-068 RTC-006 RWL-043 RS-1008 RS-1199	Trim Strip P715C. Charger Housing P715C. Case, Charger P715C. Case, Charger P715C. Case, Charger P715C. Charging Plug P715C & P15A. Charging Plug P715C & P15A. Power Cort 9715C & P15A. 1 Nickel Cad. Battery. Charging Plug Assem. P715C & P15A.	.60 17.85 4.50 .05 .10 2.80 .90 4.25 1.00

"n" DENOTES ITEMS NOT PREVIOUSLY CATALOGUED

PRICES ARE SUGGESTED LIST PRICES AND ARE SUBJECT TO CHANGE WITHOUT NOTICE.

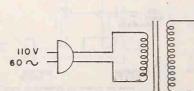
R13

D2

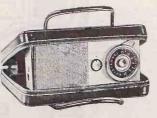
220 2



ER-S-PI5A COVERS MODELS P715C P15A







# P715C

These charging units can be used with all G. E. TROUBLE SHOOTING transistor radios having a recharging jack and using 2 rechargeable 1.2 volt batteries. When checking

units, the charging transformer had an output of 2.7 following checks: volts A.C. However, in the later production P715C and all of the P15A chargers this transformer has an 1. Check outpu output of 12 volts A.C. and uses a 220 ohm 1 watt series dropping resistor.

If it becomes necessary to replace the charging transformer, only the type catalog number RTC-006 with the 12 volt A.C. output, should be used . All RTC-006 transformers will be supplied with the 2200hm dramming resistor. The resistor chemical de second dropping resistor. The resistor should be connected in the circuit as shown in the schematic diagram.

For quickly checking the output of the charger a simple test item can be constructed in a couple of minutes. Take a charging jack-and-bracket assembly (cat. no. RS-1433) and solder a 170 or 180 ohm resistor between the jack terminal and the bracket CAT. NO frame.) With the charger plugged into the jack and across the 170 to 180 ohm resistor must be greater than 2.5 volts D.C.

Rechargeable cells that remain in a discharged condition may accumulate corrosion on the terminals. This corrosion acts as a high resistance in series with the charger when attempting to recharge the batteries.

Batteries in this condition may never become fully charged creating the illusion of a faulty charger. It is necessary therefore, to clean the terminals with fine emery cloth before attempting to recharge the batteries.

Normal recharging time for a set of rechargeable batteries is 14 to 16 hours. However, this time may vary depending upon the condition of the batteries when the recharge begins. CAUTION

Make sure the batteries are installed in the correct position. IF RECHARCEABLE BATTERIES ARE IN-STALLED IN THE REVERSE POSITION THEY WILL BE RUINED DURING RECHARGE.

P15A

RAF-0 RAH-0

RAII-4

RJB-0

RTC-0 RWL-0

RS-10

RS-11

RS-11

RS-11

RS-12 RB-10

RS-16

chargeable 1.2 volt batteries. When checking the charger output as previously In the early production of the P715C charger described, if less than 2.5 Volts D. C. make the

Check output voltage of the transformer. (a) If the charging unit uses the 220 ohm resistor, the transformer output should be 12 Volts A. C.

(b) If the 220 ohm resistor is not used in unit the transformer output should be 2.7 Volts A. C.

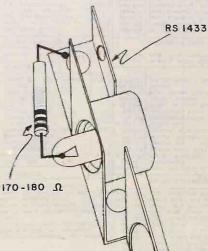
Check solder connections on terminal board

And at charger plug. Check the 220 ohm resistor by unsoldering one end and substituting one of proper resistance. Check diade D2 also by substitution. 4

ι, ·	SYMBOL	DESCRIPTION	PRIGE
09		Trim Strip P715C	.50
07		Charger Housing P715C	.60
75	1.00	Charger Case Assem. P715C	4.50
83		Terminal Strip	.05
06		Transformer	2.80
43		Cord, Power	.90
80		Battery, 1 Nickel Cad	4.25
11		Plate, Identification P7150	.30
98		Housing, Charger P15A	.70
99	1	Plug, Charger Assembly	1.00
00		Plate, Identification P15A.	.30
35		Case, Charger P15A	7.85
53	D2	1N92 Diode	2 00

All components not cataloged are common types obtainable from radio parts jobbers. Refer to schematic for symbols and values.

PRICES ARE SUGGESTED LIST PRICES AND ARE SUBJECT TO CHANGE WITHOUT NOTICE.



GENERAL C ELECTRIC SERVICE MANUAL FOR TRANSISTOR RADIO RECEIVERS

(540-1600 KC., 455 KC., 1-F.) Supersedes Service Note S-P725B

	SPECIFICATIONS
CABINET:	Plastic - Brown, P725B; Turquoise, P726B
ELECTRICAL	3 Batterics: Eveready #950, or Al00,
RATING:	Burgess #2R, or equivalent
POWER	Undistorted: 225 milliwatts
OUTPUT :	Maximum: 350 milliwatts

#### GENERAL INFORMATION

The models P725B and P726B are all transistor battery operated portable radios.

The B+ is supplied by three 1 1/2 volt flashlight type batteries producing the total B+ of 4.5 volts.

#### CHASSIS REMOVAL

1. Remove both knobs. 2. Remove the 3 batteries. 3. Remove cabinet retainer strap. 4. Unsolder the two leads on the speaker. 5. Unscrew the 5 screws holding chassis to cabinet.

current measurements are made at quiescence with the from the battery contact springs, and increase receiver turned on, volume control at maximum, tuning electrical resistance. The terminals on the batteries

This is measured by inserting a milliammeter in series with the batteries.

If an excessive total current drain is recorded,

or cutting the copper circuit wiring so that a milli-ammeter can be inserted in series with the break to measure the current flow. After each current check is completed, solder the cut carefully to complete the circuit again.

#### NO RECEPTION:

- Check battery voltage and battery contacts. Check on-off switch.
- Check all antenna lead connections.
- Check coil L2.

#### WEAK AUDIO:

- Check battery voltage for 4.5 volts.
- Check battery current. Check transistor collector currents.
- 3. 4. Check alignment.

- INTERMITTENT:
- Check battery contacts for corrosion. Check solder connections on dip-soldered side of
- circuit board.

Intermittent audio, motorboating, and poor reception is frequently caused by poor battery contact.



ER-S-P725B COVERS

MODELS

P725B

P726B

P725B, P726B

TROUBLESHOOTING Remove batteries and bend both the contect springs A check of battery condition and total current and holding springs inward to increase their tension. Grain of the increase should be made first. All Oxidation may occur on the contacts of the batteries received in mountain the contect of the batteries from the tension of the statement of the batteries and the statement of the batteries and the statement of the s gang closed, and with no signal conditions. The total receiver current drain is 16 to 18 mile. should be cleaned with emery cloth to insure positive

electrical contact. After the set has been aligned and placed in the cabinet, recheck the antenna trimmer at 1500 KC. Due to the inductance effect caused by the proximity of the individual collector currents of each transistor to the inductance effect caused by the proxisity of should be checked. An excessive current reading may the speaker when the cabinet is closed, a change in mean aborted transistor; no current will indicate the pak operating condition will be noticed. Other that a transistor or associated circuit component close the cabinet and rightly edjust the check of is defective. A single-edge rary blade is a satisfactory too contain the proper operating performance is attained

#### TRANSISTOR REPLACEMENT

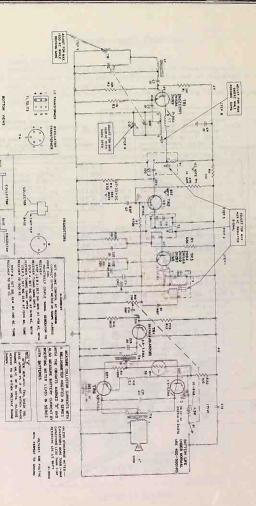
When measuring voltages at the transistor lead terminals, be sure to observe corrent voltage polarities as shown on the schematic.

When replacing a defective transistor, be sure to observe correct lead positions, as shown on schematic diagram in outline form.

#### REPLACEMENT OF COMPONENTS

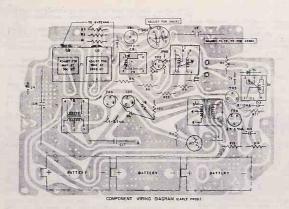
After removing a defective part, clean the mounting holes of all solder; the replacement part can then be inserted more easily and a better solder connection can be accomplished. Apply a soldering iron just long enough to heat the terminal to remove the component. Too much heat may damage a component. R15 is a thermistor (temperature compensating

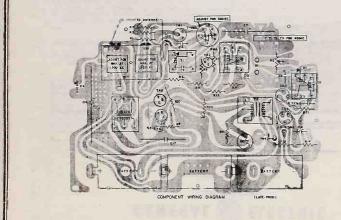
resistor) and regulates the current flow to the out-put transistors. After replacing R15, allow it to reach ambient temperature before turning the radio on.



GENERAL ELECTRIC RADIO PAGE 25ū

RADIO PAGE 25- 14 GENERAL ELECTRIC





in state of the	-	REPLA	CEMENT	PARTS LIST		-
CAT. NO.	SYMEOL	DESCRIPTION	PRICE	CAT. NO.	DESCRIPTION	PRIC
		CAPACITORS		I.	MISCELLANEOUS	PRIC
RS-1022	C2, 3, 41		1	1	The second secon	
	10,15	.01mf., 450V	. 30	RB-1057	Speaker, 4"	5.4
RS-1024	C8,13	.05mf., 50V		RS-1065	Brace, Handle, I. H	1 4
RS-1346	CI	Tuning Capacitor	.50	RS-1066	Brace, Handle, R.H.	7
RS-1458	C16	175mf., 6V	3.55	RS-1067	Screw, Handle	i.
RCE-225	C7	8mf., 10V	1.55	RS-1072	Pad, Grille, (Black Paper)	0
	C14	5mf., 10V.	1.65	RS-1073	Retainer, Handle	.0
	C17	.22mf., 100v.	1 3	RS-1074	Clip, Friction	.0
	1		in named	RS-1075	Catch, Cabinet.	.0
		RESISTORS		RS-1088	SCTEW, #6x5/16 type 25	.0
		RESISIONS		RS-1089	Screw, #6-32x1/8 P.H.	.0
RS-1355	R15	50 share at	St Succession	RS-1188	Clamp, Antenna	
10-1311	ALS	50 ohms, thermistor	.50	RS=1341	Battery Clip, Clamp & Rivet,	.1
		DOMESTIC ALCOLOGICAL			(Pos. End)	
		POTENTIOMETER	1	RS-1342	Battery Clip, Clamp & Rivet,	. 30
RS-1347	R12.51		F			
AG-1347	812,51	Volume Control, 10K & Sw	1.85	RS-1343	Battery Clamp Holder, Clamps &	. 30
3104-40-2000-0-4					ordanp norder, cramps &	
		TRANSISTORS & DIODES		RS-1344	Bracket, Antenna, (R.H.)	.40
				RS-1345	Bracket, Antenna, (L.H.).	.90
RS-1531	TRI	2N212/1297 (on some sets)	3.55	RS-1456	Wall Hanger Button.	.70
RS-1533	TR1, TR3	2N168A (on some sets)	3,20	RHC-095	Ring Dubular	.10
RS-1538	TR1, TR3	ZN169 (on some sets)	2 06	RMS-272	Ring, Tubular.	.10
RS-1547	TR2, TR3	2N94 (TR3 on some sets).	3 15	THE STR	Ring, (Compression) (for knobs)	. 05
RS-1534	TR3	2N515 (on some sets).	3.15	a contraction of the	CARTNER & IRREIT	
RS-1537	TR3	2N293 (on some sets)	3 15		CABINET & APPEARANCE ITEMS	
RS-1546	TR4	2N265/4JX1A520B	2.05	*-RB-1055	0.11.	
RS-1542	TR5, TR6	2N24LA, 2N270, or 2N321	3 20	(Assemb.)	Cabinet Front, (Tan), P725B	
RED-001	D1	1N87, Diode Detector	1 00	(Assemb.)	Cabinet Back, (Tan)	
			1.90		Pad, Grille	
		COILS & TRANSFORMERS	1000		Grille	6.45
					Nameplate	
RS-1348	T1	Transformer, 1st I.F	1 75		Catch, Cabinet, (2)	
RS-1349	T2	Transformer, 2nd I.F	1 05	*-RB-1056	Hinges, Cabinet, (2)	
RS-1350	T3	Transformer, 3rd I.F	1.05	(Assemb.)	Cabinet Front, (Turg.), P726B	
RS-1351	LŽ	Coil,Oscillator.	1.95	(Assemb.)	Cabinet Back, (Turg.)	
RS-1352		Transformer, Input	1.20		Pad, Grille	6.45
RS-1353		Transformer, Output	2.75		Grille	
RS-1354		Antonno	2.40		Nameplate	
NO LOSA	-	Antenna	2.10		Catch, Cabinet, (2)	
* - Day	notos Dam	An Mark David A david			Hinges, Cabinet, (2)	
De	noces Par	ts Not Breviously Cataloged.	4	RS-1061	Grille	2.10
All Domes	N		+	RS-1062	Nameplate	.25
Ttors	Obted	ed By Catalog Numbers Are Com	mon	RS-1063	Handle, (Brown), P725B.	.95
rcems	, Ubcaina	ble From Radio Parts Jobbers.	1	RS-1064	Handle, (Ant. White), P7268.	.95
P-1-7-1				RS-1068	Knob, Tuning, (Brown), P725B	.75
Frices A	re Sugges	ted List Prices And Subject 7	0	RS-1069	Knob, Tuning, (Ant. White), P7268.	.75
	Chan	ge Without Notice.	1	RS=1070	Knob, Volume, (Brown), P7258	.85
				RS-1074	Knob, Volume, (Ant. White), P726B.	

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# REMOVING CHASSIS FROM CASE

- 2. Remove tuning knob stud by turning counterclockwise and remove tuning knob.
- 3. Remove case cover mounting screw located behind tuning knob and remove case cover.
- 4. Remove three chassis mounting screws.
- 5. Carefully remove chassis from case allowing battery cable to slip through battery com-

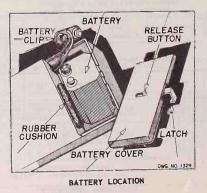
# BATTERY REPLACEMENT

Since the receiver is small and compact, not every 9 volf battery will fit in the space provided. Listed below are five available types to be used for replacement.

WARDS	NO-92
BURGESS	NO-2N6
EVEREADY	NO-246
DLIN	NO-1707
RCA	VS-305

Approximately 100 hours performance can be experienced with the above batteries before replacement is required. Battery replacement should be performed when the sound output is noticed to be muffled or distorted with a decrease in total output or if a voltage measurement shows less than 6 volts. The battery voltage should be measured with the receiver turned on after at least 5 minutes of operation.

When battery replacement is necessary, remove battery cover by pushing release button upward, grasp latch and pull up and away from case. Remove old battery and un-snap battery cable. Snap battery cable on replacement battery and insert into case. Be sure rubber cushion is between battery and side wall of case to prevent battery movements insert battery cover in place and push latch down.



# SPECIFICATIONS

Model BR-1102A

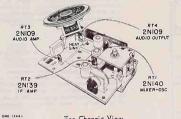
MONTOOMERY WAR

Turquoise and White

Power Supply 9 volts D.C.
Frequency Range
Intermediate Frequency 455 KC
Selectivity At 1000 KC, 70 KC at 1000 X signal
Sensitivity (2.mw ref) 800 u.v. per meter
Power Output
Speaker 2-3/4" PM, V.C. impedance-15 ohms
Cabinet 6-1/4" width, 1-3/4" depth, 3-3/8" height

# TRANSISTOR COMPLEMENT

R¶1	2N140	Oscillator-Mixer
RT2	2N139	1st. IF Amplifier
R#3	2N109	Audio Amplifier
RT4	2NI109	Audio Output
	ĆK-706A	Crystal Detector



ON-OFF

VOLUME

Top Chassis View

SERVICE LETTER REMINDER Record number of Service Letters below that apply to models listed in this manual.

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# TRANSISTOR SERVICING

The following information is presented as a guide to servicing transistor radios:

#### VOLTAGE READINGS

Because of the law bottery potential, it is suggested that a VTVM be used to measure all circuit voltages. Voltage readings will vary with the strength of the signal being raceived, the battery voltage, and the type voltmeter being used. The voltage readings indicated on the schemotic diagram ware measured with a VTVM, no signal input, and with a battery voltage of 9 volts. Voltage readings will also vary with a change of transistors. The transistors conductivity varys to one transistor to another, therefore, voltage readings will differ. All voltage readings will be negative with respect to chassis due to the PNP type transistor employed.

#### BATTERY REPLACEMENT

The bottery should be the first component checked when the radio is presented for service, since the battery voltage decreases with use and age. The bottery voltage should be checked at the battery coble connections with the receiver turned on, and after at least five minutes of operation. Batteries have a tendency to reactive (recharged when not in use, and a true test of the batteries capabilities and the determined until sufficient current has been drawn from the battery. If the battery is found to be dead, there is should be checked for a short circuit belore the replacement battery is installed. Disconnect battery and maximum situations with an other of the battery cable connections. Ohmeter will indicate approximately 1000 ohms with situate lead to chassis, approximately 4000 ohms with negative lead to chassis and approximately 4000 ohms with a situation of circuit with either meter lead to chassis. Battery replacement should be performed when the sound output is noticed to be muffled or distorted with a decrease in total output.

#### OHMMETER READINGS

When using a chameter to check continuity and resistance readings, caution must be observed. It is important to know the internal battery voltage of the ohameter as damage could result due to excessive voltages being applied to the ohameter. It is superiant to know the battery polarity of the meter leads. Incress of lypic applied to ehameter reads across of lypic appeariant to know working voltage may damage the capacitor due to excessive reverse turrent. If the meter battery voltage is greater than 12 voltage may damage the capacitor due to excessive reverse turrent. If the meter battery voltage is greater than 12 voltage, the high frequency transitor rating will be exceeded and transistors in the circuit. It is advisable to remove all transistors from their sockets before making ohamater checks.

#### SOLDERING

Cautian must be observed when using a saldering iron as excessive heat may easily damage a transistor. The transistors must be removed from their sockets before soldering at the socket pins. Heat may also damage other components such as I/4 watt resistors. Therefore, dissipate the heat to the component by grosping the component lead with a pair of long nose pliers. A low wattage small diameter tip inon is suggested.

#### TRANSISTORS

If a transistor is suspected of being defective, substitution will be the only reliable check. Checking resistance readings of a transistor with an ahmmeter will indicate only a shorted or open transistor. When inserting a transistor in its socket, make sure the transistor's leads line up with the socket halos. Illustrations on the submatric diagram show the spacing between transistor's leads and the transistor sockets. Audio transistors have a red dot on the body of the transistor adjacent to the collector lead for identifying purposes. The red dot must line up with a point dat on the chassis when the transistor is inserted into the socket. If a transistor substitution is made in the RF or sistor to another.

#### COMPONENT REPLACEMENT

An important consideration is component replacement. Miniature as well as close tolerance components are used throughout the radia, therefare, all components must be replaced with exact duplicate parts.

# TROUBLE SHOOTING

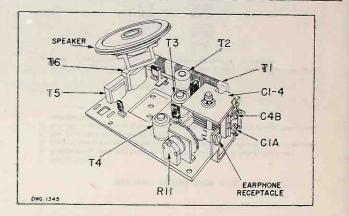
Trauble in a transistor radio can easily be isolated by using a signal generator and listening to the speaker. Circuit tracing from the base of the output stage back through the receiver to the antenna, should quickly reveal which stage is not functioning properly. When injecting the signal, use a 50 mfd lytic, negative ta base, in the audio circuit; a .5 mfd capacitor in the IP or RF stages and inductive coupling to the antenna.

Caution must be observed not to accidently short the collector circuit to the chassis, as damage to the transistor may result. Also, the practice of deliberately shorting a circuit to chassis to determine if voltage is present or to listen for a click in the speaker, must be avoided for the some reason.

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- ALIGNMENT PROCEDURE
- NOTES: 1. Remove chassis from case.
  - 2. Connect 9 volt battery.
    - 3. Use output meter with 15 ohms impedance.
  - 4. Turn volume control to maximum.
  - 5. Signal generator putput at 100 microvolts,
  - 30% modulation at 400 cycles.

-	SIGN	AL GENI	RATOR		OUTPUT		ADJUST FOR
CIRCUIT	FREQUENCY	COUPLING	CIRCUIT	GROUND	METER	GANGED CAPACITY	MAXIMUM OUTPUT ON METER
I.F.	455KC	.5MF	To Base of RT1	To Chassis	Connect in place of speaker		T3, T4
		keep	ing generator event overloa	output in all	times for best cases as low a	results, s possible	
Osc.	1620KC	.5MF	To Base of RT1	To Chassis	Connect in place of speaker	Open Gang (Fully clockwise)	C4B
		Caut	ion: Too high cause se	an output fr etting of trim	om signal gener mer on a spurior	rator may us response,	
0 c.	535KC	.SMĚ	To Base of RT1	To Chassis	Connect in place of speaker	Closed Gang (Fully counter- clockwise)	T2
Oxe.	1620KC	.5MF	To Base of RT1	To	Connect in place of speaker	Open Gang (Fully clockwise)	Ç4B
knt	1400KC	Connect 3 and place	turn loop to near T1,	generator	Connect in place of speaker	Ganged Conden- ser should be rocked	C1A



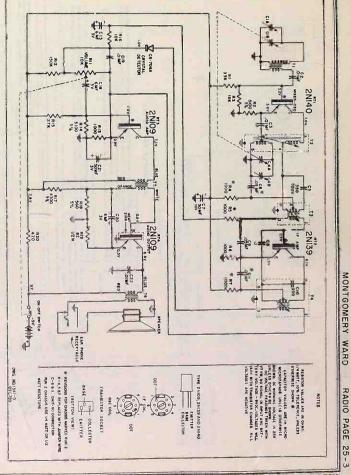
RADIO

# **REPLACEMENT PARTS LISTS**

-26383 10X820K C. 26659	RESISTORS 33K ohm, 1/4 watt, 10% 5100 ohm, 1/4 watt, 50% 5100 ohm, 1/4 watt, 50% 1000 ohm, 1/4 watt, 10% 1000 ohm, 1/4 watt, 10% 1000 ohm, 1/4 watt, 50% 200 ohm, 1/4 watt, 50% 200 ohm, 1/4 watt, 50% 200 ohm, 1/4 watt, 50% 200 ohm, 1/4 watt, 50% AD ohm, 1/4 watt, 10% AD ohm, 1/4 watt, 10% AD Adm, 1/4 watt, 1	74 75 78 ( ohm	13B-26382 12C-26467 12C-26539	NSFORMERS 2nd IF Transformer Joyupu Transformer Output Transformer ELLANEOUS Earphone receptacle Valume control bracker Valume knob screw 2-3/4" P.M. Speaker Battery Colo Screw 2-19 de Clarge Antenno spring clip Antenno spring clip
10X820K C. 26659	\$100 ohm, 1/4 watt, 5% 18K ohm, 1/4 watt, 10% 0nneff Volume control-101 1800 ohm, 1/4 watt, 10% 1800 ohm, 1/4 watt, 10% 5100 ohm, 1/4 watt, 15% 5100 ohm, 1/4 watt, 5% 62 ohm, 1/4 watt, 5% 82 ohm, 1/4 watt, 10% 470 ohm, 1/4 watt, 10%	T5 T6	12C-26467 12C-26539 MISC 44A-26374 2D-26377 32F2-5445 18A-26777 14A-26469 2M-26376 15B-24912 430-27661	Output Transformer CELLANEOUS Earphone receptacle Volume control bracket Volume knob screw 2-3/4" P.M. Speaker Battery Cable Antenno spring clip Transistor sacket-lorge
10X820K C. 26659	\$100 ohm, 1/4 watt, 5% 18K ohm, 1/4 watt, 10% 0nneff Volume control-101 1800 ohm, 1/4 watt, 10% 1800 ohm, 1/4 watt, 10% 5100 ohm, 1/4 watt, 15% 5100 ohm, 1/4 watt, 5% 62 ohm, 1/4 watt, 5% 82 ohm, 1/4 watt, 10% 470 ohm, 1/4 watt, 10%	T5 T6	12C-26467 12C-26539 MISC 44A-26374 2D-26377 32F2-5445 18A-26777 14A-26469 2M-26376 15B-24912 430-27661	Output Transformer CELLANEOUS Earphone receptacle Volume control bracket Volume knob screw 2-3/4" P.M. Speaker Battery Cable Antenno spring clip Transistor sacket-lorge
10X820K C. 26659	18K ohm, 1/4 watt, 10% 1000 ohm, 1/4 watt, 10% 1000 ohm, 1/4 watt, 10% 1000 ohm, 1/4 watt, 10% 1000 ohm, 1/4 watt, 10% 27K ohm, 1/4 watt, 5% 580 ohm, 1/4 watt, 5% 580 ohm, 1/4 watt, 5% 580 ohm, 1/4 watt, 10%	Т6	12C-26539 MISC 44A-26374 2D-26377 32F2-5445 18A-26777 14A-26469 2M-26376 15B-24912 43D-27661	Output Transformer CELLANEOUS Earphone receptacle Volume control bracket Volume knob screw 2-3/4" P.M. Speaker Battery Cable Antenno spring clip Transistor sacket-lorge
10X820K C. 26659	1000 ohm, 1/4 watt, 10% Onneff Volume cantrol-101 150K ohm, 1/4 watt, 10% 5100 ohm, 1/4 watt, 10% 5100 ohm, 1/4 watt, 10% 510K ohm, 1/4 watt, 10% 4300 ohm, 1/4 watt, 5% 500 ohm, 1/4 watt, 5% 520 ohm, 1/4 watt, 10%		MISC 44A-26374 2D-26377 32F2-5445 18A-26777 14A-26469 2M-26376 15B-24912 430-27661	ELLANEOUS Earphone receptacle Volume control bracket Volume knob screw 2-3/4" P.M. Speaker Battery Cable Antenno spring clip Transistor socket-lorge
10X820K C. 26659	On-off Volume control-101 150K ohm, 1/4 watt, 10% 1000 ohm, 1/4 watt, 10% 100 ohm, 1/4 watt, 5% 27K ohm, 1/4 watt, 10% 4300 ohm, 1/4 watt, 10% 4300 ohm, 1/4 watt, 5% 82 ohm, 1/2 watt, 10% 470 ohm, 1/4 watt, 10%	( ohm	44A-26374 2D-26377 32F 2-5445 18A-26777 14A-26469 2M-26376 15B-24912 43D-27661	Earphone receptacle Volume control bracket Volume knob screw 2-3/4" P-M. Speaker Battery Cable Antenno spring clip Transistor socket-large
10X820K C. 26659	150K ohm, 1/4 watt, 10% 1000 ohm, 1/4 watt, 10% 5100 ohm, 1/4 watt, 10% 27K ohm, 1/4 watt, 10% 10K ohm, 1/4 watt, 10% 4300 ohm, 1/4 watt, 5% 82 ohm, 1/4 watt, 10% 470 ohm, 1/4 watt, 10%	( ohm	44A-26374 2D-26377 32F 2-5445 18A-26777 14A-26469 2M-26376 15B-24912 43D-27661	Earphone receptacle Volume control bracket Volume knob screw 2-3/4" P-M. Speaker Battery Cable Antenno spring clip Transistor socket-large
C.	10% ohm, 1/4 watt, 10% 4300 ohm, 1/4 watt, 5% 560 ohm, 1/4 watt, 5% 82 ohm, 1/2 watt, 10% 470 ohm, 1/4 watt, 10%		44A-26374 2D-26377 32F 2-5445 18A-26777 14A-26469 2M-26376 15B-24912 43D-27661	Earphone receptacle Volume control bracket Volume knob screw 2-3/4" P-M. Speaker Battery Cable Antenno spring clip Transistor socket-large
C.	10% ohm, 1/4 watt, 10% 4300 ohm, 1/4 watt, 5% 560 ohm, 1/4 watt, 5% 82 ohm, 1/2 watt, 10% 470 ohm, 1/4 watt, 10%		44A-26374 2D-26377 32F 2-5445 18A-26777 14A-26469 2M-26376 15B-24912 43D-27661	Earphone receptacle Volume control bracket Volume knob screw 2-3/4" P-M. Speaker Battery Cable Antenno spring clip Transistor socket-large
C.	10% ohm, 1/4 watt, 10% 4300 ohm, 1/4 watt, 5% 560 ohm, 1/4 watt, 5% 82 ohm, 1/2 watt, 10% 470 ohm, 1/4 watt, 10%		2D-26377 32F2-5445 18A-26777 14A-26469 2M-26376 15B-24912 43D-27661	Volume control bracket Volume knob screw 2-3/4" P-M. Speaker Battery Cable Antenna spring clip Transistor socket-large
C.	10% ohm, 1/4 watt, 10% 4300 ohm, 1/4 watt, 5% 560 ohm, 1/4 watt, 5% 82 ohm, 1/2 watt, 10% 470 ohm, 1/4 watt, 10%		2D-26377 32F2-5445 18A-26777 14A-26469 2M-26376 15B-24912 43D-27661	Volume control bracket Volume knob screw 2-3/4" P-M. Speaker Battery Cable Antenna spring clip Transistor socket-large
C.	10% ohm, 1/4 watt, 10% 4300 ohm, 1/4 watt, 5% 560 ohm, 1/4 watt, 5% 82 ohm, 1/2 watt, 10% 470 ohm, 1/4 watt, 10%		32F 2-5445 18A-26777 14A-26469 2M-26376 15B-24912 43D-27661	Volume knob screw 2-3/4" P.M. Speaker Battery Cable Antenna spring clip Transistor socket-large
C.	4300 ohm, 1/4 watt, 5% 560 ohm, 1/4 watt, 5% 82 ohm, 1/2 watt, 10% 470 ohm, 1/4 watt, 10%		18A-26777 14A-26469 2M-26376 15B-24912 43D-27661	Battery Cable Antenna spring clip Transistor socket-large
C.	470 ohm, 1/4 watt, 10%		14A-26469 2M-26376 15B-24912 43D-27661	Battery Cable Antenna spring clip Transistor socket-large
C.	470 ohm, 1/4 watt, 10%		2M-26376 15B-24912 43D-27661	Antenna spring clip Transistor socket-large
26659	470 ohm, 1/4 watt, 10%		15B-24912 43D-27661	Transistor socket-large
26659	APACITORS		43D-27661	Heat sink clip
26659				
26659	APACITORS			Mounting clip
				(Transistor sockets)
			B48A-26593	Insulator (IF & Osc.
			040A-20373	osc. colls)
	Tuning condenser			osc. cons)
26457	.01 mfd, 25 volt, ceramic			
-274	350 mmf. 500 volt, 5% mie	:0	C4 D	NET DADTE
26459	.05 mfd, 25 volt, ceramic		CAB	INET PARTS
26454	50 mfd, 10 volt, lytic			
26766	12 mmf, 5%	201 A		Case
26459	.05 mfd, 25 valt, ceramic			Handle Plate
	350 mmf (incl. in T4)			Retainer PIn
26459	.05 mfd. 25 volt. ceramic	1		Case cover
26455	6 mfd, 3 volt, lytic			Bottery cover assy
26455	6 mfd, 3 volt, lytic		15A1129	Tuning knob
	.01 mtd. 25 voit, ceramic		3M-26400	Tuning knob stud
	6 mfd, 3 volt, lytic			On-off volume knob
	50 mfd, 3 volt, lytic		25M-26538	Rubber cushion
26879	.01 mfd, 25 volt, ceramic			
			*	TRANSISTOR
		RII		
		DT2		
TPA	NSEOPHERS	RIJ DT4	211-109	
INA	NSI OKMERS	R14		Crystal detector
-26452		4	1901900	(CK706 or IN295)
				(CR708 0 11273)
			A second sector	and an all from more dealers
-20380	ist, IF Iransformer			purchased from manufacture
		01 10	1010,	
	16766 16459 16459 16455 16455 16455 16453 16453 16453 16453 16453 16453 16453 16453 16453 16453 16453 16453 166879	12 mm <sup>2</sup> , 55	6439         .05 m/d, 23 volt, ceremic           6435         6 m/d, 3 volt, virte           6435         6 m/d, 3 volt, virte           6435         6 m/d, 3 volt, virte           6457         .01 m/d, 25 volt, ceremic           6458         6 m/d, 3 volt, lytic           6457         .01 m/d, 45 volt, ceremic           6457         .01 m/d, 45 volt, ceremic           700         .01 m/d, 45 volt, ceremic           701         .01 m/d, 75 volt, ceremic           702         .01 m/d, 75 volt, ceremic           703         .01 m/d, 75 volt, ceremic           704         .01 m/d, 75 volt, ceremic           705         .01 m/d, 75 volt, ceremic           707         .01 m/d, 75 volt, ceremic           708         .01 m/d, 75 volt, ceremic           709         .01 m/d, 75 volt, ceremic           700         .01 m/d, 75 volt, ceremic           701         .01 m/d, 75 volt, ceremic           703         .01 m/d, 75 volt, ceremic           704         .01 m/d, 75 volt, ceremic           704         .01 m/d, 75 volt, ceremic           705         .01 m/d, 75 volt, ceremic           704         .01 m/d, 75 volt, ceremic           705         .01 m/d, 75 volt, cere	6439        05 mfd; 23 voli, reramic         116A026           6435         6mfd; 23 voli, reramic         316/2400           6435         50 mfd; 23 voli, reramic         316/2400           6439         -01 mfd; 25 voli, ceramic         316/2400           7         7         7           7         7         7           7         7         7           7         7         7           7         7         7           7         7         7           7         7         7           7         7         7           7         7         7           7         7         7           7         7         7           7         7         7           7         7         7           7         7         7           7         7         7           7         7         7           7         7         7<

placement parts either ½ or ¼ watt resistors may be used.

Use universal parts where part numbers are not shown. Order from (LRS).



SCHEMATIC DIAGRAM

MODEL GTM 1108A, Serial 75X



**OJohn F.** Rider

type

#### ROARD REMOVAL

- 1. Remove the screw located in the center of the tuning knob. Turn dial to the high frequency end and remove the screw by turning it in a counter clockwise direction while gripping knob.
- Open the back cover and remove battery. Remove the mounting screw located at the tuning conden-ser end of the printed board.

1703 ADJUSTAINT

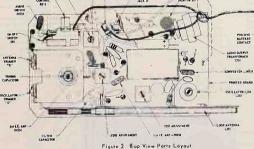
of the cabinet. 5. When replacing screwon dial knob, do not strain tuning condenser. Turn knob to low frequency end and grip knob while tightening screw. SPEAKER ----ETECTOR EARPHON JACK J OUTPUT

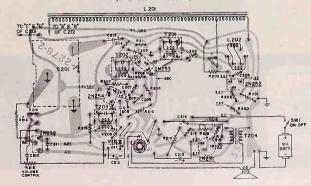
4. Hold the radio in the palm of the hand with the open side

up. Grip the printed board with the other hand and slide it down towards the tuning capacitor end of the cabinet,

until the speaker bracket is free of the metal lip. Now

raise this end of the board over metal lip and slide it out





Fugure 3 Sotion View of Printed Board Showing Top Components Symbolically

# PARTS LIST

R219

R 220

L.201

L202 T204

T202

T203

T204

297V008M01

297V002M04

297V002M05

297V004M01 297V009M01

296V002M01

754V008M01 270V024M01 770V109M02 778V018M01

513V014M01

\$50V033M02

550V017M01

761 V 804 MO I

570 V004 M01 763V000M63 470

310V012M02

230V026M01

235V014M01

235V014M01

235 V014M02

430V034N01

Ref. No.	Part No.	Descrip	tion			
-	CAPA	CÎTORS.				
C201	330V005M01	Variabl	e gang condenser			
C202		.0047 m	f 500 v Ceramic			
C203	215V300M15	.001 mf	30 v Ceramic			
C204	218V012M11	10 mf 3	v. Electrolytic			
C205	215V300M11	.01 mf	30 v Ceramic			
C206	215V300M12	.01 mf 30 v Ceramic				
C207		.0022 m	f 500 v Ceramic			
C208	215V303M03	.05 mf .	25 v Ceramic			
C209	215V303M04		25 v Ceramic			
C210	218V012M09		v Electrolytic			
C211	215V300M15		30 v GMV Ceramic			
C212	218V012M01		2 v Electrolytic			
C213	218V012M09		v Electrolytic			
C214	218V012M02		v Electrolytic			
C215	218V012M01		2 v Electrolytic			
C216	215V300M15	.001 mf	30 v GMV Ceramic			
	RESI	STORS				
	OHMS	WATTS				
R201	39 k	0.5	10% Carbon			
R202	8.2 k	0.5	10% Carbon			
R203	4-7 k	0.5	10% Carbon			
R 20 5	160	0.5	10% Carbon			
R206	1 k	0.5	20% Carbon			
R207	15 k	0.5	10% Carbon			
R 208	1 k	0.5	10% Carbon			
R209	470	0.5	10% Carbon			
R210	1.5 k	0.5	10% Carbon			
R211	56 k	0.5	10% Carbon			
R212	5. k		rol(includesSWI)			
R213	22 k	0.5	10% Carbon			
R214	3.3 k	0.5	10% Carbon			
R215	1 k	0.5	10% Carbon			
R216	2.2 k	0.5	10% Carbon			
R217	12 k	0.5	10% Carbon 10% Carbon			
	1.5 k	0.5				

Description

NOTE: USE UNIVERSAL PARTS WHERE PART NUMBERS ARE NOT LISTED. ORDER FROM (LRS)

# SUGGESTED SERVICING HINTS

Part Na

D-C N-

Make all voltage measurements with a VTVM and with tuning capacitor set for maximum capacity and the volume control at minimum. Battery current should be monitored at all times and should be approximately 17 milliamperes.

Battery voltage should be at nine volts. The battery should be the first component checked when servicing. A weak battery can cause a decrease in gain and distortion. Check the battery potential with battery in receiver and set turned on.

If all other circuit components have been checked and a faulty transistor is suspected, replacement of the transistor

#### is the surest check. It is not advisable to check transistors with an ohmmeter as damage to them can result. Transistors should not be soldered or unsoldered in the circuit when voltage is applied to the circuit.

When removing components from the printed board, including transistors, care must be taken to avoid damaging the board.

Replacement of an IF transistor usually will have no effect on the overall alignment. In some cases IF alignment may be affected. For proper IF alignment procedure refer to the section on alignment.

RADIO PAGE 25-5

10% Carbon

10% Carbon

Antenna - Iron Corelloop

Oscillator coil Ist IF transformer

2nd IF transformer

3rd IF transformer

Output transformer

0.5

TRANSFORMERS AND COILS

TRANSISTORS AND DIODE

MISCELLANEOUS

Knob - runing

Knob - on/off/volume

Washer - tuning knob

Screw - dial knob

Speaker - 21/4" PM

2N252 Transistor - converter

2N238 Transistor - audio driver 2N291 Transistor - audio output

1N295 or 1N87G crystal diode - detector

Jack (J1) - for earphone Switch on-off (SW1 - part of R212) Bracket - Volume control mounting Bracket - Speaker mounting (includes battery negative terminal - less speaker) Cabinet - leatherette

Connector assembly - battery positive

terminal

2N253 Transistor - 1st IF

2N254 Transistor - 2nd IF

3. Hold radio in the palm of the hand with the open back side up. Grip the board with the other hand and slide it

and slide it out of the cabinet.

down toward the tuning capacitor end of the cabinet, until the upper end of the speaker bracket is free of the plastic lip. Now raise this end of the bracket over lip

To insert the board into the cabinet, use the reverse

DIO

PAGE

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G

6

MONTGOMERY

WARD



### GENERAL DESCRIPTION

This Airline transistor radio is a seven transistor portable broadcast superheterodyne receiver. A jack is provided for private earphone connection. It replaces the loudspeaker when a miniature plug is inserted through the hole in the back of the receiver. This silences the speaker and allows the user to listen under noisey conditions, or situations in which operation of the speaker is undesirable. The receiver is housed in an unbreakable plastic case and the back cover is removed by loosening the coin-slot screw on the back.

The receiver employs seven junction type transistors. The converter, audio driver and audio output transistors are of the PNP type, while the IF amplifiers and detector employ NPN type transistors. The converter stage is an autodyne type mixer-oscillator. A tuned, high "Q" ferrite-core coil is used as an antenna. Two stages of IF amplification are used. The gain of the 1st IF amplifier is controlled by an Automatic Gain Control circuit.

A transistor functions as a power detector and AGC source. In addition to detecting the IF signal it also provides gain at audio frequencies. The driver stage amplifies the audio signal and transformer couples it to the two audio output transistors. These transistors are operated in pushpull with out-of-phase audio signals fed to the base of each transistor. Each transistor is operated class "B" and the alternate halves of the audio signal are combined in the output transformer and coupled to the 21/2" PM speaker.

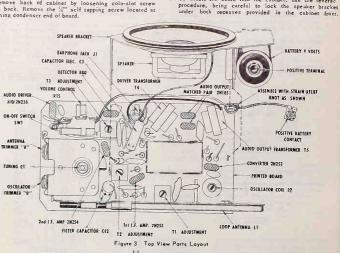
ELECTRICAL SPECIFICATIONS

Frequency range			• 1600 KC
Intermediate Freq	uency		
Sensitivity	200uv '	per meter, 50mw out	out approx.
Selectivity		8 KC at 6db	bandwidth
Transistor Comple	ment		
1 2N252			Converter
1 2N253			st IF Amp
1 2N254			nd IF Amp.
1 880 or 2N94		Transist	or Detector
1 2N238 or 310		A	udio Driver
2 2N185 (match	ed pair)	Au	dio Outbut
Power Output Undistorted Maximum			.075 watts .140 watts
Loudspeaker Voice Coil Impe	dance		PM Round 12 ohms
Power Supply:			
Ward: Evere	s - 62-96 ady - 226	RCA-VS - 300 Burgess P6	
Average current Dr Approximate Batter	ain (no sign y Life	al)	

# BOARD REMOVAL

1. Remove the screw located in center of the tuning knob. Turn the dial to the high frequency end and grip the tuning knob with one hand. Remove the screw by turning it in a counter clockwise direction. Do not cause any undue strain on the tuning capacitor.

 Remove back of cabinet by loosening coin-slot screw on back. Remove the ¼" self tapping screw located at tuning condenser end of board.



6

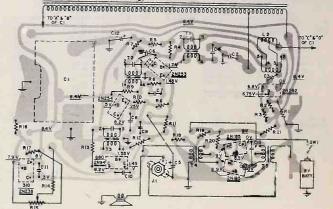
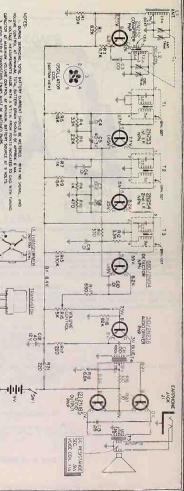


Figure 4 Bottom View of Printed Board Showing Top Components Symbollically

CJohn F. Rider





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or any objects on the bench, d do non 2 1.1

ut of the signal gener	ut of the signal generator low enough to	with the antenna loop, or detuning will occur and will be inforrect.
rency Setting	Connect Generator Output to:	Adjust for moximum
455 KC	loosely couple to LI	Remove speaker bracket assy. Set gang condenser fully and adjust T3, T2, and T1 in order Indicated. Reduce gen output if necessary for T2 and T1 adjustments.
1625 KC	Toosely couple to L1	Replace speaker bracket assy. Adjust ascillator trimmer
1400 KC	loosely couple to L1	Set gong condenser to 1400 KC and adjust antenna trimme
600 KC	loosely couple to LT	Set going to 600 KC and adjust ascillator slug.
sure that receiband	eat steps 2 & 3. Check the frequency range, sure that receiver will receive the full broad- band.	

erator Output te: couple to LT	Adjust far maximum Adjust far maximum Romere speater brocket ossy. Set gang contanser fully op and adjust TJ, TZ, and TL in adder factored. Reduce genera antiput far esset art for TZ and Ut adjustment.
cauple to L1	Replace speaker bracket assy. Adjust esciliator trimmer "D"
couple to L1	Set gong condenser to 1400 KC and adjust antenna trimmer "
couple to LT	Set gang to 600 KC and adjust ascillator sive.
trequency range. ve the full broad-	

# BATTERY INSTALLATION

FIGURE 2

# HISCELL INCOM

		MISCELLANEOUS
	770 V 109 H0 2	Bracket - Volume control mounting
	778V018H01	Bracket - Speaker mounting (Includes battery negative terminal less speaker)
	513V046H01	Cabinet - (Includes back cover; less dial and escutcheon)
	754V007H01	Connector assembly = Battery positive termin
	558V078H01	Dial - calibration
	555V015H01	Escutcheon
	754V008H01	ack (11) - for earphone
Switch	550V033H01	Knob = dial
	550V017H01	Knob - On/off/volume
	787V076H01	Screw - dial knob
	761V803H01	Screw - 8/32" Cabinet back cover
	570V004H01	Speaker - 2¼" PM (magnet weight .53 oz.) Round.
	270V024H01	Switch on-off (SW1 = part of R15)
	513V019H01	Case, carrying

Part No.

310V012H03

230 V026H01

235V014H01

235V014H01 235V014H02

430V024H01 430V025H01

2N252

2N253 2N254

880/2N94

310/2N238

2N185 (2)

TRANSFORMERS AND COILS

TRANSISTORS

Description

Oscillator Coil

1st I.F. Transformer

2nd I.F. Transformer

3rd I.F. Transformer

Antenna - Iron Core Loop

Audio Driver Transformer

Audio Output Transformer

Transistor - converter

Transistor - 1st dF

Transistor - 2nd IF

Transistor - detector

Transistor - audio driver Transistors (Matched Pair

- audio output )

NOTE: USE UNIVERSAL PARTS WHERE PART NUMBERS ARE NOT LISTED. ORDER FROM (LRS).

PARTS LIST Ref. No.

L2

T1

Ť2

T3

**T**4

T5

297V008H01 297V002H04 297V002H05

297V005H01

297V004H01

297V003H01

Description

.001 mf 30V

.002 mf 30V

.05 mf 30V .01 mf 30V

.01 mf 30V

.001 mf 30V

40 mf 12V

.05 mf 30V

10% Carbon 0.5

0.5 20% Carbon

0.5 10% Carbon

Volume Control and

10% Carbon

10% Carbon 0.5

.01 mf 40 mf 30V 3V Ceramic

.01 mf 30V Ceramic

Variable Gang Condenser

Ceramic

Ceramic

Ceramic

Ceramic

Ceramic

Ceramic

Ceramic

Electrolytic

Electrolytic

.0047 mf 500V Ceramic

# SUGGESTED SERVICING HINTS

Ref. No

CIA, B, C, D

Čž

C3 C4 C5 C6 C7 C8 C9 C10

C12

R1

R2 R3 R4 R5 R6

R7

R8

R9

R10

R11

R12

R13

R14

R15 R16 270V024H01

R17

R18

R19

R20

R2-1

Part No.

330V005H01

215V300H15

215V300H12

218V012H02

215V300H12

215V102A22

215V303H03

215V300H12

215V300H12

215V300H15

218V012H01

215V303H03

Ohms.

39K

8. 2K 0.5 10% Carbon

4.7K 0.5 10% Carbon

3.9K 15K 2.2K 0.5 10% Carbon 0.5 10% Carbon 0.5 10% Carbon

1K 1K 0.5 20% Carbon

15K 0.5 10% Carbon

470 0.5 10% Carbon

330 0.5 20% Carbon

3.3K 0.5 10% Carbon

330K 0.5 10% Carbon

680

82K

220 05 10% Carbon

6.8K 05 10% Carbon

100 0.5

10

220

SK

CAPACITORS

RESISTORS

Watts

0.5 10% Carbon

Make all voltage measurements with a VTVM and with tuning capacitor set for maximum capacity and the volume control at minimum. Battery current should be monitored at all times and should be approximately 6 milliamperes. Battery voltage should be at nine volts.

0.5 20% Carbon

The battery should be the first component checked when servicing. A weak battery can cause a decrease in gain and distortion. Check the battery potential with battery in receiver and set turned on.

If all other circuit components have been checked and a faulty transistor is suspected, replacement of the transistor is the surest check. It is not advisable to check transistors with an ohmmeter as damage to them can result. Transistors should not be soldered or unsoldered in the circuit when voltage is applied to the circuit.

When removing components from the printed board, in-cluding transistors, care must be taken to avoid damaging the board.

Replacement of an IF transistor usually will have no effect on the overall alignment. In some cases IF alignment may be affected. For proper 1F alignment procedure refer to the section on alignment.

MODEL HA-1111A, Serial 75X

ADIO PAGE

25-8

MONTGOMERY

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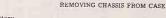
RB



MANUAL 580A Airline TRANSISTOR RADIO MODEL HA-IIIIA SERIAL No. 75X Form No. 628-5828\*

1.

2



- Remove the battery.
- Remove tuning knob by pulling straight out from the case. Remove the screw located at the end of the case and remove the case cover. Remove the two screws located one each side at the base of the volume onoff control
- Carefully remove the chassis from the case allowing the battery cable to slip through the battery compartment hole.

# BATTERY REPLACEMENT

Since the receiver is small and compact, not every 9 volt battery will fit in the space provided. Listed below are four available types to be used for replacement.

WARDS	NO-92	
BURGESS	NO-2N	
EVEREADY	NO-24	
RCA	VS-30	

Approximately 100 hours performance can be experienced with the above batteries before replacement is required. Battery replacement should be performed when the sound output is noticed to be muffled or distorted with a decrease in total output or if a voltage measurement shows less than 6 volts. The battery voltage should be measured with the receiver turned on after at least 5 minutes of operation.

When battery replacement is necessary, remove the battery cover by pushing the release button upward, grasp the latch and pull up and away from the case. Remove the old battery and un-snap the battery cable. Snap the battery cable on to the replacement battery and insert it into the case. Be sure the rubber cushion is between the battery and side wall of the case to prevent battery movement. Insert the battery cover in place and push the latch down.

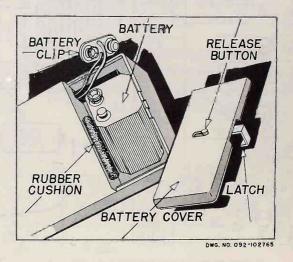
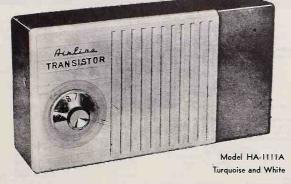
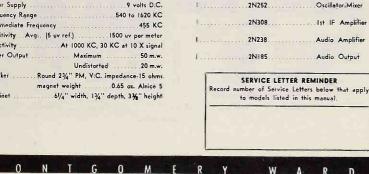


FIG. 1 BATTERY LOCATION



# SPECIFICATIONS

Power Supply		9 volts D.C.
Frequency Range		
Intermediate Frequency		
Sensitivity Avg (5 uv r	ef.)	uv per meter
Selectivity A	+ 1000 KC, 30 KC	at 10 X signal
Power Output	. Maximum	
	Undistorted	
Speaker Round 23	4" PM, V.C. imped	ance-15 ohms.
magnet v	reight	oz. Alnice 5
Cabinet		



TRANSISTOR COMPLEMENT

OJohn F. Rider

M

#### TRANSISTOR SERVICING

#### VOLTAGE READINGS

Because of the low battery potential, it is suggested that a VTVM be used to measure all circuit voltages. Voltage readings will vary with the strength of the signal being received, the battery voltage is and the type voltage used. The voltage readings indicated on the schematic diagram were measured with a VTVM, no signal input, and with a battery voltage of 2 volts. Voltage readings will also vary with a change of transistors. The transistora conductivity varies from one transistor to another; therefore, voltage readings will differ. All voltage readings will be positive with respect to the negative terminal.

#### BATTERY REPLACEMENT

The battery should be the first component checked when the radio is presented for service, since the battery voltage decreases with use and age. The battery voltage should be checked at the battery cable connections with the receiver turned on, and after at least five minutes of operation. Batteries have a tendency to reactivate (recharge) when not in use, and at use test of the battery is capabilities can not be determined until sufficient current has been drawn from the battery. If the battery is found to be dead, the receiver should be checked or a short circuit before the replacement battery is installed. Disconnect the battery and measure resistance with an ohameter at the battery cable connections. The ohameter will indicate approximately 1000 ohms with positive lead to chassis, approximately 400 ohms with negative lead to chassis. Battery replacement should be performed when the sound output is noticed to be unified or the source of the decrease in total output.

#### OHMMETER READINGS

When using an ohmmeter to check continuity and resistance readings, caufon must be observed. It is important toknow the internal battery voltage of the ohmmeter as damage could result due to kecessive voltage being applied to the ohmmeter. It is also important to know the battery polarity of the meter leads. Incorrectly placing the ohmmeter leads across a lytic capacitor with a low working voltage may damage the capacitor due to excessive reverse current. If the meter battery voltage is greater than 12 volts, the high frequency transistor rating will be exceeded and may be damaged. A diode action will be experienced when attempting to check the resistance readings with the transistors in the circuit. It is advisable to remove all transistors from their sockets before making ohmmeter checks.

#### SOLDERING

Caution must be observed when using a soldering iron as excessive heat may easily damage a transistor. If a component is replaced which must be soldered to the transistor socket, remove the transistor. When attempting any soldering, a low wattage small diameter tip iron is suggested. Heat may also damage other components, therefore, dissipate the heat by grasping the component lead with a long nose places.

#### TRANSISTORS

If a transistor is suspected of being defective, substitution will be the only reliable check. Checking resistance readings of a transistor with an ohmmeter will indicate only a shorted or open transistor. When inserting a transistor in its socket, make sure the transistor's leads line up with the socket holes. Illustrations on the schematic diagram show the spacing between transistor leads and the transistor sockets. If a transistor substitution is made in the RF or IF circuit, realignment may be necessary. This is due to the difference in operating characteristics from one transistor to another.

#### COMPONENT REPLACEMENT

An important consideration is component replacement. Miniature as well as close tolerance components are used throughout the radio; therefore, all components must be replaced with exact duplicate parts.

#### TROUBLE SHOOTING

Trouble in a transistor radio can easily be isolated by using a signal generator and listening to the speaker. Circultracing from the base of the output stage back through the receiver to the antenna, should quickly reveal which stage is not functioning properly. When injecting the signal, use a 50 mfd lytic, negative to base, in the audio circuit; a.5 mfd capacitor in the IF or RF stages and inductive coupling to the antenna.

Caution must be observed not to accidently short the collector circuit to the chassis, as damage to the transistor may result. Also, the practice of deluberately shorting a circuit to chassis to determine if voltage is present or to listen for a click in the speaker, must be avoided for the same reason.

#### ALIGNMENT PROCEDURE

#### NOTES: 1. Remove chassis from case.

2. Connect 9 volt battery.

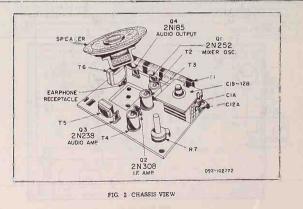
3. Use output meter with 15 ohms impedance.

4. Turn volume control to maximum.

5. Signal generator output at 100 microvolts.

30% modulation at 400 cycles

	SIGNAL	GENERATOR					ADJUST FOR
CIRCUIT	FREQUENCY	COUPLING CAPACITY	CIRCUIT	SIDE	OUT PUT METER	GANGED CAPACITY	MAXIMUM OUT PUT ON METER
I. F.	455KC	.5MFD	To Base of Q1	To Chassis	Connect in place of speaker		Т3, Т4
		keeping geno	e step two or thr erator output in a verloading of au	all cases as			
Oac.	1630KC	. SMFD	To Base of Q1	To Chassis	Connect in place of speaker	Open Gang (Fully clock- wise)	Cl2A
			Too high an outp cause setting of				
	2201 S	.5MFD	To Base of Q1	To Chassis	Connect in place of speaker	Closed Gang (Fully counter- clockwise)	Т2
1	1620KC	. 5MFD	To Base of Q1	To Chassis	Connect in place of speaker	Down Lang (Fully Clockwide)	C12A
Ant.	1400KC	Connect 3 and place ne		erator	Connect in place of speaker	Ganged Condenser should be rocked	C1A

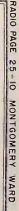


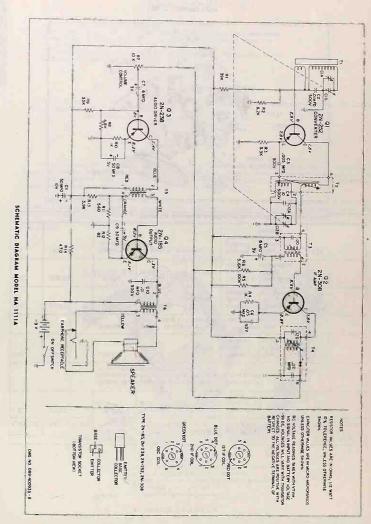
MONTGOMERY

WARD

# ©John F. Rider

MODEL HA-1111A, Serial 75X





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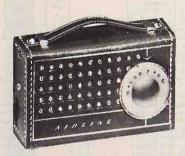
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
		TRANSFORMERS			RESISTORS (CON'T)
TI	257-300002	Antenna Rod Assembly	RS		6, 800 ohm
T2	251-200002	Oscillator Coil	R9		33,000 ohm
T2 T3	250-200002	Transformer, I. F.	R11		560 ohm
T4	250-200002	Transformer, Diode	R12		82 ohm
14   T5	255-300009	Transformer, Audio Input	R13		3, 900 ohm
T6	255-300010	Transformer, Audio	R14		470 ohm
10	233-300010	Output	1114		
		CAPACITORS			MISCELLANEOUS
				206-300007	Socket, Sub-Mine
CIAB,	248-300001	Variable (Gang)		200 01111	(3 Prong)
12AB				036-200085	Receptacle, Earphone
C2, 10		. 01 mfd 20% 500V.	4 11	285-200006	Speaker 2-3/4" P. M.
		Cer. Disc.	1 4	287-200007	Battery Cable Ass'y,
C3		. 005 mfd. 20% 500V.		329-400001	Printed Circuit Board
		Cer. Disc.	1	276-200018	Chip, Antenna Mounting
C4		10 mmf 10% 500V.	1 . 1		
		Cer. Tub.			CABINET PARTS
C5	245-200011	15 mfd +100-20% 3V.			Chibing thinks
1		lytic		316-400004	Portable Case
C6	247-300017	. 05 mfd +80-20% 50V.			(Tourquoise)
		Cer. Disc.	1 1	215-300059	Knob, Indicator
C7	245-200009	6 mfd +100-20% 3V.,		215-200058	Knob, (Vol. ON-OFF)
		lytic		241-940016	Battery Cover Heat Seal
C8	245-200013	50 mfd. +100-20%	1		Assembly
		3V., lytic		316-300005	Case, Cover (White)
C9	245-200012	30 mfd. +100-20%		216-100004	Sponge Rubber Filler
		3V., lytic			(1" x 5/8 Dia.)
C11	245-200008	50 mfd. +100-20%		216-100003	Sponge Rubber Filler
1		10V., lytic			(2" x 3/8 Dia.)
				116-100066	Battery Cover (White)
- 1		RESISTORS		241-940017	Clip & Stud Staking
_		(All resistors 10% 1/2W			Assembly
		composition unless other-			
		wise specified; )	1.1		*TRANSISTORS
R1		39, 000 ohm	Q1	312-300002	Convertor (2N252)
R2		8, 200 ohm	Q2	312-300003	I.F. Amplifier (2N308)
R3		3,300 ohm	Q3	312-300004	Audio Driver (2N238)
R4, 10		1,000 ohm	Q4	312-300005	Audio Output (2N185)
R5		100, 000 ohm			
R6		5, 600 ohm			*Transistors are to b
R7	225-200011	Volume Control and	1 1		purchased from manufact
1		switch, 10,000 ohms	1		urer of radio.
			1 1		and the second strength of the second strengt

Use Universal Parts where part numbers are not shown. Order from (LRS).

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MODEL GEN-1006A TAN

# ELECTRICAL SPECIFICATIONS

ANSISTOR AND DIODE COMPL 1 2N140 1 2N139	
1 2N139	
1 1N295	
1 2N109	Audio Driver
2 2N109 (Matched Pair)	Audio Output
WER OUTPUT	
Undistorted	
Moximum	12 Watts
UDSPEAKER	
ICE COIL IMPEDANCE	
ter cole mir Ebalter	nms at 400 Cycles
WER SUPPLY-USE ONE OF THE FOLLO	WING BATTERIES:
Words-62-96 RCA-VS-	-300
Eveready-226 Burgess F	P6 1
	25 watt output,

G O M

SELECTIVITY—4.5 KC broad at 2 times signal at 1000 KC. I.F. Base Sensitivity at 455 KC (with loop disconnected from condenser) coupled to converter base.....about 10 to 15 microvolts.

Battery Current drains at 400 cycles, 30% modulation

	AUDIO	OUTPUT	CURRENT DRAIN
	.010	Watts	6.6 Milliamperes
	.025	Watts	16.0 Milliamperes
	.050	Watts	20.0 Milliamperes
	.100	Watts	26.0 Milliomperes
	.135	Watts	29.0 Milliamperes
Reco	rd numb	pers of Serv	TER REMINDER ice Letters below that apply ed in this manual.
Reco	rd numb	pers of Serv	ice Letters below that apply
Reco	rd numb	pers of Serv	ice Letters below that apply
Reco	rd numb	pers of Serv	ice Letters below that apply
Reco	rd numb	pers of Serv	ice Letters below that apply

#### The following is required for aligning:

# ALIGNMENT PROCEDURE

 A signal generator capable of covering frequencies of 455 KC and the entire broadcast band with provisions for modulation. The test signal is injected by forming a 4 or 5 turn laop of wire, connecting it across the signal generator output cable and placing near antenna loop11.

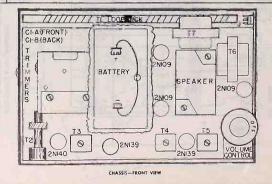
- 2. VTVM or output meter connected across voice coil.
- 3. A fiber aligning tool that snugly fits the slot in the I.F. transformer cores to prevent chipping of the slot.
- 4. Set the volume control to maximum.

5. Keep the output of the signal generator low enough to just give an indication on the VTVM or output meter. If the peak is broad or double peaking accurs when racking the IF slug adjustment, the signal generator output is excessive. Either further decoupling of the generator eoup or decreasing the generator eoup is necessary.

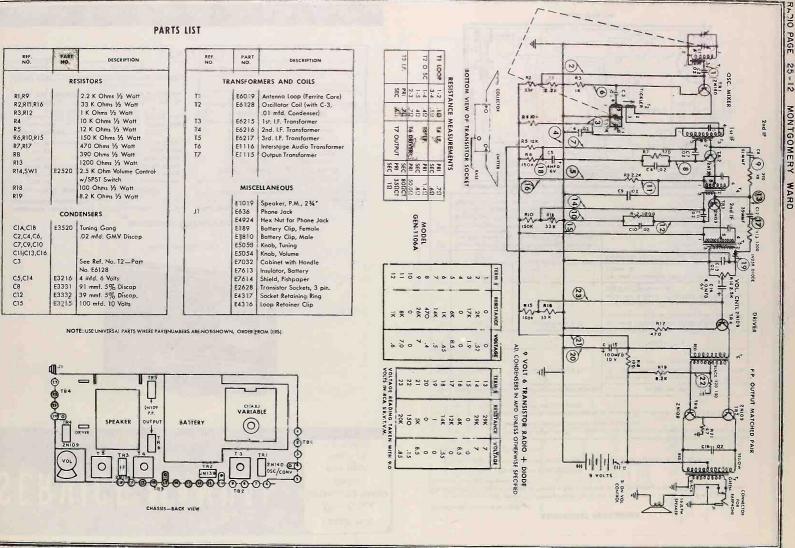
Caution—Be sure during IF alignment that the hand or any objects on the bench do not come in close contact with the antenna loop or detuning will accur and alignment will be incarrect.

STRP	FREQUENCY SETTING	CONNECT GENERATOR OUTPUT TO:	ADJUST FOR MAXIMUM
(1) •	455 KC	loosely couple to Ti.	Set gangicondenser fully open and adjust T5, T4 and T3 in order indicated, Reduce generator output if file cessary for T5 and T4 adjustments.
(2)	1640 KC		Adjust oscillator trimmer "CII-B."
(3)	535 KC	loosely couple to T1	SET Gong Condenser fully closed. Adjust 72 Stug to locate generator signal. The low end should be 535 KC. If off more than 5 KC, it may be adjusting the slug within the oscillator. If oscillator slug is adjusted, site 2 must be repeated.
R(4)	<u>1400 KC</u>		Seti gang condenser to 1400 KC and adjust antenna trimmer "B".
(5)	600 KC		Set gang to 600 KC and adjust oscillator slug.
(6)		Check the frequency range to in- receive the full broadcast band.	

(7) Tracking is checked of 600 and 1000 KC by bringing into close proximity of the loop a piece of ferrit 7 rod, then a piece of bross. In either case, the output meter should show a decrease. An increase in output meter reading indicates a mistrack condition, which may be corrected by adjusting the turns of wice on the antenna rod. If adjustment on antenna rod is made, step 4 must be repeated.



n



**OJohn F.** Rider

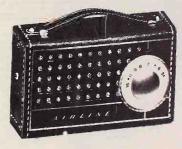
25-12 MONTGOMERY

MODEL GEN-1106A, Serial 75X

# RADIO PAGE 25-13

MODEL GEN-1112A





# MODEL GEN-1112A TAN TEXON

Service information on Model GEN-1112A is identical to that of Model GEN-1106A (covered in Service Manual 582A) with the exception of the transistors and cabinet. These parts are listed below.

The cabinet part number is E7032—Texon Cabinet. The following transistors are being used in Model GEN-1112A: 2N405, 2N407, 2N109, and 2N411.



CHASSIS HS-679



Reference to the chassis photographs, plated panel wir-ing diagrams, schematic diagram, and to chassis will per-mit the circuit to be traced easily.

NOTE: To facilitate service, phantom views showing plated panel wiring of both sides of the chasis plus loca-tion and wiring of electrical components are given. This is done in two ways; the chasis are side of the service for the service of the service of the service of the bot-tom with components as they would appear on opposite side. To further aid servicing, the plated panel bottom locates the emitters of V-1 brough V-2 by use of the litter VE on the gamed (see PLATED PANEL WIRING AS VIEWED FROM BOTTOM).

# SERVICING PRECAUTIONS

1. When servicing this radio, probing with a screwdriver

3. When making circuit resistance checks, fransisfor shunding paths may exist, which can, in some cases, cause erronous readings or possible cases to transistor. Thereiore, when checking transistors from associated cir-cuits.

# COMPONENT REPLACEMENT

Refer to "Plated Circuit Chassis Servicing Techniques" Manual (Motorola Part No. 68P636536) for recommended tools and procedures to be used when servicing Motorola plated circuit chassis.

#### TRANSISTOR CHECK

Substituting a known good transistor for a suspected one is the simplest and most positive method of checking transistors.

# EMITTER RESISTOR VOLTAGES

Voltages across the emitter resistors are provided on the schematic as an additional aid in servicing this receiver. A check of these voltages will indicate whether or not a transistor stage is functioning normally.

#### CARE OF CABINET

Cabinet may be cleaned by using a soft, dry cloth; do not use any polishes.

PLATED PANEL CHASSIS REMOVAL

4. Remove volume, tuning, and pointer knobs (to avoid scratching cabinet or escutchen, place a piece of string under the knobs and pull straight out).

Loosen cabinct back mounting screw and remove cab-inet back by inserting a coin into the cover opening slot and twisting until cabinet back is free.

3. Remove 3 chassis mounting nuts (see CHASSIS MOUNT-ING NUT LOCATION detail).

# TRANSISTOR SERVICING INFORMATION

In transistor receiver servicing, it will be found that the causes of failure can usually be divided into two categories; the bias networks and the signal paths. These can be checked with equipment now being used to service tube type receivers. The transistors can be checked by substitution or elimination.

When a receiver in defective, the first step is to locate the defective stage. This is accomplished by checking the emitter resistor voltage drops or by injecting a signal from stage to stage. Measuring the emitter resistor voltage drops will locate defects in the bias network or transistor. Sig-nal injection will locate defects in the signal paths.

A defective stage can be located by checking the voltage drops across the emitter resistors against those values shown on the schematic. These voltage drops give an indication of the current flowing through the stage when it is properly blased. A defective component in the blas network or a defective transistor will change the blas voltages causing the current to change, which in turn will cause the emit-ter resistor voltage drops to change. Therefore, a voltage drop that is not in the order of that shown on the schematic will indicate a defective stage. The next step is to deter-mine if the defect is in the bias network or the transistor. The most rapid way of checking this is to substitute a known good fransistor in the defective stage. If the emitter resistor voltage drop remains the same, the original tran-sistor is OK and the defect is in the bias network. When a ance check of the stage. If the values are within the toler-ance rating, the bias network can be eliminated as a source of defect and the transistor safely suspected. Bias network defects can be located by resistance checks.

An alternate process of docating a defective stage is by injecting a signal from stage to stage. A signal generator

# ALIGNMENT

Connect an output meter across the speaker. Set volume to maximum. Attenuate signal generator output to maintain . 6 volts on output meter at all times to prevent overloading.

STEP	GENERA TOR CONNECTION	GENERATOR FREQUENCY (400 cycle mod)	GANG SETTING	ADJŪST	REMARKS
	GNMENT	455 Kc		1.243	
1.	Ant section of gang thru, 1 mf & ground	455 KC	Fully open	4,243	Adjust for maximum.
RF AL	IGNMENT				
2,	Radiation loop*	1620 Kc	Fully open	4	Adjust for maximum.
3.		1400 Kc	Tune for max	546	
4,		600 Kc		7.849	

Repeat steps 2 and 3, RF trimmer adjustment (6) should be the last adjustment.

\*Connect generator output across 5" diameter, 5-turn loop and couple inductively to receiver antenna. Keep radiation loop at least 12" from receiver antenna.

# CJohn F. Rider



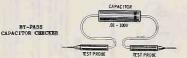
 $(\hat{O})$ 

4. Unscrew earphone jack mounting nut.

5. Remove battery holder and chassis from cabinet by pulling straight out.

with a 400 cycle output can be used for this purpose as if has a source of BF and audio signals for checking the re-spective stages. Signals are injected between the tran-gator base clerchoid of actach stage and ground until the de-fective stage is located. Then the defective component is located by resistance measurements. located by resistance measurements, and memory will ob-cate defects in stages caused by faults in the signal path in cases where the defect does not show up as a voltage read-ing difference. To facilitate servicing, a noise generator Gee December 1957 issue of Motorola Service News or Part Number 68P641210 Noise Generator Information sheet) has been devised to replace the signal generator as a signal source. The advantage of its use is the elimination of having to change its frequency when checking from the audio stages to the RF stages. This is accomplished by having an output waveform of such characteristic that the fundamental frequency falls in the audio range, but contains strong harmonics usable in the RF stages.

One of the causes of weak receivers is open by-pass ca-pacitors. To speed the checking of by-passes, a capacitor checker (shown in illustration) can be constructed. When using this aid, parallel the suspected by-pass capacitor. If by-pass is opens the output level will increase. When checking in the audio section, an increase may not occur but the pitch of the sound will change.



No.	Number	Description	No.	Number	Description
ELECTR	ICAL PARTS		R-29	682039	68 105 1/2#
A Lance I in	TCHD FARTD		R-29	6K124668	
C-1	198641384	Capacitor, variable: 3 gang		0A124000	10 105 1/28
C-2	8R129358	Capacitor, mylar disc: .04 mf 50V	T-1 T-2 T-3	248643211	Transformer, 1st IF: 455 Kc
C-3	8R129358	Capacitor, mylar disc: .04 mf 50V	T-2	240642133	Transformer, 2nd IF: 455 Kc
C-4	21K636724	Capacitor, cer disc: .01 af 10V	T-3	248641756	Transformer, 3rd 1F: 455 Kc
C-5	23K642709	Capacitor, electrolytic: 25 mf 10V	T-4	258641394	Transformer, driver
C-6	21K640366	Capacitor, cer disc: .01 mf 10V	T-5		Transformer, output
C-7	21K640366	Capacitor, cer disc: .01 mf 10V		100011000	risamini da par
C-8	21R128601	Capacitor car disc: 91 part 500V	VC1	484124296	Transistor, type 2N544: PNP (RF amp)
C-9	21K640366	Capacitor, cer disc: .01 mf 10V	V-2	484124311	Transistor, type 2N411: PNP (converter)
C-10	21R128600	Capacitor, cer disc: 39 nmf 500V	V-3	484124310	Transistor, type 2N409: PNP (lst IF sup)
C-11	21K640366	Capacitor, cer disc: .01 mf 10V	V -2 V -3 V -4 V -5 V -6 V =7	484124310	Transistor, type 2N409: PNP (2nd IF amp)
C-12		Capacitor, mylar disc: .04 mf 50V	V-5	484124315	Transistor, type 4315: PNP (AF amp)
C-13	23X636769	Capacitor, electrolytic: 6 mf 10V Capacitor, electrolytic: 25 mf 10V Capacitor, electrolytic: 6 mf 10V	V~6	484124315	Transistor, type 4315: PNP (driver)
C-14	23K642709	Capacitor, electrolytic; 25 mf 10V	¥=7	484124309	Transistor, type 2N407: PNP (pwr amp)
C-15	23K636769	Capacitor, electrolytic: 6 mf 10V	V-8	484124309	Transistor, type 2N407: PNP (pwr amp)
C-16					remained, type shadt. Far (par sup)
C-17	21X129402	Capacitor, cer disc: .0015 af 500V	MECHA	NICAL PARTS	
C-18	21K129402				
C-19	8R129440	Capacitor, mylar disc: .04 mf 50V		11642777	Battery Holder Assembly: incl spring
C-20	21K636724	Capacitor, cer disc: .01 mf 10V			contacts & syclets
				58642718	Eyclet (battery contact)
8-1	48K640754	Crystal Diode		24641729	Nut, retainer (mounts cab back to chassis)
E-2	48K640754			848643264	Plated Panel Board: less all components
E-3	9K641326	Jack, earphone		01101010101	(Note: This panel replaces 84C641758,
E-4		Speaker, PM: 3-1/2"; 3.20 VC			which may be in some sets.)
		about the second Plants		Note: The	m ordering, specify part number (and letter -
L-1	17643294	Ferrite Antenna (incl ant shield & ant mtg		if any) fo	ound on original board, and mention model number
Pro-		clamps)		of this se	t. If part number is different from that found
L-2	248642772	Coil, ant peaking		in this pa	rts list, order by complete part number found
L-3	24C641760	Coil, RF			ad mention model number of this set.
14	248641378	Coll osc		3\$129249	Screw machine: 5-32 x 1/8 (C1 sta)
				387155	Screw, machine: 6-32 x 3/16 (E4 ntg)
Renist	ors - Note:	All resistors are insulated carbon type		98642734	Socket, 3-pin (V2, V3, V4, V5, V6, V7, V8 mtg)
		All resistors are insulated curbon type unless otherwise specified. 33 000 103 1/2W		98642717	Socket, 4-pin (Vl mtg)
B-1	6K127632	33,000 10% 1/2₩		414637480	Spring (battery contact)
R-2	6K121303	270 10% 1/2m			
R-3	6K127005	5600 10% 1/2W (in some sets)	CABIN	ET PARTS	
or	6K119934	15,000 10% 1/2# (in some sets)			
R-4	6R6069			17642791	Cabinet Back: charconl (8X26E)
R-5	6K121302	820 10% 1/2W (in some sets)		17642792	Cabinet Back; maple sugar (8X265)
or	6K127513	1500 10% 1/2W (in some sets)		16E641722	Cabinet Front: charcoal (8X26E)_
8-6	6K127005	2200 10% 1/2# 820 10% 1/2# (in some sets) 1500 10% 1/2# (in some sets) 5600 10% 1/2#		16K642686	Cabinet Front: maple sugar (81268)
B-7	6K127632	33,000 10% 1/2#		13C641714	Escutcheon
R-8	686040	680 10% 1/2W		55C641724	Handle, cabinet
R-9	686406	22 10% 1/2		36K641717	Knob, On-off & vol
R-10	6K127513	1500 10% 1/2W		52B641719	Knob, pointer
B-11	6K127633	470 10% 1/2#		36C641723	
B-12	6K124507	68,000 10% 1/2W		138635573	
				24640134	Fut (E3 mtg)
R-14	6K121725	180 105 1/28 5300 105 1/28 5600 105 1/28 37000 105 1/28 Yoluwe Control & Stitch: 10,000 10.000 105 1/28		287005	Nut, hex: 6-32 (plated panel atg)
B-15	6K127005	5600 10% 1/28		+42A643679	Retainer, plastic (cab back screw ret)
R-16	68127632	33 000 105 1/2		34642077	Screw, cab back mtg
R-17	61127633	470 10% 1/2%		464641700	Stud, plated panel stg: long (top of cah)
R-18	188641627	Volume Control & Switch: 10-000		46K641701	
R-19	6K119932	10,000 10% 1/2w		*4K750206	Washer (under pointer knob)
R-20	6K124507	68,000 10% 1/2W			
R-21	6K127542	47 105 1/2			
R-21	6K124797	150 10% 1/2W			
R-22		2200 105 1/2	LUC	TED REDIACEN	ENT DARTS

Rof. Part

6R6069 6K119932 6K124507 6K127099

6K119926

R-23 R-24

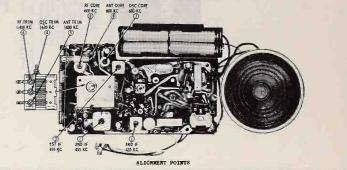
B-25 B-26

R-27 686326 47 10% 1/2# 150 10% 1/2# 2200 10% 1/2# 68,000 10% 1/2# 200 10% 1/2# 100 10% 1/2# 100 10% 1/2# 2700 10% 1/2# (see set used 1.%K = The roplacing, use the 2.7K resistor listed)

Noise: The volume of replacement on the following parts is shally, consequently, it is suggested that ordering be done only as required. 14A641959 Insulator (under E4) 14B641938 Insulator (under R18)

"New Item, Appears in any List for First Time

LIMITED REPLACEMENT PARTS



CHASSIS HS-679

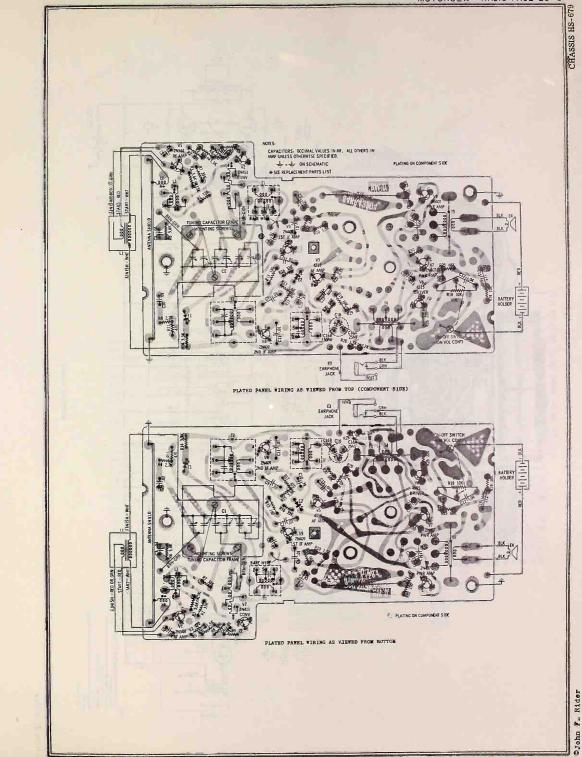
RADIO PAGE 25 -N MOTOROLA

# REPLACEMENT PARTS LIST

NOTE: When ordering parts, specify model number of set in addition to part number and description of part.

Richtensic gasts of equivalent rating are not necessarily of equivalent standards. The concesses the standard of the standard standard of the standard of the

Ref. Part

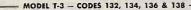


RADIO PAGE 25 - 4 C5 R10 C14 BATTERY HOLDER R22 R21 C18 V8 C19 T5 E4 R1 C2 L4 R2 R5 R8 C4 V2 R9 T1 V1-R3 L2-R7 L3 C6 R12 C3-MOTOROLA R6 C8-V3-Č. C7-R13 C20 LH R4 E1-R15, C9 R17 V4 C11 /V5 C13/R20 C16 R28 T4 E2 E3 C10 T3 R23 R19 R29 R30 R11 R14 R16 T R26 V7 R18 R25 C15 6 C17 R27 C12 R24 V6 T2 PARTS LOCATIONS 245 H ,Å 3 1 1 E L3 & L4 CONN W VI 2NMOJ PWR AMP PNP TI & TI CON T2 CONNI TA & TS CONN VI CONN V2 THRU VB CONP EI & EZ CONN VI 2NS44 RF AMP PNP V2 2N411 CONV PNP VS 4315 AF AMU PNP V6 4315 DRIVER PNP 2N409 IST IF AMP PNP 21409 210 UE AME RPHONE C10 13 R18 VOLUME LOK R28 2,78 11.5K IN 1 121 8 16 5.6K I CITY IS WE 310 82 23 +1(2) (3) (3) (3) 101 XEE MIS RIS 54K 819-10K R24 10K +| C12)1.04 3+8 18 1 2015 1 01 7 VB 2NHOJ PWR AMP ATA - BEEN K.SOK IN SAJAK SETS) 33K R11 470 R27 100 NOTES: ITS: CARACITORS - Decimal values in MP, all others in MW unless othernics specified. VCVTACE - New properties VCVTACE - New properties TOWING RAWIG - 535 KC to 1685 KC. If - 455 KC. BetStamps metured with transistors removed from associated circuitry. C168 -0 ON-OFF SWITCH + - Ground SCHEMATIC DIAGRAM



CHASSIS HS-679







## SPECIFICATIONS

CIRCUIT-Three transistor T.R.F. with reflexed audio and crystal detector.

BATTERY VOLTAGE AND TYPE-2.6 volts from 2 type P-630 mercury cells.

FREQUENCY MINIMUM COVERAGE-550 to 1550 KC

ANTENNA-Self-contained magnecor, high-impedance loop.

CABINET-Plastic, shirt-pocket type.

EARPHONE-Private listening unit only.

# ALIGNMENT PROCEDURE

GENERAL—Allow the test equipment to warm up for fifteen minutes before starting the alignment procedure. OUTPUT INDICATOR—Connect the output indicator (a V.T.V.M. using the low voltage AC range or a cali-brated oscilloscope) across the ear phone terminals.

SIGNAL GENERATOR—Use an AM r-f signal gener-ator. Radiate the signal to the radio antenna. Use a 6 to 8 turn, 6-inch diameter loop made up of insulated wire. Connect to generator terminals and place about one foot from the radio antenna.

OUTPUT LEVEL—During alignment, attenuate the signal-generator output so as to maintain the output level at 0.63 volts.

RADIO CONTROLS-Set the volume control to maxi-And/or Controls—set uning knob (the right-hand knob with the dial scale) to 600 KC. Without moving the antenna tuning, adjust the RF tuning knob to the mid-position of its fine-tuning range. DO NOT DIS-TURB the radio tuning once it is set.

Step #1-Set generator to 600 KC. Adjust the core of T1 (the 1st RF transformer) for peak. Rock the generator - NOT the radio tuning - and adjust for maximum.

Step #2-Set generator to 600 KC. Adjust the core of T2 (the 2nd RF transformer) for maximum. This transformer is very broad; there will be only a slight peak. The core may not extend above the top of the can.

REPLACEMENT PARTS LIST

NOTE: Part numbers may not be identical with those on factory parts; also, the electrical values of some re-placement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that operation will be either unchanged or improved. When ordering re-placements, use only the "Service Part No."

Resistors are 1/2 watt, 10%, carbon unless otherwise no

oted.			
ference		Service	
ymbol	Description	Part No.	
	Condenser, antenna tuning, 13-170 uuf. P	art of 76-10539	
5			
5			
5			
5	Condenser, 1st r-1 emitter, .01 ufd., disk Condenser, 2nd r-1 emitter, .47 ufd., disk		
7	Condenser, 2nd r-f emitter, .47 uid., disk		
B	Condenser, diede by-pass, .02 ufd., disk	30-1272-3	
9	Condenser, reflex coupling, .47 uid., disk		
10	Condenser, audio coupling, 1 ufd., SVDC,	30-2591-5	
	electrolytic	30-2591-5	
11	electrolytic Condenser, output collector, .005 ufd. disk Antenna coll, magnecor	30-12/2-1	
A 1	Antenna coll, magnecor	56 2028240	
1	Resistor, 1st r-f bose return, 33,000 ohms	66-3338340	
2	Resistor, reflex collector, 1800 ohms Resistor, 2nd r-f bics, 100,000 ohms	00-4100340	
3 .	Resistor, 2nd r-1 bics, 100,000 ohms	66-4108340	
4	Hesistor, 2nd r-1 bids, 22,000 onms	.13-5583-4	
Ś		43-3343-4	
6	Resistor, audio base, with transistor T-0038, code 132,		
	1 megohm	66-5108340	
	with transistor T-0039, code 134.		
	470.000 ohms	85-4478340	
	with transistor T-0040, code 136,		
	220.000 ohms	68-4228340	
	with transistor T-0041, code 138,		
	120.000 ohms	68-4128340	
1		Part of R5	
î '	Transformer, 1st r-f	32-4753-1	
2	Transformer, 2nd r.f	32-4783-2	
1305			
1306	Transistor 2nd r.f	34-6000-17	
-0038	Transistor audio code 132 only	34-6001-18	
+0039	Transistor, audio, code 134 only	34-6001-19	
-0040	Transistor, audio, code 134 only Transistor, audio, code 136 only	34-6001-20	
-0041			
TAL	Crystal diode, 2nd detector, type 1N60A		
	Printed Panel	54-6851	

# MISCELLANEOUS PARTS

Description Serv	ice Part Ke.
Cabinet	51-0007
Contact, battery	28-12377
Ear phone and cord assy.	
Cord and plug only	
Knob. volume	54-6682-1
Knob and capacitor assy., includes C1, C2 and the two	
tuning knobs in a matched assy.	76-10539
Nameplate	54-5368-1
Spring, battery, 2 used	28-12370

TRANSISTOR RADIO MODEL 75 Ŀ CODES 132, 134, 136 80 138

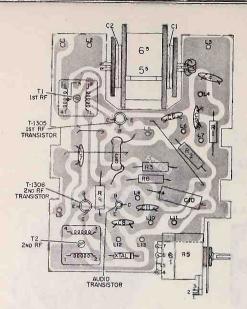
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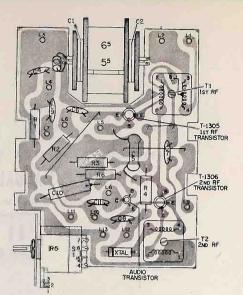
# PR-329

138 136.

134,

CODES 132.





Composite Panel View, Component Side, Showing Parts Placement.

Composite Panel View, Foil Side Showing Parts Placement.

Rider

-John

# PANEL-WIRE TERMINAL IDENTIFICATION

- Orange lead from r-f uning, C2, to T1 lug 4. Black lead from r-f uning, C2, to T1 lug 3 and red jumper to reminal 6. Orange lead from ant. runing, C1, and plain lead from bottom of ant. pri. (LA1) to panel ground. Red lead from bottom of ant. sec. (LA1) to junc-tion of R1, C4 and C5. L1 L2
- L3
- L4
- L5
- 16
- L7
- 18
- L9
- L10

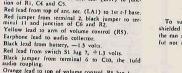
- Orange lead to top of volume control, R5 lug 1. Black lead from switch, S1, lug 6 to panel ground L12 L13

# AUDIO TRANSISTOR - CODE VARIATIONS

The only differences between the four codes are the audio ransistor type and the value of the audio base resistor. These value differences are indicated in the chart above.

# SHIELDING

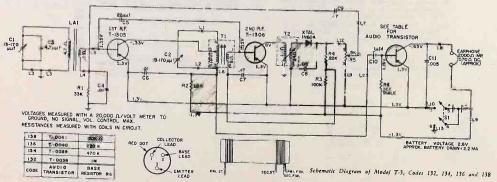
To suppress possible regeneration, the leads of T1 are shielded by wrapping a small piece of aluminum tape around the can so as to cover the cut-outs. When replacing be care-ful not to cause shorts.



- L11

All resistors 1/2 watt, carbon. All condenser values in ufd unless otherwise stated. Voltages measured with a V.T.V.M. from point indicated to ground, under "No Signal" condition, with volume control

at minimum and 2.6 volts from the battery supply. Audio collector voltage may vary between -...6 and -1.0 volt depending upon the transistor. Coil resistances measured with coil in the circuit.



NOTES

# RADIO PAGE 25-1

	MODEL NUMBER
	9222
PARTS LIST	
for	

TRANSISTOR PORTABLE RADIO

# SILVERTONE RADIO RECEIVER CHASSIS NUMBER 528.53400

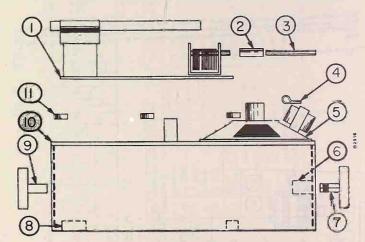


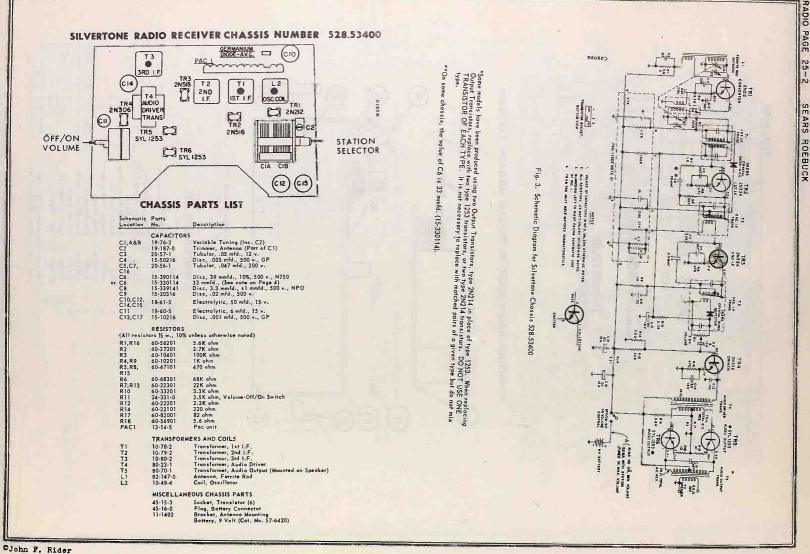
Fig. 1. Exploded View of Cabinet Parts

# CABINET PARTS LIST

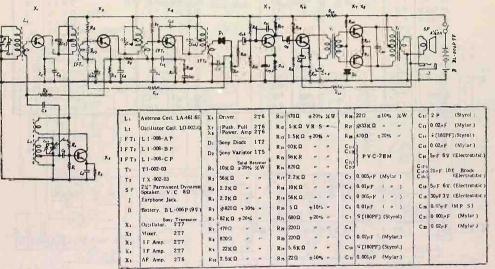
Key	Part	
No.	No.	Description
1.		Chassis, Radio
2.	39-25-0	Coupling, Tuning Shaft
3.	39-153-3	Shaft, Tuning
4.	22-102-3	Retainer, Cable Clamp
5.	33-377-4	Speaker (Inc. T5)
6.	11-1380	Bracket, Shaft Support
7.	52-1117-0	Knob, Tuning
8.	28-175-1	Pad, Rubber (4)
9.	52-1118-0	Knob, Off/On-Volume
10.	42-64-1	Cabinet, Leather
IK.	77-29-0	Spacer, Chassis (3)
	33-2660	Book, Instruction

\*Not supplied as a Repair Part. See page 3 for complete breakdown of parts. CHASSIS 528. 53400

CHASSIS 528. 53400

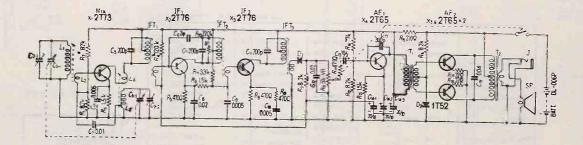


Sony Radio TR-86



\*- To be adjusted. @ - Mounted inside IF f.

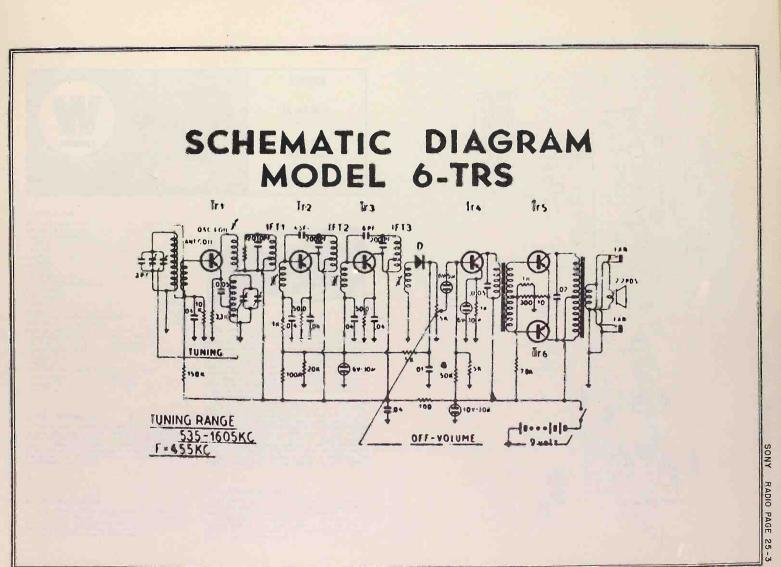
# SONY TR-610



LI L2	Ant. coil	R4	120 KΩ adjust	R 16	8.2 KQ	T Ca	0.02 µF
Ls La	Osc. coil	Rs	470 Ω	R17	22 0	C,	0.005 µF
IFT	002-AP	R <sub>6</sub>	1.5 K Q	Ris	22 0	Cio	0.000 μ1
IFT2	002-BP	R7	33 K Q	R 19	470 0	Cil	200 pF
1.F T3	002-CP	Ra	470 Ω	R 20	220 K Q	C 12	0.02 µF
Tı	Input Transformer	R9	8.2 K Q	C1		C 12	10 µF 3 V
1 12	Output Transformer	R 10	VR 5 KQ	C2	Tuning Condenser	C 13	
JJ	Earphone Jack	Rn	470 Ω	C3	0.01 µF	C 14-2	
S. P.	21/4" Dynamic Speaker	R:12	8.2 K Ω	C.	0.005 JF	C 14-3	
R,	8.2 KΩ	Rus	1.5 KQ	Cs	200 pF	Cit	0.04 µF
R <sub>2</sub>	82 KΩ adjust	Ra	27 K Q	C <sub>6</sub>	3 pF	Cis	0.005 µF
R <sub>3</sub>	1.5 ΚΩ	R 15	220 Ω	C1	200 pF	C 17	300 pF

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RADIO PAGE 25-2 SONY





#### SPECIFICATIONS

00K
SSKO
Mixe
llato
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Amp
ecto
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Watt
" P!
9ma
Ima
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## BATTERY INFORMATION

This receiver can use eithes four 1½ volt flashlight or mercury type batteries. The Mercury batteries give much longer lite and are placed in the holder with buttons in opposite direction to those of flashlight type batteries. It is important that batteries be in holder correctly before turning radio on. Refer to label on the battery holder for correct battery installation.

# BATTERY INSTALLATION

This receiver utilizes four pen-light size batteries for tadio operation and one flashlight "D" size battery for clock operation. The radio will normally operate up to 400 hours on one set of batteries (Mercury type) and clock will operate up to 1 year on one flashlight battery.



To replace radio batteries insert a coin into slot between battery cover (see figure 4, page 4) and receiver case. Two coin in slot and pull cover down and out from receiver case. Pull battery holder out from its compartment. Install flow 1½ volt pacelight batteries into holder. Use either flashlight or mercury type batteries. Werkury batteries give much longer battery life and are placed in holder with buttons in opposite direction to those of flashlight type batteries. Be sure batteries are in holder correctly before turning radio on. Refer to sketch and label to battery holder. Slide battery holder adterplace cover.

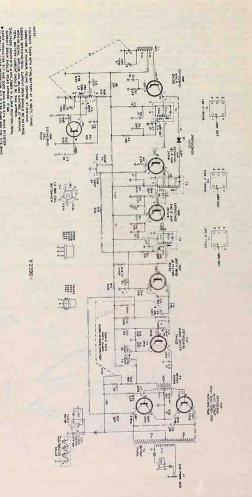
bolider back into its organis position as a consistent of the off on a sequence cover. In the sequence of the sequence of the sequence of the borrom of receiver case) between battery cover and case. Install 1/4 volt flashlight type battery into battery holder with battery burton (positive terminal) contacting the spring contact. If battery is not in bolder correctly clock will not operate. Slide battery cover back into original position.

Context, if lattery is not in which context y lock will no operate. Slide battery cover back into original position. IMPORTANT: Worn-out batteries should be removed as soon as they become defective. Otherwise radio may be damaged by worn out battery swelling or corroding. Also remove batteries before storing radio for long period of time.

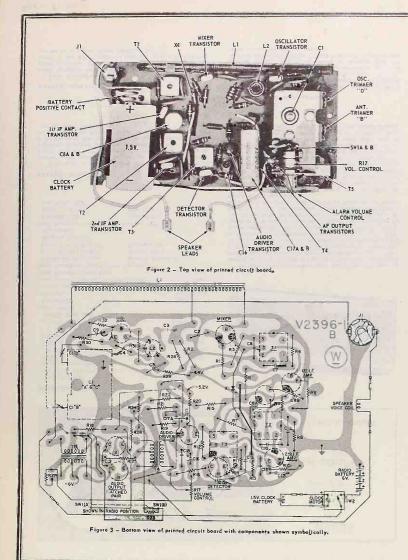
#### CLOCK SERVICE INFORMATION

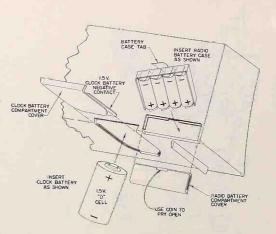
All service on the clock used in these receivers should be referred to one of the Westclox authorized clock service stations listed at the end of this service manual.

Do not forward the complete radio receiver to the clock service station. The clock should be removed from the receiver as described under "Clock Removal" and forwarded to the authorized service station.



# CHASSIS V-2396-1





# Figure 4 - Radio and Clock battery installation

#### CHASSIS REMOVAL

- 4. Remove the screw located in the center of the cabinet. rear. Remove the two screws on the underside of the cabinet.
- 2. Separate the cabinet front from the cabinet back to expose the radio chassis for servicing. If it is necessary to have complete access to all the components then proceed with steps 3 through 7.
- 3. Remove the three 11/4" hex head screws which mount the printed circuit board to the cabinet front (through fiber stand-offs).
- 4» Unsolder the black wire going from the radio battery holder contact (under clock case) to the printed circuit board chassis grnund at the printed circuit board connection.
- 5. Remove the spade connector leads from the speaker, clock battery contact (positive side) and the printed circuit board terminal next to the audio output transformer (TS).
- 6. Remove the tuning knob and dial as follows. Slip a loop of string under the tuning dial and pull the dial and tuning knob up and out of the cabinet front.
- 7. Separate the printed circuit board chassis from the cabinet front. To operate the chassis it will be necessary to reconnect the speaker and radio battery leads. To replace the chassis into the cabinet follow the reverse of the above procedure.

# CLOCK REMOVAL

- 1. Remove the printed circuit board from the cabinet as described under "Chassis Removal". NOTE: It is necessary to remove the printed circuit board to provide clearance for removal of the two clock mounting nuts locared under the edge of the printed circuit board,
- 2. Unsolder the four wires from the terminals on the underside of the clock case. 3. Remove the four 5/16" nuts securing the clock to the
- cabinet front.
- 4. Remove the clock control knobs. Remove the clock from the cabinet front. To replace the clock use the reverse of this procedure (solder wires to clock terminals as shown in figure 5).

#### NEW RADIO CIRCUITRY OPERATION

Oscillator - A separate transistor is used to develop the local oscillator signal. Oscillations are developed by in-phase signal feedback from the collector to emitter through capacitor C4. The tap on the oscillator coil determines the amount of feedback. The base of the transistor is placed at RF ground through capacitor C9. Resistors R31 and R32 form the divider network to develop the correct base voltage. The oscillator injection voltage is obtained from a tap on the oscillator coil (L2) and coupled to the base of the mixer transistor through capacitor C3 and part of the antenna (L1).

AGC - The gain of the first IF amplifier is controlled by AGC. Part of the emitter bias current for this transistor (see figure 1) flows from the -4.4 volt B- line through R12, secondary of T3, R11, R13 and R6 to ground. A fixed negative 1.2 volts bias appears on the emitter of the first IF amplifier transistor (with no signal). When the detector transistor conducts, current flows from the collector to emitter of the detector transistor, through R14, R13, R6 to ground.

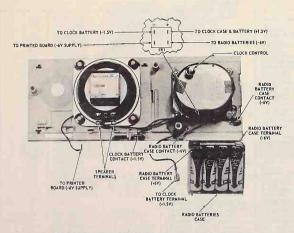
The detector current is in the same direction as the emitter bias current of the first IF amplifier transistor. As the signal level at the detector increases, the detector conduction increases and the emitter bias on the first IF amplifier becomes less positive with respect to the base. Hence as the signal level at the detector increases, the first 1F amplifier forward bias is reduced and the gain of the stage is decreased.

To increase the range of the AGC control voltage and prevent possible overloading on a very strong signal, a diode (X1) is connected from the low side of T2 to the collector of the mixer transistor. With no signal being received the diode is reverse biased (-2.8 volts on carhode and -4 volts on anode provides 1.2 volts reverse bias) and does not conduct.

When a signal is received, the first IF amplifier emitter voltage becomes more negative reducing the gain of the transistor. As the emitter-to-collector current decreases, the voltage on the collector increases toward the B- line voltage (-4.4 volts). If it were possible to completely cut off the transistor, -4.4 volts would appear on the collector.

As the signal received increases in strength, the diode reverse bias becomes less. As the diode approaches zero

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#### Figure 5 - Rear view of cabinet front with printed circuit chassis removed.

tone source. The audio section of the receiver now functions

as an audio generator to produce a continuous tone at ap-

proximately 250cps. Switch SW1A opening allows an in-phase

signal to be fed back from one side of the audio output trans-

former (T5) to the base of the audio driver transistor, SW1B

opening reduces the B- supply voltage to the driver trans-

istor, thereby lowering the volume of the tone. The frequency

of oscillations is primarily determined by capacitor CA9 and

bias the high back resistance of the diode will decrease. On very strong signals the collector voltage will exceed -4 volts and forward bias the diode. The diode then becomes a low resistance in series with capacitor C10. The resistance of diode X1 and capacity of C10 will now be in shunt with the primary of T1, lowering its "Q" and reducing the amount of IF signal coupled to the first amplifier stage.

Alarm Operation - When the user of this radio rotates the radio-volume control to the extreme left until a click is heard (SW1A and SW1B open) the radio operates as an alarm

#### ALIGNMENT REQUIREMENTS

Signal Generator - Use a generator providing modulated 455KC and AM broadcast frequencies. Connect a 4 or 5 turn loop of wire across output cable. Place the loop near the ferrite core antenna of the receiver. To increase or decrease the amount of signal coupled to the receiver move the loop closer or further from the antenna. Keep the output of the generator low enough to just give an indication on the VTVM or output meter to avoid AVC action. Keep the volume control set at maximum. Indicotor - Connect a VTVM or output meter across the voice coil.

transformer T5.

Receiver - Set the volume control to maximum. During step 1 the chassis must be removed from the cabinet front. During steps 2, 3, 4 and 5 the chassis must be attached to the cabinet front. Also during the last four steps, be sure that the hand or any objects on the bench do not come in close contact with the antenna loop or detuning will occur and alignment will be incorrect. Alignment Tool - Use a fiber aligning tool that snugly fits the slot in the ferrite cores of the IF

transformers to prevent chipping of the slot.

# ALIGNMENT PROCEDURE CHART

Mag	Loosely couple modulated signal to:	couple Generator C1 Setting		Adjust for maximum;	
1.	Loop L4	455KC	Maximum	T3, T2 and T1 in order. Reduce generator output if necessary for T2 and T1 adjustments.	
2.	Loop Li	1625KC	Minimum	Oscillator trimmet "D"	
3.	Loop L1	1400KC	1400KC	RF trimmer "B"	
4.	Loop L1	600KC	GOOKC	Oscillator coil, L2, if necessary	
5.	Repeat steps 2, 3 &	4 until no further ch	ange is noted		

#### AUTHORIZED (Westclox) CLOCK SERVICE REPAIR STATIONS (see page 1 - Clock Service Information) ALABAMA MINNESOTA

Birmingham .... Cliff's Watch Repair ... 244-45 Brown-Marx Bldg. ARIZONA

Phoenix ..... Smith's Clock & Watch Shop ... 1512 N. 7th Ave.

# CALIFORNIA

Appliance Service San Francisco 5, Schloss Mfg. Co. ..... 540 Mission St

# CONNECTICUT

Hartford 3 ..... Armin's Swiss-American ..... 6 American Row Watch Hospital

Bridgeport ..... Bridgenort Watch Hospital, Inc. .... 918 Main St. Fairfield ..... Fairfield Center Jewelers ..... 1498 Post Road

# COLORADO

Denver 2, ..... Denver Dial Company, Inc. 235 University Bldg.

# DISTRICT OF COLUMBIA

Washington D.C. Auto Clock Shop ..... 1105 21st St. N.W.

#### FLORIDA

Miami 37, ..... Electric Clock ..... 3101 N.W. 7th Ave. - Box 263 Service

Tampa ...... Brodie-Edwards, Inc. ...... 3123 E. Broadway

#### GEORGIA

Bowers Watch & ..... 1584 Piedmont Ave. N.E. Atlanta ..... Clock Repair

# **ILLINOIS**

Elgin ...... M. J. Silbert & Co. .... Stewart & Dundee Aves. Chicago 2, ..... M.J. Silbert & Co. ..... 55 E. Washington St.

#### 10.04

- Louisville ..... H.C. Korfhage Co. ..... 412 Norton Bldg

Portland ...... The Watch Shop ..... 238 Cumberland Ave.

## MARYLAND

Baltimore 1, .... Jewelers Service Co. ..... 108 W. Fayette St.

# MASSACHUSETTS

Boston 8, ..... Boston Clock Service ...... 44 Bromfield St. MICHIGAN

# Detroit 5, ..... Henning Clock Service .... 13417 Gratiot Avenue

St. Paul ...... Empire Clock Co., Inc. ..... 492 N. Robert St.

#### MISSOURI

# NEW YORK

Albany 6, ..... Julien's Clock Shop, Inc. ..... 114 Bradford St. Brooklyn 17, ... Electime Corporation ...... 306 Livingston St. 

# NEBRASKA

Omaha 2, ..... Harry A. Hansen Co. ..... 807 Kilpatrick Bldg.

## NORTH CAROLINA

Charlofte 5, .... J.F. Collins ...... 1610 Central Ave.

# OHIO

Cincinnati ...... Ken-Hav Elec, Clock Service ...... 408 Main St. Cleveland 15. ... Hoag's Shop ..... 2123 E. 9th St. Columbus 15. ... DeMers Authorized Service ..... 102 E. Broad Sr. 

#### OKLAHOMA

#### OREGON

Portland ...... Alder Street Clock Shop ...... 251 S.W. Alder St.

#### PENNSYLVANIA

Philadelphia 6, The Precision Instrument ..... 106-08 S. 7th St. Service Pittsburgh 19, .. Time Service Co. ..... 504 Court Place

# RHODE ISLAND

Providence ..... Mr. Edwin Olson ...... 7 Dyer St.

# TENNESSEE

Memphis 14, .... Tolbert Auto Clock & ..... 1791 Lamar Ave. Sneedometer Service

# 

# TEXAS

Dallas 1, ..... Long's Automobile ..... 2304 Cedar Spring Ave. Clock Service Arnold Elec. Co. ..... 1827 W. Alabama St. Houston 6

Walton's Speedometer Repair ..... 1515 W. 7th Durham Watch Repair Service ...... 512 S. Akard Fort Worth .... Dallas ..... San Antonio .... Aztec Jewelry Company .... 241 W. Commerce St.

# VIRGINIA

#### WASHINGTON

Spokane ...... Harry's Elec. Clock Hospital .... 175 S. Post St. WISCONSIN

Oshkosh ...... Miller Clock Service ...... 431 Bowen St. Milwaukee 6, · · · Schreiber Clock Service · · 623 N. 2nd St. Rm. 730 OR 1612 Center St.

614

Cedar Rapids ... Schaefer Clock Service ..... 216 3rd St. S.E. NEW JERSEY

KENTUCKY

LOUISIANA

MAINE

# PARTS LIST

# When ordering parts, specify part number, description of part and model number. Do not order by model number alone. Where applicable, prices include Federal Excise Tax. Prices are subject to change without notice.

# MODEL PARTS

Neu: Part	Ref. No.	Part No.	Equiv. Part No.	Description	List
t	-	513V037H01		Cabinet shell, back, brown, H-685P8	2.95
4		513V037H02		Cabinet shell, back, pink, H-686P8 Clock	2.95
1		650V014H01 558V197H01		Cover, radio batteries, brown, H-685P8	.15
I		558V197H02		Cover, radio batteries, pink, H-686P8	1.15
1 1		787V156H01		Cover, clock battery, brown, H-685P8	.85
+		787V157H01		Cover, clock battery, pink, H-686P8	.85
1		558V198H01		Crystal, clock	.60
t		558V195H01		Dial, clock	.40
1		555V037H01		Escutcheon	1.30
1		558V199H01 787V159H01		Front, cabinet Holder Assy., radio batteries (includes battery contacts)	1 1.15
1		781V272H01		Holder, clock battery support	.30
· ·		754V008H01		lack, earphone	.72
+		550V107H01		Knob, clock	.25
÷.		550V104H01		Knob, volume	.25
1		559V044H01		Knob Assy., tuning (includes compression spring)	.50
1		559V045H01		Knob Assy., AM dial (includes compression spring) Screw, self-tapping hex head (mounts chassis to cabinet	.50
1		761V009H28		Screw, self-tapping her head (mounts chassis to cabinet front)	.05
+ 1		783V074H02		Spaces (mounts chassis to cabinet front)	.10
1		570V058H01		Speaker, 3" PM	5.25

# CHASSIS PARTS

Vew Part	Ref. No.	Part No.	Equiv Part No.	Description	Location or Function	Li: Pri
1	CI	330V026H01	and the second	Capacitor, variable	Tuning	3.
	C2	R2CC63Z5Z103P	215V111A03	Capacitor, .01 mf, ceramic	Mixer emitter	
	C3	215V300H04	R2CC62Y5Y472M	Capacitor, .0047 mf, ceramic	Ant. coupling	1 .3
	C4	215V300H04	R2CC62Y5Y472M	Capacitor, .0047 mf, ceramic	Osc. emitter	
	C5	215V303H03	ALCOULT / THE	Capacitor, .05 mf, ceramic	Osc. collector	
	C6	R2CC63Z5Z103P	215V111A03	Capacitor, .01 mf, ceramic	1st IF amp.	
	CZ	R2CC63Z5Z103P	215V111A03	Capacitor, .01 mf, ceramic	1st IF amp.	
t	C8A	and and a second s		Capacitor, 100 mf, 6V., elect.	Supply filter )	
'	C8B	218V025H29		Capacitor, 40 mf, 3V., elect.	1st IF amp.	1.
	C2	R2CC63Z5Z103P	215V111A03	Capacitor, .01 mf, ceramic	Osc. base	
	CIO	R2CC63Z5Z103P	215V111A03	Capacitor, .01 mf, ceramic	2nd 1F amp.	
	CII	R2CC63Z5Z103P	215V111A03	Capacitor, .01 mf, ceramic	2nd IF amp.	
	C12	R2CC63Z5Z103P	215V111A03	Capacitor, .01 mf, ceramic	2nd IF amp.	
	C13	215V303H03	LISTINOS	Capacitor, .05 mf, ceramic	Detector base	
	C14	218V012H02	î	Capacitor, 40 mf, 3V., elect.	Detector	1
	GIS	215V303H04		Capacitor, 02 mf, 30V., ceramic	Detector	10.
	CIG	218V012H14		Capacitor, 5 mf, 7V., elect.	Audio driver	1
	CI7A	A subscript of the second s		Capacitor, 100 mf, 3V., elect.	Audio driver	
1	C17B	218V025H28		Capacitor, 250 mf, 7V., elect.	Audio driver	1
Ť	C18	215V308H05		Capacitor, .01 mf, ceramic	Audio driver	10
T	C19	215V303H03		Capacitor, .05 mf, ceramic	Audio output	18
	LI	310V046H01		Loop	Antenna	2
ł	1.2	230V074H01		Coil	Oscillator	1 î
L	Rt	RC20AE152K	250V221A52	Resistor, 1.5K ohms	Mixer emitter	
	R2	RC20AE333K	250V223A33	Resistor, 33K ohms	Mixer base	12
	R3	250V221A02	RC20AE102K	Resistor, 1K ohms	1st IF amp.	
	R4	250V225A62	RC20AE562K	Resistor, 5.6K ohms	1st IF amp.	10
	RS	RC20AE103K	250V221A03	Resistor, 10K ohms	1st IF amp.	1
	RG	RC20AE222K	250V222A22	Resistor, 2.2K ohms	1st IF amp.	18
	R7	RC20AE222K	250V222A22	Resistor, 2.2K ohms	1st IF amp.	
	R8	RC20AE222K	250V222A22	Resistor, 2.2K ohms	2nd IF amp.	- 80
	R9	RC20AE123K	250V221A23	Resistor, 12K ohms	2nd IF amp.	
	RIO	250V224A71	RC20AE471K	Resistor, 470 ohms	2nd IF amp.	
	RII	RC20AE102K	250V221A03	Resistor, 10K ohms	Detector base	1
	R12	250V222A24	RC20AE224K	Resistor, 220K ohms	Detector base	1
	R13	RC20AE331K	250V223A31	Resistor, 330 ohms	1st IF amp.	
	R14	250V221A01	RC20AE101K	Resistor, 100 ohms	Detector	1
	R15	RC20AE221M	250V232A21	Resistor, 220 ohms	Supply filter	
	R16	RC20AE123K	250V221A23	Resistor, 470 ohms	Detector	
+	R17	270V066H02	2501221123	Control, 2.5K ohms	Volume alarm	1 2
	RIT	270 0000002		(includes SWIA & B)	control	1 4
	R18	250V225A62	RC20AE562K	Resistor, 5.6K ohms	Alarm circuit	1 7
	R19	RC20AE6821	250V216A82	Resistor, 6.8K ohms	Audio driver	
	119	RCLORE082)	230 7210/102	Acororo, o.or onnis	muuro ariver	04

New Ref. Part No.	Part No.	Equiv. Part No.	Description	Location or Function	List
R20 R21 R23 R25 R25 R26 R26 R26 R27 R27 R27 R27 R27 R27 R27 R27 R27 R27	R C20 AE 1531 R C20 AE 661 J 250 V221 A81 R C20 AE 153 J R C20 AE 150 K R C20 AE	250V221A53 250V21A681 RC20AE181K 250V21A53 250V221A53 250V221A53 250V221A53 250V223A30 RC20AE562K 250V228A32 250V228A22 250V228A32 250V228A32	Resistor, 13K ohms Resistor, 680 ohms Resistor, 680 ohms Resistor, 13K ohms Resistor, 13K ohms Resistor, 120 ohms Resistor, 3K ohms Resistor, 5.6K ohms Resistor, 70K hms Resistor, 70K hms Resistor, 70K hms Resistor, 70K hms Resistor, 10K ohms Switch { Fransformer Transformer Transformer Transformer Transformer Transformer Crystal diode, 1N295 or 1N87G Transistor, 2N306 Transistor, 2N305 Transistor, 2N305 Transistor, 2N305 Transistor, 800, 2N35 or 2N402 Transistor, 80, 0000 or 0061	Audio driver Audio driver Audio driver Alarm circuit Audio output Audio output Audio output Audio output Audio output Oscillator Oscillator Oscillator Oscillator Oscillator Audio output Brd IF 2nd IF 2nd IF 2nd IF 2nd IF and IF Audio output AGC overload 1st [F amp. AGC overload 1st [F amp. Detector Audio driver Audio driver Audio drivet	.11 .11 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0

Resistors are ½ watt, 10% unless otherwise specified. † New part listed for the first time in Westinghouse Television or Radio service information = Price furnished on request.

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# SERVICE MANUAL MODEL "ROYAL 200" **ALL TRANSISTOR PORTABLE RADIO**

CHASSIS 7AT48Z, 7AT48Z2 & 7AT48Z4

# GENERAL

These transistor portable chassis are conventional superheterodyne receivers using an individual mixer and oscillator to produce the 455 Kc intermediate frequency. The first and second intermediate frequency amplifiers are conventional. It is necessary to use neutralization are conventional. It is necessary to use neutralization in the LF, amplifier stages as in circuits using a triade tube. A 1N87G germanium diade is used as the diade detector and AVC voltage source. This is then followed by a driver stage and a class "B" push-pull output stage. As you can see from the chart, the chassis use matched transistor pairs in the final output stage and therefore should ane transistor fail, both transistors must be replaced simultaneously as charces are they will not corrigon meansult notes compared. will not perform properly unless so matched.

Power Supply Carbon Penlite Batteries 6 volts D.C.
approx. life 100 hrs.
Mercury Batteries 5.36 volts D.C.
approx. life 400 hrs,
Frequency Range
Intermediate Frequency
Sensitivity Approximately 500 microvolts/meter for
50 milliwatts output
Power Output Undistorted 100 milliwatts
Demos Output Undistoried 100 milliwatts
Power Output Maximum 150 milliwatts
Speaker
Alnico V Voice Coil Impedance 3.2 ohms at 400 cycles
Accessory Earphone B39-24 (Impedance 15 ohms at
inceedsory Darphone D39-24 (impedance 15 ohms at
400 cycles)
CHASSIS IDENTIFICATION

The "Royal 200" seven transistor portable has been produced with three basic chassis. This expedient was necessary to enable us to produce sufficient quantities by using transistors from many sources.

Chassis 7AT48Z, 7AT48Z2 and 7AT48Z4 use identical circuitry, however, they use transistors from different sources. The transistor and trimmer layout and schematic Sources, the transistor and trimmer layout and schematic illustrate chassis ArAT42. The chassis information chart supplies the necessary information on transistors used in chassis ArAT422 and ArAT424. Transistors for specific functions are interchangeable, for example in chassis arAT422 and interchangeable, for example 121-62 or 121-83 can also be used.

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The output transistors are also interchangeable but only as matched pairs. Chassis 7AT48Z uses a matched pair of (121-96) transistors, which can be replaced with a matched pair of (121-61) or a matched pair of (121-84).

PRINTED CIRCUIT SERVICING

Servicing "printed" circuit sets is, in general, much the same as servicing ordinary receivers. However, certain tools and techniques are well suited for this type of work. The following items are especially useful:

- Good pair of long-nose pliers. Sharp wire cutters.
- Small stiff glue brush (for solder removal).
- Pencil type soldering iron with a small tip
- (25 watts or less).

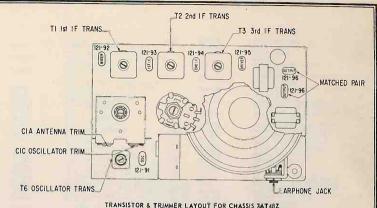
WARNING: Excessive heat may damage the "printed" circuit during component replacement if a soldering pencil, iron or gun of higher wattage rating is used.

- Tin leads on component before soldering, Use only EUTECTIC solder 63% tin 37% lead. This solder has an extremely low melting point. 5.
- 7. Metal pick (soldering aid).

# COMPONENT REPLACEMENT

Resistors and capacitors should be replaced by clipping out the defective part and nearly soldering in the new part. If a unit, such as the oscillator coil or IF trans-former, is to be removed heat the mounting lugs with a pencil type soldering iron and move them away from the soldered connection with a long-nose pilers or metal pick. Continue heating the lugs and brush away the molten solder with a small stiff gue brush. Remove the defective unit by lifting it off the chassis. Before in-serting the new unit, be cortain that the lug holes are solder filled lug hole may break the hord break has a base and the "pinted" wiring. It is, therefore, necessary to exercise care when replacing units. Resistors and capacitors should be replaced by clipping

An open or damaged section of "printed" circuit wiring can be replaced by soldering a short jumper wire across the points to be connected.



# ALIGNMENT PROCEDURE

Operation	Input Signal Frequency	Connect Inner Conductor From Oscillator To	Connect Outer Shield Conductor From Oscillator To	Set Die di	Trimmera	Purpose
1	455 KC	ONE TURN	Chassis	600 KC	A'dji T1, T2, T3 Jorsmaxi- mum output,	For 1.F. Cuignman
2	1620 KC		-	Gang wide open.	CIC	Set Oscillato
1	535 KC	COUPLED		Cang	Adjust alug	Ser Ospillator to dial scale
4	REPEAT STEPS 2 & 3	TO WAVEMAGNET	_	1	-	_
5	1260 KC			1260 KC	GIA	Align loop ant

# CHASSIS INFORMATION CHART

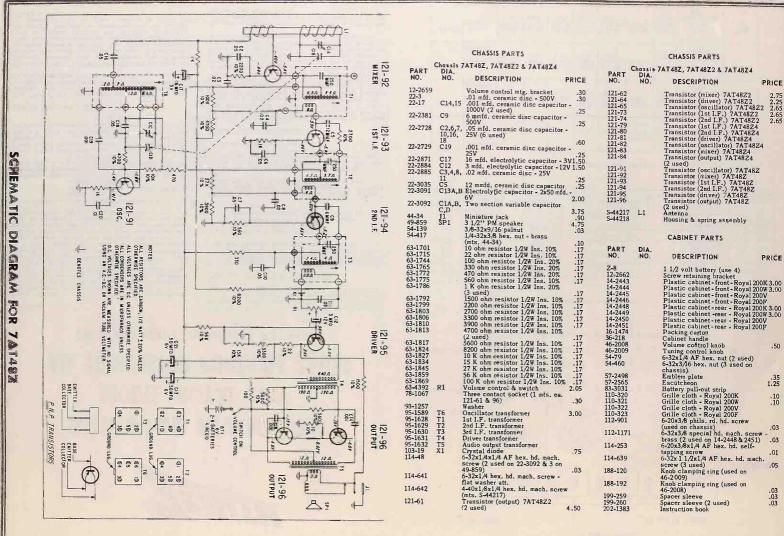
Chassis	Transistor Layout Label Color	Part No.	Mixer	Osc.	1st I.F.	2nd I.F.	Crystal Diode Detector	Driver	Output-Output	Supplier
7AT48Z	Red 102-4234 or 102-4861	Zenith RETMA Type	121-92 2N485 PNP	121-91 2N483 PNP	121-93 2N483 PNP	121-94 2N482 PNP	103-19 1N87G	121-95 2N362 PNP	121-96 2N632 Matched Pair PNP	Raytheor
			121-62 2N411 PNP	121-65 2N409 PNP	121-73 2N409 PNP	121-74 2N409 PNP	103-19 1N87G	121-64 PNP	121-61 Matched Pair PNP	R.C.A.
7AT48Z4		Zenith RETMA Type	121-83 2N414 PNP	121-82 2N413 PNP	121-79 2N413A PNP		103-19 1N87G	121-81 2N383 PNP	121-84 2N383 Matched Pair PNP	Tung Sol

PAGE 25

ENITH

RADIO

CHASSIS 7AT48Z, 7AT48Z2, 7AT48Z4



CJohn F. Rider

# CHASSIS 7AT48Z, 7AT48Z2, 7AT48Z4

RADIO PAGE 25-2 ZENITH

# HOME RADIO SECTION



# 7N1 FM-AM TUNER and 4S2 HI-FI AMPLIFIER

For complete Record Changer servicing information, see SERVICE MANUAL S800.



#### SPECIFICATIONS

#### FREQUENCY RESPONSE:

AMPLIFIER—Amplifier section flat from 50 to 20,000 cycles within 1 db at 10 watts output.

PRE-AMPLIFIER—At 1 watt level, Bass control gives 31 db change at 100 cycles and Treble control gives 26 db change at 10,000 cycles.

DISTORTION-3% at 12 watts.

POWER OUTPUT-17 watts maximum,

POWER CONSUMPTION-100 watts.

- POWER SUPPLY—117 volts AC, 60 cycle only. (Phonograph can be converted to 50 cycle operation. See "RECORD CHANGER PARTS", "Kit, 50 Cycle Conversion".)
- SPEAKER SYSTEM Woofer, 12" PM; Tweeter, 31/2" PM.



Figure 1. Operating Controls.

+ + + +

PHONOGRAPH						
MODEL	COLOR	CHASSIS				
392	Mahogany	7N1 and				
393	Blond	452				

HI-FI FM-AM CONSOLE

RECORD

CHANGER

PC

637-8

#### CHASSIS REMOVAL

- To remove amplifier chassis from cabinet:
- Disconnect line cord from power source.
   Disconnect record changer power plug (M611), speaker plug (M615), tuner audio output plug (M604), and power input plug (M606) from
- tuner chassis. 3. Remove screws that hold chassis to cabinet.
- To remove FM-AM tuner from cabinet:
- Remove control knobs from tuner front panel and phono output plug (M608) from tuner chassis.
- 2. Disconnect FM antenna from terminal board and remove terminal board from cabinet.
- Support tuner from bottom and remove 4 hex nuts and lock washers that hold tuner chassis to cabinet. Carefully remove tuner chassis from cabinet.
- To remove FM RF tuner sub-chassis:
- 1. Remove four screws that hold sub-chassis and disconnect wires from antenna terminals.
- Disconnect cable from pin 8 on S601.
   Lift sub-chassis up for scrvicing. DO NOT dis-
- connect FM tuner dial cord.

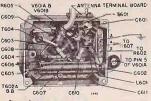


Figure 2. Bottom View of FM Tuner Sub-chassis. Location of components shown.

# TROUBLE SHOOTING HINTS

Tube locations for the tuner and amplifier are shown on figures 6 and 7. Alignment points for the tuner are shown on figure 6.

Tubes may be reached from rear of cabinet for servicing purposes.

B+ voltages and filament voltages for tuner are furnished by power supply on amplifier chassis.

By placing a jumper wire between lugs 4 and 8 of M606, the amplifier may be serviced separately. NOTE: When amplifier is serviced separately, voltage readings will be higher due to the reduced load on the power supply.

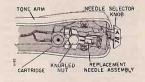
HUM LEVEL: Excessive hum can often be minimized by reversing line cord plug in wall outlet, Move Rej-On-Off pointer to "ON". Touch record changer centerpost and note hum level. Reverse line cord in wall outlet, touch centerpost again and again note hum level. Leave line cord in position giving least hum.

A Hum Level control is located on the tuner chassis, see figure 6. Hum may be further reduced, if necessary, by adjusting this control:

## RECORD CHANGER SERVICING

For complete record changer service information, see Service Manual S800.

If it becomes necessary to remove record changer from its mounting board, remove the three large washer-head screws extending through bottom of the mounting board. With these screws removed, the three springs which "float" the record changer may be loose. Lift record changer from the mounting board, being carcful to retain mounting screws for installation.



#### Figure 3. Needle Replacement.

## NEEDLE REPLACEMENT

A worn needle causes "scratch" and a hārshness of high tones in the output. Damage to records may be caused by worn needles. To replace needle assembly, refer to figure 3 and loosen the knurled nut that is located under the cartridge. Slip the worn needle assembly out and insert the new needle assembly in the exact same position. Tighten the knurled nut.

See "RECORD CHANGER PARTS" for replacement cartridge and needles.

Bass Control Mi	IER CHECKS
Boss Control Mi	
	ly Clackwise Rotation Rotation
AMPLIFICATION CHEC	<
AUDIO Frequenty	Volts in
OUTPUT 1000 C c es	0:34 Veh
AMPLIFIER Volts	Wetts
OUTPUT \$.6 Volts	10 Watt
FREQUENCY RESPONSE CI	IECK
Frequency	Volts In
AUDIO GENERATOR OUTPUT Coveles	0.34 Vola
Volis	56
AMPLIFIER 5.6 Volts OUTPUT ±.25 v.	±1.06

#### AMPLIFICATION AND RESPONSE CHECK

The amplifier may be checked for gain and frequency response by using the tests outlined below. TEST EQUIPMENT:

Audio Oscillator, preferably with flat output from 50 cycles to 20 kilocycles.

Vacuum Tube Voltmeter, preferably with decibel scale.

**PROCEDURE:** Disconnect phono power plug (MG01). Disconnect phono output plug (MG08) from socket (M603) on tuner chassis. The oscillator signal is to be injected into socket (MG03) on tuner chassis. This enables the checking of the preamplis for and amplifier for amplification and frequency response. Measurements taken with **FM-AM-Phono** switch in "**PHONO**" position.

Connect audio oscillator ground to chassis. Connect signal lead to phono input (M603). Allow several minutes warm-up for oscillator and amplifier. Set Loudness, Basa, and Treble controls as shown in "AMPLIFIER CHECKS" table.

To check amplification, adjust audio oscillator output to 0.34 volts at 1,000 cycles, measured from M603 to ground with a vacuum tube voltmeter. Connect a 3.2 ohm resistive load across secondary of T609 (audio output transformer). Measure output voltages across the load.

To check frequency response, adjust audio oscillator output to 0.34 volts. Change oscillator frequency in steps betwere D5 cycles and 20,000 cycles, readjusting oscillator output to 0.34 volts each time a new frequency setting is made.

Compare amplifier output voltage with readings given in "AMPLIFIER CHECKS" table.

# PARTS LIST

# FM-AM TUNER CHASSIS

# (7N1)

	RESISTORS	
R601	RESISTORS           22 neghma, 2 will, 608 6-225           10000 chm, 2 will, 608 6-225           10000 chm, 2 will, 608 6-225           10000 chm, 2 will, 608 6-225           1 mgbhm, 1 will, 608 6-225           1 mgbhm, 1 will, 608 6-225           1 mgbhm, 1 will, 608 6-215           1 mgbhm, 1 will, 608 6-116           1 00 chm, 1 will, 608 6-116           1 00 chm, 1 will, 508 6-116           2 00 chm, 1 will, 508 6-107           2 1 mgbhm, 1 will, 508 6-108           2 2 0 mgbhm, 1 will, 508 6-108           2 0 0 obm, 1007           1 mgbhm, 1435	
R602	10.000 ohms, 2 watts	
2603	2 2 megohms, 15 watt	
R603 R604 R605	1 megohm, 1/2 watt	
R606 R607	15,000 ohms, 12 watt 60B 8-153	
R608	150 ohms, 14 watt	
R609	100 ohms. 12 watt	
R609 R610 R611	100 ohms, 15 watt	
R612	68.000 chms, 15 watt, 5%, 60B 7-683	
R613 R614	1.500 ohms. 15 watt. 5% 60B 7-152	
R614 R615	1,000 ohms, 12 watt, 5% 60B 7-102	
R616 R617	6.800 ohms, 12 watt. 5% 60B 7-682	
R617 R621	6,800 chms, 12 watt. 5%60B 7-682	
8621	1 8 merchms, 15 watt 60B 8-185	
R622 R623 R624	10.000 ohms, 12 watt, 5% 60B 7-103	
R624	6,000 ohms, HUM	
1625	2.200 ohms, 15 watt	
R626	1 megohm, TREBLE	
R627	control	
	control	
R628	100,000 ohms. 12 watt 60B 8-104	
	47,000 ohms, 15 walt.	
1.0	1 megohm, BASS control	
R629	1 100 000 -1	
	100,000 ohms. ½ watt (used in prod. run 12 and later)	
	(and later)	
	4,700 ohms, 15 watt.	
	10 and 11 only)	
R6301		
	10,000 ohms, ½ watt (used in prod. run 12	
	(and later) 60B 8-103	
R631 R632	100,000 ohms, 32 watt 60B 8-104	
R632 R633	470.000 ohms, 15 Watt 60B 8-474	
R634 R635	22,000 ohms. 12 watt	
R635 R636	390,000 ohms. 1/2 watt	
R637 R638	390,000 ohms, 12 watt	
R638 R639	51,000 ohms, 12 watt. 5%60B 7-513	
R639	NESS control 75D 1-106	
R640	51,000 ohms, 12 watt, 5%. 60B 7-513	
R641	220.000 ohms, 12 watt 60B 8-224	
R642 R643	1.000 ohms, 15 watt	
NOT	E: Symbol numbers R618, R619 and	F
	10000 comm.; 9 waits           10000 comm.; 19 wait           1000 comm.; 100 commerce           100 comm.; 100 commerce           100 comm.; 100 comm	
	CAPACITORS	
C601	10 mmf, 500 yolts, 10%, ceramic, N470 temp, coeff	
	N470 temp. coeff	
C602	.001 mf. 500 volts.	
C603	+50 -20% cer	
	+50 -20% cer	
C604 C605	Ceramic trimmer	
2003	5%, ceramic,	
	NPO temp. coeff	
C606	20 mmt, 500 volts,	
	NPO temp. coeff	
C607 C608	Ceramic trimmer	
C008	10%, cer. P100 53C 2-59	
C609	68 mmf, 500 volts.	
	20 mmf, 500 volts, 5%, ceramics, NPO temp. coeff	
C610	10 mmf, 500 volts.	
	10%. ceramic.	
C6H	bs mini, 500 volts, 5% ceramic, N750 temp, coeff	

	10%, ceramic,	
_	N470 temp. coeff. 53C 2-52	
C611	15 mmf. 500 voits.	
	10%, ceramic.	
	NPO temp. coeff	

33 mmf, 500 volts, 5%, cer. disc, N1400 temp. coeff.......65D 10-119

C614	.001 mf. 500 volts,	
C615	.001 mf, 500 volts, cer. disc	10-6
C015	cer. disc	10-3
C616	10 mmf, 500 volts,	
	NPO temp. coeff	6-118
C617	cer. disc	10-28
C618A }	.004 mf. 500 volts,	
C618B j C619	dual cer. disc	17-1
C620A }	220 mmf, 500 volts, ccr. 65D .004 mf, 500 volts, dual cer, disc	
C620B )		
C622	5%, mica	1-4
	5%, mica	1-4
C623		10-53
C624	270 mmf, 500 volts. 5%, mica 65B 5 mf, 50 volts.	
C625	5%, mica	1-4
C626		
	.02 mf, 500 volts, GMV, ceramic disc65D	10-28
C627 C628	220 mmf, 500 volts, cer65D	6-80
C028	mylar dielec	24-32
C629	GMV, ceramic disc. 65D 220 mmf, 500 volts, cer. 65D 1 mf, 400 volts, mylar dielec. 64C 0015 mf, 500 volts, GMV, cer. disc. 65D 001 mf, 500 volts, cer. disc (used In prod. runs 10 and 11 only).65D 002 mf, 500 volts, cer. disc (used In prod. run 12 and latcr). 65D	10-4
ſ	.001 mf, 500 volts. cer.	
	runs 10 and 11 only)65D	10-53
C630	.002 mf, 500 volts, cer.	
	run 12 and later)	10-125
1	.03 mf, 400 volts, paper (used in prod. runs	
a		1-23
C631	.02 mf, 400 volts, paper (used in prod. run 12 and later)	
	12 and later)	1-24
C632 C633	.01 mf, 400 volts, paper64B .015 mf, 200 volts,	
C634		2-26
	.033 mf. 600 volts. ceramic disc	25-10
C635	.015 mf, 200 volts, 10%, paper	2.26
.C636	.005 mf, 500 volts,	2-20
C637	005 mf 500 volts	10-1
-	ceramic disc	10-1
C638 C639	220 mmf, 500 volts, cer. 65D	6-80
C640	.02 mf, 400 volts, paper. 64B 25 mf, 15 volts,	1-24
C641	25 mf, 15 volts,	4 20
C642	electrolytic	
C643		
	10 mmf, 500 volts. 10%, ceramic disc	6-44
co	ILS AND TRANSFORM	MERS
L601	Choke, Filament	2-54
L602 L603	Antenna, Rod	229-1
L603	Heater Choke 734	2-8
L605	Heater Choke	2-13
L606	Heater Choke	2-12
T601	Antenna Trans- former, complete53C	
	Tormer, complete	2-00

T601	Antenna Trans-			
	former, complete.		2-63	
	Tuning Coil, with			
*T602A	winding		2-66	
*T602B	Tuning Core		2-67	
T603	AM 1st IF Trans-			
	former, 455 KC		28-70	
T604	FM 1st IF Trans-			
	former, 10.7 MC	53C	2-64	
T605	FM 2nd IF Trans-			
	former, 10.7 MC		28-68	
. T606	AM 2nd IF Trans-			
	former, 455 KC		28-71	
T607	FM Ratio Detector			
	Transformer		28-69	
*Part nu	mbers 53C2-66 and 5	3C2-67	together	
make u	p T602A and T602B.			

# MISCELLANEOUS CHASSIS PARTS

M601	Pilot Lamp, #47	1-8
M602	Pilot Lamp, #47	1-8
M603	Socket, Phono Input	
M604	Plug, Audio Output	2-3
M605	Plug 14 nin Power	
	Supply	20-1
S601A		
S601B	Switch FM-AM Phone 77F	76-1
S601C		
S602	Switch, ON-OFF	3 77-1
Brack	t. Pilot Light Mtg	1001
Bracke	t. Tuning Sleeve	1713-1
Bracks	t. Pointer Slide 15A	1717
	for M605	

†Dial Scale Window, Plastic,		
White Lettering (used with		
BROWN background and		
extension)	210	109-1
Dial Scale Window, Plastic,		100-1
Black Lettering (used with		
ALUMINUM background		
and extension)	010	100 5
tDial Background, Dark Brow		108-5
1Dial Background, Aluminum	11220	22-1
finish		
finish. †Dial Background Extension.		33-5
Danis Background Extension,	450	
Dark Brown Dial Background Extension,	T2B	1757
Dial Background Extension,		
Aluminum Dial Pointer and Carriage		1757-2
Dial Pointer and Carriage		63
Pulley, Single Groove		1-34
Pulley, Double Groove		1-50
Roller (guides FM tuner		
dial string) Screw, (holds circuit board t	53C	2-65
Screw, (holds circuit board to	0	
FM tuner sub-chassis)		
3 required Shield, 9 pin tube	53C	2-62
Shield. 9 pin tube	87C	7-20
Socket, Pilot Light Socket, 9 pin miniature,	_82A	20-2
Socket, 9 pin miniature,		
shielded. Socket, 7 pin miniature	87B	23-2
Socket, 7 pin miniature	87A	39-2
Spring, Conical (fits under		
FM tuner roller)	19D	1-45
Spring, Dial String	19D	1-5
Spring, Tuning Core Return		
(FM tuner). †Indicates matching parts.		2-57
†Indicates matching parts.		
Indicates matching parts.		
to the second part of		

# AMPLIFIER CHASSIS (452) RESISTORS

R661	1 megohm, 15 watt	60B	8-105
R662	4,700 ohms, 15 watt	60B	8-472
R663	330,000 ohms, 15 watt	60B	8-334
R664	47,000 ohms, 12 watt, 5%.	60B	7-473
R665	47,000 ohms, 15 watt, 5%.	60B	7-473
R666	470.000 ohms, 15 watt.		
	5%	60B	7-474
R667	470.000 ohms. 12 watt.		
	5%	.60B	7-474
R668	270 ohms, 4 watts,		
	non-inductive	61B	20-22
R669	3,900 ohms, 1/2 watt		
R670	100 ohms, 2 watts	60B	20-101
R671	100 ohms, 2 watts		
R672	3,300 ohms, 3 watts		
R673	1,000 ohms, 1 watt		
R674	1,000 ohms, 2 watts	60B	20-102

# CAPACITORS

C661	.022 mf. 400 volts.		
	mylar dielec		24-36
C662	.022 mf. 400 volts.		
0	mylar dielec	EAC.	24-36
C663	220 mf, 500 volts, cer	CED	6 90
C664	220 mil, 300 voits, cer		0-00
C664	50 mf, 25 volts,		
	electrolytic	67A	4-31
C665A	80 mf. 400 v.)		
C665B	40 mf, 400 v. electro-		
C665C	40 mf, 400 v. lytic	67D	7-33
C665D	40 mf. 300 v.		
C666A	10 mf. 300 v.) (early		
C666B	To mit. 500 v. (Early		
	50 mf, 150 v. > produc-		
C666C	50 mf, 150 v. tion)	67D	7-34
C666A	10 mf. 250 v., electro-		
	lytic (later prod.)	67B	4-38
C666B	50 mf. 150 v. } elect.		
C666C	So int. 150 v. Clater	67D	7-31
C000C	50 mf, 150 v. (inter prod.)		
C667	.047 mf. 600 volts.		
	mylar dielec	63B	12-1
C668	4 mf. 10 volts	64 B	13-1
0000			

# TRANSFORMERS

# MISCELLANEOUS CHASSIS PARTS

CR601	Rectifier, Selenium	93B	1-6
M606	Socket, Power Supply		
	(14 lug)	.88A	20-2
M607	Socket, Audio from		
	tuner	88A	1
M612	Socket, Phono		
	Motor AC	.88B	8-6
M613	Socket, Speaker	88B	5-3
Line C	ord. 8 ft.	. 89B	1-1
Socket	, Octal, Tube	87A	5-1
	ARTS LIST" contin	have	-
~ 1		ingen	A.4
	next page;		

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-	ND RF ALIGNMENT PRO	in the second second			1	AM IF AN	ID RF ALIGN	IMENT PROCEDURI	
Turn re minutes     Set Vol Treble     Rotate S     Use DC	e critical for FM alignment, ceiver and amplifier on and warm-up. lume control at minimum; at mid-rotation. elector switch to FM position VTVM as output indicator. Set that indication on VTVM	allow 15 Bass and	Use a non-metallic wide for transform Refer to figure 6 i ment points. Use unmodulated s Repeat adjustments	alignment tool with tip 3/32" er adjustments. or physical location of align-	• Se Tr • Ro	rn receiver and amplifier on and nutes warm up. I Volume control at maximum, eble controls at mid-rotation. tate Selector switch to AM position nuect output meter across speaker	Bass and	<ul> <li>Use lowest setting of producing adequation of output meter.</li> <li>Use a non-metallic wide for IF transfer</li> </ul>	ps modulation for alignment of signal generator capable late indication on lowest scale alignment tool with tip 3/32' trmer adjustments. 5 to insure good results.
noise lev	el for maximum adjustments. GENERATOR	GENERATOR	neath chassis.	ADJUSTMENT	STEP	GENERATOR	GENERATOR	RECEIVER GANG SETTING	ADJUSTMENT
Connect DC	CONNECTION VTVM from "S" to ground: V	FREQUENCY	GANG SETTING	AUJUSTMENT	1	To stator plates, antenna section of gang tuning capacitor.	455 KC	Fully open	•"J", "K", "L" and "M" for
To	FM antenno terminals an IFM sub-chassis.	10.7 MC	Fully open	"A", "B", "C", "D" and "E" for maximum.	2	Same as "STEP 1".	1620 KC	Fully open	"N" for maximum,
Discolinect V	TVM and connect between pain	"R" and ground.			11-		and the second		
2	Same as "STEP 1".	10.7 MC	Fully open	"F" for zero reading.	1	Radiated signal. Loop of several turns of wire or place generator	Tano RC	Tune in on	"P" for maximum.
Disconnect V readjust "A"	TVM and connect between poir , "B", "C", "D" and "E".	nt "S" and ground	. If "Adjustment" fo	step 2 was in great error,		lead close to receiver for signal pickup.	theme the	generator signal	"P" for maximum,
3 ohm legd	e as "STEP 1". Insert a 150 resistor in series with each	109 MC	*Fully open	"G" for maximum.	•Adji	stments "K" and "M" are made fr	om bottom of e	chassis.	·····
4	Same as "STEP 3".	108:4 MC	Fully open		0				
5	Same as "STEP 3".	96 MC	Tune in on generator signal	***"Rock" generator setting slightly and adjust "H" for maximum.	Volt	VOLTAGE DATA ages shown on schematic diagra	m	accordance with fi proper.	gure 4 or 5, whichever
scale. If is	nal generator and VTVM. Ins possible to adjust RF trimmer of tracked properly.	ert tuner into cab "H" on a false p	inet and check track eak. RF trimmer "H	ing between dial pointer and " may have to be readjusted	• All	measurements, except some finges, are taken with respect to a	lament		TER SETTING
*Loosen 1 it is slav ing the w	Phillips screw that is located c ck. Perform instruction listed rasher, to which it is attached.	under "Adjustme clockwise when vi	ent". Remove slack i ewed from front of cl	n FM tuner string by rotat- assis. Tighten screw.	• Mea	na. sured on 117 volts AC, 60 cycl DIAL STRINGING ccomplish dial stringing, remo		ground bracket re riage on top edge o dial pointer to rig	fully open. With dial back moved, place pointer can f pointer glide frame. Slid ht until it is positioned a ter glide frame. Place dia
Phillips s	er should be calibrated to 108, screw and change tension sligh	4 mc. If tension atly until 108.4 M	adjustment on FM tu C is being received at	ner string is incorrect, loosen		kground bracket and string the			rriage and fasten securely
***When re	ceiver is tuned on 96 MC, the dial pointer travel). Perform	dial nointer will	he positioned at ann	roximately mid-band (center		DRUM POSITION WITH		JM TENSION TH GANG	

PARTS LIST (cont.)

CABINET PARTS LIST

Models 392 and 393

Madels 392 and 393
Main Terminal Spark,
Main Termin

# On OT-Valams, Joudness, Bas, Tricker, Bego and Gold 312 254-8 Compensator, Bego 143 3-22 Les Oppende Banes Mongram A Mongram 0 RECORD CHANGER PARTS RC637-8 RC637-8 For complete reord changer service information, see Service Manual 1800. New Your New York Manual 1800. Basenby, with twin Metal Service Manual New York Metal Plus, Phoeo Moner AC. 88A 8-5 Seeb Switch. NEL-ON-OFF 46A 1 Addrer, 5 at 104 Record (enviriped Record). 48A 8-2

mounting) Tone Arm Rest (Coral). 405A 139-2 403D 65-3

SCRE 19 FM TAR

WITH GANG

Figure 4. Dial Stringing (Early Production).

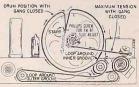
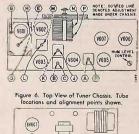


Figure 5. Dial Stringing (Present Praduction).





Tube locations shown.

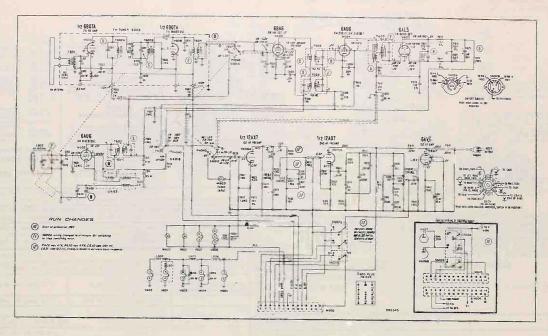
**OJohn F.** Rider

CHASSIS 7N1-4S2

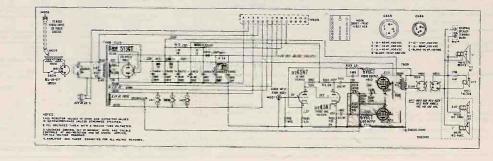
RADIO PAGE

25-4

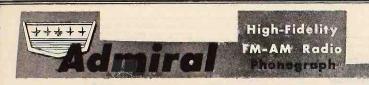
ADMIRAL



452







# 8H1 FM-AM TUNER and 4S2 HI-FI AMPLIFIER

For complete Record Changer servicing information, see SERVICE MANUAL 5800.



# SPECIFICATIONS

# FREQUENCY RESPONSE:

AMPLIFIER—Amplifier section flat from 50 to 20,000 cycles within 1 db at 10 watts output.

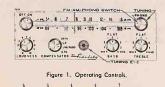
PRE-AMPLIFIER—At 1 watt level, Bass control gives 31 db change at 100 cycles and Treble control gives 26 db change at 10,000 cycles.

DISTORTION-3% at 12 watts.

POWER OUTPUT-17 watts maximum.

POWER CONSUMPTION-100 watts.

- POWER SUPPLY—117 volts AC, 60 cycle only. (Phonograph can be converted to 50 cycle operation. See "RECORD CHANGER PARTS", "Kit, 50 Cycle Conversion".)
- SPEAKER SYSTEM-Woofer, 12" PM; Mid-range, 5¼" PM; Mid-range, 4" PM; Tweeter, 3½" PM.

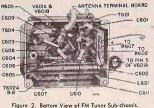


HI-FI FM-AM CONSOLE

MODEL	COLOR	CHASSIS	RECORD
402	Mahogany	8H1	
403	Blond	and	RC 637-2
404	Sierra	452	

# CHASSIS REMOVAL

- To remove amplifier chassis from cabinet:
- 1. Disconnect line cord from power source.
- Disconnect record changer power plug (M611), speaker plug (M615), tuner audio output plug (M604), and power input plug (M606) from tuner chassis.
- 3. Remove screws that hold chassis to cabinet.
- To remove FM-AM tuner from cabinet:
- Remove control knobs from tuner front panel and phono output plug (M608) from tuner chassis.
- 2. Disconnect FM antenna from terminal board and remove terminal board from cabinet.
- Support tuner from bottom and remove 4 hex nuts and lock washers that hold tuner chassis to cabinet. Carefully remove tuner chassis from cabinet.
- To remove FM RF tuner sub-chassis:
- 1. Remove four screws that hold sub-chassis and disconnect wires from antenna terminals.
- 2. Disconnect cable from pin 8 on S601.
- Lift sub-chassis up for servicing. DO NOT disconnect FM tuner dial cord.



Location of components shown.

# TROUBLE SHOOTING HINTS

Tube locations for the tuner and amplifier are shown on figures 6 and 7. Alignment points for the tuner are shown on figure 6.

Tubes may be reached from rear of cabinet for servicing purposes.

B+ voltages and filament voltages for tuner are furnished by power supply on amplifier chassis.

By placing a jumper wire between lugs 4 and 8 of M606, the amplifier may be serviced separately. NOTE: When amplifier is serviced separately, voltage readings will be higher due to the reduced load on the power supply.

Tuning Eye tube is mounted vertically on front of chassis. To remove tube, grasp at base and work downward, out of its clip, until it is free.

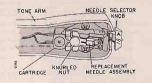
HUM LEVEL: Excessive hum can often be minimized by reversing line cord plug in wall outlet. Move Rej-On-Off pointer to "ON". Touch record changer centerpost and note hum level. Reverse line cord in wall outlet; touch centerpost again and again note hum level. Leave line cord in position giving least hum.

A Hum Level control is located on the tuner chassis, see figure 6. Hum may be further reduced, if necessary, by adjusting this control.

#### RECORD CHANGER SERVICING

For complete record changer service information, sec Service Manual S800.

If it becomes necessary to remove record changer from its mounting board, remove the three large washer-head screws extending through bottom of the mounting board. With these screws removed, the three springs which "float" the record changer may be loase. Lift record changer from the mounting board, being careful to retain mounting screws for installation.



#### Figure 3. Needle Replacement.

#### NEEDLE REPLACEMENT

A worn needle causes "scratch" and a harshness of high tones in the output. Damage to records may be caused by worn needles. To replace needle assembly, refer to figure 3 and loosen the knurled nut that is located under the cartridge. Slip the worn needle assembly out and insert the new needle assembly in the exact same position. Tighten the knurled nut.

See "RECORD CHANGER PARTS" for replacement cartridge and needles.

Al	MPLIFIER CHEC	K5
CONTROL SE	TINGS FOR AMP	LIFIER CHECKS
Loudness Cont Bass Control Trable Control	ere St	Fully Clockwise Mid Rotation Mid Rotation
A	APLIFICATION CH	ECK
AUBIO	Frequency	Volts In
OUTPUT	1000 Cycles	0.34 Volt
AMPLIFIER	Volts	Wath
TOUTFUT	5.6 Volts	10/Watts
FREQU	IENCY RESPONSE	CHECK
	Frattuancy	Valis-In
AUSING BISINGRATOR OUTPUT	in steps between 50 to 20,000 Cycles	0.34 Volt
	Volts	06
AMPLIPIER	5.6 Volts ±.25 v.	21/06

# AMPLIFICATION AND RESPONSE CHECK

The amplifier may be checked for gain and frequency response by using the tests outlined below. TEST EQUIPMENT:

Audio Oscillator, preferably with flat output from 50 cycles to 20 kilocycles.

Vacuum Tube Voltmeter, preferably with decibel scale.

PROCEDURE: Disconnect phono power plug (M601). Disconnect phono output plug (M608) from aocket (M603) on tuner chassis. The oscillator chassis. This enables the checking of the preamplifer and amplifier for amplification and frequency response. Measurements taken with FM-AM-Phono switch in "PHONO" position. Connect audio oscillator ground to chassis. Con-

Connect audio oscillator ground to chassis. Connect signal lead to phono input (M603). Allow several minutes warm-up for oscillator and amplifier. Set Loudness, Bass, and Treble controls as shown in "AMPLIFIER CHECKS" table.

To check amplification, adjust audio oscillator output to 0.34 volts at 1,000 cycles, measured from M603 to ground with a vacuum tube voltmeter. Connect a 3.2 ohm resistive load across secondary of T609 (audio output transformer). Measure out, put voltages across the load.

To check frequency response, set "Compensator" control to "LON RADIO" and adjust oscillator output to 0.34 volts. Change oscillator frequency in steps between 50 cycles and 20,000 cycles. Readjust oscillator output to 0.34 volts each time a new setting is made.

Compare amplifier output voltage with readings given in "AMPLIFIER CHECKS" table.

# CHASSIS 8N1-4S2

# PARTS LIST

FM-AM TUNER CHASSIS (8H1)

C

	(0)		
	RESISTORS		
R601	RESISTORS 25 negobins, 1 wait 10.000 ohms, 2 waits 1 sectors, 1 wait 1 megohin, 15 wait 1 megohin, 15 wait 100 ohms, 15 wait 100 ohms, 15 wait 100 ohms, 15 wait 200 ohms, 15 wait 2 megohin, 18 wait 1 megohin, 18 wait	.60B 8-225	
R601 R602 R603	10.000 ohms. 2 watts	.60B 20-103	
R604	2.2 megohms, 1/2 watt	.60B 8-225	
R605 R605 R606 R607	1 megohm, ½ watt	.60B 8-105 60B 8-153	
R607	10.000 ohms, 1 watt	.60B 14-103	
R608 R609	100 ohms, 12 watt	60B 8-101	
R610	100 ohms, 12 watt	60B 8-101	
R611 R612	68.000 ohms, 12 watt, 5%	.60B 7-683	
R613 R614	1,500 ohms, 1/2 watt, 5%.	60B 7-152 60B 7-102	
R614 R615	2.2 megohms. 12 watt		
R616 R617	6,800 ohms, 1/2 watt, 5%.	6013 7-682	
R615 R617 R618 R619	1 megohm, 12 watt	60B 8-105 60B 8-105	
R620	33,000 ohms. 1/2 watt	.60B 8-333	
R621 R622 R623	1.8 mcgohms. 1/2 watt	60B 8-185	
R623 R624	10,000 ohms, 12 watt, 5%	60B 7-103	
	LEVEL control	75C 20-107	
R625 R626	1 megohm, TREBLE		
R627	control 1 megohm, BASS	75D 1-105	
	r megonin, BASS control. 100,000 ohms, ½ watt. 47,000 ohms, ½ watt. 5% (used in prod. run. 10 and 11 only).	75D 1-105	
R628	100,000 ohms, 12 watt	60B 8-104	
	5% (used in prod. run	S	
R629	10 and 11 only)		
	100,000 ohms. ½ watt (used in prod. run 12 and later) 4,700 ohms, ½ watt. 5% (used in prod. run 10 and 11 only).		
	(and later)	603 8-104	
	5% (used in prod. run	s	
R630	10 and 11 only)		
	10.000 ohms, 12 watt		
	(used in prod. run 12 and later)		
R631	100.000 ohms, 12 watt	60B 8-104	
R632 R633	470 ohms, 12 watt	60B 8-471	
R633 R634 R635 R636 R637 R638 R639	22.000 ohms, 12 watt	60B 8-223 60B 8-394	
R636	220.000 ohms, 1/2 watt	60B 8-224	
R637 R638	51.000 ohms, 12 watt, 59	60B 7-513	
R639	500.000 ohms, LOUD-	75D 1-106	
R640	51,000 ohms, 15 watt, 59	6 60B 7-513	
R640 R641 R642 R643	220.000 ohms. 32 watt	60B 8-224 60B 8-105	
R643 R644	1,000 ohms, 12 watt	60B 8-102	
R645	82,000 ohms, 12 watt		
R645 R646 R647	120,000 ohms. 12 watt	60B 8-124	
Rout	10 end 11 only. 10.000 ohms, is wait uard later). 40.000 ohms, is wait. 40.000 ohms, is wait. 22.000 ohms, is wait. 1000 ohms, is wait. 22.000 ohms, is wait. 22.000 ohms, is wait. 180.000 ohms, is wait.		
-	CAPACITOR	5	
C601	10 mt. 500 volts, 10%, ceramic,		
C602	N470 temp. coeff	53C 2-52	
	+50 -20% cer	53C 2-53	
C603	+50 -20% cer.		
C604 C605	Ceramic trimmer	, 53C 2-55	
0005	5%, ceramic,		
C606	NPO temp. coeff 20 mmf. 500 volts.		
	5%. ceramic.	520 2.56	
C607	Ceramic trimmer		
C608	8.2 mmf, 500 volts, 10%, cer. P100	.53C 2-59	
C609	68 mmf, 500 volts,		
	N750 temp. coeff		
C610	10 mmf, 500 volts, 10%, ceramic		
-	N470 temp. coeff	53C 2-52	
C611	10%, ceramic,		
C612	CAPACITOR: 10 mf. 300 volta 10 mf. 300 volta	53C 2-61	
C612 C612 C612 C612	B Tuning capacitor, AM	68C 69	
C612 C612	D		
C613	33 mmf, 500 volts, 5%, cer. disc, N1400 temp. coeff.		
	N1400 temp. coeff.	65D 10-119	

C614	.001 mf, 500 volts, 65D 10-6	560 Switch: Record Com- pensator, 4 poiltion77B 56-4 Cover, for Magic Eye Socket88A 17 Bracket. Pointer Stide
C615	cer. disc	Cover, for Magic Eye Socket
C616	cer. disc	Bracket, Pilot Light Mtg5A 1713-1
	5%, ceramic, NPO temp, coeff	Bracket, Pointer Silde
C617	All car disc voits	†Dial Scale Window, Plastic, White Lettering (used with
C618A	.004 mf, 500 volts.	BROWN background and extension)
C618B ) C619	220 mmf. 500 volts, cer65D 6-80	BROWN background and extension)
C619 C620A C620B C621	dual cer, disc	ALUMINUM background
C621	270 mmf, 500 volts.	ADUMINUM Background and extension). 21C 108-4 (Dial Background, Dark Brown22C 33-2 Dial Background, Aluminum finish. 22C 33-6 Dial Background Extension, 15B 1757
C622	270 mmf. 500 volts.	Dial Background, Aluminum
C623	.001 mf, 500 volts,	†Dial Background Extension,
C624	5%, mica	1Dial Background Extension,
C625	5%, mica	Dark Bröwn. ISB 1157 Al Backgrond Extension. ISB 1157 Dark Backgrond Extension. ISB 1157- Dark Pointer and Carriage. ISB 1157- Dark Pointer and Carriage. ISB 1157- Background ISB 1157- Backgro
C626	electrolytic	Pulley, Single Groove
C627	GMV, ceramic disc65D 10-28	Roller (guides FM tuner
C628	.1 mf, 400 volts,	Screw. (holds circuit board to
C629	mylar dielec	3 required
	GMV, cer. disc	Shield, 9 pin tube
	disc (used in prod.	Socket 9 nin miniature 82A 20-2
C630 -	.002 mf. 500 volts, cer.	shielded 87B 23-2
	run 12 and later)	Spring, Conical (fits under
	.03 mf, 400 volts, paper (used in prod. runs	FM tuner roller)
C631	10 and 11 only)	Spring, Tuning Core Return (FM tuner) 53C 2-57
	(used in prod. run	†Indicates matching parts.
C632	.01 mf, 400 volts, paper. 64B 1-25	
C633	.015 mf, 200 volts, 10%, paper	
C634	.033 mf. 600 volts, ceramic disc	RESISTORS
C635	.015 mf, 200 volts.	R661 1 megohm, 12 watt
C636	.005 mf, 500 volts,	R661         1 megohm, ½ watt.         60B 8-105           R662         4,700 ohms, ½ watt.         60B 8-334           R663         30,000 ohms, ½ watt.         50B 8-334           R664         47,000 ohms, ½ watt.         5%,50B 7-473           R665         470,000 ohms, ½ watt.         5%,50B 7-473           R665         470,000 ohms, ½ watt.         5%,50B 7-473
C637	.005 mf, 500 volts,	R665 47,000 ohms, 12 watt, 5%.60B 7-473 R666 470,000 ohms, 15 watt,
C638	220 mmf, 500 volts, cer. 65D 6-80	5%
C638 C639 C640 C641	100 mmf, 500 volts, cer. 65D 6-3 .02 mf, 400 volts, paper. 64B 1-24	5%
C641	25 mf, 15 volts, electrolytic 67B 4-30	8668 270 ohms, 4 watts, non-inductive
C642	.02 mf. 500 volts.	R669 3,900 ohms, 12 watt
C643		R671 100 ohms. 2 watts 60B 20-101
C643	220 mmf. 500 volts,	R672 3,300 ohms, 3 watts
C644	220 mmf, 500 volts, ceramic disc	R672 3.300 ohms, 3 watts
	220 mmf, 500 volts, ceramic disc	R672 3,300 ohms, 3 watts
C644	220 mmf, 500 volts, ceramic disc	R672         3.300 ohms, 3 watts.         61B         24-337           R673         1.000 ohms, 1 watt.         60B         14-102           R674         1.000 ohms, 2 watts.         60B         20-102           CAPACITORS         C661         .022 mf. 400 volts.         600 bits.
C644 C645 C646	220 mmf, 500 volts. ceramic disc	Ref2         3.300 ohms, 3 watts         61B 24-337           Ref3         1.000 ohms, 1 watt         60B 14-102           Ref4         1.000 ohms, 2 watts         60B 20-102           CAPACITORS           C661         .022 mf. 400 volts, mylar dielec.         64C 24-36           C652         .222 mf. 400 volts,         64C 24-36
C644 C645	220 mmf. 500 volts. ceramic disc	Ref12         3.300 ohms, 3 waits         61B         24-312           Ref14         1.000 ohms, 1 wait         60B         1-102           Ref14         1.000 ohms, 2 waits         60B         20-102           CAPACITORS         CAPACITORS         Cold ovoits, a waits         61B         20-102           C661         .022 mf. 400 voits, a waits         .64C         24-36         Cold ovoits, a waits         61B         64C         24-36           C662         .022 mf. 400 voits, a waits         .64C         24-36         Cold ovoits, a waits         64C         24-36         Cold ovoits, a waits         64C         24-36         64C         24-36         Cold ovoits, a waits         64C         24-36         64C         24-36         24-36         24-36         64C
C644 C645 C646 C647	220 mmf, 500 volts. erramic disc	R672         3.000 chms, 3 watts         51B 32-337           R673         1.000 chms, 1 watts         60B 14-102           R674         1.000 chms, 2 watts         60B 20-102           C4PACITORS         60B 20-102         60B 20-102           C501         .022 mf. 400 volts, mylar dielec.         64C 24-36           C662         .022 mf. 400 volts, mylar dielec.         64C 24-36           C664         .201 mf. 500 volts, cert.         .650 6-80           C664         .201 mf. 300 volts, cert.         .674 A-13
C644 C645 C646 C647	The state of the stat	RoT2         3.300 ohms, 3 waits         518         84-337           RoT2         1.000 ohms, 1 waits         608         34-102           C661         .000 mit, 400 volis,         602         34-102           C662         .022 mit, 400 volis,         602         42-30           C664         .000 mit, 20 volis,         .602         42-30           C664         .000 mit, 400 volis,         .602         .602 mit, 400 volis,           C664         .001 mit, 400 volis,         .614 - 43.1         .600 volis,           C668         .001 mit, 400 volis,         .614 - 43.1         .600 volis,
C644 C645 C646 C647	220 mm, 500 volts, cerranic dite	Re72         3.300 ohms, 3 watts         51B         38-337           Re71         1.000 ohms, 1 watts         60B         4-102           Re71         1.000 ohms, 2 watts         60B         4-102           Re71         1.000 ohms, 2 watts         60B         4-102           C62         0.22 mf. 400 volts, mylar dielec         602 24-36         602 24-36           C62         mylar dielec         64C 24-36         602 24-36           C63         220 mf. 500 volts, cm. 65D 8-30         666         264-36           C64         30 mf. 500 volts, cm. 65D 4-30         666         666         264-36           C658         80 mf. 400 v, C6588 40 mf. 400 v, C6588 40 mf. 400 v, electro- C5590 40 mf. 400 v, electro-         67D 7-33         7-33
C644 C645 C646 C647	220 mm, 500 volts. 420 mm, 500 volts. 400 mm, 100 volts. 105, ceramic Gitz650 10-43 680 mm, 1000 volts. 105, ceramic Gitz650 10-43 680 mm, 1000 volts. 105, ceramic Gitz650 10-43 105, ceramic Gitz650 10-43 105, ceramic Gitz650 10-43 105, ceramic Gitz650 20-43 105, ceramic Gitz630 20-430 105, ceramic Git	Br72         3.300 ohms, 3 waits         618         84-337           Br71         1.600 ohms, 3 waits         618         84-337           C661         0.221 mi. 600 ohits, 642         64-30         64-30           C662         0.221 mi. 500 viris, 642         84-31         65-60           C663         0.21 mi. 500 viris, 647         4-31         656-60           C663         0.21 mi. 500 viris, 647         4-31         656-60           C664         501 mi. 400 viris, 647         4-31         656-60           C668         0.61 mi. 400 viris, 647         4-31         656-60           C668         0.61 mi. 400 viris, 647         7-33         656-60           C668         0.61 mi. 300 viris, 647 viris, 647 viris, 647         543         647           C668         0.61 mi. 300 viris, 647 viris, 647 viris, 647         543         643           C668         0.61 mi. 300 viris, 647 viris, 647 viris, 647         543
C644 C645 C646 C647	220 mm, 500 volts, everamic disc	R672         3.300 chms, 3 waits         518         84-337           R671         1.000 chms, 3 waits         608         4-102           C661         .027 mf. 400 volits,         602         4-23           C662         .027 mf. 400 volits,         662         24-36           C664         .017 .050 volits, cm, 450 volits,         662         24-36           C6654         .017 .050 volits, cm, 450 volits,         672         4-31           C6654         .017 .050 volits, cm, 450 volits,         672         7-33           C6650         .017 .050 volits, cm, 560 volits, cm, 560 volits,         672         7-34           C6650         .017 .050 volits, cm, 560 volits, cm, 560 volits,         670 r.7-34
C644 C645 C646 C647	220 mm, 500 volt. 420 mm, 500 volt. 405, creamic dite650 6-80 405, creamic dite650 10-43 407, creamic dite650 10-43 407 mm, 1000 volts. 400 mm, 1000 volts. 100 m	Br72         3.300 ohms. 3 waits         618         43-337           Br71         1.800 ohms. 3 waits         618         43-337           C661         0.821 ft.600 ohits.         642         43-36           C662         0.811 ft.600 ohits.         642         43-36           C663         0.811 ft.600 ohits.         642         43-31           C664         0.811 ft.600 ohits.         674         431           C6658         80 mf. 400 vi.         674         431           C6658         80 mf. 400 vi.         916         674         733           C6658         60 mf. 500 vi.         100mi.         670         7-34           C6664         60 mf. 50 vi.         100mi.         670         7-34           C6664         60 mf. 50 vi.         100mi.         670         7-34           C6664         60 mf. 50 vi.         100mi.         670         7-34 <t< td=""></t<>
C644 C645 C646 C647	220 mm, 500 volts. 527 mit, 500 volts. 500 mm, 1000 volts. 500 mm, 1000 volts. 500 mm, 1000 volts. 600 mm, 1000 volts. 100%, ceramic disc	Br72         3.300 chms, 3 waits         518         87-337           Br71         1.600 chms, 1 waits         618         84-337           Br71         1.600 chms, 1 waits         618         84-337           Br71         1.600 chms, 1 waits         608         84-102           C661         .027 mi. 400 volts, 1 million         602         84-102           C662         .027 mi. 400 volts, 402         84-36         642           C664         .007 mi. 400 volts, 402         84-36         642           C664         .007 mi. 400 volts, 642         84-36         642           C664         .007 mi. 400 volts, 642         84-36         642           C668         .007 mi. 400 volts, 642         84-36         642           C668         .007 mi. 400 volts, 642         84-36         642           C668         .007 mi. 400 volts, 642         84-37         643           C6688         .007 mi. 400 volts, 642         94-36         7-33           C6686         .007 mi. 150 volts, 671 mi. 97         7-34         7-34           C6686         .007 mi. 150 volts, 671 mi. 97         7-34         7-34           C6686         .007 mi. 150 volts, 671 mi. 97         7-34         7-34 <tr< td=""></tr<>
C644 C645 C646 C647	220 mm, 500 volt. 220 mm, 500 volt. 105, cramic dir. 450 10-43 105, cramic dir. 450 10-43 107, cramic dir. 450 10-43 107, cramic dir. 450 10-43 107, cramic dir. 450 10-43 108, cramic dir. 450	CAPACITORS C661 02 mi.400 volis. 200 volis.cer. 500 640 24-35 201 volis.cer. 550 640 electrolytic. 640 24-35 20 mf. 300 volis.cer. 550 64-0 electrolytic. 67A 4-31 C6656 040 ris.000 volis.cer. 757 4-31 C6656 040 ris.000 volis.cer. 757 4-33 C6656 040 ris.000 volis.cer. 757 4-33 C6656 040 ris.000 volis.cer. 757 4-33 C6666 040 ris.000 volis.cer. 757 4-33 C6666 040 ris.000 volis.cer. 67B 4-36 C6666 040 ris.000 volis.cer. 67D 7-31 C6666 040 ris.000 volis.cer. 67B 4-36 C6666 040 ris.000 volis.cer. 67D 7-31 C6666 040 ris.000 volis.cer. 67B 4-36 C6666 040 ris.000 volis.cer. 67D 7-31 C6666 040 ris.000 volis.cer. 67D 7-31 C6660 040 ris.000 volis.cer. 67D 7-31 C660 040 ris.000
C644 C645 C646 C647	220 mm, 500 volts. 327 mm, 500 volts. 105, ceramic dite650 10-43 60 mm, 1000 volts. 105, ceramic dite650 10-43 680 mm, 1000 volts. 105, ceramic dite650 10-43 105, ceramic dite650 20-43 105, ceramic dite650 20-45 105, ceramic dite550 20-450 20-450 20-45	CAPACITORS C661 02 mi.400 volis. 200 volis.cer. 500 640 24-35 201 volis.cer. 550 640 electrolytic. 640 24-35 20 mf. 300 volis.cer. 550 64-0 electrolytic. 67A 4-31 C6656 040 ris.000 volis.cer. 757 4-31 C6656 040 ris.000 volis.cer. 757 4-33 C6656 040 ris.000 volis.cer. 757 4-33 C6656 040 ris.000 volis.cer. 757 4-33 C6666 040 ris.000 volis.cer. 757 4-33 C6666 040 ris.000 volis.cer. 67B 4-36 C6666 040 ris.000 volis.cer. 67D 7-31 C6666 040 ris.000 volis.cer. 67B 4-36 C6666 040 ris.000 volis.cer. 67D 7-31 C6666 040 ris.000 volis.cer. 67B 4-36 C6666 040 ris.000 volis.cer. 67D 7-31 C6666 040 ris.000 volis.cer. 67D 7-31 C6660 040 ris.000 volis.cer. 67D 7-31 C660 040 ris.000
C644 C645 C646 C647	220 mm, 500 vols. everanic dic	CAPACITORS C661 037 mi.400 volis. 64C 24-35 022 mi.400 volis. 64C 24-35 023 mi.400 volis. 64C 24-35 0314 failet: 64C 24-35 04C
C644 C645 C646 C647	220 mm, 500 volt. 321 mm, 500 volt. 105, cramic dit. 630 10-43 105, cramic dit. 630 10-43 640 mm, 1000 volt. 105, cramic dit. 630 10-43 640 mm, 1000 volt. 105, cramic dit. 630 10-43 10 mm, 500 volt. 10 vol	CAPACITORS C661 02 uri 400 volis. 2014 01 00 voli
C644 C645 C646 C647	220 mm, 500 volts. 420 mm, 500 volts. 400 mm, 1000 volts. 401 mm, 1000 volts. 401 mm, 1000 volts. 402 mm, 1000 volts. 403 mm, 1000 volts. 403 mm, 1000 volts. 405 volts. 405 mm, 1000 volts. 405 v	CAPACITORS C661 037 mi.400 volis. 64C 24-35 022 mi.400 volis. 64C 24-35 023 mi.400 volis. 64C 24-35 0314 failet: 64C 24-35 04C
C644 C645 C646 C647	220 mm, 500 volt. 320 mm, 500 volt. 105, cramic dir. 105, crami	CAPACITORS           C661         022 mit. 400 volts.         64C 24-35           022 mit. 400 volts.         64C 24-35           023 mit. 250 volts.         64C 24-35           024 mit. 250 volts.         64C 24-35           025 mit. 250 volts.         67A 4-31           026 mit. 250 volts.         67A 4-31           026 mit. 250 volts.         67D 7-33           026 mit. 150 v.         100 mit. 150 v.           026 mit. 150 v.<
C644 C645 C646 C647	220 mm, 500 volts. 327 mm, 500 volts. 1057, ceramic dite610 0-43 307, ceramic dite610 10-43 680 mm, 1000 volts. 1058, ceramic dite610 10-43 680 mm, 1000 volts. 1058, ceramic dite610 10-43 1058, ceramic	CAPACITORS           C661         022 mit. 400 volts.         64C 24-35           022 mit. 400 volts.         64C 24-35           023 mit. 250 volts.         64C 24-35           024 mit. 250 volts.         64C 24-35           025 mit. 250 volts.         67A 4-31           026 mit. 250 volts.         67A 4-31           026 mit. 250 volts.         67D 7-33           026 mit. 150 v.         100 mit. 150 v.           026 mit. 150 v.<
C644 C645 C646 C647 CC L601 L602 L606 L606 L606 L606 T601 T602 T603 T604 T605 T606 T607 T606 T607	An to chain note call	CAPACITORS           C661         0.02 mit. 400 volis.         64C 24-35           0.02 mit. 400 volis.         67A 4-31           C6668.00 mit. 400 volis.         67D 7-33           C6668.01 mit. 300 volis.         67D 7-34           C6668.01 mit. 300 volis.         67D 7-33           C6668.01 mit. 400 volis.         67D 7-33           C6668.01 mit. 400 volis.         67D 7-33           C6669.01 mit. 600 volis.         67D 7-33           C667         601.10 volis.           C668         10 mit. 200 volis.           C668         10 mit. 200 volis.           C669         71.10 volis.           C660         71.10 volis.           C660         71.10 volis.
C644 C645 C646 C647 CC L601 L602 L606 L606 L606 L606 T601 T602 T603 T604 T605 T606 T607 T606 T607	An to chain note call	CAPACITORS           C661         0.02 mit. 400 volis.         64C 24-35           0.02 mit. 400 volis.         67A 4-31           C6668.00 mit. 400 volis.         67D 7-33           C6668.01 mit. 300 volis.         67D 7-34           C6668.01 mit. 300 volis.         67D 7-33           C6668.01 mit. 400 volis.         67D 7-33           C6668.01 mit. 400 volis.         67D 7-33           C6669.01 mit. 600 volis.         67D 7-33           C667         601.10 volis.           C668         10 mit. 200 volis.           C668         10 mit. 200 volis.           C669         71.10 volis.           C660         71.10 volis.           C660         71.10 volis.
C644 C645 C646 C647 C647 C647 CC L601 L601 L604 T601 T601 T603 T604 T605 T607 T605 T607 T606 T607 T606 T607 T606 T607 M603	An to chain note call	CAPACITORS           C661         0.02 mit. 400 volis.         64C 24-35           0.02 mit. 400 volis.         67A 4-31           C6668.00 mit. 400 volis.         67D 7-33           C6668.01 mit. 300 volis.         67D 7-34           C6668.01 mit. 300 volis.         67D 7-33           C6668.01 mit. 400 volis.         67D 7-33           C6668.01 mit. 400 volis.         67D 7-33           C6669.01 mit. 600 volis.         67D 7-33           C667         601.10 volis.           C668         10 mit. 200 volis.           C668         10 mit. 200 volis.           C669         71.10 volis.           C660         71.10 volis.           C660         71.10 volis.
C644 C645 C646 C647 CC L601 L602 L606 L606 L606 L606 T601 T602 T603 T604 T605 T606 T607 T606 T607	An to chain note call	CAPACITORS           C661         0.02 mit. 400 volis.         64C 24-35           0.02 mit. 400 volis.         67A 4-31           C6668.00 mit. 400 volis.         67D 7-33           C6668.01 mit. 300 volis.         67D 7-34           C6668.01 mit. 300 volis.         67D 7-33           C6668.01 mit. 400 volis.         67D 7-33           C6668.01 mit. 400 volis.         67D 7-33           C6669.01 mit. 600 volis.         67D 7-33           C667         601.10 volis.           C668         10 mit. 200 volis.           C668         10 mit. 200 volis.           C669         71.10 volis.           C660         71.10 volis.           C660         71.10 volis.
C644 C645 C646 C647 C647 C647 CC L601 L603 L605 L605 L605 T601 T603 T604 T603 T604 T605 T606 T607 T607 T606 T607 T606 T607 C647	And Colling and Coll. 198, 227-1 Hater Choke. 17A 2-18 Hester Choke. 17A 2-18 Hester Choke. 17A 2-18 Hester Choke. 17A 2-18 Hester Choke. 17A 2-18 Antenna Trans. Tomer Compilete 15C 2-63 Antenna Trans. Tomer 455 KC. 17D 28-70 FM 2nd if Trans. former, 157 MC. 17D 28-70 FM 2nd if Trans. former, 157 KC. 17D 28-70 Hold Lamp. 547 File Lamp. 548 A 13 File Lamp. 548 A 14 File Lamp. 548 A 15 File Lamp. 54	CAPACITORS CAPACITORS CAPACITORS CAPACITORS CAPACITORS CAPACITORS CAPACITAL
C644 C645 C646 C647 C647 C647 CC L601 L603 L605 L605 L605 T601 T603 T604 T603 T604 T605 T606 T607 T607 T606 T607 T606 T607 C647	An to chain note call	CAPACITORS           C661         0.02 mit. 400 volis.         64C 24-35           0.02 mit. 400 volis.         67A 4-31           C6668.00 mit. 400 volis.         67D 7-33           C6668.01 mit. 300 volis.         67D 7-34           C6668.01 mit. 300 volis.         67D 7-33           C6668.01 mit. 400 volis.         67D 7-33           C6668.01 mit. 400 volis.         67D 7-33           C6669.01 mit. 600 volis.         67D 7-33           C667         601.10 volis.           C668         10 mit. 200 volis.           C668         10 mit. 200 volis.           C669         71.10 volis.           C660         71.10 volis.           C660         71.10 volis.

