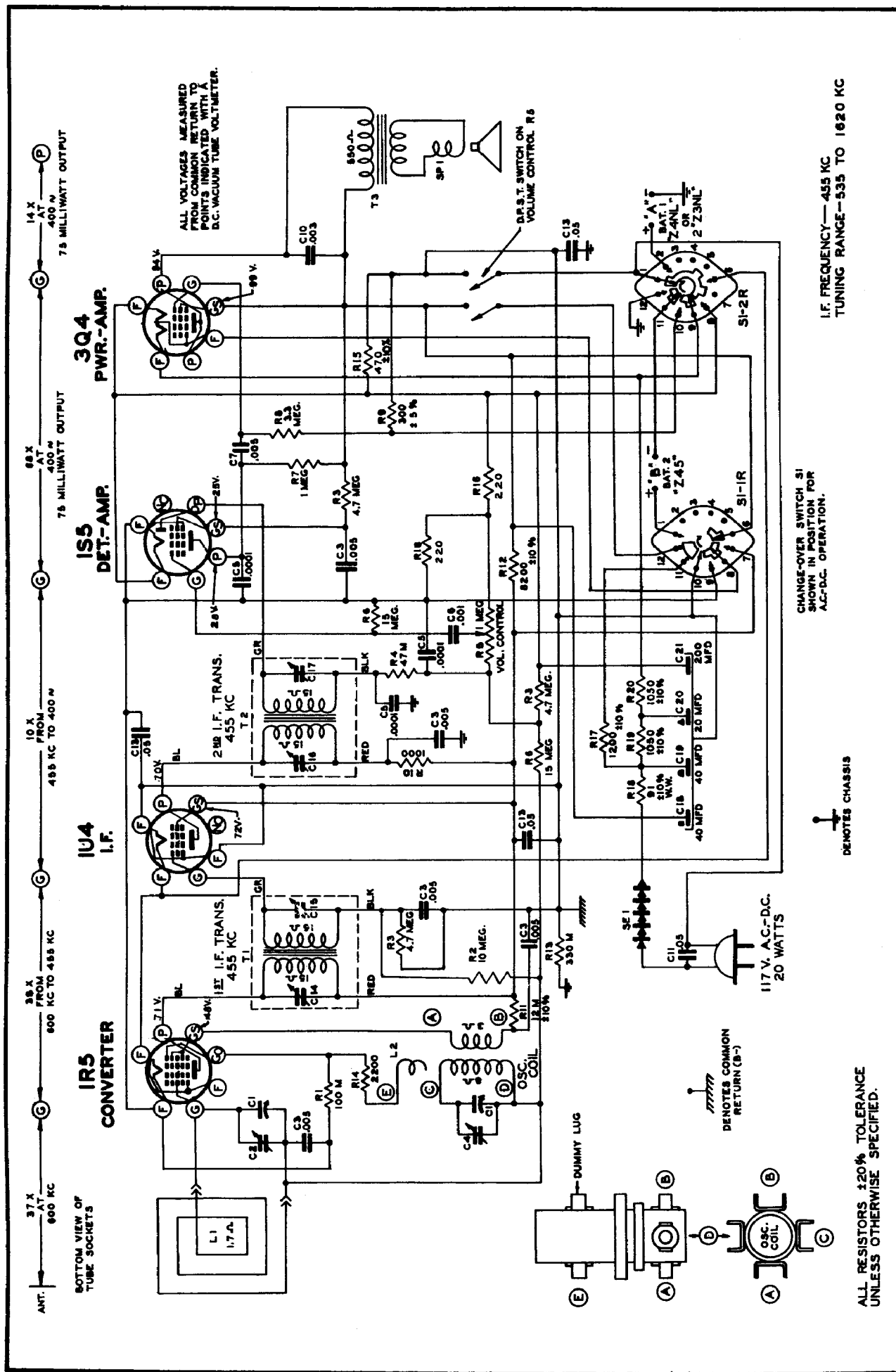
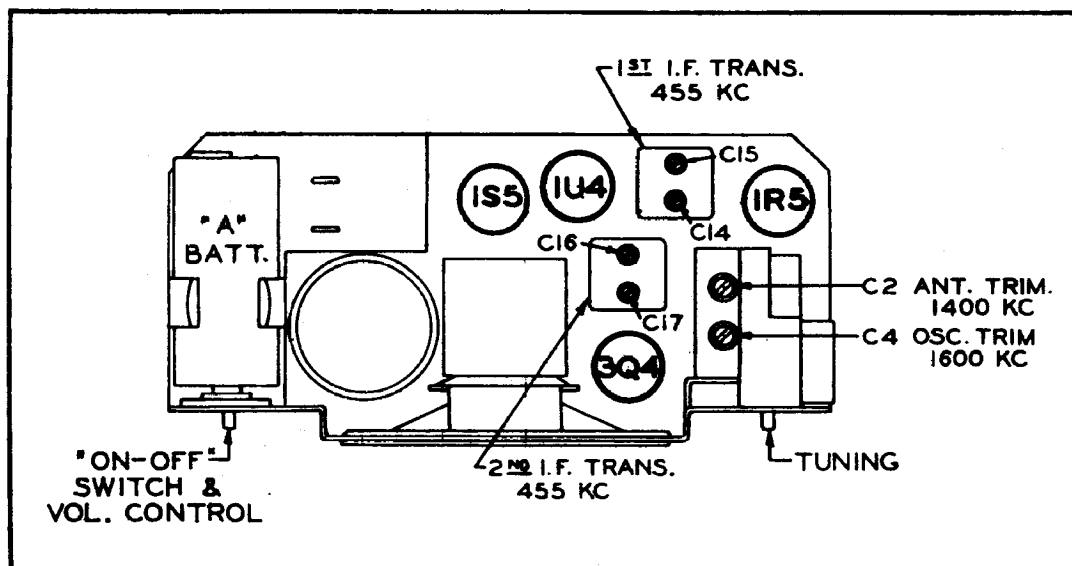




MODEL 4G800
CHASSIS No. 4E41



TUBE AND TRIMMER LOCATION

TO THE SERVICEMAN:

Final alignment of the 4E41 chassis should be made with the chassis installed in the cabinet. Tune in a weak station in the vicinity of 1400 KC and adjust the antenna trimmer for maximum.

ALIGNMENT PROCEDURE

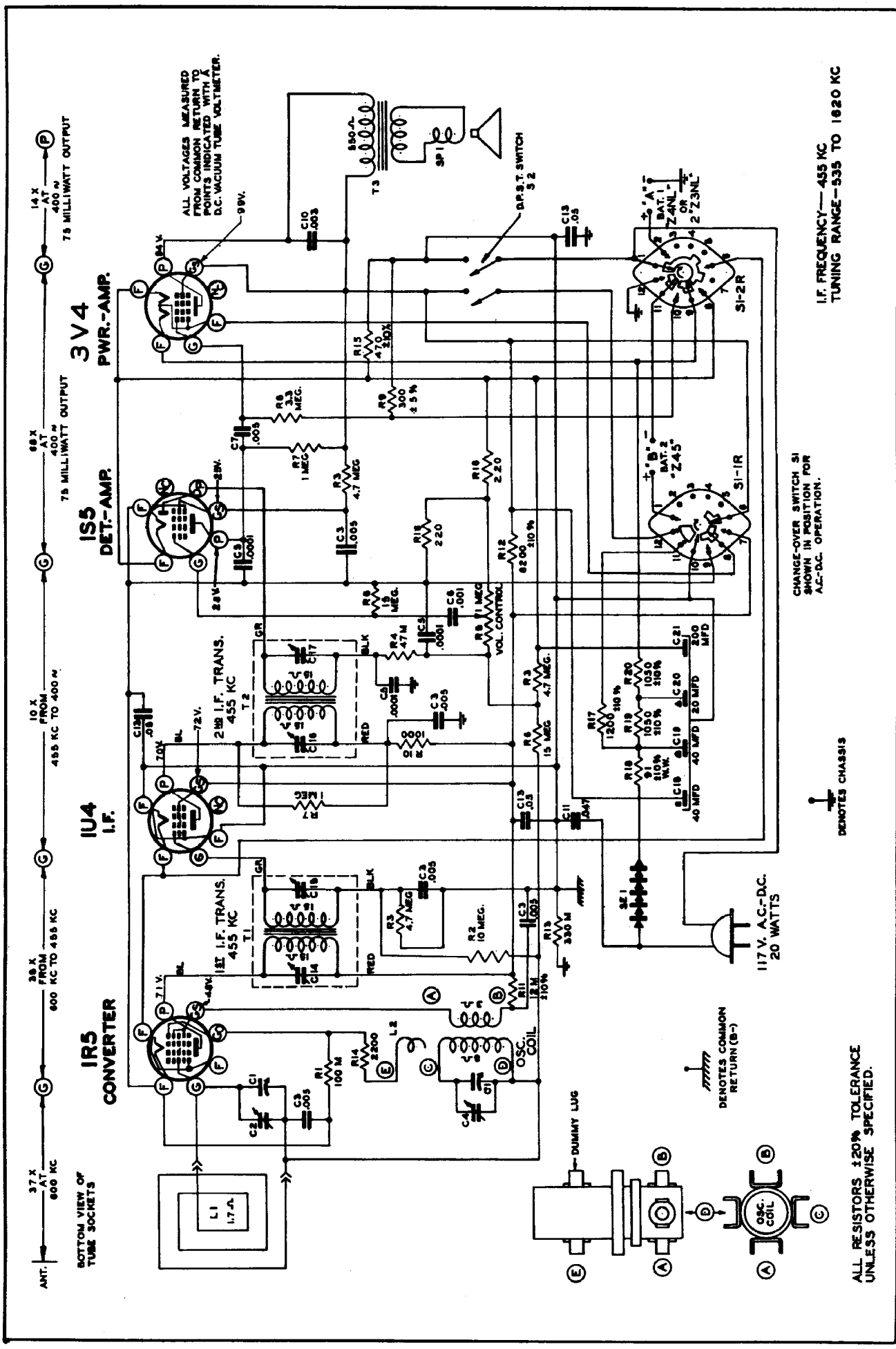
OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.1 MFD	455 Kc.	600 Kc.	C14, C15, C16, C17	Align I.F.
2	One Turn Loosely Coupled to Wavemagnet		1600 Kc.	1600 Kc.	C4	Set Oscillator To Scale --
3			1400 Kc.	1400 Kc.	C2	Adjust for Maximum.

PART NO.	REF. NO.	DESCRIPTION	PRICE
MISCELLANEOUS--Continued			
49-587	SP1	3-1/2" P. M. Speaker (Less Output Trans.)	4.25
		208-587 Cone and Voice Coil	1.65
54-254		Speed Nut (Tinnerman) (3 used on 83-1416)	.85C
57-1314		Cabinet Front Plate	3.00
57-1315		Chassis Bottom Plate	.50
78-274		Socket - Electrolytic Capacitor.	.03
78-781		Socket - Miniature Tube (1 used).	.20
78-782		Socket - Miniature Tube (3 used).	.25
80-564		"B" Battery Retaining Spring	.06
80-567		Latch Spring.	.02
80-611		Latch Spring.	.03
83-895		"B" Battery Terminal Strip.	.19
83-1416		Decorative Strip	.60
83-1417		Rubber Strip (Handle).	.10
83-1428		Wavemagnet Retainer Strip (2 used)	.03
85-400	S1	Power Change-over Switch	2.00
93-125		#6 Internal Shakeproof Lockwasher.	.31C
93-197		.031 x .128 x 1/2" Steel Washer	1.30C
93-735		.012 x .093 x 4/64" Steel Washer - Cadmium	.20C
93-863		#5 Split Lockwasher - Steel - Cadmium (212-2)	.30C
93-892		#4 Countersunk Shakeproof Lockwasher	.02
95-1014	T3	Output Transformer.	1.65
110-127		Grille Cloth	.15
112-56		#6 x 1/4" Hex Hd. Self Tapping Screw (9 used).	.55C
112-322		#2 x 3/16" Phillips Oval Hd. S. T. Screw (4 used on 24-436).	.03
112-683		#6 - 32 x 1/4" R. H. M. S. Steel Cadmium (Lockwasher attached) (2 used)	.02
112-684		#4 x 3/16" Binding Hd. S. T. Screw - Cad. Type 25 (4 used to hold bottom cover)	.01
112-685		#4 x 3/16" Flat Hd. S. T. Screw (2 used on S-13848) (2 used on S-13849)	.02
112-694		#5-40 x 1-1/4" Slotted Truss Hd. M. S. (212-2)	.01
114-58		#6-32 x 3/8" Hex. Acorn Hd. M. S. Steel N. P. (3 used) (Gang Mtg.).	.43C
125-17		Rubber Grommet.	.03
125-58		Strain Relief Grommet	.15
125-59		Strain Relief Grommet	.15
126-539		Volume Control and Power Switch Shield.	.15
199-79		Flexible Handle Sleeve	.30
202-527		Instruction Book.	.10
212-2	SE1	Selenium Rectifier (or 212-4).	1.80
S-13775		Shield and Battery Retaining Spring Assembly	.35
S-13776		Wavemagnet Terminal Strip and Bracket Assembly (Pin Jack)	.15
S-13777		Power Switch Shield Assembly	.20
S-13786	L1	Wavemagnet Winding Assembly (Type 35)	.75
S-13788		Handle Strip and Rivet Assembly	.15
S-13789		Cover Hinge and Bracket Assembly (R.H.)	.20
S-13790		Cover Hinge and Bracket Assembly (L.H.)	.20
S-13848		Hinge and Wire Assembly (R. H.).	.50
S-13849		Hinge and Wire Assembly (L. H.).	.50
S-13850		Strip and "A" Battery Front Contact Assembly.	.06
S-14482		Bottom Cover Latch Assembly	1.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY			
12-1374		Volume Control Mounting Bracket	\$ 0.08
46-683		Front Cover Latch Knob	.35
46-684		Tuning Control Knob	.06
46-685		Volume Control Knob	.10
59-200		Dial Pointer	.10
93-114		Brass Washer (Under Dial Pointer)	.03
94-295		Gang Capacitor Mounting Bushing	.04
COILS AND CHOKES			
95-1015	T1	1st I. F. Transformer	2.50
95-1016	T2	2nd I. F. Transformer	2.50
S-13774	L2	Oscillator Coil Assembly	.55
CONDENSERS			
22-326	C10	.003 MFD 400 V.	.20
22-1175	C7	.005 MFD 600 V.	.20
22-1443	C18, C19, C20, C21	Multiple Section Electrolytic 40-40-20 MFD. - 150 V. x 200 MFD. - 10 V.	3.25
22-1457	C1	Two Section Variable	4.00
22-1655	C13	.05 MFD 200 V.	.20
22-1660	C11	.05 MFD. (or 22-1756) 400 V.	.20
22-1669	C5	.002 MFD. (Ceramic) 500 V.	.20
22-1676	C6	.001 MFD. (Ceramic) (or 22-1343) 500 V.	.40
22-1706	C2	.008 MFD. (Ceramic) 450 V.	.30
RESISTORS			
63-1553	R5	Volume Control & Switch	1.81
63-1564	R18	91 Ohm, Insulated 2 W.	.33
63-1647	R19, R20	Candohm.	.65
63-1762	R9	300 Ohm, Insulated 1/2 W.	.21
63-1771	R15	470 Ohm. 1/2 W.	.10
63-1786	R10	1000 Ohm, Insulated. 1/2 W.	.21
63-1758	R16	220 Ohm. 1/2 W.	.21
63-1789	R17	1200 Ohm, Insulated. 1/2 W.	.21
63-1800	R14	2200 Ohm, Insulated. 1/2 W.	.21
63-1824	R12	8200 Ohm, Insulated. 1/2 W.	.21
63-1831	R11	12M Ohm, Insulated. 1/2 W.	.21
63-1856	R4	47M Ohm, Insulated. 1/2 W.	.21
63-1870	R1	100M Ohm, Insulated 1/2 W.	.21
63-1891	R13	330M Ohm, Insulated 1/2 W.	.21
63-1912	R7	1 Megohm, Insulated 1/2 W.	.21
63-1933	R8	3.3 Megohm, Insulated 1/2 W.	.21
63-1940	R3	4.7 Megohm, Insulated 1/2 W.	.21
63-1954	R2	10 Megohm, Insulated. 1/2 W.	.21
63-1961	R6	15 Megohm, Insulated. 1/2 W.	.21
MISCELLANEOUS			
11-102		Line Cord and Plug	.65
12-1379		Handle Support Bracket (R. H.)	.07
12-1380		Handle Support Bracket (L. H.)	.07
14-907		Model 800 Portable Cabinet - Plastic (Body Only)	2.00
14-907W		Model 800W Portable Cabinet - White Plastic (Body Only)	2.00
14-907Y		Model 800Y Portable Cabinet - Black Plastic (Body Only)	2.00
24-434		Cabinet Front Cover	1.10
24-436		Wavemagnet Cover	0.50
43-149		Handle End Piece (2 used)	1.25



MODELS 4G800Z-4G800WZ-4G800YZ
CHASSIS No. 4E41Z

I.F. FREQUENCY—455 KC
TUNING RANGE—535 TO 1620 KC

CHANGE-OVER SWITCH S1
SHOWN IN POSITION FOR
A.C.-D.C. OPERATION.

⏏ DENOTES CHASSIS

⏏ DENOTES COMMON
RETURN (B-)

ALL RESISTORS ±20% TOLERANCE
UNLESS OTHERWISE SPECIFIED.

3V4
PWR.-AMP.

IS5
DET.-AMP.

IU4
I.F.

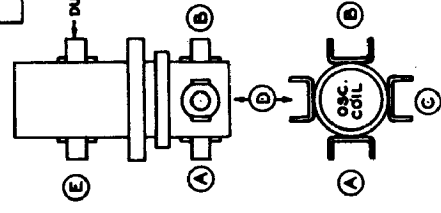
IR5
CONVERTER

ALL VOLTAGES MEASURED
FROM COMMON RETURN TO
POINTS INDICATED WITH A
D.C. VACUUM TUBE VOLTMETER.

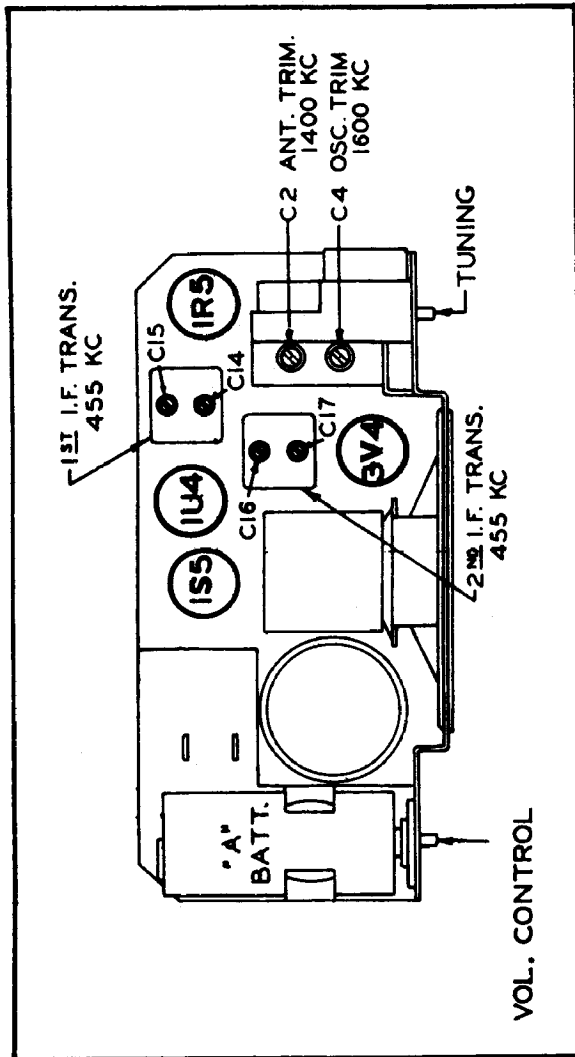
BOTTOM VIEW OF
TUBE SOCKETS

117 V. A.C.-D.C.
20 WATTS

DUMMY LUG



MODELS 4G800Z-4G800WZ-4G800YZ **CHASSIS No. 4E41Z**



TUBE AND TRIMMER LOCATION

TO THE SERVICEMAN:

Final alignment of the 4E41Z chassis should be made with the chassis installed in the cabinet. Tune in a weak station in the vicinity of 1400 KC and adjust the antenna trimmer for maximum.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.1 MFD	455 Kc.	600 Kc.	C14, C15, C16, C17	Align I.F.
2	One Turn Loosely Coupled to Wavemagnet		1600 Kc.	1600 Kc.	C4	Set Oscillator To Scale --
3			1400 Kc.	1400 Kc.	C2	Adjust for Maximum.

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY			
12-1374		Volume Control Mounting Bracket	\$0.08
46-683		Front Cover Latch Knob.	.35
46-684		Tuning Control Knob.	.06
46-684Y		Tuning Control Knob (For WZ & YZ).	.06
46-736		On-Off Switch Knob (Z).	.05
46-736W		On-Off Switch Knob (WZ Only).	.05
46-736Y		On-Off Switch Knob (YZ Only).	.05
46-737		Volume Control Knob (Used in WZ & YZ).	.10
46-737Y		Volume Control Knob (Used in WZ & YZ).	.10
59-200		Dial Pointer	.10
93-114		Brass Washer (Under Dial Pointer).	.03
94-295		Gang Capacitor Mounting Bushing.	.04
COILS AND CHOKES			
95-1015	T1	1st I. F. Transformer	2.50
95-1016	T2	2nd I. F. Transformer.	2.50
S-13774	L2	Oscillator Coil Assembly	.55
CONDENSERS			
22-326	C10	.003 MFD. 400 V.	.20
22-1175*	C7	.005 MFD. 600 V.	.20
22-1443	C18, C19, C20, C21	Multiple Section Electrolytic 40-40-20 MFD. - 150 V. x 200 MFD. - 10V	3.25
22-1457	C1	Two Section Variable	4.00
22-1655	C13	.05 MFD. 200 V.	.20
22-1669	C5	.0001 MFD. (Ceramic). 500 V.	.20
22-1676*	C6	.001 MFD. (Ceramic). 500 V (or 22-1343)	.40
22-1706*	C3	.008 MFD. (Ceramic). 500 V.	.30
22-1775*	C11	.047 MFD. 400 V.	.26
RESISTORS			
63-1564	R18	91 Ohm, Insulated 2 W	.33
63-1647	R19, R20	Candohm.	.65
63-1651	R5	Volume Control	1.20
63-1655	R18	91 Ohm W. W. 2 W	.19
63-1758	R16	220 Ohm, Insulated 1/2 W	.21
63-1762	R9	300 Ohm, Insulated 1/2 W	.21
63-1771	R15	470 Ohm. 1/2 W	.10
63-1786	R10	1000 Ohm, Insulated. 1/2 W	.21
63-1758	R16	220 Ohm. 1/2 W	.21
63-1789	R17	1200 Ohm, Insulated. 1/2 W	.21
63-1800	R14	2200 Ohm, Insulated. 1/2 W	.21
63-1824	R12	8200 Ohm, Insulated. 1/2 W	.21
63-1831	R11	12M Ohm, Insulated. 1/2 W	.21
63-1856*	R4	47 M Ohm, Insulated 1/2 W	.21
63-1870	R1	100M Ohm, Insulated 1/2 W	.21
63-1891	R13	330M Ohm, Insulated 1/2 W	.21
63-1912	R7	1 Megohm, Insulated 1/2 W	.21
63-1933	R8	3.3 Megohm, Insulated 1/2 W	.21
63-1940	R3	4.7 Megohm, Insulated 1/2 W	.21
63-1954	R2	10 Megohm, Insulated 1/2 W	.21
63-1961	R6	15 Megohm, Insulated 1/2 W	.21
MISCELLANEOUS			
11-102		Line Cord and Plug	.65
12-1379		Handle Support Bracket (R. H.)	.07
12-1380		Handle Support Bracket (L. H.)	.07
14-907		Model 800 Portable Cabinet - Plastic (Body Only)(Z)	2.00
14-907W		Model 800W Portable Cabinet - White Plastic (Body Only) (WZ Only)	2.00
14-907Y		Model 800Y Portable Cabinet - Black Plastic (Body Only) (YZ Only).	2.00
24-434		Cabinet Front Cover. (Z).	1.10
24-434W		Cabinet Cover (WZ Only)	1.10
24-434Y		Cabinet Cover (YZ Only)	1.10
24-436		Wavemagnet Cover. (Z).	0.50

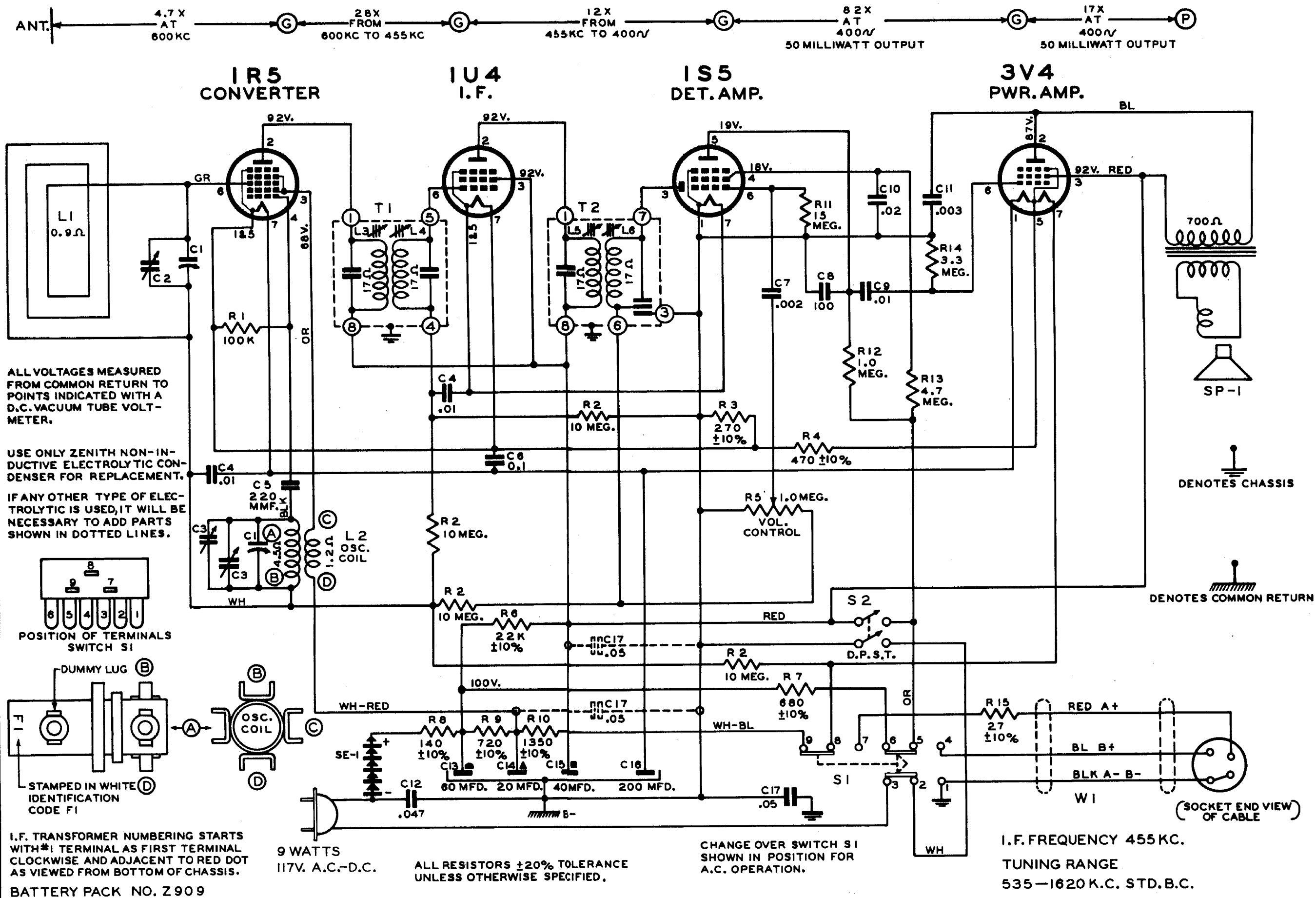
*Some 4E41Z chassis have the 4 capacitors, which are part of the 1S5 detector amplifier circuit, combined into a single unit Zenith part number 105-3. These capacitors are C5 and C7 (pin 5), C3 (pin 4) and C6 (pin 6) on the 1S5 tube.

The 105-2 unit combines the diode filter unit R4 and the two capacitors C5. This unit connects to the secondary (black lead) of the 2nd IF transformer.

MODELS 4G800Z-4G800WZ-4G800YZ
CLASSIC N.C. 4E417

PART NO.	REF. NO.	DESCRIPTION	PRICE
MISCELLANEOUS--Continued			
24-436Y		Wavemagnet Cover (YZ Only)	.50
24-462		Switch Cover	.08
24-465		Wavemagnet Cover (WZ Only)	1.00
43-149		Handle End Piece (2 Used)	1.25
49-587	SP1	3-1/2" P. M. Speaker (Less Output Trans.)	4.25
		208-587 Cone and Voice Coil.	1.65
54-254		Speed Nut (Tinnerman) (3 Used on 83-1416)	.85C
57-1314		Cabinet Front Plate.	3.00
57-1315		Chassis Bottom Plate	.50
78-274		Socket - Electrolytic Capacitor	.03
78-781		Socket - Miniature Tube (1 used)	.20
78-782		Socket - Miniature Tube (3 used)	.25
80-564		"B" Battery Retaining Spring	.06
80-567		Latch Spring	.02
80-611		Latch Spring	.03
83-1416		Decorative Strip	.60
83-1417		Rubber Strip (Handle)	.10
83-1428		Wavemagnet Retainer Strip (2 used)	.03
83-1513		"B" Battery Terminal Strip and Wire	.25
85-400	S1	Power Change-over Switch.	2.00
85-433	S2	"On-Off" Switch (D. P. S. T.)	1.20
93-125		#6 International Shakeproof Lockwasher.	.31C
93-197		.031 x .128 x 1/2" Steel Washer	1.30C
93-735		.012 x .093 x 4/64" Steel Washer - Cadmium	.20C
93-863		#5 Split Lockwasher - Steel - Cadmium (212-2).	.30C
93-892		#4 Countersunk Shakeproof Lockwasher	.02
95-1014	T3	Output Transformer	1.65
110-127		Grille Cloth.	.15
112-56		#6 x 1/4" Hex Hd. Self Tapping Screw (9 used)	.55C
112-322		#2 x 3/16" Phillips Oval Hd. S. T. Screw (4 used on 24-436)	.03
112-407		#6 x 3/8" Rd. Hd. Self Tapping Screw - Cadmium (4 Used)	.02
112-536		#6 x 5/16" Phillips Binding Hd. Self Tapping Screw - Cadmium	1.80C
112-683		#6 - 32 x 1/4" R. H. M. S. Steel Cadmium (Lockwasher attached) (2 used)	.02
112-685		#4 x 3/16" Flat Hd. S. T. Screw (2 used on S-13848) (2 used on S-13849)	.02
112-694		#5-40 x 1-1/4" Slotted Truss Hd. M. S. (212-2)	.01
112-711		#4 x 1/4" Binding Hd. Self Tapping Screw - Stat. Bronze (8 used)	1.20C
112-713		#4-40 x 1/4" Rd. Phillips Hd. M. Screw (Int. Lockwasher attached)	.02
114-58		#6-32 x 3/8" Hex. Acorn Hd. M. S. Steel N. P. (3 used) (Gang Mtg.)	.43C
125-17		Rubber Grommet	.03
125-58		Strain Relief Grommet	.15
125-59		Strain Relief Grommet.	.15
126-539		Volume Control and Power Switch Shield	.15
199-79		Flexible Handle Sleeve (Z)	.30
199-79Y		Flexible Handle Sleeve (WZ and YZ)	.30
202-613		Instruction Book	.11
212-2	SE1	Selenium Rectifier (or 212-4)	1.80
S-13775		Shield and Battery Retaining Spring Assembly	.35
S-13777		Power Switch Shield Assembly.	.20
S-13786	L1	Wavemagnet Winding Assembly (Type 35)	.75
S-13789		Cover Hinge and Bracket Assembly (R.H.)	.20
S-13790		Cover Hinge and Bracket Assembly (L.H.)	.20
S-13848		Hinge and Wire Assembly (R.H.)	.50
S-13849		Hinge and Wire Assembly (L.H.)	.50
S-13850		Strip and "A" Battery Front Contact Assembly	.06
S-14482		Bottom Cover Latch Assembly.	1.50
S-14622		Wavemagnet Terminal Strip & Bracket Assembly (Pin Jack)	.04
S-14755		Handle Strip Assembly	.05

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



TO THE SERVICE MAN:

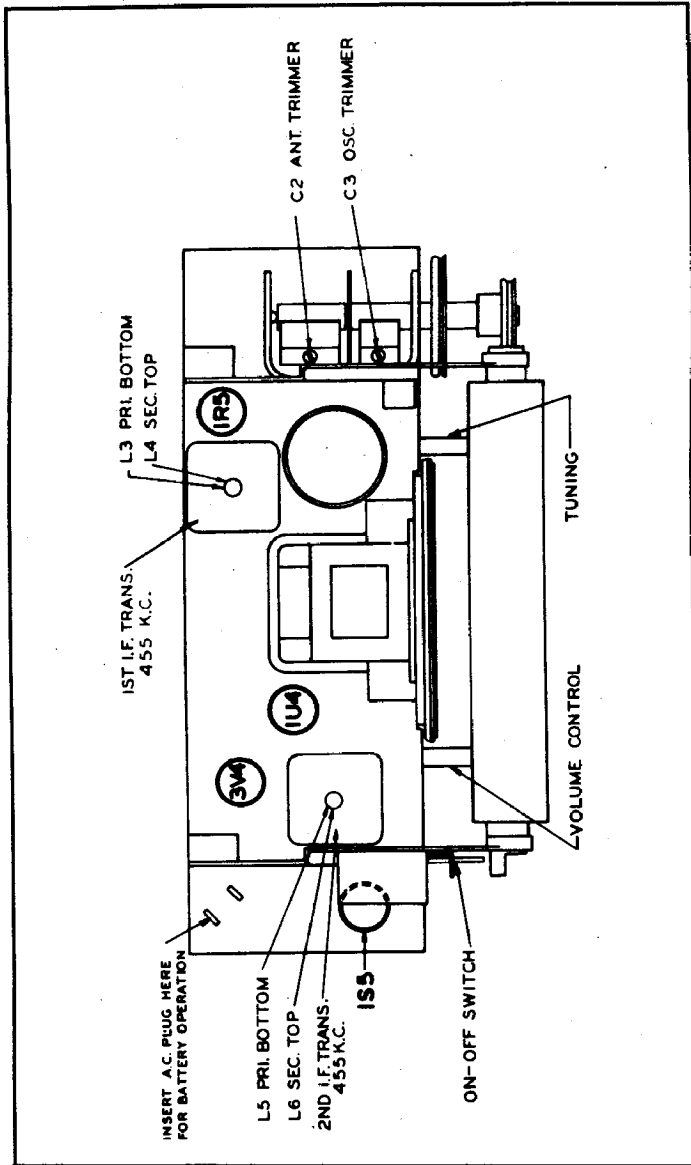
The 4F40 chassis is an AC, DC or battery operated super-heterodyne. The chassis is isolated from the DC circuit, and all measurements must be made from a common negative point. The most convenient place to reach this negative point is the terminal strip to which C17 is connected. When the change over Switch S1 is in AC position, the DC resistance from chassis to any circuit must be almost infinite. If any circuit becomes grounded a hum will result. Microphonic tubes will cause audio howl. Check the 1R5 and 1S5.

The wavemagnet is connected to the chassis by two wires that pass through the hollow dial pivots. If the R.F. becomes weak or dead, check the D.C. resistance of the wavemagnet. This D.C. resistance should be approximately .9 ohm. If it is open check the wavemagnet.

IF Alignment: Remove the chassis from the cabinet and arrange the units so that the wavemagnet can be connected. All the connections and adjustments can be made from the top of the chassis. Connect a signal generator, through a .1 mfd. dummy antenna, to the converter grid and B (common return). Connect an output meter across the voice coil of the speaker (two lugs provided). Set the signal generator to 455 Kc. and adjust L3, L4, L5 and L6 for maximum indication on the output meter. Always keep the signal output from the generator just high enough to get an indication, otherwise excessive loading may result.