111000	(14 Jug)	88A	20-2
M607	Socket, Audio from		
	tuner	88A	1
M612	Socket, Phono		
	Motor AC	88B	8-6
M613	Socket, Speaker	88B	5-3
Line C	ord. 8 ft.	89B	1-1
Socket	, Octai, Tube		5-1
- 41	ARTS LIST" conti	nued	on

RADIO PAGE 25 -5 ADMIRAL

**OJohn F.** Rider

NOTE	For FM alignment, use a signa are critical for FM alignment.			
Minu Set Tre Rom Use	n receiver and amplifier on and utes warm-up. Volume control at minimum, ble at mid-rotation. at Selector switch to FM position DC VTVM as output indicator. Set out so that indication on VTVM is 1 e level for maximum adjustments.	Bass and	wide for transforme Refer to figure 6 for ment points. Use unmodulated sig Repeat adjustments	or physical location of align
STEP	GENERATOR	GENERATOR	RECEIVER GANG SETTING	ADJUSTMENT
Connec	t DC VTVM from "S" to ground. V	oltage reading wil	I be negative.	
, 1	To FM antenña terminäls on FM   BFI sub-chassis.	10.7 MC	Fully open	"A", "B", "C", "D" and "E for maximum?
Discon	nect VTVM and connect between poi	if "R" and ground		
2	Same as "STEP if".	10.7 MG	Fully open	"F" for zero reading.
	ect VIVM and connect between point "A", "B", "C", "D" and "E".	nt "S" and ground	l. If "Adjustment" fo	r step 2 was in great error
	Some as "STEP 1". Insert a 150 ohm resistor in series with each lead.	109 MC	*Fully open	"G" for maximum.
-147	Same as "STEP 32.	108.4 MC	Fully open-	**
5	Same as "STEP 3".	96 MC	Tune in off. generator signal	***"Rock" generator settin slightly and adjust "H" f maximum.
scale.	ve signal generator and VTVM. In It is possible to adjust RF trimmer is not tracked properly.	nsert tuner into ca er "H" on a false	binet and check track peak. RF trimmer "I	king between dial pointer an 1" may have to be readjuste

\*Loosen Phillips screw that is located on tuning gang shaft. See figure 5. Loosen FM tuner string until it is slack. Perform instruction listed under "Adjustment". Remove slack in FM tuner string by rotating the washer, to which it is attached, clockwise when viewed from front of chassis. Tighten screw.

\*\*FM tuner should be calibrated to 108.4 mc. If tension adjustment on FM tuner string is incorrect, loosen

Phillips screw and change tension slightly until 108.4 MC is being received strongest. Tighten screw. \*\*\*When receiver is tuned on 96 MC, the dial pointer will be positioned at approximately mid-band (center point of dial pointer travel). Perform instructions under "Adjustment".

# PARTS LIST (cont.)

# CABINET PARTS LIST

ma	dels	402,	403	ana	404
	Trans.				

M614	Terminal Board.		
	External Speaker	10B	13-2
M615	Plug. Speaker	88B	5-2
24616	Speaker, Woofer, 12"		
	13.2 ohm voice coil)	78B	112-1
M617	Speaker, Tweeter, 315"		
	(3.2 ohm voice coll)	78B	91-2
M618	Speaker, Mid-Range, 5		
11010	(8 ohm voice coil)	780	110.4
M619	Speaker, Mid-Range, 4	100	110-4
MOID	(8 phm voice coil)	700	94 0
D-16	"U", tuner mounting	26 4	111
Cabir	o . tuner mounting.	. 20n	
	hogany (402)		410.10
BIO	nd (403)	RJOE	412-13
Sie	rra (404)	ACLA.	412-14
Clip.	Escutcheon Mounting	- 2A :	31-1
Cover	, Speaker Plug (M615)	. 888	5-12
Escut	cheon, Dial, Gold finish	23C	299-2
Escut	cheon, "hi fidelity"	. 23D	303
	ile. Leg	. 37B	123
Grille	Cloth		
for	Mahogany Cabinet (402)	. 36D	86-36
for	Blond Cabinet (403)	36D	86-37
for	Sierra Cabinet (404)	. 36D	86-38
Hing	. Lid	37A	106-2

Knobs and Associated Parts Tuning, Beige 33C 254-6	Ad
Tuning, Beige 33C 254-6 Sciector, AM-FM-Phono,	Cal
Gold	. (
On-Off-Volume, Loudness, Bass, Treble or	Cal
Compensator, Beige	Cer
and Gold	Co
Compression Ring 18A 5-12 Legs, Cabinet	Esc
Mahogany, (Model 402)	Ki
Black (Models 403 and 404) 35E 412-53	Ne
Lid Support, Brass Plated	Ne r
6Orders for cabinets and certain matching	s
parts will not be filled unless full details are given with the order and the damaged	Ne
part cannot be repaired economically.	NC
RECORD CHANGER PARTS	
RC637-2	Pla
For complete record changer service	Re
information, see Service Manual S800.	(
M608 Plug, Phono Output	
M609 Cartridge, Pick-up (includes needle	

M608	Plug, Phono Output	
M609	Cartridge, Pick-up	
	(includes needle	
	assembly, with twin	
	assembly, with twill	
	sapphire-tipped	
	needles). 409B 27-2	
M610	Motor, Record Changer,	
	4-speed	
M611	Plug, Phono Motor AC88A 8-5	
	C IN PROTO AN OFFILIORA	
2004	SWITCH, "REJ-ON-OFF",408A 1	
M611 S604	Plug, Phono Motor AC88A 8-5 Switch. "REJ-ON-OFF".408A 1	

Adapter, 45 RPM Record			
(envelope of 3)	181	5-2	
Cable, Shielded Pick-up, 20"			
(includes M608)	113A	11-5	
Cable, Tone Arm,			
Shielded Lead	113A	13-2	
Centerpost Assembly	G-100	B 601	
Control Knob (Coral)	103D	63-3	
(fits around turntable)	403D	64-5	
	98C	15-72	
	1.00		
needles)	98C	15-82	
Needle Assembly (.001"			
diamond microgroove and			
	98C	12-81	
	13B	3-15	
Chapper Motor 407C24			
	98C	15-57	
Spindle, 45 RPM Adapter	G400	B 645	-2
	405A	139-2	
Tone Arm Rest (Coral)	403D	65-3	

mins Set Tre Rot	n receiver and amplifier on and sites warm-up. Volume control at maximum, B ble controls at mid-rotation. at Selector switch to AM position. nect output meter across speaker v	sass and	Use lowest setting of producing adequa of output meter. Use a non-metallic s wide for IF transfor	s modulation for alignment, of signal generator capable te indication on lowest scale lignment tool with tip 3/32" mer adjustments. to insure good results.
STEP	GENERATOR	GENERATOR FREQUENCY	RECEIVER GANG SETTING	ADJUSTMENT
3	To stator plates, antenna section of gang tuning capacitor.	455 KC	Fully open	*"J", "K", "L" and "M" for maximum.
2	Same as "STEP 1".	1620 KC	Fully open	"N" for maximum.
	Radiated signal. Loop of several turns of wire or place generator lead close to receiver for signal pickup.	1400 KC	Tune in on generator signal	"P" for maximum.

# VOLTAGE DATA

Voltages shown on schematic diagram. · All measurements, except some filament

- voltages, are taken with respect to chassis ground.
- · Measured on 117 volts AC, 60 cycle line.

# DIAL STRINGING

To accomplish dial stringing, remove the dial background bracket and string the dial in

> MAXIMUM TENSION DRUM POSITION WITH GANG CLOSED CLOSED

Figure 4. Dial Stringing (Early Production).



Figure 5. Dial Stringing (Present Production).

accordance with figure 4 or 5, whichever is proper.

# POINTER SETTING

Set tuning gang fully open. With dial background bracket removed, place pointer carriage on top edge of pointer glide frame. Slide dial pointer to right until it is positioned at right edge of pointer glide frame. Place dial string in pointer carriage and fasten securely.

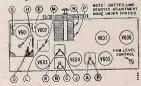


Figure 6. Top View of Tuner Chassis. Tube locations and alignment points shown.

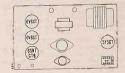
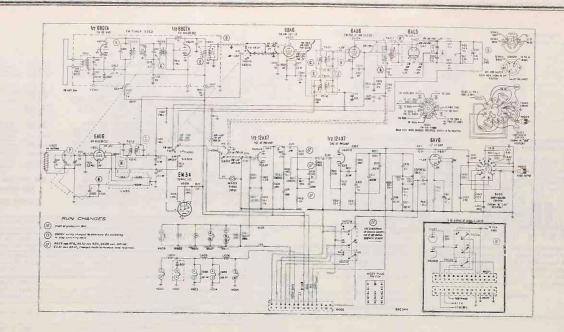


Figure 7. Top View of Amplifier Chassis. Tube locations shown.

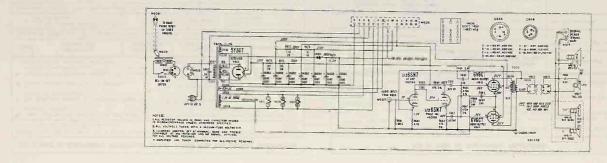
CHASSIS 8N1-4S2

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ADMIRAL



452





# 8H1 FM-AM TUNER and 6D3 HI-FI AMPLIFIER

MODEL

412

413

414

cuitry.

HI-FI FM-AM CONSOLE PHONOGRAPH

2. Disconnect FM antenna from terminal board

3. Remove four hex nuts that hold tuner in cabi-

net. Slide chassis out of cabinet and remove

metal cover from chassis bottom to expose cir-

1. Remove four screws that hold sub-chassis and

Lift sub-chassis up for servicing. DO NOT dis-

disconnect wires from antenna terminals.

and remove terminal board from cabinet.

To remove FM RF tuner sub-chassis:

2. Disconnect cable from pin 8 on S601.

connect FM tuner dial cord.

CHASSIS

8H1

and

603

COLOR

MAHOGANY

RLOND

SIERRA

RECORD

CHANGER

RC637

-25

	1	
		A
N		-

# SPECIFICATIONS

FREQUENCY RESPONSE:

AMPLIFIER—Amplifier section flat from 30 to 20,000 cycles within 2 db at 10 watts output. PRE-AMPLIFIER—At 1 watt level, Bass control gives 26.5 db change at 1000 cycles and Treble gives 32 db change at 10,000 cycles.

DISTORTION—Less than 1% at 10 watts output. POWER OUTPUT—38 watts maximum.

POWER CONSUMPTION-155 watts.

- POWER SUPPLY—117 volts AC, 60 cycle only. (Phonograph can be converted to 50 cycle operation. See "RECORD CHANGER PARTS"; KIT, 50 cycle Conversion.)
- SPEAKER SYSTEM—Woofer, 15" PM; Mid-Range, 8" PM; Mid-Range, 51/4" PM; Tweeter, 31/2" PM.



CHASSIS REMOVAL

- To remove amplifier chassis from cabinet:
- 1. Disconnect line cord from power source.
- Disconnect tuner power socket (M606), amplifier audio output plug (M619), record changer power plug (M614), tuner audio output plug (M604), and aux. input plug (M616).
- 3. Remove screws that hold chassis to cabinet. To remove FM-AM tuner from cabinet:
- 1. Remove control knobs from tuner front panel and phono output plug (M611).

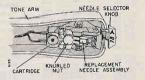
HUM LEVEL: Excessive hum can often be minmized by reversing line cord plug in wall outlet. Move Rej-On-Off pointer to "ON". Touch record changer centerpost and note hum level. Reverse line cord in wall outlet; touch centerpost again and again note hum level. Leave line cord in position giving least hum.

A Hum Level control is located on the tuner chassis, see figure 6. Hum may be further reduced, if necessary, by adjusting this control.

## RECORD CHANGER SERVICING

For complete record changer service information, see Service Manual S800.

To remove record changer from its mounting board, remove the three large waher-head screws extending through bottom of the mounting board. With these screws removed, the three springs which "Moat" the record changer may be loose. Litt record changer from the mounting board, being careful to retain mounting screws for installation.



# Figure 3. Needle Replacement.

A worn needle causes "scratch" and a harshness of high tones in the output. Damage to records may be caused by worn needles.

To replace needle assembly, refer to figure 3 and loosen the knurled nut that is located under the cartridge. Slip the worn needle assembly out and insert the new needle assembly in the exact same position. Tighten the knurled nut.

See "RECORD CHANGER PARTS" for replacement cartridge and needles.

# AMPLIFICATION AND RESPONSE CHECK

The pre-amplifier and amplifier may be checked for gain and frequency response by performing the tests outlined below and referring to the "AMPLI-FIER CHECKS" table.

#### TEST EQUIPMENT:

Audio Oscillator, with flat frequency response across the audio range.

Vacuum Tube Voltmeter, preferably with decibel (db) scale.

PROCEDURE: Connect tuner and amplifier and allow time for warm-up. It is not necessary to connect the record changer at this time. Disconnect audio output plug (M619) and connect a 3.2 ohm, 30 watt resistive load across the secondary of audio output transformer (T609).

# AMPLIFIER CHECKS

AMPLIFICATION	Set Loudness, Bass and Treble to maxi- mum (fully clockwise). Set Compen- rator to "LON, RADIO". Set AM-FM- Phono switch to "Phono".		
AUDIO	FREQUENCY	VOLTS	
GRIPHI	1,000 Cycles	0.2 Volts	
AMPLIFUR	VOLTS OUT	WATTS OUT	
CUTPUT	13.3 Velu	22 Watts	

tor to	Set Loudness at maximum. Bots and Trable to "FLAT", and Compensator to "LON. RADIO". Set AM-FM-Phono switch to "PHONO".				FREQUENCY RESPONSE CHECK	
DBCHANGE		AMPLIFIER OUTPUT		AUDIO GENERATOR OUTPUT		
Cut	Boost	Çüf	Boost	Voltage	Freq.	
-22.5	+4 .	.22 volts	5.15 volta	•.035	100 cycles	
0	0	2.9 volts	2.9 yoth	•:035	1,000 cycles	
-19.5	+12.5	.31 volts	12.2 volts	+.035	10,000	

CHECK" portion of following lext.

Connect audio oscillator output from phono input socket (M603) to ground. Before proceeding, adjust HUM LEVEL control for minimum hum.

TO CHECK AMPLIFICATION, set controls as shown in the table under "AMPLIFICATION CHECK". Adjust audio oscillator output to 002 volts at 1.000 cycles, as measured from phono input socket (M603) to ground. Measure output voltage across 3.2 ohm load and compare with the reading in the table.

FREQUENCY RESPONSE CHECK: Set controls to positions shown in "FREQUENCY RESPONSE CHECK" table. Leave the oscillator connected as shown previously.

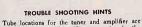
If a vacuum-tube voltmeter, that can measure 0.035 volts is not available construct a spries network consisting of a 100.000 ohm, 5% resistor and a 3,900 ohm, 5% resistor. Connect this network across the generator output and then connect the 3,900 ohm resistor between socket (M603) and ground. Appl 1 volt across this network and the proper input voltage for frequency response measurements will be applied to M603.

Apply 1 volt at 1,000 cycles to amplifier at M603 and vary the Bass and Treble controls. The output voltage, measured across the 3.2 ohm load, should not appreciably change.

Apply 1 volt at 100 cycles. Vary Bass control and measure output. At MAX (Boost), output voltage should be 5.15 volts and, at MIN (Ucu), the output voltage should be 0.22 volts. The change of voltage in the output will give a 26.5 db change in bass response.

Apply 1 volt at 10,000 cycles. Vary Treble control to both extremes and measure the output. At MAX (Boost), output voltage should be 12.2 volts and at MIN (Cut), output voltage should be 0.31 volts. This change of output voltage gives a 32 db change in treble response.

NOTE: Voltage readings for the frequency response checks should compare favorable with those listed in the "FREQUENCY RESPONSE CHECK" table.



shown on figures 6 and 7. Alignment points for the tuner are shown on figure 6.

Tubes may be reached from rear of cabinet for servicing purposes.

Figure 2. Bottom View of FM Tuner Sub-chassis:

Location of components shown.

B+ voltages and filament voltages for tuner are furnished by power supply on amplifier chassis.

By placing a jumper wire between lugs 4 and 8 of M606, the amplifier may be serviced separately. NOTE: When amplifier is serviced separately, voltage readings will be higher due to the reduced load on the power supply.

Tuning Eye tube is mounted horizontally under chassis. To remove tube, grasp at base and work backward, out of its clip, until it is free.

CHASSIS 8H1-6D3 The state of the s

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	PARTS LIST	C616
	M-AM TUNER CHASSIS (8H1)	C617
		C618 C618 C619 C620
Prot	RESISTORS           2.7 neghmi, ywatt.         600 8-225           1.000 0mm, ywatt.         502 -610           1.000 1mm, ywatt.         502 -610           1.000 0mm, ywatt.         508 -600           1.000 0mm, ywatt.         508 -520           1.000 0mm, ywatt.         508 -520           1.000 0mm, ywatt.         508 -520 </th <th>C619 C620</th>	C619 C620
R601 R602 R603	10,000 ohms, 2 watts 60B 20-103	C621
R604 R605	2.2 megohms, 1/2 watt	C622
R606 R607	15.000 ohms. 12 watt	C623
R608 R609	150 ohms, ½ watt	C624
R610 R611 R612	100 ohms. 35 watt	C625
R613	1,500 chms, 12 watt, 5% 60B 7-152	
R612 R613 R615 R615 R616 R617 R618 R619	2.2 megohms, 12 wait. 60B 8-225 6 800 obms, 15 wait. 5% 60B 7-682	C627 C628
R617 R618	6.800 ohms. 15 watt. 5% 60B 7-682 1 megohm. 16 watt 60B 8-105	C629
	1 megohm, 12 watt	
R621 R622	1 megohm. 12 watt	C630
R623 R624	10,000 ohms, 12 watt, 5%60B 7-103 6,000 ohms, HUM	ł
R625 R626	2.200 ohms, 32 watt 60B 8-222	
R620	control BASS	C631
R628	1 megohm, BASS control. 75D 1-105 100 000 obms 15 watt 60B 8-104	C632
	47,000 ohms, 1/2 watt, 5% (used in prod. runs	C632 C633
R629	1 megohm, BASS control	C634
	100,000 ohms. 15 watt (used in prod. run 12	C635
	(4.700 ohms, 12 watt,	C636
	100,000 ohms, ½ watt (used in prod. run 12 and later)	C637
R630	18 and 11 only	C638 C639
	(used in prod. run 12 and later)	C639 C640 C641
R631 R632	100,000 ohms. 12 watt	C642
R632 R633 R634 R635 R636 R637	22,000 ohms, 12 watt 60B 8-471 22,000 ohms, 12 watt 60B 8-223	C643
R636	220,000 ohms, 12 watt 60B 8-394	C644
R638 R639	51,000 ohms, 12 wait, 5%60B 7-513	C645
R640	NESS control 75D 1-106	C646
R641 R642	220,000 ohms, 12 watt 60B 8-224	C647
R643 R644	1,000 ohms, 12 watt 60B 8-102 180,000 ohms, 35 watt 60B 8-184	0
R640 R641 R642 R643 R644 R645 R645 R646 R647	82,000 ohms, 15 watt 60B 8-823 120,000 ohms, 15 watt 60B 8-124	L601 L602
R647	120,000 ohms, 12 watt60B 8-124	L603
C601	CAPACITORS	L603 L604 L605 L606 T601
CBUI	10%, ceramic, N470 temp coeff 53C 2-52	T601
C602	.001 mf, 500 volts, +50 -20% cer 53C 2-53	*T602 *T602
C603	.001 mf, 500 volts, +50 -20% cpr. 53C 2-53	*T602 T603
C604 C605	Ceramic trimmer	T604
	5%, ceramic, NPO temp. coeff	T605
Č606	20 mmf, 500 volts, 5%, ceramic,	T606
C607	NPO temp. coeff	T607
C608	8.2 mmf, 500 volts. 10%, cer, P100	Part
C609	5% ceramic,	MIS
C610	10 mmf, 500 volts,	M601
C611	N470 temp. coeff	M601 M602 M603 M604
	10%, ceramic, NPO temp, coeff. 53C 2-61	M605
C612A C612B C612C C612C	220.000 ohms, is welt	S6014
C612C C612D	Tuning capacitor, AM68C 69	S6014 S601E S601C S602
C613	33 mmf. 500 volts, 5%, cer. disc, N1400 temp. coeff65D 10-119	S603
C614	.001 mf. 500 volts.	Cove
C615	.001 mf, 500 volts, cer. disc	Brac
	cer. disc	Brac

C616	10 mmf, 500 volts, 5% ceramic 00 mf, 500 volts, 00 mf, 500 volts, 00 mf, 500 volts, 120 mf, 500 volts, 120 mf, 500 volts, 120 mf, 500 volts, 127 mmf, 500 volts, 127 mmf	†Dia W
C617	NPO temp. coeff65D 6-118	B
C618A	GMV, cer. disc	tDia B
C618A C618B C619 C620A C620B C620B C621	dual cer. disc	Ā
C620A	2.004 mf, 500 volts.	†Dia
C620B C621	270 mmf, 500 volts,	†Dia ‡Dia fi
C622	dial circ disc.         36.1 7-1           attrart, solv volts.         658 1-4           270 mm, 500 volts.         678 1-70           270 mm, 500 volts.         678 10 10-70           270 mm, 500 volts.         678 10 10-70           270 mm, 500 volts.         678 10 10-10           270 mm, 500 volts.         678 10 10-10           270 mm, 500 volts.         678 1-22           271 mm, 100 volts.         678 1-23           271 mm, 500 volts.         678 1-23           271 mm, 600 volts.         678 1-23           272 mm, 500 volts.         678 1-23	†Dia
C623	5%, mica	tDia A
C624	cer. disc	Dia
C625	5%. mica	Pul
C626	clectrolytic	Rol
	GMV, ceramic disc 65D 10-28	Scr F 3
C627 C628	220 mmf, 500 volts, cer. 65D 6-80	
C629	mylar dielec	Soc
	GMV. cer. disc	Soc
	disc (used in prod.	Sor
C630	runs 10 and 11 only)65D 10-53 .002 mf, 500 volts, cer.	Spr
	disc (used in prod. run 12 and later) 65D 10-125	Spr
	03 mf. 400 volts, paper	Spr
C631	10 and 11 only)	†Ind ‡Ind
CONT	(used in prod. run	
C632 C633	12 and later)	
C633	.015 mf. 200 volts,	
C634	.033 mf. 600 volts,	
C635	.015 mf. 200 volts	R661
C636	10%, paper	R663
C637	ceramic disc	R661 R662 R663 R664 R665
	ceramic disc	R666
C638 C639 C640 C641	100 mmf, 500 volts, cer. 65D 6-80	R667
C640 C641	.02 mf, 400 volts, paper64B 1-24 25 mf, 15 volts.	R667 R668 R669
C642	electrolytic 67B 4-30	R670
C643	ceramic disc	R671 R672
	ceramic dise	R673
C644	10%, ceramic disc 65D 10-43	
C645	680 mmf, 1000 volts, 10%, ceramic disc. 65D 10-43	R674 R675
C646	680 mmf. 1000 volts,	R676 R677
C647	10 mmf, 500 volts.	R678 R679 R680
	10%. ceramic disc65D 6-64	R680
1.601	ILS AND TRANSFORMERS Droke, FilmertSC 2:4 Antenna, RodSB 227-1 Best ConstantSC 2:4 Antenna, RodSB 227-1 Best ConstantSB 227-1 Hester ConstantSB 227-1 Hester ConstantSB 227-1 Hester ConstantSB 227-1 Inter ConstantSB 227-1 Inter ConstantSB 227-1 Puning Coli WithSC 2:46 Puning Coli WithSC 2:46 Puning Coli WithSC 2:46 Puning Coli WithSC 2:47 PortSC 2:47 former, 10.7 MCSC 2:47 FastGomerTC 2:47 former, 10.7 MCSC 2:47 for MC	R681
L602	Antenna, Rod 69B 229-1	R682 R683
L604	Heater Choke 73A 2-8	R684
L605 L606	Heater Choke 73A 2-13 Heater Choke 73A 2-12	
T601	Antenna Trans-	C661
*T602A *T602B	Tuning Coll. with	C662
*T602B	Tuning Core 53C 2-67	C663
1603	former. 455 KC	C664
T604	FM 1st IF Trans- former, 10.7 MC53C 2-64	C665
T605	FM 2nd IF Trans-	C666 C667
T606	AM 2nd IF Trans-	0001
T607	FM Ratio Detector	C668
"Part r	umbers 53C2-66 and 53C2-67 together	C668 C668 C668 C668
make	up T602A and T602B.	C668
	ELLANEOUS CHASSIS PARTS	C669 C669 C669
M601 M602 M603 M604	Pilot Lamp, #47	
M603 M604	Plug, Audio Output	C669
M605	Plug. 14 pin, Power Supply	C669
S601A S601B S601C S602	Switch, FM-AM Phone.77B 76-1	C670
S601C	Switch ON OPP 370 5"	C671
S602 S603	Switch. ON-OFF 77B 77-1 Switch. Record Com-	C672
Cover	pensator, 4 position 77B 56-4	0012
Brack	et. Tuning Sleeve	C673
Brack	Switch, Record Com- pensator, 4 position.         71B 56-4           for Magic Exp Socket.         88A 17           et. Tuning Sieeve.         15A 1001           et. Plot Light Mitg.         15A 1713-1           et. Plot Light Mitg.         15A 1713-1           et. Pointer Silde.         15A 20-12	C674
Cover	. IOF MOUS	"PAR

Dial	Scale Window, Plastic, lite Lettering (used with OWN background and		
WE	ite Lettering (used with		
BR	OWN background and		
Dial	OWN background and ension). Scale Window, Plastic, ick Lettering (used with UMINUM background d extension). Background, Dark Brow Background, Aluminum ish.	21C	108-2
Bla	ick Lettering (used with		
AL	UMINUM background		
an	extension)	21C	108-4
Dial	Background, Dark Brow	m22C	33-2
fin	sh.	220	22.0
Dial	Background Extension		33-0
Da	rk Brown	15B	1757
Dial	Background Extension,		
Dial	Pointer and Corrigge	15B	1757-2
Pulle	v. Single Groove	170	1.74
Pulle	y. Double Groove	170	1-50
Rolle	r (guides FM tuner		
Scre	(bolds observed based a		2-65
FN	tuner sub-chassis)	9	
3 r	equired	53C	2-62
Shiel	d, 9 pln tube		7-20
Sock	et. Octal, Magic Eye	87A	20-3
Sock	et 9 pin miniature.	8ZA	20-2
shi	elded.		23-2
Sock	et. 7 pin miniature		39-2
Sprin	g. Conical (fits under		
Sprin	Background, Dark Brox Background Extension, Background Extension, mellowing Marker and Carriage William Carr	19D	1-45
Sprin	ig. Tuning Core Return		1-5
(F)	M tuner)	53C	2-57
India	ates matching parts.		
Andra	aves matching parts.		
	AMPLIFIER CH	ÂSS	IS
	(6D3)		
	RESISTORS		
1661	150.000 ohms. 15 watt		8-154
1662	10,000 ohms. 12 watt	. 60B	8-103
1661 1662 1663	10,000 ohms. 12 watt 270,000 ohms. 12 watt	60B	8-154 8-103 8-274
1662 1663 1664	10,000 ohms, ½ watt 270,000 ohms, ½ watt 1200 ohms, ½ watt 3900 ohms, ½ watt	60B 60B 60B	8-103 8-274 8-122 8-392
1662 1663 1664 1665 1665	10,000 ohms, ½ watt 270,000 ohms, ½ watt 1200 ohms, ½ watt 3900 ohms, ½ watt 150,000 ohms, ½ watt	60B 60B 60B 60B	8-103 8-274 8-122 8-392
1664 1665 1666	150,000 ohms, ½ watt 10,000 ohms, ½ watt 270,000 ohms, ½ watt 1200 ohms, ½ watt 3900 ohms, ½ watt 150,000 ohms, ½ watt. 5%	60B 60B 60B 60B 60B	8-103 8-274 8-122 8-392 7-154
1664 1665 1666	10,000 ohms, ½ watt 270,000 ohms, ½ watt 1200 ohms, ½ watt 3900 ohms, ½ watt 150,000 ohms, ½ watt 5% 150,000 ohms, ½ watt	60B 60B 60B 60B 60B	8-103 8-274 8-122 8-392 7-154 8-154
1664 1665 1666	10.000 ohms, 15 watt 270.000 ohms, 12 watt 1200 ohms, 15 watt 3900 ohms, 15 watt 150.000 ohms, 15 watt 55 55 150.000 ohms, 15 watt 1 megohm, 12 watt 1 megohm, 12 watt	60B 60B 60B 60B 60B 60B 60B 60B	8-103 8-274 8-122 8-392 7-154 8-154 8-105 8-332
t664 t665	150.000 ohms, ½ watt 1 megohm, ½ watt 3.300 ohms, ½ watt	60B 60B 60B	8-154 8-105 8-332
1664 1665 1666 1667 1668 1669 1670	150.000 ohms, ½ watt 1 megohm, ½ watt 3.300 ohms, ½ watt	60B 60B 60B	8-154 8-105 8-332
1664 1665 1666 1667 1668 1669 1670	150.000 ohms, ½ watt 1 megohm, ½ watt 3.300 ohms, ½ watt	60B 60B 60B	8-103 8-274 8-122 8-392 7-154 8-105 8-332 7-164 8-222
1664 1665 1666 1667 1668 1669 1670	150,000 ohms, 12 watt 1 megohm, 12 watt 3,000 ohms, 12 watt 160,000 ohms, 12 watt 5% 2,200 ohms, 15 watt 220,000 ohms, 15 watt	60B 60B 60B 60B	7-154 8-154 8-105 8-332 7-164 8-222
1664 1665 1666 1667 1668 1669 1670	150,000 ohms, 12 watt. 1 megohm, 12 watt. 3,000 ohms, 12 watt. 160,000 ohms, 15 watt. 5% 2,200 ohms, 35 watt. 220,000 ohms, 35 watt. 220,000 ohms, 15 watt. 5%	60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-332 7-164 8-222 7-224
1664 1665 1666 1667 1668 1669 1670 1671 1672	150,000 ohms, 12 watt. 1 megohm, 12 watt. 3,000 ohms, 12 watt. 160,000 ohms, 15 watt. 5% 2,200 ohms, 35 watt. 220,000 ohms, 35 watt. 220,000 ohms, 15 watt. 5%	60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-332 7-164 8-222 7-224
1664 1665 1666 1667 1668 1669 1670 1671 1672 1673	150,000 ohms, 12 watt. 1 megohm, 12 watt. 3,000 ohms, 12 watt. 160,000 ohms, 15 watt. 5% 2,200 ohms, 35 watt. 220,000 ohms, 35 watt. 220,000 ohms, 15 watt. 5%	60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-332 7-164 8-222 7-224
1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676	150,000 ohms, 12 watt. 1 megohm, 12 watt. 3,000 ohms, 12 watt. 160,000 ohms, 15 watt. 5% 2,200 ohms, 35 watt. 220,000 ohms, 35 watt. 220,000 ohms, 15 watt. 5%	60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-332 7-164 8-222 7-224
1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1674 1675 1676	150,000 ohms, 12 watt. 1 megohm, 12 watt. 3,000 ohms, 12 watt. 160,000 ohms, 15 watt. 5% 2,200 ohms, 35 watt. 220,000 ohms, 35 watt. 220,000 ohms, 15 watt. 5%	60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-332 7-164 8-222 7-224
1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1674 1675 1676	150,000 ohms, 12 watt. 1 megohm, 12 watt. 3,000 ohms, 12 watt. 160,000 ohms, 15 watt. 5% 2,200 ohms, 35 watt. 220,000 ohms, 35 watt. 220,000 ohms, 15 watt. 5%	60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-332 7-164 8-222 7-224
1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676	150,000 ohms, 12 watt. 1 megohm, 12 watt. 3,000 ohms, 12 watt. 160,000 ohms, 15 watt. 5% 2,200 ohms, 35 watt. 220,000 ohms, 35 watt. 220,000 ohms, 15 watt. 5%	60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-332 7-164 8-222 7-224
1664         1665           1665         1665           1667         1668           1671         1672           1673         1673           1674         1675           1675         1676           1678         1679           1680         1680	150,000 ohms, 12 watt. 1 megohm, 12 watt. 3,000 ohms, 12 watt. 160,000 ohms, 15 watt. 5% 2,200 ohms, 35 watt. 220,000 ohms, 35 watt. 220,000 ohms, 15 watt. 5%	60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-332 7-164 8-222 7-224
	150,000 ohms, 12 watt. 1 megohm, 12 watt. 3,000 ohms, 12 watt. 160,000 ohms, 15 watt. 5% 2,200 ohms, 35 watt. 220,000 ohms, 35 watt. 220,000 ohms, 15 watt. 5%	60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-332 7-164 8-222 7-224
	150,000 ohms, 12 watt. 1 megohm, 12 watt. 3,000 ohms, 12 watt. 160,000 ohms, 15 watt. 5% 2,200 ohms, 35 watt. 220,000 ohms, 35 watt. 220,000 ohms, 15 watt. 5%	60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-332 7-164 8-222 7-224
1664 1665 1666 1667 1668 1669 1667 1672 1673 1674 1675 1676 1677 1678 1676 1677 1678 1679 1680 1680	150,000 ohms, 12 watt. 1 megohm, 12 watt. 3,000 ohms, 12 watt. 160,000 ohms, 15 watt. 5% 2,200 ohms, 35 watt. 220,000 ohms, 35 watt. 220,000 ohms, 15 watt. 5%	60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-332 7-164 8-222 7-224
	150,000 ohms, 12 watt. 1 megohm, 12 watt. 3,000 ohms, 12 watt. 160,000 ohms, 15 watt. 5% 2,200 ohms, 35 watt. 220,000 ohms, 35 watt. 220,000 ohms, 15 watt. 5%	60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-332 7-164 8-222 7-224
1664 1665 1666 1667 1668 1669 1667 1672 1673 1674 1675 1676 1677 1678 1676 1677 1678 1679 1680 1680	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt 1000 ohms, 12 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt	60B 60B 60B 60B 60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-322 7-164 8-222 7-224 7-224 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-222 8-223 8-223 14-102 24-337 14-102 20-102 8-100 8-100
1564 1665 1666 1667 1668 1669 1670 1671 1672 1673 1673 1674 1675 1676 1676 1678 1678 1678 1678 1678 1678	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt 1000 ohms, 12 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt	60B 60B 60B 60B 60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-322 7-164 8-222 7-224 7-224 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-222 8-223 8-223 14-102 24-337 14-102 20-102 8-100 8-100
1664 1665 1666 1667 1667 1667 1667 1677 1673 1674 1675 1676 1678 1678 1678 1678 1678 1678 1678	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt 1000 ohms, 12 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt	60B 60B 60B 60B 60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-322 7-164 8-222 7-224 7-224 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-222 8-223 8-223 14-102 24-337 14-102 20-102 8-100 8-100
1564 1665 1666 1667 1668 1669 1670 1671 1672 1673 1673 1674 1675 1676 1676 1678 1678 1678 1678 1678 1678	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt 1000 ohms, 12 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt	60B 60B 60B 60B 60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-322 7-164 8-222 7-224 7-224 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-222 8-223 8-223 14-102 24-337 14-102 20-102 8-100 8-100
1564 1565 1566 1567 1568 1569 1669 1670 1671 1572 1673 1673 1574 1673 1576 1677 1678 1678 1678 1682 1684 1682 1684	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt 1000 ohms, 12 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt	60B 60B 60B 60B 60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-322 7-164 8-222 7-224 7-224 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-222 8-223 8-223 14-102 24-337 14-102 20-102 8-100 8-100
1664         1665           1665         1666           1667         1668           1667         1667           1667         1667           1671         1673           1674         1675           1675         1676           1677         1681           1688         1688           1688         1684           1661         1662           1662         1623	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt 1000 ohms, 12 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt	60B 60B 60B 60B 60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-322 7-164 8-222 7-224 7-224 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-222 8-223 8-223 14-102 24-337 14-102 20-102 8-100 8-100
1564 1565 1566 1567 1568 1569 1669 1670 1671 1572 1673 1673 1574 1673 1576 1677 1678 1678 1678 1682 1684 1682 1684	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt	60B 60B 60B 60B 60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-322 7-164 8-222 7-224 7-224 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-222 8-223 8-223 14-102 24-337 14-102 20-102 8-100 8-100
1664         1665           1665         1667           1668         1669           1671         1668           1671         1673           1672         1673           1674         1675           1675         1676           1674         1675           1678         1678           1681         1682           1682         1683           1684         1682           1683         1684           1662         663           1663         1662	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt	60B 60B 60B 60B 60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-322 7-164 8-222 7-224 7-224 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-222 8-223 8-223 14-102 24-337 14-102 20-102 8-100 8-100
1664         1667           1668         1667           1668         1667           1668         1667           1673         1674           1673         1674           1675         1676           1676         1677           1678         1676           1678         1676           1680         1681           1682         1683           1684         1661           1662         1663           1664         1662	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt	60B 60B 60B 60B 60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-322 7-164 8-222 7-224 7-224 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-223 8-223 8-203 14-102 24-337 14-102 20-102 8-100 8-100
1664         1665           1665         1667           1668         1669           1671         1668           1671         1673           1672         1673           1674         1675           1675         1676           1674         1675           1678         1678           1681         1682           1682         1683           1684         1682           1683         1684           1662         663           1663         1662	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt	60B 60B 60B 60B 60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-322 7-164 8-222 7-224 7-224 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-223 8-223 8-203 14-102 24-337 14-102 20-102 8-100 8-100
1664         1667           1668         1667           1668         1667           1668         1667           1673         1674           1673         1674           1675         1676           1676         1677           1678         1676           1678         1676           1680         1681           1682         1683           1684         1661           1662         1663           1664         1662	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt	60B 60B 60B 60B 60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-322 7-164 8-222 7-224 7-224 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-223 8-223 8-203 14-102 24-337 14-102 20-102 8-100 8-100
1664         1665           1665         1666           1667         1668           1667         1669           1671         1672           1673         1673           1674         1675           1675         1678           1678         1678           16881         16881           16882         16884           1661         1662           1663         1664           1665         1666           16664         1665           16654         1665	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt	60B 60B 60B 60B 60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-322 7-164 8-222 7-224 7-224 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-223 8-223 8-203 14-102 24-337 14-102 20-102 8-100 8-100
1664         1665           1665         1666           1667         1668           1667         1669           1671         1672           1673         1673           1674         1675           1675         1678           1678         1678           16881         16881           16882         16884           1661         1662           1663         1664           1665         1666           16664         1665           16654         1665	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt	60B 60B 60B 60B 60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-322 7-164 8-222 7-224 7-224 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-223 8-223 8-203 14-102 24-337 14-102 20-102 8-100 8-100
1664         1665           1665         1666           1667         1668           1667         1669           1671         1672           1673         1673           1674         1675           1675         1678           1678         1678           16881         16881           16882         16884           1661         1662           1663         1664           1665         1666           16664         1665           16654         1665	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt	60B 60B 60B 60B 60B 60B 60B 60B 60B 60B	7-154 8-154 8-105 8-322 7-164 8-222 7-224 7-224 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-223 8-223 8-203 14-102 24-337 14-102 20-102 8-100 8-100
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1664         1665           1666         1667           1668         1667           1671         1673           1671         1673           1674         1673           1675         1676           1676         1673           1674         1673           1675         1676           1678         1675           1678         1678           1681         1682           1683         1684           1661         1662           1663         1664           1665         1665           1665         1665           1665         1665           1665         1665           1665         1665           1665         1665           1665         1665           1665         1665           1665         1665           1665         1665           1665         1665           1665         1665           1665         1665           1665         1665           1665         1665           1665         1665           1665 <td>10000000000000000000000000000000000000</td> <td>60B         60B           60B         60B           60C         64C           64C         64C           64D         64D           64D</td> <td>7-1541 8-105 8-105 8-105 8-105 8-222 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-103 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-105 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100</td>	10000000000000000000000000000000000000	60B         60B           60C         64C           64C         64C           64D         64D           64D	7-1541 8-105 8-105 8-105 8-105 8-222 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-103 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-105 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100
1664         1665           1665         1666           1667         1668           1667         1669           1671         1672           1673         1673           1674         1675           1675         1678           1678         1678           16881         16881           16882         16884           1661         1662           1663         1664           1665         1666           16664         1665           16654         1665	120,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 130,000 ohms, 15 watt 120,000 ohms, 15 watt 120,000 ohms, 15 watt 150,000 ohms, 15 watt 150,000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 15 watt 1000 ohms, 12 watt	60B         60B           60C         64C           64C         64C           64D         64D           64D	7-1541 8-105 8-105 8-105 8-105 8-222 7-224 7-224 8-222 8-222 8-222 8-222 8-222 8-103 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-105 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100 8-100

	.1 mf. 200 volts.
	molded, mylar64C 25-57
	.1 mf. 400 volts.
	molded, mylar 64C 24-32
	.1 mf. 400 volts.
	molded, mylar64C 24-32
	.1 mf. 400 volts.
	molded, mylar. 64C 24-32
	50 mf. 25 volts, elect. 67B 4-31
	56 mmf, 500 volts, cer65D 6-34
	2,700 mmf, 500 volts,
	ceramic disc.
	K1200 temp. coeff 65D 10-155
А	40 mf, 450 volts)
в	40 mf 450 volts
ē	40 mf. 450 volts elect67D 7-32
CD	20 mf. 350 volts
Ā	50 mf, 150 volts ) elect.
B	SU mt. 150 Volts / elect.
ĉ	50 mf. 150 volts (early 67D 7-34
C .	
А	50 mf. 150 volts { elect. 50 mf. 150 volts { (later 67D 7-31 prod.)
B	50 mf 150 volts } (later 67D 7-31
	prod.)
С	See C674; on later prod., C669C is
	separate elect.
	.047 mf, 600 volts,
	paper
	4 mf, 10 volts
	(pross-over) 64B 13-1

 77B 77-1
 Co11
 67B 13-1

 77B 56-4
 67D 166 15 0018 0
 64B 13-1

 77B 56-4
 67D 166 15 0018 0
 64B 13-1

 77B 56-4
 67D 166 15 0018 0
 61A 40-1

 77B 75-1
 C673 0.67 mt 560 volts, 61A 40-1
 61A 40-1

 77B 75-1
 C673 0.67 mt 560 volts, 61B 13-1
 61A 312-1

 77B 75-1
 C673 0.67 mt 550 volts, 61B 13-1
 61B 43-3

 78A 1001
 007 mt 500 volts, elect. 61B 43-3
 61B 43-3

 88A 20-12
 "PARTS LIST" continued on next page.
 61B 43-1

CJohn F. Rider

Channin ann & 6009

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	PARTS LIST (spet.)	Matt Territori Rep	d. Ball.	RECORD CHANGES	BC6.37-3P
Notice     Notice <th>Last Witer Chuke</th> <th>And Andreas</th> <th>LAY YEA BEE</th> <th>Mail: Plug. Plung Colput</th> <th>ma LJ</th>	Last Witer Chuke	And Andreas	LAY YEA BEE	Mail: Plug. Plung Colput	ma LJ
Image:	1928 Daiped Vesendormet	Bernalded strain Laws	Cy growing - Married	the same and the	
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Note         Control         C		Departur, A.M. 198.	Plants, Long Street, or	Reading Agencies and the	
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# VOLTAGE D'ATA

gen sloten on whereatte diagram.

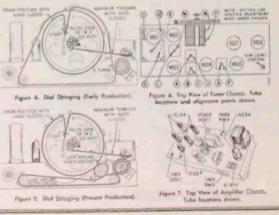
- All measurements, except some filoment voltages, are taken with corport to these
- Monapped on 117 volts AC, 66 spels line.

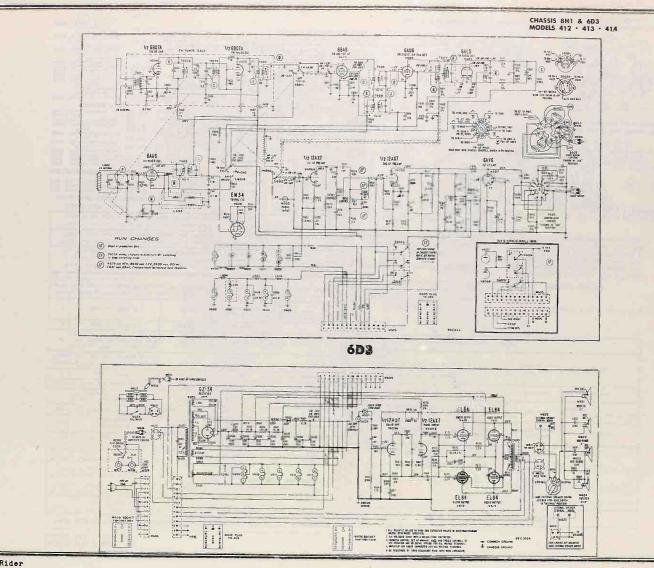
# DIAL STEENDING

To accomplish dial stringing, ressore the at background leacher and string the dial in accordance with figure 4 or 5, whithmen is proper.

# POINTER SITTING

Set tracing pang fully open, With dial background handler removed, place pointer carrage on tag only of pointer gilds frame. Shife dial pointer to right multi-fit is positioned at right odge of pointer plate trains. Place dial along is pointer carriage and future security.





RADIO PAGE 25-12 ADMIRAL

CHASSIS 8H1-6D3



# 8H18 FM-AM TUNER and 452C HI-FI AMPLIFIER

For complete Record Changer servicing information, see SERVICE MANUALS \$800 and \$800A.

This Service Manual Supplement is used with Service Manual S812 to service Models 472, 473, 474, 484 and 489.



Figure 2. Front Yiew of Model 484 Rolling Provincial style

AMPLIFIER CHASSIS REMOVAL

On Models \$72, \$73, \$78 and \$89, the cabinet

For Model 434, the amplifier chassis removal pro-

HI-FI FM-AM CONSOLE PHONOGRAPH

MODEL	COLOR	CHASSIS	RECORD
472	Mahagany	BHIB	
473	Blend	and	
474	Sierra	452	RC
484	Gray Pumice	BH18 and	638-2
489	Fruitwood	452C	

TROUBLE SHOOTING HINTS

On some models, the Tuning Eye is mounted horizontally under the FM-AM Tuner chassis. To remove this tubs, grasp if by the cover on the base and work it backwards out of its clamp.



Figure 3. Front View of Model 489. French Provincial style.



Figure 4. Operating Controls. All models.



All BH1 chausis use 6AU6 (V602) for AM Mixer-Oscillator, Ali BH1B chausis use 6BE6 (V602) AM Mixer-Oscillator, Right to FM-AM Tunter schematis diagram, in this supplement for chausis differences.

# CHASSIS DIFFERENCES

The only difference between the 452 chasmis and the 452c chasmis is that the 452c uses a pilot lamp. See figure 5 (below) for connection of pilot lamp into circuit. Use the 452 schematic diagram in S812 for servicing the 452c amplifier.



Figure 5. Partial schematic of 452C showing connection of pilot lamp.

NOTE: Some early production of the models covered by this supplement used the 8H1 FM-AM Tuner. To service these tuners, the 8H1-8H1B scheraatic diagram in this supplement and the "PARTS

To service the 8H1B, FM-AM Tuner, use the "PARTS LIST" in S812 with the following changes: RESISTORS

CAPACITORS

COILS AND TRANSFORMERS

LIST in S812 are used.

2.7 megahins, 19 wort

15,000 ohm. 16 wot

22,000 ohms, 15 watt

1,000 alms, ly watt 22,000 alms, ly watt 120,000 alms, ly watt

23 mml, 500 volts, 5%, cor. disc.

N1400 temp, coeff. 001 ref, 400 volte, GMY, cer. disc

10 mml, 500 volta 10%, cor, disc

47 mml, 500 volts, 10%, cor. disc.

14750 temp. coeff. C614 .01 ref, 500 volts, GMV, car, disc. C647 .01 ref, 500 volts, GMV, car, disc.

AM Oscillator Coll

AM Oscillator Call .....

8.601

8605

8648

8649

C613

C614

C647

C613

1401

1603

4.44

Add: Add1

# PARTS LIST (8H1B)

608 8 225

400 8 151

608 8-223

608 8-107 608 8-223

608 8-124

450 10-179

450 10-177

650 10.3 650 10-3

69A 227-1

67A 52-17

630 10-6 650 6 44 MISCELLANEOUS CHASSIS PARTS

CHASSIS BHIB . 452C

SPEAKER SYSTEMS

for speaker system

complement and con-

nection for all models

covered by this sup-

alement

Refer to figure 6

MODELS 472 . 473 . 474 : 484 . 489

- Martin

Figure 6.

Speaker System,

Deleter	
Diel Beckground	22C 33 6
Dist Beckground	225 32 2
Dial Background Estension, Dark Brown	178.1717
Diel Scolt Window	210 108 2
Dist? Scale Window	24C 108H
hdd:	
Brocket, Chussis Mrg. (1011)	138 1731-8
Bracket, Chosais Mig (right)	184 1931-6
Dial Background (aluminum)	22C 33-4
Dial Scule Window	See Cobi, Patts
Gaiket, honese (gray chipbourg)	426-307-1
Grammet, Chuste Mounting	12A 2-10
Souces Sleave (for mtg, chouse asembly	
to Dial Background)	29A 2-12-71
HI-FI AMPLIFIER	

# 452C NOTE: Use the "PARTS LIST" in SHI2 will the

following additions, for the 452	C chassis.
MA20 Pilot Lamp, # 47	BIA 1.8
Sochat and Lands (for M&20)	82A 11.5

# RECORD CHANGER

	with the following changes,
Canterpost exembly	04008 601

A68:		
Centerpost as	undely	184 8004

century in S812 is used.

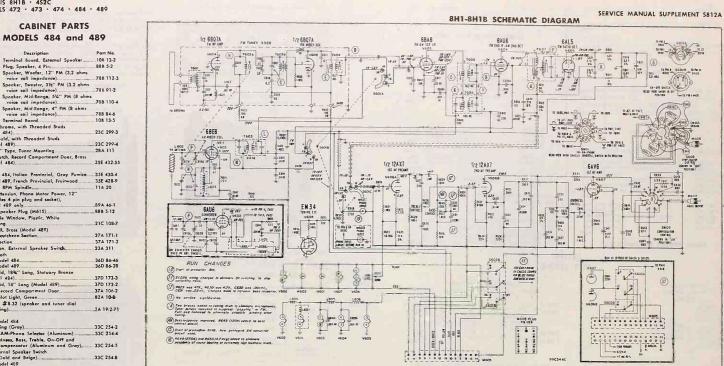
ADIO

PAGE

251

A

ADMIRAL



# CABINET PARTS MODELS 472, 473 and 474

Symbol	Description	Port No.
M614	Terminal Board, External Speaker	10B 13-2
M615	Plug, Speaker, 4 Pin.	
M616	Speaker, Woofer, 12" PM (3.2 ohms	
	voice coil impedance)	
M617	Speaker, Tweeter, 31/2" PM (3.2 ahms	
	voice coil impedance)	788 91-2
M618	Speaker, Mid-Range, 51/4" PM (8 ahms	
	voice coil impedance)	
M619	Speaker, Mid-Range, 4" PM (8 ohms	
	voice coil impedance)	78B 84-6
Antenn	a Terminal Board.	108 13-5
Bezel,	Chrome, with Threaded Studs.	23C 299-3
Bolt, "I	J" Type, Tuner Mounting	
Bullet (	Catch, Record Compartment Door, Brass	
*Cabinet		
Mah	agany (Model 472)	35E 432-12
Blong	(Model 473)	35E 432-13

Symbol [		Part No.
	74)	
Clip, 45 RPM Spin	dle	11A 20
Cover, Speaker Pla	·q	
Dial Scale Window	Plastic, White	
Lettering		
Door Pull, Brass		
Escutcheon, Externa	al Speaker Switch	
Grille Cloth		
for Model 472		36D 86-29
for Model 473		
for Model 474		
Hinge, Lid		
Hinge, Record Com	partment Door, Brass	
Kepsnut, #8-32 (s)	peaker and tuner dial	
Knob, Tuning (Gray	()	
	o Selector (Aluminum)	
Knob, Loudness, Ba	ss, Treble, On-Off,	
	luminum and Gray)	33C 254-5

Symbol	Description	Part No.
Knob, Exter	nal Speaker Switch	
(Gold or	nd Beige)	
Leg, Molde	d, with Ferrule and Anchor Balt	
for Mode	472 (Mahagany)	
for Mode	473 and 474 (Ebony)	
Leg Mounti	ng Plate (straight mounting type)	15B 1813-3
Lid Suppor	t, Bross	
Monogram,	Admirol "A"	
Palnut, 16"	(speaker switch mounting)	
	-32 (bezel mounting)	
Ponel, Cabi	inet Back (one side covered with	
acoustica	I material)	43D 308-2
Screw, #1	0-32 x 1%" WH Phillips	
(record c	hanger mounting)	1A 153-30-71
Spacer, Fel	t (for 14" tuner control shofts)	
Spocer, Tur	ner Sleeve	
Strike Plate	, Record Compartment Door, Brass	
Switch, Exte	ernal Speaker, 3 Position	
+Orders for	cabinets and certain matching parts	will not be filler

unless full details are given with the order and the damaged parts cannot be repaired economically.

# CHASSIS 8H18 · 452C MODELS 472 · 473 · 474 · 484 · 489

# CABINET PARTS

Symbol		
	Description	Part No.
M614	Terminal Board, External Speaker	108 13.2
M615	Plug, Speaker, 4 Pin.	888 5-2
M616	Speaker, Woofer, 12" PM (3.2 ohms	
Molo	Speaker, Woorer, 12 PM (3.2 onms	
	voice coll impedance)	
M617	Speaker, Tweeter, 3½" PM (3.2 ohms voice call impedance)	700.01.0
	voice coil impedance)	788 91-2
M618	Speaker, Mid-Range, 5%" PM (8 ohms	
	voice coil impedance)	78B 110-4
M619	Speaker, Mid-Range, 4" PM (8 ohms	
	voice coil impedance)	.78B 84-6
Antenno	Terminal Board	10B 13-5
	hrome, with Threaded Studs	
(Model	484)	23C 299-3
Basel (	fold, with Threaded Studs	
(Hede	1 489)	23C 299-4
(Mobile		28A 111
8011, "0		20A 111
Bullet C	atch, Record Comportment Door, Brass	
	484)	35E 432-55
*Cobinet		
Mode	484, Italian Provincial, Gray Pumice	.35E 430-4
Mode	1 484, Italian Provincial, Gray Pumice 1 489, French Provincial, Fruitwood	.35E 428-9
Clip, 45	RPM Spindle	11A 20
	dension, Phone Motor Power, 12"	
(inclus	des 4 nin nivo and socket).	
Made	des 4 pin plug and socket), I 469 only	.89A 46-1
Cause	ipeaker Plug (M615)	888 5.12
		.000 3.12
	le Window, Plastic, White	
Letter		.21C 108-7
Door Pu	II, Brass (Model 489)	
Key E		37A 171-1
Key S	ection.	. 37A 171-2
Escutche	on, External Speaker Switch	23A 311
Grille C	ath	
for M	odel 484	36D 86-46
for M	odel 489	36D 86-28
		300 00-20
Hinge, L	id, 18%" Long, Statuary Bronze	
(Mode	1 484)	.370 173-3
Hinge, L	id, 16" Long (Model 489)	.370 173-2
Hinge, 1	id, 16" Long (Model 489)	37A 106-2
Jewel, P	ilot Light, Green	82A 10-8
Kepsnut,	#8.32 (speaker and tuner dial	
mount	ing)	2A 19-2-71
Knobs for M	odel 484	
for M	odel 484 ing (Grav)	330 254.2
for Mr	ing (Gray)	33C 254-2
for Mr Tun FM	ing (Gray) AM-Phono Selector (Aluminum)	
for Mr Tun FM Lou	ing (Gray). -AM-Phono Selector (Aluminum) dness, Bass, Treble, On-Off and	.33C 254-4
for Mi Tun FM Lou	ing (Gray) AM-Phono Selector (Aluminum) dness, Bass, Treble, On-Off and compensator (Aluminum and Gray)	.33C 254-4
for Mi Tun FM Lou	ing (Gray) AM-Phono Selector (Aluminum) dness, Bass, Treble, On-Off and compensator (Aluminum and Gray)	.33C 254-4 .33C 254-5
for Mi Tun FM Lou C Exth	ing (Gray). -AM-Phono Selector (Aluminum) dness, Bass, Treble, On-Off and compensator (Aluminum and Gray) ernal Speaker Switch Gold and Beige)	.33C 254-4
for Ma Tun FM Lou C Exh ( for Ma	ing (Gray). AM-Phono Selector (Aluminum)	.33C 254-4 .33C 254-5 .33C 254-8
for Mo Tun FM Lou C Exth ( for M- Tun	ing (Gray). -AM-Phono Selector (Aluminum)	.33C 254-4 .33C 254-5
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for Mi Tun FM Lou C Exh ( for M. Tun FM. S	ing (Gray). AM-Phono Selector (Aluminum)	-33C 254-4 33C 254-5 .33C 254-8 .33C 254-6 .33C 254-7
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# Admiral

# SERVICE DATA No. ST828-1 Rev. 1

# DUAL CHANNEL Stereophonic

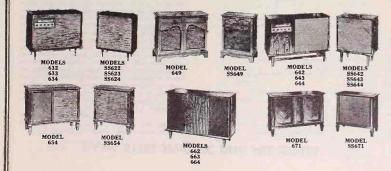
# HIGH-FIDELITY FM-AM-PHONOGRAPH

# 12B1-12B1A-5T4A CHASSIS

# MODEL IDENTIFICATION CHART

MASTER UNIT			AUXILIARY S	TEREO UNIT	
NUMBER	NAME	FM-AM TUNER CHASSIS	RECORD	MODEL NUMBER	AMPLIFIER
632	KENSINGTON	1281	RC688-165, -185	55622	ST4A
633	KENSINGTON	12B1	RC688-165, -185	55623	ST4A
634	KENSINGTON	1281	RC688-165, -185	55624	5T4A
642	ESSEX	1281	RC688-165, -185	\$\$642	ST4A
643	ESSEX	12B1	RC688-165, -185	\$\$643	5T4A
644	ESSEX	1281	RC688-165, -185	\$\$644	5T4A
649	CHANTE	12B1, 12B1A	RC688-165, -185	\$\$649	ST4A
654	TUSCANY	12B1	RC688-165, -185	\$\$654	ST4A
662	IMPERIAL	1281	RC688-175, -185		5T4A
. 663	IMPERIAL	12B1	RC688-175, -185	+	5T4A
664	IMPERIAL	12B1	RC688-175, -185		5T4A
671	TITIAN	1281	RC688-175, -185	\$\$671	5T4A

\*The auxiliary channel (including ST4A chassis and speaker system) is incorporated into the Master unit in Models 662, 663 and 664.



# SPECIFICATIONS

FREOUENCY RESPONSE-Master amplifier and Auxiliary amplifier flat from 40 cycles to 20,000 cycles within 1 dh

CONTROLS-Chassis 12B1 Off-On-Treble, Loudness (dual), Bass, Record Compensator, Selector and Tuning -Chassis 5T4A Balance, Bass and Treble.

HARMONIC DISTORTION-Chassis 12B1 Less than 1% at normal listening levels. Less than 3% at 9 watts output.

-Chassis 5T4A Less than 1% at normal listening levels. Less than 3% at 9 watts output.

POWER CONSUMPTION - 12B1 radio chassis, 115 watts. 5T4A amplifier chassis, 60 watts. Record Changer, 25 watts.

POWER SUPPLY-117 Volts AC, 60 cycles only.

**POWER OUTPUT-Up to 30 watts** 

# SPEAKER SYSTEMS-

Models 632, 633, 634 and 649: 10" PM, Woofer; 51/4" PM and 4" PM Mid-Ranges; 31/2" PM. Tweeter.

# Models 642, 643, 644 and 671:

15" PM, Woofer; 8" PM, Mid-Range; 51/4" PM and 31/2" PM, Tweeters.

# Model 654:

Two, 10" PM, Woofers; 4" PM, Mid-Range; 31/2" PM. Tweeter.

# Models 662, 663 and 664:

12" PM, Woofer; 51/4" PM, Mid-Range; 31/2" PM, Tweeter. Two identical speaker systems, composed of the listed speakers, are housed in the Master cabinet.

Models SS622, SS623, SS624 and SS649 (used with models 632, 633, 634 and 649 respectively) 10" PM, Woofer; 51/4" PM and 4" PM Mid-Ranges; 31/2" PM, Tweeter.

Models SS642, SS643, SS644 and SS671 (used with models 642, 643, 644 and 671 respectively) 15" PM, Woofer; 8" PM, Mid-Range; 51/4" PM and 31/2" PM. Tweeters.

Model SS654 (used with model 654): Two, 10" PM, Woofers: 4" PM, Mid-Range; 31/2" PM, Tweeter.

NOTE: For voice coil impedance values for each speaker, refer to the appropriate "CABINET PARTS" list.

# 12B1, 12B1A CHASSIS DIFFERENCES

Chassis 12B1 uses different dial scale than 12B1A. NOTE Except for MODEL IDENTIFICATION CHART on page 1. reference to chassis 12B1 includes chassis 12B1A.

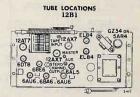


Figure 1. Top View of 12B1 Chassis, Tube Locations Shown.

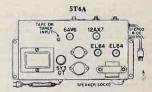


Figure 2. Top View of ST4A Chassis, Tube Locations Shown.

# TUBE REPLACEMENT

All tubes used in Master cabinets and Auxiliary cabinets are accessible for replacement. The cabinet back panels on Auxiliary cabinets need to be removed to gain access to tubes on 5T4A chassis.

On models 662, 663 and 664, the Auxiliary chassis (5T4A) is located inside the Master cabinet.

# 12B1 TUBE COMPLEMENT

	FM RF Amplifier and Mixer	.6DT8
V2	1st FM IF Amplifier	.6AU6
V3	FM 2nd IF Amplifier and AM 1st IF Amplifier	
V4	FM 3rd IF Amplifier and Limiter; AM Detector	
V5	FM Discriminator	.6AL5
V6	FM Oscillator and FM Automatic	
	Frequency Control	
V7	AM Oscillator-Mixer	. 6BE6
V8	Master Channel Audio Pre-amp and	
	Stereo Channel Audio Pre-amp	. 12AX7
9.	Rectifier	GZ34/5AR4
V10	Audio Amplifier and Phase Inverter	. 12AX7
V11	Audio Output	. EL84/6BQ5
12	Audio Output	EL84/6BQ5
	5T4A TUBE COMPLEMENT	
101	Audio Amplifier	6AV6
/102	Audio Amplifier and Phase Inverter	12AX7
/103	Audio Output	EL84/6BO5
/104	Audio Output	EL84/6BO5

V104

V105

SY3GT

ADIO PAGE

25-16

ADMIRA

# **BASIC STEREOPHONIC DISC PRINCIPLES**

For Stereophonic Disc Record Changer Servicing, Read The Entire Section. For General Understanding, Read First And Last Two Paragraphs.

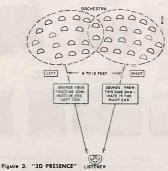
Stereophonic sound differs from today's popular hi-fi sound in that it adds a new 3D presence dimension to listening. 3D Presence, in the ordinary sense, is the illusion of being at the place of the original sound. Until the introduction of stereo, hi-fi systems have attempted to sustain this illusion merely by keeping the recorded sounds as distortion-free as possible. However, this alone cannot introduce presence since the reproduced sound emanates only from one source, a single hi-fi speaker or speaker system. What is 3D presence? A simple explanation is demonstrated if one visualizes a person sitting in front of an orchestra, as shown in figure 3. Because of the physical locations of the members of the orchestra relative to the listener, sounds from the right side are heard primarily in the right ear and sounds from the left side are heard primarily in the left ear. Thus, to recreate 3D presence in the home, it is necessary to have this same relative division of sound on both sides of the listener.

Stereophonic disc recordings are made using two separate microphones, each corresponding to a jigtner's ear, placed in front of the sound-producing body, as at L and R in figure 3. The information from each microphone is recorded independently in a single groove on the disc. Basically, one side wall of the groove records the information from one microphone while the other side records the information from the other. For stereophonic reproduction, the sounds in each separate channel are separately and simultaneously amplified and applied to two independent, and properly-placed speaker systems, as shown in figure 4.

Until the advent of stereophonic discs, hif sound was exclusively recorded on discs with a cutting stylus that moved laterally with the sound variations, as shown in figure 5A. The depth of the groove is constant. Therefore, sound variations are lateral and the recorded groove looks like the one shown in figure 5B. Many stereophonic disc ideas have been tried; such as the two parallel lateralvariation tracks method, the 90-degree vertical-horizontal

STEREOPHONIC HI-FI SOUND

REPRODUCTION



method, etc. These were discarded as unacceptable for a variety of reasons; incompatibility with present hi-fi systems, mechanical instability and critical alignment; high distortion levels, etc.

In the Westrex 45-45 stereophonic disc recording system, which is the accepted standard system of the industry, the two separate audio channels are recorded in a single groove. One channel is recorded by varying the cutting stylus position laterally as shown in figure 6A. The other channel is recording by simultaneously moving the same stylus vertically as in figure 6B; this produces "hills and dales" in the tack rather that the constant depth of monaural recordings. The resultant groove is a simultaneous combination of lateral and horizontal variations in one track. Basically, one wall varies correspondingly to one microphone while the other wall variation in independent of the other. This independence is the basis of separation of sound which we call 3D presence in stereo. The resultant sound track of a simfle-

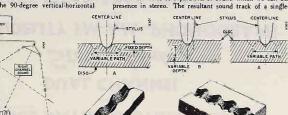


Figure 5. TYPICAL MONAURAL RECORDING

Figure 6. TYPICAL STEREOPHONIC DISC TRACK.

stylus stereophonic recording is illustrated in figure 6C.

Figure 7 shows how a single tone in one channel only is stereophonically recorded on a disc. The stylus is mechanically coupled to two recording elements. The elements are positioned 90° apart with respect to each other; each forms an angle of 45° with the horizontal. No signal is applied to element A; the sine-wave signal coupled to element B alternately pushes and pulls on the stylus causing it to vibrate back and forth along the line with arrowheads on each end. The cutting stylus cuts the signal to cause variations in the direction of element A. The variations, therefore, on each side of the track correspond to the signals in each channel cause the cutting stylus to move at an angle other than 45° to the horizontal.

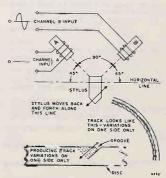


Figure 7. RECORDING A SINGLE CHANNEL SIGNAL

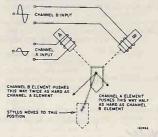


Figure 8. RESULTS OF DIFFERENT INPUTS TO BOTH ELEMENTS.

The stereophonic reproducing head is similar in construction to the recording head, except that two styli are used and the elements may be ceramic, crystal or magnetic. One is .003" (3 mils) in diameter for use with 78 RPM discs; the other is .0007" (.7 mil) in diameter for LPS (Long Play Stereophonic) and regular LP disc reproducint. A 0.7mil LPS stylus is used in place of the "standard" l-mil LP stylus because, as a stereo sound track becomes shallower than a standard LP track, the l-mil stylus would be forced out of the group. In the reproducing head, the elements develop a voltage corresponding to stylus motions caused by track variations. See figure 9.

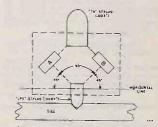
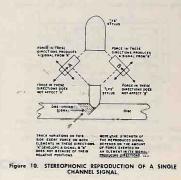


Figure 9. STEREOPHONIC REPRODUCING HEAD.

Figure 10 shows how a reproducing head translates a onechannel signal into an audiofrequency voltage. Note that only LATERAL FORCE on each element causes a signal to be produced, although the track variations cause stresses in both elements, a signal is developed only acrosse element "A". This demonstrates the ability for one groove fo selectively reproduce a signal into one amplifier channel.



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Figure 4.

In figure 8, two signals caused the cutting stylus to shift to an angle greater than 45° from the horizontal. Separation of this track variation into two signals by the reproducing head is shown in figure 11. Both elements are moved the same distance in the direction of the stylus, resulting in a small movement of element "A" in its signal-producing direction and a large movement of element "B" in its signalproducing direction. Thus, a small signal is developed across element "A" and a large signal is developed across element "B". Note that these signals correspond to the channel "A" and "B" input signals in figure 8.

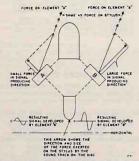


Figure 11. SEPARATION OF TRACK VARIATIONS INTO

# OPERATING CONTROLS

MASTER CHANNEL CONTROLS The operating controls for this set, excluding Auxiliary channel Balance, Bass and Treble controls, are located on radio tuning dial (figure 13) and operate as follows:

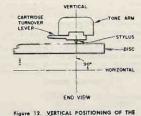


Figure 13. Operating Controls, 12B1

**ON-OFF-TREBLE:** The ON-OFF function of this control acts as a master switch to turn both Master channel and Auxiliary channel on and off. To turn set on, rotate knob to right until switch clicks.

Further rotation of the knob controls treble (high note) response of master channel output. Rotation to the left of zero position decreases treble response. Rotation to the right of zero position increases treble response. The zero position will normally give truest reproduction:

Since channel separation depends on the angle of the track variations relative to the pick-up stylus, it is important that the record changer turntable be level and the pick-up stylus be perpendicular to the turntable, as illustrated in figure 12. If these relationships are not observed, both channel separation and stereophonic fidelity will be impaired.



STEREOPHONIC STYLUS.

For operation with monaural 78 and LP discs, the outputs of the two reproducing elements are connected in parallel. This produces a high fidelity monaural signal comparable to the signals available from single-element hi-fi cartridges. The .0007" LPS stylus is used for standard microgroove records and the .003" 78 stylus is used for 78 RPM records.

BASS: Controls bass (low note) response of Master channel. Rotation to left of zero position decreases bass response. Rotation to the right of zero position increases bass response. The zero position will normally give truest reproduction.

SELECTOR: Used to select type of operation desired. Place control to position giving desired type of operation.

STEREO-for playing Stereo Disks on the phonograph or for using an external Stereo tape recorder with the Master and Auxiliary channels.

PHONO-for playing regular single-channel records on the phonograph. For transfering regular records to tape or playing back single-channel tapes from external Monaural tape recorder.

AM-for AM radio reception or for recording AM broadcasts on external tape recorder.

FM-AFC-for drift-free reception of FM radio broadcasts. Gives optimum performance in good signal areas. Placing selector in this position after station has been tuned in will keep station sharply tuned. Also for recording FM broadcasts on external tape recorder.

FM-for FM radio tuning and reception. Provides increased sensitivity for FM reception in poor signal areas.

# **OPERATING CONTROLS** (Cont.)

LOUDNESS: Used to adjust to desired sound level. Acts as master control for both Master and Auxiliary channels. TUNING: Large knob located behind Selector knob Selects desired FM or AM stations.

**RECORD COMPENSATOR:** This control compensates for the different recording characteristics used by various record manufacturers. The left setting, "78", is a filter for standard 78 RPM records to minimize needle scratch. The RIAA, LP and EUR positions provide built-in equalization networks which assure truer reproduction of commercial recordings. (During FM or AM radio operation, the compensator circuits will not affect sound output.)

AUXILIARY CHANNEL CONTROLS Auxiliary channel controls (Balance, Bass and Treble)

CHASSIS REMOVAL Master Chassis 12B1

Chassis 12B1 is located in the Master cabinet. To remove 12B1 chassis, proceed as follows:

- Disconnect line cord from power source
- 2. Disconnect FM Antenna terminal board from back of cabinet. Unplug Record Changer Power plug (M3). Disconnect two Phono Output plugs (M5 and M6). Disconnect Master Channel Speaker plug (M20)
- Disconnect Cabinet Pilot Light plug (M14)
- Remove control knobs on front of chassis and chassis mounting screws.
- Remove chassis from cabinet for servicing. To replace chassis in cabinet, perform the above procedure in reverse order.

# **Auxiliary Chassis 5T4A**

The Auxiliary chassis is located in the Auxiliary cabinet except for models 662, 663 and 664. In these models, the Auxiliary chassis (5T4A) is located in the Master cabinet. To remove Auxiliary chassis, proceed as follows:

- 1. Disconnect line cord from power source.
- 2. Remove cabinet back panel on Auxiliary cabinet. For models 662, 663 and 664, remove cabinet back panel behind 5T4A chassis (right side of Master cabinet).
- Remove three Auxiliary chassis control knobs (outside of cabinet)
- Disconnect Auxiliary Channel Audio Input plug (M101) from Stereo Input socket (M13). Remove Speaker plug (M109) from Audio Output socket (M108). Disconnect Tape Output plug (M102) from Stereo Tape Input socket (M103).
- 5. Remove chassis mounting screws. Remove chassis from cabinet for servicing. To replace chassis in cabinet, perform the above procedure in reverse order.

# **Record Changer**

To remove the record changer, perform the following procedure

1. On all models except 662, 663 and 664, remove cabinet back panel behind changer. Also, remove panel under record changer. Remove three large washer head screws are located on right side of set and affect the Auxiliary channel only. They function as follows:



BALANCE: Used to "balance" the Auxiliary channel output to match the Master channel output. Adjust for desired level of loudness between channels.

BASS and TREBLE: These controls function the same as Treble and Bass controls for the Master channel.

Figure 14, Operating Controls, 574A.

SERVICE HINTS

that hold the changer. These screws are accessible from beneath changer.

On models 662, 663 and 664, slide changer out of cabinet to gain access to changer mounting screws.

- 2. Disconnect Phono Output plugs (M5 and M6) and unplug Record Changer Power plug (M3).
- Lift record changer from inside cabinet. Retrieve changer "float" springs. They will be used when record changer is placed back into cabinet.
- 4. To replace changer, reverse the above procedure.

## POWER CONNECTION

AC line power, 60 cps, is supplied to the Master unit through the Master cabinet line cord and controlled by Off-On-Treble control R57.

The Auxiliary chassis has its separate line cord. The Off-On-Power relay (M106), located on the Auxiliany chassis, is energized by a direct current supplied by the Master chassis 12B1 through the Stereo Output socket (M13)

On Models 662, 663 and 664, the line cord to the Master cabinet is terminated in a duplex socket. Then, line cords from the radio chassis and auxiliary chassis are plugged into the duplex outlet to complete the power connection.

# CONNECTING THE STEREO UNIT

Figure 15 shows the method of making power connections in all models except 662, 663 and 664. Refer to the illustration and perform the following procedure to make power connections:

- 1. Make sure that both line cords are disconnected from wall outlet.
- 2. Connect plug on black cable from the Auxiliary unit to "STEREO OUTPUT" socket on Master cabinet. On Model 649, connect plug to socket on Master chassis. Connect socket, on black cable, to plug on rear of Auxiliary cabinet.
- 3. Connect both line cords in wall outlets and test the set. Turn the Master unit on and off. The Auxiliary unit should turn on and off at the same time.

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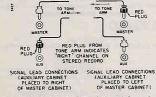
ADMIRA



#### Figure 15. Stereo Unit Connections

**RIGHT AND LEFT CHANNEL CONNECTION** The Master unit and the Auxiliary unit have been constructed in production so that the "right" channel is heard through the Auxiliary unit and the "left" channel through the Master unit. In other words, the auxiliary cabinet should be placed to the right of Master unit. If it is desired to place the auxiliary cabinet to the left of the Master unit, the connections from the record changer pick-up arm must be changed to retain the original direction of the recorded sound.

When the auxiliary cabinet is placed to the right of the Master unit, the red plug from the record changer tone arm should be in the chassis socket labeled "AUX" and the other plug in the socket labeled "MASTER". If the auxiliary unit



# Figure 16. Right and Left Hand Channel Connections

is moved to the left of the master cabinet, the red plug should be moved to the "MASTER" socket and the other plug moved to the "AUX" socket. See figure 16.

#### HEATER CIRCUIT FUSE

On chassis 12B1, the heater circuit is fused. Location of fuse is shown on figure 17. To replace fuse, connect a 2" piece of #27 gauge bare annealed copper wire between proper terminals on terminal board.



Figure 17. Heater Circuit Fuse, Chassis 1281.

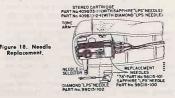
RECORD CHANGER SERVICING For complete Record Changer servicing, refer to Service Manual No. S800B.

# NEEDLE AND CARTRIDGE REPLACEMENT "For replacement part numbers, see page 16." RC688-165, -175

To replace either needle, turn NEEDLE SELECTOR so

that needle to be replaced is facing down. Grasp retaining clip and slip old needle from cartridge. See figure 18. To replace needle, reverse above procedure.

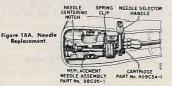
To replace cartridge, remove screws (one at each side) and three leads from cartridge. Fasten new cartridge in place. Red lead goes to terminal "R", white lead to terminal "L", shield to center terminal.



#### RC688-185

To replace needle assembly, move NEEDLE SELECTOR handle down till it is perpendicular with TONE ARM. See figure 18A. Open spring clip slightly and lift needle assembly. Make sure needle shaft clears centering notch. To replace needle assembly, open spring clip slightly and slip new assembly into position. Make sure that needle shaft is centered in notch.

Signal lead connections to cartridge are the same as above.



#### SPEAKER SYSTEMS

Speakers may be reached for servicing by removing cabinet back panels. Cross-over capacitor(s) are located on baffle boards adjacent their respective speaker systems.

Each speaker system is connected to its amplifier by a wiring harness. Plugs, sockets and capacitor(s) are replaceable. See "CABINET PARTS" for the particular model.

On model 654, baffle boards are located on front and rear of Master cabinet. To gain access to either speaker system, remove rear baffle board.

# CONNECTING AN EXTERNAL SPEAKER SYSTEM

A 5-lug terminal board on the rear of the Master cabinet provides connections for using an external speaker system in addition to the speakers in the set. (Any external speaker system used with this set should have a 16 ohm voice coil impedance for proper operation.)

When using the internal speaker system, the shorting bar, on the terminal board, is to be connected between terminals 3 and 4. See figure 19.

When an external speaker system is to be used, connect external system leads to terminals 1 and 5. Adjust the position of the shorting bar so that terminals 2 and 3 are shorted together. When a 16 ohm external speaker system is connected properly and the shorting bar is placed between terminals 2 and 3, the external speaker systems' impedance will be matched to output transformer and internal speakers.

# PHASING AN EXTERNAL SPEAKER SYSTEM

To insure best sound reproduction when making an external speaker installation, the external speaker voice coils must be phased with speaker voice coils in the Master cabinet so that the cones of all the speakers move in the same direction at the same time.

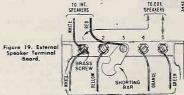
The action of each external speaker voice coil should be tested with a common 1.5 volt flashlight battery. Testing is necessary to determine which terminal on each speaker, when connected to the positive pole of the battery, causes the speaker cone to move forward.

To locate proper terminal, perform following procedure:

- 1. Connect hattery, MOMENTARILY, across voice coil terminals. Observe whether speaker cone moves in or out. If necessary, reverse the momentary connection across the voice coil terminals. On each external speaker to be used, determine which terminal, when connected to the positive pole of a battery, causes the speaker cone to move outward.
- Refer to instruction under "CONNECTING AN EX-2. TERNAL SPEAKER SYSTEM" and be sure to connect external speaker terminal(s), which causes speaker cone to move forward when connected to positive pole of a battery, to terminal 5. The other external speaker lead to terminal 1.

# PROVISION FOR EXTERNAL TAPE RECORDER

A metal bracket labeled "TAPE RECORDER" is used with each model. On models that are operated with an Auxiliary unit, one "TAPE BRACKET" is located on the Master cabinet back panel and the other on the Auxiliary cabinet back panel. On models 662, 663 and 664. two brackets are located on the cabinet back.



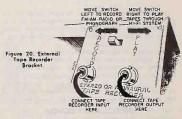
TO INTERNAL SPEAKER PLUG

Each bracket supplies input and output sockets for an external tape recorder. Brackets on Auxiliary units provide input and output sockets for stereo tape recorder recording or play-back. Each bracket looks like one in figure 20.

Connect input plug of tape recorder into left (RECORD) socket on the Master channel bracket-on Master cabinetand the tape recorder output plug into the right (PLAY) socket on the bracket. When using a stereo tape recorder, make identical connections of the recorders second channel to the sockets on the Auxiliary channel tape recorder bracket.

TO RECORD: Move switch on Master channel bracket to left (RECORD) position. (See "Operating Controls" on page 6). For stereo recording, move switch on Auxiliary channel bracket to the left (RECORD) position also.

TO PLAY: Move switch to right (PLAY) position. Place Selector switch to "PHONO" position when playing single channel tapes. Move switch on Auxiliary channel tape bracket to right (PLAY) position and Selector switch to "STEREO" when playing stereo tapes.



#### AMPLIFICATION AND RESPONSE CHECK

The pre-amplifiers and amplifiers may be checked for gain and frequency response by performing the tests outlined below and referring to the "AMPLIFIER CHECKS" table.

## TEST EQUIPMENT:

Audio Oscillator, with flat frequency response across the audio range

Vacuum Tube Voltmeter, preferably with decibel (db) scale

Oscilloscope

## AMPLIFIER CHECKS

AMPLIFICATION	to maximum	m (fully clock and Function	witch to "STER to maximum (full	Compensation EO". On 514A
	FREQ	JENCY	vo	LTS
AUDIO GENERATOR OUTPUT	to 1281 1000	to ST4A Cycles	to 1281	to 514A .02 volts ± 10%
AMPLIFIER	VOLT 1281	S OUT ST4A	WATT (28)	S.OUT ST4A
OUTPOT	5 volts	5 volts	7.8 woth	7.8 woth

Note: At 7.8 watts out, harmonic distortion is 2%.



# AMPLIFIER CHECKS (CONT.)

FREQUENCY RESPONSE CHECK SIGNAL GENERATOR OUTPUT		On 1281 and ST4A chassis, set controls as shown above. See instructions in text for settings for in- dividual controls.						
		OUTPUT VOLTAGE			DB CHANGE "From MAX to Mile position of Bass or Treble control"			
Freq.	Voltage	MAX.	MIN.	MAX.	MIN.	1281	ST4A	
100 cycles	•	\$ volts	0.5V or less	5 volts	0.7 volts	- 20	- 17	
1,000 cycles	1.1	S volts	5 volts	5 volts	s volts	0	0	
10,000 cycles	·	5 volts	0.225V	5 volts	0.22 volts	- 27	- 27	

\*Set andie penerator output so that 5 volls is indicated across 1281 and 576A antput, CAUTION: Do not averload amplifies to verdiving whitinger signal waveform at 5 voll autput readings.

# PROCEDURE:

Master chassis and Auxiliary chassis may be checked for frequency response and amplification at the same time. If Auxiliary chassis is not available, Master chassis may be checked alone.

Remove bottom covers from 1281 and 5T4A chassis. Connect a 3.2 ohms, 15 wait resistive load across secondary windings of each Audio Output transformer (T9 and T101). Connect audio oscillator output to the junction of C54 and R40B on 1281 chassis.

NOTE: Use an oscilloscope to check output voltage waveforms. At 5 volts output on each chassis, waveforms should be symmetrical.

TO CHECK AMPLIFICATION, set controls as shown in "AMPLIFICATION CHECK" table. Set generator output to 1,000 cycles and increase output amplitude until 5 volts appears across each chassis output load, as measured with a VTVM. Measure generator output voltage. See table for proper input voltage amplitude.

Change generator connection to the junction of R40A and C42 on 12B1 chassis. Set generator output voltage so that 5 volts iš indicated across 514A output load. See table for proper 514A input voltage amplitude. FREOUENCY RESPONSE CHECK:

For control settings, refer to "FREQUENCY RESPONSE CHECK" table. Connect generator "hot" lead to junction of R40B and C54 on 12BL chassis. Set suito generator

of R40B and C54 on 12B1 chassis. Set audio generator output at 100 cycles and adjust the amplitude so that 5 volts is indicated on VTW connected across 12B1 output. Rotate Bass control to minimum. 12B1 output voltage should read 0.5 volts or less (20 db change). Return Bass control setting to maximum.

Set generator output frequency to 10,000 cycles and adjust generator output until 5 volts is indicated on VTVM. Rotate Treble control to minimum (maximum counterclockwise-DO NOT turn set off). 12B1 output voltage should read 0.225 volts or less (27 db change). Return Treble to maximum position.

Connet' generator output to AUX. CHANNEL input socket (on 12B1 chassis). Connect VTVM across 5T4A load. Set generator frequency at 100 cycles. Set generator output so that 5 volts is indicated on VTVM. Rotate Bass control (on 5T4A chassis) maximum countreclockwise. The 5T4A output voltage should be 0.7 volts (17 dh change). Return Bass control to maximum (fully clockwise) setting.

Change generator output frequency to 10,000 cycles. Rotate Treble control to minimum (fully counterclockwise) position. Voltage reading at output of 5T4A should be 0.22

# volts (27 db change).

Two stringing systems are used on the radio chassis. Two drums (23%' and 1%'') and the tuning shaft are used to drive the FM-AM tuning yoke. Two pulleys (3%' dia., brass)and drum (2'') are employed to move dial pointer along dial pointer guide brackt.

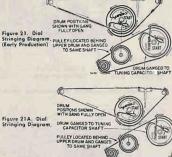
The 1%'' drum and 2'' drum are mounted on the same shaft and coordinate the movement of the dial pointer and the tuning yoke.

If necessary, either system may be restrung separately. To accomplish dial stringing, perform the following procedure:

#### 1. Remove dial scale.

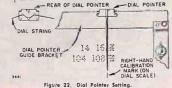
Rotate drums until they are positioned as shown in figure 21. The AM tuning gang should be set fully open.
 String front or rear pulley system or both according to figure 21 or 21A. Figure 21 shows dial stringing for

early production.



4. Replace dial scale.

5. With AM tuning gang fully open, place dial pointer on dial pointer guide bracket. Move dial pointer to line-up with the right hand calibration mark thelow "AM" and "FM" on right hand side of dial scale—see figure 22). See figure 22 for method of inserting dial string on dial pointer.



6. Check dial pointer calibration at several points on dial by tuning on known stations. Dial pointer should coincide with calibration marks on each end of the dial when tuning yoke is fully open and fully closed.



Turn radio on and allow 15 minutes warm up.

diggram).

- Set Loudness control fully clockwise, Bass and Treble controls at mid-rotation. Set Selector Switch to AM position.
   Connect output meter across voice coil (3.20). If speakers
- Connect output meter across voice coil (3.2Ω). If speakers are not to be used during alignment, connect a 3.2 ohm, 15 watt resistive load across the 3.2 ohm taps on Audia Outout Transformer secondary winding (see schematic
- Use 400 of 1000 cps modulation for alignment.
   Use lowest setting of signal generator output that produces adequate indication on lowest scale of output meter.
- Use a non-metallic alignment tool with tip ½" wide for IF transformer adjustments (Admiral part na. 98A30-10).
- · Repeat adjustments to insure best results.

Step	Generator Connection	(Gen: Freq.	Receiver Gong Setting	Adjustment
1	To stator plates, antenna section of gang tuning capacitor.	455KC	Fully open	"L", "M",* "N" and "P"* for maximum.
2	Radiated signal. Feed "hot" generator lead to antenna through several loops of wire or place generatar "hot" lead close ta receiver far signal pickup.	1620KC	Fully open	"R" for maximum.
3		1400K	Tune in generator signal.	"S" for maximum,

# FM IF AND RF ALIGNMENT (using VTVM and Signal Generator)

NOTE: For FM alignment, a signal generator with facilities for crystal calibration should be used. Signal generator frequency settings are critical for FM alignment.

- Turn radio and alignment equipment on and allow 15 minules for warm up.
  Set Loudness control to minimum, Bass and Treble controls at mid-rotation and Selector switch to "FM" posi
  - trols at mid-rotation and Selector switch to "FM" position (completely counterclockwise rotation). Use DC VTM as extended and the second sec
- Use DC VTVM as output indicator. Set generatar output so that indication, on VTVM, is approximately 1½ volts above noise level during alignment (except "Step 2").
- transformer slug adjustments (Admiral part no. 98A30-10).
  Refer to figures 24 and 25 for physical location of alignment points.
  Use an unmodulated signal during alignment.
  Adjustment "A", "B", "D" and "G" made from under side of chosis. Remove chosis bottom cover to reach.

• Use a non-metallic alignment tool with tip 35" wide for

adjusiments and to make VTVM connections.

Step	Signal Generator and VTVM Connections	Frog.	Gang Setting	Adjustment
à	Connect generator ta anténna terminals with a 150 ohm resistor in series with each lead. Connect VTVM and de- coupling network between "U" and ground (see schematic). Voltage reading will be negative. Adjust generator so that indication on VTVM is 1% volts above noise level.		Set Tuning gang fully open	"A", "B", "C", "D", ""Ê", "F" and "G" for maximum.
Increa	ase Signal generator output until VTVM reads -5 volts.			
2	No change in generator connection. Connect VTVM be- tween alignment point "//" and ground (see schematic diagram). A center zero reading scale is recommended for "ADUSTMENT" in this step.	10.7 MC	Sprin 12 "Step 1".	"H" för zerö reading.
4	Same as "STEP 1".	98 MC	98 MC	Alternately adjust "J" and "K", several times, for maximum:

\*Each slug adjustment ("J" and "K") is secured with a drop of wax on the FM tuning yoke. After making slug adjustments, use a soldering iron ta remelt was and secure adjustments "J" and "K" to yoke.

TO POINT "U" TO VIVM POINT "U" TO VIVM POINT "U" KEEP LEADS OF RESISTOR AND CAPACITOR SHORT AS POSSIBLE: USE SHIELEDE LEAD BETWEEN VIVM NETWORK

Figure 23. Decoupling Network.

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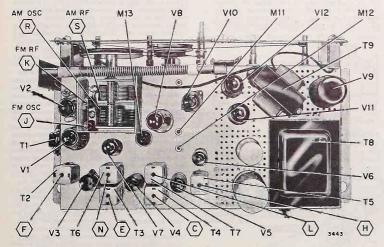


Figure 24. Top View of 1281 Chassis, Input Connections, Output Connections and Alignment Points Shown.

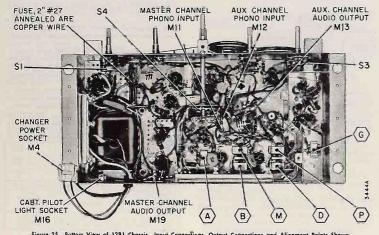


Figure 25, Bottom View of 12B1 Chassis, Input Connections, Output Connections and Alignment Points Shown.

# **PRODUCTION CHANGES**

Production changes are coded RUN 10, RUN 11, etc., as given in the headings below. Run number (stamped on chassis indicates that this chassis has the change(s) incorporated which are explained under that particular run number heading below, as well as changes (lower run numbers) made prior to that time. At the start of production, all chassis were stamped RUN 10.

RUN 11: R25 (15K, 1W) changed to (22K, 1W) to permit full interchangeability of 6BE6 tubes. R33 (1281) changed to (390K, 1/2 W), R34 changed to (100K, 1/2 W) and C39 changed to (.002MF) to improve operation on AM. R70 (470K,

1/2 W) added between M11 and M12 to minimize rumble. RUN 12: R70 (470K, 1/2 W) removed to increase chan-

(12B1) nel separation for "STEREO" operation.

# 12B1, 12B1A CHASSIS PARTS LIST

PESISTOPS

RESISTORS					
Sym.	Description	Part No.			
RI	68 ohms, ½ watt	FOR 8 (00			
R2	68 000 abms 1/2 watt				
R3	68,000 ohms, ½ watt	60B 9 100			
R4	10,000 ohms, 1/2 watt.	60B 8 102			
RS	560 ohms 1/2 wett	60P 9 561			
R6	100 ohms, 1/2 watt	60B 9.101			
R7	470,000 ohms, 1/2 watt	60B 8.474			
R8	100 ohms. 1/2 watt	60B 8,101			
R9	150 ohms, 1/2 watt	60B 8-151			
R10	39.000 ohms. 4 watt				
R11	75,000 ohms, 1/2 watt, 5%				
R12	100 ohms, 1/2 watt				
R13	68 ohms, 1/2 watt				
R14	33,000 ohms, 1 watt				
R15	75,000 ohms, 1/2 watt, 5%	60B 7-753			
R16	100 ohms, 1/2 watt				
R17	22,000 ohms, 1/2 watt	60B 8-223			
R18	27,000 ohms, 1 watt	60B 14-273			
R19	100,000 ohms, ½ watt, 5% 100,000 ohms, ½ watt, 5%	60B 7-104			
R20	100,000 ohms, 1/2 watt, 5%				
R21	47,000 ohms, 1/2 watt				
R22 R23	330,000 ohms, ½ watt				
R23 R24	1 megohm, ½ watt				
R24 R25	15,000 ohms, 1 watt (Run 10)				
R25	22,000 ohms, I watt (Run 10)	60D 14-133			
R26	22,000 ohms, 1 watt often 11 and higher)	60B 9 223			
R27	22,000 ohms, 1/2 watt	60B 8.102			
R28	68 000 ohms 14 watt	60B 8.683			
R29	68,000 ohms, ½ watt	60B 8-184			
R30	68 000 ohms 1/2 watt	60B 8-683			
R31					
R32A	7.000 ohms, 8 watts /	(1) 7 30			
R32B	7,000 ohms, 8 watts 5,000 ohms, 12 watts tapped, candohm	01A 5:17			
R33	390.000 ohms. 1/2 watt	60B 8-394			
R34					
R35	1 megohm, ½ watt	60B 8-105			
R36	390,000 ohms, 1/2 watt				
R37	390,000 ohms, ½ watt				
R38	47,000 ohms, 1/2 watt				
R39	47,000 ohms, 1/2 watt				
R40A	500,000 ohms, Loudness control dual				
R40B	500,000 ohms, Loudness control h				
R41	470,000 ohms, ½ watt				
R42	1,000 ohms, ½ watt				
R43	6,800 ohms, ½ watt				
R44 R45	39:000 ohms, 2 watts	60B 20 303			
R46A	105 Jun Frank				
R46B	125 ohms, 5 watts 1,000 ohms, 7 watts { tapped, candohm				
R40D	47,000 ohms, 7 watts 1	60B 8.473			
R47 R48	47 000 ohme lin watt	60 B 8-473			
R49	470 000 ohms 16 watt	60B 8-474			
R50	470,000 ohms, ½ watt	60B 8-222			
R51	10.000 ohms. 1 watt				
R52	220 000 abms 16 watt	60B 8-224			
R53	100,000 ohms, 1/2 watt				
R54	I megohim Bass control	75D 1-114			
R55	10,000 ohms, 1/2 watt				

Sym.	Description	Part No.
56	100,000 ohms, 1/2 watt	60B 8-104
57	1 megohm, Treble control	
	(includes Off-On switch S1)	75D 1-115
158	470,000 ohms, 1/2 watt	
59	1 megohm, 1/2 watt	60B 8-105
60	1,200 ohms, 1/2 watt	
161	150,000 ohms, 1/2 watt, 5%	
62	150,000 ohms, 1/2 watt	
163	I megohm, 1/2 watt	
164	3,300 ohms, 1/2 watt	
165	160,000 ohms, 1/2 watt, 5%	
166	470,000 ohms, 1/2 watt	
167	470,000 ohms, 1/2 watt	
868	130 ohms, 2 watts, 5%	
169	47,000 ohms, 1/2 watt	
170	470,000 ohms (Run 11 only)	

# CAPACITORS

C1	.001 mf, 500 volts, cer. disc.	65D 10-6
C2	47 mmf, 500 volts, ceramic	
C3	220 mmf, 500 volts, ceramic	
C4	17 mmf, 1.5%, NPO temp. coeff	Part of L2
CS	.001 mf, 500 volts, cer. disc.	65D 10-6
C6	.01 mf. 500 volts, cer. disc	65D 10-3
C7	2 mmf, 500 volts, 12%, ceramic,	
	N750 temp. coeff	
C8	N750 temp. coeff. 20 mmf, 1.2%, NPO temp. coeff	Part of L3
C9		
	N750 temp. coeff	
C10A	:001 mf, 450 volts { dual ceramic disc	(74 17 3
C10B	.001 mf. 450 volts { dual ceramic disc	
C11	10 ( 500 line 50% and disc	
0	N750 temp, coeff.	
C12	N750 temp. coeff	
	N750 temp. coeff	
C13	.001 mf. 500 volts, cer. disc	65D 10-6
C14	.001 mf, 500 volts, feed-through	
C15	.01 mf, 500 volts, cer. disc.	65D 10-3
C16	.001 mf, 500 volts, feed-through	65B 26-5
C1/7	.001 mf, 500 volts, feed-through	65B 26-5
·C18	.02 mf, 500 volts, cer. disc	
C19A	.004 mf, 450 volts dual ceramic disc	65 A 17.1
C19B	.004 mf, 450 volts ( duar ceramic disc	
C20	.01 mf, 500 volts, cer. disc.	65D 10-3
C21	.02 mf. 500 volts: cer. disc	65D 10-28
C22A	004 mf. 450 volts /	(14.17.1
C22B		
C23	01 mf. 500 volts, cer. disc	65D 10-3
C24A	.004 mf, 450 volts dual ceramic disc	
C24B	004 mf 450 volts { dual ceramic disc	
C25	47 mmf, 500 volts, ceramic	65D 6-79
C26	220 mmf, 500 volts, ceramic	65D 6-80
C27	.005 mf, 500 volts, cer. disc	65D 10-1
C28A	256 mm/ max ant	
C28B	356 mmf, max. ant. 104.7 mmf, max. osc.   gang	68B 71#1
C20B	47 mmf, 500 volts, 10%, cer. disc,	
C30	.001 mf, 500 volts, feed-through	65B 26-5
C20	N750 temp. coeff	65D 10-17
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Model 405, Road         * 201 405, 2           Maskel 405, Nouray         * 201 40, 2           Garantine, Concencer, Vin ed., HP AC, methods         644 103           Garantine, Concencer, Vin ed., HP AC, methods         61, 402           Garantine, Concencer, Vin ed., HP AC, methods         61, 402           Garantine, Concencer, Vin ed., HP AC, methods         61, 402           Garantine, Concencer, Vin ed., HP AC, methods         61, 402           Garantine, Concencer, Vin ed., MP AC, methods         61, 402           Garantine, Concencer, Vin ed., MP AC, M	"Calineer		
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ADIO PAGE

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ADMIRAL

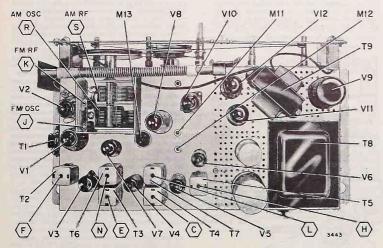
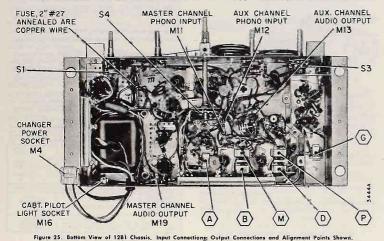


Figure 24. Top View of 1281 Chassis, Input Connections, Output Connections and Alignment Points Shown.



# **PRODUCTION CHANGES**

Production changes are coded RUN 10, RUN 11, etc., as given in the headings below: Run number (stamped on chassis indicates that this chassis has the change(s) incorporated which are explained under that particular run number heading below, as well as changes (lower run numbers) made prior to that time. At the start of production, all chassis were stamped RUN 10.

RUN 11: R25 (15K, 1W) changed to (22K, 1W) to permit full interchangeability of 68E6 tubes. R33 changed to (390K, '5W), R34 changed to (100K, '5W) and C39 changed to (002ME) to improve operation on AM. R70 (470K,

1/2 W) added between M11 and M12 to minimize rumble.

RUN 1/2: R70 (470K, ½ W) removed to increase chan-(1281) nel separation for "STEREO" operation.

# 12B1, 12B1A CHASSIS PARTS LIST

R

RESISTORS

	RESISTORS	
Svm.	Description	Part No.
R1	68 ohms, 1/2 watt	Part No.
R2	68 000 shows 14 wett	60B 8-680
R3	68,000 ohms, ½ watt 1,500 ohms, ½ watt	00B 8-083
R4	10,000 ohms, 1/2 watt.	
RS	560 ohms, 1/2 watt	00B 8-103
R6	100 ohms, ½ wat	
R7	470,000 ohms, 1/2 watt	60B 8 474
R8	100 ohms, ½ watt	60D 0 101
R9	150 ohms, 1/2 watt	60D 0 161
R10	39,000 ohms, 1 watt.	60B 14 202
RII	75,000 ohms, 1/2 watt, 5%	60B 7.753
R12	100 ohms. 1/2 watt	60B 8 101
R13	68 ohms, ½ watt	608 8 680
R14	33,000 ohms, 1 watt	60B 14.333
RIS	75,000 ohms, 1/2 watt, 5%	60B 7.753
R16	100 ohms, 1/2 watt-	60B 8-101
R17	22,000 ohms, 1/2 watt.	60B 8-223
R18	27,000 ohme 1 watt	60D 14 979
R19	100.000 ohms 1/2 watt. 5%	.60B 7-104
R20	100.000 ohms, 1/2 watt, 5%	
R21	100,000 ohms, ½ watt, 5%	
R22	330,000 ohms, 1/2 watt	
R23	1 merchm. 1/2 watt	
R24	22,000 ohms, ½ watt	60B 8-223
R25	15,000 ohms, 1 watt (Run 10)	
R25	22.000 ohms, 1 watt (Run 11 and higher)	
R26	22,000 ohms, 1/2 watt	
R27	22,000 ohms, ½ watt	60B 8-102
R28	68,000 ohms, 1/2 watt	60B 8-683
R29	68,000 ohms, <sup>1</sup> / <sub>2</sub> watt	60B 8-184
R30	68 000 ohms 1/2 walt	60B 8.683
R31	180,000 ohms, 1/2 watt	60B 8-184
R32A	7,000 ohms, 8 watts ( tanned aandahm	614 5 17
R32B	7,000 ohms, 8 watts 5,000 ohms, 12 watts 390,000 ohms, ½ watt	
R33	390,000 ohms, 1/2 watt	60B 8-394
R34		
R35	1 megohm, ½ watt	60B 8-105
R36	390,000 ohms, 1/2 watt	60B 8-394
R37	390,000 ohms, ½ watt	60B 8-394
R38	47,000 ohms, 1/2 watt	
R39	47,000 ohms, 1/2 watt	
R40A		
R40B	500,000 dilms, Loudiness control   dual	
	500,000 ohms, 12 watt. 500,000 ohms, Loudness control dual	
R41	500,000 ohms, Loudness control   dual	
R42	470,000 ohms, 1/2 watt	
R42 R43	470,000 ohms, 1/2 watt	
R42 R43 R44	470,000 ohms, ½ watt. 1,000 ohms, ½ watt. 100,000 ohms, ½ watt. 6,800 ohms, ½ watt.	
R42 R43 R44 R45	470,000 ohms, ½ watt. 1,000 ohms, ½ watt. 100,000 ohms, ½ watt. 6,800 ohms, ½ watt. 39,000 ohms, 2½ watt.	60B 8-474 60B 8-102 60B 8-104 60B 8-682 60B 20-393
R42 R43 R44 R45 R46A	470,000 ohms, ½ watt. 1,000 ohms, ½ watt. 100,000 ohms, ½ watt. 6,800 ohms, ½ watt. 39,000 ohms, 2½ watt.	60B 8-474 60B 8-102 60B 8-104 60B 8-682 60B 20-393
R42 R43 R44 R45 R46A R46B	470,000 ohms, ½ watt. 100,000 ohms, ½ watt. 6,800 ohms, ½ watt. 5,800 ohms, ½ watt. 125 ohms, 5 watts 125 ohms, 5 watts 126 ohms, 5 watts 126 ohms, 5 watts 127 ohms, 5 watts 128 ohms, 5 watts 129 ohms, 5 watts 129 ohms, 5 watts 120 ohms, 5 watts 1	60B 8-474 60B 8-102 60B 8-104 60B 8-682 60B 20-393 61A 5-18
R42 R43 R44 R45 R46A R46B R47	470,000 ohms, ½ watt. 1,000 ohms, ½ watt. 100,000 ohms, ½ watt. 39,000 ohms, 2 watts. 125 ohms, 5 watts 1,000 ohms, 7 watts { tapped, candohm	60B 8-474 60B 8-102 60B 8-104 60B 8-682 60B 20-393 61A 5-18 60B 8-473
R42 R43 R44 R45 R46A R46B R47 R48	470.000 ohms, ½ watt. 1000 ohms, ½ watt. 1000 ohms, ½ watt. 39,000 ohms, ½ watt. 125 ohms, 5 vatts 125 ohms, 5 vatt. 47,000 ohms, ½ watt. 47,000 ohms, ½ watt. 47,000 ohms, ½ watt.	60B 8-474 60B 8-102 60B 8-102 60B 8-082 60B 8-682 60B 20-393 61A 5-18 60B 8-473 60B 8-473
R42 R43 R44 R45 R46 R46 R46 R47 R48 R49	470.000 ohms, ½ watt. 1000 ohms, ½ watt. 1000 ohms, ½ watt. 39,000 ohms, ½ watt. 125 ohms, 5 vatts 125 ohms, 5 vatt. 47,000 ohms, ½ watt. 47,000 ohms, ½ watt. 47,000 ohms, ½ watt.	60B 8-474 60B 8-102 60B 8-102 60B 8-082 60B 8-682 60B 20-393 61A 5-18 60B 8-473 60B 8-473
R42 R43 R44 R45 R46A R46B R47 R48 R47 R48 R49 R50	470.000 ohms, ½ wait. 1000 ohms, ½ wait. 1000 ohms, ½ wait. 1000 ohms, ½ wait. 125 ohms, 5 waits 1200 ohms, ½ wait. 47,000 ohms, ¼ wait. 47,000 ohms, ¼ wait. 47,000 ohms, ½ wait. 47,000 ohms, ½ wait.	60B 8-474 60B 8-102 60B 8-104 60B 8-104 60B 8-682 50B 20-393 61A 5-18 60B 8-473 60B 8-473 60B 8-473 60B 8-474 60B 8-222 60B 14-153
R42 R43 R44 R45 R46A R46B R47 R48 R47 R48 R49 R50 R51	470.000 ohms, ½ wait. 1000 ohms, ½ wait. 1000 ohms, ½ wait. 1000 ohms, ½ wait. 125 ohms, 5 waits 1200 ohms, ½ wait. 47,000 ohms, ¼ wait. 47,000 ohms, ¼ wait. 47,000 ohms, ½ wait. 47,000 ohms, ½ wait.	60B 8-474 60B 8-102 60B 8-104 60B 8-104 60B 8-682 50B 20-393 61A 5-18 60B 8-473 60B 8-473 60B 8-473 60B 8-474 60B 8-222 60B 14-153
R42 R43 R44 R45 R46A R46B R47 R48 R47 R48 R49 R50 R51 R52	470.000 ohms, ½ watt. 1000 ohms, ½ watt. 1000 ohms, ½ watt. 3800 ohms, ½ watt. 39.000 ohms, ½ watt. 1200 ohms, ½ watt. 47.000 ohms, ¼ watt. 47.000 ohms, ¼ watt. 47.000 ohms, ¼ watt. 47.000 ohms, ½ watt. 47.000	60B 8-474 60B 8-102 60B 8-104 60B 8-682 60B 20-393 61A 5-18 60B 8-473 60B 8-473 60B 8-473 60B 8-474 60B 8-222 60B 14-153 60B 8-224
R42 R43 R44 R45 R46 A R46 B R47 R48 R47 R48 R49 R50 R51 R52 R53	470.000 ohms, ½ watt	60B 8-474 60B 8-102 60B 8-102 60B 8-682 60B 20-393 61A 5-18 60B 8-473 60B 8-473 60B 8-473 60B 8-474 60B 8-222 60B 14-153 60B 8-224 60B 8-104
R42 R43 R44 R45 R46A R46B R47 R48 R47 R48 R49 R50 R51 R52	470.000 ohms, ½ watt. 1000 ohms, ½ watt. 1000 ohms, ½ watt. 3800 ohms, ½ watt. 39.000 ohms, ½ watt. 1200 ohms, ½ watt. 47.000 ohms, ¼ watt. 47.000 ohms, ¼ watt. 47.000 ohms, ¼ watt. 47.000 ohms, ½ watt. 47.000	60B 8-474 60B 8-102 60B 8-104 60B 8-682 60B 20-393 61A 5-18 60B 8-473 60B 8-473 60B 8-473 60B 8-474 60B 8-474 60B 8-474 60B 8-474 60B 8-474 60B 8-474 60B 8-474 60B 8-104 75D 1-114

ym.	Description.	Part No.
56	100,000 ohms, 1/2 watt	60B-8-104
57	1 megohm, Treble control	
	(includes Off-On switch S1)	75D 1-115
58	470,000 ohms, 1/2 watt	60B 8-474
59	1 megohm, 1/2 watt	60B 8-105
60	1,200 ohms, 1/2 watt	
61	150,000 ohms, 1/2 watt, 5%	60B 7-154
62	150,000 ohms, 1/2 watt	
63	1 megohm, 1/2 watt	
64	3,300 ohms, 1/2 watt	60B 8-332
65	160,000 ohms, 1/2 watt, 5%	60B 7-164
66	470,000 ohms, 1/2 watt	
67	470,000 ohms, 1/2 watt	
68	130 ohms, 2 watts, 5%	
69	47.000 ohms, 1/2 watt	60B 8-473
70	470,000 ohms (Run 11 only)	

# CAPACITORS

C1	:00] mf, 500 volts, cer. disc.	
C2	47 mmf, 500 volts, ceramic	
C3	220 mmf, 500 volts, ceramic	
C4	17 mmf, 1.5%, NPO temp, coeff.	Part of L2
ĊS	.001 mf. 500 volts, cer. disc.	
C6	.01 mf, 500 volts, cer. disc	
C7		
0.	N750 town and	65D 6 53
C8	20 mmf 1 2% NPO temp coeff	Part of I 3
Č9	2 mmf, 500 volts, 12%, ceramič, N750 temp. coeff	anonasi are or Lo
63	N750 temp. coeff.	45D 6 10
	inviso temp. coen	
CIOA	.001 mf, 450 volts { dual-ceramic disc	
C10B	.001 mt, 450 volts 1	
C11	10 mmf, 500 volts, 5%, cer. disc,	
	N750 temp. coeff	
C12	10 mmf, 500 volts, 5%, cer. disc,	
	N750 temp, coeff	
C13	.001 mf. 500 volts, cer. disc	
C14	.001 mf, 500 volts, feed-through	
C15	.01 mf, 500 volts, cer. disc	65D 10.3
C16	.001 mf, 500 volts, feed-through	65B 26-5
C1/7	.001 mf. 500 volts, feed-through	65B 26-5
C18	.02 mf, 500 volts, cer. disc	
C19A	.004 mf; 450 volts dual ceramic disc	
C19B	004 mf 450 volts   dual ceramic disc	
C20	.01 mf. 500 volts, cer, disc.	65D 10.3
C21	.02 mf, 500 volts, cer. disc	65D 10.28
C22A	.02 mi, 500 volts, cel. disc	
	.004 mf, 450 volts dual ceramic disc	
C22B		(CD 10.0
C23	.01 mf, 500 volts, cer. disc	
C24A	.004 mf, 450 volts dual ceramic disc	65A 17J
C24B	.004 mf, 450 volts } unar ceranice discussion	
C25	47 mmf, 500 volts, ceramic	
C26	220 mmf 500 volts, ceramic	
C27	.005 mf, 500 volts, cer. disc	
C28A	356 mmf max ant )	
C28B	356 mmf, max. ant. 104.7 mmf, max. osc. { gang	
C29	47 mmf. 500 volts. 10%, cer. disc.	
C30	.001 mf, 500 volts, feed-through	65B 26.5
0.30	N750 temp. coeff	65D 10:17
	with temp. coen	

OJohn F. Rider

-	Compex decides	Part No.
C31	.02 mf, 500 volts, cer. disc .01 mf, 500 volts, cer. disc .01 mf, 500 volts, cer. disc	65D 10-28
C22	Al mí 500 male ann dinn	000 10-20
C32 C33	AT ( THE ) CET. COSC.	
633	.91 ml, 300 volts, cer. disc	65D 10-3
C34	.91 mf. 500 yolts, cer, disc.	650 10.3
C35	01 mf, 500 volta, cer, disc. 001 mf, 500 volta, cer, disc.	65D 10 53
C36	000 mf too mile and disc	050 10.33
C37	ANY ALL, SOU VOLLS, CET. CHIC.	05D 10-53
C31	UUI DE, JUU volta, CEF. dusc.	
C38	.001 ml. 500 volts, cer, disc.	65D 10-53
C39	002 mf 500 volts 10% car disc	65D 10 100
C40	220 mmi 500 mla annu i	
	a) at 300 volts, eer. dise.           200 nf. 500 volts, eer. dise.           200 nf. 500 volts, eer. dise.           220 mm, 500 volts, eer. dise.           221 mm, 500 volts, eer. dise.           221 ms, 500 volts, eer. dise.           221 ms, 500 volts, eer. dise.           231 ms, 500 volts, eer. dise.           241 ms, 500 volts, eer. dise.	65D 6-80
C41	.00%; mt, 500 volts, cer. disc	65D 10-112
C12	220 mmf, 500 volts, ceramic	65D 6-80
C43	100 mm ( 500 volte commin	450 ( 3
C44	ACAT ( TON )	00D 0-3
	JUNAT HIL, SOO VOILS, CET. GLSC	
Cits	.02 mi, 500 volts, cer. disc.	65D 10-28
C46	.02 mf. 500 volta cer diar	65D 10 29
C47	017 mf 600 salas autodas	030 10-28
A.SIO	40 mf, 350 volts 80 mf, 350 volts 40 mf, 350 volts	
C488	80 mf. 350 volts relectrolytic	670 7.37
C48C	all mf 350 sales	
C49	ab m. 500 volts, feed-through .001 ml. 500 volts, feed-through .001 ml. 500 volts, eer, disc. .0047 ml. 500 volts, eer, disc. .005 ml. 500 volts, eer, disc. .007 ml. 500 volts, eer, disc. .008 ml. 500 volts, eer, disc.	
	Jour mt. 300 soits, leed-through	658 26-5
C50	.001 mf. 500 volts, cer, disc	65D 10-6
C51	.0047 mf 500 volta cer diac	65D 10 119
C52	0047 -1 200	000 10-112
C53	JOOAT IDI, JOU VOILS, CET. GISC	65D 10-112
630	100 mmf, 500 volts, ceramic	
C56 C55	220 mmf, 500 volts, ceramic.	65D 6-80
CSS	005 mf 500 volte car dias	(CD 10.1
C56	100 1 700 1	05D 10-1
	100 mmf, 500 volts, ceramic 10 mf, 6 volts, electrolytic .02 mf, 500 volts, cer. disc.	
C57	10 ml, 6 voits, electrolytic	67B 35-7
C58	92 mf 500 volts cer dise	650 10 20
C59A	10 -( 100 -1- )	_ 000 10-28
073	40 mf, 300 volts electrolytic	6710 7 26
CS9B	50 mi, 50 volta	01D 1-30
C60	002 mf 500 volte 10% car dian	6510 10 100
C61	02 mf 600 malta and 10 /0, cc1. unt	03D 10-125
C62	ALE MAL, JOO YOILS, CET. GINC	65D 10-137
	Z20 mmf, 500 volts, ceramic	65D 6-80
C63	1.500 mmf. 500 volts, cer. dise	65D 10.107
C64	005 mf 500 value and disc	(CD 10-100
C65	07 - ( 500 - 1 - 1'	
	JJZ mr, JOU VOIIS, CET. disc	65D 10-28
C66	.1 mf, 400 wolts, molded, mylar dielec	
C67	I mf. 400 volta molded myler dialec	640 25 20
C68	50 and	04C 23-32
C69		-See C228
	20 mm!, 500 voits, ceramic	65D 6-26
C70	\$ mf, 10 volts, paper (cross-over)	64R 13.5
C71	16 mE 16 volts AC non-polarized electrolation	67 4 40 3
	50 mf, 50 enlia { leterolytic 02 mf, 50 volta, 10%, cer. disc. 02 mf, 50 volta, cer. disc. 20 mmf, 500 volta, cer. disc. 20 mmf, 500 volta, cer. disc. 03 mf, 500 volta, cer. disc. 1 mf, 400 volta, noled, mylar dislec. 50 mf, 500 volta, noled, mylar dislec. 50 mf, 500 volta, cer. disc. 50 mf, 500 volta, cer. disc. 51 mf, 500 volta, cer. disc. 52 mf, 500 volta, cer. disc. 53 mf, 500 volta, cer. disc. 54 mf, 500 volta, cer. disc. 55 mf, 500 volta, cer. 55 mf, 500	1-00+ M10 -1
	COULS AND TRANSFORME	
	COILS AND TRANSFORMER	25
LI	RF Choke Coil (3.3 nh-hlue color day	
	wound on 1 men serieter)	000 at 1
12	Fit M. O Theg realitor)	/3B 31-6
2.2	r m mixer Coil (incl. C4)	-69B 233.2
L3	COILS AND TRANSFORMER RF Cocke Cail (as) -th-blue cole dat; worad on 1 meg resistor) FM User Cail (incl. C3) FM Oser Cail (incl. C3) worad on 1 meg resistor) RF Cheke Cail (1 ub-green color dat; worad on 1 meg resistor) Red Antenna, AM Filament Cheke Cail Filament Cheke Cheke Cail Filament Cheke Cail Filament Cheke Cail Filament Cheke Cail Filament Cheke Cail Filament C	60B 222 1
14	RF Choke Coll (1 mb mean sales date	
	green color dol;	
10	would of 1 meg resistor)	73B 31-5
LS	BP Choke Coil (1 ub-green color dot:	
	wound on 1 men resistor)	200.01.0
16	Rod Antenna AM	( 3D 31-5
17	O TI . C II III	09B 229-1
Ref	Oscillator Loui, AM	-69A 52.12
L8	Filament Choke Coil	734 214
1.9	Filament Choke Coil	104 2-19
LII	RF Chake Call (T. )	13A Z-14
and I	ser chone con (1 un-green color dot;	
-	FM RF Input Transformer (windings & core)	-73B 31.5
TI	FM RF Input Transformer (windings & core)	700D 120
T2	Ist FM IF Transformer ("Mudnigs & Core)	
T3	2-1 FM IF T	(2D 28-72
	and F MI IF I ransformer	- 72D 28-68
T4	1st FM IF Transformer. 2nd FM IF Transformer. 3rd FM IF Transformer.	721) 28 69

# **5T4A CHASSIS**

Sy=

T5

MA

M10

M11 M12 M13 M16 M17 M18 M19 S1 S3

S4A S4B

Bracket, Cam Follower Bracket, Dial Scale Mig-Bracket, Idler Pulley Mig-

Bracket, Selector Switch Mig

Description

Power Transformer Audio Output Transformer (taps at 1.6 ohms, 3.2 ohms and 16 ohms)

MISCELLANEOUS 12B1 CHASSIS Socket, Reord Changer Power (vihl leds). Socket, Tape Input. Socket, Auster Channel Phono Input. Socket, Auster Channel Phono Input. Socket, Chine Pilot Light (vih 16° ledd). Socket, Dial Polio Light (vih 16° ledd). Socket, Master Channel Audio Output (5 pin). Socket, Master Channel Audio Output (5 pin).

MISCELLANEOUS 1281 CHASSIS PARTS

Switch, Record Compensator.

Switch, Selector (12 position, wafer type) ...

Part Ne.

. 72D 28-73 72D 28-70

72D 28-71

80D 35-16

79D 56-11

.700B 137-2

88B 31-3

-88B 31-3 

-82A 8-8 87B 4-6 Part of R57

.77B 86-1

.77B 84-1

15B 1870-1 \_15B 1865-1

15A 1873-1

	RESISTORS	
R101	500,000 ohms, Balance control	75D 7 110
B102	56,000 ohms, 1/2 watt	15D 1.119
B103	470,000 ohms, ½ watt	OUB 8-563
R104	2 200 share 1/	60B 8-474
R105	2,200 ohms, 1/2 watt	60B 8-222
	220,000 ohms, 1/2 watt	60B 8-224
R106	100,000 ahms, 1/2 watt	600 0 104
R107	I megohm, Bass control	750 1 116
R108	10,000 ohms, 1/2 watt	15D 1-110
R109	100,000 ohms, 1/2 watt	008 8-103
B110	470 000 abms 1/ matt	00B 8-104
R111	470,000 ohms, 1/2 watt	60B 8-474
B112	1 megohm, Treble control	75D 1-116
	I megohm, 1/2 Wall	50D 0 100
R113	1.200 ohms, 1/2 watt	60B 9 100
<b>B114</b>	150,000 ohms, 1/2 wall	60D 0 172

Brack	ket, Support, Cam Follower	15A 1872
Brack	tet. Tuning Sleeve	154 1860
Bush	ing. Cam and Pulley Mtg	27A 292.1
Bush	ing. Selector Switch	27A 296-1
Cam.		158 1971
Cam .	and Drum Assembly (includes cam. 2%" drum	
800	hushing)	700B 126
Clip.	IF Transformer Mtg	720 28.10
Cover	Chassis Bottom	150 1864
Dial I	Pointer. cale (Chassis 12B1)	25A 65
Dial S	cale (Chassis 12B1)	210 1141
Dial 2	cale (Chassis 12BIA)	210 114-2
Drum	Dial Stringing 1%" dia	17 . 54 1
Drum	, Dial Stringing, 2" dia. Dial Stringing, 2% dia.	174 40
Drum	Dial Stringing, 2%" dia	174 56.1
2"	drum and shaft)	700 4 140
Guide	drum and shaft). Rail, Dial Pointer	150 1966
Line (	Cord and Plug	80B 1 1
Pulle	Lamp, #44. , Brass, %, "dia	170 1 22
Refler	tor Pilot Lamp	170 1-32
Shaft.	Palley Min (part of 700 & 140 accombin)	021 002 1
Shield	Tube (for V1 V6 and V0)	2/A 293-1
Sleeve	Drum Sheft (her head with 3/ 20 sh 1)	870 7-20
ileeve	, Tuning, Brass, 1/2" dia.	27A 299-1
Sock.	t, Octal (for V9) t, 7 pin miniature, Black Bakelite • V3, V4, V5 and V7)	
(for	V3 V4 VC and V7)	
inska	V3, V4, V5 and V7) 4, 7 pin miniature, Black Blakelite (for V2)	
incle	Q nin miniature, Diack Blakeine (for V2)	
(for	VI, V6 and V8)	
inche		
(for	VIO, VI1 and V12) . Dial Stringing	
( IOI	Dial Stringing	87C 23-3
pring	, Return, Cam Follower	
it min	Anterura, Cam Follower	19D 1-51
itud i	Antenna Mtg. (for mtg. L6)	
ind i	Cam Follower	27A 295-1
nuu, .	Stug Aujustment	
-		
12/	ARTS LIST	
115	150,000 ohms, 1/2 watt	60B 8-154
116	I megohm, ½ watt	60B 9 105
117		
118	160,000 ohms, ½ watt, 5%	60B 7.164
119	470,000 ohms, 1/2 watt	60B 8-474
120		
121	130 ohms, 1 watt. 5%	60B 12 121
122	33.000 ohms, ½ watt	60D 0 222
123	130 ohms, 1 watt 5%	60D 13 131
124		
125	100,000 ohms, 1/2 watt	60B 8 104
		0000 0-10-9
	CARACITORS	

# CAPACITORS

C101 C102	.005 mf, 500 volts, cer. disc	
CIUL	10 mi, 6 volts, electrolytic	

	Description	
C103	100 mmf, 500 volts, ceramic	Part Ne.
C104	.002 mf, 400 volts, tubular.	
C105		
C106	.02 mf, 500 volts, cer. disc.	050 10-89
C107	1,500 mmf, 500 volts, cer. disc	65D 10-137
C108	220 mmf, 500 volts, ceramic.	05D 10-103
C109	.005 mf, 500 volts, cer. disc.	
C110	.022 mf, 400 volts, tubular.	05D 10-188
CIII	.1 mf, 400 volts, tubular	
C112	.1 mf, 400 volts, tubular.	048 8-26
C113A	50 mf 25 males /	
C113B	50 mf, 25 volts { electrolytic,	67D 7.36
C114	40 mit, 500 volts (	010 1.00
Clis	35 mmf, 500 volts, cer. disc.	65D 10-78
	.047 ml, 000 volts, tubular	
C116A	40 mf, 350 volts )	
C116B	80 ml, 350 volts electrolytic	67D 7-37
C116C	40 mf, 350 volts)	
C117	40 mf	See C113B
C118	4 mt, 10 volts, paper (cross-over)	64B 13-5
C119	16 mf, 16 volts AC, non-polarized electrolytic	
	(cross-over)	67 4 40.1

	COILS AND TRANSFORM	MERS
Sym.		
L101	Coil, Relay. Transformer, Audio Output.	Part of MOOM
T101	Transformer, Audio Output	7911 56.13
T102	transformer, rower	80B 66-1
	MISCELLANEOUS CHASSIS	PARTS
M101	Socket Stereo Input	00100
M103	Socket, Stereo Tape Input.	004.03.2
M106		
M107	Line Cord and Plug (8 ft.)	83B 22-1
M108	Socket, Audio Output	ByB 1-1
Bracke	t, Chassin Mig.	8713 4-6
Clamp	Line Cord.	
Course I	Chansis Bottom	
Insulat	Palas (Education	15C 1887-1
Man U.	or, Relay (fishpaper)	
Nut, He	ex, #440 (for mig. M106)	2A 2-7-71
nui, ne	x, # %-32 (control mtg.)	
Screw,	#4-40x%", RHMS (for mtg. M106)	IC 188-83-71
SOCKet,	Ocial (for V105)	07 A C 1
Sockel,	7 pin miniature (with adapter base for V101	D 074 117
Socket,	9 pin miniature (for V102, V103 or V104)	

# CABINET PARTS FOR MASTER UNITS

# Models 632, 633, 634, 642, 643 and 644

Sym.		Description	
M7	Secket		Part No.
MB	Socker,	Ext. Tape Input	
M9	DI T	Ext. Tape Input	88A 1
	Plug, 1a	pe Output	
M20	Plug. Ma	aster Channel Speaker	
		12" Woofer, 3.2 ohms voice coil imepedance Models 632, 633 and 634	
M21	Speaker	15" PM Woofer, 3.2 ohms voice coil impedance Models 642, 643 and	
		644	
		514" PM, Mid-Range, 8 ohms voice co impedance Models 632, 633 and 634	
M22	Speaker	8" PM, Mid-Range, 8 ohms voice coil	78C 150-2
		8 P.M., Mid-Range, 8 ohms voice coil impedance Models 642, 643 and 644	
		4" PM, Mid-Range, 8 ohms voice coil	
		impedance Models 632, 633 and	
M23		634	.78C 149-1
M23	Speaker	51/4" PM, Mid-Range, 8 olims voice coi impedance Models 642, 643 and	1
		. 644.	.78C 150-2
	1	31/2" PM, Tweeter, 3.2 ohms voice coil	
M24	Speaker	impedance, Models 632, 633 and 634	.78C 148-1
		3½" PM, Tweeter, 3.2 ohms voice coll impedance, Models 642, 643 and 644	
M25		Board, External Speaker	.78C 148-2
M25	Ginelus	Board, External Speaker les shorting bar)	100 10 0
S2	Suitel D	ecord-Play.	108 13.7
	nd Inlay (	all models)	22D 206 1
*Cabine			230 320-1
Mode	1 632. Mal	hogany	*35E 458.12
Mode	1 033, Blo	nd	*35F 459.13
Mode	1 634. Sier	T.A.	*25E ACO 14
Mode	l 642, Mal	logany	*35F 468.2
Mode	1 643. Blo	nd	*35E 468 2
Mode	1 099, Sier	over (4 mf; all models)	*35E 468-4
Capacit	or, Cross-C	over (9 m1; all models) over (16 mf, 16VAC; models 642.	64B 13-5
643 ai	nd 644)		674 40.1
Clip, 45	RPM Spi	ndic	114 20
Cover S	mark an DI	nø	00D 1 4
Dial Sca	le Windor	W	23C 331-1
Dial Sca Escutch	con. "Hea	w. d of David". (for models 642, 643 and 644)	23C 331-1

\*Orders for cabinets and certain matching parts will not be falled unless full details are given with the order and the damaged parts cannot be repaired economically.

Sym.	Description	Part No.
Grille Cloth		
Model 63		360 96 09
Model 63	3	360 86 00
Model 634		26D 86 100
Model 643	2	
Model 64		260 86 80
Model 644		260 96 00
Grommet, R	ubber (for mtg. radio chassis)	124 2 2
Hinge Lid	Brass, 15%" long (models 642, 643	
and 644)		
Hinge Lid	Brass (models 632, 633 and 634)	274 105-2
Hinge Stop	Knife Type, Brass (for record compartme	3/A 100-2
door : mou	els 642, 643 and 644)	200 400 00
Kapaput #	5-32 (bezel mtg.)	JOE 408-52
Kepanut, #1	3-32 (speaker mtg.)	ZA 19-1-71
Knobs (all n	solale)	2A 19-2-71
	eble, Bass, Loudness or Record	
Un-Un-In	cole, Dass, Loudness or Record	
Compen	salor	
Selector		
Tuning		33C 299-1
Latch, Recor	d Compartment Door (models 642, 643	
and 644)		35E 468-51
Leg, Mahoga	ny (with gold metal glide; model 632)	37D 168-2
Leg, Blond (	with metal glide; model 633)	
Leg, Ebony (	with metal glide; model 634)	37D 168-3
LId Support,	Brass (all models)	37C 170-12
Nut, Hex, #1	B-32 (for mtg. haffle board)	2A 1-13-71
Panel, Cahin	ct Back (one side covered with acoustical	
material; r	nodels 632, 633 and 634)	43D 308-5
Serew, #10-3	2x1%" WHMS PH (record changer and	
radio chass	is mtg.)	1A 100-10-71
Screw, #8-32	2x11/2" (apeaker mtg.)	24 19.7.71
Socket, Speak	(er (2 hole; center of holes 36" anart)	874 86.1
Socket, Speak	ter (2 hole; center of holes %" apart)	874 86.2
Spacer, Rubb	cr (for mtg. hafie board)	124 90

# Models 649, 654 and 671

M7	Socket, E	Ext. Tape Input		1
M8	Socket, E	Ext. Tape Input.		1
M9	Plug, Tay	pe Output.	ABB	2.8
M20	Plug, Ma	ster Channel Speaker		
	(	12" PM, Woofer, 3.2 ohms voice coil		
		impedance, Model 649.	-78C	153-1
M21	Speaker	10" PM, Woofer, 8 ohms voice coll		
5121	Speaker	Impedance, Model 654.		152-1
		15" PM, Woofer, 3.2 ohms voice coil		
		impedance, Model 671		154-1
	1	51/4" PM, Mid-Range, 8 ohms voice co	a	
		impedance, Model 649		150-2
M22	10" PM, Wooler, 8 ohms voice of	10" PM, Woofer, 8 ohms voice coil		
MZZ	Speaker	impedance, Model 654	.78C	152-1
		8" PM, Mid-Range, 8 ohms voice coil		
	l	impedance, Model 671	.78C	15141

ADIO PAGE

25-22

ADMIRAL

Part Ne.

Sym.		Description	Part No.
		4" PM, Mid-Range, 8 ohms voice coil	
		impedance, Model 649	78C 149-1
		A" DM Mid Dance 16 above union will	
M23	Speaker	impedance, Model 654.	.78C 149-2
		514" PM, Mid-Range, 3.2 ohms voice	
		coil impedance, Model 671	
			/8C 130-1
		31/2" PM, Tweeter, 3.2 ohms voice coil	
		impedance, Model 649	78C 148-1
M24	Speaker	31/2" PM, Tweeter, 3.2 ohms voice coil	
1024	opeaner	impedance, Model 654	78C 148-1
	-	impedance, Model 654. 31/2" PM, Tweeter, 3.2 ohms voice coil	
		impedance, Model 671	.78C 148-2
M25	Terminal	Board, External Speaker	
	(inclue	des shorting bar)	10B 13.7
S2	Switch, R	lecord-Play	77A 20.3
Bezel a	and Inlay (	for radio)	23D 326-1
*Cabin	et		
Mod	el 649, Fre	nch Provincial, Cherry	*35E 459.9
Mod	el 654. Ital	ian Provincial, Pumice Cherry	*35E 448.4
Mod	el 671, Ital	ian Provincial, Walnut	*35E 454-1
Capaci	tor, Cross-	over (4 mf; all models)	64B 13-5
Capaci	tor, Cross-	over (16 mf, 16VAC; model 671)	67A 40-1
Catch,	Bullet (bre	onze; model 671)	35E 454-53
Clip, 4	5 RPM Spi	ndle	11A 20
Cover,	Speaker Pl	ug	88B 3.4
Dial Sc	ale Windo	w	23( 331.1
Door P	ull (model	s 649 and 671)	37A 171-2
Escute	heon. "Hea	d of David"	234 328
Escute	heon, Door	Pull, Brass (models 649, 671)	37A 171-1
Grille			
Mod	el 649		36D 86-28
Mod	el 654 (fron	nt)	36D 86-46
Mod	el 654 (rea	r)	36D 86-85
Mod	el 671		36D 86-35

Sym.	Description	Part No.
Grommet, R	ubber (for mtg. radio chassis)	
Models 65	4 and 671	12A 2-3
Model 649	)	12A 2-15
Hinge, Door	Bronze (center section of door:	
model 671	)	37A 106.1
Hinge, Knife	Type, Brass (model 671) 15%" long (bronze; model 671)	35E 454-52
Hinge, Lid,	15%" long (bronze: model 671)	37D 173-1
Kepsnut, #	6-32 (bezel mtg.)	2A 19.1.71
Kepsnut, #8	3-32 (speaker mtg.)	2A 19.2.71
Knobs (all n	nodels)	
On-Off-Tr	eble, Bass, Loudness or Record	
Compen	salor	330 254-5
Selector		33C 254.17
Tuning		33B 200.1
Leg. Walnut	(model 671)	35E 454-51
Lid Support	(bronze, model 649)	
Right		37C 170.5
Left		37C 170.6
Lid Support	(left side; model 654)	37C 170-6
Lid Support	(model 671)	37C 170.10
Nut, Hex, 8-3	2 (for mtg. baffle board)	2A 1-13-71
Palnut #6.3	(here] mtg)	0D 6 20 71
Panel, Cabin	et Back (lined with acoustical material)	
Model 649	(speaker compartment)	43D 308.12
Model 649	(behind radio)	43D 308-13
Screw, #8x1	", Brass, PH (rear baffle board mtg;	100 000 10
model 654.		1A 15-35-72
Screw, #10-3	2x1%" WHMS PH (record	
changer mt	g.)	1A 100-10-71
Screw, #10.3	2x7/s" HH SEMS (radio chassis mtg.)	1A 152.47.71
Screw, #10-3	2x1%" WH PH (radio chassis mtg.;	
model 649		IA 153-28-71
Socket, Speak	er (2 pin; center of holes 1/2" apart)	87A 96 1
Socket, Speak	er (2 pin; center of holes %" apart)	874 86.2
Spacer, Rubb	er (for mig. baffle board)	124 00
Spring, Recor	d Changer Float	405 4 120 2
	a changer i loat	TOUR 109.2

# CABINET PARTS FOR COMBINED UNITS

# Models 662, 663 and 664

Sym.	Description	Part	No.
M7	Socket, External Tape Input	88.A	1
M8	Socket, External Tane Input	88.4	1
M9	Plug, Tape Output. Plug, Cabinet Pilot Light	884	2.3
M14	Plug, Cabinet Pilot Light	824	5.4
M15	Socket, Cabinet Pilot Light (with leads)	82A	11.10
M20	Plug, Master Channel Speaker	888	3.5
M21	Speaker, 12" PM, Woofer, 3.2 ohms voice		0.0
	coil impedance		153.1
M22	Speaker, 514" PM, Mid-Range, 16 ohms voice	100	
	coil impedance	78C	150.3
M23	Speaker, 31/2" PM, Tweeter, 3.2 ohms voice		
	coil impedance		48.1
M25	Terminal Board, External Speaker		
	(includes shorting bar)		13.7
M102	Plug, Stereo Tape Output	88.4	2.3
M104	Socket, Stereo Tape Input	88A	1
M105	Socket, Stereo Tape Input	88 A	î
M109	Plug, Speaker (5 pin)	888	3.5
M110	Speaker, 12" PM, Woofer, 3.2 ohms voice		
	coil impedance		153.1
M111	Speaker, 51/4" PM, Mid-Range, 16 ohms voice		
	coil impedance		150.3
M112			
	coil impedance	78C	148.1
S2	Switch, Record-Play	77A 1	20.3
S101	Switch, Record-Play	774 5	20.3
Bezela	and Inlay (for radio)	23D 1	326.1
Brack	et Radio Chassis Mig	15B	877
*Cabin			1000
	el 662, Mahogany	****	
Mod	lel 663, Blond		
Mod	lel 664, Sierra	*35E	
	ter oog, oferra.	*35E	404.

	Description	Part No.
Capacitor, 4 r	mf, Cross-over	
Clip, 45 RPM	er Plug (for M20 or M109)	11A 20
Cover, Speak	er Plug (for M20 or M109)	88B 3-4
Dial Scale W	indow	23C 331.1
Duplex Outle	indow t and Line Cord Assembly	700B 157
Escutcheon, "	'Head of David",	23A 328
Griffe Cloth		
Model 662.		36D 86.91
Model 663.		36D 86.92
Model 664.		36D 86.93
Grommet, Ru	bher (for mtg. radio chāssis)	124 2.3
Icwel Pilot I	ight (green) 32 (bezel mtg.)	924 10.9
Kepsnut, #6	32 (bezel mtg.)	24 10.1.71
Kepsnut, #8	-32 (Aux. chassis mtg.)	24 10 2 71
Knobs (for re	dio; front of cabt.)	
Control (O	adio; front of cabt.) n-Off-Treble, Bass, Loudness or	
Record C	Compensator)	330 954 5
Selector		220 254 17
Tuning		220 000 1
Knobs (for A	ux. chassis; side of cabt.)	
Balance		220 054 12
Race		33C 234-13
Treble		
Leg Mahogar	ny, Model 662	
Lag Blond M	lodel 663	
Leg Sierra M	lodel 664	
Line Cord	San Dualau	35E 404-54
Nut Hay #9	32 (speaker mtg.) See Duplex	Outlet and Line Cor
Panel Cabine	t Back (one side covered with	
acoustical n	naterial)	100 000 0
Seren #9 22	x1¼" (speaker mtg.)	
Screw #10.3	2x1%" WHMS PH (changer mtg.).	IA 48-4-24
Serew, #10.3	2x %" HHMS (radio chassis mtg.)	IA 100-10-7
Socket Dilas I	24 78 FILING (radio chassis mtg.)	
Socket, Fliot I	Light (with leads)	
Socket, Speak	er (2 hole; center of holes 1/2" apart	)
Socker, Speak	er (2 hole; center of holes %" apart	)

# CABINET PARTS FOR AUXILIARY UNITS

Sym.

For Models	*\$\$622, *\$	5623, *SS62	4, 55642.
	\$644, \$\$649,		

(Models S5622, S5623 and S5624 are auxiliary units used with Models 632, 633 and 634 respectively.)

Sym.		Description	Part No.
M102	Dine Cu		
M102	Tiug, Ste	reo Tape Output	88A 2-3
M104	Socket, S	tereo Tape Input.	88A I
M109	Ding C	terco Tape Output	88A 1
M109	riug, sp	eaker (5 pin)	88B 3.5
		12" PM, Woofer, 3.2 ohms voice coil impedance, Models SS622, SS623.	
		SS624 and SS649	78C 153-1
	c 1	15" DM W/	
M110	Speaker	impedance, Models SS642, SS643.	
		SS644 and SS671.	78C 154-1
		10" PM, Woofer, 8 ohms voice coil	
		impedance, Model SS654	78C 152-1
		514" PM, Mid-range, 8 ohms voice coil	100 132-1
		impedance, Models SS622, SS623.	
		SS624 and SS649	78C 152-1
		0" DM M: 1	/80 152-1
M111	Speaker	impedance, Models SS642, SS643,	
		SS644 and SS671	
		10" PM, Woofer, 8 ohms voice coil	
		impedance, Model SS654	
		4" PM, Mid-range, 8 ohms voice coil	78C 150-2
		impedance, Models SS622, SS623.	
		SS624 and SS649.	
			78C 149-1
MI12	Speaker	51/4" PM, Tweeter, 3.2 ohms voice coil	
		impedance, Models SS642, SS643,	
	-	SS644 and SS671	78C 150-1
		4" PM, Mid-range, 16 ohms voice coil	
		impedance, Model SS654	78C 149-2
		31/2" PM, Tweeter, 3.2 ohms voice coil	
		impedance, Models SS622, SS623,	
M113	Speaker	SS624, SS649 and SS654	78C 148-1
		31/2" PM, Tweeter, 3.2 ohms voice coil	
		impedance, Models SS642, SS643,	
		SS644 and SS671	78C 148-2
S101	Switch, R		.77A 20-3
		(15 feet long, shielded; includes	
plug	and socke		.893 81-1
*Cabin			
		Mahogany	*35F 461-2
Mod	el SS623	Blond	*35F 461-3
Mod	el SS624	Sierra	35E 461.4
mou			

# Model SS642, Mahogany.... Model SS643, Blond..... Model SS644, Sierra \*35E 469-2 \*35E 469-3 \*35E 469-4 \*35E 470-4 Model SS644, Sierra Model SS649, Cherry Model SS654, Pumice Cherry Model SS671, Walnut Capacitor, 4 mri, 10 volts, all models. Cupacitor, 16 mri, 16 volts AC, Models SS642, SS644, SS644 and SS671 Cover. Speaker Plug (for M109) \*35E 465-4 ...\*35E 471 ...64B 13-5 .67A 40-1 ...88B 3.4 Cover, Speaker F Grille Cloth Model S5622. Model S5623. Model S5642. Model S5643. Model S5643. Model S5649. Model S5649. Model S5654. Model S5671. .. 36D 86-94 ...36D 86-95 ...36D 86-96 ...36D 86-88 .36D 86-89 ...36D 86-90 ...36D 86-28 ...36D 86-75 ...36D 86-86 Knobs . 33C 254-13 .33C 254-14 .33C 254-15 .37D 168-2 .37D 168-3 .37D 168-4 Balance. Bass 2A 1-I3-71 -43D 308-6 ...43D 308-10 43D 308-7 Model SS654. Model SS654. .43D 308-11 Plate, Leg Mtg. (for models SS622, SS623, SS624 and Plate, Leg Nig. (for models S5027, S5028, S5054) 15B 1813-3 S5654) 15B 1813-3 Plate, Leg Nig. (for models S5642, S5643 and S5644) 37C 179-2 Screw, #6:32, 'SHSTS (for nit, beck panel) 14 47-8-71 Screw, #6:32, 'SHSTS (for nit, beck panel) 14 47-8-71 Screw, #8-32 (speaker and chassis mig.) 24 19-2-71 Scoket, Speaker (2 hole; center of holes %" apart) 87A 86-2

Description

"Orders for cabinets and certain matching parts will not be filled unless ful details are given with the order and the damaged parts can not be repaired economically.

# **RECORD CHANGERS**

# RC688-165, -175 AND -185

Sym.	Description	Part No.
M1	Cartridge, Stereo Pick-up (includes .0007" (.7 mil)	
	sapphire microgroove and .003" (3 mil) sapphire standard needles; used on RC688-16S)	409B33-1-1
MI	Cartridge, Stereo Pick-up (includes .0007" (.7 mil)	
	diamond microgroove and .003" (3 mil) sapphire standard needles; used on RC688-175)	409B33-2-1
MI	Cartridge, Stereo Pick-up (includes .0007" (.7 mil)	407055-2-1
	sapphire microgroove and .003" (3 mil) sapphire	
÷	standard needles; used on RC688-18S)	409C 34-1
M2	Motor, Record Changer (4-speed, 4 pole)	407D29
M3	Plug, Record Changer Power (includes contacts	
	and leads)	700B138-1
.M5	Plug. Master Channel Phono Output (incl 35"	
	shielded cable)	413C11-9
M6	Plug, Aux. Channel Phono Output (incl 35"	
	shielded cable)	413C11-9-1
S5	Switch, Rej-On-Off (incl. cover)	408A1

Description	Part No.
Adapter, 45 RPM Record (Envelope of 3)	
Cable, Tone Arm, Shielded 12 wires and shield;	
for RC688-16S and -17S)	413A 17-2
Cable, Tone Arm, Shielded (2 wires and shield;	
for RC688-18S)	
Centerpost Assembly	
	403A63-4
Escutcheon, Phono, Silver (fits around turntable)	
Mat, Turntable, Rubber (Black)	406C34
Needle, .0007" (.7 mil) sapphire, microgroove	
(for 409B33-1-1 cartridge)	98C15-100
Needle, .003" (3 mil) sapphire, standard	
(for 409B33-1-1 or 409B33-2-1 cartridge)	98C15-101
Needle, .0007" (.7 mil) diamond, microgroove (for 409B33-2-1 cartridge)	00015 100
Needle Assembly, .0007" (.7 mil) and .003" (3 mil)	98C15-102
sapphire needles (for 409C34-1 cartridge)	98C 95-1
Needle Assembly, 0007" (.7 mil) diamond and 003"	
(3 mil) sapphire needles (for 409C34-1 cartridge)	
Spindle, 45 RPM Adapter	400C686-1
Spring, Float (changer mtg.)	
Tone Arm Rest (Black)	403A65-6
tone /itm meat ( black /	

OJohn F. Rider

# SCHEMATIC NOTES

(2), (3). etc. indicate production changes covered by a Run Number. Run numbers are stamped at rear of classis. Brief description of Run changes given on schematic. (Y), (2), . . . etc. indicate alignment points and connec-tions.

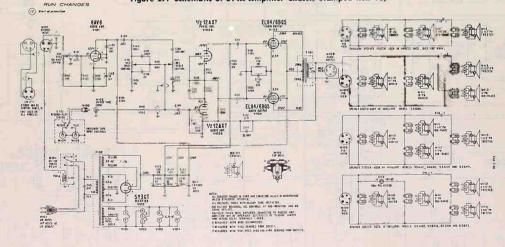
Important: Before making voltage measurements, see instructions below.

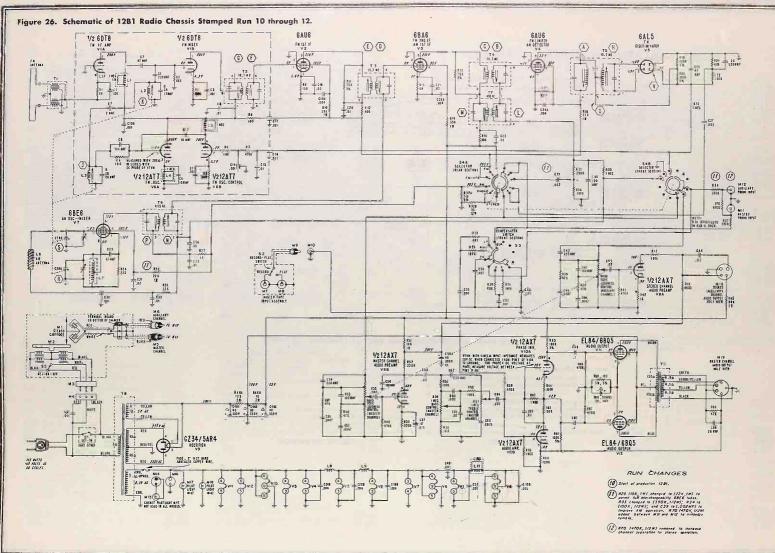
Fixed resistor values in ohms  $\pm$  10% tolerance,  $\frac{1}{2}$  watt; capacitor values shown in microforads  $\pm$  20% tolerance unless otherwise specified. Note: K = x 1,000; MEG = x 1,000,000; MMF = micromicrofarad.

# **VOLTAGE DATA**

- · All voltages measured on 117 volts AC, 60 cycle line with a vacuum-tube voltmeter.
- All voltages measured with respect to chassis ground ex-cept V9 filament voltage, primary winding voltages on T8 and T102 and heater voltages for tubes on 5T4A chassis.
- · Set controls as shown on schematic diagrams.
- · All voltages measured with FM antenna terminals shorted together and tuning dial set at low frequency end.
- · For further notes regarding voltage readings, refer to schematic diagrams.

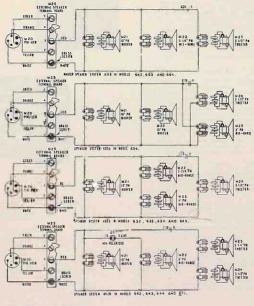
# Figure 27. Schematic of 5T4A Amplifier Chassis Stamped Run 10,





RADIO PAGE 25-24 ADMIRAL

CHASSIS 12B1-12B1A-5T4A





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ADMIRAL RADIO PAGE 25-25







MODEL 970

MODEL 971A (NOT SHOWN) IN CABINET DIMENSIONS

SPECIFICATIONS

MODEL 971\*

TYPE: Stereophonic High-Fidelity Radio Phonograph Combingtion (Model 8968). External Speaker System Enclosures (Models 971, 971A, 970)

FREQUENCY RANGE: 540-1620KC

TUBE TYPES

V1 - 12AX7 - Dual-Channel Audio Amplifier V2 - 25EH5 - Beam-Power Output (Right Channel)

#### A BRIEF DESCRIPTION OF STEREO

Stereophonic sound is to hearing what three-dimensional vision is to seeing. It adds the sensations of "depth" and "presence" to sound by recreating for the listener the spaciousness of the original sound in his own listening

Stereophonic sound is recorded simultaneously fram two (or more) separate sources and then played back through two (or more) separate but integrated channels and speaker systems with the original sound-source distance approxi-mated by the speakers. Thus, the conditions under which

#### GENERAL DESCRIPTION

MODEL 896B is a stereophonic high-fidelity radio-phono combination incorporating a superheterodyne AM radio, dual-channel stereophonic/monaval amplifier, improved automatic 4-speed intermix record changer for stereophonic and mongauch recordings, and a speeder system consisting of one 12" woofer, three tweeters, and an electrical crossover network.

Since the Model 896B has a completely self-contained stereo dual-channel amplifier it is only necessary to obtain an external speaker or speaker system for complete stereo reproduction. The external spacker or speaker system should have a voice coil impedance of 6 to 8 ohms. The following external speaker system inclosures were specifically designed to match Model 896B.

Model 971 is a matching console speaker enclosure incorporating a 3-speaker system consisting of one 12" woofer, two tweeters, and an electrical crassover network.

Model 970 is a table model speaker enclosure incorporating

V3 - 25EH5 - Beam-Power Output (Left Channel) V4 - 6BE6 - Converter (AM) V5 - 6BA6 - I.F. Amplifier (AM) X1 - Selenium Diode (Detector) SI-1 - Silicon Rectifier SI-1 – Silicon Restitier POWER SUPPLY – 60 Cyc, AC only VOLTAGE RATING – 115 Volts POWER CONSUMPTION – AMPL/PHON0-85 watts POWER CONSUMPTION – Radio Operation-60 watts

MODEL 896B

the original recording was made ore recreated and the stereophonic effect is produced.

The new "compatible" stereophonic records have two separate sound tracks in each groove. A stereo cartridge separate sound tracks in each grouve. A serie consistency picks up individual impulses from both tracks in the record grouve and feeds them separately through two single-channel amplifiers (or one stereophonic dual-channel amplifier) each channel of which feeds its own speaker system. Recommended speaker placement distance is from 8 to 15 feet apart, depending upon listening preferences of the user.

a 3-speaker system consisting of one woofer, two tweeters, and an electrical crassover network.

Either model 971 or 970 can also be used as an external (remote) speaker system for existing monaural amplifiers having provisions for an external speaker system which has a voice coil impedance of 6 to 8 ohms.

These external speaker enclosures have incorporated an on-off switch (located on back cover of cabinet) for convenient cut-off of speaker at remote locations.

# CAUTION.

Be certain that the external speaker is in "an" position at all times except when used under conditions explained above.

# CONTROLS

The following controls are necessory to secure and maintain optimum sterea performance of this instrument. These are in addition to conventional (AM) selector and on-off-tone controls.

). The Selector (function) switch has three settings:

- Ine Selector (Unicital) switch nas there as important series in the sense sense in the sense in the sense in the sense in the sense in
  - (b) Monaural (center position) connects "right" and "left" channels of amplifier in parallel and permits conventional records of all four speeds to be played in standard fashion. (note: internal/external speaker system connections
    - are independently controlled by speaker switch described below).
  - (c) Radio allows reception of all standard AM broad costs.

2. Speaker Switch - (located rear of cabinet) has three

- (a) Internal (up) \_ (using only self-contained speaker system for monaural use),
   (b) External (down) \_ When two leads from external speaker system (model 97), for example) are connected to the screw terminals on strip provided, and
- nected to the screw terminals on strip provided, and the lever switch is swung to External, only the ex-ternal (remote) speaker system will function, (c) Both (Level) Internal, external speaker systems-both used (storeo)\* Connect external speaker leads matching color-code notation on strip to laed. If no color code is found, connect speaker leads and check for correct phasing. Speaker phasing for stereo is more critical and speaker polarity may be checked in the following manner if color coding has not been used

 Connect external leads, 2. Place familiar record on turntable, 3. Swing lever to "Both" position (activating both speaker systems). 4. While record plays on turntable, transpose external speaker lead connections several times. A crisper, fuller sound indicates correct phasing of speakers.

\*NOTE: Both speaker systems may also be used together o separately for monaural record application.

3. The Dual Loudness Control is used to balance the out-3. The Quark Evaluation is used to address the mean predominates. When the speaker systems so that nother predominates. When the speaker lever switch is in the "Baht" (central) position, the inner kab controls volume of "right-hand" (internal) speakers and outer concentrically-mounted kab controls "off-hand" (sterrand) speakers), the knobs are designed to turn simultaneously as a linked control. If speaker count haloncing is required, the individual knob sections may be independently rotated as indicated below:

To balance the output, set the "selector" at "STEREO" and the rear lever-switch at "BOTH", and put a monaural record on the turntable. Turn the outer loudness knob fully

counter-clock wise and hold it firmly with one hand to pre-vent ratation. Turn up the inner loudness knob clockwise, until the sound from the right-hand (internal) speaker is set for the desired volume leval. Observe the dial scale number at which the knob indicator is set. Listen for a while to fix in mind the sound level and then turn the inner knob fully counter-clockwise, so that the right-hand speaker is silent. While preventing inner knob movement with one hond, turn the outer knob clockwise until the sound level from the left-hand (auxiliary) speaker seems to be at the same volume level previously set for the right-hand speak-er, Restrain the outer knob at this point and turn the inner knob to the previously noted scale number. The output from both speaker systems is now approximately the same. Overall loudness level can be adjusted by turning either Uverail loudness level can be adjusted by furning either knob without restraining the other, since both furn simul-taneously normally. Any desired readjustments to compen-sate for individual listening preferences can be made by restraining one knob and turning the other.

Record Changer 819126 (or 819129), used in Model 896B, is a stereophonic/monaural four-speed intermix record changer. It will play stereo and monaural 33-1/3 RPM, 16, 45, and 78 RPM records automatically or monually.

With the turntable speed control knob into Seedinder (Changer 8)126) or \*\*Auto-Brain (Changer 8)129) posi-tion and the microgroove stulus set for use, the changer will automatically intermix and pips 33-1/3 and 45 RPM records without regard to size or exponence. A total of ten records may be placed on the turntable.

The turntable automatically pauses during the changing The functions outomatrically pauses during the changing cycle in order to eliminate record abrasion. "When the changer is shut "off", or turns "off" automatically after the last record has been played, the idler wheel is auto-matically disengaged to prevent "flats" from developing.

\* NOTE: The Auto-Brain (changer 819129) has the follow-ing additional features: When Auto-Brain setting is used and the stylus selector lever is turned to the "78" (RPM) ond the stylus selector lever is furned to the "78" (RPM) side, turnholds speed will automatically be switched to 78 RPM and will remain at this speed av long as stylus see lector lever is not changed to the L.P. position, even though a record of a different speed (33-1/3 for example) is dropped to the turntable. The resulting speed-distorted being used and is a method of preventing record wear.

A stereophonic high-fidelity dual-head turnover ceramic a stereophonic integrated sapphire-tipped stylii has been incorporated into a damped, accustically isolated tone arm. This cartridge may also be used for monoural records without adaptation.

In order to play 45 RPM records (with large hale in center), 45 RPM spinder to channer, fort %92230, should be used attachment its over the existing spindle, enlarging is dismeter to accommodate this type of record and eliminate the need for separate center hale adoptras.

# DISASSEMBLY PROCEDURE

AM Tuner and Amplifier Chassis

NOTE: To replace tubes, only masonite back cover need be removed

- 1. Remove all knobs and remove masonite back. Remove fiber support bracket.
- 2. Remove four Phillips head screws securing AM tuner
- and amplifier chassis to cabinet. (On top) Slide off pilot light assembly and remove leads for 3. speaker system and loop antenna.
- Remove two screws securing A.C. interlock and its 4. bracket to base of cabinet. (Unstaple fish paper wire holder). Remove screw holding AC interlock plug to chossis
- 5. (chossis to record changer AC cord) and romove screws holding three position speaker-switching panel to back of cabinet.
- or cobine. Remove live-prong plug fram chassis and remove chassis from cobinet. (Top of Cabinet). Remave 4 screws holding masante mounting board and control panel to chassis. In some isolated cases a metal
- 7.

bracket will protrude thru the bottom of the chassis mounted masonite board. This bracket should be removed by untwisting the protruding portion until it lines up with the slot on the masonite board.

- with the slot on rne masonic scale.
   Remove masonite board/control panel from chassis.
- NOTE: The metal bracket should be removed from chassis and discorded. Exercise care in removal of this chassis mtg. bracket piece so that at no time will pressure be applied to etched printed circuit board chassis.

To reassemble, reverse procedure.

TO Remove Changer:

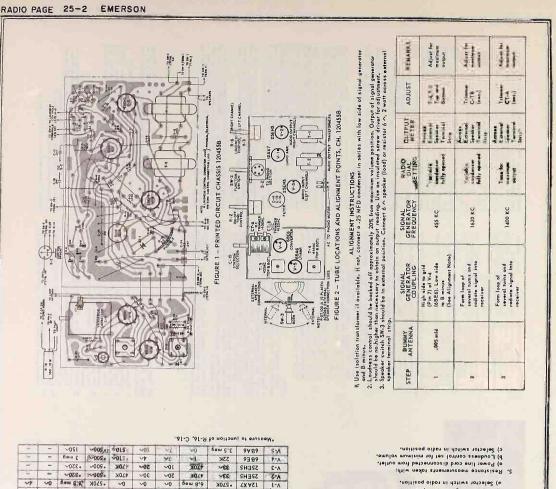
- Snop two toggle bolt spring clips into a vertical posi-tion. These spring clips secure changer hold-down toggle bolts to mounting board (which is partical cabinet).
   Remove plug (ifve-prong) from chassis.
   Remove AC interjack plug from chassis.
- 3. Remove AC interlock plug from 4. Remove changer from cabinet.
- NOTE: To reassemble, reverse procedure.

EMERSON

RADIO

PAGE

25-



6em 8.6 ~0 ~0 ~0 \*570K 9 <sup>(i)</sup>d

b niq 6 jug Tuid L uid eqn1 10quil

12AX7 1-1

RESISTANCE READING, CHASSIS 1204558

S MId

6 uld 8 uld Luld

CHASSIS 120455B

N.C. denotes no connection, K is kilohms, Meg. is megohms. Resistances marked \* are measured to junction R-16, C-16.

seniboes esnetzines bag

6. Nominal tolerance on component values makes possible a variation of ±15% in voltage Voltoges indicated are positive d.c., resistances in ohms, unless other-

CONDITIONS FOR TAKING VOLTAGE AND RESISTANCE READINGS CH 1204558 SCHEWATIC DIAGRAM, CHASSIS 1204558

d) Record changer in OFF position.

..

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1

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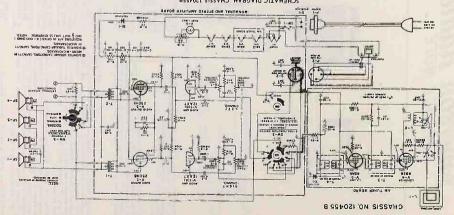
0

a) Line voltage maintained at 117 volts a.c., b) Loudness control set for minimum volume. Valtage measurements taken with:

Analoviupe to taymotion driv ebon stnemeruaned

c) Variable condenser fully closed and no signal applied.

An medsurements taken trom print d of nig mort nexot stremetuspen IIA



#### ADDITIONAL SERVICE HINTS

1. No sound or intermittent sound:

Make certain electrical contacts to cartridge are clean. If any rosin is present on contact strips within cartridge holder, remove with alcohol.

- more with alcohol. 2. This changer automatically disengages the rubber idler wheels when allowed to operate through its normal eyele. To avoid defeating this feature, do not operate the on-off lever time amplitude with its in "off" position or time amplitude with the in "off" position or time amplitude with the operate connect turn amplitude with the oper
- Do not turn amplifier switch "OFF" or disconnectline card from wall outlet while changer is operating. Turn changer switch to "off" position first.

is operating, i un changer switch to on position first. Failure to comply with above might result in damage to idler wheels or cause changer to fail to start when power is again applied.

IF ABOVE IS OVERLOOKED AND CHANGER FAILS TO START WHEN TURNED ON, SEVERAL SLIGHT TAPS ON TURNTABLE SHOULD CAUSE CHANGER TO COMMENCE OPERATION.

# STYLUS REMOVAL

To Remove Stylus Cartridge:

- Lift tone arm and grasp cartridge with fingers.
- Pull cartridge out (cartridge and stylii are an integrated unit and cannot be removed or replaced separately).
- Reinsert new cartridge. Keying of cartridge is accomplished by lining up ridge on cartridge shaft to slot on holder (see Fig. 3, Stylus removal).



FIGURE 4 - UNDERSIDE VIEW, 819126 (819129) CHANGER TONE ARM, WITH ADJUSTMENT SETTINGS SHOWN

# SERVICING OF PRINTED BOARDS

To remove defective components one of several methods may be used. A recommended method is to cut close to the body of the defective component and solder the new port to the remoining leads. Another method is to apply heat or the junction point of the component wire lead and the printed board and lift out the component. If the up. A defective component with many terminals may be removed by clipping into several parts and removing a small section of a time.

Use a low wattage (20 to 30 watts) soldering iron. Be careful not to apply excessive heat since this may cause the printed foil to loosen. Braken foil leads may be repaired by soldering a hookup wire across the break.

A small stiff-bristled brush should be used to wipe away melted solder before it has a chance to accumulate or drip on adjacent parts or printed wiring.

STYLUS CARTRIDGE

STTLUS SLEICTOR BAR (PART OF STYLUS CARRIDGE HOLDER) STYLUS CARTINDEE EMISSIN PF No 3 82327

FIGURE 3 - STYLUS REMOVAL

## ADJUSTMENTS

# Tone Arm Height Adjustment (See Figure 4)

Tone arm height should be set so that the top of tone arm clears the lowest record on the spindle shelf (When changer 1s in cycle), and the lower edge of tone arm clears the rest post. To lower tone arm, turn height adjustment screw (a) clackwise. To reise tone arm turn height adjustment screw (a) counter clackwise. Stylus Pressver Adjustment (See Figure 4)

With tone orm in horizontal position, adjust knurled nut (b) clockwise to increase pressure and counter-clockwise to reduce pressure. Stylus pressure should be adjusted for 6 grams. Needle Set-Down Adjustment (See Figure 4)

Adjust set-down screw (c) so that the stylu's comes to rest on the lead in groove of record. Adjust clockwise to move stylus away from center or counter clockwise to move stylus towards center of record.

SYMB.	PART NO.	DESCRIPTION	4	SYM	B. PART NO	DESCRIPT	ION	1
R-1 R-2 R-3 R-4 R-5 R-6 R-7 R-7 R-7 R-7 R-7 R-7 R-7 R-7 R-7 R-7	341534 390582-2 340892 340892 390583-2 97. of R- 551412 351412 351412 351412 351412 351032 350032 350032 350032 350032 350032 35132	22 MEGOHA-CARB. 23 MEGOHA-CARB. 24 MEGOHA-CARB. 24 MEGOHA-CARB. 24 MEGOHA-CARB. 24 MEGOHA-CARB. 24 MEGOHA-CARB. 24 MEGOHA-CARB. 24 MEGOHA-CARB. 25 MEGOHA-CARB. 33 OHA-CARB. 33 OHA-CARB. 33 OHA-CARB. 33 OHA-CARB. 33 OHA-CARB. 34 MEGOHA-CARB. 34 MEGOHA-CARB. 35 OHA-CARB. 35 OHA-CARB. 30 OHA-CARB. 31 MEGOHA-CARB. 31 MEGOHA-CAR	10% IROL-RIGHT CH IROL-RIGHT CH 10% 10% 0HTROL-RIGHT 20% 10% 10% 10% 10% 10% 10% 10% 1	5W C-17 C-18 C-19 5W C-19	923554           923554           921554           921554           921554           921514           923554           923554           923554           800218           800219           800219           800219           800219           50013           80720           50014           PART OF CHANGER 510145           510145           510145	047 MF-PAPER VARIABLE CAPACITOR VARIABLE CAPACITOR 047 MF-DUREZ 20 MIR-DCREZ 20 MIR-CRIMIC 042 MF-PAPER 047 MF-MOLOED 21 MF PAPER VACUUM TUBE - 12AX VACUUM TUBE - 12AX	120% -R.F. SECTION -OSC. SECTION 120%	400 400 400 400 400 400
CTA CTB C-1 C-2 C-3 C-4 C-5 C-6 C-7 C-8 C-10 C-12 C-11 C-12 C-13 C-13 C-14 C-12 C-12 C-14 C-12 C-12 C-1	P1. of C19 9288941 9288941 9289221 9289221 9289221 9289221 9289221 9289221 9289241 923514 923514 923514 924524P 924524P 924524P 924524P 924524P 924524P	TRIMMER R.F. SECTION TRIMMER, OSC. SECTION 33 MMF CERAMIC N 750 4,700 MMF CERAMIC 10,000 MMF CERAMIC 0.01 MF PAPER 200 MF -ELECTROLTTIC 100 MF - ELECTROLTIC 100 MF - ELECTROLTIC 100 MF - ELECTROLTIC	±20% ± ±20% ± ±20% 4 ±20% 4	500 V 500 V	720259 700146 716119 817079 817061 180192 925391 19126(819129) 583075 507006 41130 413359 413361 555037	LF. TRANSFORMER LOOP ANTENNA OSCILLATOR ANTENNA OSCILLATOR THE INFORMETHER PEAKER, PM, 35 IN, IT AMPEREDECTROLYTIC, INANCER, STREED, 45 LIN ECORD SOCKET, PILOT LIGHT BRACKET, REAS SUPPO BRACKET, REAS SUPPO BRACKET, REAS SUPPO TERMINAL STRIP, EXT	WEETER) OOFER) NON POLARIZED PEED NO MOTOR SWI NO MOTOR SWI DRT RT ENAL SPEAKER	

CHASSIS 1204558 PARTS LIST

#### CABINET PARTS LIST, MODEL 8968

Part No.	Description		Description Part No		Part No.	Description		
Specify Cold Specify Cold 592070 607139 604042 461055 461088 604062 413348 180191 180191	r Legs, Grille Decal, Medall Emerse Stereo Name	Plastic Cloth Bandmastër ion on Script HI-FI (Script) Plate & Adapter Holder r 335"	700146 413246 560632 583075 413375 461075 461082 461082 461076 460935 5542009	Loop Anter Bracket, P Masonite B Line Cord Control Pa Knob, Volu Knob, Volu Knob, Tuni Knob, Tuni Knob, Tuni Knob, Spec Tignerman	ilon Light lock nel me (outen) me (inner), n, On-O[f(phono → radio), kor Seigetor Switch			
		CABINET PART	SILIST. MODELS 9	70, 971, 971,	A			
970 9	71,971A	Description	970	971,971A	Description			
Specify Cole		Cohinet	510141	520141	Switch, Slide			

Specify Co Specify Co 607096 607128 560782	olor olor 460201A‡ 461055** 560783‡ 560784**	Cabinet Legs Medallion Emerson Script Emerson Script Hi-Fi Script, Decal Hi-Fi Script, Decal Back, Masonite Back, Masonite	510141 412607A 180164A 925391 180165A 592070	510141 412607A 180191 925391 180192 592070 461088** 4610911	Switch, Slide Bracket, Switch Speaker, 35," (2) Capacitor, Elactrolytic, 4 Mid, Non-Polarized Speaker, 8" Speaker, 12" Grille Clash H37Fi Script, Stereo H47Fi Script, Stereo H47Fi
t Used, Me	odel 971 only odel 971A only	STEREO RECORD CHAI	NGER 819126 (84	9129) PARTS	LIST
Pert Ne.	A MARGINAN	Description	Part No.		Description.
962326 962327 962340 962340 962376	Cartridge Tane Arm	with Stylii (Astatic 137) Holder vlus Pressure	\$62377 962378 962350 962350 962330	Screw, Adju Spindle As	tment, Stylus Pressure ustment, Stylus Pressure sembly indle Attachment (Optional Accessory)

\*Refer to Record Changer 819126, 819129 Service Note for additional technical information.

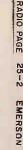
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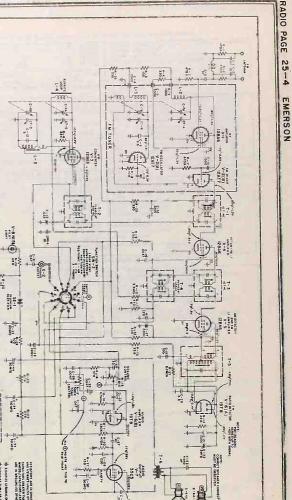
RADIO

PAGE

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CHADDID ITO TO







**Emerson Radio** 

SERVICE NOTE

MODEL 895

# SPECIFICA TIONS

Type: AM . FM Radio Frequency Range: AM: 540 - 1620KC FM: 88 - 108MC Power Supply: 105-125 V. AC OR DC. Voltage Rating: 105 - 125 volts Power Consumption: AM-FM - 35 watts

JANUARY, 1958 MODEL 895B

CHASSIS 120431B

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# GENERAL INFORMATION

Model 895B is an AM - FM table model radio incorporating Model 835B is an AM - rM table model radio incorporating one wooler, one tweeter and a continuously variable to mee control. Built-in antennas for both AM and FM are provided plus external FM antenna input terminals. A phono input jock that can be actuated by a front panel-mounted function switch is also provided.

In the "AM" position, function switch SW-2 connects B+ to the AM converter tube (V-3) and places the AM detector load network in the detector circuit (Pins 1 and 7 of V-5). In the "FM" position, B+ is applied to the FM tuner and V-5,

# DISASSEMBLY INSTRUCTIONS

To Replace Tubes:

Remove line plug from wall outlet.
 Remove screws from cabinet back.
 Grasp line cord at point where it is connected to back ond pull free of interlock. Remove back.

- To Remove AM-FM Chassis 4. Steps 1-3 above. 5. Remove 3 control knobs and 1 tuning knob; disconnect built-in FM antenna and remove antenna terminal. Un-solder 2 speaker leads at chassis solder lug strip and unscrew chassis bolts from underside of cabinet. Unclip pilot light.

(2nd FM I.F. amplifier). In addition, the ratio detector output is coupled to the high side of the volume control.

In "Phone" position B+ is removed from both AM and FM I.F. sections and V.S. (2nd FM I.F. omplifier). The screen grid of V-7 (audio autput tube) is connected to a different B+ source in this position and the audio input is connected to the phone jack output.

If replacements are made or the wiring disturbed in the R.F. section of the circuit, the receiver should be carefully re-aligned.

**OJohn F.** Rider

# CONDITIONS FOR VOLTAGE AND RESISTANCE READINGS

- Voltages indicated are positive d.c., resistances in ohms, unless otherwise indicated.
   Measurements made with voltahmyst or equivalent.
   All measurements taken from pin to chossis unless
- otherwise indicated Voltage measurements taken under the following conditions:
- a) Line voltage maintained at 117 volts a.c. only. b) Tuning capacitor fully closed with no signal.
- 5. Resistance measurements taken with a) Power Line and cord disconnected from outlet. b) Loudness control set for maximum volume.
- Nominal tolerance on component values makes possible a
- variation of ±15% in voltage and resistance readings. 7. N.C. denotes no connection, K is kilohms, M is megohms. 8. Readings given in FM/AM positions.

PIN 9

-

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#### RESISTANCE CHART CHASSIS 120431B SW-2 POSITION TUBE PIN 1 PIN 2 PIN 3 PIN 4 PIN 5 PIN 6 PINT PINNE 450K/450K V1-128A6 FM % % 12/12 \*450 \*800/\*INE % 8 10K/10K V2-12AT2 FM \*350 \*330/\*INF 450K % 12/12 24/24 % EN/AN V3-128E6 228/228 0.3 58/58 \*INF/0\* 44/44 \*INF 4M/4M 1.15 -EM 41/44 V4-12846 "/AM % 58/58 70/70 \*330/+330 \*330/\*330 % FM V5-12846 470K 70/70 % 82/82 \*330/\*INE 470 \*330/\*INE %

FM/AM 2M 20K 2M 24/24 \*250K/\* 250K 44/44 % % 4.7M 470K 74.7M FM/AM 1 82/82 118/118 \*300/+300 1150 11M/11M

\*Measured with low side of VTVM connected to Junction R24, C35 (B+ point) tMeasured to chassis - wait until meter settles (about 30 seconds)

# GENERAL ALIGNMENT INSTRUCTIONS

Set Function Switch (SW2) as indicated. Output of signal generator should be no higher than necessary to obtain an output reading with a 40% modulated R.F. signal. Use on insulated alignment screwdriver and plastic hex tool (for T-1, T-3). Volume control at maximum CTP position.

Step	Sig. Gen. Coupling	Sig. Gen. Frequency	Radio Dial Setting	Output Meter VTVM or Scope	Adjust	Remarks	
8	High side to grid end of L-4 low side to chassis thru 0.25 mfd. cop.	fully open		de to chassis fully open	the second secon	T-2 T-4 Top and borrom	Adjust for maximum output
2	Form loop of several turns and radiate signal into receiver	600K C	600KC	Across spea er voice coiff	11	Adjust for maximum	
3		1638K C	Tuning Cap fully open	Across speaker voice coil	CT-Desc,	Adjust for maximum	
4		1420K C	1420K C	Across speaker voice coil	ST-C-R.E.	Adjust for maximum	

FM ALIGNMENT INSTRUCTIONS - (Using AM GEN. & VTVM) - SW-2 IN "FM" POSITION

Step	Marker Gen. Coupling	Marker Gen. Frequency	Radio Diel Setting	VTVM Placement	Adjust	Remarks
a.	Rāise 12AT7 (V-2) shield slightly off ground and clip marker gen. high side to shield and low slide to chassis thru 0.25 mfd. cop.	(0,7 MC	Extremé GC# Pesi- tion (no signal)	Across C-22 2 mfd. stabilizer capacitor (neg. scale)	T-1, T-3 top and bottom T-5 bottom	Adjust for maximum neg. voltage, keeping gen. output for read- ings under 2.5V.
2.	Roise 12AT7 (V.2) shield slightly off ground and clip marker gen. high side to shield and low side to chossis thru 0.25 mfd. cap.	10.7 MC (no mod.)	Extreme CCW Posi- tian (no signal)	Connect two motched 100K ohm, ½ watt resistors in series occross C-22. Then place VTVM high side to junction R-13, C-18 and low side to junction of two 100K ohm resistors.	T-5 top	Adjust for 0 volts with ± readings on either side.

# FM ALIGNMENT INSTRUCTIONS (USING SWEEP AND MARKER GEN. AND SCOPE)

SW-2 in "FM" position. Sweep generator set for ±300KC frequency deviation and Morker injection level kept below point where distortion of response curve occurs.

Step	Gen. Coupling	Gen. Freq.	Radia Dial	Scope	Adjust	Romerka
T.	Raise 12AT7 (V-2) shield off ground and clip high side of sweep and marker gen. to shield low sides to chossis thru 0,25 mfd. cap.	Sweep Center freq. 10.7 MC Marker set at 10.7 MC (no mod.)	Extreme CCW (no signal)	Highside to Pin 2 of V6, low side to chossis (discon- nect negative end of C22)	T-1 T-3 top & bot. T-5 bot.	Adjust for max. gain and sym- metry
34	Sweep & Marker high sides con- nected to pin 1 of V-5 - low sides to chassis thru 0.25 mfd. cap.	Sweep center freq. 10.7 MC Marker set at 10.7 MC (no mod.)	Extreme CCW (no signel)	Connect C22 back in circuit. Highside to junct. of R13 and C18, low side to chassis	T-5 Tap	Adjust for respanse us per Fig. #2

# AM - FM TUNING - TRACKING

With tuning shaft (drive shaft) completely CCW, AM tuning capacitor should be in maximum capacity position and FM tuning slugs should be in maximum "in" position. In this position, set screw in nylon worm gear is accessible far tightening through hole in plate and spring.

# FM TRACKING (ELECTRICAL)

Ordinarily the only FM front and adjustment that might became necessary due to oscillator tube change would be CT-B, FM oscillator trimmer which is accessible through a hole provided in the tuner shield. This trimmer should be adjusted at 108MC with the tuning dial set at that frequency. This should be done only if the oscillator is off proper frequency.

Should components ar wiring be changed, a complete FM front-end alignment might be necessary as

Function Switch (SW-2) in "FM" position; tuner shield bent up for tuning purposes, but not removed (use a non-metallic screw driver).

Step	Marker Generator Coupling	Marker Generator Freq.	Radio Dial Setting	VTVM	Adjust	Remarka
J	FM Ant.	108 MC	108 MC (slugs out)	Across C-22	CT-B CT-A	Adjust for max, neg, reading, keeping gen, input level for vält- age reading below 2,5V.
2	FM Ant.	88 MC	88 MC (slugs in)	Across C-22	L-3 L-2	Adjust for max. neg. reading by spreading or compressing turns. Caution: Do not alter spacing between L-3 and mixer coupling loop.
3	Repeat Step	s 1 and 2.				100p.

# PHYSICAL FM TRACKING

This is only possible to perform if and when a new slug assembly is installed. FM osc. slug (C-78) is fixed to a plastic bar, but FM-R.F. slug (C-7A) is on a threaded flexible shaft. For correct physical tracking, both slugs should just cover glass dielectric window section simultaneously. Then, crimp R.F. slug shaft as close to plastic bar as possible on front side (see Fig. 5), and cut all but 1/8" af excess shaft length.

11

V6-19T8

¥7-35C5

CHASSIS 120431B

120% S00V

120% 400V.

+20% 600V

120% 600V

120% 500V

120% 500V

120% 500V.

±10% 500V

25V.

150V

150V

500V

500V.

150V.

DESCRIPTION

50 MFD-ELECTROLYTIC

80 MED-ELECTROLYTIC

50 MFD-ELECTRDLYTIC

.0022 MFD-CERAMIC DISK

.0022 MFD-CERAMIC DISK

1,500 MED-CERAMIC DISK

1,500 MFD-CERAMIC DISK

TUBES

VACUUM TUBE 128A6

VACUUM TURE 12845

VACUUM TUBE 19T8

VACUUM TUBE 35C5

SELENIUM RECTIFIER

FM TUNER ASSEMBLY

**FM ANTENNA COLL** 

OSC. COIL (FM) BARLOOP ANTENNA

OSCILLATOR COIL

FILAMENT CHOKE

SPEAKER-PM-3-1/2"

FUNCTION SWITCH

INTERLOCK PLUG

4-SPEED CHANGER

Electrolytic Capacitor, 4 MFD, NP Pilot light bracket

Knob - Tuning Knob - Switch-Phono-Am-Fm

Masonite back

Line cord Knob - Vol. Tone

PHONO SOCKET

ON-OFF SWITCH

SPEAKER. PM- 10 X 2-1/2

RF COIL (FM)

COILS & TRANSFORMERS

1ST FM I.F. TRANSFORMER

1ST AM I.F. TRANSFORMER 2ND FM I.F. TRANSFORMER 2ND AM I.F. TRANSFORMER

RATIO DETECTOR TRANSFORMER AUDIO OUTPUT TRANSFORMER

INTERLOCK SOCKET & LINE CORD

SOCKET & CABLE ASSEMBLY

TUBE SHIELD FOR 12846

TUBE SHIELD FOR 12ATT

33 NHE-CERANIC DISK

30 MFD-ELECTROLYTIC

VACUUM TUBE 128A5 (IFM TUNER) VACUUM TUBE 12847 VACUUM TUBE 128E6

.01 MFD-CERAMIC DISK Z5U 500V.

220 MMF-CERAMIC DISK ±20% 500V.

50 MFD-ELECTROLYTIC 150V. .047 MFD-MOLDED (U.L. BYPASS)600V.

.0022 MFD-CERAMIC DISK ±10% 500V.

CAPACITORS (CONTINUED)

022 MED-PAPER

.047 MFD-PAPER

.047 MFD-PAPER

.0047 MFD-CERAMIC DISK

LIST

PRICE

,20

.20

.25

.25

.35

. 20

.20

20

1;80

21.00

.15

4.70

.70

.15

1.60

1.60

2.35

1.60

10

.25

CHASSIS PARTS LIST, CHASSIS 120431B LIST SYMB PT NO DESCRIPTION PRICE SYMB. PT. NO RESISTORS 351132 470.000 OHM-CARBON ±20% 1/21 C-26 C-27 928922 351132 470,000 OHM-CARBON 470,000 OHM-CARBON 20% 1/2W .14 928924 PART ±20% 1/2W .14 C-28 928914 330 OHM-CARBON ±10% 1/2₩. C-29 923524 TUNER 100 OHM-CARBON ±10% 1/2W. ±10% 1/2W. .14 C-30 925433 340812 22,000 OHM-CARBON 14 C-31 PART OF 923754 470 000 OHM.CARRON ±20% 1/2W .14 C-32 923754 TUNER 10.000 OHM-CARBON ± 5% 1/2W .14 C-33 C-34 925432 350372 330 OHM-CARBON ±20% 1/2W PT. OF C-33 PT. OF C-33 351332 3.3 MEGOHM-CARBON ±20% 1/2W .14 C-35 351132 470,000 OHM-CARBON 330 OHM-CARBON ±20% 1/2W. C-36 C-37 922208 ±20% 1/2W

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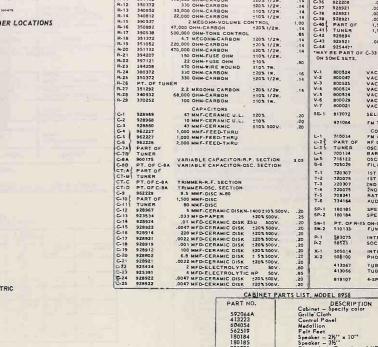
925391

413162 560612

583075

460997A 460999A

4609984



R. 1

R-2

R-3

R-4 OF

R-5

R-6

R-7

8.8

R-9

R-10 R-11

100 +0. 100 200 300 # FOR FM TURCE 45 GRACENT SEE FIG 5 FREQUENCY DEVIATION IN M Fig. 2 - FM RATIO DETECTOR Fig. 3 = TUBE AND TRIMMER LOCATIONS CHARACTERISTICS TAPERED HOLES SLIDE OIAL POINTER 2 1 -ISTEP 24-KNOT TUNING 5 ROTAT SHAF CCW NOTE TUNING SHAFT IN FIG. A SHOWN WITH GLOSED POSITION. DIAL CORD TO BE 3334"LONG. 2 TURNS. CLOSELY WOUND CCW. (FIG.B) TURNS CLOSELY TO STRING OIAL INTO JAIL: THROUGH SANLER DIALETER OF TAPPERD MOLES (FIGBL ANC) WAT. 2. PAUL, MOT THROUGHOLD, (FIGBL AND ROTATE SHAFT COUNTERCLOCKWISE UNTLO GARGIS FULLY CLOSED. 3. WIND 7 TEARS TUDES (CLOSED) SAND (FIG.A). 3. WIND 2 FRONT TURKS COUNTERCLOCKWISE WORKNO TOWARDS FRONT OF SHAFT, 6. STRING COUPED COOD UNCER TUDES (FIG.A). Fig. 4 - DIAL CORD STRINGING NYLON GEAR CRIMPED END RF SLUG SET SCREW OF RF SLUG SET SCREW ADJUST HOLE CTA-S GLASS DIELECTRIC (WINDOW) CTB-NYLON DRIVE DIAL DRIVE NYLON anne SCREW 1 3 CORD SHAFT WORM GEAR MIXER COUPLING OSC SLUG LOOP TO PIN 8 V-2 Fig. 5 - BOTTOM VIEW OF TUNER (IN MAX. CW POSITION WITH SHIELD REMOVED)

PHONO, MOTOR SOCIET

\$ 33,34,33

1918

0

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10.10

# MECHANICAL TUNER PARTS (ELECTRICAL PARTS LISTED IN CHASSIS PARTS LIST)

471066 - Slug Assembly 41	3064 - Flat Spring
460961 - Drive Shaft (Nylon) 46	0962 - Gear (Nylon) with set screw
265112 - Drive Screw 27	5095 - Thrust Washer, Rear
413065 - Shaft Plate 27	5096 - Thrust Washer, Front

CJohn F. Rider

5

PAGE 25 j o m MERSON

ADIO

MANUAL No 4-500

# Firestone PORTABLE RADIO PHONOGRAPH

STOCK NO. 4-V-17 CODE NO. 1-8-3RP8

# OPERATING INSTRUCTIONS, SERVICE MANUAL AND PARTS CATALOG

IMPORTANT: Do not lose or destroy these instructions. Read them carefully and keep far future reference and correct needle replacement.

IMPORTANT: This instrument is designed to operate from a 105-125 volt 60 cycles AC power source only. If in doubt check with your local power company before connecting the instrument.

# TO OPERATE RADIO

1. Turn ON-OFF VOLUME knob clockwise and wait until set warms up. Then push RADIO-PHONO SLIDE SWITCH to radio position. The turntable will not revolve with switch in this position. It will revolve with switch in phono position only.

2. Tune STATION SELECTOR DIAL knob so that arrow points to desired station, and adjust volume to your preference.

NOTE: This model has an external antenna connection for remote pickup.

# TO OPERATE PHONOGRAPH

1. Place record on turntable. Move speed indicator to proper speed (33 1/3, 45, or 78).

NOTE: The wrang speed may cause damage to the record, so be SURE to use correct speed.

2. Then place pick up arm on start of record. Push RADIO-PHONO SLIDE SWITCH to PHONO. This will stort the motor.

3. Adjust the volume control to your preference

NOTE: If a 45 RPM record is used, twist adapter counterclockwise to raise it and fit record onto adapter.

. 4. To shut unit off turn ON-OFF VOLUME Knob counter-clockwise until switch clicks off.

DO NOT DROP PICK UP ARM ON RECORD. This can cause damage to cartridge, needle or record.

Put pick up arm into arm rest before closing the cabinet.

# STOCK NO. 4-V-17

CODE NO. 1-8-3RP8

# SPECIFICATIONS

Cabinet Dimensions	Width 12 in., Height 5 in., Length 10 in.
Shipping Weight	8 lbs.
Power Supply	105-125 volts AC 50/60 cycles
Tuning Range	Standard Broadcast Band
Intermediate Frequency	455 KC
Loud Speaker	
Voice Coil Impedance	
Power Output	
Tube Complement	I — 12AU6—Converter
The compression	1 - 12AV6-Detector-Ist Audio
	1 - 50C5-Power Amplifier
	1 35WA Rectifier

For alignment or repairs, remove motor board by unscrewing 4 Philipshead motorboard bolts.

# ALIGNMENT

Equipment

- The following equipment is necessary for proper alignment:
- 1. Signal Generator that will provide the test frequencies as listed, modulated 400 cycles 30%.
- 2. Non-metallic screwdriver.
- 3 Output Meter.

B. Test Set Up

Volume control-maximum, all adjustments No signal applied to ontenna. Connect .01 condenser in series with output lead of signal generator. Connect ground lead of signal generator to common ground above chassis. Connect Output Meter across Voice Coil.

DIAL	GENERATOR	DUMMY	GENERATOR	TRIMMER TO BE ADJUSTED	TRIMMER ADJUSTMENT
Fully open	455 KÇ	.1 MFD	12AU6 Grid	IF Top and Bottom	Maximum
Fully open	1620 KC		Loosely couple generator to ''Loop Antenna''	Osc. sectian of tuning condenser	Maximum
Tune in signal 1400 KC from generator.			Loosely couple generator to ''Loop Antenna''	Ant. section of tuning condenser	Maximum

TO CHANGE NEEDLE:

Raise tone arm to vertical position. Needle is held by small screw an cartridge. Loosen screw, remove defective needle and replace.

NOTE: For best results use exact replacement needle and cartridge.

IMPORTANT - Set Speed Selector lever to "OFF" position when unit is not in use. This will help to prevent flat spots from developing on idler wheel.

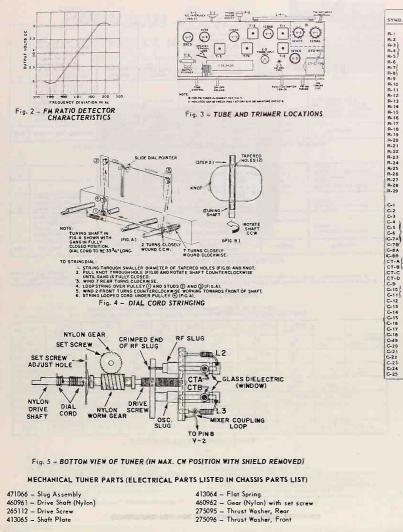
**OJohn F.** Rider

CHASSIS 120431B

RADIO PAGE 25-6

EMERSON

CHASSIS PARTS LIST, CHASSIS 1204311



				LIST					LIST
SYMB.	PT. NO.	DESCRIPTION		PRICE	SYMB.	PT. NO.	DESCRIPTION		PRICE
		RESISTOR5					CAPACITORS (CONTINUED)		
R-1	351132	470.000 OHM-CARBON	220% 1/2V".	.14	C-26	928922		500V.	.20
-2	351132	470,000 OHM-CARBON	±20% 1/2W.	.14	C-27	928924	.01 MFD-CERAMIC DISK Z5U	500V.	.20
-3)	PART	470,000 OHM-CARBON	±20% 1/2W.	.14	C-28	928914		\$ 500V.	.20
-4 }	OF	330 OHM-CARBON	±10% 1/2W.	.14	C-29	923524		\$ 400V.	.25
-57	TUNER	100 OHM-CARBON	±10% 1/2W.	.14	C-30	925433	50 MFD-ELECTROLYTIC	25V.	.95
-6	340812	22,000 OHM-CARBON	±10% 1/2W.	.14	C-31	923754		600V.	.25
.7(	PART OF	470,000 OHM-CARBON	±20% 1/2W.	.14	C-32	923754		600V.	.25
-8∫	TUNER	10,000 OHM-CARBON	± 5% 1/2W.	.14	C-33	925432	80 MFD-ELECTROLYTIC	150 V.	
.9	350372	330 OHM-CARBON	±20% 1/2W.	.14	C-34	PT. OF C-33	50 MFD-ELECTROLYTIC	150V.	1.80
10	351332	3.3 MEGOHM-CARBON	±20% 1/2W.	.14	C-35	PT. OF C-33	50 MFD-ELECTROLYTIC	150V.	
11	351132	470,000 OHM-CARBON	±20% 1/2W.	.14	C-36	922208	.047 MFD-MOLDED (U.L. BYPAS		.35
12	350372	330 OHM-CARBON	120% 1/2W.	.14	C-37	928921		500V.	
13	340852	33,000 OHM-CARBON	±10% 1/2W.	.14	C-38	928921		500V.	.20
14	340812	22,000 OHM-CARBON	±10% 1/2W.	.14	C-39	928921			.20
15	390537	2 MEGOHM-VOLUME C		1.00	C401	PART OF		500V.	.20
16	350892	47,000 OHM-CARBON	±20%1/2W.	.14	C-411	TUNER	1,500 MFD-CERAMIC DISK	500V.	
17	390538	500,000 OHM-TONE CONTRO		.65	C-42		1,500 MFD-CERAMIC DISK	500V.	
18	351372	4.7 MEGOHM-CARBON	±20% 1/2W.	.14	C-43	928894		\$ 500V.	
19	351052	220,000 OHM-CARBON	±20% 1/2W.	.14		928921		\$ 500V.	.20
20	351132	470,000 OHM-CARBON	±20% 1/2W.	.04	C-44	925447*	30 MFD-ELECTROLYTIC	150V.	
21	394207	150 OHM-FUSE OHM	±10% 1/2W.		· MAY	BE PART OF	Ç-33		
22	397121	22 OHM-FUSE OHM	210%	.80	ON SC	OME SETS,			
23	394208	470 OHM-WIRE WOUND	±10% 7W.	.80	F		TUBES		
24	380372	330 OHM-CARBON	±20% 1W.		V-1	800524	MACHINE TUDE LODAR		
25	350372	330 OHM-CARBON		.16	V-2	800047	VACUUM TUBE 12ATT	)	
26	PT. OF TU	NEP STORMECARBON	±20% 1/2W.	.14	V-3	800525	VACUUM TUBE 128E6		
27	351292	2.2 MEGOHM CARBON			V-4	800524	VACUUM TUBE 12846		
28	340932		±20% 1/2W.	.14	V-S	800524	VACUUM TUBE 128A6		
29		68,000 OHM-CARBON	±10% 1/2W.		V-6	800029			
29	370252	100 OHM-CARBON	±10% 1W.		V-7		VACUUM TUBE 19T8		
		CAPACITORS		8	V-/	800021	VACUUM TUBE 35C5		
-1	928969	47 MMF-CERAMIC U.L.	±20%	.20	SE-1	817072	SELENIUM RECTIFIER		1.80
2	928968	10 MMF-CERAMIC U.L.	±10%	.20	10)				
3	928860	47 MMF-CERAMIC	210% 500V.	.20	A	471064	FM TUNER ASSEMBLY		21.00
4 1	962227	1,000 MMF-FEED-THRU	210% 5000.	.20			COILS & TRANSFORMERS		
sl	962227	1,000 MMF-FEED-THRU		2	L+1	710034	FM ANTENNA COIL		.15
6 >	962228	2,000 MMF-FEED-THRU		9	L-21	PART OF	RF COIL (FM)		
74	PART OF	2,000 MMP-PEED-THRU			L-3 \$	TUNER	OSC. COIL (FM)		
78	TUNER				L-4	700134	BARLOOP ANTENNA		1.70
BA	900175	VARIABLE CAPACITOR-R	E CECTION		1-5	716122	OSCILLATOR COIL		.70
88				3.05	L-6	705029	FILAMENT CHOKE		. 15
	PT. OF C-8	A VARIABLE CAPACITOR-O	SC, SECTION						. 15
T-A{	PART OF				T-1	720 307	1ST FM I.F. TRANSFORMER		1.60
	TUNER	and the second		8	T-2	720075	1ST AM L.F. TRANSFORMER		1.75
r-C	PT. OF C-8/				T-3	720307	2ND FM I.F. TRANSFORMER		1.60
r-D	PT.OFC-8/				T-4	720075	2ND AM I.F. TRANSFORMER		1.75
9	962229	9.5 MMF-DISC N-80			T-5	708341	RATIO DETECTOR TRANSFORME	2	2.35
101	PART OF	1,500 MMF-DISC			T-6	734164	AUDIO OUTPUT TRANSFORMER		1,60
115	TUNER	80 MM F-DISC							
12	928967	5 MMF-CERAMIC DISKN	-1400±10% 500V	20	SP-1	180185	SPEAKER-PM-3-1/2		
13	923534	.033 MFD-PAPER	220% 500V.	.25	SP-2	180184	SPEAKER-PM-10 X 2-1/2"		
14	928924	.01 MFD-CERAMIC DISK	Z5U 500V.	,20	SW-1	PT OF B-15	ON-OFF SWITCH		
15	928922	.0047 MFD-CERAMIC DISK	±20% 500V.	.20	5#-2	510133	FUNCTION SWITCH		
16	928914	220 MFD-CERAMIC DISK	±20% 500V.	. 20					
17	928921	.0022 MED-CERAMIC DISK	120 % 500 V.	.20	P-1	583075	INTERLOCK SOCKET & LINE COR	D	
18	928919	.001 MFD-CERAMIC DISK	120% 500V.	.20	P-2	585233	SOCKET & CABLE ASSEMBLY		
19	928912	100 MMF-CERAMIC DISK	120% 500V.	.20	X-1	505014			
20	928802	6.8 MMF-CERAMIC DISK	± 5% 500 V.	.20	X-1		INTERLOCK PLUG		
2.1	928921	10022 MFD-CERAMIC DISK	±20% 500V.	.20	X-2	508100	PHONO SOCKET		
22	925434					413067	TUBE SHIELD FOR 128A6		.10
-23		2 MFD-ELECTROLYTIC		.80		413066	TUBE SHIELD FOR 12AT7		.10
	925391	4 MFD-ELECTROLYTIC		.85					.10
-24	928922 928922	.0047 MFD-CERAMIC DISK	±20% 500V.	. 20		819107	4-SPEED CHANGER		
		.0047 MFD-CERAMIC DISK	±20% 500V.	20					

	CABINET F	ARTS LIST, MODEL 8958
ſ	PART NO.	DESCRIPTION Cabinet - Specify color
31	592064A	Grille Cloth
1	413223	Control Panel
1	604054	Medallion
1	562519	Felt Feet
11	180184	Speaker - 21/2" x 110"
	180185	Speaker - 3'b''
11	925391	Electrolytic Capacitor, 4 MFD, NP
	413162	Pilot light bracket
21	560612	Masonite back
	583075	Line cord
	460997A	Knob - Vol, Tone
	460999A	Knob - Tuning
1.	460998A	Knoh - Switch-Phone-Am-Em

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MANUAL No 4-500

# Firestone PORTABLE RADIO PHONOGRAPH

STOCK NO. 4-V-17 CODE NO. 1-8-3RP8

# OPERATING INSTRUCTIONS, SERVICE MANUAL AND PARTS CATALOG

IMPORTANT: Do not lose or destroy these instructions. Read them carefully and keep far future reference and correct needle replacement.

IMPORTANT: This instrument is designed to aperate from g 105-125 volt 60 cycles AC power source only. If in doubt check with your local power company before connecting the instrument.

# TO OPERATE RADIO

 Turn ON-OFF VOLUME knob clackwise and wait until set warms up. Then push RADIO-PHONO SLIDE SWITCH to radio position. The turntable will not revolve with switch in this position. It will revolve with switch in phone position only.

2. Tune STATION SELECTOR DIAL knob So that arrow points to desired station, and adjust volume to your preference.

NOTE: This model has an external antenna connection for remote pickup.

# TO OPERATE PHONOGRAPH

1. Place record on turntable. Move speed indicator to proper speed (33 1/3, 45, or 78).

NOTE: The wrong speed may cause damage to the record, so be SURE to use correct speed.

2. Then place pick up arm on start of record. Push RADIO-PHONO SLIDE SWITCH to PHONO. This will start the motor.

3. Adjust the volume control to your preference.

NOTE: If a 45 RPM record is used, twist adapter counterclockwise to roise it and fit recard onto adapter.

. 4. To shut unit aff turn ON-OFF VOLUME Knob counter-clockwise until switch clicks off.

DO NOT DROP PICK UP ARM ON RECORD. This can cause damage to cartridge, needle or record.

Put pick up arm into arm rest before clasing the cabinet.

# STOCK NO: 4-V-17

# SPECIFICATIONS

CODE NO: 1-8-3RP8

Cobinet Dimensions	Width 12 in., Height 5 in., Length 10 in.
Shipping Weight	
Power Supply	
Tuning Ronge	
Intermediate Frequency	
Loud Speaker	
Voice Cail Impedance	
Power Output	
Tube Complement	I 12AU6-Converter
Tobe Comprometri	I - 12AV6-Detector - 1st Audio
	1 50C5-Power Amplifier
	1 35WARectifier

For alignment or repairs, remove motor board by unscrewing 4 Philipshead motorboard boltig

# ALIGNMENT

A. Equipment

- The following equipment is necessary for proper alignment: 1. Signal Generator that will provide the test frequencies as listed, modulated 400
  - cycles 30%.
- 2. Non-metallic screwdriver.
- 3. Output Meter.

B. Test Set Up

Volume control-maximum, all adjustments Na signal applied to antenna. Connect 0: Condenser in series with autput lead of signal generator. Connect ground lead of signal generator to common ground abave chassis. Connect Output Meter across Vaice Coil.

DIAL	GENERATOR	DUMMY ANT ENNA	GENERATOR	TRIMMER TO BE ADJUSTED	ADJUSTMENT
Fully open	455 KC	.1 MFD	12AU6 Grid	IF Top and Bottom	Maximum
Fully open	1620 KC		Loosely couple generator to ''Loop Antenna''	Osc. section of tuning condenser	Maximum
Tune in signal 1400 KC from generator.			Loosely couple generator to ''Loop Antenna''	Añt. section of tuning condenser	Maximum

TO CHANGE NEEDLE:

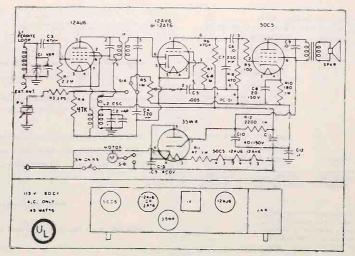
Roise tone arm to vertical position. Needle is held by small screw on cartridge. Loosen screw, remove defective needle and replace.

NOTE: For best results use exact replacement needle and cartridge.

IMPORTANT - Set Speed Selector lever to "OFF" position when unit is not in use. This will help to prevent flot spots from developing on idler wheel.

**OJohn F.** Rider

CODE 1-8-3RP8



# PARTS LIST - STOCK NO. 4-V-17

231120 229017

	Part No.	Description	List Price
31120	308.0	*Cabinet	6.00
29017	Sec. 1	*Motorboard	1.20
2	70138	*Knob, with Arrow	.23
2	70112	*Knob, Plain	.08
3	10121	*8" 3 Speed 117V. Alliance Motor	10.88
3	15013	*8" Turntable, Rust, with White "45" Adapter	1.50
321017 8	221385-	Astatic Tone Arm	1.00
3	21510	Astatic Cartridge 16L3	6.20
3:	29201	Astatic 2 Mil Straight Shank Needle #N4-2	1.00
4	14001	*4" Speaker	3.80
5	83020	40 x 40 x 20 MFD=150V. Elect. Cond. CE-1028	1.20
5	90020	*CV67 Variable Condenser	2.33
4	20006	*PC 151 Printed Circuit	.66
	60081	*VC 42 1.0 Megohm Vol. Control-with Switch	.85
	50010	*LF 57 IF Transformer	1.16
	55055	*LC 54-3 Osc: Coil	.72
	54018	*LPFE-24 Ferrite Loop Antenna	1.24
	70024	*Slide Switch DPDT Sw 44	.26
	50002	12AU6 Tube	2.12
	50005	12AV6 or 12AT6 Tube	1.64
	50004	50C5 Tube	2.08
35	50003	35W4 Tube	1.32

NOTE - All parts not appearing on parts list may be replaced with any standard replacement part of similar type and value.

\* Use genuine factory replacements for items marked with an asterisk. These parts may be ordered from your Firestane Parts Warehouse.

**OJohn F. Rider** 

# Firestone

# CLOCK RADIO

# SERVICE MANUAL AND PARTS CATALOG

# STOCK NO. 4-A-158 CODE NO. 1-8-51/284

# STOCK NO. 4-A-158

CODE NO. 1-8-51/284

# SPECIFICATIONS

Cabinet Dimensions	ß
Shipping weight	1
Power supply	
Tuning Range	
Intermediate Frequency	4
Loud Speaker	١.
Voice Coil Impedance	Ľ,
Power Output	ľ,
Tube Complement	1

Width 11 in., Height 8 in., Depth 7 in. 7½ Ibs. 105-125 volts AC 50/60 cycle Standard Broadcast Band 455 KC 4 in. P.M. 3.2 ohms at 400 cycles Maximum 1.8 watts 1 - 12BE6-Converter

- 1 12BAG-I.F. Amplifier 1 12BAG-I.F. Amplifier 1 12AVG-Detector-AVC-11st Audio 1 50C5-Power Amplifier 1 35W4-Rectifier

# To Remove Chassis:

Pull both knobs off front of cabinet

- Remove 4 Phillips head screws tying back to front of cabinet.
   Remove 4 hex-head chassis bolts on bottom of cabinet.
- 4. Pull chassis out.

To Remove Clock

Remove Clock
 Remove 2 clock knobs on face of clock by pulling away from cabinet.
 Remove 4 hex-head nots inside cabinet from clock mounting plate.
 Remove clock by pulling towards rear of cabinet.

## RESISTANCE\_CHART

	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7
E6	22K	1.2	36	24	2.2*K	2.2*K	3.2Meg
A6	3.2Meg	0	24	12	2.2*K	2.2*K	180
V6	6.8Meg	0	Ō	12	IMeg	Meg	472*K
5	150	470K	36	85	150	2.2*K	180*
4	NC	NC	85	120	115	115	~+

Measurements taken with VTVM between B-and socket pins except for readings marked with "asterist, which ware taken between pin 7 of 35W4 and socket pin. All readings with set disconnected, volume control (bully (CW) open, clock set to "Off". with set disconnected, volume control tury (CH) open, Readings may vary plus or minus 20% +This reading taken with filter cond. fully discharged. NC= No Connection

~ = Infinite

# ALIGNMENT

- A. Equipment The following equipment is necessary for proper alignment: 1. Signal Generator that will provide modulated test frequencies as listed.

2. Non-metallic screwdriver. 3. Output Meter.

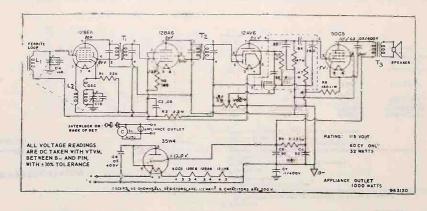
# B. Test Set Up

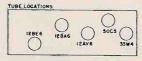
Volume control-maximum, all adjustments, No signal applied to antenna. Connect . I condenser in series with output lead of signal generator. Connect ground lead of signal generator to B... Connect Output Meter across Voice Coil. Gonerator—autput just sufficient to get reading.

DIAL	GENERATOR	DUMMY	GENERATOR	TRIMMER TO BE ADJUSTED	TRIMMER
Fully open	455 K C	.1 MFD	12BE6 Grid	lst IF Top and Bottom	Maximum
Fully open	455 KC	.1 MFD	12BE6 Grid	2nd IF Top and Bottom	Maximum
Fully open	1620 KC		Loosely couple generator to "Loop Antenna"	Osc. section of tuning condenser	Moximum
Tune in signal			As above	Ant. section of	Maximum
1400 KC from generator.	1400 KC			tuning condenser	

6.4

CODE 1-8-51/284







# PARTS LIST

PART NO.	DESCRIPTION	LIST PRICE
250370	*Plastic Cabinet, Front, White	\$2.20
250313	*Plastic Cabinet, Rear, Gold	1.84
272261	*Knob, Gold	. 16
250312	*Plastic Cabinet, Rear, Blue	1.84
272260	*Knob, Blue	.16
404006	Speaker, 4" P.M.	2.48
456023	*I.F. Transförmer T1 & T2	1.02
201 115	Electrolytic 50 x 30/150V	.92
430330	*Output Transformer	1.00
455075	*Oscillator Coil	.64
368030	*Volume Control, 1 Meg.	.60
464028	*Ferrite Loop	1,12
590054	*Variable Condenser w. drum	2.45
420006	PC 151 Couplate	.62
260068	Dial Crystal	. 10
384020	Clock	11.00
272252	Clock Knobs	.02

NOTE: - All parts not appearing on parts list may be replaced with any standard replacement part of similar type and value.

\*Use Genuine factory replacements for items marked with an asterisk. These parts may be ordered from your Firestone Parts Warehouse.

OJohn F. Rider

# STOCK NO. 4-A-157

# CODE NO. 1-8-51/283

# SPECIFICATIONS

Cobinet Dimensions	Width 11 in., Height 8 in., Depth 7 in.
Shipping weight	
Power supply	105-125 volts AC 50/60 cycle
Tuning Range	Standard Broodcast Band
Intermediate Frequency	455 KC
Loud Speaker	4 in. P.M.
Voice Coil Impedance	
Power Output	Moximum 1.8 watts
Tube Complement	1 - 12BE6-Converter
	1 - 12BA6-I.F. Amplifier

- 1 12AV6-Detector -AVC-1st Audio 1 50C5-Power Amplifier
- 1 35W4-Rectifier

To Remove Chassis:

- 1. Pull both knobs off front of cabinet 2. Remove 4 Phillips head screws tying back to front of cabinet.
- Remove 4 hex-head chassis balts on bottom of cabinet. 3
- 4. Pull chassis out.

#### To Remove Clock

- Remove Clock knobs on face of clock by pulling away fram cabinet.
   Remove 4 hex-head nuts inside cabinet fram clock mounting plate.
- 3. Remove clock by pulling towards rear of cabinet.

## RESISTANCE-CHART

	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7
2BE6	2216	1.2	36	24	2.2*K	2.2*K	3.2Meg
12BA6	3.2Meg	0	24	12	2.2*K	2.2*K	180
12AV6	6.8Meg	0	0	- 12	TMog	1 Meg	472*K
50C5	150	470K	36	85	150	2.2*K	180*
35W4	NC	NC.	85	120	1150	115	~+

Measurements taken with VTVM between B-and socket pins except for readings\_marks with 'astaris', which were taken hetween pins 7 of 35W and socket pin. All readings with set disconnected, volume control fully (CW) open, clock set to "Off". Readings may vary plus or minus 20% + This reading taken with filter cond. fully discharged. N C= NG Connection ~= Infinite Measurements taken with VTVM between B-and socket pins except for readings marked

#### ALIGNMENT

A. Equipment

The following equipment is necessary for proper alignment: 1. Signal Generator that will provide modulated test frequencies as listed. Non-metallic screwdriver. 3. Output Meter. B. Test Set Up

Volume control-maximum, all adjustments. No signal applied to antenna. Connect .1 condenser in series with output lead of signal generator. Connect ground lead of signal generator to B-. Connect Output Meter across Voice Coil. Generator-output just sufficient to get reading.

DIAL	GENERATOR	DUMMY	GENERATOR	TRIMMER TO BE ADJUSTED	TRIMMER
Fully open	455 K C	.1 MFD	12BE6 Grid	1st IF Top and Bottom	Maximum
Fully open	455 KC	.1 MFD	12BE6 Grid	2nd IF Top and Bottom	Maximum
Fully open	1620 KC		Loosely couple generator to "Loop Antenna"	Osc. section of tuning condenser	Maximum
Tune in signal			As above	Ant. section of	Maximum
1400 KC from generator.	1400 KC			tuning condenser	

# Firestone

# CLOCK RADIO

# SERVICE MANUAL AND PARTS CATALOG

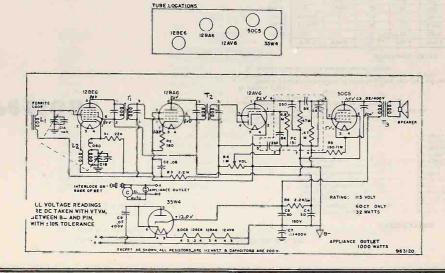
# STOCK NO. 4-A-157 CODE NO. 1-8-51/283

# PARTS LIST

PART NO.	DESCRIPTION	LIST PRICE
250360	*Plastic Cabinet, Front, White	\$2.20
250301	*Plastic Cabinet, Rear, Red	1.84
272262	*Knob, Tuning, Red	.24
272259	*Knob, Volume, Red	.16
250304	*Plastic Cabinet, Rear, Pink	1.84
272251	*Knob, Tuning, Pink	.24
272250	*Knob, Volume, Pink	.16
404006	Speaker, 4" P.M.	2.48
450023	*I.F. Transformer T1 & T2	1.02
582005	Electrolytic 50 x30/150V	.92
430330	*Output Transformer	1.00
455075	*Oscillator Coil	.64
368030	*Volume Control, 1 Meg.	.04
464028	*Ferrite Loop	1,12
590052	*Variable Condenser	2.12
420006	PC 151 Couplate	.62
260015	*Clock Crystal	
384019	*Clock	.30
272224	*Clock Knobs	10.60
	Crock Miloba	-02

NOTE - All parts not appearing on parts list may be replaced with any standard replacement part of similar type and value.

\*Use Genuine factory replacements for items marked with an asterisk. These parts may be ordered from your Firestone Parts Warehouse.



# ©John F. Rider

# STOCK NO: 4-A-156

CODE NO. 1-8-51/184

# SPECIFICATIONS

Cabinet Dimensions	Width 11 in., Height 8 in., Depth 7 in.
Shinning weight	7 lbs.
Power supply	105-125 volts AC 50/60 cycle, or DC
Tuning Range	Standard Broadaast Band
Intermediate Frequency	455 KC
Loud Speaker	4 in, P.M.
Voice Coil Impedance	3.2 ohms at 400 cycles
Power Output	Maximum 1,8 watts
Tube Complement	1-12BE6-Converter
	1-12BA0-I.F. Amplitier
	1-12AV6-Detector-AVC-1st Audio
	1-50C5-Power Amplifier
	1-35W4-Rectifier

To Remove Chassis: 1. Pull both knobs off front of cabinet.

3

Remove 4 Hexthead chassis bolts on bottom of cabinet.

4. Pull chassis out.

		F	RESISTANC	ECHART			in succession
	PINT	PIN 2	PIN.S	PIN 4	PIN 5	PIN 6	PIN 7
12BE6	22K	1.2	36	24	252*K	2.2*K	3.2Mog
12BA6	3.2Meg	0	24	12	2.2*K	2.2*K	180
12AV6	6.8Meg	0	0	12	IMeg	1Meg	472*K
50C5	150	470K	36	85	150	2.2 <u>*</u> K	1805
35₩4	NC	NC	85	120	115	115	~t

Measurements taken with VTVM between B-and sacket pins except for readings marked with \* asterisk, which were taken between pin 7 of 35W4 and socket pin. All readings with set disconnected, volume control fully (CW) open.

Readings may vary plus or minus 20%. This reading the with filter cond. fully discharged. NC = No Connection

- Infinite

# ALIGNMENT

A. Equipment

The following equipment is necessary for proper alignment:

Signal Generator that will provide modulated test frequencies as listed.
 Non-metallic screwdriver.

- 3. Output Meter.

B. Test Set Up

Volume control-maximum, all adjustments No signal applied to antenna. Connect .1 condenser in series with output lead of signal generator. Connect ground lead of signal generator to B-. Connect Output Mater across Voice Coil. Generator-output just sufficient to get reading.

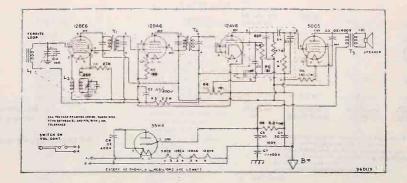
	GENERATOR	DUMMY	GENERATOR	TRIMMER TO BE ADJUSTED	ADJUSTMENT
Fully open	455 KC	1MFD	12BE6 Grid	Ist IF Top and Bottom	Maximum
Fully open	455 KC	.1 MFD	12BE6 Grid	2nd IF Top and Bottom	Maximum
Fully open	1620 KC		Loosely couple generator to "Loop Antenna".	Osc. section of tuning condenser	Maximum
Tune in sig- nal 1400 KC from genera- tor.	1400 KC		As above	Ant. section of tuning condenser	Maximum

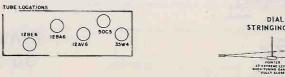
# Firestone

# 5 TUBE AC-DC RADIO RECEIVER

# SERVICE MANUAL AND PARTS CATALOG

# STOCK NO. 4-A-156 CODE NO. 1-8-51/184





)
RAM
THREE TURNS

PARTS L	

PART NO.	DESCRIPTION	LIST PRICE
250340	*Plastic Cabinet, Front, White	\$2.20
250213	*Plastic Cabinet, Rear, Gold	1.84
272261	*Knob, Gold	.16
250214	*Plastic Cabinet, Rear, Pink	1.84
272250	*Knob, Pink	. 16
404006	Speaker, 4" P.M.	2.48
450023	*I.F. Transformer T1 & T2	1.02
582005	Electrolytic 50 x 30/150V	.92
430330	*Output Transformer	1.00
455075	*Oscillator Coil	.64
368029	*Volume Control, 1 Meg., w/switch	.83
464028	*Ferrite Loop	1, 12
590054	*Variable Condenser w. drum	2.45
420006	PC 151 Couplete	62

NOTE - All parts not appearing on parts list may be replaced with any standard replacement part of similar type and value.

\*Use Genuine factory replacements for items marked with an asterisk. These parts may be ordered from your Firestone Parts Warehouse

# RADIO PAGE 25-8 FIRESTONE



# S-C415-2 COVERS MODELS C415 A,C C416 A, C C417 A.C

SUPERSEDES S-C415 -1

PRELIMINARY SERVICE DATA

	SPECIFICATIONS	
BLECTRICAL, RATING:	Voltage 105-120 Volt Wattage at 117 Volts	
POWER OUTPUT:	Undistorted Maximum	1 Watt 1.75 Watts
TUBE COMPLEMENT :	VI OscConv. "A" V VI OscConv. "C" V V2 I.F. Amplifier V3 Detector & Audio V4 Audio Output V5 Rectifier	ersion 12BE6 12BA6

#### GENERAL INFORMATION

The clock in these models has the unique Snoor-Harm feature. The clock elso provides automatic on-off control of the radio and appliance receptacle at a miniame to prevent the printed wiring. Keen soldering, keep the heat to the radio and appliance receptacle at a miniame to prevent the printed wiring from becoming the clock of the clock used is a unbonded. A 35 watt soldering iron is recommended.

# TO REPLACE DIAL LIGHT

1. Remove cabinet back. 2. Push in dial light holder and release holder from bracket. 3. Pull holder out from rear of chassis. 4. Replace dial light. 5. Insert holder and snap on bracket.

Always use an isolation transformer when servicing this receiver to protect the test equipment and personnel. When aligning, connect the output lead of the signal generator to the grid of an 1.7, tube through a .05 capacitor. This will prevent the output impedance of the generator from having a loading

TO REMOVE CHASSIS FROM CABINET Remove tuning, volume and timer knobs. Remove time set knob from shaft at back of

cabinet. Hold shaft and turn knob counter clock-

wise. Remove five hex-head screws on cabinet back. Remove four hex-head screws on bottom of cabinet. Remove timer by unscrewing four Phillips head

screws. Unsolder speaker leads from speaker. Pull chassis out slowly.Leave leads from chassis to timer attached for A.C.power while testing.

CAUTION

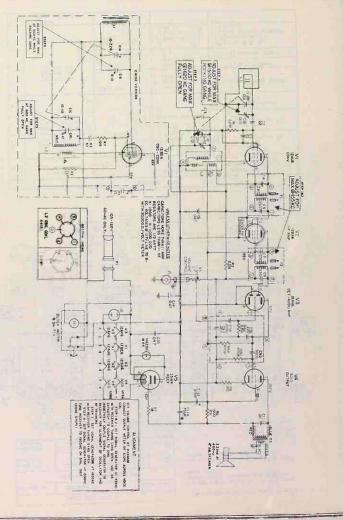
PRET INTNARY REPLACEMENT PARTS LIST

effect on the circuit.

wise.

screws.

CAT. NO.	DESCRIPTION	PRICE	GAT. ND.	SYMBOL	DESCRIPTION	PRICE
	CABINET & APPEARANCE TITEMS	1	in the second se		MISCELLANEOUS (CONT'D.)	
RB=1028 RB=1029 RB-1030 RB-1025 RB-1026	Cab., Back, Ivory, Model C415 Cab., Back, Pink, Model C416 Cab., Back, Turquotse, Model C417 Cab., Front, Ivory, Model C415 Cab., Front, Pink, Model C415	. 2.15 2.15 . 4.85 . 4.85	RHC-111 RDC-032 RHM-043 RHC-095 RWX-058		Clip, Dial Light Dial Cord,Bulk 25yds Retaining Ring,Tuning Sha Clip,Tubular, (Speaker) Socket, Dial Light	R 0
RB-1027 RS-1173 RS-1172	Cab., Front, Turquoise, Model C417 Knob, Snooz-Alarm, Ivory, Model C416 Knob, Snooz-Alarm, Pink, Model C416	5 .20		cc	DILS & TRANSFORMERS	Participa
RS-1171 RS-1096 RDK=425 RS-1170 RDP-090 RDW-112	Knob, Snoz-Alarm, Turq., Model C41 Knob, Clock (Lever Type) Knob, yol. KTune, Clear & Gold Dial Scale & Window. Dial Scale & Window. Dial Back Window-Translucent		821-197 *- 28-1973 812-142 812-064	71,2 12 12 11 11 11	1.F. Transformer Oscillator Coil C415C Oscillator Coil C415A Antenna, Iron Core C415A. Antenna, Iron Core C415C. Dansformer, Output	1,0
	MISCELLANEOUS			P	TENTIOMETER	
RB-1057 RS-1174 RS-1179 RS-1181	Speaker 4" Plate, Power Cord Bracket, Antenna Receptacle, Appliance		RRC-375	IRG C,	Vol. Cont. 1 Meg. C.T	
RS-1161 RS-1168 RVL-039 RJJ-010 RJS-232 RJS-237 RJS-182 RVX-343 RVW-037 RVW-088 RVX-130	Terrefinal 1., optimized Biver, Power Cord. Power Cord. Socket, Tube W/Conter Pin. Socket, Tube. Jack, Phono. Juling Shafts Shaft. Pullay, Volume Shaft. Soring, Tuning Drum.		RCW-3216 RCE-231 REK-011 RS-1302 RCT-099 *-RS-1480 ALL PART. OBTA	C11A,B C9A,B,C,D R4A,B,C C2 C1A,B,C,D C1A,B,C,D S NOT LISTED	3mmf., ±207, 500v, ceramic. Electrolytic 75-302150v. Network. Capacitor. Tuning Capacitor C415A. Tuning Capacitor C415C. BY CAT. NOS. ARE COMMON LOCAL RADIO PARTS JOBBERS	2.1 .8 3.3 1TEMS



# MODELS C415A, C, C416A, C, C417A, C

GENERAL, ELECTRIC

RADIO PAGE 25 -

CJohn F. Rider



	SPE	CIFICATIONS		1	PARTS I	IST CONT'D.	
	1		-	CATALOG NO.	SYNBOL		PRIC
CABINET:		ahogany; C421A. B. Blue; ose Beige		CATALOG NO.			TRIG
ELECTRICAL MATING:	105-120 30 Watte	Polts A. C. 60 cycles			C5,6 C14,16 C15,20,21	.05mf.,400V.,Paper .02mf.,400V.,Paper .047mf.,600V.,Paper	
OWER	Undistor		Watts			POTENTIOMETER	
NUTPUT:	Maximume		WATER	n-RS-1219	R8	Volume Control, 4megs	1.9
SPEAKER :	5 1/4" 3	.20hms @ 400 cps.			COILS	AND TRANSFORMERS	-
TUBE		Amplifier	12BA6 12BE6	RS-1142	T2	Oscillator Coil	
COMPLEMENT:		. Amplifier	12BA6	RS-1143	T3.4	I.F. Transformer	
		& Audio Amplifier	12AV6		TI	R.F. Transformer	
		e Output		n-RS-1220	LI	Antenna	11.
		lfier		n-RS-1222	TS	Output Transformer	3.
	CENERAL	INFORMATION			MISCELLA	NEOUS ELECTRICAL	-
		C621A, C621B, and C622B	are 5	n-RB-1046	Speaker, 5	1/4"	6.3
ine mode	criffer su	perhaterodyne radio-time	r re -	m-RS-1223	Appliance	Receptacle	1.1
relvers. A	R.F. acapl	ifier stage is used to p	rovide	RJS-182			
Increased se	neitivity a	and selectivity.		RJS-232		t with center pin, (V3)	
The vol	ume contro	is used for both the r	adio and	RJS-237		t	
hono volume	. A switch	at the center position	of the	RWL-039	Power Cord		
		radio signal from being		RS-1128		ch (Tone Control)	
		shono. A slide switch for		8S-1183		· · · · · · · · · · · · · · · · · · ·	1.
		the rear of the cabinet.				NEOUS MECHANICAL	
		ive timer units, (Telech		RS-1100	U Type Nut		1 .1
		referred to the nearest	G. E.	RS-1127		<sup>9</sup> ••••••••••••••••••••••••••••••••••••	1 .)
Service Cente	er or G. E.	Service Station.		RS-1168	Shoulder R	ivet (power cord)	1
	TO REMOVE			RS-1174 n-RS-1213		er cord)	
		uning knobs.		n-RS-1213	SOCKEE, (P	ilot light)	
	alarm set i	indicator knob (Rear).		n-RS-1214		ft Assembly	1 3
. Unsolder				n-RS-1216		lder	1 13
Remove th				n-RS-1323		it #12	
	he cabinet			n-RS-1324		tome t	
		remain connected as t	hey are	RJJ-010		Receptacle	
one enough f	to allow re	moval of radio for repa	ir.	RMS-130	Spring (Tu	ming gang)	
	TO REMOVE			RMS-374	Tube Shiel	d Pin	1 .
. Follow st	teps 1 thro	ough 5 as above.		RMW-038	Pulley, 11	/16"	1.1
		ad screws from around sp me speaker and speaker g			CABINET	AND APPEARANCE ITEMS	-
OTE: When	servicing	or aligning, always	use an	n-RB-1037	Cabinet To	p, Mahogany, C420A	4.
solation tr	ansformer	to protect test equipe	ent and	n-RB-1038	Cabinet To	p, Blue, C421A	4.
				n-RB-1039	Cabinet Bo	ttom, Mahogany, C420A	3.
	have the	volume control set for	maximum	n-RB-1040		ttom, Blue, C421A, B	3.
Always 1	he signal :	input so AVC will not af	fect	n-RB-1041		ick, Mahogany, C420A	2.
Always I				n-RB-1042		ck, Blue, C421A, B	
Always I						hogany, C420A	
Always I and reduce th sutput.		REPLACEMENT DADTE 1107		n-RB-1043		10 C/21A b	
Always I and reduce to sutput.		REPLACEMENT PARTS LIST		n-RB-1044	Grille, Bl	ue, C421A, B	1.1
Always 1 and reduce the sutput. Pl			TPRICE		Grille, Bl Cabinet To	p, Blue, C421B	4.
Always 1 und reduce th sutput. Pl	RELIMINARY		T PRICE	n-RB-1044 n-RB-1074	Grille, Bl Cabinet To Cabinet To	ue, C421A, B p, Blue, C421B p, Rose Beige, C422B pttom, Rose Beige, C422B	4.1
Always 1 and reduce the sutput. Pl	RELIMINARY		T PRICE	n-RB-1044 n-RB-1074 n-RB-1075 n-RB-1076 n-RB-1077	Grille, Bl Cabinet To Cabinet To Cabinet Bo Cabinet Bo	pp, Blue, C4218 pp, Rose Beige, C4228 pttom, Rose Beige, C4228 ck, Rose Beige, C4228	4. 3. 3. 2.
Always I and reduce to sutput. PI CATALOG NO.	REL IMINARY SYNBOL	DESCRIPTION LIS CAPACITORS		n-RB-1044 n-RB-1074 n-RB-1075 n-RB-1076 n-RB-1077 n-RB-1078	Grille, Bl Cabinet To Cabinet To Cabinet Bo Cabinet Bo Crille, Ro	p, Blue, C421B pp, Rose Beige, C422B cttom, Rose Beige, C422B ick, Rose Beige, C422B se Beige, C422B	4. 3. 2.
Always I and reduce to sutput. PI CATALOG NO. RS-1134	STMBOL C18A_B	DESCRIPTION LIS CAPACITORS 100-50mf.,150V	2.40	n-RB-1044 n-RB-1074 n-RB-1075 n-RB-1076 n-RB-1077 n-RB-1078 RS-1096	Grille, Bl Cabinet To Cabinet To Cabinet Bo Cabinet Bo Grille, Ro Clock Cont	pp, Blue, C421B pp, Rose Beige, C422B ttom, Rose Beige, C422B tck, Rose Beige, C422B se Beige, C422B trol Knob (lever type)	4. 4. 3. 2
Always I and reduce to sutput. PI CATALOG NO. RS-1134 RS-1191	C184.8	DESCRIPTION LIS CAPACITORS 100-50mf.,150V 1.8mmf., 500V	2.40	n-RB-1044 n-RB-1074 n-RB-1075 n-RB-1076 n-RB-1077 n-RB-1078 RS-1096 n-RS-1205	Grille, Bl Cabinet To Cabinet To Cabinet Bo Cabinet Bo Grille, Ro Clock Cont Window Dis	pp, Blue, C421B pp, Rose Beige, C422B tctom, Rose Beige, C422B ck, Rose Beige, C422B see Beige, C422B rol Knob (lever type) 1 Sacking, C420A	4.
Always I and reduce the sutput. PI CATALOG NO. RS-1134 RS-1191 RS-1202	C184.B C184.B C3 C19	DESCRIPTION LIS CAPACITORS 100-50mf.,150V 1.8mmf.,500V 6800mmf.,450V	2.40	n-RB-1044 n-RB-1074 n-RB-1075 n-RB-1076 n-RB-1077 n-RB-1078 RS-1696 n-RS-1205 n-RS-1206	Grille, Bl Cabinet To Cabinet To Cabinet Bo Cabinet Bo Grille, Ro Clock Cont Window Dia Window Dia	pp, Blue, C4218 pp, Rose Beige, C4228 ttom, Rose Beige, C4228 ck, Rose Beige, C4228 rol Knob (lever type) 1 Backing, C420A 1 Backing, C421A. B	4. 4. 3. 2.
Always I and reduce d putput. PI CATALOG NO. RS-1134 RS-1191 RS-1202 RS-1203	RELININARY SYMBOL C18A, B C3 C19 C12,13	DESCRIPTION LIS CAPACITORS 100-50mf.,150V 1.0m.f., 500V 6800mmf.,450V 220mmf.,450V	2.40 .15 .25 .15	n-RB-1044 n-RB-1074 n-RB-1075 n-RB-1076 n-RB-1077 n-RB-1078 RS-1096 n-RS-1205 n-RS-1206 n-RS-1207	Grille, Bl Cabinet To Cabinet To Cabinet Bo Cabinet Bo Crille, Ro Clock Cont Window Dia Window Dia Snooz-Alar	p, Blue, C4218 p, Rose Beige, C4228 ttom, Rose Beige, C4228 tck, Rose Beige, C4228 rol Knob (lever type) 1 Backing, C420A 1 Backing, C420A Ber Knob, Blue, C421A, B.	4.
Always 1 and reduce to putput. Pi CATALOG MO. KS-1134 RS-1202 RS-1203 JS-1204	RELIMINARY STMBOL C18A, B C3 C19 C12,13 C11	DESCRIPTION LIS CAPACITORS 100-50mf.,150V 1.8mmf.,500V 6800mmf.,450V	2.40 .15 .25 .15	n-RB-1044 n-RB-1074 n-RB-1075 n-RB-1076 n-RB-1077 n-RB-1078 RS-1096 n-RS-1205 n-RS-1205 n-RS-1207 n-RS-1208	Grille, Bl Cabinet To Cabinet To Cabinet Bo Cabinet Bo Crille, Ro Clock Cont Window Dia Snooz-Alar Bnooz-Alar	pp. Blue, C4218 pp. Rowe Beige, C4228 ck., Rose Beige, C4228 ck., Rose Beige, C4228 rol Knob (lever type) 1 Backing, C421A, B m Bar Knob, Blue, C421A, B. m Bar Knob, Blue, C421A, B.	4. 4. 3. 2.
Always I and reduce to surput. PI ATALOG NO. RS-1134 RS-1203 RS-1203 RS-1204	RELIMINARY SYMBOL C18A, B C3 C19 C12, 13 C11 C1A, B, C, C1A, B, C, C1A, C1A, C1A, C1A, C1A, C1A, C1A,	DESCRIPTION         LIS           CAPACITORS         100-50mf., 150V           1.8mnf., 500V         5000mmf., 450V           220mmf., 450V         150mmf., 450V	2.40 .15 .25 .15 .15	n-RB-1044 n-RB-1074 n-RB-1075 n-RB-1076 n-RB-1077 n-RB-1078 RS-1096 n-RS-1205 n-RS-1207 n-RS-1207 n-RS-1208 n-RS-1208	Grille, Bl Cabinet To Cabinet To Cabinet Ba Crille, Ro Clock Cont Window Dia Window Dia Snooz-Alar Snooz-Alar Clock Crys	pp Blue, C4218 pp, Rose Beige, C4228 trom, Rose Beige, C4228 trom, Rose Beige, C4228 rol Knob (lever type) 1 Backing, C420A 1 Backing, C420A. B. m Bar Knob, Blue, C42AA, B. m Bar Knob, Blue, C42AA, B. Tal, C420A, C42AA,	4. 4. 3. 2.
RS-1134 RS-1134 RS-1191 RS-1202 RS-1203	RELIMINARY STMBOL C18A, B C3 C19 C12,13 C11	DESCRIPTION LIS CAPACITORS 100-50mf.,150V 1.0m.f., 500V 6800mmf.,450V 220mmf.,450V	2.40 .15 .25 .15 .15 6.80	n-RB-1044 n-RB-1074 n-RB-1075 n-RB-1076 n-RB-1077 n-RB-1078 RS-1096 n-RS-1205 n-RS-1205 n-RS-1207 n-RS-1207	Grille, Bl Cabinet To Cabinet To Cabinet Ba Crille, Rc Clock Cont Window Dia Snooz-Alar Clock Crys Clock Crys Pointer, C	pp. Blue, C4218 pp. Rowe Beige, C4228 ck., Rose Beige, C4228 ck., Rose Beige, C4228 rol Knob (lever type) 1 Backing, C421A, B m Bar Knob, Blue, C421A, B. m Bar Knob, Blue, C421A, B.	4.1 4.1 3.5 2.5 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1

 PARTS LIST CONT'D.

 CATALOG NO.
 DESCRIPTION
 LIST PRICE

 CABINET AND APPEAKANCE ITEMS
 -85-1475
 Bnoos-Alarm Bar Knob, C4228, 03

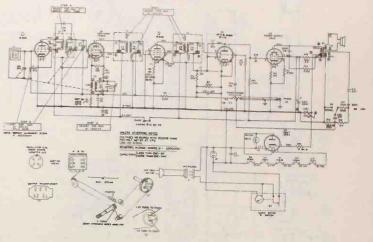
 n=85-1476
 Clock Crystal, 04218, 04228, 03
 -85

 n=85-1476
 Poinser, 04218, 04218, 04228, 03
 -33

n-Denotes Parts Not Previously Cataloged.

All Parts Not Listed By Cat. Nos. Are Common Items, Objeinable From Radio Parts Jobbers.

Prices Are Suggested List Prices And Subject To Change Without Notice.



		ALIG	NMENT CHART	
Step	Connect Test Oscillator	Test Oscillator Setting	Receiver Tuning	Adjust for Maximum Output
1.	12BA6, V3 grid (pin 1) in series with a .05 mf.	455KC.	Tuning	Cores of 2nd I. F. Transformer T4
2.	12BE6, V2 grid (pin 7) in series with a .05 mf.		Open (minimum capacity)	Cores of 1st I, F. Transformer T3
3.				Recheck adjustment of T3 and T4
4.	Inductively Coupled to	1620 KC	Tuning gang open	CLD Oscillator trimmer
5.	Antenna Ll	1500 KC	Tune for max. signal	CIF, R.F. Trimmer
6.				Cl8, Antenns trimmer
7.		Approximately 600 KC.	Rock in With core Of T1	cores of R. F. Transformer, Tl. Rock in with receiver tuning
8.	Repeat Steps 4,5,6,7			curring

CJohn F. Rider

RADIO PAGE 25-2 GENERAL ELECTRIC



# PRELIMINARY SERVICE DATA

	SPECIFICATIONS	-
CABINET:	C435A, Antique White	
OUTPUT:	.9 Watts Undistorted 1.8 Watts Maximum	
CLOCK:	Telechron Model J2G1	
DPERATING PREQUENCIES:	540 - 1600 KC 455 KC I. F.	

# TO REMOVE CABINET BACK:

Remove time set knob from shaft at back of cabinet. Hold time set shaft with long-nose pliers and turn knob counter clockwise to remove. Set cabinet on the clock end using a soft cloth to pro-tect the finish. Hold the line cord interlock plug with one hand. Place other hand on cabinet bottom with fingers around bottom edge of cabinet front, and thumb on bottom edge of cabinet back in groove prorunn on bottom eage of capitet back in glove pic-vided. Using the thumb, force the cabinet bottom away from the cabinet back to free the locking tabs on the bottom of the cabinet back. Remove back by pulling away, freeing interlock and locking tabs at top of cabinet back.

in the hole and place locking tabs on top of cabinet secure back sliding the locking tabs up the bevelot to replace the crystal slide it over the control inclines and saps in slots. Make certain the inter- on top face bottom locking tab in position. Public lock terminals and plug engage. Replace time set position. knob by turning clockwise on shaft.

#### TO REMOVE CHASSIS FROM CABINET:

After removing cabinet back remove the screw on the cabine bottom that holds the chart remove the scient on support. The tuning knob is a captive knob and re-mains in the cabinet front. Close the tuning gang to prevent any possible damage to the plates. Slide one hand under the printed chassis board placing the fingers over the front edge. Slide the board back

Lingers over the first legg. Slide the board back out of the tuning gam, shaft from the huming unit. The when replacing the charsts, close the tuning gam and line the flat slde of the tuning gam gamt up with the flat in the tuning knob. Place the ends of the board in the grooves and push on the edge of the board will set itself in the grooved board will set itself in the grooved board will set itself in the grooved boards support and self-tapping screw.

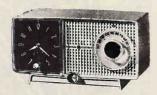
# TO REMOVE VOLUME CONTROL:

The volume control is attached to the cabinet and may be removed by pulling the knob straight off and removing the palnut. When replacing the volume control place the tab

on the control in the groove provided.

### TO REMOVE SPEAKER :

After removing the chassis board remove four tubular speaker clips and lift the speaker out of the cabinet.



s-C435

COVERS MODEL

C-435A

# TO REMOVE CRYSTAL

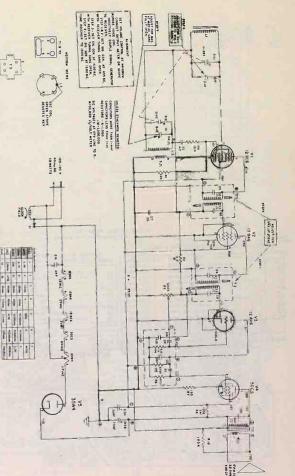
 Remove clock control knob by pulling straight off; 2. Press down on the top of the crystal slightly to release the top locking tab; 3. Move crystal up from bottom releasing the bottom locking tab; 4. Lift To replace cabinet back line the time set shaft crystal off carefully to prevent scratching on the control shaft.

#### TO REMOVE CLOCK:

Turn time set knob so that all hands are at twelve o'clock. Remove time set knob by holding shaft with long-nose pliers and turn knob counter clockwise. Remove chassis, speaker and crystal as described previously. Remove each hand separately with recom-mended hand lift tool #XC70X1 which is available from General Electric Servicenters. Remove the two tubular clips from inside the cabinet.

When replacing the clock replace the hands in the same position they were in before removal (twelve o'clock).

	REPLA	CEMENT PARTS LIST	
CAT. NO.	SYMBOL	DESCRIPTION	PRICE
		CAPACITORS	e
RCE-215 n-RS-1413 REK-011	CLA, 1B	Elect. 75-30 @ 150V Tuning Gang Bulplate	2.00
		POTENTIOMETER	
n-RS-1417	iges.	Volume Control 500K	1.00
		COILS & TRANSFORMERS	
n-83-1409 1-83-14137 n-88-1415 n-88-1415	L1 L2 T1,2 T3	Antenna (Iron Core) Oscillator Coll I.F. Transformer Output Transformer	1.15 .65 1.55 2.20

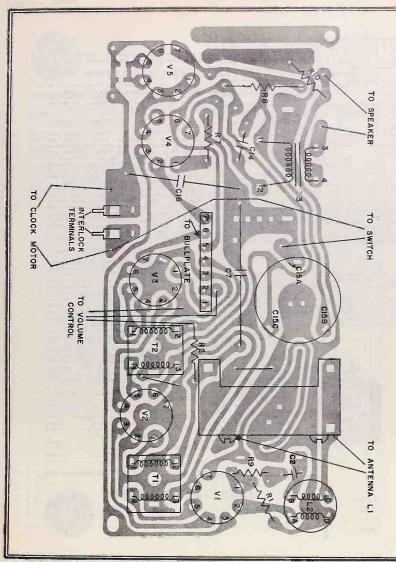


MODEL C-435A

GENERAL

ELECTRIC

RADIO PAGE 25 -



CAT. NO.	DESCRIPTION	PRICE	CAT. NO.	DESCRIPTION	PRICE
	MISCELLANEOUS		1	CABINET & APPEARANCE LITEMS	1
RMS-356 RHC-095 RS-1093 PRS-1418 RS-1188 RB-1057 RS-1455 A-RS-1307 A-RS-1309 All Parts	Clip, Captive (Tuning Kmob). Clip, Tubular (Speaker). Extension, Shaft (Clock). Terminals, Interlock. Antenna, Clamp. Speaker 4 <sup>24</sup> . Power Cord. Tube Socket, JPin W/Center Pin Not Listed By Catalog Number Are	.05 .10 .03 .15 5.45 1.00 .10 .15	M*RB-1063 n-RS-1404 n-RS-1401 n-RS-1401 n-RS-1405 n-RS-1405 n-RS-1406 n-RS-1407 n-RS-1408 n-RS-1468 RK-425 RS-1005	Cabinet, Antiqué White Cabinet Back, Masonite Crystal, Clock. Second Hand. Alarm Mand. Minute Hand. Hour Hand. Hour Hand. Knob Yuling W Linsert. Knoby Volume W Linsert Knob, Journe J.	.25

PEDIACEMENT DADMO + T

Items, Obtainable From Radio Parts Jobbers.

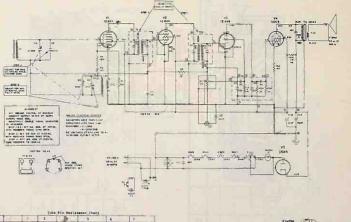
"n" - Denotes New Items Not Previously Cataloged.

Prices Are Suggested List Prices Subject To Change Without Notice. MODEL\_C-435A

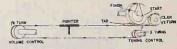
RADIO PAGE 25-4 GENERAL ELECTRIC

OJohn F. Rider

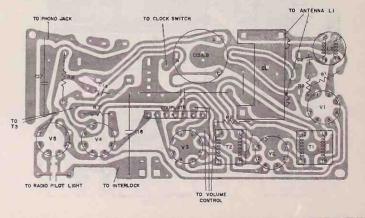
96	PRELIMINARY S	ERVICE	COV	
0	SPECIFICATIONS	PRELIMINAR	Y REPLACEMENT PARTS LIST (CON	f'D.)
CABINET:	C440A = White, Blue, & Silver C441A - White, Black & Gold	CAT. NO: STHEOL	DESCRIPTION	PRIC
OPERATING	540 = 1600 KC		POTENDIOMETER	
FREQUENCIES	455 - KC I. F.	*-RS-1568 R3	Volume Control, 1 meg	1.1
POWER OUTPUT:	Undistorted: 1 Watt Maximum: 1.5 Watts	-	COILS & TRANSFORMERS	-
TUBE : COMPLEMENT:	VI         Osc. Conv.         12BE6           V2         I.F. Amplifier         12BA6           V3         Det. 6 Audio Amplifier         12AV6           Power, Output         SOCS         SOCS	RS-1415 T1,2 RS-1437 12 *-RS-1564 L1 *-RS-1567 T3	Transformer, I.F Coil, Oscillator Antenna. Transformer, Output	1.5 .6 1.4 2.1
	V5 Rectifier 35W4		MISCELLANEOUS	-
<ol> <li>back.</li> <li>Remove two over appli</li> <li>Remove two</li> <li>Pull line gage.</li> <li>Open cabin</li> </ol>	TO REMOVE CABINET BACK Mer time-set knob from shaft on cabinet perfers at top of cabinet back and one ance outlet. perfers from line cord interlock plete. cord interlock out slightly to disen- back. pilot light, set dial at 55, then	RB-1057 RS-1323 *-RS-1522 *-RS-1557 *-RS-1559 *-RS-1561 *-RS-1562 *-RS-1569 *-RS-1569 *-RS-1570 *-RS-1570 *-RS-1571 *-RS-1656	Speaker Light, Flict #12 (Radio Dial, Turing Shaft Assembly Nolder, Interlock Socket, Pilot Light(for #12 Hood, Pilot Light(for #12 Hood, Pilot Light(for #12 Hood, Pilot Light(for #12 Hood, Pilot & 43 (Nite-Light) Receptacle, (AppHinne) Interlock. Switch, (Nite-Light)	.70
<ol> <li>Remove tur</li> <li>Unsolder g</li> </ol>	TO REMOVE CHASSIS Eps one through six as above. ing and volume knobs. treen wire from too right side of these	*-RS-1657 RDC-032 RHC-095 RJS-182 RJS-232 RJS-237 RMS-130	Clip, Spring, (Rite-Light). Cord, Dial (25 yds. bulk). Clip, Tubular Connector, Phono Socket, (with center pin) Socket, (w/o center pin) Spring, (Tuning gang)	.10
Lytic capacite	wire enters circuit board near electro- pr.)		CABINET & APPEARANCE ITEMS	
5. Remove for NOTE: When a always use an equipment and Always have reduce signal	we volume control set for maximum, and input so AVC will not affect output.	*-RB-1080 (Assem.) *-RB-1081 (Assem.)	Cabinet Front, Blue, C440A, Cabinet Back, White Crystal Hinges (2) Backing & Reflector Cabinet Front, Black & Cold C441A.	11.3
for Model C441 G. E. Servicer When remo	er C114G13 for Model C440A and C114G14 A) should be referred to the nearest ter or G. E. Service Station. wing and replacing timer, use extreme ratch the cabinet from reverse and the sectors.	RS-1096 *-RS-1528 *-RS-1529 *-RS-1556	Cabinet Back, White Crystal	1 .10
PRE	LIMINARY REPLACEMENT PARTS LIST	*-RS-1558 *-RS-1560	Window, (Dial Backing) Pointer	.50
CAT. NO. SYN	BOL DESCRIPTION PRICE	RDK-425	Knob, (Vol. & Tune)	. 35
-RS-1565 C1 RCE-215 C15 REK-011 R4, C10 13 C2 C7 C14	5,6 ,11,12 Couplate	All Parts Not Lis Items, Obtain Prices Are Sugge	nts Not Previously Cataloged. ated By Catalog Numbers Are Co abble From Radio Parts Jobbers sted List Prices And Subject ange Without Notice.	



Tube	1	2	3	1.1	5	6	1
L2AV6	6.8M	10	15	0	300K	0	*470K
12844	2.7M	0	15	в	41500eem	*1500ohm	0
12826	22K	0	35		#1500okm	*1500ohn	2.78
socs	150oha	470K	35	-80	→70K	-1500om	+300ebm
35144	R.	TP	80	t10	105	1.05	201 6.00

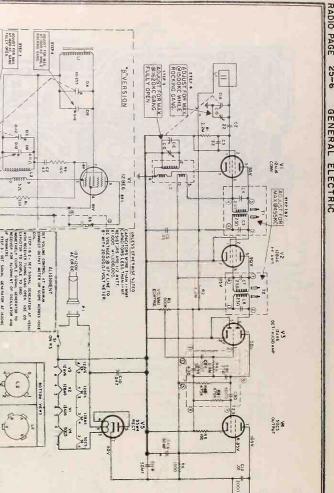


T7-Tie Point \* Meauren from Pin 7 of V5 Reafatances unsaured with pilot light(Mards # 12) in socket All neaurements taken with respect to 3- unless otherwise designated,



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MODELS T105A, T106A, B, T107B



# S-T105-2 COVERS MODEL S T105A PRELIMINARY SERVICE DATA T 106A.B T107B SUPERSEDES S-T105-1 use extreme care re-

1	SPECIFICATIONS	CAUTION: It is important to placing parts and/or soldering
CAB INET:	Plastic, 6 3/4 × 6 × 12 1/8" Model T106B, Antique White Model T107B, Turquoise	much heat on the chassis will plating to become unbonded. On iron long enough to melt the su- part to be replaced.
ELECTRICAL RATING:	105-120 Volts A-C or D-C 24 Watts @ 117 Volts A-C	A 35 watt soldering iron i repairs on the circuit board t pattern.
OUTPUT:	Undistorted 1.0 Watt Maximum 1.6 Watt	TO REPLACE THE
SPEAKER :	(2) 4 inch PM., 3.2 ohms @ 400 cps.	Remove the shaft nut and
TUBE COMPLEMENT:	V1         Oscillator-Converter	heat to the upper terminal to Apply heat to the center and 1 may be pushed out. The new c

GENERAL INFORMATION

The Models T106B and T107B are twin speaker and all-electron-tube radios. The circuitry is similar to the previous T105 radios.

### TO REMOVE CHASSIS FROM CABINET

To remove chassis from cabinet, remove cabinet lug and one ungrounded lug were connected together, back. Unsolder the output transformer leads from the the speakers would be out of phase, which would result speaker. Remove the four self-topping serves, (her in distortion and loss of audio signal. heads) one on each corner of the chassis, and the single hex screw just below the tuning gang capacitor. Pull off the volume control knob. The tuning control knob is held to the cabinet, so the chassis must be pulled out of the cabinet, at the same time pulling or aligning this receiver to protect the service it off the tuning knob, which remains on the cabinet. When pulling out the chassis, it is best to grasp the tuning capacitor (Cl) by the thumb and forefinger of one hand, the tuning knob by the other hand and pull.

PRELIMINARY PARTS LIST DESCRIPTION PRICE ICAT HO STHEOL CAPACITORS Tun. Cap. T106B, T107B.... Tun. Cap. T105A, T106A.... \*-RS-1607 CLA,B,C,D RS-1163 CLA,B,C,D RCW-3207 C9A,B,C,D R9A,B,C RCW-3266 C2,3 3.60 1.00 Bulplate..... 22mmf. ±207, 500V..... 30-50MF @150V..... .20 2.15 RCE-207 C11A, B POTENTIOMETER Vol. Cont. (500K) & Sw... 2.30 RS-1162 R3 COILS & TRANSFORMERS \*-RS-1606 L1 Loop Ant. T106B, T107B.... 1.25 RS-1415 T1,2 IF Transformer T106B, T107B 1.55 RS-1523 12 Osc. Coil T106B, T107B.... 1.00 RS-1323 L2 RS-1161 T3 RS-1156 L1 RTL-183 T1,2 RLC-135 L2 Output Transformer...... 2.55 Loop Ant. T105A, T106A.... 1.25 IF Trans. T105A, T106A.... 1.65 Osc. Coil T105A, T106A.... 1.00 "#" - Denotes Parts Not Previously Cataloged.

on this chassis. Too cause the copper ly apply the soldering solder and pull out the

is recommended for all to protect the copper

### VOLUME CONTROL

the fibre washer, then nals. Apply only enough pull out the control. lower terminals so they control may now be ind. Make sure the fibre washer is in place before installing the shaft nut.

#### SPEAKERS

When connecting the speaker leads after repair, care must be taken to insure the speakers are in correct phase with one another. To do this, you must connect the two ground lugs together, as well as the two ungrounded lugs. For example, if one grounded

# SERVICE HINT

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GENERATOR T

Always use an isolation transformer when servicing personnel and his equipment.

CAT. NO.	DESCRIPTION	PRICE
	MISCELLANEOUS ITEMS	
RS-1157	Loop Mtg. Bracket	.10
RS-1158	Tube Shield	.10
RJS-232	Tube Socket W/Center Pin	.25
RJS-237	Tube Socket	.15
RS-1159	Heat Shield	.15
RS-1164	Vol. Cont. Washer	.05
RHS-161	Eyelet, Shield	.10
RMC-061	Clamp, Plastic	.20
RMS-356	Clip, Knob	. 05
RHC-095	Clip, Speaker	.05
RWL-037	Power Cord	
RJJ-014	Receptacle, Power Cord	.15
RB-1057	Speaker 4"	
RS-1190	Ground Strap	.05
	CABINET & APPEARANCE ITEMS	
RB-1018	Cab. (Mah)W/Trim Strip & Dial Plate	
	T105A	5.70
RB-1019	Cab. (Ant. White)W/Trim Strip &	·
	Dial Plate T106A, T106B	
*-RB-1085	Cab. (Turq.)W/Trim Strip & Dial Plate	·
	T107B	
RS-1155	Cab. Back	
RS-1154	Dial Plate (Triangle)	
RS-1153	Trim Strip T106A, B, Marcon	.70
RS-1139	Trim Strip T105A, T107B, Gold	
RS-1152	Knob, Tuning	. 85
RS-1186	Dial Place (Circular W/O Triangle)	
RDK-425	Knob, Volume	.35



GENERAL 🚱 ELECTRIC	ER-S-P735A
SERVICE MANUAL	COVERS
FGR	MODELS
PORTABLE RADIO RECEIVERS	P735A
(340-1600 KC., 455 KC., 1-F.)	P7364

	SPECIFICATIONS
CABINETS: (Flastic)	Model P735A - Turquoise and White Model P736A - White and Tan
FLECTRICAL RATING :	105-120 Volts A-C (50 to 60 Cycles) or DC, 10 Watts at 117 volts A-C. 1 "A" Battery - 7 1/2 volt Everendy No, 717 or equivalent 1 "B" Battery - 90 Volt Everendy No. 479 or equivalent
OPRRATING THEQUERCIES:	Tuning range         540-1600 KG           I=F Amplifier         455 KG
AUDIO POWER OUTPUT:	150 MilliwatPS 10% distortion Maximum 250-300 Milliwatts
TUBE COMPLEMENT:	V1       Oscillator-Converter

P735A P736A

# GENERAL INFORMATION

The models P735A and P736A are four-tube superheterodyne portable radio receivers. They operate on possible to remove the parts, as excessive heat will self-contained batteries or from a power line source damage the plated wiring on the chassis boards, of 105 to 120 volts A.C. or D. C.

These models are very compactly made and in-too much replacing knobs, do not lorce them on, as corporate two plated circuit chassis, the smaller of crack, which contains the power supply components. The front of the cabinet swings down and open, providing easy VOLIME CONTROL REPLACEMENT: accessibility to tubes and batteries.

#### CHASSIS REMOVAL:

The chassis is easily removed by means of the following procedure:

1. Swing down cabinet front by grasping front four switch lugs at top edge under handle.

straight off their shafts.

3. Remove the two small Phillips-head screws from the top rear edge of the metal chassis mounting bracket.

4. Slide chassis and bracket out of cabinet.

5. Remove bracket from the chassis by removing TO REPLACE A TUBE SOCKET: the 1/4" mounting screw from center of bracket.

screws.

may be removed by removing the four speaker mounting and soldered into place. clips which secure the speaker to the four bosses on the inside of the cabinet front.

IMPORTANT: Use care when replacing defective parts.

P735A, P736A

When replacing knobs, do not force them on, as

The chassis must first be removed from the cabinet as described under CHASSIS REMOVAL and the control removed as follows:

1. Cut off the three volume control lugs and the

2. Individually remove the remaining parts of the Remove tuning volume control knobs by pulling lugs with a long-nose pliers while applying a soldering iron.

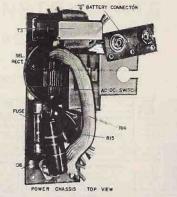
3. Clean all holes of excess solder.

4. Insert new control; then solder all lugs securely in place.

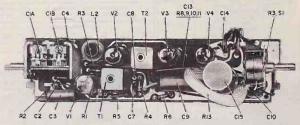
The power supply chassis is removed from the terminals at the chassis. One socket (V2) has a cabinet by removing the four small hex-head mounting center terminal which must be unsoldered. Now, heat ws. the pieces of terminals remaining in the board only enough so they may be pushed out. The new socket can The speaker is mounted on the cabinet front and now be inserted into the holes left by the old one

# BATTERY INSTALLATION:

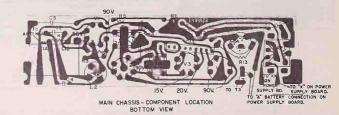
When placing the batteries into position, make Apply as little heat to terminals and connections as good contact between batteries and battery connections.

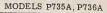




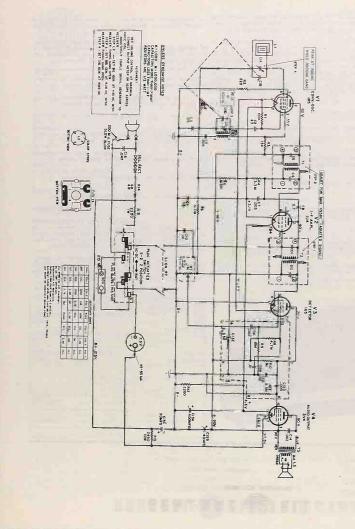


MAIN CHASSIS TOP VIEW









		REPLACEMENT I	PARTS L	IST = P735A,	P736A	12
CAT. NO.	SYMBOL	DESCRIPTION	FRICE	CAT. NO.	DESCRIPTION	PRIC
CAPACITORS			MISCELLANEOUS MECHANICAL			
RCW-3014 RCW-3014 RCW-3118 RCW-3119 RCW-3250	C7 C14 C10	Capacitor Tuning 400mf.,10V.,40mf.,90mf., @150V .003mf.,+150-0%,450V .003mf.,±20%,100V .002mf.,+100-0%,450V .01mf.,+150-0%,100V	5.00 2.95 .25 .25 .25 .25 .30	RHC-095 RHC-110 RHI-017 RHG-018 RMC-070 RMS-007 RS-1320	Clip, Speaker Mounting Clamp, (Antenna) Strain Reltef, For Power Cord Grownet Latch, (Cord Comp, Door) Stater, (Power Cord)	.05 .10 .17 .05 .05
	C2 C3	47mmf.,±20%,500V. .05mf.,±20%,400V.			Clip, I.F. Mounting CABINET & APPEARANCE ITEMS	, 04
	C8 C9	2.7mmf.,±10%,500V. .33mf.,±20%,100V.		n-RB-1047	president and the second second	
	C16.	.047mf., ±20%, 600V.		(assemb.)	Cabinet Front, White, F735A) Cabinet Back, Turquoise)	j – j
REK-010	R8,9,10, 11 Cl3A,B,C, D,E	PESISTOR-CAPACITOR NETWORK 4.7meg.,lomeg.,lmeg., 3.3meg .002mf.,.0lmf.,220mmf., .005mf., 150mmf.	1.10	n-RB-1048 (assemb.)	Hinge Grille	9.80
	R7, S1	POTENTIOMETER			Grille	9.80
-RS-1469	R7, 51	Vol. Control & Sw. 1 Meg.	1.75		Medallion Decorative Strip	
		RESISTORS		RS-1407	Door (Cord Comp.) (Turquoise), P735A	
RRW-143 RRW-144	R14 R93	68ohms, 4 Watt, Wirewound, 2450ohms, 10W. Wirewound	.30	n-RS-1233	Handle (Turquoise) and Handle, Bail, P735A	. 30
	·	COILS AND TRANSFORMERS		n-RS-1234	Handle (Tan) and Handle	.60
	12 11	Coil, Oscillator	. 78	n-RS-1235 n-RS-1237	Bail, P736A Door (Cord Comp.) (Tan) P736A Catch (Cabinet Front)	.60
RTL-193	T1,2	Antenna Assem Transformer, I.F	.95 L.50	n-RS-1238 n-RS-1239	Grille Decorative Strip	2.60
RTO-186	T3	Transformer, Output	2.40	n-RS-1240	Tuning Knob Outer.	. 35
		MISCELLANEOUS ELECTRICAL		n-RS-1241	(Turquoise), P735A Tuning Knob, Outer, Tan, P736A	.90
RER-020 RJC-035	Selenium H Connector,	DA. slo-b∯o Rectifier, 65 ma for "B" Battery	.60 2.60 .40	n-RS-1242 n-RS-1243 n-RS-1244	Volume Knob, Turquoise, P735A Volume Knob, Tan, P736A Vernier Tuning Knob, Inner, (Turquoise), P735A	1.10
RJS-232 RJS-237	Tube Socke Tube Socke	for "A" Battery t w/center pin, (V2)	.25	n-RS-1245 n-RS-1252	Vernier Tuning Knob, Inner, (Tan), P736A. Medallion	.50
RSW-114 RWL-027	Switch, AC Power Cord	- DC	1.05	"n" Denot All Parts	es Parts Not Previously Cataloged. Not Listed By Catalog Numbers Are ems, Obtainable From Radio Parts Job	

OJohn F. Rider

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# HOFFMAN HI-FI INSTRUMENTS MODEL SERIES 8003, 8005

#### MODEL SERIES 8003

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The Model Series 8003 are high quality High Fidelity hatruments which incorporate a Garrard Mark II Record Changer with Reluctance Pickup Cartridge [DIAMOND NEEDLE], preamp and Record Equalizer Control. The preamp is a transistor stage for low noise and hum factors.

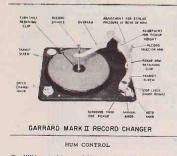
Each component of these instruments is a high quality precision unit, and exact replacement components should be used for replacement purposes to insure original performance.

#### FLOATING SOUND SPEAKER CHAMBER

This unit should be free to float on its mounting springs with no adjacent units touching the enclosure if rumblefree operation is to be maintained.

# RECORD CHANGER

The Garrard Mark II Changer Unit may be operated manually for special records, as well as automatically for 7, 10 or 12 inch records at speced of 16 2(3, 33) 1/3, 45 or 78 RPM. The changer must be floating free on its springs to prevent runble.



The HUM control is a variable control used to balance the filament circuits to ground. This control is Factory adjusted with the amplifier installed in the cabinet with all components connected. Balance may be checked with LOUDNESS control full clockwise and no audio being fed into the amplifier. Adjust to minimum hum, preferably with an AC meters across the peaker Voice Coll terminals.

# GENERAL INFORMATION

#### AM-FM TUNER

Extremely sensitive with a calcode RF stage the FM band. Built in FM antonna should be replaced with a lead from the customer's outside TV antenna it possible. This arrangement results in the ultimate in FM reception. FM-AFC permits the FM oscillator to pull the FM station into perfect tune even when the dial setting is considerably off the exact station frequency, which allows for human arror in tuning at the high FM requencies.



# FREQUENCY DISPLAY SCOPE

The Frequency Display Scope is actuated by the settings of the tone controls. This results in a visual display of tone control settings which may be logged for future playings of individual records.

To avoid actidental damage to the Frequency Display Scope Indicators, keep the Bass and Treble controls adjusted either in their extreme right or left rotation while remoing the amplifier chassis from the cabinet, and while it is outside of the cabinet. This will place the tips of the indicators inside the protective edge of the dial plate and prevent breakage.



# MODEL SERIES 8005

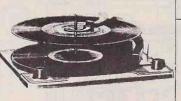
The Model Series 8005 are high quality High Fidelity instruments which incorporate a 4 speed VM Deluxe Record Changer with a ceramic cartridge.

# PLOATING SOUND SPEAKER CHAMBER

This complete speaker enclosure chamber, with its 3 matched speakers should be free to float on its 4 mounting springs if rumble-free operation fs to be achieved.

#### RECORD CHANGER

The detailed Service Data on the VM 1200A Record Changer is available in VM Booktet \$6004 and 1017, both of which may be ordered through your Hoffman Distributor. Two machine servews mount the changer to it to base board. These servews allow the changer to it to base board. These servews allow the changer to it to base board. The base base of the changer to the serves which the the transface of the changer. When the entire instrument is to be moved any distance, those servews should be turned OUT until the changer is drawn down tight against the mounting board.



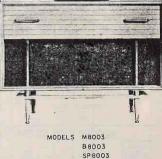
VM 120-A RECORD CHANGER

#### ELECTRICAL POWER

110 to 120 volts 60 cycle AC power. Do not connect to DC or AC of any other frequency.

#### AC LINE PLUG POLARIZING

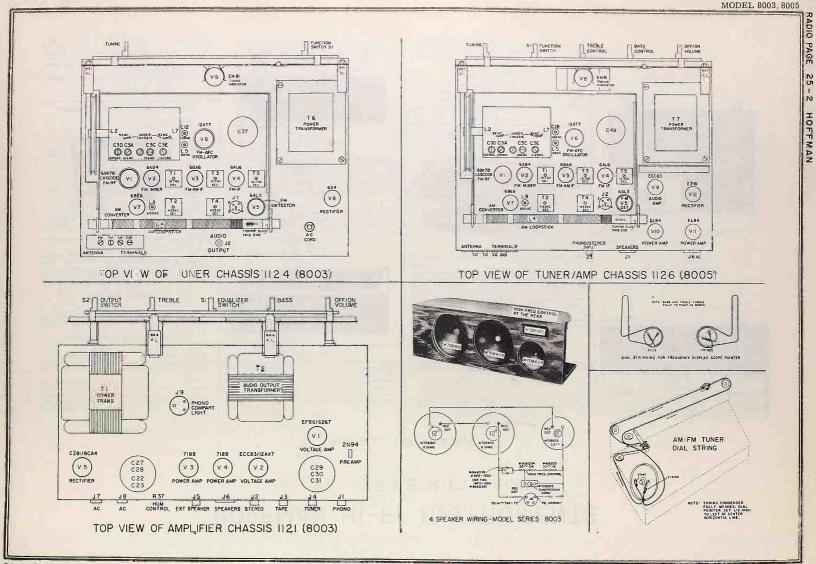
Plug in the power cord, after amplifier warms up advance the loudness control full clockwise with no audio being fed to the amplifier. Reverse the power plug and choose the polarity which gives the least hum.





SP 8005 W 8005





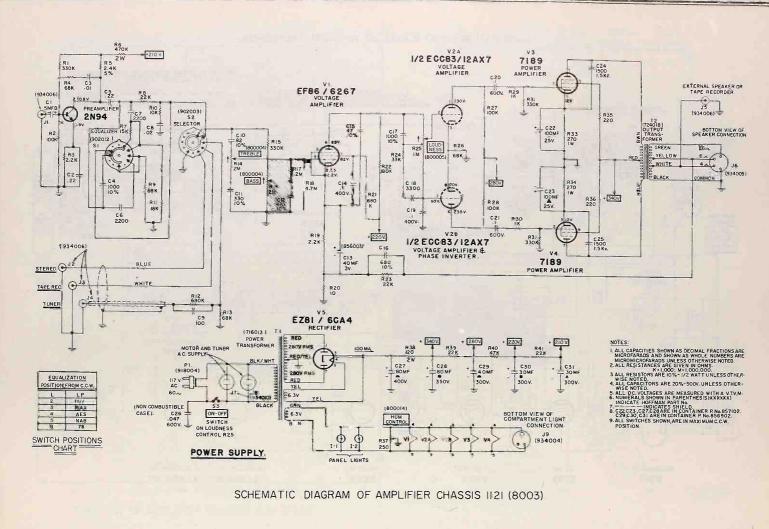
MODELD FISSA, PISOA

VIA VIB V2 V 3 V4 ٧5 1/2 6BK7B 1/2 6 BK 7 B **6AB4** 6846 6AU6 GAUS FM. CASCODE RF. EM. CASCODE RF. EM. MIXER EM.-A.M. LE EM. LE EM. DETECTOR C17 影 T 5 (774004) RATIO DET. TRANSFORMER (750008) (750009) L6 5.6µh RF. CHOKE TI (760012) (856014) (776003) ANTENNA TRANSFORMER T3 (7600|3) 10.7 1 14 2V. F.M. LF EM- LE Č4 TRANSFORME ID.7 2 10.7 11 R12 220K 142V R29 C29 PIC C11 RIA C3A C2A 333 IO6M C21 RIR 68 .01 C26 N74 RI 470K 135V. R26 390 R30 1.8 K 5% + CI8 L C24 ¥5 01 RI6 33K 닆 12AT7 T4 (760011) nov. R27 FM-A.F.C. OSCILLATOR R9 AM. L.F. 210.4 C13 2.2 Jul RII MULTIPLEX \_\_\_\_\_\_C30 (776001) 105 V, (IIOV ON AM 60 5 C22 R4 1 R21 R23 8.2K 2 W. C3C C25 R 20 8.2K 2 W. R8 FM OST 2₩. TEST SOCKET (BOTTOM VIEW) (880501) -C7 R2 220 22K 470 117 V. AC. 60.0 R25 2.2M 220 TC5. T2 1 OFF 2 AM. 3 FM.-AFC. 4 FM V 8 AM I.F. CI5 + V7 R 19 2.2M 824 47 K 6X4 500 Kc MER EXT. AM. AM. LOOP-STICK (924002) T6 RECTIFIER C34 C3 6BE6 SI. SWITCH C2 A.M. CONVERTER +270V. +245V. +210V. .01 R31 4 R32 L4 ON-OFF SWITCH 2₩ 2₩ SIA. SIC. V 9 C 37A 37A C37B ₹ C30 AN -C37C 30 µ fd C2D ON SI C20 033 E'M8I R'17 8.2 K SILVER MICA C23 TUNING E GIAL R22 C20.1 86,3 GRN C31 E.F J2 AUDIO OUTPUT LB AM OSC COIL SID 2016 GRN RECEPTACLE (7680)0) PILOT LIGHTS (210V. ON F.M.) (AtB) NOTES FUNCTION SWITCH S (902013) NUMERALS SHOWN IN PARENTHESIS INDICATE HOFFMAN PART № C2A, C2B, C2C, C2D, C2E - TUNING CONDENSER PART № 872008. C3A, C3C, C3D, C3E - TAIMMERS ON TUNING CONDENSER. C37A, C37B, C37C - IN CAN PART № 856908. SCHEMATIC DIAGRAM OF TUNER CHASSIS 1124 (8003)

HOFFMAN

RADIO PAGE

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**OJohn F. Rider** 

MODEL 8003, 8005

RADIO PAGE 25 - 4

HOFFMAN

		TUNER CH	ASSIS	1124		1		AMPLIEIE	R CHASSI	S 1121	
		APACITORS							IT ONAGOI	0 1121	
SYMBOL	PART NO.	DESCRIPTION	SYMBOL	PART NO.	DESCRIPTION	SYMBOL	PART NO.	CAPACITORS DESCRIPTION	SYMBOL	PART NO.	DESCRIPTION
C1	847205	12mmf, 5% (N750) Ceramic	R13	814208	22K, 10%, 1/2 W	CI	856011	5mfd @ 50V, Tubular	R28	814216	100K. 10%. 1/2 W
CZA			R14	814232	2.2M, 10%, 1/2 W	CZ	866029	- 22mfd, 20%, 100V	R29	814192	1K, 10%, 1/2 W
CZB	872008	3 Gang, AM-FM Tuning (with pulley)	R15 R16	814172 814210	22, 10%, 1/2 W	C3	851102	.01mfd, 20%, 500V	R30	814192	1K, 10%, 1/2 W
CZD	012000	5 Gang, Aut-Fin Tuning(with putter)	R16 R17	814210 818203	33K, 10%, 1/2 W 8.2K, 10%, 2 W	C4 C5	851110 866029	1000mmf, 10%, 500V . 22mfd, 20%, 100V	R31	814222	330K, 10%, 1/2 W
C2E			R18	814178	68, 10%, 1/2 W	C6	851108	2200mmf, 20%, 500V	R32 R33	814222 816192	330K, 10%, 1/2 W 270, 10%, 1 W
C3A -			R19	814232	2.2M, 10%, 1/2 W	C7	851108	2200mmf, 20%, 500V	R34	816192	270, 10%, 1 W
C3C	Part of C2	Alignment Trimmers	R20	818203	8.2K, 10%, 2 W	C8	851109	.02mfd, 20%, 500V	R35	814184	220, 10%, 1/2 W
C3D C3E			RZ1	814224	470K, 10%, 1/2 W	C9	851128	100mmf, 20%, 500V	R36	814184	220, 10%, 1/2 W
C4	851126	1000mmf, 20% Ceramic	RZZ	814224	470K, 10%, 1/2 W	C10	851120	82mmf, 10%, 500V	R37	800014	Hum Control, 250 chms
C5	851128	100mmf, 20% Ceramic	R23 R24	818203 814212	8.2K, 10%, 2 W 47K, 10%, 1/2 W	C11 C12	851121 851122	330mmf, 10%, 500V 470mmf, 10%, 500V	R38	818181	120, 10%, 2 W
C6	847205	12mmf, 5% (N750) Ceramic	R24	814232	2.2M, 10%, 1/2 W	C12	856003	40mfd @ 3V, Tubular	R39 R40	814208 814212	22K, 10%, 1/2 W 47K, 10%, 1/2 W
27	85100Z	.01mfd, Ceramic Disc	RZ6	814187	390, 10%, 1/2 W	C14	866225	. 1mfd, 20%, 400V	R41	814208	22K, 10%, 1/2 W
8	851002	.01mfd, Ceramic Disc	R27	814216	100K, 10%, 1/2 W	C15	848401	47mmf, 10%, 500V			
C9	850012 847205	33mmf, 20% (N750) Ceramic 12mmf, 5% (N750) Ceramic	R28	814083	6.8K, 5%, 1/2 W	C16	851118	680mmf, 10%, 500V			
211	851126	1000mmfd, 20% Ceramic	R29	814080	5.1K, 5%, 1/2 W	C17	851110	1000mmf, 10%, 500V		TRA	NSFORMERS
112	872006	1-8mmf, Tubular Trimmer	R 30	814069	1.8K, 5%, 1/2 W	C18	851123	3300mmf, 20%, 500V			
213	854035	2. 2mmf, 10% Composition	R31 R32	818186 818188	330, 10%, 2 W 470, 10%, 2 W	C19 C20	866225 866325	. 1mfd, 20%, 400V . 1mfd, 20%, 600V	SYMBOL	PART NO.	DESCRIPTION
14	862401	390mmf, 5% Silver Mica	R32	818188	470, 10%, 2 W	C2D	866325	. 1mfd, 20%, 600V	Т	716013	Power Trans.
015	851002	.01mfd, Ceramic Disc	1					100mfd @ 25V	T2	724018	Audio Output
16	851128	100mmf, 20% Ceramic	1					100mfd @ 25V			
C17	851126	1000mmf, 20% Ceramic	1			CZ4	851115	1500mmf, 20%, 1.5KV			
C18 C19	851126 851002	1000mfd, 20% Ceramic .01 mfd, Ceramic Disc	f .	TRANCEO	RMERS AND COILS	C25	851115	1500mmf, 20%, 1.5KV		MIS	CELLANEOUS
220	866Z19	.033mfd, 400V Tubular		TRANSFO	AMERS AND COILS	C26	870221	.047 mfd, 20%, 600V			and an
521	85100Z	.01mfd, Ceramic Disc	TI	760012	FM-IF Transformer	C27 C28	857102	80mfd, 400V 80mfd, 350V	SYMBOL	PART NO.	DESCRIPTION
C22	851002	.01mfd, Ceramic Disc	TZ	760011	AM-IF Trans	C28-		-0mfd, 300V	SI	902012	6 Position Equalizer Switch
223	866125	. Imfd, 200V Tubular	T3	760013	FM-IF Trans	C30 -	856902	Junfd, 300V	SZ	902003	Function Switch
224	85100Z	.01mfd, Ceramic Disc	T4	760011	AM-IF Trans	C31-		30mfd, 300V	1-1	940044	#44 Pilot light
C25	851128	100mmf, 20% Ceramic	T5	774004	Ratio Detector Trans				1-2	940044	#44 Pilot light
226	85100Z 85100Z	.01mfd, Ceramic Disc .01mfd, Ceramic Disc	T6 L1	716014 776003	Power Trans				31	934006	Connector - Phono
228	851116	270mmf, 20% Ceramic	L2	116003	FM Antenna Coil (Primary) FM Antenna Coil (Secondary)	1			JZ	934006	Connector - Stereo
229	851116	270mmf, 20% Ceramic	L3	750008	FM RF Choke			RESISTORS	J 3	934006	Connector - Tape output Connector - Tuner
230	851106	680mmf, 20% Ceramic	LA	924002	AM Loopstick Antenna			DESCRIPTION	J4 J5	934006 934006	Connector - Tuner Connector - Tape input
31	85100Z	.01mfd, Ceramic Disc	L5	768009	FM Oscillator Coil	SIMBOL	PART NO.	DESCRIPTION	J6	934005	Speaker output Jack
32	851116	270mmf, 20% Ceramic	L6	750009	FM RF Choke	R1	814222	330K, 10%, 1/2 W	J7	934010	Phono Motor AC Recept.
33	856014 851134	8mfd @ 150V Electrolitic	L7 L8	776001	FM RF Coil	RZ	814216	100K, 10%, 1/2 W	J8	934010	Tuner AC Recept.
35	851134	.004mfd, 1.5KV Line Bypasg .004mfd, 1.5KV Line Bypass	L9	750007	AM Oscillator Coil	R3	814196	2.2K, 10%, 1/2 W		571505	Transistor Socket Retainer
36	851002	. 01mfd, Ceramic Disc	1.7	190001	Filament RF Choke	R4	814214	68K, 10%, 1/2 W		880306	3 Pin Transistor Socket Pointer Retaining Clamp
37A -		30mfd @ 350V Electrolytic				R5	814072	2.4K, 5%, 1/2 W		57150Z 59400Z	Pointer Retaining Clamp Pulley-Idler
37B -	856908	30mfd @ 300V Electrolytic				R6 R7	818224 814206	470K, 10%, 2 W 15K, 10%, 1/2 W		60 30 23	Spring-Dial String
37C -		30mfd @ 300V Electrolytic				R7 R8	814206	22K, 10%, 1/2 W		619001	Dial Glass
				M	SCELLANEOUS	R9	814214	68K, 10%, 1/2 W		623001	Pointer Carriage
						R 10	814204	10K, 10%, 1/2 W		62300Z	Dial Pointer
		2010-0-0	SYMBOL	PART NO.	DESCRIPTION	R11	814207	18K, 10%, 1/2 W	-		
		ESISTORS	SIA -			R12	814226	680K, 10%, 1/2 W			
TMBOL	PART NO.	DESCRIPTION	SIB		OFF/ON, AM, FM-AFC, FM-	R13	814214	68K, 10%, 1/2 W	- 1 in m	PARTS L	IST - SPEAKER SYSTEM
		DECOMIT TION	SIC	902013	4 Position Selector Switch	R14 R15	800004 814222	Treble Control, ZM 330K, 10%, 1/2 W	PART NO.		DESCRIPTION
81	814224	470K, 10%, 1/2 W	S1D-			R15	814222	Bass Control, 2M	I ANT NO.		
12	814184	220, 10%, 1/2 W	52	Part of S1		R17	814229	1. 2M, 10%, 1/2 W	708809		Z" Round, 8 ohm, 14 oz. Magn
13	814220	220K, 10%, 1/2 W	JZ	934006	Phono Plug Receptacle	R18	814236	4.7M, 10%, 1/2 W	708810	Speaker, 1	2" Round, 8 ohm, 10 oz. Magn
.4	818212 814177	47K, 10%, 2 W	11	940047	#47, 6.3V Pilot Light	R19	814196	2.2K, 10%, 1/2 W	708603		8" Round, 3.2 ohm, 1.8 oz. N
16	814177 814204	56, 10%, 1/2 W 10K, 10%, 1/2 W	12	940047	#47, 6.3V Pilot Light	R 20	814168	10, 10%, 1/2 W	708905		Compression Speaker / Tubular Capacitor
17	814188	470, 10%, 1/2 W		565004 594002	Flywheel Pulley, Idler	R21 R22	814226 814219	680K, 10%, 1/2 W 180K, 10%, 1/2 W	866039 866035	limid, 100V	/ Tubular Capacitor
3.8	814208	22K, 10%, 1/2 W	1	603004	Dial Cord Spring	R22	814219 814208	22K, 10%, 1/2 W	806004	High Frequ	iency Control - 20 @ 2 Watts
29	814192	1K, 10%, 1/2 W		603005	Dial Mounting Clip	R23	814208	33K, 10%, 1/2 W	816255	Resistor -	10 @ 1 Watt
210	814224	470K, 10%, 1/2 W	1	603028	Tuning Eye Clip	R25	800005	Loudness Control / ON-OFF	390008		und Chamber
R11 R12	814176 814220	47, 10%, 1/2 W		619018	Dial Glass	R26	814214	68K, 10%, 1/2 W	619019		Freq. Control
		220K, 10%, 1/2 W	1	623005	Dial Pointer	RZ7	814216	100K, 10%, 1/2 W	500033	Knob - Hig	h Freq. Control

#### OJohn F. Rider

MODEL 8003, 8005

HOFFMAN RADIO PAGE 25-5

RADIO

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HOFFMAN

# EASY SERVICE GUIDE ALIGNMENT CHART AM-FM TUNER 1124 & 1126

The signal generator output should be no higher than necessary to produce 0,3 VAC during AM alignment and 2VDC during FM alignment. To set the dial pointer, tarn the tuning condenser fully closed. Then set the pointer about 1/16 inch beyond the idet end of the center horizontal line of the dial plate. Use an insulated alignment recendring when head alignment tool for adjusting trimmers and colls in the tuner,

1								
	SURES SELECIOR SELECIOR	1	GENERATOR	RADIO DIAL SETTING	C ONNECT VTVM	ADJUST	REMARKS	
1.	9.80	455 KC 8 M at 400 CPS	High side to pin #7 of V7. Low side to chassis, .01 MF isolation	High end of of dial	Across tuner output cable	Four (4) cores in 455 KC IF transformers	Adjust for maximum. Keep the generator output low. Maximum of 0.3 VAC at tuner output.	
2.	-X	600KC AM	High side to AM antenna terminal through 150MMF. Low side to chassis	600KG		600 KC L8 oscillator coil		
3.	"	620 KC		1020 KC		1620 KC C 3 B osc. trimmer	e e	
I.	38	1400 KC	"	1400 KG		1500 FC1 antenna frimmer		

	TUNER SELECTOR SWITCH	SIGNAL GENERATOR		RADIO DIAL SETTING	CONNECT VTVM	* 0 4 11 8 2	REMARKS	
	ΈM	30. 7 ME	High side to FM RF stator lug on tuning condenser. Low side to chassis. Use .01 MF for isolation.	High end of the dial	Between pin #2 of the 6AL5 and chassis. Use 5 VDC scale.	Six (6) cores in 10.7 MC IF transformers	Adjust for maximum. Keep the generator output low. Do not exceed 2 VDC on the VTVM.	
•		ñ	ñ				Attenuate the generator to get a 1 VDC reading on the VTVM.	
۲.	"	- 98 - 14		Ŷ	Move high side lead to terminal #3 of test socket.	Top core of ratio detector. Last 10, 7 MC IF transforme		
4.	10	SO MCICW	High side to the #1 Fm antenna terminal through 100 ohm. Low side to #2 FM antenna terminal through 150 ohm.		Same as step #1	88 MC 92 MC 92 MC	Same as step ∦1	
5.	"	107 MC	<b></b>	<b>MA NO</b> 1453		106 MC 106 MC 108 MC		

#### ALIGNMENT PROCEDURE FOR HOFFMAN AM-FM TUNER

#### EQUIPMENT REQUIRED:

A) VTVM

B) AM signal generator with 30% modulation at 400 CPS. The generator should have outputs at frequencies of 455 KC, 600 KC, 1400 KC, and 1620 KC.

C) CW signal generator with output at frequencies of 10.7 MC, 90 MC, 98 MC and 107 MC.

PROCEDURE:

Remove the tuner from the cabinet. Remove the bottom chassis plate and connect the power cord to a 117 volt 60 CPS AC power outlet.

Alignment adjustment points are identified by frequency on the tuner chassis illustrations and in this alignment procedure to simplify their location. IF ALIGNMENT FOR AM

1. Set the tuner selector switch to AM.

 Apply a 455 KC, 30% AM at 400 CPS signal to pin #7 of the 6BE6 AM converter. Use a .01 MF capatitor in sories with the high side lead from the generator. Connect the low side lead from the generator to the tumer chassis.

3. Set the tuning condenser to minimum capacity (wide open or with the pointer to the high end of the dial).

4. Set the VTVM to read AC and connect to the output cable of the tuner. Use the high side of the Loudness control on chassis #1126. Use a low reading scale, one volt would be ideal.

5. Adjust the four (4) 455 KC IF cores for maximum output. Reduce the inputs an ecessary to keep the output below 0.3 VAC. The four IF cores, or slugs, are in the two 455 KC transformers (one at the top and bottom of each can) on the back edge of the chassis pan.

ANTENNA AND OSCILLATOR ADJUSTMENTS - AM

1. Tighten the two AM trimmers on the tuning capacitor. 1500 KC is the antenna trimmer. (1620 KC is the oscillator trimmer. Then back off each of the two trimmers 1/4 turn to the left.

 Turn the tuning condenser to maximum capacity (fully meshed). The dial pointer should now be one pointer thickness to the left of the last dial marker. Adjust the pointer as required if it is not correctly positioned.

3. Applya 600 KC 30% AM signal through a 150 MMF condenser to the AM antenna terminal. Connect the low side to the tuner chassis. Connect the VTWM across the tuner output cable and set the meter to read AC. Tune the dial pointer to 60 on the AM position of the dial.

 Adjust 600 KC (the oscillator coil L8) for maximum. Keep the generator output reduced to the point giving an output voltage of less than 0.3 VAC.

5. Change the generator output to 1620 KC and tune to 162 on the tuner dial. Adjust 1620 KC (the oscillator trimmer) for maximum output. Attenuate the generator output if necessary to keep the output below 0.3 VAC.

6. Change the generator output to 1400 KC and tune to 140 on the tuner dial. Adjust 1500 KC (AM loop trimmer) for maximum. Keep the generator output at a level that will produce 0.3 VAC or less on the meter. IF ALIGNMENT FOR FM

1. Set the tuner selector switch to FM.

Apply a 10.7 MG CW signal through a .01 MF capacitor to the stator lug on the FM section of the center gang of the tuning condenser. NOTE: The FM section of each gang is the smaller section and has two (2) plates on the rotor and two on the stator.

3. Turn the tuning condenser for minimum capacity (pointer to the high end of the dial).

 Set the VTVM to the 5 VDC scale and connect the meter between pin #2 of the 6AL5 tube and chassis.

5. Adjust the six (6) 10.7 MC If cores for maximum DC voltage reading. Keep the DC voltage under 2 volts by reducing the generator output. The IF cores are in the top and bottom of the three (3) 10.7 MC IF transformers.

 Reduce the 10.7 MC input signal until one (1) volt output is obtained. Move the meter lead from pin #2 of the 6AL5 to terminal 3 of the test socket.

7. Adjust the top core of the ratio detector (last 10.7 MC IF) transformer for zero VDC.

ANTENNA, RF, AND OSCILLATOR ADJUSTMENT FOR FM

1. Connect the hot lead of the CW generator through a 100 ohm resistor to the #1 FM antenna terminal. Consact the low side of the generator to the #2 FM antenna terminal through a 150 ohm resistor. Use 1/2 waty composition resistors.

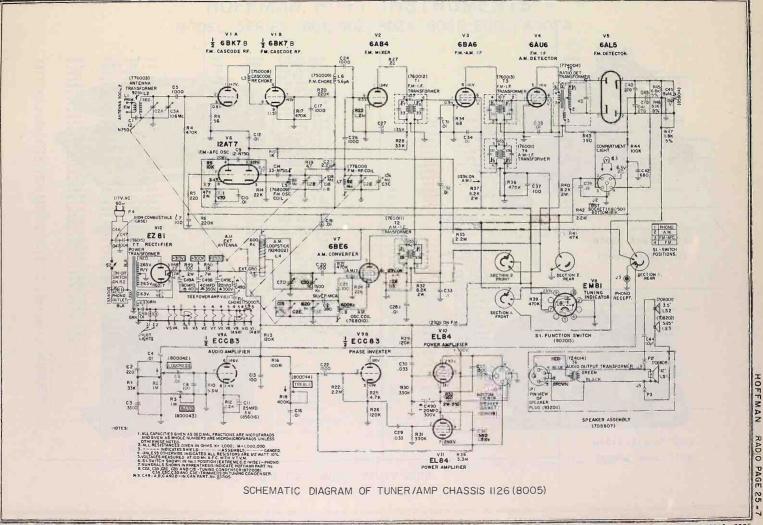
2. Set the VTVM to read 5 VDC scale and connect the meter between pin #2 of the 6AL5 tube and chassis.

 Turn the tuning condenser to a reading of 90MC on the FM section of the dial. Turn the tuner selector switch to FM.

4. Set the 108 MC adjustment (FM socillator trimmor, adjacentothe huming condensor) with the bottom of the screw head about 1/2 unch above the chassis. Loosen 106 MC (FM RF trimmer on the center section of tuning condenser) 1/8 turn from maximum lockwise. Loosen 106 MC (FW antenna trimmer on the first section of tuning condenser 5/8 turn from the maximum clockwise position.

5. With an input signal of 90 MC, adjust 88 MC (FM oscillator coil) and the two 92 MC coils (antenna coil and mixer coil located beneath the chassis) for imaximum. Reduce the generator output as required to keep the meter at 2 volts or less.

6. Turn the tuning condenser to a reading of 107 MC on the FM section of the dial. Change the generator signal to 107 MC. Then adjust 106 MC, 107 MC, and 108 MC for maximum output.



**OJohn F.** Rider

MODELS 8003, 8005

MODELS 8003, 8005

#### REPLACEMENT PARTS LIST - MODEL SERIES 8005

										CABINET PARTS LIST
										MODEL SERIES 8005
		CAPACITORS			CAPACITORS			RESISTORS		
SYMBOL	PART N	D. DESCRIPTION	SYNIBOL	PART NO	DESCRIPTION	SYMBOL	PART N			
			1	PARIN			, PARI N	O. DESCRIPTION		
C1 C2A T	850003	12mmf, 5% (N750) Ceramic	C49A C49B	857105	80mfd @ 400V 40mfd @ 350V	R47	814069	1.8K, 5%, 1/2 W		
CZB			C49C	05/102	20mid @ 300V	R48 R49	818172 818180	22, 10%, 2 W 100, 10%, 2 W		
CZC -	872008	3 Gang AM-FM Tuning(with pulley)	C49D		20mfd @ 300V	R49 R50	824425	100, 10%, 2 W 1K, 10%, 7W-WW	PART N	D, DESCRIPTION
C2D		a and the providential parcely,				1050	024425	11, 10,0, 14, 14		
C2E									381029 381030	Cabinet - Walnut
C3A T								and the second se	381030	Cabinet - Mahogany Cabinet - Oak
	Part of C2	Alignmenf Trimmers			RESISTORS	1	TRANS	FORMERS AND COILS	381032	Cabinet - Salem Maple
C3D C3E			CYNTROI	PART NO	D. DESCRIPTION	SYMBOL	PART NO	D. DESCRIPTION	311012	Floating Sound Chamber
CZ	851144	220mmf, 20% Ceramic	STMBOL	TANTIN	DESCRIPTION .	01111002		DESCRIPTION	990004	Record Changer - VM 4 Speed
C3	851125	3300mmf, 20% Ceramic	RI	814210	33K, 10%, 1/2 W	TI	760012	FM IF Trans	990502	45 RPM Adapter
C4	851002	.01mfd Ceramic Disc	R2	800042	Loudness Control & ON/OFF	T2	760011	AM IF Trans	500039	Knob-Control with Indicator
C5	851123	1000mmf, 20% Ceramic	R3	800044	BASS Control, 1 meg	T3	760013	FM IF Trans	500038 529003	Knob-Control without Indicator
C6	851002	.01mfd Geramic Disc	R4	814224	470K, 10%, 1/2 W	T4	760011	AM IF Trans	286004	Bezel-Dial Compartment Light Cover
C7	851128	100mmf, 20% Ceramic	R5	814184	220, 10%, 1/2 W	T5 T6	774004	Ratio Detector Trans	223333	Screw for Compartment Light Cover
C8	851128	00mmf, 20% Ceramic	R6	814220	220K, 10%, 1/2 W		724014	Audio Output Trans	452037	Control Panel
C9 C10	850003 851002	12mmí, 5% (N750) Ceramic .01míd Ceramic Disc	R7 R8	818212 814177	47K, 10%, 2 W 56, 10%, 1/2 W	T7 L1	716015 776003	Power Trans FM Antenna Coil (Primary)		
C10	856016	25mfd @ 3V, Tubular	R9	814204	10K, 10%, 1/2 W	L.Z	776003	FM Antenna Coil (Primary) FM Antenna Coil (Secondary)		
C12	851002	.01mfd Ceramic Disc	RIO	814234	3.3M, 10%, 1/2 W	L3	750008	Cascode RF Choke		
C13	851128	100mmf, 20% Ceramic	R11	814188	470, 10%, 1/2 W	L4	924002	AM Loopstick Antenna		
C14	850012	33mmf, 20% (NPO) Ceramic	R12	814196	2.2K, 10%, 1/2 W	L5	768009	FM Oscillator Coil		
C15	850003	12mmf, 5% (NPO) Ceramic	R13	814217	120K, 10%, 1/2 W	L6	750009	FM RF Choke		
C16	851002	.01mfd Ceramic Disc	R14	814208	22K, 10%, 1/2 W	L7	776001	FM RF Coil		CABINET PARTS LIST
C17	851126	1000mmf, 20% Ceramic	R15	814192	1K, 10%, 1/2 W	L8	768010	AM Oscillator Coil		CABINET TANTO EION
C18	872006	1-8mmf Tubular Trimmer	R16	814216	100K, 10%, 1/2 W	L9	750007	Filament RF Choke		MODEL SERIES 8003
C19 C20	851002 851128	.01mfd Ceramic Disc	R17 R18	814224	470K, 10%, 1/2 W					MODEL SERIES 8003
C20	862401	100mmf, 20% Ceramic 390mmf, 5% Silver Mica	R18 R19	800044 814176	Treble Control, 400K 47, 10%, 1/2 W	-2			+	
C22	851129	1500mmf, 20% Geramic	R20	814220	220K, 10%, 1/2 W			MISČELLANEOUS		
C23	854035	2. 2mmf, 10% Composition	R2W	814224	470K, 10%, 1/2 W					
C24	851126	1000mmf, 20% Ceramic	R22	814232	2.2M, 10%, 1/2 W	SYMBOL	PART NO	DESCRIPTION		and the second
C25	851128	100mmf, 20% Ceramic	R23	814232	2.2M, 10%, 1/2 W					
C26	851126	1000mmf, 20% Ceramic	R24	814208	22K, 10%, 1/2 W	LSI	708808	12" Round Speaker	1	
C27	851002	.01mfd Ceramic Disc	R25	814200	4.7K, 10%, 1/2 W	LS2	708201	3 1/2" Round - 8 ohm Speaker	PART NO	DESCRIPTION
C28	866219	.033mfd, 20%, 400V	R26	814217	120K, 10%, 1/2 W	£S3	708202	5 1/4" Round - 8 ohm Speaker	201004	
C29 C30	866219 866219	.033mfd, 20%, 400V	R27	814172	22, 10%, 1/2 W	S1 11	902015 940047	Function Switch - 4 Position Dial Light #47, 6.3V	381026 381027	Cabinet - Mahogany Cabinet - Oak
C31	851002	.033mfd, 20%, 400V .01mfd Ceramic Disc	R28 R29	814210 814217	33K, 10%, 1/2 W 120K, 10%, 1/2 W	IZ	940047	Dial Light #47, 6.3V	381028	Cabinet - Oak Cabinet - Salem Maple
C32	851002	.01mfd Ceramic Disc	R29 R30	814217 814222	330K, 10%, 1/2 W	13	940041	Compartment Light #44	990006	4 Speed Garrard RC121 = Mark 2 Record
C33	866126	. Imid, 20%, 200V	R31	814222	330K, 10%, 1/2 W		565004	Flywheel, Tuning		Changer
C34	851002	.01mfd Ceramic Disc	R32	818203	8.2K, 10%, 2 W		577034	Tuning Eye Bracket	990516	45 RPM Spindle Adapter Post #LRS4
C35	851115	1500mmf, 20%, 1.5KV	R33	818044	160, 5%, 2 W		594002	Pulley, Idler	981004	G.E. Reluctance Cartridge, Diamond LP.
C36	8541115	1500mmf, 20%, 1.5KV	R34	814178	68, 10%, 1/2 W		603004	Spring, Dial Cord	286005	Jewel-Indicator Light
C37	851128	100mmf, 20% Ceramic	R35	814232	2.2M, 10%, 1/2 W		619018	Tuner Dial	286004	Compartment Light Cover
C38 C39	851002 851002	.01mfd Ceramic Disc	R36	814234	3.3M, 10%, 1/2 W		623005	Dial Pointer	223333 452031	Compartment Light Cover Screw Amplifier Control Panel
C39 C40	851002 851116	.01mfd Ceramic Disc 270mmf, 10%, 500V	R37	818203	8.2K, 10%, 2 W	1			452031	Amplifier Control Panel Tuner Control Panel
C40	851116	270mmi, 10%, 500V 270mmi, 10%, 500V	R38 R39	814224 814224	470K, 10%, 1/2 W 470K, 10%, 1/2 W				500035	Knob - Control with Indicator
C42	851106	680mmí, 20% Ceramic	R 39 R 40	814224 818203	470K, 10%, 1/2 W 8.2K, 10%, 2 W				500036	Knob - Control with Indicator
C43	851116	270mmf, 10%, 500V	R41	814212	47K, 10%, 1/2 W				599034	Pad - Spindle Cup
C44	866035	lmfd, 100Y Tubular	R42	814232	2.2M, 10%, 1/2 W				603017	Floating Sound Chamber Spring
C45	856014	8mfd @ 150V Tubular	R43	814187	390, 10%, 1/2 W				529002	Bezel-Tuner Dial & Tone Display
C46	870221	.047, 20%, 600V	R44	814216	100K, 10%, 1/2 W	1			640015	Catalogue - Record Index
C47	851134	.004mfd, 20%, 1.5KV	R45	814083	6.8K, 5%, 1/2 W				940044	Pilot Light
C48	851002	. 01mfd Ceramic Disc	R46	814080	5.1K, 5%, 1/2 W				926004	FM Antenna
						1				
			-		and the second se					
						1				

#### CABINET PARTS LIST RIES 8005

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RADIO PAGE 25-8 HOFFMAN

HOFFMAN HI-FI INSTRUMENTS MODEL SERIES 801, 802, 802A, 8001, 8002, 8002A



FIGURE 4. V.M 1200A RECORD CHANGER. REFER TO V.M BOOKLETS NO. 6004 AND 1017 FOR SERVICE AND PARTS DATA.



FIGURE 2. GARRARD R.C. 121/4D RECORD CHANGER, FOR SERVICE AND PARTS DATA REFER TO HOFFMAN SERVICE DATA NOTE NO. 801.

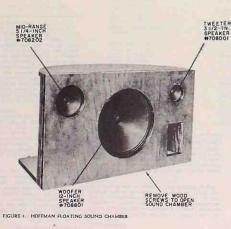




FIGURE 3. GARRARD R.C. 121/4 MARK II RECORD CHANGER

MODELS 801, 802, 802A, 8001, 8002, 8002A

#### GENERAL INFORMATION

MODEL SERIES 801 - Instruments in this group are Hoffman High Fidelity Record Players. VM fourspeed record changers and Hoffman High Fidelity Amplifier #1112 are incorporated in these models. Replacement Parts and Service Data for all parts of the instrument except the record changer are included in this Service Data Note. Refer to V-M booklets No. 6004 and 1017 for the record changer service and parts information other than cartridge, needles, and 45 RPM adapter.

MODEL SERIES 8001 - Instruments in this group are Hoffman High Fidelity AM-FM Radio/Record players. The AM-FM radio tuner is shock mounted on the amplifier, chassis 1119. Replacement Parts Data for all parts of the instrument, except record changer, are included in this Service Data Note. Refer to V-M hooklets No. 6004 and 1017 for record changer service and parts information other than cartridge, needles and 45 RPM adapter.

MODEL SERIES 802, 802A, 8002, 8002A - Instruments in this group are Hoffman High Fidelity models using the same basic amplifier, sound chamber, and cabi nets. The major differences are in the use of AM-FM typers and record changers. Refer to the Replacement Gabinet Parts list in this Service Data. Note for the components used in specific models. All service and parts data for these instruments is included in this Service Data Note except that pertaining to the record changers. Cartridge, needle, and 45 RPM parts data will be found in the Replacement Cabinet Parts List. For complete data on Garrard Changer Model R. C. 121/4D refer to Hoffman Service Data Note No. 801. complete data for Garrard Changer Model R. C. 171/4 Mk. If will be released later.

#### SIGNIFICANT CODE LETTER DESIGNATIONS

Code letters are used to designate component variations in Hoffman instruments. The code letter is stamped in the space provided for this purpose in the vicinity of the model designation. Following are code letter variations which are important regarding service and parts for the instruments covered by this Service Data Note:

MODEL SERIES 802, with no code designation have a two-conductor shielded cable between the record player and amplifier. The PHONO receptacle on the amplifier is a three-terminal receptacle (#934004), and a three-pin plug (#932003) is used on the connecting cable.

MODEL SERIES 8027 CODE "A" instruments use the conventional type phono receptacle (#934006) and cable plug (\$932008) with shielded connecting cable between the amplifier and record changer.

MODEL SERIES 802, CODE "B" and CODE "C" instruments have minor revisions to facilitate Factory assembly of the complete instrument.

MODEL SERIES 802, CODE "D" and CODE "E" instruments use the Garrard Model R.C. 121/4 Mk. II record changer. The pilot lamp connection for these instruments has been removed from the speaker socket at the year of the amplifier. A pilot lamp connect ting socket has been added to the top surface of the amplifier on these instruments.

MODEL SERIES 8002, CODE "A", CODE "B", AND CODE "C" instruments have the same variation Model Series 802 instruments for each respective code designation.

MODEL SERIES 8002, CODE "D" AND CODE "E" instruments use the Garrard Model R. C. 121/4 Mk. II record changer and AM-FM radiotuner #1120 in place of tuner #1116.

#### ACCESSORIES

Hoffman Model Series 802, 802A, 8001, 8002, and 8002A High Fidelity instruments have extra audio re-ceptacles, switch controlled AC power receptacles and an entertainment selector switch to allow for permanent plug-in installation of accessory items. Ac-cessories should be equipped with Hoffman plug No. 932015.

RECORDING ON A TAPE RECORDER - Model Series 802 and 8002 have an extra audio output receptacle connected directly across the audio output transformer. The impedance at the receptacle is 8 ohms and allows for recording on tape while you are listening to the record player or radio. It is not necessary INSTALLATION

Unpack the instrument and then refer to the special installation instructions attached to the turntable of the record changer. Follow these instructions in the order specified for best results. Models 802, 802A, and 8002A are equipped with the exclusive Hoffman "Floating Sound" Chamber.

CABINET LEGS - Models which include cabinet legs have the legs removed for shipment. The legs are packed in a small cardboard box attached to the back compartment of the instrument. Lay the instrument over on its side, on a protective pad, and then install the less by threading the bolts into the Tee Nuts mounting plates on the bottom of the cabinet.

2. FLOATING SOUND CHAMBER - The sound chamber is secured to the cabinet for shipment. The shipping bolts must be removed during installation. If the complete instrument is to be moved at any time, replace the shipping bolts to avoid accidental damage to the sound chamber or other components of the instrument during shipment.

3. 45 RPM SPINDLE ADAPTER - The 45 RPM spindle adapter will be found packed in a carton attached to the back of the instrument. On models which include legs, the adapter is packed with the legs.

4. RECORD CHANGER - On Model Series 801 and 8001 the record changer is secured to the cabinet by two machine screws which extend above the baseplate of the changer. Turn these screws down flush with the top of the baseplate to float the changer. On Model Series 802, 802A, 8002, and 8002A the changer is secured to the cabinet with two machine screws marked with red paint for easy identification. Remove these two screws when putting the instrument into operation. Remove all packing material from the changer.

For best results the record changer should be absolutely level and floating freely on its spring mounting. Check by placing a small level on the turntable. On models using the Garrard R. C. 121/4D or R. C. 121/4 Mk. II, slight corrections may be made by adjusting the changer mounting screws. On other models leveling may be accomplished by use of small shims under the legs of the instrument.

5. TONE ARM - Remove all padding material and packing from the tone arm and place the tone arm on its pedestal. Be sure to remove the stylus guard from the bottom side of the cartridge.

6. . POWER - Plug the power cord into a 110 to 120 volt 60 cycle AC power outlet. Set the selector switch to PHONO and turn the LOUDNESS fully to the right (clockwise). Reverse the AC cord plug if necessary to eliminate hum.

7. AMPLIFIER OPERATION - Rotate the LOUDNESS knob to the left to the point of minimum volume. Then proceed to check out the record changer.

to change the setting of the SELECTOR while recording. For recording purposes it is suggested that the BASS be set to the flat position and the TREBLE set to the maximum position.

Models 801 and 8001 have no recording receptacle but can be used for recording by connecting the recorder across the secondary of the audio output transformer at the back of the instrument. The output transformer for Model Series 8001 instruments is located on the frame of the 12-inch speaker.

EXTERNAL SPEAKERS - The audio output receptacle on Model Series 802 and 8002 may also be used to connect remote speakers to the instrument. Impedance at the receptacle is 8 ohms. On Model Series 801 and 8001 make appropriate connections for remote speakers directly to the output transformer.

### INSTRUCTIONS

PLAYING TAPE RECORDINGS - The input signal to the amplifier should be about 1. 5 volts for best results. Plug the output from the tape recorder into the TAPE REC. receptacle on the amplifier on Model Series 802 802A, 8002, 8002A. On Model Series 801 use the AUXILIARY receptacle. On Model Series 8001 use the PHONO receptacle. Then set the SELECTOR to the appropriate position. AUXILIARY INPUTS - Input signals from accessories which are connected to Hoffman High Fidelity instruments in the Model Series covered by this Service Data Note should have an output of about 1.5 volts. Use a preamplifier if the signal does not meet these requirements.

8. RADIO - If the instrument is equipped with a radio tuner, the radio should be checked out next for proper operation. Built-in antennas are provided for both AM and FM reception. No external antenna should be required for reception in normal signal areas. AM and FM antenna input terminals are provided on the back of the tuner chassis. Connect the ground terminal to a cold water pipe if an external AM antenna is added or if stray AC hum pick up is a problem on any por-tion of the AM band while operating on the built-in antenna. If an external FM antenna is desired, reception conditions will determine the type of antenna to be used. An external antenna will not be required for FM reception except in cases of extreme fringe signal r problem reception areas vith multi-path conditions. The FM antenna input is 300 ohm balanced.

9. CONTROLS - instruct the owner in the use of all operating controls. The TREBLE and BASS controls should be set at the mid-position for initial set up. The LOUDNESS control should be set at the minimum position when the instrument is first turned on. Be sure to instruct the owner in the use of the stylus lever; RED dot or LP for long play micro-groove records and WHITE dot or 78 for standard 78 RPM records.

Models with radio tuner have two FM tuning positions on the SELECTOR switch, FM and FM-AFC. When switched to the FM position the AFC (automatic frequency control) circuit is disabled. This feature provides for accurate tuning of FM stations which are closely spaced on the dial or in tuning stations in fringe areas. Tune the station on the FM position and then switch to FM-AFC to lock the tuner to the station.

NOTE: The LOUDNESS control is designed around a linear variable resistor rather than the tapered volume control usually found on television and radio receivers. This feature allows for uniform increase or attenuation of all frequencies as the LOUDNESS control is adjusted.

A special HUM control is provided on the amplifier of each instrument covered by this Service Data Note. This control is Factory adjusted and will usually require no further adjustment unless repair of the amplifier becomes necessary. Adjustment is made with the amplifier in the cabinet and all components of the instrument connected together in normal fashion.

#### SPECIAL SERVICE NOTES

#### MODELS WITH CHASSIS 1119 and 1120

A 330 ohm resistor is installed across the FM antenna terminals of these tuners at the Factory. The resis-tor may be removed for increased sensitivity in-areas where there is no local FM station. In areas with strong local stations, the 330 ohm resistor should not be removed or image frequency problems may result.

ALL MODELS WITH ERECUENCY DISPLAY SCOPE

To avoid accidental damage to the Frequency Display Scope Indicator, keep the Bass and Treble controls adjusted to either extreme right or extreme left while removing the amplifier chassis from the cabinet and while it remains outside of the cabinet. This will keep the tips of the indicator inside the protective edge of the dial plate and prevent breakage due to an accidental bump while handling the amplifier.

ELECTRICAL POWER - 110 to 120 volts 60 cycle AC power. Do not connect to DC or AC of any other fre-INTERMEDIATE FREQUENCIES - AM radio 455 kilocycles. FM radio 10.7 megacycles.

TUNING RANGE - AM radio, 530 to 1620 kilocycles. FM radio, 88 to 108 megacycles.

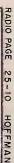
FM ANTENNA INPUT IMPEDANCE - 300 ohms balanced.

FM TUNER SENSITIVITY - 2 to 3 microvolts.

AMPLIFIER OUTPUT IMPEDANCE - 8 ohms.

SPEAKERS - 12-inch woofer, 5-1/4 inch midrange, 3-1/2 inch tweeter.

SOUND CHAMBERS - Models in the 802, 802A, 8002, and 8002A groups are equipped with the exclusive Hoffman "Floating Sound" Chamber. Models in the 801 and 8001 series have three-speaker systems built into the cabinet.



quency.

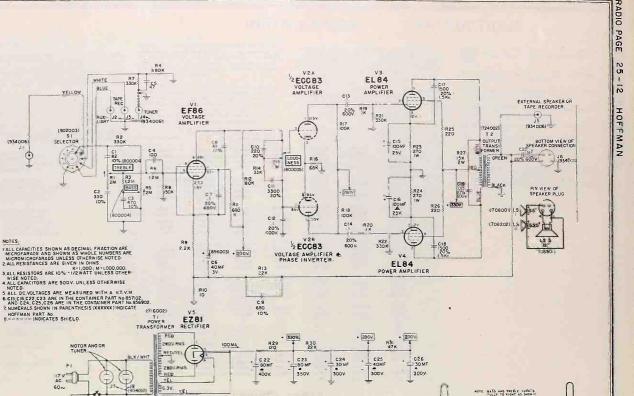
#### FINISH-MODEL-CODE----CABINET PARTS

C 003 4

							C80ZA	C8002A
	W801	W8001	W802	W802	W8002	W8002	LW802A	LW8002A
	M801	M8001	M802	M802	M8002	M8002	M802A	M8002A
MODEL NUMBER	B801	B8001	B802	B802	B8002	B8002	B802A	B8002A
	SP801	SP8001	SP807	SP80Z	SP8002	SP8002	SP802A	SP8002A
CODE LETTER			A, B, C	D, E	A, B, C	D, E		
Amplifier Chassis	1112		1108	1108	1108	1108	1408	1108
AM-FM Tuner Chassis					1116	1120		1120
Tuner-Amplifier Chassis		1119						
Record Changer	990004	990004	99000Z	990006	990002	990006	990006	990006
Sound Chamber			390003	390003	390003	390003	390003	390003
Bezel Display Scope			52900Z	52900Z	52900Z	529002	529002	529002
Bezel Tuner					529001	529001		529001
Dial Glass, Amplifier			619004	619001	619001	619001	619001	619001
Dial Glass, Tuner		619000	******		619008	619008		619008
Cabinet, Mahogany	385006	381010	381006	381018	381006	381018	381023	381023
Cabinet, Oak	385007	381011	381007	381019	381007	381019	381024	381024
Cabinet, Walnut	38 500 5	381009	381005	381017	381005	381017	381022	381022
Cabinet, Salem Maple	385008	38101Z	381008	381020	381008	381020	381025	381025
Cabinet, Cherry							381021	381021
Escutcheon, Amplifier	452014		452024	452024	452024	452024	452035	452035
Escutcheon, Tuner		452026			452025	452025		452034
Knob, With Pointer	500027	500030	500028	500028	500028	500028	500035	500035
Knob, No Pointer		500019	500029	500029	500029	500029	500036	# 500036
Instruction Booklet	640009	640016	640013	640013	640013	640013	640025	640025
Changer Cartridge	981003	981003	981003	981003	981003	981003	981003	981003
Dual Sapphire Needles	990507	990507	990507	990507	990507	990507	990507	990507
Diamond Sapphire Needles	990506	990 50 6	990506	990506	990506	990506	990506	990506
45 RPM Spindle	990502	990502	990501	990516	990501	990516	990516	990516
Speaker, 3.5 inch	708001	708001	708001	708001	708001	708001	708001	708001
Speaker, 5.25 inch	708202	708202	708202	708202	708202	708202	708202	708202
Speaker, 12 inch	708806	*708807	708801	708801	708801	708801	708801	708801
Pilot Lamp	940044	940044	940044	940044	940044	940044	940044	940044

\* NOTE: Includes 724014 Output Transformer, Plus Cable and Plug. # NOTE: For Tuner Selector Knob use 500037.

DIAL STRINGING FOR FREQUENCY DISPLAY SCOPE POINTER



BOTTOM VIEW OF COMPARTMENT LIGHT

.19

(934004)

#### SPECIAL REPLACEMENT PARTS NOTE

Refer to the Schematic NOTES for interpretation of parts symbols, description, and part numbers. Special type components are listed below for your convenience and should be replaced only with the types specified. Part numbers for replacement components which apply to complete instruments are included in the Replacement Coshier Parts List.

SYMBOL	PART NOP	DESCRIPTION
	CAPACITORS	
C6	856003	40 MF, 3 DCWV, Elec- trolytic
Č45)	857102	100 MF, 25 DCWV, Elec- trolytic
C16)		100 MF, 25 DCWV, Elec- trolytic
C22)		80 MF, 400 DCWV, Elec- trolytic
CZ31		80 MF, 400 DCWV, Elec- trolytic
C24)	856902	30 MF, 300 DCWV, Elec- trolytic
C25)		40 MF, 300 DCWV, Elec- trolytic
C2(6)		30 MF, 300 DCWV, Elec- trolytic
C17	851015	1500 MMF, 20%, 1.5 KV
C48	851115	1500 MMF, 20%, 1.5 KV
C21	870225	.1 MF, 20%, 600V, with
		non-combustible case
R1	800004	Treble Control, 2M
R6	800004	Bass Control, 2M
R15	800005	Loudness Control, 1M
R28	800014	Hum Control, 250 ohm
<b>S</b> 1	902003	Selector Switch
	MISCEL	LANEOUS
TI	71600ž	Power Transformer
T2	724002	Output Transformer
J1)	934004	Phono Receptacle for In- struments with no code.
)	934006	Phono Receptacle for Coded Instruments
J 2	934006	Auxiliary or Stereo Receptacle
13	934006	Tape Receptacle
14	934006	Tuner Receptacle
15	934006	Extra Speaker Recept.
36	934005	Speaker Receptacle
13		Speaker Plug

REPLACEMENT PARTS DATA & SCHEMATIC DIAGRAM FOR HOFFMAN CHASSIS 1108

1-2

PANEL LIGHTS

14

(800014)

HUM

BLACK GEN

6.3V.

C21 047 20%

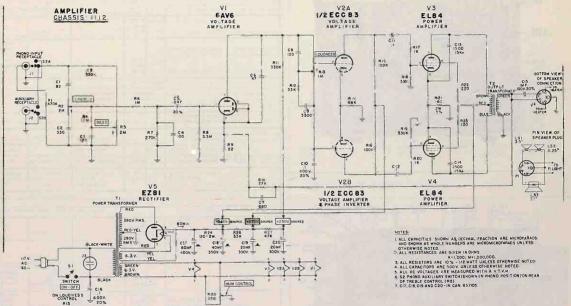
NON-COMBUSTIBLE CONTROL RIS

©John F. Rider

#### SPECIAL REPLACEMENT PARTS NOTE

Refer to the Schematic NOTES for interpretation of parts symbols, description, and part numbers. Special type components are listed below for your coavenience and should be replaced only with the types specified. Part numbers for replacement components which apply to complete instruments are included in the Replacement Cabinet Parts List.

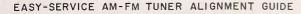
SYMBOL	PART NO.	DESCRIPTION
	CAPACITOR	s
C17)	857105	80 MF, 400 DCWV,
		Electrolytic
C18)		40 MF, 350 DCWV,
-		Electrolytic
Č19)		20 MF, 300 DCWV,
		Electrolytic
C20)		20 MF, 300 DCWV,
		Electrolytic
C13	851115	1500 MMF, 20%, 1.5 K
C14	851115	1500 MMF, 20%, 1.5 K
	C	ONTROLS
R3)	800033	Treble Control, 2M
SZ)		Phono-Auxiliary Switch
R5	800004	Bass Control. 2M
R13)	800005	Loudness Control
S1)		On-Off Switch
	MISC	ELLANEOUS
TI	716007	Power Transformer
TZ	706009	Output Transformer
J1. J2	934006	Input Receptacles
J4	934019	Speaker Receptacle
	,	aponnos nocopracio



REPLACEMENT PARTS DATA & SCHEMATIC DIAGRAM FOR HOFFMAN CHASSIS 1112

MODELS 801, 802, 802A, 8001, 8002, 8002A

# RADIO PAGE 25-14 HOFFMAN



The signal generator output should be no higher than necessary to produce 0,3 VAC during AM alignment and 2VDC during FM alignment. To set the dial pointer, turn the tuning condenser fully closed. Then set the pointer about 1/16 inch beyond the left end of the center horizontal line on the dial plate. Use an invalued alignment neceworkiver and here head alignment tool for adjusting trimmers and could in the tuner.

AM ALIGNMENT									
TUNER SELECTO SWITCH	R	GENERATOR INPUT POINT	RADIO DIAL SETTING	CONNECT	ADJUST	REMARKS			
AM.	455 KC AM at 400 CPS	High side to pin #7 of V7. Low side to chassis. .09 MF isolation	High and of of dist	Across tuner output cable	Four (4) cores in 455 KC LF transformers	Adjust for maximum. Keep the generator output low. Maximum of 0.3 VAC at tuney output.			
m	eõõke am	High side to AM antenna terminal through 150MMF. Low side to chassis	600KC	u .	600 KC L8 oscillator coil				
	1620 KC	н	цедо же		1620 KC C10B osc. trimmer				
	1400 KC		40 RC		1500 KC antenna trimmer				

Repeat step #2. If adjust

FM ALIGNMENT BADIC SIGNAL GENERATOR CONNECT TUNER SELECTOR DIAL VTVM ADJUST REMARKS FREQUENCY INPUT POINT 10.7 MG FM High side to FM Between pin #2 of the 6AL5 High end Six (6) Adjust for maximum. Keep the RF stator lug on tuning condenser of the dial generator output low, Do not exceed 2 VDC on the VTVM, cores in and chassis. 10,7 MC IF Low side to chashis Use . 01 MF for Use 5 VDC transformen scale. isolation, .... ... 2 .... 31 Attenuate the generator to get a 1 VDC reading on the VTVM. ... -Move high side Top core Adjust for zero VDC lead to terminal #3 of test socket. of ratio detector Last 10.7 MC IF transforme igh side to the #1 90 M Same as 88 MC Same as step #0 m antenna terminal through 100 ohm. stop #1 92 MC 92 MC ow side to #2 FM antenna terminal through 150 ohm. 107 140 5. .... 107 MC ... 106 MC 106 MC 108 MC Repeat step #4. If any adjustments are required, repeat step #5 also. 6

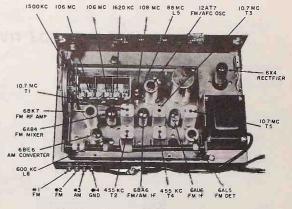


FIGURE 6. TOP VIEW OF HOFFMAN AMIEM RADIO TUNERS-CHASSIS 1116 & 1120

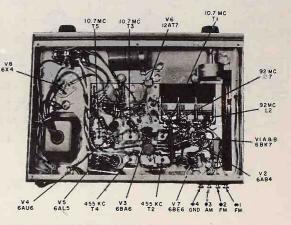


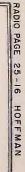
FIGURE 7. BOTTOM VIEW OF HOFFMAN AM FM RADIO TUNERS

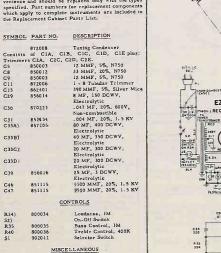
©John F. Rider

#### ALIGNMENT PROCEDURE FOR HOFFMAN AM-FM TUNER

EQUIPMENT REQUIRED:	4. Adjust 600 KC (the oscillator coil L8) for maximum. Keep the generator output reduced to the point giving an output voltage of less than 0.3 VAC.	output is obtained. Move the meter lead from pin #2 of the 6AL5 to terminal 3 of the test socket.			
B) AM signal generator with 30% modulation at 400 CPS. The generator should have outputs at frequencies	5. Change the generator output to 1620 KC and tune to 162 on the tuner dial. Adjust 1620 KC (the oscilla-	7. Adjust the top core of the ratio detector (last 10.7 MC IF) transformer for zero VDC.			
of 455 KC, 600 KC, 1400 KC, and 1620 KC.	tor trimmer) for maximum output. Attenuate the gen- erator output if necessary to keep the output below 0.3 VAC.	ANTENNA, RF, AND OSCILLATOR ADJUSTMENT FOR FM			
10.7 MC, 90 MC, 98 MC and 107 MC.		1. Connect the hot lead of the CW generator through a	#716002		Burn and the
PROCEDURE:	<ol> <li>Change the generator output to 1400 KC and tune to 140 on the tuner dial. Adjust 1500 KC (AM loop trimmer) for maximum. Keep the generator output at</li> </ol>	100 ohm resistor to the #1 FM antonna terminal. Con- nect the low side of the generator to the #2 FM antenna terminal through a 150 ohm resistor. Use 1/2 watt	1 +	57102 \$724002 ECC	83. 7856902
Remove the tuner from the cabinet. Remove the bot- tom chassis plate and connect the power cord to a 117 volt 60 CPS AC power outlet.	a level that will produce 0. 3 VAC or less on the meter. 7. Recheck steps 3 and 4. If any adjustment of 600	composition resistors. 2. Set the VTVM to read 5 VDC scale and connect the			
Alignment adjustment points are identified by fre- quency on the tuner chassis illustrations and in this	KC (the oscillator coil) is required, repeat steps 5 and 6 also.	meter between pin #2 of the 6AL5 tube and chassis.			EF86
alignment procedure to simplify their location. For example: The AM oscillator (L8) is identified as 600		<ol> <li>Turn the tuning condenser to a reading of 90MC on the FM section of the dial. Turn the tuner selector switch to FM.</li> </ol>		1	PHONO
KC which is also its alignment adjustment frequency. Alignment reference marks have also been included	IF ALIGNMENT FOR FM	4. Set the 108 MC adjustment (FM escillator trim-			
on the backside of the dial pointer slide rail to assist the technician in locating correct setting of the tuning	1. Set the tuner selector switch to FM.	mer, adjacent to the tuning condenser) with the bottom of the screw head about 1/2 inch above the chassis.			
condenser for Antenna, RF, and Oscillator alignment. For Example: 1620 KC is an AM alignment frequency.	2. Apply a 10.7 MC CW signal through a .01 MF ca- pacitor to the stator lug on the FM section of the cen-	Loosen 106 MC (FM RF trimmer on the center sec - tion of tuning condenser) 1/8 turn from maximum clock-		- 31 - 40 -	
The tuning condenser can be accurately set to 1620 KC by use of the 1620 KC mark on the back of the pointer	ter gang of the tuning condenser. NOTE: The FM section of each gang is the smaller section and has	wise. Loosen 106 MC (FM antenna trimmer on the first section of tuning condenser 5/8 turn from the	CONTRACTOR OF THE	SUDDING (FACT TO BY W	
slide rail, in conjunction with the regular dial pointer and scale. Turn the tuning knob until the left side of	two (2) plates on the rotor and two on the stator.	maximum clockwise position.		00 (O) 445 463	2000 (0)
the carriage just covers the 1620 mark on the slide rail.	3. Turn the tuning condenser for minimum capacity (pointer to the high end of the dial).	5. With an input signal of 90 MC, adjust 88 MC (FM oscillator coll) and the two 92 MC colls (antenna coll	F/	-11	
	4. Set the VTVM to the 5 VDC scale and connect the	and mixer coil located beneath the chassis) for maxi- mum. Reduce the generator output as required to	В ОНМ	RECEPTACLE	
NOTE: The alignment illustrations show tuners No. 1116 and No. 1120 but may also be used for chassis	meter between pin #2 of the 6AL5 tube and chassis.	keep the meter at 2 volts or less.	117 VAC POWER HUM AUDIO OUT OUTLETS CONTROL RECEPTAD	TPUT FOR SPEAKER A	NUXILIARY TAPE TUNER
1119 which includes the same tuner sub-chassis.	5. Adjust the six (6) 10.7 MC If cores for maximum DC voltage reading. Keep the DC voltage under 2	<ol> <li>Turn the tuning condenser to a reading of 107 MC on the FM section of the dial. Change the generator</li> </ol>	CONTROL RECEPTAG		
IF ALIGNMENT FOR AM	volts by Feducing the generator output. The IF cores are in the top and bottom of the three (3) 10.7 MC IF	signal to 107 MC. Then adjust 106 MC, 107 MC, and 108 MC for maximum output.			
. Set the tuner selector switch to AM.	transformers.	7. Repeat step 5. If any adjustments are required in	FIGURE 8. TOP VIEW OF AMPLIFIER CHA	SSIS 1108	
<ol> <li>Apply a 455 KC, 30% AM at 400 CPS signal to pin #7 of the 6BE6 AM converter. Use a .01 MF capaci-</li> </ol>	6. Reduce the 10.7 MC input signal until one (1) volt	step 5, step 6 should also be repeated.			
tor in series with the high side lead from the genera- tor. Connect the low side lead from the generator to the tuner chassis.		6			
			LOUDNESS BASS ON-OFF #800004	TREBLE #800004	SELECTOR #902003
<ol> <li>Set the tuning condenser to minimum capacity (wide open or with the pointer to the high end of the dial).</li> </ol>		and the second s	# 800005 2 MEG	2 MEG	
4. Set the VTVM to read AC and connect to the out-	1			· · · · · · · · · · · · · · · · · · ·	
put cable of the tuner. Use the high side of the Loud- ness control on chassis \$1119. Use a low reading	1				
scale, one volt would be ideal.					S WIED
<ol> <li>Adjust the four (4) 455 KC IF cores for maximum output. Reduce the input as necessary to keep the out-</li> </ol>					
put below 0.3 VAC. The four IF cores, or slugs, are in the two 455 KC transformers (one at the top and			1 minter - 8-8-	- 11 m	1 1 B. 14
bottom of each can) on the back edge of the chassis pan.	Top		the second se	Sel Alerth.	ASCALL
ANTENNA AND OSCILLATOR ADJUSTMENTS	6 TH				
<ol> <li>Tighten the two AM trimmers on the tuning capa- citor. 1500 KG is the antenna trimmer. 1620 KG is</li> </ol>					KAR AN
citor. 1500 KC is the antenna trummer. 1620 KC is the oscillator trimmer. Then back off each of the two trimmers 1/4 turn to the left.	START	and and a	- To Minoral A		ALT: WEI
2. Turn the tuning condenser to maximum capacity	11. 0.00	1 1	A A A A A A A A A A A A A A A A A A A		
(fully meshed). The dial pointer should now be one pointer thickness to the left of the last dial marker.			and the state of the second		
Adjust the pointer as required if it is not correctly positioned.		NOTE: TUNING CONDENSER	- participation		
3. Apply a 600 KC 30% AM signal through a 150 MMF		POINTER SET 1/8 INCH		V3 V4 HU L84 EL84 #8	000l4 EZ81
condenser to the AM antenna terminal. Connect the low side to the tuner chassis. Connect the VTVM		TO LEFT OF CENTER HORIZONTAL LINE.		250	UN RECIPTER
across the tuner output cable and set the meter to read AC. Tune the dial pointer to 60 on the AM position of	1-1-1				
the dial.	FIGURE 5. AM-FM TUNER DIAL STRINGING PROC	EDURE	FIGURE 9. BOTTOM VIEW OF AMPLIFIER	CHASSIS 1108	
	And the second	the second se	the second s	And an and a second second second	A DESCRIPTION OF THE OWNER OWNE

MODELS 801, 802, 802A, 8001, 8002, 8002A





Part

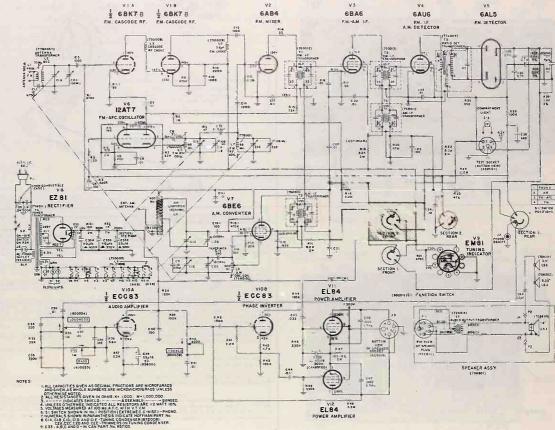
924002	AM Antenna
768009	FM Oscillator Coil
750009	AM Oscillator Coil
760012	FM IF Transformer
760011	AM IF Transformer
760013	FM IF Transformer
760011	AM IF Transformer
774004	FM Ratio Detector
716011	Power Transformer
724014	Output Transformer (1
	of speaker assembly #708807
	768009 750009 760012 760011 760013 760011 774004

SPECIAL REPLACEMENT PARTS NOTE

Refer to the Schematic NOTES for interpretation of

parts symbols, description, and part numbers. Spe-cial type components are listed below for your con-

venience and should be replaced only with the types



REPLACEMENT PARTS DATA & SCHEMATIC DIAGRAM FOR HOFFMAN CHASSIS 1119

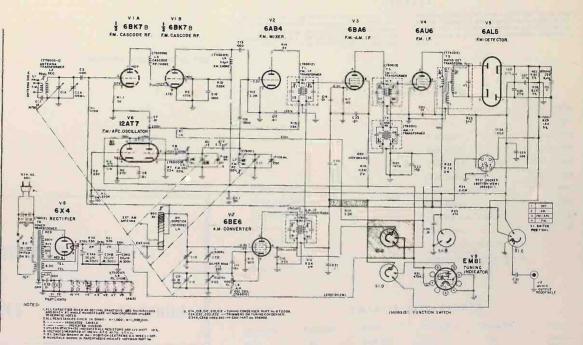
**OJohn F.** Rider

#### SPECIAL REPLACEMENT PARTS NOTE

Refer to the Schematic NOTES for interpretation of parts symbols, description, and part numbers. Spe-cial type components are listed below for your convenience and should be replaced only with the types specified. Part numbers for replacement components which apply to complete instruments are included in the Replacement Cabinet Parts List.

SYMBOL	PART NO.	DESCRIPTION
	872008	Tuning Condenser
Consists	of CIA, C	1B, CIC, CID, CIE pl
Trimmer	s CZA, C2C	, C2D, C2E.
C5	8 500 0 3	12 MMF, 5%, N750
C8	850012	33 MMF, 20%, N750
C9	850003	12 MMF, 5%, N750
CII	872006	1 - 8 MMF, Tubular
		Trimmer
	862401	390 MMF, 5%, Silver N
C29	856014	8 MF, 150 DCWV,
		Electrolytic
	851134	.004 MF, 20%, 1.5 KV
	851134	.004 MF, 20%, 1.5 KV
C34A)	856908	30 MF, 350 DCWV,
		Electrolytic
C34B)		30 MF, 300 DCWV,
		Electrolytic
C34C)		30 MF, 300 DCWV.
		Electrolytic
	C	ONTROLS
SI)	902008	Selector Swtich.
		Chassis 1116
S2)		
S1)	902013	Selector Switch,
		Chassis 1420
S2)		
	MISC	ELLANEOUS
14	924002	AM Antenna
	768009	FM Oscillator Coil
	768010	AM Oscillator Coil
	760012	FM IF Transformer
	760011	AM IF Transformer
	760013	FM IF Transformer
	760014	AM IF Transformer
	774004	FM Ratio Detector
	716012	Power Transformer
		rower transformer

Mica



REPLACEMENT PARTS DATA & SCHEMATIC DIAGRAM FOR HOFFMAN CHASSIS 1116 & 1120

#### GENERAL

This manual covers the 51 series radio chassis, versions 51-01AA thru 51-11AA and also the 51-03BA version. Three complete electrical paris lists and 3 schematics are shown to provide complete coverage. On the 51-03BA version an electrical change has been

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made regarding the AC switch on the rear of the band switch. This switch was eliminated and a double-throw switch used on the Bass control as an Off-On switch. This change is shown on the schematic diagram on page 10.

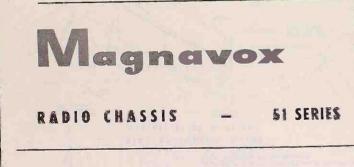
#### SPECIFICATIONS

		AM Detector (crystal)		INSAM
ning Frequency Range:				6E5
Broadcast Band	540-1620 KC	Tuning Eyet		6AV6
	88-108 MC	Audio Amp*		
FM Band	455KC/10.7 MC	Audio Amp**	(1/2)	6U8
ermediate Frequency	433107 2011	Audio Amp***	(1/2)	12AX7
ibes:		Phase Inverter**	(1/2)	6U8
FM RF Amplifier	6C45	Cathode Follower***	(1/2)	12AX7
AM RF Amplifier	6BZ6	Audio Output*		6AQ5
FM Mixer & Osc.	6U8	Push-Pull Audio Output**	(2)	6AQ5
AM Converter	6BE6	Rectifier***		5¥3
IF Amplifier	6BA6	Not used on 51-01, 02, 07, 09 & 11		
FM Driver	. 6BA6	*Used only on 51-02		
Ratio Detector	6AL5	***Used only on 51-03,05 & 08		

#### CHASSIS DIFFERENCES

		Output	Chassis No.	Tuning Lye	Quipar
Chassis No.	Tuning Eye		51-07	No	Push-Pull
51-01 51-02	No No	Push-Pull Single Ended	51-08 51-09	Yes No	None Push-Pull
51-03 51-04	Yes Yes Yes	Push-Pull None	51-10 Not Rele 51-11	ased No	Push-Pull
51-05 51-06 Not Rele					

#### MAINTENANCE MANUAL 1326



Output

......

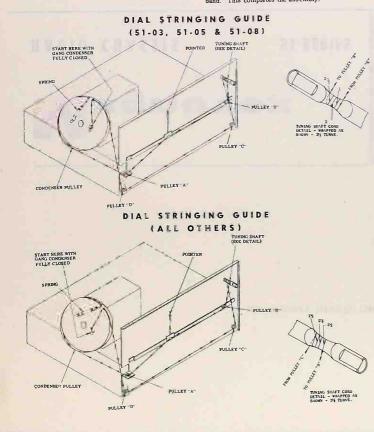
CHASSIS 51 SERIES

#### DIAL STRINGING INSTRUCTIONS

#### DIAL CORD PLACEMENT

Selecta 50-inch length of dial cord and tie a small loop at each end. Turn the tuning gang fully out of mesh and hook one end of the cord over the metal hook on the condenser pulley nearest the front of the chassis and proceed with the stringing as shown in the drawing below. Place the dial pointer onto the pointer slide and turn the tuning gang completely in mesh. Lace the dial cord around the three hooks on the front of the pointer and with the tuning condenser still fully in mesh, slide the pointer over until it lines up with the last dial calibration markat the low frequency end of the broadcast band. This completes the assembly.

DIAL POINTER PLACEMENT



SIGNAL	GENERATOR	SET RECEIVER	ADJUSTMENTS	CONNECT	REMARKS	
COUPLE TO:	FREQUENCY	DIAL TO:	ADJUSTMENTS	OUTPUT METER		
6BE6 (pin 7) thru.01 mfd	455 kc (modulated)	Near 1000 kc (free of interference)	T202, T106, top and bottom slugs	Across voice coil	Adjūst för max. output	
AM ant. term. thru 10 mmf	1400 kc (modulated	1400 kc	C101F C101D C101B	11.	18 -	
	600 kc (modulated)	600 kc	T105, T104		Adjust for max. output.	
				17"	Repeat steps 2 and 3.	

ALIGNMENT

AM ALIGNMENT

Set band switch to AM position. Check dial pointer positioning.

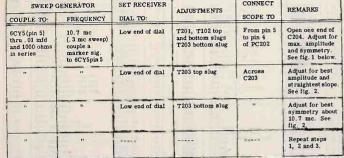
FM ALIGNMENT (Using AM Signal Generator and VTVM) Set band switch to FM position. Note: Place a 1 megohim resistor in series with hot side of VTVM.

SIGNAL C	GENERATOR	SET RECEIVER	ADJUSTMENTS	CONNECT	REMARKS	
COUPLE TO:	FREQUENCY	DIAL TO:	ADJUSTMENTS	METER	REMARKS	
6CY5(pin 5) thru.01 mfd	10.7 mc unmodulated	Low end of dial	T201, T102 top & bottom slugs and T203 bottom slug	From (pin 5) to pin 4 of PC202	Adjust for max neg. reading on VTVM;	
		Low end of dial	T203 top slug	Across © 2031	Tune for zero VTVM. (Point where voltage swings pos <sub>b</sub> or neg.)	
	- 10	Low end of dial	Repeat steps 1 & 2	Repeat steps 1 & 2	Repeat steps 1 & 2	
FM ant. terms in series with: 120 ohms (high side) 150 ohms (low side)	107 mc	107 mc	C109 C101A C101C	From pin 5 to pin 4 of PC202	Adjust for max neg. reading on VTVM.	
	89 mc	89 mc	L104 (osc. coil)	11,		
n.			*****		Repeat two preceding steps.	



SWEEPC	ENERATOR	SET RECEIVER	ADJUSTMENTS	CONNECT	REMARKS
COUPLE TO:	FREQUENCY	DIAL TO:		SCOPE TO	
6CY5(pin 5) thru.01 mfd and 1000 ohms in series	10.7 mc (.3 mc sweep) couple a marker sig. to 6CY5pin 5	Low end of dial	T201, T102 top and bottom slugs T203 bottom slug	From pin 5 to pin 4 of PC202	Open one end of C204. Adjust for max. amplitude and symmetry. See fig. 1 below.
	U.	Low end of dial	T203 top slug	Across C203	Adjust for best amplitude and straightest slope See fig. 2.
n an	h	Low end of dial	T203 bottom slug		Adjust for best symmetry about 10.7 mc. See fig. 2.
					Repeat steps 1, 2 and 3.

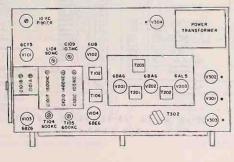
ALIGNMENT FM I-F AND RATIO DETECTOR ALIGNMENT (Using Sweep Generator and Oscilloscope). Note: Place 1 megohm resistor in series with hot scope lead.

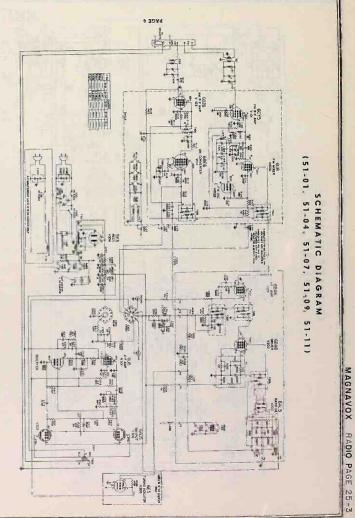






CHASSIS LAYOUT

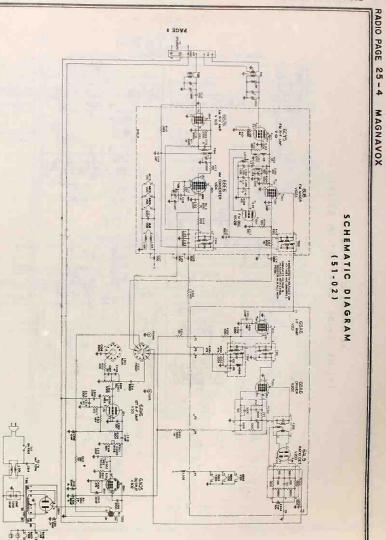




CHASSIS 51 SERIES

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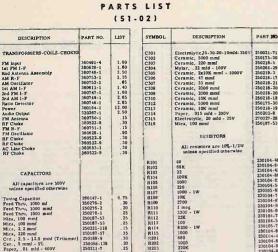
CHASSIS 51 SERIES



#### PARTS LIST (51-01, 51-04, 51-07, 51-09, 51-11)

	A planter and a planter a	1			The second se	T	-
SYMBOL	DESCRIPTION	PART NO.	LIST	SYMBOL	DESCRIPTION	PART NO.	LIST
	TRANSFORMERS-COILS-CHOKE	s		C309	Cer., 2000 mmf	250218-20	. 25
				C310	Cer., 10K mmf	250218-19	. 20
T101	FM Input	360491-4	1.00	C311	Paper, .047 mfd-200V	250202-11	. 25
T102	1st FM I-F	360626-1	1.60	C312	Ceramic, 5000 mmf	250175-30	. 20
T103	Rod Antenna Assembly	360746-1	3.50	C313	Cer., 100 mmf Cer., 10K mmf	250218-22	. 25
T104	AM R-F	360753-1	1.35	C314	Cer., 10K mmf	250218-19	. 20
T105	AM Oscillator	360752-1	. 65	C315	Electrolytic, 20 mfd-25V	270027-28	1.00
T106	1st AM 1-F	360611-1	1.40	C316	Cer., 680 mmf	250218-4	. 20
T201	2nd FM I-F	360747-1	1.60	C317	Paper, .047 mfd-200V	250202-11 270027-28	. 25
T202	2nd AM I-F	360749-1	2.65	C318	Electrolytic, 20 mfd-25V	250202-11	1.00
T203	Ratio	360748-1	2.65	C319	Paper, .047 mfd-200V	230202-11	. 23
T301	Power Power (51-04)	300165-1	12.00	1	P		1
T301		300165-2	13.50	-	RESISTORS	1	
T302 L101	Audio Output FM Antenna	320077-1 360750-1			RESIDIONS	A 1	10 - E
L101	RF Choke	360750-1	. 15	1	All resistors are 10%-1/2W	1	1
L102	FM R-F	360751-1	.30	1	unless specified otherwise		1
L103	FM Oscillator	360628-1	.90		uneas specified other wise	A	
L104	RF Choke	360522-9	.30	R101	68	230104-48	2.00
L105	RF Choke	360522-9	.30	R101	68K	230104-84	2.00
L301	10KC Filter	360621-1	.35	R102	22	230104-42	2.00
L302	RF Choke	360522-9	.30	R104	100K	230104-86	2.00
L302	RF CODE	300322-9		R105	1000	230104-62	2.00
			1 1	R105	220	230104-54	2:00
	CAPACITORS		4	R107	1000 - 1W	230105-62	2.50
	CAPACITORS	1	1 1	R108	10K	230104-74	2.00
	All capacitors are 500V		1	R109	2700	230104-67	2.00
	unless specified otherwise	1	1 1	R110	1 meg.	230104-98	2.00
	uniess specified otherwise		1	RIII	3300 - 1W	230105-68	2,50
C101	Tuning Capacitor	250147-1	6.75	R112	22K	230104-78	2.00
C102	Feed Thru, 1000 mmi	250276-2	. 20	R113	100	230104-50	2.00
C101	Feed Thru, 1000 mmf	250276-2	20	R114	8200 - 1W	230105-73	2,50
C104	Feed Thru, 1000 mmf	250276-1	25	R115	1000	230104-62	2.00
C105	Mica, 100 mmf	250187-53	25	R201	680	230104-48	2.00
C106	Mica, 100 mmf	250187-53	.25	R202	1000	230104-62	2.00
C107	Mica, 2,2 mmf	250221-118	15	R203	220K	230104-90	2.00
C108	Mica, 220 mmf	250187-57	.35	R204	47K	230104-82	2.00
C109	Cer. 2.5-12.0 mmf (Trimmer)	250188-9	.30	R205	47K	230104-82	2.00
C110	Cer. 5 mmf-5%	250088-138	20	R206*	1.5 meg.	230104-100	2.00
C112	Cer. 5000 mmf	250175-30	.20	R207*	2, 2 meg.	230104-102	2,00
C113	Mica, 200 mmf	250187-57	.35	R208*	2.2 meg.	230104-102	2.00
C114	Mica, 470 mmf	250159-102	.25	R301	Loudness Control (3.3 meg)	220131-13	@1. 25
C115	Cer., 12 mmf-5%	250088-179	, 20	R302	Treble Control (1 meg)	220072-36	@1.00
C116	Cer., 5000 mmf	250175-30	. 20	R303	Bass Control (3.3 meg)	220073-21	@1. 25
C118	Mylar 1 mfd-100V	250261-125	.40	R304	2. 2 meg	230104-102	2.00
C119	Cer., 47 mmf Cer., 5000 mmf	250218-17	. 15	R305	220K	230104-90	2.00
C120	Cer., 5000 mmf	250175-30	. 20	R306	330K	230104-92	2.00
C121	Cer., 5000 mmf	250175-30	. 20	R307	2.2 - 2W	230109-2	3.50
C122	Cer., 5000 mmf	250175-30	. 20	R308	150 - 2W	230106-1052	3.50
C123	Cer., 5000 mmf	250175-30	. 20	R309	750 - 3W	230150-315	3.50
C124	Cer., Feed Thru, 1000 mmf	250276-1	. 25	R310	10K - 2W	230106-1074	3.50
C125	Cer., Feed Thru, 1000 mmf	250276-1	. 25	R311	1200 - 2W	230106-1063	3:50
C126	Cer., Feed Thru, 1000 mmf	250276-1	. 25	R312	100K	230104-86	2.00
C127	Cer., Feed Thru, 1000 mmf	250276-1	. 25	R313	3300	230104-68	2.00
C201	Cer., .01 mf Cer., .0033 mf	250234-66	.30	R314	1000	230104-62	2.00
C202	Cer., .0033 mf	250234-154	. 25	R315	2. 2 meg.	230104-102	2.00
C203	Cer., . 0015 mf	250234-146	. 20	R316	470K	230104-94	2.00
C204	Electrolytic, 4mf-50V	270559-9	1.10	R317	470K	230104-94	2.00
C205 •	Paper, . 1mf -200V	250240-13	. 35	R318	5600	230104-71	2.00
C301	Electrolytic 35 mid-350V	270021-71	2.75	R319	470K	230104-94	2.00
	30 mfd-350V			R320	33K	230104-80	2,00
	20 mfd-350V		1	R321	470K	230104-94	2.00
	10 mfd-350V			R322	220 - 2W	230108-1054	3.50
C302	Mica, 1000 mmf, 5%	250228-354	. 45	R323	68K	230104-84	2.00
C303	Mica, 1000 mmf, 5%	250228-354	.45	R324	12K	230104-75	2.00
C304	Ceramic, 680 mmi	250218-4	_ 20	R325	3900 - 1W	230105-69	3.50
C305	Ceramic, 2 x 10K mmf-1000V	250219-3	.55	R326	470K	230104-94	2.00
C306	Ceramic, 47 mmf	250218-17	.15	R327*	1 22K	230104-78	2.00
C307	Ceramic, 33 mmf	250218-21	.25		ly on 51-04 Chassis.	1	
C308	Ceramic, 2000 mmf	250218-20					

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250221-118

250187-57

250088-138

250175-30 250187-57

250159-102

250088-179 250175-30

250261-125 250218-17

250218-17 250175-30 250175-30 250175-30 250175-30

250276-1

250276-1 250276-1

250276-1 250234-68

250234-154 250234-146

270559-9

250188-9

250211-7

Cer., 2.5 - 12.0 mmi (Trimmer) Cer., 5 mmi - 5%

Paper, .01 mid - 400V Cer., 5000 mmi Mica, 220 mmf

Cer., 5000 mmi Mylar, 1 mfd - 100 V Cer., 47 mmi Cer., 5000 mmf Cer., 5000 mmf Cer., 5000 mmf

Cer., 5000 mml Cer., Feed Thru, 1000 mf Ceramic, .01 mf

Ceramic, .0033 mf Ceramic, .0015 mf

Electrolytic 4 mf - 50V

Mica, 470 mmf Cer., 12 mmf - 5%

Cer., 5000 mmf

notene.	Ton	neurone		-		DECKION.	-	10		INDICATED	-	0
FUCCO	ron	RE31310R3	MAL	TON	~	FACEAGE	01	10	OLITEROS	INDIGATED		· 49 · -

1000

1000 220K 47K

478

220K

10 meg 470

10K - 2W

3300 560 - 2W

3900 - 1W

68K 270

1200 - 2W

100%

470K 68K

Loudness Control (3. 3 meg)

Treble Control (1 meg) Bass Control (3. 3 meg) 2, 2 meg

R201

R202

R203

R204 R205

R301 R302

R303

R304

P305

R305 R306

R308 R309

1310

R311

R313

D314

R316 R323

R325

#### MISCELLANEOUS PARTS LIST



SYMBOL	DESCRIPTION	PAST NO.	LIFT	SYMBOL	DESCRIPTION	PART NO.	LIST
SW303 SW303 SW303 PC201	Phono & Tape Input Pilot light #1847 Band Switch Band Switch (51-02 & 04) Band Switch (51-03BA) Printed Circuit	180566-1 180161-17 180161-17 180284-1 160284-2 160284-4 250255-1	. 20 . 20 . 20 2, 75 1, 75 1, 75 1, 15	PC202	Printed Circuit Crystal Diode (1N34A) Dial Gians (S1-05) Dial Gians (S1-05) Dial Gians (S1-03) Dial Gians (S1-03) Dial Gians (S1-06) Dial Gians (S1-06) Dial Gianst (S1-06) Dial Gianster	250254-1 530049-1 150545-1 150520-1 150533-1 150549-1 150551-1 150551-1 102448-2	1.15 1.85 .90 .85 .90 .90 .85 .90 .35

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

PRICES SLIGHTLY HIGHER IN WEST

PART NO. LIST

250175-30

250261-29

250218-17

250218-21

250218-20

250218-20

250218-19

250175-30

250218-19

250202-8

250202-8 270027-28 250187-53

230104-48

230104-84 230104-42

230104-86 230104-62

230104-54 230105-62

230104-74

230104-67

230104-98

230105-68

230104-78

230104-50

230105-73

230104-62

230104-48

230104-48 230104-62 230104-90

230104-82 230104-82

220131-13 220072-36

220073-21

230104-90

230104-50 230104-50 230104-58

230104-84 230104-55

230106-1074 230106-1063

230104-86

230104-68

230106-105

230104-94 230104-84

230105-69

230104-102

250218-5

250219-3

2,75

20

.20

2.00

2.00 2.00 2.00

@1.00 @1.25

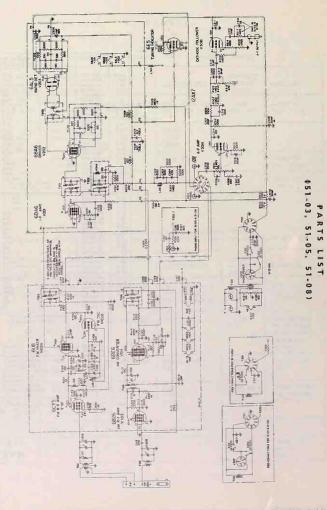
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MAGNAVOX

RADIO PAGE

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SYMBOL

T101

T102 T103 T104

T104 T105 T106 T201 T202

T203 T301 T302 L101 L102 L103 L104 L105 L106

L301 L302

C101 C102 C103

C103 C104 C105 C106 C107 C108

C109 C110

C114 C115 C116 C118 C119 C120 C121 C122 C123 C124 C125 C126 C127

C201

C 202 C 203 C 203

CHASSIS 51 SERIES

#### SCHEMATIC DIAGRAM (51-03, 51-05, 51-08)

SYMBOL	DESCRIPTION	PART NO.	LIST	SYMBOL	DESCRIPTION	PART NO.	LIST
	TRANSFORMERS-COILS-CHOKE			C311	Ceramic, 470 mmf	250218-6	. 20
	TRANSFORMERS-COILS-CHOICE	1	1. 1	C312*	Ceramic, 22 mmf	250218-1	.20
		360491-4	1.00	C313	Ceramic, 10K mmf	250218-19	.20
101	FM Input	360628-1	1.60	C314	Ceramic, 10K mmf	250218-19	. 20
102	1st FM I-F	360746-1	3,50	C315	Electrolytic, 20 mfd - 25V	270027-28	1.00
F103	Rod Antenna Assembly		1.35				. 25
104	AM R-F	360753-1		C316	Mica, 100 mmf	250187-53	
r105	AM Oscillator	360752-1	.65	C317	Ceramic, 10K mmf - 1000V	250219-2	. 20
106	1st AM I-F	360611-1	1.40	C318	Ceramic, 1000 mmf	250218-18	. 20
201	2nd FM 1-F	360747-1	1.60	C319**	Ceramic, 1000 mmf	250218-18	. 20
202	2nd AM I-F	360749-1	2.65	C320**	Ceramic, 180 mmf	250175-40	. 20
203	Ratio Detector	360748-1	2.65				
1301	Filament	320277-2	4.50	13 1	1		
101	FM Antenna	360750-1	. 15		RESISTORS		
102	RF Choke	360522-9	.30			1 1 1 1 1 1 1	
103	FM B-F	360751-1	. 15		All resistors are 10%-1/2W		
104	FM Oscillator	360628-1	90		unless specified otherwise		
104	RF Choke	360522-9	.30			4	
105	RF Choke	360522-9	.30	R101	68	230104-48	2.00
106		360621-1	.35	R102	68K	230104-84	2.00
301	10KC Filter		.30	R102	22	230104-42	2.00
.302	RF Choke	360522=9	. 30		100K	230104-42	2.00
				R104			2.00
	and the second sec			R105	1000	230104-62	
	CAPACITORS			R106	220	230104-54	2.00
			140	R107	1000 - 1W	230105-62	2.50
	All capacitors are 500V			R108	10K	230104-74	2.00
	unless specified otherwise		1 3	R109	2700	230104-67	2,00
				R110	1 meg	230104-98	2.00
101	Tuning Capacitor	260147-1	6.75	R111	3300 - 1W	230105-68	2.50
102	Feed Thru, 1000 mm.f	250276-2 -	.20	R112	22K	230104-78	200
103	Feed Thru, 1000 mmf	250276-2	.20	R113	100	230104-50	2,00
104	Feed Thru, 1000 mml	250276-1	.25	R114	8200 - 1W	230105-73	2,50
2105	Mica, 100 mmf	250187-53	25	R115	1000	230104-62	2.00
2105	Mica, 100 mmi	250187-53	.25	R201	680	230104-48	2,00
	Mica, 2.2 mmt	250221-118	.15	R202	1000	230104-62	2.00
C107		250187-57	35	R203	220K	230104-90	2.00
C108	Mica, 220 mmf	250188-9	30	R204	47K	230104-82	2.00
C109	Cer. 2.5 - 12.0 mmf (Trimmer)	430100-9	20	R205	47K	230104-82	2.00
C110 .	Cer., 5 mmf - 5%	250088-138					2.00
C111	Paper, . 01 mfd - 400V	250211-7	. 25	R206	1.5 meg.	230104-100	
C112	Cer., 5000 mmf	250175-30	. 20	R207	2.2 meg	230104-102	2,00
C113	Mica, 220 mmf	250187-57	. 35	R208	2.2 meg	230104-102	2.00
C114	Mica, 470 mmf	250159-102	. 25	R301	Loudness Control (3, 3 meg)	220131-13	@1.25
C145	Cer., 12 mmf - 5%	250088-179	. 20	R302	Treble Control (1 meg)	220072-38	@1.00
C116	Cer., 5000 mmi	250175-30	. 20	R303***	Bass Control (1 meg)	220073-24	@1.25
C118	Mylar, .1 mfd = 100V	250261-125	. 40	R304	2.2 meg	230104-102	2,00
C119	Cer., 47 mml	250218-17	. 15	R305	220K	230104-90	2.00
C120	Cer., 5000 mmf	250175-30	. 20	R306	330K	230104-92	2.00
C121	Cer., 5000 mmf	250175-30	.20	R307	1 meg	230104-98	2.00
C122	Cer., 5000 mmf	250175-30		R308	68K	230104-84	2.00
C122	Cer., 5000 mmf	250175-30	.20	R309	330K	230104-92	2.00
	Cer., Feed Thru, 1000 mf	250276-1	25	R310	10K - 2W	230104-1074	3.50
C124	Cer., reed Inrd, 1000 mi	250276-1	.25		10K - 2W 1200 - 2W	230106-1063	3.50
C125	Cer., Feed Thru, 1000 mf		1 .23	R311		230106-1063	2.00
C126	Cer., Feed Thru, 1000 mf	250276-1	. 25	R312	100K		2.00
C127	Cer., Feed Thru, 1000 mf	250276-1	. 25	R313	3300	230104-68	
C201	Ceramic, .01 mf	250234-66	. 30	R314	1000	230104-62	2.00
C202	Ceramic, .0033 mf	250234-154	.25	R315	47K	230104-82	2.00
2203	Ceramic, . 0015 mf	250234-146	. 20	R316	470K	230104-94	2:.00
204	Electrolytic 4 mf - 50V	270559-9	4.10	R317*	1 meg	230104-98	2.001
205	Paper, .1 mf - 200V	250240-13	. 35	R318	1 meg	230104-98	2.00
301	Electrolytic, 30-30 mfd=450V	270021-58	2,25	R319	4700	230104-70	2.00
2302	Mica, 1000 mmf	250228-354	.45	R320	2500 - 10W	240071-39	@ .40
2303	Mica, 1000 mmf	250228-354	. 45	R321	100	230104-50	2.00
C304	Ceramic, 470 mmi	250218-6	20	R322	100	230104-50	2.00
C305	Caramia 3-10K mmf 1000M	250219-3	55		3900 - 1W	230105-69	2.50
	Ceramic, 2x10K mmf - 1000V	250218-17	.15	R326 R327**		230104-85	2, 50
C306	Ceramic, 47 mms				82K		2.50
C307	Ceramic, 3300 mmf	250175-28	. 25	R328**	1 330K	230104-92	2.50
C308	Ceramic, 2000 mmi	250218-20	. 25	*Used o	nly in 51-03.		
C309	Ceramic, 2000 mmf	250218-20	. 25		nly in 51-05 & 08		
C310	Ceramic, 10K mmi	250218-19	. 20		only in 51-03BA		

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#### ALIGNMENT

# Magnavox MAINTENANCE MANUAL 1326

#### 51 SERIES RADIO CHASSIS

#### GENERAL

Complete maintenance information necessary for the properservicing of any of the 51 series radio chassis is covered on the following pages. Some of these chassis's are AM-FM tuners only which require an additional amplifier for voltages and output. Others contain a built-in amplifier which may have push-pull output or single ended output. The chassis having push-pull output on put provide approximately 6-watts power output and those chassis having single-ended output provide approximately 3-watts power output. Electrical changes which were made on the 51-01 and 51-03 are included on the schematic diagram covering those chassis. These electrical charges will appear in those chassis which contain the suffix letters "BA" appearing after the chassis numbers. The chassis which have the sufficient "BAX" appearing after the chassis numbers are identical to the "BA" versions, however, they use a different transformer as illustrated in the Parts List.