RF Alignment: Connect a two turn loop across the leads of the signal generator, loosely couple this loop to the wavemagnet. Set the signal generator and the dial pointer of the receiver to 1600 Kc. and adjust C3 oscillator trimmer to resonance. Set the signal generator and dial pointer to 1400 and adjust C2 antenna trimmer to resonance. These trimmers are on the top of gang condenser. Check operation and re-install set in cabinet. Tune in a weak station near 1400 Kc. or use background noise and readjust antenna trimmer for maximum sensitivity.

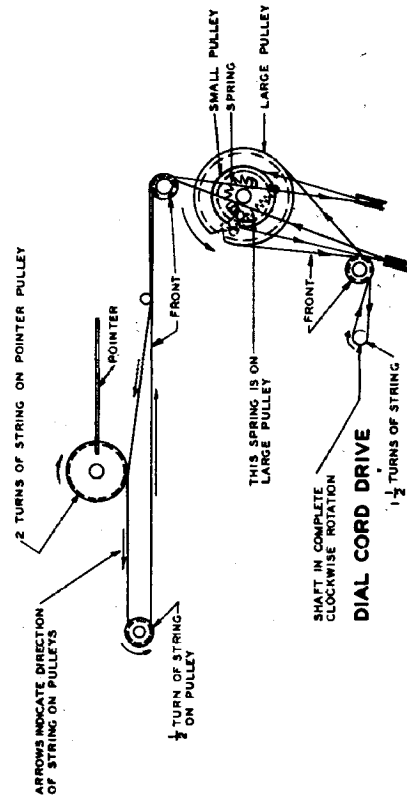
TUBE, TRIMMER LOCATION



ALIGNMENT PROCEDURE

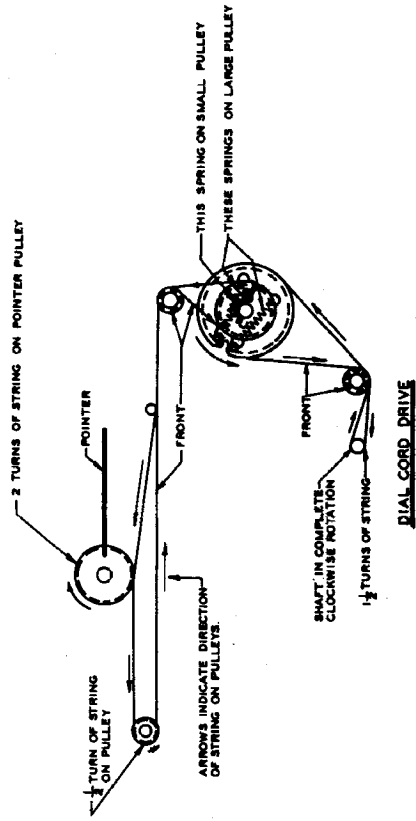
OPERATION	CONNECTOR TO OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	BAND	SET DIAL TO	TRIMMERS	PURPOSE
1	Converter Grid	.1 Mfd	455 Kc.	BC	600 Kc.	L3, 4, 5 & 6	I.F. Alignment
2	Two turns loosely coupled to Wavemagnet		1600 Kc.	BC	1600 Kc.	Osc. Trim. C3	Set Oscillator to scale
3	Two turns loosely coupled to Wavemagnet		1400 Kc.	BC	1400 Kc.	Ant. Trim. C2	Align Wavemagnet

DIAL CABLE DRAWING



On receivers using Tuning Gang #22-2032, Dial String Assemblies #S-15440 (short) and #S-15441 (long) must be used.

DIAL CABLE DRAWING



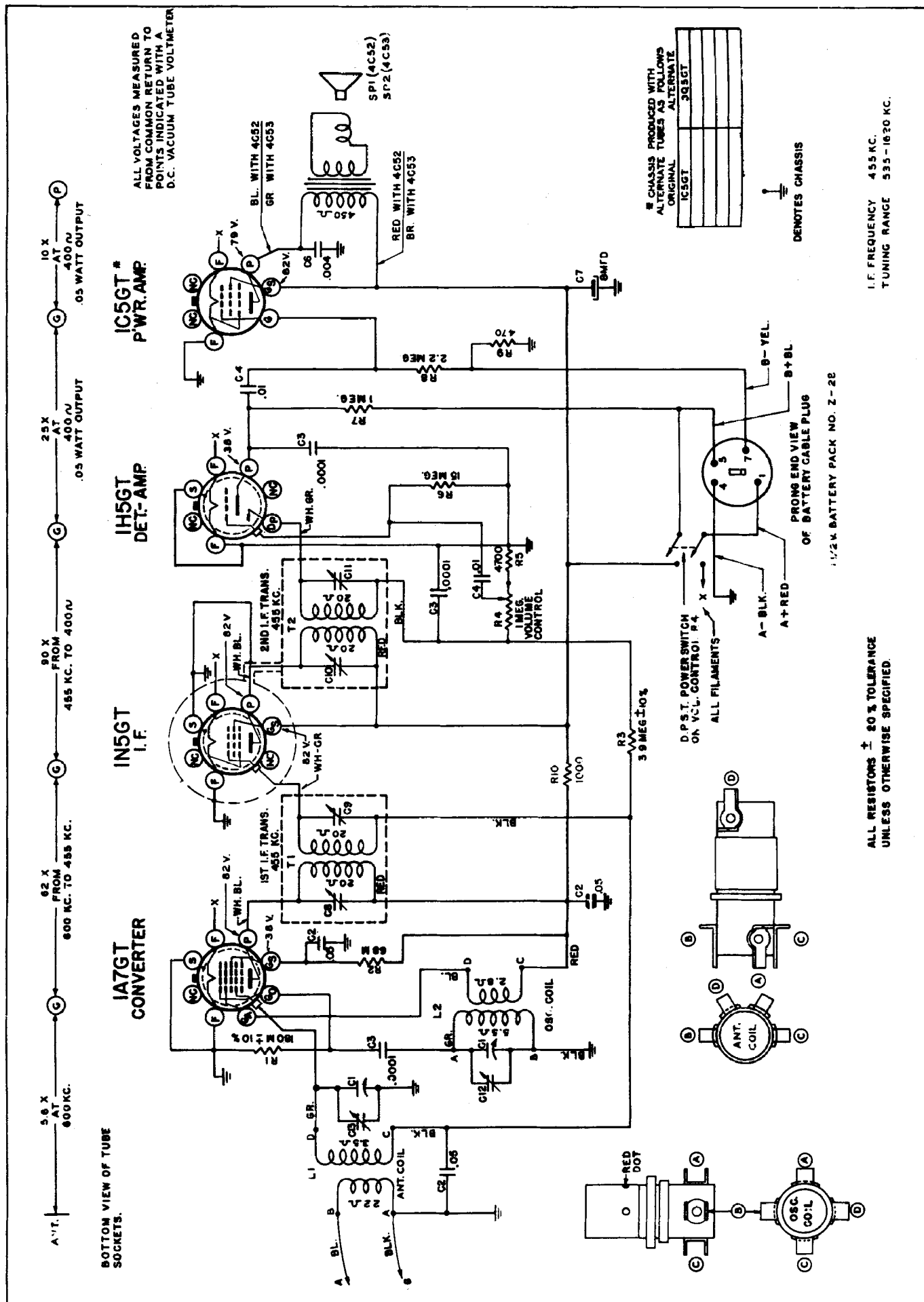
On receivers using Tuning Gang #22-2108, Dial String Assemblies #S-15440 (short) and #S-16106 (long) must be used.

PARTS LIST

PART NO.	REF.NO.	DESCRIPTION	PRICE	PART NO.	REF.NO.	DESCRIPTION	PRICE	PART NO.	REF.NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY											
12-1554		Tuning Shaft Bracket	.02	63-1912	R12	1 Meg Ohm 1/2W 20% Ins.	.21	78-782		Miniature Tube Socket	.25
26-420		Dial Scale	.90	63-1933	R14	3.3 Meg Ohm 1/2W 20% Ins.	.21	78-806		Miniature Tube Socket	.15
46-785		Tuning & Vol. Control Knob (2 Used)	.10	63-1940	R13	4.7 " " 1/2W 20% "	.21	78-807		Miniature Tube Socket (2 Used)	.15
57-1490		Emblem Plate	.40	63-1954	R2	10 " " 1/2W 20% "	.21	80-699		Latch Spring	.03
57-1493		Trim Plate	1.40	63-1961	R11	15 " " 1/2W 20% "	.21	83-1600		Handle Strip (Slotted)	.20
57-1513		Emblem Plate (Y Model only)	.40	63-1999	R8	140 Ohm 3W 10% (Zipohm) Ins. (or 63-2014)	.33	83-1610		Wavemagnet Retaining Strip (2 Used)	.015
57-1514		Trim Plate (Y Model only)	1.60	63-2010	R9,10	Two Section Candohm	.60	85-450	SI	Power Change-Over Switch	1.00
76-540		Tuning Shaft	.10	63-2013	R5	Volume Control	1.20	85-451	S2	On-Off Switch	.55
80-209		Dial Cord Tension Spring (3 Used)	.024					94-472		Handle Mtg. Bushing (2 Used)	.18
93-978		Felt Washer (Used behind Pointer Assem.)	.005	MISCELLANEOUS							
188-32		Retaining Ring (Used on 76-540)	1.03C					112-761		#2 X 1/4" Phill. R.H.S.T. Type 2 Steel N.P.	.02
S-15430		Pointer & Pulley Assem.	.15					113-18		(2 Used on Emblem Plate)	.02
S-15440		Dial Cord Assem. (Short)	.05					113-23		#6-32 X 5/16 Hex. Hd. Slotted M.S. Steel	.02
S-15441		Dial Cord Assem. (Long)	.10							Cad. Pl. Shakeprf. (2 Used on 85-450)	
S-6016		Dial Cord Assem. (Long)	.10							#8-32 X 5/16 Hex Hd. Sl. M.S. Steel Cad.	.02
										Pl. Int. Shakeprf. Lock (2 Used on S-15633)	
										#6 X 1/4" Hex Hd. S.T. Screw Cad. Pl.	.72C
										(4 Used on S-15437)	
										#6-32 X 1" Hex Hd. Slotted M.S. Steel N.P.	.02
										(1 Used to Mt. Rectifier	
										#8-32 X 11/16" Hex Hd. Slotted M.S. Steel	.015
										Cad. Pl. (2 Used to Mt. Handle)	.02
										Speaker Mtg. Spacer	.25
										Door Latch	.02
										Rear Cover Catch (2 Used-Black)	.30
										Door Latch (Y Model only)	.02
										Rubber Bumper (Speaker & Gang)	.60
										Dial Glass	.40
										Flexible Handle Sleeve (With Cardboard Strips)	.10
										Paper Sleeve (Used on Wavemagnet Lead)	.45
										Instruction Book	.70
										Selenium Rectifier (or 212-2)	.50
										Cabinet Front & Hinge Assem.	.25
										Support Brkt. & Idler Pulley Assem.	3.00
										(Gang & Door)	1.50
										Wavemagnet Winding Assem.	4.50
										Battery Cable & Socket Assem.	3.00
										Speaker Baffle & Grille Cloth Assem.	1.50
										(110-137)	
										Cabinet Rear Cover Assem.	
										Handle End Pieces Assem. (2 Used)	
										Brkt. & Idler Pulley Assem. (Lower)	
										Cabinet Front & Hinge Assem. (Y Model only)	
										Cabinet Rear Cover Assem. (Y Model only)	
										Handle End Pieces Assem. (Y Model only)	

Prices subject to change without notice.

ZENITH RADIO CORPORATION



MODELS 4K016-4K035
CHASSIS Nos. 4C52-4C53

MODELS CHASSIS

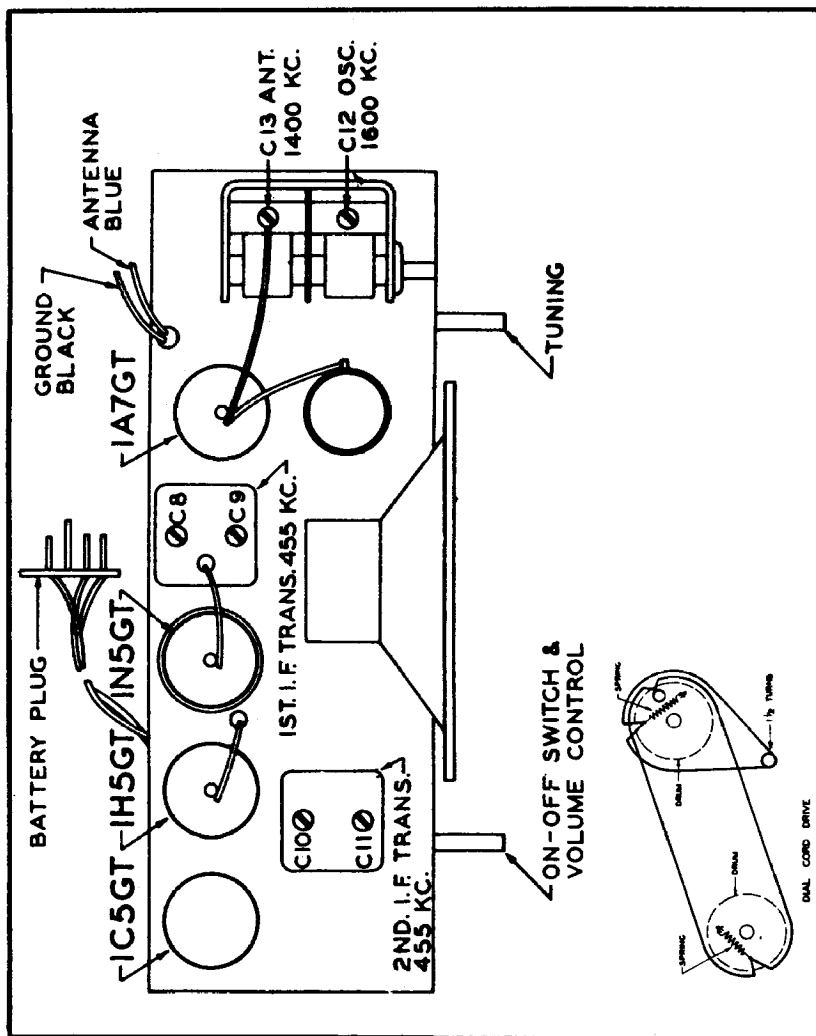
4K016-4K035
Nos. 4C52-4C53

PARTS LIST

PARTS FOR CHASSIS 4C52 AND 4C53 ARE INTERCHANGEABLE EXCEPT WHERE OTHERWISE INDICATED

PART NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY		
26-340	Dial Scale (4C52)	.27
26-339	Dial Scale (4C53)	.24
59-122	"On-Off" Indicator	.12
59-160	Dial Pointer	1.14
76-335	Tuning Control Shaft (4C52)	.07
76-420	Tuning Control Shaft (4C53)	.20
80-185	Indicator Spring	.03
80-209	Dial Cord Tension Spring	.06
80-471	Tuning Shaft Spring	1.31C
186-50	Plug Button (Dial Scale Mtg.)	.01
186-32	Retaining Ring	1.00C
186-34	Retaining Ring	1.00C
83-95	Indicator Cam	.12
83-96	Dial Cord and Eyelet Assem. (Long)	.12
83-97	Dial Cord and Eyelet Assem. (On Gang)	.12
56810944	Pointer and Pulley Assem. (4C52)	.12
11811128	Dial Cord and Eyelet Assem. (4C53)	.07
811232	Pointer Pulley and Bushing Assem.	.11
8113034	Dial Cord and Eyelet Assem. (Short)	.07
COILS AND CHOKES		
95-814	1st I. F. Transformer (T1)	1.77
95-839	2nd I. F. Transformer (T2)	1.77
812014	Oscillator Coil Assem. (L2)	.77
812024	Antenna Coil Assem. (L1)	.98
CONDENSERS		
22-182	.0001 Mfd. (C3)	.20
22-196	.01 Mfd. (C4)	.20
22-448	.004 Mfd. (C6)	.20
22-464	Dry Electrolytic . . . 8 Mfd. (C7) 150 V.	.20
22-829	.05 Mfd. (C2)	.40
22-1453	Two Gang Variable (C1-4C53)	3.85
22-1454	Two Gang Variable (C1-4C52)	3.85
RESISTORS		
65-271	1 Megohm (R7)	.09
65-583	1M Ohm (R10)	.09
65-587	4700 Ohm (R5)	.09
65-594	68M Ohm (R2)	.09
65-800	2.2 Megohm (R8)	.09
65-834	820 Ohm (R9)	.09
65-854	180M Ohm (R1)	.09
65-869	3.9 Megohm (R3)	.09
65-876	15 Megohm (R6)	.09
65-1235	Volume Control and Switch (R4)	1.81
65-1361	Volume Control and Switch (R4-4C52)	1.81
MISCELLANEOUS		
2-106	Cabinet Back (4C52)	.13
12-1040	Handle Bracket (4C52)	.02
14-916	Model Old Bakelite Cabinet (Walnut - 4C52)	6.90
49-519	5" P. M. Speaker (4C52)	1.97
49-450	206-519 Output Transformer	1.75
59-190	8-1/2" P. M. Speaker	7.24
57-110	206-450 Output Transformer	1.67
57-111	208-450 Cone and Voice Coil	1.97
58-74	Speaker Cable	.19
78-611	Antenna Lead Marker	.03
83-258	Ground Lead Marker	.03
92-548	Battery Cable Plug	.12
110-122	Socket - Octal (8 Contact)	.12
112-273	Brown Felt Washer (4C52)	.79C
114-134	Grille Cloth (4C52)	1.20C
128-379	Chassis Mounting Screw (4C52)	.07
159-42	#6 x 1/16 Hex Washer Hd. S. Screw (Chassis Mtg.)	.02
186-32	Back Retaining Button (4C52)	1.90C
186-34	Retaining Ring (4C52)	1.90C
186-35	Dial Crystal (4C52)	2.00
186-36	Dial Crystal (4C53)	.08
186-37	Dial Crystal	.08
186-38	Dial Crystal	.08
186-39	Indicator	.08
186-40	Indicator	.08
186-41	Indicator	.08
186-42	Indicator	.08
186-43	Indicator	.08
186-44	Indicator	.08
186-45	Indicator	.08
186-46	Indicator	.08
186-47	Indicator	.08
186-48	Indicator	.08
186-49	Indicator	.08
186-50	Indicator	.08
186-51	Indicator	.08
186-52	Indicator	.08
186-53	Indicator	.08
186-54	Indicator	.08
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186-56	Indicator	.08
186-57	Indicator	.08
186-58	Indicator	.08
186-59	Indicator	.08
186-60	Indicator	.08
186-61	Indicator	.08
186-62	Indicator	.08
186-63	Indicator	.08
186-64	Indicator	.08
186-65	Indicator	.08
186-66	Indicator	.08
186-67	Indicator	.08
186-68	Indicator	.08
186-69	Indicator	.08
186-70	Indicator	.08
186-71	Indicator	.08
186-72	Indicator	.08
186-73	Indicator	.08
186-74	Indicator	.08
186-75	Indicator	.08
186-76	Indicator	.08
186-77	Indicator	.08
186-78	Indicator	.08
186-79	Indicator	.08
186-80	Indicator	.08
186-81	Indicator	.08
186-82	Indicator	.08
186-83	Indicator	.08
186-84	Indicator	.08
186-85	Indicator	.08
186-86	Indicator	.08
186-87	Indicator	.08
186-88	Indicator	.08
186-89	Indicator	.08
186-90	Indicator	.08
186-91	Indicator	.08
186-92	Indicator	.08
186-93	Indicator	.08
186-94	Indicator	.08
186-95	Indicator	.08
186-96	Indicator	.08
186-97	Indicator	.08
186-98	Indicator	.08
186-99	Indicator	.08
186-100	Indicator	.08

TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING



TO THE SERVICE MAN:

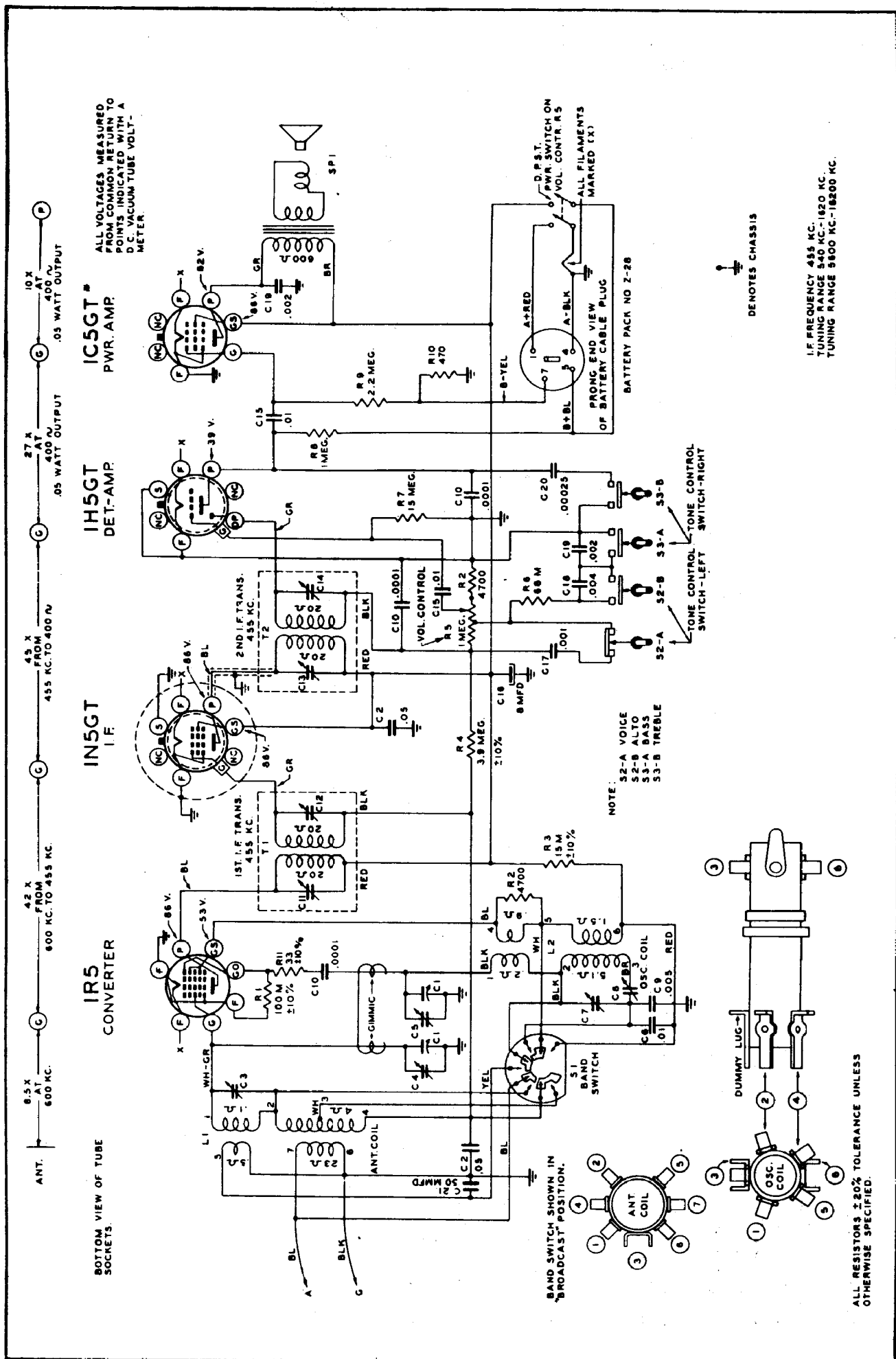
The alignment of this chassis is conventional.

A 4700 ohm resistor R5 between the low end of the volume control and ground allows some audio output with normal signal input when the volume control is in counter clockwise positions. This is the Guardian Reminder circuit.

If the audio output is objectionably high (with the volume control in counter clockwise position) resistor R5 may be reduced in value to 2500 ohms or removed from the circuit and the low end of the control grounded.

ALIGNMENT PROCEDURE

OPERATION	CONNECT	DUTY	INPUT SIG.	SET	TRIMMERS	PURPOSE
	OSCILLATOR TO	ANTENNA	FREQUENCY	DIAL AT		
1	Converter	.5 Mfd	455 Kc.	600 Kc.	C-8, C-9, C-10, C-11	Align I. F.
2	Antenna and Ground	200 mmfd.	1600 Kc.	1600 Kc.	C-12	Set Oscillator to Dial Scale.
3	Antenna and Ground	200 mmfd.	1400 Kc.	1400 Kc.	C-13	Align Antenna Stage.



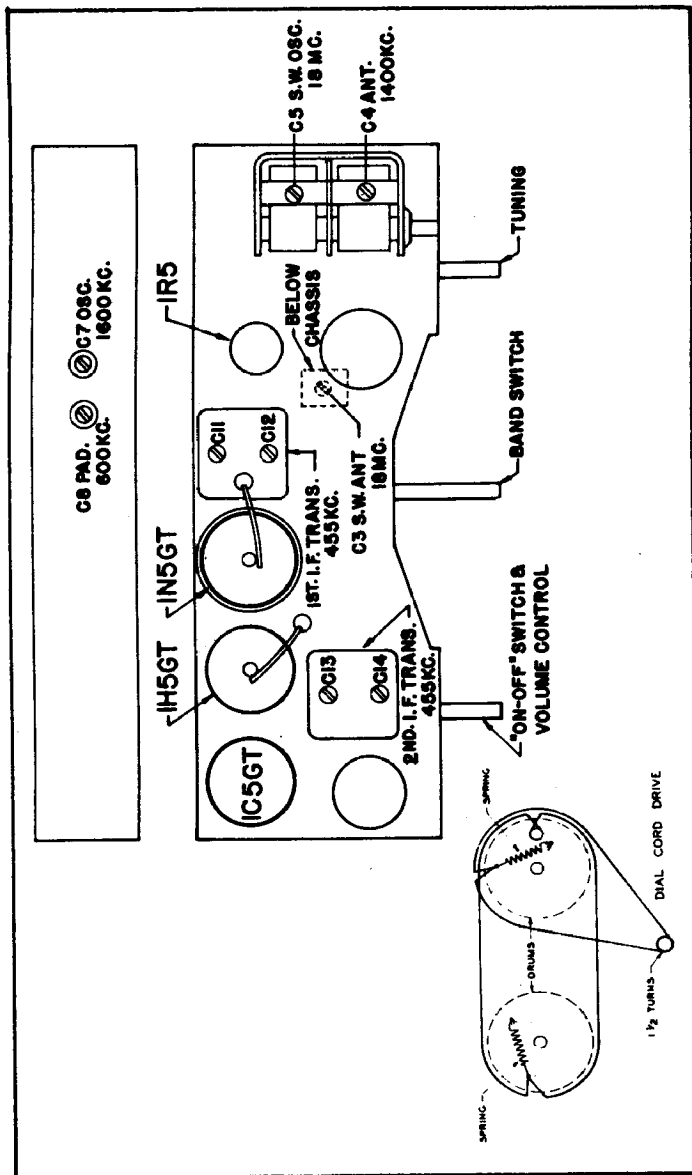
MODELS 4K040-4K040G CHASSIS No. 4C54

MODELS 4K040-4K040G **CHASSIS No. 4C54**

TO THE SERVICE MAN:

The alignment of this receiver is conventional. An output meter, connected across the voice coil of the speaker, is very helpful in making correct adjustments.

The Guardian Reminder Circuit consist of a 4700 ohm resistor (R2) in series with the low side of the volume control. With this circuit, it is impossible to turn the volume completely off and leave the power on. In some cases where the minimum volume is too high even at the lowest setting of the volume control, R2 may be changed to a lower value or shorted out completely.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSC. TO	DUMMY ANT.	INPUT SIG. FREQUENCY	BAND	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	BC	600 Kc.	C-11, C-12, C-13, C-14	Align I.F.
2	Ant.-Gnd.	400 ohms	18 Mc.	SW	18 Mc.	C-5	Set Osc. to Scale
3	Ant.-Gnd.	400 ohms	400 ohms	SW	Rock Gang 18 Mc.	C-3	Align Antenna
4	Ant.-Gnd.	200 Mmf.	1600 Kc.	BC	1600 Kc.	C-7	Set Osc. to Scale
5	Ant.-Gnd.	200 Mmf.	1400 Kc.	BC	1400 Kc.	C-4	Align Antenna
6	Ant.-Gnd.	200 Mmf.	600 Kc.	BC	Rock Gang 600 Kc.	C-8	Adjust Padder

PARTS LIST

DIAL ASSEMBLY

26-342	Dial Scale.....	.32
46-443	Radiogram Knob (Voice).....	.07
46-444	" " (Treble).....	.07
46-445	" " (Alto).....	.07
46-446	" " (Bass).....	.07
59-122	Off & ON Indicator.....	.12
59-160	Dial Pointer.....	1.14
76-335	Tuning Control Shaft.....	.07
80-183	Indicator Spring.....	.024
80-209	Dial Cord Tension Spring.....	.024
80-471	Tuning Shaft Spring.....	1.31C
93-690	Felt Washer (S-11362).....	.60C
192-90	Dial Crystal.....	.50
196-64	Dial Crystal Gasket.....	.08
S9588	Indicator Cam Assem.....	.07
S9610	Dial Cord & Eyelet (Pointer).....	.12
S9733	Dial Cord & Eyelet (Gang Cond.).....	.07
S9751	Pulley & Rivet Assem. (Gang Cond.).....	.12
S11362	Pulley & Bushing Assem. (Pointer).....	.11
S11558	Vol. & Tuning Knob Assem. (2 used) (46-520).....	.28
S12305	Band Switch Knob Assem. (46-598).....	.32

COILS & CHOKES

95-838	1st I.F. Transformer (T1).....	1.77
95-839	2nd I.F. Transformer (T2).....	1.77
S9829	Osc. Coil Assem. (L2).....	1.39
S9832	Ant. Coil Assem. (L1).....	1.39

CONDENSERS

22-162	.0001 Mfd. (C10).....	600 V.	.20
22-182	.00025 Mfd. (C20).....	600 V.	.26
22-196	.01 Mfd. (C15).....	600 V.	.20
22-448	.004 Mfd. (C18).....	600 V.	.20
22-492	.002 Mfd. (C19).....	600 V.	.20
22-684	Dry Electrolytic 8 Mfd. (C16).....	150 V.	.45
22-826	.01 Mfd. (C6).....	200 V.	.20
22-829	.05 Mfd. (C2).....	200 V.	.20
22-887	.001 Mfd. (C17).....	600 V.	.20
22-1022	.005 Mfd. (C9).....	600 V.	.38
22-1208	Two Section Gang (C1).....		2.56
22-1239	Two Section Trimmer (C7 & C8).....		.58
22-1240	Single Section Ceramic Trimmer (C3).....		.20
22-1532	50 Mmfd. (C21).....	500 V.	.20

PARTS LIST

RESISTORS

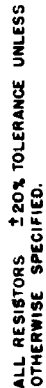
63-260	100M Ohm (R1).....	1/4 Watt	.09
63-271	1 Megohm (R8).....	1/4 "	.09
63-311	15M Ohm (R3).....	1/4 "	.09
63-581	470 Ohm (R10).....	1/4 "	.09
63-587	4700 Ohm (R2).....	1/4 "	.09
63-594	68M Ohm (R6).....	1/4 "	.09
63-600	2.2 Megohm (R9).....	1/4 "	.09
63-620	33 Ohm (R11).....	1/4 "	.09
63-669	3.9 Megohm (R4).....	1/4 "	.09
63-976	15 Megohm (R7).....	1/4 "	.09
63-1236	Volume Control & Switch (R5).....		1.81

MISCELLANEOUS

49-522	6 1/2" P.M. Speaker.....	10.00
	206-522 Output Transformer.....	2.21
	208-522 Cone & Voice Coil.....	2.09
52-190	Speaker Cable.....	.19
54-34	#6-32 x 1/4 x 3/32 Hex Nut.....	.31C
57-11A	Antenna Marker.....	.024
57-11G	Ground Marker.....	.024
57-900	Dial Mtg. Plate.....	.35
57-1159	Radiorgan Escutcheon Plate (2 used).....	.18
58-74	Battery Cable Plug.....	.12
70-124	#2 x 3/8 Phillips Hd. Wood Screw - Brass Plated (57-1159).....	1.70C
78-436	Miniature Tube Socket.....	.19
78-611	Octal Base Tube Socket (3 used).....	.12
95-279	Band Selector Switch.....	.72
85-284	Radiorgan Switch L.H. (Voice & Alto).....	.55
85-288	Radiorgan Switch R.H. (Treble & Bass).....	.55
93-125	#6 Internal Shakeproof Lockwasher.....	.31C
93-258	Brown Felt Washer (Knobs).....	.78C
94-295	Steel Bushing (Radiorgan) (4 used).....	.036
112-56	#6-1/4 Hex Hd. Self Tapping Screw.....	.55C
114-67	#6-32 x 7/16 Hex Acorn Hd. M.S. Steel N.P. (Radiorgan) (4 used).....	.43C
114-162	#8 x 7/8 Hex Acorn Hd. Self Tapping Screw (Chassis Mtg.).....	1.20C
125-17	Rubber Grommets (85-284 & 288).....	.03
125-39	Rubber Grommets.....	.02
126-379	Tube Shield.....	.07
159-14	Plug Buttons (Dial Scale).....	.78C
188-32	Retainer Ring (76-335).....	1.03C
188-34	Retainer Ring (S-11362).....	1.20C
188-48	Control Knob Decorative Ring.....	.035
202-384	Instruction Book.....	.15

Prices subject to change without notice.

MODELS 4K040-4K040G
CHASSIS No. 4C54



MODELS 5D011-5D027-5D011Z-5D027Z CHASSIS 5C01-5C01Z

PARTS LIST

PART NO.	DESCRIPTION	PRICE
28-331	Dial Scale (Z Models only)	.80
28-364	Dial Pointer	.58
78-153	Dial Pointer Shaft	1.00
78-227	Dial Pointer Spring	.15
78-365	Dial Pointer Socket and Wire	.24
80-470	Dial Cord Tension Spring	.03
100-67	Dial Cord Tension Spring	.10
139-53	Dial Cord Bulb	.01
139-54	Tuning Shaft Retaining Ring	.02
139-55	Dial Light Sleeve	.02
139-56	Dial Cord and Eyelet Assem.	.09
139-57	Pulley and Bushing Assem.	.33
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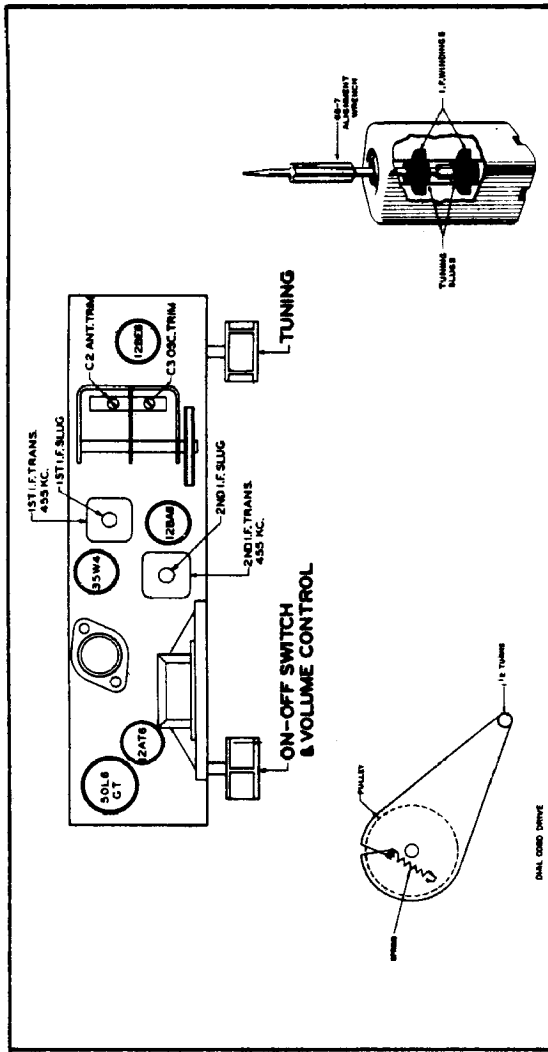
MODELS 5D810 CHASSIS 5E02

PARTS LIST

PART NO.	DIAL ASSEMBLY	PRICE
26-415	Dial Scale	.95
59-222	Dial Pointer	.30
76-515	Tuning Shaft	.17
80-209	Dial Cord Tension Spring	.03
188-32	Retaining Ring	1.03C
188-54	Retaining Ring (Pointer)	.02
514843	Dial Cord & Eyelet Assem.	.07
	COILS & CHOKES	
95-1101	1st. I. F. Transformer	1.60
95-1102	2nd. I. F. Transformer	1.60
514842	Oscillator Coil Assem.	.35
	CONDENSERS	
22-162	100 Mfd. (or 22-1669)	.20
22-829	.05 Mfd.	.20
22-854	.0005 Mfd.	.20
22-1156	.05 Mfd.	.20
22-1379	.02 Mfd.	.20
22-1775	.047 Mfd.	.26
22-1804	.047 Mfd.	1.95
22-1807	Dry Electrolytic 60 x 20 Mfd.	3.25
105-14	Two Section Gang	
	Dual Ceramic	
	RESISTORS	
63-686	150 Ohm W.W. Insul.	.21
63-1219	22 Ohm W.W. Insul.	.21
63-1574	1 M Ohm W.W. Insul.	.24
63-1575	39 Ohm W.W. Insul.	.33
63-1660	Vol. Con. & Sw.	1.81
63-1737	68 Ohm Insul.	.21
63-1782	820 Ohm Insul.	.21
63-1814	4700 Ohm Insul.	.21
63-1828	10M Ohm Insul.	.21
63-1898	470M Ohm Insul.	.21
63-1926	2.2 Megohm Insul.	.21
63-1940	4.7 Megohm Insul.	.21
	MISCELLANEOUS	
11-79	Line Cord & Plug (6 Ft.)	.65
14-1010	Model 810Y Plastic Cabinet	3.50
46-745Y	Tuning & Vol. Con. Knob (2 Used)	.15
49-645	4" P.M. Speaker	6.00
	208-645 Output Trans.	1.67
	208-645 Cone & Voice Coil	1.73
	#3/8-32 x 9/16 Palnut	.01
	Speed Nut	.01
	#6-32 x 5/16 Palnut	.45C
	Cabinet Front Plate	.70
	Socket - Electrolytic	.03
	Socket - Octal Tube (8 Contact)	.12
	Socket - Miniature Tube	.15
	Socket - Miniature Tube (3 Used)	.15
	Line Cord Insulating Strip	.02
	Gang Cond. Mfg. Bushing	.67C
	#6 x 7/16 Straight Side B.H.S.T. Screw	.02
	#6-32 x 7/16 Hex Acorn Hd. M.S.	.43C
	#8 x 1/4 Hex Hd. Slotted S. T. Screw	.75C
	Rubber Grommet	.03
	Spk. Baffle	.20
	Trimount Stud (Cab. Back Mfg.)	.01
	Rubber Bumper (or 166-41)	.02
	Instruction Book	.02
	Wavemagnet Assem.	1.10
	Front Plate & Spk. Baffle Assem.	1.00

Prices subject to change without notice.