#### AM ALIGNMENT Set band switch to AM position. Check dial pointer positioning.

SIGNAL	GENERATOR	SET RECEIVER	ADJUSTMENTS	CONNECT	REMARKS	
COUPLE TO:	FREQUENCY	DIAL TO:	1200011110	METER		
6BE6 (pin 7) thru .01 mfd	455 kc (modulated)	Near 1000 kc (free of interference)	T202, T106, top and bottom slugs	Across voice coll	Adjust for max. output	
AM ant. term. thru 10 mmf	1400 kc (modulated	1400 kc	C101F C101D C101B	- 7		
	600 kc (modulated)	600 kc	T105, T104	and the second sec	Adjust for max. output.	
		****			Repeat steps 2 and 3.	

#### SPECIFICATIONS

		Detter Determine	6AL5	
Tuning Frequency Range:		Ratio Detector		
Broadcast Band	540-1620KC	AM Detector (crystal)	1N34A	
FM Band	88-108MC	Tuning Eye (51-03, 04, 05, 08)	6E5	
Intermediate Frequency	455KC/10.7MC	Audio Amp. (51-02)	6AV6	
Tubes:		Audio Amp. (51-01, 04, 07, 09, 11)	(1/2) 6U8	
FM RF Amplifier	6CY5	Audio Amp (51-03, 05, 08)	(1/2) 12AX7	
AM RF Amplifier	6BZ6	Phase Inverter (51-01, 04, 07, 09, 11)	(1/2) 6U8	
FM Mixer & Osc.	6U8	Cathode Follower (51-03, 05, 08)	(1/2) 12AX7	
AM Converter	6BE6	Audio Output (51-02)	6AQ5	
IF Amplifier	6BA6	Audio Output Push-Pull (51-01, 04, 07,		
FM Driver	6BA6	Rectifier (51-01.02.04.07.09.11)	5Y3	

#### CHASSIS DIFFERENCES

Chassis No.	Tuning Eye	Output	Chassis No.	Tuning Eye	Output
51-01	No	Push-Pull	51-07	No	Push-Pull
51-02	No	Single Ended	51-08	Yes	None
51-03	Yes	None	51-09	No	Push-Pull
51-04	Yes	Push-Pull	51-10 Not Released		
51-05 51-06 Not Released	Yes	None	51-11	No	Push-Pull

#### FM ALIGNMENT (Using AM Signal Generator and VTVM) Set band switch to FM position. Note: Place a 1 megohm resistor in series with hot side of VTVM.

SIGNAL C	ENERATOR	SET RECEIVER	ADJUSTMENTS	CONNECT	REMARKS	
COUPLE TO:	FREQUENCY	DIAL TO:	ADJOOTMENTO	METER		
6CY5 (pin 5) thru.01 mfd	10.7 mc Low end unmodulated		T201, T102 top & bottom slugs and T203 bottom slug	From (pin 5) to pin 4 of PC202	Adjust for max neg. reading on VTVM.	
n	JT.	Low end of dial	T203 top slug	Across C203	Tune for zero VTVM. (Point where voliage swings pos. or neg.)	
	0	Low end of dial	Repeat steps 1 & 2	Repeat steps 1 & 2	Repeat steps 1 & 2	
FM ant. terms in series with: 120 ohms (high side) 150 ohms (low side)	107 mc	107 mc	C109 C101A C101C	From pin 5 to pin 4 of PC202	Adjust for max neg. reading on VTVM.	
	89 mc *	89 mc	L104 (osc. coil)		0	
					Repeat two preceding steps.	

ADIO

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MAGNAVOX

#### ALIGNMENT

#### FM I-F AND RATIO DETECTOR ALIGNMENT (Using Sweep Generator and Oscilloscope). Note: Place 1 megohm resistor in series with hot scope lead.

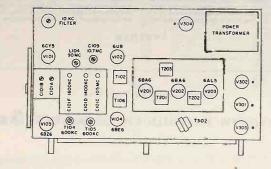
SWEEP O	GENERATOR	SET RECEIVER	ADJUSTMENTS	CONNECT	BRILLOW
COUPLE TO:	FREQUENCY	DIAL TO:	ALGUSIMENIS	SCOPE TO	REMARKS
6CY5 (pin 5) thru .01 mfd and 1000 ohms in series	10.7 mc (.3 mc sweep) couple a marker sig. to 6CY5pin 5	Low end of dial	T201, T102 top and bottom slugs T203 bottom slug	From pin 5 to pin 4 of PC202	Open one end of C 204. Adjust for max. amplitude and symmetry. See fig. 1 below.
ñ	e e	Low end of dial	T203 top slug	Across C203	Adjust for best amplitude and straightest slope See fig. 2.
	"	Low end of dial	T203 bottom slug	37	Adjust for best symmetry about 10.7 mc. See fig. 2.
"	11			line .	Repeat steps 1, 2 and 3.

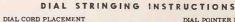
10.7%C



RATIO DETECTOR RESPONSE

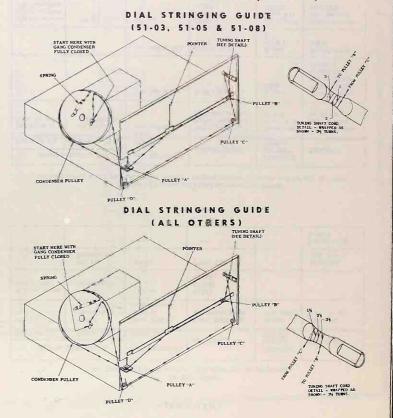
#### CHASSIS LAYOUT



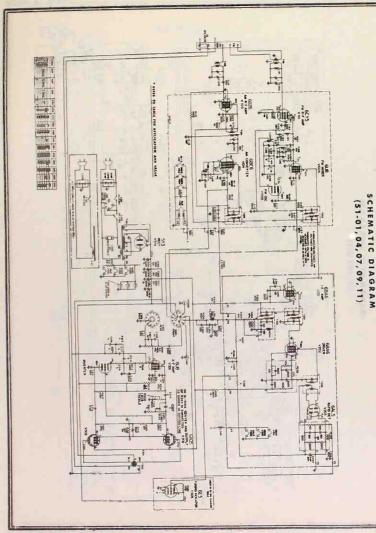


#### DIAL POINTER PLACEMENT

Selecta 50-inch length of dial cord and tie a small loop at each end. Turn the tuning gang fully out of mesh and hook one end of the cord over the metal hook on the condenser pulley nearest the front of the chassis and proceed with the stringing as shown in the drawing below. Place the dial pointer onto the pointer slide and turn the tuning gang completely in mesh. Lace the dial cord around the three hooks on the front of the pointer and with the tuning condenser still fully in mesh, slide the pointer over until it lines up with the last dial callbration mark at the low frequency end of the broadcast band. This completes the assembly.



CJohn F. Rider



#### REPLACEMENT PARTS LIST (51-01, 04, 07, 09, 11)

TYMBOL	DESCRIPTION	PART NO.	SYMBOL	DESCRIPTION
-	TRANSFORMERS-COILS-CHOKES		C314	Cer., 10K mmf
	Tions of an and the control of a character		C315	Electrolytic, 20 mfd-25V
T101	FM Input	360491-4	C316	Cer., 680 mmf
T102	1st FM I-F	360626-1	C316	Cer., 470 mmI (01-01BA)
T103	Rod Antenna Assembly	360748-1	C317	Paper, . 047 mfd-200V
T104	AM R-F	360753-1	C317	Paper. , 1 mfd-200V (51-01BA)
T105	AM Oscillator	360752-1	C318	
T106	1st AM I-F	360611-1	C319	Paper, .047 mfd-200V Paper .1 mfd-200V (51-01BA)
T201	2nd FM I-F	360747-1	C319	Paper .1 mfd-200V (51-01BA)
T202	2nd AM I-F	360749-1	C326	Cer., 330 mmf Cer., 100 mmf (51-01BA) Cer., 1000 mmf (51-01BA)
T203	Ratio	360748-1	C326	Cer., 100 mmf (51-01BA)
T301	Power	300165-1	C327	Cer., 1000 mmf (51-01BA)
T301	Power (51-04) & (51-01BAX)	300165-2	1	
T302	Audio Output	320077-1	4	RESISTORS
L101	FM Antenna	360750-1	1	
L102	RF Choke	360522-9	1	All resistors are 10%, 1/2W
L103	FM R-F	360751-1		unless specified otherwise
L104	FM Oscillator	360628-1	1	1
L105	RF Choke	360522-9	R101	68
L106	RF Choke	360522-9	R102	68K
L301	10KC Filter	380621-1	R103	22
L302	RF Choke	360522-9	R104	100K
			R105	+ 1000
	the second se		R106	220
	CAPACITORS		R107	1000, 1W
	the set and the set of		R108	10K
	All capacitors are 500V		R109	2700
	unless specified otherwise	1000	R110	1 meg
			R111	3300, 1W
C101	Tuning Capacitor	260147-1	R112	22K
C102	Feed Thru, 1000 mmf	250276-2	R113	100
C103	Feed Thru, 1000 mmf Feed Thru, 1000 mmf	250276-2	R114	3200, 1W
C104	Feed Thru, 1000 mmf	250276-1	R115	1000
C105	Mica, 100 mmf	250187-53	R201	680
C106	Mica, 100 mmf	250187-53	R202	1000
C107	Mica, 100 mmf Mica, 2.2 mmf	25022f-118	R203	220K
C108	Mica, 220 mmf	250187-57	R204	47K
C109	Cer. 2.5-12.0 mmf (Trimmer)	250188-9	R205	47K
C110	Cer. 5 mmf, 5%	250088-138	R206*	1.5 meg. 2.2 meg
C112	Cer. 5000 mmf	250175-30	R207*	2.2 meg.
C113	Mica, 200 mmf	250187-57	R208* R301	Loudness Control (3.3 meg)
C114	Mica, 470 mmf	250159-102	R301	Treble Control (1 meg)
C115	Cer., 12 mmf, 5%	250088-179	R303	Bass Control (3.3 meg)
C116	Cer., 5000 mmf	250175-30 250261-125	R304	2, 2 meg
C118	Mylar, . 1 mfd, 100V Cer., 47 mmf Cer., 5000 mmf Cer., 5000 mmf		R305	220K
C119	Cer., 47 mmf	250218-17	R306	330K
C120	Cer., 5000 mmf	250175-30 i	R307	2 2 - 2W
C121	Cer., 5000 mmf	250175-30	R308	2.2 - 2W 150, 2W
C122	Cer., 5000 mmf	250175-30	R309	750, 3W
C123	Cer., 5000 mmf	250276-1	R310	10K, 2W
C124	Cer., Feed Thru, 1000 mmf		R311	1200, 2W
C125	Cer., Feed Thru, 1000 mmf Cer., Feed Thru, 1000 mmf Cer., Feed Thru, 1000 mmf	250276-1	R312	100K
C126	Cer., Feed Thru, 1000 mmi	250276-1	R313	3300
C127	Cer., Feed Inru, 1000 mmi	250234-66	R314	1000
C201	Cer., .01 mf	250234-154	R314	330 (61-01BA)
C202	Cer., . 0033 mi	250234-146	R315	2.2 meg
C203	Cer., .0015 mf	270559-9	R316	470K
C204	Electrolytic, 4 mf-50V Paper, . 1mf - 200V	250240-13	R317	470K
C205*	Electrolytic 35 mfd - 350V	270021-71	R318	5600
C301	30 mfd - 350V		R318	3300 (51-01BA)
	20 mfd - 350V		R319	470K
	10 mfd - 350V		R320	33K
C302	Mino 1000 mmf 5%	250228-354	R321	470K
C302 C303	Mica, 1000 mmf, 5% Mica, 1000 mmf, 5%	250228-354	R322	220, 2W
C303	Coromic 680 mmf	250218-4	R323	68K
C304 C305	Ceramic, 680 mmf Ceramic, 2 x 10K mmf-1000V	250219-3	R323	150K (\$1-01BA)
C305		250218-17	R324	12K
C306 C307	Ceramic, 33 mmf	250218-21	R324	4.7K (51-01BA)
C308	Ceramic, 33 mmf Ceramic, 2000 mmf	250218-20	R325	3900, 1W
C308	Car 2000 mmf	250218-20	R326	470K
C309	Cer., 2000 mmf Cer., 10K mmf	250218-19	R327*	22K
C310 C311	Paper, .047 mfd-200V	250202-11	R330	22 (51-01BA)
C311 C312	Ceramic, 5000 mmf	250175-30		
	Cer., 100 mmf	250218-22		nly on 51-04 Chassis.

CHASSIS 51 SERIES

PART NO.

250218-19 270027-28 250218-4 250218-6 250202-11 250202-13 270027-28

250202-11

250202-13 250207-49 250218-22

250218-8

230104-48 230104-84 230104-42 230104-86 230104-62 230104-62 230104-54 230105-62 230104-74 230104-67

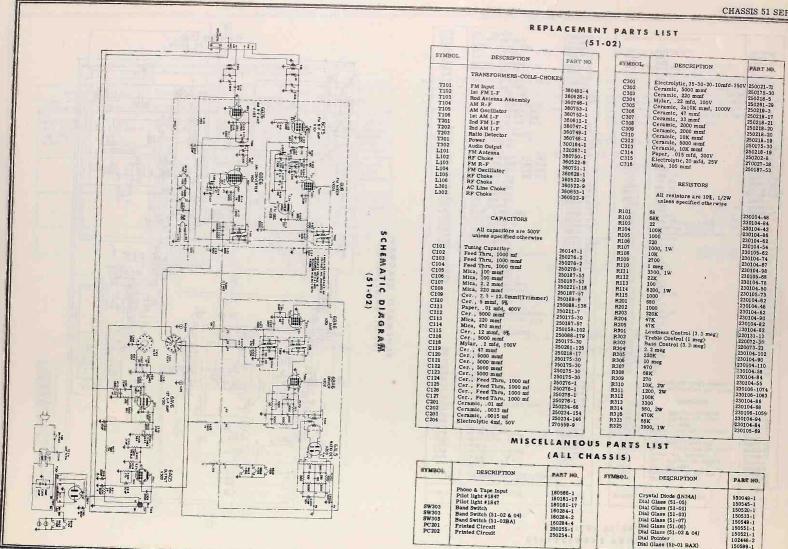
230104-67 230104-98 230105-68 230104-78 230104-50

 $\begin{array}{c} 330105-73\\ 230104-81\\ 230104-82\\ 230104-82\\ 230104-92\\ 230104-92\\ 230104-92\\ 230104-92\\ 230104-92\\ 230104-92\\ 230104-92\\ 230104-102$ 

MAGNAVOX

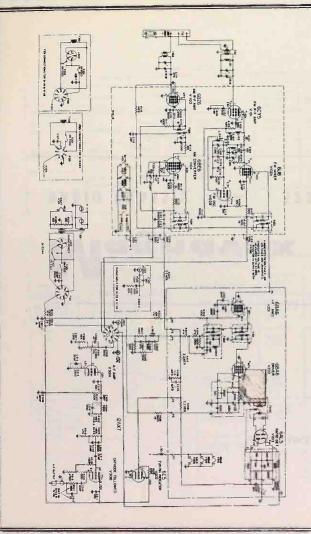
RADIO PAGE 25-9

OJohn J. Rider



CJohn F. Rider

CHASSIS 51 SERIES



SCHEMATIC DIAGRAM

(51-03, 05, 08)

#### REPLACEMENT PARTS LIST (51-03,05,08)

SYMBOL	DESCRIPTION	PART NO.	SYMBOL.	DESCRIPTION
	TRANSFORMERS-COILS-CHOK	es.	C311	Ceramic 470 mmf
		1	C312*	Ceramic, 470 mmf Ceramic, 22 mmf
T101	FM Input	360491-4	C313	Ceramic, 10K mmf
T102	1st FM I-F	360626-1	C314	Ceramic, 10K mmf
T103	Rod Antenna Assembly	360746-1	C315	Electrolytic, 20mfd, 25V
T104	AM R-F	360753-1	C316	Mica, 100 mmf
T105	AM Oscillator	360752-1	C317	Ceramic, 10K mmf, 1000V
T106	1st AM I-F	360611-1	C318	Ceramic, 1000 mmf
T201	2nd FM I-F	360747-1	C319**	Ceramic, 1000 mm
T202	2nd AM I-F	360749-1	C320**	Ceramic, 1000 mmf
T203	Ratio Detector	360748-1	0320**	Ceramic, 180 mmf
T301	Filament	320277-2	1	PROJECT DO
L101				RESISTORS
L101 L102	FM Antenna RF Choke	360750-1		
		360522-9		All resistors are 10%, 1/2
L103	FM R-F	360751-1	1	unless specified otherwise
L104	FM Oscillator	360628-1	1	
L105	RF Choke	360522-9	R101	68
L106	RF Choke	360522-9	R102	68K
L301	10KC Filter	360621-1	R103	22
L302	RF Choke	360522-9	R104	100K
			R105	1000
			R106	220
	the second s	1 - 1	R107	1000, 1W
	CAPACITORS	1 1	R108	10K
23		1	R109	2700
·	All capacitors are 500V		R110	1 meg
_	unless specified otherwise		R111	3300, 1W
	where a pectited other wise		R112	22K
0101	Burles Conseller	000147 1	R113	100
C101	Tuning Capacitor	260147-1		
C102	Feed Thru, 1000 mmf	250276-2	R114	8200, 1W
C103	Feed Thru, 1000 mmf	250276-2	R115	1000
C104	Feed Thru, 1000 mmf	250276-1	R201	680
C105	Mica, 100 mmf	250187-53	R202	1000
C106	Mica, 100 mmf	250187-53	R203	220K
C107	Mica, 2.2 mm	250221-118	R204	47K
C108	Mica, 220 mmf	250187-57	R205	47K
C109	Cer. 2. 5-12. 0 mmf(Trimmer)	250188-9	R206	1.5 meg.
C110	Cer., 5 mmf, 5%	250088-138	R207	2.2 meg
C111	Paper, . 01 mfd, 400V	250211-7	R208	2.2 meg
C112	Cer., 5000 mmf	250175-30	R301	Loudness Control (3.3 meg)
C113	Mica, 220 mmf	250187-57	R302	Treble Control (1 meg)
C114	Mica, 470 mmf	250159-102	R303	Bass Control (1 meg)
C115	Cer., 12 mmf, 5%	250088-179	R303***	Bass Control (4 meg)
C116	Cer., 5000 mmf	250175-30	R304	2. 2 meg
C118	Mylar, .1 mfd, 100V	250261-125	R305	220K
C119	Cer., 47 mmf	250218-17	R306	330K
C120	Cer., 5000 mmf	250175-30	R307	1 meg
C120	Cer., 5000 mmf	250175-30	R308	68K
C121	Cer., 5000 mmf	250175-30	R309	330K
	Cer., 5000 mm		R310	10K, 2W
C123	Cer., 5000 mmf	250175-30	R310 R311	1200, 2W
C124	Cer., Feed Thru, 1000 mf	250276-1		1200, 2W 100K
C125	Cer., Feed Thru, 1000 mf	250276-1	R312	
C128	Cer., Feed Thru, 1000 mf	250276-1	R313	3300
C127	Cer., Feed Thru, 1000 mf	250276-1	R314	1000
C201	Ceramic, .01 mf	250234-66	R315	47K
C202	Ceramic, . 0033 mf	250234-154	R316	470K
C203	Ceramic, .0015 mf	250234-146	R317*	1 meg
C204	Electrolytic 4 mf, 50V	270559-9	R318	1 meg
C205	Paper, .1 mf, 200V	250240-13	R319	4700
C301	Electrolytic, 30-30 mfd, 450V	270021-58	R320	2500, 10W
C302	Mica, 1000 mmf	250228-354	R321	100
C302	Mica, 1000 mmf	250228-354	R322	100
C304	Ceramic, 470 mmf	250218-6	R326	3900, 1W
C305	Ceramic, 2x10K mmf, 1000V	250219-3	R327**	82K
C305	Commin 47 mm	250218-17	R328**	330K
	Ceramic, 47 mmi	250218-17	1000-	
C307	Ceramic, 3300 mmi		attend a	mly in 51-03.
C308	Ceramic, 47 mmf Ceramic, 3300 mmf Ceramic, 2000 mmf Ceramic, 2000 mmf Ceramic, 10K mmf	250218-20		nly in 51-05 & 08
C309	Ceramic, 2000 mmi	250218-20 250218-19		mly in 51-03BA

MAGNAVOX RADIO PAGE 25-1

CJohn F. Rider

CHASSIS 51 SERIES

PART NO.

250218-6 250218-1 250218-1 250218-1 250218-1 270027-28 250187-53 250219-2 250218-18 250218-18 250218-18 250218-40

120104-48 230104-59 230104-59 230104-50 230104-52 230104-52 230104-54 230105-52 230104-54 230105-52 230104-74 230104-74 230104-74 230104-75 230104-75 230104-75 230104-50 230104-50 230104-50 230104-50 230104-50 230104-50 230104-102 2300

CHASSIS 52 SERIES

6BA6

6BA6

GAL5

1N34A (1/2) 12AT7 (1/2) 12AX7

(1/2) 12AT7

(1/2) 12AX7 6AV6 5Y3 6E5

# ADIO PAGE 25-12 MAGNAVOX

#### GENERAL

The service information on the following pages covers the three versions of the 52 berles chassis. These chassis are AM-FM tuners only and the 52-01 and 52-02 versions obtain their voltages from the Amplifier used in conjunction with them. The 52-03 version contains its own power supply and uses a 573GT as a rectifier.

provisions are provided for the connection of an external AM or FM antenna. A terminal board having two connections marked FM, a connection marked AM and three other connections marked G, 1, and 2 respectively are located on a fibre board fastened to the rear of the radio chassis. To connect an external FM antenna to this unit merely connect the FM antenna leads to the two connections marked FM and to connect an external AM antenna connect one lead to the AM connection and ground the antenna to the connection marked G. The connections marked 1 and 2 are not used.

Provisions have also been provided for using a tape recorder in conjunction with instruments using these chassis. On the rear apron of the radio chassis are two sockets labeled "Record" and "Play". To record from either radio or phono set the band selector switch to the desired recording position and connect the input of the tape recorder to the socket identified as "Record". To play the tape recorder back thru instruments using these chassis, set the band selector switch to Tape and plug the output of the recorder into the socket identified as "Play".

#### SPECIFICATIONS

WER SUPPLY 117 V	OLTS, 50/60 CYCLES AC	I.F. AMPLIFIER
WER CONSUMPTION	75 WATTS	FM DRIVER
NING FREQUENCY RAN	GË:	RATIO DETECTOR
BROADCAST BAND	540-1620 KC	AM DETECTOR (CRYSTAL DIODE)
FM BAND	88-108 MC	IST AUDIO AMP (52-01)
TERMEDIATE FREQUEN		IST AUDIO AMP
BES:		CATHODE FOLLOWER (52-01)
FM RF AMPLIFIER	6CY5	CATHODE FOLLOWER
FM MIXER-OSCILLAT	OR 6U8	PHONO PREAMPLIFIER
AM RF AMPLIFIER	6BZ6	RECTIFIER (52-03)
AM CONVERTER	6BE6	TUNING INDICATOR

#### DIAL STRINGING

#### DIAL CORD PLACEMENT

PO

PO

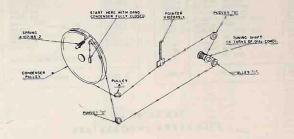
TU

INT

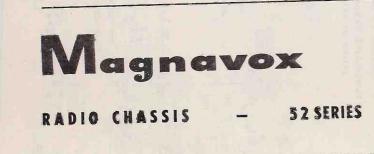
TU

Select a 64 inchilength of dial cord and tie a small loop at each end. Turn the tuning gang fully out of mesh and hook one end of the cord over the metal hook on the condenser pulley nearest the front of the chassis and proceed with the stringing as shown in the drawing below. DIAL POINTER PLACEMENT Place the dial pointer onto the pointer slide and turn the tuning completely in mesh. Lace the dial cord

Place the main pointer onto the pointer brack that a tuning gang completely in mesh. Lace the dial cord around the "three hooks on the front of the pointer and with the tuning condenser still fully in mesh, slide the pointer over until it lines up with the last dial calibration mark at the low frequency end of the broadcast band. This completes the assembly.



#### MAINTENANCE MANUAL 1327



#### **OJohn F.** Rider

SIGNAL	ENERATOR	SET RECEIVER	ADJUSTMENTS	CONNECT OUTPUT	REMARKS
COUPLE TO:	FREQUENCY	DIAL TO:		METER	
6BE6 (pin 7) thru.01 mfd	455 kc (modulated)	Near 1000 kc (free of interference)	T202, T106, top and bottom slugs	Across voice coil	Adjust for max. output
AM ant. term. thru 10 mmf	1400 kc (modulated	1400 kc	C101F C101D C101B	( <sup>11</sup>	
	600 kc (modulated)	600 kc	T105, T104		Adjust for max. output.
		*****			Repeat steps 2 and 3.

#### AM ALIGNMENT Set band switch to AM position. Check dial pointer positioning.

#### SWEEP GENERATOR SET RECEIVER CONNECT ADJUSTMENTS REMARKS COUPLE TO: FREQUENCY DIAL TO: SCOPE TO 6CY5 (pin 5) thru.01 mfd From p 5 to pin 4 202 10.7 mc Low end of dial T201, T102 top Open one end of C204. Ad ust for (.3 mc sweep) and bottom slugs T203 bottom slug and 1000 ohms couple a max. amplitude in series marker sig. and symmetry. See fig. 1 below. to 6CY5pin 5 .. Low end of dial T203 top slug AcToss Adjust for best Adjust for best amplitude and straightest slope, See fig. 2. C203 Adjust for best symmetry about 10.7 mc. See ., ... Low end of dial T203 bottom slug .. fig. 2. ., -----Repeat steps ----------1, 2 and 3.

ALIGNMENT

FM I-F AND RATIO DETECTOR ALIGNMENT (Using Sweep Generator and Oscilloscope). Note: Place 1 megohm resistor in series with hot scope lead.

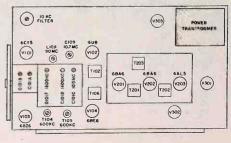
#### FM ALIGNMENT (Using AM Signal Generator and VTVM) Set band switch to FM position. Note: Place a 1 megohm resistor in series with hot side of VTVM.

SIGNAL G	ENERATOR	SET RECEIVER	ADJUSTMENTS	CONNECT	REMARKS	
COUPLE TO:	FREQUENCY	DIAL TO:	100 COTIMETTIC	METER		
6CY5 (pin 5) thru . 01 mfd	10.7 mc unmodulated	Low end of dial	T201, T102 top & bottom slugs and T203 bottom slug	From (pin 5) to pin 4 of PC202	Adjust for max neg. reading on VTVM.	
		Low end of dial	T203 top slug	Across C203	Tune for zero VTVM. (Point where voltage swings pos. or neg.)	
		Low end of dial	Repeat steps 1 & 2	Repeat steps 1 & 2	Repeat steps 1 & 2	
FM ant. terms in series with: 120 ohms (high side) 150 ohms (low side)	107 mc	107 mc	C109 C101A C101C	From pin 5 to pin 4 of PC202	Adjust for max neg. reading on VTVM.	
•	89 mč	89 mc	L104 (osc. coil)	н		
90		-7697			Repeat two preceding steps.	

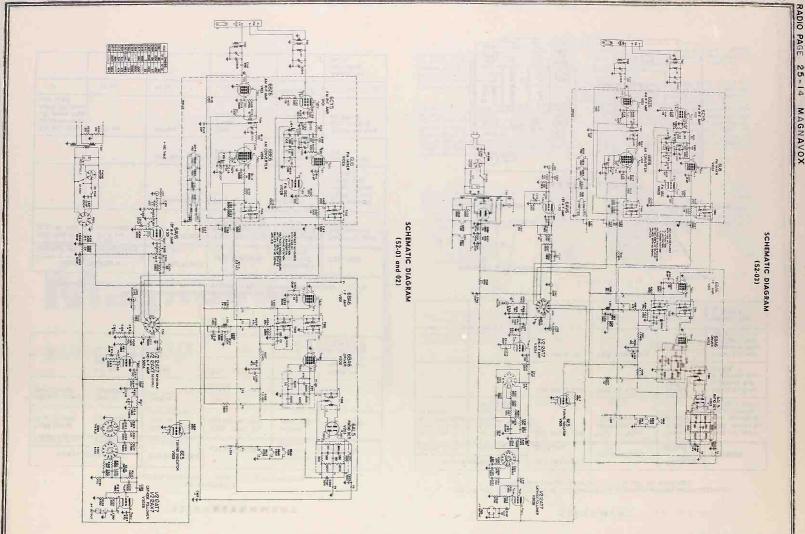




#### CHASSIS LAYOUT



CHASSIS 52 SERIES



6

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CHASSIS 52 SERIES

#### REPLACEMENT PARTS LIST

1.0

1.60

3. 50

. 30

4.5

1.40

2.65

4, 50

.15

. 15

. 90

. 35

8,75

2

. 25

25

15

. 30

25

. 20

25

. 44

15

20

20

25

25

2

30

2

. 20

. 30

. 20

25

20

20

. 25

. 20

. 25

.45

15

45

20

20

. 25

20

1.00

. 25

25

1.00

. 20

1,00

11.50

SYMBOL

C315

C315

C315

C315

C317

C31

C31

C313

C318 C319

C319

C320

C321 C321

C322

C323

C324

C325

C325

C326 C327

C328

C329

R10

R104

R10

R105

R108

R110

811

R112 R113

RUA

RJ 15

9116

R20

R202

R 203

R204

R 205

R204

8 202

R206

P301

R301 R302

R302

R302

R303

R303

R304

R304

P305

R305

R306 R307

R308

R308

P100

R309

0110

R310

8311

R311

8312

R312

R313

12114

68

22

68K

100K

1000

10K 2700

228

100

1000

1000

2208

47K

47 K

1.5 meg

2. 2 meg 2. 2 meg

1 meg

3300

3.3 meg 330K (52-03) 15K (52-01)

6.8 meg (52-03) 2.2 meg (52-01)

6.8 meg (52-03)

82K (52-01)

47K (52-02)

3300 (52-03)

1 meg 220K (52-03)

1 meg 33K (52-03)

470K (52-03)

3300 (52-03)

1 meg 1 meg -Loudness (52-03)

1 meg - Loude I meg (52-03)

meg

220K

2.2%

100%

33K (52-03)

1000. 19

1 meg 3300, 1W

8200 11

2. 2 meg

220

DI DT NO 1 101

MA461.4

350626-1

360746-1

350553-1

360752.1

360611-

1000 00 -

360749-

360748-1

320076-

300166-

360750-

360622.9

360751-

MC4 28-

340499 0

360822-9

360521-1

360622-6

250747-1

250276-

250278-2

250187-53

250187-53

250221-118

250218-5

250188-9

250211-7

750175-30

250187 - 57

250159-102 250088-179

250175.30

250261-125

250218-17

250175-30

250175-30

250175-30

250175-30

250276-1

250276-1

250276-1

250276-

250234-68

250234-154

250234-148

250202-13

250175-40

250218-7

250218-8

250218-6

250207-49

220027-28

250218-22

250218-11

250218-19

220027-29

250218-7

250218-20

250218-19

250228-354

250218-17 250228-354

250218-1 250218-5

250218-19

250175-30

250207-1

250218-21

250218-19

270027-28 250218-22

250212.22

270027-28

250088-138

250276

#### DESCRIPTION DAPT NO LIST SYMBOL DESCRIPTION Ceramic, . 01 mfd Ceramic, 220 mmf (52-03) 250218-19 P314 47K (52-03) 250218-5 R315 33K (52-01) Ceramic, 1000 mmf (52-01) Ceramic, 2000 mmf (52-03) 250218-8 25 R115 47K (\$2-02) 220K (52-03) Ceramic, 680 mmf (52-01) 250218-4 20 8316 68K (52-01) R316 R317 1 meg - Timbre (52-03) 220K (52-01) Ceramic, 1000 mmf (52-02) 250218-8 25 Ceramic, 33 mmf (52-03) 250218-21 . 15 Ceramic, 5000 mmf Ceramic, 5000 mmf Ceramic, 01 mfd (52-03) R317 R317 330K (52-02) 470K (52-03) 250175-30 250218-19 20 250218-19 250202-11 250218-20 R318 R318 R319 1 meg - Timbre 100K (52-03) Paper, . 047 mfd-200V 25 Ceramic, 2000 mmf (52-03) . 25 Paper, .015 mfd-200V 250202-8 . 25 1 meg 1000 (52-03) Electrolytic, 20mfd-150V(52-03) R319 R320 270027-13 Paper, 6800 mmf-200V Ceramic, 5000 mmf (52-03) 250211-6 . 25 47K R320 R321 4.7K (52-03) 20 Ceramic, 2000 mmf Ceramic, 3300 mmf (52-03) 6.88 250718 20 . 25 1 meg (52-03) 56K R321 R322 R322 250175-28 Ceramic, 5000 mmf Ceramic, 1000 mmf (52-03) 250175 30 20 22K (52-03) . 25 250218-8 27 K Paper, 6800 mmf-200V Ceramic, 1000 mmf (52-03) Ceramic, 470 mmf 250211-6 25 47K (52.03) 25 8323 R324 R324 10K 100K (52-03) 250218-6 20 Paper, .022 mid-200V (\$2-03) Ceramic, .01 mfd 250202-9 R325 R325 250218-19 4.7K 20 680K (52-03) Ceramic, .01 mfd-1000V Ceramic, .01 mfd-1000V 250910 2 20 250219-2 D926 1000 20 R326 220K (52-03) Electrolytic, 30-30m/d-450V Electrolytic, 35-30-20-10m/d-350 270021-58 2 25 2.75 R327 1 meg 100K (52-03) 4.7K 270021-71 Ceramic, 5000 mmf (52-02) 250175-30 R328 4.7K 10K (52-03) 1200 - 2W R328 R329 RESISTORS R329 1.5 meg (52-03) All resistors are 10%-1/2W unless specified otherwise 230104-48 2.00 230104-84 230104-42 2 00 2,00

230104-86

230104-62

230104-54

230105-62

220104-74

230104-67

230104-98

230105-68

230104-50

230105-73

230104-62 230104-102

230104-10

230104-90

230104-82

230104-82

230104-100

230104-102

230104-102

230104-104

230104-102 230104-76

230104-80

230104-102 230104-98

230104-68

230104-108

230104 85

230104-82

230104-68

230104-98

230104-90

230104-98

230104-90

220074-14

230104-96

230104-98

230104-80

220074-15

230104-98

230104-66

250104-68

230104-86

2.00 2.00 2.00

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Q1.00 2,00

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2.00

2.00

#### REPLACEMENT PARTS LIST (Con't.)

PART NO.	LIST	SYMBOL	DESCRIPTION	PART NO.	LIST
230104-82	2.00	R330	10X - IW	\$30106-1074	3.50
230104-80	2.00	R330	100K (52-03)	230104-86	2 50
230104-82	2.00	R331	3900 - 1W	230105-69	2.50
230104-90	2.00	8331	2. 3 meg (52-03)	230104-102	2.00
230104-84	2.00	R332	2500 - 2W.W.W.	240071-39	3, 50
220135-5	2,00	R332	10K - 5W (52-03)	230150-342	13.50
230104-90	2.00	R333	470K	230104-94	2.00
230104-92	2.00	R333	1200 - 2W (52-03)	230106-1063	3.50
230104-94	2.00	R334	100	230104-50	2.00
220135-5	61.60	R334	8. 2K - 2W (52-03)	230104-1073	3.50
230104-86	2.00	R335	100	230104-50	2.00
230104-98	2.00	R335	10K, 5W (52-05)	230150-518	6 35
230104-62	2.00	R336	68K (52-02)	230104-64	2.00
230104-82	2.00	RJ36	1000 (52-03)	230104-82	2.00
230104-70	2.00	R337	470K (62-03)	230104-94	2.00
230104-72	2.00	R338	2000 - Hum Balance (52-03)	220120-4	10 . 45
230104-98	2.00	R339	1000 (62-03)	220104-62	2.00
230104-83	2.00	the second second			2.00
230104-78	2.00	1	MISCELLANEOUS		
230104-79	2.00				
230104-82	2.00	PC201	Printed Circuit	250255-1	1.15
230104-74	2.00	PC202	Printed Circuit	250254-1	I. 18
230104-86	2.00	SW301	Band Switch	160284-3	2 75
230104-70	2.00	SW302	Bass Switch (wafer)	100478-2	1.7
230104-96	2.00	SW302	Treble Switch (wafer)	160278-2	1.75
230104-62	2.00	J301	Phono Jack	180466-1	.10
230104-90	2.00	. 1302	Recorder Jack	180566-1	20
230104-98	2.00	J303	Part of J302		
230104-86	2.00	1	Dial Glass	150534-1	. 90
230104-70	2.00		Dial Pointer	635321-1	. 35
230104-74	2.00		Pilot Light (#1847GE)	180161-17	. 30
230106-1053	3.50		Crystal Diode (1N34A)	530049-1	1.85
230104-100	2.00	1			1,00

# N AGNAVOX RADIO PAGE 25

G

#### CJohn F. Rider

STABL

7101

T103

T 103

**T104** 

T105

TION

T201 T202

7705

T301

1301

L101

1 102

L193 £104

LIOS

L301

C101

CIAS

C 104 C 105

C108 C107

C105

C100

C11/

C113 C113

C114

10116

C118

CIIS

C120 C121

C122

C123

C125

C121 C201

C202

C203

C204

C205

C301 C301 C302 C302 C302

CINS

C304 C304

C305 C305

C305 C307

C307

C308

C100

C310

C312 C312

CIU

C313

C314

C314

DESCRIPTION

PM Input

AM. RF

Lat FM - L-F

AM Oscillater

and FM-1-F

Filament

87 Choke

FM - RF

RF Choice

1000 Filter

R.F Choke

Ratio Detecto

Promer (53.07

FM Astrona

EM Oscillator

Rod Astenna Asey

TRANSFORMERS-COLLE-CHOKE

CAPACITORS

All campations are 500%

miess specified otherwise

Tuning Gang Fred Thru, 1000 mmf Fred Thru, 1000 mmf Fred Thru, 1000 mmf

Ceramic, 220 mmi Trimmer 2, 5, 12 mmi

Ceramic, 5 mmf, %

Paper, .01 mfd Ceramic, 5000 mmf Mica, 220 mmf

Ceramic, 12 mmi, 5% Ceramic, 5000 mmf Mylar, .1 mfd

Ceramic, 47 mmf Ceramic, 5000 mmf Ceramic, 5000 mmf

Ceramic, 5000 mmf Ceramic, 5000 mmf

Feed Thra, 1900 mmi

Fred Thru, 1000 mmf

Ceramic, .01 mfd

Ceramic, 58 mml

Ceramic, 58 mmf

Ceramic, . 0033 mid Ceramic, . 0015 mid

Feed Thru, 1000 mmf

Electrolytic, 4 mid-50V Paper, 1 mid, 200V

Ceramic, 180 mmf (52-01)

Ceramac, 1000 mmf (52-01)

Electrolytic, 20mid-25V (52-01) Ceramic, 100 mmf

Electroivtic, 20mid-25V (\$2-03)

Ceramic, 470 mmf (52-02 Ceramic, 330 mmf (52-03

Ceramic, 47 mmf (52-02) Ceramic, .01 mfd

Ceramic, 2000 mmf Ceramic, .01 mfd (52-03) Mica, 1060 mmf

Ceramic, 47 mmf (\$2-03) Mica, 1900 mmf

Ceramic, 22 mmi (52-03) Ceramic, 220 mmf

Ceramic, .01 mid (52-03) Ceramic, .5000 mmf Ceramic, 5 mmf (52-01)

Ceramic, 33 mmd (52-02) Ceramic, .01 mid (52-03)

Electrolytic, 20 mid, 25V Ceramic, 190 mmid (52-03)

Electrolytic, 20mid-25V(52-03)

Ceramic, 100 mmf

Mica. 470 mmf

Mica, 100 mmf Mica, 100 mmf Mica, 2, 2 mmf

carry the suffix letters "AA" after the 740. If it is necessary to make an electrical change, the chassis will then be identified as the CR-740BA. If no elec-

#### GENERAL

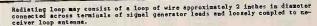
The CR-740 radio chassis is designed for use on the AM broadcast band and works in conjunction with separate audio amplifier. All voltages are obtained from the external amplifier.

Original production of the CR-740 will

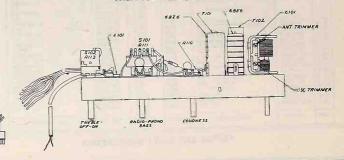
#### ALIGNMENT

The output indicator may be a VTVM connected in the AVC circuit from test point A to circuit ground = or an output meter across the speaker voice coll if test signal is modulated.

SIGNAL GENERATOR	SIGNAL GENERATOR FREQUENCY	TUNING CAPACITOR SETTING	ADJUSTMENTS	NOTES	
Converter grid (pin #7 of 6BE6) thru .01 mfd cap.	455 KC	Near mid-range point of no interference	Top and bottom slugs of TIO2 and TIO1	Adjust for mex. reading of VTVM or output meter	
Same	1620 KC	Fully unmeshed (maximum high frequency limit of tuning dial)	Oscillator trimmer, on tuning gang	· Same	
Radiating loop*	1400 KC	Tuned to 1400KC	Ant. trimmer on tuning gang	Same	
Same	600 KC	600 KC	If necessary, move adjust- able portion of rod antenna back and forth	Same	
		Repeat last two st	ops		

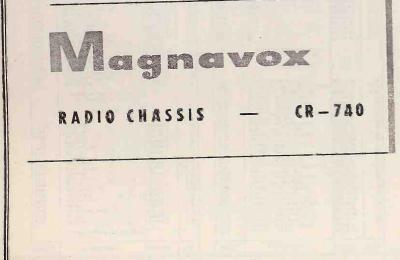






#### MAINTENANCE MANUAL 1319

MAINTENDE



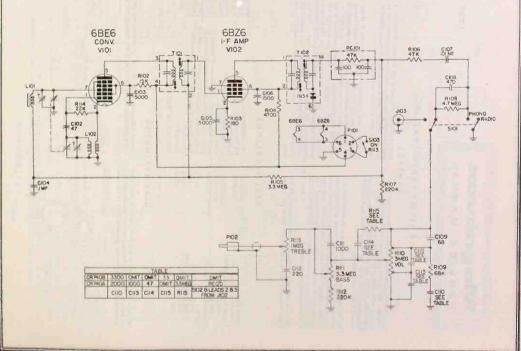


RADIO PAGE 25-16 MAGNAVOX

#### REPLACEMENT PARTS LIST

SYMBOL	DESCRIPTION	PART NO.	LIST	SYMBOL	DESCRIPTION	PART NO.	LIST
	TRANSFORMERS & COILS			C102	Cer., 47 mmf	250218-17	.15
_		1		C103	Cer., 5000 mmf	250175-1	. 25
T101	1st I-F transformer	360611-1	1.40	C104	Paper, .1 mfd, 200V	250202-13	. 30
T102	2nd I-F transformer	360703-1	2.35	C105	Cer., 5000 mml	250175-1	. 25
L101	Ferrite antenna coil	360705-1	2.50	C106	Cer., 1500 mmf	250218-18	. 20
L102	Oscillator air core coil	360702-1	.85	C107	Cer., .01 mfd	250218-19	. 20
			1 1	C108	Cer., 470 mmf	250218-15	. 30
				C109	Cer., 68 mmf	250218-7	. 20
	RESISTORS			C110	Cer., 2000 mmf	250218-20	. 25
	All resistors are 10%, 1/2W			C110	Cer., 3300 mmf	250218-24	. 25
	unless specified otherwise			C111	Cer., 1000 mmf	250218-8	. 25
	Prices shown are for packages of	of 10		C112	Cer., 220 mmf	250218-5	. 20
			1	C113	Cer., 1000 mmf	250218-8	. 25
R101	100	230104-50	2.00	C114	Cer., 47 mmf	250218-17	.15
R102	15K , 2W	230106-1076	3.50	C115	Cer., 33 mmf	250218-21	.15
R103	180	230104-53	2.00				1. 1. 20
R104	3300, 2W	230106-1068	3.50				
R105	3.3 meg	230104-104	2.00		CONTROLS		
R106	47 K	230104-83	2.00	V			
R107	220K	230104-90	2.00	R110	3.3 meg, Volume	220131-9	1,10
R108	4.7 meg	230104-106	2.00	R111	3.3 meg, Bass (with S101 Radio-		
R109	68K	230104-84	2.00		phono switch)	220119-4	1.90
R112	220K	230104-90	2.00	R113	1 meg, Treble (with S102 On-Off		
R114	22K	230104-78	2.00		switch)	220123-26	1.35
R115	3.3 meg	230104-104	2.00	R113	1 meg, Treble (CR-740BA)	220072-38	1.25
	CAPACITORS				MISCELLANEOUS		E.
1	All capacitors are 500V			14.			1
	unless specified otherwise	1		J101	Phono receptacle	180466-1	. 10
		1		PC101	Printed circuit diode filter	250170-1	. 40
C101	Gang condenser	260139-1	3.55	1N34A	Crystal diode	530049-1	1.85

#### SCHEMATIC DIAGRAM



CJohn F. Rider

CHASSIS 54 SERIES

#### ALIGNMENT AM ALIGNMENT

Set band switch to AM position. Check dial pointer positioning.

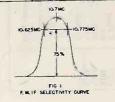
SIGNAL CENERATOR		SET RECEIVER	ADJUSTMENTS	CONNECT	REMARKS	
COUPLE TO:	FREQUENCY	DIAL TO:		METER		
6BE6 (pin 7) thru .01 mfd	455 kc (modulated)	Near 1000 kc (free of interference)	T202. T106, top and bottom slugs	Across voice coil	Adjust for max. output	
AM ant. term. thru 10 mmf	1400 kc (modulated	1400 kc	C101F C101D C101B	-	н	
	600 kc (modulated)	600 kc	T105, T104	at.	Adjust for max. output.	
"	*****		0 - H - H		Repeat steps 2 and 3.	

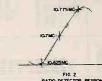
#### FM ALIGNMENT (Using AM Signal Generator and VTVM)

Set band switch to FM position. Note: Place a 1 megohm resistor in series with hot side of VTVM.

SIGNAL G	ENERATOR	SET RECEIVER	ADJUSTMENTS	OUT PUT	RBMARKS	
COUPLE TO:	FREQUENCY	DIAL TO:		METER		
6CY5 (pin 5) thru .01 mfd	10.7 mc unmodulated	Low end of dial	T201, T102 top & bottom slugs and T203 bottom slug	From (pin 5) so pin 4 at PC 202	Adjust for max neg. reading on VTVM.	
e .	a)	Low end of dial	T203 top slug	Across C203	Tune for zero VTVM. (Point where voltage swings pos. or neg.)	
	U.	Low end of dial	Repeat steps 1 & 2	Repeat steps 1 & 2	Repeat steps 1 & 2	
FM ant. terms in series with: 120 ohms (high side) 150 ohms (low side)	107 mc	107 mc	C109 C101A C101C	From pin 5, to pin 4 of PC202	Adjust for max neg. reading on VTVM.	
n	89 mc	89 mc	L104 (osc. coil)	0	н. 	
n					Repeat two preceding steps.	

PAGE 2

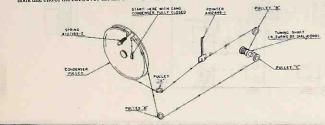




## RATIO DETECTOR RESPONSE

6BE Used only on 54-02

Select a 64 inch length of dial cord and tie a small loop at each end. Turn the tuning gang fully out of mesh and hook one end of the cord over the metal hook on the con-



#### CJohn F. Rider

Power Supply

Tubes

Power Consumption

FM Band

Tuning Frequency Range:

Broadcast Band

Intermediate Frequency

FM RF Amplifier FM Mixer-Oscillator

AM RF Amplifier

AM Converter

6BA6

#### 54 SERIES RADIO CHASSIS

#### GENERAL

The 54 series radio chassis contains two separate audio circuits. These are necessary for operation of the chassis with record changers or tape recorders de-signed for stereo operation. Dual controls are used throughout which vary the output from each channel equally and simultaneously.

Magnavox

SERVICE MANUAL

On the 54-02 and 54=03 inputs are provided for connecting a Stereo tape recorder which will enable the tape recorder to play through the audio circuits of these chassis. On the 54-01 only a conventional tape recorder can be played through the audio circuits. On all three chassis, however, only conventional monaural tape recordings can be made.

Due to the design of the chassis it is recommended that a tape recording having a high input and output imped-

#### SPECIFICATIONS

50/60 cycles AC	F. Amplifier	00040
	FM Driver	6BA6
75 watts		6AL5
	Ratio Detector	1N34A
	AM Detector (Crystal Diode)	
540-1620KC	Alvi Detector (or juli 18.2)	12AX7
88-108MC	Audio Amp (Channel 1&2)	12AX7
455KC/10.7MC	Audio Amp & Cathode Follower (Channel 1)	
400KC/10. 111C	Audio Amp & Cathode Follower (Channel 2)	12AX7
	Audio Amp & Cathous Follows (Channel 1)*	12AT7
6CY5	Audio Amp & Cathode Follower (Channel 1)*	12AT7
6U8	Audio Amp & Cathode Follower (Channel 2)*	
		5Y3GT
6BZ6	Rectifier*	6E5
6BE6	Tuning Eye	.0130
	#Head only on 54-02 Chassis.	

#### DIAL STRINGING

denser pulley nearest the front of the chassis and proceed with the stringing as shown in the drawing below.

an external AM antenna connect one lead to the AM connection and ground the antenna to the connection marked G. The connections marked 1 and 2 are not used.

#### 117 volts, 50/60 cycles AC 75 watts

T. F. Huphasse	6BA6
FM Driver	6AL5
Ratio Detector	1N34A
AM Detector (Crystal Diode)	12AX7
Audio Amp (Channel 1&2)	12AX7
Audio Amp & Cathode Follower (Channel 1)	12AX7
Audio Amp & Cathode Follower (Channel 2)	12AT7
Audio Amp & Cathode Follower (Channel 1)*	12AT7
Audio Amp & Cathode Follower (Channel 2)*	5Y3GT
Rectifier*	6E5
Tuning Eye	OLU
the state of the states	

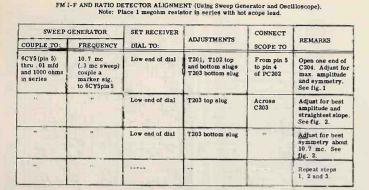
#### ance be used for recording and playback. However, a tape recording having a low output impedance can be used for playback providing sufficient signal output is available from the tape recorder.

Provisions are provided for the connection of an external AM or FM antenna. A terminal board having two connections marked FM, a connection marked AM and three other connections marked G, 1, and 2 respectively are located on a fibre board fastened to the rear of the radio chassis. To connect an external FM

antenna to this unit merely connect the FM antenna leads to the two connections marked FM and to connect

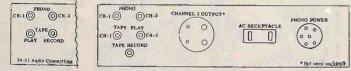
#### 1329 . . .

ADIO PAGE 25 1 8 MAGNAVOX

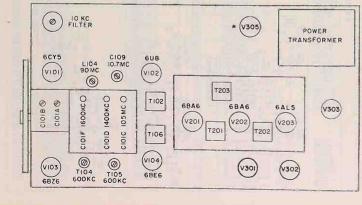


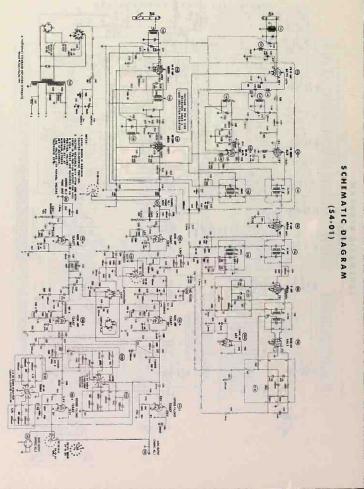
ALIGNMENT

#### CHASSIS REAR PANEL



#### CHASSIS LAYOUT



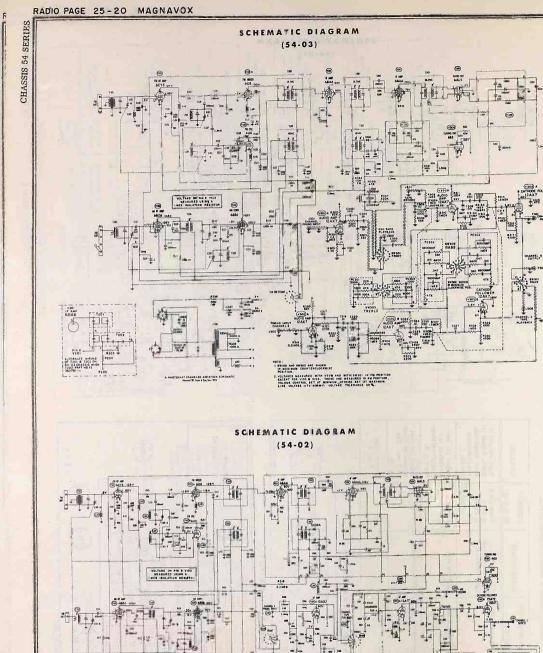


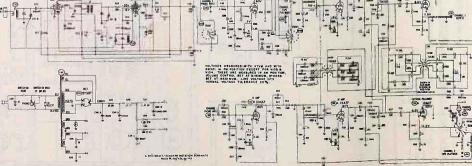
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MAGNAVOX

RADIO PAGE

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CJohn F. Rider

CHASSIS 24 SERIES

#### REPLACEMENT PARTS LIST

#### REPLACEMENT PARTS LIST (Con't)

SYMBOL	DESCRIPTION	FART NO.	STMBOL.	DESCRIPTION	PART NO.		REFLA	CEMEI
	TRANSFORMERS & COILS		R316 R317	1000 (54-03)	230104-62			
F101	FM Input Transformer	360491-4	R317 R317	380K (54-01) 220K (54-02)	230104-90			
F102	1st FM I-F trans.	360628-1	R317	4700 (54-03)	230104-70			
F103	Rod Antenna Assembly	360746-1	R318	22K (54-01)	230104-78 230104-102		and the second	-
T104	AM RF trans.	360753-1	R318	2.2 meg (54-02)	230104-102	SYMBOL	DESCRIPTION	e ce
T105 T106	AM Oscillator Coll Ist AM IF Trans.	360811-1	R318 R319	2. 2 meg (54-03) 68K (54-01)	230104-84	DIMDUL		PART 2
T201	2nd FM IF Trans	360747-1	R319	1 mcg (54-02)	230104-98	C112	Cer., 5000 mmf	250175-
T202	2nd AM IF Trans.	360749-1	R319	3300 (54-03)	230104-88 230104-98	C113 C114	Mica, 220 mmf, 10%	250187-
T203	Ratio Detector Trans. Filament Trans.	360748-1	R320	1 meg (54-01)	220151-2	C114 C115	Mica, 470 mmf Cer., 12 mmf, 5%	250159-
T301 T301	Power Trans. (54-02)	300166-1	R320 R320	Dual 1 meg, Loudness (54-02) 82K, (54-03)	230104-85	C118		250088-
L101	FM Antenna Coll	360750-1	R321	Dual 1 meg Loudness (54-01)	220151-1	C118 C119	Mylar, . 1 mfd, 100V Cer., 47 mmi Cer., 5000 mmi Cer., 5000 mmi	250281-
L102	RF Choke	360522-9	R321	33K (54-02)	230104-80 230104-91	C119 C120	Cer., 47 mmf	250218-
L103 L104	FM RF Coll FM Oaculator	360751-1 350628-1	R321 R322	270K (54-03)	230104-98	C120	Cer 5000 mmf	250175-250175-
L105	BF Choke	360522-9	R322	1 meg (54-01) 33K (54-02)	230104-80	C122 C123	Cer., 5000 mmf	250175-
L108	RF Choke	360522-9	R322	22K (54-03)	230104-78	C123 C124	Cer., 5000 mmf	250175-
L301	10KC Filter	360621-1 360522-9	R323	2200 (54-01) 470K (54-02)	230104-86 230104-94	C124 C125	Feed Thru, 1000 mmf Feed Thru, 1000 mmf	250276-
L302	RF Choke	300522-8	R323 R323	68K (54-03)	230104-84	C126	Feed Thru, 1000 mmf	250276
			R324	100K (54-01)	230104-86	C127 C201	Feed Thru 1000 mmf	250276-
	RESISTORS		R324	470K (54-02)	230104-94	C201	Cer., .01 mfd Cer., 3300 mmf Cer., 1500 mmf	250234-
	All resistors are 10%, 1/2W		R324	1 meg (54-03) 33K (54-01)	230104-98 230104-80	C202 C203	Cer., 3300 mmf	250234-
	unless specified otherwise		R325 R325	33K (54-01) 3300 (54-02)	230104-80	C203	Elect., 4 mfd, 50V	250234-270559-
R101	68	230104-48	R325	2200 (54-03)	230104-66	C 204 C 205 C 301	Paper. 1 mfd. 200V	250240-
R102	68K	230104-54	R328	220K (54-01)	230104-90	C301	Paper, .1 mfd, 200V Cer., 180 mmf, 10% (54-01)	250175-
R103	22	230104-42	B328	3300 (54-02)	230104-58	C301	Cer., 68 mmf (54-02) Cer., .01 mfd (54-03)	250218-
R104	100K	230104-86	R326 R327	220K (54-03)	230104-90	C301	Cer., .01 mfd (54-03) Cer., 1000 mmf (54-01)	250218-250218-
R105 R106	1000 220	230104-62 230104-50	R327 R327	Dual 1 meg, Timbre (54-01) 470K (54-02)	220150-2	C302 C302	Cer. 330 mm( (54-02)	250218
R106 R107	1000, 1W	230105-62	8327	1.5 meg (54-03)	230104-94 230104-100	C302	Cer., 330 mmf (54-02) Cer., 100 mmf (54-03) Cer., 5000 mmf (54-01) Cer., 47 mmf (54-02)	250218
R108	10K	230104-74	R327 R328	1 meg (54-01)	230104-98	C303	Cer., 5000 mmf (54-01)	250175
R109	2700	230104-67	R328	2, 2 mez (54-02)	230104-102	C303	Cer., 47 mmf (54-02)	250218-
R110 R111	1 meg 3300, 1W	230104-98 230105-88	R328 R329	1 meg (54-03) 2200 (54-01)	230104-98 230104-86	C303 C304	Cer., .01 mfd (54-03) Cer., 47 mmf (54-01)	250218-
R112	2300, 1W	230104-78	R329 R329	47K (64-02)	230104-82	C304	Cer., 100 mmf (54-02)	250218-250218-
R113	100	230104-50	R329	1000 (54-03)	230104-52	C304	Cer., 01 mfd (54-03)	250218-
R114	8200, 1W	230105-73	R330	100K (54-01)	230104-86	C305 C305	Cer., .01 mfd (54-01) Elect. 25-25mfd, 25V (54-02)	250218-
R115	1000 2.2 meg (54-01 & 03	230104-82 230104-102	R330	Dual 1 meg, Timbre (64-02)	220150-2 230104-70	C305 C305	Elect. 25-25mfd, 25V (54-02)	270043- 250175-
R116 R201	2.2 meg (34-01 & 03	230104-102 1	R350 R331	4700 (54-03) 33K (54-01)	230104-80	C308	Cer., 5000 mmf, (54-03) Cer., 100 mmf (54-01)	250218-
R202	1000	230104-62	R331	100K (54-02)	230104-86	C 306	Cer., 68 mm (54-02) Cer., 47 mmi (54-03) Cer., 2000 mmi (54-01)	250218-
R203	220K.	230104-90	R331	3900, 1W (54-03)	230105-69	C306 C307	Cer., 47 mmf (54-03).	250218 -
R204	47K	230104-82	R332	220K (54-01)	230104-90	C 307 C 307	Cer., 2000 mmf (54-01) Cer., .01 mfd (54-02)	250218-250218-
R205	47K 1.5 meg	230104-82 230104-100	R332	10K (54-02)	230104-74 230106-1074	C307	Cer., 5000 mmf (54-03)	250218- 250175-
R207	2 2 mer	230104-102	R332 R333	10K, 2W (54-03) 470K (54-01)	230104-94	C307 C308 C308		250218-
R208	2.2 meg	230104-102	R333	220K (54-02)	230104-90	C308	Cer., 68 mmf (54-02) Cer., 102 mmf (54-03)	250218-
R209		230104-86	R333	470K (54-03)	230104-94	C308 C309	Cer., 102 mmf (54-03) Cer., 1000 mmf (54-01)	250218-
R301 R301	330K (54-02) 3.3 meg (54-01)	230104-92 230104-104	R334 R334	10K, 2W (54-01) 220K (54-02)	230106-1074 230104-90	C309	Cer., 1000 mmf (54-01)	250218-250218-
R301	2.2 meg (54-03)	230104-102	R334	2000 Hum Balance (54-03)	220120-4	C309 C309	Cer., 47 mmf (54-02) Cer., 1000 mmf (54-03)	250218-
R302	15K (54-01)	230104-76	R335	3900, 1W (54-01)	230105-69	C310	Cer., 220 mmf (54-01) Cer., 330 mmf (54-02)	250218-
R302	6.8 meg (54-02)	230104-108	R335	47K (54-02)	230104-82	C310	Cer., 330 mmf (54-02)	250207-
R302 R303	82K (54-03) 2.2 meg (54-01)	230104-85 230104-102	R335 R336	1000 (54-03)	230104-62 230106-1063	C310	Elect. 25-25 mid. 25V (64-03)	270043- 250218-
R303	1 meg (54-02)	230104-98	R336	1200, 2W (54-01) 2.2 meg (54-02)	230106-1065	C311 C311	Cer., 270 mmf, 10% (54-01) Cer., 100 mmf (54-02)	250218-
R303 R304	3300 (54-03) 3300 (54-01)	230104-68 230104-68	R336	2500, 10W, W. W. (54-03)	240071-39	C314	Cer., .01 mfd (54-03) Paper, .022 mfd, 200V (54-01)	250218-
R304	3300 (54-01)	230104-88	R337	2500, 10W (64-01)	240071-39	C312	Paper 022 mfd, 200V (54-01)	250202-
R304	6.8 meg (54-02)	230104-108	R337	10K (54-02)	230104-74 230106-1063	C312 C312	Cer., 68 mmf (54-02) Cer., 220 mmf	250218-
R304 R305	270K (54-03) 620K (54-01)	230104-91 230104-94	R337 R338	1200, 2W (54-03) 2000, Hum Balance (54-01)	230106-1063 220120-4	C313		250218-250178-
R305	33K (54-02)	230104-80	R338	100K (54-02)	230104-86	C313	Cer., 3300 mmf (54-02)	250175-
R305	22K (54-03)	230104-78	R339	1000 (54-01 & 02)	230104-62	C313	Cer., 2000 mmf (54-03)	250218-
R306	390K (54-01)	230104-93	R340	1 meg (54-01) 4700 (54-02)	230104-98	C313 C314 C314	Cer., 1000 mmf (54-01 & 02)	250218-250218-
R306	1 meg (54-02) 68K (54-03)	230104-98	R340 R341	4700 (54-02) 4700 (54-01 & 02)	230104-70 230104-70	C315	Cer., .01 mfd (54-03) Cer., 5000 mmf (54-01)	250175-
B307	220K (54-01)	230104-84 230104-90	R342	1000 (54-01 & 02)	230104-62	C315	Cer., 1000 mmf (54-02)	250218-
R307	470K (54-02)	230104-94	R343	1 meg (54-01 & 02)	230104-62 230 04-98	C315 C316	Cer., 470 mmf	250218-
R307	220K (54-03)	230104-90	R344	1000 (54-01)	230104-62	C316 C318	Cer., 47 mmf (54-01) Cer., 5000 mmf (54-02)	250218- 250175-
R308	1 meg (54-01) 330K (54-02)	230104-98	R344	1 meg (54-02) 4700 (54-01)	230104-98 230104-70	C315	Cer., .01 mfd (54-03)	250218-
R308	1 meg (54-03)	230104-98	R345 R345	4700 (54-01) 2000, Hum Balance (54-02)	220120-4	C317	Cor 01 mtd (\$4-01)	250218-
R309	22K (54-01)	1 230104-78	R346	1000 (54-02)	230104-52	C317	Cer., 47 mmf (54-02)	250218-
R309	330K (54-02)	230104-92	R346 R347	1000. BW (54-02)	230150-518	C317 C318	Cer., 100 mmf (54-03) Cer., 100 mmf (54-01)	250218- 250218-
R309 R310	1 meg Loudness (54-03) 3.3 meg (54-01)	220151-1 230104-104	R348	1000, 5W (54-02)	230150-518	C318 C318	Cer . 22 mmf (54-03)	250218-3
R310	6.8 meg (54-02)	230104-108	R349 R350	8200, 2W (54-02) 10K, 2W (54-02)	230106-73 230106-1074	C318	Cer., .01 mfd (54-03) Cer., 270 mmf 10% (54-01)	250218-1
R310 R311	1 meg (54-03) 15K (54-01)	230104-98	R361	1200, 2W (54-02)	230106-1063	C319	Cer., 270 mmf 10% (54-01)	250218-
R311	15K (54-01)	230104-76			1	C319	Cer., .01 mfd (54-02 & 03)	250218-1
R311 R311	470K (54-02) 220K (54-03)	230104-94 230104-90		1	1		the second s	
R312	2.2 meg (54-01)	230104-102	1	CAPACITORS	1 1			
R312 R312	2.2 meg (54-01) 1 meg (54-02)	230104-102 230104-98		All capacitors are 20%, 500V unless specified otherwise	1			
R312	2200 (54-03)	230104-66		anices specifies otherwise	1 1			
R313	3300 (54-01 & 02)	230104-68	C101	Tuning capacitor	260147-1 350276-2			
R313 R314	1 meg, Timbre (54-03) 82K (54-01)	220150-4 230104-85	C102	Feed Thru. 1000 mmf	250276-2			
R314 R314	82K (54-01) 1 meg (54-02)	230104-85 230104-98	C103	Feed Thru. 1000 mmf Feed Thru, 1000 mmf Feed Thru, 1000 mmf	250276-2			
R314	1.5 meg (54-03) 82K (54-01)	230104-100 230104-85	C104	Feed Thru, 1000 mmf	250276-1 250167-53			
R315	82K (54-01)	230104-85	C105 C196	Mica, 100 mmf, 10%	250187-53			
R315	220K (54-02)	230104-90	C106 C107	Mics, 100 mmf, 10% Molded, 2.2 mmf, 10%	250167-53 250221-116			
R315	1 meg (54-03) 820K (54-01)	230104-98	C108	Mica, 230 mmf, 10%	250187-57			
R316 R316	220K (54-01)	230104-97 230104-90	C109 C110	Trimmer, 2.5-12mmf	250188-9 250088-138			
		1 1	CIII	Cer., 5 mmf, 5% Paper, .01 mfd, 400V	250211-7			

SYMBOL	DESCRIPTION	PART NO
C320	Paper, .022 mfd, 200V (54-01) Cer., 47 mmf (54-02) Cer., 5000 mmf (54-03)	250202-9
C320	Cer., 47 mmf (54-02)	250218-17
C320	Cer., 5000 mmf (54-03)	250175-30
C321 C321	Cer., 5000 (54-01)	250175-30
C321	Cer., .01 mfd (54-02) Cer. 47 mmf (54-03)	250218-11
C322	Cer., 47 mmf (54-03) Cer., 47 mmf (54-01)	250218-11
C322	Cer., 47 mmf (54-01) Cer., 5000 mmf (54-02) Cer., 5000 mmf (54-03) Cer., 5000 mmf (54-01) Cer., 47 mmf (54-01) Cer., 47 mmf (54-01) Elect, 25-25 mfd, 25V (54-02) Cer., 01 mmf (54-01)	250218-19
C322	Cer., 5000 mmf (54-03)	250175-30
C323	Cer., 5000 mmf (54-01)	250175-30
C323 C324	Cer., 100 mmi (54-03)	250218-22
C324	Elect. 25-25 mfd 25V (54-02)	270043-1
C324		250218-19
C325	Cer., 5000 mmf (54-01)	250175-30
C325	Cer., 100 mmf (54-02) Cer., 220 mmf (54-03) Elect. 25-25mfd, 25V (54-01)	250218-23
C325 C326	Cer., 220 mmf (54-03)	250218-5 270043-1
C326	Car 100 mm( (54 02)	250218-23
C326	Cer., 100 mmf (54-02) Cer., 2000 mmf (54-03) Cer., 100 mmf (54-01)	250218-20
	Cer., 100 mmf (54-01)	1 250218-23
C327 C327	Cer., .01 mfd (54-01) Cer., 100 mmf (54-01)	250218-19
C328	Cer., 100 mmf (54-01)	250218-23
C328	Cer., 220 mmf (54-02)	250218-5
C328 C329	Cer., 1000 mmf (54-03)	250218-8 250218-11
C329	Cer., .01 mfd (54-01) Cer., 2000 mmf (54-02)	250218-20
C329	Cer., .01 mfd, 1000V (54-03)	250219-2
C330	Cer., .01 mid, 1000V (54-03) Cer., 880 mml (54-01) Cer., 2000 mmd (54-02) Elect. 30-30 mid, 450V	250218-4
C330	Cer., 2000 mmf (54-02)	250218-20
C330	Elect, 30-30 mfd, 450V	270021-58
C331 C331	Cer., 1500 mmf (54-01)	250218-18
C331 C332	Cer., .01 mfd (54-02) Cer., 1500 mmf (54-01)	250218-18
C332		250218-15
C333	Cer., 01 mid (54-01) Cer., 220 mmi (54-02) Cer., 680 mmi (54-01)	250218-19
C333 C334	Cer., 220 mmf (54-02)	250218-5
C334	Cer., 680 mmf (54-01)	250218-4
C334		250218-20
C335 C335	Cer., .01 mfd (54-01) Cer., 2000 mmf (54-02)	250218-19
C336	Cer. 01 mfd (54-01 & 02)	250218-19
C337	Cer., .01 mfd (54-01 & 02) Elect. 30-30mfd, 450V (54-01)	270021-58
C338	Cer., .01 mfd, 1000V (54-01) Elect. 20 mfd, 150V (54-02)	250219-2
C338	Elect. 20 mfd, 150V (54-02)	270027-13
C339	Cer., 470 mmf (54-01)	250218-6
C340	Floct 35, 30, 20, 10m(d-450V (54-02)	270021-71
	Cer., .01 mfd, 1000V(54-02) Elect. 35-30-20-10mfd-450V (54-02)	
	MISCELLANEOUS	1
SW301	Band Switch (54-01)	160293-1
SW301	Band Switch (54-02 & 03)	160293-3
SW302	Bass Switch	160278-2
SW303	Treble Switch Printed Circuit	160278-2 250255-1
PC201 PC202	Printed Circuit	250254-1
PC301	Printed Circuit (54-01 & 03)	250291-1
PC301 PC301	Printed Circuit (54-02)	250293-1
PC302	Printed Circuit (54-01 & 03)	250291-1
PC302	Printed Circuit (54-02)	250293-1
PC303	Printed Circuit (54-01 & 03)	250292-1 250292-2
PC303 PC304	Printed Circuit (54-02 & 03)	250292-2
PC304	Printed Circuit (54-01) Printed Circuit (54-02 & 03)	250292-2
3301	Input Socket	180631-2
1302	Input Socket	180631-2
1303	Input Socket	180631-2
3304	Input Socket	160631-2
1305	Input Socket Dial Pointer	180631-2 635321-1
	Dial Glass	150534-1
	Crystal Diode (1N34A)	530049-1

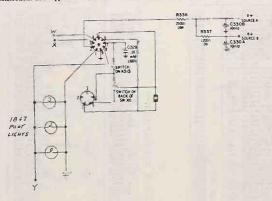
OJohn F. Rider

#### ADDENDA

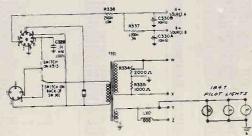
#### SERVICE MANUAL 1329

The following information concerns production changes made since the publication release of Service Manual 1329.

The 54-03 Chassis has been revised in the initial production run so that a filament transformer is not used. All power connections are supplied from the Main Amplifier as shown below.



The 54-04 Chassis has recently been released for production. This version is identical to the 54-03 except for the power connections shown below.



The schematic diagram shown in Manual 1329 for the 54-03 Chassis will be correct for the 54-03 and 54-04 with exceptions noted above.

The Parts List for the 54-03 Chassis in Manual 1320 is correct for the 54-03 and 54-04 Chassis except that T301, L302, R334 & R335 are not used on the 54-03.

OJohn F. Rider



SUPERSEDES SK16, 17, 18 SERIES PRELIMINARY SERV

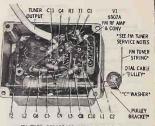
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HOM	E RADIÖ
ODELS	CHASSIS
K16W	HS-710,711
516W	
5K17W	HS-710,711
517W	-
K18M	HS-710,711
518M	-
Drovo	1 Corior

Drexel Series

#### **EM TUNER SERVICE NOTES**

Do not free the dial cable pulley located on the FM tuner unit, as this may result in audio howi. This is due to core vibration caused by acoustic feed-back from the loudspeaker at certain frequencies. Silicon grease is applied at the junc-tion of string and pulley, to insure smooth tuning action and must not be removed. Therefore, whenever tuning action Must not be removed, increaser, whenever using action is crasic, deck for proper use of allicon grass (Motorola Part Number 11M490407). Also affecting tuning action, is the angle of the pulley bracket with respect to the take-up shaft. Position bracket until tuning action is as smooth as possible.



FM UNIT 77D638430 PARTS LOCATION

#### AUXILIARY CIRCUITS AND EXTERNAL CONNECTIONS

SERVICE NOTES

#### STEREO TAPE INPUT JACKS

A stereophonic tape recorder may be connected to these A server apparent operator may be connected to take a fact (located on cabinet back) to enable streepolancially recorded takes to be played through this system when the COMPENSATOR is set to TAPE. The output of the hape recorder should be .1 volts RMS or more, pre-equalized (in tape recorder) for NARTB playback curve. Connect the right channel output of the recorder to RIGHT STEREO TAPE INPUT and the left channel output of the recorder to LEFT STEREO TAPE INPUT. Use a suitable phone plug (Motorola Part No. 28K731154 or equivalent) and shielded audio cable to minimize hum pick-up.

#### AUX JACK

An audio signal from any external source (such as the

pre-equalized output from a monaural tape recorder ... etc.) whose magnitude is .1 volts RMS or more, may be con-nected into the AUX (input) jack on back of cabinet; the ex-ternal source can be operated when the COMPENSATOR is turned to AUX position. Use a suitable phono plug (Motorola Part No. 28K731154 or equivalent) and shielded audio cable to minimize hum pick-up.

IMPORTANT: Care should be exercised when making connection to transformerless type equipment. When in doubt, suitable tests should be employed to prevent damage to equipment and dangerous electrical shock.

TUNING

TYPE - Models SK16, SK17 & SK18 are console stereophonic, high-fidelity, radio-phono combinations containing a dual channel amplifier, AM-FM tuner, four-speed record changer and multiple speaker system. Models S16, S17 & S18 are the right chan-ngl speaker systems. These models differ from each other only in the type of cabinetry used.

#### TUBE COMPLEMENT -

SE16 SERIES

#### HS-710 TUNER & PRE-AMP

Ref. No.	Type	Function
VEL	6BQ7A	FM RF amp & converter
V-2	6BA6	Ist FM IF
V - 3	6BA6	AM IF & 2nd FM IF
V-4	6AU6	FM limiter
V-5	6AL5	FM ratio detector
V = 6	6BA6	AM RF amp
V - 7	6BE6	AM converter
V-8	EM81/6DA5	Tuning indicator
V-9	12AX7	Let & 2nd AF amp
V-10	12AX7	1st & 2nd AF amp

#### HS-711 POWER AMP

Ref. No.	Type	Function
V-1	12AX7	Phase inverter
V-2	EL84/6BQ5	Power amp
V-3	EL84/6BQ5	Power amp
V-4	12AX7	Phase inverter
V-5	EL84/6BQ5	Power amp
V-6	EL84/6BQ5	Power amp
V-7	5U4GB	Rectifier

#### RECORD CHANGER

These models use the VM24RC record changer. Refer to the VM17-VM25RC Record Changer Service Manual (Motorola Part Number 65F643068) for service information and changer operation.

ELECTRICAL SPECIFICATIONS

#### Frequency Response - ± 1 db from 20 to 20, 000 cps at normal listening levels Power Output - 10 watts at 1% distortion each channel

(20 watts peak) Tone Controls - Bass + 10 db, -15 db at 50 cps Treble +7 db. -12 db at 10,000 cps

Amplifier Sensitivity - .2 volts max RMS (at 1000 cps); in for 10 watts output.

#### Conditions:

- 1. Compensator switch set to AUX position. 2. Loudness and Bass controls at max, Treble at
- 3. 8 ohm, 20 watt resistive load across the output
- of each channel (speakers disconnected). Output meter across each registive load.
- 5. Source (generator) connected to AUX jack.

#### Procedure:

- 1. With .1 volts RMS (at 1000 cps) in, adjust Bal-
- ance control for equal output from each channel. With 8.9 volts (10 watts) across the output loads, 2.
- the input voltage (from generator) should be . 2 volts pr less.

Power Supply - 120 volts, 60 cycle AC only Power Consumption - 175 watts AM Tuning Range - 540 to 1600 Kc AM II AM IE - 455 Kc FM Tuning Range - 88 to 108 Mc FM IF - 10.7 Mc Speaker System -

- caker System -Left channel (SK16, SK17, SK18) 15" woofer 2-5-1/4" mid-range 5" tweeter Right channel (\$16, \$17, \$18)
- 10" woofer 2-5-1/4" mid-range 5" tweater

- To Remove Chasais From Cabinet, (HS\_710)
- 1. Remove control knobs.
- 2. Remove cabinet back cover-

3. Disconnect all chassis connecting leads (from power amp, record changer...etc. NOTE: The green AM antenna lead is held in place by an armite strip, therefore, slide the lead through the strip so that chassis can be removed easily).

4. Remove pilot light socket from record changer compartment by first pulling up the light shield, then unclipping pilot light mounting socket from the retaining clip.

5. Remove the 4 chassis mounting screws (accessible from underneath chassis) and remove chassis from cabinet.

To Remove Chassis From Cabinet (HS-711)

L. Remove cabinet back cover.

2. Disconnect all chassis connecting cables except connections to left channel speaker system

3. Remove chassis mounting screws, then rotate chassis until left channel speaker mounting screws are accessible; then disconnect leads to left channel system.

4. Remove chassis from cabinet,

To Remove Record Changer From Cabinet

COMPENSATOR

1. Remove cabinet back cover.

2. Turn the 2 record changer mounting screws clockwise until they are flush with the changer base.

3. Disconnect all cable to record changer.

4. Turn the mounting clips, located at the ends of the mounting screws, so they are parallel with the mounting screws.

5. Lift the changer out of the cabinet,

CHASSIS HS-710, 711

MOTOROLA

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PAGE

25







817 & S18 SER-IES

DISASSEMBLY INSTRUCTIONS

CHASSIS HS-710, 711

#### To Replace Pilot Light (From chassis)

1. Remove chassis from cabinet (see HS-710 Chassis Removal).

2. Replace pilot light,

To Replace Pilot Light (in record changer compartment)

1. Remove light shield in compartment by pulling straight up.

#### STEREO NOTES

Excellent stereophonic reproduction can be obtained from this unit with correct installation.

Seemingly imperfect stereophonic record reproduction does not necessarily mean the unit itself is at fault. In-correct location, volume level, balance adjustment...etc., can create the illusion that the unit is not operating properly. Therefore, before suspecting the unit, make certain that the initial setup is correct (see Operating Instruction booklet, if necessary). The room, with its individual acous-tic characteristics, and the level at which the unit is op-erated, are of importance. Some room settings are better than others, are of importance. Some room settings are better than others, experimentation in setting up the units will de-termine which setting is best (try to have the main unit and right channel speaker placed along the same wall). The lev-el at which the unit is operating and the distance of the listener from the units will affect spacing--use closer spacing (4 to 7 feet) at low volume levels (listener is close to units and greater spacing (5 to 10 feet) at higher volume levels (listener is further away). Too great a spacing, however, will cause the commonly known "hole in the middle" effect, or if the listener is seated too far from the units, there will

2. Replace pilot light,

To Replace On-Off Indicator Pilot Light (SK17, SK18 only)

- 1. Remove cabinet back cover (model SK18 only).
- 2. Remove pilot light bracket mounting screw located in-side cabinet (near bottom).
- 3. Replace pilot light.
- 4. Replace bracket and cabinet back cover (SK18).

be a loss of the stereophonic effect.

Once the room setup is determined, the controls must be adjusted. First, the output level from both speaker systems must be made the same. With the unit operating (use a monaural LP disc; set COMPENSATOR to RIAA) and the loudness control at an intermediate setting to avoid blast-ing, adjust the balance control so that each speaker has approximately the same volume level.

Secondly, adjust the loudness control to desired listen-ing level. (Extremely low loudness levels may require re-adjustment of the balance control.)

Thirdly, since the directional characteristic of stereo-phonic reproduction is dependent to a great degree on midrange and treble notes, the treble control should be advanced to increase treble response; however, the "hardness" of some rooms may require an intermediate setting for best tonal balance.

Finally, re-orientation of main cabinet and right chan-nel speaker system may be necessary.

# PRODUCTION CHANGES HS-710

Chassis Coding	Changes	Chassis Coding	Changes
HS-710A HS-710B	Original chassis SHEEDED CABLE ADDED, The signal input cable to the grids of V-10A-12AXT (pin #2), V-10B-12AXT (pin #2), and the cable to the input of the two lowiness controls (pin #1 on E-4 and E-6) has been changed to a buileded type,	HS-710B (cont <sup>9</sup> d)	TO REDUCE 12AX7 FILAMENT VOLTAGE Dropping resistor added, the following werr used: 1 ohm 2W wwi. 12 ohm 1/2W wwi. 43 ohm 1/2W ww. Use 17K488266, .47 ohm 10% 1/2W ww. Gor replacement (see R-43 on sche- matic diagram).
	POINTER CALIBRATION MARK - LINE UP POINTER WITH CANG FULLY CLOSED		WITH GANG FULLY OPEN
	HEAR STRING VE	en Ci	INFORMED AND DESCRIPTION OF ARROW TO TAKE UP SLOCK THEN TIGHTEN SET SCREWS.
	Finish 3-12 Junis	AT ST	CANG SHAFT CLOSED NAT
	MITHOUT TENSION ON STRING	3-UZ TURI	a de la companya de l
	FM TUNER UNI MEASURE FM TUNER STRING, THIS W		
	DIAL STRING	ING DETAIL	

in the parts, speckly model number of	set in ac	dition to p	art number and description of part.
listed in this Service Manual have been chose circuits involved. For maximum customer sat	on for rel	ishilfty an	d applicability is the components
circuite involved. For maximum customer sat: Motorola parts replacement.	isfaction	and minimiz	a applicability to the specific
Motorola parts replacement.		and another	ou carrouchs, use the exact
	-		
DescFiption	Rof.		
	No.	Number	Description
(UT-343) ELECTRICAL PARTS	1-4	10042400	
Consolton and the second		+19642412	AM Antenna & Panel: incl C21 (SE16 only)
Capacitor, cer tub: 10 mmf 500v NTC750PPM Capacitor, cer tub: .001 mf 500v		+1V642408	AM Antonna & Panel: incl C21 (Sk17 only) AM Antonna & Panel: incl C21 (Sk18 only)
Capacitor, sica tris: (RF tris)	L-5	24863834	Coil, AM osc
Capacitor, cor tuby 001 -4 room			
Capacitor, cor tub: 20 mmf 500v	Resis	tors - Note	All resistors are insulated carbon type
Capacitor, cor tub: .001 mf 500y Capacitor, cor tub: 20 mmf 500y Capacitor, cor tub: 20 mmf 500y			
	8-1	-	See PM Tunor Parts List
	R-2	6R6054	10,000 20% 1/2#
	R-3 R-4	6R6054	10,000 20% 1/2%
PTC100PPM	R-5	6x124797	150 10% 1/2W 4.7 mog 10% 1/2W
Capacitor, cer tub: 15 mmf 500v	8-6	6K121277 6K122324	4.7 meg 10% 1/2w
Capacitor, cer tub: 68 mmf 500V NTC750PPM	B-7	6K127516	
	B-8	6K125534	82 105 1/2W
Perrite Bead (this represents inductance	8-9	6K127516	100,000 10% 1/2
shown as L1 on schematic) Coil, FM RF: complete (incl L3)	R-10	6K119932	82 10% 1/2w 10,000 10% 1/2w
Coil, FM osc (part of 12)	R-11	6R2039	68 10% 1/2m
inter the chart of 127	R-12	6K122319	68 10% 1/2w 10,000 10% 1% (in some sets)
Resistor, carbon film: 1 meg 10%	or	6K119926	
	R-13	6K119405	22,000 20% 1/2*
Fransformer, FM ant input	R-14	6K125534	22,000 20% 1/2w 100,000 10% 1/2w
Transformer, FM IF: incl cores	R-15 R-16	17K641740	
	R-10	013010	
(UT-343) MECHANICAL PARTS	R-18	6K121299 6K119407	47,000 10% 1/2W
	R-19	6R5646	3.3 meg 20% 1/2w 390,000 10% 1/2w 2.2 meg 10% 1/2w (not in all gets)
PM Tuner: complete	R-20	6K127001	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Collar, tuning gang shaft: loss setscrews	8-21	6K124494	1 mcg 10% 1/2w (not in all gets)
Core, ant & RF coil: incl string Core, IF trans	R-22	6K124494	1 meg 105 1/2w
Pulley, dial	R-23	8K121847	
crew, machine (tuner sub-chassis atg)	or	6K121301	1000 10% 1/2m
crew, tapping: #4 x 3/8 (FM tuper mtg)	R-24	188642127	Dual Control: 1 meg (loudness)
otscrew (tuning gang shaft collar)	R-25	6K121302	
	R-26	6K 129 185	18,000 10% 10
pring, RF & osc coil return	R-27 R-28	6K119935	22,000 10% 1/2W
	R-29	188642126	Dual Control: 2 meg (bass) 180,000 105 1/2w
asher, "C" (pulley anti-vibrating = not in	R-30	6K125534	180,000 101 1/28
	R-31	180642343	100,000 10% 1/2
(asher, "C" (pulley retainer)		100041043	Triple Control & Switch: 2 meg (trable); 400K (balance)
	R-32	6K-122445	1800 10% 1/2w
ARTS	R-33	6K125534	100,000 10% 1/2#
	R-34	6K121302	820 10% 1/2w
ee FM Tuner Ports List	R=35	6K129185	18,000 105 1
apacitor, cer disc: .01 mf 500V (not in .	IR-36	6K119935	22,000 105 1/2
all sets)	R-37	6K125531	180,000 10% 1/2
apacitor, cer disc: .005 mf 500V	R-38	6K125534	180,000 10% 1/2W 100,000 10% 1/2W
apacitor, cer disc: .002 mf 500V	R-39	6K122445	1800 10% 1/2w
apacitor, cer disc: .01 mf 500V	R-40	6K125534	100,000 105 1/28
apacitor, cer disc: .01 mf 500V	R-41	6K121300	27,000 10% 1/2w (not in all Sets)
apacitor, cer disc: .01 mf 500V	R-42	6K121301	
apacitor car disc. 01 at 500V	R-43	178488266	Wirewound: 47 10% 1/2W (See Prod Change HS #710B)
Apacitor, cer disc: 47 mmf 500V apacitor, cer disc: .01 mf 500V Apacitor, electrolytic: 8 mf 50v	S-1		
apacitor, mica trim: 1.3 mmf to 11 mmf	S-1F	406643293	Switch, AC-On-Off (on S1)
apacitor, var: 3 gang	T-1 &		
apacitor, paper tub: .05 mf 200V	T-3	248642112	See PM Tuner Parts List

REPLACEMENT PARTS LIST

NOTE: When ordering parts, specify model number of set in addition to part number and description of part.

77D638430 43K640041 76K640043 76K640036 49K640035	
3K640042	
	Screw, machine (tuner sub-chassis atg)
35127518	Screw, tapping: #4 x 3/8 (FM tuner stal
3K640044	Sotscrew (tuning gang shaft collar)
9K640039	Socket, tube: 9 pin min
41K640037	Spring, RF & osc coil return
31K640040	Strip, ant terminal
48601456	Werker unt terminal
	Washer, "C" (pulley anti-vibrating = not in all sets)
4K640038	Washer, "C" (pulley retainer)

# HS-710 ELECTRICAL PARTS

Rof. Part No. Number

C-1 C-2 C-3 C-4 C-5 C-6 C-7 C-8 C-9

C-10 C-11

L-1

L-2 L-3

B-1

PH TUNER 770638430 (U

21K640021 21K640022 20K640022 21K640022 21K640024 21K640024 21K640024 20K640025

21K640026 21K640027

218640028 Capa

21K640029 758640030 Ferr

FM\_TUNER\_ 77D638430 (UT

24K640031 Coll

17X640032 Res1 25K640033 Tran 25K640034 Tran

C-1 t	bru C-11	See FM Tuner Ports List
C-12	21R482726	Capacitor, cer disc: .01 mf 500V (not in .
		all sets)
C-13	21R122871	Capacitor, cer disc: .005 mf 500V
C-14	21K121836	Capacitor, cer disc: .002 mf 500y
C-15	21R482726	
C-16	21R482726	
C-17	21R482726	
C-18	21R115593	
C-19	21R482726	
C-20	234638536	Capacitor, cer disc: .01 mf 500V Capacitor, electrolytic: 8 mf 50V
C-21	208641777	
C-22	198641650	Capacitor, mica trim: 1.3 mmf to 11 mmf
C-23	8R121005	Capacitor, var: 3 gang
C-24	21R121946	Capacitor, paper tub: .05 mf 200V
C-25	8R121869	Capacitor, cer disc: .01 mf 500v
C-25	21R482726	Capacitor, paper tub: .1 mf 600V
C-27		Capacitor, cer disc: .01 mf 500v
C-28	21R482726	Capacitor, cer disc: .01 mf 500V
	21R121946	
C=29 C-30	8R122185	Capacitor, paper tub: .05 mf 600v
	8R122103	Capacitor, paper tub: .001 mf 600V
or C-31	8R121568	Capacitor, paper tub: .002 mf 600V
C-31	21R125999	Capacitor, cor disc: 220 mmf 500V (not
		in all sets)
C-32	21R120872	Capacitor, cer disc: 56 mmf 500V (not
		in all sets)
C-33	8K128691	Capacitor, paper tub: .02 mf 400V
C=34	211121836	Capacitor, cer disc: .002 mf 500V
C-35	8K128691	Capacitor, paper tub: .02 mf 400V
C-36	238642409	Capacitor, slectrolytic: 10 mf 400v
C-37	8R128691	Capacitor, paper tub: .02 mf 400V
C-38	21R121946	Capacitor, cer disc: .01 mf 500V
C-39	21R121106	Capacitor, cer disc: .002 mf 500V
C-40	21R400537	Capacitor, cer disc: 100 maf 500V(120 some sets)
C-41	21R410127	Capacitor, cer disc: .001 mf 500V
C-42	21R121946	Capacitor, cer disc: .01 mf 500v
C-43	21R482726	Capacitor, cer disc: .01 mf 500y
C-44	8R128691	Capacitor, paper tub; .02 mf 400V
C-45	21R121106	Capacitor, cor disc; .002 af 500V
C-46	21R400537	Capacitor, cer disc: 100 mmf 500V(120somesets)
C-47	21R410127	Capacitor, cer disc: .001 mmf 500V
C-48	21R482726	Capacitor, cer disc: .01 mf 500V
C-49	21R482726	Capacitor, cer disc: .01 mf 500V (not in
		all sets)
C-50	8R121568	Capacitor, paper tub: .002 mf 600V
E-1	518639144	Printed Resistor - Capacitor Plate
E-2	65R125595	Bulb, pilot light: #1847: 6V
E-3	65R125595	Bulb, pilot light: #1847; 6v
E-4	518641643	Printed Rosistor - Capacitor Plate
E-5	488636691	Crystal Diode
E-6	51B641643	Printed Resistor - Capacitor Plate
E-7	65R125595	Bulb, pilot light: #1847; 6V

L-1, 2 & 3 See FM Tuner Parts List T-1 & 2 T-3 2 T-4 2 T-5 2 T-6 2 T-7 2 T-8 2 2 See PN Tuner Parts List 24K6342112 Transformer, PN IP: 10.7 Mc 24K638478 Transformer, PN IP: 10.7 Mc 24C53458 Transformer, raito detector 24C534251 Transformer, AN HP: 455 Kc 24K642707 Transformer, AN IP: 455 Kc ES-710 MECHANICAL PARTS 64C641390 Background, dial 43A638357 Busbing, tuning shaft 13A741368 Cap, ping (for 8-pin per plug) 420733793 Clip, 73 thru T8 ats 13641335 Dirb Prieza Busbing Assembly (on pulley brkt - large) 5A643159 Eyelet (C22 mtg) 498638235 Flywheel, tuning: less setscrews 37A12691 Grommet, rubber (C22 insulating) A4433651 Insulator (under phone recept) 24645361 Lug, FB Jicess 256453761 Lug, FB Jicess 26547370 Plug, epla (pri) 26547370 Plug & Chile Answably (right h left stereo 30544377 Plug & Chile Answably (right h left stereo 30544377 Plug & Chile Answably (right h left stereo 30544377 Plug & Chile Answably (right h left stereo 30544377 Plug & Chile Answably (right h left stereo 30544377 Plug & Chile Answably (right h left stereo 30544377 Plug & Chile Answably (right h left stereo 30544377 Plug & Chile Answably (right h left stereo 30544377 Plug & Chile Answably (right h left stereo 30544377 Plug & Chile Answably (right h left stereo 30544377 Plug & Chile Answably (right h left stereo 30544377 Plug & Chile Answably (right h left stereo 30544377 Plug & Chile Answably (right h left stereo 30544377 Plug & Chile Answably (right h left stereo 3054477 Plug & Chile Answably (right h left stereo 3054477 Plug & Chile Answably (right h left stereo 3054477 Plug & Chile Answably (right h left stereo 3054477 Plug & Chile Answably (right h left stereo 3054477 Plug & Chile Answably (right h left stereo 3054477 Plug & Chile Answably (right h left stereo 3054477 Plug & Chile Answably (right h left stereo 3054477 Plug & Chile Answably (right h left stereo 3054477 Plug & Chile Answably (right h left stereo 3054477 Plug & Chile Answably (right h left stereo 3054477 Plug & Chile Answably (right h left stereo 305477 Plug & Chile Answably (right h left stereo 305477 Plug & Chile Answably (right h left stereo 305477 Plug & Chile Answably (right h left stereo 305477 Plug & Chile Answably (right h left stereo 305477 Plug & Chile Answably (right h left stereo 305477 Plug & Chile Answably (right h left stereo 305477 Plug & Chile Answably (right h left stereo 305477 Plug & Chile Answably (right h left stereo 305477 Plug & Chile Answably (right h left stereo 305477 Plug & Chile Answably (right h left stereo 305477 Plug & Chile Answably (right h left stereo 305477 Plug & Chile Answably (right h left stereo 305477 Plug & Chile Answably (right h left Derief Derief

17641829 26A634276 9K642867 Socket, pilot light (in record changer compartme

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Ref. Part Number Description Socket, pilot light (on chassis) Socket, tube: 9 pin min (EM81/6DA5) Socket, tube: 9 pin min (12AX7) Socket, tube: 7 pin min 98642279 98641598 98642797 94638433 Socket, tube: 7 più min Spring (pulley) Terminmi, pin (AM ant pamel conn) Washer, "C" (tuning shaft & pulley) Washer, fibre (EMSI tube scht inn) Washer, fibre (tuning shaft & pulley) 41A471681 29A76280 48592098 48592098 4K641703 KS ELECTRICAL PARTS 88122287 Cascitor, paper tub: 02 of 600V 88122287 Cascitor, paper tub: 02 of 600V 88122287 Capacitor, paper tub: 02 of 600V 21X21797 Capacitor, paper tub: 02 of 600V 21X21797 Capacitor, cer disc: 210 warf 500V ot 1s sl1 C-1 C-2 C-3 C-4 C-5 C=6 218(1013) Cipacitor, ere diac: 220 mi 5007000 ts =11 211(2177) Scherter, ere diac: 470 mi 5007 218(1013) Capacitor, ere diac: 220 mi 5007000 ts ±10 220(4266 Capacitor, electrolytic: 40-0-300//4007; 23462250 Capacitor, electrolytic: 5 mf (316, s17 & 23462250 Capacitor, electrolytic: 5 mf (316, s17 & 23462250 Capacitor, electrolytic: 5 mf (316, s17 & C-7 C-8 C-9 C-10 C-11 Speaker, 15"PM Speaker, 5-1/4"PM Speaker, 5-1/4"PM Speaker, 5"PM Speaker, 10"PM Speaker, 5-1/4"PM Speaker, 5-1/4"PM Speaker, 5-1/4"PM SCG41273 Spaker, 3749 SGG43575 Spaker, 5-1/4794 SGG43575 Spaker, 5-1/4794 SGG43575 Spaker, 5-1/4794 SGG43576 Spaker, 5-1/4794 SGG43576 Spaker, 5-1/4794 SGG43576 Spaker, 5-1749 SGG43576 Spaker, 5-1749 SGG43565 Light, pliot: #1447; eV (tm Bx17 4 Bx18 cs)y) 500642725 Σ-1 Σ-2 Σ-3 Σ-4 Σ-6 Ε-7 Ε-8 Ε-9 All resistors are land had carbon type (1) resistors are land had carbon type (1) resistors and (1) resistors Rest tors - Note: All resistors are insulated carbon type 6%6182 6%6182 6%122445 6%127513 6%122445 6%127513 6%125534 6%125534 6%125534 6%122534 R-1 R-2 R-3 R-4 R-5 R-6 R-7 R-6 R-7 R-8 R-9 R-11 R-12 R-13 R-13 R-13 6K122322 6K119934 6K122322 686326 R-16 R-17 R-18 R-19 R-20 R-21 R-22 R-23 R-24 R-25 6R6326 6K122322 6R6326 6R6326 6K122322 6R6326 17K634893 17K642037 17×642824 25C641731 Transformer, output (loft channed) 25C641731 Transformer, output (right channel) 25D642131 Transformer, per T-1 T-2 T-3 BS-21 MECHANICAL PARTS 9A702469 Receptacle, L & R input 9A701065 Socket, tube: 8 pin 9B639547 Socket, tube: 9 pin min 3L642104 Strip, terminal (output) Strup. TT A most, did (Liver) A most, did (Liver) A most, control of the state A most, did (Liver) A most, rober (Canada at a) A most of the state A SE16 CABINET PARTS

 
 Number
 Description

 25119013
 Xvi, pai: #0-32 (spr. st)

 2644248
 Nut, pai: #0-32 s 3/4 how (bacel stg)

 2644248
 Nut, pai: #0-32 s 3/4 how (bacel stg)

 2054248
 Nut, pai: #0-32 s 3/4 how (bacel stg)

 2054248
 Nut, pai: #0-32 s 3/4 how (bacel stg)

 20542487
 Plus and chair dawn(bar juich han spir

 2054248
 Plus, escutcheon (smamplate stg)

 20542487
 Plus and chair dawn (bar juich han spir

 20542487
 Plus, secutcheon (smamplate stg)

 20542489
 Scerer, achier: 8-32 si 1-3/4 (spir stg)

 2054249175
 Screer, tool is tool 446188 Tahor, ruber (chamin stg) 200401 Part 200400 Par SK-17 CABINET PARTS SK18 CABINET PARTS CALUET MATE CALUET MATE Discost and the set of the se

Description

Ref. No. Part Number

# Part Number Ref. No. Description 168842214 1.14 (SK18N)

SK16, SK17, SK18 LINITED REPLACEMENT PARTS

Note: The volume of replacement on the following parts is small, consequently, it is suggested that ordering be done only

# Ref No.

#### Part Number Description

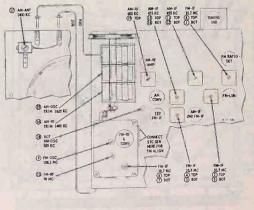
as requiréd. 15D642041 Cover, cabinet back (SE16) 15D642042 Cover, cabinet back (SE17) 15D642043 Cover, cabinet back (SE18)

#### \$16, \$17, S16 CABINET PARTS

6E641960	Cabinet, walnut (S16W)
6K641966	Cabinet, walnut (S17#)
6E641965	Cabinet, mahogany (S18M)
58636715	Glide, dome: 3/4 dim; 3-prong
38641968	Grille, metal (S17W, S18M)
5K641961	Grille cloth (S16W)
5×642197	Grille cloth (S17W)
5K641967	Grille cloth (S18M)
\$119913	Nut: #8-32 bex (spkr stg)
K120846	Screw, machine: #8-32 x 1-1/# (spkr stg
14642104	Strip, terminal

516,437,438 LIMITED.APPLACEMENT\_PAUS Bots, The solution of repletered to the following parts is small, as required, it is suggested that ordering be done only as required. 15642114 Cover, solutet back (512) 15642114 Cover, solutet back (512)

"New Item, Appears in any List for First Time



ALIGNMENT LOCATION DETAIL

CHASSIS HS-710, 711

38C642334 Knob, treble 35K641619 Knob, treble 53K642148 Latch, foucb 18K740075 Leg (SK16W) 18K642151 Lid (SK16W) 33K472321 Naacplate 33C642045 Nameplate, Hi-Fi

CHASSIS HS-710, 711

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MOTOROLA



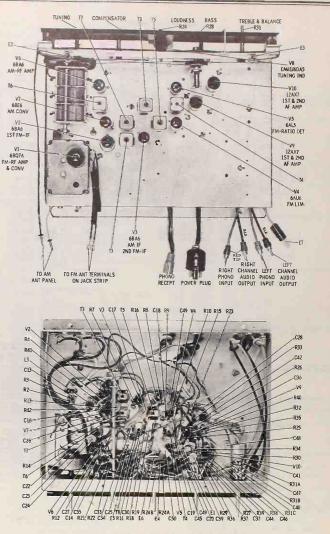
## PRELIMINARY PROCEDURE

Either AM or FM alignment may be performed independent of the other. Use an AM signal generator, a VTVM and output meter as indicated. Set loudness and bass controls to maximum, breble control to minfmum. The AM antenna loop about be connected; use either the speakers or an 8 ohm load connected to output transformer secondary. Use insulated alignment tools. As tages are brought into alignment, keep reducing signal generator output so meter reads no more than .8V DC when aligning FM, or no more than 2V AC when aligning AM, this prevents overloading and as assures greater accuracy. With gang fully closed, right edge of pointer (resr) about interp velts mark corright end of pointer real (see Dial Stringing Detail). In AM alignment, signal generation output should be modulated with 400 cps.

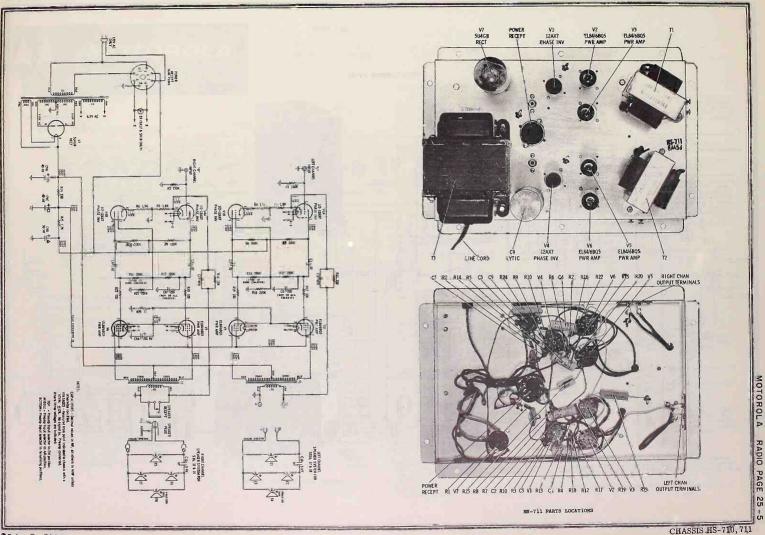
ALIGNMENT FM ant terminals						
	No mod	Fully open	FM	VTVM-DC probe to lead 7 on E-1. Com to chassis	1, 2, 3, 4, 5, 6 & 7	Adjust for max neg reading
FM ant terminals	"	2	FM	V TVM-DC probet to lead 3 of E-1. Com to chassis	8	Adjust for zero reading on VTVM. A positive and neg- ative reading will be ob- tained on either side of cor rect setting. (If metre has zero center scale, use this scale.) Repeat steps 1 and 2 until no further increase; step 2 should be last step.
FM ant terminals	108.1 Mc No mod	Fully open	FM	VTVM-DC probe to lead 7 on E-1. Com to chassis	9	Adjust for max neg reading
FM ant terminals	98 Mc No mod	Tune for max	FM		10	n
F ALIGNMENT 6BE6 grid (pin 7) or antenna stator of AM tuning cap thru, 1 mf & chassis	455 Kc	Fully open	АМ	Output meter across VC	11, 12, 13 & 14	djust for max feading
ALIGNMENT Radiation loop**	1620 Kc	- 0	AM		15	
	1400 Kc	Tune for max	AM	н	16	
"	n	n	AM		17	With chassis installed in cabinct, adjust for max reading
Do not perform t	he following ste ed.	ps unless the RF c	or oscillator	cores have been t	ampered	
6BE6 grid (pin 7) thru. 1 mf &	1620 Kc	Fully open	АМ	Output meter across VC	15	Adjust for max reading
11	535 Kc	Fully closed .	AM	43	18	Adjust for max reading. Re- peat steps 9 & 10 until os- cillator covers required range; step 9 should be last adjustment.
Radiation loop**	1400 Kc	Tune for max	AM	e .	16	Adjust for max reading
	600 Kc	Tune for max	АМ		19	Adjust for max reading, Re- peat steps 11 and 12 untilnc further increase; step 11 should be last adjustment.
	FM ant terminals FM ant terminals * ALIGNMENT (SDE6 grid (pin 7) true, 1 mf 6 chassis * ALIGNMENT Radiation loop** * * Radiation loop** * Radiation loop** * Regeat step 8.	No mod FM ant terminals No mod FM ant terminals ALLGNMENT ABLE grid (pin 7) or antenn status ALLGNMENT Radiation loop** 1400 Kc " " bave been replaced. basais " bas	FM ant terminals     108.1 Mc     Fully open       FM ant terminals     98 Mc     Tune for max       ALIGNMENT     5826 grid (pin 7)     455 Kc     Fully open       * ALIGNMENT     455 Kc     Fully open       * ALIGNMENT     1620 Kc     "       * Markinson loop**     1620 Kc     "       * ''     1400 Kc     Tune for max       * ''     1620 Kc     Fully open       * ''     1620 Kc     "       * ''     ''     "       * ''     ''     "       * ''     ''     "       * ''     ''     ''       * ''     ''     ''       * ''     ''     ''       * ''     ''     ''       * ''     ''     ''       * ''     ''     ''       * ''     ''     ''       * ''     ''     ''       * ''     ''     ''       * ''     ''     ''       * ''     ''     ''       * ''     ''     ''       * ''     ''     ''       * ''     ''     ''       * ''     ''     ''       * ''     ''     ''       * ''     '' <td< td=""><td>FM ant terminals     108.1 Mc No mod     Fully open     FM       FM ant terminals     88 Mc No mod     Tune for max     FM       * ALIGNMENT Sale grid (pin 7) thru, 1 mf 6 chassis     455 Kc     Fully open     AM       * ALIGNMENT Radiation loop**     1620 Kc     "     AM       * 1400 Kc     Tune for max     AM       * 1400 Kc     Tune for max     AM       * 1400 Kc     Fully open     AM       * 20 not perform the following steps unless the RF or oscillator have been replaced.     AM       65E6 grid (pin 7) thru, 1 mf 4     1620 Kc     Fully open       * 355 Kc     Fully closed     AM       * 600 Kc     Tune for max     AM</td><td>ALIGNMENT -See Note * FM ant terminala 108, 1 Mc No mode Tune for max FM " ALIGNMENT No mode ALIGNMENT 1620 KC " 1400 KC Tune for max AM " 1400 KC Fully open AM Output meter thru 1 mf chassis FM ant terminals the RF or oscillator cores have been thru 1 mf chassis FM ant terminals 1620 KC Fully open AM Output meter thru 1 mf chassis FM ant terminals 1620 KC Fully open AM " 1400 KC Fully open AM Output meter thru 1 mf chassis FM ant terminals for the for max AM " 1400 KC Tune for max AM " 1</td><td>ALICIMENT -See Note * FM ant terminala 108, 1 Mc Pully open FM VTYM-DC probe 5 I of lead 7 on E-1. Gom to chastals FM ant terminala 98 Mc Tune for max FM " 10 CALICIMENT No mod 10 CALICIMENT 10 SEE grid (mn 7) MC Tune for max AM 1 1 CALICIMENT 16 CALICIM</td></td<>	FM ant terminals     108.1 Mc No mod     Fully open     FM       FM ant terminals     88 Mc No mod     Tune for max     FM       * ALIGNMENT Sale grid (pin 7) thru, 1 mf 6 chassis     455 Kc     Fully open     AM       * ALIGNMENT Radiation loop**     1620 Kc     "     AM       * 1400 Kc     Tune for max     AM       * 1400 Kc     Tune for max     AM       * 1400 Kc     Fully open     AM       * 20 not perform the following steps unless the RF or oscillator have been replaced.     AM       65E6 grid (pin 7) thru, 1 mf 4     1620 Kc     Fully open       * 355 Kc     Fully closed     AM       * 600 Kc     Tune for max     AM	ALIGNMENT -See Note * FM ant terminala 108, 1 Mc No mode Tune for max FM " ALIGNMENT No mode ALIGNMENT 1620 KC " 1400 KC Tune for max AM " 1400 KC Fully open AM Output meter thru 1 mf chassis FM ant terminals the RF or oscillator cores have been thru 1 mf chassis FM ant terminals 1620 KC Fully open AM Output meter thru 1 mf chassis FM ant terminals 1620 KC Fully open AM " 1400 KC Fully open AM Output meter thru 1 mf chassis FM ant terminals for the for max AM " 1400 KC Tune for max AM " 1	ALICIMENT -See Note * FM ant terminala 108, 1 Mc Pully open FM VTYM-DC probe 5 I of lead 7 on E-1. Gom to chastals FM ant terminala 98 Mc Tune for max FM " 10 CALICIMENT No mod 10 CALICIMENT 10 SEE grid (mn 7) MC Tune for max AM 1 1 CALICIMENT 16 CALICIM

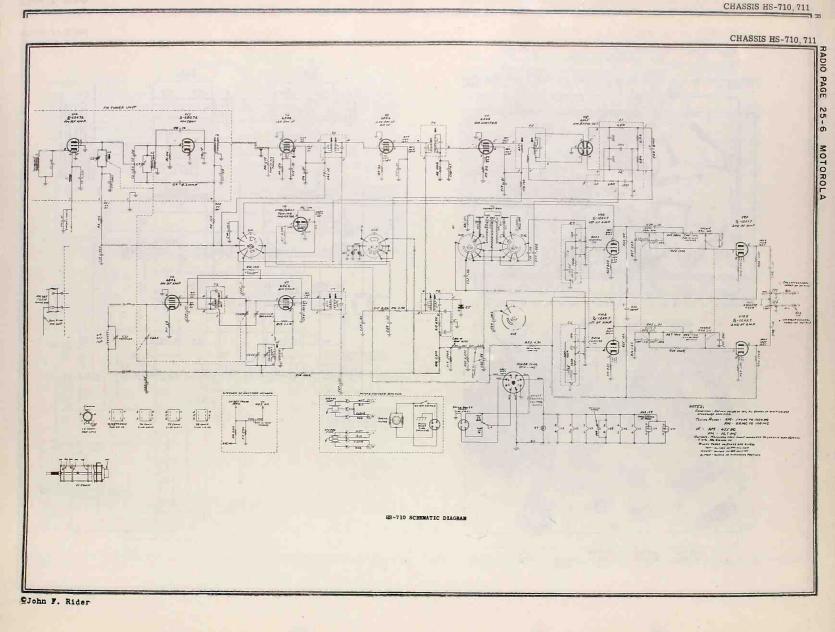
\*IF FM tuner string has been replaced or tampered with, check it for correct length and set-up before proceeding with steps 3 & 4. String haudid measure about 2-1/2" from FM tuner opening to gang shaft collar. Open gang islay, place collar and string on gang shaft, then turn collar clockwise to just remove slack from string; tighten collar setacrews (see Dial Stringing Detai).

\*\*Connect generator across 5" diameter, 5-turn loop and couple inductively to receiver loop. Keep radiation loop at least 12" from receiver loop.



HS-710A PARTS LOCATIONS (SEE PRODUCTION CHANGES)







# HOMÉ RADIO MODEL CHASSIS HK-27 HS-695

#### GENERAL INFORMATION

TYPE - High-Fidelity AM-FM tuner custom designed for installation in the record storage compartment of Motorola Models 6K13, 6K22, SK11, SK12, SK13, SK14 or into any space that has the following dimensions: 14-3/4 x 6-1/8" x 6-3/4" (HDD).

> This model features built-in AM antenna with provision for internal or external FM antenna, Nywheel tuning for simplified tuning, turing eve for precision fine tuning of stations (on both AM and FM) and low impedance cathode follower output to permit longer interconnecting cables between tuner and amplifier with little or no high frequency loss.

When the tuner is installed into the Motorlah Models listed above per instructions given in the HK-27 Installation instruction booklet, all former operating instructions of those models remain the same when the tuner Operation Selector homb is in the PHONO sostion; in the AM or Tyd positions, the PHONO selection is the CM or Tyd positions, the PHONO selection is the CM or Tyd positions, the PHONO selection is the CM or Tyd positions, the AM or TFM stations are played through the amplifier-opeaker system of the phonograph.

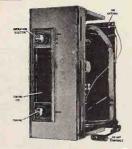
POWER SUPPLY = 120 volts, 60 cycle AC only

POWER CONSUMPTION - 40 watts

TUNING RANGE - AM 540 to 1600 Kc FM 88 to 108 Mc AM IF - 455 Kc FM IF - 10,7 Mc

#### FM TUNER SERVICE NOTES

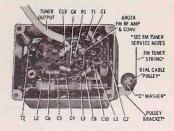
Do not free the dist calls quilty located on the FM tuncr unit, as the may regait in audio how?. This is due to core vibration caused by acoustic feed-back from the londspeaker at certain frequencies. Silicon grease is applied at the junction of string and pulley, to insure smooth tuning action and must not be removed. Therefore, whenever tuning action is erratic, check for proper use of silicon grease (binose of a thumber 11Ma/0485). Also altecting tuning choiced bar. Humber 11Ma/0485), Also altecting tuning choice of a thumber 11Ma/0485). Also altecting tuning smooth as possible.



HK-27 SERIES

#### TUBE COMPLEMENT -

Туре	Function
6BE6	AM converter
6BQ7A	FM RF amp & converter
6BA6	FM IF amp
6BA6	AM-FM IF amp
6AU6	FM limiter
6AL5	FM ratio detector
12AU7	AM Det-AVC-cathode follower
6X4	Rectifier
EM-81/6DA5	Tuning eye



FM UNIT 77D638430 PARTS LOCATION

#### ALIGNMENT

#### PRELIMINARY PROCEDURE

Either AM or FM alignment may be performed independent of the other. Use an AM signal generator and a YTVM has indicated. The AM antenna loop should be connected. Use insulated alignment ionis. As bugs at ret brought into signment, keep reducing signal generator output so meter reads no more theorem, with ago fully closed, left edge of pointer (from) aligning AM, usis marks niette end of pointer rail(see Dial Stringing Detail). In AM slignment, signal generator should be modulated with 400 cps.

STEP	GENERATOR CONNECTION	GENERA TOR	GANG SETTING	SETTING	OU TPUC INDICATOR	ADJUST	REMARKS
	ALIGNMENT FM ant terminals	10.7 Mc Ne mod	Fully open	FM	VTVM-DC probe to lead 7 on E-1, Com to chassis	1, 2, 3, 4, 5, 6 & 7	Adjust for max neg read- ing.
2.	FM ant terminals			FM	VTVM-DC probe to lead 3 of E-i. Com to chassis	8	Adjust for zero reading on VTVM. A positive and megative reading will be obtained on either side of correct setting. [If meier has zero center scale, us this scale.] Repeat steps 1 and 2 until no (urther in- crease; step 2 should be last step.
FM-R	ALIGNMENT -See	Note *		84. R.			
3.	FM ant terminals	108, 1 Mc No mod	Fully open	FM	VTVM-DC probe to lead 7 on E-1. Com to chassis	9	Adjust for max neg read- ing
4.	FM ant terminals	98 Mc No mod	Tune for max	FM		10	u
AM-IF	ALIGNMENT			1			
5.	6BE6 grid (pin 7) or antenna stator of AM funing cap thru .1 mf & ch	455 Kq	Fully open	AM	VTVM-DC probe to AVC line (pin 3 of T6). Com to chassis	13 & 14	
AM-R 6.	F ALIGNMENT Radiation loop**	1620 Kc	ai.	AM		15	
	Kadration toop	1400 Kc	Tune for max	AM		16	With chassis installed in
7.		1400 Kc	Thue for max.	AM.			cabinet, adjust for max close of tuning eye

8.	6BE6 grid (pin 7) thru , 1 mf & chassis	1620 Kē	Fully open	AM	VTVM-DC probe to AVC line (pin 3 of T6). Com to chassis	15	Adjust for max neg read- ing
9.	1 m · · · ·	535 Kc	Fully closed	Ам		17	Adjust for max neg read- ing. Repeat steps 8 & 9 until oscillator covers re- quired range; step 8 should be last adjustment
10.	Repeat step 7.		1				1

#IF FM tuner string has been replaced or tampered with, check if for correct length and set-up before proceeding with steps 3 & 4. String should measure about 3" from FM tuner opening to gang shaft collar. Open gang fully, place collar and string on gang shaft, then turn collar counterclockwise to just remove slack from string; tighten collar setscrews (see Dial Stringing Detail).

\*\*Connect generator across 5" diameter, 5-turn loop and couple inductively to receiver loop. Keep radiation loop at least 12" from receiver loop. MOTOROLA RADIO PAGE 25

C17 AM TUNING

CAPACITOR

TUNER

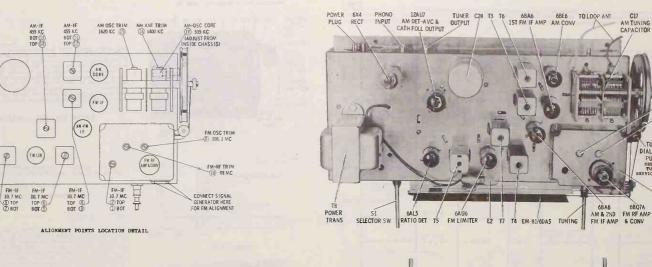
DIAL CABLE

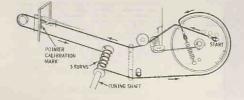
PULLEY SEE FM TUNER BERVICE NOTE

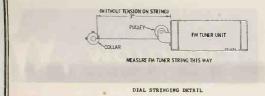
6BQ7A UNIT

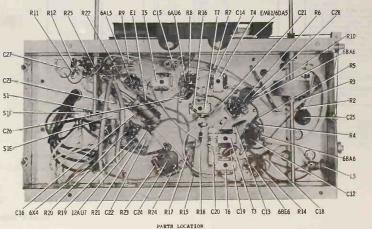
FM

TUNER









CJohn F. Rider

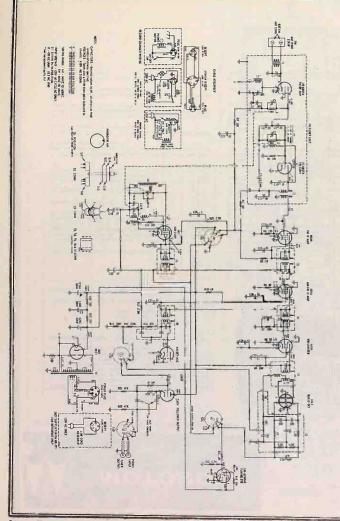
AM DET

F N

SE-4 95

PAGE 25 1 00 MOTOROLA

RADIO



# REPLACEMENT PARTS LIST

	NOTE :	When ordering parts,	specify model	number of set	in addition to par	t number and de	scription of m	et.
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Electronic parts of equivalent rating are not proceedently of equivalent this and a. The composets listed in this fortier Annual Nave have howen for rating the statistic of the statistic of the specified circuits involved. For existence outcomer satisfaction and ministed calibacks, use the specified beforein parts replacement.

Ref. No.	Part Number	Description	Ref. No.	Part Number	Description
FR. TU	ER 77063843	0 (UT-343) ELECTRICAL PARTS	R-9	686054	10,000 20% 1/2%
		Capacitar, cor tub: 10 mm <sup>2</sup> 5007 WTC750PPM Capacitar, cor tub: 0.0 mf 5007 Capacitor, cor tub: 0.0 1 mf 5007 Capacitor, cor tub: 0.0 mf 5007 Capacitor, cor tub: 20 mm <sup>2</sup> 5007 Capacitor, cor tub: 20 mm <sup>2</sup> 5007 Capacitor, cor tub: 20 mm <sup>2</sup> 5007 WTC750PPM Capacitor, cor tub: 1.0 mm <sup>2</sup> 5007 WTC750PPM Capacitor, cor tub: 1.0 mm <sup>2</sup> 5007 WTC750PPM Capacitor, cor tub: 1.8 mm <sup>2</sup> 5007 WTC750PPM	R-10	6K127960	10,000 20% 1/2# 1000 20% 1/2# 1 meg 10% 1/2#
C-1	218640021	Capacitor, cer tub: 10 mmf 500V NTC750PPM	R-11	6K124494	1 meg 10% 1/2w
C-2	21K640022	Capacitor, cer tub: .001 mf 500V	R-12	6K121277	4.7 meg 10% 1/2w
C-3	206640023	Capacitor, mica trim (RF trim)	R-13	6K122324	4.7 meg 10% 1/2w 1 meg 20% 1/2w 22,000 20% 1/2w
C-4 C-5	216640022	Capacitor, cer tub: .001 mf 500V	R-14	6K119405 6K127001	22,000 205 1/2# 22,200 205 1/2# 270,000 2105 1/2# 270,000 2105 1/2# 1 wc 205 1/2# 1 wc 205 1/2# 47,000 205 1/2#
C=5 C=6	218640024	Capacitor, cer tub: 20 mmi 500V	H-15	6K127001 6K121687	2.2 meg 105 1/20
C-7	208610024	Capacitor, cer (do. 10 mar 500)	B 17	6R6414	270 000 107 1/28
C-8	218640026	Capacitor cer tub: 10 mmf 500V NTC470PPM	8-18	686015	220 000 205 1/2
C-9	216640027	Capacitor, cer tub: 8.2 mmf 500V PTC100PPW	R-19	6K122324	1 mer 205 1/2W
C-10	21K640028	Capacitor, cer tub: 15 mmf 500V	B-20	6K121301	1000 105 1/2#
C-11	21K640029	Capacitor, cer tub: 68 mmf 500V NTC750PPM	R-21	6K121687	47,000 20% 1/2
			R-22	6K121687	47,000 20% 1/2#
L-1	76K640030	Ferrite Bead (this represents inductance	8-23	6R6147	330 20% 1# 330 20% 1# 2700 10% 1/2#
		shown as L1 on schematic) Coil, FM RF: complete (incl L3)	R-24	6R6147	330 20% 1
L-2 L-3	24K640031	Coil, FM RF: complete (incl L3) Coil, FM osc (part of L2)	R-25	6K419926	2700 105 1/2*
L-3	-	Coll, FM and Longreto (Land Los) Coll, FM acc (part of L2) Resistor, carbon film; 1 mcg 10% Transformer, FM ant		400538431	Switch, operation selector
R-1	178610032	Resiston combon film: 1 and 105	5-15	401639788	Switch SPDT (on S))
N-1	111010031	Resistor, carbon film. I beg ton	S-1P	406639787	Switch SPST (on S1)
T-1	25K640033	Transformer, FM ant	•		
T 2	25K640034	Transformer, FM ant Transformer, FM IF: incl cores	T-1 &	2 -	See FM Tuner Parts List
			T-3	24C638646	See FW Tuner Parts List Transformer, FW 1st IP: 10.7 Nc Transformer, FW 2nd IF: 10.7 Nc Transformer, Ratio Detector Transformer, AM 1st IP: 455 Nc Transformer, AM 2nd IP: 455 Nc
FNITUR	ER 77063843	0 (UT-343) MECHANICAL PARTS	T-4	24X638647	Transformer, FM 2nd IF: 10.7 Mc
	and a contract of the		T-5	24C638488	Transformer, Ratio Detector
	770638430	FM Tuner, complete	T-6	24C634507	Transformer, AM 1st 4F: 455 KC
	43K640041	FM Tuner, completé Collar, tuning gang mhaft: less setscrews Core, ant & RF coll: Incl string	T-7	24K634508	Transformer, AN 2nd IF: 455 KC
	76K64004J	Core, ant a KF coll: inclatring	1-0	230838289	Transformer, power
	16K640036	Core, ir trans			A. 1.
	38640042	Screw machine (tuner Subschassis atg)	HS-693	RECHANICAL	PARTS
	38640044	Collar, tual mag cang manfil lean settere Core, "At trans il loci settere Pulley, dial Core, "At trans, tuber tuberchasts matrix Scittere (tuber gang shart collar) Scittere (tuber gang shart Scittere (tuber gang shart Scittere (tuber gang shart) Scittere (tuber gang shart)		£ 18678074	Background, dial
	98640039	Socket, tube: 9 pin min		434638267	Bushing tuning thaft
	41K640037	Spring, RF & osc coil return		428733793	Bushing, tuning shaft Clip, T3 thru T7 mtg
	31K640040	Strip, ant terminal		5×3195	Eyelet (C17 insulating)
	4K601456	Washer, "C" (pullcy anti-vibrating)		498638235	Flywheel, tuning shaft: less setscrews
	4K640038	Masher, "C" (pulley retainer)		5X470916	Grommet, insulating (gang insulating)
HS-695	ELECTRICAL	PARTS		28A638343	
an contra				1K638233	Pointer
C-1 t)	ru C-11	See FW Tunor Parts List Capacitor, cer disc: .01 af 500Y Capacitor, electrolytic: 8 af 50Y		49A638219 58470101	Pulley, dial cord Rivet, shoulder (dial cord pulley ret =
C-12	21R482726	Capacitor, cer disc: .01 at 500v		38470101	long)
C-13	218482726	Capacitor, cer disci .01 #1 500Y		5812814	Rivet shoulder (dial cord pulley ret -
C-14	218115593	Capacitor, cer disc: 47 mai 500V Microuppa		JAILOIN	long) Rivet, shoulder (dial cord pulley ret - short)
C 16	221628536	Capacitor, electrolytic: 8 pf 50V		5K481776	
C-17	198641739	Capacitor, var: 2 gang			Screw, tapping: #4 x 3/8 (FM tuner unit m Setscrew: 6-32 x 1/4 (diywhcel)
C-18	21R482726	Capacitor, cer disc; .01 mf 500V		359724	Setscrew: 6-32 x 1/4 (diywheal)
C-19	218482728	Capacitor, cer disc: .01 mf 500V		9A638432	Socket, pilot light
C-20	8R121567	Capacitor, paper tub: .05 mf 400V		94702469	Socket, 1 pin (phono input & tuner output)
C-21	21R482726	Capacitor, cer disc: .01 af 500V			Socket, tube: 7 pin min
C-22	21R482726	Capacitor, ccr disc: .01 mf 500V		9K638368 9B639547	Setterre: 0-12 x 1/4 cultured) Socket, 1 pin (phono input & tuner output) Socket, tube: 7 pin min Socket, tube: 9 pin min (SNBI tuning syc) Socket, tube: 9 pin min (SNBI tuning syc)
C-23	8R121573	Capacitor, paper tub: .1 mf 200V		414471681	Soring dial
C-24	238638449	Capacitor, electrolytic: 8 af 50V Capacitor, var: 2 gang f 500V Capacitor, cer disc: .0 af 500V Capacitor, paper tub: .0 af 500V Capacitor, cer disc: .01 af 500V Capacitor, en disc: .01 af 500V Capacitor, en disc: .01 af 500V		14638268	Tuning Shaft & Pulley Assembly
C-25	218462726	Capacitor, cer disc; .01 mf 500V		4K501364	Washer, "C" (tuning shaft)
C-26 C-27	218482726	Capacitor, cer disc: .01 mf 500V Capacitor, cer disc: .01 mf 500V Capacitor, paper tub: .1 mf 200V Capacitor, cer disc: .01 mf 500V			
C-27	218482726	Canacitor, cor disc; .01 mf 500V			
			HK-22	CABINET PAR	π <u>s</u>
E-1	51B639144	Printed Capacitor - Resistor Plate Bulb, pilot light: 6V; #1847	diad	240641532	Antonna & Pañel
E-2	65R125595	Bulo, bilor Likur. or, story		·13K641506	Beze 1
				·13K641538	Escutcheon
L-1, 2 & :		See FM Tuner Parts List		5A739914	Gronnet, nylon (escutcheon stg)
2 4 . L-4		See Cabinet Parts List		5A739914 36K641534	
L-3	248638340	Ceil. esc		28K639662	Plug, 1 pin (tuner output)
				28B743781	Amon, control Plug, 1 pin (tuner output) Plug, 4 pin (tiring harness) Receptacle, 4 pin (wiring harness) Receptacle, 5 pin (wiring harness) Scale, dial
Resia	ors - Note:	All resistors are insulated carbon type		98690618	Recoptacle, 4 pin (wiring harness)
				94638342	seceptacie, 5 pin (wiring harness)
8-1	-	See FM Tuner Parts List		-340641521	Scale, dial
R-2	6R6054	See FM Tuner Parts List 10,000 20% 1/2W 10,000 20% 1/2W		337536	Scrie, dial Serce, tapping: #6 x 3/8 (ant panel Btg) Shell (4 pin plug & recept) Shell (5 pin recept)
R-3	6R6054	10,000 20% 1/2W		158639348	Shell (5 pin recent)
R-4	6K124797	150 10% 1/2W 1000 20% 1/2W		28638081	Speednut (bezel mtg)
R-5	6K127960 6K127516	1000 20% 1/2#		2X637444	Speednut (dial scale mtg)
		0.4 10% 1/20		31A21990	Strip, terminal: FM ant connecting
R-6	CHARTER C				
	6K125534	62 10% 1/2W 100,000 10% 1/2W 82 105 1/2W		29A76280	Terminal, pin (black - ant conn)

"Now iten, Appears in any List for First Time

ADIO PAGE

25-10

MOTOROLA





DISASSEMBLY INSTRUCTIONS

To Remove Chassis From Cabinet

 Remove two screws on bottom of cabinet; separate rear cabinet from front cabinet and unscrew (from inside rear cabinet) the lead lug which connects chassis to rear cabinet.

2. Remove the insert knob sections on the Loudness control and the Dial Scale. (The two control knobs are each composed of two sections.)

3. Remove Dial Scale knob and the screw (located behind knob) that mounts chassis to cabinet.

4. From front of cabinet, unscrew palnut from Loudness control. It is not necessary to remove the Loudness Indi-cator knob in order to free the chassis.

5. From rear of cabinet, remove the two acrews that mount the plated panel bracket to cabinet.

6. Unsolder speaker leads, antenna leads, and remove chassis from cabinet.

bottom.

3. Reference to the schematic diagram, plated panel wir-ing diagrams, and to chassis, will permit the circuit to be traced easily.

NOTE: To facilitate servicing, phantom views showing plated panel wiring of both sides of the chassis plus loca-tion and wiring of electrical components are given. This is done in two ways; the chassis as viewed from the bot-(component side) and the chassis as viewed from the bottom with components as they would appear on opposite side.

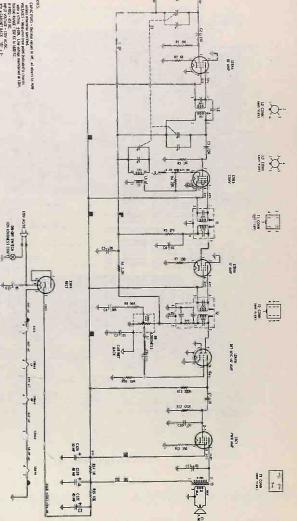
COMPONENT REPLACEMENT

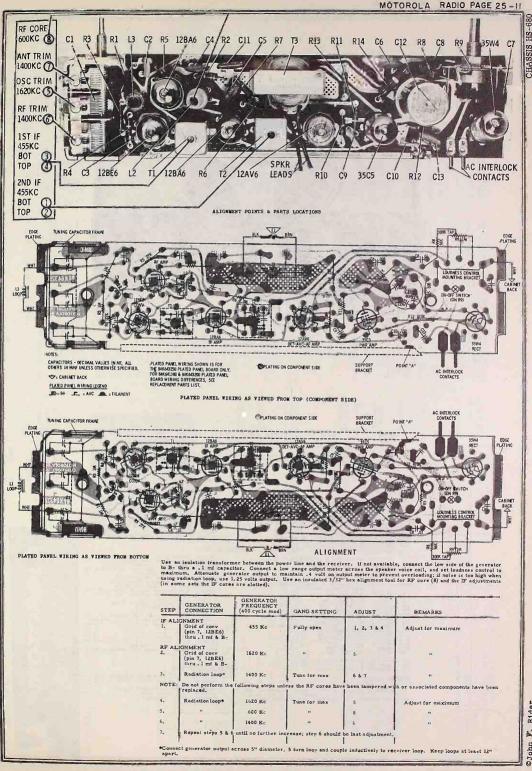
Refer to "Plated Chassis Servicing Techniques" manual (Motorola Part No. 68F65636) for recommended tools and procedures to be used when servicing Motorola plated circuit chassis.

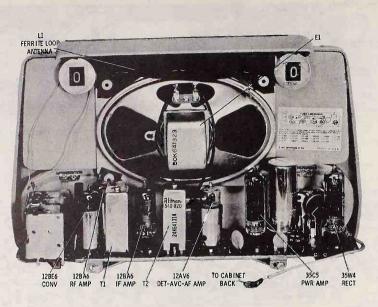
#### SAFETY PRECAUTIONS

1. Do not service the chassis on a metal plate because of the possibility of a short circuit.

2. Use caution when handling the chassis with power applied because all high voltage leads are exposed.







PARTS LOCATION

# REPLACEMENT PARTS LIST

NUTE: Them ordering parts, specify model number of not in addition to part number and description of part. Electronic parts of equivalent rating are not macessarily of equivalent standards. The components listed to this Service Ranual have been chosen for rationity and speciability to the specific circuit involved. For maximus customer satisfaction and minimized cali-backs, use the sact hotorob parts replacessat.

		ADIOFOIN PRFUS replacement.			
Ref.	Part		Ref.	Part	
No.	Number	Description	No.	Number	Description
				10000	
ELECTI	RICAL PARTS			used as re	placement for 84K641380 & 84K643200. This
				panel repl	aces the two other versions. In panel the support bracket and the edge plating
C-1	19C641067	Capacitor, variable: 3 gang		84K641380,	acted to B In panel 84K643200; the support
C-2	218127652	Capacitor, cer disc; 150 mmf 500V		Were COnne	d cdge plating were removed electrically
C-3	21K127652	Capacitor, cer disc; 150 mmf 500V		bracket an	In panel 84K643250, the support bracket and
C-4	21R128284	Capacitor, cer disc: .01 = 500V		fron B	ing were connected to B- thru a capacitor (C7).
C-5	8K121268	Capacitor, paper tub: .05 mf 400V		odge plats	al placement of the components is the same in
C-6	218633232	Capacitor, cer disc: .005 mf 500V		The physic	ons. When replacing panel, solder plated panel
C-7	21R128284	Capacitor, cer disc: .01 mf 500V		All verbic	point "A" as indicated on Plated Panel Wiring
C-8	21R128284	Capacitor, cor disc: .01 af 500V			point A as indicated on Finted Finter
C-9	21R128284	Capacitor, cer disc: .01 mf 500V		Diagrau. 5x636314	Rivet, shield (tube socket center)
C-10		Capacitor, cer disc: 150 mmf 500V		98635616	Socket, tube: 7 pin min
C-11	21K533472	Capacitor, cer disc: .01 mf 500V		aB032010	Socket, tube: / pin ska
C-12	238639496	Capacitor, electrolytic: 30-40-40mf/150V			
C-13	<b>BK121268</b>	Capacitor, paper tub: .05 mf 400V	CABIN	ET PARTS	
				19641361	Cabinet Front: brown (6T15N)
E-1	500640765	Speaker, PM: 4 x 6"; 3.2 ohm VC		17641362	Cabinot Front: tan (6715S)
				168641010	Cabinet Rear: tortoise shell
L-1	17641352			28637286	Clip, speed (latch mtg - not in all sets)
L-2 L-3	24B641321	COLL, RF		28637708	Clin speed (spkr stg)
L-3	248641320	Coil, oscillator		11642899	Grille, trim: incl nameplate
				368641065	Knob dial scale: brown (6T15N)
80818	tors - Note:	All resistors are insulated carbon type		368641064	Knob. dial scale: tan (67158)
		unless otherwise specified.		358641028	Knob. loudness indicator: brown (67158)
R-1 R-2	6K122324 6R2039	1 meg 20% 1/2W 68 10% 1/2W		36K641027	
R-3		1 meg 20% 1/2W		36C641020	Knob, tuning: clear
R-4		22,000 20% 1/2W		350641022	Knob, On-off & loudness: clear
R-5	6K119405 6K121300	27,000 105 1/2		308640846	Line Cord: brown
R-6	6R3927	2,2 meg 20% 1/2W		33A640999	Nanoplate
8-7	68124797	150 10% 1/2W		237051	Palnut: 3/8-32 x 9/18 (loudness cont stg)
8-8	6K127541	56,000 10% 1/2W		35128636	Screw, tapping: #8 x 3/8 (cab back atg)
B-9	100440050	Loudness Control & Switch: 1 meg, tap at 300K		35122335	Screw, tapping: #6 x 1/2 (loudness knob &
R-10	EX110409	10 neg 20% 1/2W			chassis mtg)
B-11		220,000 20% 1/2W		42B640989	
R-12	68119406	470,000 20% 1/2W		7K640907	Stand, cabinet: gold
R-13		150 10% 1/2₩		38122335	Screw, tapping: #6 x 1/2 (cover latch spring
R-14		1000 105 1/20			ntg - not in all sets)
R-15	686326	100 105 1/28		44643646	Washer, cup (cover latch spring stg - not in
	oncono				all sets)
T-1	248641313	Transformer, 1st IF: 455 Kc			
T-2	241641314	Transformer, 2nd IF: 455 Kc			Charles and Charles an
T-3	25K640899	Transformer, output	LINIT	ED REPLACENE	INT PART
			1000		of replacement on the following parts is small,
NECHA	SICAL PARTS		- Note:	The volume	ly, it is suggested that ordering be done only
				as require	
	29A635682	Contact, AC interlock		78643262	Bracket, plated panel support
	17841355	Plated Panel Board: less all components; incl		424643259	Clip, plastic (brkt atg)
		AC contacts and 84X643250 plated panel board		220640979	Gasket, trim grille
Note:	when repla	aging the plated panel, Part No. 84K643250 is		320340979	

CJohn F. Rider

# CHASSIS HS-680



# SUPERSEDES 13KT15 PRELIMINARY SERVICE MANUAL PART NO. 68P643064

# GENERAL INFORMATION

TYPE - Hi-Fi radio-phonograph containing an AM-FM tuner, four-speed record changer, multiple speaker system. Also built-in provision for simple, future conversion to stereophonic operation through use of appropriate conversion kit.

#### THRE COMPLEMENT

Ref. No.	Туре	Function			
V-1	6B07A	FM RF amp and converter			
V-2	6BA6	1 1st FM IF amp			
V-3	6BA6	AM IF amp -2nd FM IF amp			
V-4	6AU6	FM limiter			
¥-5	6AL5	FM ratio detector			
V-6	6BA6	AM RF amp			
¥-7	6BE6	AM converter			
V-8	EM81/6DA5	Tuning indicator			
¥-9	12AX7	lst & 2nd AF amp			
V-10	12AX7	AF amp & inventer			
V-11	EL84/6BQ5	Power output			
V-12	EL84/6BQ5	Power output			
V-13		Rectifier			

#### ELECTRICAL SPECIFICATIONS

Frequency Response: 20 to 20,000 cps at normal lis-Frequency Response: 20 to 20,000 cPs at normal ins-Power Output = 10 w wind a distribution; 20 watts peak Amplifier Sensitivity - 2 volt in Yor 10 watts output essured access an Sohm re-sistive load, A reading of 8,9 volts indicates an output of 10 watte

#### **FM TUNER SERVICE NOTES**

Do not free the dial cable pulley located on the FM tuner unit, as this may result in audio howl. This is due to core vibration caused by acoustic feed-back from the loudspeaker at certain frequencies. Silicon grease is applied at the junc at certain irequencies, Sunchargeness is applied at the junc-tion of string and pulley, to insure smooth tuning action and must not be removed. Therefore, whenever tuning action is errait, check for proper use of allicing grease (Motorola Part Number 11M490487). Also affecting tuning action, is the angle of the pulley bracket will respect to the take-up shaft. Position bracket until tuning action is as smooth as possible.

# HOME RADIO

MODEL	CHASSIS
13KT15B	HS-677
13KT15CW	HS-677
13KT15M	HS-677



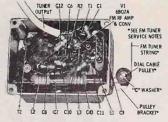


13TTAS SERIES

Tone Controls - Bass +10, -15 db at 50 cps Treble +7, -12 db at 30 cps AM Tuning Range - 540 to 1600 Kc FM Tuning Range - 88 to 108 Mc FM IF - 10, 7 Mc Power Supply - 120 volts, 60 cycle AC only Power Consumption - 165 watts Speaker System - one 15" woofer, two 5-1/4" mid-range, one 5" tweeter

#### RECORD CHANGER

These models use the VM17RC record changes. Refer to the VM17RC - VM25RC Record Changer Service Manual (Motorola Part Number 68P643068) for service information and changer operation.



#### FM UNIT 77D638430 PARTS LOCATION

PRODUCTION CHANGES

Chassis Coding	Changes	Chassis Coding	Changes
HS-677A	Original Chassis		2W ww; 1.2 ohm 1/2W ww; .94 ohm choke (used
HS-677B	TO REDUCE 12AX7 FIL VOLTAGE: Dropping resistor added, the following were used: 1 ohm		asresistor); .47 ohm 1/2W ww. Use 17K488266, .47 ohm 10% 1/2W wirewound as replacement (see R50 on schematic diagram).

# AUXILIARY CIRCUITS AND EXTERNAL CONNECTIONS

#### EXT SPEAKER JACK

The Hi-Fi sound of this Radio-Phonograph can be played inc mirr; sound of this Kallorradograph can be pikyed dirough an external speaker system in addition to the inter-nal speaker system within the cabinet; the extornal speaker system is connected to the EXT SPEAKER 8 N jeck on the cabinet back. The Speaker Switch selects either inter-nal, external, or simultaneous operation of both internal and external speakers.

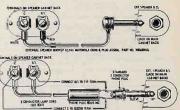
Use an external PM speaker with a voice coil impedance of 4 to 8 chms; 8 chms is recommended. The use of more than one external speaker may cause a loss of volume. connect external speaker, use Cord and Piug Assembly (Motorola Part No. 30K643010), or no more than 25 feet of Number 20 lamp cord (see Details). If the distance is Number 20 lamp cord (see Details). It use distance is greater than 25 feet, use a heavier gauge wire to reduce power losses. A complete line of autable speaker enclo-sures, such as the S12, S14, S16, S17, S18, and S2L, is available from Motorala Dealers or Distributors. When using a Motorala external speaker system, the proper phasing of internal and external speakers is achieved if the con-nections are made as shown in the details shown, however, when using other speaker systems, the phasing should be checked (see Speaker Phasing).

#### RIGHT STEREO CHANNEL JACK -STEREO CONVERSION

The RIGHT STEREO CHANNEL jack (located on cabinet back) terminates in a second pair of leads located in the tone arm; these leads are used when this model is to be converted to stereophonic operation. Motorela Stereo Con-version Kit HK33, available at Motorela Dealers or Dis-tributors contains all necessary conversion parts, including stereophonic cartridge.

#### AUX (INPUT) JACK

An audio signal from any external source (such as the



EXTERNAL SPEAKER HOOKUP CONSTRUCT CORD AS SHOWN OR USE MOTOROLA CO

#### EXTERNAL SPEAKER BOOKUP

pre-equalized output from a tape recorder ... . etc) whose pre-equalized output from a tape recorder...,etc) winse magnitude is. 1 volts. RMS or more may be connected into the AUX (input) jack on back of cabinet; the external gource can be operated which the COMPENSATOR knob jut turned to AUX position. Use a shielded cable to minimize hum pickup.

IMPORTANT: Care should be exercised when making connection to transformerless type equipment. When in doubt, suitable tests should be employed to prevent damage to equipment or dangerous electrical shock.



#### FRONT PANEL CONTROLS

DISASSEMBLY INSTRUCTIONS

To Remove Chassis From Cabinet.

#### 1. Remove control knobs,

Remove light shield inside record changer compart-Remove light socket from its mounting clip.
 Remove leads from FM antenna terminals on rear of

 Cabinet, then remove Cabinet back cover.
 Disconnect all chassis connecting leads (AM antenns leads, phono power plug...etc). 5. Unsolder hlue lead at 15" speaker and disconnect black

apeaker circuit lead from chassis. 6. Remove the four chassis mounting acrews (accessible

from record storage compartment) and remove chassis from cabinet.

#### To Remove Record Changer From Cabinet

- Remove cabinet back cover
- Disconnect all changer leads.
- Turn the two record changer mounting screws fully clockwise (down flush against changer base). 4. From bottom of changer, tura the two mounting clips, located at ends of imounting screws, so they are parallel



- To Replace Pilot Light (in record changer compartment)
- Remove light shield (in record changer compartment).
   Replace pilot light in socket.
- To Replace Pilot Lights (on chassis).
  - Remove cabinet back cover.
- 2. From inside cabinet, replace pilot light in socket.

#### SPEAKER PHASING

THE SPEAKERS MUST BE IN PHASE OR A LOSS OF MID-RANGE FREQUENCIES WILL RESULT

Disaving can be checked by momentarily connecting a work of the schight bittery in parallel with the spear connecting leads (temporarily short across any capacitor in same direction. If they do not, reverse the connections of the speaker whose cone is out of phase.

RADIO

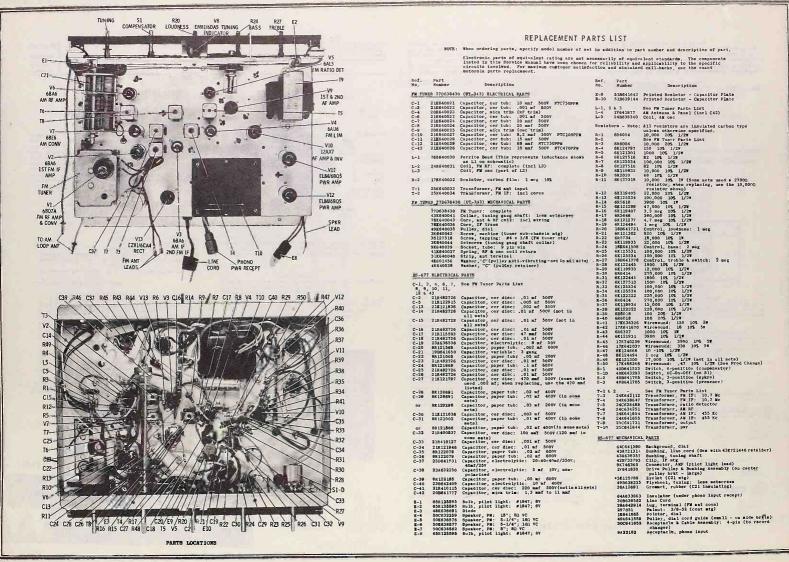
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MOTOROL

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Part	
Sumber	Description
438721440	Retainer, line cord (Use with 43A721314 busbing)
58641563	Rivet, shoulder (dial cord guide - on brkts)
51740712	Rivet, shoulder (dial cord guide - on main
	chassis)
352294	Screw, lock: 6-32 x 1/2 (C21 stg)
35127518	Screw, tapping: #4 x 3/8 (FM tuner stg)
38129023	Setscrew: 5-40 x 3/16 (pulley brkt bushing)
3\$9724	Setscrew: 6-32 x 1/4 (flywheel mtg)
17641828	Shaft & Pulley Assembly (on center pulley brat -
	smill)
17641829	
98641838	Socket, pilot light (in record changer com-
	partment)
9K642279	Socket, pilot light (on chassis)
94638433	Socket, tube: 7 pin min
98641598	Socket, tube: 9 pin min (EM81/6DA5)
98642797	Socket, tube: 9 pin min (12AX7, EL84)
414471681	Spring (pulley)
29476280	Terminal, pin (AM ant panel conn)
4B592098	Washer, "C" (tuning shaft & pulley)
44641680	Washer, fibre (EM81 tube scat ins)
48641703	Washer, fibre (tuning shaft & pulley)

# 13ET15 CABINET PARTS

130641514	Bezel, dial (lower)
130641512	Bezel, dial (upper)
434641691	Bushing, rubber (chassis wtg)
55E482792	Bullet Catch
16x641782	Cabinet: blond (L3ET15B)
161641781	Cabinet: cberry (13ET15CW)
16E641780	Cabinet: mahogany (13XT15M)
424641558	Clip, speed (45RPM spindle holder stg)
424638434	Clip, speed (medallion stg)
424641557	Clip, speed (pilot light rod)
358641784	Cloth, grille (13ET15B)
358641783	Cloth, grille (13KT15CW & 13KT15M)
16X641788	Door, cabingt (13ET15B)
16X641787	Door, cabinet (13ET15CW)
16K641786	Door, cabinet (13KT15M)
55x641785	Escutcheon, door & key (13KT15M)
55x638887	Escutcheon, door (13KT15CW)
5K129019	Eyclet (chassis ntg)
324641689	Gasket, dial scale trim
55x636715	Glide, done (cab bot)
55K634714	Hinge, cab lid
55E643428	Hinge, door (LH)

\*\*\*\*\*\*\*\* 42C641566 9x642169 55x638886 36x641615 36x641610 36x641613 36x641613 36x641657 36x641657

Bef. No. Part

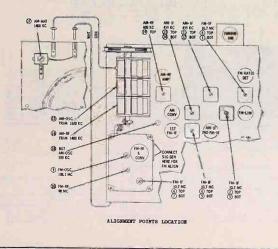
Description Hings, dory follow biles, dory spinis biles, dory furtises biles, bortiol (bases) tes, dory (bases) tes, dory (bases) tes, centrol (breases) & spira) tes, centrol (breases) & spira) tes, centrol (breases) & spira) tes, centrol (testage) tes, testage (testage) testage 16K641791 16K641790 16K641789 28638607 2K638607 29K730154 13B641645 33B638467 287007 2B642685 225121830 0 Pic, restrictions (Lange Jie at()) output) output) 9 Piug (Sabia Antonio (Sabora - aux) 9 Piug (Sabia Antonio (Sabora - aux) 9 Reing All Rein 308642877 101642878 47K641977 34C641737 3K641795 3X 120850 357526 38749168 38749168 38129033 26B636238 55K482793

Description

314641792 55K642448 13B638687 4K634854 4A641686

#### LINITED REPLACEMENT PARTS

- Note: The volume of replacement on the following part is small, consequently, it is suggested that ordering be done only as required. 15D642106 Cover, cab back
- "New Item, Appears in any List for First Time



# ALIGNMENT

#### PRELIMINARY PROCEDURE

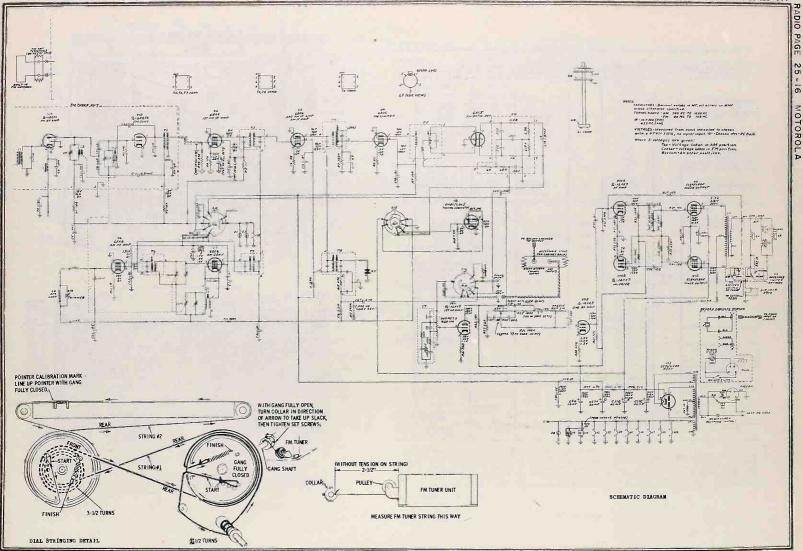
Either AM or FM alignment may be performed indépendent of the other. Use an AM signal generator, a VTVM and out-put meter as indicated. Set loudness andbass controls to maximum, treble control to minimum. The AM Amitema loop should be connected; use either the speakers or an 8 ohm load connected to output transformer secondary. Use insulted alignment tools. As stages are brought into alignment, keep reducing signal generator output so meter reads nome than aVD be when aligning FM, or no more than 2YA C when aligning AM, this prevents overloading and assures greater secures. With gang fully closed, right edge of pointer (rear) should line up with mark on right end of pointer rail (see Dial Stringing Detail). In AM alignment, signil generator output should be modulated with 400 ops.

STEP	GENERATOR	FREQUENCY	GANG'SI TTING	BAND SW SETTING	OUTPUT INDIGATOR	ADJUST	REMARKS
FM-IF	ALIGNMENT FM ant terminals	10.7 Mc No mod	Fully open	ГМ	VTVM-DC probe to lead 7 on E-1. Com to chassis	1, 2, 3, 4, 5, 6 & 7	Adjust for max neg reading
2.	FM ant terminals			FM	VTVM-DC probe to lead 3 of E-1, Com to chassis	8	Adjust for zero reading on VTVM. A positive and neg- ative reading will be ob- tained on either side of cor- recf setting. (If meter has zero center scale, use this zero center scale, use this zero the set of the state of the zero the set of the state of the zero 2 about the state step.
FM-RI	ALIGNMENT -See	Note *					
3.	FM ant terminals	108, 1 Mc No mod	Fully open	FM	VTVM-DC probe to lead 7 on E-1. Com to chassis	9	Adjustfor max neg reading
4.	FM ant terminals	98 Mc No mod	Tune for max	FM		10	
AM-L	F ALIGNMENT			t ni		1 8	
5.	6BE6 grid (pin 7) or antenna stator of AM tuning cap thru.lmf&chassis	455 Ke	Fully open	АМ	Output meter across VC	11, 12, 13 & 14	Adjust for max reading
AM-RE	ALIGNMENT			£		1000	
6,	Radiation loop**	1620 Kc	1 1 1	AM		15	1
7.		1400 Kc	Tune for max	AM	1 H	16	н.
8.			n.	Ам		17	With chassis installed in cabinet, adjust for max reading
NOTE	Do not perform i	he following stored.	eps unless the RF	or oscillato	Cores have been	tampered	with or associated component
9%	6BE6 grid (pin 7) thru, 1 mf & chassis	1620 Kc	Fully open	AM	Output meter across VC	15	Adjust for max reading
10.		535 Kc	Fully closed	AM		18	Adjust for max reading. Repeat steps 9 & 10 until os cillator covers required range; step 9 should be last adjustment:
14.	Radiation loop**	1400 Kc	Tune for max	AM		16	Adjust for max reading
12.		600 Ke	Tune for max	АМ		19	Adjust for max reading. Re- peat steps 11 and 12 until no further increase; step 11 should be last adjustment.

eff FM tuner string has been replaced or tampered with, chack it for correct length and set-up before proceeding with steps 3 & 4. String should measure about 2-1/2" from FM tuner opening to gang shaft collar. Open gang fully, place collar and atring on gang shaft, then turn collar clockwise to just remove slack from string; tighten collar setscrews (see Dist Stringing Detail).

\*\*Connect generator across 5" diameter, 5-turn loop and couple inductively to receiver loop. Keep radiation loop at least 12" from receiver loop.

G







# SUPERSEDES 10TK12 PRELIMINARY SERVICE MANUAL PART NO. 68P643062.

# GENERAL INFORMATION

TYPE - Hi-Fi radio-phonograph containing an AM-FM tuner, four-speed record changer, multiple speaker system. Also built-in provision for simple, future conversion to stereophonic operation, through use of appropriate conversion kit.

#### TUBE COMPLEMENT

Ref. Noi	Туре	Function
V-1	6BQ7A	FM RF amp and converter
V-2	6AU6	1st FM IF amp
V-3	6BA6	AM IF amp-2nd FM IF amp
V-4	6AL5	FM ratio detector
V-5	6BE6	AM converter
V-6	12AX7	1st & 2nd AF amp
V-7	12AX7	AF amp & inv
V-8	EL84/6BQ5	Power output
V-9	EL84/6BQ5	Power output
V-10	EZ81/6CA4	Rectifier

#### FI FC TRICAL SPECIFICATIONS

Frequency Response - 20 to 20,000 cps at normal lis-

tening level Power Output - 10 watts @ 1% distortion; 20 watts peak Amplifier Sensitivity - .2 volt in for 10 watts output measured across an 8 ohm resistive load. A reading of 8,9 volts indicates an output of 10 watts).

# **EM TUNER SERVICE NOTES**

Do not free the dial cable pulley located on the FM tuner unit, as this may result in audio howl. This is due to core vibration caused by acoustic feed-back from the loudspeaker at certain frequencies. Silicon grease is applied at the junction of string and pulley to insure smooth tuning action and must not be removed. Therefore, whenever tuning acand must not be removed. Intercore, whenever turing ac-tion is erratic, check for proper use of silicon grease (Motorola Part No. 11M490487). Also affecting turing ac-tion is the angle of the pulley bracket with respect to the take-up shaft. Position bracket until tuning action is as smooth as possible.

# AUXILIARY CIRCUITS AND EXTERNAL CONNECTIONS

#### EXT SPEAKER JACK

The Hi-Fi sound of this Radio-Phonograph can be played through an external speaker system in addition to the in-ternal speaker system within the cabinet; the external speaker system is connected to the EXT SPEAKER 8 Ω jack on the cabinet back. The Speakers Switch selects either in-ternal, external, or simultaneous operation of both internal and external speakers.

Use an external PM speaker with a voice coil impedance of 4 to 8 ohms; 8 ohms is recommended. The use of more than one external speaker may cause a loss of volume. To connect external speaker, use Cord and Plug Assembly (Motorola Part No. 30K643010), or no more than 25 feet of Number 20 lamp cord (see details). If the distance is greater than 25 feet, use a heavier gauge wire to reduce power losses. A complete line of suitable speaker enclosures, such as the S12, S14, S16, S17, S18, and S21 is

available from Motorola Dealers or Distributors. When using a Motorola external speaker system, the proper phasing of internal and external speakers is achieved if the conmections are made as shown in the details below, however, when using other speaker systems, the phasing should be checked (see Speaker Phasing).

# RIGHT STEREO CHANNEL JACK -STEREO CONVERSION

The RIGHT STEREO CHANNEL jack (located on cabinet back) terminates in a second pair of leads located in the tone arm: these leads are used when this model is to be converted to stereophonic operation. Motorola Stereo Con-version Kit HK33, aveilable at Motorola Dealers or Distributors contains all necessary conversion parts, including stereophonic cartridge.

#### AUX (INPUT) JACK

An audio signal from any external source (such as the pre-equalized output from a tape recorder. ..etc.) whose magnitude is .l volts RMS of more may be connected into the AUX (input) jack on back of cabinet; the external source can be operated when the COMPENSATOR knob is turned to AUX position. Use a suitable phono plug (Motorola Pari No. 28K731154 or equivalent), and shielded cable to minimize hum pick-up.

DISASSEMBLY INSTRUCTIONS

## To Remove Chassis From Cabinet

h. Remove control knobs.

2. Remove light shield inside record changer compartment; then remove pilot light socket from its mounting clip.

3. Remove leads from FM antenna terminals on rear of cabinet, then remove cabinet back cover.

4. Disconnect all chassis connecting leads (AM antenna leads, phono power plug...etc.).

5. Unsolder blue lead at 12" speaker and disconnect black speaker circuit lead from chassis.

6. Remove the four chassis mounting screws (accessible from record compartment) and remove chassis from cabi net.

# To Remove Record Changer From Cabinet

1. Remove cabinet back cover.

TREBLE

FLAT

OF

BATERNAL THE

2. Disconnect all changer leads.

3. Turn the two record changer mounting screws fully clockwise (down flush against changer base).

DUAL

-

BASS

IMPORTANT: Care should be exercised when making connection to transformerless type equipment. When in doubt, suitable tests should be employed to prevent damage to equipment or dangerous electrical shock.





EXTERNAL SPRAKER HOOK-UP

# SERVICE NOTES

4. From bottom of changer, turn the two mounting clips, located at ends of mounting screws, so they are parallel with the screws

5. Grasp changer at base and lift up.

- To Replace Pilot Light (in record changer compartment)
- 1. Remove light shield (in record changer compartment).
- 2. Replace pilot light in socket.
- To Replace Pilot Lights (on chassis)

COMPENSATOR

- h. Remove cabinet back cover.
- 2. From inside cabinet, replace pilot light in socket.

#### SPEAKER PHASING

THE SPEAKERS MUST BE IN PHASE OR A LOSS OF MID-RANGE FREQUENCIES WILL RESULT

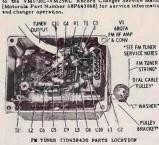
Phasing can be checked by momentarily connecting a  $10^{\circ}/2$  volt flashlight battery in parallel with the speaker connecting leads (temporarily short across any capacitor incross-over network) and noting if all speaker comes move in the same direction. If they do not, reverse the connections of the speaker whose cone is out of phase.

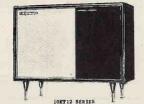
TUNING

PRESENCE SPEAKERS

FRONT PANEL CONTROLS

LOUDNESS





HOME RADIO

CHASSIS

HS-674

HS-674

HS-674

MODELS

10KT12B

10KT12M

10KT12W

Tone Controls - Bass +10, -15 db at 50 cps Treble +7, -12 db at 10,000 cps AM Tuning Range - 540 to 1600 Kc AM IF - 455 Kc 88 to 108 Mc FM IF - 10.7 Mc Power Supply - 120 volts, 60 cycle AC only Power Consumption - 165 watts Speaker System - one 12" woofer, one 6" mid-range,

# one 4" tweeter

# RECORD CHANGER

These models use the VM17RC record changer. Refer to the VMI7RC-VM25RC Record Changer Service Manual (Motorola Part Number 68P643068) for service information

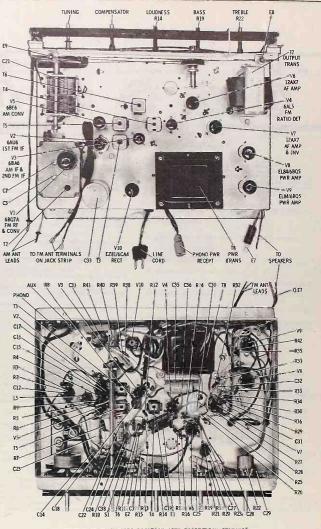
RADIO

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MOTOROLA



T5-

C74

C3-

T2

CHASSIS HS-674A PARTS LOCATION (SEE PRODUCTION CHANGES)

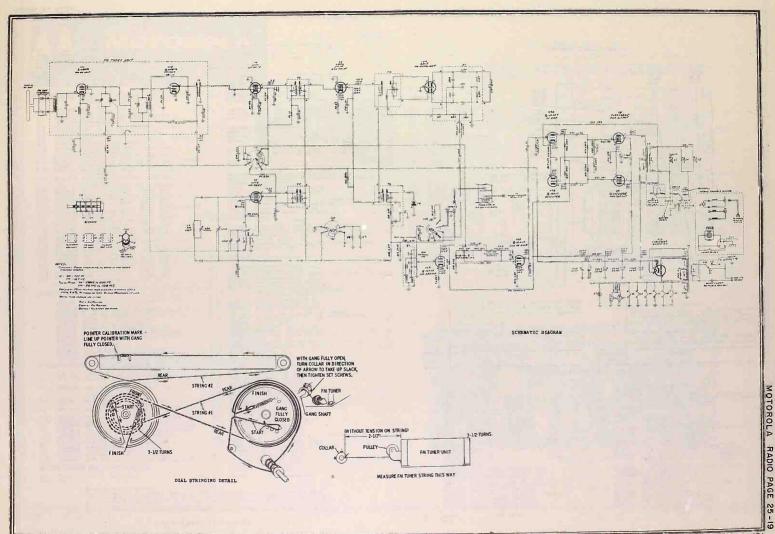
# ALIGNMENT

Either AM or FM alignment may be performed independent of the other. Use an AM signal generator, a VTVM, and out-put meter as indicated. Set loadness and bass controls to maximum, treble control to minimum. The AM antenna loop should be connected; use either the speakers or an 8 ohm bad connected to output transformer scendary. Use insulted alignment tools. As stages are brought into alignment, keep reducing signal generator output is o meter reads no more than a 50 MC whan aligning FM, or no more than 20 AC when aligning AMI, this promise overloading, to read to the an aligned to the aligned state overloading. In a state of the speakers of the alignment for the speakers of the aligned state overloading, speakers of the spe

STEP	GENERATOR CONNECTION	GENERATOR FREQUENCY	GANG SETTING	BAND SW SETTING	OUTPUT INDICATOR	ADJUST	REMARKS
FМ-Ш	ALIGNMENT FM ant terminals	10,7 Mc Nó mod	Fully open	FΜ	VTVM-DC probe to lead 7 on E-1. Com to chassis	1, 2, 3, 4, & 5	Adjust for max neg reading
2. F M-RI	FM ant terminals	" Note *	đ	FM	VTVM-DC probe to lead 3 of E-l. Com to chassis	6	Adjust for zero reading on VTVM. A positive and neg- ative reading will be ob- tained on either side of cor rect setting. (If meter has zero center scale, use this scale.) Repeat stops 1 and 2 until no further increase; step 2 should be last step.
3.	FM ant terminals	108.1 Mc No mod	Fully open	FM	VTVM-DC probe to lead 7 on E-1. Com to chassis	7	Adjust for max neg reading
4,	FM ant terminals	98 Mc No mod	Tune for max	FM		8	
AM=1 5.	F ALIGNMENT Pin 7 of 6BE6 or antenna stator of AM tuning capa- citor thru . 1 mf and chassis	455 Kc	Fully open	АМ	Õutput meter across VC	9, 10, 11, & 12	Adjust for max reading
AM-RI 6.	ALIGNMENT Radiation loop**	1620 Kc	14	AM	n	13	
7.		1400 Kc		АМ		14	Adjust för max. Repeat steps 6 and 7 until no fur- ther increase; step 7 should be last step.
NOT	E: Do not perform replaced.	steps 8 & 9 unle	ss the oscillator c	ore has bee	n tampered with or	associat	ed components have been
8.	6BE6 grid (pin 7) thru. 1 mf & chas	1620 Kc	Fully open	AM	Output meter across VC	13	Adjust for max reading.
9,	sis "	535 Kc	Fully closed	АМ	9	15	Adjust for max reading. Repeat steps 8 and 9 until oscillator covers required range; step 8 should be last step.
10.	Radiation löop**	1400 Kc	Fully open	AM	7	14	With chassis installed in cabinet, adjust for max reading.

•If FM tuner string has been replaced or tampered with, check it for correct length and set-up before proceeding with steps 3 k 4. String should measure about  $2-1/2^n$  from FM tuner opening to gang shaft collar. Open gang tilly, place collar and string on gang shaft, then turn collar colevaies to just remove slack from string tighten collar starters will be collar String Detail).

\*\*Connect generator across 5" diameter, 5-turn loop and couple inductively to receiver loop. Keep radiation loop at least 12" from receiver loop.



# REPLACEMENT PARTS LIST

NOTE: When ordering parts, specify model number of sot in addition to part number and description of part.

Electronic parts of equivalent rating are not accessarily of equivalent standards. The components listed in this Sortice Manual have been chosen for reliability and explicibility to the specific circuits involved. For maximus customer satisfaction and ministed call-backs, use the exact Motorola parts replacement.

No.	Part Number	Description	Ref. No.	Part Number	Description .
PH TIN	CER 7706384	10 (UT-343) ELECTRICAL PARTS	8-8		82 105 1/2# 22,000 205 1/2# 27,00 105 1/2# 47,000 105 1/2# 33.3 mog 205 1/2# 390,000 105 1/2# 390,000 105 1/2#
1000-7100			R-9	6K119405	22,000 20% 1/2W
C-1	218640021	Capacitor, cor tub: 10 mmf 500V NTC750PPM	R-10	6K119926	2,700 10% 1/2
C-2	216640022	Capacitor, cer tub: .001 mf 500V	R-11	6K121299	47,000 10% 1/2#
C-1 C-2 C-3 C-4 C-5 C-6	208640023	Capacitor, cor tub: 10 maf 500V WTC750PPu Capacitor, car tub: (10 tri) Opacitor, car tub: (10 tri) Capacitor, cor tub: (01 tri Capacitor, cor tub: (01 tri Source Capacitor, cor tub: (01 tri Source Capacitor, cor tub: (01 tri Capacitor, cor tub: (01 maf 500V WTC70PPu Capacitor, cor tub: (01 maf 500V WTC70PPu	R-12 R-13	6K119407	3.3 mog 20% 1/2W
0-5	216640022	Capacitor, cor tub: 20 mmf 500V	R-13 R-14	188641721	Control, loudness: 1 meg
C-6	218640024	Capacitor, cer tub: 20 mmf 500W	R-15		Control, loudness: 1 meg 1 meg 10% 1/2W 820 10% 1/2W
C-7	20K640025	Capacitor, mica trim (osc trim)	R-16	6K 124494 6K 121302	820 10% 1/2#
C-8	21K640026	Capacitor, cer tub: 10 mmf 500V NTC470PPM	R-17	685734	18,000 10% 1W 22,000 10% 1/2W
C-9	21K640027	Capacitor, cer tub: 8.2 mmf 500V PTC100PPM	R-18	6K119935	22,000 10% 1/2w
C-10 C-11	218640028	Capacitor, cer tub: 15 mmr 500V	R-19	18X641508	26,000 105 1/20 Control, bass: 2 mog 180,000 105 1/20 100,000 105 1/20 Control, troble & switch; 2 mog
C-11	214040025	Capacitor, cer cui: 68 mar MIC/SOPPA	R-20 R-21	6K125531 6K125534	180,000 10% 1/28
L-3	768640030	Ferrite Bead (this represents inductance shown as L1 on schematic) Coil, FM RF: complete (incl L3) Coil, FM osc (part of L2)	R-22	188641776	Control trable & switch: 2 mail
		shown as L1 on schematic)	R-23	6K122445	1.800 10% 1/2%
L-2	248640031	Coil, FM RF: complete (incl L3)	R-24	6K119933	12.000 105 1/2*
1-3	-	Coil, FM osc (part of L2)	R=25	6R6414	270,000 10% 1/2#
			R-26	6K122445	Control, trend a match, 2 mcg 1,800 10% 1/2m 270,000 10% 1/2m 1,800 10% 1/2m 1,800 10% 1/2m 1,500 10% 1/2m
R-1	178640032	Resistor, carbon film: 1 meg 10%	R-27	6K127513	1,500 10% 1/2#
r-1	254640033	Terretown PH and torus	R-28 R-29	6K125534 6K125534	1,500 10% 1/2*28 100,000 10% 1/28 220,000 10% 1/28 270,000 10% 1/28 15,000 10% 1/28 15,000 10% 1/28
T-2	258640033	Transformer, FM ant input Transformer, FM IF; incl corés	R-29	6K125534	100,000 10% 1/2%
	238040034	Tradstormes, ra ir; inci cores	R-30 R-31	6R122322 6R6414	220,000 10% 1/2%
	FR 77063843	0 (UT-343) MECHANICAL PARTS	R-31	6K119934	15 000 10% 1/2#
			R-33	6R6018	100 20% 1/2
	770638430	FM Tuner, complete Collar, tuning gang shaft: less setscrows Core, at & RF coll: incl string Core, IF trans	R-34	6K122322	100 20% 1/2W 220,000 10% 1/2W 100 20% 1/2W
	43K640041	Collar, tuning gang shaft: less setscrows	R-35		100 20% 1/2%
	76K640043	Core, ant & RF coil: incl string	R-36	17K636326	100 20% 1/2W Wirrewound: 150 10% 5W Wirsewound: 18 10% 5W 3900 10% 1/2m Wirsewound: 2,200 10% 5W Wirsewound: 2,200 10% 5W Wirsewound: 330 10% 5W
	76K640036	Core, IF trans	B-37	17K641670	#irewound: 18 10% 5w
	49K640035	Pulley, dial	R-38	6E121931	3900 10% 1/2W
	JK640042	Screw, machine (tuner sub-chassis atg)	R-39	178641740	Wirewound: 2,200 10% 5W
	35127518	Screw, tapping: #4 x 3/8 (FM tuner ntg),	R-40	17K641740	Wirewound: 2,200 10% 5W
	JA640044	Setscrew (tuning gang shaft collar)	R-41	178642037	#1rewound: 330 10% 5#
	418640039	Spring BF & one coil return	R-42		
	318640040	Strin ant terminal	R-43	17K488266	Wirewound: .47 10% 1/2W (See Prod Change 22,000 20% 1/2W (See Prod Changes)
	48601456	Washer, "C" (nulley anti-vibrating -not in	R-44	6K119405	22,000 20% 1/2W (See Prod Changes)
		Core, JP frees Core, JR frees Seree, machine (tuper sub-chassis stg). Seree, inschine (tuper sub-chassis stg). Seree, in the seree state stg). Series, IP i ose coll return Series, IP i ose c	S-1 S-1D	400642108	22,000 20% 1/2% (See Frod Changes) Switch, 4-Sen-off (in 3) Switch, 4-Sen-off (in 3) Switch, 4-Sen-off (in 3) Switch, 1-Sen-off (in 3) Switch, 1-S
	48640038	Washer, "C" (pulley retainer)	3-10	408643293	Switch, AC-on-oir (on SI)
			5-3	408641705	Switch 3-pos (speakers)
CHASSIS	S ES-674 EL	ECTRICAL PARTS	T-1,2	400041100	See PM Tuner Benlacement Parts List
			T-3	248642112	Transformer, FM IF: 10.7 Mc
C-1 thr	ry	and the second sec	T-4	24C638488	Transformer, ratio detector
2-11		See FM Tuner Parts List	T-5 T-6	24K641654	Transformer, AM IF: 455 Kc
-12	21R482726	Capacitor, cer disc: .01 mf 500V	T-6	24K641655	Transformer, AN IF: 455 Kc
C-13	21R122915	Capacitor, cer disc: .005 mf 500V	T-7	250641731	Transformer, output
C-14 C-15	218480706	Capacitor, cer disc: .002 af 500V	T-8	250641644	Transformer, power
2-16	2)8482726	Capacitor, cor disc: .01 Mi 500V			
2-17	218482726	Capacitor, cer disc01 af 500V	ES-674	MECHANICAL	PARTS
-18	21R482726	Capacitor, cer disc: .01 mf 500V		64K641593	Background, dial
C=19	234638536	Capacitor, electrolytic: 8 mf 50V		434721314	Bucking line and (use bith (20201440 - Fri
-20	208641777	Capacitor, mica trim: 1.3 mmf to 11 mmf		434638357	Bushing, line cord (use with 43K721440 refai Bushing, tuning shaft Clip, IF mtg
223	19C641649	Capacitor, var: 2-gang		428733793	Clip IF stg
-22	8R121005	Capacitor, paper tub: .05 mf 200V		91746360	Connector, AMP (pilot light lead) Drive Pulley & Bushing Assembly (on Center
-23	8R121869	Capacitor, paper tub: .1 mf 600V		17641830	Drive Pulley & Bushing Assembly (on Center
-25	81128691	Capacitor, paper tub: .02 mf 400V			
20	218121826	Capacitor, paper tub: .02 mr 400v		5K125789	Systet (C21) FlyWhcel, tuning: loss actacrows Gaskot, dial scale (gold) Grommet, rubber (C21 insulating) Insulator (under phono input receptacle)
-26	218121030	Capacitor, cer diac: .002 mr 500V		498638235	Flywheel, tuning: less setscrews
-28	218400537	Capacitor car diac: 100 and 500V(120 comenter)		32A641689	Gasket, dial scale (gold)
-29	218410127	Capacitor, cer disc: .001 mf 500V		37412691	Grommet, rubber (C21 insulating)
-30	8R121789	Capacitor, paper tub: .01 mf 600V		644633863	Insulator (under phono input receptacle)
-31	8R122079	Capacitor, paper tub: .02 mf 500V		30B638552	Line Cord
-32	8R122079	Capacitor, paper tub: .02 mf 600V		298642914	Lug, one-pin (FM ant conn)
-33	230641531	See Fr Tuner Parts Lint Capacitor, cor disc: 0.05 af 5007 Capacitor, cor disc: 0.05 af 5007 Capacitor, eer disc: 0.16 f 5007 Capacitor, eer disc: 0.16 f 5007 Capacitor, eer disc: 0.16 f 5007 Capacitor, eicertolytic: 8 af 5007 Capacitor, eicertolytic: 8 af 5007 Capacitor, eicertolytic: 8 af 5007 Capacitor, paper tub: 1.36 af 2007 Capacitor, paper tub: 1.05 af 2007 Capacitor, paper tub: 1.02 af 4007 Capacitor, eicertolytic: 6 af 5007 Capacitor, eicertolytic: 60 af 5007 Capacitor, eicertolytic: 60 af 5007 Capacitor, eicertolytic: 60 af 6007 Capacitor, eicertolytic: 60 af 007 Capacitor, eicertolytic: 60 af 1.07; Capacitor, eicertolytic: 60 af 1.07;		18641665	Painter dial
	ant River	350V; 40 mf/25V		494641550	Pulley dial cord suide (analian aide fu-at-
-34	234632250	Capacitor, electrolytic: 5 mf. 10V; non-polarized		300541852	Jime Cora-pin (FM ant cons) Palmut: 3/8-32 (control msg) Pulley, dial cord guide (small-on side Sfacke Receptacic & Cable Ammenbly: four-pin (renord chamser)
	220640400	non-polarized			(record changer)
-35					Receptacle, phone input
-35	8R122185	Capacitor manar tub: 05 of 600V		9A22182	
-35	8R122185 21R410115	Capacitor, paper tub: .05 mf 600V		9A22182 43K721440	Retainer, line cord (use with 43A721314
-35 -36 -37 -38	8R122185 21R410115 21K121797	Capacitor, paper tub: .05 mf SOOV Capacitor, cer disc: 220 mmf SOOV(notinallests) Capacitor, cer disc: 470 mmf SOOV(notinallests)	5	438721440	Retainer, line cord (use with 43A721314 bushing)
-35 -36 -37 -38	8R122185 21R410115 21K121797	Capacitor, paper tub: .05 mf 600V Capacitor, cer disc: 220 mmf 500V(notinallästs) Capacitor, cer disc: 470 mmf 500V (See Prod Chances)	5	43K721440 5K641563	hughing
-35 -36 -37 -38		nos-politized Capacitor, electrolytic: 10 mf 400Y Capacitor, electrolytic: 05 mf 500Y Capacitor, cer disc: 220 mm 500Y(netinallästs) Capacitor, gör disc: 470 mm 500Y" (See Prod Changes) Capacitor, mäper tub; 002 mf 500W	5 	438721440	Rivet, shoulder (dial cord guide -on brkts) Rivet, shoulder (dial cord guide -on main
C-39 C-39 E-1	518639144	Printed Refistor-Capacitor Plate	5	43K721440 5K641563 5K740712	Rivet, shoulder (dial cord guide -on brkts) Rivet, shoulder (dial cord guide -on main chasts)
C-35 C-36 C-37 C-38 C-39 E-1 E-2	518639144	Printed Redistor-Capacitor Plate	53 	43K721440 5K641563 5K740712 352294	Rivet, shoulder (dial cord guide -on brkts) Rivet, shoulder (dial cord guide -on main chasts)
C-35 C-36 C-37 C-38 C-39 E-1 E=2 E=3	518639144	Printed Redistor-Capacitor Plate	а 	43K721440 5K641563 5K740712 3S2294 3S129023	Rivet, shoulder (dial cord guide -on brkts) Rivet, shoulder (dial cord guide -on main chasts)
C-35 C-36 C-37 C-38 C-39 E-1 E=2 Σ-3 E=4	518639144	Printed Redistor-Capacitor Plate		43K721440 5K641563 5K740712 352294 35129023 359724	Nivet, shoulds? (dial cord guide -on brkts) Rivet, shoulds? (dial cord guide -on mais chassis) Scrow, lock: 6-32 x 1/2 (C21 atg) Setacrew: 5-40 x 3/16 (pulley brkt bushing) Sctacrew: 6-32 x 1/4 (flywheal atc).
C-35 C-36 C-37 C-38 C-39 E-1 E-2 E-3 E-4 E-4 E-5	518639144	Printed Redistor-Capacitor Plate	5	43K721440 5K641563 5K740712 3S2294 3S129023	Rivet, BAGUIder (dial cord guide -on brkn) Rivet, BAGUIder (dial cord guide -on bak schwaiz) Schwaiz) Setacrev: 5-40 x 3/16 (pulley brak bunhing) Sotacrev: 6-32 x 1/4 (flybbeel atg). Sotacrev: 6-32 x 1/4 (flybbeel atg).
C-35 C-36 C-37 C-38 C-39 E-1 E-2 E-3 E-4 E-5 E-6	518639144 48K636691 50K642356 50C642357 50C636446 518641643	Printed RESintor-Logacitor Plate Diode Speaker, PM: 12%, 60 VC Speaker, PM: 6%: 160 VC Strikter, SM: 6%: 160 VC	53	43K721440 5K641563 5K740712 352294 35129023 359724 1V641828	Rivet, shouldsr (dial cord guide con britts) Rivet, shouldsr (dial cord guide con main chassis) Scree, lock: 6-32 x 1/2 (C21 stg) Scree, resc. 6-32 x 1/2 (C21 stg) Screet, resc. 7-32 x 1/2
C-35 C-36 C-37 C-38 C-39 E-1 E-2 E-3 E-4 E-5 E-6 E-7	518639144 48K636691 50K642356 50C642357 50C636446 518641643	Printed RESintor-Logacitor Plate Diode Speaker, PM: 12%, 60 VC Speaker, PM: 6%: 160 VC Strikter, SM: 6%: 160 VC	53	13K721440 5K641563 5K740712 352294 35129023 359724 1V641828 1V641829	Rivet, shouldsr (dial cord guide con britts) Rivet, shouldsr (dial cord guide con main chassis) Scree, lock: 6-32 x 1/2 (C21 stg) Scree, resc. 6-32 x 1/2 (C21 stg) Screet, resc. 7-32 x 1/2
	518639144 48K636691 50K642356 50C642357 50C636446 518641643	Printed RESintor-Logacitor Plate Diode Speaker, PM: 12%, 60 VC Speaker, PM: 6%: 160 VC Strikter, SM: 6%: 160 VC	3	43K721440 5K641563 5K740712 352294 35129023 359724 1V641828	Rivet, shouldsr (dial cord guide con britts) Rivet, shouldsr (dial cord guide con main chassis) Scree, lock: 6-32 x 1/2 (C21 stg) Scree, resc. 6-32 x 1/2 (C21 stg) Screet, resc. 7-32 x 1/2
	518639144 48K636691 50K642356 50C642357 50C636446 518641643	Printed Redistor-Capacitor Plate	3	43K721440 5K641563 5K740712 352294 35129023 359724 1V641829 26A634276	Alver, Aboligy (dial cord suise on price) chastel Scree, lock: 6-32 x 1/2 (C2) stg) Scree, lock: 6-32 x 1/2 (C2) stg) Screek, 1/2 (C2) stg) Screek, 1/2 (C2) stg) Shaft & Pulloy Assembly (tuning) Shaft & Apulloy Assembly (tuning) Shaft & Julo Ligbt (in record changer con- Screek, Filot Ligbt (in record changer con-
2-35 2-36 2-37 2-38 2-39 2-39 2-39 2-39 2-38 2-3 2-39 2-38 2-39 2-38 2-39 2-39 2-39 2-39 2-39 2-39 2-39 2-39	518639144 48K636691 50K642356 50C642357 50C636446 518641643 65R125595 65R125595	Deckton Britanos-Capacitor Plats Diode Speaker, PH: 12% 50 YC Speaker, PH: 25% 50 YC Speaker, PH: 25% 50 YC Printed Resistor-Capacitor Plats Puls, pliot light: siled7; 6V Buls, pliot light: siled7; 6V Buls, pliot light: siled7; 6V		43K721440 5K641563 5K740712 3S2294 3S129023 3S9724 1V641829 26A634276 9X641838 9K642279	Alver, Aboligy (dial cord suise on price) chastel Scree, lock: 6-32 x 1/2 (C2) stg) Scree, lock: 6-32 x 1/2 (C2) stg) Screek, 1/2 (C2) stg) Screek, 1/2 (C2) stg) Shaft & Pulloy Assembly (tuning) Shaft & Apulloy Assembly (tuning) Shaft & Julo Ligbt (in record changer con- Screek, Filot Ligbt (in record changer con-
2-35 2-36 2-37 2-38 E-1 E=2 E=3 E=4 E=5 E=6 E=7 E=8 E=8 E=9 L=1,2, L=4	518639144 48K636691 50K642356 50C642357 50C636446 518641643 65R125595 65R125595 65R125595	Printed Hillstor-Capacitor Plats Diede Diede Spacker, PH: 12: 51 TC Spacker, PH: 42: 50 TC Spacker, PH: 42: 50 TC Spacker, PH: 42: 50 TC Diels, plats lights sider; or Buils, plats lights sider; or Buils, plats lights sider; or Buils, plats lights sider; or Buils, plats lights sider; or	3	43K721440 5K641563 5K740712 352294 33129023 359724 1V641828 1V641829 26A634276 9K641838 9K642279 9K63633	Alver, Aboligy (dial cord suise on price) chastel Scree, lock: 6-32 x 1/2 (C2) stg) Scree, lock: 6-32 x 1/2 (C2) stg) Screek, 1/2 (C2) stg) Screek, 1/2 (C2) stg) Shaft & Pulloy Assembly (tuning) Shaft & Apulloy Assembly (tuning) Shaft & Julo Ligbt (in record changer con- Screek, Filot Ligbt (in record changer con-
2-35 2-36 2-37 2-38 E-1 E=2 E=3 E=4 E=5 E=6 E=7 E=8 E=8 E=9 L=1,2, L=4	518639144 48K636691 50K642356 50C642357 50C636446 518641643 65R125595 65R125595 65R125595	Printed Hillstor-Capacitor Plats Diede Diede Spacker, PH: 12: 51 TC Spacker, PH: 42: 50 TC Spacker, PH: 42: 50 TC Spacker, PH: 42: 50 TC Diels, plats lights sider; or Buils, plats lights sider; or Buils, plats lights sider; or Buils, plats lights sider; or Buils, plats lights sider; or	3	43K721440 5K641563 5K740712 335294 335129023 339724 1V641828 1V641828 2K6434276 9K641838 9K642279 9A638433 9K641562	Alver, Aboligy (dial cord suise on price) chastel Scree, lock: 6-32 x 1/2 (C2) stg) Scree, lock: 6-32 x 1/2 (C2) stg) Screek, 1/2 (C2) stg) Screek, 1/2 (C2) stg) Shaft & Pulloy Assembly (tuning) Shaft & Apulloy Assembly (tuning) Shaft & Julo Ligbt (in record changer con- Screek, Filot Ligbt (in record changer con-
2-35 2-36 2-37 2-38 E-1 E-2 E-3 E-4 E-5 E-6 E-7 E-8 E-9 L-1,2, L-4 L-5	51B639144 46K636691 50K642356 50C642357 50C636426 51B641643 65R125595 65R125595 65R125595 3 1V642422 24B638340	Pristo differo-Capacitor Plate Diode Speaker, PH: 12: 51 TC Speaker, PH: 12: 51 TC Speaker, PH: 47: 61 TC Pristo Resistor-Capacitor Plate Dails, Pilot Hight: #1457; 67 Bulb, Pilot Hight: #1457; 67 Bulb, Pilot Hight: #1457; 67 Bulb, Pilot Hight: #1457; 67 Control Participation Participation Bulb, Pilot Hight: #1457; 67 Bulb, Pilot Hight: #1457; 67 Control Participation Participation Advances A page (isci C20) Coll, Ad one	5	43K721440 5K641563 5K740712 332294 335129023 359724 1V641828 26A624276 9K642279 9A638433 9K641562 414471681	Aver, Mobiler (Mil Cord golds on Bril) Chastle. Chastle. Chastle. Construction (Cord golds (Cord)) Setecreve 3-63 r J/2 (Cord) Setecreve 3-62 r J/4 (Chybel sig). Setecreve 3-62 r J/4 (Chybel sig). Setecreve 3-62 r J/4 (Chybel sig). Drit-eal) Satt b Piloy Assessby (Concerts pully) Satt b Piloy (Concerts pully) Satt b P
$\begin{array}{c} -35\\ -36\\ -37\\ -38\\ C-39\\ E-1\\ E-2\\ E-3\\ E-4\\ E-5\\ E-6\\ E-7\\ E-8\\ E-9\\ L-1,2,\\ L-4\\ L-5\\ \end{array}$	51B639144 46K636691 50K642356 50C642357 50C636426 51B641643 65R125595 65R125595 65R125595 3 1V642422 24B638340	Pristo differo-Capacitor Plate Diode Speaker, PH: 12: 51 TC Speaker, PH: 12: 51 TC Speaker, PH: 47: 61 TC Pristo Resistor-Capacitor Plate Dails, Pilot Hight: #1457; 67 Bulb, Pilot Hight: #1457; 67 Bulb, Pilot Hight: #1457; 67 Bulb, Pilot Hight: #1457; 67 Control Participation Participation Bulb, Pilot Hight: #1457; 67 Bulb, Pilot Hight: #1457; 67 Control Participation Participation Advances A page (isci C20) Coll, Ad one	55	43K721440 5K641563 5K740712 332294 335129023 359724 1V641828 26A624276 9K642279 9A638433 9K641562 414471681	Aver, Mobiler (Mil Cord golds on Bril) Chastle. Chastle. Chastle. Construction (Cord golds (Cord)) Setecreve 3-63 r J/2 (Cord) Setecreve 3-62 r J/4 (Chybel sig). Setecreve 3-62 r J/4 (Chybel sig). Setecreve 3-62 r J/4 (Chybel sig). Drit-eal) Satt b Piloy Assessby (Concerts pully) Satt b Piloy (Concerts pully) Satt b P
$\begin{array}{c} -35\\ -36\\ -37\\ -38\\ C-39\\ E-1\\ E-2\\ E-3\\ E-4\\ E-5\\ E-6\\ E-7\\ E-8\\ E-9\\ L-1,2,\\ L-4\\ L-5\\ \end{array}$	51B639144 46K636691 50K642356 50C642357 50C636426 51B641643 65R125595 65R125595 65R125595 3 1V642422 24B638340	writted Witter-Causaitor Plate Diode Speaker, PH: 12%, SN YC Speaker, PH: 12%, SN YC Speaker, PH: 12%, SN YC Printed Resistor-Capacitor Diate Bulb, plot light: s1847; GY Bulb, plot light: s1847; GY Bulb, plot light: s1847; GY Sec Pf Tuger Replacement Parts List Af saturas A panel (inc) CO) Col, AN onc	5	43K721440 5K641563 5K740712 332294 335129023 359724 1V641828 26A624276 9K642279 9A638433 9K641562 414471681	Aver, Mobiler (Mil Cord golds on Bril) Chastle. Chastle. Chastle. Construction (Cord golds (Cord)) Setecreve 3-63 r J/2 (Cord) Setecreve 3-62 r J/4 (Chybel sig). Setecreve 3-62 r J/4 (Chybel sig). Setecreve 3-62 r J/4 (Chybel sig). Drit-eal) Satt b Piloy Assessby (Concerts pully) Satt b Piloy (Concerts pully) Satt b P
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Ref. No. Part Number 
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 Description

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 Catast, block ost, (DCT28)

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 6564177
 Catast, c Description Description 2312641 Not, box: 6-32 (light shield clip stg) 237007 Not, box: 6-32 (light shield clip stg) 237007 Not, box: 8-32 (speaker stg) 23212830 Not, box: 8-32 (speaker stg) 648(4339 Plate, leg stg 30633996 Plate, leg stg 3063399 Plate, leg stg 30633996 Plate, leg st 30633996 Plate,

X641796	Screw, machine: 8-32 x 1 (handle stg)
K120846	Screw, machine: 8-32 x 1-1/4 (speaker mtg)
B749168	Screw, wood: #6 x 5/8 (cabinet back stg)
37526	Screw, wood; #8 x 1-1/8 (chassis mtg)
68636238	Shield, light
5K482793	Strike & Nail
48641533	Strip, ornamental (aluminum)
14641792	Strip, receptacle (right stereo output, aux
	input & FM antenna terminals)
5X638638	Support, 11d
A641686	Washer, rubber (chassis atg)

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RADIO

PAGE

25 - 20

MOTOROL

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LINITED REPLACEMENT PARTS

The volume of replacement on the following part is gmall consequently, it is suggested that ordering be done only as required. 15D642105 Cover, cabinet back Note:

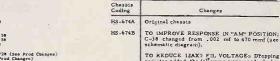
# PRODUCTION CHANGES

Chas Codi

HS-

ng sis	Changes
1	#sresistor); .47 ohm 1/2W ww. Use 17K488266, .47 ohm 10% 1/2W ww asreplacement (see R-43 on schematic diagram.
674C	TO ELIMINATE SPURIOUS OSCILLATION (which

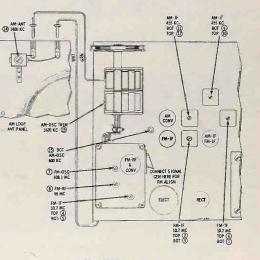
occurredon some sets): A 22,000 ohm resistor added from pin 3 of E-1 to .002 mf (C-39) -see R-44 on schematic diagram.



13B641645 Medallion 33B638467 Nameplate

Ref. No. Part Number

TO REDUCE 12AX7 FIL VOLTAGE: Dropping resistor added, the following were used: 1 ohm 2W ww; 1.2 ohm 1/2W ww; .94 ohm choke (used



ALIGNMENT POINTS LOCATION



# SUPERSEDES 5C15 SERIES PRELIMINARY SERVICE MANUAL PART NO. 68P642576.

#### GENERAL INFORMATION

TYPE - Clock model superheterodyne receiver with plated circuit chassis and ferrite loop antenna. This receiver has an electric clock for automatically controlling radio operation,

TUBE COMPLEMENT - 12BE6 12BA6 12AV6 5005

Converter DF amp Det-AVC -AF amp Pwr amp 35W4 Rectifier

TUNING RANGE - 532 to 1620 Kc IF = 455 Kc

POWER SUPPLY - 120 volts, 60 cycle AC only; 35 watts

# SERVICE NOTES

#### USE OF ISOLATION TRANSFORMER

The chassis of this receiver is connected directly to the power line, however, the power cord circuit is broken by an interlock when the cabinet rear section is removed. When servicing or aligning this chassis, an isolation transformer should be inserted between the power line and the chassis,

CIRCUIT DESCRIPTION

1. The circuit of this chassis is conventional - there are no built-in resistors or capacitors. Leads are plated on both sides of the chassis base, thereby replacing the usual connecting wires and making wiring more uniform.

2. The metal plating extends through all the holes on the chassis, connecting circuits on the top with those on the bottom.

3. Reference to the schematic diagram, plated panel wiring diagrams, and to chassis, will permit the circuit to be traced easily.

NOTE: To facilitate servicing, phantom views showing plated panel wiring of both sides of the chassis plus loca-tion and wiring of electrical components are given. This is done in two ways; the chassis as viewed from the top (component side) and the chassis as viewed from the bot-tom with components as they would appear on opposite side.

#### COMPONENT REPLACEMENT

Refer to "Plated Chassis Servicing Techniques" manual (Motorola Part No. 68P636536) for recommended tools and procedures to be used when servicing Motorola plated circuit chassis.

#### SAFETY PRECAUTIONS

1. Do not service the chassis on a metal plate because of the possibility of a short circuit.

# TIME SET - AUTO SET OPERATION SLEEP CONTROL SELECTOR VOLUM

MODELS

5C15BW

5C15GW

5C15VW

HOME RADIO

CHASSIS

HS-662

HS-662

HS-662

Ref. No.

C-1 C-2 C-3 C-4 C-5 C-6

E-1 E-2 E-3 E-4 E-5

L-1 L-2

R-1 R-2 R-3 R-4 R-5 R-6

T-1 T-2 T-3

MECHAN

Note:

Resist

ELECTR

5C15 SERIES

2. Use caution when handling the chassis with power applied because all high voltage leads are exposed.

DISASSEMBLY INSTRUCTIONS

#### To Remove Chassis From Cabinet

- 1. Remove the dial scale, tuning and volume knobs.
- 2. From rear, remove the 2 rear cabinet mounting screws and pull out rear cabinet.
- 3. Remove the 4 chassis mounting screws.

Remove chassis from čabinet.

#### To Remove Clock Crystal

1. From rear, remove the 2 rear cabinet mounting screws and pull out rear cabinet.

2. From rear of cabinet, insert a screwdriver between cabinet and clock crystal on left-hand side of clock; twist slightly, the clock crystal will pop out. Caution should be exercised when removing the crystal so as not to scratch or break it.

#### To Remove Clock From Cabinet

- ). From rear, remove the 2 rear cabinet mounting screws and pull out rear cabinet.
- 2. Remove clock knobs
- Remove clock crystal (see To Remove Clock Crystal). Unsolder clock leads. 5. From rear of clock, remove 3 clock mounting speed clips. CAUTION: To avoid damage, use care in removing speed clips.
- 6. Remove clock from cabinet.

#### To Replace Pilot Light

1. From rear, remove the 2 rear cabinet mounting screws and pull out rear cabinet. 2. Replace pilot light (located near tuning capacitor).

# **REPLACEMENT PARTS LIST**

NOTE: When ordering parts, specify model number of met in addition to part number and description of part.

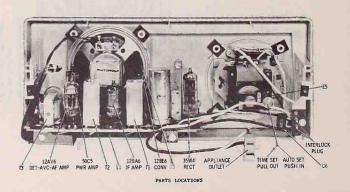
Electronic parts of equivalent relies are not necessarily of culture in the device of the second sec

Part		Ref.	Part	
Number	Description	No.	Number	Description
RICAL PARTS			9K636609	Socket, tube: 7 pin min
198640769	Capacitor, variable: 2 gang	CABIN	ET PARTS	
21K127652	Capacitor, cer disc: 150 mmf 500V			
21B533471	Capacitor, cer disc; .01 mf 500V		17642896	Cabinet Front: blue (SC15BW)
218533473	Capacitor, cer disc: .0033 mf 500V		17640956	Cabinet Front: green (501508)
238639496	Capacitor, electrolytic: 30-40-40mf/150V		11640957	Cabinet Front: byscinth (SC15VW)
8K128690	Capacitor, mylar: .05 mf 400V		17640958	Cabinet Rear: antique white (5015 Series)
			2K736822	Clip, speed (clock stg)
510637000	Modular Component		424537825	Clip, speed (rear cab screw ptg)
\$1x637001	Wodular Component		618638013	Crystal, clock
508641383	Speaker, PM: 5"; 3.2 ohm VC		130637997	Escutcheon: gold
65P175595	Bulb, pilot light: #1847		5K125601	Eyelet (line cord fitg)
708640838	Clock Assembly		367637836	Enob. clock
128040030	CLOCK ADDUNDLY		389637996	Knob, dial scale: clear
0.0000000	Antenna, ferrite rod		368638014	Knob, tuning: antique white
248637228	Cath and		268638014	Knob, volume: antique white
240031220	corr, oac		308640858	
	All resistors are insulated carbon type		298534326	
torn - Hote:	unless otherwise specified.		201001000	all sets)
********	1 neg 20% 1/2W		334640833	
6K121300			334637852	
6K121300			284641393	
184633088	Volume Control; 1 meg.; tap at 300K		98640817	Receptacle, appliance outlet (rubber - in
6K121687	47,000 20% 1/2W		. 30040011	seta)
686018	100 20% 1/2		•98643019	Receptacle, appliance outlet (plastic - in
086018	100 20% 1/2#		-98643019	sots)
248628016	Transformer, 1st IF: 455 Kc		3S120646	Screw, lock: 6-32 x 3/16 (gang brkt atg)
	Transformer, 2nd IF: 455 Kc		33115599	Screw; machine: 6-32 x 1/2 (rear cab ntg)
258640767	Transformer, output		35127592	Screw, machine: 10-24 x 3/4 (line cord at
	Transformer, earper		38639288	Screw, special (spkr mtg)
NICAL PARTS			3\$128635	Screw, tapping; #6 x 5/8 (chassis atg)
ALCOND PARTS			35122335	Screw, tapping; #6 x 1/2 (chassis & inter
848841493	Plated Panel Board: loss all components		50111500	ntg)
	ring, specify part number (and letter - if any)			
found on a	priginal board, and mention model number of this	TINT	TED REPLACEN	ENT BADTS
	part number is different from that found in this		The abridiers	an vario
	t, order by complete part number found on board	Note	The volum	o of replacement on the following pant is a
parts 110	on model number of this set.	HOLD		tly, it is suggested that ordering be done of
	Rivet, shield (tube socket center)		as requir	
01636008	Socket, allot light			Bracket, plated panel support
94036008	Socree' bries avene		10031002	present, hurden hundt adbhourt

#### LINITED REPLACEMENT PARTS

Note: The volume of replacement on the following part is small, consequently, it is suggested that ordering be done only as required 78637862 Bracket, plated panel support

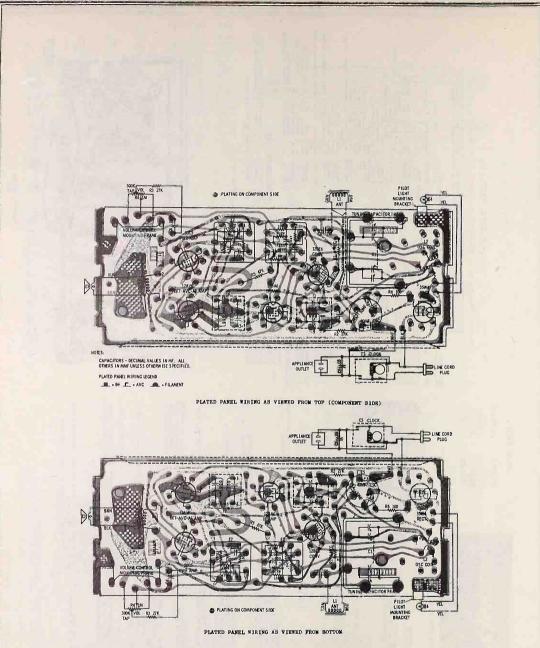
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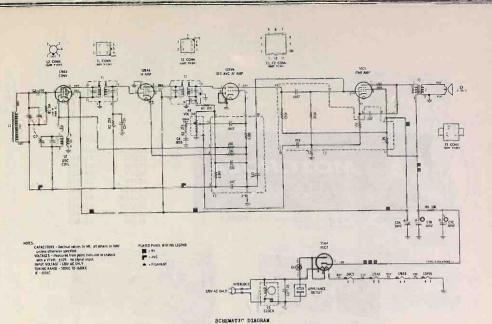
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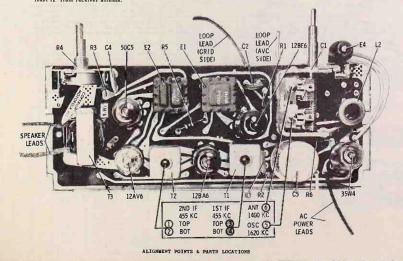


# ALIGNMENT

Use an isolation transformer between the power line and the receiver. If not available, connect low side of generator to B-through a.l mf capacitor, Connect a low range output meter across the speaker voice coil and set volume control to maxi-mum. Attenuate generator output to mainfaint, a volts on output meter to prevent overloading the receiver.

	GENERATOR	GENERATOR FREQUENCY (400 cycle mod)	GANG SETTING	ADJUST	REMARKS
IF AL. 1.	IGNMENT 12BE6 grid (pin 7) thru. 1 mf & B-	455 Kc	Fully open	1, 2, 3 & 4	Adjust for maximum.
RF AL	IGNMENT Radiation loop*	1620 Kc	Fully open	15	Adjust for maximum.
3.		1400 Kc	Tune for max	6 .	

Repeat steps 2 & 3 until no further increase; step 3 should be last adjustment.
 \*Connect generator output across 5" diameter, 5 turn loop and couple inductively to receiver loop. Keep radiation loop at least 12" from receiver antenna.





HOME	RADIO
MODELS	CHASSIS
5C13B	HS-660
5C13M	HS-660
5C13P	H'S-660
5C13W	HS-660
5C14CW	HS-661
5C14GW	HS-661
5C14P₩	HS-661
5C16NW	H S - 663

HS-663

M

VOLUME

5C16W

(MOTOHOLA)

OPERATION

5C14 SERIES

SLEE

CONTRO

SLEEP OFF ON RADIO ALARM BUTTON BUTTON BUTTON BUTTON

SUPERSEDES 5C13, 5C14, 5C16 SERIES PRELIMINARY SERVICE MANUAL PART NO, 68P642572.



5C13 SERIES

# GENERAL INFORMATION

TYPE - Clock model superheterodyne receivers with a plated circuit chassis and ferrite rod antenna. These receivers have an electric clock formulomatically controlling radio operation.

MENT	- 12BE6	Converter
	12BA6	IF amp
	12AV6	Det-AVC-AF an
	50C5	Power amp
	35W4	Rectifier

TUNING RANGE - 532 to .1620 Ke IF - 455 Kc

POWER SUPPLY - 120 volts, 60 cycle AC only; 35 watts

# SERVICE NOTES

тр

#### USE OF ISOLATION TRANSFORMER

The chassis of this receiver is connected directly to the power line, however, the power cord circuit is bracken by When ervicing or all guing while chassis, an isolation tranformer should be inserted between the power line and the chassis.

# CIRCUIT DESCRIPTION

TUBE COMPLE

1. The circuit of this chassis is conventional - there are no built-in resistors or capacitors. Leads are plated on both sides of the chassis base, thereby replacing the usual connecting wires and making wiring more uniform.

2. The metal plating extends through all the holes on the chassis, connecting circuits on the top with those on the bottom.

3. Reference to the schematic diagram, plated panel wiring diagrams, and to chassis, will permit the circuit to be traced easily. NOTE: To facilitate servicing, phantom views showing phated paol wring of bolk sides of the chassis plus location and wiring of electrical components are given. This is done in two ways, the chassis as viewed from the top (component side) and the chassis as viewed from the both iom with components as they would appear on opposite side.

# COMPONENT REPLACEMENT

Refer to "Plated Chassis Servicing Techniques" manual (Motorola Part No. 68P636536) for recommended tools and procedures to be used when servicing Motorola plated circuit chassis.

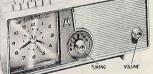
# SAFETY PRECAUTIONS

 Do not service the chassis on a metal plate because of the possibility of a short circuit.

 Use caution when handling the chassis with power applied because all high voltage leads are exposed.

# SILVER STATE

TUNING



5C16 SERIES

# DISASSEMBLY INSTRUCTIONS

# To Remove Chassis From Cabinet (5C13 Series)

- Remove volume and tuning knobs. From rear, remove the cabinet back mounting screws
- and remove cabinet back,
- 3. From inside cabinet, unsolder antenna, speaker and AC power leads.
- Remove the 3 chassis mounting screws.
   Remove chassis from cabinet.

# To Remove Chassis From Cabinet (5C14 & 5C16 Series)

- 1. Remove the dial scale (5C16 Series), tuning and volume
- 2. From rear, remove the 2 rear cabinet mounting screws
- and pull out rear cabinet.
- Remove the 4 chassis mounting screws. Unsolder antenna, speaker and AC power leads.
   Remove chassis from cabinet.

#### To Remove Clock Crystal (5C13 Series)

1. Pull off clock knobs. Insert a screwdriver between the cabinet and the right-hand edge of the clock crystal (near

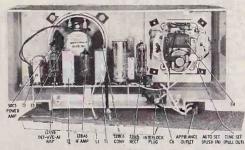
1600 on crystal) to release catch. 2. Pry the crystal out with the screwdriver. Caution should be exercised when removing the crystal so as not to scratch or break it.

#### To Remove Clock Crystal (5C14 Series)

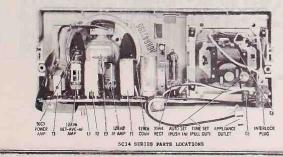
Remove clock (see "To Remove Clock" -5C14 Series): Remove clock crystal.



- 1 Remove dial scale and tuning knobs.
- From rear, remove the Z rear cabinet mounting screws and pull out rear cabinet. 3. From rear, remove 2 escutcheon mounting speed clips.
- 4. Remove escutcheon, then clock crystal.
- To Remove Clock From Cabinet (5C13 Series)
- 1. From rear, remove the 2 cabinet back mounting screws
- Prom real, remove the 2 capiter back moduling sectors and remove cabinet back.
   Remove clock crystal (see "ToRemove Clock Crystal
- 5C13 Series).
- Unsolder clock leads.
   From rear of clock, remove the 3 clock mounting speed clips.
- 5. Remove clock from cabinet.
- To Remove Clock From Cabinet (5C14 Series)
- From rear, remove the 2 rear cabinet mounting screws and pull out rear cabinet. 2. Unsolder clock leads.
- Remove 3 clock mounting speed clips.
- 4. Remove clock from cabinet.
- To Remove Clock From Cabinet (5C16 Series)
- 1. From rear, remove the 2 rear cabinet mounting screws and pull out rear cabinet.
- 2. Unsolder clock leads.
- Remove clock crystal and escutcheon (see "To Remove Clock Crystal & Escutcheon" -5C16 Series).
- 4. Remove 3 clock mounting speed clips.
- 5. Remove clock from cabinet.



5C13 SERIES PARTS LOCATIONS



# REPLACEMENT PARTS LIST

HOTE: When ordering parts, specify model number of set in addition to part number and description of part.

Biostronic parts of equivalent rating are not accesserily of equivalent stendards. The corporate listed in this Service Mawash have here chooses (or replicibility and applicability to the specific circuits isvolved. For maximum customer estimated the similar desil-backs, use the exact Motorola parts replacement.

Part		Ref.	Part
Number	Oescription	No.	Number
BICAL PARTS			17641152
			20730627
198640821	Capacitor, variable: 2 gang (5C13 Series)		2K736822
198640820	Capacitor, variable: 2 gang (5C14 Series)		
198640770	Capacitor, variable: 2 gang (5C16 Series)		42463782
21K127652	Canacitor, cer disc: 150 maf 500V		2K637708
218533471	Capacitor, coi disc: .01 mf 500V		
21K633232	Capacitor, cer disc: .005 mf 500V		61K640807
	(5C16 Sories only)		618637834
238639496	Capacitor, electrolytic: 30-40-40mf/150V		618640819
8X128690	Capacitor, mylar: .05 mf 400V		130640815
			5K125601
510637000	Modular Component		
51K637001	Modular Component		368641068
50K638023	Speaker, PH: 4"; 3.2 ohm VC (5C13 Series)		36C635812
50C637838	Speaker, PM: 4"; 3.2 ohm VC (SC13 Seriem) Speaker, PM: 4"; 3.2 ohm VC (SC14 Seriem) Speaker, PM: 4"; 3.2 ohm VC (SC16 Seriem)		368637835
50K640832	Speaker, PH: 4"; 3.2 ohn VC (5C16 Series)		36K640808
720638025			36K64085-
72K640805	Clock Assembly (5C13B, 5C13P, 5C13W)		36K640963
72X640839	Clock Assembly (5C14 Series)		36K640809
720640857	Clock Assembly (5C16 Series)		36K640854
			36C637894
-	Antenna, ferrite rod (For 5C13 Sories - See		30863802
	Cabinet Back)		30864085
24K638190	Antenna, forrite rod (5C14 & SC16 Series)		
248637228	,Coil, osc		29469008
torr - Notor	All resistors are insulated carbon type		29K53432
tota - noto.	unless otherwise specified.		
68122224	1 pag 20% 1/2%		13863785
	27.000 105 1/2%		33A64081
188638017	Volume Control: 1 mog (5C13 Series)		33B64084
189637860			33464098

- Rest
- R-1 R-2 R-3 108650716 Volume Control: 1 mm (C(14 Strien) 18650718 Volume Control: 1 mm (C(14 Strien) 18650718 Volume Control: 1 mm (C(14 Strien) 6K121637 47,000 207 1/2W 6K125253 39,000 105 1/2W (SC16 Scrime only) 6K19402 100 20% 1/2W
- R-4 R-5 R-6
- 24K636016 Transformer, 1st IF: 455 Kc 24K639362 Transformer, 2nd IF: 455 Kc 25B640767 Transformer, output T=1 T=2 T-3

#### MECHANICAL PARTS

840641400 Plated Panel Board: less all components Thes ordering, specify part sumber (and letter \_insp) act, if part number is different from that to do in the parts list, order by complete part number found on board and anottom model auxber of this set. \$8124431 Rivet\_which'd (tube sector conter) \$853600 Scover, tube: 7 pin sin

#### CABINET PARTS

Ref.

C-1

C-2 C-3 C-4

C-5 C-6

E-1 E-2 E-3

6-4

1. Let

L-2

ELECTI

644640814	Background, dial scale (5C13 Series)
348640849	Background, dial scale (5014 Series)
11640896	Cabinet: blue (5C13B)
1¥642969	Cabinet: mahogany (5C13#)
1V640895	Cabinet: pink (SC13P)
1¥640897	Cabinet: antique white (5C13W)
24X640992	Cabinet Back: incl ant (5C13 Series)
11640935	Cabinot Front: blue (5C14CW)
11640936	Cabinet Front: green (SC14GW)
11640937	Cabinet Front: pink (SC14PN)
19641150	Cabinot Front: mocha (SC16NW)
17641151	
11640938	Cabinot Rear: antique white (6C14 Series)
1¥640935 1¥640936 1¥640937 1¥641150 1¥641151	Cabinet: intigue white (50138) Cabinet Back: incl and (5013 Sories) Cabinet Front: plue (501407) Cabinet Front: pink (501407) Cabinet Front: pink (501407) Cabinet Front: antique white (50187) Cabinet Front: antique white (5014 Sories)

 Clip, mored (clock att = SCI3 Sortes)
 SCI3 S 334637852 28A638016 28A641393 •38X641367 9X636019 BX250013 Recognicis, appliance outlet: Incl atg brit
 By260017 Recognicis, appliance outlet: Gold Series & Gold Series - Fubber - In some sets)
 By260017 Recognicis, applications outlet (Gold Series & Gold Series, Ioki, 6-22 x 3/06 (seeg brit type)
 B311509 Seree, Ioki, 6-22 x 3/06 (seeg brit type)
 B312509 Seree, Ioki, 6-22 x 3/06 (seeg brit type)
 B312509 Seree, Ioki, 6-32 x 3/06 (seeg brit type)
 B312509 Seree, Ioki, 6-32 x 3/06 (seeg brit type)
 B312509 Seree, Ioki 6-32 x 13/06 (see brit type)
 B312509 Seree, Ioki 6-32 x 13/06 (see brit type)
 B3122605 Seree, Ioki 8 x 10/06 (see brit)
 B3122615 Seree, Ioki 8 x 10/06 (see brit)

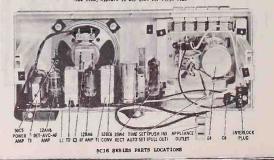
Description

Cabinet Rear: antique White (SC16 Series) Clip, speed (clock stg - SC13 Series) Clip, speed (escutcheon & clock stg -SC16 Series)

#### LINITED REPLACEMENT PARTS

Note: The volume of maintenant on the following works as an an arguing an arguing maintenant of the second second second second second maintenant of the second second second second second maintenant second seco

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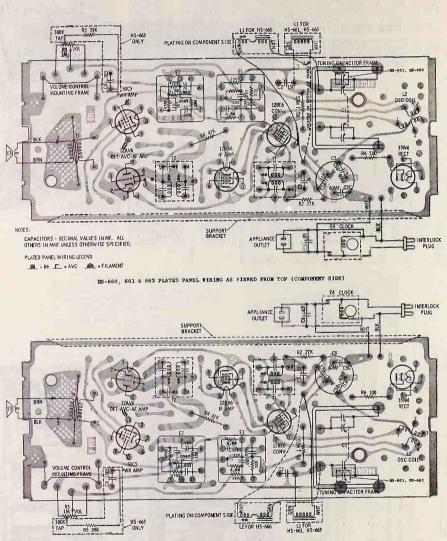
MOTOROLA

RADIO

PAGE

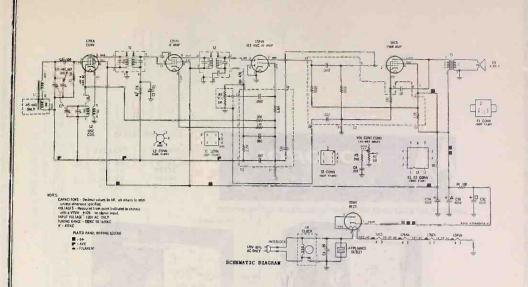
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N in



# MOTORQLA RADIO PAGE 25-27

CHASSIS HS-660, 661, 663

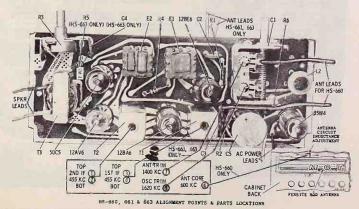


# ALIGNMENT

Alignment on 155-661 and 155-662 can be performed visiont sensoring charsis from cohinet. Use an isolation transformer jutween the power line and the receiver. If not available, connect low side of signal generator to B- through a. In claracture. Connect a low range output meter across speaker voice coil and set volume control to maximum. Attenuate generator output to maintain. A volis on output meter to prevent overlaad ig.

STEP	GENERATOR	GENERATOR FREQUENCY (400 cycle mod)	GANG SETTING	ADJUST	REMARKS
IF ALE	GNMENT Grid of conv (pin 7, 12BE6) thru. 1 mf & B-	455 Kc	Fully open	1, 2, 3 & 4	Adjust for maximum.
RF AL	GNMENT Grid of conv (pin 7, 12BE6) thru. 1 mf & B-	1620 Kc		5	ä
ANTEN 3.	NA ADJUSTMENT (HS=0 Radiation loop*	60) 600 Kc	Tune for max	6	With radio installed in cabinet adjust for maximum.
ANTEN 3.	NA ADJUSTMENT (HS-6 Radiation loop*	61, 663) 1400 Kc	Tune for max	7	Adjust for maximum,

\*Connect generator output across 5" diameter, 5 turn loop and couple inductively to receiver loop. Keep loops at least 12" apart.





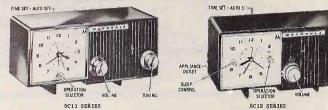
HOME	RADIO
MODELS	CHASSIS
5C11E	HS-658
5C12M	HS-658
5C12P	HS-658
5C12W	HS-658

UNIN

Converter IF amp Det-AVC-1st AF amp Pwr amp Rectifier

IF - 455 Ko

SUPERSEDES 5C11 & 5C12 SERIES PRELIMINARY SERVICE MANUAL PART NO. 68P642573.



# GENERAL INFORMATION

TYPE - Clock model asperheteroedyne receives with plated clock in the site interplate and the site of the later an electric clock for automatically controlling radio operation. Model 5012 alon has an appliance outlet (located on back of receiver) and a sleep con-trol on the clock.

POWER SUPPLY - 120 volts, 60 cycle AC only; 35 watts

# SERVICE NOTES

# USE OF ISOLATION TRANSFORMER

The chassis of this receiver is connected directly to the power line, however, the powercord circuit is broken by an interlock when the cabinet rear cover is removed. When servicing or aligning this chassis, an isolation transformer should be inserted between the power line and the chassis.

# DISASSEMBLY INSTRUCTIONS

To Remove Chassis

Remove cabinet back screws and remove cabinet back,
 Pull off the two control knobs from the front of the radio,
 From front, remove the Phillips head screw near tuning shaft.

ing smat. 4. From tear, remove chassis mounting screw from the ear of the volume control. 5. Unsolder power leads from connector strip located be-hind clock and also unsolder speaker leads from speaker, 6. Remove chassis from cabinet.

#### To Remove Clock Crystal

Puil off clock knobs. Insert a screwdriver between the cabinet and the right-hand edge of the clock crystal (near number 3) to release catch.
 Pry the crystal out with the screwdriver.

#### To Remove Clock

Remove clock crystal (see above).
 Remove mounting screws from the interlock plug and the connecting strip.
 Remove two speednuts from the rear of clock and pull clock out through front of radio.

#### CIRCUIT DESCRIPTION

TUBE COMPLEMENT - 12BE6 12BA6 12AV6 50C5 35W4

TUNING RANGE - 535 to 1620 Kc

The circuit of this chassis is conventional - there are no built-in resistors or capacitors. Leads are plated on both sides of the chassis base, thereby replacing the usual connecting wires and making wiring more uniform.

2. The metal plating extends through all the holes on the chassis, connecting circuits on the top with those on the bottom.

Reference to the schematic diagram, plated panel wir-ing diagram, and to chassis, will permit the circuit to be traced easily.

NOTE: To facilitate servicing, phantom views showing plated panel wiring of both sides of the chassis plus loca-tion and wiring of electrical components are given. This is done in two ways; the chassis as viewed from the top (component side) and the chassis as viewed from the bot-tom with components as they would appear on opposite side.

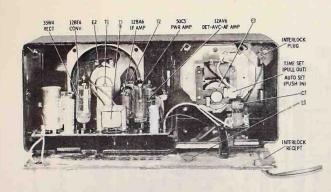
## COMPONENT REPLACEMENT

Refer to "Plated Chassis Servicing Techniques" manual (Motorola Part No. 68P636536) for recommended tools and procedures to be used when servicing Motorola plated cir-cuit chassis.

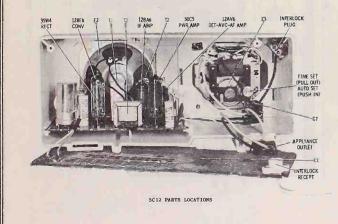
#### SAFETY PRECAUTIONS

1. Do not service the chassis on a metal plate because of the possibility of a short circuit,

Use caution when handling the chassis with power ap-plied because all high voltage leads are exposed.



SCII PARTS LOCATIONS



# REPLACEMENT PARTS LIST

NOTE: When ordering parts, specify model number of set in addition to part number and description of part.

Electronic parts of equivalent rating are non-necessarily of equivalent standards. The component listed in this Service Manual have been chosen for reliability and applicability to be specific circuits involved. For maximum cutther satisfaction and minimized coll-backs, use the exect motorial price relations.

Part Number Description	Rof. No.	Part Number	Description
TRICAL PARTS		314636820	Strip, conn (connects radio to clock - SC11 Series, SC12 Series)
198632026 Capacitor, variable: 2 gang 8K121268 Capacitor, paper tub: .05 mfd 400V	CABIN	ET PARTS	
21K127652 Capacitor, cer disc: 150 mmf 500V 21K120853 Capacitor, cer disc: .01 mfd 500V 8K122883 Capacitor, paper tub: .03 mfd 400V		19641060	Cabinet Assembly: black; incl mameplate (SC11E)
23B532015 Capacitor, hear tub: .05 mid 4007 8K122650 Capacitor, mylar: .05 mid 4007		18641047	Cabinet Assembly: mahogany; incl mameplate (5012M)
518635833 Printed Capacitor - Resistor Plate		17641048	Cabinet Assembly: pink; incl nameplate (5012P)
50K638565 Speaker, PM: 4"; 3.2 ohn VC 72K640910 Clock Assembly: Telechron (5C11E)-		19641049	Cabinet Asscably: antique white; incl names plate (5C12%)
72K640909 Clock Assembly: Telechron (5C12W) 72K640908 Clock Assembly: Telechron (5C12W)		10638104	Cabinet Back Assembly: incl Ll & line cord (SC11E)
- Loop Ant (See Cab Back Assembly)		17641363	Cabinet Back Assembly: incl 11 4 line cord (SC12M)
24K636206 Coil, oscillator	4	19641344	Cabinet Back Assembly: incl Ll & line cord (SC12P, SC12W)
istors - Note: All resistors are insulated carbon type unless otherwise specified,		61K640868 61K640869	Crystal, clock (SC12M)
6X122324 1 meg 20% 1/2W 6X119405 22,000 20% 1/2W		36X638216	Crystal, clock (5C12P, 5C12W) Knob, clock: clear (5C11 Series)
6K121300 27,000 10% 1/2W		36K641340	Knobs, clock (5C12 Series) Knob, tuning: clear (5C11 Series, 5C12 Series)
6K124797 150 10% 1/2W 6K119407 3.3 meg 20% 1/2W		36K637751	Knob, volume: clear (5C19 Series, 5C12 Series)
18K633692 Volume Control: 1 meg 6K124797 150 10% 1/2%			Line Cord: with plug & interlock recept (SC11 Series)
6B119404 1000 20% 1W		30X641342	Line Cord: with plug & interlock recept (5C128)
24K636016 Transformer, 1st IF: 455 Kc 24K638563 Transformer, 2nd IF: 455 Kc		308641341	Line Cord: with plug & interlock recept (SC12P, SC12W)
25K638564 Transformer, output		45122928 33A640859	Lockwasher: #6 ext (chassis mtg)
HANICAL PARTS		9K636019 5A632570	Receptacle, appliance outlet (5C12 Series only) Rivet (line cord atg)
84C641510 Plated Panel Board: lcss all components		35122517 35121413	Screw, machine: 6-32 x 1 (chasmis mtg) Screw, tapping: #6 x 1/2 (cab back mtg)
When ordering, specify part number (and letter - if any) found on original board, and mention model number of this		35122516	Screw, tapping: #6 x 3/8 (chassis atg)

The advantage of the second standard the second standard the second standard standar

Ref, No.

C-1 C-2 C-3 C-4 C-5 C-6 C-7

E-1 E-2 E-3

L-1 L-2

R-1 R-2 R-3 R-4 R-5 R-6 R-7 R-8

T-1 T-2 T-3

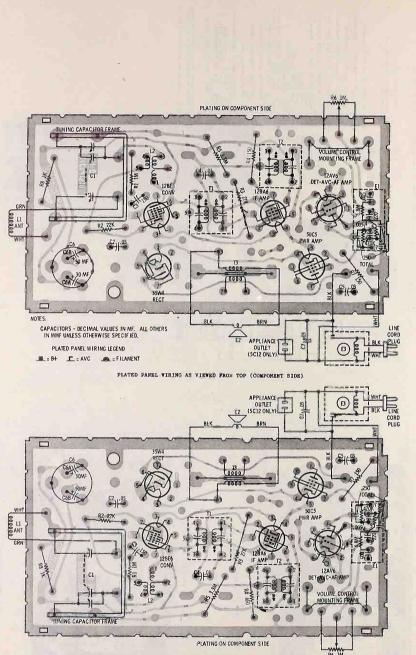
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Note:

Resist

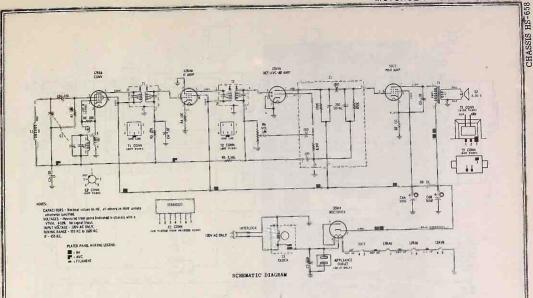
ELECTRI

35122516 Screw, tapping: wo x 3/0 (canssis sig) 2x736822 Speednut (clock stg) 4x624873 Washer, felt (mounts inside control knobs) CINITED REPLACEMENT PARTS Note: The volume of replacement on the following part is small, consequently, it is suggested that ordering be done only me required. 29A590089 Lug, clinch (on appliance outlet = 5Cl2 Series)



PLATED PANEL WIRING AS VIEWED FROM BOTTOM

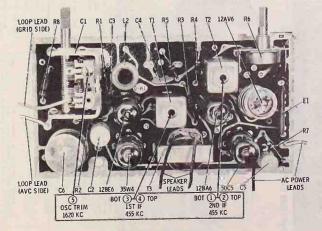
#### RADIO PAGE 25-31 MOTOROLA



# ALIGNMENT.

Use an isolation transformer between the power line and the receiver. If not available, connect low side of generator to B-through a , 1 mf capacitor. Temporarily connect apeaker thru jumper and connect AC leads. Connect a low range output meter across speaker voice coil and set volume control to maximum. Attenuate generator output to maintain .40 volts on output meter to prevent vorticating.

STEP	GENERA TOR CONNECTION	GENERATOR FREQUENCY (400 cycle mod)	GANG SETTING	ADJUST	REMARKS
IF ALI	GNMENT Grid of conv (pin 7, 12BE6) thru . 1 mf & B-	455 Kc	Fully open	1, 2, 3 & 4	Adjust for maximum.
2.	IGNMENT Grid of conv (pin 7, 12BE6) thru. 1 mf & B-	1620 Kc	Fully open	5	Adjust for maximum.



ALIGNMENT POINTS & PARTS LOCATIONS



SUPERSEDES 5T11 PRELIMINARY SERVICE MANUAL PART NO. 68P642569

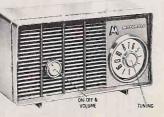
#### GENERAL INFORMATION

TYPE = AC/DC table model superheterodyne receiver with plated circuit chassis, modular components and ferrite loop antenna.

TUBE COMPLEMENT - 12BE6 Converter 12BA6 IF amp 12AY6 Det-AYC-AF amp 50C5 Pwr amp 55W4 Rectifier

TUNING RANGE = 535 to 1620 Kc IF - 455 Kc

POWER SUPPLY - 120 volts AC/DC; 35 watts



MODELS

5T11G

5T11M

5T11R

5T11W

HOME RADIO

CHASSIS

HS-652

HS-652

HS-652

HS-652

# ST11 SERIES

# SERVICE NOTES

# USE OF ISOLATION TRANSFORMER

The chassis of this receive is connected directly to the power line, however, the power cord direct is howen by an inversely on ligning this chassis from AC, an isolation gamsformer should be inserted between the power line and the chassis.

TO REMOVE CHASSIS FROM CABINET

 Remove the two screws that hold the cabinet back cover in place, and remove back cover.

 Do not attempt to remove tuning knob from front of ram dio, as it is held in place with a speed clip from inside of cabinet. (See Tuning Knob Removal section.)

 From rear of radio, remove the two chassis mounting screws from gang mounting bracket and ear of volume control.

 Remove plated circuit chassis by taking hold of gang condenser and the volume control, and sliding out of cabinet. Volume knob will come off without marring the cabinet.

TO REMOVE TUNING KNOB

1. Remove chassis from cabinet. (See Chassis Removal section.)

2. From rear of radio, remove speed clip from manual tuning knob.

 The circuit of this chassis is conventional - there are no built-in resistors or capacitors. Leads are plated on both sides of the chassis base, thereby replacing the usual connecting wires and making wiring more uniform.

2. The metal plating extends through all the holes on the chassis, connecting circuits on the front with those on the rear.

3. Reference to the schematic diagram, plated panel wiring diagram, and to chassis, will permit the circuit to be traced easily.

NOTE: To facilitate scrytcing, phantom views showing plated panel wiring of both sides of the chassis plus locabon and wiring of electrical components are given. This is done in two ways; the chassis as viewed from the top (component side) and the chassis as viewed from the both moments are here would appear on opposite side.

COMPONENT REPLACEMENT

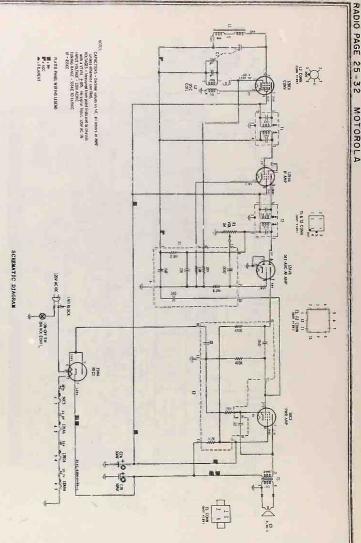
CIRCUIT DESCRIPTION

Refer to "Plated Chassis Servicing Techniques" manual [(Motorola Part No. 68P636536) for recommended tools and procedures to be used when servicing Motorola plated circut chassis.

# SAFETY PRECAUTIONS

1. Do not service the chassis on a metal plate because of the possibility of a short circuit.

2. Use caution when handling the chassis with power applied because all high voltage leads are exposed.

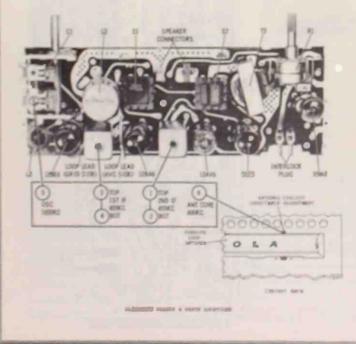


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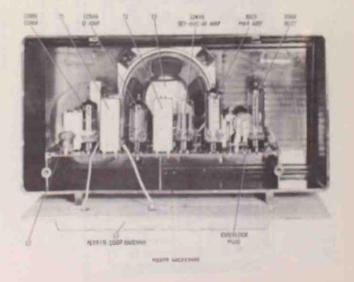
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BJohn F. Blder

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SUPERSEDES 5T11 PRELIMINARY SERVICE MANUAL PART NO. 68P642569

## GENERAL INFORMATION

TYPE = AC/DC table model superheterodyne receiver with plated circuit chassis, modular components and ferrite loop antrana,

TUBE COMPLEMENT = 12BE6 Converter 12BA6 IF amp 12AY6 Det-AYC aFF amp 50C5 Pwr amp 35W4 Rectifier

TUNING RANGE - 535 to 1620 Kc IF - 455 Kc

POWER SUPPLY = 120 volts AC/DC; 35 watts



MODELS

5T11G

5T11M

5T11R

5T11W

HOME RADIO

CHASS15

HS-652

HS-652

HS-652

HS-652

#### 5T11 SERIES

# SERVICE NOTES

# USE OF ISOLATION TRANSFORMER

The chassis of this receiver is connected directly to the power line, however, the power cord circuit is broken by an interlock when the cabinet chassis forover. When remains the chassis of the chassis of the chassis the chassis is abald be inserted between the power line and the chassis.

TO REMOVE CHASSIS FROM CABINET

). Remove the two screws that hold the cabinet back cover in place, and remove back cover.

2. Do not attempt to remove tuning kmob from front of radio, as it is held in place with a speed clip from inside of cabinet. (See Tuning Knob Removal section.)

 From rear of radio, remove the two chassis mounting screws from gang mounting bracket and ear of volume control.

 Remove plated circuit chassis by taking hold of gang condenser and the volume control, and sliding out of cabinet. Volume knob will come off without marring the cabinet.

TO REMOVE TUNING KNOB

1. Remove chassis from cabinet. (See Chassis Removal section.)

2. From rear of radio, remove speed clip from manual tuning knob.

 The circuit of this chassis is conventional - there are no built-in resistors or capacitors. Leads are plated on both sides of the chassis base, thereby replacing the usual connecting wires and making wiring more uniform.

2. The metal plating extends through all the holes on the chassis, connecting circuits on the front with those on the rear.

3. Reference to the schematic diagram, plated panel wiring diagram, and to chassis, will permit the circuit to be traced easily.

NOTE: To facilitate servicing, phantom views showing plated panel wiring of both sides of the chassis plus loca - tion and wiring of electrical components are given. This is done in two ways; the chassis as viewed from the top (component side) and the chassis as viewed from the both component side) had the chassis as viewed from the both components as they would appear on opposite side.

COMPONENT REPLACEMENT

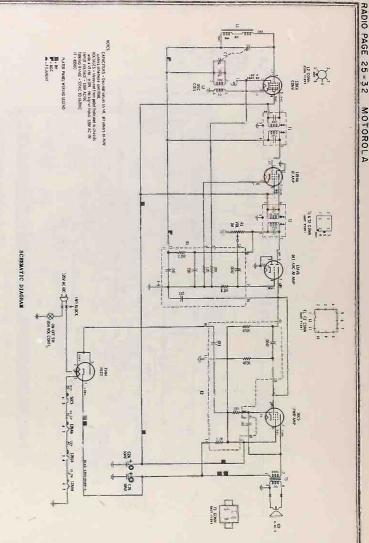
CIRCUIT DESCRIPTION

Refer to "Plated Chassis Servicing Techniques" manual (Motorola Part No. 68P636536) for recommended tools and procedures to be used when servicing Motorola plated circuit chassis.

SAFETY PRECAUTIONS

 Do not service the chassis on a metal plate because of the possibility of a short circuit.

2. Use caution when handling the chassis with power applied because all high voltage leads are exposed.

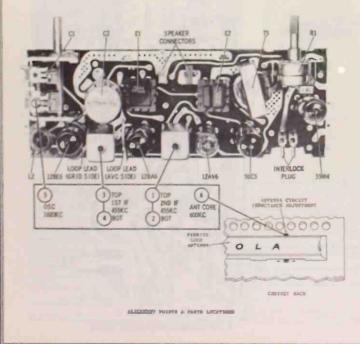


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# REPLACEMENT PARTS LIST

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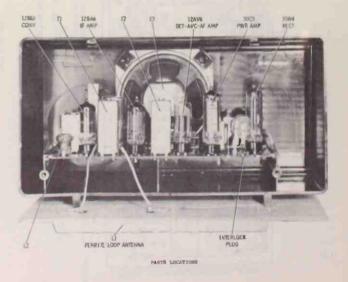
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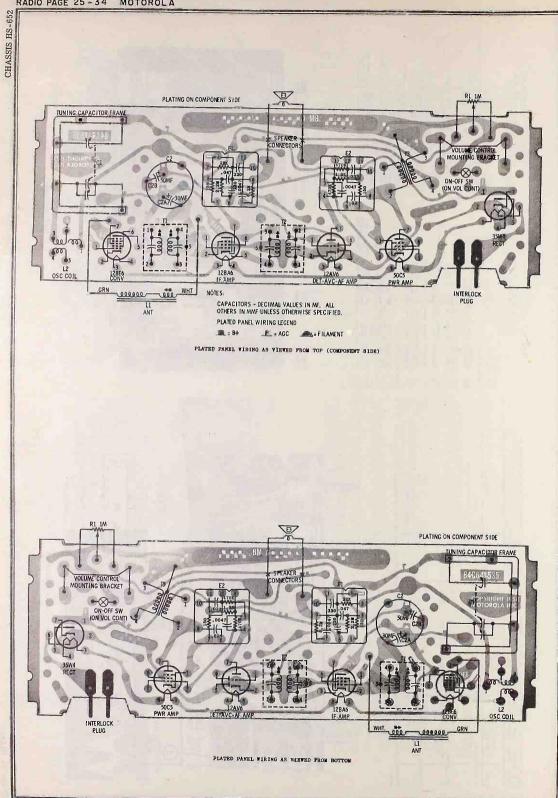
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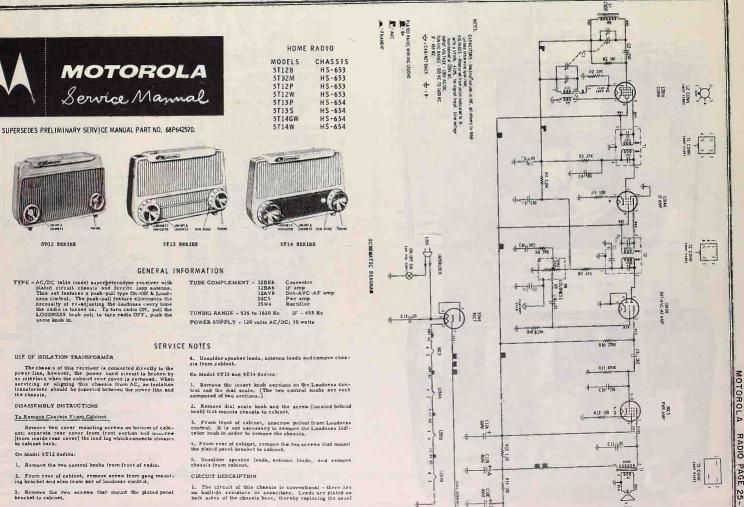


MOTOROLA

RADIO PAGE

25-3





RADIO PAGE 25-35

CHASSIS HS-653, 654

ADIO PAGE

25-36

MOTOROLA

connecting wires and making wiring more uniform.

2. The metal plating extends through all the holes on the chassis, connecting circuits on the top with those on the bottom.

3. Reference to the schematic diagram, plated panel wir-ing diagrams, and to chassis, will permit the circuit to be traced easily.

NOTE: To facilitate servicing, phantom views showing plated panel wiring of both sides of the classis plate laca-tion and wiring of electrical components are given. This is done in two ways: the chassis as viewed from the top (component said) and the chassis, as viewed from the both form with components as a theywould appres on opposite side.

#### COMPONENT REPLACEMENT

Refer to "Plated Chassis Servicing Techniques" manual (Motorola Part No. 68P636536) for recommended tools and procedures to be used when servicing Motorola Plated circuit chassis.

#### SAFETY PRECAUTIONS

1. Do not service the chassis on a metal plate because of the possibility of a short circuit.

Use caution when handling the chassis with power ap-plied because all high voltage leads are exposed.

#### REPLACEMENT PARTS LIST

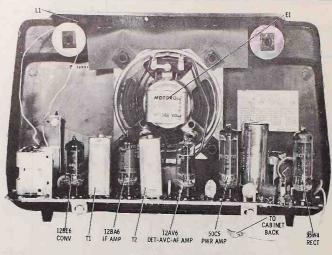
NOTE: When ordering parts, specify model number of set in addition to part number and description of part. Slectronic parts of equivalent rating are not accounting of curvulent students. The concounting listed is this forvice Named have been chosen for reliability and applicability is the specific circuits involvéd. For saxisus curtower sätisfaction and minimized call-backs, use the exact Motorola parts replacement.

Ref. No.	Part Number	Description	Ret.	Part Number	Description
				5K636314	Rivet, shield (tube soc
ELECTR	ICAL PARTS			98636609	Socket, tube: 7 pin mi
C-1	198640822 19K640993	Capacitor, variable: 2 gang (5713 &	CABIN	ET PARTS	
C1-27		5T14 Series)		17641118	Cabinet Front: blue (5
C-3	8K121268	Capacitor, cer disc: 150 mmf 500V		17641119	Cabinet Front: mahogan
C-4	210129284	Capacitor, paper tub: .05 mf 400V Capacitor, cer disc: .01 mf 500V		1V641120 1V641121	Cabinet Front: pink (5 Cabinet Front: antique
C-3	218127652	Capacitor, cer disc: 150 mmf 500V		19641196	Cabinet Front: antique Cabinet Front: pink (5
C-6	218633232	Capacitor, cer disc: .005 mf 500V		17641197	Cabinet Front: maple s
C=7	218128284	Capacitor, cer disc: .01 mf 500V		10641311	Cabinet Front; green (
C-8	21R128284	Capacitor, cer disc: 01 mf 500V		19641312	Cabinet Fronts antique
C-9	218633232	Capacitor, cer disc: .005 mf 500V Capacitor, cer disc: 150 mmf 500V		166641006	Cabinet Rear: antique Cabinet Rear: mahogany
C-10	21X127652	Capacitor, cer disc: 150 mmf 500V		16D641004	Cabinet Rear: mahogany
C-11	21K533472				
C-12	23B639496	Capacitor, electrolytic: 30-40-40mf/150V		16K641007	Cabinet Rear: metallic
C-13	8K121268	Capacitor, paper tub: .05 mf 400V		16K641008	Cabinet Rear: black &
		and the second		16K641009	Cabinet Rear: antique
£=1	50K640764	Speaker, PM: 4"; 3.2 chm VC (5T12 Series) Speaker, PM: 4 x 6"; 3.2 chm VC (5T13 4		2K637286	Clip, speed (latch mtg
	50K640832	Speaker, PM: 4 x 6"; 3.2 ohn VC (5713 4		2K637708	Clip, speed (spkr mtg)
		5T14 Series)		13C640990	Grille, trim (5T14 Seri
	17641116	A REAL PROPERTY AND A REAL PROPERTY AND A		36C641061	
Lel	17641198	Antenna, ferrite rod (5712 Series) Antenna, ferrite rod (5713 & 5714 Series)		201012000	5T14W)
L-2	248637228	Call and Call and Calls a Sile Series		368641062	Knob, dial scale: mapl
	*40031220	C011, 08C		366641063	Knob, dial scale: greet Knob, loudness indicato
Residt	ors - Note:	All resistors are insulated carbon type		300041024	& ST14W)
		ubless otherwise specifiedt		268641025	Knob, loudness indicato:
8=1	6×122324	1 meg 20% 1/2w		368641025	Knob, loudness indicato
R-2	6K-119405	22.000 205 1/2		36K640997	Kaob, tuning: antique
R-2 R-3	6K121300	1 meg 20% 1/2w 22,000 20% 1/2w 27,000 10% 1/2w		36K641021	Knob, tuning: clear (5"
R-4	6R3927	2.2 neg 20% 1/2W		36C641020	Knob, tuning: clear (5'
R=5 R=6	6R6326	100 10% 1/2#		36D640996	
	6K125535	39,000 10% 1/2#			Series)
R=7	6K121687	47,000 20% 1/2#		36K641023	
R-8	188640762	Loudness Control & Switch: 1 meg; tap at 300K		36C641022	Knob, On-off & loudness
	Tene incore.	(5T12 Series)		308640843	
	100040939	Loudness Control & Switch: 1 meg; tap at 300K (5713 & 5714 Scrief)		30X640844	
R-9	6R5585	8 2 mon 107 1/2W		30K640845	
R=10	6R6015	8.2 meg 10% 1/2W 220,000 20% 1/2W 470,000 20% 1/2W 150 10% 1/2W		308640846	Line Cord: brown (5T13
R=11	6K119406	470 000 205 1/2#		257051	Palnut: 3/8-32 x 9/16
R-12	6K124797	150 10% 1/28		35120646	5T14)
R=13	6R5770			00120040	Screw, lock: 6-32 x 3/3 5T12 Series)
R=14	6R6326	100 10% 1/2#		35128636	Screw, tapping: #8 x 3,
				35122516	Seres, tapping, we x 3,
T-1	24K636016	Transformer, 1st IF: 455 Kc			Scres, tapping: #6 x 3, 5T12 Series; loudness )
T-2	24K639362	Transformer, 2nd IF: 455 Kc			5T13 & 5T14 Series)
T=3	258640763	Transformer, output (5712 Series) Transformer, output (5713 & 5714 Series)		35 22335	Screw, tapping: #6 x 1,
	25K640899	Transformer, output (5T13 & 5T14 Series)			mtg - not in all sets)
				44639647	Washer, cup (cover latch
MECHAN	ICAL PARTS				all sets)
		and the second se		428640989	Spring, cover latch
	294635682	Contact, AC interlock		78640906	Stand, cabinet: chrone
	17641128	Plated Panel Board: less all components; incl		7K640907	Stand, cabinet: gold (
Noter	Then ronle	AC contacts and 84K643249 plated panel board.			
note:	wred ne repla	cing the plated panel, Part Number 84K643249 is placement for 84C640824 & 84K643199. This panel			the Walter
		he two carlier versions. In the first version,	DINITE	D. REPLACEME	NI PARTS
	the suppor	t bracket and the edge plating were connected to	Notan	The volume	
	B In th	e second version, the support bracket and edge		Consequent	of replacement on the fily, it is suggested that
	plating we	re removed electrically from B In the third		as require	d.
		he support bracket and edge plating were connec-		78640975	
	version, t				
	ted to B-	thru a capacitor (C7). The physical placement		*7K643260	
	ted to B- of the com	thru a capacitor (C7). The physical placement popents is the same in all versions. When		•7K643260	Bracket, plated panel s
	ted to B- of the com replacing	thru a capacitor (C7). The physical placement		*7K643260 *42A643259	

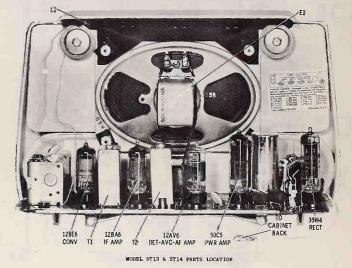
	Number	Description
	5K636314	Rivet, shield (tube socket center)
	98636609	Socket, tube: 7 pin min
80	ET PARTS	
		the second s
	17641118	Cabinet Front: blue (5712B) Cabinet Front: mnhogany (5712M)
	17641119	Cabinet Front: mahogany (5712M)
	17641120	Cabinet Front: pink (5712P) Cabinet Front: antique white (5712W)
	10641121	Cabinet Front: antique white (5712W)
	17641196	Cabinet Front: pink (5T13P) Cabinet Front: maple sugar (5T13S)
	17641197	Cabinet Front: maple sugar (5T13S)
	10641311	Cabinet Front: green (5T14GW) Cabinet Front: antique white (5T14W)
	19641312	Cabinet Front: antique white (5T14W)
	16K641006	
	16D641004	Cabinot Rear: mahogany (5T12M)
	16×641005	Cabinet Rear: gray (5T12P, 5T12W)
	16K641007	Cabinet Rear: gray (5T12P, 5T12W) Cabinet Rear: metallic wood (5T13P)
	16K641008	Cabinet Rear: black & gold (5T13S)
	16K641009	Cabinet Rear: antique white (5714 Series)
	2K637286	Clip, speed (latch atg - not in all sets)
	2K637708	Clip, speed (spkr mtg)
	13C640990	Grille, trim (5T14 Series)
	36C641061	Koob, dial scale: antique white (5713P &
		5T14W)
	36K641062	Knob, dial scale: maple sugar (57138)
	36K641063	Knob, dial scale: maple sugar (5T13S) Knob, dial scale: green (5T14GW)
	36C641024	Knob, loudness indicator: antique white (5713)
		4 5T14W)
	36K641025	Knob, loudness indicator: maple sugar (57135)
	36K641026	Knob, loudeese indicator: mpic sugar (51153)
	36K640997	Knob, loudness indicator: green (ST14GW) Knob, tuning: antique white (ST12 Serice) Knob, tuning: clear (ST13 Serice) Knob, tuning: clear (ST14 Serice) Knob, On-Off & loudness: antique white (ST12
	36K641021	Kaob, tubing. antique abite (5112 berick)
	360641021	Knob, tuning: clear (5113 Series)
	36D640996	Knob, tubing: clear (Sil4 Series)
	200040830	Series)
	36K641023	Knob, On-off & loudness: clear (5T13 Series)
	360641022	Knob, On-off & loudness: clear (5714 Series)
	308640843	the Cond (fmion fmion fmion)
	30X640844	
	30K640845	Line Cord: Drown (SII2R)
	30K640846	Line Cord; brown (57135)
	287051	Palnut: 3/8-32 x 9/16 (vol cont ntg - 5T13 4
	201001	5T14)
	35120646	Scrow, lock: 6-32 x 3/16 (gang brkt mtg -
	00120010	5T12 Series)
	35128636	Screw, tapping: #8 x 3/8 (cab back mtg)
	35122516	Scres, tapping: #6 x 3/8 (chassis stg -
	00 10 10	5T12 Series; loudness knob & chassis mtg -
		5T13 & 5T14 Series)
	35 22335	Screw, tapping: #6 x 1/2 (cover latch spring
	33122333	screw, tapping: #6 x 1/2 (cover latch spring
	44639647	
	40000047	Washer, cup (cover latch spring mtg - not in
	428640989	all sets)
		Spring, cover latch
	78640906	Stand, cabinet: chrome (5T12 Series)
	7K640907	Stand, cabinet: gold (5713 & 5714 Series)
	-	1 M 1
I	D.REPLACEME	INT PARTS

Noten The volume	of replacement on the following parts is small.
consequent	ly, it is suggested that ordering be done only
as require	d,
78640975	Bracket, plated panel support (5712 Series)
*7K643260	Bracket, plated panel support (5713 & 5714 Sories)
*42A643259	Clip, plastic (brkt mtg - 5713 & 5714 Series)
328640979	Gasket, trim grille (5T14 Sories)

"New Item, Appears in any List for First Time



MODEL 5T12 PARTS LOCATION



©John F. Rider

MOTOROLA RADIO PAGE 25-37

654

CHASSIS HS-653,



Adjust for maximum

\*Connect generator output across 5" diameter, 5 turn loop and couple inductively to receiver loop. Keep radiation loop at least 12" from receiver loop.

5

6

Fully open

Tune for max

GENERATOR

1620 Kc

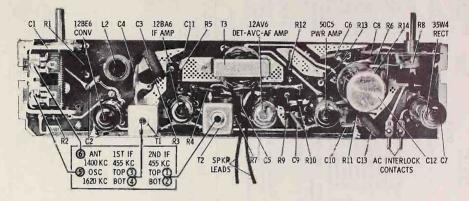
1400 Kc

IF ALIGNMENT 1. 12BE6 grid (pin 7) thru, 1 mf & B-

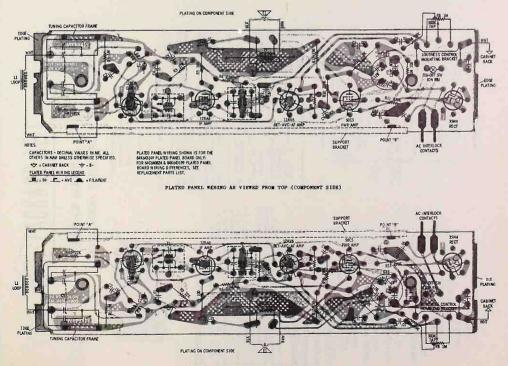
RF ALIGNMENT 2. Radiation loop

STEP

3.



ALIGNMENT POINTS & PARTS LOCATIONS



PLATED PANEL WIRING AS VIEWED FROM BOTTOM



#### 12333 W. Olympic Blvd. Los Angeles 64

# SERVICE MANUAL

# TABLE MODEL RADIO 5R5



# GENERAL DESCRIPTION:

Model 5R5 is a five tube superheterodyne radio receiver. The cabinet is plastic and is available in a variety of colors. The electron tubes are of the stand-ard miniature type, connected for AC-DC operation. A permanent magnet speaker is employed, there are two controls, the tuning knob with sweep pointer, and the values cancel with mutch. the volume control with switch.

The antenna is a high impedance pancake type loop mounted on the back of the set. If an external antenna is required, couple it to the loop as directed on back.

SPECIFICATIONS (to nearest 1/4 in.): DIMENSIONS: 51/4 h by 101/4 w by 41/4 dp

### WEIGHT: 3.3 lb

#### ELECTRICAL RATINGS:

Line voltage, 110-120 volts AC or DC Power consumption, 27 watts (Reverse power plug for minimum hum.)

#### TUNING FREQUENCY RANGE: 540 to 1620 Kc.

ELECTRICAL POWER OUTPUT, MAXIMUM: 1.7 watts

#### SPECIAL SERVICING INFORMATION: DC RESISTANCE MEASUREMENTS

1st I-F Coil: Primary, 19 ohms Secondary, 19 ohms 2nd I-F Coil: Primary, 19 ohms Secondary, 19 ohms

Manual BC-57 Oct. 10, 1958

#### **Oscillator Coil:** Primary, 1 ohm Secondary, 10 ohms

Loop Antenna: Resistance, 5 ohms

## ALIGNMENT PROCEDURE:

The alignment of the set is accomplished by following the steps in the chart below. Connect output meter to speaker voice coil. Use isolation transformer, if available, for shock protection.

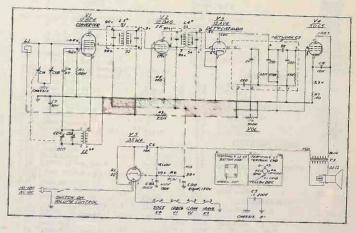
Each adjustment should be made using a minimum input signal. Connect oscillator through a .01 mfd capacitor in step one; loose-couple oscillator lead in steps two and three.

Ste	P Connect Test Oscillator To	Test Oscillator Frequency	Radio Dial Setting	Adjust
1.	Pin 1, V-1 (12BE6)	455 Kc.	540 Kc.	& S.4 for MAY
2.	Loose-couple to antenna	1620 Kc.	1620 Kc.	C-2B for MAX
3.	ditto	1500 Kc	Tune te	C 10 4-14

C-1B for Max Osc. Signal

#### (54 BENEATH) SI (S2 BENEATH) g VI CIB V2 64 CIA C28 BELOW 62A 13 V4 V5

Adjustments, Model 5R5



#### Schematic, Model 5R5

Socket voltages measured as follows: 1. Line voltage, 117 volts AC. 2. Volume control at maximum

3. VTVM between socket terminal and B minus bus 4. Only DC voltages measured. Allow 10% toil

erañce

# REPLACEABLE PARTS

#### CAPACITORS

	ERENCE	PACKARD BELL	1/2 watt, 20%, unles	s specified
	MBOL DESCRIPTION	PART NUMBER	REFERENCE	PACKARD BELL
C-1 C-1 C-2 C-2 C-3	B Trimmer, RF section Variable, osc section Trimmer, osc section	23556	SYMBOL DESCRIPTION R-1 22,000 ohms R-2 22 ohms R-3 2.2 megohms R-4 See CONTROLS	PART NUMBER 73141 73105 73165
C-4 C-5 C-6	Ceramic, 47 mmf, 20%, N14 Paper, molded case, .1 mfd, 2 Ceramic, 10,000 mmf	200 v 23707	R-5 220 ohms R-6 1000 ohms, 1 watt R-7 150 ohms	73117 73325 73115
C-7	Network	23631 23630B	ELECTRON TL	
C-8 C-9	Same as C-6 (A&B) Electrolytic, 40-20 mfd/15	50 v 24163C	V-1 Converter V-2 I-F amplifier V-3 Detector & 1st Audio V-4 Audio output	12BE6 12BA6 12AV6
	CONTROL		V-5 Rectifier	50C5 35W4
R-4	Volume, 500,000 ohms w/sw	25062E	MISCELLAN Cabinet, specify color Cord, AC power, 6 ft	Y 21152B 32032A
	COILS		KNOBS	STOOTA
L-1 L-2 L-3 L-4	Loop antenna Oscillator coil 1st I-F 2nd I-F	29361 29157B 29155	Tuning (specify color) Volume (specify color) Speaker, 4 in. PM, 3.2 ohms Transformer, audio output (T-1)	52246 52247 83019
		29156	2500 to 3.2 ohms	89487

# RESISTORS

PACKARD BELI RADIO PAGE 25

John F. Rider

MODEL 7R1

29088

ADIO

PAGE

25

L

N

PACKARD

BELL



12333 W. Olympic Blvd. Los Angeles 64

# SERVICE MANUAL

### MODEL 7R1 SIGALERT RADIO



#### **GENERAL DESCRIPTION:**

Model 7R1 is a seven tube radio receiver designed to receive police calls and sigalerts as well as standard AM broadcasts. The switch on the back selects between

- RADIO, for customary broadcast reception 1 2 POLICE, which includes all police broadcasts,
- including sigalerts. SIGALERT, which also tunes to police fre-
- 3. quency, but reproduces only sigalerts and hourly time signals.

#### SPECIFICATIONS:

- OVERALL DIMENSIONS: 121/2" w by 61/2" h by 71/2" (incl knobs) d
- ELECTRICAL RATINGS
- Line voltage 110-120 v AC or DC
- Power consumption 30 watts TUNING FREQUENCIES:
- 540 to 1620 kc
- 1730 kc

#### SHIPPING WEIGHT: 8 Ib

#### ALIGNMENT:

#### EQUIPMENT NEEDED:

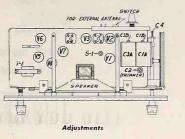
- Signal generator providing the following: 455 kc modulated by 400 or 1000 cps, 30% 610 kc 1000 kc
- 11 11 10 10 10 1500 kc 1730 kc  $\pm$  .03%, modulated by 25 cps  $\pm$  .25 cps, and also by 400 or 1000 cps.
- 2 Vacuum tube voltmeter
- Output meter, range 50 milliwatts.
- 4 Tuning wand, w/brass and powdered-iron ends 5 Capacitor, paper, .01 mfd.

#### PROCEDURE:

- Connect generator through .01 mfd capacitor to mixer grid of 12BE6 (pin 7, V-2). Negative lead goes to B-minus bus.
- 2. Connect output meter across secondary of audio output transformer. Set to 50 mw range.
- 3 Turn variable capacitor to open position and set switch to RADIO.
- Turn volume control fully clockwise.
- 5. Set generator frequency to 455 kc, modulated, and turn generator output up until a reading is obtained on meter.

Manual BC-59 Oct. 20, 1958

- 6. Adjust S2, S3, S4, and S5 for maximum reading. Now connect generator through capacitor to grid 7. of 6BJ6 (pin 1, V-1). With frequency still 455 kc, modulated, adjust S-1 (455 kc trap) for mini mum reading on meter. Disconnect generator.
- Loose couple signal generator output to antenna 8. and feed in a 1500 kc signal, modulated.
- Turn tuning control on receiver to 1500 kc 9 Adjust oscillator trimmer C3-B, and RF trimmer 10
- C1-B for maximum reading on meter.
- Set generator frequency to 610 kc, modulated (still coupled to antenna).
- 12. Test for resonance with tuning wand. If approach of iron end causes an increase in output, the antenna is tuned to too high a frequency. If brass end causes increase, it is tuned to too low a frequency. When antenna is properly tuned, either end of wand will cause a drop in output. The rotor plates OR the antenna coupling coil should be adjusted until this last condition exists.
- If an adjustment has been required in the last 13 step (12), it will be necessary to repeat steps 8, 9, & 10 14. Now set generator frequency to 1000 kc. Re-
- sponse should be about the same as for 610 and 1500 kc. Turn switch to POLICE.
- 16
- Set signal generator to 1730 kc, modulated 400 or 1000 cycles, and loose couple to antenna. 17 Adjust oscillator trimmer C-4 and RF trimmer
- C-2 for maximum meter reading. 18.
- Adjust signal generator output for 50 mw reading when modulated at 400 or 1000 cycles. Leave generator output the same and modulate with 25 cycles instead of 400 or 1000. Proceed with 25 cycle filter alignment (next page).



#### 25 CYCLE FILTER ALIGNMENT: Turn switch to SIGALERT. Feed a 1730 kc signal modulated 25 cycles ±

- 25 cycles to loose coupled antenna Connect VTVM across C-29, .47 mfd capacitor. 3
- Positive lead goes to junction of C-29 and R-30, negative to B minus bus. Set VTVM to 15 volt range 4. Adjust 25 cycle filter for maximum voltage on

1.2

29358

Trap, 455 kc

VTVM by alternately adding and removing C-19 (470 mmf) and R-24 (22,000 ohms).

NOTE: C-19 is in parallel with C-23 & R-24, and may be removed by clipping out of circuit. R-24 is in series with R-25 (215K) and may be removed or added by the use of a jumper wire.

The voltage across C-29 should be at least 8 volts at 25 cycles, and not more than 3 volts at 21 cycles and 29 cycles.

#### **REPLACEABLE PARTS, 7R1** CAPACITORS C-1A RF section of variable 23550A

Trimmer for C-1A Trimmer, 2.7 to 30 mmf C-1B 23438 C-2 C-3A Osc section of variable 23550A C-3B Trimmer for C-3A C-4 Trimmer, tubular, 1.5 to 23430 10 mmf. NPO C-5 Ceramic, 18 mmf, 5%, N750 23637 Paper, .047 mfd, 200 v C-6 C-7 Ceramic, 220 mmf, 20% 23915 Ceramic, 27 mmf, 20% Ceramic, 47 mmf, 20% Ceramic, 47 mmf, 10%, NPO Ceramic, 1.5 mmf, 10% Č-8 23912 Č-9 23833 C-10 23866 Č-11 Same as C-7 C-12A Eltriytic, 50 mfd, 150 v C-12B Eltriytic, 50 mfd, 150 v 24073 Ceramic, 10,000 mmf, GMV 23939 C-13 23916 C-14 Ceramic, 470 mmf, 20% Same as C-13 C-15 C-16 Same as C-13 C-17A Dual, same as C-12 (A & B) C-17B C-18 Paper, 15 mfd, 200 v 23708 Same as C-14 C-19 C-20 Same as C-6 C-21 Same as C-6 C-22 Same as C-6 Paper, .01 mfd, 5%, 200 v 23170 C-23 C-24 Same as C-23 C-25 Same as C-23 Paper, .15 mfd, 10%, 200 v 23308 C-26 C-27 Same as C-6 C-28 Same as C-6 C-29 Paper, .47 mfd, 200 v 23071 C-30 Same as C-6 Ceramic, 10,000 ohms, 20 % C-31 23612 Ceramic, 50,000 mmf, 50 v 23614A C-32 (C-32 at grid of V4B) C-33 Same as C-31 (C-33 near R-9) C-34 Same as C-6 (C-34 near R-6) CONTROLS R-7 Control, volume, 500,000 25047 ohms, w/switch

COILS

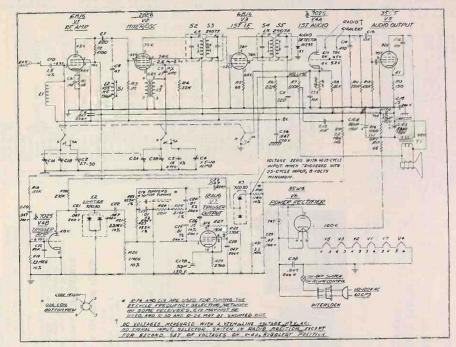
Loop, ferrite

L-1

L-3	Oscillator coil	29229
L-4 L-5	1st I-F 2nd I-F	29077 29078
L-J		25070
	RESISTORS	
	1/2 watt unless specified 10% unless specified	
R-1	68 ohms	73011
R-2	4700 ohms	73033
R·3	1 megohm, 20%	73161
R-4	22,000 ohms	73041
R-5	Same as R-1	70105
R-6 R-7	2.2 megohms, 20% See CONTROLS	73165
R-8	82,000 ohms	73048
R-9	5600 ohms	73034
R-9 R-10	2.2 megohms	73065
R-11	220,000 ohms, 20%	73153
R-12 R-13	470,000 ohms, 20% 150 ohms	73157 73015
R-14	Not used	/3013
R-15	Not used	
R-16	1000 ohms, 20%, 1 watt	73325
R-17	Same as R-1	
R-18	120,000 ohms	73050
R-19 R-20	Same as R-10 270,000 ohms	73054
R-21	Same as R-10	73034
R-22	955.000 ohms, 1%	73727
R-23	Same as R-22	
R-24 R-25	Same as R-4	
R-25	215,000 ohms, 1%	73728
R-26 R-27	1 megohm	73061 73051
R-27	150,000 ohms 330,000 ohms, 20%	73155
R-29	2700 ohms	73030
R-30	Same as R-26	
R-31	3.3 megohms, 20%	73167
	TRANSFORMER	
J-1	Audio output	89417
	2500 to 3.2 ohms	
	CRYSTALS	
V 1	Diode, 1N295, audio detector	72028
X-1 X-2	Diode, dual	72030
X-3	Same as X-2	12000
	ELECTRON TUBES	CDUC
V-1 V-2	RF amplifier Converter	6BJ6 12BE6
V-2 V-3	1-F amplifier	6BJ6
V-4A	Audio amplifier	1/27025
V-4B	Trigger amplifier	1/27025
V-5	Audio output	35C5
V-6	Rectifier	35W4
V-7	Trigger output	12AU6
	MISCELLANY	
Cabinet		21142-1
Cord, AC	power, white	32029A
Dial, rad	0	38161B
Drive con		40003 52220-1
Knob, sw	ning or volume	52227
Lamp, di	al. T-47	54002
Plug, AC	al, T-47 interlock	66047
Pointer		67045
Speaker,	6 x 4	83122 86065A
Switch		BOODDW

©John F. Rider

MODEL 7R1



Schematic Diagram, Model 7R1

ADIO PAGE

25

1

4

PACKARD BELL



SERVICE MANUAL MODELS 11RP6S, 11RP7S, 11RP8S, & 11RP9S COMBINATION RADIO-PHONOGRAPHS

12333 W. Olympic Blvd. Los Angeles 64

(CHASSIS 11HF1S)

Manual BC-56 Nov. 1, 1958

Model 11 RP95

CC č C C



Model 11RP6'S



Model 11 RP75

#### **GENERAL DESCRIPTION:**

Models 11RP6S, 11RP7S, 11RP8S, and 11RP9S are radio-phono combinations, each using the same chassis, 11HF1S. The illustrations above show the external differences, and the list of replaceable parts. points out other variations, such as speaker

complement and record changer. The chassis contains eleven electron tubes, and

is designed to receive AM and FM radio as well as to reproduce recordings. Stereophonic records may be played with the addition of an external amplifier, as described in the section headed "Stereophonic Operation.

Antennas for both AM and FM are built in the sets, but terminals are provided for an outside FM antenna which may be needed in weak- signal areas.

#### SPECIFICATIONS:

	CA	ABINET	DIMENSIONS	&	FINISHES
--	----	--------	------------	---	----------

Model	Height	Width	Depth	Finishes
11RP6S		24"	18"	MOC*
11RP7S	26"‡	24"	18"	WMOC
11RP8S	21"8	38"	18"	MOCSc
<b>11RP9S</b>	33″	31"	20"	MOCFp
•M	Mahogany,	0 - 0ak	C - Colon	
W	Walnut, Sc -	- Scandia	. Fp - Fre	nch Prov.
† Plus	legs, 12"			
‡ Plus	legs, 6"			
	legs, 10"			
	dimensions			

Cabinet dimensions are to nearest inch, and vary somewhat with the style of the cabinet.

SHIPPING WEIGHTS: 11RP6S: 60 lb. 11RP7S: 90 lb. 11RP8S: 100 lb 11RP9S: 100 lb

Model 11RP85

#### **ELECTRICAL RATINGS:**

Line voltage, 110-120 v, 60 cycles only Power consumption: 75 watts

#### TUNING FREQUENCY RANGE:

AM radio: 530 to 1620 kc FM radio: 88 to 108 mc

#### WATTS OUTPUT:

1% distortion: 6 watts 10% distortion: 10 watts Peak output: 18 watts

#### SPEAKERS & ELECTRON TUBES: See parts list.

#### STEREOPHONIC OPERATION:

Stereophonic recordings may be reproduced with the aid of an external amplifier speaker system. This system is connected to either the OUTPUT LO or the OUTPUT HI according to the setting of the switch (see next paragraph).

The switch at the rear of the set has three positions: Position 1: AM-FM HI. The tuner output, besides going thru the regular speaker-amplifier system in set, is amplified and piped to the OUTPUT HI for use with the remote system. See Position 3.

Position 2: STEREO LO. Stereo signal from cartridge goes directly, without amplification, to OUT-PUT LO. This output is for use with an external system with enough gain that preamplification of the stereo signal is not required. In this position OUTPUT HI is dead

Position 3: AM-FM LO, STEREO HI. Stereo output of cartridge is preamplified, and appears at OUTPUT HI. (Use position 2 and STEREO LO unless gain of external system is insufficient.

In position 3 the tuner output, at a lower level than in position 1, appears at OUTPUT LO. This is for a remote system with high gain.

#### DC RESISTANCE MEASUREMENTS: (Coils not listed have negligible resistance).

L-2, choke, 2 ohms L-4, 1st I-F, FM, primary 1.5 ohms, sec., 1.5 ohms.

L-5, 2nd I-F, FM, primary 2.5 ohms, sec., 0.75 ohms.

L-6, ratio detector, primary 3.2 ohms, sec., 0.25 ohms

- L-7 and L-10 chokes, 0.5 ohms
- L-8, 1st I-F, AM, primary 16 ohms, sec., 16 ohms
- L-9, 2nd I-F, AM, primary 16 ohms, sec., 16 ohms L-11, ferroloop, 0.3 ohms

L-13, oscillator, AM, primary 8.5 ohms, sec., 0.6 ohms

	CAPACITORS	
2-1	Ceramic, 1000 mmf, GMV, disc	23860
.2	Same as C-1	
.3	Ceramic, 5000 mmf, GMV, disc	23931
2.3	Same as C-1	
5	Ceramic, 47 mmf, 20%	23912
6	Ceramic, 330 mmf, 20%	23944
	Variable, four section	20044
,.,	w/trimmers	23547C
	C.7 A & B = FM RF w/trimmer	233470
	C.7 C & D = FM osc w/trimmer	C 25
	$C.7 \in \&F = AM RF w/trimmer$	0.25
	$C_{1} = A_{1} + E_{2} + E_{1} + A_{1} + A_{2} + A_{2} + A_{3} + A_{4} + A_{4$	
	C-7 G & H = AM osc w/trimmer	
-8	Same as C-3	
-9	Same as C-1	
-10 -11	Same as C-3	
-11	Same as C-3	00000
-12	Ceramic, 10,000 mmf, 500 v	23632
	Same as C-1	000074
-14	Ratio detector network	23627A
-10	Electrolytic, 5 mfd/50 v	24164
C-16	Paper, .047 mfd, 400 v	23124
2-17	Paper, .1 mfd, 400 v	23126
-18	Same as C-16	
C-19 C-20A	Not used	
C-20A	Electrolytic, 25 mfd/25 v	
C-20B	Electrolytic, 40 mfd/350 v Electrolytic, 40 mfd/350 v	24092
C-20C	Electrolytic, 40 mfd/350 v	24032
-20D -21 -22 -23	Electrolytic, 20 mfd/350 v	
C-21	Same as C-3	
.22	Same as C-1	
2-23	Ceramic, 10,000 mmf, 25 v min	23612
24	Not used	
2-25	Trimmer, 5 to 25 mmf (= C-7D)	23428
C-25 C-26	Ceramic, 4.7 mmf, 10%, NPO	23978
2-27	Same as C-5	
-27 -28	Ceramic, 1.5 mmf, 10%	23866
-29	Same as C-1	
C-29 C-30	Same as C-1	
2-31	Same as C-23	
-31 -32 -33 -34 -35	Ceramic, 220 mmf, 20%	23915
2-33	Same as C-3	
-34	Not used	
.35	Paper, .022 mfd, 200 v	23103
-36	Same as C-23	
C-36 C-37	Same as C-35	
2-38	Same as C-23	
	04110 43 0 20	

## REPLACEABLE PARTS

C-39	Electrolytic, 25 mfd/25 v	24006
C-40	Same as C-16	
C-41	Same as C-3	
C-42	Ceramic, 470 mmf, 20%	23916
C-43	Paper, .022 mfd, 400 v	23122
C-44	Same as C-16	
C-45	Paper, 1 mfd, 100 v	23040
C-46	Ceramic, 50,000 mmf, 25 v min	23614
C-47	Same as C-5	
C-48	Same as C-1	
C-49	(A & B) Ceramic, dual .01 mfdl, AC	23982A

#### CONTROLS

2.33	500,000	ohms,	tapped	100K,	
	volume				25057
2.37	500,000	ohms,	treble,	w/switch	25039A
2.39	500,000	ohms,	bass		25038A

#### COILS

L-1	Antenna, FM	29426
L-2	Choke, 1 microhenry	29124
L-3	RF, FM	29158
1.4	1st I-F. FM	29148
L-5	2nd I-F, FM	29152
L-6	Ratio detector	29084
L-7	Choke, 4.7 microhenry	29145
L-8	1st I-F, AM	29066
L-9	2nd I-F, AM	29067
L-10	Same as L-7	
L-11	Loop antenna, AM	29 <b>3</b> 58A
L-12	Oscillator, FM	29242A
L-13	Oscillator, AM	29229B

#### RESISTORS

	1/2 watt, 10% unless specified	
R-1	180 ohms	73016
R-2	4700 ohms	73033
R-3	3.3 megohmns, 20%	73167
R-4	1000 ohms	73025
R-5	120 ohms	73014
R-6	68 ohms	73011
R-7	10.000 ohms	73037
R-8	820 ohms	73024

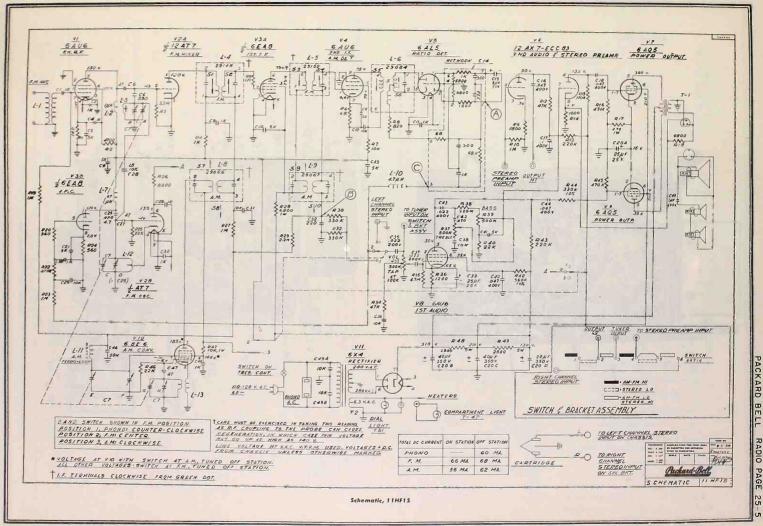




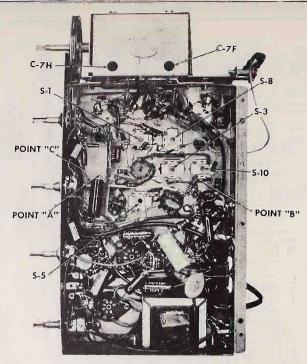
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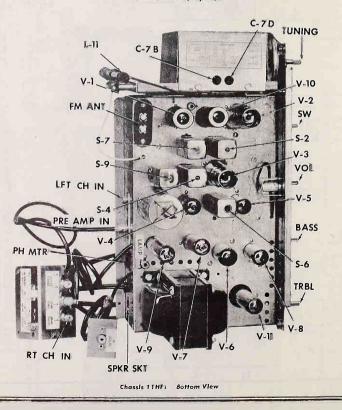
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MODELS 11RP6S, 11RP7S, 11RP8S, 11RP9S



Chassis 11HF15, Top View



CJohn F. Rider

Equipment Required: S	
igna	
generator,	
AM	
two	2
1.20	0
ohn	
1 1/2	-
wat	-
t resistors;	17.
ors; one .	
.01	
mfd,	
600	
volt	
pap	
er capacitor	

OJohn F. Rider

			TEASE IN VTVM	REPEAT STEPS 7 THRU 10 UNTIL NO FURTHER INCREASE IN VTVM READING OCCURS.	CURS.	11. REPEAT STEP READING OCC
Melt wax on L-3 and expand or compress for MAX VTVM reading. Rewax to prevent how	Melt wax on L-3 and for MAX VTVM read	Ditto	Ditto	Ditto	Ditto	10. Ditto
djust core of reading	Remove shield and adjust core of L-12 for MAX VTVM reading	Ditto	92 mc	92 mc, unmodulated	Ditto	9. Ditto
None	C7-B for MAX	Ditto	Ditto	Ditto	Ditto	8. Ditto
None	C7-D (=C25) for MAX	Negative to pt. "A," positive to ground	106 mc	106 mc, unmodulated	FM antenna terminal	7. 150 ohms in each lead
					, FM SECTION	ALIGNMENT OF R.F.
A plus or minus reading will be obtained on each side of setting.	S-6 for ZERO	Negative to pt. "C," positive to ground	Ditto	Ditto	Ditto	6. Ditto
None	S-5 for MAX	Negative to pt. "A," positive to ground	Ditto	Ditto	Ditto	5. Ditto
Reduce signal generator output to less than one volt at pt. "B"	S-1, S-2, S-3, & S-4 for MAX	Ditto	Low frequency end point	10.7 mc, unmodulated	Pin 2 of V-2A (grld, FM mixer, 1/2 12AT7)	401 mfd. in series with gen. output
					FM SECTION	ALIGNMENT OF 1-F,
Nonē	C7-F for MAX	Ditto	Tune in signal	1500 kc, modulated with 400 cps	Ditto	3. None
None	C7-Hi for MAX	Ditto	High frequency end point	1620 kc, modulated with 400 cps	Loose-couple to loop	2. None
					AM SECTION	ALIGNMENT OF R.F.
Reduce signal generator output to lowest usable level	S-7, S-8, S-9, & S-10 for MAX	Negative to pt. ''B,'' positive to ground	Low frequency end point	455 kc, modulated with 400 cps	Pin 7 of V-10 (grid 3, 6BE6)	101 mfd in series with gen. output
			AUCE AND A		AM SECTION	ALIGNMENT OF I-F,
NOTES	ADJUST	VTVM CONNECTION	DIAL SETLING	FREQUENCY	CONNECTION	ANTENNA

R 121 R R 145 R R 145 R R 147 R 147	47,000 ohn 220,000 oh 3ame as R 100,000 oh 470,000 oh 470,000 oh 470,000 same as R 560 ohms Not used Same as R 520,000 oh 330,000 oh 350,000 oh 350,0000 oh 350,000 oh 350,000 oh 350,000 o
	TRA
T-1 T-2	Output, 10, Power Prima Secon
	ELEC
V-1 V-2A V-2B V-3A V-3B V-4	FM RF amp FM mixer FM oscillato 1st I-F amp AFC 2nd I-F amp

V.4 V-5 V-6

V.7

V-8

V.9

V-10

V-11

R-9

R-10 R-11

R-12

1800 ohms 1 megohm, 20%	73028 73161
Not used	/3101
47,000 ohms	73045
220,000 ohms, 20% Same as R-9	73153
Same as R-9	
100,000 ohms	73049
470,000 ohms, 20%	73157
470 ohms, 1 watt	73221
6800 ohms Same as R-10	/3035
560 ohms	73022
Not used	/ Gome
Same as R-16	
Same as R-10	
Same as R-20	
22,000 ohms	73041
8200 ohms	73036
Same as R-10 6800 ohms, 1 watt	73221
2.2 megohms, 20%	73165
330,000 ohms, 20%	73155
Not used	,0100
Same as R-30	
See CONTROLS	
Same as R-12	
4.7 megohms	73169
1200 ohms	73026
See CONTROLS	
Same as R-13	
See CONTROLS Same as R-25	
Not used	
560,000 ohms, 20%	73158
Same as R-13	
330,000 ohms (10%)	73055
Same as R-16	
Same as R-25	
10,000 ohms, 1 waft 2500 ohms, 5 watts	73237
Same as R-48	73635
Same as R-46	
TRANSFORMERS	
Output, 10,000 ohms to 8 ohms	89460
Power	89075
Primary: 117 volts	
Secondary: 550 volts CT (	a 70 ma
6.3 volts @ 4	1/2 amp
ELECTRON TUBES	
FM RF amplifier	6AU6
FM mixer	1/2 12AT7
FM oscillator	1/212AT7
1st I-F amplifier	1/26EA8
AFC	1/26EA8
2nd LE amplifier AM detector	6A116

2nd I-F amplifier, AM detector

2nd audio & stereo preamplifier 12AX7

Ratio detector

AM converter Rectifier

Power amplifier 1st audio amplifier Power amplifier

1/26EA8 6AU6 6AL5

or ECC83 6AQ5 6AU6

6AQ5 6BE6

6X4

Cord, AC power, 8 ft.	32031
Dial, tuning	38170
Drive cord, 31 in.	40003
Knob, Treble, Bass, or Switch	52205
Knob, Volume or Tuning	52206
Lamp, T-47, compartment	54002
Lamp, T-51, dial	54006
RECORD CHANGER:	
Model 11RP6S:	
	58076
with Electro Voice stereo cartridge model 0166 with dual sapphire needle	63041
Model 11RP7S:	
	58076
with Electro-Voice stereo cartridge model 0126 with dual sapphire needle	
Model 11RP8S:	
	58077
with Electro-Voice stereo cartridge model 0126 with diamond & sapprire	
needle	63045
Model 11RP9S:	
V-M 1210 changer with Electro-Voice stereo cartridge	
model 0126 with diamond & sapprire	63045
noouro	
Spindle, 45 rpm Spindle clip: 28052	58056-1
	66013
(Used w/shield 78026)	
Pointer	67041
SPEAKERS (Impedance of each = 8 ohms)	
11RP6S: 4 in. PM (resonance 900 cycles	
4 in. PM (resonance 1200 cycles	83110
	83111
6 x 9 in. oval PM (resonance 110 cycles)	83121
11RP7S: 4 in. PM (resonance 900 cycles	5)
	83110

MISCELLANY

4 in PM (resonance 1200 cycles).

5 in. PM (resonance 1200 cycles)

12 in. PM (resonance 55 cycles) 83807

(IRP8S: 5 in. PM (resonance 900 cycles) 83211

11RP9S: Same as in 11RP8S

Switch, AM-FM-Phono

Socket, phono

10 in. PM (resonance 85 cycles) 83708B

PACKARD BELL

RADIO PAGE

25-7

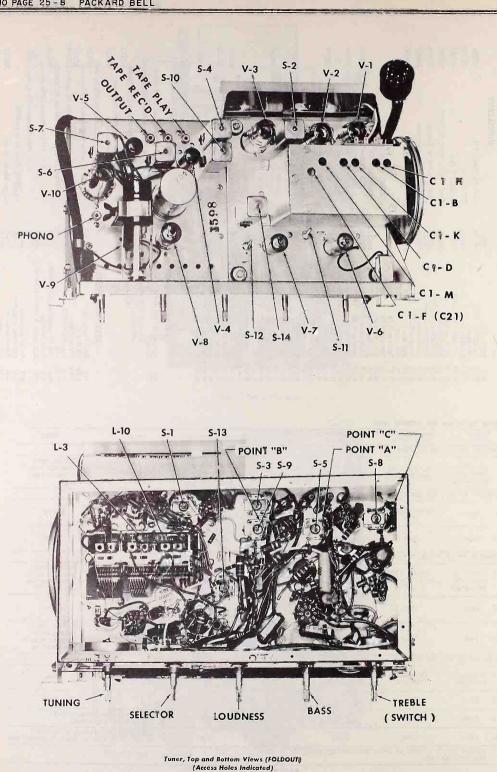
83111

83212

86072

79109





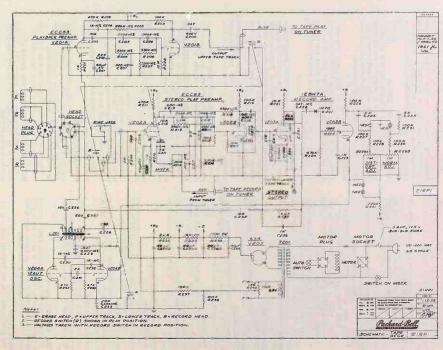
CJohn F. Rider

DUMMY SIGNAL GENERATOR		SIGNAL GENERATOR	RADIO RECEIVER DIAL SETTING	VTVM CONNECTION	ADJUST	NOTES	
LIGN	MENT OF 1-F	AM SECTION					
1.	.01 mfd in series with gen. output	Pin 7 of V-7 (grid 3, 68E6)	455 kc, modulated with 400 cps	Low frequency end point	Negative to pt "B" thru 4.7 megohms, positive to ground	S-9, <b>S-</b> 10, S-13, & S-14 for MAX	Reduce signal generator output to lowest usable level
LIGN	MENT OF R-F,	AM SECTION					
2.	Nor.e	Loose-couple to loop	1620 kc, modulated with 400 cps	High frequency end point	Ditto	C1-M for MAX	None
3.	None	Ditto	1500 kc, modulated with 400 cps	Tune in signal	Ditto	C1-H & C1-K for MAX	None
4.	None	Ditto	600 kc, modulated with 400 cps	600 kc	Ditto	S-12 & S-11 for MAX	None

6,	.01 mfd in series with gen. output	Pin 7 of V-2A (grid, FM mixer, ½12AT7)	10.7 mc, unmodulated	Low frequency end point	Negative to pt "A" thru 4.7 megohms, positive to ground	S-1, S-2, S-3, S-4, S-5, & S-6 for MAX	Reduce signal generator output to less than one volt at pt. "A"
7.	Ditto	Ditto	Ditto	Ditto	Positive to pt "C" thru 4.7 megohms, negative to ground	S-7 for MAX	Detune S-8 slightly before adjusting S-7
8.	Ditto	Ditto	Ditto	Ditto	Ditto	S-8 for min	None
LIGN	MENT OF R-F,	FM SECTION					
9.	150 ohms in each lead	FM antenna terminal	106 mc, unmodulated	106 mc	Negative to pt "A" thru 4.7 megohms, positive to ground	C1-F (= C21) for MAX	None
10.	Ditto	Ditto	Ditto	Ditto	Ditto	C1-D & C1-B far MAX	None
11.	Ditto	Ditto	92 mç, unmodulated	92 mc	Ditto	Compress or expand coil L-10 for MAX VTVM reading	
12.	Ditto	Ditto	Ditto	Ditto	Ditto	Compress or expand coil L-3 for MAX VTVM reading	

#### ALIGNMENT CHART

Equipment Required: Signal generator, AM; two 150 ohm ½ watt resistors; one .01 mfd, 600 volt paper capacitor., one 4.7 megohm resistor.



Tape Deck, Schematic

ACKARD-BELL

ART NUMBER

73030

73251

73029

25044

25522

25521

23552

23915

23611

23612

23914

23931

23603

23944

23860

23616

23862 23432

23912

23978

23930

23910

23105

23324

23986

#### Tape Deck

THE TAPE DECK IS FOUND ONLY ON MODEL 21RP1 BUT THIS SECTION MAY BE USEFUL IN USING AN EXTERNAL TAPE RECORDER WITH THE 16RP1

MIXER control is used to add phone or radio output to microphone recording.

LEVEL control adjusts volume to correct level for tape recording as indicated by the NORMAL and DIS-TORT lamps. It also controls volume of stereo output when playing binaural tapes.

DISTORT adjustment, NORMAL adjustment, and HUM adjustment are concealed.

CONNECTORS (cable with pin-plug)

- 1. RED cable: to TAPE REC'D on tuner chassis. Receives audio signal for recording on tape.
- 2. BLUE cable: to TAPE PLAY on tuner chassis. Feeds output of playback preamplifier to tuner chassis, then to power chassis.
- 3. STEREO OUTPUT. Feeds pre-amplified output of binaural head to external amplifier and speaker.

MICROPHONE JACK. Besides microphone supplied, any high impedance crystal, ceramic, or dynamic microphone may be plugged into this receptacle

#### PUSH BUTTONS

Stop Button

The STOP button should be depressed before each operation and when the machine is not in use

#### **Record Button**

Depress the RECORD button for recording a tape. The red SAFETY lever must be held to the right before the RECORD button can be depressed.

#### Play Button

Depress the PLAY button for playing back a recording. Adjust the VOLUME control and TONE controls on the tuner chassis.

**Rewind and Forward Buttons** 

These wind the tape in either direction at high speed.

#### RECORD LEVEL INDICATORS

Distort Indicator

The DISTORT lamp indicates when tape is being overloaded while recording. Adjust the LEVEL control so that faint flashes occur at loudest sounds.

#### Normal Indicator

The NORMAL lamp indicates correct recording level. Adjust the LEVEL control until the NORMAL lamp flashes regularly.

#### TAPE INDEX TIMER

Set both the large and small dials of the timer to zero after threading a reel of tape. After each selection is recorded, note the timer readings for future reference

#### SPEED CONTROL BUTTON

The pointer on the speed control knob indicates the speed (inches per second) at which the tape is passing by the heads. To change speed, turn speed control knob after depressing stop button.

#### SAFETY LEVER

The safety lever locks the RECORD button to prevent accidental erasing. Push "S" lever to the right and hold while depressing the RECORD button.

#### PAUSE BUTTON

To stop the travel of the tape while recording or playing, push the PAUSE button. To lock, push it to the rear and move it to the right. The purpose of this control is to allow for the adjustment of recording volume before the tape is set in motion, to eliminate commercials from a radio recording, or lulls from a recorded conversation.

RE

#### AUTOMATIC SHUT-OFF SWITCH

The mechanism is automatically shut off unless tape is threaded in front of the plastic shut-off lever. Should tape break, or the supply wheel become empty, the mechanism will shut off automatically and will remain so until the machine is rethreaded.

#### STEREOPHONIC TAPES

Stereophonic tapes of the type called "stacked", or "in line", may be played on the 21RP1 by attaching an additional amplifier and speaker system to the jack marked STEREO OUTPUT. This allows the second soundtrack to be amplified and reproduced simultaneously with the first.

#### THREADING THE TAPE

With STOP button depressed, place empty reel on right hand (take-up) spindle. Place a full reel of tape on left hand (supply) spindle, so that it unwinds counterclockwise. Thread tape, glossy side out, following threading line (embossed in plastic escutcheon) straight through the slot in the covers and in front of the plastic automatic shut off lever. Place tape in front of chrome plated tape guide and insert free end of tape into hub slot of right hand reel. Wind right hand reel one or two turns counterclockwise to take up slack.

Detailed instructions for performing the various operations of recording, playback, etc., are given in the operating instructions supplied with the set.

ADJUSTMENT OF RECORDING INDICATOR LIGHTS Set MIXER and VOLUME controls to maximum.

Inject 30 millivolts at 1000 cycles into TAPE REC'D plug (red cable). Set NORMAL adjustment so that NORMAL light just flickers.

Increase voltage to 0.5 volts (1000 cycles). Set DISTORT adjustment so that DISTORT light just flickers or goes out.

As a further check, advance voltage to one volt (1000 cycles) and turn VOLUME to minimum. Now advance it (clockwise). The NORMAL should light between one-quarter and one-half turns, and the DIS-TORT between one-half and three-fourths.

Turn VOLUME full up and MIXER to minimum Both lamps should now be out.

#### HUM ADJUSTMENT

Turn on receiver and tape mechanism. Set SE-LECTOR switch to TAPE position and turn the TREBLE, BASS and LOUDNESS controls to maximum. Then adjust HUM control (R-238) for minimum hum.

Reverse AC power cord plug and readjust HUM control. Use plug position that produces the least hum.

#### MECHANICAL ADJUSTMENTS AND PARTS LIST

See Service Manual on V-M models 711 and 750 (published by V-M Corporation) for mechanical adjustments and parts list.

Packard-Bell Factory Service Depts. will be supplied with a copy of the V-M manual.

#### **REPLACEABLE PARTS, TUNER CHASSIS**

	RESISTORS (1/2 w unless specified)		REFEREN SYMBO	L DESCRIPTION P.	ACKAR
FEREN	(10% unless specified)		R-60	2700 ohms	73
		ACKARD-BELL	R-61	150,000 ohms, 1 watť	73
SYMBO		ART NUMBER	R-62	Same as R-32	
R-1	470,000 ohms, 20%	73157	R-63	Same as R-27	
R-2	68 ohms	73011	R-64	2200 ohms	73
R-3	Same as R-1		R-65	Same as R-61	
R-4	3.3 megohms, 20%	73167	R-66	Same as R-15	
R-5	180 ohms	73016		CONTROLS	
R-6	180 ohms (w/ coil) See coil L-	-4	D 42		
R-7	47,000 ohms	73045	R-42	1 megohm, tapped, volume	25
R-8	100 ohms	73013	R-48	5 megohms, w/ switch, treble	25
R-9	Same as R-8		R-51	5 megohms, bass	25
R-10	10,000 ohms, 2 watts	73437		CAPACITORS	
R-11	Same as R-10		C-1	Variable, 6-gang w/ trimmers	23
R-12	1000 ohms	73025	<b>•</b> •	Sec. A-B — FM antenna & trim	- Co
R-13	220,000 ohms, 20%	73153		Sec. C-D - FM RF & trimmer	inter
R-14	27,000 ohms	73042		Sec. E-F - FM osc & trimmer	1
R-15	150,000 ohms, 5%	73051-1		Sec. G-H — AM antenna & tri	21
R-16	Same as R-15	/3051-1			nmer
R-17	68.000 ohms	72047		Sec. J-K — AM RF & trimmer	
R-18	220 ohms	73047	0.0	Sec. L-M - AM osc & trimmer	
R-19		73017	C-2	Ceramic, 220 mmf, 20%	23
R-20	Same as R-1	70007	C-3	Ceramic, 5000 mmf, +80,	23
R-21	10,000 ohms, 1 watt	73237		-20%, working voltage, 25 v	1
	Not used			minimum, 1/4 in. dia. Ceramic, 10,000 mmf, 25 v,	
R-22	560 ohms	73022	C-4	Ceramic, 10,000 mmf, 25 v,	
R-23	1 megohm, 20%	73161		3/8 in. dia (see p/m 4)	23
R-24	15,000 ohms, 1 watt	73239	C-5	Same as C-3	
R-25	22,000 ohms	73041	C-6	Ceramic, 100 mmf, 20%	23
R-26	6800 ohms, 2 watts	73435	C-7	Same as C-6	
R-27	2.2 megohms, 20%	73165	C-8	Ceramic, 5000 mmf, GMV	23
R-28	Same as R-13		C-9	Ceramic, 1 mmf, 10%	23
R-29	Same as R-13		C-10	Same as C-6	
R-30	Same as R-27		C-11	Ceramic, 330 mmf, 20%	23
R-31	Not used		C-12	Ceramic, 1000 mmf, GMV	23
R-32	47,000 ohms, 1 watt	73245	C-13	Same as C-12	2.
R-33	Same as R-27	10210	C-14	Ceramic, 100 mmf, 5%, N47	23
R-34	470 ohms	73021	C-15	Same as C-3	2 22
R-35	Same as R-20	TOOLX	C-16	Same as C-12	
R-36	Same as R-1		C-17	Same as C-8	
R-37	10,000 ohms	73037	C-18	Same as C-4	
R-38	Same as R-25	73037	C-19	Same as C-4	
R-39	15,000 ohms, 2 watts	73439	C-20	Same as C-6	~
R-40	100,000 ohms, 20%		C-20 C-21	Ceramic, 10,000 mmf, GMV	23
R-41	Same as R-7	73149	0-21	Trimmer for C-1, sec F, 3 to	23
R-42	See CONTROLS		0.00	12 mmf, NPO	
R-43			C-22	Same as C-6	
R-43	Same as R-40		C-23	Same as C-20	
	1800 ohms	73028	C-24	Ceramic, 47 mmf, 20%	23
R-45	Not used		C-25	Same as C-12	
R-46	Same as R-40		C-26	Same as C-12	
R-47	Same as R-20		C-27	Same as C-6	
R-48	See CONTROLS		C-28	Same as C-4	
R-49	Same as R-23 (see p/m 3)		C-29	Ceramic, 4.7 mmf, 10%, NPC	23
R-50	390,000 ohms (see p/m 3)	73056	C-30	Same as C-24	
R-51	See CONTROLS		C-31	Same as C-12	
R-52	Same as R-40		C-32	Tweet filter, seé diagram	23
R-53	330,000 ohms, 20%	73155	C-33	Same as C-20	
R-54	Same as R-25		C-34	Ceramic, 15 mmf, 20%	23
R-55	Same as R-32		C-35	Same as C-2	
R-56	4.7 megohms, 20%	73169	C-36	Paper, .047 mfd, 200 v	23
R-57	Same as R-27 (see p/m 1)	10105	C-37	Paper, .047 mfd, 400 v, 10%	
R-58	Same as R-23 (in 6E5 skt)		C-38	Ceramic, 5000 mmf, 10%	23
R-59	Same as R-7		C-39	Same as C-34	23
	001110 001117		0.35	Quine 43 0-34	

	and succession in succession	DACK	ARD-BELL	REFEREN	CF		PACK	ARD-BELL
REFERENC			NUMBER	SYMBO		DESCRIPTION		NUMBER
SYMBO	Same as C-24	PARI	NUMBER	L.7		I-F, AM		29067
C-40				L-7		I-F. FM		29096
C-41	Same as C-8					criminator		29092B
C-42				L-9			~	29238B
C-43	Same as C-20			L-10		illator, FM (see p/m	2)	292366
	Same as C-36			L-11		enna, AM		
	Same as C-4			L-12		AM		29143
	Same as C-36			L-13		illator, AM		29237
	Same as C-6			L-14	1st	I-F, AM		29093
C-48A	Electrolytic, 40 mfd, 450	V)	1.			MISCELLANEOUS P	ARTS	
	Electrolytic, 40 mfd, 450		24147	Orientiday		#C-1D3SC		63037
C-48C	Electrolytic, 20 mfd, 450	V				#4-GC-1D3SC		63038
C-49	Paper, .022 mfd, 400 v		23122					58066A
C-50	Ceramic, 82 mmf, 10%			Changer,				28000A
	(see p/m 3)		23964			C-121)		
C-51	Same as C-12			Dial, gla:				38162A
C-52	Ceramic, 2000 mmf, 200	4	23839	Dial, pap	ber			65221
C-53	Same as C-4	0	20005	KNOBS				
C-54	Paper, .1 mfd, 200 v		23107	Treble	Ba	sis, Loudness & Selec	tor	52205
C-55			25107	Tunin				52206
	Same as C-20			Magic	Pow	er-Minder		52210
C-56	Same as C-20			Lamp, T-		er minder		54002
C-57	Same as C-12			Plug, spl				66013
C-58	Same as C-52			Filling, spi	NI /c	hield 78026)		00010
C-59				Pointer	w/ 5	neid / 6020)		67044A
	Same as C-8							79109
C-61	Same as C-8			Socket,			- 1	19105
C-62	Same as C-8					mpedance of each: 8	onms)	00011
	COILS					00 cps resonance		83211
L-10	Antenna, FM		29425B	5" PI	M, 1:	200 cps resonance		83212
L-2	Choke, RF		29145			cps resonance		83808
L-3	RF coil, FM		29144D	Switch, I				86061
1.4	Choke, suppressor		29146	Switch, p	powe	r-minder		86064
L.5	1st I-F, FM		29148			064-1)		
1-6	2nd I-F, FM		29148			UBES & CRYSTAL:	See p 2	
20				***		SUPPLY		
	CAPACITORS	CEAD	LE PAR	REFEREN		COUPPEI	PAC	ARD-BEL
REFEREN		PACH	ARD-BELL	SYMBO		DESCRIPTION		NUMBE
SYMBO			NUMBER	R-114		ame as R-113		. Hernber
C-101			23916	R-115		ame as R-113		
		%						
C-102			23126	R-116		ame as R-113		
	A Electrolytic, 40 mfd, 4			R 117	S	ame as R-105		70710
C-103	B Electrolytic, 40 mfd, 45	50 v }	24147	R-118	3 V	irewound, 125 ohms	, 10 watt	s /3/18
C-103	C Electrolytic, 20 mfd, 45	0 y 1		R-119		irewound, 1000 ohm		
C-104			23145	R-120		/irewound, 2000 ohm	is, 5 watt	
C-105				R-121	1 1	0 ohms		73001
- C-106	Electrolytic, 250 mfd, 2	5 v	24144			TRANSFORMER	S	
C-107	Ceramic, dual 10,000 r	nmf, AC	23982A	T-101	L C	utput		89478A
C-108			24143	T-102		ower		89063
C-109			24146			Pri: 117 v		
	non-polarized					Sec: 5 v @ 3 amp		

C-103B	Electrolytic, 40 mtd, 450 v >	24147	K-118	wirewound, 125 onms, 10 watts	/3/10
C-103C	Electrolytic, 20 mfd, 450 v		R-119	Wirewound, 1000 ohms, 5 watts	73621
C-104	Paper, .1 mfd, 600 v	23145	R-120	Wirewound, 2000 ohms, 5 watts	
C-105	Same as C=104	Forte	R-121	10 ohms	73001
C-106	Electrolytic, 250 mfd, 25 v	24144	11.757	TRANSFORMERS	10001
					004704
C-107	Ceramic, dual 10,000 mmf, AC		T-101	Output	89478A
C-108	Electrolytic, 40 mfd, 450 v	24143	T-102	Power	89063
C-109	Electrolytic, 5 mfd, 25 v,	24146		Pri: 117 v	
	non-polarized			Sec: 5 v @ 3 amp	
				700 v CT @ 225 ma	
	RESISTORS			6.3 v @ 3 amp	
	(10% unless specified)			6.3 v @ 21/2 amp	
	(1/2 w unless specified)			ELECTRON TUBES	
R-101	1500 ohms	73027	V=1014	Audio amplifier )	
R-102	470,000 ohms, 20%	73157	V-101B		6AN8
					ALL OT
R-103	270,000 ohms	73054	V-102	Output	6V6-GT
R-104	1.2 megohms	73062	V-103	Output	6V6-GT
R-105	680 ohms, 1 watt	73223	V-104	Output	6V6-GT
R-106	47 ohms	73009	V-105	Output	6V6-GT
R-107	47,000 ohms, 5%, 1 watt	73245-1	V-106	Rectifier	5U4-GB
R-108	Same as R-107			MISCELLANEOUS PARTS	
R-109	Same as R-107		Cord, AC	internation of the state	32011
R-110	Same as R-103		Socket, 4-	nin AC	79180
R-111	Same as R-103		Socket, ph		79005
R-112	820 ohms, 2 watts	73424	Socket, po		79122
R-113	1000 ohms	73025	Socket, sp	Jeaker	79004

#### CJohn F. Rider

#### REPLACEABLE PORTS, TAPE DECK

	RESISTORS			CAPACITORS	
	(1/2 watt unless specified) (10% unless specified)		REFERENCE SYMBOL	DESCRIPTION	PACKARD-BELL PART NUMBER
REFERENCE	PA	CKARD-BELL	C-201	Electrolytic, 40 mfd, 3 v	
SYMBOL	DESCRIPTION PAI	RT NUMBER	C-202 C-203	Ceramic, 220 mmf, 20% Ceramic, 10,000 mmf, 0	6 23915 GMV 23862
R-201	1000 ohms	73025	C-203	Ceramic, 10,000 mmf, 10	% 23983
	470,000 ohms, 20%	73157	C-204	Paper, .0068 mfd, 10%	
	220.000 ohms	73053	C-206	Same as C-205	, 2001 20110
	330:000 ohms	73055	C-207	Paper 022 mfd. 10%.	200 y 23177
	100,000 ohms	73049	C-208	Paper, .022 mfd, 10%, Paper, .047 mfd, 20%,	400 v 23124
	Same as R-204	75045	C-209	Ceramic, 100 mmf, 209	6 23914
	Same as R-204		C-210	Same as C-201	
	10 megohms, 20 %	73173	C-211	Ceramic, 5000 mmf, GM	AV 23931
	1 megohm, 20%	73161	C-212	Same as C-203	02002
	Same as R-201	13104	C-213	Ceramic, 680 mmf, 109	6 23892
	Same as R-202		C-214	Same as C-205 Same as C-205	
	Same as R-202		C-215 C-216	Ceramic, 2000 mmf, 20	23839
	See CONTROLS		C-217	Same as C-207	/0 20005
	Same as R-204		C-218	Paper, .047 mfd, 10%	400 v 23324
	Same as R-205		C-219	Same as C-202	
	Same as R-204		C-220A	Electrolytic, 25 mfd, 25	V )
	Same as R-208			Electrolytic, 40 mfd, 35	
	Same as R-204			Electrolytic, 40 mfd, 350	OV (
	Same as R-205			Electrolytic, 20 mfd, 350	5v /
	See CONTROLS		C-221	Same as C-208	
	10.000 ohms	73037	C-222 C-223	Same as C-218 Same as C-204	
	56.000 ohms	73046	C-224	Same as C-211	
	2200 ohms	73029	C-225	Same as C-211	
	Same as R-202	10020	C-226	Same as C-203	
	Same as R-205		C-227	Same as C-202	
R-226	Same as R-205		C-228	Same as C-202	
R-227	Same as R-205		C-229	Same as C-218	
R-228	Same as R-205		C-230		
R-229A			C-231 C-232	Same as C-216 Same as C-204	
R-229B			C-233	Ceramic. 20,000 mmf. 2	20% 23972
	Same as R-205		C-234	Electrolytic, 40 mfd, 45	
R-231	Same as R-205		C-235	Same as C-203	
	47.000 ohms	73045	C-236	Ceramic, 1000 mmf, GM	AV 23860
	Same as R-232			01005	
	22,000 ohms	73041		DIODE	
	10,000 ohms, 1 watt	73237	X-201	Crystal diode 1N70	72040
	2500 ohms, 5 watts	73635		COILS, TRANSFORM	ERS
R-237	Same as R-205		L-201	Coil, bias oscillator	29240
R-238	Same as R-205		T-201	Transformer, power	89068
R-239	120,000 ohms	73050			
R-240	See CONTROLS		70 - 1 10	MISCELLANY	and on Tupor and
R-241	Same as R-203			tion to Miscellany listed u Power Supply sec.	.)
			Fuse, 3 am	np, 125 volt, slo-blo	45043
			Jack, micr		51005 52205
	CONTROLS		Knob, mix	er and volume	54009
			Lamp, neo Lamp, neo		54010
R-213	500,000 ohms, mixer, w/ swit	tch 25048	Microphon		57013
R-220	500,000 ohms, recording lev	el 25058	Shield, no		78114
R-229A	1 megohm, distort adjust	ual 25050	Switch, pu		86307
R-229D	I megorini, normai aujusti				
R-240	150 ohms, hum control	25943			

MODELS 6R1, 6RC1

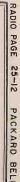
PACKARD-BELL

PART NUMBER

29077

35C5

35W4







12333 W. Olympic Blvd. Los Angeles 64

#### SERVICE MANUAL

Manual BC-50 Jan. 15, 1958

RE

L-3

Oscillator coil

#### TABLE MODEL RADIO 6R1 CLOCK RADIO MODEL 6RC1





#### GENERAL

The circuit used in both models is a six tube superheterodyne receiver circuit with an untuned RF stage. Standard miniature tubes are connected for AC-DC operation. Sixty cycle AC is required for clock operation

The schematic diagram is the same for both models except for the addition of the timer (clock) motor. nite-lite, and second speaker to model 6RC1.

The 6R1 has one 6 by 4 in. oval speaker, while the 6RC1 contains two 3 in. speakers. The latter are connected in series, with a red dot indicating the input side for proper phasing. The nite-lite in the 6RC1 is turned on by the push-

pull switch on the volume control. In the 6R1 this switch is the radio ON-OFF control.

#### CLOCK OPERATING INSTRUCTIONS

Operating instructions are attached to the bottom of the clock radio and are repeated here.

Radio knobs:

Left is volume control and switch (pull out) for nite-lite. Right is tuning. Clock knobs

	Left is sleep switch, for 0 to 60 min. Right is control knob.
P FOR	PROCEDURE
Radio only	Set control knob to ON and adjust tuning

- and volume. Turn set on with sleep switch, tune 2. Radio with station and set sleep switch to interval desired before shut-off. (60 min = 180°) After step 1, set alarm and turn control knob to AUTO. shut-off
- 3. Automatic turn-on 4. Automatic After step 3, turn control knob to ALARM.
- turn-on with Buzzer will follow radio turn-on by 10 minutes. After step 2, set control knob to either buzzer 5. Automatic
- shut-off and AUTO or ALARM. turn-on

To service tubes, remove two hex head screws at rear of cabinet, and slide entire chassis and front panel out of cahinet.

CABINET DIMENSIONS (to nearest 1/4 in.); 6 in. h by 121/2 in. w by 6 in. d SHIPPING WEIGHT: Radio 6R1: 8 lb. Clock radio 6RC1: 8 lb ELECTRICAL RATINGS: Line voltage 110-120 volts AC or DC (must be 60 cycle AC for clock radio) Power consumption, 30 watts for radio, 32 watts for clock radio TUNING FREQUENCY RANGE: 540 to 1620 kc. POWER OUTPUT, MAXIMUM: 1.9 watts

SPECIFICATIONS: (both models unless noted)

#### SPEAKER DATA:

See parts table, also general description above. SPECIAL SERVICING INFORMATION: OSCILLATOR GRID VOLTAGES, Pin 1, V-2:

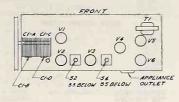
(Measured using a VTVM with input impedance of more than 10 megohms. Line voltage 117 volts AC )

1500 kc	-5.5 volts DC (rms)
1000 kc	-5.5 volts
750 kc	-5 0 volte

540	kc	-4.8 volts	
NMENT	DDO	CEDURE.	

#### ALIG The alignment of the set is accomplished by fol-

lowing the steps in the chart below. Connect output meter to speaker voice coil. Use isolation transformer between radio and power line to reduce shock hazard. Each adjustment should be made using a minimum input signal. Connect test oscillator through a .01 mfd capacitor to the point indicated below. Ground lead of oscillator is connected to B minus bus.



Adjustments

Step	Connect Test Oscillator to	Test Oscillator Frequency	Radio Dial Setting	Adjust
1.	Pin 1, V-1 (12BA6)	455 kc	540 kc	S-1 for minimum
2.	ditto	ditto	ditto	S-2, S-3, S-4, & S-5 for MAXIMUM
3.	ditto	1620 kc	Tune to	C1-D for MAXIMUM
4.	Loose-couple to antenna	1500 kc	1620 kc oscillator	C1-B for MAXIMUM

#### REPLACEABLE PARTS MODELS 6R1 & 6RC1

Parts are common to both models unless noted.

	RESISTORS (Rating 1/2 watt unless no	oted)	REFERENC	
EFERENC	E	PACKARD-BELL	L-4	1st I-F
SYMBOL	DESCRIPTION	PART NUMBER	L-5	2nd I-F
R-1	68 ohms, 10 %	73011	T-1	Transformer, o
R·2	4700 ohms, 10%	73033		2500 to 3.2 of
R-3	1 megohm, 20 %	73161		SPEA
R-4	22,000 ohms, 10%	73041	Model	Oval, 6 x 4 in.,
R-5	Same as R-1		6R1	Impedance 3.2
R-6	2.2 megohms, 20%	73165		
R·7	Control, volume,		Model	Three in. dia.,
	500,000 ohms w/switch	25047	6RC1	Impedance of
(Switch is	ON-OFF on 6R1 and Nite	-Lite on 6RC1)		3.2 ohms
R-8	4.7 megohms, 20%	73169		KNO
R-9	220,000 ohms, 20%	73153	Both	Tuning & Volu
R-10	470,000 ohms, 20%	73157	models	
R-11	150 ohms, 10%	73015	6RC1	Timer knob (tv
R-12	1000 ohms, 20%,	73325	only	
	1 watt			MISCE
R-13	Same as R-1		Cabinet	
			Cord, AC	
	CAPACITORS			1 (#18 AWG)
C-1	Variable, two gang &	23550A		C1 (#16 AWG)
(A, B,	trimmers		Dial	
C, D)				eon, front
C-2	Paper, molded case,	23705	6R 6R	
	.047 mfd. 200 volts		Light, di	
C-3	Ceramic, 220 mmf, 209		Light "	Nite-Lite", T-43
C-4	Ceramic, 47 mmf, 20%	23912		6RC1 only)
C-5 C-6	Same as C-4	23707	Timer (c	
0-0	Paper, molded case, .1 mfd, 220 volts	23/0/		6RC1 only)
C-7	Same as C-3			interlock
C-8	Ceramic, 5000 mmf, GM	V 23931	Pointer	
C-9	Ceramic, 470 mmf, 209		Pulley	
C-10	Ceramic, 10,000 mmf, (			AC appliance
C-11	Same as C-10	20000		n 6RC1 only)
C-12	Dual 50 mfd/150 volts	24073B		ELECTRO
(A & B)		2.11.11	V-1	<b>R-F</b> Amplifier
C-13	Same as C-2		V-2	Converter
			V-3	I-F Amplifier
	COILS & TRANSFORM	ERS	V-4	Detector and /
1-1	Loop, ferrite	29358		Amplifier
L-2	Trap, 455 kc	29088	V-5	Audio output
1.0	0 111 1 11	000000	11.0	D -1'//-

29229B

V-6

Rectifier

L-5	2nd I-F	29078
т.1	Transformer, output 2500 to 3.2 ohms SPEAKERS	89417A
Model 6R1	Oval, 6 x 4 in., one used Impedance 3.2 ohms	83122
Model 6RC1	Three in. dia., two used Impedance of ea., 3.2 ohms	83120
	KNOBS	
Both models	Tuning & Volume	52227A
6RC1 only	Timer knob (two used)	52226B
1	MISCELLANY	
Cabinet		21142D
6F	C power R1 (#18 AWG) RC1 (#16 AWG)	32029A 32028A
Dial		38161A
	eon, front	
66	C1	41140C 41124D
Light d	ial T.47	54002
Light. "	ial, T-47 Nite-Lite'', T-43	54007
(0	n 6RC1 only)	
Timer (		58064A
	n 6RC1 only)	
Plug, Al Pointer	C interlock	66047 67045A
Pulley		69003C
Socket.	AC appliance	79096
(0	n 6RC1 only)	
	ELECTRON TUBES	
V-1	R-F Amplifier	12BA6
V-2	Converter	12BE6
V-3	I-F Amplifier	12BA6
V-4	Detector and Audio	12AV6
	Amplifier	

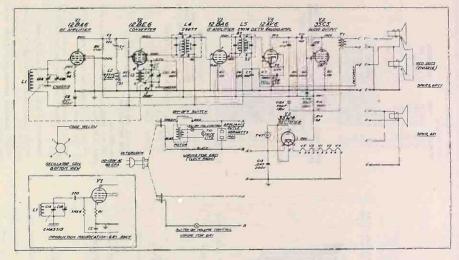
DESCRIPTION

CJohn F. Rider

STE

## DACKADA DELL BANIA DACE 25-15

PACKARD BELL RADIO PAGE 25-13



Note production modification at lower left on 6R1 only.

DC RESISTANCE MEASUREMENTS: 1st I-F Coil (29077): Primary, 12 ohms Secondary, 13 ohms

2nd I-F Coil (29078) Primary, 13 ohms Secondary, 13 ohms

Schematic, 6R1 & 6RC1. Note differences in speaker section and AC power input section in the two circuits.

> Oscillator Coil (29229B) Primary, 1 ohm Secondary, 5.5 ohms

Loop antenna: Resistance, 0.3 ohms

RADIO

PAGE

25-14

PACKARD

.

ELL



## SERVICE MANUAL

MODEL 16RP1 COMBINATION PHONO-RADIO MODEL 21RP1 COMBINATION PHONO-RADIO-TAPE RECORDER

12333 West Olympic Blvd. Los Angeles 64, Calif.





Walnut or Oak Finish

(Apply to both the 16RP1 and 21RP1 unless noted)

#### Colonial Finish (Mhgny Similar)

#### GENERAL DESCRIPTION:

Model 16RP1 is a high-fidelity combination phonograph and radio (AM and PM) containing a total of sixteen electron tubes, including rectifier. Separate treble and bass controls are provided, and the ON-OFF switch is the push-pull type, operated by the treble control knob. The selector switch has six posi-tions, two for AM and FM radio, three for record reproduction (AES, LP, and 78), and one for tape playback from an external tape recorder.

The record changer is automatic, four speed, with a spindle provided for 45 rpm records. Antennas for both AM and FM are built-in the set, but in fringe areas a separate antenna may be needed for FM recention

A special feature is the "Magic Power Minder" switch which may be set to turn off power after last record is completed.

Provision is made for connecting additional speak ers if desired. Connections for four, eight, or sixteen ohms impedance are available.

Model 16RP1 is divided into two chassis: the tuner chassis and the power supply chassis. The former contains the AM and FM circuitry, plus two stages of audio to the output receptacle. The power supply chassis, besides furnishing power to the system, contains the push-pull parallel output stages

Model 21RP1 consists of the two chassis comprising the 16RP1 plus a tape recorder and associated amplifier on a third chassis, the tape deck. This has five additional tubes, making the total twenty-one.

A block diagram illustrates the functions of the component circuits for both the 16RP1 and 21RP1.

**OJohn F.** Rider

#### TUBE COMPLEMENT:

#### Tuner chassis:

fier
det'r
ager
M
ator
ňp

REFEREN		PACKARD-BELL
YMBOL	DESCRIPTION	PART NUMBER
X-1	Crystal, Amperex 1N542	72027
X-2	(matched pair)	

V-101	6AN8	Audio amp! & inverter
V-102	6V6-GT	)
V-103	6V6-GT	1
V-104	6V6-GT	Parallel pushepull output
V-105	6V6-GT	
V-106	5U4•GB	Rectifier

V-201	(A & B)	
	ECC83	Playback pre-amp
V-202A	1/2 ECC83 .	. Stereo OR mic pre-amp
V-202B	1/2 ECC83	. Stereo pre-amp OR mixer
V-203A	1/2128H7A	. Stereo output OR recording ampl
V-203B	1/212BH7A	. Recording amplifier
V-204	(A&B)	6 -
	12AU7	. Bias oscillator
V 205	6YA	Destifies

#### CONTROLS, CONNECTORS, SWITCHES, AND INDICATORS:

**Tuner Chassis** 

TREBLE, BASS, and LOUDNESS knobs are indicated by markings.

ON-OFF switch is push-pull type operated by TRE-BLE control knob.

SELECTOR switch has positions for FM radio, AM radio, Tape playback, and three positions for phonograph

TUNING knob is for both AM and FM radio.

POWER CABLE plugs into receptacle on power supply chassis.

PHONO receptacle receives pin-plug from record player cartridge.

OUTPUT receptacle feeds output of audio ampli-

#### fier in tuner through cable to dual push-pull power amplifier and speakers.

TAPE REC'D receptacle feeds output of radio or phono to MIXER in tape deck in Model 21RP1, or to any external tape recorder used with model 16RP1.

TAPE PLAY receptacle receives input from tape playback pre-amplifier in tape deck (Model 21RP1) or other tape output (Model 16RP1).

TUNING INDICATOR tube allows visual control for accurate frequency adjustment.

#### Power Supply Chassis

INPUT receptacle receives audio signal from tuner chassis for final amplification and output.

EXTERNAL SPEAKER connections are provided for attaching an additional speaker (s) if desired. Binding posts are marked for speaker impedances of 4. 8, or 16 ohms.

SPEAKER socket and SPEAKER plug are both on this chassis, as are the PHONO AC plug and socket ..

TAPE RECORDER AC socket is used with tape deck or other tape recorder.

POWER RECEPTACLE feeds power thru cable attached to tuner.

#### RECORD CHANGER

The operation of the record changer is covered by the booklet furnished with the set and printed by the manufacturer (Garrard) of the changer. An important adjunct to the changer is the Magic Power-Minder switch described immediately below.

#### MAGIC POWER®MINDER

A special feature of your instrument is the Magic Power-Minder switch. This is controlled by the knob near the left rear corner of the record changer. There are two positions of this knob: MAN'L and AUTO.

(Be sure to distinguish between this switch and the AUTO-MANUAL switch on the changer plate.)

When the Magic Power-Minder is in MAN'L position, changer will turn off after last record but set will remain on.

When the Magic Power-Minder is in AUTO position. entire set will turn off after last record

Leave the Magic Power-Minder knob in MAN'L position unless it is desired to turn off entire set after last record.

To use this automatic power off feature, the record player must be in operation automatically (records stacked, switch ON CHANGER set to AUTO, and control knob set to START). Then the Magic Power-Minder knob is turned to AUTO and the set left to turn itself off.

SWITCHING TO "AUTO" WHILE CHANGER IS NOT OPERATING WILL TURN OFF THE SET.

V-205 6X4 ..... Rectifier

# S

V-2A		. FM mixer
V-2B	1/212AT7	. FM oscillator
V-3A	1/26118	. 1st I-F amplifier
V-3B	1/26U8	AFC
V-4	6AU6	I-F ampl; AM det'r
V-5	6AU6	Limiter
V-6	6BA6	RF ampl, AM
V-7	6BE6	Converter, AM
V-8A	1/212AT7	Audio ampl
V-8B	1/212AT7	Audio ampl
V-9	6Ē5	
V-10	12AX7	Phono pre-amp

#### CRYSTAL DIODES

SY MBOL		PACKARD-BEL PART NUMBE
X-1 X-2	Crystal, Amperex 1N542 (matched pair)	72027

#### Power supply chassis:

i onci suppiy	chassis.	
V-101	6AN8	Audio amp! & inverter
	6V6-GT	
V-103	6V6-GT	ť.
V-104	6V6-GT	Parallel pushapull outp
V-105	6V6-GT	
V-106	5U4•GB	Rectifier

Tape deck (in model 21RP1 only);

CABINET FINISHES: Mahogany, Oak, Colonial, and Walnut CABINET DIMENSIONS: Height, 321% in. Width, 37 in. Depth, 211/2 in.

#### CHASSIS DIMENSIONS:

SPECIFICATIONS:

Tuner chassis 13" w by 5" h by  $8\frac{1}{2}$ " d Power chassis: 13" w by  $5\frac{1}{2}$ " h by 6" d Tape deck (in 21RP1 only): 14" w by 8" h by 8" d (excluding reels)

SHIPPING WEIGHT:

Line voltage, 110-120 volts AC, 60 cycles only Power consumption:

FM radio, 88 to 108 mc

20 watts at less than 1% distortion 30 watts at less than 10% distortion

#### AMPLIFIER FREQUENCY RESPONSE:

20 to 50,000 cps @ 1 watt w/ less than 1% distortion

distortion

INTERMEDIATE FREQUENCIES:

16RP1, 160 lb.; 21RP1, 180 lb. ELECTRICAL RATINGS: 16RP1, 180 watts; 21RP1, 265 watts TUNING FREQUENCY RANGE: AM radio, 530 to 1620 kc

OUTPUT

AM, 455 kc; FM 10.70 mc

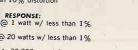
MANUAL BC-46

MARCH 1, 1958

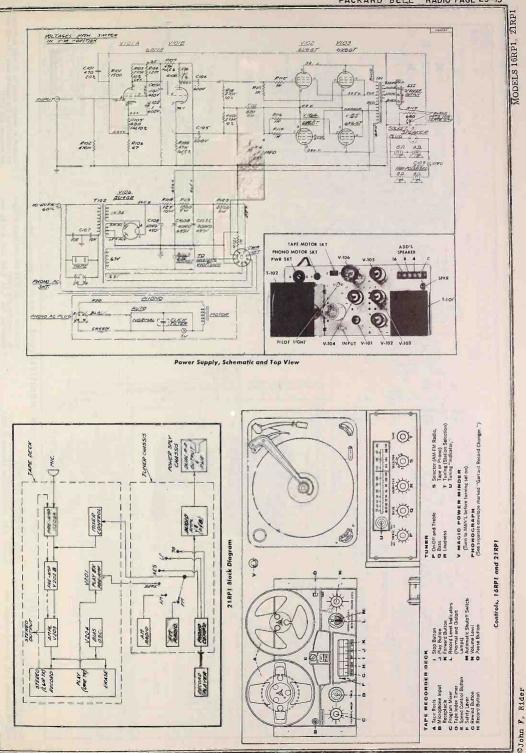
40 watts peak

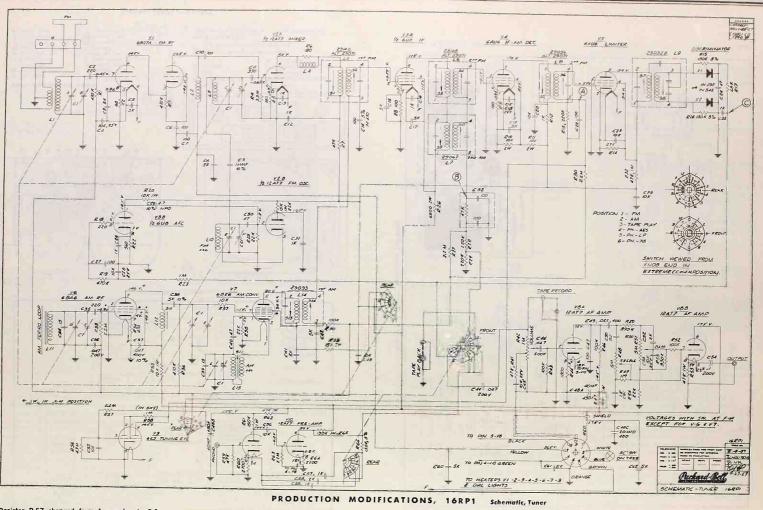
30 to 15,000 cps @ 20 watts w/ less than 1%

# ± 1 db from 15 to 30,000 cps at 1 watt









1. Resistor R-57 changed from 1 megohm to 2.2 megohms (CO 1598) 2. Coil, FM oscillator, L-10, diameter changed. Part

number now 29238B. (CO 1673) 3. Capacitor, C-50, 100 mmf, changed to 82 mmf. Resistor, R-50, 270,000 ohms, changed to 390,-

000 ohms. Resistor, R-49, 220,000 ohms, changed to 1 megohm. (CO 1680) 4. Capacitors C-4, C-18, C-28, C-45, & C-53 were

changed in voltage rating to 25 volts to reduce the physical size. The capacity value (.01 mfd) was not changed. (C0 1723)

MODELS 16RP1, 21RP1

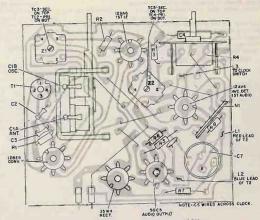
RADIO PAGE 25-16 PACKARD BELL



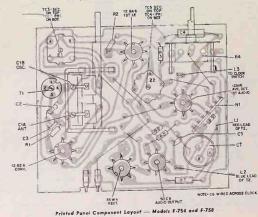
#### ALIGNMENT CHART

	SIGNAL GENERATOR			and the second	
STEP	CONNECTION TO RADIO	BIAL	EETTING	SPECIAL INSTRUCTIONS	ADJUST
ł.,	Ground lead to B—; output lead through a 1 mf condenser to grid (pin 7) of 128E6 or top of r-f tun- ing condensor.	358. Se.	Tuning yang fully open,	Adjust tuning cores, in order given, for maximum output. TC3 and TC5 are located on top of transformers.	TC5-2nd i-f soc. TC4-2nd i-f pri. TC3-1st i-f soc. TC2-1st i-f pri.
2	Rediating loop (See Note below).	1620 kc.	1620) kc.	Adust for maximum output.	CI-B-ose.
	Same as stop 2.	(1500) kc.	1500 kg.	Adust for maximum output.	C1-A-aorial

NOTE: Make up a 5-8 turn, 5 inch diameter loop from insulated wire, connect to signal-generator leads, and place near radio loop. For proper adjustment of the escillator trimmer, fully open the tuning gang and insert a .005 inch non-metallic shim between the beel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in blace, and then remove the shim without distributing the gang sufficiency and the state of the rotor and distribution.



Printed Panel Component Layout - Model F-750



#### NOTE

Printed panel component layout for Models F-743 and F-752 is similar to that of Models F-754 and F-758 except for the foil arrangement at pins 4, 5 and 6 of the 35W4. The foil arrangement of the 35W4 in Models F-743 and F-752 is similar to that of the Model F-750. This change is to accommodate the pilot light. (See schematic diagram.)

11-0

HOME

RADIO

MODELS

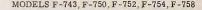
F-750

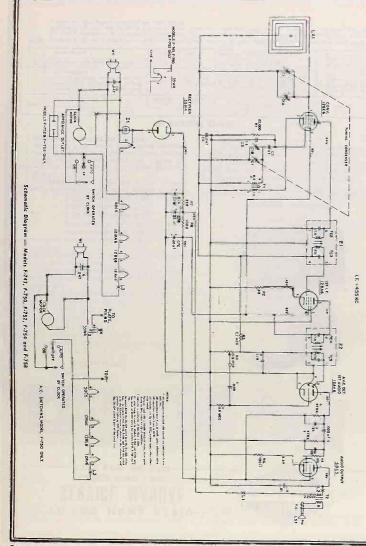
F-752,

F-754

F-758

PR-3175







## REPLACEMENT PARTS LIST

# Refer Syml R5 R6 R7 R8 T1 T2 W1 Z1 Z2

Reference Symbol	Description	Service Part No.
CI	Condonser, tuning, models F-743, F-750 and F-7	
	Condenser, tuning, models F-754 and F-758	21 2782 1
C2	Condenser, oscillator grid, 47 mmf	62 04200000
C3	Condenser, osc. temp. compensaling, 7.5 mmf, N2200	30-1224-83
C4	Condenser, AVC by-pass, .D47 mf, moulded	30-4650-4
C5	Condenser, output plate01 mi	30-1238-3
Ċ6	Condenser, line by-pass, .047 mf, moulded	30-4650-63
C7	Condenser, electrolytic filter, 3 section	30.2585.2
11	Pilot Lamp, models F-754 and F-758 only	34-2066
LAI	Antenna See Back and Loop Assy. U Speaker	Inder Cabinel
	Speaker, model F-758 only	30.165
NI	RC Network, audio circuit	30-5005-1
RI	Resistor, oscillator grid, 22,000 ohms	55.3228340
R2	Resistor, I-F cathode bias, 68 ohms	66.0688340
R3	Resistor, AVC, 2.2 megohms	
R4	Resistor, volume control, 500,000 ohms	

Cabinet, Model F-743

Cabinet, Model F-750

Pink Cabinet Back and

CHASSIS REMOVAL

(1) Remove Back: In model's F-750, F-752, F-754 and

(2) Remove the drive screw which holds the volume

(3) It may be desirable or necessary to unsolder the

CLOCK REMOVAL In all models, except model F-750, the clock is re-movable through the front of the cabinet after the crys-tal and the four nuts holding the clock to the cabinet

To remove the clock in the model F-750, the following

(inside cabinet) have been removed.

procedure must be followed:

1. Remove the crystal.

speaker and clock leads to obtain full chassis free-dom.

control frame to a boss on inside of cabinet.

F-758 there are two screws holding the back to the cabinet. In model F-743 spring the cabinet top to allow the back top to come back and out. Then

lift (or slide upwards) the back to free back from bottom slots. Disengage interlock,

Cabinet, Model T-752

bol	Description	Service Part 'No.
	Resistor, output grid, 150 ohms	66.115834
	nesistor, output cathode bias. 150 ohms	66.115824
	nesistor, B+ filter, 220 ohms, 1 watt	66-122434
	Resistor, B+ filter, 1000 ohms	66.210834
	transformer, oscillator	32.4693.
	ransformer, audio output	32.9394
	Line Cord	41-422
	Transformer, 1st I.F	32.4593.1
	Transformer, 2nd I-F	32.4583 1
	Printed Panel, model F-750	54.6280
	Printed Panell models F-754 and F-758	54.6280
	Printed Panel, models F-743 and F-752	54.6280
	Socket, lube, 5 used	27-5309-
	Contact, male, 2 used	1.3520FF1
	Socket Assembly, pilot light, models F-754 and	F.759 27 6222
	Appliance Outlet, models F-752 and F-758	76-393

A. 300

#### CABINET PARTS

Part No.	Description
11100 0	Clock
11132-2	Clock face
11192-1	Crystal, clock
76-11130-2	Knob, clock, 2 used
54-6290-2	Knob, tuning
	Knob, volume
.41-2066-3	Sabinet, Model F-754
	Grey
54-6289-1	Lustre Ivory
54-5292-2	Cabinet Back and Loop
54-6421	Clip, Pilot Light
	Clock
	Clock face
	Crystal, clock
	Knob, clock, 2 used
	Knob, tuning (grey)
54-5287-1	Knob, Juning (L1)
	Knob, volume (grey)
28-11374-13	Knob, volume (L1)
	Swivel Base
	Cabinet, Modell F-758
	Turquoiso
	Pink
	Clip, pilot light
	Cabinet Back and Loop
	Clock
	Clock face
_11263-1	Crystal, clock
	Knob, clock, 2 used
	Knob, tuning
	Knob, volume
	Part 8a. 11195-1 11195-1 11195-1 11195-1 11195-1 11195-1 11195-1 11195-1 11195-1 11195-1 11195-1 11195-1 11295-1 11

### 2. Remove the clock hands CAREFULLY.

- 3. Remove clock from inside cabinets
- To replace the clock:
- 1. Set clock to AUTO.
- 2. Furn time set shaft until switch has just closed.
- Replace clock in cabinet. 3.
- 4. Replace hands by pushing on shafts. (Place all hands at 12:00).
- 5. Replace crystal.

#### CLOCK CRYSTAL REMOVAL

F-750 and F-752 - Remove tuning knob. Remove screw located under tuning knob. Pull bottom of crystal out and down to allow top ears to clear cabinet.

F-754 and F-743 - Remove screw from cabinet bottom. Pull bottom of crystal out and down to allow top ears to clear cabinet.

F-758 - Carefully pry, with screw driver, between bottom of crystal and cabinet to spring bottom crystal ear out and free. Then pull crystal out and down to allow top ears to clear cabinet.

Part No. Service

41-2066-8 28-11352-4

54-6434.2 54-6436-1

54-6156.18

.54-6313-3

11259-1

W-2563FA3

41-2065-4

28-11352-2

54-6428

54-6438-1

54-6426-1

\$4-6428-2

76-11527

11262

11262-3

54-6427-1

\$4-6427-2

-W2563FA3

76-11536-1 41-2066-5

28-11352-3

54.6430

54-6436-1

54.6282.2 54-6313-3

Strategic and

11259

ADIO

# -PHILCO HOME RADIO SERVICE MANUAL

PHILCO

Factory-Supervised Service

CAUTION --- To avoid shock hazard, the receiver should be connected to the a-c line through an isolation

1. Connect generator, through a .05 mfd condenser, to grid, pin 7, of the AM converter, S-3. Connect

Set generator to 455 kc, tuning gang fully closed and adjust, in order given, TC14, TC13, TC12 and TC11 for maximum output. Repeat until no further gain

Connect generator to radiating loop. Set generator to 1600 kc. Set receiver to 1600 kc as indicated by pointer. Adjust VC-2B for maximum.

Set generator to 1400 kc. Tune receiver to signal and

FM ALIGNMENT PROCEDURE

AM Broadcast Section should be aligned first

Connect the scope, through a 100,000 ohm isolat-ing resistor, to junction of R12 and C26. Scope

Connect the signal generator to bottom of TI secondary (junction of TI with RI and C5). Gen-

4. Inject marker signal, 10.7 mc (unmodulated).

Inject sweep signal, 10.7 mc, approximately 150 kc total deviation. (do not over sweep).

Adjust cores TC8, TC7, TC6, TC5, TC4 and TC3

for maximum amplitude, symmetrical curve with the 10.7 mc marker at top of curve.

Adjust input signal to maintain output, as shown on scope, below 2 volts peak during alignment.

Repeat step 6 until no further gain is obtained.

8. Change the scope connections to L10 (FM audio output to function switch).

Remove sweep signal. Inject 10.7 mc, 30% AM modulated signal. Adjust TC10 for minimum indi-

shift in frequency with an increase in signal input (below overload). If a shift does occur, the I-F is

not properly aligned, particularly the first stage, TC3 and TC4.

10. Inject 108.5 mc, 30% AM modulated signal, through an antenna matching network to the re-

13. Open tuning condenser. Insert a 6 mil, non-metallic, shim between stator and rotor of the FM

14. With tuning condenser fully closed, inject 87.75 mc,

15. Inject 91 mc, sweep signal and with tuning gang

Adjust VC3 for minimum indicating between peaks.

30% AM modulated, signal and adjust TC2 for mini-mum indication between peaks. See note below.

tuned to 91 mc, adjust TC1 for maximum output.

NOTE: Signal input must he as low as possible in

order to obtain a sharp indication. In some cases it may be necessary to set sig-nal generator to the first sub-harmonic.

ceiver antenna terminals.

See note below.

gang and close gang against shim.

cation between peaks. See note below. 10. Inject 10.7 mc sweep signal and adjust TC9 for maximum symmetrical output. 11. Touch up cores as in Step 6 plus TC9 for a symmetrical, maximum amplitude, discriminator curve. To check alignment, discriminator curve should not chift is forgument.

Calibrate the scope for 2 volts P/P.

8

HOMI

RAD

MODEL

AM/FM

RECEIVER

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-

-

transformer.

2

3

6

is indicated

ground lead to chassis.

adjust VC-2A for maximum.

ground lead to chassis.

erator ground lead to chassis.

7. Calibrate the scope for 5 volts P/P.

-AM/FM MODEL F-974-



#### Model F=974

#### SPECIFICATIONS

Cabinet --- Plastic table model --- Ebony or Marcon. Circuit - Seven-tube superheterodyne plus selenium rectifier

Frequency Ranges - Tuning drive ratio 12:4

Broadcast - 540-1620 KC FM - 88-108 MC

Audio Output - 1 watt

Operating Voltage - 105 - 120 volts, a.c./d.c.

Power Consumption - 40 watts

Antennas - AM - Built in high impedance, pancake

loop FM-Line cord with provision for connecting external antenna.

Intermediate Frequency - AM 455 KC FM 10.7 MC

Phileo Tuber – 12ATT FM R.F and converter, 12BA6 FM IF amplifier, 12BE6 AM converter-oscillator, 12BA6 FM MI FF amplifier, 12AU6 FM limiter, 19T8 FM discriminator AM detector – AVC – 11st audio, 35C5 audio output.

#### AM ALIGNMENT PROCEDURE

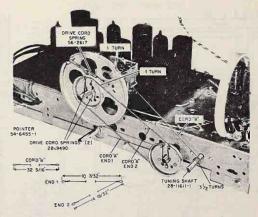
The AM alignment should be completed before the FM alignment is made. Before beginning the alignment, allow the receiver and test equipment to warm up for fifteen minutes.

DIAL POINTER - With the gang fully closed, adjust the pointer to be vertical.

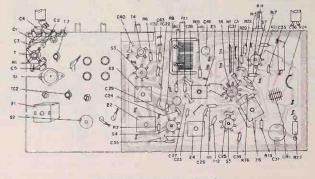
RADIO CONTROLS-Set the volume control to maximum, set the function switch to AM and the tuning control as indicated

OUTPUT INDICATOR - Connect either an a-c voltmeter or an oscilloscope across the voice coil terminals. SIGNAL GENERATOR - Use an AM r-f signal generator with modulated output.

OUTPUT LEVEL - During alignment, maintain the output below .4 volts a.c.