ZENITH RADIO CORPORATION



TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

TO THE SERVICEMAN

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 I. F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped 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.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO ANTENNA	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-3	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna Stage

MODELS 5D811 CHASSIS 5E01

PARTS LIST

PART NO.	DIAL ASSEMBLY	PRICE
26-414	Dial Scale	1.10
59-222	Dial Pointer	.30
78-515	Tuning Shaft	.17
78-820	Pilot Light Socket & Wire	.25
80-209	Dial Cord Tension Spring	.03
100-67	Dial Light Bulb - 6.3V. -15 Amp.	.09
188-32	Retaining Ring	1.01C
188-54	Retaining Ring (Pointer)	.02
514843	Dial Cord & Eyelet Assem.	.07

COILS & CHOKES

95-1101	1st I.F. Transformer	1.60
95-1102	2nd I.F. Transformer	1.60
514842	Osc. Coil Assem.	.35

CONDENSERS

C-14	100 Mmfd. (or 22-1669)	500V.	.20
C-4	.05 Mfd.	200V.	.20
	.0005 Mfd.	600V.	.20
C-11	.05 Mfd.	200V.	.20
C-13	.02 Mfd.	400V.	.20
C-5	.047 Mfd.	400V.	.26
C15, 16	Dry Electrolytic 60 x 20 Mfd.	150V.	1.95
C-1	Two Section Gang		3.25
U-1	Dual Ceramic		

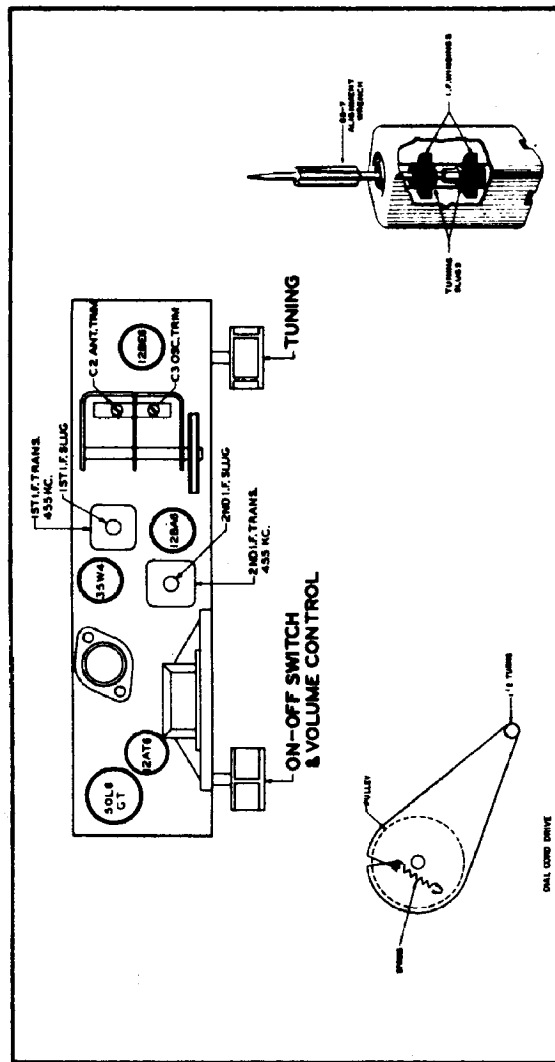
RESISTORS

R-9	150 Ohm W.W. Insul.	1/2W	.21
R-11	22 Ohm W.W. Insul.	1/2W	.21
R-10	10000 Ohm W.W. Insul.	1W	.24
R-4	Var. Con. & Sw.		1.81
R-2	68 Ohm Insul.	1/2W	.21
R-5	820 Ohm Insul.	1/2W	.21
R-6	4700 Ohm Insul.	1/2W	.21
R-1	10M Ohm Insul.	1/2W	.21
R-8	470M Ohm Insul.	1/2W	.21
R-3	2.2 Megohm Insul.	1/2W	.21
R-7	4.7 Megohm Insul.	1/2W	.21

MISCELLANEOUS

11-79	Line Cord & Plug (6 Ft.)	.65
14-1011	Model 811 Plastic Cabinet	3.95
14-1011W	Model 811W Plastic Cabinet	5.25
14-1011Y	Model 811Y Plastic Cabinet	4.50
43-165	Handle Housing	1.00
46-744	Tuning & Vol. Con. Knob (2 Used) (5D811)	.15
46-744Y	Tuning & Vol. Con. Knob (2 Used) (5D811W - 811Y)	.15
49-645	P.M. Speaker	6.00
SP-1	260-545 Output Trans.	1.66
	260-545 Cone & Voice Coil	1.73
	Speed Nut	.07
	Cabinet Front Plate	.70
	Socket - Electrolytic	.10
	Socket - Octal Tube (6 Contact)	.12
	Socket - Miniature Tube	.15
	Socket - Miniature Tube	.15
	Line Cord Insulating Strip	.30
	1/16 x 1/4 x 3/8 Steel Washer	.01
	Gang Cond. Mtg. Bushing	.40C
	Insulula Lub. T. Screw	.01
	#6 x 3/8 Hex S.T. Screw	.02
	#6 x 7/16 Hex S.T. Side B.H.S.T. Screw	.02
	#6-32 x 7/16 Hex Acorn B.H.M.S. (3 Used)	.45C
	#8 x 1/4 Hex Hd. Slotted S. T. Screw (2 Used)	.75C
	Rubber Grommet	.01
	Spl. Ballie	.20
	Flintmount Stud (for 166-41)	.01
	Rubber Plug (for 166-41)	.02
	Flexible Handle Sleeve (5D811)	.35
	Flexible Handle Sleeve (5D811W-811Y)	.35
	Insulating Block	.02
	Strip & Sheet Assem.	.20
	Front Plate & Spl. Buffer Assem.	1.00
	Wave magnet Assem. (5D811-811Y)	1.10
	Wave magnet Assem. (5D811W)	1.25

Prices subject to change without notice.
REPAIR PARTS CORPORATION



TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

TO THE SERVICEMAN

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 I. F. transformers the tuning wrench 68-7 can be inserted into the top slug, rotated until maximum output is obtained and then dropped 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.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO ANTENNA	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-3	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna Stage

PARTS LIST

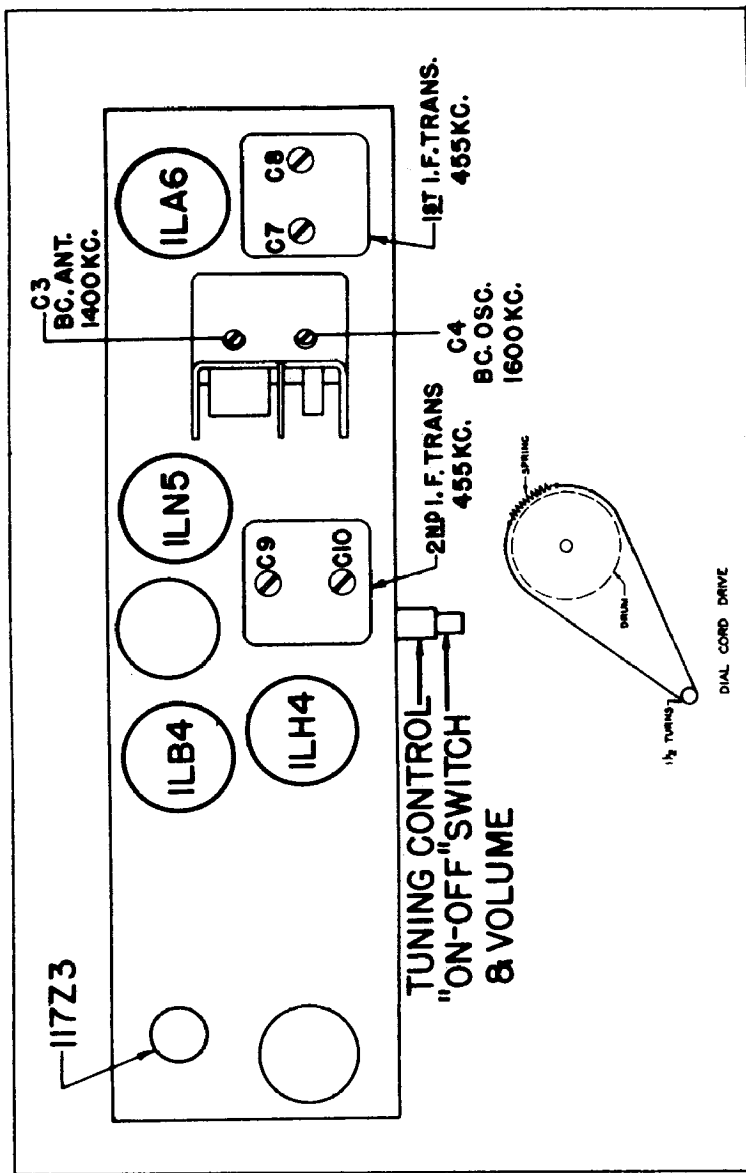
63-654	180M Ohm $\frac{1}{4}$ Watt (R1).....	.09
63-976	15 Megohm $\frac{1}{4}$ Watt (R7).....	.09
63-1097	870 Ohm W. W. Insl. 1 Watt (R9).....	.24
63-1099	33 Ohm W. W. Insl. $\frac{1}{2}$ Watt (R14).....	.21
63-1363	Two Section Candohm (63-1132) (R11-R12).....	.60
63-1366	Zipohn (R10).....	.24
63-1549	Vol. Control & Switch D P S T (R6).....	1.81

MISCELLANEOUS

11-70	A. C. Line Cord & Plug (Alt 11-90).....	.60
12-1322	Reinforcing Brkt. (2 used Handle).....	.15
14-903	Polystyrene Cabinet Front Less Accessories (use S-13209)	...
15-51	Battery Socket Cap.....	.09
24-371	Cabinet Rear Cover Less Accessories (Use S-11999).....	...
40-28	Cabinet Hinge.....	.20
43-111	Handle End Pieces (Die Cast).....	.65
49-540	4" P M Speaker.....	7.25
	206-540 Output Transformer.....	1.67
	208-540 Cone & Voice Coil Assem.....	1.73
54-224	Speed Nut (2 used S-11999).....	.017
57-1119	Chassis Bottom Plate.....	.24
64-98	Brass Eyelet (S-11999).....	.011
64-99	Brass Eyelet (S-11999).....	.01
78-229	Electrolytic Socket.....	.024
78-275	Electrolytic Socket.....	.024
78-400	Loktal Base Tube Socket.....	.19
78-437	Miniature Base Tube Socket.....	.12
78-446	Loktal Base Tube Socket (3 used).....	.19
78-637	Battery Cable Socket.....	.23
80-436	Tube Retaining Spring (117Z3).....	.15
82-20	Battery Retaining Strip.....	.25
83-1393	Rubber Strip (Handle).....	.30
85-367	Power Change Over Switch.....	.82
86-66	Pin Jack Terminal (Gang).....	.02
86-142	Pin Jack Terminal (Gang).....	.017
93-743	Bakelite Spacer Washer (S-11999).....	.025
110-119	Grille Cloth.....	.15
112-468	#6 x 5/16 Phillips B H Self Tapping Screw (82-20).....	1.83C
112-533	#6 x 1/4 Phillips R. H. Self Tapping Screw (40-28).....	.02
112-604	#6 x 5/16 Phillips Stove Hd. Self Tapping Screw..... (Chassis Mtg.)	.027
126-482	Spiral Shield.....	.05
139-61	Baffle Board (or 139-66).....	.08
156-27	Cover Catch (2 used).....	.09
199-53	Flexible Handle Sleeve.....	.40
202-429	Instruction Book.....	.03
S-11999	Cabinet Back & Wavemagnet Assem.....	...
	Complete (24-371) (L1).....	4.75
S-13209	Front Cabinet & Hinge Assem. (14-903).....	6.25
S-13210	Strap & Rivet Assem. (Handles).....	.20

Prices subject to change without notice.

MODEL 5G003
CHASSIS No. 5C40



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICEMAN:

The alignment of chassis 5C40 is conventional and the most accurate alignment will be accomplished if the procedure is followed exactly. The IF frequency is 455 KC and all measurements, voltage, and resistance have been taken with an electronic voltohmm meter.

Stage by stage gain measurements are for reference purposes only. Gain measurements can seldom be duplicated, and are used only for comparison purposes.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSC. TO	DUMMY ANT.	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455	600	C7, C8, C9 and C10	I. F. Alignment
2	Single Turn Loop	--	1600	1600	C4	Set Osc. to scale
3	Coupled Loosely to	--	1400	1400	C3	Alignment of Antenna
	Wavemagnet					

PARTS LIST

DIAL ASSEMBLY

26-366	Dial Scale.....	.12
46-530	Volume Control Knob (Small).....	.17
46-587	Tuning Control Knob (Large).....	.11
57-1120	Escutcheon Plate.....	1.00
57-1187	Dial Plate.....	.60
59-164	Dial Pointer.....	.19
76-488	Tuning Control Shaft.....	.28
80-365	Tuning Shaft Tension Spring (63-1459).....	.03
80-508	Dial Cord Tension Spring.....	.04
125-17	Rubber Grommets (22-1450).....	.03
147-148	Dial Plate Spacer.....	.02
159-50	Plug Button (26-366-192-99).....	.01
188-53	Tuning Shaft Retainer Ring.....	.01
192-99	Dial Glass.....	.20
196-88	Dial Glass Gasket.....	.06
S-11098	Pulley & Bushing Assem.....	.33
S-11137	Dial Cord & Eyelet Assem.....	.09

CHOKES AND COILS

95-937	First I. F. Transformer (T1).....	1.85
95-938	Second I. F. Trnasformer (T2).....	1.85
S-11830	Osc. Coil Assem. (L2).....	.95

CONDENSERS

22-162	.0001 Mfd. 500 Volt (C2).....	.20
22-196	.01 Mfd. 600 Volt (C13).....	.20
22-326	.003 Mfd. 400 Volt (C14).....	.20
22-470	.00015 Mfd. 600 Volt (C12).....	.20
22-492	.002 Mfd. 600 Volt (C11).....	.20
22-827	.1 Mfd. 200 Volt (C6).....	.23
22-829	.05 Mfd. 200 Volt (C5).....	.20
22-1014	Dry Electrolytic 20 x 20 Mfd. - 150 V. (C15 & C16).....	.95
22-1017	.05 Mfd. 200 Volt.....	.20
22-1081	Dry Electrolytic 40 x 20 Mfd. - 150 V. (C17 & C18).....	.83
22-1450	Two Section Gang (C1).....	4.15

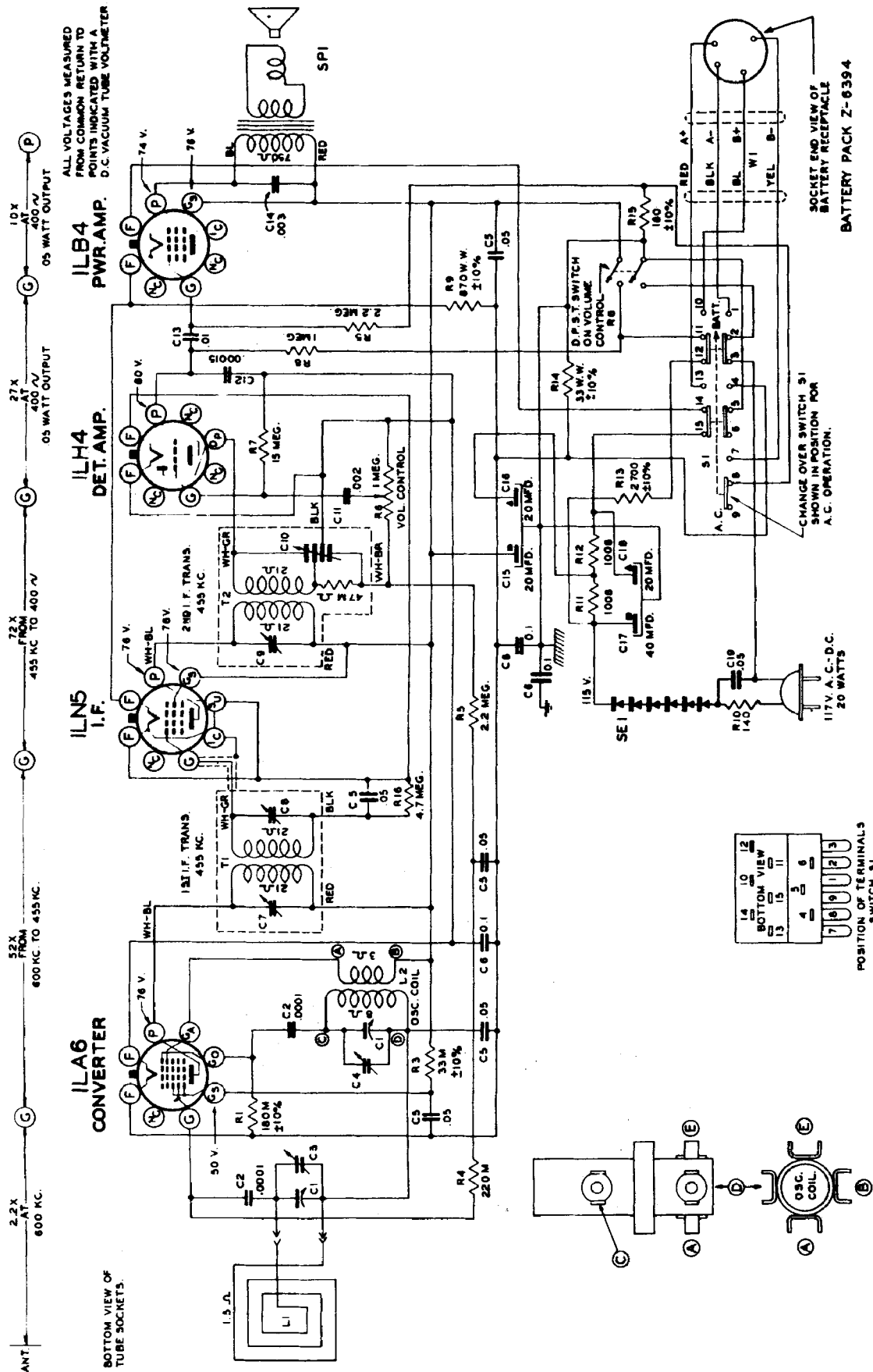
RESISTORS

63-271	1 Megohm	$\frac{1}{4}$ Watt (R8).....	.09
63-296	220 M Ohm	$\frac{1}{4}$ Watt (R4).....	.09
63-439	2700 Ohm	$\frac{1}{4}$ Watt (R13).....	.09
63-579	220 Ohm	$\frac{1}{4}$ Watt (R2).....	.09
63-600	2.2 Megohm	$\frac{1}{4}$ Watt (R5).....	.09
63-602	4.7 Megohm	$\frac{1}{4}$ Watt (R16).....	.09
63-627	180 Ohm	$\frac{1}{4}$ Watt (R15).....	.09
63-646	33 M Ohm	$\frac{1}{4}$ Watt (R3).....	.09

MODEL 5G003
CHASSIS No. 5C40

MODELS 5G003Z - 5G003ZZ

CHASSIS



ALL RESISTORS $\pm 20\%$ TOLERANCE UNLESS OTHERWISE SPECIFIED.

I.F. FREQUENCY 455 K.C.
TUNING RANGE 535 KC.-1620 KC.

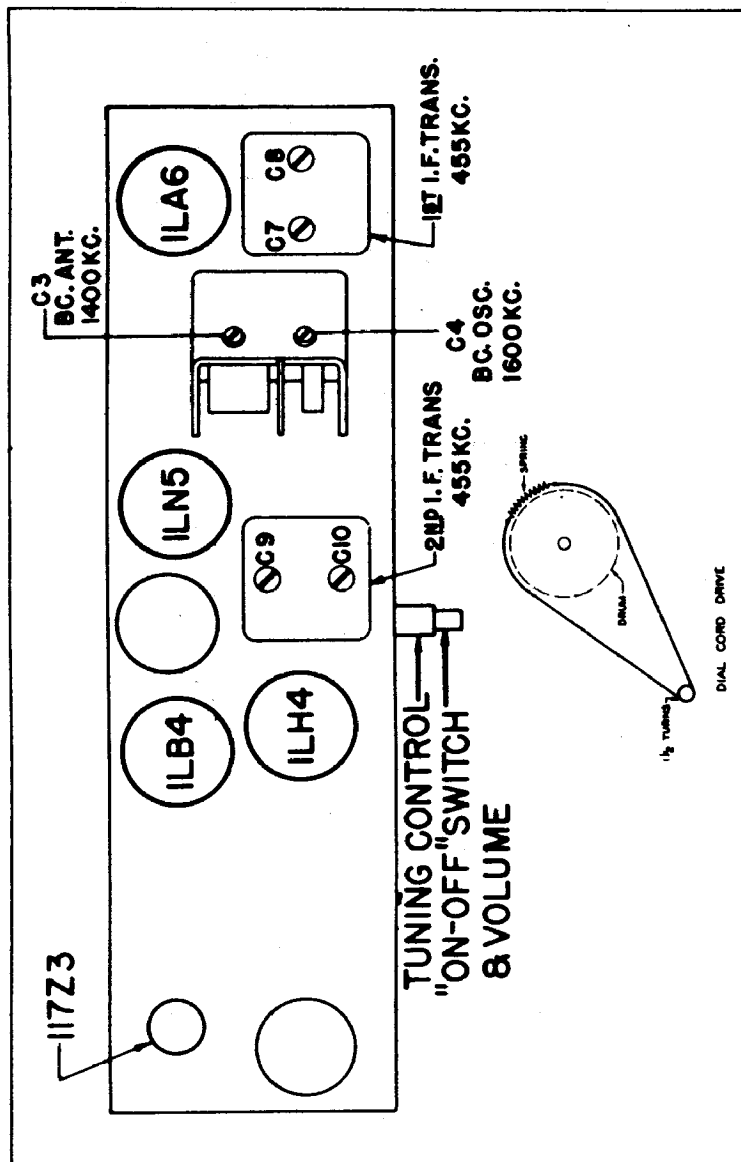
DE NOTES CHASSIS

A diagram of a cantilever beam. It is represented by a horizontal line with a vertical line at the right end, indicating a fixed support. The beam is free at the left end.

BATTERY PACK Z-6394

MODEL	5G003ZZ	CHASSIS No.	5C40ZZ
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MODELS 5G003Z - 5G003ZZ
CHASSIS Nos. 5C40Z - 5C40ZZ



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICEMAN:

The alignment of chassis 5C40 is conventional and the most accurate alignment will be accomplished if the procedure is followed exactly. The IF frequency is 455 KC and all measurements, voltage, and resistance have been taken with an electronic voltohmm meter.

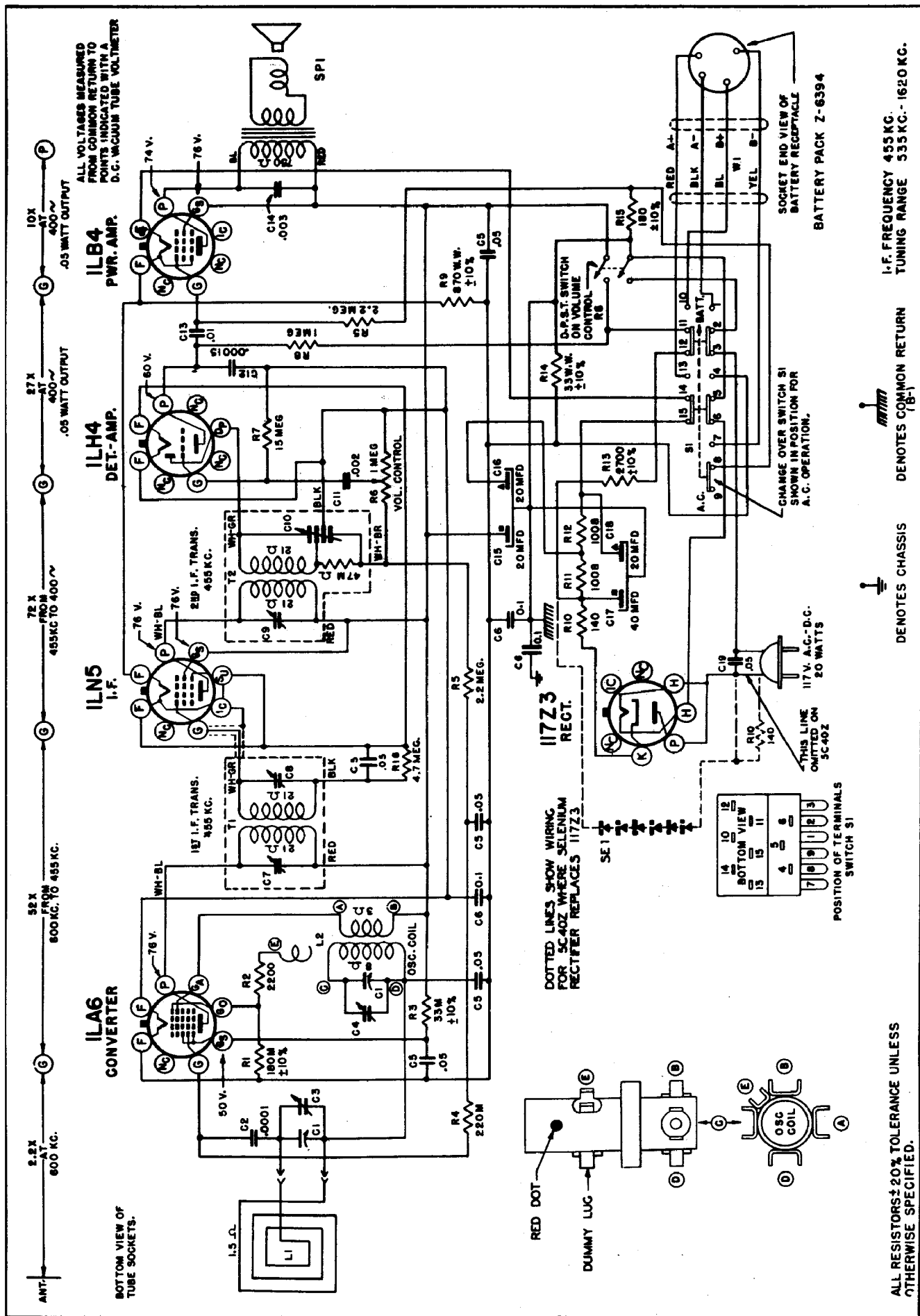
Stage by stage gain measurements are for reference purposes only. Gain measurements can seldom be duplicated, and are used only for comparison purposes.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSC. TO	DUMMY ANT.	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455	600	C7, C8, C9 C10	I. F. Alignment
2	Single Turn Loop	--	1600	1600	C4	Set Osc. to scale
3	Coupled Loosely to Wavemagnet	--	1400	1400	C3	Alignment of Antenna

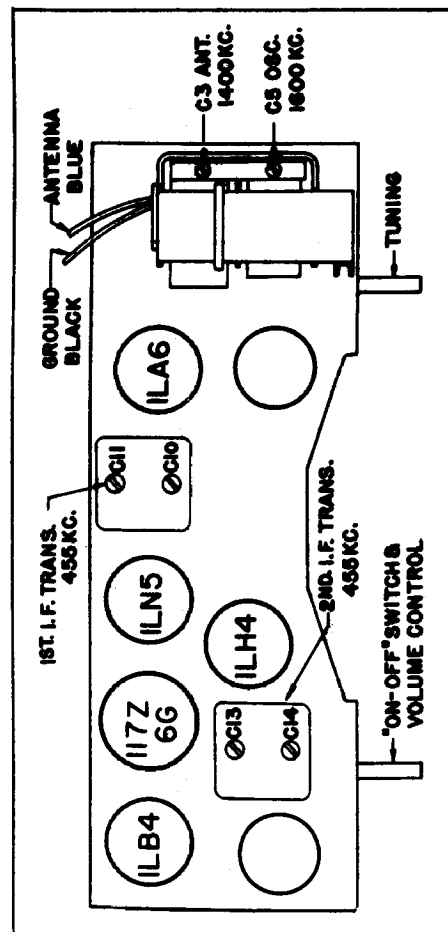
Prices subject to change without notice.

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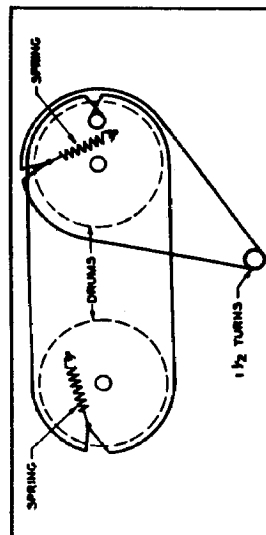


MODEL 5G036 CHASSIS

PART NO. REF. NO.		PARTS LIST		PRICE		PART NO. REF. NO.		PRICE	
DIAL ASSEMBLY									
26-339	DIAL SCALE.....	.24	85-271 R6	1 McOmms.....	1/4 WATT	.09	RESISTORS		
46-445	Radiation Key - Voice.....	.07	85-439 R14	3700 Ohms.....	1/4 WATT	.09			
46-444	Radiation Key - Treadle.....	.07	85-567 R6	4700 Ohms.....	1/4 WATT	.09			
46-443	Radiation Key - ALTY.....	.07	85-568 R3	6900 Ohms.....	1/4 WATT	.09			
46-446	Radiation Key - Bass.....	.07	85-600 R9	2.2 McOmms.....	1/4 WATT	.09			
46-450	Volume & Tuning Control.....	---	85-627 R15	100 Ohms.....	1/4 WATT	.09			
80-122	Keys (Use S-11896).....	---	85-646 R2	320 Ohms.....	1/4 WATT	.09			
96-146	On-Off Indicator.....	.12	85-654 R1	1600 Ohms.....	1/4 WATT	.09			
76-238	DIAL POINTER.....	1.14	85-776 R7	15 McOmms.....	1/4 WATT	.09			
66-103	Tuning Control, SHFT.....	.07	85-1060 R10	35 Ohms W.W. Insul. 1/2 Watt		.24			
66-102	Indicator Spring.....	.05	85-1296 R4	Volume Control & Switch.....		1.61			
80-123	Dial Cord Tension Spring.....	.05	85-1299 R12	Cansome (See 95-1469).....		.69			
96-471	Tuning SHFT Spring.....	1.31 C	85-1365 R11	140 Ohms W.W. (Used only when used 95-1469) 1/2 Watt		.24			
85-690	Brushed Fly Washer.....	.80 C		820 Ohms W.W. Insul. 1/4 Watt		.24			
150-50	Cinch Plug Button #40351 - Black Oxidize.....	.01	85-1956 R3						
160-32	Retaining Ring (76-238).....	1.05 C							
160-34	Retaining Ring (S-11362).....	1.20 C							
162-90	DIAL CRYSTAL.....	.50	11-66	Line Cord & Plug.....		.05			
196-64	DIAL CRYSTAL GASKET.....	.08	19-67	Battery Cable Plug Cap.....	.04				
S-9868	Indicator Cam Assembly.....	.07	40-523 SP1	5 1/2" P.M. Speaker.....	10.00				
S-9810	Dial Cord & Eyelet Assm.....	.12	52-180	200-525 Output Transformer.....	2.81				
S-9733	Dial Cord & Eyelet Assm.....	.07	54-34	200-525 Cam & Voice Coil.....	2.09				
S-9751	PLY (Gas Condenser).....	.12	57-116	Speaker Cable & Plug.....	.19				
S-11262	Pulley & Rivet Assembly.....	.11	70-124	96-32 x 1/4" x 5/88" Hex Nut - Steel N.P.....	.31 C				
S-11596	Decorative Ring & Control Knob Assembly (2 uses).....	.28		Antenna Lead Manner.....	.03				
S-11660	Dial Plate & Indicator Assembly.....	1.00		Radiogram Recticuum.....	.15				
				92 x 3/8" Phillips No. Wood Screws-Brass Plated (37-1189).....	1.70 C				
CELLS & COILS									
95-616 T1	1st I.F. Transformer.....	1.36	76-229	Electrolytic Condenser.....	.07				
95-617 T2	2nd I.F. Transformer.....	1.77	78-240	Battery Cable Seclet.....	.03				
S-11600 L1	Antenna Coil Assembly.....	.90	78-401	Latent Base Tube Socket (for 76-306-729).....	.15				
S-12069 L2	Oscillator Coil Assembly.....	1.28	78-406	Latent Base Tube Socket (7 Contact).....	.15				
			78-611	Octal Base Tube Socket (6 Contact).....	.12				
32-162 C4	.0001 Mf.	.600 V.	85-254 S3	Power Chassis Over Switch.....	.46				
32-162 C7	.00025 Mf.	.600 V.	85-264 S1	Radiogram Switch (Voice & ALTY) (Left).....	.85				
32-166 C1	.01 Mf.	.600 V.	85-268 S2	Radiogram Switch (Treadle & Bass) (Right).....	.85				
32-263 C29	.004 Mf.	.600 V.	85-125	Lockwasher.....	.31 C				
32-448 C20	.00015 Mf.	.600 V.	85-259	Brown Felt Washers (10000).....	.78 C				
32-470 C18	.002 Mf.	.600 V.	94-258	Radiogram Switch Mounting Bushing (4 used).....	.04				
32-482 C19	.1 Mf.	.600 V.	112-56	96 x 1/4" Hex No. Self Tapping Screws.....	.85 C				
32-527 C7	.05 Mf.	.600 V.	114-97	96-32 x 7/16" Hex Acorn Nuts.....	.49 C				



TUBE TRIMMER	LOCATION
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DIAL CABLE DRAWING

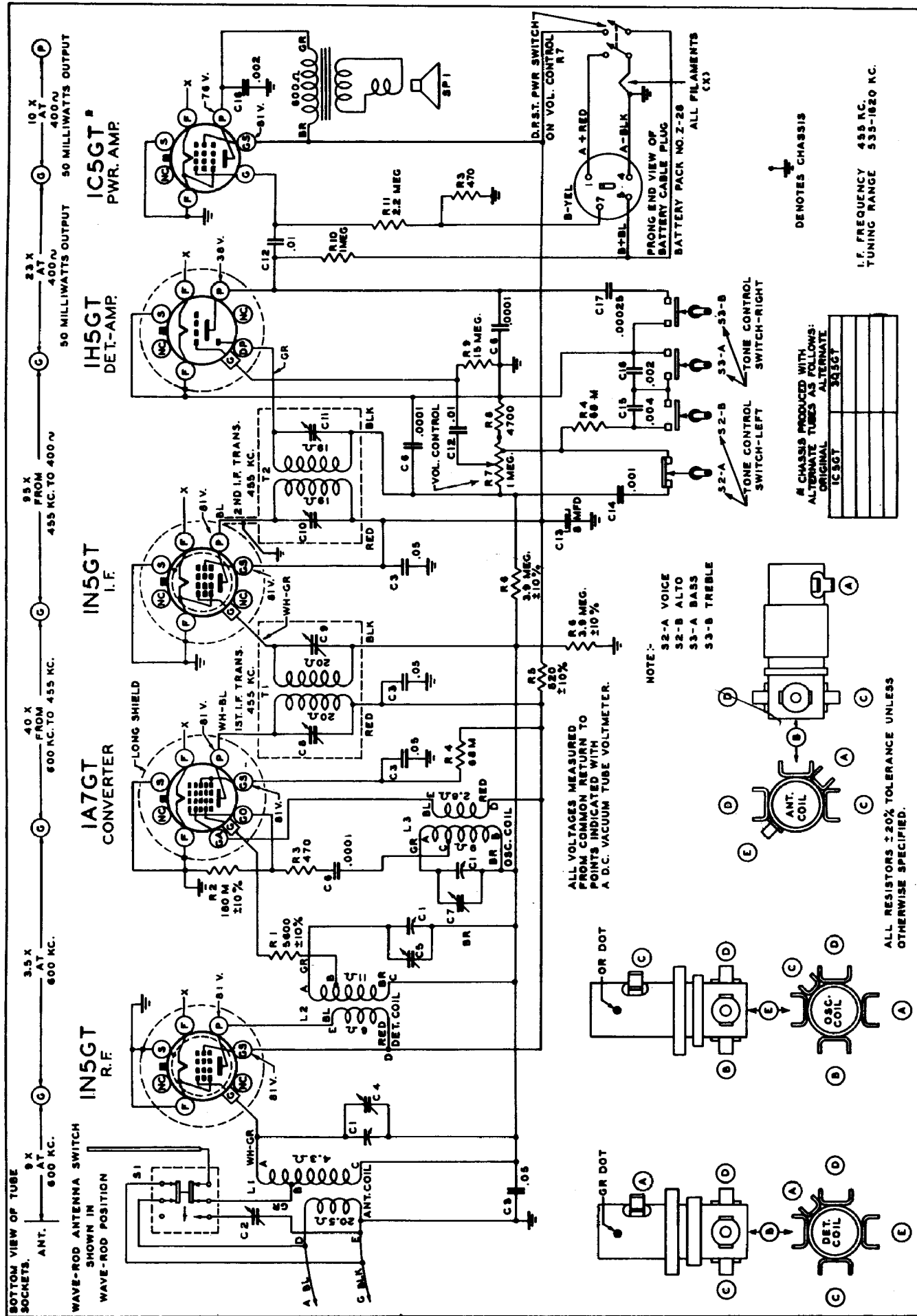
TO THE SERVICEMAN:

The alignment of chassis 5CS1 is conventional. None of the adjustment interlock, however, the most accurate alignment will be accomplished if the procedure is followed exactly. The IF frequency is 455 KC and all measurements, voltage, and resistance have been taken with an electronic voltohmmeter.

Stage by stage measurements are for reference purposes only. Gain measurements can seldom be duplicated, and are used only for comparison purposes.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C10, C11 C13 and C14	Align I. F.
2	Antenna and Ground	200 Mfd.	1600 Kc.	1600 Kc.	C5	Set Oscillator to scale
3	Antenna and Ground	200 Mfd.	1400 Kc.	1400 Kc.	C3	Align Antenna



MODEL 5K037 CHASSIS No. 5C50

MODEL 5K037 CHASSIS No. 5C50

PARTS LIST

DIAL ASSEMBLY

26-344	DIAL SCALE.....	.32	63-669	3.9 MEGOHM (R6) 1/2 WATT.	.09
46-443	RADIOGANG KNOB (VOICE).....	.07	63-976	15 MEGOHM (R9) 1/2 WATT.	.09
46-444	RADIOGANG KNOB (TREBLE).....	.07	63-1236	VOLUME CONTROL & SWITCH (R7).....	1.81
46-445	RADIOGANG KNOB (ALTO).....	.07			
46-446	RADIOGANG KNOB (BASS).....	.07			
59-122	OFF & ON INDICATOR.....	.12			
59-160	DIAL POINTER.....	1.14	12-1082	ANT. ROD MFG. BRKT.....	.06
76-335	TUNING CONTROL SHAFT.....	.03	46-572	TELESCOPIC ANT. KNOB.....	.12
80-183	INDICATOR SPRING.....	.07	48-522	6 1/2" P.M. SPEAKER.....	10.00
80-209	DIAL CORD TENSION SPRING.....	.03		206-522 OUTPUT TRANS.....	2.21
80-471	TUNING SHAFT SPRING.....	1.31C		206-522 CONE & VOICE COIL.....	2.09
93-690	BROWN FELT WASHER (S-11362).....	.60C	48-523	6 1/2" P.M. SPEAKER (ALT. FOR 49-522) (SP1).....	10.00
188-32	RETAINER RING (76-335).....	1.03C		206-523 OUTPUT TRANS.....	2.21
188-34	RETAINER RING (S-11362).....	1.20C		208-523 CONE & VOICE COIL.....	2.09
192-90	DIAL CRYSTAL.....	.50	52-190	SPEAKER CABLE.....	.19
196-64	DIAL CRYSTAL GASKET.....	.08	57-11A	ANTENNA MARKER.....	.03
S-9588	INDICATOR CAM & BUSHING ASSEMBLY.....	.07	57-11G	GROUND MARKER.....	.03
S-9610	DIAL CORD & EYELET ASSEM.....	.12	57-900	DIAL PLATE.....	.35
S-9733	DIAL CORD & EYELET ASSEM (GANG).....	.07	57-1103	ANTENNA KNOB ESCUTCHEON.....	.70
S-9751	PULLEY & RIVET ASSEM. (GANG).....	.12	57-1139	RADIOGANG ESCUTCHEON.....	.18
S-11362	PULLEY & BUSHING ASSEM.....	.11	58-74	BATTERY CABLE PLUG.....	.12
S-11558	VOL. & TUNING KNOB ASSEM (2 USED) (46-520).....	.28	70-124	#2 X 3/8 PHILLIPS HD. WOOD SCREW (ESC. MTG).....	1.70C

CHOKES & COILS

95-814	1ST I.F. TRANSFORMER (T1).....	1.77	85-284	RADIOGANG SWITCH (VOICE & ALTO L.H) (S2).....	.55
95-839	2ND I.F. TRANSFORMER (T2).....	1.77	85-288	RADIOGANG SWITCH (TREBLE & BASS R.H. (S3).....	.55
S-9570	DETECTOR COIL ASSEM. (L2).....	.69	93-125	INTERNAL SHAKEPROOF LOCKWASHER.....	.31C
S-9746	OSCILLATOR COIL ASSEM (L3).....	.90	93-258	BROWN FELT WASHER (KNOBS).....	.78C
S-11731	ANTENNA COIL ASSEM. (L1).....	1.35	94-295	STEEL BUSHING (RADIOGANG 4 USED).....	.04

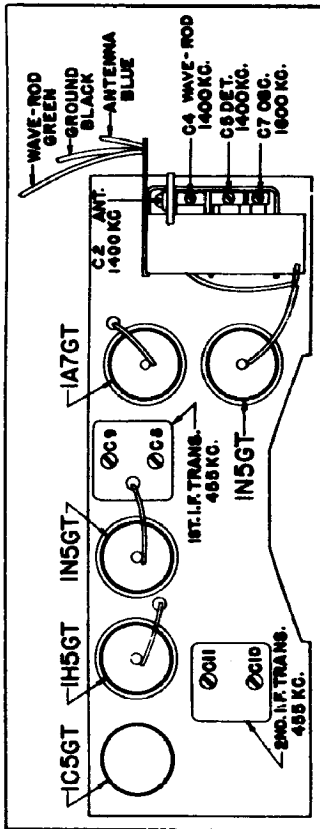
CONDENSERS

22-162	.0001 MFD. (C6) 600 V.....	.20	112-56	#6 - 1/2 HEX HD. SELF TAP. PING SCREW.....	.55C
22-162	.00025 MFD. (C17) 600V.....	.26	114-67	#6-32 X 7/16 HEX ACORN HEAD SCREW.....	.43C
22-196	.01 MFD. (C12) 600V.....	.20	114-162	#8 X 7/8 HEX ACORN WASHER HD S.T. SCREW (CHASSIS MTG).....	1.20C
22-448	.004 MFD. (C15) 600V.....	.20	125-17	RUBBER GROMMETS.....	.03
22-492	.002 MFD. (C15) 600V.....	.20	126-379	TUBE SHIELD (3USED) SHORT.....	.07
22-684	DRY ELECTROLYTIC 5MFD. (C13) 150 V.....	.45	126-382	TUBE SHIELD (1A7GT) LONG.....	.08
22-829	.05 MFD (C3) 200 V.....	.20	159-50	PLUG BUTTON (BLK OXIDIZE).....	.01
22-867	.001 MFD. (C14) 600V.....	.20	202-386	INSTRUCTION BOOK.....	.25
22-1356	THREE SECTION GANG (C1).....	4.50	S-11251	TELESCOPIC ANTENNA ASSEM. (COMPLETE).....	7.85
22-1421	ANTENNA TRIMMER (C2).....	.40	S-11586	RELEASE ASSEM. (TELESCO-PIC ASSEMBLY).....	.50

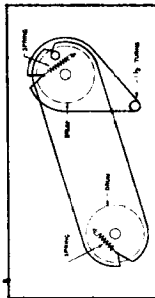
RESISTORS

63-271	1 MEGOHM (R10) 1/2 WATT.....	.09	S-11729	WAVEROID SWITCH & PLATE ASSEMBLY.....	.75
63-561	470 OHM (R3) 1/2 WATT.....	.09	Z-28	BATTERY PACK (BP).....	
63-567	4700 OHM (R8) 1/2 WATT.....	.09			
63-594	68M OHM (R4) 1/2 WATT.....	.09			
63-600	2.2 MEGOHM (R11) 1/2 WATT.....	.09			
63-634	820 OHM (R5) 1/2 WATT.....	.09			
63-638	5600 OHM (R1) 1/2 WATT.....	.09			

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.
15M2-15-47



TUBE TRIMMER LOCATION



DIAL CABLE DRAWING

TO THE SERVICEMAN:

The alignment of chassis 5C50 is conventional. None of the adjustment interlock, however, the most accurate alignment will be accomplished if the procedure is followed exactly. The IF frequency is 455 KC and all measurements, voltage, and resistance have been taken with an electronic volt ohm meter.

Stage by stage gain measurements are for reference purposes only. Gain measurements can seldom be duplicated, and are used only for comparison purposes.

OPERATION	CONNECT	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C8, C9, C10, and C11	Align I.F.
2	Ant. and Ground	200Mafd Antenna Switch in Ant. position	1600 Kc.	1600 Kc.	C7	Set Oscillator to Dial Scale.
3	"	"	1400 Kc.	1400 Kc.	C5	Align Detector
4	"	"	"	"	C2	Align Antenna
5	Two Turns Loosely Coupled To Waveroid	Wave Rod Fully extended Switch in Waveroid Position	1400 Kc.	1400 Kc.	C4	Align Waveroid Antenna



MODELS

P A R T S L I S T

PART NO.	DIAL ASSEMBLY	PRICE
26-354	Dial Scale (Z Models only)	.28
26-367	Dial Scale (Z Models only)	.19
26-367	Tuning Control Shaft	.16
76-116	Tuning Control Shaft	.08
76-325	Tuning Shaft Precision Spring	.08
80-345	Dial Cord Tension Spring	.10
80-470	Dial Light Bulb (P. L. L.)	1.200
100-67	Retaining Ring	.05
158-50	Dial Cord and Eyelet Assm.	.05
61511281	Drive Pulley and Bushing Assm.	.24
61511098		
95-905	2nd. I. F. Transformer (72)	1.75
95-919	1st. I. F. Transformer (71)	1.80
20311284	Oscillator Coil Assm. (L2)	.62
20312452	Oscillator Coil Assm. (Z Models only) (L2)	.76
	CONDENSERS	
22-136	.01 Mfd. (C15) 600 V.	.20
22-669	.01 Mfd. (C11) 500 V.	.20
22-628	.01 Mfd. (C12) 200 V.	.20
22-629	.05 Mfd. (C3) 200 V.	.20
22-654	.0005 Mfd. (C14) 600 V.	.20
22-653	.0002 Mfd. (C10) 600 V.	.19
22-1017	.05 Mfd. (C5) 200 V.	.20
22-1366	Two dang. Variable (5004)	.20
22-1374	.02 Mfd. (C16) 400 V.	.20
22-1375	Dry Electrolytic 40 - 40 Mfd. - 150 V. (C17, C18, C19)	1.71
22-1419	Two dang. Variable (C1) (Z Models only)	3.45
22-1527	Two dang. Variable (Z Models only)	3.45
or 22-1552		
	RESISTORS	
63-583	1000 Ohm (C1) 1/4 Watt	.09
63-585	10K Ohm (R2) 1/4 Watt	.09
63-587	470K Ohm (R7) 1/4 Watt	.09
63-600	2.2 Megohm (R4) 1/4 Watt	.09
63-602	4.7 Megohm (R12) 1/4 Watt	.09
63-644	22K Ohm (R6) 1/4 Watt	.09
63-686	150 Ohm W. W. (R8) 1/2 Watt	.21
63-696	22 Ohm W. W. (R9) 1/2 Watt	.21
63-1219	22 Ohm W. W. (R10) 1 Watt	.24
63-1220	100 Ohm W. W. (R11) 1 Watt	.24
63-1221	680 Ohm W. W. (R11) 1 Watt	.24
63-1221	Volume Control and Sw. (R5)	1.81
63-1346		
	MISCELLANEOUS	
11-87	Line Cord and Plug	.95
15-62	Phono Socket Cap	.22
46-536	Radio - Photo - Reject Sw. Knob (Release Button)	.10
46-548	5" P.M. Speaker	.07
49-516	206-518 Output Trans.	1.97
	AC Receptacle (P3 - Used on 5004 Only)	1.73
	Scotchwood Plate	.90
	Socket - Electrolytic Cond.	.03
	Socket - Photo (6 Contact)	.11
	Socket - Radio Sw. (S1) 8 Contact	.12
	Record Recept. Sw. (S2 - 5002 and 5002Z)	.80
	Champing Ring (Tuning Knob)	1.81C
	Dial Crystal Gasket	.02
	Instruction Book	.04
	Volume Con. Knob and Ring Assm. (46-530)	.04
	Phono Cable and Socket Assm. (P1 - 5002 and 5002Z)	1.07
	Phono Cable (Used on 5004 Only)	1.32
	Magnet Assm. (Type 2A) (L1)	1.16
	Magnet Assm. (Type 2B) (Models 7 only) (L1)	1.16
	RECORD CHANGER MTG. PARTS	
19-123	Record Changer Mtg. Clip	.10
80-407	Record Changer Mtg. Spring	.02
112-420	Record Changer Mtg. Screw	.33
202-361	Phono Instruction Sheet	.10
311465	Non - Interferer Record Changer	1.32
	PRICES SUBJECT TO CHANGE WITHOUT NOTICE	
	15N 2-28-47	

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUTY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIPPERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	1600 Kc.	C-6, C-7, C-8, C-9	Align I. F.
2	Single Turn Loop Loosely Coupled to Wave Magnet	---	1600 Kc.	1600 Kc.	C-4	Set Oscillator to Dial Scale.
3		--	1400 Kc.	1400 Kc.	C-2	Align Antenna.

TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

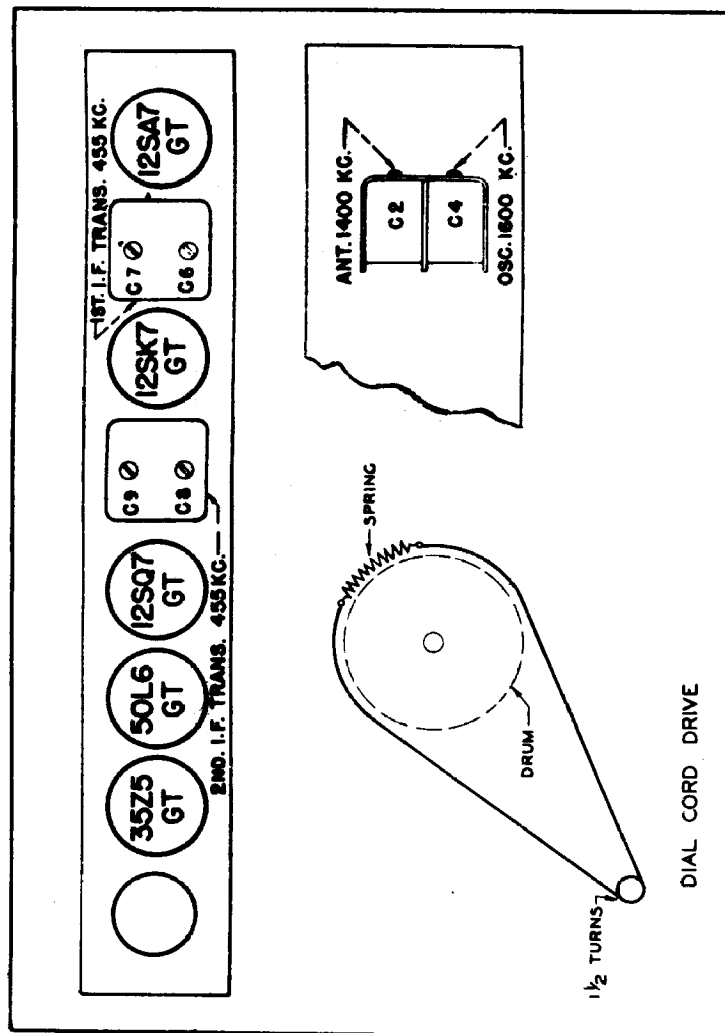
TO THE SERVICE MAN:

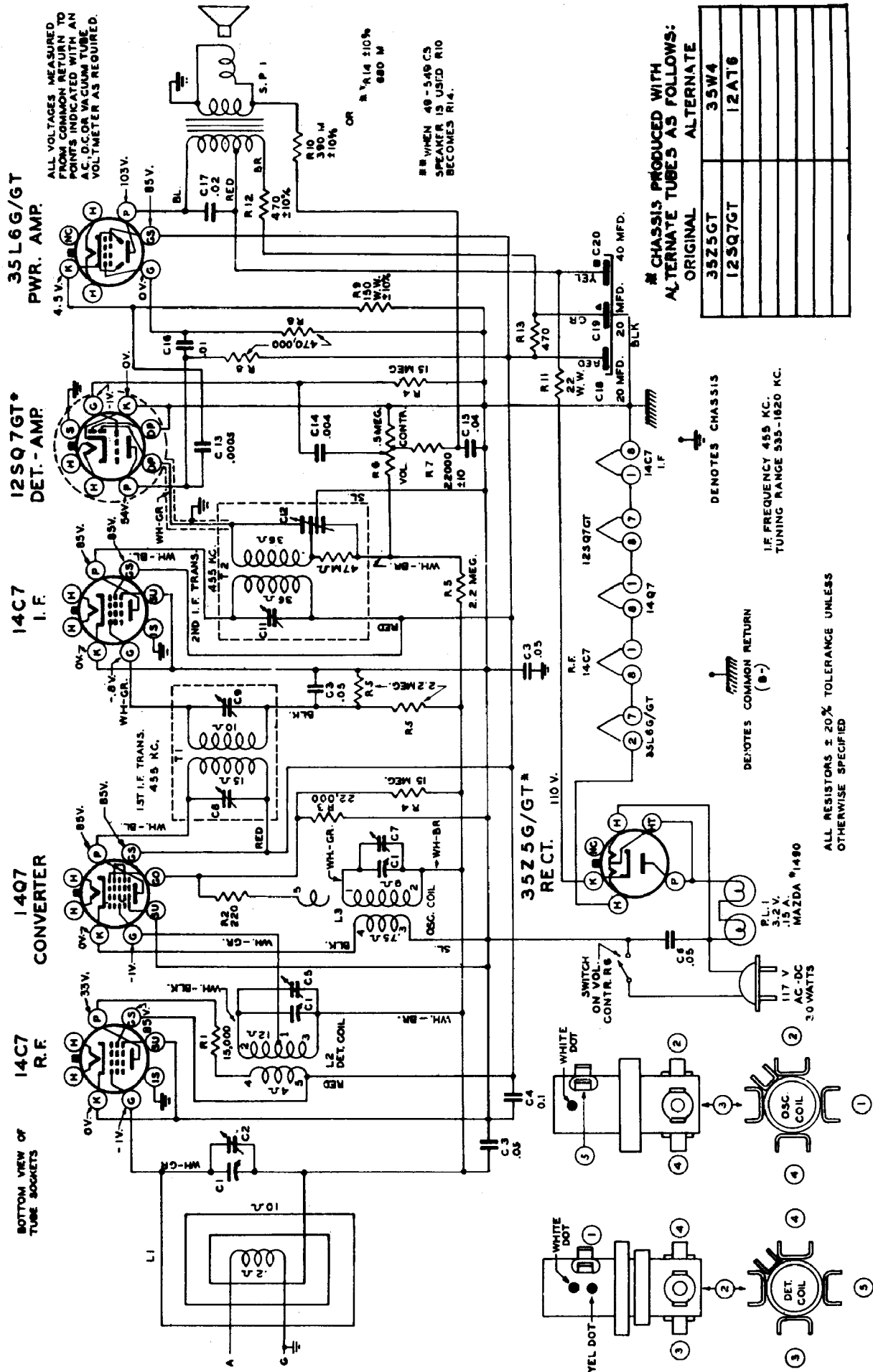
The 5C02 and 5C04 chassis are identical electrically. Chassis 5C02 has a Record Reject push button switch on the receiver control panel to reject records.

The socket P1 is used to connect the automatic record changer to the receiver.

The Phono-Radio switch is a two position double acting push-button switch and when in the "in" position connects the changer for playing records.

Channel 5C04 has the same Phono-Radio switch arrangement. However, the 5C04 does not have socket p1 and the Record Reject switch. The record player is connected to the receiver by a shielded cable and socket arrangement.



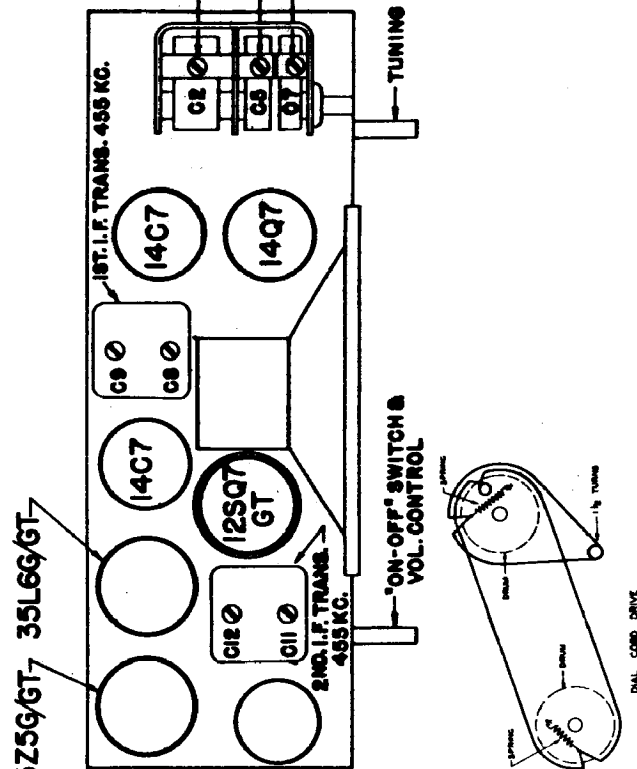


MODELS 6D014-6D029
CHASSIS No. 6C01

MODELS 6D014-6D029 CHASSIS No. 6C01

PARTS LIST

PART NO.	DIAL ASSEMBLY	PRICE
28-323	Dial Scale	.38
28-324	Tuning Control Shaft	.42
28-325	Dial Light Socket and Wire	.43
28-326	Dial Cord Tension Spring	.03
28-327	Tuning Shaft Spring	1.30
28-328	Dial Light Bulb (Tuning Con. Shaft)	1.13
28-329	Retaining Ring (Pulley Pulley)	1.03
28-330	Retaining Ring (Pulley Pulley)	1.03
28-331	Dial Cord and Eyelet Assem. (Short)	1.07
28-332	Pulley and Pulley Assem. (on gang)	.12
28-333	Pulley and Pulley Assem. (on gang)	.49
28-334	Dial Cord and Eyelet Assem. (Long)	.07
28-335	COILS AND CHOKES	
28-336	2nd. I. F. Transformer (72)	2.00
28-337	1st. I. F. Transformer (71)	2.10
28-338	Detector Coil Assem. (12)	.49
28-339	Oscillator Coil Assem. (13)	.49
28-340	CONDENSERS	
28-341	.01 Mfd. (C16)	.30
28-342	.01 Mfd. (C4)	.30
28-343	.01 Mfd. (C3)	.30
28-344	.0005 Mfd. (C13)	.30
28-345	.0005 Mfd. (C6)	.30
28-346	Three Gang Variable (C1)	4.50
28-347	.04 Mfd. (C15)	.30
28-348	.04 Mfd. (C14)	.30
28-349	.02 Mfd. (C17)	.30
28-350	Dry Electrolytic 40-40-40 Mfd. - 150 V. (Alternates for 28-351)	1.71
28-351	Dry Electrolytic 20-20-40 Mfd. - 150 V. (C18, 19 and 20)	1.55
28-352	RESISTORS	
28-353	220 Ohm (R2)	.08
28-354	150 Ohm (R1)	.08
28-355	220 Ohm (R3)	.08
28-356	470 Ohm (R4)	.08
28-357	2.2 Megohm (R5)	.08
28-358	220 Ohm (R7)	.08
28-359	500 Ohm (R10)	.19
28-360	500 Ohm (Replaces R10 when a 49-540CS Speaker is used)	.08
28-361	15 Megohm (R4)	.24
28-362	470 Ohm W.W. (R12)	.21
28-363	150 Ohm W.W. (R9)	1.81
28-364	Volume Control and Sw. (R6)	.24
28-365	470 Ohm W.W. (R13)	.24
28-366	50 Ohm W.W. (R11)	.24
28-367	MISCELLANEOUS	
28-368	Cabinet Back (6D014 and 0147)	.13
28-369	Cabinet Back (6D014)	.11
28-370	Line Cord and Plug	.65
28-371	Handle Bracket	.50
28-372	Model 014 Bakelite Cabinet (Walnut)	5.90
28-373	Model 014 Bakelite Cabinet (White)	7.00
28-374	Model 014 Bakelite Cabinet (Ebony)	8.00
28-375	Speaker	1.97
28-376	500-540 Output Transformer	1.75
28-377	500-540 Output Transformer (6D039 and 0390)	1.60
28-378	Socket - Electrolytic Cond.	.08
28-379	Socket - Electrolytic Cond.	.12
28-380	Socket - Octal (8 contact)	.75
28-381	Socket - Octal (8 contact)	.75
28-382	Socket - Octal (8 contact)	.75
28-383	Grille Cloth	.25
28-384	4 x 3/4" Oval B. S. H. Screw (Chassis Mfg. 014)	.90
28-385	4 x 1 1/8" Hex Slotted Washer M. S. T. Screw (Chassis Mfg. 039)	1.20
28-386	Tube Shield	.07
28-387	Back Retaining Button	.35
28-388	Dial Crystal (6D039 and 0390)	.45
28-389	Dial Crystal (6D014 and 0147)	2.00
28-390	Dial Crystal (6D014) (Black lettering)	2.00
28-391	Dial Crystal (6D014) (Black lettering)	.07
28-392	Instruction Book (Type 755) (11)	.75
28-393	Volume and Tuning Control Knob (49-535)	.49
28-394	Volume and Tuning Control Knob (49-535)	.49
28-395	PRICES SUBJECT TO CHANGE WITHOUT NOTICE	1.51 2-55-47



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

Chassis 6C01 features a high gain tuned R. F. circuit ahead of a conventional superheterodyne, with feedback in the audio circuit, and a new filter circuit to reduce hum to a minimum. Part of the audio voltage from the voice coil is fed back to the first audio grid (12SQ7) in phase through resistor R10 and 17 to a tap on the volume control R6. Capacitor C15 bypasses the high to ground. One side of the output transformer secondary is grounded. The side grounded determines the phase relationship of the feedback voltage, therefore, when replacing the output transformer be certain the proper end of the secondary is grounded or regeneration will result. The overall result of this arrangement is to boost the bass tones.

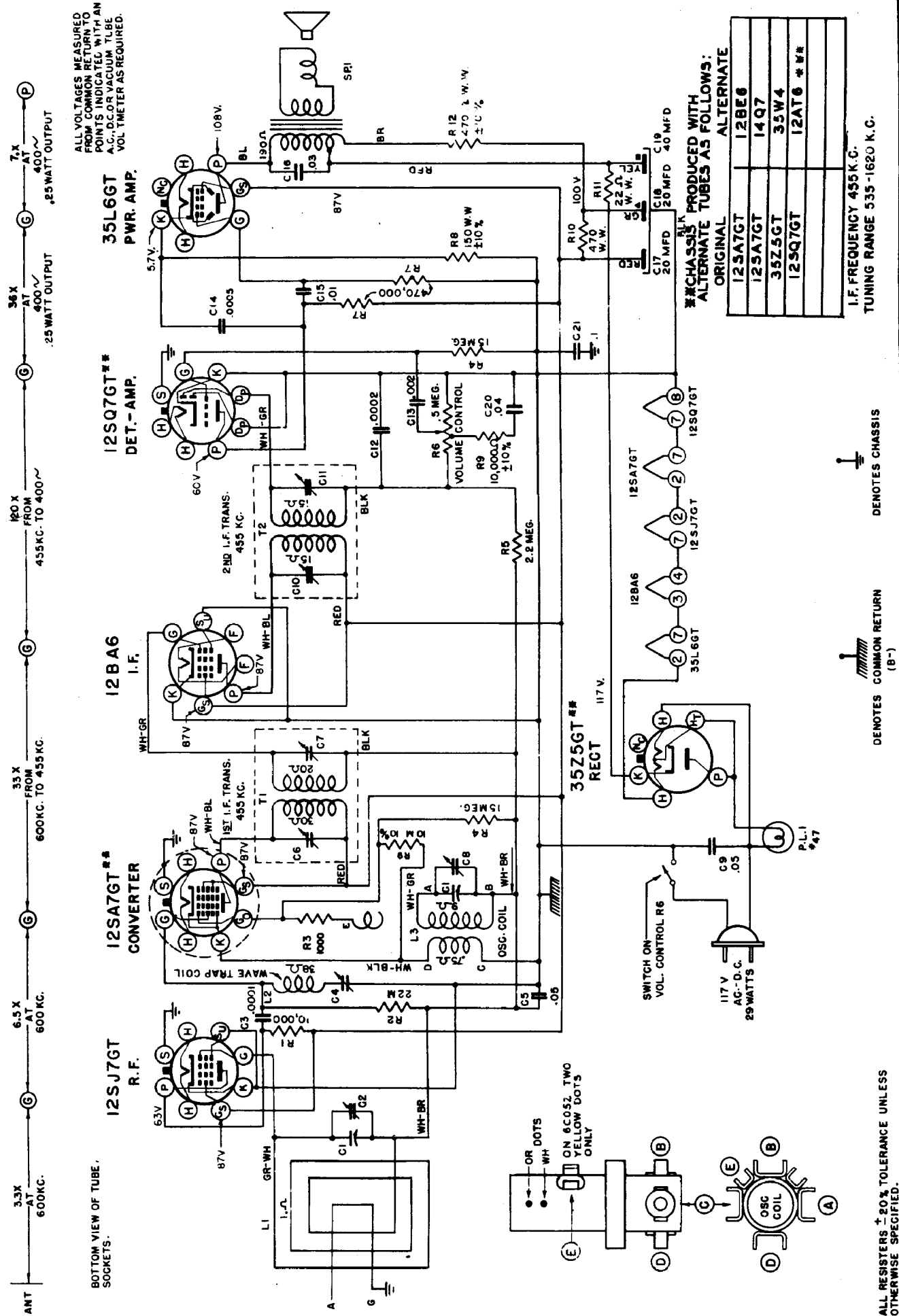
The filter circuits of chassis 6C01 incorporate new features that should be well understood by the service man. An examination of the schematic drawing will show the output transformer tapped slightly off center. This tap is the B + connection from filter resistor R11 and capacitor C30 off the cathode of the rectifier 35Z5 in the 35L6 plate. The lower connection of the output transformer feeds B + to the rest of the tubes in the receiver. Current flowing through the upper windings of the output transformer to the 35L6 produces a magnetic field which is 180° out of phase with the magnetic field produced by current flowing in the opposite direction through the output transformer to the rest of the receiver, therefore, most of the AC hum is cancelled. Further reduction of hum is accomplished by filtering through resistors R12 and R13 and capacitors C18 and C19.

This development in filtering systems allows a higher effective plate voltage on the 35L6 for increased power output.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 500-549 be sure to add the speaker code letter to the transformer Part Number when ordering replacements.

ALIGNMENT PROCEDURE

OPERATOR	CONNECT OSCILLATOR TO CONVERTER	DUPPLY ANTENNA FREQUENCY	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Grid	.5 Mfd.	455 Kc.	800 Kc.	C-6, C-9, C-12	Align I. F.
2	One Turn Loosely Coupled	--	1600 Kc.	1600 Kc.	C-7	Set Oscillator to Dial Scale.
3	Loosely Coupled	--	1400 Kc.	1400 Kc.	C-5	Align detector
4	Wave Magnet	--	1400 Kc.	1400 Kc.	C-2	Align antenna stage



MODELS 6D015—6D030—6D015Z—6D030Z
CHASSIS Nos. 6C05—6C05Z

ALL RESISTERS +20% TOLERANCE UNLESS OTHERWISE SPECIFIED.