Drive Cord Installation Details



Chassis and Printed Panel Component Layout View

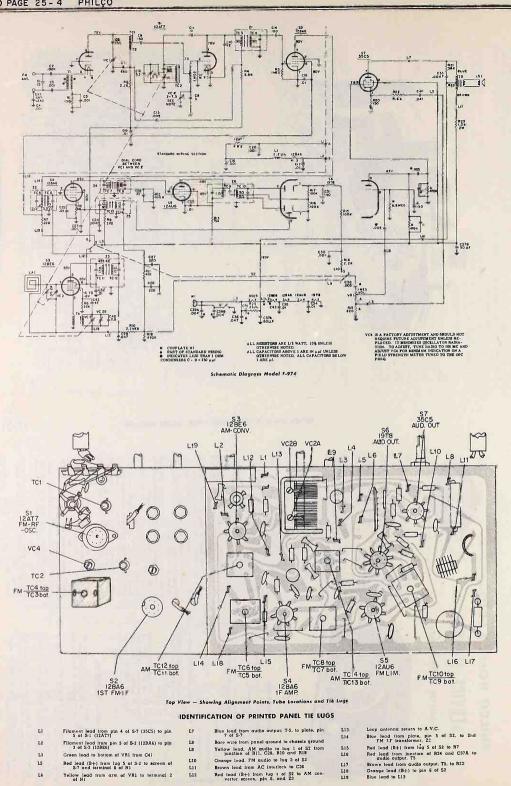
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MODEL F-974

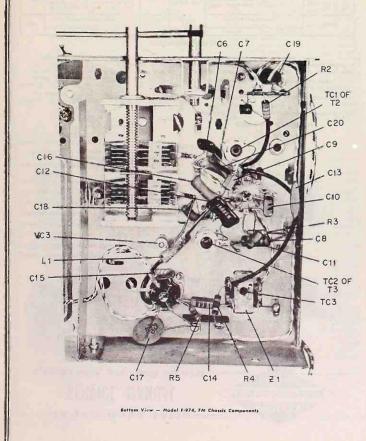
OJohn F. Rider

#### RADIO PAGE 25-4 PHILCO

MODEL F-974



DJohn F. Rider



#### REPLACEMENT PARTS LIST

Symbol	Description Part No.
CI	Condenser, FM antenna, 15 mmf, ceramic
C2	Condenser, FM antenna coupling, .001 mid.
	ceramic
C3	Condenser, FM antenna coupling, .001 mld, ceramic 30-1267-4
C4	Conductor antices land only -14 seconds the local i
C5	Condenser, input cathodo hwnger, 001 mid
	Condenser, input cathode by-pass, .001 mid, ceramic
C6	Condenser, gang DC isolation, 150 mml, mica
C7	Condenser, r-I coil signal return, 680 mmf, mica.60-10685411
CB .	Condenser, mixer coil signal return, 5 mmf.
	ceramic
C9	Condenser, interstage coupling, 150 mml, mica
C10	Condenser, mixer plate by-pass, 12 mmf, ceramic62-012300001
C14	Condenser, osc. coupling, 10 mmf, ceramic
C12	Condensation DC totaling the and the
····	special mica
C13	Condenser, B+ neutralization, .005 mid. disk
C14	Condenser, I-F grid coupling, 100 mmf, ceramic62-110009001
C15	Condenser, I-F screen by-poss .01 mfd
C16	Condenser, illament by-pass, .001 mid. coramic
C17	Condensor, filament by-pass01 mld. disk
CI8	Condenser, FM temperature compensating, 3.3
	mid. disk
C19	Condenser, B+ by-pass, .01 mfd30-1238-2
C20	Condenser, filament by-pass, .001 mfd
C22	Condenser, 2nd I-F cathode by-pass, .01 mid, disk30-1262
C23	Condenser, 2nd I-F screen de-coupling, .001 mid disk
C24	Condenser, 2nd I-F B+ de-coupling, .0047 mld, disk
C25	Condenser, 3rd I-F screen de-coupling, .01 mid.
	disk
C26	Condenser, 3rd I F grid by-pass. 22 mmt, disk
C27 C28	Condenser, AM I-F filter, 220 mmf, disk
C28	Condenser, AM I-F filter, 220 mmf, disk30-1262-23
C30	Condenser, A.V.C. by-pass, .047 mld, moulded
C30	Condenser, de-emphasis, .001 mid. disk 30-1262-12
C32	Condenser, de-emphasis, 150 mmt. disk30-1262-24 Condenser, AM mixer screen de-coupling, .01
0.32	mld, disk
C33	Condenser, lone compensation0047 mid, disk 30-1262-3
C34	Condenser, lilament by-pass, .01 mld, disk
C35	Condenser, filament by-pass, .01 mfd, disk
C36	Condenser, AC by-pass, .047 mid, tubular
C37	Condenser, electrolytic, 2 section lilter, 80/50, 150 WVDC 30-2585-9
Cas	Condenser, gudio coupling, .005 mfd, disk
C39	Condenser, line by pass 004/004 mid duel
	disk
C40	Condenser, Osc. temp. compensating, 7.5 mml, cordmic
CII	Condenser, tone control, .047 mtd, moulded
	Condenser, tone control, .047 mtd, moulded
013	concenser, Apr osc. coupling, 47 mml, ceramic30-1230-4

Reference Symbol	Description	Service Part No.
CRI	Selenjum rectifier, 100 mg	
L1	Choke, filament de coupling, 2.2 mh	32-4422-8
LAI	Loop anlenna, Am	76.11304
L.C.	interlock connector, AC	27.5240.10
LSI	Speaker, 5" pm, 3.2 ohm V.C. impedance	45-9733
NI	Resistor-condenser network, audio stage	30-6027
R1	Resistor, FM R-F cathode, 150 ohms	
R2	Resistor, FM R-F B- de-coupling 2200 phms	65-2228340
R3	Resistor, FM R-F B- de-coupling, 2200 ohms	
R4	Resistor, mixer B+ de-coupling, 5600 ohms	
RS	Resistor, FM I-F grid return. 1 megohm	
R6	Resistor, AM Osc. grid return. 22,000 ohms	
R7	Resistor, FM I-F 8+ de-coupling, 220 ohms	66-1228340
RØ	Resistor, 1-F cathode bias, 68 ohms	
R9	Resistor, I-F Bde-coupling, 220 ohms	
R10	Resistor, AVC filter, 2.2 megohms	
R14	Resistor, AM I-F filter, 47,000 ohms	
R12	Resistor, 3rd FM I-F grid return, 100,000 ohms .	
R13	Resistor, 3rd FM I-F B+ de-coupling, 15,000	
	ohms	
R14	Resistor, de-emphasis, 2200 ohms	
R15	Resistor, de-emphasis, 100,000 ohms	
R16	Resistor. discriminator, 100.000 ohms	
R17	Resistor, discriminator, 100,000 ohms	
R18	Resistor, AM detector load, 470,000 ohms	66-4478340
R19	Resistor, audio leedback, 820 ohms	
R20	Resistol, output cathede bias, 150 ohms	
R21	Resistor. tone compensation, \$6,000 ohms	
R22	Resistor, feed-back, tone circuit 5600 ohms	66-2558340
R23	Resistor, B+ lilter, 1200 ohms, 2 watts	66-2125340
R24	Resistor, rectifier current limiting, 22 ohms	33-1334-21
S1	Switch, on-off	Part of VRI
S2	Switch, AM-FM	42-2058-3
T1	Transformer, FM antenna	32-4718-1
T2	Transformer, FM r-1	
-T3	Transformer, FM osc.	
T4	Transformer, AM osc.	
TS	Transformer, audio output	
VC1	Tuning gang, 2 section, FM	
VC2	Tuning gang, 2 section, AM	
VC3	Variable condenser, FM osc., .5-3.0 mmi	
VC4	Variable condenser, osc. bridge capacitor, 2-7.5	
VBI	Volume control, 1 meg	33-5588-9
WI	line cord	41-4230
21	Transformer 1st FM	32-4715-1
72	Transformer, 2nd FM	32-4712-1
73	Transformer, 1st AM	
	Transformer, 3rd FM	12.4712.2
Z4.	Transformer, 2nd AM	17.4582.17
ZS Z6	Transformer, 2nd AM	22.4714.2

#### CABINET MISCELLANEOUS PARTS

Description	Service Part No.
Cabinet, Ebony	
Maroon	
Knobs, 2 used, volume and luning, ebony	.54-6093-16
2 used, volume and tuning, marcon	
Knob, AM-FM switch, ebony	54-6458-1
maroon	
Pointer	
Cabinel back and loop assy.	
Scale	
FM antenna assy.	

Description	Service Part No.
Shield, tube 12AT7	\$6-5629-5
Shield, tube 128E6	.56-5629-12
Socket, 3 pin min., 12AT7, chassis mtg.	
7 pin min., 12BA6, chassis mtg.	27-5203
7 pin min., panel mtg., 4 used	27-6309-1
9 pin min., panel mig., 1978	.27-6309-2
Spring, drive cord tension, 2 used	28-9490
Spring, drive cord tension, 1 used	56-2817
Shaft, tuning	.28-11611-1
Ring, relgining	1W60978FA3

#### PRODUCTION CHANGES

with

- 1. C8 was changed from 10 µµf to 5 µµf and VC4 was added.
- 2. Cl was moved from the coil side to the antenna side of C2 and C3.
- 3. A .001 condenser, C4, from the antenna lead to ground was removed eduction and the antenna transformer (T1) was wired

	connect	ion changed	trom cente	from centertap to lower end of		
4.	A 1000 circuit	and feed thr	u condenser 5 (S2).	was removed	from the	screen grid

- 5. C15 was changed from a 680 uni condenser to a .01 mid condenser

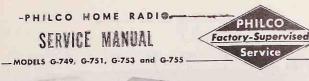
RADIO PAGE 25-5

PHILCO

ADIO PAGE

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Model G-7

SPECIFICATIONS

Cabinet-Plastic, table models.

Circuit-5 tube superheterodyne (including rectifier).

Frequency Range-540 KC to 1620 KC.

Intermediate Frequency-455 KC.

Audio Output-9 watt.

Power Consumption-30 watts.

Operating Voltage-105 to 120 volts, 60 cycles.

Aerial-High impedance loop mounted on inside of cabinet back.

- Philco Tubes-12BE6, oscillator converter; 12BA6, J-F amplifier; 12AV6, 2nd detector; AVC, 1st audio; 50C5, audio output and 35W4, rectifier.
- Timer-Model G 749 uses a Telechron J2 G-751 uses a Telechron J3
  - G-753 uses a Telechron J3
  - G-755 uses a Westclox fully automatic push button timer.
- Speakers-All models employ one 4-in., 3.2 ohm V.C., pm speaker.
- Slow-off-All models except G-749 have the on-off switch in the filament return line. When the switch is opened, the set fades our rather than cuts off. Model G-749 has a conventional switching arrangement jocated in the B-- uline.



Model G-753

HOME RADIO MODELS G-749, G-751, G-753

onc.

G-755

PR-3252

Model G-755

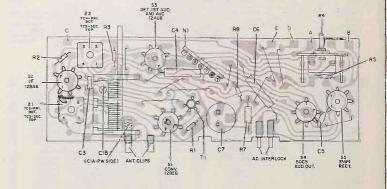
#### ALIGNMENT PROCEDURE

- Radio Controls-Set volume control to maximum. Set tuning control as indicated in chart. Output Meter-Connect across voice coil terminals.
- Signal Generator-Connect generator and set frequency as indicated in chart. Use modulated output, 30%.
- Output Level-During alignment, adjust signal-generator output to hold output-meter reading below .5 volts.

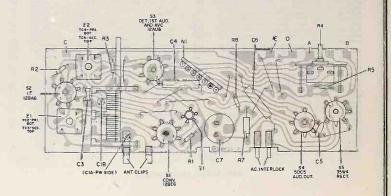
ALIGNMENT CHART

	SIGNAL GENERATOR				
STEP	CONNECTION TO RADIO	DIAL	DIAL	SPECIAL INSTRUCTIONS	ADJUST
1.	Ground lead to B: output lead through a .1 mf condenser to grid (pin 7) of 12856 or top or r-f tun- ing condenser.		Tuning gang fully open.	Adjust tuning cores, in order given, for maximum output. TC3 and TC5 are located on top of transformers.	TC5-2nd i-f sec. TC4-2nd i-f pri. TC3-1st i-f sec. TC2-1st i-f pri.
2.	Rediating loop (See Note below).	1620 kcz j	1620 kc.	Adjust for maximum output.	CI-B-osc.
3.	Same as step 2.	1500 For	1500 kc.	Adjust for maximum output.	CI-A-aorial

NOTE: Make up a 6.8 turn, 6 inch diameter loop from insulated wire, connect to signal-generator lead, and place near radio loop. For proper adjustment of the scillator stimmer, fully each the tuning gang and inset a .066 inch non-metallic sim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim vithout disturbing the gang softing.



Printed Panel Component Layout - Model'G-749



Printed Panel Component Layout - Models G-757 G-753 and G-755

#### REPLACEMENT PARTS LIST

Reference

R4 R5 R7 RS TI

T2 wi

**Z**1 Z2

Reference Symbol	Description Part No.	
Cl	Condenser, tuning	5
C2	Condenser, oscillator grid Part of osc. col	1
C3	Condenser, osc. temp. compensating, 7.5 mmf, N220030-1224-83	
C4	Condenser, AVC by-pass, .047 ml, moulded	5
C5	Condenser, output plate, .01 mf 30-1262	
C6	Condenser, line by-pass, .047 mf, moulded30.4650.45	
C7	Condenser, electrolytic filter, 3 section30-2585-11	
LAI	Antenna 32-4768-1	
LSI	Speaker and transformer, Model G-749 and G-751	
	Speaker and transformer, Model G-753 and G-755	
N1	RC Network, audio circuit	
RI	Resistor, oscillator grid, 22,000 ohms66-3228340	
R2	Resistor, I-F cathode blas, 68 ohms65-0688340	
83	Resistor AVC 2.2 merchine SE:5228340	

e	Description	Service Parl No.
	Resistor, volume control, 500.000 ohms	
	Resistor, leakage, 33,000 chms	
	Resistor, B+ filter, 220 ohms, 1 walt	
	Resistor, B+ filter, 1000 ohms	
	Transformer, oscillator	32-4756-1
	Transformer, audio output	32-8384-2
	Line Cord (G-749 and G-751)	41.4270-5
	Line Cord (G-753 and G-755)	41-4270-4
	Transformer, 1st I-F	
	Transformer, 2nd I-F	32-4583-21
	Printed Panel, model G-749	54-6585-3
	Printed Panel, models G-751, G-753, and	
	G-755	
	Socket tube 5 used	27.6209.1

Contact, male, 2 used ..

Tube shield

Description

Cabinet, Model G-753

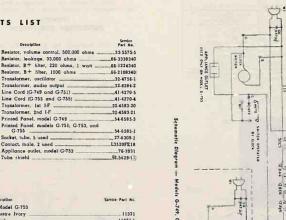
#### CABINET PARTS

#### Description Service Part No. Cabinet, Model G-749, Lustre Ivory .51-0017 Crystal, clock 6713:1 Clock 41-2068 Dial, clock 54-5379-1 Hand, hour 28-11374-25 Hand, minute -28-11374-26 ----Hand, alarm set \_\_\_\_\_\_ 28-11374-20 Shaft, reartime set . 28-11985-3 Knob, tuning Knob, volume \_\_\_\_\_54.6624.5 Knob, clock \_\_\_\_ 54-6436-2 Cabinet, Model G-751

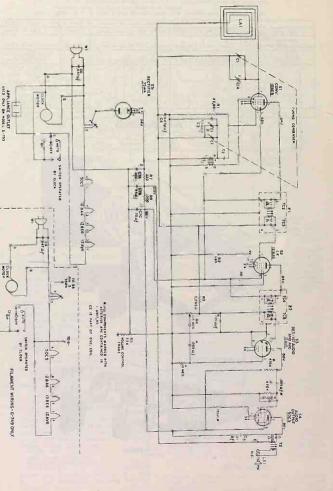
Lustre Ivory	51-0017
Pink	51-0017-1
Aqua	.51-0017-2
Clock	41-2070
Crystal. clock	54-6714-1
Dial, clock, Lustre Ivory	
Dial, clock, Pink or Aqua	54-5380-2
Hand, alarm set, Lustre Ivory	28-11374-31
Hand, alarm set, Pink or Aqua	28-11374-20
Hand, hour, Lustre Ivory	
Hand, hour, Pink or Aqua	28-11374-17
Hand, minute, Lustre Ivory	
Hand, minute, Pink or Aqua	28-11374-18
Hand, sweep	
Knob, clock (2 used)	
Knob, tuning, Lustre Ivory	
Knob, tuning, Pink or Aqua	
Knob, volume, Lustre Ivory	54-6624-9
Knob, volume, Pink or Aqua	54-6624-5
Shall, rear time set	

Lustre Ivory Pink . .11321-1 Charcoal 11321-2 Back and loop assy. 76-10493-1 Clock -41-2070 Crystall clock 54-6623-1 Dial, clock and radio. Pink only ... 54-5350-1 Dial clock and radio Hand, alarm set, Lustre lvory or Charcoal \_ .28-11374-20 Hand, alarm set, Pink 28-11374-31 Hand, hour, Lustre Ivory or Charcoal \_ 28-11374-17 Hand, hour, Pink ... 28-11374-29 Hand, minute, Lustre Ivory or Charcoal ... 28-11374-18 Hand, minute, Pink 28-11374-30 Hand, sweep . 28-11374-19 Knob, clock (2 used) \_\_\_\_\_ 54-6436-3 Knob, volume 54-6093-19 Knob, tuning \_\_\_\_ 54-6093-20 Shait, rear time set 28-11985-3 Cabinet, Model G-755 Aqua ..... 51-0018-2 Lustre lvory Cabinet back and loop assy. 76-10659-1 Clock . 41-2071-1 Crystal, clock \_ 54-6715-1 Knob, tuning 54-6624-6 Knob, volume 54-6624-7 Shaft, rear time set . 29-11986-3

Remaining cabinet parts for Model G-755 are identical to those of the Model G-753.







MODELS G-749, G-751, G-753, G-755

PHILCO

RADIO PAGE 25-7

## MODELS G-761, G-963



- PHILCO HOME RADIO

SERVICE MANHAL

#### SPECIFICATIONS

Cabinet: Plastic, table model; Model G-963 has a rotary dial scale with a 5<1 drive ratio. Model G-761 has a slide rule dial with a 6:1 drive ratio.

Circuit: Six tube superheterodyne, including a tuned RF stage.

Frequency Coverage: 535KC to 1620KC. Intermediate Frequency: 455KC. Audio Output: 0.9 watts.

Operating Voltage: Model G-963-105 to 120 volts, AC-DC; Model G-761-105 to 120 volts, AC.

Aerial: High impedance loop mounted on back. Speakers: (2) 4" pm speakers, each with 3.2 ohm voice coil.

- Philco Tubes: 12BA6 RF Amplifier, 12BE6 Oscillator-Converter, 12BA6 IF Amplifier, 12AV6 Detector-AVC-1st Audio, 35C5 Audio Output, 35W4 Rectifier and a type 47 Dial Light.
- Timer: G-761 only-A fully automatic Telechron (type C-103) internal timer and clock. Includes Sleep-Switch, Buzzer Alarm, and "Lullaway" Slow Shut-off.

#### SPEAKER PHASING

When either or both of the paralleled speakers are replaced or reconnected, it is possible to cause weak output and distortion unless properly connected.

Model G-963

G-761-Since the speakers are mounted in opposite ends of the cabinet, the speakers must be connected "in proper phase." The common lead between the two speakers should connect from the V.C. lug with the green dot of one speaker to the unmarked V.C. lug on the other.

PHILCO

**Factory-Supervised** 

Service.

G-963-Since the speakers are both mounted on the cabinet front, the speakers must also be connected "in proper phase." The green V.C. lugs of the speakers are connected together and the unmarked lugs connect together.

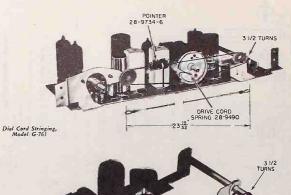
#### ALIGNMENT PROCEDURE GENERAL

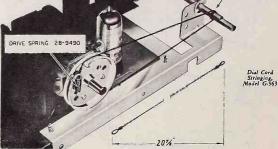
Radio Controls-Set volume control to maximum. Set radio tuning as directed in the alignment chart.

Output Indicator-Connect output indicator (either an oscilloscope or a 1000 ohms/volt a-c meter) across speaker voice-coil terminals.

Signal Generator-Use an AM r-f generator connected as indicated in the alignment chart.

Output level-During alignment, attenuate the signal generator output to maintain radios' output, as shown on meter or scope, below 0.4 volt.





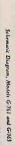
#### ALIGNMENT CHART

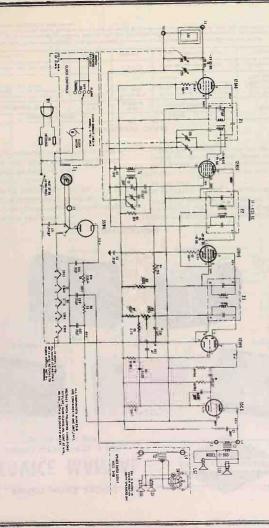
Step	Signal Generator	Freq.	Dial Setting	Special Instructions	Adjust
1	Ground lead to B—. Output lead through a .01 mfd cond. to pin 7 (input grid) of 12BE6 converter	455KC	Gang fully open	Adjust, in order given, for max. output	Sec., 2nd IF, top Z3 Prt., 2nd IF, bot. Z3 Sec., 1st IF, top Z2 Pri., 1st IF, bot. Z2
2	Radiating loop. See Note 1 below	1620KC	620KC See Nore 2 below	Adjust for max. output	C1C, osc. trimmer
3	Same as step 2	1520KC	Fune radio to gen. signal	Adjust for max. output	C1B, mixer grid trimmer C1A, ant. trimmer
4	Same as step 2	580KC	Tune radio to gen. signal	dju t for max. outpu	Sec., RF trans., top ZI
5	5 Repeat steps 3 and 4 until no further improvement is obtained.				

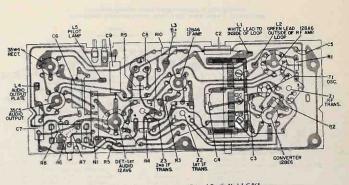
Note 1: Make up a 6-8 turn, 6 inch diameter loop from insulated wire, connect to signal-generator leads and place near radio loop antenna.

Note 2: To set the tuning gang to 1620KC-place a 6 mil shim between rotor and stator, turn rotor until shim is held in place, remove shim.

**OJohn F.** Rider







Composite View, Component Layout of Printed Panel, Model G-963

## REPLACEMENT PARTS LIST

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WJ Z1 Z2 Z3

#### Service Part No. Referen Descriptio Condenser, 3 gang runing, Model G-963 Model G-761 CI 31-2787-2 Condenser, AVC by-pass, .047 mfd, moulded C2 30-4650-45 Condenser, oscillator coupling, 47 mmf, ceramic C3 62-047009001 Condenser, osc. temperature compen-sating, 7.5 mmf, N2200 ceramic ..... CA 30-1224-83 Condenser, bracket grounding, .01 mfd, ceramic disk ·C5 .30-1262 Condenser, bass compensation, .1 mfd, moulded C6 30-4650-47 Condenser, tone compensation, output plate, .0047 mfd, ceramic disk C7 30-1262-2 Condenser, electrolytic, 3 section filter, 30/150, 25/150 20/150 C8 30-2585-2 Condenser, line by-pass, .047 mfd, moulded C9 30-4650-45 **G1** Pilot lamp, type 47, clear bulb, Model G-963 \_\_\_\_\_34-2068 type 47, frosted bulb, Model G-761 \_\_\_\_34-2676 Loop antenna-part of back & loop assy., Model G-963 Model G-761 LA1 LS1 & LS2 Speaker, 2 used, Model G-963 Model G-761, with transformer Model G-761, without transformer 36-1655-3 36-1655-15 36-1655-16 Resistor-Condenser network, audio N1 30-6500-1 coupling 66-1188340 Resistor, RF cathode bias, 180 ohms R1 Resistor, osc. grid return, 22,000 ohms 66-3228340 R2 66-1108340 Resistor, IF cathode bias, 100 ohms **R3** .66-5228340 Resistor, AVC filter, 2.2 megohms R4 Resistor, volume control shuni, 680,000 ohms **R**5 66-4688340 Volume control, 2 megohms, Model G-963 (with switch) Model G-761 R6 33-5575 33-5575-11 66-1478340 Resistor, bass compensation, 470 ohms **R**7 Resistor, bass compensation, 2700 ohms ...66-2278340 R8 66-2108340 Resistor, B+ filter, 1000 ohms **R**9 R10

#### Service Part No. burbits Switch, speaker selector, Model Grofto any, 42-2078 Transformer, oscillator 32-4693-6 Transformer, audio output, 32-2054 Model Grofto 33-8822 Line code G-761 34-8822 Line code G-761 41-4230 Reference SW1 T1 322-0054 32-8822 41-4230 32-4723-1 32-4583-17 Line cord Transformer, RF Transformer, 1st IF Transformer, 2nd IF Printed Panel, Model G-963 Printed Panel, Model G-761 32-4583-17 54-6394-4 54-6394-3

#### MODEL G-761

Cabinet, pink & ivory	11:274-2
Cabinet, pink & ivory	11274-1
Cabinet, pink & ivory	76-10188
Back and loop assy.	41-2066-8
Clock, pink & ivory	41-2066-9
Clock, pink & ivory Clock, mahogany	\$4.6506-1
Clock, mahogany Clock, crystal Clock, knobs, 2 used	54.6436-1
Clock, knobs, 2 used	54.6716-1
Dial backplate trim Dial window, radio	\$4-6508-1
Knobs, radio control, 2 used	54.6512
Knob, speaker selector	78.0730.0
Pointer	27-6233-6
Knob, speaker selector Pointer Socket, pilot lamp	28-11860-2
Tuning drive shaft	1W60980FE5

#### MODEL G-963

and the second sec	11244-1
Cabinet, lustre ivory	11244-2
Cabinet, mahogany	76-11463-1
Back and loop assy.	54-6409-2
Dial scale	\$4-4718-43
Knobs, 2 used	54-6396-1
Pointer	76-1179-10
Socket assy, pilot lamp	28-11860-1
Tuning drive shaft	1W60980FE5

#### MISCELLANEOUS

Interlock contacts, male, 2 used	L3520FE18 27-6309-1 28-9490
Spring, drive cord Tube shields, 2 used, 12AV6 & 12BA6 (RF)	28-11527-7

#### OJohn E. Rider

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PHILCO

RADIO PAGE

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OPERATING VOLTAGE-105 to 125 volts, AC-DC. AERIAL-High Impedance loop mounted on inside of back. SPEAKER—Model G-826 employs two 4 in. p-m speakers in parallel. Model G-828 employs one 6 in. p-m speaker and one 4x6 in. p-m speaker connected in parallel. The others use one 4 in. p-m speaker.

#### ALIGNMENT CHART

	SIGNAL GENERATO	2	RADIO		
CONNECTION TO I	CONNECTION TO RADIO	DIAL	DIAL	SPECIAL INSTRUCTIONS	ADJUST
d	Ground lead to B; output lead through a .1 mf condenser to grid (pin 7) of 12BE6.	455 KC	Tuning gang fully open.	Adjust tuning cores, in order given, for max. output. TC3 and TC5 are located on top of trans- formers.	TC4-2nd i-f sec TC3-2nd i-f pri TC2-1st i-f sec. TC1-1st i-f pri.
3	Radiating loop. (See Note below):	1620 KC	1620 K.C*	Adjust för maximum öutput.	C1-Bosc.
3	Same as step 2.	1500 KC	1500 KC	Adjust för maximum output.	C1-A-aerial

NOTE: Make up a 6-8 turn, 6-inch diameter loop from insulated wire, connect to signal generator leads, and place near radio loop.
• For proper adjuttment of the oscillator trimmer, fully open the uning gang and insert a .006-inch non-metallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to bold the shim in place, and then remove the shim without disturbing the gang strong.

#### ALIGNMENT PROCEDURE

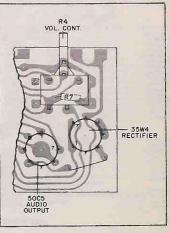
RADIO CONTROLS-Set volume control to maximum. Set tuning control as indicated in chart. OUTPUT METER-Connect across voice coil

- terminals. SIGNAL GENERATOR-Connect generator and
- set frequency as indicated in chart. Use modulated output, 30%.

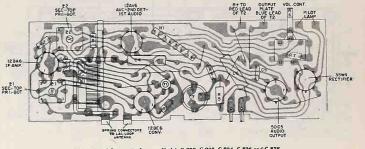
OUTPUT LEVEL-During alignment, adjust signal-generator output to hold output-meter reading below .5 volts.

#### SPEAKER PHASING (Models G-826 and G-828 only)

When replacing or reconnecting the two, paral<sup>10</sup> leled speakers, it is possible that an out-of-phase condition may exist. This is readily apparent<sup>4</sup> by weak output and serious distortion. To correct, interchange the leads to one of the speakers.

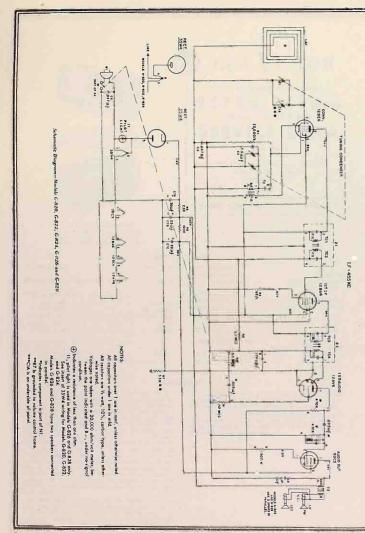


Partial Printed Panel Showing C-820, G-822 and G-824 AC Input Circuit Foil Difference



Printed Panel Component Layout-Models 6-820, 6-822, 6-824, 6-826 and 6-828 (See Figure Abore for 6-820, 6-822 and 6-824 AC Input Difference)

OJohn F. Rider



REPL	ACEM	ENT P	ARTS	LIST

Referen		Service Part No.
CI	Condenser, runing gang, model G-820 and G-822	
	Condenser, tuning gang, model G-824	
	Condenser, runing gang, model G-826 and G-828	
C2	Condenser, osc. gridPart	of T1, osc. coil
C3	Condenser, osc. temp. compensating, 7.5 mmf N2	20030-1224-83
CA	Condenser, A.V.C. by pass, .047 mf	30-4650-45
C5	Condenser, output plate, .01 mf disk	
C6	Condenser, line by-pass, .047 mf	30-4650-45
C7	Condenser, electrolytic filter, 3-section	30-2585-11
11	Pilos lamp, #47, models G-826 and G-828 only	
LAI	Antenna	e Cabinet Parts
LSI	SpeakerSe	e Cabinet Parts
NI	R.C. oetwork audio circuit.	30-6500-1
Rı	Resistor, osc. grid, 22,000 ohms.	66-3228340
R2	Resistor, i-f cathode bias, 68 ohms	66-0688340
R3	Resistor, A.V.C., 2.2 megohms	66-5228340
R4	Volume control, .5 megohm, models G-820	
	and G-822	33-5575-17

Description

Cabinet, model G-820 Mahogany..... Dial

Knob, funing.

Knob, volume..... Cabinet back and loop assy

Speaker, 4-inch pm.

Line cord .

Cabinet, model G-822

Lustre ivory . Dial

Knob, tuning.

Knob, volume

Cabinet, model G-824 Ivory and black.

Pink and black.... Dial plate. Trim, cabinet front

Trim, cabinet hont. Trim, cabinet back. Knob, runing..... Knob, volume....

Back, cabinet.

Cabinet back and loop assy.

Refere		Service Part No.
	Volume control, .5 megohm, models G-824, G-826	
	and G-828	33-5575-15
R5	Resistor, B+ filter, 1 watt, 220 ohms	66-1224340
R6	Resistor, B+ filter, 1000 ohms	66-2108340
<b>R7</b>	Resistor, leakage, 33:000 ohms	
TI	Transformer, oscillator	32-4756-1
T2	Transformer; audio output	32-8384-2
	Transformer audio output, model G-828 and G-82	6 322-0054
21	Transformer, 1st i-f	
7.2	Transformer, 2nd i-f.	
	Printed panel, models G-820, G-822 and G-824	
	Printed panel, models G-826 and G-828	
	Contact, male, AC interlock, 2 used	
	Contact, panel, antenna	
	Contact, panel, antenna (includes antenna trimmer)	28-12282-1
	Finger, grounding.	
	Shield, rube	56-5629-12
	Socket, tube, 5 used	
	Pilot lamp socket assy	27.6233-103

#### CABINET PARTS

Service Part No.	Description	Service Part No.
	Antenna loop	
	Line cord	
.54-5355	Speaker, 4-inch pm	
.54-6653-1	Cabinet, model G-826	
	Lustre ivory	
.76-10521-1	Flame	
	Aqua.	
.36-1675-6	Dial.	
	Trim, cabinet	
	Knob, tuning.	
	Knob, volume	
	Cabinet back and loop assy.	
	Line cord	
	Speaker, 4-inch pm.	
	Speaker, 4-inch pm (with transformer)	
	Cabinet, model G-828	
	Mahogany.	51-004-
	Dial	54-6661-
	Trim cabinet	
	Medallion.	
	Knob, tuning.	
	Knob, volume.	
	Cabinet back and loop assy	
	Line cord	41-4270-
	Speaker, 6-inch pm (with transformer)	36-1681.
	Speaker, 4x6-inch pm	

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9.C.7 Series- The "Herald" Model 9-C-7EE — Antique White Model 9-C-7FE — Pink and White Model 9-C-7LE — Turquoise and White



9-C-8 Series - The "Bulletin" Model 9-C-8FE - Pink and White Model 9-C-8J - Two-tone Gray Model 9-C-8ME - Maple and White

SPECIFICATIONS 

INTERMEDIATE FREQUENCY	Size and type
TUBE COMPLEMENT     (1) RCA 12BE6     Converter       (2) RCA 12BA6     I.F. Amplifier	POWER OUTPUT Undistorted
(3) RCA 12AV6	TUNING DRIVE RATIO
(5) RCA 35W4Rectifier	WEIGHT
POWER SUPPLY RATING	CABINET DIMENSIONS

115 volts, 60 cycles, c. c. .35 watte Caution: Do not connect to a d. c. power supply.

#### DESCRIPTION

Model 9-C-7

Model 9-C-8

ance on at a prodetermined time.

The "9-C-7 Series" and the "9-C-8 Series" are five-tube (including Tectifier) table model clock-radios designed for operation on a 115 volt 60 cycle power supply. The cabinet completely encloses the radio chassis and clock, using a molded hood instead of a conventional back cover. The chassis and clock are mounted in a plastic, "cradle" which comprises the cabinet bottom and front. The plastic slide rule dial is heat-sealed to the cradle. The 9-C-8 Series has a decorative metal base attached to the bottom of the cabinet.

The chassis is of the "printed wiring" type in which all electrical components except loop antenna and speaker are mounted on an insulation plate. A conventional superheterodyne circuit is employed using 150-milliampore series-string minicture tubes. All wiring, except for external leads, is "printed" on the underside of the insulation plate. The switching type phono input Jack is accessible at the left side of the cabinet.

The clock-timer features not only the commonly accepted self-starting type of clock with sweep-second hand but also a clock-controlled switch which will: (1) turn the radio (and appliance if desired) of after a period of operation of up to 60 minutes; (2) turn the radio (and appliance if desired) on at a



Depth

Width

12%" 6"

1.2 % " 6"

Height

61%

7%

time predetermined up to 11 hours in advance, and (3) sound

an alarm (if desired) at the prodetermined time. Lover type

An appliance outlot having a rated capacity of 1100 watts

is wired in parallel with the radio, allowing an appliance to be connected and the clock-timer set to turn the appli-

function knobs are used for maximum ease of operation.

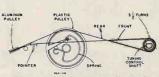
#### 9-C-7 Series, 9-C-8 Series

#### Alignment Procedure

Test Oscillator-For all alignment operations, connect the low side of the test oscillator to the "common negative wiring." If a power supply isolation transformer is not avail-able for use during service, an isolating caracter should be used between the low side of the test oscillator and the "common negative wiring."

If an audio output meter is used for alignment indication, keep the oscillator output as low as possible to avoid a-v-c

Dial Indicator --- With tuning condenser plates fully meshed, set left hand edge of dial indicator to the calibration mark on the dial backplate.



ASSEMBLY SHOWN WITH TUNING CONDENSER PLATES FULLY MESHED

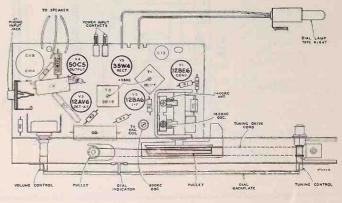
Tuning Drive Cord Assembly

Step	Connect the high side of test-oscillator to	Tune test-osc. to—	Turn radio diat to—	Address the Sollowing has man, output
1	12BA6 I-F grid through .01 mfd. capacitor		Quiet-	TI (Jap) Sast I-F irona
2	Stator of C1-B through .01 mfd.	455 ke	1.600 ke end of seel	TI ()op sent beform) let LJ trans
3		1,620 km	Gang kata sym	Car Jonan Cl.A
4	Short wire placed near loop to radiate signal	1,400 kc	1.400 as metrici	sof tites
5		600 kc	600 kc signal	anar andi 3-4 (main parap)
6		Re	peat steps 3,	4, and 5

#### Servicing Precaution

The "common negative wiring" of these receivers is con-nected directly to one side of the AC power supply. Service should not be attempted by anyone not thoroughly familiar with the precautions necessary when working on this type of circuit.

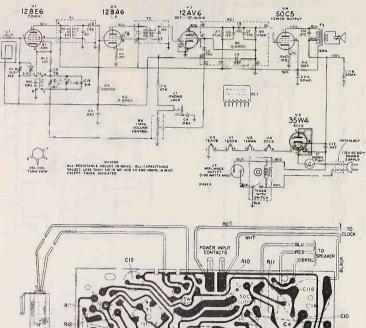
An isolation transformer (115 v./115 v.) should be con-nected between the AC power line and the power attach-ment cord of the radio before performing any service on the radio.



#### Complete Chassis Assembly - View from Component Side

CHASSIS RC-1166B





C 3 T4 OSC. COIL R2 R4 R3 PCI TUNING COND. VOLUME CONT

Chassis Wiring and Components - View from Wiring Side

The assembly represented above is viewed from the wiring side of the board. The printed wiring, on the near side of the board, is presented in "phomtom" view superimposed on the component layout of the reverse side.

PILOT LAMP

c2-

Component replacement, when necessary, should be made follow-ing the techniques outlined in "RCA Radio and Victrola Service Tips" Volume VI - issue 6 - Doted August 25, 1955.

PHONO

£197267

#### OPERATING INSTRUCTIONS

To Set Clock Time-Push in and turn TIME SET knob (at back of orbinet

To Set Alarm Time-Turn TIME SET knob counterclockwise (at back of cabinet)

#### RADIO OPERATION

To Play the Radio - With phono input cable removed from PHONO INPUT socket, move SERVICE lever to "ON." Turn TUNING knob to select desired station and adjust VOLUME as desired. Move SERVICE lever to "OFF" when through listening.

Always remove phono input cable from PHONO INPUT socket when radio operation is desired

To Set Radio for "SLEEP" Operation-Move SLEEP lever for desired playing time (up to 60 minutes). Turn TUNING knob to select desired station and adjust VOLUME as deknob to select desired station and dayses could be sized. SLEEP" operation can be used individually, in con-stred. "SLEEP" operation or with "Alarm" operation

For "Wake-up" or "Alarm" Operation-With SERVICE lever at "ON," tune in the desired station and adjust volume level. Move SERVICE lever to "AUTO" for "Wake-up" operation only or to "ALARM" for "Wake-up" operation in conjunction with alarm buzzer. The alarm buzzer will start a few minutes after radio starts to play. To stop alarm buzzer, move SERVICE lever to any position other than ALARM.

#### APPLIANCE OPERATION

To Turn Appliance on Automatically-Turn TIME-SET knob to desired starting time. Move SERVICE lever to "AUTO" or "ALARM." Plug appliance into APPLIANCE outlet. With this setting, the appliance will operate continuously after starting time unless disconnected or SERVICE lever is moved to "OFF."

To Time Appliance Operation - With SERVICE lever at "OFF," plug appliance to be timed into APPLIANCE outlet. Move SLEEP lever for desired operating time (up to "60 minutes)

#### PHONOGRAPH OPERATION

To Play Records-With phono input cable inserted into PHONO INPUT socket and SERVICE lever at "ON," lurn VOLUME knob clockwise about one-half turn and adjust cord into APPLIANCE outlet. Play records according to phonograph attachment instructions

To Wake-Up to Record Music-Turn TIME-SET knob to desired starting time. Belore retiring, operate record player as described above to adjust volume level. Select and load records desired and start record player into automatic op-eration, Move SERVICE lever to "AUTO" or "ALARM" just as needle lands on first record.

IMPORTANT -- Keep SERVICE lever at "OFF" position when instrument is not in use.

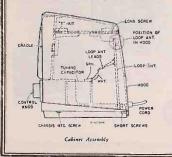
#### REMOVAL OF CABINET HOOD

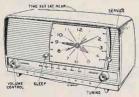
Remove two screws at boltom rear of hood and one screw (long) at top rear of hood. The time-set knob is not re-movable. Pull bottom of hood away from chassis cradle to disengage power interlock. Lift hood up and to the rear.

#### ASSEMBLING CABINET HOOD TO CHASSIS CRADLE

Place loop antenna in retaining slots at rear of cradle, pull top of antenna to the rear. Place hood over antenna so that top edge of antenna will first contact back of hood. Lower hood so that top edge of antenna will be engaged by positioning boss inside of hood. Fush hood forward. Refer to illustration below. Position the power cord plug, which is attached to the hood, to the power input contacts on the chassis. Push plug firmly on to the contacts.

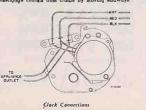
Make certain that edges of hood are properly seated on chassis cradle before lightening hood retaining screws. The long screw at the top rear of the hood should be tightened with care; excessive tightening may break chassis cradle.





REMOVAL OF CHASSIS FROM CRADLE

Remove volume and tuning control knobs. Disconnect clock leads at chassis. Disconnect three speaker leads Remove one screw at outside of cradle (close to speaker). Remove one screw at bottom of cradle (right end). Swing right end of chassis (as viewed from rear) to the rear of the cradle Disengage chassis from cradle by moving endways



#### REPLACEMENT PARTS

SYMBOL NO.	BTOCK	DESCRIPTION	SYMBOL NO.	STOCK NO.	DESCRIPTION
-		CHASSIS ASSEMBLY		103200	Socket-Tube socket, 7 pin miniature
		RC-1166B		76332	for V4 and V5 Spring—Dial cord tension spring
C1A, C1B C2	103209	Capacitor-Variable tuning capacitor Capacitor - Fixed, ceramic, 56 mmf.		77585	Washer — "C" type retaining washer for tuning control drive shaft
C3	73553	± 10%, 500 v. Capacitor — Fixed, paper, 0.047 ml.,			SPEAKER ASSEMBLY
C4	103191	±20%, 400 v. Capacitor — Fixed, paper, 0.082 mf., ±10%, 400 v.	T3	79283 103669	Transformer—Output transformer Speaker — 4" P.M. speaker complete with cone — LESS output transformer
C5 to ]	103205	Part of PC1			MISCELLANEOUS
C9 Incl. ∫ C10	103195	Capacitor — Fixed, paper, 0.012 ml., ±10%, 400 v.	12	103376	Connector-2-contact female appliance outleb - LESS mounting bracket
CIIA L	103197	Capacitor - Electrolytic, 50/50 mf.,		103186 ¥7005	Cable—AC power cable and plug Case—Plastic case back — antique
C11B ∫ C12	103239	150/150 v. Capacitor - Fixed, paper, 0.047 mf.,		¥7007	white for Model 9C7EE Case—Plastic case back — pink —
C13	103440	±20%, 400 v. Capacitor—Fixed, ceramic, 5.6 mmf., ±0.5 mml., 500 v., coeff. N-3300		¥7005	for Model 9C7FE e Case_Plastic case back - turquoise
н	103199A	Connector-2-contact closed circuit le-		Y7008	— for Model 9C7LE Case—Plastic case front — antique
12 L)	103376	male phono connector See "Miscellaneous" Antenna—Antenna loop and mounting		17008	white - for Models 9C7EE, 9C7LE, 9C7FE
PCL	103205	board Circuit-Printed circuit consisting of		¥7001	Case_Plastic case back = pink - for Model 9C8FE
RI	502333	R7, R8, R9, C5, C6, C7, C8 and C9 Resistor — Fixed, composition, 33,000		¥7002	Case—Plastic case back — dark gray — for Model 9C8]
R2, R3	502533	ohms, ±20%, ½ w. Resistor-Fixed, composition, 3.3 meg-		¥7000	Case-Plastic case back - maple sugar - for Modell 9C8ME
R4	502110	ohms, ±20%, ½ w. Resistor-Fixed, composition, 100 ohms,		¥7003	Case—Plastic case front — antique white — for Models 9C8FE and
R5	502347	±20%, ½ w. Resistor - Fixed composition, 47,000		¥7004	9C8ME Case—Plastic case front — light gray
10		ohms, ±20%, 1/2 w.			- for Model 9C8)
R6 R7 10 ]	103214	Control-Volume control		105825	Clock-Radio clock-timer 100/125 v. 60 cycle
R9 Incl.	103205	Part of PC1		103227	Dial-Plastic tuning control dial with
R10	502115	Resistor-Fixed, composition, 150 ohms, ±10%, ½ w.		74839	AM calibration Fastener-Metal fastener for cabinet
R11	512212	Resistor - Fixed, composition, 1200 ohms, ±10%, 1 w.		105826	base - 9C8 Series Knob-Time-set control, knob for clock-
R12	502110	Same as R4		100000	timer Knob-Tuning control knob-antique
T1 T2	103206 103207 79283	Transformer — 1st I.F. transformer Transformer — 2nd I.F. transformer Part of "Speaker Assembly"		103228	white - with spring - all models
T3 T4	103204	Coil - Oscillator coil		105872	
	103503	Board—Printed circuit board chassis assembly including I. F. transformers, oscillator coil, printed audio circuit,		103229	gray — with spring — for 9C8] Knob-Volume control Knob-antique white — with spring — all models except 9C8]
	1	interlock contacts, tube sockets, fixed resistors & capacitors - less		105871	
		tubes, tuning capacitor, phono con-	1	100010	gray — with spring — for 9C8) Plate—R.H. or L.H. aluminum satin
	1	nector, pilot light assembly, volume control, capacitors C4 & C13 Bracket—Dial plate mounting bracket		103218	finish cover plate for case front 12
	103215	with pulley		103908	req'd) Nut-Special brass tee nut for case front and back mounting screw
	103192	Bushing—Tuning control shaft bushing Contact—Single contact male — for		103978	Nut-Speednut, retainer for speaker
	72953	AC power input (2 reg'd) Cord-Dial drive cord, 250' spool		105968	Retainer-Clock-timer window retainer
	100014	(approx. 34 inches reg'd)	1	103219	Screw-#8-32 x 3.94 round neud
	103211 103216	Lamp — Miniature bayonet type 1847 Plate—Dial backplate with gray deco-		10105	screw for case front and back mount- ing Spring-Retaining spring for volume
	103213	rative lines Pointer—Dial pointer		101069	control or tuning control knobs
	103198	Fulley-2.69" O.D. phenolic dial cord pulley		103253	Support-Metal support for cabinet
	103212	Shaft-Tuning control drive shaft	12	8078	Washer-Spring washer for cabinel
	100643	Socket-Pilot lamp socket with leads		105827	base - 9C8 Series Window-Plastic window for clock-
	103201	Socket-Tube socket, 7 pin miniature for V1, V2, and V3			limer

# J 0 D RADIO PAGE 25

**OJohn F. Rider** 

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1-BX-6 Series The "Caravan" 1-BX-62 Green and White 1.BX-64 Pink and White 1-BX-67 Yellow and White

1-BX-7 Series The "Cruiser" 1-BX-78 Flame and Beige 1-BX-79 Turquoise and Beige

TUNING RANGE	
INTERMEDIATE FREQUENCY	
LÖUDSPEAKER	
Size and Type	
Voice Coil Impedance	is at 400 cycles

-BX-5 Series The "Shipmate"

1-BX-57 Maple and White

1-BX-59 Turquoise and White

#### POWER OUTPUT (Battery operation)

Undistorted				milliwatts
Maximum				5 milliwatts
Power output on power	line	operation i	s approx.	10% less.

#### TUBE COMPLEMENT

(1) R	CA IR5	Convertor	
(2) R	CA 1U4	I.F. Amplifier	
(3) R	CA 1U5		
(4) R	CA 3V4	Output	
		ier is used.	

#### Power Line Operation

A power cord is stored inside the cabinet. To open the cabinet, pull backwards on the top of the cabinet back. It is secured by means of two spring clips and catches on the inside of the cabinet. Remove the plug of the power cord from its socket on the chassis and insert the plug into a convenient electrical power outlet. A notch in the left side of the cabinet allows the back to be closed with the cord passing through.

Note: If reception is not obtained on DC, reverse plug in power outlet. On AC operation, reversal of the plug may reduce hum.

MODEL 1-BX-5 SERIES MODEL 1-BX-6 SERIES MODEL 1-BX-7 SERIES Chassis Nos. RC-1183, RC-1183A, RC-1183B SERVICE DATA - 1958 No. 5 PREPARED BY COMMERCIAL SERVICE RCA SERVICE COMPANY CAMDEN 8', N. J. FOR REA VICTOR RADIO AND "VICTROLA" DIVISION RADIO CORPORATION OF AMERICA	CA VICTOR AC-DC-Battery Portable Radio	
MODEL 1-BX-6 SERIES MODEL 1-BX-7 SERIES Chassis Nos. RC-1183, RC-1183A, RC-1183B SERVICE DATA - 1958 No. 5 PREPARED BY COMMERCIAL SERVICE RCA SERVICE COMPANY CAMDEN 8', N. J. FOR RCA VICTOR RADIO AND "VICTROLA" DIVISION RADIO CORPORATION OF AMERICA coffications	AODEL 1-BX-5 SERIES	
MODEL 1-BX-7 SERIES Chassis Nos. RC-1183, RC-1183A, RC-1183B <b>SERVICE DATA</b> — 1958 No. 5 — PREPARED BY COMMERCIAL SERVICE RCA SERVICE COMPANY CAMDEN 8', N. J. FOR RCA VICTOR RADIO AND "VICTROLA" DIVISION RADIO CORPORATION OF AMERICA Sectifications Market Supply RATING Power Line Operation Power Line Operation 15 Voids d. c. or 30 to 60 cycles a. c		
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CAMDEN 8, N. J. FOR RCA VICTOR RADIO AND "VICTROLA" DIVISION RADIO CORPORATION OF AMERICA cifications composed for the operation power Line Operation to 115 volts, d. c. or 50 to 60 cycles a. c		
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cifications tage power supply rating power Line Operation to 115 volts, d. c. or 50 to 60 cycles a. c		
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cc POWER SUPPLY RATING Power Line Operation 115 volts, d. c. or 50 to 50 cycles a. c		
cc POWER SUPPLY RATING Power Line Operation 115 volts, d. c. or 50 to 50 cycles a. c		
Power Line Operation kc 1:15 volts, d. c. or 50 to 60 cycles a. c		
kc 115 volts, d. c. or 50 to 60 cycles α. c	D. GUDDIN BATINC	
		15 watts
Battery Operation	Line Operation	

approx. 35 hrs. intermittent service Battery life TUNING DRIVE RATIO 1-BX-5, 1-BX-6 Series 

#### WEIGHT (Approx.) With battery ..... 51/2 lbs. Without battery .... 41/2 lbs:

DIMENSIONS (Overall)

Depth .... 31/2 in

#### **Battery Operation**

Place the power cord plug in the socket provided on the top of the chassis. Wind the power cord around the two small spools attached to the cabinet back

#### Alignment Procedure

Test Oscillator-For all alignment operations, connect the low side of the test oscillator to the receiver chassis an keep the oscillator output as low as possible to avoid AVC actio

Battery operation of the receiver is preferable during alignment. On AC operation, it may be necessary to con-nect the low side of the test oscillator to "common negative."

Output Meter Alignment- If this method is used, connect the meter across the voice coil and turn the receiver volume control to maximum.

Step	Connect High Side of Sig Gen. to —	Sig Gen. Outpub	Dial Pointer Setting	Adjust for Max: Output			
1	Rem	ove chass	is from ca	se			
2	Pin #6 of 104 tube in series	455 kc Quiet point near 1600 kc	Quiet	T2 2nd I. F. Trons.			
3	Connection lug of Cl A in series with 01 mid		Tl Ist I. F. Trans,				
4	Install chassis in case. On 1-BX-6 and 1-BX=7 Series, lasten antenna leads in slots provided in cabinet						
			Gana				
5	Chest wire	1620 kc	fully ejetn	C)-R (asc.)			
5	Short wire placed near antenna for radiated signal	1620 kc		Cl-R (sec.) Cl-A (ent.)			
	placed near antenna for		apenn 1400 kc				

CAUTION -

Do not remove any tubes from the chassis with the set operating and the plug connected to the power line. Dam-age to tubes may result.

#### CAUTION

AN ISOLATION TRANSFORMER SHOULD BE USED FOR THE RECEIVER WHEN BENCH SERVICE IS BEING PER-FORMED AND THE RECEIVER IS BEING OPERATED FROM AN A-C POWER LINE.

#### Circuit Description

These instruments are three-way "personal" portable radio receivers using four miniature tubes and a selenium rectifier

The receiver circuit is a conventional superheterodyne including pentagrid converter, i-f amplifier stage, combined detector-a.v.c.-lirst audio stage and a power amplifier.

Switching from battery operation to power line operation is accomplished by inserting the line plug in the chassis to actuate the LINE-BATTERY switch. The line plug is non-polarized.

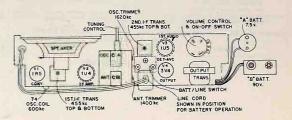
#### Critical Lead Dress

1. Dress ballast resistors R12, R13, R14 and fuse resistor R11 such that they do not contact other leads or short to chassis cover.

- 2. Make lead from V2-2 to T2-3 as short as possible and dress down toward chassis. Also keep other leads away 3. Solder C6 with short lead at V2-2 and dress down lowards chassis
- Dress leads into lance below selenium rectilier such that they do not contact rectifier plates.
- 5. Dress leads at volume control such that they clear cabinet enclosure when chassis is mounted in the cabinet. 6. Dress oscillator lead from osc. coil to gang away from
- metal as much as practicable. 7. Dress lead from antenna section of gang to VI-6 be-tween IU4 tube shield and 1st I-F transformer and
- away from top of chassis.
- 8. Make sure speaker is grounded to chassis.
- 9. Dress blue lead of output transformer to 3V4 plate toward rear apron of chassis.
- 10. Dress loop leads into slots provided in cabinet. Excess lead should be on outside of chassis.

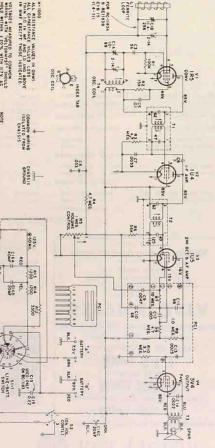
#### To Remove Cabinet Back

With the back fully open, grip the cabinet with thumb pressing forward against case front and fingers pressing backward against case back. Insert a screwdriver under one hinge and pry the center of the hinge out of the open-ing in the cabinet while maintaining pressure on the back with the fingers and on the cabinet with the thumb. Repetit this procedure with the other hinge. Pull the back straight to the rear using both hands.



Tube and Trimmer Locations

FOR RC-11834 6 AC11838 CI-8 IS 11.4-311 TOTAL "A" CURRENT SSMA. @ 7.5V. ALL RESISTANCE VALUES IN ONMS. ALL CAPACITANCE VALUES LESS THAN I.O IN MF AND IO AND ABOVE IN MMF EXCEPT THOSE INDICATED. BATTERY OLTAGES MEASURED TO COMMON WIRING WITH "VOLTOHWYST" SHOULD OLD WITHIN 120% WITH 117V AC TUBE AV OPERATION "8" VOLTAGES 90-A 2-14 INDEX TAB COMMON WIRING WHEN POWER PLUG CONTACT IS INSERTED AGAINST SWITCH SI-IA LEVER ASM, SWITCH CONTACTS SHOWN (1) MOVE INTO POSITION 2 FOR BATTERY OPERATION. (INMER CONTACTS REMAIN STATIONARY) POSITION 3 POLE-2 POSITION SWITCH SI SHOWN FROM TERM. END WITH SWITCH SHAFT IN CCLOCKWISE POSITION #1. (115 V. AC-DC OPERATION) - TISY AC-DC OPERATION BATTERY OPERATION 035 CHASSIS 4.7 MEG I MEG -9 2 RII 0 60M min 100 2200 4045 RE 1200 617 617 617 20168 YEL 1200 PCI 812 3300 ius 0.10 81. SI-IA (PART OF SI-I) BAT 7.50 POWER PLUG TO SI-IA OR IISV. POWER SUPPLY LINE-BATT BATTERY



	-	a second s			and the second
MBOL No.	STOCK NO.	DESCRIPTION	SYMBOL No.	STOCK NO.	DESCRIPTION
		CHASSIS ASSEMBLIES		79263	Shield-Tube shield for V2
		RC-1183 for 1-BX-5 Series RC-1183A for 1-BX-6 Series			Socket-Tube mocket 7 pin miniature for V1 and V3
		RC-1183A for 1-8X-6 Series RC-1183B for 1-8X-7 Series	1	77087	Socket-Tube socket 7 pin miniature for V Socket-Tube socket 7 pin miniature for V
, CIB	105946		1	77420	Washer-Nylon insulating washer for tuning capacitor (2 req'd)
, CIB	105954	Capacitor-Variable tuning capacitor for chansis RC1183	4		SPEAKER ASSEMBLY
CIB	105955	Capacitor-Variable tuning capacitor for chossis RC1183A		79696A	Speaker-4" PM apeaker complete with
., CIB	101232	Capacitor-Variable tuning capacitor for chassis RC1183B			MISCELLANEOUS
		Capacitor-Fixed, ceramic, 56 mmf., +20%, 500 v.	6	105951	Antenna-Ferrite antenna and case as
	73960	Capacitor-Fixed, cetamic, 0.01 mf., +100%, -0%, 500 v.			Anienna-Ferrite anienna and case as sembly for Models 18X62, 18X64, 18X65 18X78 and 18X79-Anifque while car ried in stock for replacement
	101233	+100%, -0%, 500%. Capacitor-Fixed, headed lead, 3 mmi., ±10%, 500 v.	1.1	105937	Antenna-Forrite antenna rod assembly for models 18X57 and 18X59
	102425A	Capacitor-Fixed, paper, 0.0033 mi., ±20%, 200 v.		¥7009	Case-Case trent and back assembly-
	73552	Capacitor—Fixed, paper, 0.033 ml., ±20%, 400 v.	1	¥7010	maple sugar and antique white to Model 18X57
C10, C12,		and the second	1	17010	Gase-Case front and back assembly- light turquess and antique while to Model 18X59
	77446	Part of PC1 Capacitor—Fixed, paper, 0.0022 ml., ±20%, 400 v.	1	¥7011	Case-Case front and back assembly- antique white and dawn green to Model 1BX62
	79918	±20%, 400 v. Capacitor-Fixed, ceramic, 0.01 mi. +100% -0%, 600 v.	1	¥7012	Model 18X62
A, C16B, C, C16D	105945	+100% -0%, 500 v. Capacitor-Electrolytic 40/20/20/100 mi., 150/150/150/25 v.	#		Case-Case iront and back assembly- antique white and pink for Mode IBX64
C, C16D	79740	150/150/150/25 v. Capacitor-Fixed, paper, 0.22 ml., 		¥7013	Case-Case itont and back assembly-
	77423	Canacitar-Fixed names 0.1 mf +20%	4	¥7014	Model 18X67 Case-Case front and bock assembly- towny being and hame for Model 18X78
	79740	400 v. Capacitor-Fixed, paper, 0.22 mi., ±20%, 200 v. (used on RC-1183 only)			tawny beige and flame for Model 18X78
	77292	Rectilier-Selenium rectifier-65 mg.		¥7015	Case—Case front and back assembly tawny beige and light turquoise fo Model 18X79
	105936	Circuit-Printed component audio coupling consisting of C9, C10, C11, C12, C13, R7, R8, R9, R10	1	101877	Catch-Case front and back catch
	502410	R6, R9, R10 Bestator-Fixed composition 100,000 chms	ii	105953	(2 reg'd) Digi-Aluminum foil tuning control dig
	502315	Resistor-Fixed, composition, 100,000 chms, ±20%, ½ w. Beliator-Fixed, composition, 15,000 chms			with calibrations and markings in Models 1BX62, 1BX64 and 1BX67
R4	502547	Resistor-Fixed, composition, 15,000 ohms,. ±20%, Va w. Balalot-Fixed, composition, 47 mag.		105952	Grille-Case front grille and screen as sembly for Models 18X78 and 18X79
	105938	Resistor-Fixed, composition, 4.7 meg- ohms, ±20%, 1/1 w.		105949	Handle-Carrying handle antique white- for Models IBX57 and IBX59
	502356	Control-Volume control with "on-off" switch, includes S2 Basistor-Fixed composition \$5,000 plums		105950	Handle — Carrying handle for Model 18X62, 18X64, 18X67, 18X78 and 18X7 —antique white carried in stock for
RA		Resistor-Fixed, composition, \$6,000 ohms, ±10%, ½ w.	4	1	
R8, R10	105927	Part of PCI		105930	Indicator—Tuning control indicator—Ilam red for vernier tuning control knob- Models 18X78 and 18X79
	502233	Resistor-Fixed, wirewound, fuse type, 68 ohms, ±10%. Resistor-Fixed, composition, 3300 ohms,		105268	Insulator-Soli rubber insulator for mount ing ferrite antenna rod #105937
R14	101881			105939	Knob-Tuning control knob-onlique whit with spring-for Models IBX57 & IBX5
an	502222	Resistor-Fixed, wirewound, 1200 ohms, ±5%, 4 w.	4	105931	Knob-Tuning control knob-antique white with spring-for Models 18X52, 18X6 and 18X67
	502182	Resistor-Fixed, composition, 2200 ohms, ±10%, Va w.			and 18X67
		Resistor-Fixed, composition, 820 ohms, ±10%, % w.		105932	Knob-Vernier tuning control knob-lawny beige with spring-for Medels 18X7 and 18X79
	502210 502147	Resistor-Fixed, composition, 1000 ohms, ±10%, % w.		105928	Knob-Volume control knob-anlique white with apring-for Models 18X57, 18X59
		Resistor-Fixed, composition, 470 ohms, ±10%, 1/2 w.		105929	IBX62, IBX64 and IBX67
'n	101882	Switch-"Line-battery" function switch with bracket		100013	18X62, 18X64 and 18X67 Knob-Volume control knob-lawny beig with spring for Models 18X78 an 18X79.
	105938 105933	Pari of RS Transformer—lat I-F transformer		79744	Retainer-Formed wire binge retainer to case front and case back (2 reg'd)
	105934 105926	Transformer-2nd I-F transformer Transformer-Output transformer		105943	Retainer-Hairpin retainer for carrying
	105935 73128	Coll-Oscillator coil		101874	Spring-Retaining spring for versier tun
	105940	Cable-AC power cable with plug Cable-"B" battery cable with male and		101069	Spring-Reigining spring for volume con trol knobs tuning control knobs 105935 105931 and indicator #105930
	73935	Clip-Mounting clip for 1-F transformers		101875	105931 and indicator #105930 Stop-Phenolic stop for ontenna assembl
	74324	Connector-3 contact polarized male con- nector for "A" battery leads		1010/3	Stop-Phenolic stop for ontenna assembly Models IBX52, IBX54, IBX57, IBX78 and IBX79
	105942	Cup-Aluminum cup for volume control Grommet-Strain relief grommet for power		101903	Washer-Phenolic retaining washer for AC power cable (2 reg'd)
		cable		101876	Washer-Spring washer for anleund as sembly Models IBX62, IBX64, IBX67 IBX78 and IBX79
	105941	Insulator-Phonolic insulator for tuning capacitor	1		1BX78 and 1BX79

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RCA

RADIO PAGE 25-5



Model SHC-8 The "Mar. VIII D" Model SHP-3 The "Mark VIII" Model 9-T-2 Mabogany, Oak, Maple or Walnut AM-FM Tumer

Model SHC-8 is a combination radio-phonograph. It is a combination of Model SHP-8 and Model 9.7-2.

Model SHP-4 is a phonograph using AF amplifier charses R5-171, record changer RP-205C-2X or RP-205E-2X and four apeakers.

Model 9-T-2 is an AM-FM tuner using tuner chassis RC-1155-AX: it is an accessory designed for installation in Model SHP-8

RCA VICTOR

Stereophonic High-Fidelity Combination

MODEL SHC-8 Stereophonic High-Fidelity Victrola®

> MODEL SHP-8 AM-FM Tuner

MODEL 9-T-2 Tuner Chassis No. RC-1155AX

Amp. Chassis No. RS-171

Record Changer RP-205C-2X, RP-205E-2X

SERVICE DATA - 1958 No. 13 -PREPARED BY COMMERCIAL SERVICE

RCA SERVICE COMPANY A DIVISION OF

RADIO CORPORATION OF AMERICA CAMDEN 8. N. J.

#### SPECIFICATIONS

TUNING RANGE	LOUDSPEAKERS
Standard Broadcast (AM) 540-1606 kr Frequency Modulation (FM) 88-108 inc	Two 12" PM "woolers"
INTERMEDIATE FREQUENCIES	POWER SUPPLY RATING
AM .455 kc FM	Model SHC-8: 115 volts, 60 cycles
TUNER CHASSIS RC-1135AE	AUDIO POWER OUTPUT
(1) RCA 6276	Stereo
(3) RCA 12BA6 LF. Amplifier (4) RCA 12AU6 FM LF. Amplifier	FREQUENCY RESPONSE. 45 cycles to 20,000 cycles
(5) RCA 12AU6	TUNING DRIVE RATIO
(7) BCA 12AV5         AM DeL-A♥C—Phase Inv.           (8) RCA 35W6         Bectifier	DIMENSIONS (Overall) Height
AMPLIFTER CHASSIS RS-171	1/1/1/26
II) RCA 6CG7. Two-channel A.F. Preempliker     IZ) RCA 6CG7. Two-channel ist A.F. Ampliker     IZ) RCA 6CG7. Two-channel Zod A.F. Ampliker     40 RCA 6V6C7. Left Channel A.F. Output     S) RCA 6V6C7. Bight Channel A.F. Output	
(6) RCA SY3GT	

# (S) BCA EVECT RECORD CHANGER

TUNING BANCE Standard Broad

Turntoble speed	
Record capacity	
	or twelve 10 inch.
	or ten 12 inch.
	or ten 10 in. and 12 in. intermixed.
Pickup (Stock No. 106770)	Stereophonic Ceramic



ALIGNMENT PROCEDURE

#### FM SWEEP ALIGNMENT

An RCA VoltOhmyst® or equivalents meter is necessary for meas-uring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate maximum crudio output during AM alignment. Connect the output meter across the speaker voice coll. The RCA VoltOhmyst can also be used as an AM alignment indicator, either to measure audio output or to measure AVC voltage. When audio output is being measured, the volume control should be turned to maximum. Adjust tone controls to mid-position

For all alignment operations, connect the low side of the signal generator to the receiver chassis. If output measurement is used for AM alignment, the output of the signal generator should be kept as low as possible to avoid AVC action.

ALIGNMENT INDICATORS

SIGNAL GENERATOR

#### AM Alignment

FUNCTION SWITCH IN AM POSITION

Steps	Connect high aide ol sig: gen. to	Sig. gen. output	Turn radio dial to	Adjust for peak output	
1	Pin No. 1 of V3 in series with .01 mid	455 kc.	Quiet point at high	T4 bottom core (sec.) T4 top core (prl.)	
2	Tap lug (No. 4) en AM RF coll	(mod.)	freq. and	T2 boilom core (sec.) T2 top core (prl.)	
3		1620 kc. (mod.)	1620 kc. (gang open)	CIE-T (osc.)	
4	Short wire placed near	1400 kc. (mod.)	1400 kc. signal	CIA-T (ent.) CIC-T (rl.)	
5	radimed signal	600 kc. (mod.)	600 kc. signal	L6 (osc.) (rock gang)	
6				14 (RF)	
7	Repeat steps 4, 5 and 6 until maximum gain is obtained				

Oscillator frequency is above signal frequency on both AM and FM.

# If on FM sweep percenter is used for FM alignment, edges for 107 mc, 04 m for sweep. Contract calculating ductimators 75 iop cores for 10.7 mc et auxiliarities for balanced peaks, Peak sequencies, and the experimentally 330 kc. When aligning the other TM tuned circuits, connect coefficience table and through a 22K revision to pin 1 of VS, Follow alignment table sequence, adjusting for maximum gain and symmetrical curves.

FM Alignment

DIO PAGE

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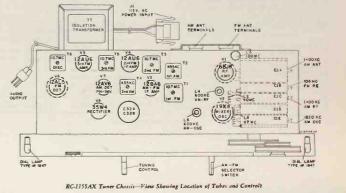
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#### FUNCTION SWITCH IN FM POSITION

Steps	Connect high side of sig. gen. to-	Sig. gen. output	Tum radio dial to	Adjust for max. output
.L	Pin No. 1 of VS-12AU6		Quiei	T6 top core for sero d.c. across C23 T6 bottom gore for maximum d.c. at junction al R18 and R19
2	Pin No. 1 of V4-12AU6	10.7 me	point at low frequency end	1T5 top core
3	Pin No. 1 of V3-12BA6			T3 top cors †*T3 bollom core
4	C1-B Stator			Ti top core
8		87 mc	(gang closed)	TFM old. L8
6		106 mc	106 mc signal	TEM R.F. CIB-T
7	FM Ant. terminole thru 270	90 mc	90 mc signal	TPM R.F.
8	ohm resistor	Repea	gain le obtai	ntil mostimum ned
9		100 mc	100:mc signal	TPM ont. coll L5

# "It necessary for accurate peaking, the winding in the same transformer not being peaked should be loaded with a 680 ahm resistor. "Connert VollCharyst to fuil a 1 of V5 intrough a 2202 itelating resistor with W inch maximum exposed lead at grid terminal ead. Output adjusted for 1 volt dc. Dues VollCharyst lead away from input atrautis.

#### NOTE-FM coils 1.8, 1.2 and 1.5 are adjusted by increasing or decreasing spacing between turns.



#### DESCRIPTION

Model SHC-8 is a radio-phonograph. It is a combination of Model SHP-8 and Model 9-7-2.

Model SHP-8 is a phonograph designed for use with either stereophonic records or mongural records. The instrument employs audio amplifier chassis RS-171, record changer RP-205C-2X or RP-205E-2X, two 12-inch wide-range speakers and two 31/2-inch tweeters mounted on plastic housings to give panoramic distribution of the higher frequencies

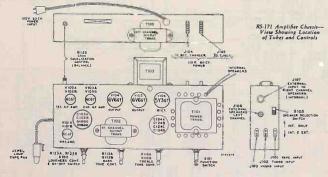
The tuner chassis provides R-F amplification on both AM and FM operation. The FM antenna input is broad-banded and resonates to the approximate center of the FM band. The mixer is pentode connected for AM operation and triode connected for FM opera-tion. AM I-F circuits use a conventional I-F amplifier and a diode detector which provides AVC voltage. FM I-F circuits include three I-F complifiers without AVC and a discriminator detector. An item of unusual interest is the inclusion of an A.F. phase inverter in this chassis. This simplifies switching between stereo and monaural operation in the audio chassis. AC supply voltage for the 35W4 rectifier tube and the series connected tube heaters is obtained from an isolation transformer.

A five-position audio function switch is contained in the audio amplifier chassis and permits use of a tape recorder in conjunction with either radio or phono functions. This chassis has two singleended amplifiers for dual-channel amplification of stereophonic sound from records or tour-channel amplification of stretephonic sound from records or topes. The outputs of these two single-ended amplifiers are reconnected as a push-pull amplifier when using the instrument for monaural reproduction. Three 6CG7 tubes (dual tinde) provide three stages of dual-channel AF amplification; a 6V6GT tube is used for power output in each channel. Negative feedback, applied to each third AF amplifier, is derived from the secondaries of the two output transformers.

A dual loudness control and dual tone controls are used to provide equal and simultaneous regulation of volume and tone in each amplifier channel. A gain equalization control in the input of the right channel 3rd AF amplifier stage permits the right channel (internal speakers) output to be balanced with left channel (external speakers) output.

A speaker selection switch (one rystem or two system) is used to connect the two amplifier channels in parallel when internal speakers only are used. Provision is made to use this instrument as a companion speaker in conjunction with other amplifiers when so desired

A four-speed record changer (16%, 33%, 45 and 78 r.n.m.) is used which is designed for use with either stereophonic or monaura records. It utilizes a ceramic two-stylus pickup having two elements and two audio outputs.



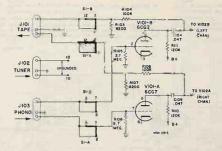
#### CRITICAL LEAD DRESS

- CHASSIS RC-1155AX
- All FM IF transformer grid and plate leads should be short and direct as possible and kept low, near chasts.
- R18 and R19 leads should be kept as short as possible on T6 terminal 6 side
- 3. Keep leads V5 pin 5, to T6 torm 1, as short as possible and low near chassis.
- Dress C33 down on chassis and against terminal board. Run filament lead between V5 and V6 on side of V6 socket opposite
- All bypass capacitors should have leads as short as possible.
- Green lead from AM oscillator stator gang terminal to AM oscillator coil should be dressed against front of shield box and up above filament choke.
- RF plate choke Ll, should be dressed at least '4" away from AM R.F. coil L4 and at least '4" from shield.
- Mixer grid condenser C10 should be dressed away from FM oscillator gang stator terminal and away from leads connecting to terminals 8 and 9 of V2 socket

- - 9. Filament chokes L10 and L11 should be raised a minimum of 1/16" above chassis.
  - Oscillator grid condenser C12 should have short leads and be dressed away from filament choke L10. Pl. Keep wires and components away from 1200 ohm resistor R22.
  - 12. C24 should ground in hole near terminal 5 of V6 with short leads
  - Heavy buss load from terminal 6 of V2 to SI-A terminal 9 should be short and direct.

#### CHASSIS BS.171

- 1. The following components, R103, R104, R105, R111 and C104, in the procamplifier (V101) circuit should have relatively short leads and be dressed away from R106, R107, R108, R110 and C109
- 2. Stand PC101 and PC102 vertically between the tone controls.
- 3. Dress all wires and components away from R140 (2200 ohms) 4. Leads from function switch to V101 should be dressed down to chassis and against chassis apron; maintain some separation between wires

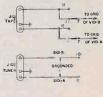






TUNEF







#### POSITION #4 - TAPE STERED

- (1) Tape inputs are connected independently to grids of V101-A and V101-B.
- (2) Tuner input is grounded
- (3) Phone input is open circuited.
- (4) Yellow leads (secondary tap) of the output transformers are not connected in parallel.

POSITION #1 - PHOND SINGLE Yellow leads (secondary tap) of both output transformers are connected in parallel through S101-B Front.

#### POSITION #2 -PHONO STERED Identical to Position #1 except that: (1) There is no connection between term, #7 and

#8 or between term. #11 and #2 of the func-(2) S101-B Front floes not connect yellow leads of out-

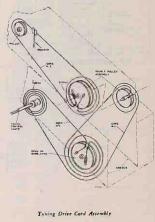
out transformers in parallel.

#### POSITION #5 --- TAPE SINGLE Identicalife Position #1 except that: (1) Through connection of tape inputs is made through term, #12 and #7 instead of #11 and #7-(2) Yellow leads of both output transformers are con-nected in parallel through S101-B Front.

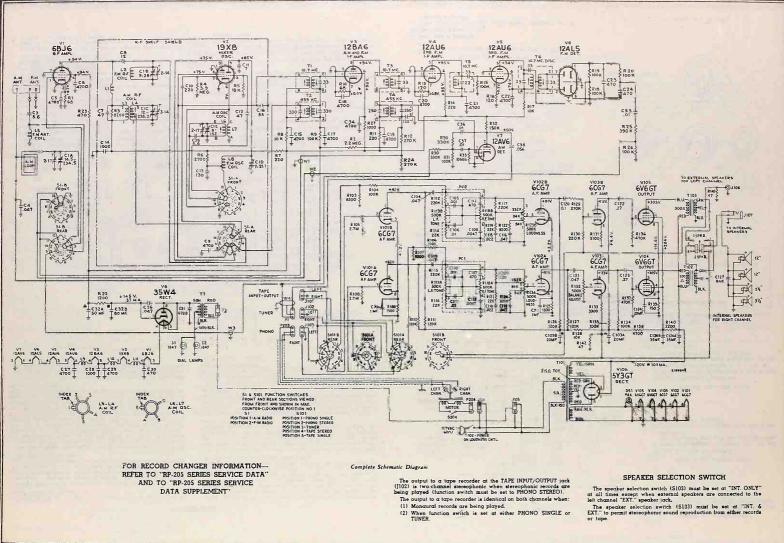
POSITION #3 - TUNER (1) Tuner input is connected to grids of V101-A and V101-B. (2) Output to tape recorder (101) is connected to sutputs of VIOTA and VIOTB as in Position #1. (3) Yellow leads (secondary tap) of both output transformers are connected in parallel through S101-B Front.

Simplified Schematic Diagrams of Function Switch in

#### Amplifier Chassis RS-171



CHASSIS RC-1155AX, RP-205C-2X, -205E-2X, RS-171



CJohn F. Rider

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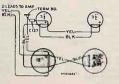
CHASSIS RC-1155AX, RP-205C-2X, -205E-2X, RS-171

### CHANNEL GAIN EQUALIZATION - CHASSIS RS-171

A gain equalization control is provided to enable the gain of the RIGHT CHANNEL (internal speakers) to be balanced with the gain of the LEFT CHANNEL (external speakers).

This equalization control (R132) is located on the bottom apron of the chassis toward the front of the cabinet. When adjusting this control, four conditions must exist:

- A monaural signal input must be used. This should be α monaural record; use a frequency test record when measuring with an output meter or use α music record for listening test.
- The function switch (S101) must be in #2 position (PH STEREO). This enables the two channels to have independent outpuls
- The speaker selection switch (S103) must be in the "INT. 6 EXT. SPKRS." position. This is necessary for the two chamnels to have independent outputs.



### 4. Both internal and external speaker systems must be connected or the outputs loaded equally with resistors. If output is measured with an output mater, a channel having no speakers connected will have an abnormally high output voltage reading.

Adjust the equalization control (R132) to obtain right channel output equal to left channel output. The left channel gain is not adjustable.

### NOTES:

It is not necessary to measure the audio output while making the equalization adjustment; sufficient accuracy can usually be had by listening.

If the external speaker system is other than 3.5 ohms impedance, the output voltages will not be equal for equal power output.

### IMPORTANT

The four speakers must be connected as shown in the illustration at left. Improper connections may result in distorted or weak reproduction.

### REPLACEMENT PARTS

SYMEOL NO.	STOCE NO.	DESCRIPTIÓN	SYMBOL NO.	STOCK NO.	DESCRIPTION
	1	XM/FM TUNER CHASSIS		1	RESISTORS: Fixed, Composition, % watt unless
	1	RC-1155AX		1	RESISTORS: Fixed, Composition, 1/2 watt unless otherwise specified
	k	CAPACITORS:	RI	502068	68 ohms ±10%
CIA, B, C, D, E		Variable tuning	R2	502522	2.2 megohms, ±20%
C3	74182	Ceramic, 5.6 mmi., ±1.0 mmi., 500 v. Coel0	R3	502282	8200 ohms, ±10%
C4	73558	Paper, 0.047 ml., ±20%, 200 v.	84	502539	3.9 megohms, ±10%
C5, C6	73473	Ceramic, 4700 mmf., +100% -0%, 500 v.	85	502318	18,000 ohms, ±10%
C7	101940	Ceramic, 22 mml., ±10%, 500 v.	86	502227	2700 ohms, ±10%
C8	70595	Ceramic, 12 mml., ±5%, 500 v.	87	502122	220 ohms, ±20%
C9	73473	Ceramic, 4700 mmf., +100% -0%, 500 v.	BB	502310	
CID	101374	Mica, 220 mml., ±20%, 500 v.	89	502410	10,000 ohms, ±10%
CII	77530	Ceramic, 7 mmi., ±0.5 mmi., 500 v.	BIO	502068	100,000 ohms, ±5%
C12	77531	Ceramic, 47 mmf., ±10%, 500 v. Coef0	RIT	502068	68 ohms, ±10%
C13	77532	Ceramic, 130 mmi., +21/1 %, 500 v. Coel750	BIZ		220 ohms, ±20%
C14	105660	Feed thru, 1000 mmf., +100% -0%, 500 v.	813	502427	270,000 ohms, ±10%
CIS	73473	Ceramic, 4700 mmf., +100% -0%, 500 v.	BI4	502112	120 ohms, ±10%
C16	100150	Feed thru, 33 mmf., ±5%, 500 v.	R14 R15	502122	220 ohms, ±20%
CI7 thru C20	73473	Ceramic, 4700 mmf., +100%, -0%, 500 v.	RIG	502410	100,000 ohms, ±5%
C21	104205	Ceramic, 3300 mml., ±20%, 500 v.	R15	502112	120 ohms, ±10%
C22	73473	Ceramic, 4700 mmi, +100% -0%, 500 v.		502310	10,000 ohms, ±10%
C23, C24	76992	Mica, 470 mmi., ±20%, 300 v.	R18,R19,R20 822	502410	100,000 ohms, :±5%
226	73592	Paper, 0.047 mi., ±20%, 500 v.		76346	1200 ohms, ±10%, 4 w., wirewound
C27	73473	Ceramic, 4700 mmi., +100% -0%, 500 v.	H23	502147	470 ohms, ±20%
C28	105560	Feed thru, 1000 mmf., +100% -0%, 500 v.	R24.	502427	270,000 ohms, ±10%
C29	73473	7 880 Inru, 1000 mmi., +100% -0%, 500 v.	R25	502439	390,000 ohms, ±10%
C30	76992	Ceramic, 4700 mmf., +100% -0%, 500 v. Mica, 470 mmf., ±20%, 300 v.	R261	502410	100,000 ohms, ±5%
C31	73473		R27	\$02210	1000 ohms, ±10%
C32A. C32B	73520	Ceramic, 4700 mml., +100% -0%, 500 v.	R28	502322	22,000 ohms, ±10%
233	79316	Electrolytic, 50/80 mf., 150/150 v.	R291 R30	502433	330,000 ohms, ±10%
234	73473	Paper, 0.01 mi., ±10%, 200 v.	R31	502410	100,000 ohms, ±5%
C35	103440	Ceramic, 4700 mml., +100% -0%, 500 v.	R32	502415	150,000 ohms, ±10%
236	106185	Cerainic, 5.6 mmf., ±0.5 mml., 500 v. CostN3300	R33	502610	10 megohms, ±10%
237	101000	Paper, 0.01 ml., ±10%, 400 v.	SIA, SIB	104608	Switch-AM/FM Junction
238	103269A	Paper, 0.01 ml., ±10%, 200 v.	71	100112	Transformer-lat FM 1F
1		Paper, 0.056 ml., ±10%, 400 v.	T2	76335	Transformer-lat AM IF
	106344 77534	Connector-2-contact male for AC power	T3	77513	Transformer-2nd FM IF
2		Coll-RF choke	T4	76328	Transformer-2nd AM IF
3. 14	77536	Coll-FM RF	TS	77512	Transformer-3rd FM IF
5. 14	77525	Coll-AM RF	T6	77511	Transformer-FM discriminator
L6 L7	77538	Coll-FM anlenna	17	104609	Transformer-Power transformer
L6, L7 _8	77526	Coil-AM oscillator	1	104612	Bumper-For tuner wood frame (4 reg'd)
	77537	Coll-FM oscillator	14	104611	Bumper-Rubber for R.F. shelf mounting
9, L10 L11	77535	Coil-Filament choke		101344	Bushing-For tuning control shaft

### REPLACEMENT PARTS-Continued

NO.	NO.	DESCRIPTION	SYMBOL NO.	NO.	DESCRIPTION
	73935	Clip-IF transformers mounting	Rist	502233	3300 ohms, ±10%
	74879	Connector-2-contact female for antenna leads	R132	106212	Control-Gain-Equalization
	72953	Connector-3-contact male audio cable from tuner Cord-Dial drive (250 foot spool)	R133	502233	
	104610	Dial-Tuning control	R134,R135 R136,R137	502410	3.000 Forms, ±10% 470,000 Forms, ±10% 470,000 Forms, ±10% 150 Forms, ±10%, 2 w. 2200 Forms, ±10%, 2 w. 47 or Shars, ±10%, 2 w.
	101345	Evelet-For RF shell mounting grammet	R136,R137	502447 502247	470,000 ohms, ±10%
	104603		8139	522115	150 ohms ±10% 2 m
	X3823		R140	522222	2200 ohms ±10% 2 w
	16058	Grommet-Rubber RF shell mounting (4 reg'd) Plate-Dial backplate with %" O.D. pulley, double pulley shaft-less double pulley	R141, R142	522047	47 ohms, ±10%, 2 w.
	104607	Plate-Dial backplate with % O.D. pulley,	SI01A,SI01B	106209	Switch-Function Part of RI23A, RI23B
	104605		\$102 \$103	46750	Part of R123A, R123B
	101352	Politer-Control dial Pulley-Double for dial backplate Pulley-RF shell drive cord Pulley-#6-32 x %" cup point for drive cord Pulley-#6-32 x %" cup point for drive cord Pulley-	T101	46/60	Switch—Speaker selector Transformer—Power
	101351	Pulley-RF shelf drive cord	T102, T103	106211	Transformer-Output
	102627	Pulley-%" O.D. for dial backplate	1100, 1100	70392	Cable-AC power cable and plug
	34300	Screw-#6-32 x " cup point for drive cord pulleys		106289	Clip-Mounting and detent for loudness contr and "en-off" switch
	104604			A DOWN	and "on-off" switch
	75192	Shield-For VI		100270	Grommet-Strain relief for power cable (1 set)
	79721	Shield-For V2		102787	Socket-Pilot tamp socket and leads Socket-Octal for V104 and V105
	79263	Shield-For V6		31251	Socket-Octal for Vi05
	100642 77087	Shalt-Tuning confol Shield-For V1 Shield-For V2 Shield-For V6 Socket-Lamp socket and lead assembly Socketpin miniature for V1		76971	Socket-9 pin miniature for VIOL and VIO2
	73117	Socket-7 pin miniature for V1		100474	Socket-9 pin miniature log V103
		Socket-7 pin miniature for V3, V4, V5, V6, V7 6			
	100101	Socket-9 pin miniature for V2			RECORD CHANGER WIRING
	100109	Spring-Drive cord	P103	74882	Connector-3-contact male - for phone picku
	77586	Washer-"C" type retaining for double nulley	P104	106344	Connector-2-contact male, for phone motor cabl
	77585	Washer-"C" type retaining for double pulley Washer-"C" type retaining for tuning control shalt		100211	Connector-Closed and for phone motor leads
		AMPLIFIER ASSEMBLY	0.00		SPEAKER ASSEMBLY
		RS-171	C127	100509	Capacitor-Electrolytic, 8 ml., 10 v. AC Coher-Cone and voice coli ktt for 12" speake stamped 5616283. Codo 222 Cone-Cone and voice coli ktt for 12" speake stamped 5616283. Codo 274
		CAPACITORS:		102312	sigmand 961629.3 and 222
		CAPACITORS:		100909	Cone-Cone and voice coil kit for 12" speck
	1.00010				stamped 961628-3 code 274
C103A, C103B	105240	Electrolytic, 20/20 ml., 400/400 v. Paper, 0.047 ml., ±10%, 400 v.		100467	Housing-Plastic for 3%" speaker Speaker-3%" PM Speaker-12" PM
CIOS Ibru	105240			105395	Speaker-JV," PM
2105 thru 2108		Part of PC102		100831	Speaker-12 PM
2109	105240	Paper, 0.047 mf., ±10%, 400 v.			MISCELLANEOUS
Cli0 thru		Pert of PC101		101363	Antenng-AM loop assembly
7114	106772			101363	Board Terminal board for FM emission apple
2114	79343	Plin, 1 ml., ±10%, 50 v.		104531	Board-Terminal board for FM antenna cable Bracket-Interior light window mounting
2116	105578	Thin, I al., ±10%, 50 w. Peper, 622 al., ±10%, 200 v. Peper, 622 al., ±10%, 200 v. Pim, I al., ±10%, 200 v. Peper, 6027 al., ±10%, 200 v. Peper, 6027 al., ±10%, 200 v. Peper, 61 al., ±10%, 400 v. Electropic, 51, 400 v. Electropic, 51, 400 v. Electropic, 31, 400 v. Status, 31, 400		104530	Bracket-Knob escutcheon mounting
2117	106772	Film 1 m( +10% 50 v		104796	Bushing-Rubber tuner mounting
C117 C118	79343	Paper 0.022 ml +10% 200 -		X4189	Bushing-Rubber tuner mounting Cahinet-Mahogany
2119	105578	Paper, 0.047 mf., ±10%, 200 v.		X4191	Cabinet-Maple Cabinet-Oak
0120	78922	Paper, 0.1 mi., ±10%, 400 v.		¥4282	Cabinet-Walput
2121	105240	Paper, 0.047 ml., ±10%, 400 v.		104336	
122, C123	78571	Paper, 0.27 ml., ±10%, 400 v.	1. 1	X3723	Cap-Lamp cop Cloth-Grille-lor mahogany cabinet
124A_B_C	105765	Electrolytic, 35/35/20 ml., 400/400/25 v.		X3725	Clath-Grille-lor maple cabinet
101 thru	101998	Part of Speaker Assembly		X3724	Cloth-Grille-lor maple cabinet Cloth-Grille-lor oak cabinet
01 thru 103		Connector-3-contact polarized female tape input- output, tuner input and phone input		X3763	Cloth-Grille-for walnul cabinet
04, 1105	106471	Connector-2-conject female for phone mater or		74752	
		Connector-2-contact female for phone motor or tuner isolation transformer leads	1	74882	Connector-3-contact (polarized) mais, for loo anisana cable
106	35787			¥3800	Cover-Bottom for tuner compariment (SHP-8 only
107	101526	speakers Jack-Internal speaker		100459	Cushion-Lid
C101. PC102	105457	Circuli-Printed circult audio coupling		104538	Escutcheon-Control knob
	100101			102420	Hinge-Lid
		RESISTORS: Fixed, Composition, 1/4 watt unless		79957	Insulator-Rubber, record changer mounting (
	,	RESISTORS: Fixed, Composition, 1/2 watt unless otherwise specified		104127	req'd)
				106446	Knob-Bass or treble Knob-Audio function Knob-AM/FM function Knob-Tuning
103	502282	8200 ohms, ±10%		104797	Ench_AM/FM function
104	502410	100,000 ohms, ±10% 2.7 megohms, ±10%		104797 104798	Kneb-Tuning
105	502527	2.7 megohms, ±10%		104536	
05	502410	100,000 ohms, ±10% 8200 ohms, ±10%		X3797	Lid—For mahagany cabinet
108	502282 502527	0200 onms, ±10%		X3799	
09	502215	2.7 megohms, ±10% 1500 ohms, ±10%		X3798	Lid-For oak cabinet
10, R1-11	502412	120,000 ohme, ±10%		X3919	Lid—For walnut cabinet Motif—'New orthophonic high fidelity RCA Victor'
112		Part of PC102		103755 76894	Nut_#10.32 for record changer mounting atte
113A,R113B	106214	Control-Dugl base			Motif "New orthophonic high fidelity RCA Victor" Nut#10-32, for record changer mounting stur #79339
14	3	Part of PC102		73634	Nut-Retainer for speaker Ornament-"V" type for cabinet
15, R116	502422	Part of PC101 220,000 ohms, ±10%		104176	Ornament-"V" type for cabinet
118A,RI18B	106213	Control-Dugi troble		104421	Spring-Knob retaining Spring-Record changer mounting
19	502322	22 000 ohms +10%		73508	Spring-Anob retaining
20	502422	220,000 ohms. ±10%		79339	
21	\$02322	220,000 ohms, ±10% 22,000 ohms, ±10% 8200 ohms, ±10%			positions
22	502282	8200 ohms, ±10%		104124	
23A,R123B	106537	Control-Loudness control with push-pull "on- off" switch (S102)		104422	
24	502282	oll switch (S102)		104539	Washer-Decorative, for lamp cap Washer-Fiber, for record changer mounting stud #79339
25	502282	8200 chms, ±10% 1500 chms, ±10%		79340	washer-riber, lot record changer mounting stud
26,R127	502412	120,000 ohms, ±10%		103929	Washer-Nylon, for control knobs
28	502310	10.000 ohms +10%		78753	Washer-Nylon, for control knobs Washer-Rubber insulating, for record changes mounting stud #79339
29 30	502427	270,000 ohms, ±10% 220,000 ohms, ±10%			mounting stud #79339
	502422			104540	Window-For interior light

OJohn F. Rider

CHASSIS RC-1168C, RP-205G-1



Model SHC-4 The "Mark IV" Mahogany, Maple or Oak

### TUNING RANGE

Standard Broadcast (AM)	
Frequency Modulation (FM)	
INTERMEDIATE FREQUENCIES	3
AM 455 kc.	FM10:7 mc.
TUBE COMPLEMENT	
(1) RCA 6CB6	R.F. Amplifier
(3) RCA 6BA6	I.F. Amplifier
(5) RCA 6AU6	
	A.M. DetAVC-Ph. Inv.
	Rectifier
(10) RCA 6CG7	
(11) RCA 6CG7	
(12) RCA 6CG7	
(13) RCA 6V6GT	
	erer and an and an

The "MARK IV" is a stereophonic high-fidelity combination instrument consisting of a tuner/amplifier, stereophonic record changer and four speakers all in one cabinet.

The tuner/amplifier incorporates a tuned r.f. stage, mizer/oscil-lator, one stage of AM i.f. amplification and three stages of FM i.f. amplification. Audio amplification is twin-channel för storeo-phonic reproduction. Each avdio channel consists of preemplifier. two stages of voltage amplification and, 6V6GT power output. Inverse leedback, derived from the secondaries of the two output transformers, is applied to the third a.f. amplifiers.

The circuit is designed to enable tape recordings to be made from either records (either monaural or stereo) or radio programs. The program being recorded can be monitored on the speakers.

A two-pushbutton switch, located above the tuning dial, is used to select either MONAURAL or STEREO audio output. This switch permits stereo reproduction from stereophonic sources and yet relating many of the advantages of push-pull operation when monaural sources are used. A "left channel" external speaker system must be used in conjunction with the "MARK IV" when stereophonic sound is desired.

**OJohn F. Rider** 

### RCA RCA VICTOR

Stereophonic High-Fidelity Combination

### MODEL SHC-4

Tuner/Amp. Chassis No. RC-1168C

Record Changer RP-205G-1

SERVICE DATA

- 1958 No. 14 -

PREPARED BY COMMERCIAL SERVICE RCA SERVICE COMPANY A DIVISION OF

### RADIO CORPORATION OF AMERICA CAMDEN 8, N. J

### SPECIFICATIONS

115 volts, 60 cycles, 145, v	vatts (includes record changer)
TUNING DRIVE RATIO	
RECORD CHANGER	
Turntable speed	
Record capacity	. Up to fifteen 7 inch or
	twelve 10 inch or
	ten 12 inch or
	ten 10 inch and 12 inch intermixed
Pickup Stock No. 106770.	Stereophonic. Ceramie
AUDIO POWER OUTPUT.	
FREQUENCY RESPONSE.	
LOUDSPEAKERS	
Two 12" PM "woofers"	
CABINET DIMENSIONS	
Hataba 941/."	.Width, 38"

DESCRIPTION

A two-position slide-type switch, located on the back of the chassis, is used to permit operating the two audio output channels in parallel when a "left channel" speaker system is not connected.

Provision is made for use of this instrument as a companion speaker unit in conjunction with stereotape players.



### Signal Generator

For dignment operations connect the low side of the signal generator to the receiver chassis. The output of the signal generator should adways be controlled to prevent over-loading or excessive AVC action.

### Alignment Indicators

For measuring the developed d-c voltage across R45 or R47 during FM alignment an RCA VoltOhmyst® or an equivalent meter should be used.

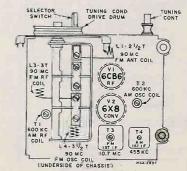
The RCA VoltOhmyst can also be used to indicate audio output voltage across the voice coil or developed voltage on the AVC bus.

### Alignment Sequence

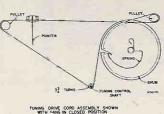
There is a slight interaction between AM and FM adjustments on the tuning condenser; if a large amount of adjustment is required of any circuit, all others should be checked in the following order: FM LF. AM LF.

AM Osc. ant. and r.f. FM Osc., ant. and r.f.

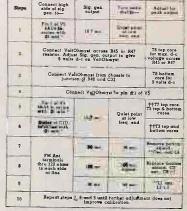
Final adjustment of AM ant, trimmer should be made with chassis and antenna in cabinet



FM Coil Locations



### FM Alignment RANGE SWITCH IN FM POSITION VOLUME CONTROL MAXIMUM\_TONE CONTROL CENTER



### \* Use ceramic disc capacitor with short leads.

++ Alternate loading may be necessary to provide accurate observation of pecks. Alternate loading involves the use of a 270 Alternation to load the plate winding while the grid wanding of the SAME TRANSPORMER is being pecked. These the grid wanding is loaded with the transitor while the plate winding is pecked. Only one winding is loaded at any one time.

It is pessible to run the IF transformer cores all the way through the coil winding and obtain a second peak. This will cause serious overcoupling and should be avoided by using a marked adjusting stick. The correct peak is always the first peak obtained when the core is started in from the "backed all the way out" possion.

\*\* Note: FM antenna, mixer and oscillator coils are adjustable by increasing or decreasing the spacing between turns. The location of the tap on the antenna coil is % turn to % turn from the ground end.

Oscillator frequency is above signal frequency on both AM and FM.

### Oscilloscope Alignment

It is preferable to use a sweep generator and oscilloscope for aligning I.F. and R.F. circuits to obtain a visual observation of curve shape during alignment.

With FM sweep generaton connected between FM ant. (#3) termind and chassis, and oscilloscope connected between the junction of R40-C33 and chassis, the overall FM linearity may be observed. There should be a peak-to-peak separation of 250 kc. with 50,000 microvolts input.

For IM digminent of the ratio detector, connect oscilloscope to junction of R40-C33 as in alignment table, adjusting T8 top and bottom cores for 10.7 mc. crossover and Ladimoch pecks. When aligning other FM tuned discutte, connect oscilloscope to pin #1 of VS (3rd FM, II) and discutte. CCA Follow disgument table sequence, adjusting for maximum gain and symmetry.

Dial Cord and Drive Assembly

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### ALIGNMENT PROCEDURE - LEAD DRESS

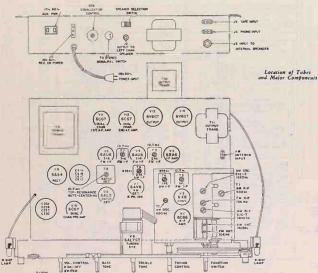
### AM Alignment

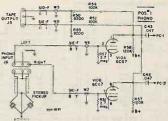
Steps	Connect high side of sig. gen. to-	Sig. gen. output (400 cy. modulation)	Turn radio dial to—	Adjust for peak output		
I	Pin 1 of V3 68A6 in series with _01 mid.	455 kc.	Quist point	T5 bottom core (pri.) T5 top core (sec.)		
2	Tl term. 4 in series with .01 mfd.	455 kc.	at low freq. and	T4 top core (sec.) T4 bottom core (pri.)		
3		1620 kc.	gang tully open	C17		
4		1400 kc.	1400 kc. signal	C3 cm1. C9 r.f.		
5	AM terminal on ont, input	Shunt a 10,000 ohm resistor across th r.L. section (CIC) of the gang.				
6	strip	600 kc.	600 kc. signal	T2 osc. (Rock gang.		
7	-	Remove th	he 10.000 ohm r rk Ti r.f. at 600	im resistor and t 600 kc.		
8		Re	peat 3, 4, 5, 6 a	nd 7		

The RF transformer (T1) and the oscillator coil (T2) cores should be adjusted on the peak obtained with the core coming out the lug end of the coil. When adjusting from the top of the chassis, this is the peak with the core farthest into the coil.

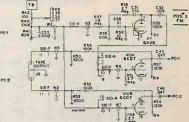
### Critical Lead Dress

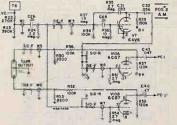
- 1. Dress R16, R33, R83 and R87 up in the air and away from all other components 2. Dress R51 and R54 down against chassis and keep leads short.
- 3. Keep\*leads of C33 and C39 short and dress these components down against chassis.
- 4. Keep all I.F. bypass capacitor leads short
- 5. Dress power line leads away from all audio leads at loudness control
- 6. Do not relocate ground straps from chassis to R.F. shelf 7. Lead from terminal "B" of 1st FM I.F. transformer to switch
- should be 3 inches ± 1/4 8 Dress all components and wiring gway from VI grid circuit.
- Keep grid end of R3 short. 9 Dress R42 down against chassis
- 10. Leads of R40 and R43 joining to R42 should be as short as possible.
- 11. Keep knob light leads gway from audio leads on same terminal
- Dress audio capacitors down against chassis and away from heater leads wherever possible. 13. Replace all shields securely if it has been necessary to remove

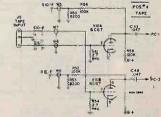




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### Simplified Schematic Diagrams of Audio Circuit

### CHANNEL GAIN EQUALIZATION

A gain equalization control is provided to enable the gain of the RIGHT CHANNEL (internal speakers) to be balanced with the gain of the LEFT CHANNEL (external speakers).

This equalization control (R78) is located on the back of the chassis. When adjusting this control, five conditions must exist:

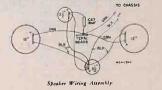
- 1. A monaural signal input must be used. This should be  $\alpha$ monaural test record; use a frequency test record when moasuring with an output meter or use a music record for listening
- 2. The function switch must be in #1 position (PHONO)
- 3. The STEREO pushbutton must be depressed. This onables the two channels to have independent outputs
- The speaker selection switch must be in the "INT. & EXT. SPKRS." position. This is necessary for the two channels to have independent outputs.
- 5. Both internal and external speaker systems must be connected or the outputs loaded equally with resistors. If output is measured with an output meter, a channel having no speakers connected will have an abnormally high output voltage reading.

Adjust the equalization control (R78) to obtain right channel output equal to left channel output. The left channel gain is not adjustable

NOTES

It is not necessary to measure the audio output while making the It is not necessary to measure the audio output while making the equalization adjustment; sufficient accuracy can usually be had by listening. This is best done by playing a manaural record with the left channel speaker placed for storeo listening. Adjust the balance control until the sound appears to be coming from a point midway between the two speakers.

If the external speaker system is other than 3.5 ohms impedance. the output voltages will not be equal for equal power output.



CHASSIS RC-1168C, RP-205G-1

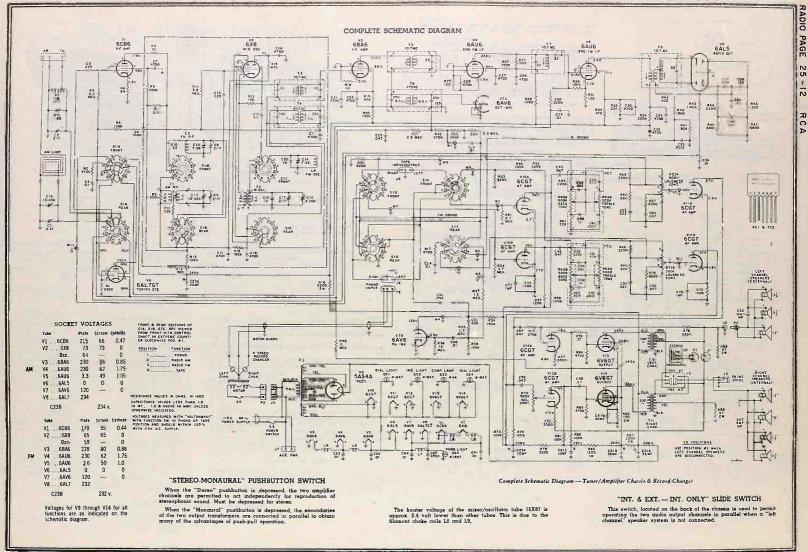
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**OJohn F. Rider** 

CHASSIS RC-1168C, RP-205G-1



**OJohn F.** Rider

### REPLACEMENT PARTS

SYMBOL NO.	STOCK NO.	DESCRIPTION	SYMBOL NO.	STOCE NO.	DESCRIPTION	SYMBOL NO.	STOC
		CHASSIS ASSEMBLY			RESISTORS	NO.	NO.
		RC-1168C	¥		Fixed. Composition, 1/2 watt unless otherwise	877	502233
		CAPACITORS:	81	502231	specified:	R78	106212
CIA thru CIF	103364		R1 R2	502233	3300 ohme, ±20% 4700 ohme, ±10%	R79, R80	502233
	100004	Variable tuning (includes C2, C3, C8, C9, C17)	83	502522	2.2 megohms, ±20%	R81, R82	502410
2. C3	79251	Part of CIA, B, C, D, E, F	R4	502058	58 ohms, ±10%	R03	512212
s	71520	Paper, 0.1 mi., ±10%, 200 v. Ceramic, 220 mmi., ±10%, 500 v., Coef750	RS	502210	1000 ohme, ::: 20%	R84, R85 R85	502447 522115
6	105660	Feed thru, 1000 mmi., +100% -0%, 500 v.	R6	502010	10 ohms, ±20%	887	522222
77	73473	Ceramic, 0.0047 ml., +100% -0%, 500 v.	R7	502310	10,000 ohms, ±20%	888, R69	522047
C8, C9		Part of CIA, B, C, D, E, F	R8 R9	502410	100,000 ohms, ±10%	R90	522622
C10	75739	Ceramic, 33 mml., ±10%, 500 v., Coel0	810	502233	3300 ohms, ±10% 330 ohms, ±10%	SIA thru	
211	73473	Ceramic, 0.0047 ml., +100% -0%, 500 v.	811	502539	3.9 megohms, ±10%	SIE	106445
C12 C13	105660	Feed thru, 1000 mmf., +100% -0%, 500 v.	R12	502318	18,000 ohms, ±10%	53	1
13	73473	Ceramic, 220 mmi., ±10%, 500 v., Coei750 Ceramic, 0.0047 mi., ±100% -0%, 500 v.	R13	502210	1000 ohms, ±20%	S5	46760
15	39042	Ceramic, 47 mmi., ±10%, 500 v., Ceel750	RI4	512347	47,000 ohms, ±20%, 1 w.	TI	76338
16	76349	Ceramic, 12 mmi., ±10%, 500 v., Coei330	R15	512415	150,000 ohms, ±20%, 1 w.	T2	76337
217		Part of CIA, B, C, D, E, F	R16	522222	2200 ohms, ±10%, 2 w.	T3 T4	75559 76335
216	39668	Mica, 0.0047 ml., ±20%, 500 v.	R17 R18	502247	4700 ohms, ±10%	75	76329
219	73473	Ceramic, 0.0047 ml., +100% -0%, 500 v.	RIS	502068 502347	68 ohms, ±10% 47,000 ohms, ±20%	76	76328
20	33098	Ceramic, 10 mml., ±0.5 mml., 500 v., Coel750	R20	502347	47,000 ohms, ±20%	17	77939
21, C22 23A, C23B	73473	Ceramic, 0.0047 ml., +100% -0%, 500 v.	R21	502522	2.2 megohms, ±20%	TB	77938
23A, C23B	106210 79251	Electrolytic, 20/20 mi., 400/400 v.	R22	502427	270,000 ohms, ±10%	TS	106334
25	73558	Paper, 0.1 mi., ±10%, 200 v. Paper, 0.047 mi., ±10%, 200 v.	R23	502439	390,000 ohms, ±10%	T10, T11	106211
226	73960	Ceramic, 0.01 mi., +100% -0%, 500 v.	R24	502522	2.2 megohms, ±20%	1	101344
27, C28	73473	Ceramic, 0.0047 mi., +100% -0%, 500 v.	R25	502112	120 ohms, ±10%	. 12	103339 70392
29	73960	Ceramic, 0.01 mf., +100% -0%, 500 v.	R26 R27	502410 502415	100,000 ohms, ±10%		73935
30	73473	Ceramic, 0.0047 mi., +100% -0% 500 v.	R28	502415	150,000 ohms, ±10% 1000 ohms, ±20%		13333
731 732	100369	Paper, 0.033 mf., ±10%, 400 v.	R29	502410	100.000 ohms, ±10%		106289
32 33	103269A 105579	Paper, 0.056 mf., ±10%, 400 v.	R30	502422	220,000 ohms, ±10%		68592
.33 34, C35	73473	Paper, 0.0012 mf., ±10%, 400 v.	R31	502112	120 ohms, ±10%		98235
36	73960	Ceramic, 0.0047 mi., +100% -0%, 500 v. Ceramic, 0.01 mi., +100% -0%, 500 v.	R32	502322	22,000 ohms, ±10%		72953
37, C38	39644	Mica, 470 mmf., ±10%, 300 v.	R33	512347	47,000 ohms, ±20%, 1 w.		74639
39	103166	Ceramic, 100 mmf., ±20%, 500 v.	R34	502422	220,000 ohms, ±10%		16058
:40	79181	Electrolytic, 2 ml., -10% +100%, 50 v.	R35 R36	502527 502610	2.7 megohms, ±10%		100270
41	73960	Ceramic, 0.01 mi., +100%0%, 500 v.	H35 B37	502510	10 megohms, ±10% 1:8 megohms, ±10%		106337
43	105240	Paper, 0.047 mi., ±10%, 400 v.	838	502410	100.000 ohms. ±10%		103910
44 thru 47	(	Part of PC1	839	502415	150,000 ohms, ±10%		103909
48	105240	Paper, 0.047 ml., ±10%, 400 v.	R40	502410	100,000 ohms, ±10%		75708
49 thru	and the second s	Part of PC2	R41	502382	82,000 ohms, ±10%	1	73584
52	79343		R42	502110	100 ohme, ±20%		76331
253 254	73558	Paper, 0.022 ml., ±10%, 200 v.	R43 R44	502510	l megohm, ±20%		76972
-54	79343	Paper, 0.047 ml., ±10%, 200 v. Paper, 0.022 ml., ±10%, 200 v.	R44	502222	2200 ohms, ±10%		100642
56	73558	Paper, 0.047 mi., ±10%, 200 v.	R45	502268	5800 ohms, ±10% 1200 ohms, ±10%	1	104810
57, C58	105240	Paper, 0.047 ml., ±10%, 400 v.	847	502268	6800 ohms, ±10%		100643
59, C60	78571	Paper, 0.27 mi., ±10%, 400 v.		001100	occo enina, 110 m		74179
61A,B,C.D	101414	Electrolylic, 35/35/10/20 mf., 400/400/350/25 v.	RSD	502282	8200 ohms, ±10%		77937
62, C53,	73960	Ceramic, 0.01 mf., +100% -0%, 500 v.	RS1	502527	2.7 megohms, ±10%		31251
65	73473	Ceramic, 0.0047 mi., +100% -0%, 500 v.	R52	502410	100,000 ohms, ±10%	1	102787
67	134/3	Part of Speaker Assembly	R53	502282	8200 ohms, ±10%		76336
68	101000	Paper, 0.01 ml., ±10%, 200 v.	R54 R55	502527	2.7 megchms, ±10%	4	76971 100474
69	73473	Ceramic, 0.0047 ml., +100% -0%, 500.v.	R56	502215 502410	1500 ohms, ±10% 100,000 ohms, ±10%		77585
70. C71	105772	Electrolytic, 1 mf., 50 v.	R57, R58	502412	120,000 ohms, ±10%		11303
	00000		R59		Part el PC1		£
1	38975	Connector-2-contact female for "stereo-monaural"	R60A,R60B	106336	Control-Dual bass	P2	1
	35787	Connector-Single contact lemale for external	R61		Part of PC1	P2 P6	106344 74882
		speakers	R62, R63		Part of PC2	100	100211
	101526	Jack-Internal speaker	R64A,R648 R65	106335	Control-Dual treble		
	105471	Connector-2-contact female phono power		502422	220,000 ohms, ±10%		
, 16	101000	Connector-3-contact (polarized) lemale for AM antenna phono or tape input	R66 R67	502322 502282	22.000 ohms, ±10% 8200 ohms, ±10%	C67	100509
	52131	Connector-2-contact lemale, auxiliary AC power	R68	502422	220,000 ohms, ±10%	1	105913
u	103501	Coil-FM anienna	R69	502322	22,000 ohms, ±10%		100909
2	Service of the servic	Part of "Miscellaneous"	R70	502282	8200 ohms, ±10%	1 1	
3 1	76353	Coll-FM RF	R71A,871B	106536	Control-Dugi volume with push-pull "on-off"		100467
	77973	Coil-FM oscillator			Control-Dual volume with push-pull "en-off" switch (S3)	1	105395
5 thru	71942	Coil-Filament choke	R72	502215	1500 ohms, ±10%	1	100897
8, L9	7635)	Coll-Filament choke	R73, R74 R75	502412 502427	120,000 ohms, ±10%	1	
CI, PC2	106457	Circult-Printed circuit	R76	502427	270,000 ohms, ±10% 220,000 ohms, ±10%	1	
	0.	the second se		JULILL	10,000 Onine, 210 #		

### REPLACEMENT PARTS -- Continued

NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DESCRIPTION
233	3300 ehms, ±10%		-	MISCELLANEOUS
212	Control-Gain Equalization		ATTene	
233	3300 ohms, ±10%	12	105685	Antenna-AM loop
410	100,000 ohms, ±10%	PL.	77726	Connector-2-contact male for "sterno-monaural"
212	1200 ohms, ±10%, 1 w.	56	105497	Switch-Function "stereo-monaural" push-buttor
447	470,000 ohms, ±10%	50	100437	type
115	150 ohms, ±10%, 2 w.	1 64	100523	Board-Terminal board for FM antenna cable
222	2200 ohms, ±10%, 2 w.		103911	Bracket-Knob escutcheon mounting
047	47 ohms, ±10%, 2 w.	1	106687	Button-"Mongural" push button
622	22 megohms, ±10%		104364	Button-"Stereo" push button
			X4140	Cabinet-Mahogany
445	Switch-Function-4 position rotary type		X4141	Cabinet-Maple
			X4368	Cabinat-Oak
	Part of 871A and 871B		71892	Cabinet—Oak Calch—Cabinet doör
760	Switch-Speaker selection, D.P.D.T. slide type	1	30716	Clip-Magic eye tube mounting-less wing screw
338	Coll-AM RF		X3723	Cloth-Grille for mahogany cabinet
337	Coil-AM excillator	1	X3725	Cloth-Grille for maple and oak cabinets
559	Transformer-lat FM IF		74752	Connector-2-contact male for FM antenna cable
335	Transformer-1g: AM IF		74882	Connector-3-confact male for AM loop missing
329	Transformer-2nd FM IF	1	74004	coble
328	Transformer-2nd AM IF		104339	Cöver-Cabinet back
939	Coll-3rd FM IF		101958	Cushion-Felt for record changer drawer
938 ]	Transformer-FM ratio detector		104855	Dial-Tuning
334	Transformer-Power		X3750	
211 🕴	Transformer-Output			Door-Cabinet door with record changer drawer- 1 set-less hardware-for mahogany cabinet
344	Bushing-For tuning control shaft	1 Vi	X3751	Door-Cabinet door with record changer drawer-
339	Bushing-RF shell mounting (2 regid)			1 set-less hardware-for maple cabinet
392	Cable-AC power cable and plug		X3972	Door-Cabinet door with record changer drawer-
935	Clip-lat AM, 2nd AM, and 3rd FM IF transformer			I set-less hardware-for oak cabinet
	mounting		106534	Escutcheon-Control dial
289	Cip-Mounting and detent for loudness control	P	106399	Esculcheon-Control knob Esculcheon-Stereo switch
	and "ignicill" switch		104175	Escutcheon-Stereo switch
92	Connector-8-conlact female socket for magic eye V8-(less shell)		103429	Eyelet-Metal chassis mounting
353	V8-(less shell)		75548	Grommel-Rubber(Chassis mounting (4 reg'd)
	Cord-Dial drive (250 loot spool)	I CINES	74308	Hinge-Cabinet door (1 get)
539	Fastener-R.F. shell mounting (2 reg'd)	£	79957	Insulator-Rubber for record changer mounting
058	Grommet-Rubber-RF shell mounting	F		atud
270	Grommet-Strain relief for power cable (1 set)	1 I I I	103928	Jewel-For control knob escutcheon
337	Plate-Dial backplate with pulleys and brackets		103923	Knob-Function
910	Pointer-Dial		103924	Kngb-Treble or bass
627	Pulley-Aluminum "4" O.D. for diat backplate.		003921	Knob-Tuning
909	Shalt-Tuning control		103922	Knob-Volume
708	Shell-For connector #68592		106325	Motil-"Sigree orthophonic high fidelity RCF
584	Shield-For VI			
331	Shield-For V2		33225	Nut-Retaining for knob escutcheon jewel
972	Shield—For VIO		74788	Nut-Retaining for motif
542	Socket-Lamp socket and lead assembly	1	76894	Nut-#10-32 for record changer mounting stud
810	Socket-Lamp socket and twin lead assembly	1	106426	Ornament-"V" shape
543	Socket-Lamp socket (molded bakelite) with leads			
	and bracket		X3759	Panel-Record changer drawer back for mahogany cabinet
179	Socket-7 pin miniature for VI		X3760	
937	Socket-7 pin miniature for V3, V4, V5, V6 and V7		A3100	Panel-Record changer drawer back for maple cabinet
151	Socket-Octal for V9		X3761	Panel-Record changer drawer back for oal
87	Socket-Octal for V13 and V14			cabinet
136	Socket-9 pin miniature for V2		106346	Pull-Cabinet door and record changer drawer
971	Socket-9 pin miniature for V10		103912	Reiractor-Plexigians for knob lamp
174	Socket-9 pin miniature for V11 and V12		104159	Roller-Nylon, för record changer drawer slider
85	Washer-"C" type retaining for tuning control		75083	Screw-Wing type, for magic eye mounting clip
	ehalt		103927	Shield-Rubber for magic eye tube
	RECORD CHANGER WIRING			
44	Connector-2-contact male phono power		103427	Slider-Extension slide for record changer drawer (1 set)
82	Connector-2-contact male phono power Connector-3-contact male pickup cable		104128	Spring-Conical spring for mounting record
11	Connector-3-contact male pickup cable Connector-Closed end, for motor leads	and the second of	104120	changer
	Connector-Glosed end, for motor leads	1	74734	Spring-Tone, function or tuning knob retaining
	SPEAKER ASSEMBLY	5	101069	Spring-Volume knob retaining
09	Capacitor-Electrolytic, 8 mi., 10 v. AC		78750	Stud-Record changer mounting (2 req'd)
13	Cons Cons and voice call kit for 12" marker	-		
	Cone-Cone and voice coll kit for 12" speaker. stamped 961628-3 code 232		79340	Washer-Fiber insulating washer for record changer mounting stud
09	Cone-Cone and voice coll kit for 12" anegker.		104622	Washer-Felt for knobs
1.0	Cons-Cone and voice coll kit for 12" speaker. stamped 961628-3 code 274	1 m		
67	Housing-Plastic housing for 34s" speakers		103929	Washer-Nylon for knobs
195	Speaker-341" P.M.		78753	Washer-Rubber lot record changer mounting stud
197	Speaker-12" P.M.		102915	Washer-Vellutex (or diai
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Model SHC-7 The "Mark VII D' Model SHP-7 The "Mark VII" Mahogany, Maple or Cherry

Model SHC-7 is a combination radio-phonograph. It is a combination of Model SHP-7 and Model 9-Tr2.

Model SHP-7 is a phonograph using AF amplifier chassis RS-174, record changer RP-205G-1 and four speakers.

Model 9-T-2 is an AM-FM tuner using tuner chassis RC-1155B; it is an accessory designed for installation in Model SHP-7.

### SPECIFICATIONS

LOUDSPEAKERS

POWER SUPPLY RATING

AUDIO POWER OUTPUT

DIMENSIONS (Overall)

Height ..... 321/2"

RCA VICTOR

Stereophonic High-Fidelity Combination

MODEL SHC-7

Stereophonic High-Fidelity Victrola®

Tuner Chassis No. RC-1155B

Amp. Chassis No. RS-171 Record Changer RP-205G-1

ERVICE DATA

- 1958 No. 15 -

PREPARED BY COMMERCIAL SERVICE

RCA SERVICE COMPANY

RADIO CORPORATION OF AMERICA

CAMDEN 8, N. J.

Two 31/2 PM "tweeters" ...... 6.8 ohms each @ 3000 cycles

Width .... 2913/16"

Depth ....1711/16"

### TUNING RANGE

Standard	Broadcast (A	M) .	 	 	 	ke
Frequenc	y Modulation	(FM)	 	 	 88-108	mc

### INTERMEDIATE FREQUENCIES

### TUBE COMPLEMENT

### TUNER CHASSIS RC-1455B

(1) RCA 6BJ6	
(2) RCA 19X8	Mixer-Oscillator
(3) RCA 12BA6	l.F. Amplifier
(4) RCA 12AU6	
(5) RCA J2AUS	
(6) RCA MALS	
(7) RCA 12AVE	
(8) RCA 35W4	

### AMPLIFIER CHASSIS RS-174

(1) RCA 6CG7	
(2) RCA 6CG7	Two-channel 1st A.F. Amplifie:
(3) RCA 6CG7	
(4) RCA 6V6GT	Left Channel A.F. Outpu
(5) RCA &V6GT	
(6) RCA 5Y3GT	Rectifie

### RECORD CHANGER

Turntable speed	
Record capacity	Up to fifteen 7 inch
	or twelve 10 inch.
	or ten 12inch.
	or ten 10 in. and 12 in. Intermixed.
Pickup (Stock No.	106770)Stereophonic Ceramic

**OJohn F. Rider** 

### AM/FM TUNER CHASSIS RC-1155B

This chassis is identical to Chassis RC-1155AX except for a slight difference in finish of the dial backplate and the wood frame surrounding the dial. MODEL 9-T-2

Except for the use of Chassis RC-1155B instead of RC-1155AX. Model 9-T-2 as used in Model SHC-7 is identical to Model 9-T-2 as used in Model SHC-8.

FOR ADDITIONAL INFORMATION REFER TO SERVICE DATA 1958 NO. 13 (SHC-8, SHP-8, 9-T-2)

FOR RECORD CHANGER INFORMATION REFER TO "RP-205 SERIES SERVICE DATA" AND TO "RP-205 SERIES SERVICE DATA SUPPLEMENT"

### REPLACEMENT PARTS

AM/FM TUNER CHASSIS RC-1155B

Same as previously listed for RC-1155AX in Service Data 1958 No. 13 (SHC-8, SHP-8, 9-T-2)

> EXCEPT Stock No. X3971 Frame is used in place of X3823 Frame.

> > AMPLIFIER CHASSIS RS-171

Same as previously listed for RS-171 in Service Data 1958 No. 13 (SHC-8, SHP-8, 9-T-2.

RECORD CHANGER WIRING. SPEAKER ASSEMBLY

Same as previously listed in Service Data 1958 No. 13 (SHC-8, SHP-8, 9-T-2).

### MISCELLANEOUS

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTIÓN
101963	Antennam AM loop	106446	Knob-Function
104531	Bracket-Mounting for interior light	106666	Knob-Loudness
100523	Board-Terminal, for FM antenna cable	104798	Knob-Tuning
104796	Bushing-Rubber, for mounting tuner chassis	X3974	Lid-For cherry bisque cabinet
X4428	Cabinet-Cherry Bisque	X3973	Lid-For mahogany cabinet
X4427	Cabinet-Mahogany	X3975	Lid-For maple cabinet
X4433	Cabinet-Maple	73634	Nut-Retainer for speaker
X3723	Cloth-Cabinet grille	76894	Nut-#10-32 for record changer mounting stud #79339
74752	Connector-2 contact male for FM antenna cable	106601	Pull-Decorative door pull
74882	Connector-3 contact (polarized) male for AM	104421	Spring-For lid support
	loop antenna cable	104128	Spring-For mounting record changer
X3800	Cover-Polystyrene bottom for tuner compart-	74734	Spring-Retaining for control knobs
100459	ment Cushion—Lid	0.04124	Stud-Record changer mounting-front and rear positions
106425	Escutcheon-Control knob	79339	Stud-Record changer mounting-side posi- tions
101051	Hinge-Lid-cherry and maple cabinets	104422	Support-Lid
102420	Hinge-Lid-mahogany cabinet	79340	Washer-Fiber, for record changer mounting
79957	Insulator-Rubber, for record changer mount- ing stud (4 req'd)	103929	stud #79339 Washer-Nylon for control knobs
13103	Jewel-Lamp cap	78753	Washer-Rubber, for record changer mounting
104797	Kneb-AM/FM function		stud #79339
104127	Knob-Bass or treble	104540	Window-For interior light



Madel SHC-2 The "Mark II" Mahogany or Cherry

Model SHC-3 The "Mark III" Mahoe. Oak or Wal



Model SHC.6 The "Mark VI" Mabog., Oak or Wal.

TUNING RANGE Standard Broadcast (AM) 540-1 600 kc Frequency Modulation (FM).... INTERMEDIATE FREQUENCIES TUBE COMPLEMENT (I) RCA 6CB6 R.F. Amplifier (2) BCA 6X8 Mixer & Oscillator (3) RCA 6BA6 .....I.F. Amplifier (4) RCA 6AU6 2nd F.M. I.F. Ampl. (5) RCA 6AU6 3rd F.M. LF. Ampl. (6) RCA 6ALS ....Ratio Detector (7) RCA 6AV6 A.M. Det.-AVC-Ph. Inv. (8) RCA 6AL7-GT (9) RCA 5AS4A Rectifier (10) RCA 6CG7 Two-channel Audio Preamp. (10) RCA 6CG7 Two-channel Audio Ampl (12) RCA 6CG7 Two-channel Audio Ampl. (13) RCA 6V6GT Left Channel Output (14) RCA 6V6GT Right Channell Output

### RCA VICTOR

Stereophonic High-Fidelity Combination

MODELS SHC-2, SHC-3 Tuner/Amp, Chassis No. RC-1168C

### MODEL SHC-6

Tuner/Amp. Chassis No. RC-1168D

### Record Changer RP-205G-1 SERVICE DATA

= 1958 No. 17 -

PREPARED BY COMMERCIAL SERVICE RCA SERVICE COMPANY A DIVISION OF RADIO CORPORATION OF AMERICA CAMDEN 8. N. J.

### SPECIFICATIONS

POWER SUPPLY RATING	vatts (includes reco	rd changer)
TUNING DRIVE RATIO		3% turns of knob
RECORD CHANGER		
Turntable speed Record capacity	16%, 33 Up to lifteen 7 in twelve 10 inch or ten 12 inch or ten 10 inch and i	ich or
Pickup Stock No. 106770		reophonic Cerami
AUDIO POWER OUTPUT.		14 watts maximu
FREQUENCY RESPONSE.		es to 20;000 cycle
LOUDSPEAKERS		
Two 12" PM "woolers". Two 3½" PM "tweeters".		ohms @ 400 cycle hms @ 3000 cycle
CABINET DIMENSIONS		
SHC-2: Height 36"	Width 37 1/4"	Depth
SHC-3: Height	Width	Depth. 181/4 Depth. 171/4

used. A "left channel" external speaker system must be used in

conjunction with the combination instrument when stereophonic

### DESCRIPTION

sound is desired.

Models SHC-2, SHC-3 and SHC-6 are stereophonic high-fidelity combination instruments; each consisting of a tuner/amplifier stereophonic record changer and lour speakers all in one cabinet.

The tuner/amplifier incorporates a tuned r.f. stage, mixer/oscillator, one stage of AM id. amplification and three stages of FM i.f. amplification. Audio amplification is twin-channel for stereo phonic reproduction. Each audio channel consists of preamplifier two stages of voltage amplification and, 6V6GT power output Inverse feedback, derived from the secondaries of the two output fransformers, is applied to the third a.f. amplifiers.

A switch is used to select either MONAURAL or STEREO audio output. On Models SHC-2 and SHC-3 this switch is a two-pushbutton type and is located above the tuning dial. On Model SHC-6 this switch is a slide type and is located in the record changer compartment. This switch permits stored reproduction from stereophonic sources and yet retaining many of the advantages of push-pull operation when monaural sources are

Models SHC-2, SHC-3 and SHC-6 are radio/phonograph instruments very similar to Model SHC-4.

Tuner/amplifier chassis RC-1168C is used in Models SHC-2, SHC-3 and SHC-4. Tuner/amplifier chassis RC-1168D is used in Model SHC-6, it differs from RC-1168C only in the omission of the indicator lamp and the knob lamp

### FOR ADDITIONAL INFORMATION REFER TO SERVICE DATA PREVIOUSLY ISSUED FOR MODEL SHC-4.

### PARTS LIST ADDITIONS (All models)

On original production, a two-piece motif was used; on late pro-duction a one-piece motif is used. This one-piece motif (Stock No. 105789) can be used to replace the two-piece motif.

Stock No.	ock No. Description			
106789	Motif—"Dual Amplifier Stereo — Orthophonic Fidelity RCA Victor"			
74879	Connector-2-contact female for FM antenna (part of chassis assembly)	cable		

FOR RECORD CHANGER INFORMATION -REFER TO "RP-205 SERIES SERVICE DATA" AND TO "RP-205 SERIES SERVICE DATA SUPPLEMENT"

The following "MISCELLANEOUS" items are used on Model SHC-2 but not on Model SHC-4. Refer to replacement parts listing of Model SHC-4 for all other items.

STOCK NU.	DESCRIPTION
X4426	Cabinet-Cherry
X4425	Cabinet-Mahogany
104860	Cap-L.H. trim for knob escutcheon or "Victrola" drawer escutcheon
104861	Cop-R.H. trim for knob escutcheon or "Victrola"
X3978	Door-L.H. and R.Hless hardware, for cherry cabinet
X3977	Door-L.H. and R.Hless hardware, for mahogany
X3980	Drawer-Record changer mounting-less hardware- for cherry cabinet
X3979	Drawer-Record changer mounting-less hardware- for mahogany cabinet
106590	Escutcheon-Control knob
106591	Escutcheon-"Victrola" drawer
102849	Panel-Record changer drawer back-mahogany only slocked for replacement
106592	Pull-Door pull with key (RH and LH) (1 set)
102848	Slider-For record changer drawer (2 reg'd)

The following "MISCELLANEOUS" items are used on Model SHC-3 but not on Model SHC-4, Refer to replacement parts fisting of Model SHC-4 for all other items.

S	TOCK NO.	DESCRIPTION
Y	4485	Cabinet-Mahogany
	4487	Cabinet-Oak
	4486	Cabinet-Walnut
	(5045	Cloth-For speaker baffle and cabinettdoor
10	03771	Clip-Retaining for cabinet back cover latch pin
X	5033	Door-With cloth and back panel-less hinges for manogany cabinet
	15035	Door-With cloth and back panel - less hinges for oak cabinet
	\$5034	Door-With cloth and back panel - less hinges for walnut cabinet
	06763	Escutcheon-Control knob
10	06773	Latch-For cabinet back cover
1 3	71892	Latch-For cabinet door
X	5042	Legs-Front legs and cross bar assembly for mahogany cabinet (i) set)
×	(5044	Legs-Frontlegs and cross bar assembly for oak cabi- net (1 set)
X	15043	Legs—Front legs and cross bar assembly for walnut cabinet (1 set)
1 2	(5039	Lea-Rear leg for mahogany cabinet
X	(5041	Leg-Rear deg for oak cabinet
	(5040	Leg-Rear leg for walnut cabinet
1 10	01859	Spring-Extension for cabinet back cover latch

The following "MISCELLANEOUS" items are used on Model SHC-6 but not on Model SHC-4. Refer to replacement parts listing for Model SHC-4 for all other items.

STOCK NO.	DESCRIPTION
X4497	Cabinet-Mahagany-less legs
X4498	Cabinet-Oak-less legs
X4499	Cabinet—Walnut—less legs
103771	Clip-Tubular for back cover latch pin
X5045	Cloth-Grille for cabinet
106800	Escutcheon-Control knob
106801	Escutcheon-"Stereo Monaural," for slide switch (S6)
101051	Hinge-Cabinet lid
106773	Latch-For cabinet back cover
25050	Leg-Metal-for cabinet
74712	Nut-Retainer for motif
104423	Nut-Tee-cabinet leg mounting
106819	Support-Cabinet lid
33900	Switch-"Stereo/Monaural" function switch (S6) - slide type

CHASSIS RC-1168C, -D, RP-205G-1

RCA

RADIO PAGE 25

DIO

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Models SHP-9 and SHR-9 on SHB-2



Model SHC-9 The "Mark IX D" Model SHP-9 The "Mark IX" Model SHS-9-Same as above except that cabinet top does not open. Ebony, Mahogany, Oak or Walnut

Model SHC-9 is a combination radio-phonograph. It is a combination of Model SHP-9 and Model 9-T-2.

Model SHP-9 is a phonograph using AF amplifier chassis RS-171A record changer RP-205G-1 and three speakers.

Model SHS-9 is an auxiliary speaker cabinet using three speakers.

Model 9-T-2 is an AM-FM tuner using tuner chassis RC-1155B; it is an accessory designed for installation in Model SHP-9.

### SPECIFICATIONS

TUNING RANGE Standard Broadcast (AM) 540-1600 kc Frequency Modulation (FM) 88-108 mc	RECORD CHANGER Turntable speed Record capacity
INTERMEDIÀTE FREQUENCIES           AM         455 kc         FM         10.7 mc           TUBE COMPLEMENT           TUNER CHASSIS RC-11558           (1) RCA 6816         F.F. Amplifier           (2) RCA 19286         Mizer-Oscillator           (3) RCA 19286         I.F. Amplifier           (4) RCA 122405         FM LF Amplifier           (5) RCA 122405         FM LF Amplifier           (7) RCA 23504         Rectifier	Pickup (Stock No. 106 FREQUENCY RESPONS TUNING DRIVE RATIO DIMENSIONS (Overall) SHC-3, SHP-3, [Height or SHS-9 With le SHR-9 Height SHB-1, SHB-2
AMPLIFIER CHASSIS RS-171A (1) RCA SCG7 Two-chamsel AF, Precmplifier (2) RCA SCG7 Two-chamsel Ji AF, Amplifier (3) RCA SCG7 Two-chamsel Zad AF, Amplifier (4) RCA SVGGT Left Chamsel AF, Output (5) RCA SVGGT Right Chamsel AF, Output (6) RCA SVGGT Right Chamsel AF, Output (6) RCA SVGGT Right Chamsel AF, Output	
DOWER SUPPLY RATING         Model SRC:9:         140 watts           Model SRC:9:         115 volts. 60 cycles         105 watts           LOUDSPEAKERS         0ae 12'' PM 'wooter"         3.2 ohms e400 cycles           Two 33'', PM ''wooter"         5.8 ohms each @ 3000 cycles	
	(5) RCA 5V6GT         Right Channel A.F. Output           (6) RCA 5V3GT         Rectifier           POWER SUPPLY RATING         Model SHC-9: 115 volts; 60 cycles         140 watts           Model SHC-9: 115 volts; 60 cycles         105 watts         105 watts           LOUDSPEAKERS         3.2 ohms @ 400 cycles         3.2 ohms @ 400 cycles

CJohn F. Rider

RCA VICTOR
tereophonic High-Fidelity Combination
MODEL SHC-9
Stereophonic High-Fidelity Victrola®
MODEL SHP-9
AM-FM Tuner MODEL 9-T-2
Cabinet MODEL SHR-9
Cabinet MODEL SHS-9
nches MODELS SHB-1, SHB-2
Tuner Chassis No. RC-1155B
Amp. Chassis No. R5-171A
Record Changer RP-205G-1
SERVICE DATA
PREPARED BY COMMERCIAL SERVICE
RCA SERVICE COMPANY
RADIO CORPORATION OF AMERICA

.16%, 33%, 45 or 78 r.p.m. Up to lifteen 7 inch

a. Traman

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Reco

Auxili

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or twelve 10 inch. or ten 12 inch. or ten 10 in. and 12 in. intermixed. Stereophonic Ceramic 6770) SE. 50 cycles to 20,000 cycles .742:1 (3% turns of knob) 

### legs at. 14 ½" Width. 29 ½" Depth. 16 %" Length. 60 ½" Width. 17 %"

### ALIGNMENT PROCEDURE

### ALIGNMENT INDICATORS:

An RCA VoltOhmyst® or equivalent meter is necessary for meas-uring developed d-c voltage during FM alignment. Connections are specified in the alignment (abulation. An output moter is also necesspecime air the cupinism induction. An output more's disc neces-sary to indicate maximum audio output during AM alignment. Connect the output meter across the specker voice coil. The RCA VollOhmyst con disc be used as an AM alignment indicate, either to measure audio output or to measure AVC voltage When audio output is being measured. the voltame control should be turned to maximum. Adjust tone controls to mid-position.

### SIGNAL GENERATOR:

For all alignment operations, connect the low side of the signal generator to the receiver chassis. If output measurement is used for AM alignment, the output of the signal generator should be kept as low as possible to avoid AVC action. 5 b.f. 51

Connect high side of sig. gen. to-	Sig. gen. output	Turn radio dial to	Adjust for peak output
Pin No. 1 ol V3 in series with .01 mid	455 kc.	Quiet point	T4 bottom core (sec.) T4 top core (pri.)
Tap lug (No. 4) on AM RF coil	(mod.)	freq. end	T2 boitom core (sec.) T2 top core (pri.)
	1620 kc. (mod.)	1620 kc. (gang open)	CIE-T (osc.)
Short wire placed near	1400 kc. (mod.)	1400 kc. signal	CIA-T (ant.) CIC-T (rf.)
radiated signal	600 kc	600 kc.	L6 (osc.) (rock gang)
	(mod.)	signal	L4 (RF)
	side of sig. gen. 10 Pin No. 1 ol V3s in sories with 01 mid Tap lug (No. 4) on AM RF coll Short wire placed near loop for radiated	side of sig. gen. to- Jupper definition participation particip	uide of sig     object     diff and       Pin Nop, 1     diff and     diff and       in astina     dSS bc.     Ouise point       in astina     dSS bc.     Ouise point       With Olim Id     dSS bc.     Grad bc.       NR P coil     lf60 bc.     l600 bc.       Short wise     lf60 bc.     lf60 bc.       Discod nort     lf60 bc.     lf60 bc.       Short wise     lf60 bc.     lf60 bc.       ingnait     600 bc.     600 bc.

Oscillator frequency is above signal frequency on both AM and FM

### FM SWEEP ALIGNMENT.

II on FM sveep constitute is used for FM alignment, oduri for 107 mt, 0.4 mt sveep Connect scaliborop errors C23, odurity discriminator T6 lop core for 10.7 mc crosswere, and T6 boltom core for balanced procks. Peak separation should be approximately 330 ic. When aligning the other FM funde circuits, connect excillatorope lead through, a 200k resistor print in U.S. Poliov alignment table sequence, adjusting for maximum gain and symmetrical curves.

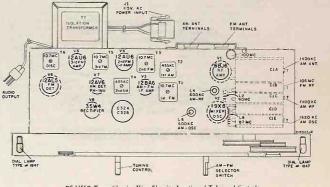
### FM Alignment

### FUNCTION SWITCH IN FM POSITION

Steps	Connect high side of sig. gen. to-	Sig. gen. oulput	Tura radio dial to	Adjust for max, output
1	Pin No. 1 ol VS-12AU6	10.7 mc	Quiet	T6 top core for zero d.c. across C23 T6 bottom core for maximum d.c. at junction of R18 and R19
2	Pin No. 1 of V4-12AU6 Pin No. 1 of V3-12BA6		point at low irequency	TS top core
3			end	T3 top core †*T3 bottom core
4	C1-B Stator		1.1	Tl top core †*Tl bottom core
5		87 mc	87 mc (gang closed)	TFM osc.
6	FM Ant. terminals thru 270 ohm resistor	106 mc	106 mc signal	†FM R.F. CIB-T
7		90 mc	90 mc signal	TFM R.F.
8		Repea	1 steps 6 and 7 u gain is obtain	ntil maximum ned
9		100 mc	100 mc hignel	tFM ant. coll L5

"Il necessary for accurate peaking, the winding in the same transformer not being peaked should be loaded with a 680 okm resistor. Connet Vol(Olmystic load) in 1 of V5 through a 220K isolating resistor with Ne inch maximum exposed lead at grid terminal end. Output adjusted for 1 volt d.c. Dress Vol(Ohmystic lead away from input circuits.

### NOTE-FM coils L8, L2 and L5 are adjusted by Increasing or decreasing spacing between turns.



RC-1155B Tuner Chassis-View Showing Location of Tubes and Controls

### DESCRIPTION

Model SHC-9 is a radio-phonograph. It is a combination of Model SHP-9 and Model 9-T-2.

Model SHP-9 is a phonograph designed for use with either Model 5HP-9 is a phonograph designed for use with either stereophonic records or monarual records. The instrument employs audio amplifier chasis RS-171A, record changer RP-205G-1, one 12/inch wide-range speeder and two 3/4-inch tweeters mounted on plastic housings to give panoramic distribution of the higher frequencies.

The tuner chassis provides R-F amplification on both AM and FM operation. The FM antenna input is broad-banded and resonates to the approximate center of the FM band. The mixer is pentode the approximate contex of the FM band. The mixer is pended connected for AM operation and indee connected for M opera-tion. RM 1.5° circuits use a conventional 1.7° amplifier and a diade for the second second second second second second second F amplifiers where AM convention of an AF. phase inverter in this details. This simplifies withing between second second second operation in the audio chronis. AC supply voltage for the 35W4 m including transformation for the second second forms of the second second second second second second second second operation in the audio chronis. AC supply voltage for the 35W4 m including transformation for the second an isolation transformer.

A five-position audio function switch is contained in the audio amplifier chassis and permits use of a tape recorder in conjunction with either radio or phono functions. This chassis has two single-

ended amplifiers for dual-channel amplification of stereophonic sound from records or tapes. The outputs of these two single-ended amplifiers are reconnected as a push-pull amplifier when using the ampuiliers are reconnected as a push-puil amplilier when using the instrument for monaural reproduction. Three 6CG7 tubes (dual triade) provide three stages of dual-channel AF amplification; a SVEGT tube is used for power output in each channel. Negative leedback, applied to each third AF amplifier, is derived from the secondaries of the two output transformers.

A dual loudness control and dual tone controls are used to pro-A dual tolucies control and audi tone controls are used to pro-vide equal and simultaneous regulation of volume and tone in each amplifier channel. A gain equalization control in the input of the right channel. 3rd AF amplifier stage permits the right channel (internal speakers) output to be balanced with left channel (external speakers) output.

A speaker selection switch (one rystem or two system) is used to connect the two amplifier channels in parallel when internal speakers only are used. Provision is made to use this instrument as a companion speaker in conjunction with other amplifiers when so dasired

A four-speed record changer (16%, 33%, 45 and 78 r.p.m.) is used which is designed for use with either stereophonic or monaural records. It utilizes a ceramic two-stylus pickup having two elements and two audio outputs.

9. Filament chokes L10 and L14 should be raised a minimum of

Oscillator grid condenser C12 should have short leads and be dressed away from filament choke L10.

12. C24 should ground in hole near terminal 5 of V6 with short

Heavy buss lead from terminal 6 of V2 to S1-A terminal 9 should be short and direct.

The following components, R103, R104, R105, R111 and C104, in the preamplifier (V101) circuit should have relatively short loads and be dressed away from R106, R107, R108, R110 and C109

2. Stand PC101 and PC102 vertically between the tone controls.

3. Dress all wires and components away from R140 (2200 ohms)

4. Leads from function switch to V101 should be dressed down to chassis and against chassis apron; maintain some separation

Keep wires and components away from 1200 ohm resistor R22

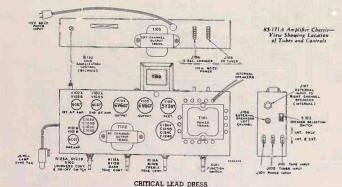
1/16" above chassis.

leads

C109

CHASSIS RS-171A

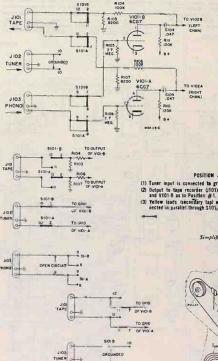
between wires.



### CHASSIS RC-1455B

- All FM IF transformer grid and plate leads should be short and direct as possible and kept low, near chassis.
- R18 and R19 leads should be kept as short as possible on T6 terminal 6 side.
- Keep leads V5 pin 5, to T6 term 1, as short as possible and low near chassis.
- Dress C33 down on chassis and against terminal board. Run filament lead between V5 and V6 on side of V6 socket opposite C33
- 5. All bypass capacitors should have leads as short as possible.
- 6. Green lead from AM oscillator stator gang terminal to AM oscillator coil should be dressed against front of shield box and up above filoment choke.
- RF plate choke Ll, should be dressed at least 1/4" away from AM R.F. coil L4 and at least 1/4" from shield.
- Mixer grid condenser C10 should be dressed away from FM oscillator gong stator terminal and away from leads connecting to terminals 8 and 9 of V2 socket.

### SHC-9, SHP-9, SHS-9, 9-T-2



SIOI-A OPEN CIRCUIT

### MSA 2813 POSITION #4 - TAPE STERED

J103

PHONO

- (1) Tape inputs are connected independently to grids of V101-A and V101-B.
- (2) Tuner input is grounded.
- (3) Phono input is open circuited.
- (4) Yellow leads (secondary tap) of the output transformers are not connected in parallel.

### POSITION #1 -- PHONO SINGLE Yellow leads (secondary tap) of both output trans-formers are connected in parallel through \$101.8 Front.

### POSITION #2 - PHOND STERED

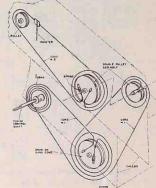
- Identical to Position #1 except that: (1) There is no connection between term. #7 and #8 or between term. #11 and #2 of the function switch.
- (2) S101-B Front does not connect yellow leadstor out-put transformers in parallel.

POSITION #5 - TAPE SINGLE Identical to Pesition #1 except that: (1) Through connection of tape inputs is made through term. #12 and #7 instead of #11 and #7. (2) Yellow leads of both output transformers are con-nected in parallel through \$101-B Front.

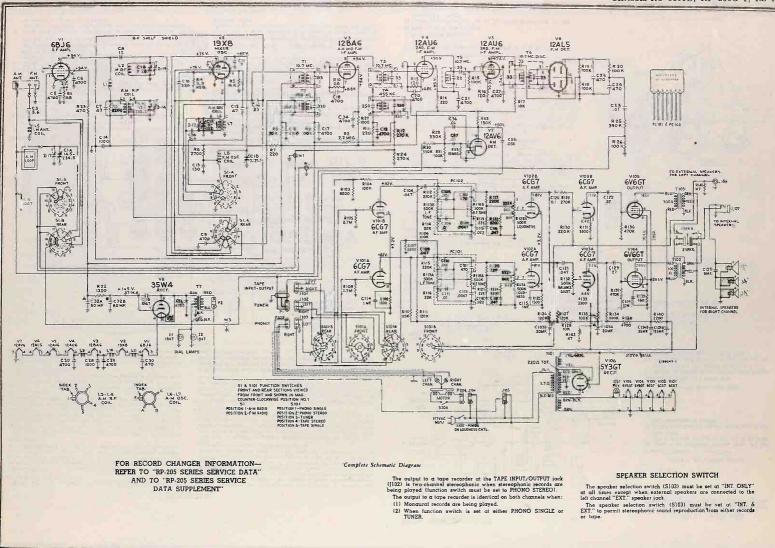
### POSITION #3 -- TUNER

- (1) Tuner input is connected to grids of V101#A and V101-B. (2) Output to tape recorder (1101) is connected to outputs of V101-A
- (3) Yellow leads (secondary tap) of both output transformers are con-nected in parallel through SIOLB Front.

Simplified Schematic Diagrams of Function Switch in Amplified Chassis RS-171A



### Odaha F Dias



CJohn F. Rider

CHASSIS RC-1155B, RP-205G-1, RS-171A

RADIO PAGE 25-18

RCA

### SHC-9, SHP-9, SHS-9, 9-T-2

### CHANNEL GAIN EQUALIZATION -- CHASSIS BS-171A

A gain equalization control is provided to enable the gain of the RIGHT CHANNEL (internal speakers) to be balanced with the gain of the LEFT CHANNEL (external speakers). This equalization control (R132) is located on the bottom apron of the chasts toward the tront of the cabinet. When adjusting this

control, four conditions must exist: 1. A mongural signal input must be used. This should be a

A monatural signal input must be used. This should be a monatural record; use a frequency less trecord when measuring with an output meter or use a music record for listening test. The function switch (S101) must be in #2 position (PH STEREO). This enables the two chamnels to have independent

- 2. outputs
- The speaket selection switch (S103) must be in the "INT. & EXT. SPKRS." position. This is necessary for the two channels to have independent outputs. 2



4. Both internal and external speaker systems must be connected or the outputs loaded equally with resistors. If output is measured with an output meter, a channel having no speakers connected will have an abnormally high output voltage reading.

Adjust the equalization control (R132) to obtain right channel output equal to left channel output. The left channel gain is not adjustable.

### NOTES:

It is not necessary to measure the audio output while making the equalization adjustment; sufficient accuracy can usually be had by listening If the external speaker system is other than 3.5 ohms impedance.

the output voltages will not be equal for equal power output.



Speaker Connections-Model SHS-9

Speaker Connections-Model SHC-9 or SHP-9

IMPORTANT

The three speakers must be connected as shown in the illus trations above. Improper connections may result in distorted or weak reproduction

### REPLACEMENT PARTS

YMBOL NO.	STOCK NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DESCRIPTIÓN
		AM/FM TUNER CHASSIS	1	1	RESISTORS: Fixed, Composition, Vi wait unless
		RC-1155B			otherwise specified
		CAPACITORS:	R)	502068	68 ohms, ±10%
CIA, B, C, D, E		Variable tuning	R2	502522	212 megohms, ±20%
23	74182	Ceramic, S.6 mmf., ±1.0 mmf., 500 v. Coet0	R3	502282	8200 @hms, ±10%
24	73558	Paper, 0.047 mi., ±20%, 200 v.	R4	502539	3.9 megohms, ±10%
C5, C6	73473	Ceramic, 4700 mmf., +100%0%, 500 v.	R5	502318	18,000 ohms, ±10%
57	101940	Ceramic, 22 mmf., ±10%, 500 v.	R6	502227	2700 ohms, ±10%
28	70595	Ceramic, 12 mmf., ±5%, 500 v.	R7	502122	220 ohms, ±20%
79	73473	Ceramic, 4700 mmf., +100% -0%, 500 v.	Re	502310	10,000 ohms, ±10%
210	101374	Mica, 220 mmi., ±20%, 500 v.	R9	502410	100,000 ohms, ±5%
211	77530	Ceramic, 7 mml., ±0.5 mmf., 500 v.	R10	502068	68 ohms, ±10%
512	77531	Ceramic, 47 mml., ±10%, 500 v. Coel0	R11	502122	220 ohms, ±20%
213	77532A	Ceramic, 130 mml., +241%, 500 v. Coel750	R12	502427	270,000 ohms, ±10%
C14	10\$660	Feed thru, 1000 mmf., +100% -0%, 500 v.	R13	502112	120 ohms; ±10%
C15	73473	Ceramic, 4700 mmf., +100% -0%, 500 v.	R14	502122	220 ohms, ±20%
C16	100150	Feed thru, 33 mml., ±5%, 500 v.	RIS	502410	100,000 ohme, ±5%
C17 thru C20	73473	Ceramic, 4700 mmi., +100%, -0%, 500 v.	R16	502112	120 ohms, ±10%
C21	104205	Ceramic, 3300 mmf., ±20%, 500 v.	R17	502310	10,000 ohms, ±10%
C22	73473	Ceramic, 4700 mmi., +100%0%, 500 7.	R18,R19,R20	502410	100,000 ohms, ±5%
C23, C24	76992	Micg. 470 mml., ±20%, 300 v.	R22	76346	1200 ohms, ±10%, 4 w., wirewound
C26	73592	Paper, 0.047 mf., ±20%, 600 v.	R23	502147	470 ohms, ±20%
C27	73473	Ceramic, 4700 mmf., +100% -0%, 500 v.	R24	502427	270,000 ohms, ±10%
C28	105660	Feed thru, 1000 mml., +100%0%, 500 v.	R25	502439	390;000 ohms, ±10%
C29	73473	Ceramic, 4700 mmi., +100% -0%, 500 v.	R26	502410	100,000 ohms, ±5%
C30	76992	Mica, 470 mmi., ±20%, 300 v.	R27	502210	1000 ohms, ±10%
C31	73473	Ceramic, 4700 mmi., +100% -0%, 500 v.	R28	502322	22.000 ohms, ±10%
C32A, C32B	73520	Electrolytic, 50/80 mi., 150/150 v.	R29, R30	502433	330,000 ohms, ±10%
C33	79316	Paper, 0.01 ml., ±10%, 200 v.	R31	502410	100,000 ohms, ±5%
C34	73473	Ceramic, 4700 mmf., +100% -0%, 500 v.	R32	502415	150,000 ohms, ±10%
C35	103440	Ceramic, 5.6 mml., ±0.5 mml., 500 v. CoelN3300	R33	502610	10 megohms, ±10%
C36	106185	Paper, 0.01 mt. ±10%, 400 v.	SIA, SIB	104608	Switch-AM/FM function
C37	101000	Paper, 0.01 ml., ±10%, 200 v.	71	100112	Transformer-lat FM JF
C38	103269A	Paper, 0.056 mf., ±10%, 400 v.	T2 .	76335	Transformer-lat AM IF
D	106344	Connector-2-contact male for AC power	T3	77513	Transformer-2nd FM IF
L1	77534	Coll-RF choke	T4	76328	Transformer-2nd 7AM IF
L2	77536	Coll-FM RF	75	77512	Transformer-3rd FM IF
L3. L4	77525	Coll-AM RF	76	77511	Transformer-FM discrimingtor
15	77538	Coll-FM antenna	17	104609	Transformer-Power transformer
L6, L7	77526	Coll-AM oscillator		104612	Bumper-For tuner wood frame (4 reg'd)
L8	77537	Coll-FM escillator	( ) · · · ·	104611	Bumper-Rubber for R.F. shell mounting
L9, L10, L11	77535	Coll-Filgment choke	2	101344	Bushing-For tuning control shall

### Shield—For V6 Socket—Lamp socket and load assembly Socket—7 pin miniature for V1 Socket—7 pin miniature for V3, V4, V5, V6, V7 6 V8 100642 77087 73117 100111

MO

STOCE

73939

74879 74882 72953

104607

104605

101352

102627

100109 Spring-Drive cord

Socket-9 pin ministure (or V2

Strew-26.32 × 4" pulleys Shaft-Tuning control Shield-For V1 Shield-For V2 Shield-For V6

DESCRIPTION

Clip-IF transformers mounting Connector-2-contact lemale for antenna leads Connector-3-contact male audio cable from tunët Cord-Dlal drive (230 loot spool)

Gerd-Dick drive (23) fors speak) Dick-Trung contain State-Trung contain State (1996) State (1997) State (1997) State (1997) Frame-Wood (Irane and Bial mounting (Iray dia Frame-Wood Irane (Iran Mark) Gramm-T-Rubber (IP) shall neuraling (Iray dia Frame-Wood Irane (Iran Iran) Gramm-T-Rubber (IP) Gramm-T-Rubber (Iran) Gramm-T-Rubber (Iran) Grammatic (Iran) Grammati

	77586	Washer-"C" type retaining for double pulley	106702	Speaker-12" PM
	77585	Washer-"C" type retaining for tuning control		MISCELLANEOUS ITEMS
		shall		MODELS SHC-9 & SHP-9
		AMPLIFIER ASSEMBLY	101363	Antenng-AM loop for SHC-9
		RS-171A	100523	Board-Terminal lor FM antenna for SHC-9
		CAPACITORS:	104531	Bracket-Mounting for window
C103A, C103B		Electrolytic, 20/20 ml., 400/400 v.	104796	Bushing-Tuner mounting for SHC-9
C104 C105 thru	105240	Paper, 0.047 mi., ±10%, 400 v.	X4496	Cabinet-Black-less legs
Clos thru		Part of PC102	X4493	Cabinet-Mahogony-less legs
C108 C109 C109 C10 thru	105240	Paper, 0.047 mf., ±10%, 400 v.	X4495	Cabinet-Oakates legs
CH0 thru		Part of PCI01	X 4494	Cabinet-Walnut-less legs
C113 C114			X3959	Cloth-Grille, for black cabinet
C114 C115	106772	Film, 1 mf., ±10%, 50 v.	X3723	Cloth-Grille, for mahogany cabinet
Chis	79343. 105578	Paper, 0.022 mf., ±10%, 200 v.	X3725 74752	Cloth-Gtille, for walnut or oak cabingt Connector-2 contact male for FM antenna cable
C117	106772	Paper, 0.047 ml., ±10%, 200 v.	74/52	Connector-2-contact male for FM antenna cable
CIIB	79343	Film, 1 mi., ±10%, 50 v. Paper, 0.022 mf., ±10%, 200 v.	/4882	cable
C119	105578	Paper, 0.047 mf., ±10%, 200 v.	X3800	Cover-Bottom for tuner compariment
C120	78922	Paper, 0.1 mi., ±10%, 400 v.	100459	Cushion-Cabinet IId
C121	105240	Paper, 0.047 ml., ±10%, 400 v.	106425	Escutcheon-Control knob
C122, C123	78571	Paper, 0.27 mi., ±10%, 400 v.	101051 79957	Hinge-Cabinet lid
CI24A,B,C	105765	Electrolytic, 35/35/20 ml., 400/400/25 v.	79957	Insulator-Record changer mounting (4 reg d)
C127	1	Part of Speaker Assembly	104797	Knob-AM/FM function
1101 thru	101998	Connector-3-contact polarized female tape input-	104798	Knob-Tuning Knob-Audio function
1103		output, tuner input and phone input	105446	Knob-Audio function
J104, J105	106471	Connector-2-contact female for phone meter or	106666	Knöb-Loudness
1106	35787	tuner isolation transformer loads Connector-Single contact female, for external	104127	Knob-Treble or bass
1100	00101	spoakers	Z3796 X5049	Leg-Metal for cabinet Lid-Less hardware-for black cabinet
1107	101526	Jack-Internal speaker	X5049 X5046	Lid-Less hardware-for mahogany cabinet
PC101, PC102	106457	Circuit-Printed circuit audio coupling	X5048	Lid-Less hardware-for oak cabinet
	1	RESISTORS: Fixed, Composition, 1/2 watt unless	X5040	Lid-Less hardware-for walnut cabinet
		otherwise specified	106789	Motil-'Dual Amplifier-Stereo-Orthophonic High
R103	502282	8200 ohms, ±10%	100.00	Fidelity RCA Victor
R104	502410	100,000 ohms, ±10%	76894	Nut-#10-32 for record changer mounting stu-
R105	502527	2.7 megohms, ±10%	Parata	#79339
R106	502410	100,000 ohms, ±10%	104423	Nut-Tee-leg mounting
R107	502282	6200 ohms, ±10%	106426	Ornament- 'V' shape (pilot (ight)
R108	502527	2.7 megohms, ±10%	104421	Spring—For lid support Spring—Record changer mounting (4 req'd)
R109	502215	1500 ohms, ±10%	74734	Spring-Retaining for knobs
R110, R111	502412	120,000 ohms, ±10%	104124	Stud-Record changer mounting-front and rear
R112 R113A,R113B	106214	Part of PC102 Control-Dual bass	101124	positions
R114	100214	Part of PC102	79339	Stud-Record changer mounting-side positions
R115. R116		Part of PC101	104422	Support-Cabinet lid
R117	502422	220,000 ohms, ±10%	79340	Washer-Fiber, for record changer mounting stud
RIISA, RIISB	106213	Control-Dugi troble	- Anno -	#79339
R119	502322	22,000 ohms, ±10%	103929	Washer-Nylon, for knobs
R120	502422	220,000 ohms, ±10%	- 78753	Washer-Rubber, for record changer mounting stud #79339
R121	502322	22,000 ohms. ±10%	104540	Window-Plastic, for pilot light
R122	\$02282	8200 ohms, ±10%	04340	window-ridane, for prot light
R123A,R123B	106537	Control-Loudness control with push-pull "on-	1	MISCELLANEOUS ITEMS
		oli" switch (S102)		MODEL SHS-9
R124	502282	8200 ohms, ±10%	X4467	Cabinet-Ebony-less legs
R125	502215	1500 ohms, ±10%	X4464	Cabinet-Mahogany-less legs
R126,R127 B128	502412 502310	120,000 ohms, ±10%	X4456	Cabinet-Oak-less legs
	502427	10,000 ohms, ±10% 270,000 ohms, ±10%	X4465	Cabinet-Walnut-less legs
R120	502427	220,000 ohms, ±10%	X3959	Cloth-Ebony cabinet
R131	502233	3300 ohms, ±10%	X3724	Cloth-Grille for oak and wainut cabiners
	106212	Control-Gain-Equalization	X3723	Cloth-Mahogany cabinet
	502233	3300 ohma, ±10%	Z3796	Leg-Metal-ler cubinet
	502410	100,000 ohms, ±10%	106325	Motil-"Steree Orthophonic High Fidelity RCA Victor"
	502447	470,000 ohms, ±10%	104423	Nul-#5/16-18 100
R138	\$02247	4700 ohms, ±10%	104423	and the second state of th
R139	\$22115	150 ohms, ±10%, 2 w.	P 2	REPLACEMENT PARTS NOT STOCKED
	522222 522047	2200 ohms, ±10%, 2 w. 47 ohms, ±10%, 2 w.	2340 34	FOR SHR-9, SHB-1 or SHB-2

### REPLACEMENTS PARTS (Continued)

STMBOL NO.

S101A, S101 106209

\$102 S102 S103 T101 T102, T103

PINT

P104

C126 C127

STOCK

46760

106458

70392 105289

00270

100543

102787

31251 76971

100474

74862

106344

DESCRIPTION

Transforme--Dever Transforme--Output Cable-AC power cable and plug Cla-Mounting and default for loadness control Grommet-Strain relief for power cable (1 et) Sockia-Piol leads Sockia-Piol leads Sockia-Piol leads Sockia-Piol leads Sockia-Piol leads Sockia-Piol leads Sockia-Piol ministure for VIO

RECORD CHANGER WIRING

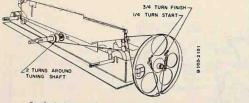
Connector-3-contact male – for shone pickupi cable Connector-2-contact male, for phone mater cable Connector-Clescel and lar phone motor fields,

SPEAKER ASSEMBLY SPEAKER ASSEMBLY Capacitor-Electrolylic, 8 ml., 10 v. AC Connector-Single contact male for speaker cable Housing-Plasific, for 3%" speaker Speaker-3%," PM

Switch-Function

Part of R123A, R123B Switch—Speaker selector Transformer\_Power

9



MODEL

7043

7043A

METEOR RADIO RECEIVER CHASSIS NUMBER 528.53080

Fig. 1. Dial Stringing Diagram Chassis 528.53080

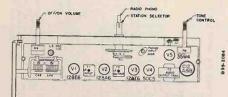
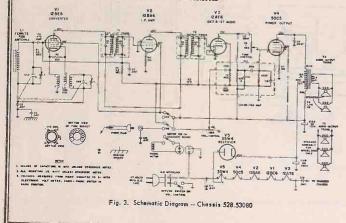


Fig. 2. Top View Chassis 528.53080



### METEOR RADIO RECEIVER CHASSIS NUMBER 528.53080

		CHASSIS PARTS LI	IST	
SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	PART NUMBER	DESCRIPTION
	CAPACITO	DRS	45-17-2	Socket, 7 Pin Miniature (3)
			45-18-2	Socket, 7 Pin Miniature (Center
C2,C3, }	20-52-1	Tubular, .047 mfd., 400 v., 10%		Pin) (2)
C10,C11 5	10 10 0		45-8-3	Socket, Phono Audio
C4A & B C6	19-60-2	Variable Tuning	45-1-3	Socket, Phone Motor
	15-47116	Disc, 470 mmfd., 500 v.	31-380-0	Guide, Dial Pointer
C7,C13	20-47-1	Tubular, .047 mfd., 200 v.	67-619-1	Dial Background
C8,C9 C12A & B	15-47216	Disc, .0047 mfd., 500 v., 20%	52-5-1	Pointer
CIZA&B	18-49-5	Electrolytic, 30 mfd., 150 v.	70-269-0	Spring, Dial Cord Tension
		(A): 50 mfd., 150 v. (B)	51-105	Dial Cord (47")
	-		39-6-0	Bushing, Dial Pointer
(A11	RESISTOR		39-9-1	Pulley Idler (5)
(All resistors )	2 w.,-10%.unl	ess otherwise noted)*	45-7-3	Receptacle, AC Interlock
01.02	(0.00501		71-69-0	Shield, Tube (2)
R1,R3	60-22501	2.2 megohm	11-1683	Bracket, Interlock Mounting
R2	60-22301	22K ohm	11-1063	Bracket, Control Mounting
R4	60-15101	150 ohm		
R5	60-47301	47K ohm	CABINET	PARTS LIST - MODELS 7043, 7043A
R6	24-147-2	1 megohm, TONE		& 8049
R7	60-18101	180 ohm	42-7-3	Cabinet & Lid
R8	60-12211	1.2K ohm, 1 w.	21-197-0	Back Cover
R9 RC1	24-275-0	I megohm, OFF/ON-VOLUME	84-3753	Assembly, Back Cover
RCI	13-14-3	Couplate	(3.11.0)	(Inc. Interlock & Linecord)
-	DUNCTOR		49-1149	Leg (Inc. Nut & Washer) (4)
	KANSFURME	RS AND COILS	23-21-0	Line Cord & Plug
т1	10-81-2	and a second second second	40-352-2	Logo, "METECOR"
T2	10-81-2	Transformer, I.F. Input	33-335-4	Speaker, 5" PM, 3.2 ohm (2)
T3	80-9-1	Transformer, I.F. Output	45-129-0	Speaker, Plug (2)
	82-122-0	Transformer, Audio Output	45-1-0 45-18-0	Plug, Phono Motor Phono Plug
L2	10-34-4	Antenna, Ferrite Rod	98-92-0	Grill Cloth
-4	10-34-4	Coil, Oscillator	52-704-0	Knob, TONE
uls.	ELL MEAN	CHASSIS PARTS	52-849-0	Knob, TUNING
MISC	ELLANEOU	CHASSIS PARIS	52-849-0	Knob, RADIO-PHONO
51A&B	69-244-0	Switch, RADIO/PHONO	52-705-0	Knob, OFF/ON-VOLUME
AGD	84-3661		83-700	45 RPM Adaptor Discs (Pack of 1
	04-3001	Pulley and Pulley Bushing	38-1806	Service Data Sheet
			38-1805	Owners Manual
			38-1005	Cullers Mallogi

Models 7043, 7043A & 8049 use a record changer of the 528.56000 series. The actual record changer used can be determined ONLY by the number on the metal plate found under the turntable. Refer to the parts list corresponding to the number on the metal plate for regain parts information.

	MODEL
	NUMBERS 9024
PARTS LIST	9025
for	
Silvertone	Laura
Silverione	

SILVEBTONE GLOCK-RADIO REGEIVER CHASSIS NUMBER 528.53420

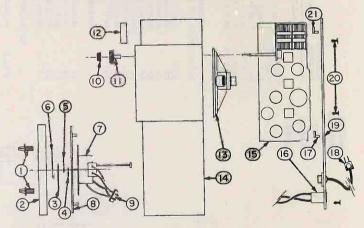


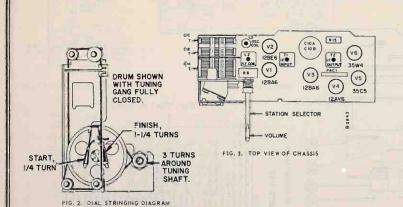
FIG. 1. EXPLODED VIEW OF CABINET PARTS

### CABINET PARTS LIST

	9024 BROWN	MODEL N 9025 IVORY	
Key No.	P art No.	P art No.	Description
1.	52-1057-0	52-1057-0	Knob, Clock Control (2)
2.	48-158=1	48-158-1	Window, Clock
3.	52-70-1	52-70-1	Hand, Minute
	52-66-1	52-66-0	Hand, Alarm Set
5.	52-71-1	52-71-1	Hand, Hour
	52-69-1	52-69-1	Hand, Second
7.	59-134	59-134	Timer, Clock (Inc. 3, 4, 5 and 6)
8.	67-653-0	67-653-0	Face, Clock
	45-160-3	45-160-3	Receptacle, AC Interlock
10,	52-702-0	52-702-0	Knob, Volume
11.	52-703-0	52-703-0	Knob, Tuning
12.	48-143-1	48-143-1	Window, Dial Scale
13.	33-295-4	33-295-4	Speaker, 5", (Inc. 13)
14.	42-59-1	42-60-1	Cabinet
15.	*		Chossis, Radio
16.	45-17-3	45-17-3	Outlet, Appliance
17.	11-1692	11-1692	Bracket, Board and Back Support
18.	23-26-0	23-26-0	Line Cord and Plug
19.	82-8-1	82-8-1	Antenna Loop and Cabinet Back
20.	22-2-5	22-2-5	Clip, Cabinet Back Retainer
21.	11-1412	11-1412	Bracket, Board Retainer

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SEARS ROEBUCK RADIO PAGE 25-3

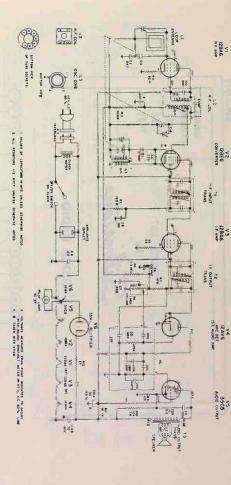


SILVERTONE CLOCK-RADIO RECEIVER CHASSIS NUMBER 528.53420

### CHOSSIS PARTS LIST

Schematic Location	No.	Description	Schematic		Description
1	CAP	ACITORS	Section 14		
CI A, B& C	19-24-3	Variable, Tuning	T2	10-95-2	Transformer, I.F. Output
C2	20-47-1	Tubular, .047 mfd., 200 v.	T3	80-14-1	Transformer, Audio Out-
C3, C5	15-10217	Disc, .001 mfd, 500 v., GMV		00-14-1	put (Mounted on Speaker)
C4	15-470118	Disc, 47 mmfd., 500 v., N3300	LI	82-8-1	Loop Antenna and Cabinet Back
C6	15-10116	Disc, 100 mmfd., 500 v.,	L2	10-23-0	Coil, R.F., with cover
C7	15-50217	Disc, .005 mfd., 500 v., GMV	L3	10-35-4	Coll, Oscillator
C8	15-20317	Disc, .02 mfd., 500 v., GMV	1		
C9	15-60216	Disc, .006 mfd., 500 v., 20%, GF	H M	SCELL ANE	OUS CHASSIS PARTS
C00 A& B	18-58-5	Electrolytic, 30 mfd., 150 v. (A)	1	11=1694	Bracket, Volume Cantrol
		70 mfd., 150 v. (B)	16	39-9-1	Pulley, Idler (3)
	ŘES	ISTORS		39-2-1	Pulley, Idler
(ALE resi	stors 16 w., 16	% unless otherwise noted)		39-2-5	Shaft, Tuning Pulley
R1	60-82001	82 ohm		70-201-0	Spring, Tuning Shaft Retainer
R2, R3	60-10401	100K ohm	1 I I I I I I I I I I I I I I I I I I I	51-109	Cord, Dial (29")
R4	60-22302	22K ohm, 20%		70-295-0	Spring, Extension
R5	60-68001	68 ohm		11-1693	Bracket, Dial Scale Mounting
R6	60-22502	2.2 megohm, 20%	40	67-632-0	Dial Scale
R7	60-47301	47K ohm	1	22-15-1	Clip, Dlal Scale Mounting (2)
R8	24-276-0	1 megohm, VOLUME	£	52-15-1	Pointer
R9	60-12101	120 ohm	100	45-22-2	Socket, Tube (V1, V3)
R10	60-10321	10K ohm, 2 w.		45-23-2	Socket, Tube (V5, V6)
RIL	60-10211	1K ohm, 1 w.		45-49-2	Socket, Tube (V2, V4)
R12	60-27001	27 ohm		71-69-0	Shield, Tube (2)
RCI	13-14-3	Ceramic Coupling Unit		45-7-4	Socket, Pilot Light
RCI				89-7	Pilot Light, #47 Bayonet
		WERS AND COILS		33-295-4	Speaker, 5", (Inc. T3)
T1	10-94-2	Transformer, I.F. Input		23-26-0	Line Cord and Plug





SCHEMATIC

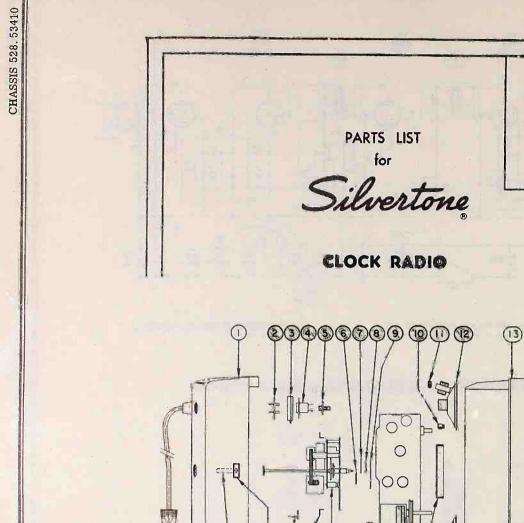
DIAGRAM

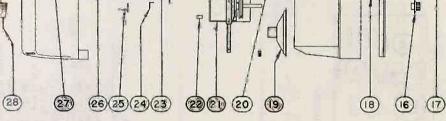
FOR SIL

VERTONE

CHASSIS 528.53420

### CHASSIS 528. 53420





528.53410

MODEL NUMBERS 9027

9028

9029

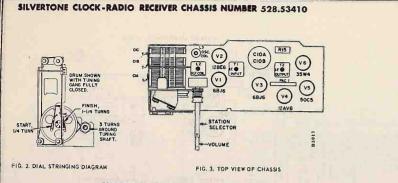
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FIG. 1. EXPLODED VIEW OF CABINET PARTS

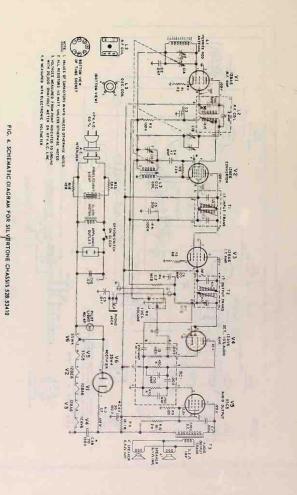
### CABINET PARTS LIST

		PULLI I MILLO BIOI
REF.	PART	
NO.	NO.	DESCRIPTION
1.	21-352-0	Cover, Cabinet, Brown, Model No. 9027
	21-353-0	Cover, Cabinet, Ivory, Model No. 9028
	21-354-0	Caver, Cabinet, Pink, Model No. 9029
2.	45-56-3	Receptacle, Interlock
<b>3</b> .	11-1298	Brocket, Interlock
4.	45-161-3	Receptacle, Appliance Outlet
5.	45-58-3	Receptocle, Phano Input
6.	52-66-1	Hand, Alarm Set
7.	52-65-1	Hand, Hour
8: -	52-64-1	Hand, Minute
9.	52-63-1	Hand, Sweep Second
10.	22-23-3	Clamp, Cable
11.	77-28-0	Spacer, Speaker Mounting (2)
12.	33-364-4	Speaker, 4" PM (Inc. Output Transformer)
13.	40-37-1	Grille and Base, Cabinet
14.	67-650-0	Dial Scale and Trim Strip
15.	48-157-1	Window, Timer
16.	52-1093-0	Knob, Tuning and Valume (2)
17.	52-1057-0	Knob, Timer (2)
18.	67-8-1	insert, Clock Face (Daylight)
19.	33-363-4	Speaker, 4" PM
20.	44-34-0	Baffle, Light
21.		Chassis, Radio
22.	11-1297	Bracket, Chassis Mounting
23.	59-133	Timer, Clock (Inc. 6, 7, 8, 9 and Panelescent Light)
24.	11-860	Bracket, Timer Mounting (4)
25.	76-37-0	Strip, Terminal
26.	52-1092-0	Button, "SNOOZ-AL ARM"
27.	22-173-0	Retainer, "SNOOZ-AL ARM" Button
28.	23-43-0	Line Cord and Plug
	* Not S	iupplied äs a Repair Part.



### CHASSIS PARTS LIST

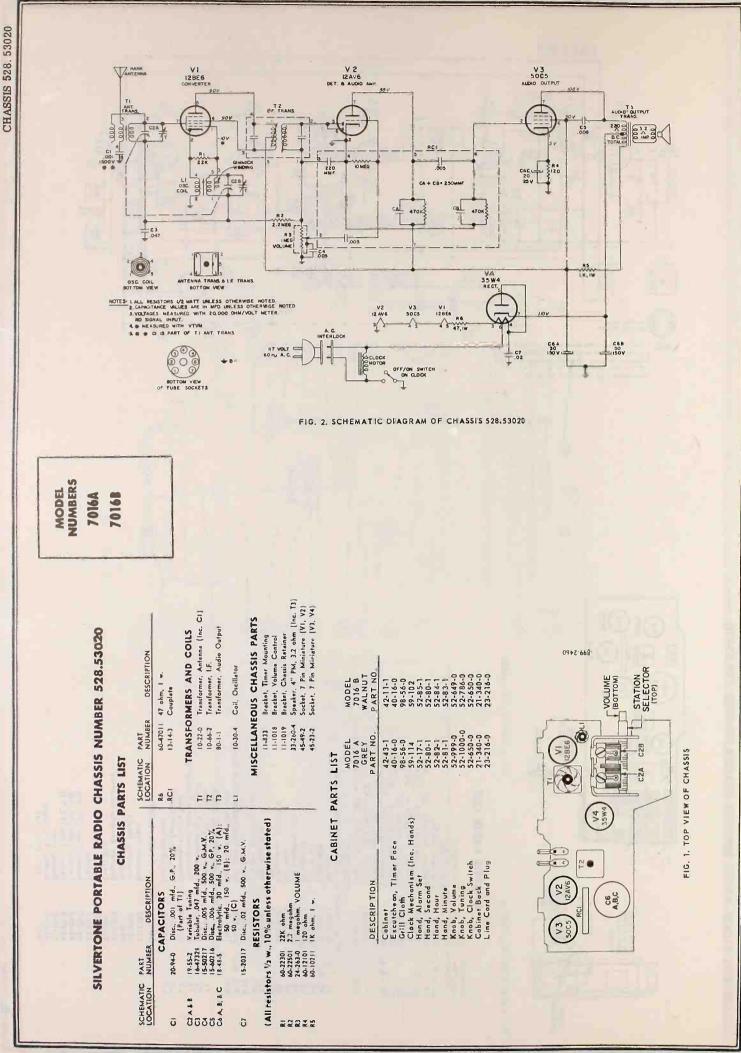
Schematic	Part	
Location	No.	Description
		CAPACITORS
CI A, B&C		Voriable, Tuning
C2	20-47-1	Tubular, .047 mfd., 200 v., 20%
C3, C5	15-10217	Disc, .001 mfd., 500 v., GMV
C4	15-470118	Disc, 47 mm fd., 500 v., N3300
C6	15-10116	Disc, 100 mmfd., 500 v., 20%
C7	1,5-60216	Disc, .006 mfd., 500 v., 23%, GP
C8 A & B	18-58-5	Electrolytic, 30 mfd., 150 v. (A);
		70 mfd., 150 v. (B)
C9	16-47348	Tubular, .047 mfd., 400 v., 20%
CIÓ		
Cild.	15-20317	Disc, .02 mfd., 500 v., GMV
100		RESISTORS
(4	All resistors	2. w., 10% unless otherwise noted)
RI	60-82001	82 ohm
R2, R4	60-10401	100K ohm
R3	60-22301	22K ohm
R5	60-68001	68 ohm
R6	60-22502	2.2 megohm, 20%
R7	60-47 30 1	47K ohm
R8	24-317-0	1 megohm, VOLUME
R9	60-12101	120 ohm
R10	60-10321	10K ohm, 2 w.
R11	60-10211	1K ohm 1K ohm, 1 w.
R12	60-27001	27 ohm
R13, R14	60-18301	18K ohm (Mounted on Clock Timer)
RCI	13-14-3	Ceramic Coupling Unit
	TP.	ANSFORMERS AND COILS
T1	10-94-2	Transformer, I.F. Input
T2	10-95-2	Transformer, I.F. Input
T3	80-67-1	Transformer, I.F. Output
L.I	82-148-0	Transformer, Audio Output (Mounted on Speaker)
L2	10-23-0	Antenna, Ferrite Rod
13	10-35-4	Coil, R.F. (with Cover)
		Coll, Oscillator
		EOUS CHASSIS PARTS
	11-1299	Bracket, Front
	37-57-0	Insulator, Shield
	39-9-1	Pulley, Idler
	11-1295	Bracket, Antenno Mounting
	51-109	Cord, Dial
	70-295-0	Spring, Extension
	52-62-1	Pointer
	45-22-2	Socket, Tube (V1, V3)
	45-23-2	Socket, Tube (VS, V6)
	45-49-2	Socket, Tube (V2, V4)
	71-69-0	Shield, Tube
	45-56-4	Socket, Pilot Light
	89-7	Light, Pilot, #47



SEARS RQEBUCK

RADIO PAGE 25-5

### RADIO PAGE. 25-6 SEARS ROEBUCK



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### SILVERTONE CLOCK-RADIO REGEIVER CHASSIS NUMBER 528.53200

### CABINET PARTS LIST

		MODEL NO. 8019 BROWN	MODEL NO. 3020 IVORY	MODEL NO. 9017 BROWN
Ref		CABINET	CABINET	CABINET
No.	Description	Part No.	Part No.	Part No.
1.	Mechanism, Timer	59-109	59-109	59-127
	(Includes 2, 3, 4 and 5)			
2.	Hand, Alarm Set	52-23-1	52-23-1	52-66-1
3.	Hand, Hour	52-57-1	52-57-1	52-46-1
4.	Hand, Minute	52-15-1	52-15-1	52+47-1
5.	Hand, Second	52-24-1	52-24-1	52+78-1
6.	Window, Timer	48-146-1	48-146-1	48-150-1
7.	Cabinet	42-36-1	42-37-1	42-46-1
8.	Knob, Clock	52-784-0	52-784-0	52-650-0
9.	Knob, Volume	52-932-0	52-932-0	52-1030-0
10.	Knob, Tuning	52-933-0	52-933-0	52-1029-0
11.	Logo, "Silvertone"	40-21-2	40-21-2	40-51-2
12.	Speaker, 4" PM, 3.2 oh			
121	(Including T3)	33-327-4	33-327-4	33-327-4
	Baffle, Speaker			
	(Not illustrated)	44-11=0	44-11-0	
13.	Chassis, Radio	*	+	*
14.	Brocker, Chassis			
14.	Retainer	11-1169	11-1169	11-1169
15.	Line Cord and Plug	23-216-0	23-216-0	23-43-0
16.	CHp, Cabinet, Back	20 210 0		
10.	Retainer	22-2-5	22-2-5	22-2-5
	Clip, Timer Mounting			
	(Not illustrated)	22-4-17-2	22-417-2	
17	Back and Antenna Loop			
17.	(L1)	82-126-1	82-126-1	82-2-1
	Owners Manual and			
	Service Data Sheet	38-2051	38-2051	38-2297
	* Not supplied as a res			
	iter supplied us a let	an parts		

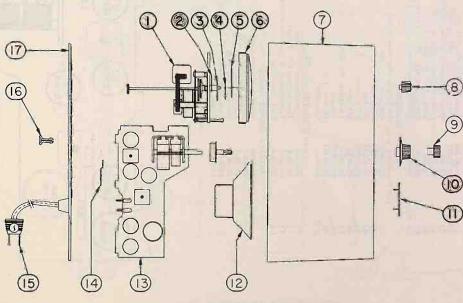
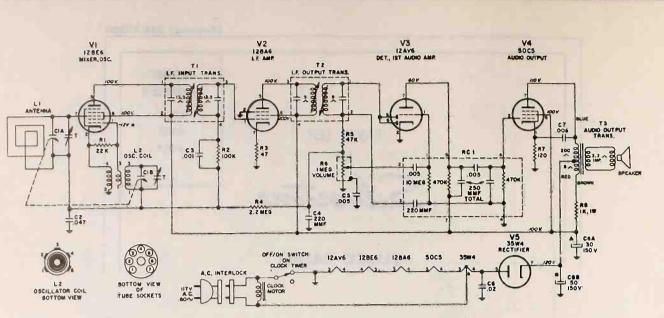


FIG. 1. EXPLODED VIEW OF CABINET

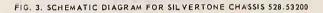
### RADIO PAGE 25-8 SEARS ROEBUCK



NOTES

3. I. VALUES OF CAPACITORS IN MFD, UNLESS OTHERWISE NOTED. 2. ALL RESISTORS 1/2 WATT, UNLESS OTHERWISE NOTED. 3. VOLTAGE MEASURED FROM POINT INDICATED TO GROUND WITH 20,000 OMM/VOLT METER ON ITY.A.C. LINE.

4 & MEASURED WITH ELECTRONIC VOLT METER.



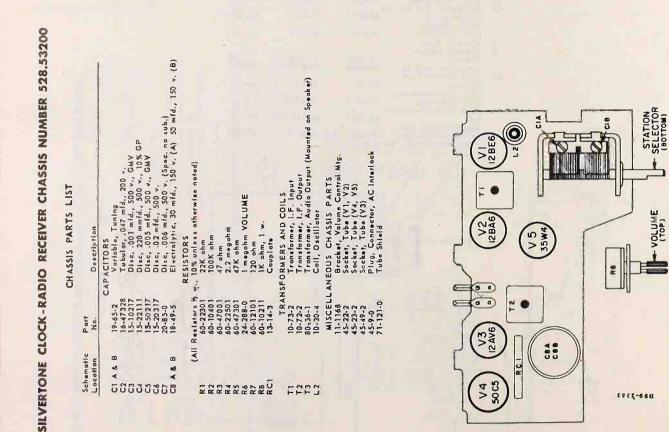


FIG. 2. TOP VIEW OF CHASSIS

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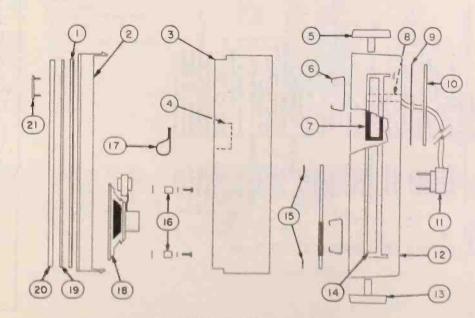


### SILVERTONE PORTABLE RADIO CHASSIS NUMBER 528.53350

CABINET PARTS LIST

Ret. No,	Description	MODEL 9214 COCOA Part No.	MODEL 9215 AQUA C Port No.	MODEL 9217A HARCOAL GREY Part No.	MODEL 9218A CORAL Port No.
1.	Trim Strip (Grillo)	***	40-85-8	40-105-3	40-105-3
2.	Grille, Front	40+29-1	40-30-1	40-41-1	40-41-1
3.	Chassis				
4.	Retainer, Chassis	22-180-0	22-180-0	22-180-0	22-180-0
5.	Knob, Off/On-Volume	52-1067-0	52-1068-0	\$2-1068-0	\$2-1068-0
6.	Hinge, Clip (2)	22-77-1	22-77-1	22-77-1	22-77-1
7.	Insulator, Switch	37-46-0	37-46-0	37-46-0	37-46-0
8.	Retainer, Door Catch	22-165-0	22-165-0	22-165-0	22-165-0
9.	Retainer, Door Spring	22-164-0	22-164-0	22-164-0	22-164-0
10.	Doer, Reer Comportment	21-322-0	21-323-0	21-385-0	21-386-0
11.	Power Cord and Plug	23-40-0	23-40-0	23-40-0	23-40-0
12.	Cobinet	42-57-1	42-58-1	42-62-1	42-63-1
13.	Knab, Tuning	52-1065-0	52-1066-0	52-1066-0	52-1066-
14.	Trim Strip (Handla)			40-106-3	40-106-3
15.	Retainer, Antenno (2)	22-163-0	22-163-0	22-163-0	22-163-0
16.	Ferrule, Speeker Mounting (2)	83-1236	83-1236	83-1236	83-1236
17.	Clamp, Cable	22-23-3	22-23-3	22-23-3	22-23-3
18.	Speaker (Inc. T3)	33-357-4	33-357-4	33-357-4	33-357-4
19.	Beffle, Grille		33-337-4	44-30-0	
20.	Grille, Metel			40-43-1	44-30-0
21.	Logo, DUR-PAC			40-67-2	40-43-1

\* Not Supplied op's Repüir Part



### RADIO PAGE 25-10 SEARS ROEBUCK

CHASSIS 528. 53350

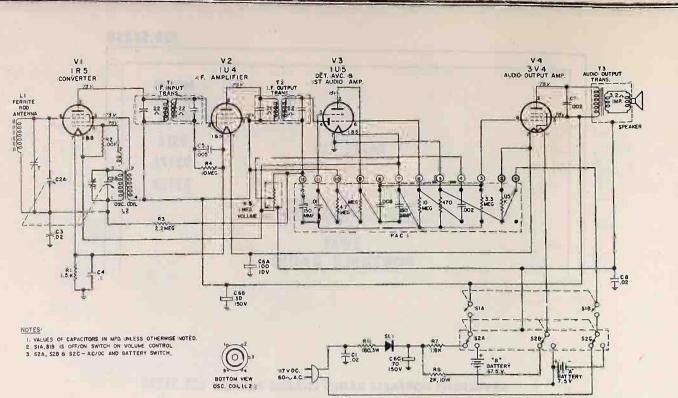
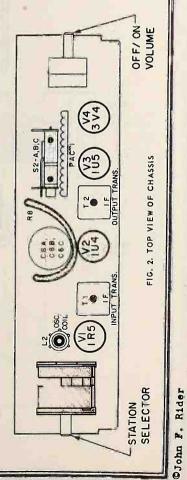


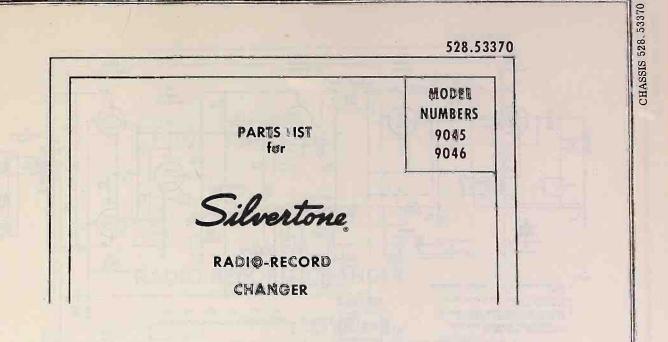
FIG. 3. SCHEMATIC DIAGRAM FOR SILVERTONE CHASSIS 528.53350

Schematic	Part	Deretion
	20-82-0	Disc, .02 mfd., 1400 v.
2 A& B	19-71-2	Varlable, Tuning
	20-70-0	Disc02 mfd., 500 v., GP
C4	20-51-1	Tubular, .1 mfd., 200 v.
CS	20-91-0	Disc005 mfd 500 v GP
C6 A, B & G	C 18-54-5	Electrolytic, 100 mfd., 10 v. (A):
C7	20-69-0	
ő	16-20343	2 mfd., 400 v
		RESISTORS
	(All resistors	15. w. 10% unless otherwise noted)
-	60-15201	
2	60-10401	100K ahm
	60-22502	2.2 meachin 20%
4	60-10602	10 meachm 20%
RS	24-310-0	1 meachm VOLUME & OFF/ON Switch
8	61-22-0	160 ohm, 3 w.
2	60-18201	1.8K ohm
	61-23-0	2K ohm, 10 w.
AC 1		Erie Pac Unit
	TR AN SF	ö
1, 12	10-102-2	Transformer, 1st and 2nd 1.F.
	80-62-1	Transformer, Audio Output
	82-143-0	Antenno, Ferrite Rod
N	MISCELLANFOUS	Coil, Oscillator DUS CHASSIS PARTS
Į.	83-1117	ctifiar. Seleniu
52 A, B&C	69-275-0	Switch, AC-DC, Botterv
	45-128-2	Socket, Tube (V1, V2, V3)
	45-126-2	Tube (V4)
	45-56-3	Receptacle, Line Card
oľ	45-59-3	Receptacle, Line Cord (Alta Part)
	45-28-0	Connector. "A" Battery
	45-75=5	
	27= A7=D	



# 528.53350 SILVERTONE

### SEARS ROEBUCK RADIO PAGE 25 - 11



### PARTS BIST - RADIO CHASSIS 528.53370

SCHEMATIC LOCATION	PART	DESCRIPTION	SCHEMATIC LOCATION	PART	DESCRIPTION
	CAPAG	CITORS	RCI	13-18-3	Cauplate, Tone Compensato Couplate, Push Pull
			RC2	13=16-3	Couplate, Posteroll
CI, C6, C16	20-44-1	Tubular, .047 mfd., 400 v.		TRANSFOMERS A	NDICOUS
C2A & B	19-74-2	Variable Tuning		IKANSPONEKS A	ND COLD
C3, C12	15-47111	Disc., 470 mmfd., 500 v., 10%	TO'	10-81-2	Transformer, I.F. Input
C4	19-180-0	Trimmer, Antenna (Part of L1)		10-71-2	Transformer, I.F. Output
C5, C9	20-47-1	Tubular, .047 mfd., 200 v.	T2 T3	80-69-1	Transformer, Audio Output
C7	15-151164	Disc., 150 mmfd., 500 v., N750		82-126-0	Coil, Antenna, Ferrite Rod
C8, C1	15-10316	Disc., .01 mfd., 500 v.,	LI .	02-120-0	Type (Inc. C4)
C10	18-62-5	Electrolytic, 4 mfd., 150 v.	10	10-34-4	Coil, Oscillator
C13A & 8	18-58-5	Electrolytic, 30 mfd., 150 v. (A);	L2	10-34-4	Coll, Oscillator
		70 mfd., 150 v. (B)		MISCELLANEOUS	CHASSIS BADTS
C14 & C15	15-102-16	Disc., .001 mfd., 500 v.,		MISCELLANEOUS	CHASSIS PARTS
C17	20-55-1	Tubular, .047 mfd., 400.v.			Tuning Shaft
				39-132-3	Bracket, Dial Disc
	RESIS			84-6439	Shaft & Pulley, Dial Disc
(All resist	ors 1/2 w., 10%	unless otherwise stated)		84-6440	Retainer, "C" Washer (4)
				22-49-1	Dial Disc
R1, R11	60-22301	22K ohm		52-165-1	
R2, R4	60-22502	2.2 megohm, 20%		45-7-3	Receptacle, AC Line
R3	60-15101	150 ahm		45-8-3	Socket, Phono Audio
R5	60-47302	47K ohn, 20%		45-61-3	Socket, Phono Motor
R6A & B	24-173-2	Tone Control, 500K ohm, BASS		45-17-2	Socket, 7 Pin Miniature
		(a); 3 megohm TREBLE (b)		45-18-2	Socket, 7 Pin Miniature Shield
R7	60-56501	5.6 megohm			(3) (V1, V2 & V3)
RB	24-330-0	1 megohm, VOLUME and OFF/ON Sv	۷.	45-116-2	Socket, 7 Pin Miniature
R9	60-15501	1.5 megohm		45-115-2	
R10	60-33401	330K ohm		51-105	Dial Cord (42-3/4")
R12	60-47501	4.7 megohm	S1A & B	69-270-0	Switch, RADIO-PHONO
R14	60-10501	l megohm		70-295-0	Spring, Dial Cord Tension (2)
R15	60-10101	100 ohm		71-69-0	Tube, Shield (2)
R16	60-10211	IK ohm, lw.	ISL1	83-1/146	Selenium Rectifier (100MA)
R17	61-10-0	33 ahm, 3 w.			
R18	60-10401	100K ohm			

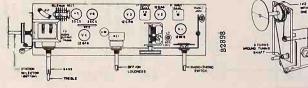


Fig. 1. Top View Chassis

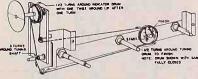


Fig. 2. Dial Stringing Diagram

### RADIO PAGE 25-12 SEARS ROEBUCK

CHASSIS 528. 53370

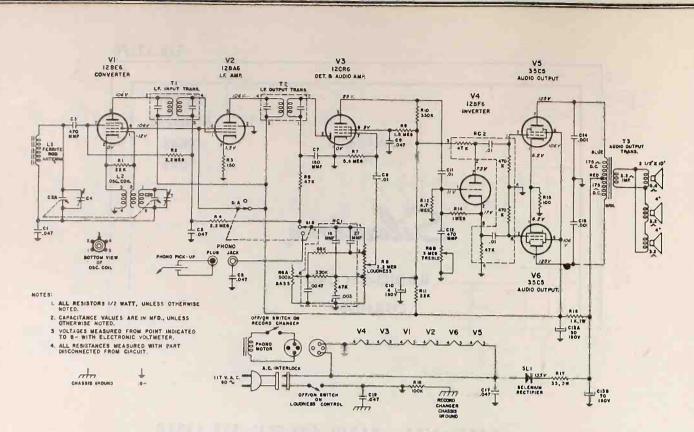
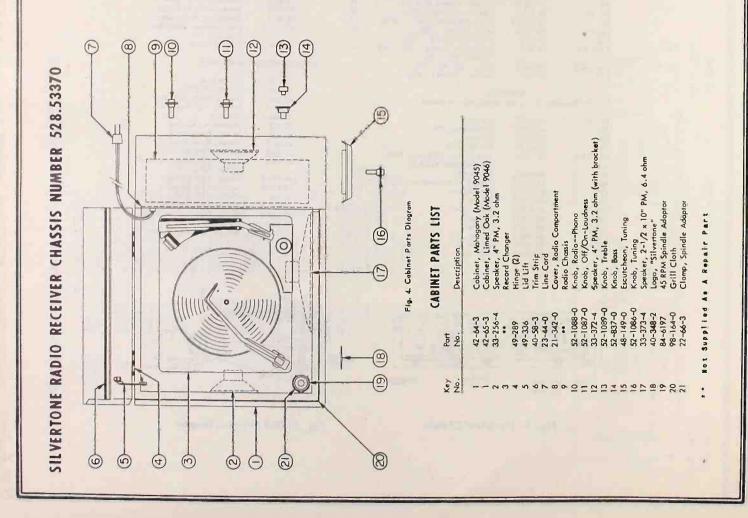


Fig. 3. Schematic Diagram - Chassis 528,53370



DJohn F. Rider

<b></b>	_				528.53380
				N	MODEL
		PARTS	LICT	1.	9061 9062
					1002
		10	r	1	
		Silve	atan		
-		uve	uone		
		AM-F	M		
		RADIO-RECORD	CHAN	GER	
1 1					
Schematic	Parts	CHASSIS	PARTS LIST Schematic	Part	
Lecation	No. CAPACITO	Description DRS	Location R59,R62, R63,R74	No. 60-22401	Description 220K ohm
C1, A, B, C, D, I C3, C9, C14, C	E 19-6-6	unless otherwise noted) Tuning Trimmer, Part of CTA	R61 R66,R67	24-180-2 60-12401	Boss Control 120K ohm
C4,C5,C7,C1 C13,C22,C23	E 19.6-6 19 15-470611 2, 15-10316	Tubular, 47 mmfd.	R70,R73 R71,R72 R75	60-10102 60-36125 60-39201	360 ohm, 2 w., 5%
C26,C27,C28 C29,C30,C31 C33,C34,C46	\$15-10316	Disc, JOI GP	14 A		ORMERS AND COILS
	17-103-0	AM Antenna Trimmer	12	10-24-1 10-47-4	Coil, Antenna (FM) Coil, R.F. (FM) Coil, Oscillator (FM) Coil, Chake
C8,C35,C48 C10 C11,C15,C24	16-47348 20-45-0 15-50216	Tub., .047 mfd. Tub., 3.3 mmfd. Disc, .005 mfd., 20%	L3 L4 L5 L6	10-140-1 10-46-4 10-129-1	Coll, Uscillator (AM)
217,013,024 217 218 220 221 225	15-100613	Trimmer AM Osc. (Part of CIA) Tub., 10 mmfd., NPO	L6 L7 T1,T2	80-11-6	Filter Choke Transformer, 1st & 2nd IF (FM
20	15-330611	Tub., 33 mmfd., NPO Trimmer (Part of C1B) Tub., 100 mmfd., N3300	T3 T4 T5 T6 T7	10-15-0 10-101-2 10-45-2	Transformer Ratio Detector ( Transformer, 1st IF (AM) Transformer, 2nd IF (AM)
25 32,C68 36,C38,C39	20-27-0 15-10116 15-27111	Tub., 100 mmfd., N3300 Tub., 6.8 mmfd., NPO Disc, 100 mmfd., 20%, GP Disc, 270 mmfd., GP	T6 T7	80-11-0 80-24-1	Transformer, Power Transformer, Audio Output
C37 C40	15-10261 18-74-5	Electrolytic, 8 mfd., 50 v.		11-1367	NEOUS CHASSIS PARTS Bracket, Pilot Light (2)
241,C65	15-10211 15-47111 15-15211	Disc, .001 mfd. Disc, 470 mmfd., GP Disc, 1500 mmfd., GP		11-1369 11-1371 11-1376	Bracket, Tuning Eye Bracket, Pointer Mounting Bracket, Pointer Support
43 44 45	15-60211 20-647-1	Disc, .006 mfd., GP Tub., .047 mfd., 600 v., 85 (Molded)		21-17-1 21-82-1	Shell, Connector Shell, Connector
C47,A,B,C	18-35-3	(Molded) Electrolytic, 100 mfd., A; 40 mfd.,B; 25 mfd. C; 350 v.		21-381-0 22-32-1 22-74-1	Caver, Volume Control Switch Clip, I.F. Mtg. Retaining Ring (2)
50,C51,C55	15-47061 15-20316	Tub., 47 mmfd., GP Disc, .02 mfd., 20%, GP		22-81-1 22-113-0	Retaining Ring (2) Retainer "C", Washer Tube Holder
56,C57,C59	16-47258 15-33111	Tub., .0047 mfd., 600 v., 20%, (Moldød) Disc, 330 mmfd., GP		22-142-1 23-18-0 26-19-2	Spring Clip Line Cord Threaded Bushing
60,C61	16-22357 18-23-0	Electrolytic, 50 mfd., 25 v.		31-322-0 37-6-0 37-43-0	Plate, Shield Cover Shield, Coil
63,C64	16-33268 19-3-5	Tub., .0033 mfd., 1000 v., 20% (Molded) Trimmer, Ceramic (FM Osc.)		37-53-0 39-9-1	Insulator, Transformer Insulator, Tuning Eye Socket Idler Pulley (4)
67	18-9-5 RESISTORS	Electrolytic, 4 mfd., 150 v., NP		39-20-2 39-21-2 39-40-1	Idler Pulley (4) Crown Gear (Pulley Shaft) Crown Gear (Pointer Shaft) Bulley & Shaft)
1.R6.R16	12 w., 10% un 60-22501	less otherwise noted) 2.2 megohm		39-147-3 39-149-3	Pulley & Shaft Pointer Shaft Gear Shaft
2,R15 3 4	60-10001 60-10501 60-56101	10 ohm I megohm		39-150-3 44-43-1 44-65-1	Shaft Idler Pulley (2) Shield, Pilot Light (2) Heat Barrier
5	60-68502 60-68001	560 ohm 6.8 megohm, 20% 68 ohm		45-4-2 45-4-3	Sacket, Octal (Molded) AC Power Receptacle
8 9,R24 10 R13	60- 68301 60- 10301 60- 68311	68K ahm 10K ohm 68K ahm, 1 w.		45-7-0 45-11-2 45-12-2	Phono Plug (2) Socket (9 Pin) (Molded) Socket, 7 Pin (Molded) (3)
10,R13 11,R19,R28 12,R23,	60- 10401 60- 47101	100K ohm. 470 ohm		45-12-3	Socket, 7 Pin (Molded) (3) Socket, Double-Phano (2) Plug, 6 Pin Socket 9 Bis (Moldet) (2)
64,R65 14,R17 18	60-22301 60-15001	22K ohm 15 ohm		45-33-2 45-59-4 45-60-3	Sacket, 9 Pin (Molded) (2) Socket, Pilot Light (Dial) Socket, 6 Pin Wafer
20 21 22,R47	60-15311 60-10502 60-47401	15K ohm 1 megohm		45-62-3 45-62-4 45-122-2	Socker, G Pin Water Socker, G Pin Water Socket, Pilot Light (Cabinet) Socket, 9 Pin (Molded) Socket, 7 Pin (Wolded) Socket, 7 Pin (Wolded) Socket, 7 Pin (Wolfer) (3) Dial Cord (183")
25	61-136-0 60-47201 60-22311	470K ohm 8K ohm, 15 w., w.w. 4.7K ohm 22K ohm, 1 w.		45-123-2 45-203-2	Socket, 7 Pin (Molded) Socket, 7 Pin (Wofer) (3)
27 29,R35,R40 30,R36	60-22311 60-68001 60-27311	22K ohm, 1 w. 68 ohm 27K ohm, 1 w.		51-105 69-269-0 69-277-0	Selector Switch
31,R42 32,R68,R69	60-10201 60-10401	1K ohm 100K ohm		69-278-0 70-246-0	Compensator Switch Spring, Ground Wiper
33,R52 34 37	60-39401 60-22502 60-22202	390K ohm 2.2 megahm, 20% 2.2K ohm, 20%		70-269-0 70-295-0 71-69-0	Spring, Dial Cord (Long) Spring, Dial Cord (Short) Tube Shield (7 Pin)
41,R60 43	60-68301 60-56901	68K ohm 5.6 ohm		71-80-0 71-93-0 77-162-0	Tube Shield (9 Pin) Shiëld, Tuner (Top) Spacer (4)
44,R45 46 48,R49	60-68201 60-12201 60-47502	6.8K ohm 1.2K ohm 4.7 megohm, 20%		84-6415 84-6582	Connector Receptacle Bracket, Gear & Pointer Mto
50 51	61-137-0 24-327-0 60-15401	4.7 megohm, 20% 900 ohm, 10 w., w.w. Stereo Balance Cantrol 150K ohm		84- 6583 84- 6586 84- 6587	Pulley & Shaft Connector Cable Pulley & Hub
53 54 55	24-328-0 60-33321	Volume Control 33K, 2 w.		84-6668 84-6669	Tracking Indicator Idler Pulley (2)
56	60-10602	10 megohm, 20% 270K ohm		84-6672 84-6675	Pointer (Cylinder) Bottom Shield Spring Washer
57	60-27401 24-181-2	Treble Control		86-408 89-7	Spring Washer Pilot Lamp, #47 (3)

RADIO PAGE 25-14 SEARS ROEBUCK

CHASSIS 528. 53380

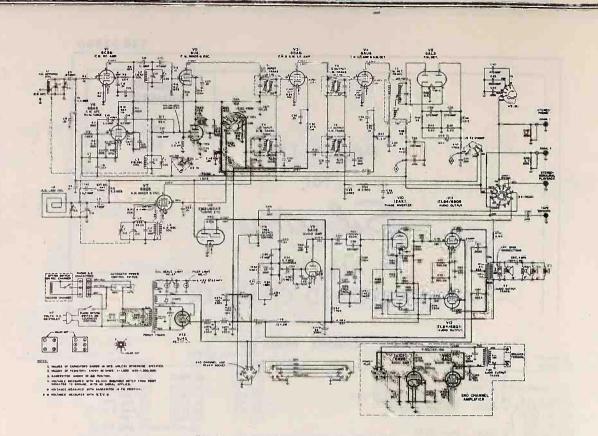
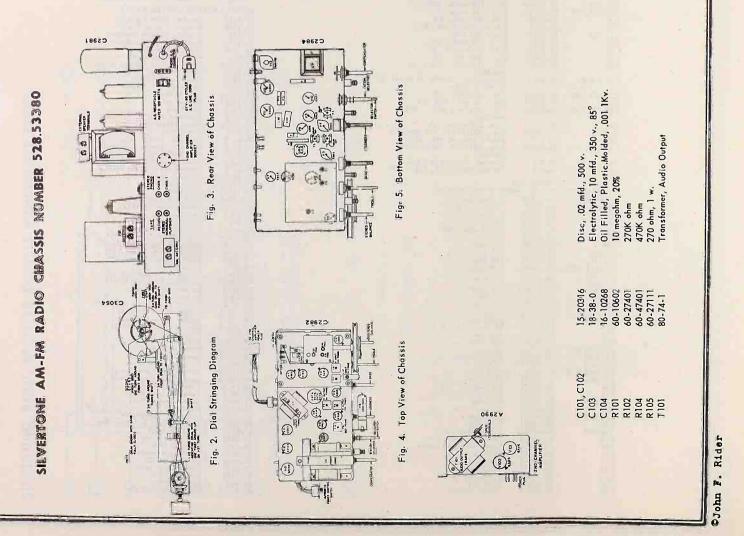


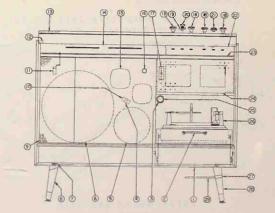
Fig. 1. Schematic Diagram Chassis 528.53380



### SILVERTONE AM-FM RADIO CHASSIS NUMBER 528.53380

### SILVERTONE AM-FM RADIO CHASSIS NUMBER 528.53380

Rof. No.	Part No.	Description	Rof. No.	Part No.	Desciption
1	42-79-3	Cabinet (Mahagany 9061)	15	33-375-4	Tweeter, 5" PM
3	42 - 80 - 3	Cabinet (Limed Oak 9062)	16	49-354	Knob, Phone Deer
2	49-98	Drower Pull	17	40-145-0	Escutcheon, Auto Power Control
3	22-66-3	Clamp, Spindle Adaptor	18	52-1115-0	Knob, Indicating
4	22-20-1	Clip, Capacitor, Mounting	19	52-1109-0	Knob, Station Selector
5	33-365-4	Speaker, 8" PM, 8 ahm	20	52-1132-0	Knob, OFF/ON Switch
6	33-319-4	Speaker, 15" PM, 8 ahm	21	52-1131-0	Knob, Dual
7	22-151-2	"T" Nut, #10-32	22	67-654-0	Dial Scale
8	19-401	Leg (Mahagany - Rear)	23	22-58-5	Dial Scale Cushion
8	49-402	Leg (Limed Oak - Rear)	24	22-30-3	Rodia Chassis
9	98-163-0	Grill Cloth	25	84-6299	
10	18-9-5	Cross over Capocitor, 4 mfd., NP		04-0299	45 RPM, Spindle Adaptor (Cat. No. 57- 5774)
11	11-1377	Clip, Capacitar Mounting	26 27	40-102-3	Record Changer
12	49-392	Hinge Pin (2)			Log Band (2)
13	21-46-0	Control Panel Cover (Mahagany)	28	49-399	Leg (Mahogany Front)
13	21-407-0	Control Panel Cover (Limed Oak)	28	49-401	Leg, (Limed Oak Front)
14	31-511-0	Panel Bockground	29	40-107-3	Rod, Log Support
	31-311-0	runer Duckground		21-397-0	Back, Phono Compartment



	84-6384	Phono Pull-Out Unit	56	77-24-0	Spacer (2)
50	37-32-3	Grommet Pass Thry (2)	57		
51				26-28-2	Bushing, Spring Anchor (2)
	84-6349	Carriage Frame	58	86-394	Flotwasher (Nylon) (2)
52	84-6385	Hinge (RH)	59	70-338-0	Spring (2)
53	62-115-0	Bumper Plug (2)	60	21-377-0	Bottom Panel
54	11-1280	Cross Broco (2)	61	84-6386	Hinge (LH)
55	84-6335	Wing Nut (2)		62-1160	Bumper Plug (Rear) (2)



CHASSIS 528, 53380

## Spartan

### MAINTENANCE MANUAL 109

### DIAL STRINGING INSTRUCTIONS

### DIAL CORD PLACEMENT

Select a 50-inch length of dial cord and tie a small loop at each end. Turn the tuning gang fully out of mesh and hook one end of the cordover the metal hook on the condenser pulley nearest the front of the chassis and proceed with the stringing as shown in the drawing below.

### DIAL POINTER PLACEMENT

Place the dial pointer onto the pointer slide and turn the tuning gang completely in mesh. Lace the dial cord around the three hooks on the front of the pointer and with the tuning condenser still fully in mesh, slide the pointer over until it lines up with the last dial calibration mark at the low frequency end of the broadcast band. This completes the assembly.

### **51 SERIES** RADIO CHASSIS

### GENERAL

This manual covers the 51 series radio chassis, versions 51-01AA thru 51-11AA and also the 51-03BA yersion. Three complete electrical parts lists and 3 schematics are shown to provide complete coverage. On the 51-03BA version an electrical change has been

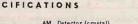
made regarding the AC switch on the rear of the band switch. This switch was eliminated and a double-throw switch used on the Bass control as an Off-On switch. This change is shown on the schematic diagram on page 10 .

### SPECIFICATIONS

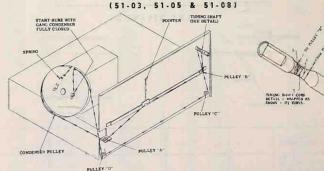
Tuning Frequency Range:		AM Detector (crystal)		1N34A
Broadcast Band	540-1620 KC	Tuning Eyet		6E5
FM Band	88-108 MC	Audio Amp*		6AV6
Intermediate Frequency	455KC/10.7 MC	Audio Amp**	(1/2)	6U8
Tubes:		Audio Amp***	(1/2)	12AX7
		Phase Inverter**	(1/2)	6U8
FM RF Amplifier	6Ç45	Cathode Follower***	(1/2)	12AX7
AM RF Amplifier	6BZ6	Cathode Follower	(1/4)	I SAAT
FM Mixer & Osc.	608	Audio Output*		6AQ5
IN Co.		Push-Pull Audio Output**	(2)	6AQ5
AM Converter	6BE6	Rectifier***		5¥3
IF Amplifier	6BA6	Nectalet		515
FM Driver	6BA6	+Not used on 51-01, 02, 07, 09 & 11 *Used only on 51-02		
Ratio Detector	6AL5	**Used only on 51-01, 04, 07, 09 & ***Used only on 51-03, 05 & 08	11	

### CHASSIS DIFFERENCES

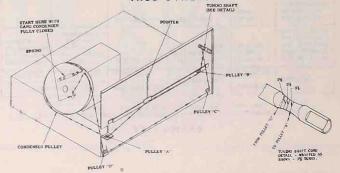
Chassis No.	Tuning Eye	Output	Chassis No.	Tuning Eye	Output
51-01 51-02 51-03	No No Yes	Push-Pull Single Ended None	51-07 51-08 51-09	No Yes No	Push-Pull None Push-Pull
51-04 51-05 51-06 Not Rele:	Yes Yes ased	Push-Pull None	51-10 Not Relea	No	Push-Pull

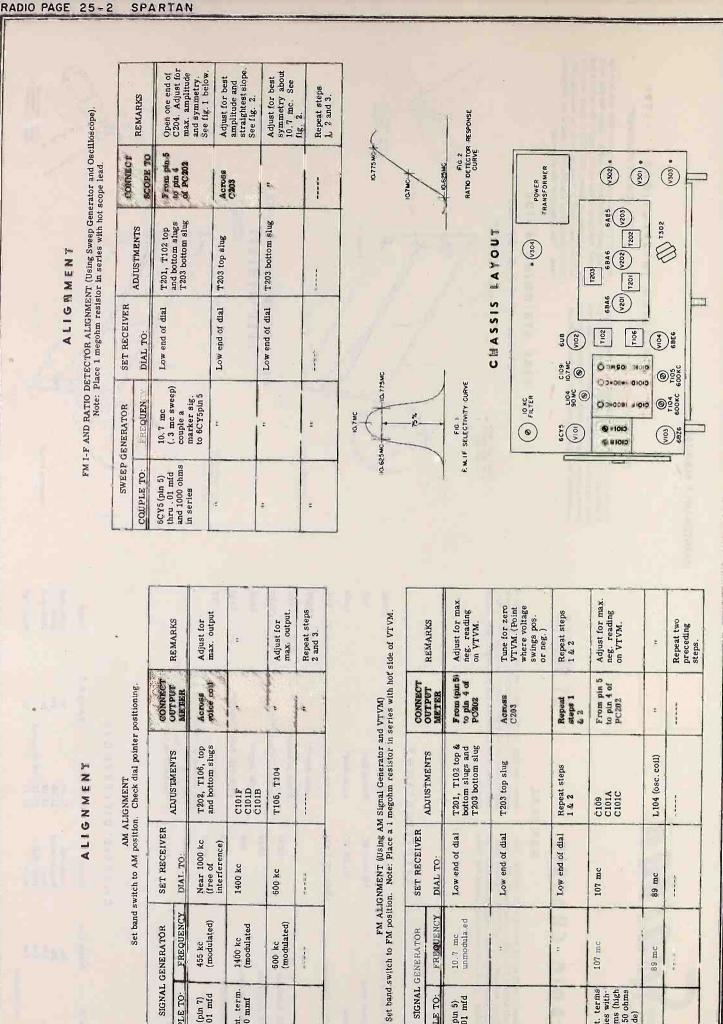


### DIAL STRINGING GUIDE



DIAL STRINGING GUIDE (ALL OTHERS)





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ē

AM ant. term. thru 10 mmf

£

6BE6 (pin 7) thru . 01 mfd COUPLE TO.

CJohn F. Rider

mc

107

6CY5 (pin 5) thru . 01 mfd COUPLE TO:

:

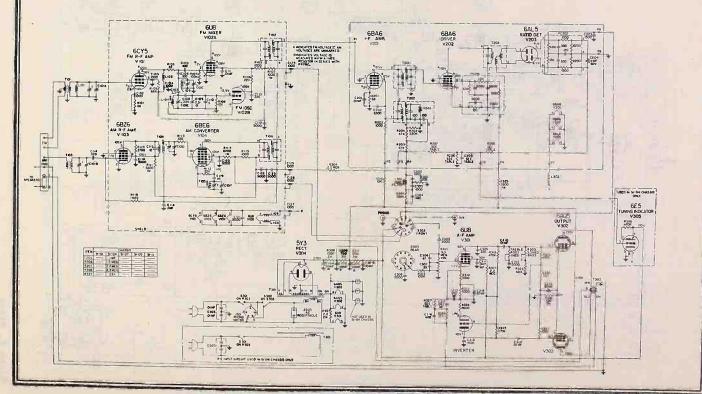
FM ant. terms in series with: 120 ohms (high side) 150 ohms (low side)

89 mc

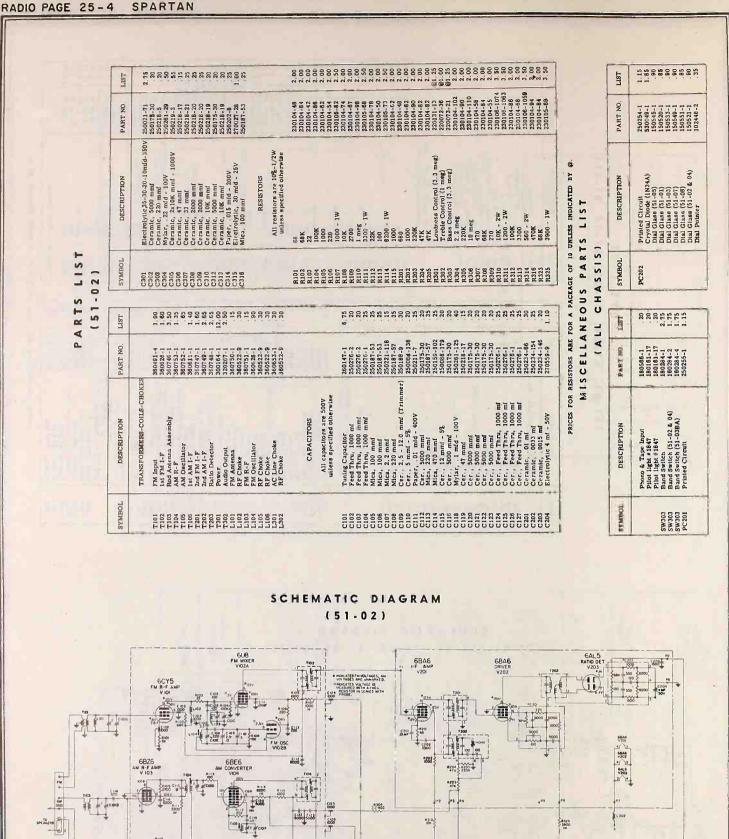
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CHASSIS 51 Series

SPARTAN RADIO PAGE 25-3 CHASSIS 51 Series 282288228282 TSL 220104-49 220104-49 220104-47 220104-57 220104-57 220104-57 220104-67 220104-67 220104-67 220104-10 20040-10 250218-20 250218-19 250218-19 250175-30 250175-30 250218-19 250218-19 250218-19 2502218-19 2502218-19 2502218-11 270027-28 250228-11 250228-11 2 PART All resistors are 10%-1/2W unless specified otherwise Cer. 2000 mmf Cer. 2000 mmf Paper, 007 mmf 200V Paper, 007 mmf Cer. 100 mmf Cer. 100 mmf Cer. 100 mmf Cer. 200V Electrolytte, 20 mmf -25V Paper, 047 mfd -25V Paper, 047 mfd -25V Paper, 047 mfd -25V Control (3. 3 meg) mtrol (1 meg) trol (3. 3 meg) 51-11 e RESISTORS DESCRIPTION UNLESS INDICATED BY 51-04 Ch 51-04, 51-07, 51-09, 50 200 300 300 00K 22.2 4701 4701 4701 55600 335K 335K 335K 2220 585K 122K 33900 470K 470K 222K PARTS LIST 2 SYMBOL Used ů LIST 4 FOR 2001/1-1 2007/6-2 2007/6-2 2001/8-5 2001/8-5 2001/8-15 2001/8-15 2001/8-15 2001/8-10 2 PART NO. 250228-354 250228-354 250218-4 250219-3 250218-17 250218-17 250218-21 RESISTORS ARE 360491-4 360762-1 360752-1 360752-1 360752-1 360752-1 360752-1 360749-1 360749-1 360749-1 360749-1 360749-1 360749-1 360749-1 360752-9 360752-9 360522-9 360522-9 360522-1 360522-1 360522-1 360522-1 360522-1 360522-1 360522-1 360522-1 Manuary and a second metal and a second metal accounter (51-01, TRANSFORMERS-COILS-CHOKI FOR All capacitors are 500V niess specified otherwise CAPACITORS nmf (Tri PRICES DESCRIPTION hund Feed Thrue, Canada Con-Feed Thrue, 1000 r Feed Thrue, 1000 r Mices, 1000 mund Mices, 1000 mund Mices, 22 amult Mices, 22 amult Mices, 22 amult Mices, 2200 mund Mices, 2500 mund Mices, 2500 mund Mices, 2500 mund Mices, 2500 mund Corr. 9600 mund Corr. 960 r (51-04) o Output Antenna Choke FM Input 1st FM 1-F Rod Antenna AM R-F AM Oscillate 1st AM 1-F Znd FM 1-F Ratio FM Antenns RF Choke FM R-F FM Oscillat RF Choke RF Choke IOKC Filter RF Choke NMBOL T101 T102 T103 C302 C303 C304 C304 C305 C305 C305 C305 C306 SCHEMATIC DIAGRAM (51-01, 51-04, 51-07, 51-09, 51-11)



DJohn F. Rider



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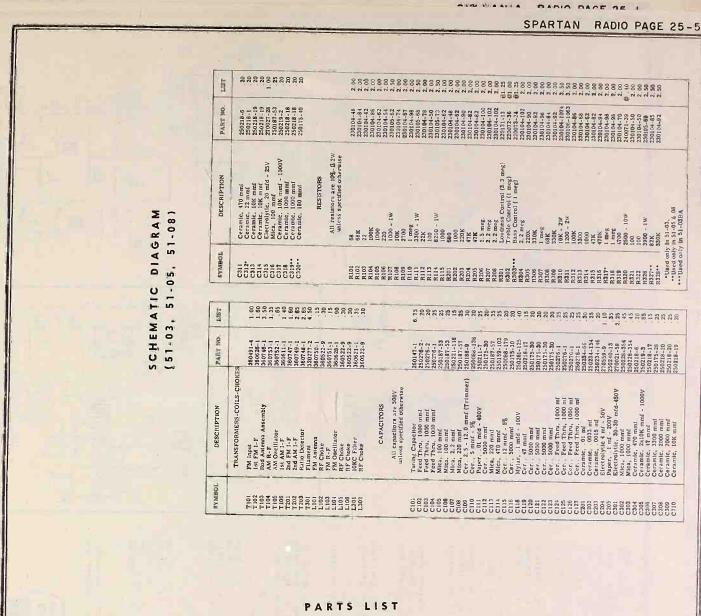
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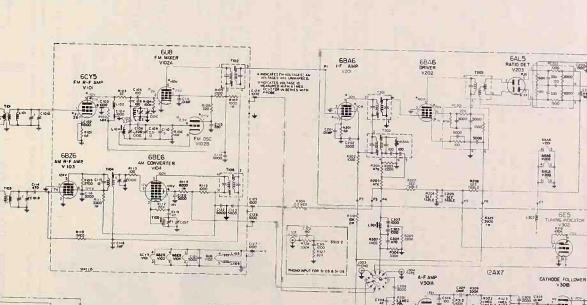
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CJohn F. Rider

## CHASSIS 51 Series





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(51-03, 51-05, 51-08)

CJohn F. Rider

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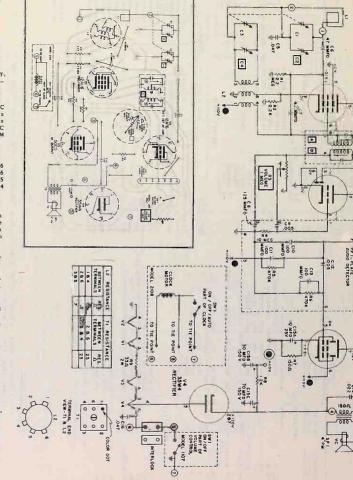
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C 304 3 3MEG

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SYLVANIA RADIO PAGE 25

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### RADIO PAGE 25 - 2 SYLVANIA

T 2

CHASSIS 1-629-1,

			SCHEMATIC LOCATION	SERVICE PART NO.	DESCRIPTION	
		a contraction of the second		COILS AND T	RANSFORMERS	
			2.3	PART OF BACK COVER	ANTENNA - LOOP	
			L2	113-0044	CO.III 0201111-000	
			T1	121-0107	COIL - OSCILLATOR TRANSFORMER - IF	
	REPLI	ACEMENT PARTS LIST	T2	143-0045		
SCHEMATIC	SERVICE			143-0045	TRANSFORMER - AUDIO OUTPUT (S	SPEAKER MOUNTER
LOCATION	PART NO.	DESCRIPTION				
LOCATION	PART NO.	DESCRIPTION		MUSCERIANEO	US ELECTRICAL PARTS	
	CAPACITORS			MUJOCLERANEO	OS LECORRICAL PARIS	
	UNIACTIONS		PP1	190.0028	PLATE - AUDIO DETECTOR	
	170-0019	VARIABLE TUNING CAPACHTOR	C8.C9		125 MMFD., .005 MFD.	
C1.C3	170-0013	ANTENNA GANG, OSCILLATOR GANG	C10,C11		100 MMFD., 100 MMFD.	
C2.C4		ANTENNA TRIMMER, OSCILLATOR TRIMMER	C12,C13		.005 MFD., 100 MMFD.	
,C5		.047 MFD - 20% - 400V - PAPER	R4, R5, R6		10 MEG OHM, 470,000 OHM,	470 000 000
CG		47 MMFD - 10% - 400V - CERAMIC	SWI	PART OF	SWITCH - ON/OFF - MODEL 2	
C7		4.7 MMFD - 10% - 400V - CERAMIC		CLOCK	SHITCH + UNFOFF + MODEL 2	100
C8.C9.C10	PART OF	SEE "MISCELLANEOUS ELECTRICAL PARTS"	SWI	PART OF	SWITCH - ON/OFF - MODEL 1	107
00.00.010	PP1	SEE MISCELEAREOUS ELECTRICAL PARTS		VOLUME	SHITCH - UN/UFF - MODEL I	1107
C11.C12.C13	PART OF	SEE "MISCELLANEOUS ELECTRICAL PARTS"		CONTROL		
	PP1	SEE MISCELEAREOUS ELECTRICAL PARIS		CONTROL		
C14		.022 MFD - 20% - 400V - PAPER			CADINET DADTE	
C15	161-3035	3 SECTION ELECTROLYTIC			CABINET PARTS	
A	101-3035	10 MFD, 25V	DESCRIPTION		M	DELS
B		30 MFD 150V	<u>DESCRIPTION</u>			
c		70 MFD 150V			1107	2108
C16		.047 MFD - 20% - 400V - PAPER	CABINET - N		813-0117	813-01
		1047 MPD - 208 - 4007 - FAFER	CABLE - AC		195-0001	195-00
	ESISTORS		COVER . INT	ERLOCK (TNCLUD	ES ANTENNA 582-0032	582-00
	LOTOTORO				CABLE)	
11		2.2 MEGOHM - 20% - +W	CRYSTAL - C			717-00
2		2.200 OHM + 10% - 1W	FACE - CLOC			721.00
3	157-0050	1 MEGOHM-VOLUME/ON/OFF-CONTROL-MODEL 1107	HAND - MINU			206-00
3	157-0051	MEGOHM-VOLUME CONTROL-MODEL 2108	HAND - HOUR			206-00
4.85.86	PART OF	SEE "MISCELLANEOUS ELECTRICAL PARTS"	HAND - SWEE			206-00
	PP1	DEE MIDDEELANEOUS ELECTRICKE FARTS-	HAND - ALAR			206-00
87		150 OHM - 10% - +W.	KNOB - TUNI		741-0042	741-00
8		1,200 OHM - 10% - 1W	KNOB - VOLU		742-0022	742-00
9		33 OHM - 10% - 2W	KNOB - CLOC			740-01
				ENSION - TIME	SET	493-01
			SPEAKER - 4	"РМ	539-0429	539-04
					CHASSIS PÁRTS	
			SOCKET - TU	BE - 7 PIN MIN	ATURE 412-0040	412-004
			TERMINAL -	AC PRONG	487-0040	487-00
	SCHEMATLO	NOTES:				
	the second se					

VOLTAGES MEASURED TO NEGATIVE "B" USING SYLVANIA "POLYMETER", LINE VOLTAGE 117VAC AND SIGNAL-INPUT KEPT TO MINIMUM.

2. COIL AND TRANSFORMER RESISTANCES ARE AVERAGE VALUES AND ARE TAKEN WITH COMPONENT CONNECTED

IN THE CIRCUIT. 3. INTERMEDIATE FREQUENCY 455KC.

A. ENCIRCLED NUMBERS CORRESPOND WITH THE POINTS ON PRINTED BOARD.
 VOLTAGE SOURCE IS INDICATED BY ENCIRCLED SYMBOL .: CORRESPONDING SYMBOL WITHOUT CIRCLE INDICATES VOLTAGE THE POINTS.
 ↓DESIGNATES NEGATIVE "B".

PRELIMINARY INSTRUCTIONS (CONT'D)

7. Apply 117V. to chassis. Set signal generator for an RF output signal amplitude modulated (AM) by 400 cycles. Allow radio chassis and signal gen-erator several minutes warm-up time. During alignment, keep signal gen-erator output at lowest level that rives correspible and is output gives perceptible audio output.

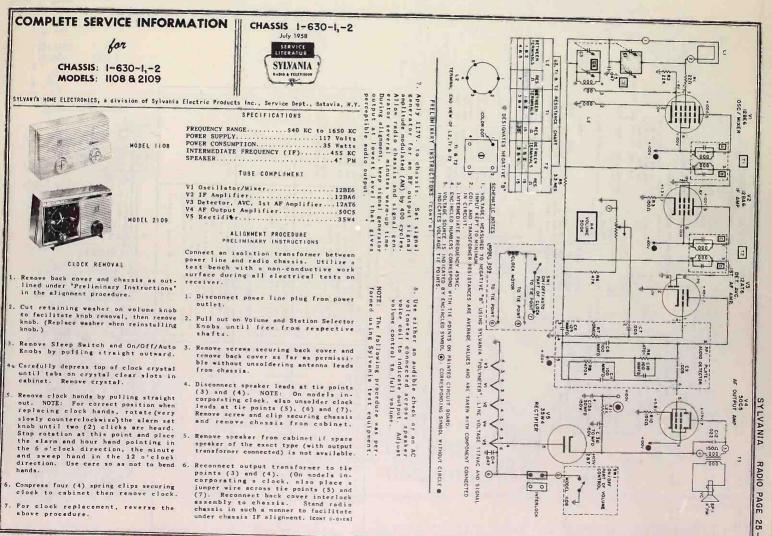
Use either an audible check or an AC voltmeter connected across speaker voice coil to indicate output. Adjust volume control to full volume.

NOTE: The following alignment procedure was performed using Sylvania test equipment.

F. Rider

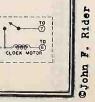
DJohn

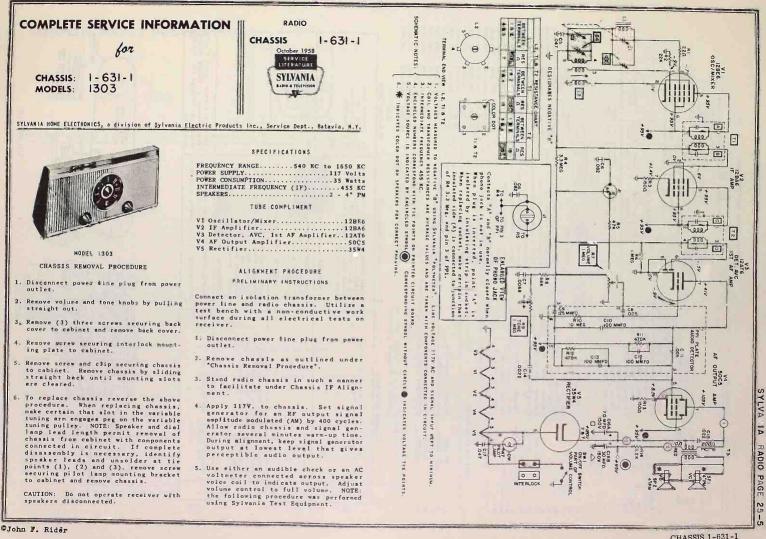
STEP	ALIGNMENT SETUP NOTES TEST EQUIPMENT HOOKUP		ADJUST FOR MAXIMUM OUTPUT		
1.	Set variable tuning capacitor fully open (minimum capacity).	SIGNAL GENERATOR - "Hot" lead through a .1 Mfd. capacitor to tie point number (1). Ground lead to negative "B". Set generator to 455 KC. AC VOLTMETER = Across speaker voice coil.	T1-A - Top core Repeat for optimum performance		
2.	Søme øs step 1.	SIGNAL GENERATOR - Radiate signal to receiver through a loop of several turns of wire. Set generator to 1650 KC. AC VOLTMETER - across speaker voice coil.	C4 - trimmer		
3.	Set variable tuning capacitor to the 600 KC position, (plates meshed approx- imately 3/16"). Adjust this setting slightly to eliminate any interfering signals.	SIGNAL GENERATOR - Radiate signal to receiver through a loop of several turns of wire. Set generator to a frequency corresponding to receiver tuning capacitor setting (until signal is heard through receiver speaker). AC WOLTMETER - Aciross speaker voice coil.	C2 - tir immer		



SCHEMATIC	SERVICE	DESCRIPTION		SCHE	MATIC	SERVICE PART NO.	DESCRIPT	ION		
LOCATION	CAPACITORS				1417 - P.	AND TRANSFORM	a second second			
							nick o			
	170.0019	VARIABLE TUNING CAPACITOR		LB		PART OF BACKCOVER	LOOP- AN	TENNA		
C1,C3		ANTENNA GANG. OSCILLAT	DR GANG	L.2		113-0045		SCILLATOR		
C2.C4		ANTENNA TRIMMER, OSCILI .047 MFD - 20% - 400V, - 1		T1 T2		121-0108		MER - 1'ST I		
C5 C6.C7.C8	PART OF PP1	SEE "MISCELLANEOUS ELECTR		T3		143-0045		MER - 2ND 1 MER - AUDIO		PEAKER MOUNTED
C9,C10,C11	PART OF PP1	SEE "MISCELLANEOUS ELECTR								
C12 C13	161-2016	.022 MFD - 20% - 400V F 2 SECTION ELECTROLYTIC	PAPER			OUS ELECTRIC				
A		30 MFD - 150V.		PP1 C6.C		190-0028		AUDIO DETEC MFD005 M		
B C:14		70 MFD - 150V. 047 MFD - 20% - 400V. • 1	APER	C8.C				MFD, .005 M		
014	RESISTORS			C 10,0				MFD, 100 MM		
				SW1		PART OF	IO ME	GOHM 470.00	U UHM, 470	.000 0HM
R1 R2		22 OHM - 20% - 높₩. 22,000 OHM - 10% - 높₩.		a.u.i		CLOCK	SWITCH-0	N/OFF MOD	EL 2109	
R3		150 OHM - 10% - ±₩.		S Wil		PART OF VOLUME				
R4	157-0041	500,000 OHM - CONTROL-VOLU		L 1108		CONTROL	SWITCH -	ON/OFF . M	ODEL 1108	
R4 R5	1.57-0052	500.000 OHM - CONTROL-VOLU 3.3 MEGOHM - 20% - 1/2W,	IME MODEL 2109							
R6		47.000 OHM - 20% - ₺₩.			SIS PARTS			MO	DEL	
R7, R8, R9 R10	PART OF PP1	SEE "MISCELLANEOUS ELECTRI 150 OHM + 20% + #W.	CAL PARTS"		RIPTION	¥0. ¥5		0.1108	21:09	
-R 1 1		1,200 OHM - 10% - 1W.			D - TUBE -	7 PIN MINUA	TURE	482-0012	482-0012	
				STRAP	· GROUND	- TUBE SHIEL		499-0014	499-0014	
	CABINET PART	S			NAL - AC P		like a sec	487-0040		
	DESCRIPTION			08WH	1108BL	UOBRE	20.09BL	2109RE	2109WH	
	CABINET - MOI		811	3-0119					813-0128	
	CABINET - PA CABINET - PA	INTED ( INCLUDES CLOCK FACE)			813-0121	813-0122	813-0120	813-0123		the second second
	CABLE - AC PO	OWER	19	5.0001	195-0001	195,-0001	195-0004	195.0001	195-0001	
	FACE · CLOCK	DCK					717-0005	717-0005	717-0005	
	HAND - HOUR					1	206-0006	206-0006	206-0010	
	HAND - MINUTE	C. C. Martinez and provide and the					206-0007	206-0007	206-0011	
	HAND - SWEEP					i ii	206-0008	206-0008	206-0008	
	KNOB . TUNING			1-0043	741-0044	741-0045	741-0044	741-0045	741-0068	
	KNOB - VOLUME		74:	2-0023	742-0025	742=0026	742-0024	742-0024		
		CONTROL - ON/OFF					740-0170	740-0170	742-0024	
	KNOB - CLOCK NAMEPLATE - S	CONTROL - SLEEP	011				740-0205	740-0205	740-0205	
		ISION - TIME SET	818	8-0147	818-0148	818-0149	493-0131	493-0131	493-013	
	SPEAKER - 4"			9-0429	539-0429	539-0429	539-0429	439-0429	539-0429	
	COVER - INTER	RLOCK (INCLUDES ANTENNA AND	AC CABLED 582	2-0034	582-0034	582-0034	582-0035		582-0035	
	ALIGNM	ENT SETUP NOTES	1	TEST FOU	PMENT HOO	KUP	FOR M	ADJUST AXIMUM OUTP	U-	
T			i		·····					
1.		e tuning capacitor open (minimum ca=				Hot" lead		- Bottom		
	pacity).	open (minimum cas				acitor to and pin 7		- Top co - Bottom		
			of V1 (1	ction of R1 (22 Ohm) and pin 7 V1 (12BE6); ground lead to			D T1-A	T1-A - Top core		
			(negative "B"). Set gene 455 KC.			nerator to		Repeat for opti-		
			TO AL.					erforman		
					- acros	s speaker				
			voice co						- N.	
2.	Same as step	1.				ate signal		rimmer	100000	
						a loop of				
1 1			erator t			Set gen-			E 16 1	
			AC VOLTM voice coi		· Acros	s speaker			2011	
			voice 601		terror and the second					
3.		tuning capacitor to				ate signal		rimmer		
		ion, plates meshed 3/16 inch. Adjust				a loop of Set gen-				
	this setting s	slightly to eliminate	erator t	o a f	requenc	y corres-				
	any interferin	ng signals.				uning ca-				
						signal is speaker).				
2										
			AC VOLTM		Acros:	s speaker				

12BES DET. AV 811 1.2 K AUDIO DETECTO - 0 -Re O C12 022 ONLY 10m 10 - 22 0 • ITV AC 200- 1 1 23 5 3 SW I ON/OFF/AUTO PART OF ICLOCK .04 V2 I2BA6 IF AMP 7 RIO 150 Ω 6 5 5 V5 35W4 RECTIFIER MODEL 2109

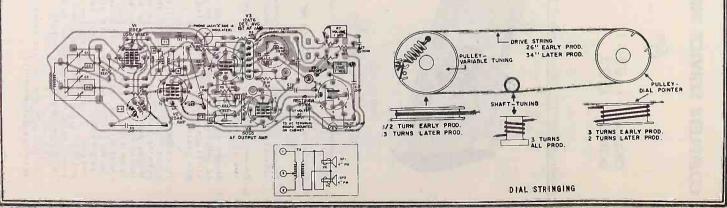




CHASSIS 1-631-1

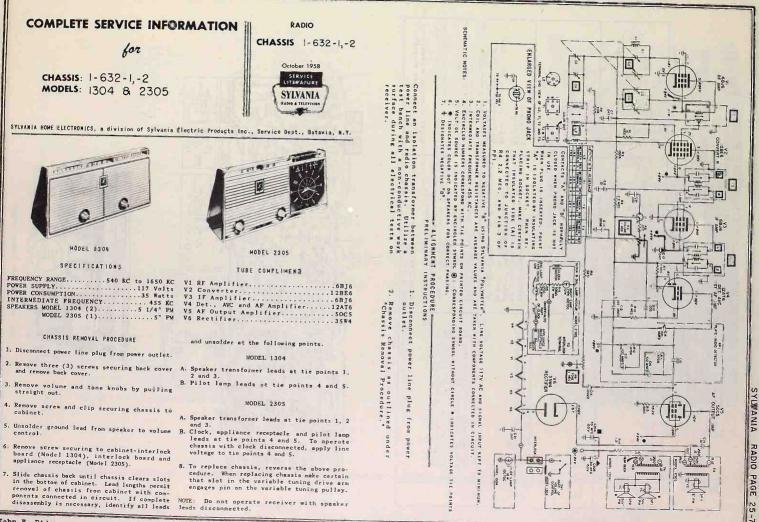
### RADIO PAGE 25-6 SYLVANIA

CHEMATIC	SERVICE	DE COLUETION	MISCE	LLANEOUS ELECTRICAL	PARTS			
OCATION	PART NO.	DESCRIPTION						
			PPI	1.90 - 0028		UDIO DETECT		
	CAPACITORS		C8.C9			D. 125 MMFD		
			C10.C11 C12,C13			D. 100 MMFD		
1.03	170-0030	VARIABLE TUNING CAPACITOR	R10, R11			OHM, 470,000		
C2	PART OF CI	ANTENNA TRIMMER	812		470,000		- O'AM	
C4	PART OF C3	OSCILLATOR TRIMMER	CW.I	PART OF				
5		.047 MFD - 20% - 400V PAPE .082 MFD - 20% - 400V PAPE		VOLUME CONT.	SWITCH -	ON/OFF		
7		.0068 MF0 - 20% - 500V CERA		417-0030	SOCKET +	PHONO TINPUT		
8.09.010		SEE "MISCELLANEOUS ELECTRICAL						
11.012.013	3	SEE "MISCELLANEOUS ELECTRICAL		CHASSIS PARTS				
14		.0022 MFD - 20% - 400V PAP	ER					
15		.022 MFO - 20% - 400V PAPE	R	487-0050	CLAMP - P	LASTIC - AN	TENNA RETAIN	ER
16	161-2016	2 SECTION ELECTROLYTIC		482-0016	SHIELD .			
A		70 MFD + 150V.		412-0051			N MINIATURE	
В		30 MFD + 150V.	a second s	487-0040		+ AC PRONGS		
17		.047 MFD - 20% - 400V PAPE	R	411-0035	SOCKET -	PILOT LAMP		
	RESISTORS							
T.		22 ОНМ - 20% - ±₩.	CABINET	PARTS				
2		22.000 ОНМ - 20% - ±₩.	Directory of the second					
3		150 Онм - 20% - ±₩.	DESCRIPT	ION		1303RE	1303TU	1303Y
4		3.3 MEGOHM - 20% - ±₩.	A. D. L					
5		47.000 OHM - 20% - ±W.		RIABLE CAPACITOR DR	II VE	473-0005	473-0005	473-00
6		1 МЕGOHM - 20% - ±₩.		IND - DIAL SPEAKER		727-0009	727-0009	727-00
7	152-0054	1 MEGOHM - VOLUME CONTROL		TERMINAL . INTERLOC	×	776-0011	776-0011	776-00
В	BLOT OF	68.000 OHM - 20% - ±W.	CABINET			822-0029	415-0029 822-0031	822.00
9	PART OF	1 MEGOHM - TONE CONTROL		- FRONT - INCLUDES	OVERLAY	822-0028	822-0031	822-00
10.R11.R12		SEE "MISCELLANEOUS ELECTRICAL				822-0030	822-0032	822.00
13		150 Онм - 20% - ±₩.		ASSEMBLY . POWER		195-0019	195.0020	195-00
14		1,200 OHM - 10% - 1W.		SYLVANIA		818-0169	818-0169	818-01
			DIAL AND	DRIVE MOUNT		722.0069	722-0069	722-00
			KNOB . D			740-0225	740.0225	740-02
				ONE AND ON/OFF		740-0223	740.0223	740-02
C	ALLS AND TRANSCOL	DUEDO						
v	OILS AND TRANSFO	AME NO	KNOB - T			740.0222	740-0222	
U	OILS AND TRANSPOT	AME NO	KNOB - V	OLUME		740.0222 740.0224	740-0222 740-0224	740-02
			KNOB - V Pointer	OLUME		740.0222 740.0224 792.0023	740-0222 740-0224 792-0023	740-02
1	581-0015	ANTENNA - FERRITE ROD	KNOB - V Pointer Pulley •	OLUME - DIAL DIAL POUNTER		740.0222 740.0224 792.0023 494.0033	740-0222 740-0224 792-0023 494-0033	740-02 792-00 494-00
1	581-0015 113-0046	ANTENNA - FERRITE ROD Coil - Oscillator	KNOB - V Pointer Pulley - Pulley -	OLUME - DHAL DIAL POUNTER VARIABLE TUNING		740.0222 740.0224 792.0023 494.0033 493.0147	740-0222 740-0224 792-0023 494-0033 493-0147	740-02 792-00 494-00 493-01
1 2 1	581-0015 113-0046 121-0108	ANTENNA - FERRITE ROD Coil - Oscillator Transformer - 1st IF	KNOB - V Pointer Pulley - Pulley - Retainer	OLUME - DIAL DIAL POMMTER VARIABLE TUNING - LINE CORD		740.0222 740.0224 792.0023 494.0033 493.0147 554.0086	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086	740-02 792-00 494-00 493-01 554-00
1 2 1 2	581-0015 113-0046 121-0108 121-0108	ANTENNA - FERRITE ROD Coil - Oscillator Transformer - 1st IF Transformer - 2nd IF	KNOB - V Pointer Pulley - Retainer Shaft -	OLUME - DIAL DIAL POMINTER VARIABLE TUNING - LINE CORD POINTER		740.0222 740.0224 792.0023 494.0033 493.0147 554.0086 493.0146	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146	740-02 740-02 792-00 494.00 493-01 554-00 493-01 493-00
1 2 1	581-0015 113-0046 121-0108	ANTENNA - FERRITE ROD Coil - Oscillator Transformer - 1st IF	KNOB - V POINTER PULLEY - PULLEY - RETAINER SNAFT - SPEAKIER MOUNTED) SHAFT -	OLUME - DIAL DIAL POUNTER VARIABLE TUNING - LINE CORD POINTER TUNING	RAUSFORMER	740.0222 740.0224 792.0023 494.0033 493.0147 554.0086 493.0146 493.0075	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086	740-02 792-00 494-00 493-01 554-00
1 2 1 2	581-0015 113-0046 121-0108 121-0108	ANTENNA - FERRITE ROD Coil - Oscillator Transformer - 1st IF Transformer - 2nd IF	KNOB - V POINTER PULLEY - PULLEY - RETAINER SNAFT - SPEAKIER MOUNTED) SHAFT -	OLUME - DIAL DIAL POUNTER VARIABLE TUNUNG - LINE CORD POINTER TUNING - 4" PM (INCLUDES T	RA 14 S F O R ME R &	740.0222 740.0224 792.0023 494.0033 493.0147 554.0086 493.0146 493.0075	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0075	740-02 792-00 494-00 493-01 554-00 493-01 493-00 539-04
1	581-0015 113-0046 121-0108 121-0108	ANTENNA - FERRITE ROD Coil - Oscillator Transformer - 1st IF Transformer - 2nd IF	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER SPEAKER	OLUME - DIAL DIAL POWNTER VARWABLE TUNNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T		740.0222 740.0224 792.0023 494.0033 493.0147 554.0086 493.0146 493.0075 539.0431	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0075 539-0431	740-02 792-00 494.00 493-01 554-00 493-01 493-00 539-04 539-04
1	581-0015 113-0046 121-0108 121-0108 143-0052	ANTENNA - FERRITE ROD Coll - Oscillator Transformer - 1st IF Transformer - 2nd IF Transformer - Audio Output (S	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER SPEAKER SPEAKER SPRING -	OLUME - DIAL DIAL POWNTER VARMABLE TUNNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST	RING	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0075 539.0431 539.0432 496.0023 ADJUST	740-0222 740-0224 792-0023 493-0147 554-0086 493-0147 539-0431 539-0431 539-0432 496-0023	740-02 792-00 494.00 493-01 554-00 493-01 493-00 539-04 539-04
1 2 1 2	581-0015 113-0046 121-0108 121-0108 143-0052	ANTENNA - FERRITE ROD Coil - Oscillator Transformer - 1st IF Transformer - 2nd IF	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER SPEAKER SPEAKER SPRING -	OLUME - DIAL DIAL POWNTER VARWABLE TUNWING - LINE CORD POUNTER TUNING - 4 <sup>TI</sup> PM (INCLUDES T - 4 <sup>TI</sup> PM	RING	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0147 493-0146 493-0075 539-0431 539-0432 496-0023	740-0222 740-0224 792-0023 493-0147 554-0086 493-0147 539-0431 539-0431 539-0432 496-0023	740-02 792-00 494-00 493-01 554-00 493-01 493-00
1 2 1 2	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM	ANTENNA - FERRITE ROD Coll - Oscillator Transformer - 1st IF Transformer - 2nd IF Transformer - Audio Output (S	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER SPEAKER SPEAKER SPEAKER SPRING - TEST EQUIT	OLUME - DIAL DIAL POWNTER VARWABLE TUNNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu	RING F(	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.0431 539.0432 496.0023 ADJUST OR MAXIMUM (	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0075 539-0431 539-0432 496-0023	740-02 792-00 494-00 493-01 554-00 493-01 493-00 539-04 539-04
1 2 1 2 3 3	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES	KNOB - V POINTER PULLEY - PULLEY - RETAINER SNAFT - SPEAKER MOUNTED) SHAFT - SPEAKER SPEAKER SPEAKER SPEAKER SPRING - TEST EQUIN SIGNAL GENERATOR .1 Mfd capacitor	OLUME - DIAL DIAL POWNTER VARMABLE TUNNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of	RING F( 2gb T2 - R1 T2 -	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0075 539.0431 539.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom ( - C Top Cort	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0146 493-0146 493-0146 493-0146 493-0431 539-0431 539-0431 539-0432 496-0023	740-02 792-00 494-00 493-01 554-00 493-01 493-00 539-04 539-04
3	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set veriable t	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER SPEAKER SPEAKER SPEAKER SPENIG - TEST EQUIT SIGNAL GENERATOR .1 Mfd capacitor (22 Ohm) and pi	OLUME - DIAL DIAL POWNTER VARWABLE TUNUNG - LINE CORD POUNTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throw to junction of n 7 of V1 (12BE6	RING F( R1 T2 F); T1	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.042 539.0431 539.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom (	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0075 539-0431 539-0431 539-0431 539-0023	740-02 792-00 494.00 493-01 554-00 493-01 493-00 539-04 539-04
3	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set veriable t	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER SPEAKER SPEAKER SPEAKER SPRING - TEST EQUI SIGNAL GENERATOR .1 Mfd capacitor (22 Ohm) and pi ground lead to (	OLUME - DIAL DIAL POINTER VARIABLE TUNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of V1 (12BEG n 20 f V1 (12BEG	RING F( R1 T2 F); T1	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0075 539.0431 539.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom ( - C Top Cort	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0075 539-0431 539-0431 539-0431 539-0023	740-02 792-00 494.00 493-01 554-00 493-01 493-00 539-04 539-04
3	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set veriable t	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER SPEAKER SPEAKER SPEAKER SPENIG - TEST EQUIT SIGNAL GENERATOR .1 Mfd capacitor (22 Ohm) and pi	OLUME - DIAL DIAL POINTER VARIABLE TUNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of V1 (12BEG n 20 f V1 (12BEG	RING F( 1 T2 - 1 T2 - 1 T2 - 1 T1 - 1 T1 -	740.0222 740.0224 792.0023 493.0147 554.0086 493.0147 553.0431 539.0431 539.0432 496.0023 ADJUST OR MAXIMUM 6 - C Top Cord - B Bottom 6 - A Top Cord	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0146 493-0175 539-0431 539-0432 496-0023	740-02 792-00 493-00 493-01 554-00 493-01 493-00 539-04 539-04 496-00
1 2 1 2 3 3	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set veriable t	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER S	OLUME - DIAL DIAL POWNTER VARMABLE TUNNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRUVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of V1 (12BE6 negative "B"). S KC.	RING Pgh T2 - R1 T2 - (); T1 - ret T1 - Rep	740.0222 740.0224 792.0023 493.0147 554.0086 493.0147 553.0431 539.0431 539.0432 496.0023 ADJUST OR MAXIMUM 6 - C Top Cord - B Bottom 6 - A Top Cord	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0075 539-0431 539-0431 539-0431 539-0023	740-02 792-00 493-00 493-01 554-00 493-01 493-00 539-04 539-04 496-00
1 2 1 2 3 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set veriable t fully open (min	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER S	OLUME - DIAL DIAL POWNTER VARMABLE TUNNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of V1 (12BE6 negative "B"). S KC.	RING F(1) R1 T2 - R1 T2 - T1 - Rep pill.	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom ( - B Bottom ( - B Bottom ( - A Top Cort)	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0146 493-0175 539-0431 539-0432 496-0023	740.02 792.00 494.00 493.01 554.00 493.01 539.04 539.04 539.04
1 2 1 2 3 3	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set veriable t	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER S	OLUME - DIAL DIAL POWNTER VARMABLE TUNNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRUVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of V1 (12BE6 negative "B"). S KC. - Sagesker voice co	RING         F(           rgh         T2         -           R1         T2         -           ret         T1         -      <	740.0222 740.0224 792.0023 493.0147 554.0086 493.0147 553.0431 539.0431 539.0432 496.0023 ADJUST OR MAXIMUM 6 - C Top Cord - B Bottom 6 - A Top Cord	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0146 493-0175 539-0431 539-0432 496-0023	740-02 792-00 493-00 493-01 554-00 493-01 493-00 539-04 539-04 496-00
1 2 1 2 3 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set veriable t fully open (min	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES	KNOB - V POINTER PULLEY - PULLEY - RETAINER SNAFT - SPEAKER MOUNTED) SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER	OLUME - DIAL DIAL POWNTER VARMABLE TUNNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of V1 (12BE6 negative "B"). S KC.	T2         Fi           R1         T2         T1           ();         T1         T1           ();         T1         Kep           ();         T1         C4	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom ( - B Bottom ( - B Bottom ( - A Top Cort)	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0146 493-0175 539-0431 539-0432 496-0023	740-02 792-00 493-00 493-01 554-00 493-01 493-00 539-04 539-04 496-00
1 2 1 2 3 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set veriable t fully open (min	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES	KNOB - V POINTER PULLEY - PULLEY - RETAINER SNAFT - SPEAKER MOUNTED) SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER	OLUME - DIAL DIAL POWNTER VARMABLE TUNUNG - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of V1 (12BE6 negative "B"). S KC. DSS speaker voice co	T2         Fi           R1         T2         T1           ();         T1         T1           ();         T1         Kep           ();         T1         C4	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom ( - B Bottom ( - B Bottom ( - A Top Cort)	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0146 493-0175 539-0431 539-0432 496-0023	740-02 792-00 493-00 493-01 554-00 493-01 493-00 539-04 539-04 496-00
1	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set veriable t fully open (min	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER S	OLUME - DIAL DIAL POINTER VARIABLE TUNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of VI (12Bé negative "B"). S KC. DSS speaker voice co - Radiate signal n a loop of sever Set generator	T2         Fi           R1         T2         T2           D;         T1         T1           et         T1         Rep           oill.         Rep         C4	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom ( - B Bottom ( - B Bottom ( - A Top Cort)	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0146 493-0175 539-0431 539-0432 496-0023	740-02 792-00 493-00 493-01 554-00 493-01 493-00 539-04 539-04 496-00
1 2 1 2 3 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set veriable t fully open (min	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER S	OLUME - DIAL DIAL POWNTER VARMABLE TUNUNG - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of V1 (12BE6 negative "B"). S KC. DSS speaker voice co	T2         Fi           R1         T2         T2           D;         T1         T1           et         T1         Rep           oill.         Rep         C4	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom ( - B Bottom ( - B Bottom ( - A Top Cort)	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0146 493-0175 539-0431 539-0432 496-0023	740.02 792.00 494.00 493.01 554.00 493.01 539.04 539.04 539.04
1 2 1 2 3 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	581-0015 113-0046 121-0108 121-0108 143-0052 AL1GNMM Set variable t fully open (min	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER S	OLUME - DIAL DIAL POINTER VARIABLE TUNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of VI (12Bé negative "B"). S KC. DSS speaker voice co - Radiate signal n a loop of sever Set generator	RING         F(           rgh         T2         T2           R1         T2         T1           ret         T1         Rep           oill.         C4         to           oill.         C4         State	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom ( - B Bottom ( - B Bottom ( - A Top Cort)	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0146 493-0175 539-0431 539-0432 496-0023	740-02 792-00 494-00 493-01 554-00 493-01 493-00 539-04 539-04 496-00
1.	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNMI Set variable t fully open (min Same as step 1 Same as step 1	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES uning capacitor plates imum capacity).	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER S	OLUME - DIAL DIAL POINTER VARIABLE TUNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of V1 (12BE6 negative "B"). S KC. DSS speaker voice co - Radiate signal 1 a loop of several Set generator DSS speaker voice co	ring         F(           rgh         T2         r           rgh         T2         r           rgh         T2         r           rgh         T1         r           ret         T1         r           roill.         r         r           roill.         r         r           roill.         r         r	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.0431 539.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom ( - C Top Corr - B Bottom ( - A Top Corr eat for opt	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0146 493-0175 539-0431 539-0432 496-0023	740-02 792-00 494-00 493-01 554-00 493-01 493-00 539-04 539-04 496-00
1.	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNMM Set variable t fully open (min Same as step 1 Same as step 1 Set variable tum position, plat for approximat	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES uning capacitor plates imum capacity).	KNOB - V POINTER PULLEY - PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER	OLUME - DIAL DIAL POINTER VARIABLE TUNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of V1 (12BE6 negative "B"). S KC. DSS speaker voice co - Radiate signal n a loop of sever Set generator DSS speaker voice co - Radiate signal loop of several tu: prator to a frequer	RING         F(           rgh         T2         F(           R1         T2         T1           ret         T1         Kep           poill.         C4         1           to         C4         C4           poill.         C2         rns           to         C2         rns	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.0431 539.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom ( - C Top Corr - B Bottom ( - A Top Corr eat for opt	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0146 493-0175 539-0431 539-0432 496-0023	740.02 792.00 494.00 493.01 554.00 493.01 539.04 539.04 539.04
1.	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set veriable t fully open (min Same as step 1 Same as step 1 Set variable tu position, plat for approximat this setting s1	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES uning capacitor plates imum capacity).	KNOB - V POINTER PULLEY - PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER	OLUME - DIAL DIAL POINTER VARIABLE TUNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of VI (12BE n 7 of VI (12BE n 7 of VI (12BE) n 7 of VI (12BE) n 7 of VI (12BE) n 7 of VI (12BE) n 7 of D (12BE) n 7 of VI (12BE) NGC. - Radiate signal loop of several ture rator to a frequer o receiver tuni	RING         Ff           agh         T2         Ff           ggh         T2         T1           it         T1         T1           oill.         Rep         C4           to         C4         C4           oill.         C4         T1           to         C2         T1           ng         C2         T1	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.0431 539.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom ( - C Top Corr - B Bottom ( - A Top Corr eat for opt	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0146 493-0175 539-0431 539-0432 496-0023	740-02 792-00 493-00 493-01 554-00 493-01 493-00 539-04 539-04 496-00
1.	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNMM Set variable t fully open (min Same as step 1 Same as step 1 Set variable tum position, plat for approximat	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES uning capacitor plates imum capacity).	KNOB - V POINTER PULLEY - PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER	OLUME - DIAL DIAL POINTER VARIABLE TUNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of V1 (12BEG negative "B") S KC. Coss speaker voice co - Radiate signal n a loop of sever Set generator coss speaker voice co - Radiate signal loop of several tu- coss speaker voice co - Radiate signal loop of several tu- cost of sev	RING REAL T2 - F( RI T2 - T1 -	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.0431 539.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom ( - C Top Corr - B Bottom ( - A Top Corr eat for opt	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0146 493-0175 539-0431 539-0432 496-0023	740-02 792-00 493-00 493-01 554-00 493-01 493-00 539-04 539-04 496-00
1.	581-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set veriable t fully open (min Same as step 1 Same as step 1 Set variable tu position, plat for approximat this setting s1	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES uning capacitor plates imum capacity).	KNOB - V POINTER PULLEY - PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER	OLUME - DIAL DIAL POINTER VARIABLE TUNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of V1 (12BEG n 7 of V1 (12BEG n 7 of V1 (12BEG coss speaker voice co - Radiate signal loop of several loop of several tur- rate signal loop of several tur- rate to a frequen- to ceiver speaker	RING         Fi           agh         T2         T2           b);         T1         T1           cet         T1         Rep           oil.         C4         1           to         C4         1           to         C2         rns           ng         is         ).         .	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.0431 539.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom ( - C Top Corr - B Bottom ( - A Top Corr eat for opt	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0146 493-0175 539-0431 539-0432 496-0023	740.02 792.00 494.00 493.01 554.00 493.01 539.04 539.04 539.04
1	S81-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set variable t fully open (min Same as step 1 Same as step 1 Set variable tur position, plat for approximat this setting sig	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 15T IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES uning capacitor pdates imum capacity).	KNOB - V POINTER PULLEY - PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER	OLUME - DIAL DIAL POINTER VARIABLE TUNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throut to junction of n 7 of V1 (12BE6 n 7 of V1 (12BE6 n 7 of V1 (12BE6 SGC. - Radiate signal n a loop of sever Set generator oss speaker voice co - Radiate signal loop of several tun isrator to a frequer to receiver tuning (until signal Sec symaker voice co	RING         F(           rgh         T2         F(           rgh         T2         T1           ret         T1         F(           ret         T1         Rep           oill.         C4         for the second s	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.023 ADJUST OR MAXIMUM ( - D Bottom ( - C Top Cord - B Bottom ( - A Top Cord eat for opt Trimmer	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0075 539-0431 539-0431 539-0432 496-0023 DUTPUT Coře core	740-02 792-00 493-01 554-00 539-04 539-04 539-04 496-00
1.	S81-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set variable t fully open (min Same as step 1 Same as step 1 Set variable tur position, plat for approximat this setting sig	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 1ST IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES uning capacitor plates imum capacity).	KNOB - V POINTER PULLEY - PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER	OLUME - DIAL DIAL POINTER VARIABLE TUNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throu- to junction of n 7 of V1 (12BEG n 7 of V1 (12BEG n 7 of V1 (12BEG coss speaker voice co - Radiate signal loop of several loop of several tur- rate signal loop of several tur- rate to a frequen- to ceiver speaker	RING         Ff           agh         T2         Ff           ggh         T2         T1           it         T1         T1           oil.         Rep         Oil.           to         C4         Oil.           to         C2         Oil.           oil.         Oil.         Oil.           3.         L2	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.0432 495.0023 ADJUST OR MAXIMUM ( - D Bottom ( - D Bottom ( - D Bottom ( - A Top Corr eat for opt Trimmer Trimmer	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0075 539-0431 539-0432 496-0023 DUTPUT Core Core	740.02 792.00 493.01 554.00 539.04 493.00 539.04 496.00 mence.
1	S81-0015 113-0046 121-0108 121-0108 143-0052 ALIGNM Set variable t fully open (min Same as step 1 Same as step 1 Set variable tur position, plat for approximat this setting sig	ANTENNA - FERRITE ROD COIL - OSCILLATOR TRANSFORMER - 15T IF TRANSFORMER - 2ND IF TRANSFORMER - AUDIO OUTPUT (S ENT SETUP NOTES uning capacitor pdates imum capacity).	KNOB - V POINTER PULLEY - PULLEY - RETAINER SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER MOUNTED) SHAFT - SPEAKER	OLUME - DIAL DIAL POINTER VARIABLE TUNING - LINE CORD POINTER TUNING - 4" PM (INCLUDES T - 4" PM TENSION - DRIVE ST PMENT HOOKUP - "Hot" lead throut to junction of n 7 of V1 (12BE6 n 7 of V1 (12BE6 n 7 of V1 (12BE6 SGC. - Radiate signal n a loop of sever Set generator oss speaker voice co - Radiate signal loop of several tun isrator to a frequer to receiver tuning (until signal oss speaker voice co	RING         Fd           rgh         T2         rg           R1         T2         rg           rgit         T1         rg           oill.         Rep         rg           oill.         C4         rg           oill.         C2         rg           oill.         C2         rg           oill.         C2         rg           is         )         oill.           3.         L2         sim	740.0222 740.0224 792.0023 493.0147 554.0086 493.0146 493.0146 493.0146 493.0146 493.0146 493.0146 493.0431 539.0432 496.0023 ADJUST OR MAXIMUM ( - D Bottom ( - D Bottom ( - D Bottom ( - B Bottom ( - A Top Cort) eat for opt Trimmer Trimmer	740-0222 740-0224 792-0023 494-0033 493-0147 554-0086 493-0146 493-0075 539-0431 539-0431 539-0432 496-0023 DUTPUT Coře core	740.02 792.00 493.00 554.00 493.01 554.00 539.04 539.04 496.00 mmm.ce



CJohn F. Rider

CHASSIS 1-631-1



	3. Stand radio chassis in such a to facilitate under Chassis ment. Apply 117V. to chass signal generator for an R signal amplitude modulated 400 cycles. Allow radio ch signal generator several min up time. During alignment, ka generator output at lowest 1	IF Align- sis. Set 4. Use either an aud Foutput voltmeter connec (AM) by voice coil to indi assis and volume control t utes warm eep signal NOTE: The follo	ible check or an AC ted across speaker cate output, Adjus <del>d</del>
	ALIGNMENT SETUP NOTES	TEST EQUIPMENT HOOKUP	ADJUST FOR MAXIMUM OUTPUT
1.	Set variable tuning capacitor plates fully open (minimum ca- pacity).	SIGNAL GENERATOR - "Hot" lead through a .1 Mfd. capacitor to pin 7 of V2 (12BE6); ground lead to (negative "B"). Set generator to 455 KC. AC VOLTMETER - Across speaker	T3-D - Bottom core T3-C - Top core T2-B = Bottom core T2=A - Top core Repeat for optimum per-
		voice coil.	formance.
2.	Same as step 1.	SIGNAL GENERATOR - Radiate signal to receiver through a loop of several turns of wire. Set gen- erator to 1650 KC. AC VOLTMETER = Across speaker voice coil.	Cő trimmer
3.	Set variable tuning capacitor to 1400 KC.	SIGNAL GENERATOR - Radiate signal to receiver through a loop of several turns of wire. Set gen- erator to 1400 KC. AC VOLTMETER - Across speaker voice coil.	C4 trimmer C2 trimmer While rocking variable tuning capacitor through 1400 KC.
4.	Set variable tuning capacitor to 600 KC position, plates fully meshed except for approximately 3/16 inch. Adjust this setting slightly to eliminate any inter- fering signals.	SIGNAL GENERATOR - Radiate signal to receiver through a loop of several turns of wire. Set gen- erator to a frequency correspond- ing to receiver tuning capacitor setting (until signal is heard through receiver speaker).	L2 - Oscillator coil T1 = RF coil
		AC VOLTMETER – Across speaker voice coil.	While rocking variable tuning capacitor through 600 KC.
	STORE	CB CB CB CB CB CB CB CB CB CB	CILIA VOLUME CONT SUT OF CILIA VOLUME CONT SUT OF CILIA VOLUME CONT OCC VOCEL ISO4 TO INTERLOCK TERME CILIANO TO INTERLOCK TERME CILIANO TO INTERLOCK TERME CILIANO TO INTERLOCK TERME CILIANO CILIANO CILIANO TO INTERLOCK TERME CILIANO CI

CJohn F. Rider

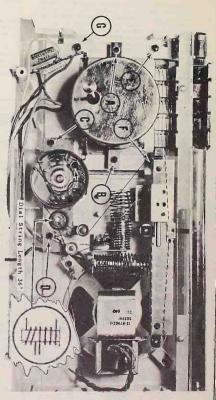
MODEL 1304 - DIAL DRIVE & SPEAKER ASSEMBLY

8

0

Dial String Length 41%

CHASSIS 1-632-1, -2



### MODEL 2305 ii. CLOCK,J DIAL DRIVE & SPEAKER ASSEMBLY

### CLOCK REMOVAL PROCEDURE

- "Chassi X CKCOV ٦ 20 cnass r s ed under
- N Re CONTROL knobs y pullin pulling ing strai ight STFA ght 001 and clock
- Carefully clears sl 5101 ۵. 0 č crys n tal ta crystal

ω

- 4 Remov SCIEV 3 and (B) -0 ve 0
- Kemove 6 and Ð TUD Bur pulley 5

s

- abinet and 5 one 100 ide
- Identify H ă chassi 85 ā 10 E ť olde c I lock 8 cloc 10 3 5 (4) leads
- cabine h nuts (E), (F), <u>6</u> ā (H) 10 clo Ŷ ť
- I raun Pul 1 DO clo SII è clears 8 0 apine bottom 0 0 anc dowr
- certain clock Restring dial То rtain clo cord if B reverse necessary os the ð correct dure terminals.

9 œ 7. 5

				CLOG		SHITCH - ON.	
	15 MEGONM - 20% - 1#.			611-	0007	LANP - 10 M	TT
	22.000 DNN - 205 - 1W.						
	100.000 OHM - 20% - 1W.			0	HASSIS PAI	Te	
	2.2 MEGONN - 205 - 18.						
	47.000 OHM - 20% - 4W.		35	417	0030		
152-0055	I MEGONH - VOLUNE CONTROL		~		0050	SOCKET . PH	DNO JACK
	INCLUDES TONE AND DN/OFF H	ari 1204			0016	CLAMP . PLA	TIC . ANTER
152-0057	I MEGONN . VOLUME CONTROL .				0051	SHIELD . TU	
	INCLUDES TONE - MODEL 2305				0051	SOCKET - TU	E . 7 PIN I
	1 MEGONW - 20% - 1W.			40/.	0040	TERMENAL - J	C PRONG
	58.000 DHM - 20% - IW.						
PART OF	totte the tran the						
OLUNE							
ONTROL	I MEGONN - TONE CONTROL						
	SEE "MISCELLANEOUS ELECTRIC						
	150 OHM - TOS - TH	AL PARTS"					
	1.200 OHH - 10% - 18.						
89-0064	100 ONN - 105 - 18.						
89-0065	120 OHM - 10% - 3W. W.W	MODEL 2305	ONLY				
	500 OHN - 10% - 7W. W.W	HODEL 2305	ONLY				
CABINET	PLOTE						
	19415						
DESCRIPT	Tiow						
	VE-VARIABLE TUNING	TBOARE	1304TU	1304YE	2305RE	2305TU	2305YE
BACKCOR	UND - DIAL	473-0005	473-0005	473-0005	473-000	473.0005	473-0005
BOARD TO	ERNINAL INTERLOCK	728-0002	728-0002	728-0002	728-000	728-0003	728-0003
Ourrest	CRAINAL INTERLOCK	415-0029	415-0029	415-0029	415-002		415-0029
CABINET	· SLEEP/ON/OFF/RADIO/RADIO ALA			1	751-000		751-0001
CABINET	BACK	822-0029	822.0031	822-0033	822-001		822-0039
	AC POVER	822.0035	822.0035	822-0035	822-0036	822-0036	822-0036
		195-0019	195-0020	195-0021	195-0014		195.0021
CRYSTAL	SYLVANIA	818-0170	818-0170	\$18-0170	818-015		818-0169
					717-000		717-0007
DIAL - S	TATION	722-0070	722-0070	722-0070	722.0071		722-0071
KNOP . T		740-0225	740.0225	740.0225	740-0225		740-0225
		740-0223	740.0223	740-0223	740-0223		740.0223
KHOS . T	UNING	740-0222	740-0222	740-0222	740-0222		740-0223
KH08 - V	OLOWE	740-0224	740-0224	740.0274	740-0224		
OVERLAY	- BUTTON - ON				751-0002		740-0224
POINTER	- SLIDE	792-0024	792-0024	792.0024	792-0024		
POLLEY	· VARIABLE TUNING	493-0148	493-0148	493-0148	493-0148		792-0024
RETAINER	- LINE CORD	554-0086	554-0086	554-0086	554-0086		493-0148
SHAFT -	EXTENSION . TIME SET		1		493-0150		554-0086
SHAFT .	TUNING	493-0149	493-0149	493-0149	493-0149		493-0150
SOCKET -	PILOT LIGHT	41.1.0036	411.0036	411.0036	411-0037		493-0149
SOCKLT .	2 PRONG - APPLIANCE RECEPTACUE				417.0009		411-0037
SPEAKER .	- 5" PH (INCLUDES TRANSPORTED)				539-0510		417.0009
SPEAKER .	- 5 1/4" PM (INCLUDES				539-0510	539.0510	539-0510
	TRANSFORNER)	539-0578	539-0578	539-0578			
SPEAKER .	5 1/4" PM	539-0579	539-0579	539-0579			
SPRING .	TENSION - DIAL STRING	495-0023	496-0023	496.0023	496-0023	1.2	
TRIM - FI	RANE	818-0171	618-0171	818-0171	496-0023	496.0023	496-0023
TRIM Cr	EST - BOTTON	\$18-0173	818-0173				
	ICST - TOP	818-0173	818-0173	818-0173	and a second	1 - march	
TRIN - CP							

SCHEMATIC LOCATION

L1 L2

T1 T2 T3 T4

PP1

5#1

C12.C13 C14.C15

C16.C17 R10.R11.R12 SW1

SERVICE

PART NO.

581.0016

113-0046

121.0110

121-0108

190-0028

PART OF VOLUNE

PART OF

COILS AND TRANSFORMERS

MISCELLANEOUS ELECTRICAL PARTS

DESCRIPTION

COIL - FERRITE ROD - ANTENNA COIL - OSCILLATOR

PLATE - AUDIO DETECTOR .005 MFG, 125 MHFG 100 MHFG, .005 MFG 100 MHFG, 100 MHFD

Selten-ON/OFF - MODEL 1304

SWITCH - ON/OFF/AUTO - MODEL 2305 LAMP - 10 MATT

COIL - OSCILLATOR Taansfohuer - RF Taansfohuer - Ist if Taansfohuer - 2ng if Thansfohuer - 2ng if Thansfohuer - Audio Output (Speaker Mounted)

10 NEGONA, 470.000 ONN. 470.000 ONN

NHA RETAINER

CJohn F. Rider

SCHEWITIC

LOCATION

C1.C2 C3.C4 C5.C6 C7 C8 C9 C10 C11 C12.C13.C14 C15.C15.C17 C19 C20 A E

621

R1 R2 R3 R4 R5 R6

87

R8 R9

R10.R11.R12 R13 R14 R15 R15

SERVICE PART NO.

CAPACITORS

170.0031

161-2016

RESISTORS

PART VOLUS

189-0

DESCRIPTION

VARIABLE TUNING CAPACITOR ARTENNA GANG, ANYENNA TRINUCH RF GANG, RF TRINUCH

 MF Gase, MF Taxania

 OCTALLERG Gene, GotLLARGE Taware

 OAT MARE GENE, SCHLARGE TAWARE

WG

### MODEL NO. DC2836B

FACTS ABOUT YOUR NEW TRUETONE FM AND BROADCAST RADIO

### CHECK YOUR LINE VOLTAGE

Unless otherwise marked this radio must be operated on a supply of 105-125 volts AC, 50-60 cycles or 105-125 volts DC. Do not connect the radio to a wall outlet unless certain that the power supply is correct for the receiver. If in doubt, telephone your local power company before inserting the plug. Radios of this model which are to be used on other power supplies are marked accordingly.

### BROADCAST BAND

540-1600 KILOCYCLES-This band is calibrated inchannel numbers. To obtain the kilocycle number add two zeros to the dial number. Thus when the dial pointer is at 12 on the dial, the radio is tuned to 1200 kilocycles.

### ON-OFF SWITCH AND VOLUME CONTROL

The On-Off switch and Volume control are operated by the same knob. To turn the radio on, turn the knob clockwise until a click is heard. Allow approximately 30 seconds for the tubes to heat. Then continue to turn the knob clockwise to increase the volume.

### AM - FM SWITCH

This control has two positions, FM & AM. Turn the knob to the extreme right for AM (broadcast) reception and to the extreme left for FM (frequency modulation) reception.

### FM BAND

88 - 108 MEGACYCLES-This band is calibrated in megacycles and covers the frequency modulation band or 88-108 megacycles. Reception in this band is usually limited to "line of sight" distances between the transmitting and receiving antemas. This is normally up to about 30 miles with approximately 45 miles being the extreme range.

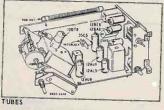
### TUNING KNOB (FM OR AM)

Use this knob to tune in the desired station. Turn the knob until the station is heard. Then slowly rotate it back and forth until the signal is clearest and strongest. If signal is noo strong, reduce it by means of the volume control, not by using the tuning knob.

### ANTENNA

Two built-in antennas are incorporated in the receiver, A Truetone Stratoscope Antenna for the broadcast range and an FM antenna for the FM (frequency modulation) range. When operating the radio with the built-in antennas, directional effects are obtained, Better reception of distant stations and reduction of local Interference may be obtained by rotating the radio until the desired signal is at a maximum.

However, in some locations for the reception of FM stations, an outside antenna is essential. A folded dipole with a 300 ohm line lead-in should be used. It must be carefully installed according to the directions furnished with it and connected to the FM terminals at the rear of the receiver. It should be remembered in conjunction with the erection of an FM folded dipole antenna that FM reception is usually limited to "line of sight" distances or up to 45 miles. Before erecting a special antenna for FM reception it is best to make certain that an FM station exists in your area.



The type designation of each tube is stamped on the tube. The correct positions in which the tubes must be installed are shown in the tube position illustration.

All tubes must be in their sockets to operate the radio.

The tubes in the radio should be checked periodically by taking them out and having them tested. To reach the tubes for servicing, remove the two screws from the rear of the cabinet. Then remove cabinet front,

When replacing the tubes, be sure that they are inserted in the proper sockets. To install a tube into a miniature type tube socket, line up the tube proons with the holes in the socket and then gently push the tube down until it is held firmly in the socket.

### IF THE RADIO FAILS TO OPERATE SATISFACTORILY

Recheck the foregoing instructions. If the radio still does not appear to operate satisfactorily, proceed as follows:

FIRST-Check Power Supply. Be sure there is power at the convenience outlet to which the radio is connected. To determine this, connect a lamp to the outlet and see whether or not the lamp lights.

Check the voltage and frequency of the power supply with that shown on the power rating label on the radio. If there is any doubt concerning the power supply, withdraw the plug from the outlet and consult the local power company before reinserting the plug.

SECOND-Check Tube Positions. See that the tubes are in the correct sockets as shown in the illustration.

Make certain that the tubes are operating, (Glass tubes will light very dimly.)

### MODEL NO. DE2836B

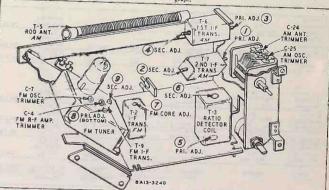
IHIRD-Check Antenna. If an outside antenna is being used, inspect the antenna system to see that it is in good condition and not grounded at any point.

FOURTH-Test Tubes. Remove the tubes from the radio, take them to your local radio dealer and have them tested either by means of a tube tester or by inserting them in a radio that is operating satisfactorily.

FIFTH-Service. If the radio does nor function properly after the above procedure has been followed and the tubes have been tested, get in touch with the dealer from whom the radio was purchased or call in a competent radio technician.

### FAULTY FM RECEPTION

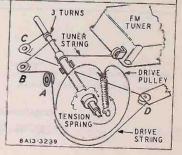
The requirements for FAI reception are more critical than for Standard band broadcast or short wave reception. This includes the area in which the receiver is located, the type of antenna used, the distance the receiver and other factors not encountered in Standard band broadcast receiver is it is to be noted that receiven in the high frequention. The top of a signification in the high frequency FAI band is usually limited to "line of sight" distances or up to about 55 miles. Also call buildings or other strucures between the transmitter and the receiver may be found to affect reception. Reception under these conditions will sometimes be help the addition of an external formation concerning with a 300 ohm ine lead-in. Information concerning this is given in the Antenna para



### DRIVE CORD REPLACEMENT

Replacement of the drive cord may be accomplished as shown in the illustration. For this purpose use the drive cord assembly listed in the replacement parts list. Then install the string as shown, whiching meters list. Then the shown of the turns shoft with the turn targets sing toward the rear of the chassis. After the cord agrees sing rouse the tuning shaft several times in order to take up any slack in the cord.

The string from the FM tuner to the tuning shaft is wound 2 turns counter-clockwise and then tied to the clin.



MODEL DC2836B

MODEL NO. BC28368

## TUBE COMPLEMENT

WG No. 10-475

R-F Amplifier & Mixer	FMi 1-F Amplifler	FM I-F Amplifier	FM Detector	AM Converter	AM I-F Amplifier	AM Detector & 1st Audio Ampilitie	Audio Output	
1-12DT8	1-12AU6	1-12AU6	1-12AL5	1-12BE6	1-12BA6	1-12AV6	1-35C5	

ELECTRICAL SPECIFICATIONS

Selectivity - AM - 45 KC broad 1000 times down, and 8 KC at two lines down. I.F. FM - 200 KC broad at 2 times down I.F. FM - 900 KC broad at 100 times down

AM Sensitivity - (Far 50 Milliwatts output) 25 microvolts average

FM Sensitivity - (Far 50 Milliwatts output) 25 microvolts average

Power Input -35 watts, 105-125 volts AC 50-60 cycles or 105-125 volts DC

Power Output = 2 watts maximum ].3 watt 10% distortion

## ALIGNMENT PROCEDURES

### AM STAGES

The following is required for aligning:

An All Wave Signal Generator Which Will Provide an Accurately Calibrated Signal at the Test Frequencies as listed.

Output Indicating Meter, Non-Metallic Screwdriver, Dum-my Antenna = 1, mf.

Volume Control Maximum all Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for Several Minutes.

	SIGNAL GENERATOR	RATOR				
FREQUENCY	CONNECT GENERATOR OUTPUT TO	THROUGH DUMMY ANTENNA	CONNECT GROUND TO	GANG CONDENSER SETTING	ADJUST	ADJUS
455KC	Control Grid	.lmf	Chassis Base	Rotor Fully Open	2nd I. F. Pri. (1) and Sec. (2)	Maximu
455KC	Control Grid 12BE6 Pin No. 7 1st Det.	a limf	Chassis Base	Rater Fully Open	1st I. F. Pri. (3) and Sec. (4)	Maximu Outpu
455 K C	Control Grid 12BE6 Pin No. 7	. Լաք	Chassis Base	Rator Fully Open	2nd. 1. F. Pri. (1) and Sec. (2)	Maxim
1620KC	Control Grid 12BE6 Pin No. 7	⊥] mf	Chassis Base	Rotor Fully Open	OscHlator C-25	Maxim
1400 KC	See Note A		See Note A	Set Pointer to 1400 KC	Antenna C-24	Maxim

CJohn F. Rider

## FM STAGES

MODEL NO. DC2836B

ALIGNMENT PROCEDURES

The following is required for aligning:

Frequency Ranges Broadcast 540-1600 KC Frequency Modulation 88-108 MC

Intermediate Frequency -AM 455 K C - FM 10.7 MC

Speaker - 4 X 6 Inch PM dynamic .

An accurately calibrated signal generator providing un-modulated signals at the test frequencies listed below. Dummy antennas, 5000 mmf and 300 ohms.

V.T.V.M. having a range of approximately 5 volts.

Allow chassis and signal generator to heat up for several minutes.

FREQUENCY CENI	NOTAL OLIVERY ON	SR SR				
	CONNECT GENERATOR OUTPUT TO	THROUGH DUMMY ANTENNA	BAND SWITCH SETTING	DIAL	ADJUST	ADJUST
2nd ()	Pin 1 of 2nd 12AU6 (Note 3)	5000 mmf	Υ	E&reme Clockwise Rotation	Ratio Det. Pri. (5)	Maximum Deffection (Note 1)
10.7 MC Pi 2nd	Pin 1 of 2nd 12AU6	5000 mmf	FM	Extreme Clockwise Rotation	Ratio Det. Sec.(6)	(Note 2)
10.7 MC Pi 1st ((	Pin 1 of 1st 12AU6 (Note 4)	5000 mmf	Ψ	Extreme Clockwise Rotation	2nd I. F. Adj. (at top only) (7)	Maximum Deflection (Note 1)
10.7 MC FM A	FM Antenna Terminals	300 of ms	¥	Éxtreme Clockwise Rotation	] sr ]. F. Adi. Pri. (8) and Sec. (9)-2nd. I.F. Adi. (7) Ratio Det. Pri. (5) In order shown.	Maximum Deflection (Note 1)
10.7 MC FM A	FM Antenna Terminals	300 ohms	FM	Extreme Clockwise Rotation	Ratio Det. Sec. (6)	(Note 2)
108 MC FM A	FM Antenna Terminal s	300 ohms	M F	Pointer to 108 mc. on dial	0sc. Trimmer C=7	Măžimum Deflection (Note 1)
98 MC FM A	FM Antenna Terminals	300 ahms	WL	Pointer to 98 mc. ôn dial	R.F. Trimmer C-4	Maximum Deflection (Note 1)

## FM ALIGNMENT NOTES

- Connect V.T.V.M. common lead to chassis. Connect D.C. probe to Pin 7, of 12AL5. Input should be adjusted for approximately = 4.5V. output. NOTE 1 -
- Connect 2 100 Kohms .5 watt resistors in series and connect from pin 7 of 12AL5 to chassis, Connect V, T, V, M. common lead to mid NOTE 2 -

point of above 2 resistors and connect D.C. probe to junction point of C-18 and R-8. Adjust ratio detector secondary for zero volt-NOTE 3 - 12AU6 nearest ratio detector (T-3). age.

NOTE 4 = 12AU6 nearest I.F. transformer FM (T-2).

### MODEL NO. DC2836B

### REPLACEMENT PARTS LIST FOR DC2836B

Ref. No.		MIS		Approx- imate Selling
12A331 25A1163 66X18 76X5 3A491 4X1165 13X615-3 10X316-3 28X603 20X1660 28X635 2A488 10A910-1 10A910-1 10A910-1 10A910-1 5-98A366 5-98A367		4" x 6 Tuner, Selenir Resist Tube S Crest Line C Drive C Spring, Ring, C Spring, Kaob, I Kaob, I Kaob, C Fron C Assemb	" PM Speaket F-M am Recifice or Capacitor Assembly octet (12AVG-35C5) octet (12AVG-312BC6-12BA6) ord Assembly ord Assembly ord Assembly Assembly Add Assembly Add Assembly Add Assembly Add Assembly Add Assembly (10A910-1 & 10A912-1 Knob) Ad-PM Ad-PM Jul Scale FM Sming Mile and Air Cich Assembly Mile and Air Cich Assembly My, Cabinet Shell (Charcoal)	Price 11,50 2.55 .65 .13 .75 .65 .05 .05
C-i C-2 C-3 C-4 C-5 C-4 C-7 C-8 C-7 C-8 C-9 C-10 C-11	Part of 25AX	CA 163 FM Tuner	PACITORS Assenbījy	
C-12 C-15 C-33 C-38	47X507	5K mmf	500 V Ceramie	-30
C-13 C-14 C-16	47X670 Part of T-2 Part of T-3	47 mm <sup>2</sup>	Ceramic	-20
C-17 C-18 C-19 C-20 C-21A C-21B C-21B C-22 C-22	47X623 47X575 45X423 RCP10M2103h Part of 76X5 ( RCP10M4103M	See Miscellan		-30 -25 -90 -25
C-23A C-23B	14A232		400 V Molded Tubulār aser Assembly	.25
C-24 C-25 C-26	Part of Gang C	ondenser Ass		3.35
C-29 C-27 C-28 C-30	RCP10M2473M Part of T-6	.047 mf	200 V Molded Tubular	-30
C-31 C-32 C-34	Part of T-7 RCP10M4473M	.047 mf	400 V Molded	
C-35A C-35B	45X444	70 mf 50 mf	100 V Molded Tubular 150 V 150 V Dry Electrolytic	.30
C-36 G-37 G-39 Prices St	80X15	680 mmf	500 V Ceramic abject to Change Without Notice.	
			, the change without Notice.	

### MODEL NO. DC2836B

Ref. No.

R-1 R-3 R-2 R-4 R-6 R-5 R-7 R-8 R-9 R-10 R-11A R-11B R-12 R-13 R-15 R-16 R-17 R-18 R-19

L-I L-2 T-2 T-3 T-4 T-5 T-6 T-7 T-9

### REPLACEMENT PARTS LIST FOR DC2836B

.

	Descri	ation		Appro
		RESISTO	RS	Selli
B84103	10 K			
	1163 FM Tuner	0.5	Carbon	.15
1 411 01 201	TIOS PM Luner	Assembly	·	
B84680	68	0.5	Carbon	
	võ	0.5	Carbon	-15
B85102	1K	0.5	Carbon	
B84273	27 K	0.5		.10
		•••	Callon	.15
B84223	22 K	0.5	Carbon	
B85106	10 Meg.	0.5	Carbon	-15
				.10
Part of 76X	5 (See Miscellan	cous)		
B84181	180	0.5	Carbon	-15
B85330	33	0.5	Carbon	.10
B84121	120	0.5	Carbon	.15
B85225				
36X399	2.2 Meg.		Carbon	.10
	500 K 22	Volu	me Control	4.20
43X386 C84122			Wirewound (Fuse Type)	
C84122	1.2 K		Carbon	.20
	TRANSFORM	ERS & C	OILS	
9A 2408	Oscillator C	oil		.85
Part of 25A1	163 FM Tuner A:	sembly		.0)
9A 2309	Coil,I-F FM			1.00
9A2260	Ratio Detect			3.25
51X188	Output Trans			1.75
9A2409	Rod Antenna			1.70
9A 2343	Coil, Ist I-F			1.20
9A2344	Coil, 2nd I-F			1.30
Part of 25A1	163 FM Tuner As	sembly		

MODEL DC2836B

Approx-imate Selling Price

MODELS DC2980A, DC2981A

### Manual No. 10-477

HGR

### MODEL NOS. DC2980A & DC2981A

### Factory Model 462 4 Tube, Including Rectifier

OPERATION

### INSTALLATION

Place the receiver upright on a table or other level surface convenient to a power outlet. Do not place it on or near a radiator or heater.

This receiver is designed to operate from a 117 Volt AC or DC source of supply. On AC, improved reception may sometimes be obtained by turning the plug halfway around and reinserting it into the power outlet. Try it both ways and leave it in the position which gives the best reception. On DC, the receiver will operate with the plug inserted in only one position.

### ANTENNA

This Radio is equipped with a built-in loop antenna which will produce satisfactory reception from nearby stations. This antenna may be somewhate directional and in some installations the signal may be improved by turning the cabinet in various directions.

This receiver is designed to operate without a ground connection and no attempt should be made to use one.

Insert the power cord plug into the power receptacle. Turn the receiver on, by turning the Volume Control knob at the left clockwise until a click is heard, In about 30 seconds the set will be in operating condition. Turning the Volume to the right or clockwise increases the volume,

Tune in stations by turning the large upper knob. The numbers on the tuning scale show Kilocycles with the last two ciphers left off. For example number 9 is the location of 900 Kilocycles. As you have tuned in the station desired move the tuning knob to the position which produces the deepest rounded tones with a minimum background noise and clearest reception.

The tuning scale shows the "CD" Civil Defense Emblem at-Conelrad Frequencies-640 and 1240 Kilocycles. In a Civil Defense emergency tune to either of these frequencies to receive defense news, instructions and information.

To turn the receiver off, turn the volume knob to the left or counter clockwise position until a click is heard.

In locations where signals of low strength prevails signals can be increased by adding a length of wire running around the room floor and around the window frames. Attach this wire to the lead provided in the back of the receiver.

### ELECTRICAL SPECIFICATIONS

Sensitivity ..... 50 milliwatts Output 

### TUBE COMPLEMENT

12AU6 ..... Mixer and Oscillator 12AV6 ..... Detector, A.V.C. and 1st Audio 50 C5 ..... Audio Output 

MODELS DC2980A (White ) & DC2981A (Red )

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### N CЛ 5 \$ m S TE RN AUTO

ADIO

PAGE

No. 10-477

truetane TABLE RADIO

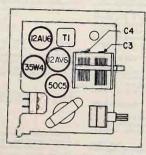
INSTALLATION, OPERATING

and SERVICE INSTRUCTIONS

### MODEL NOS. DC2980A & DC2981A

### TUBES

This receiver is shipped with the tubes in their proper sockets. If for some reason tubes have been removed, make certain they are reinserted into their proper sockets as shown below.



JUBE LAYOUT

### ALIGNMENT PROCEDURE

### PRELIMINARY:

### ALIGNMENT PROCEDURE CHART

			REPEAT ST	EPS 2 AND 3
	USE RADIATED SIGNAL	1500 KC	MAXIMUM SIGNAL APPROX.1500 KC	C3(ANTENNA TRIMMER)
3	LIGE BARRIES	1650 KC		C4 (OSCILLATOR TRIMMER)
1	ANTENNA SECTION TUNING CONDENSER IN SERIES WITH .1 MFD COND.		FULL CLOCKWISE POSITION. (CONDENSER PLATES) FULLY OPEN)	BOTTOM 8 TOP OF T-1 IN SAME ORDER (LF. TRANSFORMER)
		то-		GENERATOR AS LOW AS POSSIBLE.)
STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO-	SET SIGNAL GENERATOR	TURN RECEIVER DIAL	ADJUST THE FOLLOWING FOR MAXI MUM OUTPUT. (KEEP SIGNAL

outpput near 0.4 volts.

Always keep the output from the generator at its lowes;

The alignment procedure should be done in the order given for greatest accuracy.

### **OJohn F. Rider**

### MODEL NOS. DC2980A & DC2981A

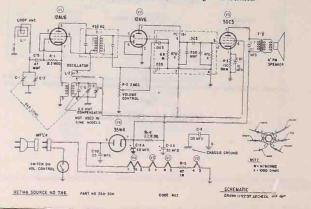
### REPLACEMENT PARTS LIST

When ordering ports, specify part number, model number and series.

			APPROX-
			IMATE
REF. NO.	PART NO.	DESCRIPTION	SELLING
		RESISTORS	PRICE
RI	180-107		
R2	120-117	2.2 Megohms ± 20%, 1/2 w	.08
R3	180-111	Volume Control, 2 Megohms, (with Switch)	1.10
R4	180-101	150 ohms ± 20%, 1/2 w	.08
R5	180-185	2200 Ohms ± 20%, 1/2 w	.08
		47 Ohms ± 10%, 1/2 w CONDENSERS	.14
C1,C2,C3,C4	160-129	245-102 MMF Variable	
CS	156-107	50 MMFD	2.64
C6	168-102	6.8 MMFD	.16
C7	158-102	.01 MFD	.16
C8	150-141	60-30-10/150 V, Electrofytic	.18
C9	152-111	.05/400 V	1.50
C10	152-111	.05/400 V	.26
PC151	166-111	Couplate	.26
		CABINET AND ACCESSORIES	-82
	220-152	Knob, Tuning - clear	
	220-122	Knob, Volume - clear	-56
	210-142Ř	Cabinet - Red (with dial)	.26
	210-142W	Cabinet - White (with dial)	4.00*
	215-164	Dial Insert	4.00*
	185-128	Line Cord	.26
	175-137	Speaker - 4" - Alnico V	.72
· · · ·		COILS AND TRANSFORMERS	3.86*
T1 T2	130-106	Transformer, IF	1.50
	138-130	Transformer, Output = 2500/3.2 Ohms	1.86
LI	134-112	Loop, with back	1.24*
L2	136-139	Oscillator Coil	.94
			+ 74

· Federal Excise Tax Included

Prices Shown Are Approximate and Subject to Change Without Notice.



Factory Model 816 6 Tubes, Including Rectifier

### ELECTRICAL SPECIFICATIONS

Power Supply
Frequency Range
Intermediate Frequency
Sensitivity 20 microvolts on ferrite loop for 50 MW output
Selectivity
Tuning
Speaker
Power Consumption
Power Output1.5 Watt undistorted

### DESCRIPTION

This receiver is equipped with a six tube radio receiver incorporating a tuned radio frequency amplifier which is capable of receiving weak stations with minimum noise background. This radio frequency stage increases selectivity - the ability to separate a signal from one station to another - minimizing interference, Background signal interference is also eliminated.

This receiver makes use of the very latest advances achieved in the field of high fidelity sound reproduction. Great strides have been made in present day reproduction of sound which is now accomplished with lower distortion and a finer balance between bass frequencies and treble frequencies. Among high fidelity enthusiasts this balance between bass and treble tones is referred to as loudness contour. A tone control that enables the listener to tailor the treble response to their taste has been incorporated in this receiver. The deep console like bass response achieved in this Truetone table receiver = accomplished by Basso-fonic circuitry and special speaker characteristics - represents a distinct advance in the field of table radios.

### INSTALLATION

Place the receiver upright on a table or other level surface convenient to a power outlet. Do not place it on or near a radiator or heater.

This receiver is designed to operate from a 117 Volt.AC or DC source of supply. On AC, improved reception may sometimes by obtained by turning the plug halfway around and reinserting it into the power outlet. Try it both ways and leave it in the position which gives the best reception. On DC, the receiver will operate with the plug inserted in only one position.

### ANTENNA

**OJohn F.** Rider

This Radio is equipped with a built-in ferrite loop antenna which will produce satisfactory reception. This antenna may be somewhat directional and in some installations the signal may be improved by turning the cabinet in various directions.

This receiver is designed to operate without a ground connection and no attempt should be made to use one.

### TUBE COMPLEMENT

2BA6	RF	Amplifier
2BE6	Oscillator	and Mixer
2BA6	l.F.	Amplifier
2AV6Detecto	A.V.C. and	Ist Audio
5C5	Au	dio Output
SWA		Rectifier

### GENERAL DESCRIPTION

### OPERATION

Make sure that "Phono-Radio Switch" in back of receiver is moved to the right- the Radio position. Turn the receiver on, by pulling the bottom volume control knob out until a click is heard. In about 30 seconds the set will be in operating condition. Turning the volume control knob to the right, or clockwise, increases the volume.

Tune in stations by turning the top tuning knob at the right. The number on the tuning scale show Kilocycles with the last two ciphers left off. For example number 9 is the location of 900 Kilocycles. As you have tuned in the station desired move the tuning knob to the position which produces the deepest rounded tones with a minimum background noise and clearest reception.

The tuning scale shows the "CD" Civil Defense Emblem at - Conelrad Frequencies - 640 and 1240 Kilocycles, In a Civil Defense emergency tune to either of these frequencies to receive defense news, instructions and information

To turn the receiver off, push lower volume knob in. When Radio is turned on by pulling this knob outward again, the volume level will return to your previous setting.

### TONE CONTROL

The center knob is the tone control, To increase bass response, rotate this control counter clockwise, or to the left . To increase treble response, rotate this control to the right, or clockwise.

### PHONOGRAPH - STERED CONNECTION

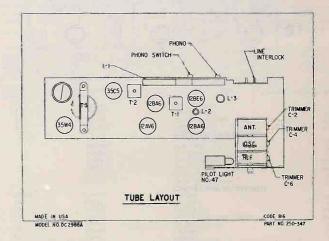
To play records through this radio connect the "pick-up plug" from the record player to the jack to "Phono-Stereo" socket at the rear of the receiver. Move phono-radio switch to the left (looking at back of cabinet) turn bottom volume control knob in counter clockwise position. Phonograph volume increases with counter clockwise movement of this bottom volume control knob.

This radio can be used for the second channel of a stereo phonograph by having the "pick-up plug" of stereo equipment channel 2 inserted in the phono-stereo socket provided in the back of the receiver. The "pick-up plug" of either a phonograph or the second channel stereo can remain attached to the receiver. In order to restore operation as a radio, return phono-radio switch to the right move bottom volume control clockwise.

### STOCK NO. DC2988A

### TUBES

This receiver is shipped with the tubes in their proper sockets. If for some reason tubes have been removed, make certain they are reinserted in their proper sockets as shown below.



### ALIGNMENT PROCEDURE

The alignment of the receiver below indicates the method for obtaining maximum sensitivity and lowest noise pickup.

- (1) Connect ouput meter across voice coil of receiver. Use oxide rectifier type with 0-1 volt scale.
- (2) Use isolation transformer to keep power line ground off chassis

(3) Use the minimum amount of signal necessary. Keep generator as far away as possible if the shielding is inadequate.

(4) Use .4 volts as reference level;

(5) Volume and tone controls set in maximum position.

ADIO PAGE

25-6

	When order	PARTS PRICE LIST ing partis; specify stock number, model number and part number. RESISTORS	
		KESIS TORS	Approx-
	Part No.	Description	Selling
	180-117		Price
	180-107	330 Ohms ½ Watt 10% 2.2 Megohms ½ Watt 20%	.10
	180-102	22K / Watt 20% 20K // Watt 20% 10K // 10% 220 Ohms // Watt 10%	.08
	180-190 180-148	10K ½ 10%	-08
	180-107	2.20 Ohms ½ Watt 10% 2.2 Mesohms ½ Watt 20m	.10
	180-140	2.2 Megohms ½ Watt 20% 680 Ohms ½ Watt 5% Critical 4 Megohm Volume Control with Switch	.08
	120-137 180-135	4 Megohm Volume Control with Switch	1.26
	180-110	6.8 Megohm ½ Watt 20% 470 K Ohms ½ Watt 20% 150 Ohms ½ Watt 20%	.08
	180-111	150 Ohms 1/2 Watt 20%	.08
	180-110 180-184	470 K Ohms 1 W Watt 20% 1000 Ohms 1 W WW 10%	.08
	120-138	Tone Control 100 K Ohme	.18
	180-115	15K Ohms ½ Watt 10% Critical	.10
	180-109 180-159	330 K ¼ Watt 20% 1800 Ohms ¼ Watt 10%	.08
		1000 Chars / wate 10/	,10
		CONDENSERS	
	160-130	Variable Condenser 3/sec Planetary	4.66
	156-111 152-104	220 MMF Disc 400V	.16
	152-122	.05 MFD 200 WV (small) .1 MFD 200 WV (small)	.22
	152-102	072 MED 400 WV (email)	.34 .20
	156-111 158-102	220 MMF DISC 400V .01 MFD "K" CAP-400V	.16
	152-102	.022 MFD 400 WV (small)	.18
	152-109	.05 MED 400 WV (small)	.20
	152-109	.05 MFD 400 WV (small) .05 MFD 400 WV (small) Electrolytic 100 x 80 - 150 WV w/strap	.28 .28 1.76
17B	150-142	Electrolytic 100 x 80 - 150 WV w/strap	1.76
	152-122 152-102	.1 MFD - 200 WV (small)	-34
	166-107	.022 MFD - 400 WV (small) PC-50 Gouplate Tweet Filter	.20 .36
		COILS AND TRANSFORMERS	
	132-140	Loop Ferrite Rod	•1.92
	132-139	RF Coil (with R4)	1.16
	136-141 130-114	Oscillator Coil (with R3) IF Transformer No. 1	1.44
	130-114	IF Transformer No. 2	1.28
	138-131	Output Transformer	*3.20
		CABINET AND ACCESSORIES	
	210-155 205-126	Cabinet Shell - Ebony, in carton (230-174) Panel Insert	* 5.20 *2.20
	205-130	Control Panel Insert, Crystal	<ul> <li>.32</li> </ul>
	205-134 215-165	Panel Insert, Plate	.74
	220-158	Indicator Bar, Tuning Dial Knob (Volume & Tone)	• .28
	220-159 220-160	Calibration Disc	.32 .34
	250-342	Knob (Tuning Planetary) WA Crest	.32
	170-140	Phono Jack No 47 Pilot Light	.10
	140-116 140-134	No 47 Pilot Light Pilot Light Assembly	.25
	185-128	Line Cord (Push-In Interlock) 6' 0"	.48
	175-139	Speaker - PM - 6%"	*6.10
	125-111	Slide Switch	.36
		* Federal Excise Tax Included.	

**OJohn F.** Rider

RADIO PAGE 25-

WESTERN AUTO

	S	TOCK NO. D	2988A	No. 10-48
	SIGNAL GENERATOR FREQUENCY	CONNECTION TO RADIO	ADJUSTMENTS	AD JUST FOR
IF	456 KC Approx. 500 Microvolrs	C5 Section Variable and Pin 3 12AV6	Top and Bottom TI and T2	Maximum Output
	SIGNAL GENERATOR FREQUENCY	POSITION OF GANG	CONNECT	ADJUST
	1650 KC	Fully Open	Same as	C4 Trimmer for maximum output
RF	540 KC	Fully Gosed	for 1F Position	Check for range only
	4500 KC	Set for Maximum Signal	Spray signal into loopstick using 6 turns across generator output. Couple close enough to get signal.	C2-6 Trimmer maximum output
	600 KC	Set for Maximum Signal	Aş Above	Adj. L-2 Slug for maximum

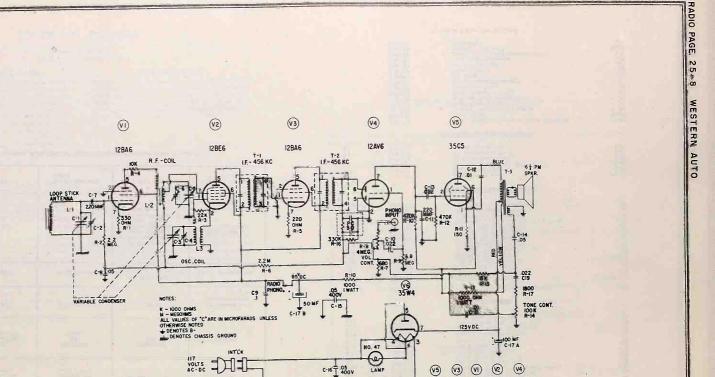
Check tracking, using slicer or Ferrite stick and Aluminum Plate 4" square.

HG No. 10-485

Ref. No. R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R15 R17

C1-2-3 4-5-6 C-7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17A,C C19

L-1 L-2 L3 T1 T2 T3



SCHEMATIC NO. DC 2988A DRAWN 3-19-58 +CAPPROVED P

SWITCH ON VOL. CONT'L

RET MA SOURCE NO 786 CODE BIG

PART NO 250-349

OJohn F. Rider

MODEL DC2988A

60



Pull Out A SLUMBER CONTROL KNOB SLUMBER CONTROL KNOD Turning this knob turns the radio on for a period of time only - auto-motically turns radio off after the time you set for hos elopsed. Turned clockwise oil the way is the set-ting for 60 minutes. Turned holfway is the setting for 30 minutes of play you can adjust the slumber time setting in any amount you prefer, up to 60 minutes, by positioning this

Pull Out D

### INSTALLATION - OPERATING INSTRUCTIONS

### DESCRIPTION

This Clock Radio is equipped with a six tube radio receiver incorporating a tuned radio frequency amplifier which is capable of receiving weak stations with minimum noise background. This radiofrequency stage increases selectivity - the ability to separate a signal from one station to another - minimizing interference. Background signal interference is also eliminated.

This Clock Radio makes use of the very latest advances achieved in the field of high fidelity sound reproduction. Great strides have been made in present day reproduction of sound which is now acomplished with lower distortion and a finer balance between bass frequencies and treble frequencies. Among high fidelity enthusiasts this balance between bass and treble tones is referred to as loudness contour. A tone control that enables the listener to tailor the treble response to his taste has been incorporated in this receiver. The deep console like bass response achieved in this Truetone Clock Radio - accomplished by Basso-fonic circuitry and special speaker characteristics represents a distinct advance in the field of Clock Radios.

### INSTALLATION

Place the receiver upright on a table or other level surface convenient to a power outlet. Do not place it on or near a radiator or heater.

Pull Out E To increase volume, turn to the right clockwise. To lower volume, turn to the loft, counter-clockwise.

Flğure 1

This receiver is designed to operate on 117 Volt AC only. Improved reception may sometimes be obtained by turning the plug halfway around and reinserting it into the power outlet. Try it both ways and leave it in the position which gives the best reception.

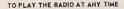
### ANTENNA

This Radio is equipped with a built-in ferrite loop antenna which will produce satisfactory reception from nearby stations. This antenna may be somewhat directional and in some installations the signal may be improved by turning the cabinet in various directions.

This receiver is designed to operate without a ground connection and no attempt should be made to use one.

### TO SET THE CLOCK

Your self-starting Telechron movement will begin operating when the set is plugged into the AC outlet. Check the clock by noting the rotation of the Sweep Second Hand. Set the clock to the correct time by means of the "Alarm and Time Set Knob" in the back of the cabinet. Gently pull this knob back - away from the cabinet - which engages the hands of the clock, enabling you to set the clock to the correct time. See Figure 2 on following page.



To turn on the radio, turn the "Selector Switch Knob" to the "ON" position. Rotate "Volume Control Knob" - in lower right hand corner - to 3/4 rotation position.

Tune in stations by turning the "Radio Tuning Knob" located at the top right hand corner. The numbers on the Tuning Scale show Kilocycles with the last two cyphers left off. For example, number 9 is the location of 900 Kilocycles. As you have tuned in the stations desired, move the Tuning Knob to the position which produces the deepest rounded tones with a minimum background noise and clearest reception.

The Tuning Scale shows the "CD" Civil Defense emblem at Coneirad Frequencies 640 and 1240 Kilocycles. In a Civil Defense emergency tune to either of these frequencies to receive defense news, information in instructions.

Adjust the Volume Control by turning the bottom "Volume Knob" to the volume desired.

To turn off the radio, turn the "Selector Switch Knob" to the "OFF" position. See figure 1.

### TO GO TO SLEEP BY MUSIC

Turn the "Slumber Control Knob" to the desired play time, up to 60 minutes, as shown in Figure 1. If you wish to turn the radio off before end of setting turn "Slumber Control Knob" counter clockwise.

### TO WAKE UP TO MUSIC(w/or without Buzzer Alarm)

- 1. Adjust the volume and tune the radio to the desired station you would like to hear in the morning.
- 2. Set the Red Alarm Setting Hand to the time you want to be awakened. Gently move the "Alarm and Time Set Knob" forward to the front of the cabinet, which engages the Red Alarm Setting Hand, enabling you to set the alarm for the time you want to be awakened. See Figure

- 3. With Buzzer Alarm move "Selector Switch Knob" (see Figure 1) to right, or clockwise "Radio Alarm" position. The Buzzer will come on ten minutes after the radio has been turned on automatically.
- 4. To turn off Radio and Buzzer, move the "Selector Switch Knob" clockwise to "OFF" position.
- 5. Without Buzzer Move this "Selector Switch Knob" clockwise to "Auto-Radio" position.

### OPERATION OF APPLIANCE OUTLET

AL ARM AND TIME SET KNOB

APPLIANCE

OUTLET

An electrical appliance outlet is provided in the back of the receiver for connecting an electric lamp or an electrical appliance up to rating of 1100 Watts. This Appliance Outlet is shown in Figure 2.

To turn off appliance connected to the outlet, turn the "Selector Switch Knob" to "OFF" and remove appliance plug.

### TONE CONTROL

STOCK NO. DC2989A

0

PHONO

STEREO RADIO

-PHONO

SWITCH Figure 2

OF U

The center knob (see figure 1) is the Tone Control. To increase bass response, rotate this control counter clockwise, or to the left. To increase treble response, rotate this control clockwise, or to the right.

### PHONOGRAPH - Stereo Connection IN

To play records through this radio connect the "pick-up plug" from the record player to the jack to "Phono-Stereo" socket at the rear of the receiver. Move phono-radio switch to the left (looking at back of cabinet) turn bottom volume control knob in counter clockwise position. Phonograph volume increases with counter clockwise movement of this bottom volume control knob.

This radio can be used for the second channel of a stereo phonograph by having the "pick-up blug" of stereo equip-ment channel 2 inserted in the Phono-Stereo socket pro-vided in the back of the receiver. The "pick-up plug" of

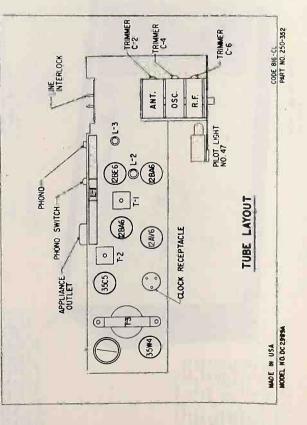
either a phonograph or the second channel stereo can re-main attached to the receiver, in order to restore opera-don as a radio, return phono-radio switch to the right -move bottom volume control clockwise.

### SERVICE DATA

## ELECTRICAL SPECIFICATIONS

### TUBES

This receiver is shipped with the tubes in their proper sockers. If for some reason tubes have been removed, make certain they are reinserted in their proper sockets as shown below.



CHECK TRACKING, USING SLICER OR FERRITE STICK AND ALUMINUM PLATE 4" SQUARE

ADJUST FOR	Maximum Output	TSULAR	C4 Trimmer for maximum output	Check for range only	C2-6 Trimmer maximum ourput	ADJ .L-2 Slug for maximum
ADJUSTMENTS	Top and Bottom T1 and T2	CONNECT	Same as for the	Position	Spray signal iato loopsick using 6 turns across gene- rator output. Couple close enough to get signal	as above
CONNECTION TO RADIO	C5 section variable and Pin 3 12AV6	PosiTion OF GANG	Fully Öpen	Fully Closed	Set for Maximum signal	Set for Maximum signal
SIGNAL GENERATOŘ FREQUENCY	456 KC Approx. 500 Microvolts	SIGNAL GENERATOR FREQUENCY	1650 KC	540 KC	1500 KC	600 KC
	<u>н</u>		1,	L L	2	

### RADIO PAGE 25-10 WESTERN AUTO

(3) Use the minimum amount of signal necessary. Keep generator as far away as possible if the shielding is

STOCK NO. DC2989A

ALIGNMENT PROCEDURE

(5) Volume and tone controls set in maximum position.

(2) Use isolation transformer to keep power line ground off chassis.

Connect output meter across voice coil of receiver. Use oxide rectifier type with 0-1 volt scale.

(4) Use .4 Volts as reference level.

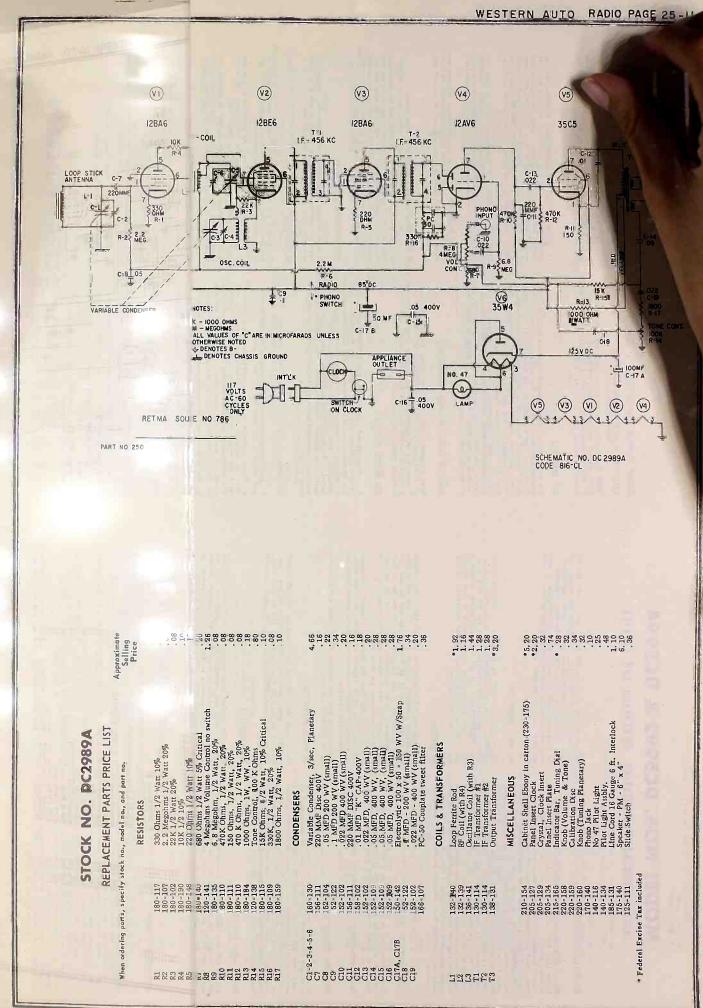
inadequate.

The alignment of the receiver below indicates the method for obtaining maximum sensitivity and lowest noise pickup.

128A6. 128E6. 128A6. 12AV6. 35C5. 35W4.

TUBE COMPLEMENT

OJohn F. Rider



CJohn F. Rider

This radio can be used for the second channel of a stereo phonograph by having the ''pick-up plug' of stereo equip-ment channel 2 inserted in the Phono-Stereo socket pro-vided in the back of the receiver. The ''pick-up plug'' of

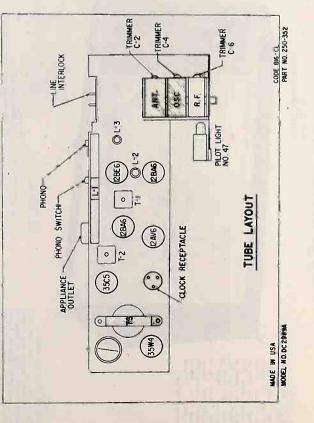
either a phonograph or the second channel stereo can re-main attached to the receiver. In order to restore opera-tion as a radio, return phono-radio switch to the right -move bottom volume control clockwise.

### SERVICE DATA

# ELECTRICAL SPECIFICATIONS

### TUBES

This receiver is shipped with the tubes in their proper sockets. If for some reason tubes have been removed, make certain they are reinserted in their proper sockets as shown below.



CJohn F. Rider

TUBE COMPLEMENT

STOCK NO. DC2989A ALIGNMENT PROCEDURE

(1) Connect output meter across voice coil of receiver. Use oxide rectifier type with 0-1 volt scale.

The alignment of the receiver below indicates the method for obtainfing maximum sensitivity and lowest noise pickup.

(2) Use isolation transformer to keep power line ground off chassis.

(3) Use the minimum amount of signal necessary, Keep generator as far away as possible if the shielding is inadequate. (4) Use .4 Volts as reference level.

(5) Volume and tone controls set in maximum position.

SIGNAL GENERATOR FREQUENCY	456 KC Approx. 500 Microvoles	SIGNAL GENERATOR FREQUENCY	1650 KC	540 KC	1500 KC	600 KC
CONNECTION TO RADIO	C5 section variable and Pig 3 12AV6	POSITION OF CANG	Fully Open	Fully Closed	Set for Maximum signal	Set for Maximum signal
<b>A</b> ĎJUSTÁRENŢS	Top and Bottom T1 and T2	CONNECT	Same as for 1F Position		Spray signal into loopstick using 6 turns across gene- trator output. Couple close enough to get signal	as above
AD JUST F OR	Maximum Output	SULOA	C4 Ttimmer for maximum output	Check for range only	C2-6 Trimmer maximum output	ADJ .1-2 Slug for maximum

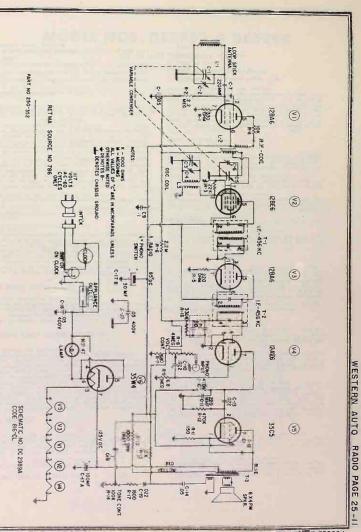
CHECK TRACKING, USING SLICER OR FERRITE STICK AND ALUMINUM PLATE 4" SQUARE

### RADIO PAGE 25-10 WESTERN AUTO

MODEL DC2989A

REPLACEMENT PARTS PRICE LIST

When ordering p	oarts, specify stor	k no., model no., and part no.	Approximate Selling Price
		RESISTORS	Frice
R1	180-117	330 Ohms 1/2 Watt 10%	. 10
R2	180-107	2. 2 Megohms 1/2 Watt 20%	.08
R3	180-102	22K 1/2 Watt 20%	. 08
R4	180-190	10K 1/2 10%	. 10
R5	180-148	220 Ohms 1/2 Watt 10%	. 10
R6 R7	180-107	2.2 Megohms 1/2 Watt 20%	. 08
R7 R8	180-140 120-141	680 Ohms 1/2 Watt 5% Critical 4 Megohms Volume Control no switch	. 20
R9	180-135	6.8 Megohm, 1/2 Watt, 20%	1.26
R10	180-110	470K Ohms 1/2 Watt 20%	.08
R11	180-111	470K Ohms, 1/2 Watt, 20% 150 Ohms, 1/2 Watt, 20%	. 08
R12	180-110	470 K Ohms, 1/2 Watt, 20%	. 08
R13	180-184	1000 Ohms, 1W, WW, 10%	. 18
R14 R15	120-138	Tone Control, 100 K Ohms	. 80
R15 R16	180-115 180-109	15K Ohms, 1/2 Watt, 10% Critical 330K, 1/2 Watt, 20% 1800 Ohms, 1/2 Watt, 10%	.10
R17	180-159	1800 Ohme 1/2 Watt 10%	. 08
id i	100-105	1800 Onnis, 1/2 watt, 10%	. 10
		CONDENSERS	
C1-2-3-4-5-6	160-130	Variable Condenser, 3/sec, Planetary	4.66
C7	156-111	220 MMF Disc 400V	. 16
C8 C9	152-104 152-122	. 05 MFD 200 WV (small)	.22
C10	152-102	.1 MFD 200 WV (small) .022 MFD 400 WV (small)	. 34
CII	56-111	220 MMF DISC 400V	.20
C12	158-102		. 18
C13	152-102	. 022 MFD, 400 WV (small) .05 MFD, 400 WV, (small) .05 MFD, 400 WV, (small) .05 MFD, 400 WV, (small)	. 20
C14	152-109	.05 MFD, 400 WV, (small)	. 28
C15	152-109	. 05 MFD, 400 WV, (small)	. 28
C16	152-109	. OJ WIPD, 400 WV (small)	.28 1.76
C17A, C17B C18	150-142 152-122	Electrolytic 100 x 50 - 150 WV W/Strap	1.76
C19	152-102	.1 MFD - 200 WV (small) .022 MFD - 400 WV (small)	. 34
	166-107	PC-50 Couplate tweet filter	.20
		COILS & TRANSFORMERS	
Li	132- <b>1</b> 40	Loop Ferrite Rod	
L2	132=139	RF Coil (with R4)	• 1. 92
L3	136-141	Oscillator Coil (with 83)	1.16 1.44
TU	130-114	Oscillator Coil (with R3) IF Transformer #1	1. 28
T2	130-114	IF Transformer #2	1, 28
T3	138-131	Output Transformer	°3,20
		MISCELLANEOUS	
	210-154	Cabinet Shell Ebony in carton (230-175)	*5.20
	205-127	Panel Insert Clock	*2.20
	205-129	Crystal, Clock Insert	. 32
	205-134	Panel Insert Plate	. 74
	215-165	Indicator Bar, Tuning Dial	• .28
	220-158 220-159	Knob (Volume & Tone) Calibration Disc	. 32
	220-160	Knob (Tuning Planetary)	. 34
	170-140	Phono Jack	. 32
	140-116	No 47 Pilor Light	.25
	140-134	Pilot Light Assbly.	. 48
	185-131	Line Cord 16 Gauge 6 ft. Interlock	1. 10
	175-140 125-111	Speaker - PM - 6" x 4"	6.10
P Federal Excis		Slide Switch	. 36
- regent Excis	e fax included		



This readio can be used for the factorial channel of a stereo phonomytem by harving the "yolds up plug" of a stereo spacing ment channel 3 tuperend in fing (honou-Stereo spacing pug" at vided in the back of the recenter, The "Fuch-up plug" at

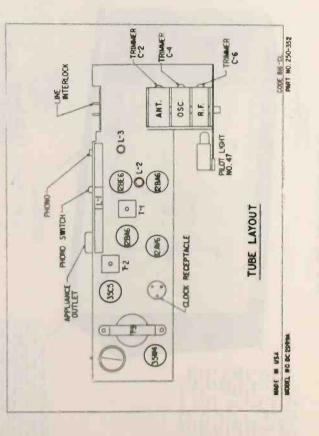
eldher a phonigraph or the succoul changel Stereo cin re-main structure resolver. In order to respone open-tion as a raide, return phono-raidio switch to the right -more bottom valurie countrol clockware.

### SERVICE DATA

## ELECTRICAL SPECIFICATIONS

### TUBES

Thus receiver is skipped with the tubes in their proper sockets, if for some reason tubes have been removed, make certain they are reinserted in their proper sockets as shown below.



## OJohn T. Rider

CHECK TRACKING, USING SLICER OR FERRITE STICK AND ALUMINUM PLATE 4" SQUARE

FOR	Ma kimum Output	TSULAN	Cd Trimmer for maximum output	Check for range only	C2-6 Trimmer nastimum output	ADJ. Lo2 Slug for maximum	
AD JUST MENTS	Top and Bottom T1 and T2	CONNECT	Same as for IF Position		Spray signal into looperick using 6 turns across gene- turns across gene- turor output.Couple close enough to get signal	ав вроче	
CONNECTION TO RADIO	C5 section variable and Pin 3 12AV6	POSITION OF GANG	Fully Open	Fully Closed	Set for Mazimum signal	Set for Maximum signal	
SIGNAL GENERATOR FREQUENCY	456 KC Approx. 500 Microvolts	SIGNAL GENERATOR FREQUENCY	1650 KC	540 KC	1500 K.C	600 KC	
	Ľ		L	ů		L	

### RADIO PAGE 25-10 WESTERN AUTO

(3) Use the minimum amount of signal necessary. Keep generator as far away as possible if the shielding is indequate.

The alignment of the receiver below indicates the method for obtaining maximum sensitivity and lowest noise pickup.

Detector A.V. C. Andlo Ourpat

12846-12846-12846-12846-5564-

TUBE COMPLEMENT

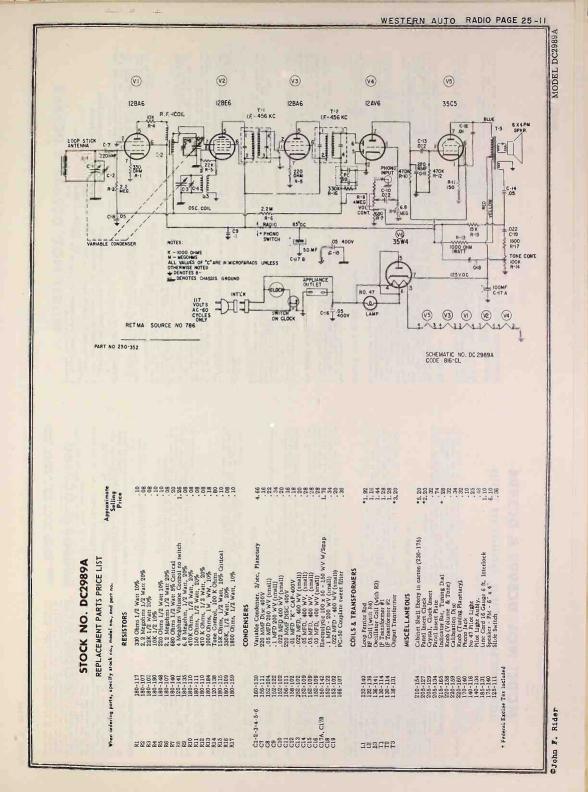
Connect output meter across voice coll of receiver. Use oxide rectifier type with 0-1 volt scale.

(I) Connect

(2) Use isolation transformer to keep power line ground off charsels.

STOCK NO. DC2989A ALIGNMENT PROCEDURE (§) Volume and tone controls set to maximum position,

(4) Use .4 Volts as reference level,



ADIO

PAGE

25

N

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ESTERN

AUTO

### MODEL NOS. DC5992 & DC5994

Instructions for Installation. Operation and Service

### GENERAL DESCRIPTION

This high fidelity AM-FM Radio-Phono combination is This high fidelity AM-FN Redico-Phone combination is a ten (10) tube (including rectifier) plus four (4) diodes, chassis. It has a four (4) speed automatic record charger. Controls are provided for tuning, executed the second second second second second special features include true adaptability for a TREO DISC REPRODUCTION, separate variability for a true plus extension speaker out-put jack. \* A switch, which in conjunction with the Stereo amplifier jack, which in conjunction with the Stereo amplifier jack, (2) \* woofers and two (2) 3W tweeters that he connected by a crossover network which feeds the connected by a crossover network which feeds the highs and lows into the proper speakers. A spindle for playing 45 RPM records automatically without using adapters is included. \* This feature functions only when set has been adapted to Stereo Disc Reproduction.

### CHECK YOUR LINE VOLTAGE

This radio must be operated on a 105 to 125 volt, 60 the local power company before inserting the plug.

AM-540 to 1620 Kilocycles FM- 88 to 108 Megacycles BROADCAST BANDS -

### BASE AND TREBLE CONTROLS

By using the two tone controls, bass and treble, the high and low tones can be increased or decreased to suit your individual listening pleasure. To bring suit your individual istening pleasure. to Diang out the full richness of the bass instruments turn the bass control clockwise. For the full brilliance of the treble instruments, and for overtones of all instruments, turn the treble control clockwise. See 00-0FF.BASS CONTROL upd RECORD CUMORE instructions for other functions of bass control.

### ON-OFF-BASS CONTROL

The ON-OFF and BASS CONTROL is operated by the same knob. To turn the set "ON", pull up on knob. Allow spproximately 30 seconds for tubes to heat. To turn set "OFF", push down. This type of control allows set "OFF", push down. This type of control allows the set to be turned on and off without changing a pre-set position of the bass control.

### STEREOPHONIC SOUND

OJohn F. Rider

This unit is truly adaptable to store of discrepose duction with the use of an additional amplifier, speaker system and store cartidge. A switch is provided on the back of the cabinet for separation of second phone channel and AN radio. Plug a con-netting table from the second amplifier-speaker unit phono position the unit is then ready for is in the attern records. This unit has been designed so that with the switch in the radio position it can receive both an AN and an PN broadcast simultaneously. When a the state of the state of the state of the possible to use the set as a storeologing the two possible to use the set as a storeologing to the two the flat. This unit is truly adaptable to stereo disc reproFM program as usual on the Hi-Fi set. Tune the AM program with the "AM" dial but adjust the volume and tone with the controls on your second amplifier. When this set is adapted for stereophonic sound, it is also possible to receive an FM program in one room while receiving an AM program on the remote speaker unit in another room,

### EM RADIO OPERATION

First turn set "ON" as outlined in "ON-OFF-BASS" CONTROL. Then turn SELECTION of the MASS turn to desired PM station using the FM DELTION, turn 52 desired PM station using the FM DELTION, turn SELECTOR knob to AFC position which automati-cally locks the station in and keeps it from dritt-ing. Adjust the BASS and TREBLE controls to the most pleasing balance.

### EM ANTENNA

Intervening hills or other obstructions may reduce the signal strength in your area. If you are within the normal range of an FN Station and do not get good reception, it may be necessary to use an outdoor FM Astenna. It is advisable also to use the outdoor FM Astenna in on six gates or when reception from greater distances is desired.

The built-in Air Wave FM Antenna is usually adequate for reception of FM signals of normal strength within a line of sight distance of 30-40 miles from the brondcasting station.

Connections for the outdoor FM Antenna are provided on the back of the set.

### AM RADIO OPERATION

First turn set "ON" as outlined in "ON-OFF-BASS" CONTROL. Then turn SELECTOR knob to AM position, tune to desired AM station using the AM DIAL knob. Set the BASS and TREBLE control to the most pleasing balance

### AM ANTENNA

The built-in Air Wave Antenna is sufficient for re-ceiving local and powerful distant stations. To re-cive less powerful or more distant stations, attach an AM buildor antenna to the AM antenna terminal on of the radio. The use of the antenna also will imm distant and the station of the antenna also will improve reception in noisy locations.

### THE CHASSIS SPECIFICATIONS

POWER SUPPLY - 11	7 V.A.C. 60 Cycles-Radio 75 Watts
FREQUENCY RANGES	Phone OO Watta
I.F. FREQUENCY -	FM - 88 to 108 MC AM - 455 KC FM - 10.7 MC

AMPLIFIER FREQUENCY RESPONSE - 30 - 17,000 Cyclies

POWER OUTPUT - 17 watts maximum. 8 watts at less than 1% distortion.

LOUDSPEAKERS - 2, 8" woofers and 2, 3%" tweeters.

TUBES - Ten (10) including rectifier plus four Diodes. Two 6BQ5 tubes are used for Push-Pull output.

### RECORD CHANGER - 1210A-132

CARTRIDGE - ASTATIC-DUAL SAPPHIRE #89TB Powerpoint

NOTE: The needles on this cartridge are not replaceable, as the cartridge and needle are on one unit It will be necessary, therefore, to replace the com-plete cartridge when a needle is worn.

### THE SPEAKERS

The four (4) permanent magnet speakers used in this The four (4) permanent memor speakers used in this exproducer me designed for optimum speaker per-reproducer me designed of the consists of one eight inch "wooler" designed of the constant of the middle-range". The two (2) 34" "tweeters" repro-duce the high frequencies and are speaced to aid in proper sound dispersion. All are connected by iton. In addition, am extension description. In addition, an extension speaker jack is located on the back of the set to which an additional speaker may be connected.

### CONELRAD (CIVIL DEFENSE INFORMATION)

When broadcast stations must leave the air because of a national emergency, CONELRAD (Civil Defense In-formation) will be broadcast. This information is broadcast on 640 or 1240 Kc indicated by the Civil Defense symbol on your radio dial.

### THE RECORD CHANGER

This four speed (16-33-45-78) TRUETONE automatic record changer has been especially engineered for the reproduction of both monaural and STEREO records. the reproduction of octamonaural and Sibatsu records, it mointains constant speed even when records are changing. Intermixes 10° and 12° records of the same speed. Balanced turntable has smooth operating noise-free motor. Muting switch. The changer itself abuts off automatically after the last record has been played

### LOADING

1. Lift record support arm clear of center spindle and swing it all the way to the right.

2. Place records on the spindle, allowing them to rest on spindle itself. Steady records with one hand and swing records support arm back to center. Ten and thelve inch records may be intermixed, pro-vided all orr of the same speed. Use 45 RPM spindle or record adapter discs in all 45 RPM records.

3. The power point cartridge contains two needles. 3. The power point cartridge contains two needles. Standard 78 RPM records require one needle and long playing 16, 33-1/3 and 45 RPM require another needle. To change from one needle to the other, push the lever on the side of the tone arm downward and under to the other side of the tone arm.

NOTE: When needle is in proper position, the lever will rend "78" or "LP" (Long Piay Records).

### AUTOMATIC OPERATION

1. Turn the MOTOR SPEED control to the proper speed. 2. Turn the SELECTOR control to the PHONO position.

3. Turn the RECORD CHANGER control to "REJ." and release

4. Adjust TONE and LOUDNESS controls to the most pleasing tonal balance.

5. To turn changer off before the last record has been played, remove any remaining records, return record support arm to center and turn record changer control to "REJ." position and release.

Be sure to push ON-OFF-BASS Control sil the way down when through playing records or radio, and turn the changer speed selector to the "S-78" position.

IF MECHANISM FAILS TO CHANGE NEXT RECORD - An old The record may not have the eccentric cycling grooves needed for automatic changing. Home recordings and some 7 Inch 78 RPM (children's records) will not change automatically. Should one of these records be in the stack, turn the RECORD CHANGER Control to "REJ." and release, to start the automatic cycling.

TO REJECT A RECORD - If you do not want to hear the record that is playing turn the RECORD CHANCER Control to "REJ." and release. The pickup arm will lift and the next record will drop into position.

MANUAL OPERATION - By leaving the record support arm in its place at left of the changer instead of put-ting it on the spindle, records may be played manually.

EXTENSION SPEAKER (Optional)

To play the speakers in the console and the extension To play the speakers in the console and the extension speaker at the same time, place phono plug in the extension speaker only, place the switch to extension speaker position. To play the speakers in the con-sole only, remove the extension speaker plug.

TAPE RECORDER (Optional)

To play a tape recorder through your set, place the selector switch to the "Tape" position and plug tape recorder into input jack on back of set.

### MAINTENANCE

The pickup arm of the record changer may be moved in any direction at any time without damaging the cy-cling mechanism or the adjustments.

If the pickup arm should fail to function or neglect to cycle, your records may be the cause. Some re-cords are not standard or are imperfect.

Noisy scratching while the phonograph is playing in-dicates worn records or needle. Some records will last longer than others, even though all are given the same use.

### TUBES AND DIAL LAMPS.

The type designation of each tube is stamped on the tube. The correct positions in which the tubes must be installed are shown in the tube position illus-tration. All tubes must be in their sockets to op-ente the radio. Use only No. 12 dial lamps for replacement of burned out dial lamps. Use only a GE No. 47 for replacement of the indicator lamp, located in the front of the cabinet

- 1 6AQ8/ECC85 used with Tuner #1023
- 1 6DT8 used with Tuner #1023A
- 1 6BE6 AM Converter
- 1 6BA6 AM-I-F Amplifier
- 1 6AV6 1st Audio

### MODEL NOS. DC5992 & DC5994

- 1 12AU7 2nd Audio & Phase Splitter
- 2 6BQ5 Audio Output (push-pull)
- 2 6CB6 FM-I-F Amplifier used with \$1023 Tuner
- 2 6AU6 FM-I-F Amplifier used with #1023A Tuner
- 1 EZ81 Rectifier
- 1 1N636 AM Detector Diode
- 2 IN636 FM Detector Diode
- 1 Spec. Junction Diode
- 2 #12 Diel Lamps
- 1 #47 Indicator Lamp

### CARE AND MAINTENANCE

This instrument has been designed and constructed to render trouble-free performance with a minumum of care or maintenance and under normal conditions will care or maintenance and under normal conditions will not require any special attention. If reception is poor or redio will not operate, the following action is recommended:

- 1. Be sure the radio is connected and operated as described in this folder.
- 2. See if there is power at the wall outlet by disconnecting radio and connecting a lamp to the same outlet.
- 3. If radio programs cannot be tuned in when the tuning knob is rotated, note if the SELECTOR is turned to the position you wish to have function.
- 4. Check for a corroded or loose connection on the outside antenns (if one is used) and be sure it is not grounded.
- 5. Inspect tubes to be sure each is firmly seated in its socket. It is well to first disconnect the power cord from wall outlet.
- A tube may be faulty. A qualified radio service-man will test the tubes. Failure to replace the tubes socket, line up the tube prongs with the holes in the socket and then gently push the tube down until it is held firmly in the socket.
- 7. The cabinet has a rubbed and waxed finish. Care The cobinet has a rubbed and waxed linith. Late for it as you would any other piece of fine fur-niture. Remove film or dust and restore original lustre by merely wiping the cabinet with a po-lishing cloth. CAUTION - Do not place the set too near a hot radiator or where it will be exposed to direct sunlight.
- 8: If performance is still unsatisfactory, get in touch with the store or dealer from whom the set was purchased.

HOW AND WHERE TO ORDER REPLACEMENT PARTS

To eliminate error and to speed delivery of replacement parts always include the following information on your order.

1. Complete identification of the Radio-Phonograph for which the post is wonted.

(a) Name Item Phonograph (b) Model Number-DC5992 Mahog. DC5994 Oak (c) Serial Number

2. Best possible identification of the part itself

(a) Part Number

Part Name (c) If necessary, return the old part as sample.  CUSTOMERS may order all replacement parts from any Western Auto Store or Associate Store. Each store has an up-to-date price list on replacement parts.

Company and Associate Stores may order any part shown in any Western Auto Replacement Parts and Price Lists from these Parts Warehouses:

Western Auto Parts Warchouse 2610 Grand Avenue Kansas City 8, Missouri

Western Auto Parts Warehouse 1227-29 First Avenue South Birminghem, Alabama

Western Auto Parts Warehouse 1217 Alhambra Avenue Sacramento, California

Western Auto Parts Warehouse 3142-44 West Liberty Pittsburgh, 'Pennsyllvania



### ALIGNMENT PROCEDURE

DIMN

ANTEN

.1 M

1 10/18

1.MMF

AM STAGES

iustments.

Connect Radio Chassis to ground post of Signal Genes rator with a short heavy lead.

Allow Chassis and Signal Generator to "heat up" for 15 minutes.

	GANG		ADJUST	
Y NA	SETTING	ADJUST	FOR	NOTES
FD	Open	A7 - A8 A9 - A10	Max. Output	
*	Open	A6	Max. Output	*2 Turns insulated wire may be used
*	Mex. Out- put 1400KC	A5	Max. Output	

### FM STAGES

300 obms.

Zero center scale DC vacuum tube voltmeter having a range of approximately 3 volts. Allow Chassis and Signal Generator to "heat up" for 15 minutes.

unmodulated signals at the test frequencies listed A second to F Londing Residence (5000 mm)

The following is required for aligning:

SIGNAL GENERATOR

as listed.

FREQUENCY

SETTING

455KC

1620KC

1400KC

Non-Metallic Screwdriver.

below.

An All Wave Signal Generator which will provide an

accurately calibrated signal at the test frequencies

Output indicating Meter, Non-Metallic Screwdriver, Dummy Antenna--, I mf. Volume Control Maximum all Ad-

CONNECT TO

Pin 7 (Control Grid)

of V-4

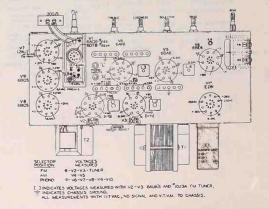
Yellow Wire on L5

Yellow Wire on L5

An accurately calibrated Signal Generator providing

The following is required for aligning:

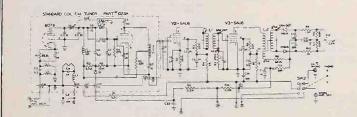
ommy An	centras and v.	- Dongring	te averagor abou	, and the second			
	SIGNAL GENER	THROUGH	DI AL	CONNECT	ADTUST	ADJUST	NOTES
FREQ.	TO	DUMMY	SETTING	TO	1000	FOR	
10.7 MC	Pin 1 V-2	5000 MMP	Extreme Clockwise Rotation	Junction of C10 & R9	A1-A2-A4	Maximum Voltage	Adjust input signal for 1.5 to 3, volts deflection
10.7 MC	Pin 1 V-2	5000 MMF	Extreme Clockwise Rotation	Junction of C14 & R13	A-3 (Top L2)	O: Volts (Balance)	
100 MC	Ant. Terminal	300 OHM	Tune for 100 MC	Junctron of Ci0 & R9	T1 in FN Tuner	Neximum Voltage	Rock tuner while making this adjustment

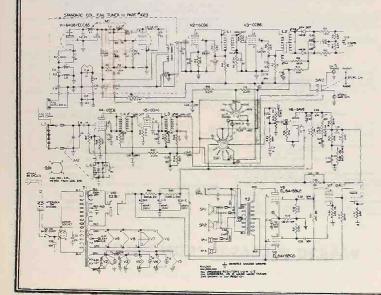


61

MODELS DC5992, DC5994

### MODEL NOS. DC5992 & DC5994





### PARTS & PRICE LIST

APPROX

REF. NO.	PART NO	DESCRIPTION	SELLING PRICE	REF. NO.	PART NO.	DESCRIPTION	APPROX. SELLING PRICE
	TRANSFO	RMERS & COILS			0.01	DENSERS	THICD
L4	1405	455KC I.F.		C1-A, C1-B.	1032		11.12
L3	1406A	455KC I.F.		C1-C, C1-D	1031	Filter Condenser 40-40 30/350 50/50	\$ 3.00
L1	1413	10.7 MC I.F. (Automatic 1607-1 or equivalent)	\$ 1.00	C2	819B	.01 Discap w/Tuner	. 14
L2	1414	10.7 MC Ratio Detector		C18	804	.1 MFD/200 V	. 16
		(automatic 2607-5 or equivalent)	1.32	C29, C26, C32, C33	828A	.05 MFD/400 V	. 22
L6	1401A	AM Osc. Coil	.52	C13	916	10 MFD/25 V	.68
T1	1108	Power	10.20	C35,C36	911	.01 MFD Discap	, 14
T2	1212	Output	4.06	C39	9.117	.0033 MFD/600 V	. 16
	0	ONTROLS		C21,C30	910	.0033 MFD Discap	. 15
R30	423	2 Mega Bass Control	1,16	C16,C19,C22, C37,C38,C39	819B	.01 MFD Discap	. 14
R25	401E	Volume Control	. 68	C4, C5, C6,	906	.005 MFD Discap	.42
R28	421	1 Meg. Treble Control	. 64	C8,C9,C29			
	0.0	SISTORS		C17	845	20UUF N750 10% Discap	, 1/2
R40	642			C14,C15,C31	832	.001 MFD Discap	. 12
R39	643	2K 10W 10%	. 30	C10,C11,C12	839	330 MMFD	. 08
R4 1	648	130 Ohm 5W 10%	. 24	C25,C27	8.17	250 MMFD Discap	. 16
R1		1000 Ohm 2W 10%	. 24	C20,C31	826	100 MMFD Discap	. 12
R19, R22	646	4700 Ohm 1W 10%	. 12	C7	843	47 MMFD Discap	, 12
	647	22K 1W 10%	. 14	C23	908	33 MMFD Discep	. 12
R2, R8	551A	68 Ohm 2W 10%	.08	C3	846A	#8 MMFD Discep 5%	, 14
R14 R20	5 20	47 Ohm 1 W 20%	.06	C34	830A	2 MFD Sou	. 84
	546	270 Ohm 1W 10%	. 08			Unpolarized Lytic	
R4, R7, R12	539A	1000 Ohm 1 10%	.08			LLANEOUS	
R9 R32	559	1500 Ohm 1 W 10%	.08	L5	1512E	Loop Ant.	1.66
R10,R11	556A	3900 Ohm 1W 10%	.08		2640	8" Speaker	6.96
R36	549Å	6800 Ohm 1W 10%	. 08		2640A	8" Speaker	8.00
	522	10K 2W 20%	.06	3	2641	3 <sup>1</sup> / <sub>2</sub> " Speaker	3.76
R3,R6,R18 C28	517	22K 2W 20%	.06		1651	Dial Plate	3.60
	821	1500 MFD Discap	. 16		2457	AM Tuning Knob	. 38
R23, R29	523A	47K 10%	.08		2457A	AM Dial Skirt	.42
R34,R35	523B	47K 2W 5%	. 14		2458	FM Tuning Knob	.42
R13, R25 R24	547A	68K 1W 10%	.08		2458A	FM Dial Skirt	.42
R24 R31	507A	100K 1 W 10%	. 08		2436	Aux. Knobs	, 14
	508	180K 2W 20%	.08	SW2	1892A	DPDT Slide Switch	. 28
R27,R33	511A	220K 2W 10%	,08	M2	1024	AM Tuning Gang	2.88
R5	529A	270K 2W 10%	.08	SW1	420A	4 Pole 5 Position	2,40
R42, R37, R28	502A	470K 2W 10%	.08		1002	Switch	
R17	516	1 Meg. 2W 20%	.06		1023	FM Tuner (w/6AQ8)	
R15, R16, R24	615	2.2 Meg. 2W 20%	.06		1023A	FM Tuner (w/6DT8)	
R26	530	10 Meg. 2W 20%	.06				

. .

CJohn F. Rider



riequency Range	
Intermediate Frequency	
Tube Complement:	
1 12AU6	
	Det., AVC and 1st AF Amp.
1 50C5	Output Amp
1 35₩4	
Power Output:	
Undistorted	
Loudspeaker:	
Operating Voltage 105 t	o 120 volts, 50-60 cycle AC or DC
Power Consumption	

### PRINTED BOARD REMOVAL 1. Remove the front control knobs.

- 2. Remove the screw located above the tuning shaft (this screw mounts the printed circuit board to the front of the cabinet).
- 3. Remove the two self-tapping screws from the back of the cabinet.
- 4. Remove the back cover. Be careful not to break the two leads from the antenna loop to the chassis.
- 5. Loosen the metal band securing the speaker leads to

### ALIGNMENT

It is recommended that the chassis be isolated from the power line by means of an isolation transformer. While making the following adjustments, keep the volume control set for maximum output and the signal generator output attenuaged to weakest sushie signal level.

Siep	Connect Signal Generator To +	Signal Generator Frequency	Radio Dial	Connect V.T.V.M. Across Voice Coil and Adjust for Maximum Output -
1.	Stator of ant. tuning capacitor through a 200 mmf capacitor	455 kc.	minimum capacity	Top and bottom slugs of T1.
21	Radiated signal	1625 kc.	minimum capacity	Oscillator trimmer (D)
30	Radiated signal	1400 kc.	1400 kc.	Antenna trimmer (B)

\*itils recommended that a fiber aligning tool that anugly fits the slot in the powdered iron care be used to prevent chipping of the slot.



### the speaker to provide slack in the leads.

- Carefully slide the printed board out from the rear of the cabinet (the printed board is held secure in the cabinet by a top and bottom channel molded into the cabinet).
- Use a conventional TV AC interlock line cord to power the radio while servicing. It is recommended that the chassis be isolated from the power line by means of an isolation transformer.

64

36.8M

20 A

6.8

85 i 000

0R

220 MMF

NR/

200

180

0 6

MO

1 B

005

DUTPUT TRANS

CHASSIS

NO.

<

2239

-

ON-OF

FIGURE 1. SCHEMATIC DIAGRAM

WESTINGHOUSE RADIO PAGE 25-1

CJohn F. Rider

CHASSIS V-2239-7

12 AUG

CHASSIS V-2390-4

List Price

> .40 7.95

> 7.95

.10

1.12 1.57

.45

.15 2.75 .35 .35 .22

.22 .05 .40 .20

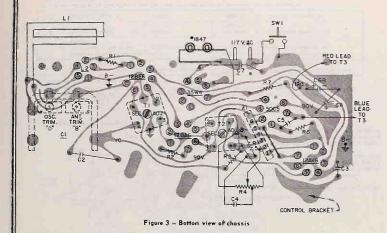
.17

.17

.80 8.75

.10

.05



			CABIN	IET AND MISCELLANEOUS
New Part	Ref. No.	Part No.	Equiv. Part No.	Description
T T T		558V120H02 513V017H01 513V017H02 V-15765-1 751V000A01 V-3219 558V083H06 558V185H01 558V185H01 558V153H02 783V061H01 550V082H01	770V415H01	Background, foil Gabinet, H-632T3/ (Mocha & White) Cabinet, H-632T3/ (Mocha & White) Contact, male Cord, AC power (snap-in) Cord, dial stringing, 100' spool Dial Dial- D
ł		758 v501H02 558 v5089H01 761 V075 H56 783 V055 H06 751 V513 H01 751 V513 H04 751 V513 H04 751 V546 H01 751 V529 H01 570 V051 H01 V-6795-3 72 V0001H01	77ōV250H03	Lamp, pilot iamp, a 1964 Pointer Screw, 3% (mounts cabinet) Shaft, tuning Socket, anap-in (35W4) Socket, snap-in (12BE6 & 12BA6) Socket, dan-jin (12AV6) Socket, diai Light Speaker, 10" * 2 5/8" PM (includes T3) Spring-dia drive

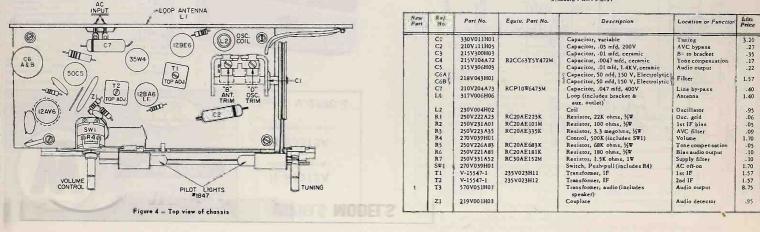
PARTS LIST

When ordering parts, specify part number, description and model number of set.

### CHASSIS PARTS LIST

Washer, "C" tuning shaft

763V000H24

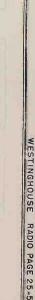


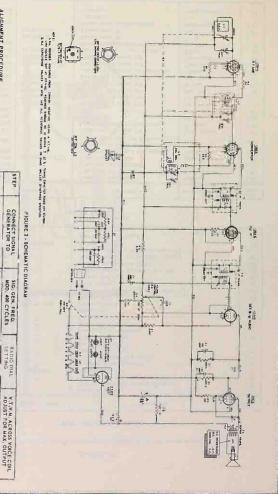
† New part number listed for the first time in Westinghouse television or radio service information.

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RADIO





PROCED

cha

ated

1101

717 8 2BE6

SETTING

ADJUST FOR MAX. OUTPUT

cap

man thro . 7 of the

. cap

1625kg ISSke

capacity

Oscillator Trimmer (F) Top & bottom slugs of T2 and T1 in order given.\*

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the

tool that signal

A

ator of antenna ning capacitor ) through a 200 nf. capacitor

4

Same as Step 2 Radiated signal

1400kc 1400kc

And

enna Trimm

(B)

**RF** Trimmer

Ð



### SPECIFICATIONS

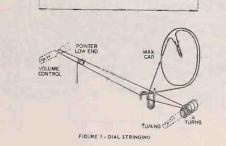
Frequency Range	1600 Kc
Intermediate Frequency	455 Kc
Tube Complement;	
1 12BA6	
1 12BE6 C	onverte
1 12BA6	IF Amp
1 12AV6 Det., AVC and 1st /	AF Amp
1 35C5 Out;	nur Amp
1 35w4	Pección
Power Output:	Recenter
Undistorted 0	0
Maximum	watts
Loudspeaker:	(ou p)
Operating Voltage .105 to 120 volts, 50-60 cycle A	DIA PN
Power Consumption	C or DC
rower consumption	3) watts

### PRINTED BOARD REMOVAL

- 1. Remove the two 31/2" screws located at either end of the cabinet rear.
- Remove the screw on the bottom of the cabinet
- Separate the cabinet front from the cabinet back to expose the radio chassis. (The two 3½" screws can be

used to do this by pushing on both at same time). 4. Use a conventional TV AC interlock line cord to power the radio while servicing. It is recommended that the chassis be isolated from the power line by means of an interline transform. isolation transformer.