MODELS 6D015-6D030-6D015Z-6D030Z CHASSIS Nos. 6C05-6C05Z

PARTS LIST	
PART NO.	DESCRIPTION

DIAL ASSEMBLY

PRICE

Dial Scale.....	14
Dial Plate (2 Models only).....	15
Dial Pointer.....	46
Dial Pointer Mount.....	15
Tuning Control Knob and Wire.....	24
Tuning Shaft Tension Spring.....	05
Dial Cord Tension Spring.....	04
Dial Light Bulb.....	01
Retaining Ring Tuning Shaft.....	01
Dial Cord and Eyelet Assem.....	01
Pulley and Bushing Assem.....	01

COILS AND CHOKES

1st. I. F. Transformer (T1).....	1.75
2nd. I. F. Transformer (T2).....	1.75
Wave Trap Coil Assem. (L3).....	25
Oscillator Coil Assem. (L2).....	05
Oscillator Coil Assem. (2 Models only) (L2).....	02

CONDENSERS

.0001 Mfd. (C3).....	20
.01 Mfd. (C15).....	20
.002 Mfd. (C13).....	20
.1 Mfd. (C21).....	20
.001 Mfd. (C14).....	20
.001 Mfd. (C16).....	20
.0002 Mfd. (C12).....	15
Wave Trap Trimmer (or 22-1598) (C4).....	20
.05 Mfd. (C9).....	20
.03 Mfd. (C18).....	20
.04 Mfd. (C20).....	20
Dry Electrolytic 40 - 40 Mfd. - 150 V. (Alternate for 22-1519).....	1.1
Dry Electrolytic 40 - 20 - 20 Mfd. - 150 V. (C17, 18 and 19).....	1.55
Two Gang Variable (Replaces 22-1521) (2 Models only) (C1).....	3.45

RESISTORS

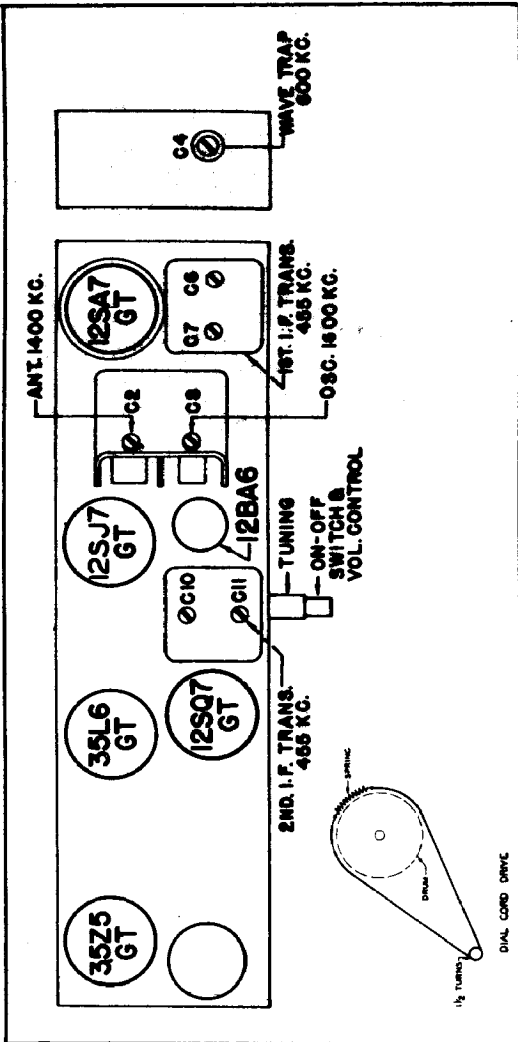
1000 Ohm (R3).....	09
200 Ohm (R1).....	09
4700 Ohm (R7).....	09
100 Ohm (R5).....	09
2.2 Megohm (R6).....	09
1.0M Ohm W. W. (R8).....	21
150 Ohm W. W. (R4).....	09
15 Megohm (R12).....	24
470 Ohm W. W. (R10).....	1.24
Volume Control and Switch (R6).....	1.24
22 Ohm W. W. (R11).....	24

MISCELLANEOUS

Cabinet Back (6D015 - 0157).....	11
Cabinet Back (6D015Z).....	11
Cabinet Back (6D030).....	14
Line Cord and Plug.....	14
Line Cord and Plug.....	14
Cabinet Handle Retaining Bmt. (2 used).....	02
Model 015 Bakelite Cabinet (Walnut).....	5.35
Model 015W Bakelite Cabinet (White).....	7.95
Model 015Z Bakelite Cabinet (Ebony).....	7.95
Tuning Control Knob.....	07
Volume Control Knob.....	07
205-547 Output Transformer.....	7.00
205-547 Cone and Voice Coil.....	1.87
205-547 Cone and Voice Coil.....	1.75
Excutechon (6D030).....	1.85
Excutechon (6D030Z).....	09
Socket - Electrolytic Cond.....	12
Socket - Octal (5 contact).....	12
Socket - Octal (6 contact).....	12
Socket - Octal (8 contact).....	12
Tube Retaining Spring.....	10
Red Acetate Indicator Strip.....	05
Grille Cloth.....	12
# 8 x 1 1/4 Oval B. H. S. T. Screw (Chassis Mfg.).....	02
# 8 x 20 x 5/16 Hex Hd. S. T. Screw (Handle Bmt. Mfg.).....	01
205-547 Bmt.....	07
Shim Bmt.....	01
Shim Button (Dial Crystal Mfg.).....	01
Dial Crystal (6D030).....	01
Dial Crystal (6D015).....	01
Dial Crystal Gasket.....	04
Instruction Book.....	06
Advancing Assem. (Type # 28) (L1).....	1.05
Advancing Assem. (Type # 28C) (L1).....	1.05
Advancing Assem. (Type # 28C) (2 Models only) (L1).....	1.05

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PRICES SUBJECT TO CHANGE WITHOUT NOTICE



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

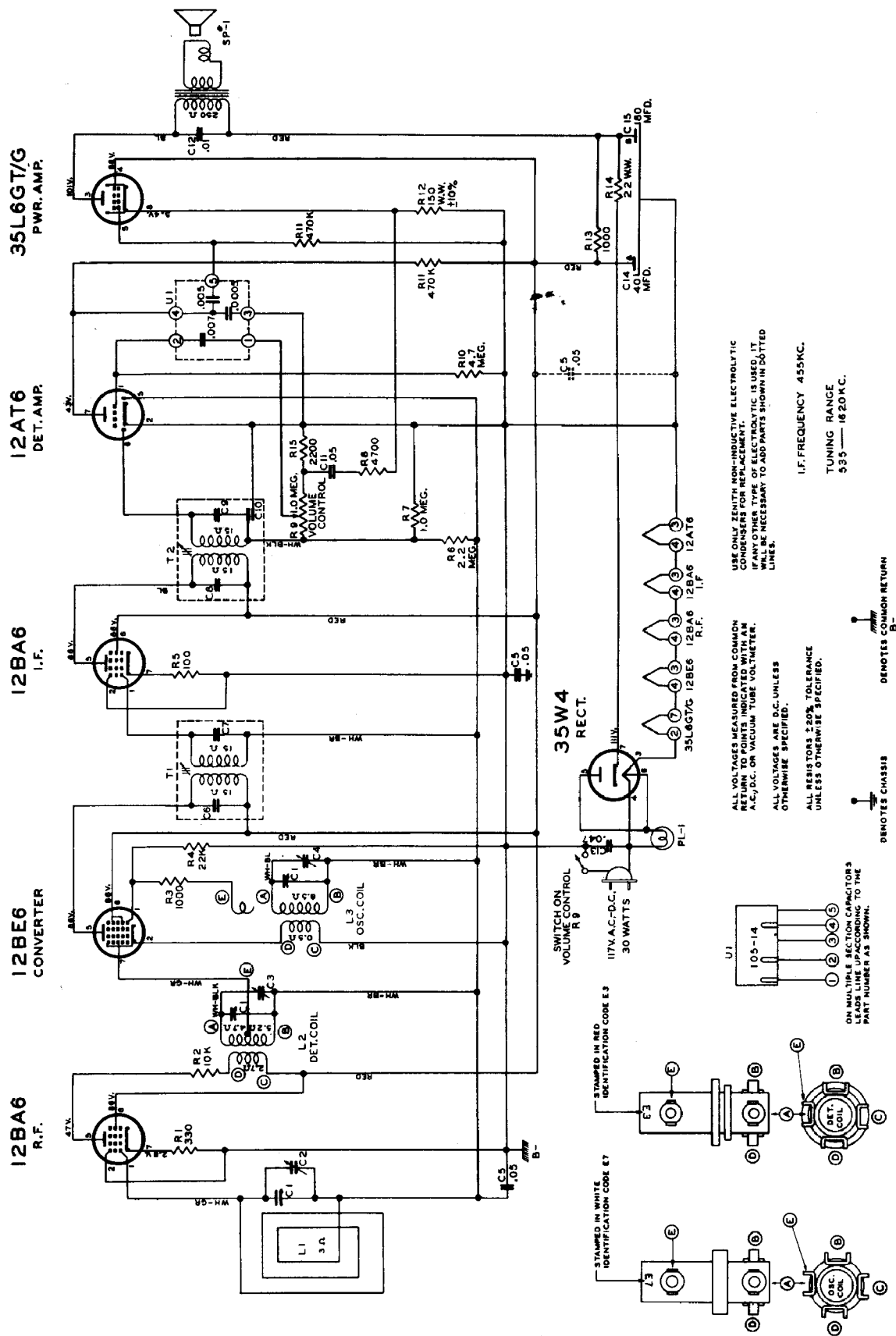
The filter circuits of chassis 6C05 incorporate new features that should be well understood by the service man. An examination of the schematic drawing will show the output transformer tapped slightly off center. This tap is the B + connection from filter resistor R11 and capacitor C19 off the cathode of the rectifier 35L6 to the 35L6 plate. The lower connection of the output transformer feeds B + to the rest of the tubes in the receiver. Current flowing through the upper windings of the output transformer to the 35L6 produces a magnetic field which is 180° out of phase with the magnetic field produced by current flowing in the opposite direction through the output transformer to the rest of the receiver, therefore, most of the AC hum is cancelled. Further reduction of hum is accomplished by filtering through resistor R10 and 12 and capacitors C17 and 18.

This development in filtering systems allows a higher effective plate voltage on the 35L6 for increased power output.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 205-547. Be sure to add the speaker code letter to the transformer Part Number.

ALIGNMENT PROCEDURE

OPERATION	CONNECT	OSCILLATOR TO ANTENNA	DUMMY INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid		.5 Mfd.	455 Kc.	C-6, C-7, C-10, C-11	I. F. Alignment
2	Single Turn Loosely Coupled to Wave Magnet		--	455 Kc.	C-4	Adjust Wave Trap to minimum.
3			--	1600 Kc.	C-8	Set Oscillator to Dial Scale.
4			--	1400 Kc.	C-2	Antenna Alignment



MODELS 6D815 CHASSIS 6E05

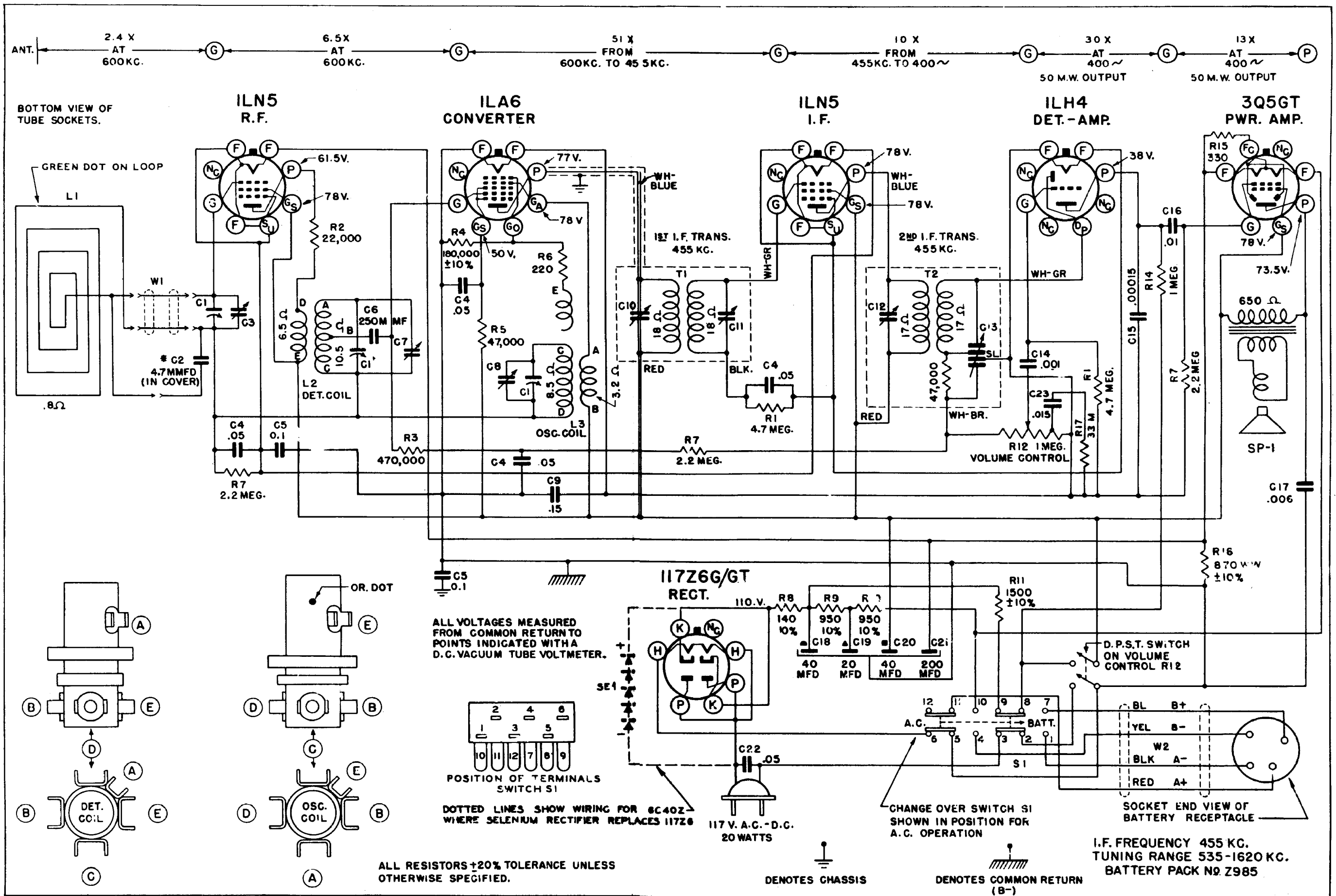
PARTS LIST

PART NO.	DIAL ASSEMBLY	PRICE
59-146	Dial Pointer	.24
75-304	Tuning Control Shaft	.08
80-209	Dial Cord Tension Spring	.08
80-345	Indicator Spring	.08
188-32	Retaining Ring	1.08C
39634	Indicator Lever and Rushing Assem.	.07
1189663	Dial Cord and Eyelet Assem.	.07
20810868	Dial Cord and Shutter Assem. (25-322)	1.42
61N5684	Pulley and Bracket Assem.	.19
	COILS AND CHOKES	
95-804	1st. I. F. Transformer (T1)	1.39
95-806	2nd. I. F. Transformer (T2)	1.39
20810868	Oscillator Coil Assem. (L3)	.75
20810864	Detector Coil Assem. (L2)	.91
	CONDENSERS	
22-182	250 Mfd. (C6)	.26
22-196	.01 Mfd. (C16)	.20
22-303	5 Mfd. (C2)	.20
22-458	.006 Mfd. (C17)	.20
22-470	150 Mfd. (C15)	.20
22-827	.1 Mfd. (C5)	.23
22-829	.05 Mfd. (C4)	.20
22-1017	.05 Mfd. (C22)	.20
22-1025	.15 Mfd. (C9)	.20
22-1120	.015 Mfd. (C23)	.20
22-1226	Oscillator Trimmer (C8)	.95
22-1352	Three Gang Variable (C1)	4.15
22-1431	.001 Mfd. (C14)	.600 V.
22-1443	Dry Electrolytic 40 - 40 - 20 - Mfd. - 150 V.	.200 Mfd. - 10 V. (C18, 19, 20 and 21)
22-1516	5 Mfd. (Alt. for 22-303) (C2)	500 V.
	RESISTORS	
63-271	1 Megohm (R14)	1/4 Watt
63-418	1500 Ohm (R11)	1/2 Watt
63-579	220 Ohm (R6)	1/4 Watt
63-580	330 Ohm (R15)	1/4 Watt
63-592	33M Ohm (R17)	1/4 Watt
63-600	2.2 Megohm (R7)	1/4 Watt
63-602	4.7 Megohm (R1)	1/4 Watt
63-644	22M Ohm (R2)	1/4 Watt
63-713	47M Ohm (R5)	1/4 Watt Insl.
63-719	470M Ohm (R3)	1/4 Watt
63-773	180M Ohm (R4)	1/4 Watt Insl.
63-1097	870 Ohm W. W. (R16)	1 Watt Insl.
63-1537	Volume Control and Sw. (R12)	1.81
63-1562	Candohm (Two 950 Ohm - 3w. Sections) (R9 and R10)	.65
63-1365	Candohm (Alt. for 63-1562)	.65
63-1366	Zipohm Resistor (140 Ohm 2 Watt) (R8)	.24
	MISCELLANEOUS	
11-86	Line Cord and Plug	.65
14-901	Model 001Y Portable Cabinet	18.25
15-51	Battery Cable Plug Cap	.09
36-27	Cabinet Handle (Includes 36-28 Insert)	.64
46-518	Tuning Control Knob	.07
46-577	Volume Control Knob	.07
49-513	5 1/4" P. M. Speaker	9.00
54-211	206-512 Output Trans.	1.97
57-1017	208-512 Cone and Voice Coil	1.73
57-1018	Speed Nut	.01
70-111	Cabinet Front Panel	2.00
71-67	Escutcheon	1.50
78-274	# 5 x 3/8 Phillips B. H. Wood Screw	.01
78-371	# 4 - 40 x 1/4" Flat Hd. M. S. (Black Anozinc)	.24C
78-445	Socket - Electrolytic Cond.	.03
78-446	Socket - Loktal (8 contact)	.19
78-543	Socket - Oktal (6 contact)	.12
83-1228	Socket - Loktal (7 contact)	.19
85-311	Socket - Battery Cable (4 Prong)	.13
93-553	Pin Jack Terminal Strip (on gang)	.10
110-106	Power Change - Over Sw.	.82
112-290	Black Felt Washer	.60C
112-403	Grille Cloth	.10
139-54	# 8 x 1" Phillips Countersunk Oval Hd. S. W. Screw	.03
159-25	#10/24 x 1" Washer Hd. M. S. (Handle Screw)	.03
159-49	Baffle Board	.05
188-47	Plug Button	.04
192-107	Snap Button	.01
196-85	Handle Ring (2 used)	.02
202-370	Dial Crystal	.24
313038	Dial Crystal Gasket	.05
	Instruction Book	.05
	Complete Cabinet Front Panel Assem.	4.00
	WAVEMAGNET PARTS	
19-134	Wavemagnet Cable Clip	.05
197-13	Wavemagnet Suction Cup	.06
310857	Wavemagnet Winding and Plate Assem.	3.75
310862	Wavemagnet Cable Assem.	1.08
310865	Wavemagnet Suction Cup Assem.	.14
310866	Wavemagnet Mtg. Strip Assem. (3 contact)	.33
310867	Wavemagnet Mtg. Strip Assem. (1 contact)	.13
312528	Wavemagnet Suction Cup Assem. (Alt. for 310865)	.14

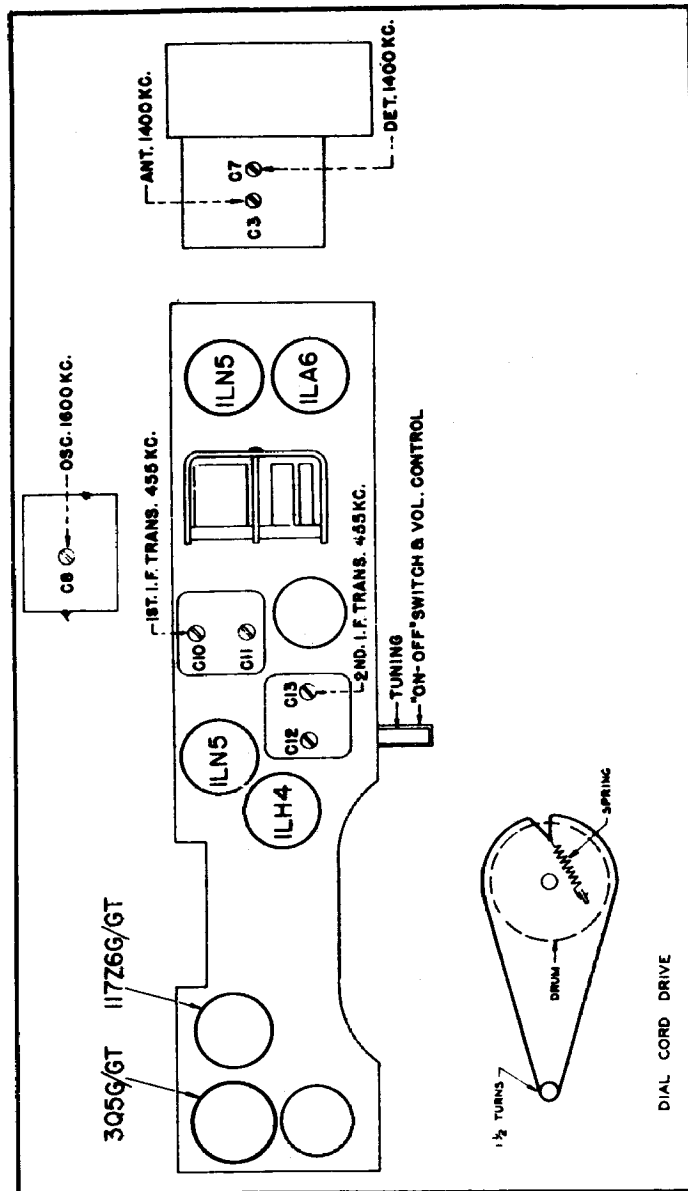
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MODEL 6G001
CHASSIS No. 6C40



MODEL 6G001 CHASSIS No. 6C40



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	BAND	SET DIAL TO	TRIMMERS	PURPOSE
1	Converter Grid	.1 Mfd	455 Kc.	BC	600 Kc.	C10-11-12-13	I.F. Alignment
2	Two turns loosely coupled to Wavemagnet		1600 Kc.	BC	1600 Kc.	C-8	Set Oscillator to scale
3	Two turns loosely coupled to Wavemagnet		1400 Kc.	BC	1400 Kc.	C-7	Align Det.
4	Two turns loosely coupled to Wavemagnet		1400 Kc.	BC	1400 Kc.	C-3	Align Wavemagnet

TO THE SERVICE MAN:

The 6C40 chassis is an AC, DC or battery operated superheterodyne circuit with a stage of RF amplification. The chassis is isolated from the DC circuit, and all measurements must be made from a common negative point. The most convenient place to reach this negative point is the terminal strip to which C5 is connected. The DC resistance from chassis to any circuit must be almost infinite. If any circuit becomes grounded a hum will appear. Microphonic tubes will cause audio howl. Check 1LA6.

The wavemagnet is connected to the chassis through the hinges in the cabinet, snaps and flexible leads. If the RF becomes weak or dead, check resistance of wavemagnet at condenser gang. The DC resistance across the two leads should be approximately 1 ohm. If the circuit is open, remove the two screws that hold the handle and top panel. When the top is removed, the wavemagnet connecting leads will be visible for inspection. Also loosen the snap-on socket and check for shorted or broken leads.

IF Alignment: Remove the chassis from the cabinet and arrange the units so that the wavemagnet can be plugged in. All the connections and adjustments can be made from the top of the chassis. Connect a signal generator, through a .1 mfd. dummy antenna, to the lug on top of the center section of the gang condenser (converter grid) and condenser gang frame. Connect an output meter across the voice coil of the speaker (two lugs provided). Set the signal generator to 455 Kc. and adjust C10, C11, C12 and C13 for maximum indication on the output meter. Always keep the signal output from the generator just high enough to get an indication, otherwise excessive loading may result. Remove the signal generator leads from the gang.

RF Alignment: Connect a two turn loop across the leads of the signal generator, loosely couple this loop to the wavemagnet. Set the signal generator and the dial pointer of the receiver to 1600 Kc. and adjust C8 to resonance. Set the signal generator and dial pointer to 1400 and adjust C7 (detector) and C3 (RF) to resonance. These trimmers are on the side of gang condenser. Check operation and re-install set in cabinet. Tune in a weak station near 1400 Kc. or use background noise and readjust C3 through the hole in the side of the cabinet for maximum sensitivity.

MODEL 6G004Y—CHASSIS No. 6C41

PARTS LIST

DIAL ASSEMBLY

12-887 TUNING CONTROL SHAFT BRACKET
26-366 DIAL SCALE
46-578 TUNING VOLUME CONTROL KNOB
46-573 SW (2 USED)
59-146 DIAL POINTER
59-167 ON-OFF INDICATOR
78-304 TUNING CONTROL SHAFT
80-209 DIAL CORD TENSION SPRING
80-421 INDICATOR SPRING
186-32 RETAINING RING (76-304)
192-112 DIAL CRYSTAL
S-9534 INDICATOR LEVER & BUSHING ASSEMBLY
S-9653 DIAL CORD & EYELET ASSEMBLY
MS-684 PULLEY & BRACKET ASSEMBLY

COILS AND CHOKES

95-804 1ST I.F. TRANSFORMER (T1)
95-805 2ND I.F. TRANSFORMER (T2)
S-8326 WAVE TRAP COIL ASSEMBLY (L5)
S-11591 ANTENNA LOADING COIL ASSEMBLY (L3)
S-11798 OSCILLATOR COIL ASSEMBLY (L6)
S-11800 PEAKING COIL ASSEMBLY (L4)
S-11801 ANTENNA COIL ASSEMBLY (L2)

CONDENSERS

22-147 500 MMFD. (C26) 600 V.
22-162 .0001 MFD. (C6) 500 V.
22-196 .01 MFD. (C18) 500 V.
22-258 .006 MFD. (C20) 600 V.
22-270 .0015 MFD. (C21) 600 V.
22-286 .01 MFD. (C27) 200 V.
22-287 .05 MFD. (C25) 200 V.
22-289 .05 MFD. (C24) 200 V.
22-307 .05 MFD. (C25) 200 V.
22-310 .05 MFD. (C25) 200 V.
22-312 .05 MFD. (C25) 200 V.
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22-498 .05 MFD. (C25) 200 V.
22-499 .05 MFD. (C25) 200 V.
22-500 .05 MFD. (C25) 200 V.

RESISTORS

63-371 1500 OHM (R9) 1/4 WATT
63-380 330 OHM (R10) 1/4 WATT
63-390 1500 OHM (R2) 1/4 WATT
63-392 3300 OHM (R6) 1/4 WATT
63-393 3300 OHM (R6) 1/4 WATT
63-394 3300 OHM (R6) 1/4 WATT
63-395 3300 OHM (R6) 1/4 WATT
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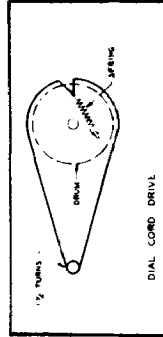
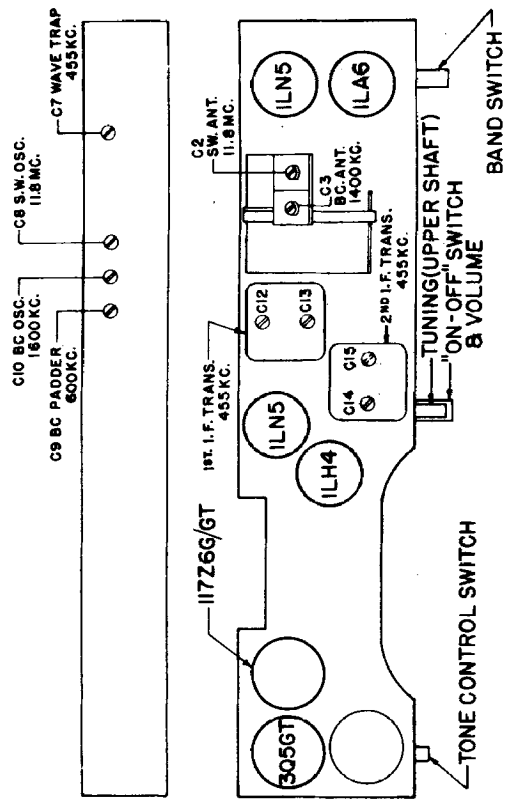
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

3-10-47

MISCELLANEOUS

11-70 LINE CORD & PLUG (OR 11-90)
12-1134 TELESCOPIC ANTENNA SUPPORT
15-51 PLUG CAP
19-125 ANTENNA MOUNTING CLIP
19-126 ANTENNA MOUNTING CLIP
36-37 CABINET HANDLE & INSERT
49-512 5" 1/2" SPEAKER
206-512 OUTPUT TRANSFORMER
208-512 CONE & VOICE COIL
SPEED NUT (3 USED)
54-211 FRONT PANEL
54-211 ESCUTCHEON
57-1121 BRASS EYELET
64-99 BRASS EYELET (ANT. LEAD)
700-111 #5 X 3/8" PHILLIPS B.H. WOOD SCREW (FRONT PANEL MTG.)
78-274 ELECTROLYTIC SOCKET
78-371 LOKTAL BASE TUBE SOCKET
78-401 LOKTAL BASE TUBE SOCKET (OR 78-596 OR 78-729)
78-543 FOUR PRONG FEMALE SOCKET (BATTERY CABLE)
78-611 OCTAL BASE TUBE SOCKET
78-671 OCTAL BASE TUBE SOCKET
83-1401 FELT STRIP (USED ON 46-573)
85-311 POWER CHANGE-OVER SWITCH (244705) (S3)
85-364 BAND SWITCH (S1)
85-368 TONE CONTROL SWITCH (S2)
93-485 COUNTERSUNK WASHER (2 USED) (STAINLESS BRONZE) (CHASSIS MTG.)
93-553 BLACK FELT WASHER (2 USED)
110-105 GRILLE CLOTH
112-236 ORNAMENTAL HD. M.S.C. (ANT. MTG.) (2 USED)
112-290 CHASSIS MTG. SCREW (2 USED)
112-403 10-24 X 1" WASHER HD. M.S. (HANDLE MTG.) (2 USED)
125-17 RUBBER GROMMET (GANG MTG. & ANT. MTG.)
139-54 Baffle BOARD
156-19 DOOR LATCH - UPPER HALF
156-21 DOOR LATCH - LOWER HALF
157-21 STRIKE FASTENER (2 USED)
184-7 BALL TIP FOR TELESCOPIC ANTENNA
188-47 HANDLE RING (2 USED)
202-400 INSTRUCTION BOOK
S-11802 ANTENNA TRIMMER BRKT. & PIN JACK ASSEM.
S-11820 TELESCOPIC ANT. ASSEM. (COMPLETE)
S-13719 TONE SWITCH KNOB YOKE & PLATE ASSEM.

WAVEMAGNET PARTS
19-134 WAVEMAGNET CABLE CLIP
S-10865 WAVEMAGNET CABLE ASSEMBLY
S-10866 WAVEMAGNET STRIP ON CUP ASSEM. (OR S-12528) (2 USED)
S-10867 WAVEMAGNET MTG. STRIP ASSEMBLY (SINGLE SNAP)
S-11928 WAVEMAGNET WINDING & PLATE ASSEMBLY (L1)
S-12382 WAVEMAGNET MTG. STRIP ASSEMBLY (THREE SNAP)



DIAL CABLE DRAWING

TUBE TRIMMER LOCATION

TONE CONTROL SWITCH

BAND SWITCH

TUNING (UPPER SHAFT) ON-OFF SWITCH B VOLUME

WAVEMAGNET PARTS

CONDENSERS

RESISTORS

COILS AND CHOKES

DIAL ASSEMBLY

MISCELLANEOUS

TUBE TRIMMER LOCATION

TONE CONTROL SWITCH

BAND SWITCH

TUNING (UPPER SHAFT) ON-OFF SWITCH B VOLUME

WAVEMAGNET PARTS

CONDENSERS

RESISTORS

COILS AND CHOKES

DIAL ASSEMBLY

MISCELLANEOUS

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY			
59-121		Dial pointer.	.19
76-305		Tuning Control shaft.	.12
80-69		Dial Cord Tension Spring.	.02
80-227		Tuning Shaft Tension Spring	.02
93-482		Black Bakelite Washer (used with 59-121).	.72C
188-27		Retaining Ring (76-305)	1.20C
S-9643		Dial Scale & Indicator Assembly (26-293)	1.20
S-9758		Dial Cord Assembly.	.07
MS-586		Pulley & Bracket Assembly	.12
COILS & CHOKES			
95-821	T1	1st I.F. Transformer.	1.77
95-822	T2	2nd I.F. Transformer.	1.77
S-9689	L3	Oscillator Coil & Wire Assembly	1.26
S-9690	L2	Detector Coil Assembly.	1.04
S-11815	L1	Antenna Coil Assembly	1.65
CONDENSERS			
22-162	C23	.0001 Mfd 500 Volt.	.20
22-196	C24	.01 Mfd 600 Volt.	.20
22-229	C33	.005 Mfd. 600 Volt.	.20
22-289	C9	50 Mmfd 500 Volt.	.20
22-303	C10	5 Mmfd. 500 Volt.	.20
22-326	C25	.003 Mfd. 400 Volt.	.20
22-327	C6	.02 Mfd. 200 Volt.	.20
22-358	C17	.002 Mfd. 600 Volt.	.38
22-448	C26	.004 Mfd. 600 Volt.	.20
22-470	C35	.00015 Mfd. 600 Volt.	.20
22-492	C30	.002 Mfd. 600 Volt.	.20
22-827	C29	.1 Mfd. 200 Volt.	.23
22-829	C8	.05 Mfd 200 Volt.	.20
22-830	C32	.02 Mfd 600 Volt.	.20
22-887	C31	.001 Mfd. 600 Volt.	.20
22-930	C12	Dual unit padder.	.83
22-954	C34	.00035 Mfd. 600 Volt.	.16
22-1017	C20	.05 Mfd 400 Volt.	.20
22-1047	C36,37,38	10-20-30 Mfd. Dry Electrolytic.	1.63
22-1144	C13,14,15,16	Four Section Ceramic Trimmer.	.83
22-1183	C3	.01 Mfd 400 Volt.	.20
22-1217	C1	Three Gang Variable	4.48
22-1230	C4,C5	Two Section Ceramic Trimmer	.38
22-1234	C27,28	200 Mfd.- 10 V. x 40 Mfd. 150 V. Dry Electrolytic	1.92
22-1421	C2,C11	Trimmer Capacitor	.40
RESISTORS			
63-271	R15	1 Megohm. 1/4 Watt.	.09
63-577	R5	100 Ohm 1/4 Watt.	.09
63-580	R18	330 Ohm 1/4 Watt.	.09
63-589	R2	10,000 Ohm. 1/4 Watt.	.09
63-591	R6	22,000 Ohm. 1/4 Watt.	.09
63-593	R10	47,000 Ohm. 1/4 Watt.	.09
63-594	R11	68,000 Ohm. 1/4 Watt.	.09
63-597	R20	470,000 Ohm 1/4 Watt.	.09
63-600	R3	2.2 Megohm. 1/4 Watt.	.09
63-602	R1	4.7 Megohm. 1/4 Watt.	.09
63-604	R16	10 Megohm 1/4 Watt.	.09
63-605	R21	1000 Ohm. 1/2 Watt.	.10
63-635	R7	3300 Ohm. 1/4 Watt.	.09
63-640	R8	8200 Ohm. 1/4 Watt.	.09
63-654	R4	180,000 Ohm 1/4 Watt.	.09
63-976	R17	15 Megohm. 1/4 Watt.	.09
63-1097	R19	870 Ohm. W.W. Insul. 1 Watt.	.24
63-1244	R9	Volume Control	1.20
63-1259	R13,14	Candohm (2 section).	.43
63-1366	R12	140 Ohm Zipohm W.W. 2-1/2 Watt	.24

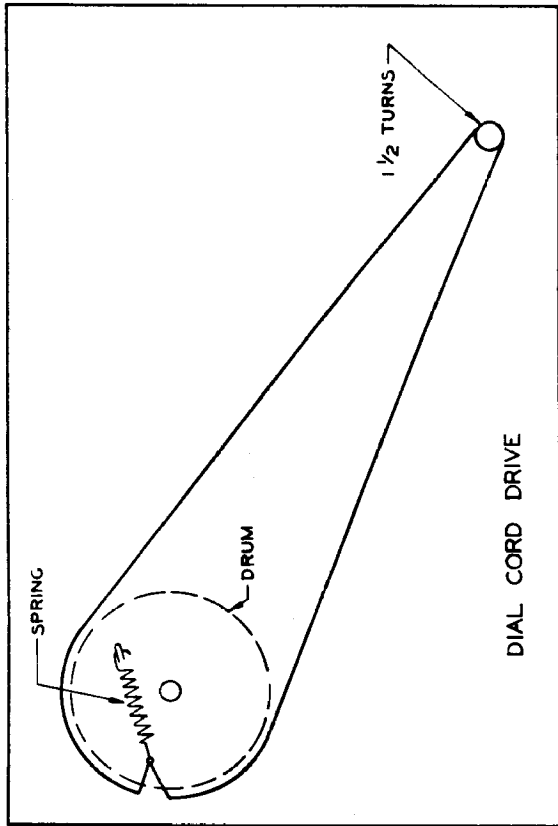
MODELS 6G038
CHASSIS No. 6C50

**MODEL 6G038
CHASSIS No. 6C50**

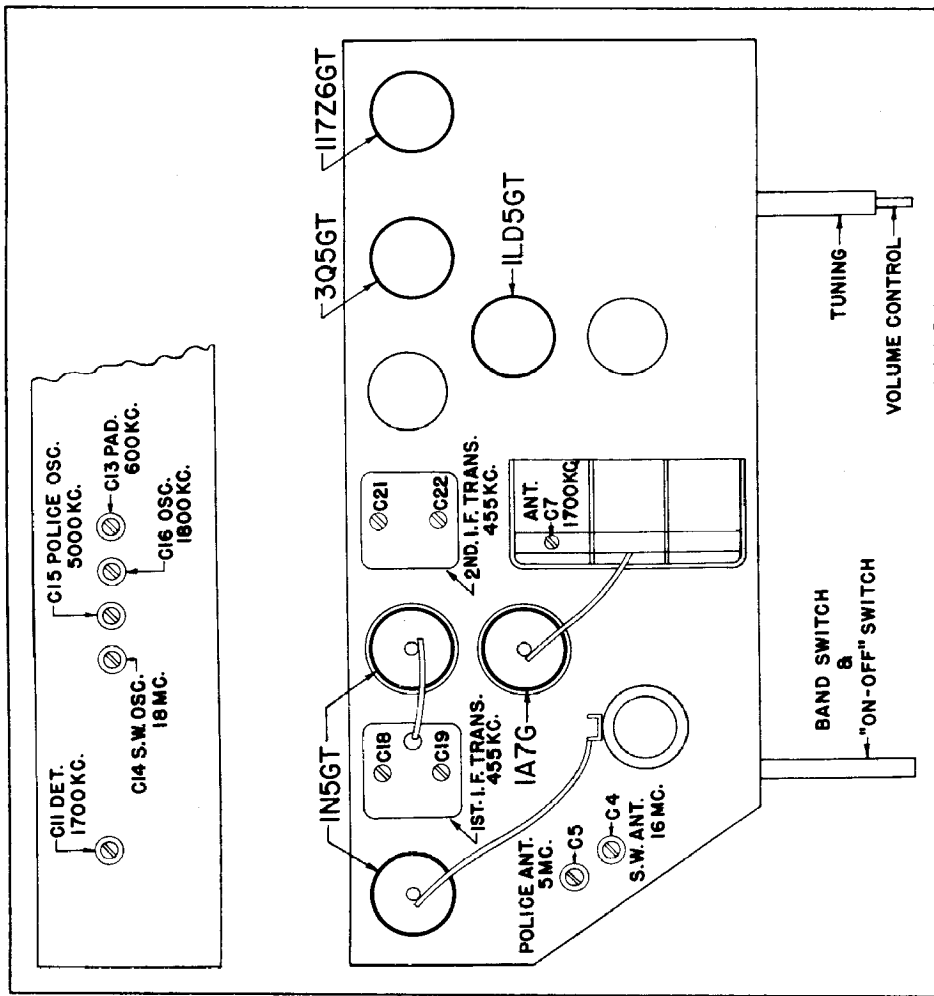
PART NO.	REF.NO.	DESCRIPTION	PRICE
RADIO ESCUTCHEON PARTS			
S-9995		Radiorgan Escutcheon & Knob Assem. L.H. (Complete) . . .	1.20
S-9996		Radiorgan Escutcheon & Knob Assem. R.H. (Complete) . . .	1.20
MS-660		Pracket Assembly	.25
S-9590		Knob & Eyelet Assem. (3 used on L.H., 1 on R.H.) . . .	.12
S-9591		Knob & Eyelet Assembly (2 used on R.H. only)	.12
57-911		Tenite Escutcheon (Black) (1 used on L.H. only)	.36
57-912		Tenite Escutcheon (Black) (1 used on R.H. only)	.36
76-337		Latch Shaft.	.03
76-338		Knob Shaft	.04
80-264		Latch Spring	.72C
114-159		#6 x 1/4" Hex Hd. Self Tapping Screw (2 used)	.72C
156-10		Latch.	.36C
MISCELLANEOUS			
11-68		Line Cord & Plug (8 ft. long)	.65
12-782		Volume Control Mounting Bracket.	.05
12-787		Tuning Sleeve Support Bracket.	.04
12-1082		Antenna Rod Mounting Bracket	.06
15-34		Socket Cap (or 15-67) (Battery Cable)	.07
17-67		Antenna Rod Retaining Clamp.	.08
19-77		Cable Retaining Clamp.	.01
46-579		Band Selector Switch Knob.	.20
49-464	SP1	8" P.M. Speaker.	10.52
		206-464 Output Transformer	1.97
		208-464 Cone & Voice Coil	2.63
57-11A		Antenna Lead Marker.	.03
57-11G		Ground Lead Marker	.03
57-905		Dial Escutcheon (or 57-1112) (Part of S-9580 or S-11777)	2.41
57-1103		Antenna Knob Escutcheon.	.70
70-124		#2 x 3/8" Oval Hd. Wood Screw (Ant. Esc. Mtg.)	1.70C
72-58		#2 x 3/8" Flat Hd. Wood Screw (Dial Esc. Mtg.)	.02
78-190		Speaker Plug Socket.	.12
78-229		Electrolytic Capacitor Socket.	.03
78-396		Four Contact Socket (Battery Cable)	.12
78-446		Octal Base Tube Socket (7 contact)	.19
78-611		Octal Base Tube Socket (8 contact)	.12
78-671		Octal Base Tube Socket	.12
85-171	S5	Power Switch	.31
85-303	S1	Antenna Switch	.35
85-366	S2	Band Selector Switch	2.00
93-215		Rubber Washer (Chassis Mtg.)	.07
112-56		#6 x 1/4" Hex Hd. Self Tapping Screw (Radiorgan Switch Mtg.)	.55C
114-40		#10-32 x 7/8" Hex Washer Hd. M.S. Steel (Chassis Mtg.)	.72C
		(3 used)	
114-128		#10 x 1-1/16" Hex Washer Hd. Self Tapping Screw	1.81C
		(Chassis Mtg.) (1 used)	
125-17		Rubber Grommet	.03
126-379		Tube Shield (for GT type)	.07
126-382		Tube Shield.	.08
192-68		Dial Escutcheon Glass (Part of S-11777 or S-9580)	.43
196-47		Dial Escutcheon Gasket(" " " " ")	.19
202-398		Instruction Book	.25
S-8540		Dummy Knob & Set Screw Assembly (46-350)	.24
S-9580		Dial Escutcheon Assembly (or S-11777)	3.01
S-9595	S3,4	Radiorgan Strip & Contact Assembly (2 used)	.31
S-9816		Tuning Control Knob & Set Screw Assembly	.30
S-11251		Telescopic Antenna Assembly.	7.85
S-11899		Volume Control Knob Assembly (46-578)	.26

Prices subject to change without notice 25 5-1-47

MODEL 6G038
CHASSIS No. 6C50



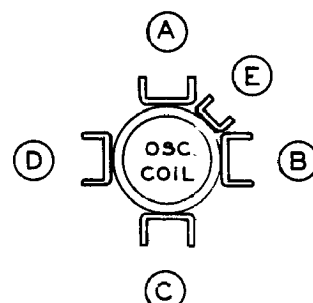
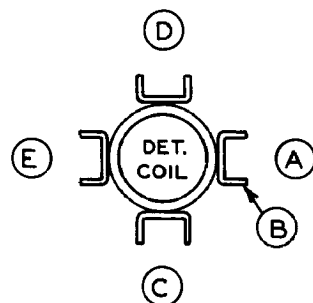
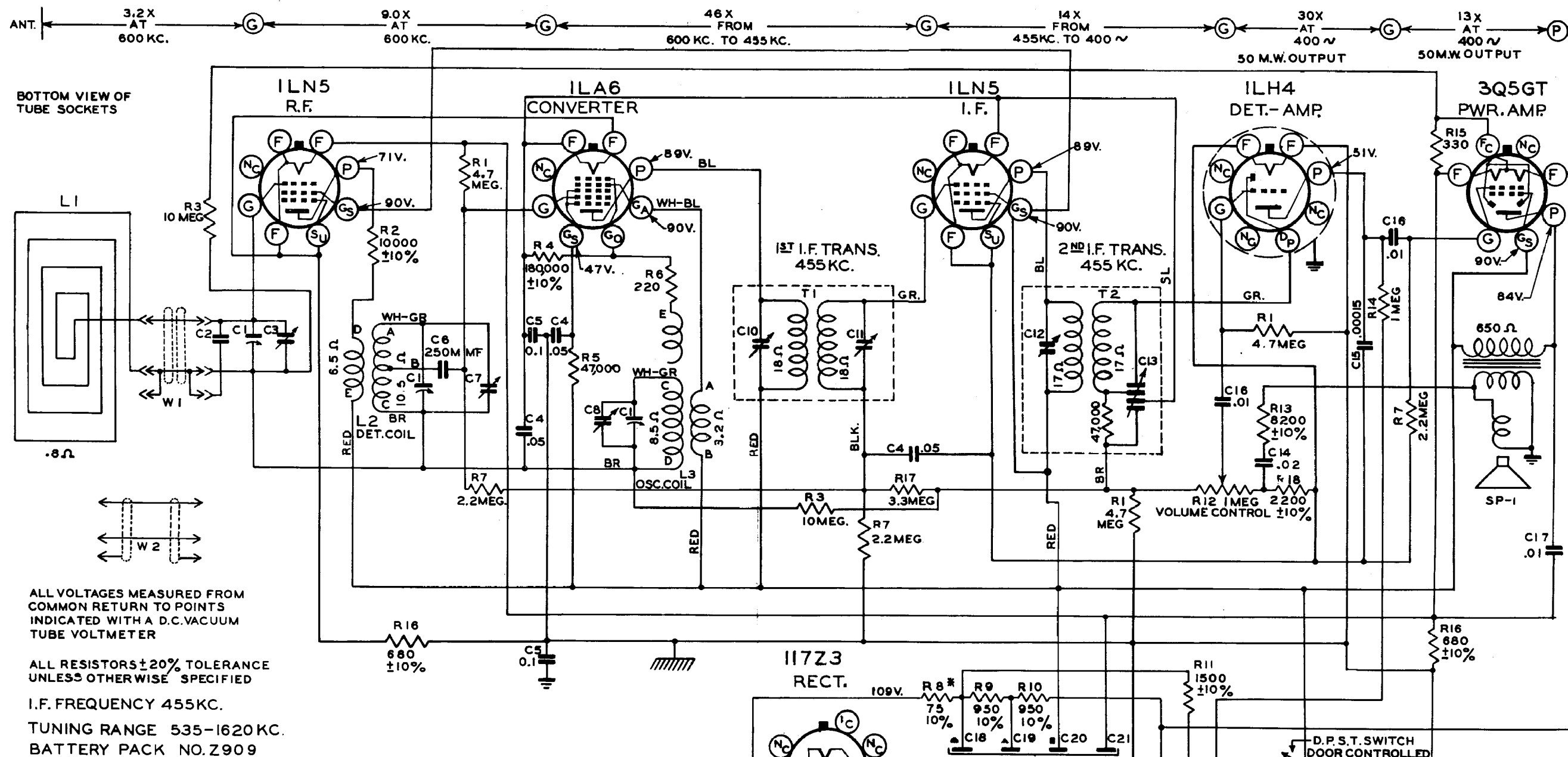
DIAL CABLE DRAWING



TUBE TRIMMER LOCATION

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter grid	.5 mfd	455 Kc.	600 Kc.	C18, C19, C21, C22	Align I.F.
2	One turn		18 Mc	18 Mc	C14	Adjust oscillator to scale
3			16 Mc	16 Mc	C4	Adjust for max.
4	Loosely		5 Mc	5 Mc	C15	Adjust oscillator to scale
5	Coupled		5 Mc	5 Mc	C5	Adjust for max.
6	To		1800 Kc	1800 Kc	C16	Adjust oscillator to scale
7	Waverod		1700 Kc	1700 Kc	C11 & C7	Adjust for max.
8			600 Kc	600 Kc	C13	Rock gang and adjust for max.



POSITION OF TERMINALS SWITCH S1

*NOTE: DOTTED LINES SHOW WIRING WHEN SELENIUM RECTIFIER REPLACES 117Z3 R8 BECOMES 140 OHMS $\pm 10\%$ WHEN SELENIUM RECTIFIER IS USED

117V. A.C.-D.C. 20WATTS

DENOTES CHASSIS

DENOTES COMMON RETURN (B-)

CHANGE OVER SWITCH S1 SHOWN IN POSITION FOR A.C. OPERATION

SOCKET END VIEW OF CABLE

MODEL 6G801
CHASSIS 6E40

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY			
26-399		Louver dial	\$.65
54-262		Speed nut (4 used on 26-399)	.01
76-500		Tuning Control Shaft	.25
80-69		Dial Cord Tension Spring	.02
80-209		Dial Cord Tension Spring	.03
188-32		Retaining Ring (76-500)	1.03C
188-75		Retaining Ring (S-13829)	.02
S-13829		Dial Pointer & Pulley Assembly (59-201)	.30
S-13830		Condenser Pulley & Bushing Assembly	.45
S-13838		Pulley Mtg. Bracket & Stud Assembly	.20
S-14407		Dial Cord & Eyelet Assembly (Long)	.05
S-14406		Dial Cord & Eyelet Assembly (Short)	.04
COILS AND CHOKES			
95-1085	T1	1st I.F. Transformer	2.00
95-1086	T2	2nd I.F. Transformer	2.30
S-14385	L2	Detector Coil Assembly	.80
S-14389	L3	Oscillator Coil Assembly	.75
CONDENSERS			
22-182	C6	.00025 MFD. (or 22-1666) 500 V.	.26
22-196	C16	.01 MFD 600 V.	.20
22-327	C14	.02 MFD 200 V.	.20
22-470	C15	150 MFD. (or 22-1675) 500 V.	.20
22-827	C5	.1 MFD 200 V.	.23
22-829	C4	.05 MFD 200 V.	.20
22-1017	C22	.05 MFD 400 V.	.20
22-1182	C17	.01 MFD 400 V.	.20
22-1726	C3,7,8	Single Section Trimmer (use with 22-1352)	.35
22-1727	C1	Three Gang Variable (or 22-1352)	4.15
22-1741	C18,19,20,21	Four Section Electrolytic 20-40-60 MFD.-150V. x 200 MFD. *10V.	3.50
22-1763	C2	2.2 MMFD. Ceramic 500 V.	.20
RESISTORS			
63-1362	R9,10	Two Section Candohm	.65
63-1562	R8	75 ohm W. W. (Insulated)	.33
63-1642	R12	Volume Control	1.20
63-1758	R6	220 ohm (Insulated)	.21
63-1765	R15	330 ohm (Insulated)	.21
63-1778	R16	680 ohm (Insulated)	.21
63-1792	R11	1500 ohm (Insulated)	.21
63-1799	R18	2200 ohm (Insulated)	.21
63-1824	R13	8200 ohm (Insulated)	.21
63-1827	R2	10 K ohm (Insulated)	.21
63-1856	R5	47 K ohm (Insulated)	.21
63-1880	R4	180 K ohm (Insulated)	.21
63-1912	R14	1 Megohm (Insulated)	.21
63-1926	R7	2.2 Megohm (Insulated)	.21
63-1933	R17	3.3 Megohm (Insulated)	.21
63-1940	R1	4.7 Megohm (Insulated)	.21
63-1954	R3	10 Megohm (Insulated)	.21
MISCELLANEOUS			
11-104		Line Cord & Plug - 7 ft	.65
15-51		Plug Cap & Insulator	.09
17-103		Battery Cable Clamp	.02
24-458		Switch Cover	.15
28-23		Cabinet Door (R.H.)	.75
28-24		Cabinet Door (L.H.)	.75
40-74		Door Hinge (4 used)	.20
40-78		Cabinet Rear Cover Hinge (2 used on S-14412)	.04
43-159		Handle End Piece (2 used)	1.25
46-731		Door Release Knob	.25
46-732		Tuning & Volume Control Knob (2 used)	.15
49-631	SP-1	P.M. Speaker (5 1/4")	8.25
		206-631 Output Transformer	1.97
		208-631 Cone & Voice Coil	1.73
52-475	W1	Wavemagnet Cable	1.75
52-476	W2	Wavemagnet Extension Cable	1.50
54-30		#8-32 x 5/16" Hex. Nut - Steel - N.P.	.31C
54-139		#3/8 - 32 x 9/16" Palmnut - Cad.	.01
54-141		Tinnerman Speed Nut (used on 52-475)	1.20C
54-211		Tinnerman Speed Nut (6 used on S-14417)	.01
54-261		Spring Nut (used on 80-600)	.01
54-263		Speed Nut (used on 80-603)	.02
54-267		#6-32 x 5/16" Palmnut Steel-N.P.	.45
56-236		Hinge Pin (4 used) (2 on 28-23) (2 on 28-24)	.01
57-1360		Chassis Front Plate	.15
57-1384		Chassis Civer Plate	.04
73-35		#8-32 x 3/16" Hex. Hd. Slotted Set Screw- Cup point	.03
78-274		Socket- Electrolytic Capacitor	.03
78-488		Socket - Loktal Tube	.25
78-543		Socket - Battery Cable (4 Contact)	.13

PART NO.	REF. NO.	DESCRIPTION	PRICE
MISCELLANEOUS--Continued			
78-596		Socket - Loktal Tube (or 78-762) (8 Contact)	\$.18
78-781		Socket - Miniature Tube	.20
78-801		Socket - Octal Tube	.15
78-802		Socket - Wavemagnet Plug (3 Contact)	.10
80-597		Door Release Knob Spring	.02
80-598		Door Catch Spring	.02
80-599		Cover Catch Spring (2 used on S-14412)	.04
80-600		Door Hinge Retaining Spring (2 used on S-14417)	.05
80-601		Lock Lever Spring (Used on S-14424)	.04
80-602		Latch Bar Spring (used on S-14424)	\$0.06
80-603		Wavemagnet Release Spring	.15
80-626		Pressure Spring (2 used on S-14424)	.02
80-629		Link Lever Spring	.03
83-1482		Rubber Strip (Handle)	.15
83-1487		Chassis Insulating Strip	.30
83-1510		Gang Condenser Shield Strip (used with 22-1352)	.02
83-1512		Rubber Strip (Handle)	.12
83-1524		Wavemagnet Cable Spacer Strip	.02
83-1525		Wavemagnet Cable Spacer Strip	.01
83-1531		Cushion Strip	.07
85-311	S1	Battery Change-Over Switch	.82
85-428	S2	D.P.S.T. Switch	.45
93-35		.032 x .144 x 3/8" Steel Washer - N.P.	.25C
93-125		#6 Int. Shakeproof Lockwasher #1206	.31C
93-126		#8 Int. Shakeproof Lockwasher #1208	.36C
93-179		.031 x .140 x 5/16" Steel Washer - Cad. Pl.	.65C
93-282		Fibre Shoulder Washer	.01
93-321		Fibre Washer (used on 52-475)	.03
93-525		1/16" x .127 x 5/16" Fibre Washer	.65C
93-609		.015 x .134 x 1/4" Steel Washer - N.P.	.07C
93-721		Black Felt Washer (used on 80-603)	.01
93-906		Black Felt Washer (used on 80-603)	.02
93-911		Spring Washer (4 used)	.01
93-912		.010 x 9/64" x 5/16" Steel Washer N.P.	.85C
93-913		.020 x .192 x 5/16" Steel Washer - Black Zinc Finish	.01
94-295		Condenser Mounting Bushing	.04
110-131		Grille Cloth	.25
112-713		#4-40 x 1/4" Rd. Phillips Hd. M.S. (Lockwasher attached)	.02
112-714		#4 x 1/4" Flat Hd. Self Tapping Screw (2 used)	.01
114-26		#8 x 1/2" Hex. Hd. Self Tapping Screw (6 used)	.55C
114-48		#6-32 x 1/2" Hex. Acorn Hd. M.S. - Steel - N.P.	.43C
114-50		#8-32 x 1/2" Hex. Acorn Hd. M.S. - Steel - N.P.	.43C
114-248		#6-20 x 5/16" Hex. Hd. Slotted Self Tapping Screw (8 used)	.01
114-251		#10-32 x 5/8" Hex. Washer Hd. Slotted M. Screw (2 used)	.03
114-291		#8-32 x 7/16" Hex. Hd. Slotted M.S. - Steel - N.P.	.85C
114-298		#6-32 x 3/8" Hex. Hd. Slotted M.S. (Lockwasher attached) (4 used)	.02
125-17		Rubber Grommet (3 used)	.03
125-26		Rubber Grommet (4 used)	.03
125-39		Rubber Grommet (2 used)	.02
126-572		Wavemagnet Shield (used on S-14563)	.08
126-573		Tube Shield	.04
139-72		Speaker Baffle	.75
159-49		Snap Button	.01
159-57		Snap Button (2 used on S-14563)	.02
197-18		Rubber Suction Cup (used on S-14563)	.08
197-22		Rubber Suction Cup (used on S-14563)	.10
199-83		Flexible Handle Sleeve	.45
202-589		Instruction Book	2.00
212-3	SE-1	Selenium Rectifier	.20
S-14412		Cabinet Frame Assembly	4.25
S-14414		Cabinet Door Latch, Release Knob & Spring Assembly	.45
S-14416		Switch Mounting Bracket & Lever Assembly	.30
S-14417		Cabinet Front Cover Assembly	5.75
S-14420		Cabinet Rear Cover & Rivet Assembly	3.25
S-14421		Handle Strap Assembly	.30
S-14422		Wavemagnet Assembly	2.65
S-14424		Cover Strip & Latch Bar Assembly	1.40
S-14563		Wavemagnet Shield Assembly	.35

MODEL 6G801
CHASSIS 6E40

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODEL 6G801 CHASSIS 6E40

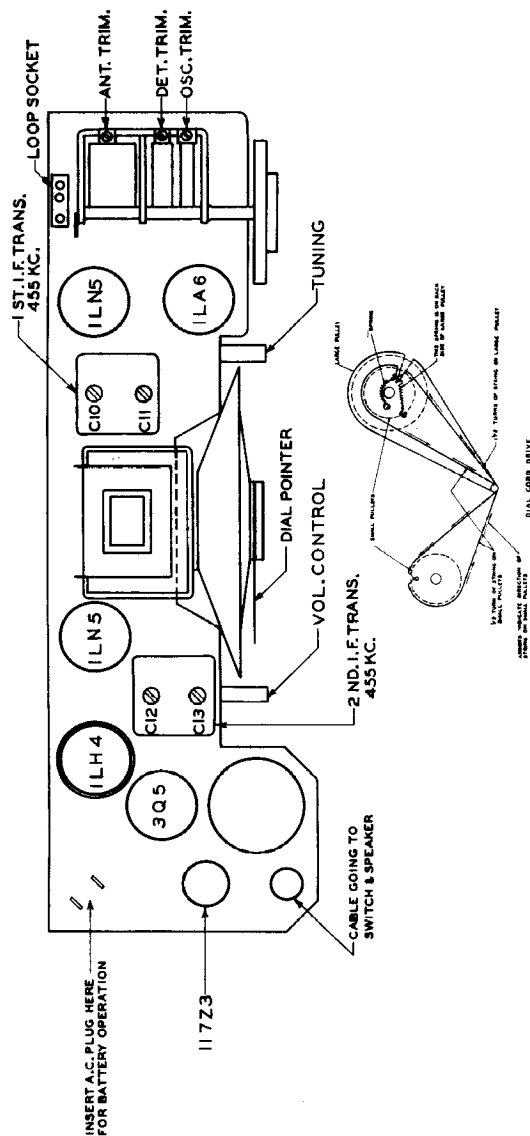
TO THE SERVICE MAN:

The 6E40 chassis is an AC, DC or battery operated superheterodyne circuit with a stage of RF amplification. The chassis is isolated from the DC circuit, and all measurements must be made from a common negative point. The most convenient place to reach this negative point is the terminal strip to which C5 is connected. The DC resistance from chassis to any circuit must be almost infinite. If any circuit becomes grounded a hum will appear. Microphonic tubes will cause audio howl. Check 1LA6.

The wavemagnet is connected to the chassis with a two wire cable. If the R.F. becomes weak or dead, check the D.C. resistance of the wavemagnet and connecting cable. This D.C. resistance should be approximately 1.75 ohms. If it is open check the cable and wavemagnet.

IF Alignment: Remove the chassis from the cabinet and arrange the units so that the wavemagnet can be plugged in. All the connections and adjustments can be made from the top of the chassis. Connect a signal generator, through a .1 mfd. dummy antenna, to the lug on top of the center section of the gang condenser (converter grid) and condenser gang frame. Connect an output meter across the voice coil of the speaker (two lugs provided). Set the signal generator to 455 Kc. and adjust C10, C11, C12 and C13 for maximum indication on the output meter. Always keep the signal output from the generator just high enough to get an indication, otherwise excessive loading may result. Remove the signal generator leads from the gang.

RF Alignment: Connect a two turn loop across the leads of the signal generator, loosely couple this loop to the wavemagnet. Set the signal generator and the dial pointer of the receiver to 1600 Kc. and adjust oscillator trimmer to resonance. Set the signal generator and dial pointer to 1400 and adjust detector trimmer and antenna trimmer to resonance. These trimmers are on the top of gang condenser. Check operation and re-install set in cabinet. Tune in a weak station near 1400 Kc. or use background noise and readjust antenna trimmer for maximum sensitivity.



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	BAND	SET DIAL TO	TRIMMERS	PURPOSE
1	Converter	.1 Mfd	455 Kc.	PC	600 Kc.	C-10-11-12-13	I.F. Alignment
2	Two turns loosely coupled to Wavemagnet		1600 Kc.	PC	1600 Kc.	Osc. Trim.	Set Oscillator to scale
3	Two turns loosely coupled to Wavemagnet		1400 Kc.	PC	1400 Kc.	Det. Trim.	Align Det.
4	Two turns loosely coupled to Wavemagnet		1400 Kc.	PC	1400 Kc.	Ant. Trim.	Align Wavemagnet

MODELS 6R084 CHASSIS Nos. 6C21

PART NO.	REF. NO.	PARTS LIST	PRICE
26-332		Dial Scale	.30
46-350		Tone & Volume Control Knob (2 used) (See S11558)	.11
46-352		Dummy Knob	.10
46-354		Tuning Control Knob	.07
46-356		Phono Socket Switch Knob (2 used)	.29
76-413		Tuning Control Shaft	.40
76-570		Dial Light Socket & Wire Assembly	.03
80-402		Dial Cord Tension Spring (2 used)	.10
100-36		Tuning Shaft Retaining Ring (5 used)	.01
138-50		Shap Button (Dial Scale Mfg.) (5 used)	1.20
158-50		Pointer Retaining Ring (2 used)	.04
168-54		Volume Control Clamping Ring	.64
188-54		Dial Crystal	.40
198-91		Pointer & Pulley Assembly (50-148)	.06
S-10653		Drive Pulley Cord & Eyelet Assembly	.06
S-11161		Pointer Pulley Cord & Eyelet Assembly	.06
S-11162		Dial Mounting Plate & Stud Assembly	.60
S-11165		Drive Pulley & Bushing Assembly (Gang Condenser)	.41
S-11168		Decorative Ring & Control Knob Assembly	.28
S-11558		Tuning Control Knob Assembly	.45
S-13089		Tuning Control Knob Assembly	.25
COLLS & CHOKES			
9C-909	(T1)	1st I.F. Transformer	1.85
9C-1110	(T2)	2nd I.F. Transformer	2.10
9C-1111	(T3)	Detector Coil Assembly	.71
9C-11164	(T4)	Oscillator Coil Assembly	.58
CONDENSERS			
22-139	(C16)	.05 Mfd.	.33
22-171	(C17)	.05 Mfd.	.26
22-268	(C18)	.003 Mfd.	.20
22-327	(C19)	.003 Mfd.	.20
22-448	(C20)	.004 Mfd.	.20
22-859	(C21)	.004 Mfd.	.20
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22-859	(C275)	.004 Mfd.	.20
22-859	(C276)	.004 Mfd.	.20</

MODELS 6R087-6R087Z **CHASSIS No. 6C22-6C22Z**

TO THE SERVICE MAN:

A feature of chassis 6C22 and 6C22Z is a high gain tuned R.F. stage ahead of the conventional superheterodyne circuit.

When making repairs or adjustments on the chassis be sure to have the Phone-Radio switch in Radio position (button out).

The Tone Control circuit used in chassis 6C22 is unusual. Attenuation or control occurs in both the grid and plate circuit of the triode section of the 6SQ7 tube. To increase the bass response Resistor R10 and Capacitor C9 boost the bass in the grid circuit.

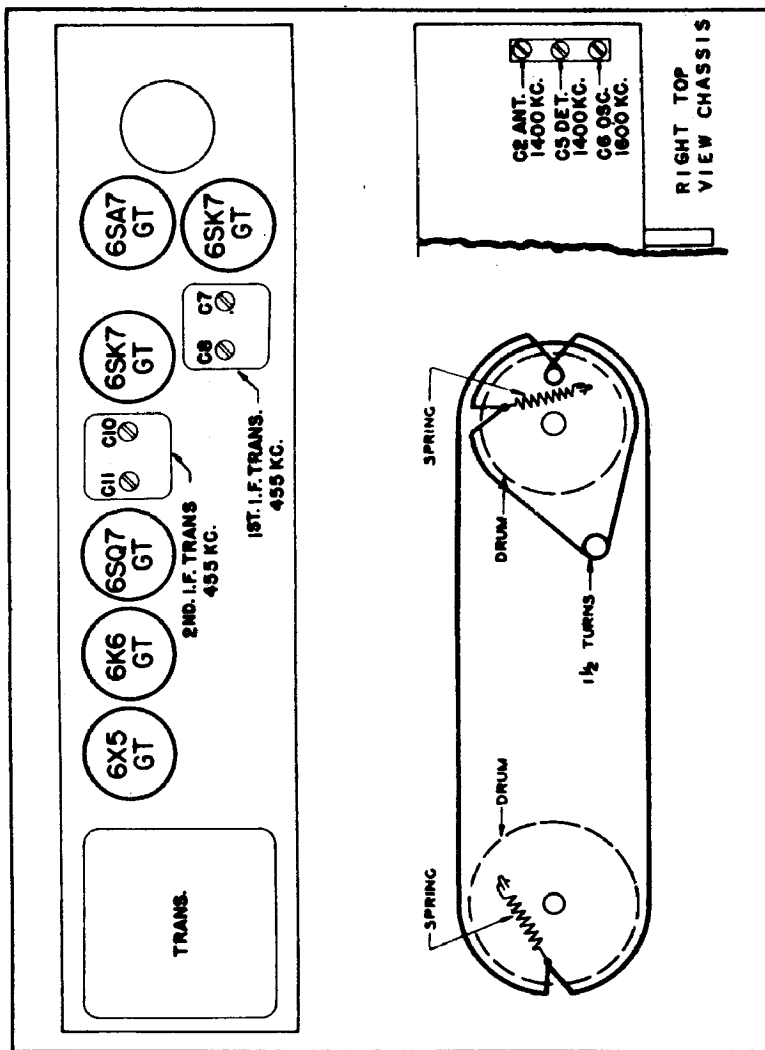
Capacitor C14 and the Variable Tone Control R12 attenuate the highs in the plate circuit.

When the tone control R12 is in the treble position attenuation to highs are greatly reduced in the plate circuit and minimum bass boost takes place in the grid circuit.

When the tone control is in bass position, attenuation to the highs takes place in the plate circuit with maximum bass boost in the grid circuit.

The result of this arrangement allows a smooth tone control over the audio frequency range.

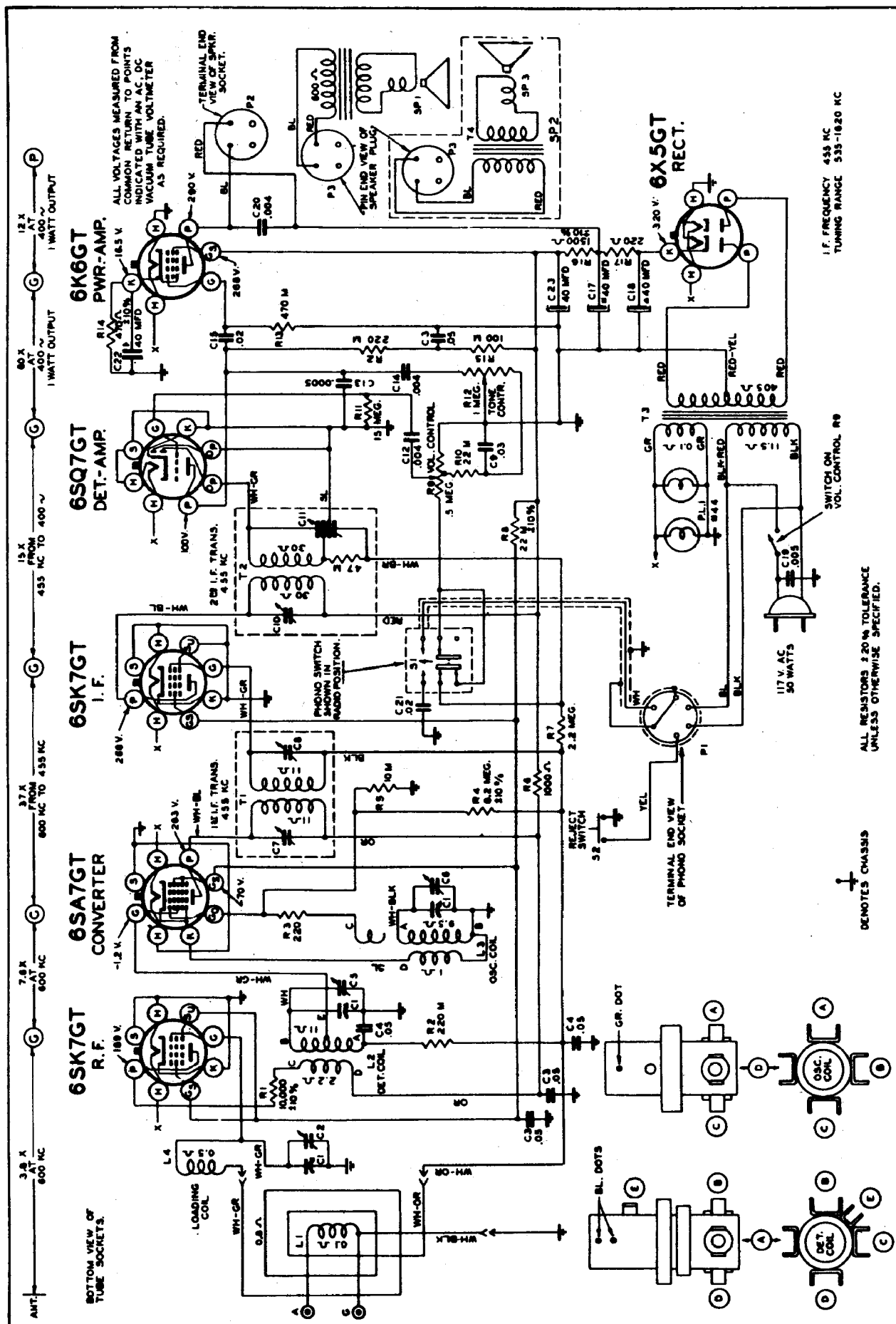
Chassis 6C22 Model 6R087 uses an electro dynamic speaker. Chassis 6C22Z model 6R087Z uses a pm type speaker. Differences in the power supply are apparent when examining the schematic.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT ' OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C-7, C-8, C-10, C-11	Align I. F.
2	One turn loop coupled loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-6	Set Oscillator to Dial Scale
3		--	1400 Kc.	1400 Kc.	C-5	Align Det.