56-791-1416



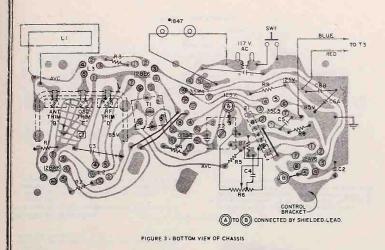
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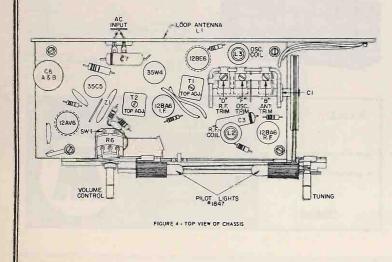
OJohn F. Rider

CHASSIS V-2391-6

RADIO PAGE 25 - 6

WEŞTINGHOUSE





### PARTS LIST

When ordering parts, specify part number, description and model number of set.

### CABINET AND MISCELLANEOUS

New Part	Rel. No.	Part No,	Equiv. Part Nor	Description	List Price
		558V120H02		Background, foil	:40
		513V017H04		Cabinet, H-636T6A (Ivory & White)	7.95
		513V017H05		Cabinet, H-637T6A (Coral & White)	7.95
100		V-15765-1	770V415H01	Contact, Male, AC	.10
		751V000A01		Cord, AC power (snap-in)	1.12
		V-3219		Cord, dial string (100'spool)	1.57
t		558V083H05		Dial	.85
		558V185H01		Dial background	.15
t j		558V153H01		Front, cabinet	3.00
		783V061H01		Insert, cabinet mounting	.35
		550V082H01		Knob, volume & tuning	.35
		756V501H02		Lamp, pilot light, # 1847	.22
		558V088H01	and the second sec	Nameplate	.27
		V-5353-2	767V002A01	Palnut, control	.05
1.1.1		558V089H01		Pointer, dial	.22
	8 III II	761V809H01	3	Screw, hex head, 31/2" (Cabinet mounting)	.05
10		783V055H06	1	Shaft, tuning	.40
		751V529H01		Socket, dial light	.80
		751V513H04		Socket, snap-in 7 pin (35C5 & 35W4)	.17
		751V513H05		Socket, snap-in 7 pin (12BA6)	.17
1		751V546H01	1	Socket, snap-in 7 pin (12BE6 & 12AV6)	.45
		570V050H01		Speaker, 10" × 2 5/8" PM (includes T3)	8.75
1.1		V-6795-3	770V250H03	Spring, dial drive	.10
		763V000H24		Washer, "C" (tuning shaft)	.05

### CHASSIS PARTS LIST

New Part	Ref. No.	Part No.	Equiv. Part No.	Description	Location or Function	List Price
	C	330V012H01		Capacitor, variable	Tuning	4.90
	C2	215V300H03		Capacitor, .01 mfd, 1KV, ceramic	B - to bracket	.35
	·C3	210V111H05		Capacitor, .05 mfd, 200V	AVC to B-	.27
	C4	-215V104A72	R2CC63Y5Y472M	Capacitor, .0047 mfd	Tone Compensation	.17
	C5	215V306H03		Capacitor, .01 mfd, 1 KV, ceramic	Audio output.	.22
	C6A C6B	218V043H01		Capacitor, 50 mfd, 150 V, Electrolytic Capacitor, 50 mfd, 150 V, Electrolytic	Filter	1.57
	C7	210V213A33		Capacitor, .033 mfd, 600V	Line bypass	.40
	LI	317V006H06		Loop (includes mtg. brackets)	Antenna	1.40
	1.2	230V037H01		Coil	RF amp	1.00
	L3	230V004H02		Coil	Oscillator	.95
	R1	250V223A31	RC20AE331K	Resistor, 330 ohms, 1/W	RF amp bias	.05
	R2	250V221A03	RC20AE103M	Resistor, 10K ohms, 1/W	RF plate load	.05
	R3	250V222A23	RC20AE223M	Resistor, 22K ohms, 1/2W	Osc. grid	.06
	R4	250V221A51	RC20AE151K	Resistor, 150 ohms, 1/W	IF bias	.05
	R5	250V223A35	RC20 AE 335M	Resistor, 3.3 megohms, 1/W	AVC filter	.09
	RG	270 V039H01		Control, 500K ohms (includes SW1)	Volume	1.70
	R7	250V226A83	RC20AE683K	Resistor, 68K ohms, 1/W	Tone compensation	.05
	RS	250V221A81	RC20AE181K	Resistor, 180 ohms, 1/1W	Audio output bias	.10
	R9	250V321A22	RC30AE122K	Resistor, 1.2K ohms, 1 W, 10%	Filter	.12
	SW1	270V039H01		Switch, push pull (part of R6)	AC off-on	1.70
	T1	V-15547-1	235 V023H01	Transformer, IF	1st IF	1.57
	T2	V-15547-1	235V023H01	Transformer, IF	2nd IF	1.57
	T3	570V051H01		Transformer, audio (includes speaker)	Audio output	8.75
	Z1	219V001H01		Couplate	Audio coupling	.95

† New part number listed for the first time in Westinghouse television or radio service information.

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### WESTINGHOUSE RADIO PAGE 25-7



### SPECIFICATIONS

OPERATING VOLTAGES 105 to 120 volts DC or
50 to 60 cycles AC
POWER CONSUMPTION
POWER OUTPUT
Maximum
Undistorted 1,5 Watts
TUNER FREQUENCY RANGES:
AM 540 to 1600 kc
FM
INTERMEDIATE FREQUENCIES
AM 455 kc
FM 10.7 mc

### TUBE COMPLEMENT

12BA6	FM RF Amplifier
12AT7	FM Mixer-Oscillator
12AU6	1st FM IF Amplifier & AM Converter
12BA6	
12AL5	FM Detector
12AV6	AM Detector & 1st Audio Amplifier
50C5	Audio Output



### PHONOGRAPH INPUT INFORMATION

The audio amplifier section of the receiver can be used as a phonograph amplifier by inserting the plug from the phonograph output into the receptacle on the tear of the receiver. The AM-FM-PHONO switch should be set to the PHONO position.

The phonograph should employ either a crystal or ceramic type cartidge for best results. If hum is being picked up by the phonograph try reversing the AC plug of the phonograph in the AC power outlet, and/or the radio power plug.

### FM ANTENNA INFORMATION

The receiver is shipped from the factory with the FM antenna connection in the internal position. The FM antenna connections are located on the back of the AM loop antenna and are accessible through a hole in the rear cover. When the captivated shorting bar connects the center and right hand terminals the FM input is connected to the AC power line through capacitor C33. The AC power line hence serves as the FM argence. the FM antenna.

When using an external FM antenna, disconnect the captivated shorting bar from the center terminal. Connect a 300 ohm antenna across the center and left hand terminals.

### CHASSIS REMOVAL

1. Remove the two 31/2" long screws located at either end of the cabinet rear.

the cabinet rear.
 Remove the short screw located in the center of the cabinet rear and the screw on the bottom of the cabinet.
 Separate the cabinet front from the cabinet back to expose the radio chassis. (The two 3½" screws can be used to do this by pushing on both at same time).
 Use a conventional TV AC interlock line cord to power the radio while servicing. It is recommended that the chassis be isolated from the power line humans.

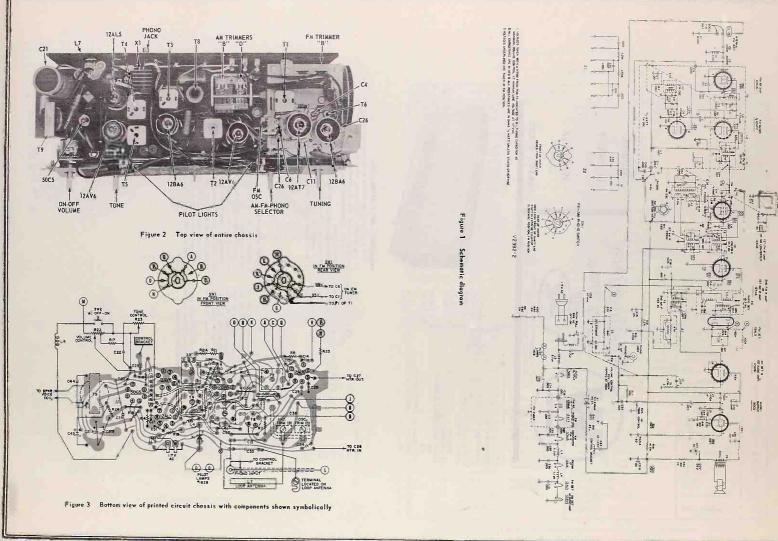
isolated from the power line by means of an isolation transformer.



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WESTINGHOUSE



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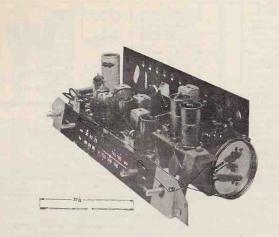


Figure 4 Dial string arrangements

### AM ALIGNMENT

### AM ALIGNMENT

- Connect V.T.V.M. as indicated in the AM alignment chart.
   Use signal generator covering 455 kc to 1700 kc, AM modulated, with adjustable output attenuator.
   Set the volume control R22 at maximum.
   Set with SWI at AM.

- 5. Keep the signal generator output voltage level low to avoid AVC action.
- 6. Set C38 (tuning capacitor) to minimum.

### AM ALIGNMENT CHART

Step	Connect Signal Generator to:	Signal Generator Frequency	C38 Setting	K. P.V.M. Connection	Adjustment
1	High side thru .1 mfd to stator "A" of C38. Low side to tuning capacitor frame (B=)	455 kc modulated	mis,	Teriory apta.	Primary and secondary of T5 and T3 for maximum output
2	"	1625 kc modulated	13	110	C38 "D" for maximum output
3	Radiated signal	1400 kc modulated	Tune for signal	11	C38 "B" Rock in for maximum output





Figure 5 Impedance matching network

### FM ALIGNMENT

### FM ALIGNMENT

I. Don't attempt FM alignment until the AM alignment has been completed.

been completed.
2. Connect two 100k ohm resistors from test point "C" (pin No. 7 12AL5) to ground as shown in schematic.
3. Use V.T.V.M. connected as indicated in the FM alignment

chart.

4. Use a signal generator with output frequencies of 10.7 mc and 80 to 110mc. Generator should have an adjustable output attenuator.

5. Set the volume control R22 at maximum.

6. Set the switch SWI to the FM position.

7. Keep the signal generator output voltage level low to avoid overload.

### FM ALIGNMENT CHART

Anti-	Connect Signal Generator to:	Signal Generator Frequency	Series.	V.T.V.M. Connection	Adjustment
1	High side of generator to lug F or H of SWI	10.7 mc unmodulated	Min.	Between points "A" and "B" see fig. 1	Secondary of T4 (top adj.) for zero voltage
5			12	Between point "C" and ground	Primary of T4 (bottom adj.) and primary and secondary of T2 for maximum negative volrage
3		10.7 mc unmodulated input increased 10X	U	Between points "A" and "B"	Recheck T4 secondary and adjust for zero voltage if necessary
4	17		1)	Befween point "C" and ground	Recheck T4 primary and adjust for maximum negative voltage if necessary
5	REMOVE THE T	O 100K OHM RESISTOR	Ş		
Q	Across FM antenna with proper term- ination see fig. 5	98 mic unmodulated	98 mc	Between point "C" and ground	T7 for maximum negative voltage
7	"		44	"	Ti primaty and secondary for maximum negative voltage
8	6	108.5 mc unmodulated	Mia.	<b>1</b> <sup>17</sup>	C41 for maximum negative voltage
9	44	87.5 mc unmodulated	Max.		T7 for maximum negative voltage
10	REPEAT STEPS	AND 9 UNTIL NO FUR	THER CHAN	GE	
11	ACROSS FM antenna with proper term- ination	106 mc unmodulated	Tune for signal	Between point "C" and ground	C37 "B" for maximum megative voltage (rock in)
12		90 mc unmodulated	(1/	17	T6 for maximum negative voltage (rock in)
13	CHECK STEPS 8	AND 9 AND TOUCH UP	IF NECESSA	RY	

WESTINGHOUSE RADIO PAGE 25-9

CHASSIS V-2392

RADIO PAGE 25-10 WESTINGHOUSE

### CHASSIS PARTS LIST -- Continued

### MISCELLANEOUS AND MODEL PARTS

When ordering parts, specify part number, description of part and model number. Do not order by model number alone. Where applicable, prices include Foderal Excise Tax.

New Part	Ret. No.	Part No.	Ēģuiv. Part No.	Description	List Price
t		513V017H13		Cabinet shell, Ivory, H649T7	4.90
† I	. 8	513V017H16		Cabinet shell, Charcoal, H650T7	4.90
		770V415H01	V-15765-1	Contact, male, AC power	.10
1	e - 9	781V042H01		Coupling, flexible variable gang to pulley shaft	.05
		751V000A01		Cord, AC power, snap-in	1.12
		V-3219		Cord, dial drive, 100 foot spool	1.57
1		558V118H01	(;	Dial, plastic front	1.30
1		558V175H01	12	Dial, background, scale	.25
1		558V153H01		Front, cabinet	3.00
1		783V061H01		Insert, mounts cabinet front	.35
1		550V082H04		Knob, AM-FM Tuning, Volume & Tone	.35
†		550V082H02		Knob, AM-FM-Phono selector	.40
1 1		756V501H07		Lamp, pilot light, W# 1828	.95
- 1		768V015H18		Nut, speed, secures AM loop	.05
. 1		558V088H01		Nameplate, Wide - Fi 10" Speaker	.27
1		558V172H01		Pointer	.20
1		783V055H09		Shaft, tuning	.40
		751V513H05		Socket, 7 pin, center shield, 12AL5	.17
	6 3	751V513H07	Ø	Socket, 7 pin, 50C5	.20
	1 1	751V546H01		Socket, 7 pin, shielded, 12AV6, 12AU6 & 12BA6	.45
†		751V549H01		Socket, 7 pin, shielded, 12BA6	.45
1		751V549H02		Socket, 9 pin, shielded, 12AT7	.45
-		751V529H01		Socket, dial light	.80
		770V250H03	V-6795-3	Spring, dial drive	.10
		570V024H01		Speaker, 10" x 2 5/8"	10.12

### CHASSIS PARTS LIST

New Part	Ref. No.	Plan 1/a.	Equiv. Part No	Description	Location or Function	List Price
	RI	250V234A75	RC20AE475K	Resistor, 4.7 megohms, 1/W	FM RF grid	.05
	R2	250V226A81	RC20AE681K	Resistor, 680 ohms, 1/2W	FM RF screen decoup.	.17
	R3	250V231A03	RC20AE103K	Resistor, 10K ohms, 1/2W	AM converter cathode	.05
	R4	250V226A81	RC20AE681K	Resistor, 680 ohms, 1/W	FM osc. plate decoup.	.17
	R5	250V223A35	RC20AE335K	Resistor, 3.3 megohms, 1/1W	FM mixer grid	.12
	R6	250V221A03	RC20A/E103K	Resistor, 10K ohms, 1/W	FM osc. grid	.05
	R7	250V226A81	RC20AE681K	Resistor, 680 ohms, 1/W	FM mixer plate	.17
	R8	250V221A25	RC20AE125K	Resistor, 1.2 megohms, WW	12AU6 grid	.12
	R9	250V226A81	RC20AE681K	Resistor, 680 ohms, 1/1W	12AUG plate decoup.	.17
	RIO	250V224A70	RC20AE470K	Resistor, 47 ohms, 1/1W	IF amp. cathode	.05
	RII	250V226A81	RC20AE681K	Resistor, 680 ohms, 1/1W	IF amp. plate decoup.	.17
	R12	250V222A25	RC 0AE225M	Resistor, 2.2 megohms, 1/W, 20%	AVC filter	.06
	R13	250V214A74	RC20AE4741	Reuistor, 470K ohms, 1/2W, 5%	AVC filter	.22
	R14	1 250V222A23	RC20AE223K	Resistor, 22K ohms, 1/W	FM detector	.07
	R15	250V222A21	RC20AE221K	Resistor, 220 ohms, 1/W	FM audio coupling	.05
	R16	250V321A81	RC30AE181K	Resistor, 180 ohms, 1W	Audio output cathode	,12
	R17	250V226A83	RC20AE683K	Resistor, 68K ohms, 1/W	Tone compensation	.05
1	R18	251V020H15		Resistor, 1K ohms, 5W	B+ filter	.40
†	R19	251V023H20	1	Resistor, 22 ohms, glassohm	Rectifier protection	.40
†	R20	250V436A81	RC40AE681K	Resistor, 680 ohms, 2W	Pilot lamp	.25
†	R21	250V436A81	RC40AE681K	Resistor, 680 ohms, 2W	dropping	.25
	R22	270V039H01		Control, 500K ohms (includes SW2)	Volume	1.70
1	R23	270V039H07		Control, 1 megohm	Tone	.95
	R24	250V321A81	RC30AE181K	Resistor, 180 ohms, 1W	B+ filter	.12
	R25	250V224A70	RC20AE470K	Resistor, 47 ohms, 1/2W	12AU6 cathode bias	.05

	CHASSIS PARTS LIST Continued								
New Part	Ref. No.	Part No.	Equiv. Part No.	Description	Location of Function	Price			
†	C1	213V182H01		Capacitor, 10 mmf, 10%, mica	Impedance matching	.25			
†	C2	213V182H01		Capacitor, 10 mmf, 10%, mica	Impedance matching	.25			
†	C3	215V111A01		Capacitor, 100 mmf, ceramic	FM ant. coupling	.20			
1	C4	215V308H02		Capacitor, .001 mf, ceramic, GMV	FM RF amp. screen	.20			
	C5	215V102A22	R2CC62Y5Y222M	Capacitor, .0022 mf, ceramic , 20%	FM RF amp. screen	22			
t	C6	219V025H02		Capacitor, .0015 mf, feed thru	B+ RF amp.	.20			
†	C7	215V308H02		Capacitor, .001 mf, ceramic, GMV	FM osc. plate				
†	C8	215V300H45		Capacitor, 47 mmf, 10%, N750	Osc. grid	.20			
†	C9	217V011A09	1 1	Capacitor, 1 mmf, 10%, ceramic	Osc. injection	.20			
	C10	215V104A71	R2CC61Y5Y471M	Capacitor, 470 mmf, ceramic, 20%	FM RF coupling	.15			
t	C11	219V025H02		Capacitor, .0015 mf, feed thru	B+ FM mixer	.20			
Ť	C12	215V308H02		Capacitor, .001 mf, ceramic, GMV		.20			
Ť	C13	210V111H06			Filament by-pass	.20			
	C14	215V014A70	R1CC62G470K	Capacitor, .047 mf, 600 V, 20%	AM RF return	.25			
	C15	215V102A22	R2CC62Y5Y222M	Capacitor, 47 mmf, 10%, ceramic	12AU6 grid coupling	.17			
	C16	215V102A22		Capacitor, .0022 mf, ceramic, 20%	12AUG screen by-pass	.22			
+			R2CC62Y5Y222M	Capacitor, .0022 mf, ceramic, 20%	1F Amp screen by-pass	.22			
	C17	215V308H02		Capacitor, .001 mf, ceramic	FM detector	.20			
t	C18 C19	210V111H05		Capacitor, .05 mf	AVC filter	.27			
1		215V306H03		Capacitor, .01 mf, 1.4 KV, ceramic	Control bracket to Bt-	.35			
	C20	215V300H03		Capacitor, .01 mf, 1 KV, ceramic	Audio plate	.22			
†	C21A	218V033H01	early production	Capacitor, 60 mf, 150 V, elect.	B+ filter	2.10			
1	C21B		only	Capacitor, 80 mf, 150 V, elect.	B+ filter	2.10			
† , .	C22	215V308H04		Capacitor, .005 mf, ceramic	Tone	.20			
	C23	215V306H02		Capacitor, .01 mf, 1.4 KV, ceramic	Control bracket to B-	.35			
1	C25	210V214A73		Capacitor, .047 mf, 600 V	Line by-pass	.35			
†	C26	219V025H02		Capacitor, .0015 mf, feed thru	Filament FM tuner	.20			
† †	C27	219V025H02	1 1	Capacitor, .0015 mf, feed thru	Filament FM tuner	.20			
1	C28	215V308H04		Capacitor, .005 mf, ceramic	Filament by-pass	.20			
1	C29	215V308H04		Capacitor, .005 mf, ceramic	Filament by-pass	.20			
1	C30	215V308H04		Capacitor, .005 mf, ceramic	Filament by-pass	.20			
†	C31	215V308H04		Capacitor, .005 mf, ceramic	Filament by-pass	.20			
†	C32	218V012H13		Capacitor, 4 mf, electrolytic, 50 V	FM detector	1.15			
1	· C33	213V182H02		Capacitor, 47 mmf, mica, 20%	Line by-pass	.20			
†	C34	215V308H04		Capacitor, .005 mf, ceramic	Filament by-pass	.20			
†	C36	215V300H46		Capacitor, 8.2 mmf, ±.5%, N470	FM osc. grid	.20			
t	C37	330V016H01		Capacitor, variable	FM cuning	3.75			
†	C38	330V015H04		Capacitor, variable	AM tuning	3.10			
t i	C39	215V308H04		Capacitor, .005 mf, ceramic	IF amp. screen	.20			
† I	C40	215V308H04		Capacitor, .005 mf, ceramic	FM mixer plate	.20			
† I	C41	215V307H01	C	Trimmer, 1.5-6 mmf	FM oscillator	.35			
4	C42	215V308H04		Capacitor, .005 mf, ceramic	FM B+ decoupling	.20			
1	C43	218V022H01		Capacitor, 20 mf, electrolytic, 175 V	B+ filter				
1.1	C45	218V012H01				1.29			
1				Capacitor, 40 mf, electrolytic, 25 V	Audio output cathode	1.35			
÷	LI	230V065H01		Coil, antenna	FM RF input	.25			
1	L2 L3	230V056H17 230V056H02		Coil, RF (includes 820 ohm resistor)	FM mixer plate	40			
				Coil, RF reactor, 1.1 uh	Filament choke	35			
	L4	230V056H02	2201020100	Coil, RF reactor, 1.1 uh	Filament choke	-35			
	LS	V-9099-5	230V028H05	Coil, RF reactor, 2.7 uh	RF choke	.20			
100	L6	V-9099-5	230V028H05	Coil, RF reactor, 2.7 uh	RF choke	.20			
1	L7	787V087H01		Loop antenna assembly	AM loop	2.25			
	SW1	756V027H01		Switch	Selector	2.10			
1	SW2	270V039H01		Switch, push-pull (part of R22)	On-off	1.70			
	T1	235V039H01	V-9688	Transformer, 10.7 mc	FM mixer plate	1.80			
Ť	T2	235V037H02		Transformer, 10.7 mc	2nd FM IF	1.65			
1	T3	235V044H01		Transformer, 455 kc	1st AM IF	4.65			
+	T4	235V035H01		Transformer, 10.7 mc	FM detector	2.30			
†	T5	235V038H02		Transformer, 455 kc	2nd AM IF	1.50			
1	T6	230V045H01		Coil	RF FM plate	.90			
†	T7	230V045H02		Coil	FM oscillator	.90			
t	T8	230V044H01		Coil	AM oscillator	.90			
t	T9	430V051H01		Transformer	Audio output.	1.75			
t	Zi	219V019H01		Packaged circuit	Audio coupling	.95			
+	Z2	219V020H01		Packaged circuit	FM deemphasis	.75			
+	Z3				AM tweet filter	.45			
ť	X1	219V022H01		Packaged circuit	AC rectifier	2.75			
1	AL	295V012H01		Rectifier, selenium	AC rectifier	2.13			

† New Part number listed for the first time in Westinghouse Television or Rodio Service Information, Prices are subject to change without notice. All resistors are 10% unless otherwise specified.

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### SPECIFICATIONS

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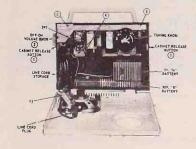
"A" Battery		.050 Amp.		
"B" Battery		.009 Amp.		

### CHASSIS REMOVAL (See figure 1)

1. Press in the two cabinet release buttons on either side of the receiver case. Open the case to expose the chassis and batteries.

2. Unsnap the battery cable assemblies from the  $^{\prime\prime}A^{\prime\prime}$  and  $^{\prime\prime}B^{\prime\prime}$  batteries.

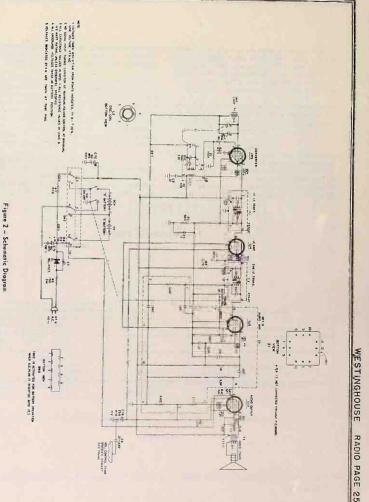
3. Remove the two self-tapping screws securing the AC receptable.



4. Remove the two self-tapping screws securing the chassis bracket to the top of the case.
5. Carefully side the chassis out from the receiver case. The oroff-volume control knob is captivated and thus remains in the case as its control shaft is pulled off the knob. Then servicing with the receiver connected to the AC power line use an isolation transformer between the receiver and the AC line. To replace the chassis tereate the above procedure. Be careful to correctly seat the chassis in the cabinet mounting grooves.

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Figure 1 View of cabinet case opened showing battery location and components to be removed for chassis removal.



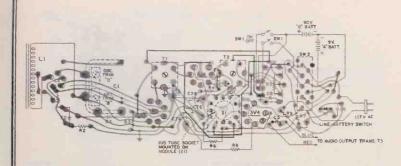
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RADIO PAGE

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WESTINGHOUSE



ALIGNMENT

While making the following adjustments, keep the volume control set at maximum output and the signal generator output attenuated to avoid AVC action.

Step	Connect Signal to:	Signal Generator Frequency	Radio Dial	Adjust for Maximum Output
1	Stator of ant. tuning cap. "A" thru a .01 mfd capacitor	455 kc	Min, cap.	Top and bottom slugs of T2 and T1 in order given
2		1625 kc	Min. cap.	Osc. trimmer "D"
3	Radiated sig.	1400 kc	1400 kc	Antenna trimmer **B**

It is recommended that a fibre aligning tool that snugly fits the slot in the powdered iron core be used to prevent chipping of the slot in the IF transformer.

### MODULE SERVICING INFORMATION

The Detector-First Audio Amplifier stage of this receiver has been modularized to provide greater reliability, compactness and ease of servicing. All the components of this stage, including the tube socket, are contained in this packaged circuit.

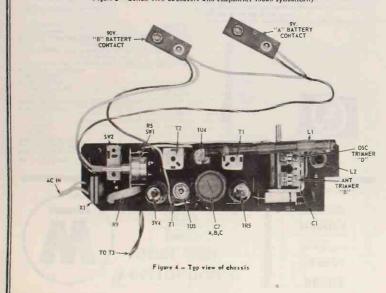
The module consists of five printed circuits, stacked, one on top of another. Each printed circuit is made up of a ceranic wafer with more than one component (capacitors or resistors) printed on the wafer. The five stacked wafers are connected together by reelver isser wires. At the top of the module, seven of the risers connect to the tube socket. At the bottom of the module the riser wires are extended so that they can be soldered directly into the printed circuit board.

Because the module is a complete unit, it is easier to service and replace than the individual components. A bottom view of the module is shown on the schematic diagram (figure 2). A key (notch) on one side of the module indicates pin #1 of the module. With exception of pin #9 all the tiste wires are soldered into the printed circuit chassis. The components contained in the module are shown on the schematic enclosed in dashed lines. The corresponding riser numbers are shown as they enter the circuit.

It is not recommended that the module itself be serviced. It is rather difficult to replace components within the module. If the trouble is localized to the module it is recommended that the module be replaced.

To replace a module cut the riser wires at the base of the module, where they enter the printed circuit board. Remove the remaining wires from the board with the soldering iron (low wattage type). Observing the correct position of the module key, install the new module in the holes in the board and solder in place.

Figure 3 - Bottom view of chassis with components shown symbolically



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### MODEL PARTS LIST

When ordering parts, specify part number, description of part and model number. Do not order by model number alone. Where applicable, prices include Federal Excise Tax.

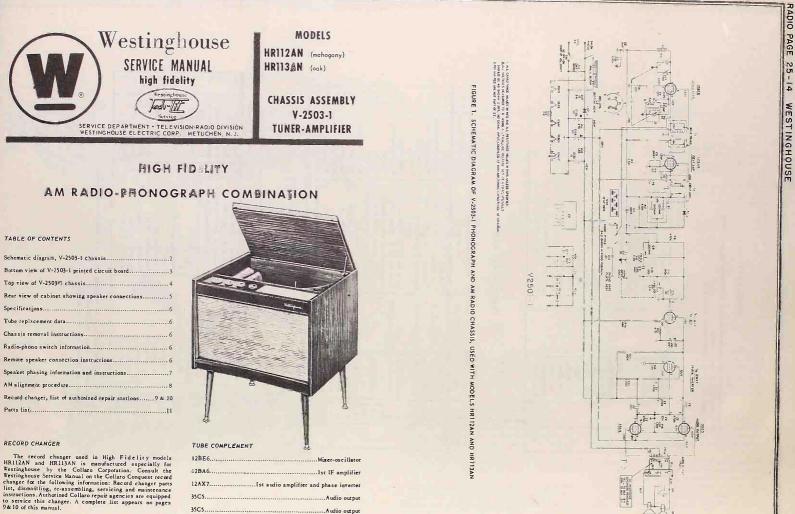
New Part Ref. No. List Part No. Equiv. Part No. Description Ŧ 770V565H01 Bracket, handle ,10 Bracket Assy., AC receptacle t 778V104H01 .45 t 559V027H01 Catch Assy., H-659P4 1.00 559V027H02 Catch Assy., H-660P4 1.00 † Cabinet Assy., Mocha & White, H-659P4 Cabinet Assy., Red & White, H-660P4 513V028H01 8.75 t 513V028H02 + 8.75 t 759V042H02 Cable, Batteries .70 Cord, AC power 751V009H01 .75 ÷ 558V159H01 Handle .65 558V166H01 Insignia .45 550V096H02 Knob, volume .55 + 550V088H02 Knob, tuning .75 t 770V520H01 Spring, hinge .10 751V513H04 Socket, 7 pin - 3V4 .17 Socket, 7 pin, shielded, 1U4, 1R5 Speaker, 4" PM (includes T3) 751V513H05 .17 t 570V050H01 6.00

### CHASSIS PARTS LIST

New P <b>art</b>	Ref. No.	Part No:	Equiv. Part No.	Description	Location or Function	List Price
†	C1	330V014H02		Capacitor, variable	Tuning	.40
	C2	215V111A03	₹2CC63Z5Z103P	Capacitor, .01 mf, ceramic GMV	Osc. plate by-pass	.20
†	C3	210V111H08		Capacitor, .15 mf, 200 V, tubular	IF Amp. grid bias	.35
	C4	215V112A22	R2CC62Z5Z222P	Capacitor, .0022 mf, ceramic, 500 V	IF Amp. screen by-pass	.17
	CS	215V308H04		Capacitor, .005 mf, ceramic, 500 V	Audio output	.20
	C6	215V111A03	R2CC63Z5Z103P	Capacitor, .01 mf, ceramic, 500 V	Rectifier by-pass	.20
†	(C7A)		(	Capacitor, 80 mf, 150 V, electrolytic	AC filter	2.45
†	C7B	218V025H18		Capacitor, 250 mf, 150 V, electrolytic	AC filter	2.45
†	CTC)			Capacitor, 60 mf, 150 V, electrolytic	AC filter	2.45
	C8	215V306H03		Capacitor, .01 mf, 1.4 kv	Bracket to ground	.35
	R1	250V231A04	RC20AE104M	Resistor, 100K ohms, 1/2W, 20%	Osc. grid	.05
	R2	250V234A73	RC20AE473J	Resistor, 47K ohms, 1/2W , 5%	Osc. screen	.17
	R3	250V226A81	RC20AE681K	Resistor, 680 ohms, ½W	IF grid bias	.17
	R4	250V234A72	RC20AE472J	Resistor, 4.7K ohms, 1/2W, 5%	IF Amp. plate	.12
†	R5	270V027H06		Control, 1 megohm (includes SW1)	Volume	1.95

New Part	Ref. No.	Part No.	Equiv. Part No.	Description	Location of Functio	List Price
24 C	RG	250V222A70	RC20AE270K	Resistor, 27 ohms, 1/W	3V4 filament	.0
	R7	250V228A21	RC20AE821K	Resistor, 820 ohms, 1/2W	B+ filter	.1
t	R8	251V026H01		Resistor, 2K ohms, 7W, ballast	Filament dropping	.70
†	R9	251V025H02		Resistor, 150 ohms, 3W, ballast	Selenium protection	.5
	R10	250V211A56	RCZOAE156J	Resistor, 15 megohms, 1/W, 5%	Audio output grid	.20
t	LI	310V041H01		Loop, iron-core	Antenna	1.8
t	L2	230V063H01		Coil	Oscillator	.9
t	SW1	270V027H06	().	Switch (includes R5)	On-off	1.9
÷.	SW2	756V030H01		Switch	AC battery	1.4
t	TI	2357043H01		Transformer, 455 kc	1st IF	1.6
t	T2	235V043H02		Transformer, 455 kc	2nd IF	1.6
t	T3	570V050H01		Transformer (includes speaker)	Audio output	6.0
t	XI	295V014H01	6	Rectifier, selenium	AC rectifier	2.0
÷	21	219V026H01		Module, used with 1U5	Audio citcuit	2.3

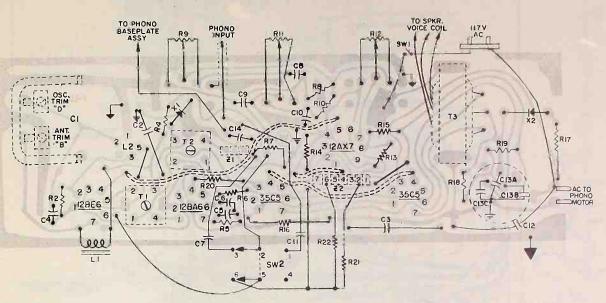
† New part listed for the first time in Westinghouse Television or Radio Service Information. Prices are subject to change without notice. All resistors are 10% miles otherwise specified.



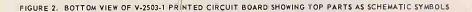
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CHASSIS V-2503-1

### WESTINGHOUSE RADIO PAGE 25-15



V2503-1



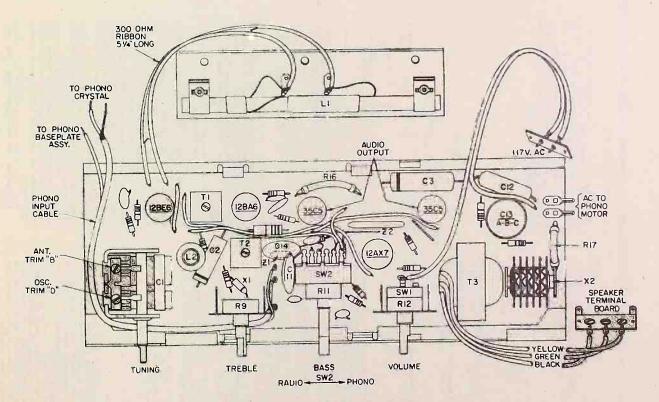
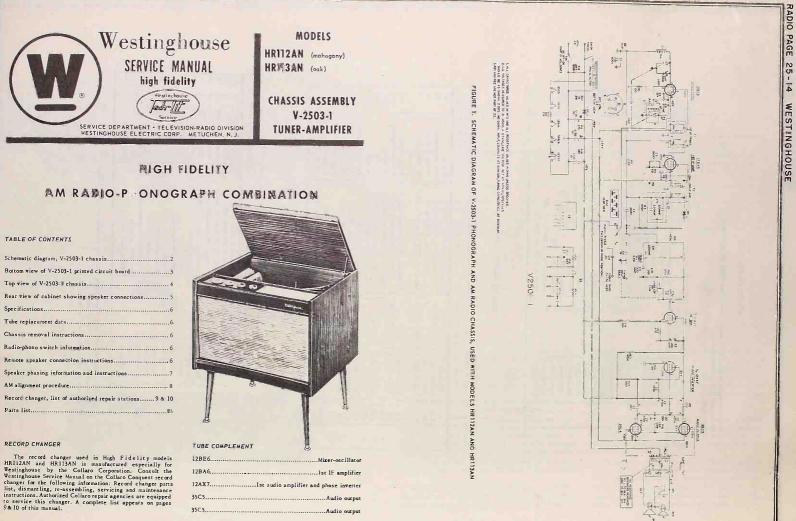


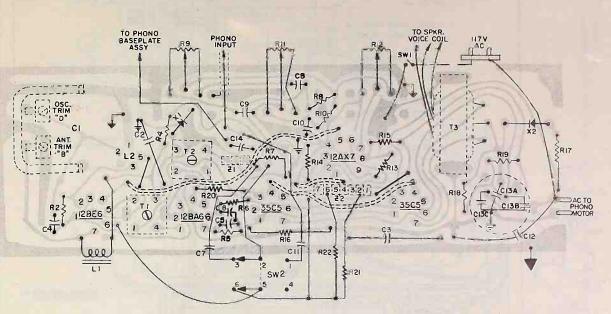
FIGURE 3. TOP VIEW OF V-2503-1 CHASSIS



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CHASSIS V-2503-1

## WESTINGHOUSE RADIO PAGE 25-15



V2503-1

FIGURE 2. BOTTOM VIEW OF V-2503-1 PRINTED CIRCUIT BOARD SHOWING TOP PARTS AS SCHEMATIC SYMBOLS

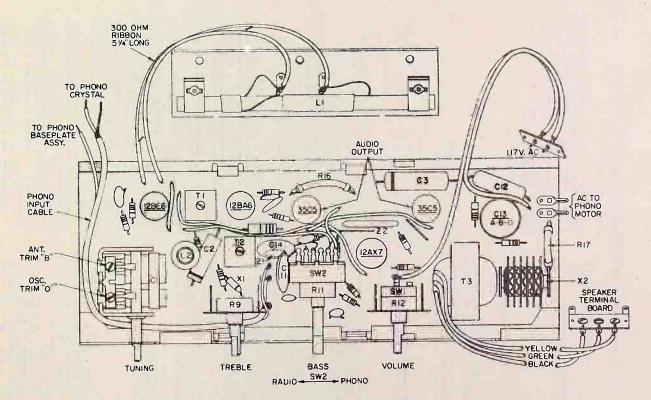


FIGURE 3. TOP VIEW OF V-2503-1 CHASSIS

RADIO PAGE 25-16 WESTINGHOUSE

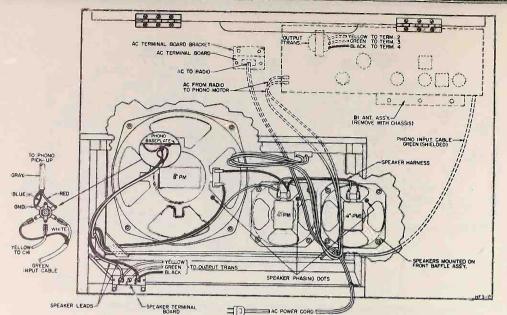
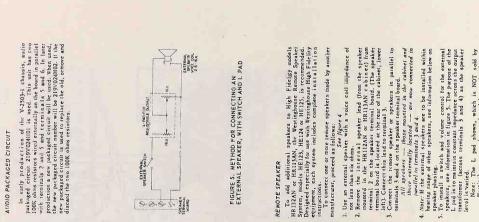


FIGURE 4. REAR VIEW OF CABINET, MODELS HR112AN AND HR113AN, SHOWING SPEAKER CONNECTIONS



RADIO-PHONO SWITCH

A RADIO-PHONO switch of novel design is used in the distribution and highly many service of a service is used to the site of the weat service of the pair where a postion. The BASS control is used to its characteristic is heard in the weat service (or the radio sound "When the BASS control is turned to its extreme clackwise weat the BASS control is turned to its extreme clackwise weat the BASS control is turned to its extreme clackwise weat the BASS control is turned to its extreme clackwise weat the BASS control is turned to its extreme clackwise is working (or the PHONO position. The BASS control will be a different of the PHONO position. The BASS control will be a different of the PBBS outcours will be a construction the different of the PBBS outcours will be a construction the different of the PBBS outcours and a sourter clack where different of the PBBS outcours and a based as the function of broades will also function of the transful and broades will be a based outcours and a sourter clack.

105 to 120 volts, 60 cycles AC motor in operation. . 70 watts

secondary) 12.8 ohms .6.4 ohms 

Out put impedance (across audio output transformer Terminals 2 and 4 Terminals 3 and 4

Audio output power Undistorted

AC power consumption Radio Radio Radio (amplifier) with phono

SPECIFICATIONS Operating voltage. Frequency response ......Flat from 100 to 15,000 cps, ±2 db at 1 watt output

.... Low frequency .....540 to 1600 kc .....Collaro Conquest

Frequency range of radio.....

tridge...., Electro-Voice No.0156-TUL (needle rot removable = entire cattridge must be replaced)

Phono carrridge Record Changer Speakers One 8'' PM. Two 4'' PM.

To check or replace tubes, remove the five wood screws which secure the cover back located inside the record changer well.

CHASSIS REMOVAL

TURE REPLACEMENT

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 Remore works is located using a stars.
 Remore works is located using a stars.

Most repair work can be performed at this times To test the equipment, connect the AC cord through an isolation transformer.

To add additional spaces to the fieldly models HH112AM or HH113AM, the Westinghese Remoded. System, models HH12A, HH12A or HH12A, streamended. Designed capticially for use with Westinghouse HH2A fieldly restriction.

To connect one or more remote speakers made by another manufacturer, proceed as follows:

1

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TO COMPLETELY REMOVE THE CHASSIS, CONTINUE SPECTAL COST: SI HAL COST HAL HAL HAL SI HAL COST HAL HAL SI HAL COST HAL SI HAL HAL HAL SI HAL COST HAL SI HAL HAL HAL HAL HAL HAL HAL SI HAL SI HAL HAL SI HA

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CHASSIS V-2503-1

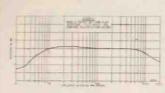


FIGURE 6. FREQUENCY RESPONSE CURVE

#### SPEAKER PHASING

When we are more speckers are used in the same lightening we have a series of the important consideration. There is a series of the same instant when adding the same instant we have a series of the same instant when adding the same instant we have a series of the same instant when adding the same series of the same instant we conserved in phase using the barrery method samgested under SPEAKER MAMDAG METHOD, or a "our and try" method may be made the same series in phase imports the sound, speakers we have used the same series in phase in phase sound speakers in the same series in the value out of the same series of the speakers. If even is the last imports the sound, speakers are method in proceed to speakers are used to be speakers. If even we had is not proceed to be phasers. If even method is not proceed to be sound, speakers are and the intere method is not proceed.

If two speakers are to be separated from each other by some disaster, a "rost and try" planing method may be destinable. As indicated in figure 7 the sound from one speaker, losself as a present distance from the Eistener, for this manual, is a distant later than sound from the figure speaker. For this manual, is a definitive to experiment. The this sector is later than be and the speaker of the sector is later.



## FIGURE 7. SPEAKER LOCATION AFFECTS

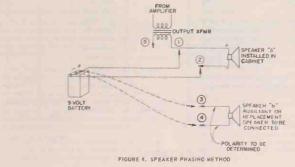
#### SPEAKER PHASING METHOD

#### (Figure 8)

The following method may be used when auxilliary speaker is to be added or a replacement speaker installed. This method involves the use of a nine volt battery.

- All terminal references mentioned here refer to those shown in figure 8
- 1. Disconnect one voice coil lead of speaker A.
- Connect the battery to speaker A, as shown by the solid-line battery leads. Note whether the speaker cone moves in or out when the battery is connected.
- 3. Remove the battery leads from the speaker A voice coil. Connect the battery leads to the speaker B voice coil is o that the cone of speaker B moves in the some direction or did the cone of speaker A. For example, if the speaker A cone had moved in, connect the speaker B voice coil to the battery so that the speaker B cone of so moves in, To a chieve this result, it may be necessary to concret terminal 3 to positive and 3 to negative.
- 4. Connect both speaker voice coils in perallel no that the conce of both speakers move in the some direction when the battery is connected to the paralleled voice coils. For example, if + connected to terminal 1 exused speaker A cone pull-in, connected to terminal 8 caused speaker B cone pull-in, connect terminals 1 and 3 together. (The remaining voice coil leads are then connected to together).
- 5. Connect the paralleled voice coils to the output transformer secondary, terminals 1 and 5.

The phasing technique described above may be adapted to the installation of more than one additional speaker.



AM ALIGNMENT Preliminary Instructions

1. Remove chassis as described under CHASSIS REMOVAL.

- Use an isolation transformer between the AC input of the equipment and the AC source. Connect AC and turn on equipment.
- During slignment, leave the LOUDNESS control set at maximum volume. The signal generator output level should be kept sufficiently attenuated to avoid AVC action.
- 4. Turn the BASS control to its extreme counterclockwise position so that SW 2 is witched to the RADIO position. Then, turn the BASS control to sproximately mid-mage. (The equipment will remain in the RADIO position, The action of this which and control is explained under RADIO-PHONO SWITCH in this manual).
- Connect a 12 or 13 ohm, 4 watt resistor between terminals 2 and 4 on the speaker terminal board.
- 6. Use a non-metallic alignment tool which fits snugly into the adjustment slot. A properly fitting alignment tool prevents damage to the slotted iron core.

#### AM ALIGNMENT CHART

#### Connect VTVM ocross terminals 2 and 4

Step	Connect Signal Generator Output To:	Sig. Gen. Freq.	Radio Dial Setting	Adjust Following for Maximum VTVM Reading
1	Stator of antenna tuning capacitor (A) thru a 200 mmf capacitor.	455 kc	Minimum capacity	Top slug of T2. Bottom slug of T2. Top slug of T1. Bottom slug of T1.
2		1625 kc	Minimum capacity	Oscillator trimmer (D)
3	Disconnect signal generator. Leave signal generator ourput lead several fect from receiver antenna so that radiated signal is picked up.	1400 kc	1400 kc	Antenna trimmer (B).

CHASSIS V-2503-1

## MODEL PARTS

## HR112AN - mabogany

HR113AN - oak

New Part	Ref. No.	Part No.	Ēquiv. Part No.	Description	List Price
+		559V028H01		Baffle and grille cloth assembly	5.95
<i>+</i>		516V053H01		Cabinet, mahogany, HR112AN	35.80
+		516V053H02		Cabinet, oak, HR113AN	36.75
7		770V415H01	V-15765-1		
,		751V008H01	V-13703-1	Contact, male, AC to phono	.10
4	1 1	751V008H01 768V080H05		Cord, AC power	.85
		768V080H05		Hinge, but, HR112AN	.57
				Hinge, but, HR113AN	.57
+		550V084H01		Knob, on-off-volume, base and treble	.45
- 1		550V030H01		Knob, tuning	.50
		550V019H01		Knob, dial	.45
+		518V001H11		Leg, HR112AN	2.00
+		518V001H12		Leg, HR113AN	2.00
1		754V003A01	the fact that is	Receptacle, power cord	.17
		751V513H01		Socket, 7 pin molded 35C5	.17
+		751V551H01		Socket, 9 pin, 12AX7	.20
1		751V513H05		Socket, 7 pin, 12BE6 and 12BA6	.17
4	1	570V048H01		Speaker, 8 inch PM	9.50
+		570V049H01		Speaker, 4 inch PM	3.95
		770V454H04		Support, lid, HR 112AN	.90
		770V454H03		Support, lid, HR113AN	1.07
+		558V126H03		Trim, plastic angle	.65
+		558V165H01	1	Ttim, handle	2.20

## CHASSIS PARTS

#### V-2503-1 cbassis

New Part	Ref. No.	Paris New	Equiv. Part No.	Description	Function	List Price
+	CI	330V010H02		Capacitor, variable two gang	Turkey,	
Ť	C1 C2				Tuning	3.75
		210V054A73		Capacitor, .047 mf 400V	AVC	.22
· 3	C3	210V214A73		Capacitor, .047 mf 600V	B- to chassis	.35
	C4	215V014A70	RICC62R2G470K	Capacitor, disc, 47 mmf, 20%	Oscillator grid	.17
	CS	215V114A72	R2CC62Z5Z472P	Capacitor, disc .0047 mf	IF cathode	.17
	C6	215V103A32		Capacitor, disc, 3300 mmf	IF neutralizing	.27
	C7	215V114A72	R2CC62Z5Z472P	Capacitor, disc .0047 mf	Detector coupling	.17
	C8	215V102A21	R2CC61Y5Y221M	Capacitor, disc, 220 mmf	Treble control	. 22
4	C9	215V103A31		Capacitor, disc, 330 mmf	Treble control	.20
. 9	C10	215V101A02	R2CC62Y5Y102M	Capacitor, disc 1000 mmf	Bass control,	.22
	C11	215V201A03		Capacitor, disc .01 mf 1.4 KV	Phono coupling	.3
	C12	210V024A73	RCP10W6473M	Capacitor, molded .047 mf 600V	Across AC line	. 22

CHASSIS PARTS (Con'f.)

V-2503-1 chassis

V-12	503-1 cha.					
Neu Parl	1	Part No.	Equiv. Part No.	Description	Function	List Price
+ + +	C-13A C-13B C-13C	2181025117	E.	Capacitor, electrolytic 80-60-10 mf 150V	Filter	2.50
	C14	215V201A03		Capacitor, .01 mf disc, 1.4 KV	Phono base plate	.35
4	LI	310V030H01		Loop antenna, iron core		2.10
+	1.2	230V061H01		Coil, oscillator		.90
			1	ed at 1/2 watt, 10% unless otherwise noted		*
	RĄ	250V231A01	RC20AE101M	Resistor, 100 ohms	Oscillator cathode	.05
	R2	250V222A23	RC20AE223K	Resistor, 22K ohms	Oscillator grid	.07
	R3	250V224A70	RC20AE470K	Resistor, 47 ohms	Oscillator grid	.05
	R4	250V223A35	RC20AE335K	Resistor, 3.3 megohms	AVC	.12
	R5	250V226A80	RC20AE680K	Resistor, 68 ohms	IF cathode	.04
	R6	250V221A02	RC20AE102K	Resistor, 1K ohms	12BA6 screen	.12
	R7	250V224A74	RC20AE474K	Resistor, 470K ohms	Diode load	.05
	R8	250V224A74	RC20AE474K	Resistor, 470K ohm3	Tone compensation	.05
4	R9	270V027H07		Control, 3.3 megohms	Treble	1.10
	R10	250V221A84	RC20AE184K	Resistor, 180K ohms	Bass compensation	.05
4	RIU	270V052H01		Control, 3.3 megohms, 1/2W, includes SW2	Bass	1 1
7	R12	270V027H08		Control, 1 megohms, includes SW1	Volume	2.00
	R13	250V224A71	RC20AE471K	Resistor, 470 ohms	12AX7	1.63
	R14	250V221A82	RC20AE182K	Resistor, 1.8K ohms		.12
	R15	250V226A83	RC20AE683K	Resistor, 68K ohms	12AX7 cathode	.05
4	R16	250V023H19	NGLONEOU JR		12AX7 cathode	.05
+	R17	251V023H13	V-6067-12	Resistor, 120 ohms, 1:5W, 10% glasohm	Cathode output	.40
1	R18	250V222A71	RC20AE271K	Resistor, 15 ohms, 2W, glasohm	Selenium protection	.27
	R19	250V221A82	1	Resistor, 270 ohms	AC filter	.10
+	R20	250V221A82	RC20AE182K	Resistor, 1.8K ohms	AC filter	.05
-	1	and the second se	D.C.D. T. LOUK	Resistor, 68 ohms, 2W 10%	Filament series	-35
	R21	250V221A04	RC20AE104K	Resistor, 100K ohms	Plate load	.12
	R22	250V221A04	RC20AE104K	Resistor, 100K ohms	Plate load	-12
4	SW1	270V027H08		Switch, on-off, part of R12		1.65
4	SW2	270V052H01		Switch, radio-phono, part of R11		2.00
4	Ť1	235V042H01		Transformer, 1st IF (455 KC)		1.50
4	T2	235V042H02		Transformer, 2nd IF (455KC)		1.50
4	T3	430V058H01		Transformer, audio		3.20
	X1	296V002H01		Crystal, diode		1.25
4	X2	295V012H02		Rectifier, selenium, 150 ma		2.85
4	ZI	2190033H02		Packaged circuit, detector filges		1.75
+	Z2	219V024H01		Packaged circuit, audio	0	1.75

4 New part number listed for the first time in Westinghouse television or radio service information.

## CJohn F. Rider

RADIO PAGE 25-18 WESTINGHOUSE



#### SPECIFICATIONS

Progamney Lange
Intermediate Frequency
Tube Complegent
1 IIIS Converter
1 Hud L.F. Amplifier
1 105 Detector AVC and 1st Audio Amplifier
1 5V4 Audio Ourpur
Power Consumption AC Operation
Audio Power Output (AC Operation)
Maximum
Undistorted
Spenier
Power Supply
Battery Operation
1 "A" Battery (9V) Everendy #276, Bargens #D6, Ray-O-Vac
#1603, General #88
1 "B" Battery (90V) Everendy \$479, Burgess +P60, Ray-O-
Vac #214, General #176
Current Consemption (Battery Operation)
"A" Bactery
"B" Battery

#### MODULE SERVICING INFORMATION

The Detector-First Audio Amplifier stage of this receiver has been modularized to provide greater reliability, compactness and case of servicing. All the components of this stage, including the tube socket, are contained in this packaged circuiz.

The module consists of five printed circuits, stacked, one on top of another. Each printed circuit is made up of a ceramic wafer with more than one component (capacitors or resistors) printed on the water. The five stacked wafers are connected together by swelve riser wires. At the top of the module, seven of the risers connect to the tube socket. At the bortom of the module the riser wires are extended so that they can be soldered directly into the printed circuit board.

Because the module is a complete unit, it is easier to service and replace than the individual components. A bottom view of the module is shown on the schematic diagram



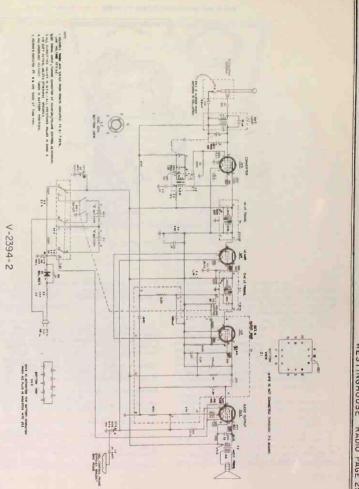
Figure 1 - Sche

Die

(figure 1.). A key (notch) on one side of the module indicates pin #1 of the module. With exception of pin #9 all the riser wires are soldered into the printed circuit chassis. The components contained in the module are shown on the schematic enclosed in dashed lines. The corresponding riser numbers are shown as they enter the circuit.

It is not recommended that the module itself be serviced. It is rather difficult to replace components within the module. If the trouble is localized to the module it is recommended that the module be replaced.

To replace a module cut the riser wires at the base of the module, where they enter the printed circuit board. Remove the remaining wires from the board with the soldering iron (low wattage type). Observing the correct position of the module key, install the new module in the holes in the board and solder in place.



RADIO PAGE 25-20

WEST INGHOUSE

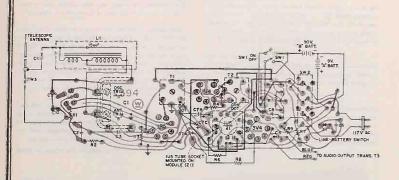


Figure 2 - Bottom view of chassis with components shown symbolically

#### CHASSIS REMOVAL

- Press in the two cabinet release buttons on either side of the receiver case. Open the case to expose the chassis and batteries.
- 2. Unsnap the battery cable assemblies from the  ${}^{\prime\prime}A^{\prime\prime}$  and  ${}^{\prime\prime}B^{\prime\prime}$  batteries.
- Remove the two self-tapping screws securing the AC receptacle.
- Disengage the volume control knob from the control shaft. This knob is captivated and thus will remain in the case when the chassis is removed.
- 5. Remove the battery leads from under the two retaining bands.
- Unsolder the wire to the telescoping antenna. Unsolder the loop antenna end of capacitor C11 (.001 mf).
- 7. Remove the two self-tapping screws securing the chassis bracket to the top of the case.

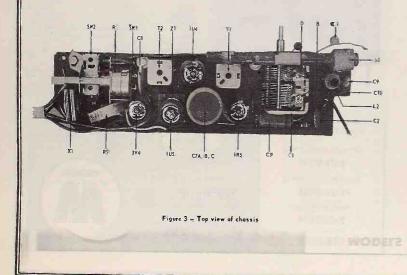
8. Carefully slide the chassis out from the receiver concer-When servicing, with the receiver connected to the AC power line, use an isolation transformer between the AC line and the receiver. To replace the chassis, reverse the above procedure. Be careful to correctly seat the chassis in the cabinet mounting grooves.

#### ANTENNA INFORMATION

This receiver employs two antennas. One is a horizontal ferrite-core and the other a vertical telescoping antenna. The telescoping antenna has 5 sections and when fully extended is 38" long. The telescoping antenna is inductively and capacitively coupled to the grid of the RF amplifier. It is connected to a primary winding, wound on the ferrite rod antenna and tightly coupled to the tuned secondary. The high ends of the windings are coupled together through a 15 mm capacitor. In this manner a constant high impedance is presented to the telescoping antenna over the endire AM band. For low AM frequencies the signal is predominantly coupled inductively while high AM frequencies are primarily coupled inductively while high AM frequencies are primarily

When extended, the telescoping antenns represents 15 mmf capacity to earth ground. In the recessed position this is reduced to approximately 7 mmf. Hence, to maintain a constant capacity, an 8.2 mmf capacitor is placed in shour with the antenna, in the recessed position (SW3). The teles scoping antenna should therefore be used in either the fully extended or fully recessed positions for optimum results, not in some intermediate position.

The telescoping antenna serves as a non-directional pickup. This means that the radio can be rotated to any position without encountering nulls (dead spots) as usually found with conventional loop or ferrite-core antennas. In areas of high ambient electrical noise level, it may be found advantageous to keep the telescoping antenna in its fully recessed position for best performance.



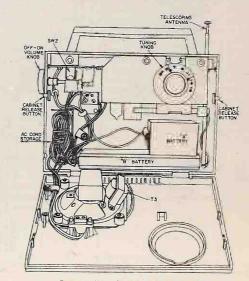


Figure 4 - View of receiver with case opened

**OJohn F.** Rider

## ALIGNMENT

While making the following adjustments, keep the volume control set at maximum output and the signal generator output attenuated to avoid AVC action. If the receiver is powered from the 117 volt AC line, it is recommended that an isolation transformer be used between the receiver and the AC line.

Step	Connect Signal to:	Signal Generator Frequency	Radio Dial	Adjust for Maximum Output
1	Stator of tuning capacitor (F) through a .01 mf capacitor.	455KC	Minimum capacity	Top and bottom slugs of T2 & T1 in order given
2	Capacitor Cll as shown in Figure 5 through a 15 mmf capacitor.	1625KC	Minimum capacity	Oscillator trimmer "C"
3	Same as step #2	1400KC	1400KC	RF trimmer "F" and antenna trimmer "B"
4	Same as step #2	600KC	600KC	L2
5	Repeat steps 2, 3 & 4 until no fu	ther change is noted		

It is recommended that a fibre aligning tool, that snugly fits the slot in the powdered iron core, be used, to prevent chipping of the slot in the IF transformers and coils.

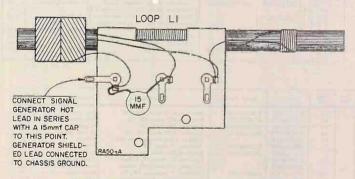


Figure 5 - Signal generator connection in step 2 of alignment procedure

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#### MODEL PARTS LIST

When ordering parts, specify part number, description of part and model number. Do not order by model number alone.

Where applicable, prices include Federal Excise Tax.

New Part	Ref. No.	Part No.	Equiv. Part No.	Description	List Price
		318V004H01		Antenna, telescoping	3.00
- 1		770V565H01		Bracket, handle	.10
		778V104H01		Bracket assy., AC receptacle	.45
†		513V028H03		Cabinet, H662P4, Charcoal & White	10.00
t (		513V028H04		Cabinet, H663P4, Spruce Green & White	10.00
t		513V028H05		Cabinet, H664P4, Lemon Yellow & White	10.00
		759V042H02		Cable, batteries	.70
F		\$59V027H03		Catch assy., H662P4	1.00
t		559V027H04		Catch assy., H663P4	1.00
r		559V027H05		Catch assy., H664P4	1.00
		770V588H01		Contact, antenna (secured to inside of cabinet)	.20
1		751 V009H01		Cord, AC power	.75
1		\$55V028H01		Escutcheon	.85
		558V159H01		Handle	.65
1		558V166H01		Insignia	.45
		550V096H01		Knob, volume	.55
		550V087H01		Knob, dial	.55
		\$50V088H01		Knob, tuning	1.00
		558V162H03		Nameplate, handle	.85
- 1		768V044H09		Nut (captivates dial knob)	.05
- 1	1	783V079H01		Nut, brass sleeve (mounts relescoping antenna)	.10
		751V513H04		Socket, 7 pin (3V4)	.17
		751V513H05		Socket, 7 pin (1R5 & 1U4)	.17
		570V050H01		Speaker, 4" PM (includes T3)	6.00
		770V520H01		Spring, hinge	.10
		763V000H95		Washer (captivates volume knob)	.05

## CHASSIS PARTS LIST

Resistors are 1/4 watt, 10% unless otherwise specified.

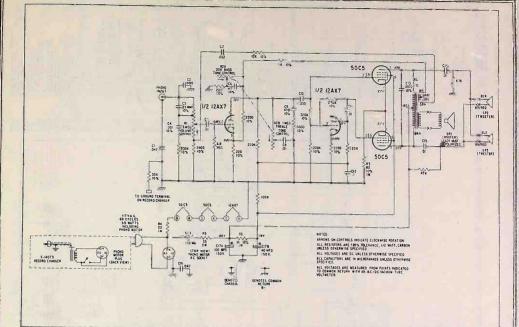
New Part	Ref. No.	Part No.	Equiv. Part No.	Description	Location or Function	List Price
†	CI	330V008H03		Capacitor, variable	Tuning	3.75
	C2	215V111A03	R2CC63Z5Z103P	Capacitor, .01 mf, ceramic GMV	Osc. plate by-pass	.20
	C3	210V111H08		Capacitor, .15 mf, 200 V, tubular	IF Amp. grid bias	.35
	C4	215V112A22	R2CC62Z5Z222P	Capacitor, .0022 ml, ceramic, 500 V	IF Amp. screen	.17
	C5	215V308H04		Capacitor, .005 mf, ceramic, 500 V	Audio output	.20
	C6	215V111A03	R2CC63Z5Z103P	Capacitor, .01 mf, ceramic, 500 V	Rectifier by-pass	.20
	C7A )			(Capacitor, 80 mf, 150 V, electrolytic)		
	C7B }	218V025H18		Capacitor, 250 mf, 150 V, electrolytic	AC filter	2.45
	C7C )			Capacitor, 60 mf, 150 V, electrolytic		
	C8	215V306H03	and the second se	Capacitor, .01 mf, 1.4 kv	Bracket to ground	.35
+	C9	215V300H48		Capacitor, .001 mf	Osc. padder	.20
	C10	215V300H46	the second states of	Capacitor, 8.2 mmf	Ant. loop	.20
	C11	215V111A02	R2CC61Z5Z102P	Capacitor, .001 mf	Ant. loop	.13

New Part	Ref. No.	Part No.	Equiv. Part No.	Description	Location or Function	List
	R1	250V231A04	RC20AE104M	Resistor, 100K ohms, %W, 20%	Osc. grid	.05
	R2	250V234A73	RC20AE473]	Resistor, 47K ohms, 1/W, 5%	Osc. screen	.17
	R3	250V226A81	RC20AE681K	Resistor, 680 ohms, 1/1	IF grid bias	.17
- 1	R4	250V234A72	RC20AE4721	Resistor, 4.7K ohms, 1/W, 5%	IF Amp. plate	.12
1	R5	270V027H06		Control, 1 megohm (includes SW1)	Volume	1.95
	R6	250V222A70	RC20AE270K	Resistor, 27 ohms, 5W	3V4 filament	.06
	R7	250V228A21	RC20AE821K	Resistor, 820 ohms, 1/W	B+ filter	.12
	R8	251V026H01		Resistor, 2K ohms, 7W, ballast	Filament dropping	.70
1	R9	251 V020H55		Resistor, 150 ohms, 5W, ballast	Selenium protection	.35
	R10	250V211A56	RC20AE1561	Resistor, 15 megohms, 1/W, 5%	Audio output grid	.20
	LI	310V031H01		Loop, (includes 15 mmf capacitor)	Antenne	2.00
1	1.2	230V067H01		Coil	Oscillator	1.20
	SW1	270V027H06		Switch, (includes R5)	On-off	1.95
	SW2	756V030H01		Switch	AC battery	1.45
	SW3	318V004H01		Switch, (includes telescoping antenna)		3.00
	T1	235V043H01		Transformer, 455 kc	1st IF	1.60
	T2	235V043H02		Transformer, 455 kc	2nd IF	1.60
	T3	570V050H01		Transformer, (includes speaker)	Audio output	6.00
	XI	295V014H01		Rectifier, selenium	AC rectilier	2.00
	Z1	219V026H01		Module, used with 1U5	Audio circuit	2.30

† New pure listed for the first time in Vestinghouse Television or Radio Service Information. Prices are subject to change without notice.

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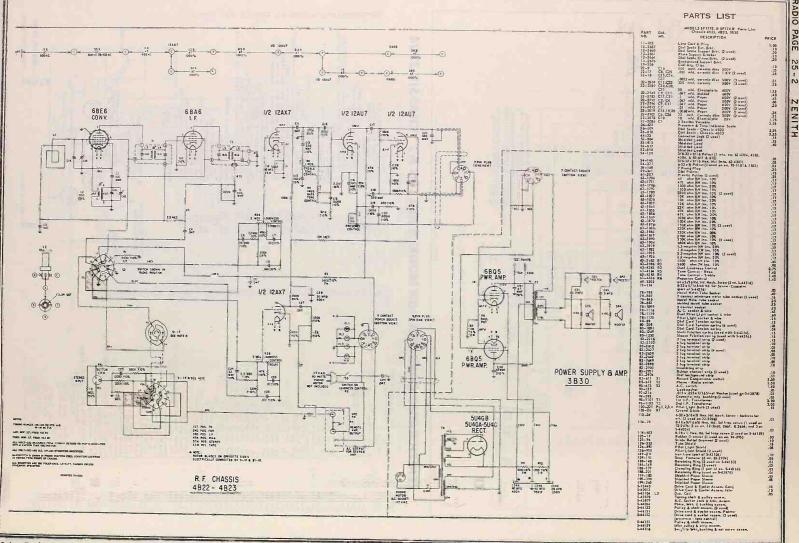
## ZENITH RADIO PAGE 25 -1



# ZENITH RADIO CORPORATION MODELS HE110G & J CHASSIS 3204

ART DIA.	3ZD4 CHASSIS PARTS			
1-103	DESCRIPTION Line Cord	PRICE		
2-3 C5,8,11,		1.00	40-189 Hinge (2 part of 14-2405 G & J)	
14,15 2-11 C10	.01 mfd. ceramic disc. 1KV (5 used)	.30	46-1318 Knob - Volume & Tone HF110J 46-2001 Knob - Volume & Tone HF110G	
2-11 C10 2-12 C2	.0033 mfd.ceramic disc. 500V .0015 mfd.ceramic disc. 500V	25 .25 .25 .35 .60 .35 .25 .30 .25	49-795 SP1 75' P.M. Speaker	
2-16 C9	470 mmf, ceromic disc. 800V	.25	54-10 8-32 x 1/2 Hex. Nut (3 part of 14-2405 G & J)	4-923 & 924) 14-2405 G & J)
-17 C4	.001 mfd. ceramic disc. 1KV	25	34-424 8-32 × 11/32 Hex, Poinut (3 mt. 49-795)	
-2765 C6	.1 mfd. molded - 200V .47 mfd. tubular - 200V	.35	70-215 6x3/8 Phils, Rd, Hd, Wood Screw [6 ured on ]	4 972 8 074)
-2792 C1. 16	.47 mfd. tubular - 200 V .047 mfd. tubular - 200 V (2 used)	.60	0×7/8 Phils, Oval Hd. Wood Screw (4 used on	14-2405 G& I)
-2807 C7	.022 mfd. tubular - 200V	.35	83-703 Armite strip (2 used)	
-2839 C13	.0022 mfd, tubular - 600 V 33 mmf, ceramic disc - 500 V	.30		
-2864 CI7A. B	Electrolytic 40/150V, 100/150V	.25	83-2535 Phono Shipping Strip (2 used) 83-2761 Phono Shipping Strip	
-25	Phono jock	2.50 .25 .01	86-254 Terminal (4 used)	
-139	3/8-32 x 9/16 hex painut (1 mis. ea. 63-4003 & 4004)	.01	93-1173 6 Finishing Washer (1 used on ea. 70-239) 93-1260 Fibre Washer (2 port of S-14083)	
-965 R6	6-32 x 5/16 hex poinut (used on 114-510) 1000 ohm 1W ins. 10%	.01	97-511 Handle Stud (2 part of 14-2405 G & 1)	
-1757	220 ohm 55W (ns. 10% (2 used)	.25	1/2-/88 8-32 x 1-1/8 Swedge Hd. Mach. Screw (3 port of	24-2405G & J)
-1785	220 ohm 5W ins. 10% (2 used) 1000 ohm 5W ins. 10% (2	.17		
-1806	2200 ohm ½W Ins. 10% 3300 ohm ½W Ins. 10%	.17	114-329 6-18x 3/8 x 1/4 Hex. Hd. Self Ton Screw (2 mt an	298) . S-23829)
-1810	3900 ohm WW ins. 10%	.17	114-478 10-32 × // Hex Slot Hd. Mach. Screw - Flat washer	att.
-1817	5600 ohm 1/3W ins. 10%	.17	(4 used on 3Z04)	
-1827	10K ohm ½W ins. 10% 33K ohm ½W ins. 10%	.17	156-45 Cover Latch (2 part of 14-24051)	3
-1856	47K ohm ½W Ins. 10% 47K ohm ½W Ins. 20% (2 used)	.17	159 – 94 Plug Button (4 used on 14-2405G & J)	
-1870	100K ohm 1/2W Ins. 20%	.17	159=95 Plue Butten Screen (2 used on 14-2405 G & I)	
-1883	220K ohm ½W Ins. 10% (2 used)	.17	166-114 Plastic Bumper (4 part of 14-2405 G & J) 188-102 Knob Retaining Ring (1 part of ea. S-43478, 434	70 (1)0(0
- 1887	220K ohm ½W ins. 20% (2 used) 270K ohm ½W ins. 10% 330K ohm ½W ins. 10%	.17	44127)	19, 44120 6
-1890	330K phm %W ins. 10%	.17	188-195 Retaining Ring (2 part of S-14083) 202-1362 Instruction Book	
-1947 -31.97 R4	6.8 megohm 1/3W Ins. 20%	.17	202-1362 Instruction Book S-14083 Record Changer	
-3636 R3	22 ohm 1W ins. 20% 82 ohm 1W ins. 10%	.25	S-23829 SP2, 3 Tweeter Speaker (2 used)	- 1
-3637 R2A, B	I megohim treble - 20K bass	.25	S-41437 45 RPM Record Adapter	2.
-3687 R1	3 megohim volume control		S-42308 Cartridge Holder (part of S-14083) S-43478 Kook & Ring Assem	1.
-3643 R5 -275	33 ohm 2W Ins. 20%	.34	S-43478 Knob & Ring Assem. S-43479 Knob & Ring Assem.	
-4.02	Electrolytic socket 4 Contect socket	.05	S-44126 Knob Ring Assem, Tone HE110G	
-810	7 Contact miniature tube sacket (1 mts en 50/5)	.15	5-44127 Knob & Ring Assem. Dummy HF110G	
-846	y r in minioture tube socket (mts. 12AX7)	25		
-2115	Insulating strip 7 Lug terminal strip		PHONO MOTOR	
-2216	7 Lug terminal strip	.05	AND SOMET POST	
-23 07	4 Lug terminal strip	10		
-2454 -2494	4 Lug terminal strip (2 used) Insulating strip	.10		
- 2530	Armite strip	.05 .10	TO RECORD CHANGER TO 7 V2" SPEAKER	N
-2628	Lug terminal strip	.05	VOICE COIL	( here
-2635 -254	5 Lug terminal strip	.05	TERMINALS	~
-2	Terminal (part of S-24248) Brass washer (2 mt. 95-1481)	.05		A.C. CORD
1481 71	Output transformer	.01	PHONO JACK TWEETER BLK SPEAKER WH/RED SPEAKER WH/RED SPEAKER	
-510 -96	6-32 x 1-5/8 x 1/2 hex hd. mach. screw (mts. 212-18)	.03	WH/RED WH/RED #2	
-18 SE1	Strain rellef grammet Selenjum rectifier	.10		
1248	Wire & terminal assem.	2.35	(50C5) (50C5)	
	MODELS HEIIO, G & J CABINET PARTS		(3003)	
RT DIA.	Using Chassis 3ZD4			
NO.	DESCRIPTION	PRICE		
2405G	Table Cabinet - Model HF110G			
2405J	Toble Cohinet - Model HE1101			
298	Packing Carlon Mounting Clip (mis. 5-41437)	20	6 John of	-
923		.20		- l
924	Chassis Cover - Model HF110G			
211	Cabinet Handle (part of 14-2405G)		i i i i i i i i i i i i i i i i i i i	
157	Cabinet Handle (part of 14-2405J) Lid Support Hinge (part of 14-2405, G & J)	1.30	H BA	SS TONE CONTROL
			U-LOUDNESS CONTROL	





**OJohn F. Rider** 

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	PARTS LIST	
Cutorie in it.	PARTS LIST PARTS LIST Particle and particle and particl	
12-2187	Owsels mg, linkt, (3 used)	.10
22-2376 C30,C31	47 mmf. ceromic disc. 500V (2 used) Electrolytic 20/350 40/450 40/450	10,225,069,007,77,74,42
54-382 58-172	Fuse receptor in nut 9 prong plug	.06
62-17 63-1780	Fuse recepted = 1000 ehm 5% ins. 20% (2 used)	.12
63-1912 63-3988 R10	1 megsh m/jW ins. 20% (2 used) 1200 ohm 2W ins. 10%	17
63-4387 R9 63-4397 R7	1500 ehm 3W 10% 135 ehm 2W 5%	.45
63-4402 R8 78-251	Belence control 2 context socket	1.40
78-939 78-1043	9 contact molded tabe socker (2 used) 7 contact socket	80000000000000000000000000000000000000
83-1475 83-2639	Armite strip 3 lug terminol strip (2 used)	.03
93-1170 91-1180	3 lug terminel strip Rubber wesher	.108.03
95-1624 T4 95-1625 T3	Power Transformer Audia output Transformer	.05
202-3790 114-78	Lobal (Sphr. Lood cannections) 8-18x5/16%Hes. hd. self-tep screw (2 ml. 95-1625	1 .03
125-85	(4 nt, 95-1624) Rubber Grammat	.05
136-36 F1 237-1	Fuse - 2 amp. Coble Rev. clip	.05 .05 .10
MODEL SFITAR (U.	Ing Chessis 4822)	
12-2440 14-1299 9-279 9-279 22-2945 40-195 40-213 46-2050 46-2050 46-2050 46-2050 49-853 572 49-853 572 49-853 572 49-853 572 49-853 572 49-853 572 572 572 572 572 572 572 572	Indicator light mig. brkt. Contale cablest	.05
16-1469	Pocking corron mounting clip (mis. 5-43992)	.20
22-2945	3 mld. electrolytic 30V (i part of ee. 49-8466856) Lid Hinge (2 part of 14-2426R)	.20 1.25 .60
46-2080	Knob (Rodio Phono-Record Compensator) Valuma control i onthe (remote)	
46-2097 49-846 SP1	Yoluma control knob 3%" PM reamers specker	7.00
49-846 SP1 49-852 SP3 49-853 SP4 49-856 SP2	12" PM speaker 12" PM speaker	7.00
54-10 54-34	8-32 x % Hex. nut (8 part of 14-2426R) -32 x % Hex. nut (8 part of 14-2426R)	
54-312	ond 4 ml, 49-856) Speed nut (2 port of 14-2426R)	.03 .03 .03
54-312 54-424 57-2490 57-2521 57-2561 78-1121 80-1003 80-1233 82 745	8-32 x11/32 Hex. Painer (4 mt. eo. 49-852 & 853) Emblem Piete (part of 14-2426R)	.00
57-2561	None Plate (sert of 14-2426R)	1.00
80-1003 80-1233	Knob Ret. spring (  part of at. 5-44167) Grystol Ret. spring (4 used)	1.866.992.888.992.991
83-765 83-1475	Armite smip (2 used) Armite smip (2 used)	.8
83-2763 83-2922	Phone shipping strip Ruhar shapping strip	.15
86-237 90-367	Connector Israinal (8 used) Indicator light tube	.03
85-1233 81-765 81-1475 81-2335 81-2335 81-2345 81-2345 82-2922 86-2977 90-387 91-3240 100-221 112-789	Fiber wesher (2 used on S-14090) Indicater light bulb - 45	15
112-943	Carl Armony of Carl A	.03
112-943 112-1008 112-1142 114-329	Record chonger mig. screw (2 used on \$14090) 5-20 x 35 Phile Rd. Hd. Self-top screw (ms. 19-29	.15
114-329	6-18x3/8x% Hex. Hd. Self-tep screw (1 used an 4822 and 2 on 12-2608)	.03
114-386	Chessis mg. screw (4 used) 8-18x5/16 Hex. Hd. Self-tep screw (1 used on	.10
174-453	618x5/8 Sict. Hex Wesher Hd. Self-tep screw 2 wad en 5-40420	.10
114-636	8-10 x 3/8 Hex. Hd. Self-tep screw - flat washer 611. (6 used on 57-2521)	. 05
138-183	4-40×5/32 Fill Hd. Nach. Serew (2 used) Metal Grille (part of 14-2426R)	.03
159-91	Plug Botton (2 used) Indicator Linht Lens	.10
188-54 188-195	Knob Clamping Ring (perr al S-44166) Recoining Ring (2 used on S-14090)	.40 .03 .75 .50
202-1379	Dial Crystel Instruction Back	.50
5-26657 5-41992	Terminel Strip (pert al 49-856)	.20
$\begin{array}{c} 115-34\\ 136-180\\ 142-92\\ 159-91\\ 171-19\\ 188-54\\ 188-195\\ 188-295\\ 188-295\\ 188-295\\ 188-295\\ 542099\\ 5-26657\\ 5-29657\\ 5-29972\\ 5-44167\\ 5-44167\\ \end{array}$	Tuning Knob & Ring Assen. Knob & Ret. spring assem. (presence-bass-	
5-40.420 5-45342 5-45343	Meteoro Anteoro 48/22 Charles	1510
5-45343	3630 Power Supply R (Using Chassis 4823)	
MODELS SETT &	R (Using Chassis 4823)	
2-589	Cobiner Bock - SF177R Cabiner Back - SF177E	
12-2608	Indicator Light Mtg. Brkt. Hold Down brkt.(2 yand)	. 05
14-2478 14-2478E	Cebiner Bose Frame - SF 177 Cebiner Bose Frame - SF 177E	
14-2476R 14-2480	Cobinet Boss Frome - SF177R Consele Cabinet (top section) SF 177	
14-2480R 16-1478	Console Cabiner (top section) SF1772 Perking Console	
2-548 2-599 2-599 2-599 12-3264 12-3278 14-32788 14-32788 14-32788 14-32788 14-32788 14-32788 14-32788 14-32788 14-32788 14	Mounting Cilp (mts. 5-43992) 3 mid. Electrolytic (1 part of es. 49-8466 856)	.20
36-220	Hendle Kneb (Redis Phann-Record Company	
46-1997 46-2097	Volume Control Knob (remote) Volume Control Knob	
49-852	35" PM Tweeter speaker	7.00
49-855	5" PM specier 5" PM specier 8-32 ** Hes. No! (6 pert of 14-24800"	7.00 16.00 14.00 7.00 .02
54-34	6-32 x X Hex. Not (6 peri of 14-2480R 2 ml. 49-84 6 5 4 ml. 49-85 6)	
54-312 54-424	502 x 11/32 Hex. Polnut (4 mt. ee. 49-852 & 853)	00,0000
57-1284 57-2498	Strike Plote (2 per of 14-2480R) Emblem Plote (per of 14-2480R)	.05
54-312 54-424 57-1270 57-12784 57-2498 57-2561 57-2587 72-64	Name Plate (port of 14-2460R) Rodio Diel Escutcheon	1.00
12-54	R (Unic Charles 432) Charles Ass. 2 (1) Charles Ass. 2 (1) Char	.03

PARTS LIST

		where E refinition of contridge,
#Z 85c)	.05 .20 1.25	It is most important that coded speaker leads be connected to coded terminals on speakers for proper polarity within the speaker group. In addition to this, when these units are used in conjunction with remote amplifier and speaker units, SRS10 or SRS15 as a Steres Combination, it is then next important that the speaker groups are in the pack of the speaker groups are into steres or monorular lead of with the recard compensator in RLA position, with the form controls on both units in mid position and with the audio outputs from each unit of the same leave, Under these conditions, the sound should paper to provide the speaker groups are in the used in the sound sound speak each unit of the same leave. Under these conditions, the sound should paper to provide the should check to speaker additive. But you of phase with the other and you should check to speaker additive.
iter)	7.00	If one or both of the 6BQ5 output tubes are replaced, it will be necessary to connect a DC volt meter across the balance terminals and adjust the balance control for minimum voltage.
	7.00 .02 .03	The I.F. transformers incorporated in this receiver are of the new permeability funed type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil
-852 & 853)	.05	is the secondary and the lower the primary. When adjusting these I.F. trans- formers, the tuning wrench 68-19 can be inserted into the top slug, rotated un- til mayimum output is obtained and to be inserted into the top slug.

amplifier and speaker units SRS10 or SRS15.

is its extreme The upper coil hese I.F. transslug, rotated unmaximum output is obtained and then drapped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

4B22 dial scale is mounted vertically and chassis 4B23 dial scale is mounted

Chassis (4822-3830) and (4823-3830) are complete high-fidelity amplifiers, and in addition have a cathode follower which feeds audio energy to remote

The wires to the stereo cartridge should be connected as follows, "Red" wire to "R" terminal of cartridge, "Black" to "middle" terminal and "white" wire to "L" terminal of cartridge.

#### TUBE, TRIMMER LOCATION AND DETAILED VIEW OF I.F. TRANSFORMERS ALIGNMENT PROCEDURE

Ope n	Connect Oscillator to	Dummy Antenna	Input Sig. Frequency	Set Dial at	Trimmers	Pumpôse
8	Converter Grid	.5 Mfd.	455 K c.	600 K c.	L9, L4, L5, L6	Align .F. for maxi- mum out- put,
2	Öne turn Loop Coupled		16.00 K c.	1600 k c.	61 <u>0</u>	Set Osc. to Dial Scale
3	Loosely to Wave Magnet	-	1400 Kc.	1400 Kc.	CIB	Align Antenna Stage

ZENITH

RADIO PAGE

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## HODELS S

74-75

80-107 80-1233 80-1233 83-765 83-765 83-2972 83-2972 83-3015 83-3015 83-3015 83-3015 83-3015 84-235 90-347 90-183 90-183 90-183 100-221 112-789

112-852

112-943 112-1131 112-1143 112-1143 112-1143 112-1144 113-65 114-80 114-329

114-396

114-453

114-636

114-644

1 15-34 126-73 142-92 152-26 156-33 156-35 158-35 159-98 159-10

1 65-31 171-19 1 88-54 1 88-199 192-263 199-250 202-138 5-14090

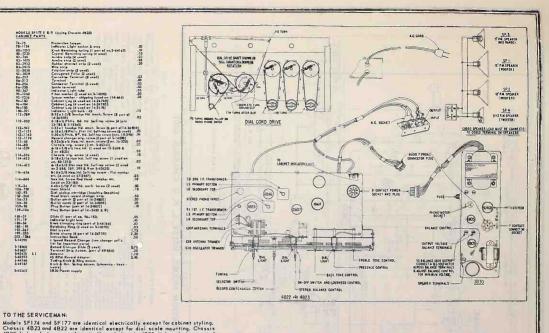
5-18560 5-26657 5-40420 5-43992 5-44166 5-44167

\$45343

horizontally.

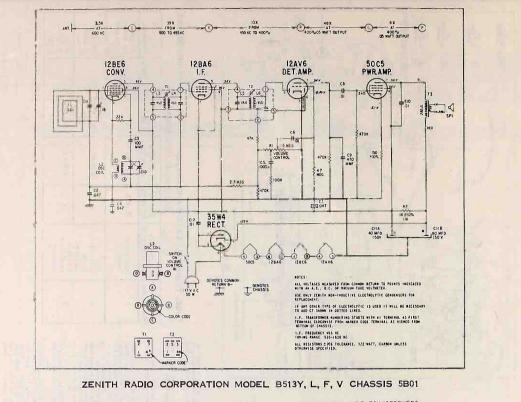
TO THE SERVICEMAN:

PARTS	& R (Using Chosels 4523)	
	Protective Screen	.00
	Indicator Light socket & wire Knob Retaining spring (1 part of ea.5-44167)	.00
	Armite strip (4 used) Armite strip (2 used)	
	Arnite strip (2 used)	.03
	Rubber channel strip (2 used) Wire strip	.20
	Corrugated Filler (2 used)	.03
	Connector Terminal (8 used) Terminal	.03
	Connector Terminel (5 used)	
	Spade terminal	.03
	Fiber washer (2 used an S-14090)	.05
	Specer wesher - shipping (used on 114-644)	.20
	Cobinet Leg (4 used on 14-2478R) Cobinet Leg (4 used on 14-2478E)	
	Cobiner Leg (4 used on 14-2478E)	
	Indirates Light hulb . 45	.15
	Cobiner Leg (4 used an 14-2478) Indicator Light bulb - 45 8-32x1-3/8 Swedge Hd. Mach. Screw (8 part a	
	14-24 BDR)	.03
	8-18x 5 Phile. Rd. Hd. Self-rep screw (4 join	
	6-12x1 Swedge Hd. Mech. Screw (6 pert of 14-2	4 80 R)
	b. 18 x5, Philes. Rd. Hd. Seel-rep. screw (4 joint 13-185 & 5-18550) 6-12 z 1 Swedge Hd. Mech. Screw (6 part of 14- 5-18 z X5/8 Phils. Fit Hd. Self-rep. screw (6 years 5-20 z K) Phils. R <sup>a</sup> . Hd. Self-rep. screw (2 part of 5-1609) Record, changer mile. screw (2 part of 5-1609).	0.03
	5-20 x KPhile, Rª, Hd. Self-tap screw (mts. 19-2	98) .04
	Chatsle mig. screw (3 ml. 5-45343) 6-18 x 3/8 x 4 Hox Hd. (1 used on 12-2008 8.	.05
	6-18 x 3/8 x 4 Hex Hd. (1 used on 12-2008 &	.03
	2 on 4823) Chassis mig. screw (4 used)	.10
	8-18x5/10 Hex Hd. Sell top screw (1 used on	
	+*. 80-1233)	.03
	6-18x5/8 Stat Hex Hd. Self-tep screw (2 used an 2-588, 569, 599 & 9 an 5-40420)	10
	Billy 3/8 May Md Sall top terring . Bat mather	
	8-18x3/8 Hex. Hd. Self-tep screw - flot wesher ett. (6 used on 57-2587)	.05
	Hen Hd, Scraw Red Head - wesher an, (used on 33-185)	.10
	(used on 33-185) 4-40 x 5/32 Fill Hd. wech. Screw (2 used)	.03
	Heat Shield	.10
	Dial pickup carridge (Sopphire-Sopphire) Wood block record changer ship	
	Weed block record changer ship	.50
	Buller carch (2 part of 14-2480E) Bullet carch (2 part of 14-2480R) Plug Butten (part of 14-2480E)	.05
	Plug Butten (part of 14-2480E)	. 10
	Plus Button (part of 14-2480 & R)	
	Glide (1 epri of ee. 26-183)	.05
	Indicator Light lens	
	Knob clamping ting (part of 5-64166)	
	Retaining Ring (2 used on 5-140 90)	.03
	Diel crystel Brete slaeve (4 port of 14-2477R)	1.75
	Instruction Book	.50
	4 Speed Record Changer (see changer paris	
	Her for Impariant parts) Record Changer Silde (2 used)	2.75
	Terminel Strip Assem. (part of 49-856)	.20
4	Antenno	
	45 RPM Record Adapter Tuning Knob & Ring assem.	2.95
	3B30 Power supply	



RADIO PAGE 25-4 ZENITH

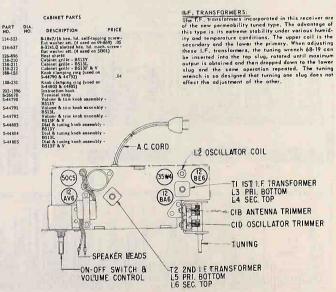
CHASSIS 5B01



CHASSIS PARTS

		CHASSIS PARTS	
		Chassis 5801	
PART NO.	DIA. NO.	DESCRIPTION PRI	CE
11-85 12-2323 12-2677 12-2678 19-238 22-3	C6,8,	Line cord & plug Wavemagnet mig. bracket Variable capacitor mig. bracket Coll mounting clip (part of 5-43910) .01 mfd. ceramic disc capacitor - 500V (4 used)	.15
22-5	C6,8, 10,12 C3	500V (4 used) 100 mmfd, ceramic disc capacitor -	.30
		100 mmfd, ceramic disc capacitor - 500V	.25
22-6	C9	470 mmfd, ceramic disc capacitor - 1 KV	.25
22-11	C5	.0033 mfd, ceramic disc capacitor- 500V	.25
22-2351		Electrolytic capacitor - 40/150	
22-2792	C2,4,7	80/150 .047 mfd. paper dielectric capacitor 200V (2 used) Two section variable capacitor	.30
22-3098	CIA,B, C,D	Two section variable capacitor	.30
54-139	C,D	3/8-32x9/16 poinut (mts. 63-4404)	.03 .25
63-965 63-1750 63-1842	R2	3/8-32x9/16 poinut (mts. 63-4404) 1000 ohm ins. 1W 10% 150 ohm ins. 1/2W 10%	.25
63-1842		150 ohm ins. 1/2W 10% 22 K ohm ins. 1/2W 10% 47 K ohm ins. 1/2W 20% 470 megohm ins. 1/2W 20% 470 megohm ins. 1/2W 20% Volume control & switch Electrolytic capacitor socket	
63-1856 63-1870 63-1898		47 K ohm Ins. 1/2W 20%	.17
63-1870		100 K ohm Ins. 1/2W 20%	.17
		2.2 mesohm ins. 1/2w 20%(5 used)	.17
63-1940		4.7 megohm Ins. 1/2W 20%	.17
63-4404	R1	Volume control & switch	.05
78-275		Electrolytic capacitor socket	.05
63-1926 63-1940 63-4404 78-275 78-831 78-989		Seven contact wafer tube socket Seven contact wafer tube socket	
		(3 used)	.15
78-990 83-2132		Seven contact water tube socket	.15
86-199		Seven contact water tube socket (3 used) Seven contact water tube socket Single lug terminal strip Terminal shakeproof (used with 114-275) Connector terminal (2 used)	
		114-275)	.03
86-237 94-295			.03
		(3 used)	.05
95-1504	TI	1st I.F. transformer	2.50
95-1504 95-1505 95-1637	T2 T3	Output transformer	2.30
113-78		Gang capacitor stg. bushing (3 used) 1at 1.F. transformer Output transformer 6-3255/551/4 AF hex. M. mach. scrw - Jackwaher att. (2 used on 2 used) (2 used on 3 used) (2 used) (2 used) (2 used) (1 used on 2 used) (2 used) (2 used) (2 used) (1 used on 2 used) (2 u	
		22-3098)	.03
114-78		8-18x5/16x1/4 AF hex. hd. self-	
		tapping screw (1 used on 12-2323,	.03
114-365		8-32x3/8 hex. hd. self-tap screw -	.05
		flat washer att. (used on S-44517)	.05
114-542		6-32x11/32 hex. hd. mach. screw (used on 22-3098)	.03
125-94		Rubber grommet (3 used)	.03
125-94 125-96 149-211		(used on 22-3098) Rubber grommet (3 used) Strain relief grommet Iron core (part of S-43910)	.10
S-43910 S-44517	1.2	Oscillator coll	.10
S-44517	L2 L1	Wavemagnet	
		CABINET PARTS	
12,2670		Min henchet (2 uned)	
12-2684		Mtg. bracket (2 used) Mtg. bracket (2 used)	
14-2499		Plastic table cabinet - B513Y Plastic table cabinet - B513L Plastic table cabinet - B513F	
14-2500		Plastic table cabinet + B513L	
12-2679 12-2684 14-2499 14-2500 14-2501 14-2502			
16-1495 49-869		Packing carton 6" x 9" PM speaker	
49-869	SP1	6" x 9" PM speaker	.30
57-2445 83-3048		Felt strip (4 used)	
112-107	6	6-20x5/16 phillips fillister hd. sel	f•
		6 X 9 PM speaker Emblow plate Fell strip (4 used) 6-20x5/16 phillips fillister hd. sel tapping screw (2 used on ea. 12- 2684)	
112-118	1	2854) 8-32x 1 7/8 phillips pan hd, mach, acrew (2 used) 8-32x3/8 phillips pan hd, mach, acrew (2 used on ea. 138-210 & 21 8-18x1/2x1/4 AF hex, hd, self- tapping acrew (2 used on ea. 12-2679)	
112-118	5	8-32+3.6 philling out hd much	
		screw (2 used on es. 138-210 & 21	2)
114-335		8-18x1/2x1/4 AF hex. hd. self-	
		12-2679)	.03
- internet			

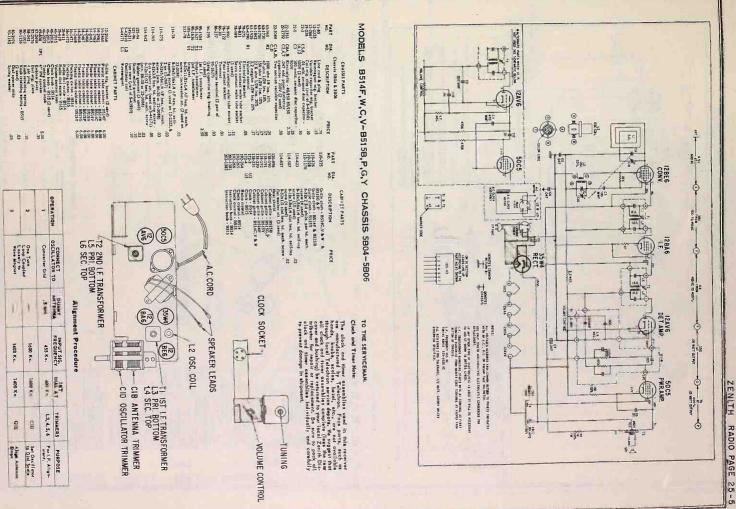
#### CABINET PARTS



			ALIGNMENT P	ROCEDURE		
OPERATION	CONNECT OSCILLATOR TO	DUMM Y	INPUT SIG.	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L3,L4,L5,L6	Align I.F. for max. output
2	One Turn Loop		1600 Kc.	1600 Kc.	CID	Set Osc. to Dial Scale.
	Coupled Loosely to Wave Magnet.	-	1400 Kc.	1400 Kc.	CIB	Align Antenna Stage.

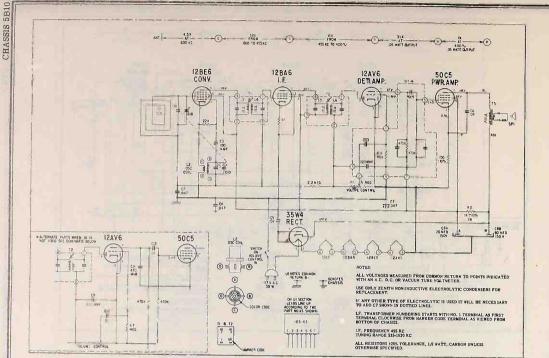
Rider

OJohn F.



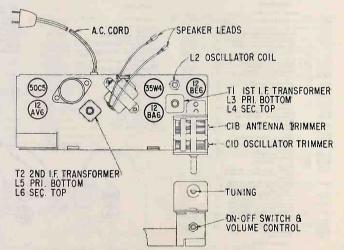
CHASSIS 5B04-5B06

RADIO PAGE 25-6 ZENITH



## MODELS B511 B, P, L, V CHASSIS 5B10

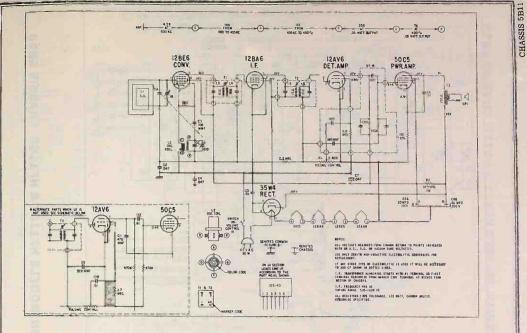
		CHASSIS PARTS	
PART	DIA.	Chassis 5B10	
NO.	NO.	DESCRIPTION	PRICE
11-85 12-2323 12-2667 19-238 22-3		Line cord & plug Wavemagnet mtg. bracket Variable capacitor mtg. bracket Coil mtg. clip (part of S-43910) .01 mfd. ceramic disc capacitor 500 V (2 used)	.75 .15 .10
22-5		100 mmfd, ceramic disc capacito 500V	
22-2202 22-2792 22-3088	C8A,B C4 C1A,B, C,D	Electrolytic - 20/150 60/150 .047 mfd. paper - 200V Two section variable capacitor	.25 2.15 .30
63-965 63-1730 63-1750 63-1842 63-1926 63-4440 78-275 78-831	R1	1000 ohm resistor 1W Ins. 10% 47 ohm 1/2W Ins. 20% 150 ohm resistor 1/2W Ins. 10% 22 K ohm resistor 1/2W Ins. 20% 2.2 megohm resistor 1/2W Ins. 20% 2.2 megohm resistor 1/2W Ins. 20% Volume control & switch Electrolytic socket Seven contact wafer tube socket	.25 .17 .17 .17 .17 .17 .17 .05
78-989		Seven contact wafer tube socket (3 used)	.15
78-990 86-30 86-237		Seven contact wafer tube socket Terminal	.15
		95-1626)	.03
94-295		(3 used)	.05
95-1504 95-1626 95-1636 105-43 113-78	T1 T3 T2 U1	Constant Ist I.F. transformer Output transformer Integnet 8-18x11/3/2x1/4 AF hex. hd. self tap screw - lockwasher stt. (1 us on 12-2323, & 2 used on ea. 12-2367, & 22-3088)	2.50
114-365		12-2667 & 22-3088)	.03
114-542		8-32x3/8 hex. hd. self-top screw (used on 12-2323) 6-32x11/32 hex. hd. mach. screw	.05
125-94		(used on 22-3088) Rubber grommet (3 used)	.03 .03
125,96		Strain relief prommet	.10
149-211 5-43910	L2	Iron core (part of S-43910) Oscillator coil assembly	.10
5-44171	L1	Wavemagnet assembly CABINET PARTS	
12-2666 14-2456 14-2457 14-2458 14-2459 16-1470 46-2012 46-2013		Grille mtg. bracket (2 used) Plastic table cabinet - BSIIB Plastic table cabinet - BSIIP Plastic table cabinet - BSIIV Plastic table cabinet - BSIIV Placking carton Tuning knob Volume control knob 4" PM speaker Emblom bisto	6:00 6:00 6:00 6:00
49-838		Volume control knob 4" PM speaker	5.00
57-2498 80-1003			5.00 .35 .10
93-1182		Spring washer	.10
112-1170		Knob retaining spring Spring weaker 8-32x 2 3A phillips pan hd. mach screw (2 used) 8-18x5/16x1/A AF hex. hd. scif- tapping screw (2 used) 8-18x3/8 slot hex. hd. scif-tap screw (4 used) 8-32x1/2 slotted hex. hd. mach. screw - flat washer att. (3 used)	•
114-423		8-18x5/16x1/4 AF hex. hd. self- tapping screw (2 used)	.03
114-507		8-18x3/8 slot hex. hd. self-tap screw (4 used)	.03
114-637		8-32x1/2 slotted hex, hd, mach. screw - flat washer att. (3 used)	
126-896 138-186 138-187			
138-188 202-1380		Cabinet grille - B511B Cabinet grille - B511P,V Cabinet grille - B511L Instruction book	



Operation	Connect Oscillator To	Dummy Antenna	Input Sig. Frequency	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 Mfd,	455 K ci	600 Kc.	L3. L4. L5. L6	For I.F. Align ment.
2	One Turn Loop Coupled		1600 Kc.	1600 Kc.	<b>Q</b> 10	Set Oscillator to Dial Scale
3	Looseiy to Waye Magnet		1400 K c	1400 Ke	C18	Align Antenna Stage

PJohn F. Rider

## ZENITH RADIO PAGE 25-7



MODELS B509C, P, V, F CHASSIS 5B11

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		CHASSIS PARTS				CABINET PARTS		
PART	DIA.	Chassis 5B11		PART	DIA.			
NO.	NO.	DESCRIPTION P	RICE	NO.	NO.	DESCRIPTION		PRICE
11-85		Line cord & plug	.65	46-2030		Volume & tuning co	ontrol knob	•
12-2323		Wavemagnet mtg. bracket	.15	46-2031		L509P (2 used) Volume & tuning co	antrol knoh	
12-2677		Variable capacitor mtg. bracket		40+2031		B509V (2 used)	Junor Knob	
2-2678		Volume control mtg. bracket Coil mtg. clip (part of S-43910)	.10	46-2032		Volume & tuning co	ontrol knob	-
9-238	C5 6	.01 mfd. ceramic disc capacitor -				B509F (2 used) 3 1/2" PM speaker		
	C5,6, 10,12	500V (2 used)	.30	49-865	SP1	3 1/2" PM speaker		
22-5	C3	100 mmfd, ceramic disc capacitor		54-459		Tinnerman nut (2 u	sed)	.30
		500V	.25	57-2445 112-1176		Emblem plate 6-20x 4 7/16 phillip	s nan hd. s	self-
2-2202	C8A,B	Electrolytic - 20/150 60/150 .047 mfd. paper dielectric	2.15	112-11/0		tapping screw (2 us 6-20x5/16x1/4 AF 1	sed)	
-2792	C2,4,	capacitor - 200V (2 used)	.30	114-248		6-20x5/16x1/4 AF 1	hex. hd. sel	lf-
		Two section variable capacitor	3.25	-		tapping screw (2 m	t. ea. 54-45	59) .03
	C,D			9	1			
-139		3/8x32x9/16 painut (mts.	.03	42	F	De la compañía de la comp		
0.00	-	63-4401) 1000 ohm resistor 1W Ins. 10%	.05	· · · ·		A.C. CO	)RD	
3-965 3-1750	R2	150 ohm resistor 1/2W Ins. 10%	.25			11 A.O. 01		\$ 1
3-1842		22 K ohm resistor 1/2W Ins. 20%	.17			111	1	-
3-1926		2.2 megohm resistor 1/2W Ins. 20				111	//	1º
3-4401	R1	Volume control & switch				111	//	//
8-275		Electrolytic socket	.05				1 /	
-831		Seven contact wafer tube socket Seven contact wafer tube socket				<u>III</u>	11 11	
-989		(3 used)	.15	5	-	600		~ 1
8-990		(3 used) Seven contact wafer tube socket	.15	6	and l	0 9		35W4) ©
5-199			.03	()	DC5)		K Y C	5011
6-237		Connector terminal (2 part of 95-1626)	.03		$\leq$ (		$\mathbb{K} \setminus \mathbb{K}$	0
4-295		Gang capacitor mtg. bushing	.05	1	12		201	12
-293		(3 used)	.05	(A	12	~ (O) 4	~ 0 (	HAG
1504	T1	1st I.F. transformer	2.50	LS	1/			OF CO
1626	T1 T3 T2	Output transformer			/	0		61
1636	T2	2nd I.F. transformer			/			0 %
43	U1	Integnet 6-32x5/16x1/4 AF hex. hd. mach.		/		0		TP
-78		screw - lockwasher att. (2 used	on	X	194344			
		22-3096)	.03	12	TT	ar	1123	
14-78		8-18x5/16x1/4 AF hex. hd. self-		/		ONLOFE SWITC	HA	
		tapping screw (1 used on 12-232 2 on 12-2677 & 3 on 12-2678)	3, 02	/	1000	ON-OFF SWITC	TROL	
14.205		2 on 12-2677 & 3 on 12-2678)	.03	1	0	VOLUME CON	TRUL	
14-365		8-32x3/8 hex. hd. self-tap screw	.05	1				
14-542		flat washer att. (used on S-44383 6-32x11/32 hex. hd. self-tapping	,	T2 2ND	) I.F. 1	RANSFORMER		
		screw - flat washer att. (used on		L5 PRI	BOT	TOM		
		22-3096)	.03	16 SEC	TOD			
125-94 125-96		Rubber grommet (3 used)	.03	L6 SEC	. 10P			
125-96		Strain relief grommet Iron core (part of S-43910)	.10				ALIGN	MENT P
5-43910	L2	Oscillator coil assembly			· · · · ·	1	Burney	Input SI
44336		Electrolytic capacitor & clamp		Öpe	rotion	Connect	Dummy Antegent	Fegunde
		assembly		THE REAL PROPERTY AND ADDRESS OF		Oscillator To	Man Heldend	
5-44383	L1	Wavemagnet assembly					2 1162	455 1
		CABINET PARTS		1	1	Converter Grid	.5 MHd.	435 1
4-2491		Plastic table cabinet - B509C	5.50				anonalistic count-th	
14-2492		Plastic table cabinet - B509P	5.50		2	One Turn	-	1600 1
		Plastic table cabinet - B509V	5.50		-	Loop Coupled		
4-2493		Plastic table cabinet - B509F	5.50	-	an and a second			10
14-2493 14-2494		Packing carton				Loosely to		1400
14-2493 14-2494 16-1489								
14-2493 14-2494 16-1489 27-259		Pointer indicator disc			3	Wave Magnet	_	
14-2493 14-2494 16-1489		Pointer indicator disc Dial knob Volume & tuning control knob -			3	Wave Magnet		



8-18x5/16x1/4 AF hex. hd. self- tapping screw (4 mt. 49-865)	.03
8-32x1/2 slotted hex. hd. mach.	
screw - flat washer att. (4 used	
on 5B11)	
Heat shield	
Cabinet grille - B509C,P & V	
Cabinet grille - B509F	
Knob clamping ring (1 used on	.04
46-2030, 2031 or 2032) Knob clamping ring (used on	.04
46-2028)	
Instruction book	

PRICE

202-1389 SPEAKER LEADS

PART DIA

114-423

114-637

126-896 138-204 138-207 188-155

188-231

AUIGNMENT PROCEDURE

Input Sig. Featuresy

455 Ke.

1600 Kc.

1400 Kc.

Set Dial At

600 Kc.

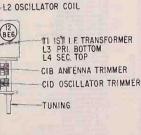
1600 Ks. CID

1400 Kc.

Trimmers

L3, L4, L5,

CIB



Purpose

For I.F. Align

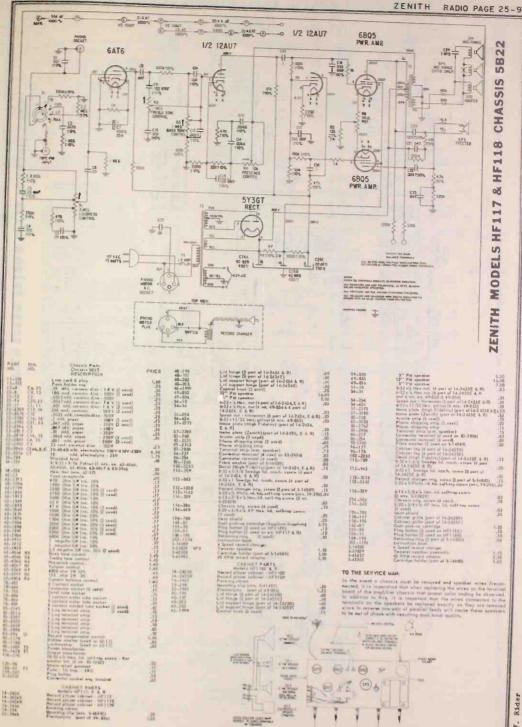
Set Oscillator to Dial Scale

Align Antenna Skoge

CJohn F. Rider

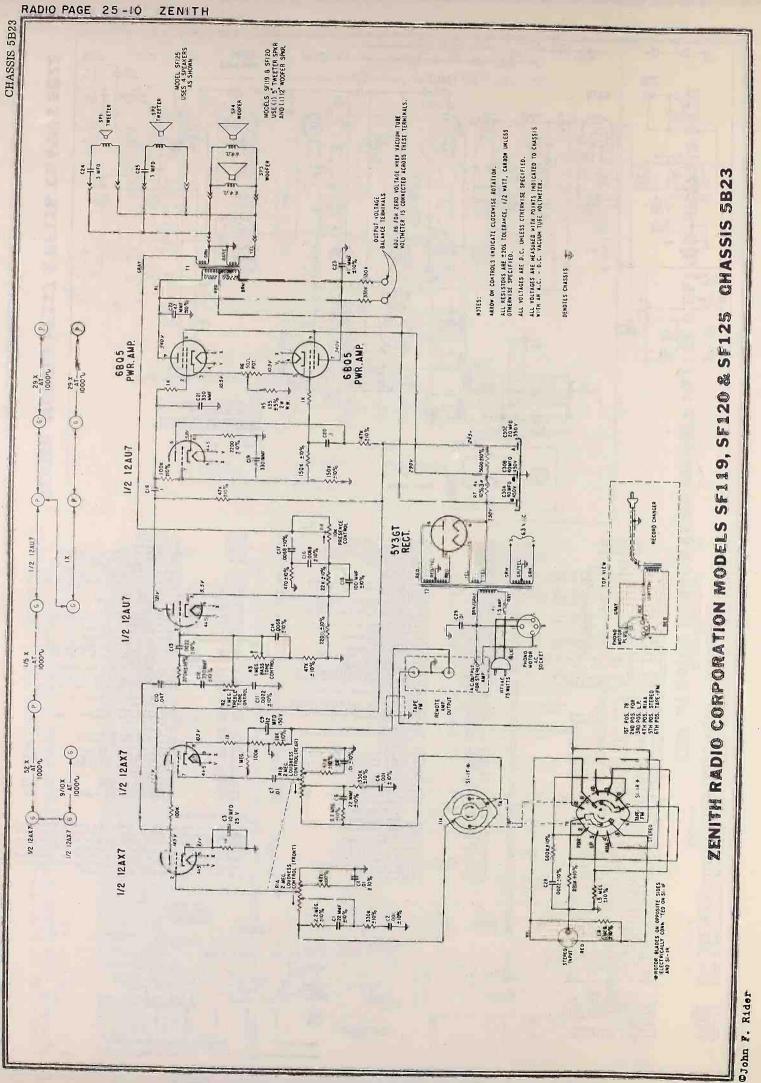
#### 7 FNITH RADIO PAGE 25-11

CHASSIS 5B22

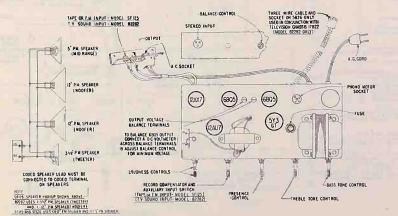


T. Rider OJohn

15202



#### ZENITH RADIO PAGE 25-11 ZENITH RADIO CORPORATION MODELS SF119, SF120 & SF125 CHASSIS 5823 TO THE SERVICEMAN: CABINET PARTS Models SF120 E & R DESCRIPTION CABINET PARTS Models SF125, E & R DESCRIPTION CABINET PARTS Models SF120 E & R DESCRIPTION PRICE Lid hinge (2 part of 14-2519R) .60 Lid support hinge (part of 14-2519R) .60 Valume control knob (4 used) .75 Y PM speaker 700 S' P M speaker .600 B-32 x ¼ Hax nus (4 part of 14-2519ER) .03 G-32 x ¼ Hax nus (4 part of 14-2519ER) .03 B-32 x ¼ Hax nus (4 part of 14-2519ER) .03 B-32 x ¼ Hax nus (4 part of 14-2519E R) .03 B-32 x ¼ Hax nus (4 part of 14-2519E R) .03 B-32 x ¼ Hax nus (4 part of 14-2519E R) .03 B-32 x ¼ Hax nus (4 part of 14-2519E R) .03 Phone shipping strip .03 Phone shipping strip (2 used) .03 Connector terminal (2 used) .03 Phone shipping strip (2 used) .03 Cabinet leg (4 part of 14-2519E R) .03 Record chosper mig. screw (2 part of 5-14091)</td Models SF119, SF120, and SF125 are identical electrically ex-cept for cabinet styling, speaker systems and Model SF125 uses a chrome changer. PART DIA. PRICE PART NO. DIA. PRICE 40-195 114-329 6-18 x 3/8 x ¼ AF hex. hd. self-tap screw (2 used on 5B23) 40-195 40-197 40-202 40-203 46-1997 46-2081 46-2096 49-850 49-856 chassis SB23 is a complete high-fidelity amplifier and in addi-tion has a cathode follower which feeds audio energy to remote amplifier and speaker units SRS10 or SRS15. 12 used on 5823) .10 C+0assis may screw (4 used) .10 C+0assis may screw (4 used) .10 (2 mit 34-34) .11. hd. mach. screw .03 (2 mit 34-14) .11. hd. mach. screw .03 (4 mit 34-14) .10 Matel or it [part of 14-240], 8 R) Matel grille (part of 14-240], 8 R) Dual pick-up cartridge (Sapphire-Sapphire) 20.50 . 03 114-386 The has a cathode follower which feeds audic energy to remote omplifier and speaker units SRS10 or SRS15. The wires to the starse carriage should be connected as follows, "Red" wire in "R": terminal of cortridge, "Black" to "outer" terminal and "White" wire to "L" terminal of carriage. It is most impartant that coded speaker leads be connected to caded terminals on speakers for proper palarity within the speak-er group. In addition to this, when these units are used in con-junction with remote amplifier and speaker units, SRS10 or SRS15 as a Starce Combination, it is then most important that the speaker groups be in phase with each other. An excellent method to determine if the speaker groups are in phase with each other is to play either a stere or monarual record with the reacod compensator in RIAA position, with the tone controls on both out a speaker groups be the plant makers. If the sound comes from a point midway between the two units. If the sound comes from ony other point then one speaker speaker groups. Under these with the other and you should check speaker polarity. If one or both of the 6BOS output tubes are replaced, it will be necessary to connect a DC valt meter across the balance termin-als and adjust the balance control for minimum voltage. 126-780 138-178 138-179 142-92 49-856 49-871 54-10 54-34 Plug button (2 used) Retaining ring (2 used oniS-14090 or S-14033) Instruction book # Speed record changer 4 Speed record changer 159-91 188-195 .03 54-312 202-1350 S-14090 o S-14093 0 54-424 57-2498 CHASSIS PARTS Chassis 5B23 DESCRIPTION PART NO. 57-2561 83-765 83-2535 83-2762 DIA . NO. PRICE $\begin{array}{c} 11 - 103 \\ 15 - 115 \\ 22 - 3 \\ 22 - 9 \\ 22 - 17 \\ 22 - 18 \end{array}$ Line cord & plug Fuse holder cap .01 mfd. ceromic disc - 1KV (2 used) 100 mmf. ceromic disc - 500V .001 mfd. ceromic disc - 500V (3 used) .0022 mfd. ceromic disc - 500V (3 used) .75 .25 .30 .25 .25 83-2/62 86-237 86-254 86-312 93-1260 96-177 96-178 112-789 15-115 22-3 C7, 29 22-9 C15 22-17 C2, 6 22-18 C11,13, 28 22-2056 C9 22-2309 C12,19, 21 12 mfd. electrolytic capacitor - 150V .330 mmf. ceramic - 500V (3 used) 47 mmfd. ceramic - 500V (2 used) .047 mmfd. paper - 600V .01 mfd. paper - 600V (2 used) .02 mmfd. ceramic disc - 500V (2 used) 20 mdf. apper - 200V (3 used) 22 mmfd. ceramic disc - 500V (2 used) 10 mfd. paper - 200V (3 used) 20 mdfd. ceramic disc - 500V (2 used) 10 mfd. electrolytic capacitor - 30V Connector jock (2 part of 5-43879) Shielded lead 378-32 x 9716 Palonu (4 used) 1000 ohm 5W Ins. 10% 1000 ohm 5W Ins. 10% 12 K ohm 5W Ins. 10% 12 K ohm 5W Ins. 10% 12 K ohm 5W Ins. 10% 13 K ohm 5W Ins. 10% 10 K ohm 5W Ins. 10% 20 K ohm 5W Ins. 1 12 mfd. electrolytic capacitor - 150V .330 mmf. ceramic - 500V (3 used) 1.20 CABINET PARTS Models SF119, E & R DESCRIPTION CABINET PARTS Models SF119, E&R DESCRIPTION PRICE Record player cabinet - SF119 Record player cabinet - SF119R Record player cabinet - SF119R Packing carion 20 Muning clip (mis. S-43972) 20 Electrolytic capacitor mid. - 30V (port of 47856) 10 Lid hinge (part of 14-2518, R) .60 Lid support hinge (part of 14-2518, R) .60 Valume control knob .75 Valume control knob .70 Striperdent for thinge (part of 14-2518, E&R) .03 112-943 22-2376 22-2782 22-2794 22-2813 22-2819 22-2903 22-3046 21 C22,23 C18,20 C10 C4. 8 C14,16,17 C1 C30A,B, PART NO. DIA. NO. .25 .45 .35 .25 .30 .25 PRICE 112-1038 14-2518 14-2518R 14-2518R 14-2518E 16-1498 112-1142 114-329 19-298 22-2945 C24,25 4.50 114-386 22-3076 C3 44-33 52-797 54-139 54-140 40-195 .50 126-780 40-197 40-202 40-203 46-1997 138-197 138-198 142-92 54-382 62-17 63-1771 63-1786 63-1799 63-1817 63-1838 63-1841 63-1855 63-1845 46-1997 46-2081 46-2096 49-870 49-856 54-10 54-34 Retoining ring (2 used on S-14090) Instruction book Four speed record changer Terminal strip as sembly (1 port of ea. 49-850, 49-856 & 49-871) 45 FPM record adapter 188-195 202-1350 S-14091 S-26657 5.43992 2.95 54-312 CABINET PARTS Models SF125, E & R DESCRIPTION $a_{-1}^{a_{-1}}a_{-3}^{a_{-1}}a_{-3}^{a_{-1}}a_{-1}^{a_{-1}}a_{-$ 54-424 PART NO. PRICE DIA. 57-2498 57-2561 83-765 83-2535 83-2762 86-237 86-237 86-254 93-1260 112-789 14-2401 14-2401E 14-2401R 16-1440 19-298 .20 22-2945 C24,25 1.25 40-195 40-197 40-210 40-211 . 60 .60 R3 R2 R4 112-943 112-1038 40-211 46-1997 46-2081 46-2096 49-846 49-852 49-852 49-853 49-856 54-10 54-34 R7 R1A,B .75 112-1142 .75 7.00 16.00 16.00 7.00 8) .03 **R**5 114-329 R6 Current balance control 2/64x 5/16 Rd.hd. mach. screw (2 used on 63-4373) 4 contact socket 9 contact wafer tube socket (2 used) 9 contact molded tube 9 contact molded tube 9 contact molded tube socket (2 used) 4 Lug terminal strip 8 Lug terminal strip 8 Lug terminal strip 9 contact moder tube 8 contact for the socket for the socket 9 contact 1.40 114-386 78-402 78-755 78-846 78-039 78-1099 78-1116 80-1249 80-1250 83-2145 83-245 83-2618 83-2618 83-2618 83-2618 83-2617 83-.15 .20 .25 .40 .20 .65 .15 .15 .10 .05 .10 126-780 Heat shield Dual pick-up cartridge (Sapphire-Sapphire) 21:50 .03 54-312 54-424 Retaining ring (2 used on 5-14091) Instruction book 188–195 202–1350 S-14901 S-23071 S-26657 .03 .03 .35 1.00 57-2498 57-2561 83-765 83-2535 83-2763 86-237 86-254 86-312 93-1260 Instruction book Four speed record changer Speaker lead & terminal assembly Terminal strip assembly (2 part of 49-856) 45 RPM record adapter assembly Terminal strip assembly (port of 49-856) 45 RPM record adapter .45 .03 .03 .15 .03 .05 .20 2.95 .20 2.95 S-43992 S-26657 S-43992 2.50 .03 .03 15.50 5.50 CABINET PARTS Models SF120 E & R DESCRIPTION .03 PART NO. DIA. NO. 112-789 PRICE .03 14-2519E 14-2519R 16-1499 19-298 Record player cabinet - SF120E Record player cabinet - SF120R 112-943 .03 .05 .10 .15 Packing carton Mounting clip (mts. 5-43992) 112-1038 125-96 136-32 \$-43879 .20 .15



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22-2945

3 mfd. electrolytic capacitor - 30V (part of 49-856)

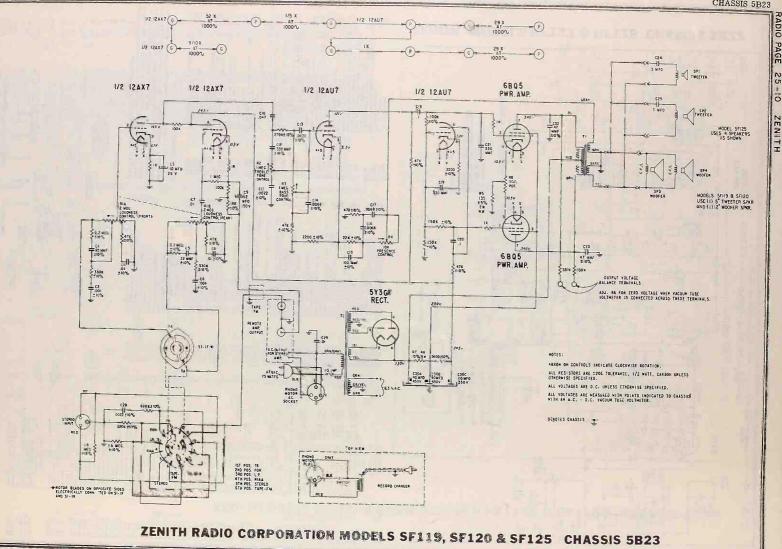
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Rider DJohn

5B23

CHASSIS



CHASSIS 5B23

#### ZENITH RADIO PAGE 25-11

CADINET DADTS

5B23

CHASSIS

## ZENITH RADIO CORPORATION MODE: S SE119, SE120 & SE125 CHASSIS 5B23

DIA.

CABINET PARTS

#### TO THE SERVICEMAN

TO THE SERVICEMAN: Models SFT19, SF120, and SF125 are identical electrically ex-cept for cablinet styling, speaker systems and Model SF125 uses a chrome changer. PART NO.

 Model S SE 119, SF 110, SF 100, and on the view manufacture incoming years
 40-195

 Chesters 5022 is a complete high-fidelity emplifier and in addition of the view holds of 120 with the source incoming years
 40-195

 The wrise to have a strenge and which fields output of the source incoming years
 40-195

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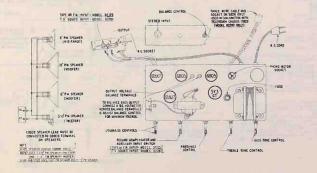
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 40-200

 The source incoming on specker groups and in mean of the source which we seed with the source of which the source of which the source of the source incoming on the source on the source incoming of the source incoming of the source of the source incoming of th NO. 40-195 40-202 40-203 46-1997 46-2081 46-2096 49-850 49-850 49-851 54-10 54-34

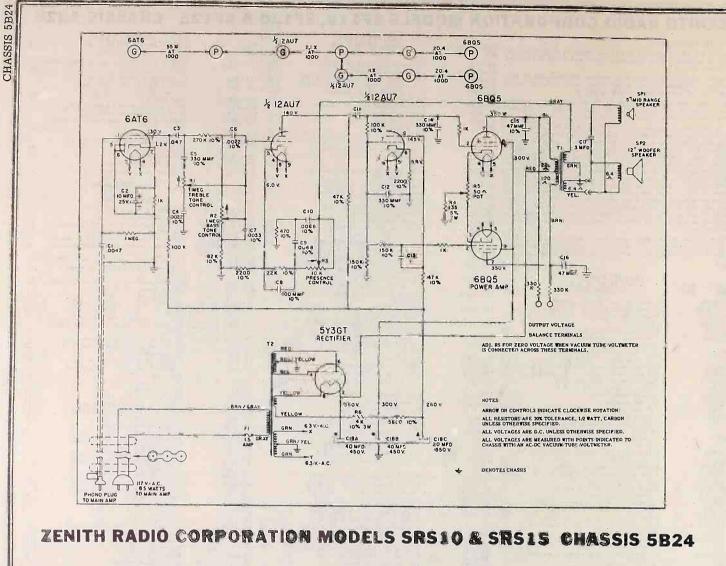
		11.2-789
D.D.T. 1011	CABINET PARTS Models SF119, E & R	112-943
PART DIA. NO. NO.	DESCRIPTION PRICE	112-1038
14-2518 14-2518R	Record player cabinet - SF1 19 Record player cabinet - SF119R	112-1142
14-2518E 16-1498	Record player cabinet - SF119E Packing carton	114=329
16-1498 19-298	Mounting clip (mts. S-43992) .20	
22=2945 C24,25	Electrolytic capacitor 3 mfd 30V (part of 49-856) 1.25	114-386
40-195	Lid hinge (part of 14-2518, R) .60	115-34
40-197 40-202	Lid hinge (part of 14-2518E) .60 Lid support hinge (part of 14-2518 & R) .60	126-780
40-202	Lid support hinge (part of 14-2518 & R) .60 Lid support hinge (part of 14-2518E) .60	138-197 138-198
46-1997	Volume control knob (remote)	142-92
46-2081 46-2096	Control knob (4 used) .75 Volume control knob .75	100 105
49-870	12" PH marker	188-195 202-1350
49-856 SP2	5" PM speaker 7,00 8-32 x½ Hex. nut (4 part of 14-2518, E&R) .03 6-32 x½ Hex. nut - steel (4 part of	S-14091
54-10 54-34	8-32 x¼ Hex. nut (4 part of 14-2518, E&R) .03 6-32 x¼ Hex. nut-steel (4 part of	S-26657
34-34	14-2518, E & R & 4 mt. 49-856) .03	5-43992
54-312	Speed nut - tinnerman (2 part of 14-2518,	5-45772
54-424	E & R) .03 8-32 x 11/32 Hex. poinut washer type	
34=424	(4 mt. 49-870) .03	PART DIA- NO. NO.
57-2498	Emblem plote (port of 14-2518, E & R) .35	NO. NO.
57-2561 83 765	Name plate (part of 14-2518, E & R) 1.00 Armite strip (3 used) .03	14-2401
83-765 83-2535	Armite strip (3 used) .03 Phono shipping strip (2 used) .03	14-2401E
	Phono shipping strip .15	14-2401R
86-237	Connector terminal (4 part of \$-23071) .03	16-1440
86=254	Connector terminol (2 part of 5-23071) .05	19-298 22-2945 C24
93-1260	Fibre wosher (2 used on \$-14091) .03	22-2945 624
112-789	8-32 x 1-3/8 Swedge hd. mach. screw (4 part of 14-2518, E & R) .03	40-195
112-943	6-32 x 1'' Swedge hd, mach, screw	40-197 40-210
	(4 part of 14-2518, E & R) .03	40-210
112-10.38	Record changer mtg. screw (2 part of S-14091) .15	46-1997
112-1142	5-20 x ½ Phillip rd. hd. self-topping	46-2081 46-2096
114-329	screw (mts. 19-298) .04 6-18 x 3/8 x ¼ AF hex. hd. self-tap screw	40-2096 49-846 SP1
114-327	(2 used on 5B23) .03	49-852 SP3
114-386	Chossis mtg. screw (4 used) .10	49-853 SP4
115-34	4-40 x 5/32 Fill. hd. mach. screw (2 mts.	49-856 SP2 54-10
126-780	142-92) .03 Heat shield .25	54-34
142-92	Dual pick-up cartridge (Sapphire-Sopphire)	
	21.50	54-312
188-195	Retaining ring (2 used on S-14091) .03	54-424
202-1350 S-14901	Instruction book .50 Four speed record changer	57-2498
S-23071	Speaker lead & terminal assembly .45	57-2561
S-26657	Terminal strip assembly (2 part of	83-765
	49-856) .20	83-2535 83-2763
S-43992 S-26657	45 RPM record adapter assembly 2.95	86-237
S-439 92	Terminal strip assembly (part of 49-856) .20 45 RPM record adapter 2.95	86-254
		86-312
BLOT BU	CABINET PARTS Models SF120 E & R	93-1260
PART DIA. NO. NO.	Models SF120 E & R DESCRIPTION PRICE	112-789
14-2519E		
14-251 9R	Record player cabinet - SF120E Record player cabinet - SF120R	112-943
16-1499	Packing carton	112-1038
19-298	Mounting clip (mts. S-43992) .20	
22-2945	3 mfd. electrolytic capacitor - 30V	112-1142
	(part of 49-856) 1.25	

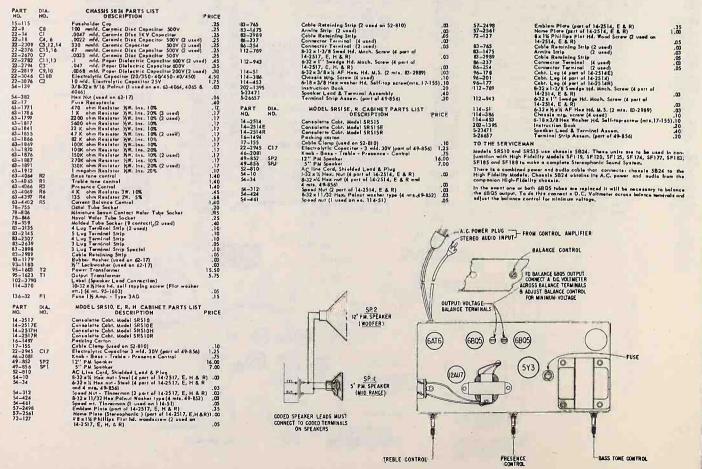
	CABINET PARTS		PART
	CABINET PARTS Models SF120 E & R DESCRIPTION F	RICE	NO.
	DESCRIPTION Thinse (2) and (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)	.60	114-329
	Lid hinge (2 part of 14-2519E) Bid support hinge (part of 14-2519E)	.60 .60 .60 .50 .75 .75 5.50 7.00 16.00	
	Lid support hinge (part of 14-2519E)	. 60	11.4-386
	Volume control knob (remote) Control knob	.50	
	Volume control knob (4 used)	.75	1.26-780 138-178 138-179 142-92
	5" PM speaker	5.50	138-179
	12" PM speaker	16.00	
	8-32 x 1/4 Hex nut (4 part of 14-2519E&R	) .03	159-91
	and 4 minutes. 40-850 A 49-856) Speed nut-1 hypermem (2 part of 14-2519 K A R) 1024t 4 69 (14-2519 K 1024t 4 69 (14-2519 K A R) Emblem plete (pert of 14-2519 K A R) Armite strip (3 used) Armite strip (3 used) Connector terminal (3 used) Connector terminal (4 used)	.03	188-195
	Speed nut-tignerman (2 part of 14-2519	E .03	202-1350
	8-32 x 1 1/32 Hex polnut washer type	.03	S-14090 S-14093
	(4 mts. 49-871)	.03 .35 1.00 .03 .03 .15 .03 .05 .03 .03	5-14093
	Name plate (part of 14-2519E & R)	1.00	0.07
	Armite strip (3 used)	.03	PART NO.
	Phono shipping strip (2 used) Phono shipping strip	.03	11-103 15-115 22-3 22-9 22-17 22-18
	Connector terminal (6 used)	.03	15-115
	Cannector terminal (2 used) Terminal shoke groaf	.05	22-9
	Fibre washer (2 used on S-14091)	.03	22-17
	Cabinet leg (4 part of 14-2519R)		
	8-32 x 1-3/8 Swedge hd. mach. screw		22-2056 22-2309
	(4 part of 14-2519E & R)	. 03	
	(8 part of 14-2519F & R)	.03	22-2376
	Record changer mtg. screw (2 part of		22-2376 22-2782 22-2794 22-2813 22-2819 22-2903 22-3046
	5-14091) 5-20 x % Philling of hd self-tenning	.15	22-2813
	screw (mts. 19-298)	.04	22-2819
	6-18x3/8x1/4 AF hex. hd. self-tap scru 12 used on 5B23)	.03	22-3046
	Chassis mtg. screw (4 used)	.10	
	4-40 x5/32 Fill. hd. mach. screw (2 m	15. 02	22-3076 44-33 52-797 54-139 54-140
	Heat shield	.03 .25	52-797
	Cabinet grille (part of 14-251 9R)		54-139
	Dual aick-up cartridge (Sapphire-Sapph	ire)	
		21.50	54-382
	Retaining ring (2 used on S-14090)	.03	63-1771
	Four speed record changer		63-1786
	Retaining ring (2 used an S-14090) Instruction back Four speed record changer Terminal strip assembly (1 part of ea. 49-850, 49-856 & 49-871) 45 RPM record adapter		$\begin{array}{c} 54-382\\ 62-17\\ 63-1771\\ 63-1771\\ 63-1786\\ 63-1786\\ 63-1879\\ 63-1841\\ 63-1883\\ 63-1883\\ 63-1883\\ 63-1883\\ 63-1883\\ 63-1883\\ 63-1883\\ 63-1890\\ 63-1891\\ 63-1912\\ 63-1912\\ 63-1912\\ 63-1912\\ 63-192\\ 63-192\\ 63-406\\ 63-400\\ 63-40\\ 63$
	45 RPM record adapter	2.95	63-1838
			63-1855
	CABINET PARTS Models SF125, E & R DESCRIPTION	PRICE	63-1869
	DESCRIPTION		63-1870
	De la la crista		63-1883
	Record player cabinet - SF125 Record player cabinet - SF125E Record player cabinet - SF125R		63-1887
	Record player cabinet - SF125R		63-1891
	Packing carton Mounting clip (mts. 5-43992)	.20	63-1904
4,25	3 mfd. electrolytic 3 mfd 30V		63-1918
	(1 part of ea. 49-856 & 49-846) Lid hings (2 part of 14-2401 & P)	1.25	63-1922
	Lid hinge (2 part of 14-2401E)	.60	63-1923
	Lid support hinge (port of 14-2401 & F	2) .60	63-4065
	Volume control knob (remote)	.00	63-4066
	Control knob (4 used)	.75	63-4373
1	36" PM tweeter speaker	7.00	63-4397
3 .	12" PM speaker	16.00	69-320
4	5'' PM speaker	7.00	
	8-32 x¼ Hex nut (8 part of 14-2401, E8	R) .03	78-755
	6-32 x 1/2 Hex nut (6 port of 14-2401, E8	R 03	78-846
	Speed nut (2 part of 14-2401, E & R)	.03	78-939
	8-32 x 11/32 Hex. palnut (4 mts. ea.	02	78-1110
	Emblem plate (part of 14-2401, E & R	.05	80-124
	Name plate (part of 14-2401, E & R)	1.00	83-214
	Phono shipping strip (2 used)	.03	83-230
	Phono shipping strip	.15	83-2618
	Connector terminal (8 used) Connector terminal (2 used)	.03	83-2622
	Terminal shoke proof		83-291
	Fibre washer (2 used on S-14090 or S-14093)	.03	85-607
	8-32 x 1-3/8 Swedge hd. mach. screw		$\begin{array}{c} 78 = 402 \\ 78 = 755 \\ 78 = 846 \\ 78 = 939 \\ 78 = 1099 \\ 78 = 1099 \\ 78 = 1104 \\ 80 = 1256 \\ 83 = 2142 \\ 83 = 2452 \\ 83 = 2452 \\ 83 = 2452 \\ 83 = 2622 \\ 83 $
	(8 part of 14-2401, E & R)	.03	95-1603
	(6 part of 14-2402, E & R)	.03	95-1604
	Record ployer cabinet - SF 123E Record ployer cabinet - SF 123F Mounting clip (mt. 5 43992) and, electrophysics and, - 30V (1 di hunge (2 part al 14,240) & R) Lid support hunge (part al 14,240) & R) Lid support hunge (part al 14,240) & R) Lid support hunge (part al 14,240) & R) (2 di la control and (noise) Control knob (4 used) Valume control and (noise) (2 di la control and (14,240) & R) Valume control and (14,240) & R) (2 di la control and (1	15	
	5-20 x ½ Phils. rd. hd. self-top screw	.15	125-96 136-32 S-43879
	(mts. 19-298)	.04	5-43879

PART NO.	DIA.	CABINET PARTS Models SF125, E & R P DESCRIPTION	RICE
114-329	110.	6-18x3/8x1/4 AF hox. hd. self-tap scree	
11.4-386		DESCRIPTION (8) x (3) x (4) AF hor. hd. soll-top scret (2) und on 5823) (Chassa and, screw (4) used) 440 x (3) 27 Fill, hd. mech, screw (2) und, 142 x (2) and (2) and, 142 x (2) (2) and (2) and (2) an	.03
		(2 mts. 142-92) Heat shield	.03
126-780 138-178 138-179 142-92		Metal grille (part of 14-2401, & R) Metal grille (part of 14-2401E)	
		Dual pick-up cartridge (Sapphire-Sapphi	re) 21.50
159-91 188-195		Plug button (2 used) Rotaining ring (2 used on S-14090.er S-14093) Instruction book 4 Speed record changer 4 Speed record changer	.03
202-1350 S-14090	or	Instruction book	.50
S-14093			
PART NO.	DIA.	CHASSIS PARTS Chassis 5823 DESCRIPTION P	DICE
11-103		Line cord & plug Fuse holder cap (01 mfd. ceramic disc - 1KV (2 used) 100 mmf.coramic disc - 500V .001 mfd. ceramic disc - 1KV (2 used) .0022 mfd. ceramic disc - 500V (3 used)	
11-103 15-115 22-3 22-9 22-17	C7, 29	.01 mfd, ceramic disc - 1KV (2 used)	.75 .25 .30 .25 .25 .25
22-9 22-17	C15 C2, 6	100 mmf.coromic disc - 500V .001 mfd. ceromic disc - 1KV (2 used)	.25
22-18	C7, 29 C15 C2, 6 C11,13, 28	.0022 mfd. ceramic disc - 500V (3 used)	
22-2056 22-2309	C12.19	12 mfd. electrolytic capacitor - 150V .330 mmf. ceramic - 500V (3 used)	1.20
22-2376 22-2782 22-2794 22-2813 22-2819 22-2903 22-2903 22-3046	C22,23 C18,20	47 mmfd, ceramic disc - 50 0V (2 used) 1 mfd, paper - 600V (2 used)	.25 .45 .35 .25 .30 .25
22-2794	C10	.047 mfd. paper - 600 V	.35
22-2819	C14,16,17	.0068 mid. paper - 200V (3 used)	.30
22-2903	C1 C30A,B,	20-40-40 mfd, electrolytic - 350V-450V	.20
22-3076	C30A,B, C C3	10 mfd. electrolytic capacitor - 30V	4.50 1.75 .15 .50 .03
44-33 52-797		Connector jack (2 part of S-43879) Shielded lead	.15
22-3076 44-33 52-797 54-139 54-140		47 mmld, ceronic disc, 500V (2 used) 147 mld, ceronic disc, 500V (2 used) 147 mld, poper 600V (3 used) 148 mld, poper 600V (3 used) 149 mld, poper 600V (3 used) 150 mld, poper 600V	.03
		(used on 63-4373) Hex. nut (used on 62-17)	.06
54 - 382 62 - 17 63 - 1786 63 - 1786 63 - 1779 63 - 1817 63 - 1817 63 - 1841 63 - 1869 63 - 1876 63 - 1876 63 - 1876 63 - 1876 63 - 1876 63 - 1876 63 - 1879 63 - 1890 63 - 1912 63 - 1922 63 - 1925 63 - 1		470 ohm ½W Ins. 10%	.06 .40 .17 .17 .17 .17 .17 .17 .17 .17 .17 .17
63-1786 63-1799		1000 ohm ½W Ins. 20% (4 used) 2200 ohm ½W Ins. 10% (2 used)	.17
63-1817 63-1838		5600 ohm ½W Ins. 10% 18 K ohm ½W Ins. 10%	.17
63-1841		22 K ohm ½W Ins. 10% 47 K ohm ½W Ins. 10% (5 used)	.17
63-1869		100K ohm ½W ins. 10%	.17
63-1876		150K ohm ½W Ins. 10% (2 used)	.17
63-1887		270K ohm VW ins. 10%	.17
63-1890		330K ohm 5 W Ins. 20% (2 used)	.17
63-1904		680K ohm ½W Ins. 10%   megohm ½W Ins. 20%	.17
63-1918 63-1922		1.5 megohm ½W Ins. 10% 1.8 megohm ½W Ins. 10%	.17
63-1925 63-4064	R3	2.2 megohm ½W Ins. 10% (2 used) Boss tone control	.17
63-4065	R2 R4	Treble tone control Presence control	1.40
63-4069	R7 R1A,B	4000 ohm 3W 10% Dual volume control	.45
63-4064 63-4065 63-4066 63-4069 63-4373 63-4397 63-4402 69-320	R5 R6	135 ohm 2W 5% Current halance control	1.40 1.40 .45 2.75 .68 1.40
	R5 R6	2/64 x 5/ 16 Rd, hd, much, screw (2 use	d
78-402		4 contact socket	.15
78-846		9 contact water tube socket (2 used)	.25
78-939		3 contact socket	.20
78-1116 80-1249		A.C. socket & wire Shaft friction spring	.15 .20 .25 .40 .20 .65 .15 .15 .15 .10 .05 .10 .05 .10
80-1250 83-2145		Sleeve friction spring 5 Lug terminal strip (2 used)	.15
83-2307		4 Lug terminal strip 2 Lug terminal strip	.10
83-2618		8 Lug terminal strip 2 Lug terminal strip	.10
78-402 78-755 78-846 78-939 78-1099 78-1116 80-1249 80-1250 83-2145 83-2612 83-2612 83-2612 83-2618 83-2627 83-2898 83-2915 85-607		3 Lug terminal strip	.10
83-2915 85-607 93-1179 93-1180 95-1603 95-1604 114-370	\$1	Record compensator switch Rubber washer (used on 62-17)	2.50
93-1180	T2	Lockwasher (used on 62-17) Power transformer	.03 .03 15.50 5.50
95-1604	T2 T1	Output transformer	5.50
		flat washer att. (4 mts. 95-1603)	.05 :10 .15
125-96 136-32 S-43879	IF1	Fuse 1 ½ amp 3AG (2 used)	.15
5-43879		A.C. socket, jack & bracket assembly	



Rider -CJohn RADIO PAGE 25-12 ZENITH





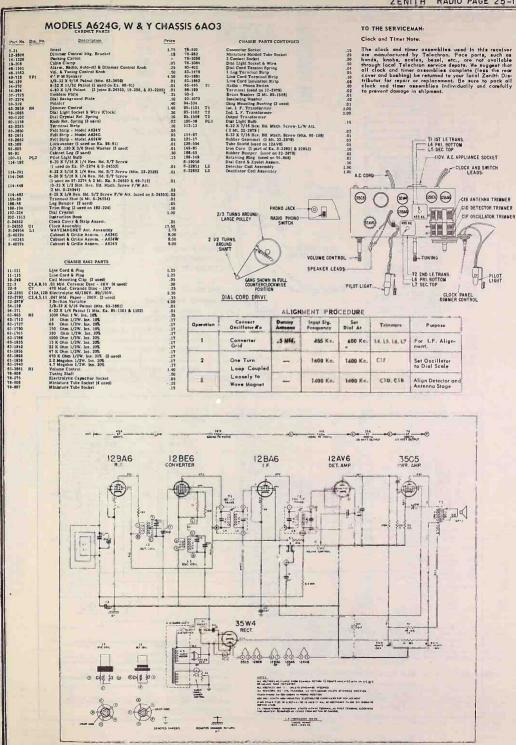
F. Rider

John

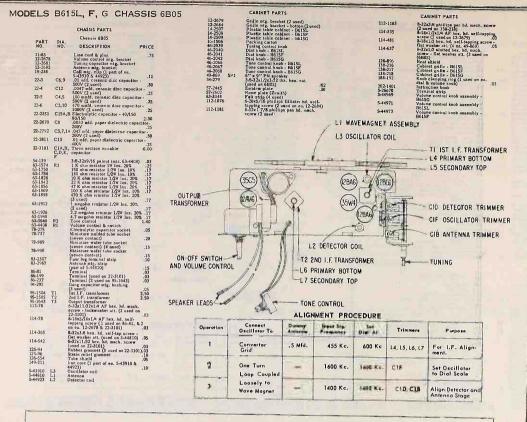
## ZENITH RADIO PAGE 25-13

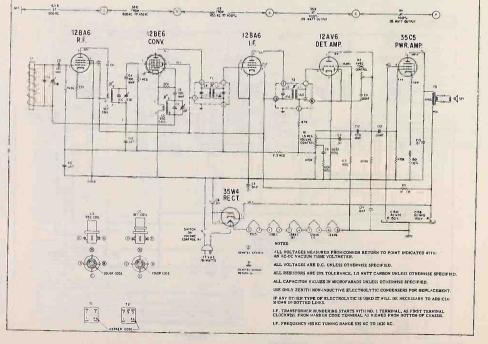
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CHASSIS









ZENITH RADIO CORPORATION MODELS B615L, F, G CHASSIS 6805

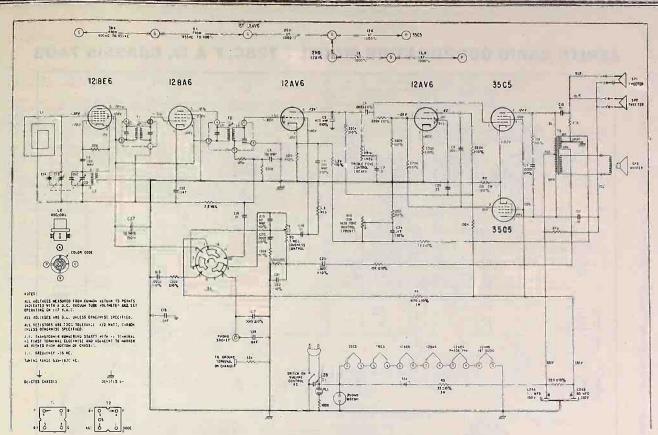
Rider

OJohn F.

CHASSIS 6B05

#### ZENITH RADIO PAGE 25-15

CHASSIS 6B06



# Zenith Radio Corporation Model HF660 Chassis 6806

Chassis Parts Chassis 6306 DESCRIPTION	PRICE	PART NO.	DIA. NO.	Chassis Parts Chassis 6806 DESCRIPTION	PR ICE	PART NO.	DIA. NO.	
Line cord & plug	1.00	63-4372	R3	Radio-phono switch & volume control &		19-298		

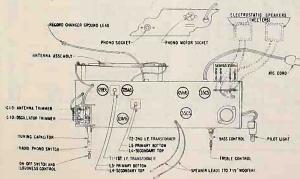
T1 T2 T3 PL1

SE1

11-103		Line cord & plug	1.00	63-4372
12-2329		Variable capacitor mtg. bracket	.15	
19-306		Coil mtg. clip	.10	78-229
22-3	\$7,10,11,16,	second		78-402
	22,28	.01 Mfd. ceramic disc - 500y (5 used)	-30	78-806
22-5	C2,3	100 Mmf. ceramic disc - 500V (2 used)	.25	10.000
22-12	C17	.0015 Hfd. coramic disc - 5007	.25	78-807
22-18	C9,20	.0022 Mrd. ceramic disc - 500V (2 used)	.25	78-1060
22-2321	C4	220 Mmf. ceremic - 500V	.25	
22-2376	C19	47 Mmf. ceramic disc 500V	.25	83-1119
22-2670	C5.13	.0033 Mfd. ceramic disc - 500V (2 used)	.25	83-2145
22.2765	C24	.47 Mrd. paper - 200V	-55	83-2373
22-2781		1 Hfd. paper - 400V		83-2536
22-2792	012,15,18	.047 Hrd. paper - 2007 (3 used)	.30	83-2964
22-2793		.047 Hrd. paper - 400V		83-2965
22-2805	C8	1022 Hrd. paper - 400V	.25	83-2984
22-2807		.022 Mfd. paper - 200V (2 used)		86-199
22-3073	CIA, B, C, D	2 Section variable	.25	86-237
22-3078	C26A,B	2 Section Variable		86-254
44-25	02.04,0	60-100 Hrd. electrolytic - 150 V	3.00	93-127
54-139		Phono jack	.25	94-295
74-135		3/8 - 32 x 9/16 Palnut ( 1 mts. ea.		95-1504
54-267		63-4003 & 63-4372)	.03	95-1556
63-1744		6-32 x 5/16 Palnut (used on 114-510)	.03	95-1618
63-1757		100 Ohn 1/2W Ins. 20%	.17	100-105
63-1785		220 Ohm 1/24 Ins. 10% (3 used)	.17	113-34
63-1799		1 K Ohm 1/2W Ins. 10%	.17	
63-1806		2200 Ohm 1/24 Ins. 10%	.17	114-201
		3300 Ohm 1/2W Ins. 10%	,17	
63-1810		3900 Ohm 1/2W Ins. 10%	.174	114-293
63-1827		10 K Ohm 1/2W Ins. 10% (2 used)	.17	114-510
63-1828		10 K Ohm 1/2W Ins. 20%	.17	114-510
53-1949		8.2 Megoha 1/24 Ins. 5%	34	114-628
<b>3-1856</b>		47 K Ohm 1/2W. Ins. 20% (3 used)	.17	114-060
63-1870		100 K Ohm 1/24 Ins. 20% (2 used)	.17	105.17
63-1873		120 K Ohm 1/24 Ins. 105 (2 used)	.17	125-17 125-96
63-1883		220 K Ohm 1/24 Ins. 105 (4 used)	.17	
63-1887		270 K Ohm 1/24 Ins. 105	.17	149-85
63-1891		330 K Ohm 1/24 Ins. 205	.17	
63-1926		2.2 Megoha 1/24 Ins. 20%	.17	212-18
63-1947		6.8 Megohm 1/2W Ins. 20%	.17	S-24248
	82	100 0hm 2W Ins. 105	.34	5-24654
	R5	33 Ohm 3W WW 10%		S-24659
	Rh	320 Ohm 1W Ins. 10%	.45	
63-4003	RLA, B	Dual tons control	.25	
		pust colle courter	2.75	
				14-2419F
				16-1463
			12	
		F		
			Par IIC	FLEGTROSTATIC

PART NO.

DIA.



DESCRIPTION	PHICE	NO. NO.	DESCRIPTION	PRICE
Radio-phono switch & volume control &		19-298	No. of the second	
switch		24-855	Mounting elip (mts. S-41437)	.20
Electrolytic socket	.05	36-212	Chassis cover	2.25
4 Contact socket	.15		Cabinet handle (part of 14-2419F)	
7 Contact miniature wafer tube socket	.15	40-157	Lid support hinge (part of 14-24197)	1.30
(5 used)	.15		Hinge (2 part of 14-2419F)	-30
		46-1992	Loudness & treble tone control knob	
7 Contact miniature wafer tube sockat	.15	46-1993	Bass tone control knob	
Pilot light socket & wire	.50	46-1995	Tuning knob	
Insulating strip (phono Jack)	.03	46-2021	Radio-phono knob	
5 Lug terminal strip (2 used)	.10	49-849	7 1/2" FH speaker	
5 Lug terminal strip		54-10	8-32x1/4 Hex. nut (4 part of 14-2419F)	.03
Antenna mtg. strip (part of S-24659)	.05	54-424	8-32x11/32 Hex. palnut (4 mt. 49-849)	-03
6 Lug terminal strip	.10	70-215	6x3/8 Phils. rd. hd. wood screw (6 used o	
7 Lug terminal strip	- 10		24-855)	.04
5 Lug terminal strip		70-239	6x7.8 Fhils. oval hd. wood screw	
Terminal	.03		(4 used on 14-2419F)	.04
Connector terminal (2 part of 95-1618)	.03	83-765	Armite Strip (2 used)	.03
Connector terminal (part of S-24248)	-05	83-1475	Armite Strip	.03
Lockwasher	.01	83-2535	Phono shipping strip (2 used)	.03
Capacitor Mtg. bushing (3 at. 22-3073)	.05	83-2761	Phone shipping strip	.15
lst. I. F. transformer	2.50	86-254	Terminal (2 used)	.05
2nd. I. F. transformer	2.50	93-1173	Finishing washer - brass plate	
Audio output transformer			(1 used on es. 70-239)	.03
Pilot light bulb - NE-51	.21	93-1260	Fibre washer (2 part of S-14063)	.03
6-32x3/8x1/4 Hex. hd. mach. screw-		97-511	Handle stud (2 part of 14-2419F)	.25
lockwasher att. (2 used on 22-3073)	.03	112-788	8-32x1 1/8 Swedge hd. mach. screw	)
8-32r5/16x1/4 Hex. hd. self-tap screv	.05	112-100	(4 part of 14-2419F)	.03
(2 used on 22-3073)	.03	112-1038	Record changer mtg. screw	.03
6-32x3/8x1/4 Hex. hd. mch. screv	.03	116-1030	(2 part of S-14083)	.15
6-32x1 5/8x1/4 Hex. hd. mach. screw	.03	112-1142	5-20x1/2 Fhils. rd. hd. self-tap scrov	
(mts. 212-18)	-03		(1 mt. 19-298)	.04
8-18x1 5/8x1/4 Hex. hd. self-tap screw	-03	114-329	6-18x3/8x1/4 Har. hd. self-tap screw	
(2 Mt. S-24659)		224-349	(2 nt. ea. \$23829)	
	.03	114-478		.03
Rubber grounet (3 used)	.03		10-32x1/2 Hex. slot hd. mch. screw-	
Strain relief gromet	.10	142-87	flat washer att. (4 used on 6B06)	.03
Iron core (part of S-24654)	.10	156-45	Dual cartridge (capphire-capphire)	3.95
Spacer sleeve (1 used on os. 114-628)	.05	159-94	Cover latch (2 part of 14-2419F)	1.50
Selenium reotifier	2.35	165-29	Plug button (4 used on 14-2419F)	.10
Wire & torminal assombly - black	.15	171-15	Motal glide (4 part of 14-2419F)	-10
Oscillator soil	.85		Pilot light lens	.25
Antenna	1.75	188-195	Rotaining ring (2 part of 9-14083)	.03
		202-1375 S-14083	Instruction book	
CABINET PARTS			Record changer	
		S-23829 SP1,2	Tweeter speaker (2 used)	1.10
Table cabinot		S-41437	45 RPM record adapter	2.95
Packing carton		S-42308	Cartridge holder (part of S-14083)	1.00

Chassis Parts Chassis 6806

. F. TRANSFORMERS:

The I. F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these 1.F. transformers, the tuning wrench 68-19 can be insorted into the poly, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation re-peated. The tuning wrench is so designed that turning one slug does not aliest the adjustment of the other.

## TUBE, TRIMMER LOCATION AND DETAILED VIEW OF I.F. TRANSFORMERS.

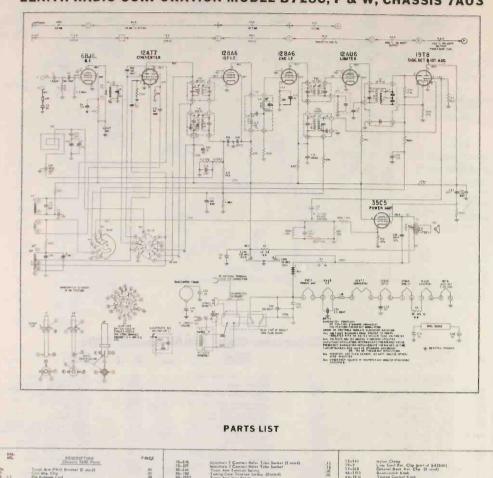
ALIGNMENT PROCEDURE

OF ERATION	CONNECT SCILL TO	DUMMY	INPUT SIG. FREQUENCY	BLAL AT	TRIMMERS	PERFOSE
U	Converter Grid	.5 Mfd.	455 R.o.	600 Kc.	13, 14, 15, 16	Align I.F. for- meximum output
2	One Turn Loop Constant Looperty	-	berre a.e.	1600 Kc.	CID	Set Ozcillater te Diel Scale.
3	m Taxa magnat	-	1400 Kc.	1400/K2	C18	Align Antenna Stope

F.O.

RADIO PAGE 25-16 ZENITH

CHASSIS 7A03



# ZENITH RADIO CORPORATION MODEL B728C, F & W, CHASSIS 7A03

Manatore ) Contrast Ratio Late Socker () small Wintere ) Contrast Ratio Tak Socker () Same An Foreign Parker Tame An Barris Barring Tame An Barris Barring Drive Lat ( Texano Sarah Barring Lat ( Texano Sarah Barring DESCRIPTION Charge TABL Ports Coal May Clip Per Announce Carl PART  $\begin{array}{c} 17.-14.3\\ 19-24.8\\ 49-13.4\\ 49-13.4\\ 49-13.4\\ 49-13.4\\ 49-13.4\\ 49-13.4\\ 49-13.4\\ 49-13.4\\ 49-13.4\\ 49-13.4\\ 49-13.4\\ 49-13.4\\ 49-13.4\\ 49-13.4\\ 49-13.4\\ 49-13.4\\ 19-1$ Nylan Clump Line God Ren. Clip (pert of \$43504) Centrer Back Ren. Clip Bands witch Kenb Turning General Kresk Valumo General Kresk Dack Reak (\$ used) 11 Ren Valum (\$ used) 78-079 78-079 80-444 80-444 80-1785 80-1785 80-1780 80-1780 80-1780 80-1780 80-1780 80-1855 81-1460 80-1247 81-24 810-24 81010 2055555555555555 17-Lede 17-201 10-595 12-7 18.8 A real and the second of the s Poliume Control Krost Clack Frails (Pused) 4<sup>17</sup> PAI Spettier 5 37 s 11 32Poleseijused w And it is a first the part of 22-4 22-4 22-4 22-4 2-37 ing controly eb 184 5631 ないないないななないなないなないないの A promoto (see on the first set) Proto en (2000 b) and enth (1-121) in proto (see on the 100 b) in sec on the 100 b .30 .30 .01 95 115 95 125 95 125 95 135 95 151 10 42 112-7% 113-10 8000 In a 1 t Washes men I weed an en. (H with 20 men a 1 wit (J weed) I we men ted bell Tag Scene (P weed an July (I) an men ted bell Tag Scene (P weed an July (I) the men ted bell Tag Scene (P weed an July (I) the men ted bell Tag Scene (P weed an July (I) the men ted bell Tag Scene (P weed an July (I)) .30 a nd rat Lold-Pap Screw (7 at. 05-1417) Her thi Mach Sarpet - Lach Wester at. and a simulation thank that a start a said whether and the start a start a start a start a start a start a start of the start a start a start a start a start a start a start of the start a start a start a start a start a start a start of the start a start a start a start a start a start of the start a start a start a start a start a start of the start a start a start a start a start a start of the start a start a start a start a start a start of the start a start a start a start a start a start of the start a start a start a start a start a start of the start a start a start a start a start a start of the start a start a start a start a start a start of the start a start a start a start a start a start of the start a start a start a start a start a start the start a star .93 113-10 114-222 A set of the set of th .05 .02 124-297 .H. .62 tid mach harps - Flat Wagher att. fored an 115-840 111.39  $\begin{array}{c} 114 & 0.01\\ 144 & 0.01\\ 144 & 0.01\\ 144 & 0.01\\ 144 & 175\\ 144 & 175\\ 144 & 175\\ 144 & 175\\ 144 & 174\\ 144 & 174\\ 144 & 174\\ 144 & 174\\ 144 & 144\\$ 114 - 447 125 - 72 146 - 147 147 - 44 147 1 Par Constitution Call Constitution Fuller, & Const Augustade Deuts Call & Santa - Passand RE Porter, & Souther Assender Un Porter, & Souther Assender Un Porter, & Souther Assender Turning Back & Porter Assender ed with 12-1211 10,10 6-42013 6-42014 5-42015 5-42005 5-42000 South States B  $\label{eq:constraint} \begin{array}{l} f_{\rm constraint} & f_{$ of 6-41703 Haller. madata UPIEC, F & B Column Party All prices shown we supported wind prices which undude forders) mondigations for her bas shown mappendie and on undust it shown without any 25. 12-121 Long Gard & Prog

# CJohn F. Rider

ZENITH RADIO PAGE 25-17

7A03

CHASSIS

TO THE SERVICE MAN

The 7A63 chassis incorporates a superheterodyne circuit with two stages of IF, on ine FM Band, and two stages on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7A03 or any AC-DC chassis, a line isolation transformer (10-V knyut to 110-V output) is recommended in order to svoid a hot chassis. If an isolation transformer is not avail-able, cheschald C voltage between chassis and beach ground, and if there is any indication of voltage, reverse the pubg before handling the set.

The I.F. transformers and the discriminator transformer are the new permeability tuned type. The advantage of an IF transformer of this type's its extreme stability under various humidity and temperature condi-tions. The upper coil is the secondary and the lower the primary. When adjusting these IF and discriminator transformers, tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtain-dand then dropped down to be lower slug and the same operation repeat-ed. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment. Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model Bool Signal Genera-tor (Form ZB001) covers complete FM alignment procedure. If visual alignment equipments unavailable, reasonably accurations and the visual made by following the procedure outlined in this service note.

FM Discriminator Alignment: When the secondary of the discriminator is

aligned (operation 5) use sufficient signal input to get a good positive and accentse indication before setting the slug for zero reading. A center zero indicating meter is reversing the leads of a softwarman, but is not absolutely necessary. Reversing the leads of a softwarman of the or observing closely when the meter starts to go to the left (argetive) of zero will give the same results.

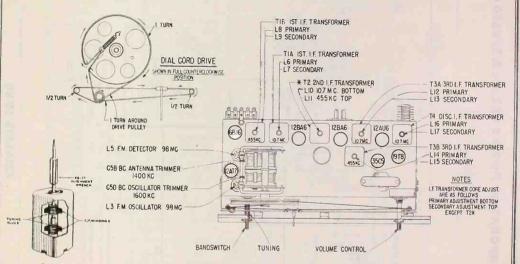
Alignment of this chassis will, in most cases, be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered

Correct alignment can only be made if the following procedure is followed

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an im-dication on the meter. (e) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chass-is (half discriminator lond). (b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chass-is (full discriminator lond). (c) Vacuum Tube Voltmeter from Limiter Grid to Chassis. (d) Loosen Slugs by applying a hot iron to the cement.



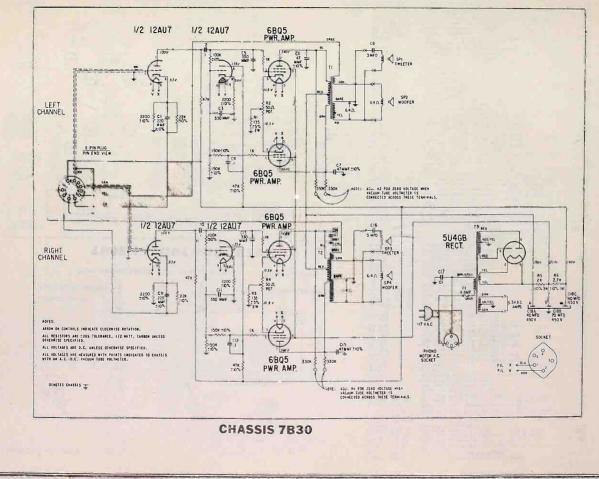
#### Detail of IF Transformer

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	BAND	SET DIAL TO	ADJ. TRIMMERS	PURPOSE
1	PIn 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated.	BC	600 Kc.	L8, 9, 11, 14, 15	Align I.F. channel for maximum output
2	2 turns loosely coupled to wavemagnet		1600 Kc. Madulated.	BC	1600 Kc.	C5D	Set oscillator to dial scale.
3	2 turns loosely coupled to wavemagnet		1400 Kc. Moduloted.	BC	1400 Kc.	C5B	Align antenna stage
4 (a)	Pin 1 (grid) on 12AU6 limiter	.05 Mfd.	10.7 Mc. Unmodulated.	FM .		L 16 coll alug Primory discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter	.05 MId.	10.7 Mc. Unmodulated.	FM		L 17 coll slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 128A6 2nd IF.	.05 MId.	10.7 Mc. Unmodulated.	FM		L12& L13 Prim. & Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (e)	Pin 1 (grid) on 128A6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated.	FM		L 10 Prim. of 2nd IF transformer.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated.	FM		L6& L7 Prim. & Sec. of 1st IF trans.	Align 1st IF transformer for maximum reading.
9 (c)	Antenno Post FM	270 ohms	98 Mc. Unmodulated.	FM	98 Mc.	L3Osc. Coll Slug	Set Oscillator to dial scale.
0 (c) {d}	(Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM	98 Mc.	L5 Det, Coll Slug	Align det, stage to maximum reading.

## TUBE AND TRIMMER LOCATION

Rider -CJohn



ZENITH

RADIO PAGE 25-19

CHASSIS 1B30--7B30

PRICE

.30 .25 .25 .25 1.50

.30

1.75

.03

PRICE

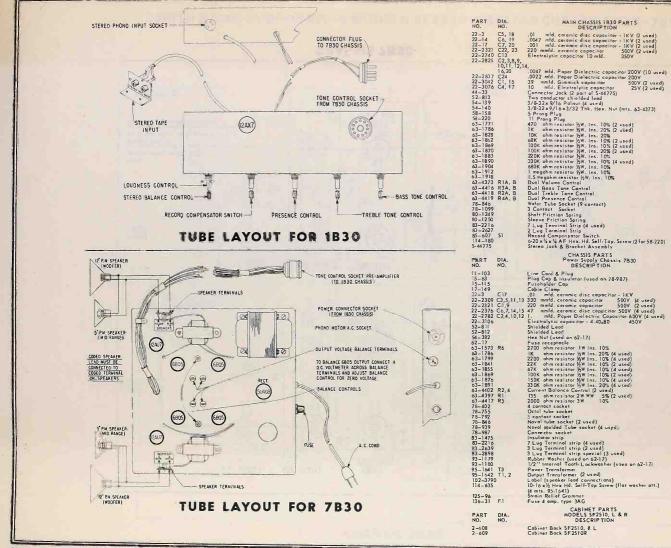
1.00 .30 .25 .05 .30 .25 .25 .25 .45

6.00

.05

PRICE

4.00



**OJohn F.** Rider

ADIO PAGE 25-20 ZENITH

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	and the second	
14-2521	Recard Player - Cabinet Model SF2310 Recard Player - Cabinet Model SF2310 Recard Player - Cabinet Model SF2310 Recard Player - Cabinet Model SF2310 Berger - Cabinet Model Berger - Cabinet Format Berger - Cabinet Model Berger - Cabinet Berger Berger - Cabinet Model Berger - Cabinet Berger Berger - Cabinet Model Berger - Cabinet Berger Berger - Cabinet Berger - Cabinet B	
14-2521L 14-2521R 16-1502	Record Player - Cobinet Model SF2510R	
16-1502	Packing Carton	20
19-298 22-2945	Mounting Clip (mts. S-13992) 201( (part of 49.954)	.20
22-2945 40-195	Lid dinge (2 part of 14-252), L & R)	.60
40-212	Lid Support Hinge (part of 14-2521, L & R)	. 60
40-195 40-212 46-1997 46-2081	Volume Control Knob (Remote)	.50 .75
46-2081	Control Knob (4 Used)	
46-2098 49-856	S" PM Speaker (2 used)	7.00
49-873	12" PM Speaker (2 used)	22.50
54 - 10 54 - 34	6.32 x 1/4 Hex nut (8 part of 14-2521, L & R & 4 mt. eo. 49-856)	.03
54-312	Speednut Tinnerman (2 part of 14-2521, L & R)	.03
5.1-424	8-32 x 11/32 Hex Poinut Washer type (4 mt. co. 49-8/3)	.35
57-2498	Nome Plate (port of 14-2521, L & R)	1.00
57-2498 57-2561 72-127	# 8x / Phillips Flot Hd. Wood Screw (4 used on 14-2521,L &R)	.05
83-765 83-1475	Armite strip (3 used)	.03
83-14/5 83-2535	Phone Shipping strip (2 used)	.03
83-2762	Phone Shipping strip	.15
86-237 86-254	Connector Terminal (8 used)	.05
86-312	Terminal Shakeproof (2 used)	.03
93-12:00	Fibre Washer (2 used on 5-14090 or 5-14093)	602
96-170 96-171	Cabinet Leg (4 part of 14-2521)	
96-172 112-789	Cabinet Leg (4 part of 14-2521R)	.03
112-789	8-32 x 1-3/8 Swedge Hd. Mach. screw (8 part of 14-252), Con	.03
112-943 112-1038	Record Changer Mtg. Screw (2 used)	.15
112-1142 114-40 114-329 114-386	5-20 x 1/2 Phillips Rd. Hd. Self-Tap. Screw (mts. # 9-298)	.03
114-40	Chassis mtg. screw (4 used)	.03
114-329	Chassis mtg. screw (4 mts. power supply)	. 10
114-453	6-18 x 5/8 Slotted Hd. Wosher Hd. Self-Tap. screw (9 used)	.03
114-453 115-34 142-93	5-40 x 5/32 Fill. Hd. Moch. Screw (2 mts. (42.93)	37.50
142-93 188-195	Retaining Ring (2 used on S-14090 or S-14093)	.03
202-1398	Instruction Book	
S-14090	Four Speed Record Changer Four Speed Record Changer	
S-14093 S-26657	Terminal Strip Assem. (1 eo. part of 49-856)	.20
5-43992	45 R. P.M. Record Adopter Assem. Final Power supply & amplifier (chossis model 7B30)	2.95
S-44901 S-44931	Final chossis assem. (Model 1830)	
5-44931		
PART DIA.	CABINET PARTS MODELS ST 2550 E, R DESCRIPTION	
NO. NO.	DESCRIPTION	PRICE
	Cabinet Back Medd 15 7 2550 Cabinet Back Medd 15 7 2530R Cabinet Back Medd 15 7 2530R Cansale Cabinet Medd 15 7 2530 Cansale Cabinet Medd 16 (Shipeng)	5.75
2-595 2-596 2-597	Cabinet Back Model SF 2550R	5.75 5.75
2-597	Cobinet Back Model SF 2550E	5.75
14-2498 14-2498E 14-2498R	Console Cabinet Model SF 2550 E	
14-2498R	Console Cabinet Model SF 2550R	
12-2696 86-1503	Hold Down Brkt. (2 used) (Shipping) Packing Carton	
19-298	Mtg. clip (mts. 43992)	.20
19-298 22-2945 CB, 1/6	3 mfd. Electrolytic capacitor 30V (part of 49-856)	8.00
33-185 36-220	Record Changer Mig. Irania Record Changer Handle	1,00
46-1997	Volume Control Knob (Remote)	.50
46-2081	Control Knob (4 used)	
46-2096	Heid Dewn Britt, CL used) (Shipping) Pocking Carts, A19 201 Mag. Cla (mits, A19 202) Mag. Cla (mits, A19 202) Mag. Cla (mits, A19 202) Record Chenger Hondle Volume Control Krabs (Records) Volume Control Krabs (Records) Volume Control Krabs (Records) Volume Control Krabs (Records) Solution Control Krab	7.00
49-873	12" PM Speaker (2 used)	22.50
54-10 54-34 54-312	8-32 x % Hex Nut (8 pert of 14-2498, C & R) 6 22 x % Hex Nut (8 pert of 14-2498, F&R and 4 mts, eq. 49 85	6) ,03
54-312	Speed Nut (2 part of 14-2476, E & R)	
54-424	8-32 x 11/3 2 Hex Polnut (4 ea. mts. 49-873)	.03
57-1270	Strike Plate (2 part of 14-2498C) Strike Plate (2 part of 14-2498 & R)	.05
57-2498	Emblem Plate (part of 14-2498, E & R)	.35
57-2561	Nome Plate (port of 14-2498, E & R)	.03
72-84	Armite strip (6 used)	.03
83-2535		.03
54-424 57-1270 57-1284 57-2561 72-84 83-765 83-2535 83-3015 83-3038	Wire strip Existing strip - shipping (2 used)	
	Wire strip Friction strip - shipping (2 used) Convegetad, Filler strip - shipping (2 used) Convector Terminal (8 used) Convector Terminal (5 used)	őr
83-3039 86-237	Connector Terminal (8 used)	.05
86-254 86-255	Snade Terminal (Dused)	.03
93-1260	Fibre Washer (2 used on S-14090 ar S-14093)	.03
93-1336	Spacer Washer (Shipping) Cabl. Les (4 part of 14/24988)	.20
96-193	Cobt. Leg (4 part of 14-2498)	
96-193 96-194 96-195	Coht Log (4 part of 14-2498E)	
	CODI LOG ( 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
112-789 112-852 112-943	Connector Terminal (5 used) Space I Terminal 7 used on 5-14090 or 5-14093) Spacer Wasier (Si-pping) Cobi. Leg (4 part of 14-2408R) Cobi. Leg (4 part of 14-2408R) Satur (1-2408R) Satur (1-240	-185) .03

112-1131	6-18x5/8Phil. Flat Hd. Self-Tiap. screw (3 ea. mts. S-18560)	.03
112-1142	5-20 x1/2 Phillips Rd. Hd. Self-Top. Screw (mts. 19-298)	- 940
112-1194	Record Changer mtg. screw (2 used)	
113-65	8:32 x ¼ x ¼ AF Hex. Hd. Mach. screw (Lockwasher att.) (2 mts. 36-185)	.05
4-40	Chassis mtg. screw (4 used)	.03
114-329	o-18x3/8x1/4 AF Hex Hd. Self-Top. Screw (2 used)	
144-386	Chassis Mtg. Screw (4 mts. Power Supply)	.10
114-453	6-18 x 5/8 Slotted Hex Washer Hd. Self-Tap. screw	
	(9 mts. Cobt. back)	. NO
114-644	Special Hex Hd. Screw Red Finish on Head - washer att.	
10.42 010	(used on 33-185)	.0.0
115-34	4-40 x 5/32 Fill. Hd. Moch. Screw (2 mts. 142-93)	.03
142-93	Dug, Pickup Cartridge (Diamond-Sopphire)	37.50
152-268	Wood Block (Record Changer Stop)	. 50
156-33	Bullet Catch (2 part of 14-2498E)	
156-35	Bullet Catch (2 part of 14-2498, R)	.05
188-195	Retaining Ring (2 used on S-14090 or S-14093	.03
202-1398	Instruction Book	
5-14090 or	Four Speed Record Changer	
S-14090 or S-14093	Four Speed Record Changer	
S-18560	Record Changer Slide Assem. (2 used)	2.75
	Terminal strip assem. (2 part of 49:856)	.20
S-26657	5 R.P.M. Record Adaptor Assem.	2.9
5-43992	Final Power Supply & Amplifier Chassis - Model 7B30	
S-44901	Final Chassis Assem Model 1830	
5-449311	Findi Chassis Assent, - Moder 1000	

All prices shown are suggested retail prices which include Federal Manufacturers' Excise Tax where applicable — and are subject to change without notice.

#### TO THE SERVICEMAN:

Models SF2510, SF2510L, SF2510R, SF2550E and SF2550R are identical elect: rically. The only differences are in cabinet styling and chassis mounting.

Chassis (1830-7830) are complete high-fidelity stereophonic amplifiers. They use two 12-inch woofer and two 5-inch cone tweeter speakers.

The wires to the stereo cartridge should be connected as follows. ''Red" wire to ''R'' terminal of cartridge, ''Black'' to ''middle'' terminal and ''white'' wire to "L'' terminal of cartridge.

It is most important that coded speaker leads be connected to coded terminals on speakers for proper polarity within each speaker group. It is most important then that the speaker groups be in phase with each other. An excellent method to determine if the speaker groups are in phase is to play either a stereo or mo-naural record with the record compensator in RIAA position, with the tone controls on both units in mid position and with the audio outputs from each speaker group at the same level. Under these conditions, the sound should appear to come from a point mid-way between the two speaker groups. If the sound comes from any other point than mid-point then one speaker group is out of phase with the other and you should check speaker polarity.

if one or both of the 63QS output tubes in each final audio amplifier are replac-ed, it will be necessary to connect a DC volt meter across the balance terminals and adjust the balance control for minimum voltage.