MODEL 6R087Z CHASSIS No. 6C22Z

PARTS LIST

DIAL ASSEMBLY

26-334	DIAL SCALE.....	.35
46-522	CONTROL KNOB (DUMMY).....	.11
46-538	TUNING KNOB.....	.10
46-548	RADIO-PHONO REJECT KNOB.....	.07
57-1071	ESCUTCHEON PLATE.....	7.20
59-161	DIAL POINTER.....	.57
76-413	TUNING CONTROL SHAFT.....	.29
78-504	DIAL LIGHT SOCKET & WIRE.....	.16
80-385	TUNING SHAFT TENSION SPRING.....	.03
80-402	DIAL CORD TENSION SPRING.....	.03
100-36	DIAL LIGHT BULB 6.3 VOLTS.....	.10
159-50	PLUG BUTTON (DIAL SCALE MTG.).....	.01
188-30	RETAINING RING (TUNING SHAFT).....	1.20C
188-32	RETAINING RING (DIAL PULLEY).....	1.03C
188-34	RETAINER RING.....	1.20C
188-54	KNOB CLAMPING RING.....	.015
192-94	DIAL CRYSTAL.....	2.20
S11161	DIAL PULLEY CORD & EYELET ASSEM.....	.06
S11162	POINTER PULLEY CORD & EYELET ASSEM.....	.06
S11168	CONDENSER PULLEY & BUSHING ASSEM.....	.41
S11292	DIAL PULLEY & BUSHING ASSEM.....	.16
S11558	TONE & VOLUME CONTROL KNOB & RING ASSEM.....	.28

CHOKES & COILS

95-909	1ST I. F. TRANSFORMER.....	1.85
95-910	2ND I. F. TRANSFORMER.....	2.15
S11163	DETECTOR COIL ASSEM.....	.71
S11164	OSCILLATOR COIL ASSEM.....	.58
S11896	ANTENNA LOADING COIL ASSEM.....	.34

CONDENSERS

22-138	.2 MFD. (C16).....	.33
22-171	.05 MFD. (C3).....	.26
22-448	.004 MFD. (C14 & C20).....	.20
22-829	.05 MFD. (C4).....	.20
22-830	.02 MFD. (C15).....	.20
22-854	.0005 MFD. (C13).....	.20
22-1041	.005 MFD. (C19).....	.20
22-1157	.03 MFD. (C9).....	.20
22-1362	.004 MFD. (C12).....	.20
22-1369	3 SECTION GANG COND. (C1).....	5.40
22-1372	DRY ELECTROLYTIC 15 MFD. 450V. X (C17 & C18).....	2.00
22-1382	DRY ELECTROLYTIC 40 X 40 MFD. 450V. (C17, 18, 22).....	3.25
22-1611	DRY ELECTROLYTIC 40 MFD. 450V. (C23-6C222).....	1.81
22-1386	.02 MFD. (C21).....	.600 V.
22-1611	DRY ELECTROLYTIC 40 MFD. (C23) 450 V. (2 MODELS).....	

RESISTORS

63-156	10M OHM (R1).....	1 WATT
63-298	220M OHM (R2).....	1/4 WATT
63-579	220M OHM (R3).....	1/4 WATT
63-589	10M OHM (R5).....	1/4 WATT
63-591	22M OHM (R10).....	1/4 WATT
63-595	100M OHM (R15-6C222).....	1/4 WATT
63-597	470M OHM (R13).....	1/4 WATT
63-600	2.2 MEGOHM (R7).....	1/4 WATT
63-605	1M OHM (R6).....	1/2 WATT
63-655	220M OHM (R14-6C222).....	1/4 WATT
63-656	270M OHM (R15-6C222).....	1/4 WATT
63-673	8.2 MEGOHM (R4).....	1/4 WATT
63-976	15 MEGOHM (R11).....	1/4 WATT
63-1058	22M OHM (R8).....	2 WATT
63-1170	1500 OHM W.W. (R16-6C222).....	2 WATT
63-1222	470 OHM W.W. (R14-6C222).....	1 WATT
63-1227	220 OHM W.W. (R17-6C222).....	1 WATT
63-1340	VOLUME CONTROL & SWITCH (R9).....	1.81
63-1341	TONE CONTROL (1 MEGOHM) (R12).....	1.20
63-1545	400 OHM 10W (R16-6C222).....	

MISCELLANEOUS

2-121	CABINET BACK.....	2.00
11-85	LINE CORD & PLUG.....	.65
11-87	LINE CORD & PLUG (2 MODELS).....	.65
12-1138	WAVEMAGNET MTG. BRKT.....	.14
15-23	PLUG CAP & INSULATOR (USED ON S11456).....	.054
15-62	PLUG CAP & INSULATOR (USED ON S11456).....	.22
19-123	PHONO UNIT MTG. CLIP.....	.10
27-81	MOUNTING FLANGE (SHAFT BEARING DISC).....	.05
36-31	RECORD CHANGER PULL-OUT HANDLE.....	.57
49-526	10" DYNAMIC SPEAKER.....	11.00
	206-526 OUTPUT TRANSFORMER.....	2.57
	207-526 FIELD COIL (NOT REPLACEABLE).....	
	208-526 CONE & VOICE COIL.....	3.41
	10" DYNAMIC SPEAKER (ALT. FOR 49-526).....	11.00
49-542	206-542 OUTPUT TRANSFORMER.....	2.57
	207-542 FIELD COIL (NOT REPLACEABLE).....	
	208-542 CONE & VOICE COIL.....	3.41
	10" DYNAMIC SPEAKER (ALT. FOR 49-526).....	11.00
49-563	206-563 OUTPUT TRANSFORMER.....	2.57
	207-563 FIELD COIL (NOT REPLACEABLE).....	
	208-563 CONE & VOICE COIL.....	3.41
49-581	10" P.M. SPEAKER (2 MODEL (ALSO SEE S-132571).....	
	OUTPUT TRANSFORMER (SEE 95-1011).....	
	208-581 CONE & VOICE COIL.....	3.41
	10" P.M. SPEAKER (2 MODEL).....	
49-585	206-585 OUTPUT TRANSFORMER.....	2.57
	208-585 CONE & VOICE COIL.....	3.41

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

52-377	SPEAKER CABLE (49-563).....	.60
58-88	WAVEMAGNET PLUG (3 PRONG).....	.07
58-132	SIX PRONG PLUG (USED ON S11456).....	.12
58-156	SPEAKER PLUG (49-585).....	.12
70-83	#8X1/2 WASHER HD. WOOD SCREW (CABINET BACK).....	.65C
72-55	#8X3/8 FLAT PHILLIPS HD. WOOD SCREW.....	.013
72-59	#2X2 1/2 PHILLIPS FLAT HD. WOOD SCREW (ESC. MTG.).....	.015
78-128	SPEAKER PLUG SOCKET.....	.12
78-349	WAVEMAGNET PLUG SOCKET.....	.07
78-373	OCTAL BASE TUBE SOCKET (5 CONTACT).....	.12
78-374	OCTAL BASE TUBE SOCKET (6 CONTACT).....	.12
78-376	OCTAL BASE TUBE SOCKET (8 CONTACT).....	.12
78-555	SIX PRONG SOCKET (USED ON S11456).....	.11
78-611	OCTAL BASE TUBE SOCKET (2 MODEL) (8 CONTACT).....	.12
78-623	PHONO SOCKET (6 PRONG).....	.12
78-732	SPEAKER PLUG SOCKET (2 MODEL).....	.15
80-463	PHONO MTG. SPRING.....	.03
83-1218	INSULATING STRIP (GANG COND.).....	.01
83-1240	BLACK VINYLITE TRIM STRIP (RECORD CHANGER).....	.75
85-337	PHONO-RADIO SWITCH.....	.72
85-349	RECORD REJECT SWITCH.....	.60
94-295	BUSHING-SWITCH MTG. (2 MODEL).....	.036
94-334	BUSHING-SWITCH MTG.....	.67C
95-911	POWER TRANSFORMER.....	6.20*
95-1011	SPKR. OUTPUT TRANSFORMER (49-581).....	
112-420	PHONO MTG. SCREW.....	.33
112-489	HANDLE MTG. SCREW (36-31).....	.028
114-58	6-32 X 3/8 HEX ACCRN HD. M.S. SCREW.....	.43C
114-128	CHASSIS MTG. SELF TAPPING SCREW.....	1.81C
114-193	#8 X 3/16 HEX ACCRN HD. S.T. SCREW.....	.90C
114-202	#8-32X1-1/8 SLOTTED HEX WASHER HD. S.T. SCREW (USED ON 12-1138).....	
125-17	SWITCH MTG. GROMMETS.....	.027
125-45	CONDENSER MTG. GROMMETS.....	.02
198-80	DUST GASKET.....	.45
202-381	PHONO INSTRUCTION SHEET.....	.10
202-388	INSTRUCTION BOOK.....	.07
237/1	CABLE CLAMP.....	.02
S11450	WAVEMAGNET ASSEM. (30A).....	3.31
S11456	INTER CONNECTING CABLE ASSEM.....	2.20
S11468	RECORD CHANGER ASSEM.....	
S11920	RECORD CHANGER MTG. FRAME ASSEM.....	5.07
S12864	DRIVE WHEEL & PIN ASSEM. (REC. CHANG.).....	.24
S13257	10" P.M. SPKR. & TRANSFORMER ASSEM. (ALT. FOR 49-585) (2 MODEL).....	

19M 2-10-47

PARTS LIST

DIAL ASSEMBLY			RESISTORS			MISCELLANEOUS		
26-334	DIAL SCALE.	\$0.35	63-156	10M PHM (R1).	.12	2-121	CABINET BACK.	2.00
46-522	CONTROL KNOB (DUMMY).	.11	63-296	220M OHM (R2).	.09	11-85	LINE CORD & PLUG.	.65
46-538	TUNING KNOB.	.10	63-579	220 OHM (R3).	.09	11-87	LINE CORD & PLUG (Z MODELS).	.65
46-548	RADIO-PHONO REJECT KNOB.	.07	63-589	10M OHM (R5).	.09	12-1138	WAVEMAGNET MTG. BRKT.	.14
57-1071	ESCUTCHEON PLATE.	7.20	63-591	22M OHM (R10).	.09	15-23	PLUG CAP & INSULATOR (USED ON S11456).	.054
59-161	DIAL POINTER.	.57	63-597	470M OHM (R13).	.09	15-62	PLUG CAP & INSULATOR (USED ON S11456).	.22
76-413	TUNING CONTROL SHAFT.	.29	63-600	2.2 MEGOHM (R7).	.09	19-123	PHONO UNIT MTG. CLIP.	.10
76-504	DIAL LIGHT SOCKET & WIRE.	.16	63-605	1M OHM (R6).	.10	27-81	MOUNTING FLANGE(SHAFT BEARING DISC)	.05
80-365	TUNING SHAFT TENSION SPRING.	.03	63-655	220M OHM (R14-6C22).	.09	36-31	RECORD CHANGER PULL-OUT HANDLE.	.57
80-402	DIAL CORD TENSION SPRING.	.03	63-656	270M OHM (R15-6C22).	.09	45-526	10" DYNAMIC SPEAKER.	11.00
100-36	DIAL LIGHT BULB 6.3 VOLTS.	.10	63-673	8.2 MEGOHM (R4).	.09		206-526 OUTPUT TRANSFORMER.	2.57
159-50	PLUG BUTTON (DIAL SCALE MTG.).	.01	63-976	15 MEGOHM (R11).	.09	49-563	207-526 FIELD COIL (NOT REPLACEABLE).	3.41
188-30	RETAINING RING (TUNING SHAFT).	1.20C	63-1058	22M OHM (R8).	.24		208-526 CONE & VOICE COIL.	3.41
188-32	RETAINING RING (DIAL PULLEY).	1.03C	63-1340	VOLUME CONTROL & SWITCH (.5 MEG.) (R9)	1.81		206-563 OUTPUT TRANSFORMER.	2.57
188-34	RETAINER RING.	1.20C	63-1341	TONE CONTROL (1 MEGOHM) (R12).	1.20		207-563 FIELD COIL (NOT REPLACEABLE).	3.41
188-54	KNOB CLAMPING RING.	.015	63-1545	400 OHM 10W (R16-6C22).		52-377	208-563 CONE & VOICE COIL.	.60
192-94	DIAL CRYSTAL.	2.20				58-88	SPEAKER CABLE (49-563).	.07
S11161	DIAL PULLEY CORD & EYELET ASSEM.	.06				58-132	WAVEMAGNET PLUG (3 PRONG)	.12
S11162	POINTER PULLEY CORD & EYELET ASSEM.	.41					SIX PRONG PLUG (USED ON S11456).	
S11168	CONDENSER PULLEY & BUSHING ASSEM.	.16						
S11292	DIAL PULLEY & BUSHING ASSEM.	.16						
S11558	TONE & VOLUME CONTROL KNOB & RING ASSEM.	.28						
CHOKES & COILS			CONDENSERS			SPEAKERS		
95-909	1ST I.F. TRANSFORMER.	1.85	22-138	.2 MFD. (C16).	.33	70-83	SPEAKER PLUG.	\$0.15
95-910	2ND I.F. TRANSFORMER.	2.15	22-171	.05 MFD. (C3).	.26		#6 X 1/2 WASHER HD. WOOD SCREW (CABINET BACK).	.05C
S11163	DETECTOR COIL ASSEM.	.71	22-448	.004 MFD. (C14 & C20).	.20	72-55	#6 X 3/8 FLAT PHILLIPS HD. WOOD SCREW	.013
S11164	OSCILLATOR COIL ASSEM.	.58	22-530	12 MMFD.	.20	72-59	#2 X 2-1/2 PHILLIPS FLAT HD. WOOD SCREW (ESC. MTG.).	.015
S13478	ANTENNA LOADING COIL ASSEM.	.90	22-1444	.001.	.20		SPEAKER PLUG SOCKET.	.12
			22-829	.05 MFD. (C4).	.20	78-128	WAVEMAGNET PLUG SOCKET.	.07
			22-830	.02 MFD. (C15).	.20	78-349	OCTAL BASE TUBE SOCKET (5 CONTACT).	.12
			22-854	.0005 MFD. (C13).	.20	78-373	OCTAL BASE TUBE SOCKET (6 CONTACT).	.12
			22-1041	.005 MFD. (C19).	.20	78-374	OCTAL BASE TUBE SOCKET (8 CONTACT).	.12
			22-1157	.03 MFD. (C9).	.20	78-376	SIX PRONG SOCKET (USED ON S11456).	.11
			22-1362	.004 MFD. (C12).	.20	78-555	OCTAL BASE TUBE SOCKET (Z MODEL).	.12
			22-1369	3 SECTION GANG COND. (C1).	5.40	78-611	PHONO SOCKET (6 PRONG).	.12
						78-623	SPEAKER PLUG SOCKET (Z MODEL).	.15
						78-732	PHONO MTG. SPRING.	.03
						89-463	INSULATING STRIP (GANG COND.).	.01
						83-1218	BLACK VINYLITE TRIM STRIP (RECORD CHANGER).	.75
						83-1240	PHONO-RADIO SWITCH.	.72
						85-337	RECORD REJECT SWITCH.	.60
						94-295	BUSHING-SWITCH MTG. (Z MODEL).	.036
						94-334	BUSHING-SWITCH MTG.	.67C
						95-911	POWER TRANSFORMER, 117V. 50.60.	6.20
						95-1007	OUTPUT TRANSFORMER.	2.70
						95-1019	FILTER CHOKE.	2.25
						112-420	HANDLE MTG. SCREW.	.33
						112-489	PHONO MTG. SCREW (36-31).	.028
						114-58	6-32 X 3/8 HEX ACCRN HD. M.S. SCREW.	.43C
						114-128	CHASSIS MTG. SELF TAPPING SCREW.	1.81C
						114-193	#8 X 3/16 HEX ACCRN HD. S.T. SCREW.	.90C
						114-202	#8-32 X 1-1/8 SLOTTED HEX. WASHER HD S.T. SCREW (USED ON 12-1138).	.027
						125-17	SWITCH MTG. GROMMETS.	.02
						125-45	CONDENSER MTG. GROMMETS.	.026
						196-80	DUST GASKET.	.45
						202-381	PHONO INSTRUCTION SHEET.	.10
						202-388	INSTRUCTION BOOK.	.07
						237-1	CABLE CLAMP.	.02
						S13479	LOOP ANTENNA.	1.00
						S13391	12" PM SPEAKER ASSEMBLY.	18.50
						S13406	10" PM SPEAKER ASSEMBLY.	16.50
						S11456	INTER CONNECTING CABLE ASSEM.	2.20
						S11468	RECORD CHANGER ASSEM.	
						S11920	RECORD CHANGER MTG. FRAME ASSEM.	5.07
						S12864	DRIVE WHEEL & PIN ASSEM. (REC. CHANG).	.24

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

CPC--12M--11-1-47

MODEL 6R087ZZ CHASSIS No. 6C22ZZ

A feature of chassis 6C22ZZ is a high gain tuned R.F. stage ahead of the conventional superheterodyne circuit.

When making repairs or adjustments on the chassis be sure to have the Phono-Radio switch in Radio position (button out).

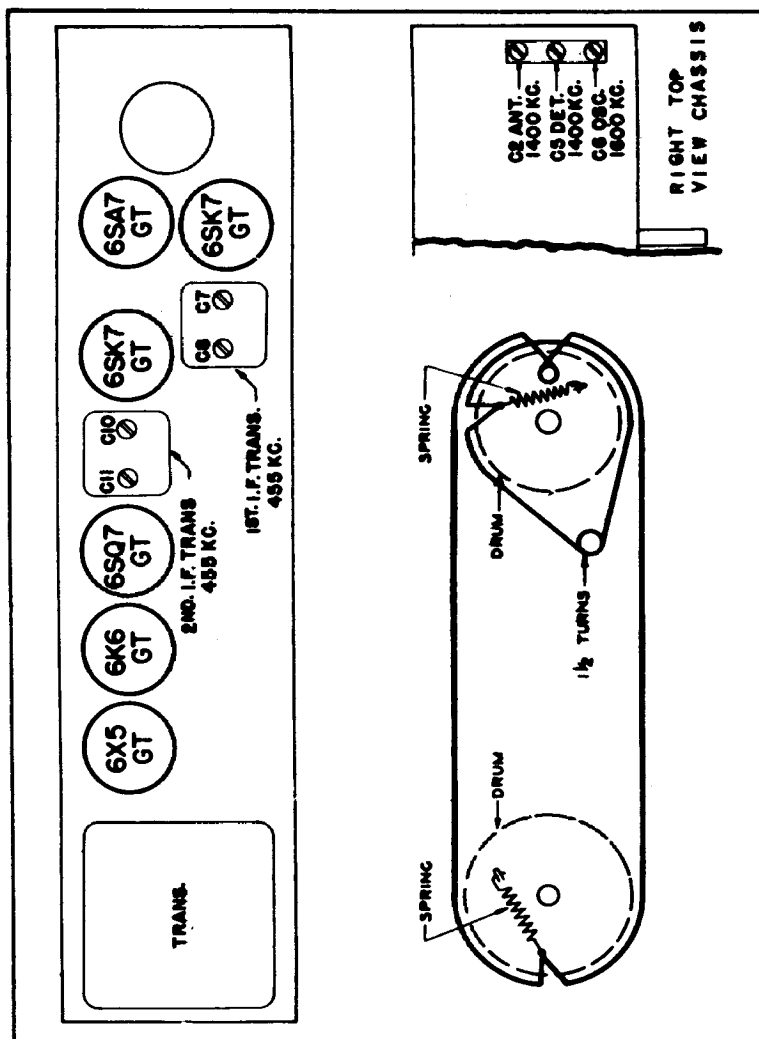
The Tone Control circuit used in chassis 6C32ZZ is unusual. Attenuation or control occurs in both the grid and plate circuit of the triode section of the 6SQ7 tube. To increase the bass response Resistor R10 and Capacitor C9 boost the bass in the grid circuit.

Capacitor C14 and the Variable Tone Control R12 attenuate the highs in the plate circuit.

When the tone control R12 is in the treble position attenuation to highs are greatly reduced in the plate circuit and minimum bass boost takes place in the grid circuit.

When the tone control is in bass position, attenuation to the highs takes place in the plate circuit with maximum bass boost in the grid circuit.

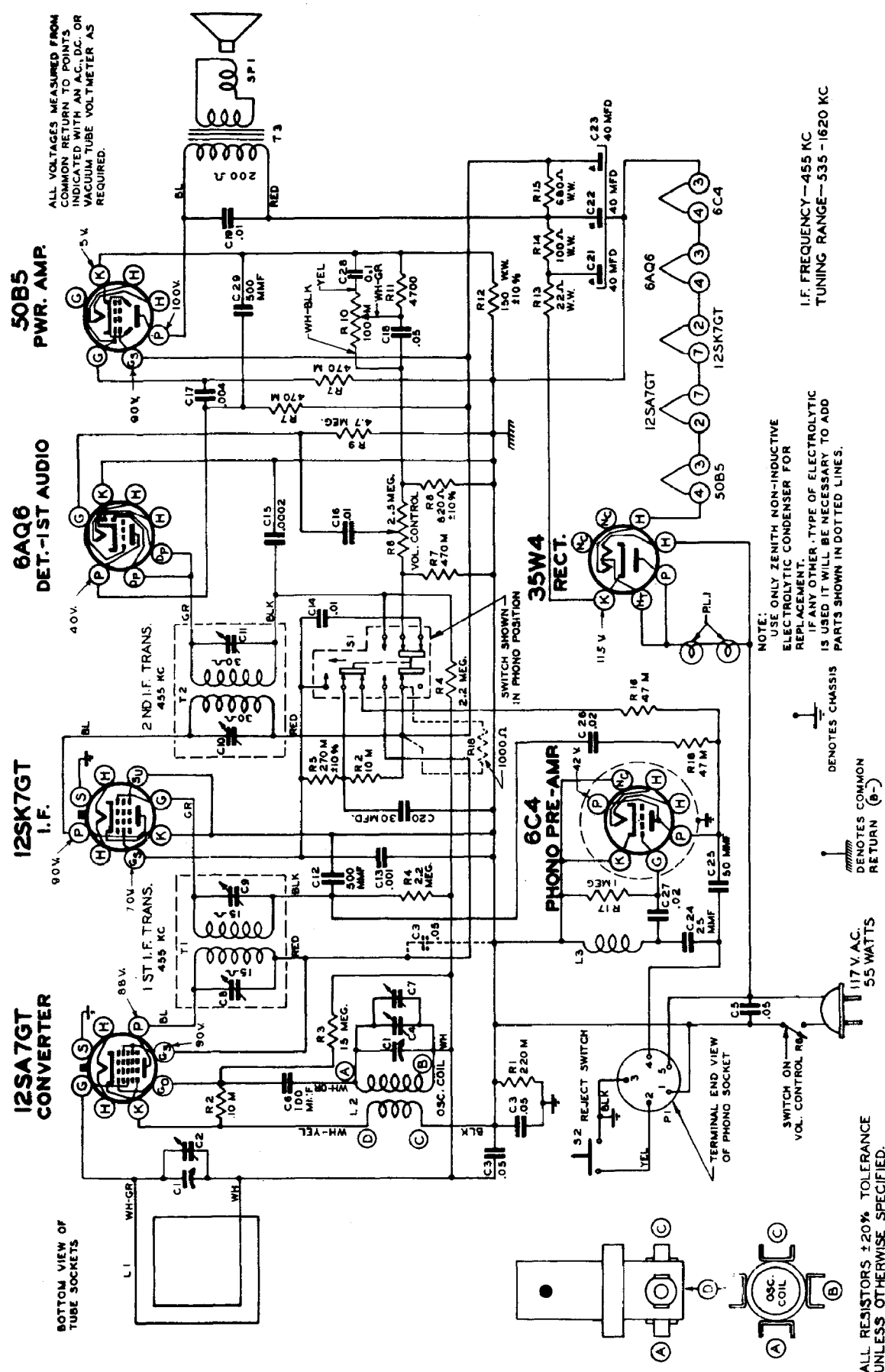
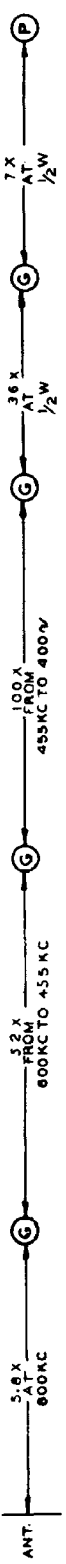
The result of this arrangement allows a smooth tone control over the audio frequency range.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C-7, C-8 C-10, C11	Align I. F.
2	One turn loop coupled loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-6	Set Oscillator to Dial Scale
3		--	1400 Kc.	1400 Kc.	C-5	Align Det.
4		--	1400 Kc.	1400 Kc.	C-2	Align Ant.



ALL RESISTORS $\pm 20\%$ TOLERANCE
UNLESS OTHERWISE SPECIFIED.

NOTE:
USE ONLY ZENITH NON-INDUCTIVE
ELECTROLYTIC CONDENSER FOR
REPLACEMENT.
IF ANY OTHER TYPE OF ELECTROLYTIC
IS USED IT WILL BE NECESSARY TO ADD
PARTS SHOWN IN DOTTED LINES.

I.F. FREQUENCY—455 KC
TUNING RANGE—535 - 1620 KC

MODELS 6R880 CHASSIS 6E03

MISCELLANEOUS

2-135		Cabinet Back	.30
2-136		Cabinet Back (6R880GO only)	.35
11-104		Line Cord Plug - 7 ft.	.65
12-1468		Tone Control Mounting Bracket	.15
12-1486		Shield Support Bracket	.02
19-123		Record Changer Mounting Clip (4 used)	.10
46-687		Tuning & Volume Control Knob	.10
46-688		Tone Control Knob	.12
46-689		Phono Switch Knob	.10
49-602	SP-1	P. M. Speaker (5 1/4")	4.75
		208-602 Cone & Voice Coil	1.73
54-30		#8-32 X 5/16" Hex Nut Steel N.P. (2 used)	.31C
54-139		#3/8 - 32 X 9/16" Palnut Type 9N -Steel Cad. (2 used)	.01
54-143		Speed Nut	.03
54-228		Speed Nut (Used on 26-387)	.75C
54-267		#6-32 X 5/16" Hex Palnut - Inverted Type (4 used)	.45C
57-1105		Wavemagnet Lead Spacer Strip	.02
57-1398		Dial Escutcheon	4.00
57-1402		Chassis Cover Plate	.75
70-117		#6 X 5/16" Phillips Rd. Hd. Wood Screw-Steel - Statuary Bronze (7 used)	.01
70-128		#5 X 3/8" Washer Hd. Wood Screw-Steel-Statuary Bronze (6 used) (Cabinet Back Mtg.)	.01
72-74		#4 X 3/8" Phillips Flat Hd Wood Screw-Steel Brass Plate (Escutcheon Mtg.)	.02
78-274		Socket - Electrolytic Capacitor	.03
78-436		Socket - Miniature Tube	.19
78-792	P-1	Socket - Phono (5 contact)	.15
78-793		Socket - Octal Tube (2 used)	.15
78-794		Socket Miniature Tube (7 contact)	.20
78-795		Socket - Miniature Tube (7 contact) (2 used)	.20
80-407		Record Changer Mounting Spring (4 used)	.02
84-70		Tone Arm Support	.10
85-421	S-1	Phono - Radio Switch (or 85-438)	.90
85-422	S-2	Reject Switch	.40
93-125		#6 Int. Shakeproof Lockwasher (4 used)	.31C
93-126		#8 Int. Shakeproof Lockwasher (2 used)	.36C
93-721		Felt Washer (2 used)	.01
94-295		Capacitor Mounting Bushing (5 used)	.04
95-1025	T-3	Output Transformer	1.65
110-129		Grille Cloth	.25
112-544		Record Changer Mounting Screw (4 used)	.11
112-721		#6 X 7/16" Straight Binding Hd. Wood Screw Steel Statuary Bronze (8 used)	.85C
114-58		#6-32 X 3/8" Hex Acorn Hd. M.S. Steel N.P. (2 used)	.43C
114-67		#6-32 x 7/16" Hex Acorn Hd. M. S. Steel N.P. (3 used)	.43C
114-128		#10 X 1 1/16" Hex Washer Hd. Self Tapping Screw	1.81C
114-217		#8 X 1/4" Hex Hd. Slotted Self Tapping Screw-Cad (9 used)	.75C
114-291		#8-32 X 7/16" Hex Hd. Slotted M. Screw - Steel N.P.	.85C
125-17		Rubber Grommet (5 used)	.03
125-66		Rubber Grommet (2 used)	.05
139-71		Speaker Baffle	.40
166-44		Rubber Bumper (or 166-41)	.02
202-662		Instruction Book (Phono & Chassis)	.10
S-14958	L-1	Wavemagnet Assembly - Type 26 FR	1.25
S-14007		Non-Intermixer Record Changer	
S-14657		Hinge Assembly	1.85

PRICES SUBJECT TO CHANGE WITHOUT NOTICE
Z.R.C. 9/8/48

PARTS LIST

DIAL ASSEMBLY

12-1383		Dial Light Bracket (2 used)	.02
26-387		Dial Scale	.70
76-492		Tuning Control Shaft	.15
78-769		Dual Dial Light Socket & Wire	.60
80-69		Dial Cord Tension Spring	.02
80-209		Dial Cord Tension Spring	.03
97-284		Dial Cord Guide Stud	.17
100-90	PL-1	Dial Light Bulb (2 used)	.11
188-32		Retaining Ring	1.03C
188-34		Retaining Ring	1.20C
S-13827		Dial Cord Assembly (Short)	.04
S-13828		Dial Cord Assembly (Long)	.05
S-13830		Tuning Pulley & Bushing Assembly	.45
S-14667		Dial Pointer & Pulley Assembly (59-214)	.30

COIL & CHOKES

95-906	T-2	2nd I. F. Transformer	1.75
95-919	T-1	1st I. F. Transformer	1.80
S-12603	L-3	Phono Oscillator Coil Assembly (FM-Phono)	.75
S-13799	L-2	Oscillator Coil Assembly	.75

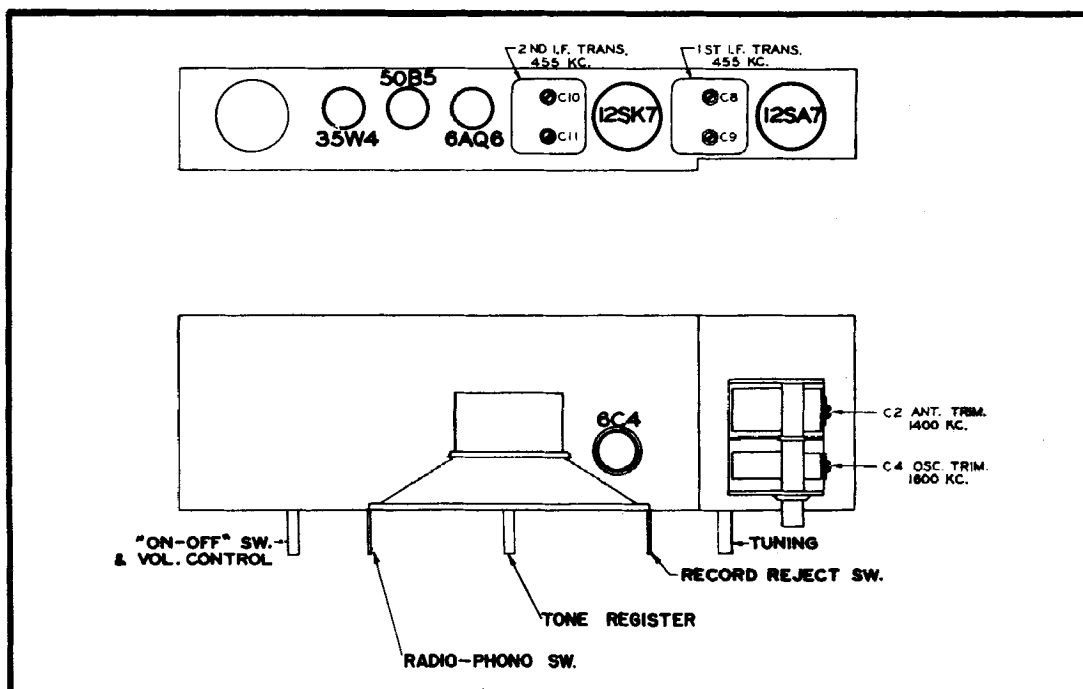
CONDENSERS

22-162	C-6	.0001 MFD (or 22-1669)	500 V.	.20
22-178	C-18	.05 MFD	200 V.	.20
22-188	C-26	.02 MFD	400 V.	.20
22-196	C-16	.01 MFD	600 V.	.20
22-243	C-14	.01 MFD	400 V.	.20
22-327	C-27	.02 MFD	200 V.	.20
22-448	C-17	.004 MFD	600 V.	.20
22-716	C-29	.0005 MFD	500 V.	.26
22-827	C-28	.1 MFD	200 V.	.23
22-829	C-3	.05 MFD	200 V.	.20
22-854	C-12	.0005 MFD	600 V.	.20
22-953	C-15	.0002 MFD (or 22-1668)	500 V.	.18
22-1017	C-5	.05 MFD	400 V.	.20
22-1182	C-19	.01 MFD	400 V.	.20
22-1444	C-13	.001 MFD	200 V.	.20
22-1532	C-25	50 MMFD (or 22-1674)	500 V.	.20
22-1657	C-1	Two Gang Variable		3.00
22-1707	C20,21,22,23	Dry Electrolytic 40-40-40-30 MFD	150 V.	3.00
22-1758	C-24	25 MMFD Ceramic	500 V.	.20

RESISTORS

63-686	R-12	150 ohm W. W.	$\frac{1}{2}$ W.	.21
63-1219	R-13	22 ohm W. W.	$\frac{1}{2}$ W.	.21
63-1220	R-14	100 ohm W. W.	1 W.	.24
63-1221	R-15	680 ohm W. W.	1 W.	.24
63-1555	R-6	Volume Control & Switch		1.81
63-1653	R-10	Tone Control		1.20
63-1782	R-8	820 ohm (Insulated)	$\frac{1}{2}$ W.	.21
63-1814	R-11	4700 ohm (Insulated)	$\frac{1}{2}$ W.	.21
63-1828	R-2	10 M ohm (Insulated)	$\frac{1}{2}$ W.	.21
63-1856	R-16	47 M ohm (Insulated)	$\frac{1}{2}$ W.	.21
63-1884	R-1	220 M ohm (Insulated)	$\frac{1}{2}$ W.	.21
63-1887	R-5	270 M ohm (Insulated)	$\frac{1}{2}$ W.	.21
63-1898	R-7	470 M ohm (Insulated)	$\frac{1}{2}$ W.	.21
63-1911	R-17	1 Megohm (Insulated)	$\frac{1}{2}$ W.	.21
63-1926	R-4	2.2 Megohm (Insulated)	$\frac{1}{2}$ W.	.21
63-1940	R-9	4.7 Megohm (Insulated)	$\frac{1}{2}$ W.	.21
63-1961	R-3	15 Megohm (Insulated)	$\frac{1}{2}$ W.	.21

MODELS 6R880 CHASSIS 6E03



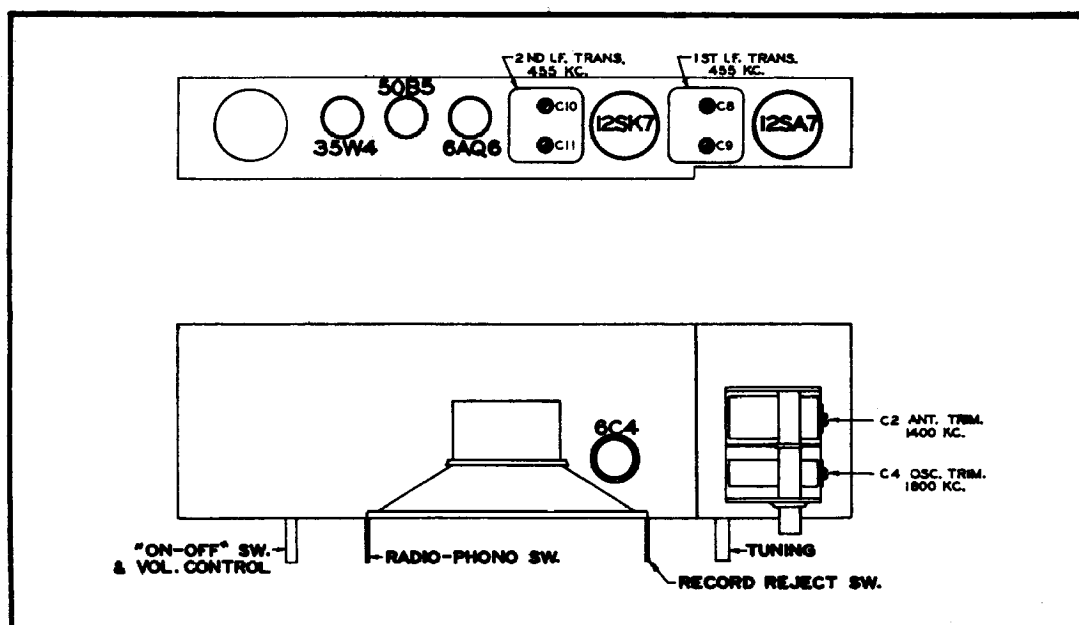
TUBE AND TRIMMER LOCATION

TO THE SERVICEMAN:

The alignment of chassis 6E03 is conventional, however the adjustments interlock to some degree, therefore, the procedure must be followed exactly. Since this chassis is of the AC/DC type, care must be exercised when making measurements. Chassis 6E03 has a phono-radio push button switch of the double acting type. When in the "In" position this connects the radio for playing records. Socket P1 is used to connect the changer to the receiver chassis.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 MFD	455 Kc.	600 Kc.	C8, C9, C10, C11	Align I.F.
2	Single Turn Loop Loosely Coupled to Wavemagnet	-----	1600 Kc.	1600 Kc.	C4	Set Oscillator to Dial Scale.
3		-----	1400 Kc.	1400 Kc.	C2	Align Antenna.



TUBE AND TRIMMER LOCATION

TO THE SERVICEMAN:

The alignment of chassis 6E02 is conventional, however the adjustments interlock to some degree, therefore, the procedure must be followed exactly. Since this chassis is of the AC/DC type, care must be exercised when making measurements. Chassis 6E02 has a phono-radio push button switch of the double acting type. When in the "In" position this connects the radio for playing records. Socket P1 is used to connect the changer to the receiver chassis.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 MFD	455 Kc.	600 Kc.	C8, C9, C10, C11	Align I.F.
2	Single Turn Loop Loosely Coupled to Wavemagnet	-----	1600 Kc.	1600 Kc.	C4	Set Oscillator to Dial Scale.
3		-----	1400 Kc.	1400 Kc.	C2	Align Antenna.

PARTS LIST

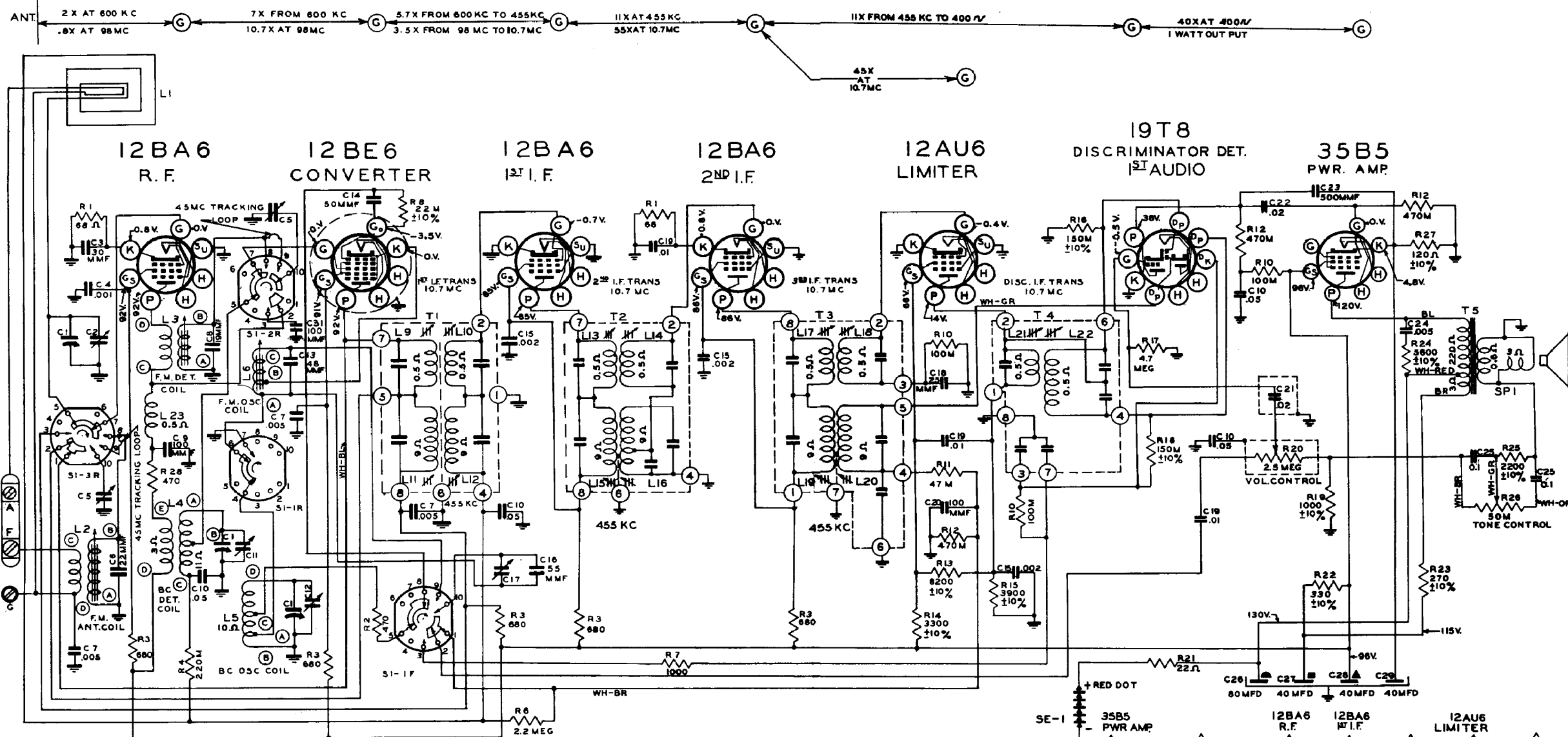
PART NO.	REF. NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY			
26-387		Dial Scale	\$0.07
76-492		Tuning Control Shaft	.15
78-769		Dial Light Socket and Wire	.60
80-69		Dial Cord Tension Spring	.01
80-209		Dial Cord Tension Spring	.03
97-284		Dial Cord Guide Stud.	.17
100-90	PL1	Dial Light Bulb (2 used)	.11
102-454		Dial Calibration Label	.09
188-32		Retaining Ring (76-492)	1.03C
188-75		Retaining Ring (S13829)	.02
S-13827		Dial Cord Assembly (Short)	.04
S-13828		Dial Cord Assembly (Long)	.05
S-13829		Dial Pointer and Pulley Assembly (59-201)	.30
S-13830		Tuning Pulley and Bushing Assembly	.45
COILS AND CHOKES			
95-906	T2	2nd I. F. Transformer	1.75
95-919	T1	1st I. F. Transformer	1.80
S-12603	L3	Phono Oscillator Coil Assembly (FM-Phono)	2.02
S-13799	L2	Oscillator Coil Assembly	.75
CONDENSERS			
22-127	C24	25 MMFD. 500 V	.20
22-162	C6	.0001 MFD 500 V	.20
22-178	C18	.05 MFD 200 V	.20
22-188	C26	.02 MFD 400 V	.20
22-196	C16	.01 MFD 600 V	.20
22-243	C14	.01 MFD 400 V	.20
22-327	C27	.02 MFD 200 V	.20
22-448	C17	.004 MFD. 600 V	.20
22-716	C12	.0005 MFD 500 V	.26
22-829	C3	.05 MFD 200 V	.20
22-953	C15	.0002 MFD 500 V	.16
22-1017	C5	.05 MFD 400 V	.20
22-1182	C19	.01 MFD 400 V	.20
22-1444	C13	.001 MFD. 200 V	.20
22-1532	C25	.50 MMFD 500 V	.20
22-1657	C1	Two Gang Variable	3.00
22-1707	C20, C21, C22, C23	Dry Electrolytic 40-40-40-30 MFD. - 150 V	3.00
RESISTORS			
63-686	R12	150 Ohm, Insulated. 1/2 W.	.21
63-1219	R13	22 Ohm, Insulated 1/2 W.	.21
63-1220	R14	100 Ohm, Insulated. 1 W.	.24
63-1221	R15	680 Ohm, Insulated. 1 W.	.24
63-1555	R6	Volume Control and Switch.	1.81
63-1782	R8	820 Ohm, Insulated. 1/2 W.	.21
63-1814	R11	4700 Ohm, Insulated 1/2 W.	.21
63-1828	R2	10M Ohm, Insulated 1/2 W.	.21
63-1856	R16	47M Ohm, Insulated 1/2 W.	.21
63-1884	R1	220M Ohm, Insulated. 1/2 W.	.21
63-1887	R5	270M Ohm, Insulated. 1/2 W.	.21
63-1898	R7	470M Ohm, Insulated. 1/2 W.	.21
63-1911	R17	1 Megohm, Insulated 1/2 W.	.21
63-1926	R4	2.2 Megohm, Insulated 1/2 W.	.21
63-1940	R9	4.7 Megohm, Insulated. 1/2 W.	.21
63-1961	R3	15 Megohm, Insulated 1/2 W.	.21

CHASSIS No. 6E02

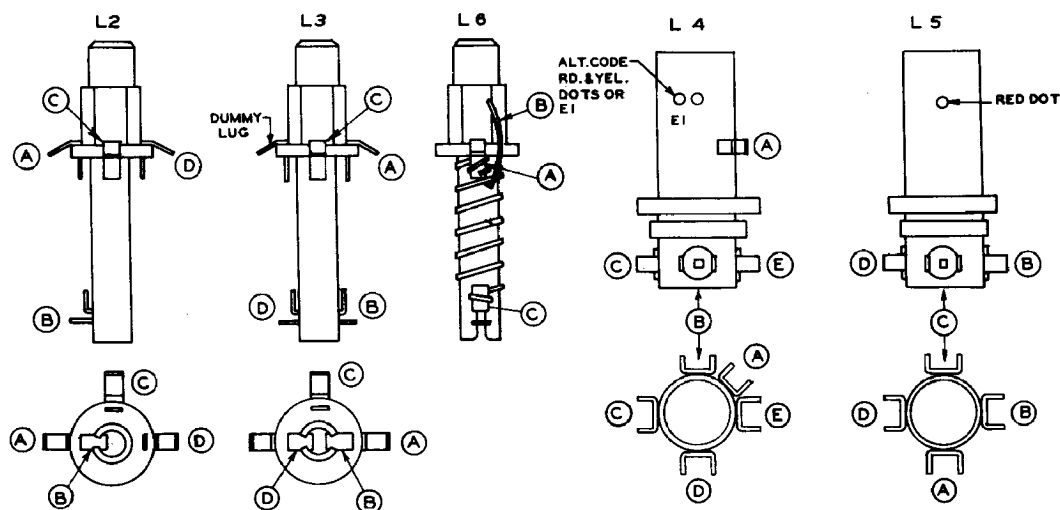
**MODEL 6R886
CHASSIS No. 6E02**

PART NO.	REF. NO.	DESCRIPTION	PRICE
MISCELLANEOUS			
2-122		Cabinet Back	\$. 0.30
11-104		Line Cord and Plug (7 Ft.).	.65
46-687		Tuning Control Knob (2 used)	.10
46-689		Phono Switch Knob (2 used)	.10
49-602	SP1	5-3/4" P. M. Speaker	4.75
208-602		Cone and Voice Coil	1.73
54-228		Speed Nut - Tinnerman #109-3/4 (26-387)	.75C
57-1319		Escutcheon	4.80
57-1320		Chassis Cover Plate	.75
70-128		#5 x 3/8" Washer Hd. Wood Screw Steel Stationary Bronze	.01
72-74		#4 x 3/8" Phillips Flat H. W. S. Steel Brass Plate (Escutcheon Mtg.)	.02
78-274		Socket Electrolytic Capacitor	.03
78-436		Socket Miniature Tube	.19
78-755		Socket Octal Base Tube	.18
78-792	P1	Socket Phono (5 contact)	.15
78-794		Socket Miniature Tube	.20
78-795		Socket Miniature Tube (2 used)	.20
85-421	S1	Phono Radio Switch	.90
85-422	S2	Reject Switch	.40
93-721		Felt Washer	.01
95-1025	T3	Output Transformer	1.65
110-129		Grille Cloth.	.25
114-128		#10 x 1-1/16" Hex Washer Hd. S. T. Screw Type Z Cad. Pl. (2 used).	1.81C
114-291		#8-32 x 7/16" Hex Hd. Slotted M. S. Steel N. P.	.85C
125-17		Rubber Grommet (5 used)	.03
125-39		Rubber Grommet (2 used)	.02
126-553		Tube Shield	.11
139-71		Speaker Baffle	.40
166-13		Rubber Bumper (2 used)	.03
166-20		Tack Bumper (4 used)	.03
166-44		Rubber Bumper	.02
202-528		Instruction Book	.06
S-13815		Hinge Assembly	1.50
S-13817	L1	Wavemagnet Assembly Type 26F	1.25
RECORD CHANGER MTG. PARTS			
19-123		Record Changer Mounting Clip.	.10
80-407		Record Changer Mounting Spring (4 used).	.02
112-544		Record Changer Mounting Screw (2 used)	.11
S-14001		Non-Intermixer Record Changer.	

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



BAND SWITCH S1 SHOWN IN STANDARD BROADCAST POSITION
 BANDSWITCH POSITIONS
 1ST POS. - STD. BROADCAST
 2ND POS. - FM, 100 MC.
 3RD POS. - FM, 45 MC



ALL VOLTAGE MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER

ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED

ALL RESISTORS $\pm 20\%$ TOLERANCE UNLESS OTHERWISE SPECIFIED

⏏ DENOTES CHASSIS

AMP. MOD. I.F. FREQUENCY 455 K.C.
 FREQ. MOD. I.F. FREQUENCY 10.7 MC.

TUNING RANGES
 540-1620 K.C. STD. B.C.
 88-108 M.C. FM, 100
 42-48.5 M.C. FM, 45

MODEL 7H820
 CHASSIS 7E01

PARTS LIST

PART NO.	REF. NO.	DIAL ASSEMBLY
112-1407		Dial Light Socket Mounting Bracket.
28-389		Louvre Dial
46-538		Tuning Control Knob
46-688		Tone Control Knob
46-718		Band Switch Knob
54-211		Speed Nut (Dial Scale Mtg.)
57-1335		Tone Knob Escutcheon.
76-493		Tuning Shaft.
78-786		Dial Light Socket
80-69		Dial Cord Spring.
80-209		Dial Cord Spring.
80-444		Tuner Arm Tension Spring.
80-580		Tuner Arm Stop Spring
80-581		Tuner Arm Pressure Spring
83-1504		Dial Light Shield
93-475		Felt Washer
94-371		Pointer Pulley Bushing (SL3944)
97-284		Dial Cord Guide Stud.
100-97		Dial Light Bulb - 115 V. - 10 W.. . . .
189-30		Retaining Ring (76-493)
189-102		Clamping Ring (46-538).
S-13944		Pointer Pulley and Bushing Assembly (59-205).
S-13945		Cam, Pulley and Bushing Assembly.
S-13981		Tone Control Mtg. Bracket and Lug Assem. (12-1404).
S-13982		Dial Cord and Eyelet Assembly (Short)
S-13983		Dial Cord and Eyelet Assembly (Long).
S-14129		Volume Control Knob Assembly (46-522-697)
S-14429		Tuner Arm Assembly.

PART NO.	REF. NO.	DESCRIPTION
22-162	C31	100 Mmfd. (or 22-1669)
22-365	C20	100 Mmfd. (or 22-1701)
22-829	C10	.05 Mfd.
22-830	C22	.02 Mfd.
22-1017	C30	.05 Mfd.
22-1138	C23	500 Mmfd. (or 22-1703)
22-1220	C15	.002 Mfd.
22-1367	C14	50 Mmfd.
22-1385	C19	.01 Mfd.
22-1418	C25	.1 Mfd.
22-1506	C6	22 Mmfd. (Ceramic)
22-1507	C18	25 Mmfd. (Ceramic)
22-1661	C27, C28, C29	Dry Electrolytic 80-40-40 Mfd. 150 V. X 40 Mfd. - 25 V.
22-1669	C9	100 Mmfd. (Ceramic).
22-1676	C4	.001 Mfd. (Ceramic).
22-1677	C1	Three Gang Variable.
22-1683	C21	.02 Mfd. (Shielded).
22-1685	C5	Single Section Trimmer
22-1686	C17	Single Section Trimmer
22-1688	C8	19 Mmfd. (Ceramic)
22-1689	C13	48 Mmfd. (Ceramic)
22-1691	C16	55 Mmfd. (Silver on Ceramic)
22-1702	C24	.005 Mfd.
22-1705	C2	30 Mmfd. (Ceramic)
22-1706	C7	.005 Mfd. (Ceramic) (Disc Type)

PART NO.	REF. NO.	CONDENSERS
63-1202	R22	330 Ohm (Wirewound).
63-1450	R21	22 Ohm (Wirewound)
63-1452	R23	270 Ohm (Wirewound).
63-1582	R26	50M Ohm Tone Control.
63-1584	R20	Volume Control and Switch.
63-1737	R1	68 Ohm (Insulated)
63-1747	R27	120 Ohm (Insulated).
63-1772	R2	470 Ohm (Insulated).
63-1779	R3	680 Ohm (Insulated).
63-1765	R19	1M Ohm (Insulated)
63-1786	R7	1000 Ohm (Insulated)
63-1799	R25	2200 Ohm (Insulated)
63-1806	R14	3300 Ohm (Insulated)
63-1810	R15	3900 Ohm (Insulated)

PART NO.	REF. NO.	RESISTORS
63-1202	R22	330 Ohm (Wirewound).
63-1450	R21	22 Ohm (Wirewound)
63-1452	R23	270 Ohm (Wirewound).
63-1582	R26	50M Ohm Tone Control.
63-1584	R20	Volume Control and Switch.
63-1737	R1	68 Ohm (Insulated)
63-1747	R27	120 Ohm (Insulated).
63-1772	R2	470 Ohm (Insulated).
63-1779	R3	680 Ohm (Insulated).
63-1765	R19	1M Ohm (Insulated)
63-1786	R7	1000 Ohm (Insulated)
63-1799	R25	2200 Ohm (Insulated)
63-1806	R14	3300 Ohm (Insulated)
63-1810	R15	3900 Ohm (Insulated)

PART NO.	REF. NO.	COILS AND CHOKES
S-11157	L5	Broadcast Oscillator Coil Assembly.
S-12256	L7	A.C. Line Choke Coil Assembly
S-12259	L6	F.M. Oscillator Coil Assembly
S-13871	L3	F.M. Detector Coil Assembly
S-13970	T1	1st I.F. Transformer Assembly
S-13971	T2	2nd I.F. Transformer Assembly
S-13972	T3	3rd I.F. Transformer Assembly
S-13973	T4	Discriminator Transformer Assembly.
S-13974	L4	Broadcast Detector Coil Assembly.
S-13997	L8	Filament Choke Coil Assembly.
S-14126	L23	R.F. Choke Coil Assembly.
S-14192	L2	F.M. Antenna Coil Assembly.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12BE6 Converter	.05 Mfd.	455 Kc.	BC	600 Kc.	L-11, 12, 15, 16, 19 and 20	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc.	BC	1600 Kc.	C12	Set oscillator to dial scale.
3	2 turns loosely cpld. cpld. to wavemagnet		1400 Kc.	BC	1400 Kc.	C11 and C2	Align det. and ant. stages.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc.	FM		L21 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc.	FM		L22 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc.	FM		L17 and L18 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc.	FM		L13 and L14 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 12BE6 converter tube socket	.05 Mfd.	10.7 Mc.	FM		L9 and L10 Prim. and Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading.
9 (c) (d)	Antenna Post F (Re-move line ant.)	270 ohms	98 Mc.	FM	98 Mc.	L6 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc.	FM	98 Mc.	L3 and L2 Det. and RF coil Slugs	Align det. and ant. stages to maximum reading.
11 (c)		270 ohms	45 Mc.	FM	45 Mc.	C17	Set oscillator to dial scale.
12 (c)		270 ohms	45 Mc.	FM	45 Mc.	C5 Det., C5 Ant.	Align detector and ant. stages for maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 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 indication on the meter.

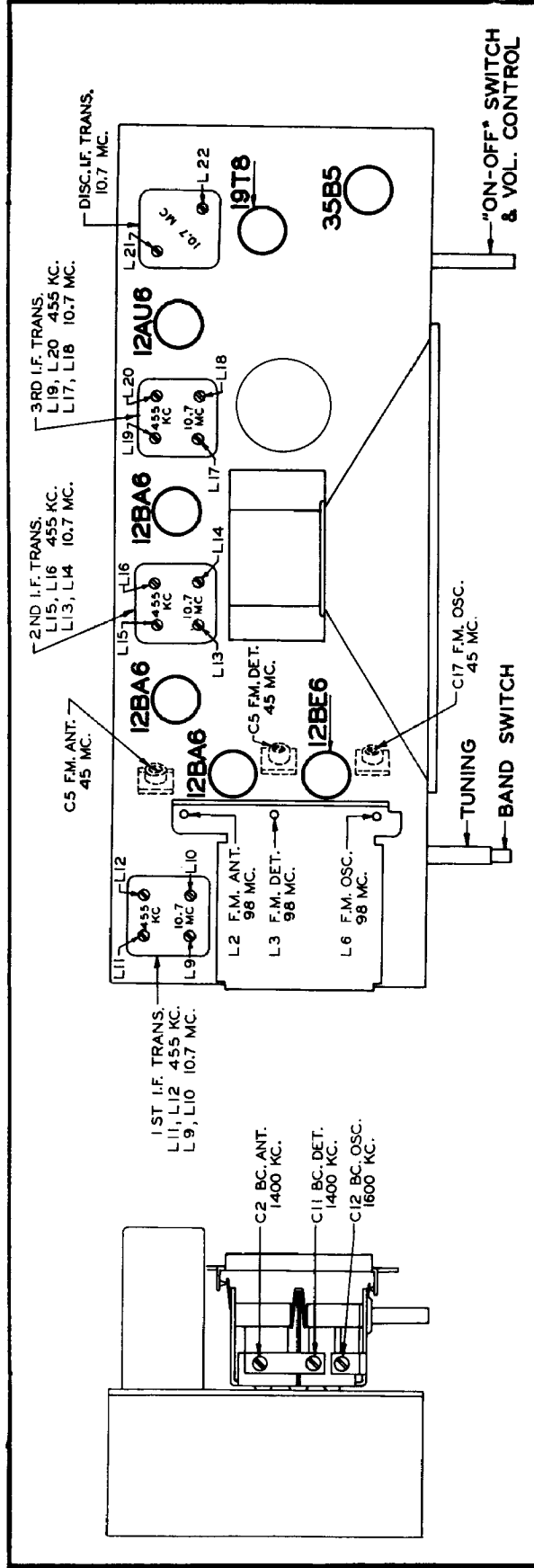
(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter Lug 3 on 3rd IF transformer (Limiter Grid).

(d) Loosen Slugs by applying a hot iron to the cement.

MODEL 7H820 **CHASSIS 7E01**



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 7E01 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands. When adjustments are made on the 7E01 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment, the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F. s. Observe the same precautions when making adjustments.

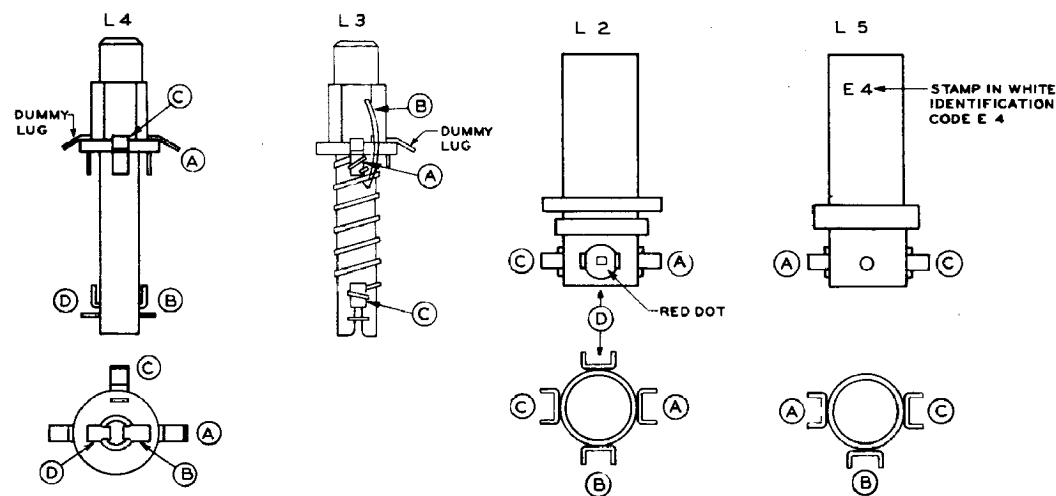
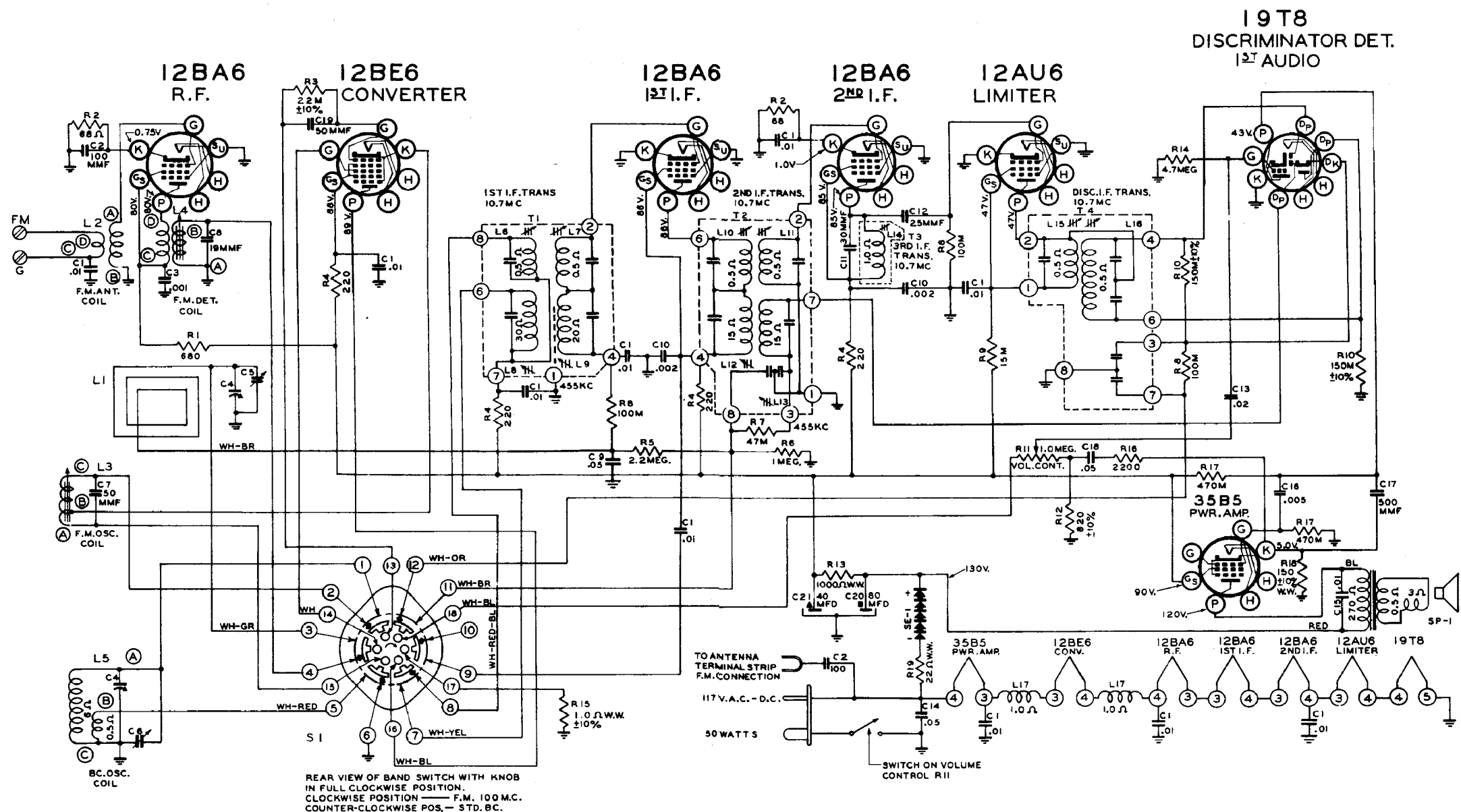
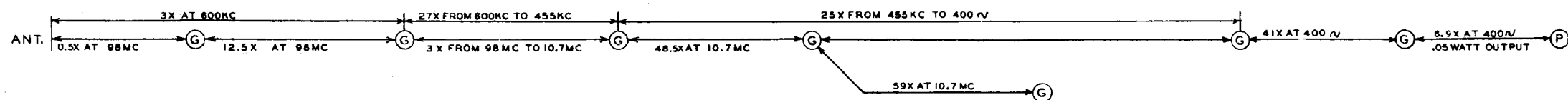
FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

The tone control is of the low impedance type in which a portion of the audio voltage is taken from the voice coil and fed back into the grid of the first audio. The voltage is fed back out of phase. R25, 26 and C25 determine the characteristic of the feed back voltage. A much greater variation of tone can be had by this system.

The filter circuits of chassis 7E01 incorporate new features. An examination of the schematic drawing will show the output transformer tapped slightly off center. This tap is the B + connection from filter capacitor C26 off the selenium rectifier to the 35B5 plate. The lower connection of the output transformer feeds B + to the rest of the tubes in the receiver. Current flowing through the upper windings of the output transformer to the 35B5 produces a magnetic field which is 180° out of phase with the magnetic field produced by current flowing in the opposite direction through the output transformer to the rest of the receiver, therefore, most of the AC hum is cancelled. Further reduction of hum is accomplished by filtering through resistors R22 and R23 capacitors C27 and C28.

This development in filtering systems allows a higher effective plate voltage on the 35B5 for increased power output.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 95-1035 be sure to add the speaker code letter to the transformer Part Number when ordering replacements.



ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN AC, D.C. OR VACUUM TUBE VOLTMETER

ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED

ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED

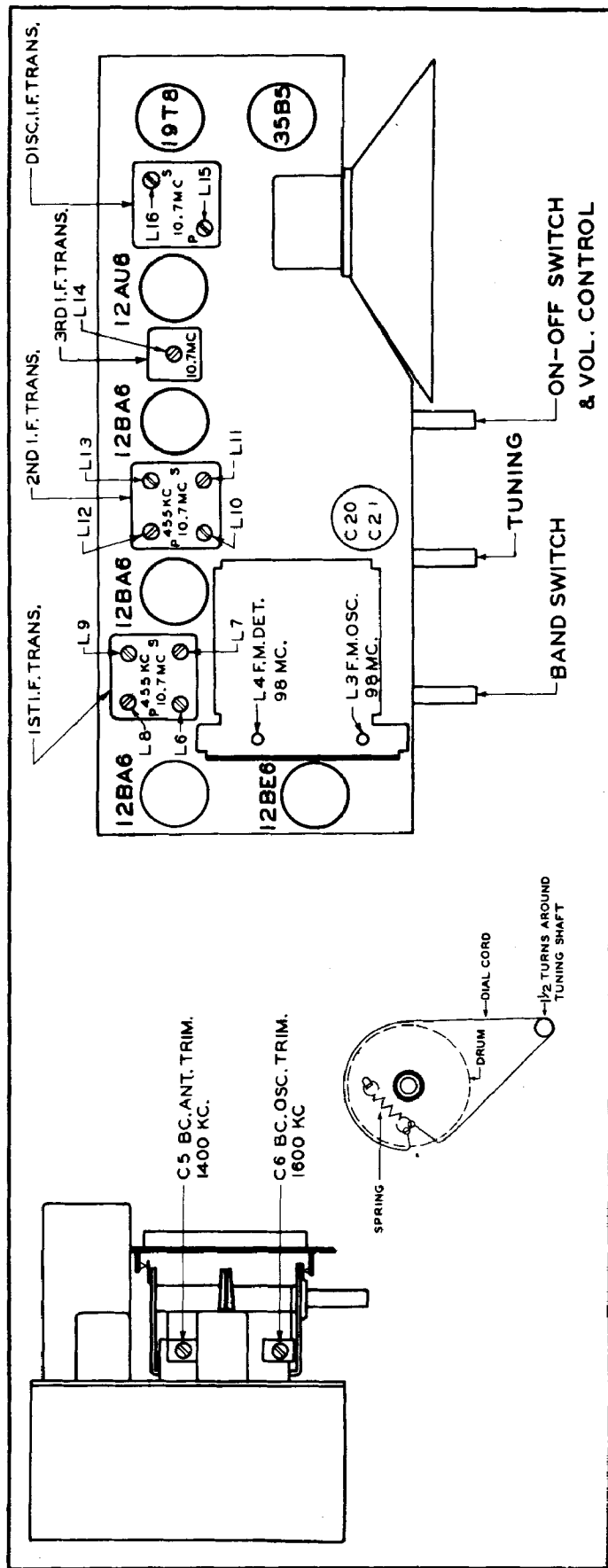
AMP. MOD. I.F. FREQUENCY 455 K.C.
 FREQ. MOD. I.F. FREQUENCY 10.7 M.C.

TUNING RANGES
 540-1620 K.C. STD. BC.
 88-108 M.C. F.M. 100



MODEL 7H822
 CHASSIS 7E02

MODEL 7H822 CHASSIS 7E02



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 7E02 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on all bands.

When adjustments are made on the 7E02 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM IF's. Observe the same precautions when making adjustments.

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 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

MODEL 7H822 CHASSIS 7E02

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE	PART NO.	REF. NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY							
26-403		Dial Scale	\$0.85	22-830	C13	.02 MFD.	\$0.20
46-734		Volume and Tuning Control Knob (2 used)		22-854	C17	500 MMFD.	.20
46-735		Band Switch Knob.	.10	22-1017	C14	.05 MFD.	.20
54-268		Speed Nut (Cabinet Plate Mtg.)	.20	22-1126	C15	.01 MFD.	.20
57-1378		Cabinet Emblem Plate.	.01	22-1158	C18	.05 MFD.	.20
59-146		Dial Pointer.	.70	22-1220	C10	.002 MFD.	.20
76-506		Tuning Control Shaft.	.24	22-1367	C19	50 MMFD. (Ceramic)	.33
80-69		Dial Cord Tension Spring.	.15	22-1385	C1	.01 MFD.	.20
80-444		Tuner Arm Tension Spring.	.02	22-1492	C7	50 MMFD. (Ceramic)	.27
80-444		Tuner Arm Tension Spring.	.05	22-1507	C12	25 MMFD. (Ceramic)	.33
80-580		Tuner Arm Stop Spring.	.06	22-1676	C3	.001 MFD. (Ceramic)	.40
80-581		Tuner Arm Pressure Spring.	.10	22-1688	C8	19 MMFD. (Ceramic)	.30
93-956		1/16" x 9/32 x 3/4" Black Felt Washer (59-146)	.01	22-1742	C4	Two Section Variable	3.00
94-295		Dial Spacer Bushing	.04	22-1757	C20, C21	Electrolytic 80-40 MFD. -150 V.	2.50
188-32		Retaining Ring.	1.03C	22-1768	C11	30 MMFD. (Ceramic)	.20
S14523		Tuning Shaft Bracket and Insulating Strip Assembly.	.20	RESISTORS			
S14524		Condenser Pulley and Cam Assembly	.55	63-686	R18	150 Ohm W. W. (Insulated).	.21
S14525		Tuner Arm Assembly.	.75	63-1223	R15	1 Ohm W. W. (Insulated).	.21
S14526		Dial Cord and Eyelet Assembly	.05	63-1450	R19	22 Ohm W. W. (Insulated).	.24
COILS AND CHOKES							
S13871	L5	F. M. Detector Coil Assembly.	.75	63-1527	R13	1000 Ohm W. W. (Insulated)	.39
S13973	T4	Discriminator Transformer Assembly.	2.00	63-1646	R11	Volume Control and Switch.	1.81
S13997	L17	Filament Choke Assembly (2 Used).	.40	63-1737	R2	68 Ohm (Insulated).	.21
S14480	L2	F. M. Antenna Coil Assembly	.50	63-1758	R4	220 Ohm (Insulated).	.21
S14481	L5	Broadcast Oscillator Coil Assembly.	.75	63-1779	R1	680 Ohm (Insulated).	.21
S14509	T3	3rd. I. F. Coil Assembly.	2.50	63-1782	R12	820 Ohm (Insulated).	.21
S14521	T1	1st. I. F. Transformer Assembly	2.50	63-1800	R16	2200 Ohm (Insulated).	.21
S14522	T2	2nd. I. F. Transformer Assembly	2.75	63-1835	R9	15M Ohm (Insulated).	.21
S14695	L3	F. M. Oscillator Coil Assembly.	.60	63-1842	R3	22M Ohm (Insulated).	.21
CONDENSERS							
22-162	C2	100 MMFD (Or 22-1669)	.20	63-1856	R7	47M Ohm (Insulated).	.21
22-229	C16	.005 MFD.	.20	63-1870	R8	100M Ohm (Insulated).	.21
22-829	C9	.05 MFD	.20	63-1876	R10	150M Ohm (Insulated).	.21
MISCELLANEOUS							
		Wavemagnet Mounting Bracket.	.25	63-1898	R17	470M Ohm (Insulated).	.21
		Model 822-Plastic Cabinet.	5.00	63-1912	R6	1 Megohm (Insulated).	.21
				63-1926	R5	2.2 Megohm (Insulated).	.21
				63-1940	R14	4.7 Megohm (Insulated).	.21

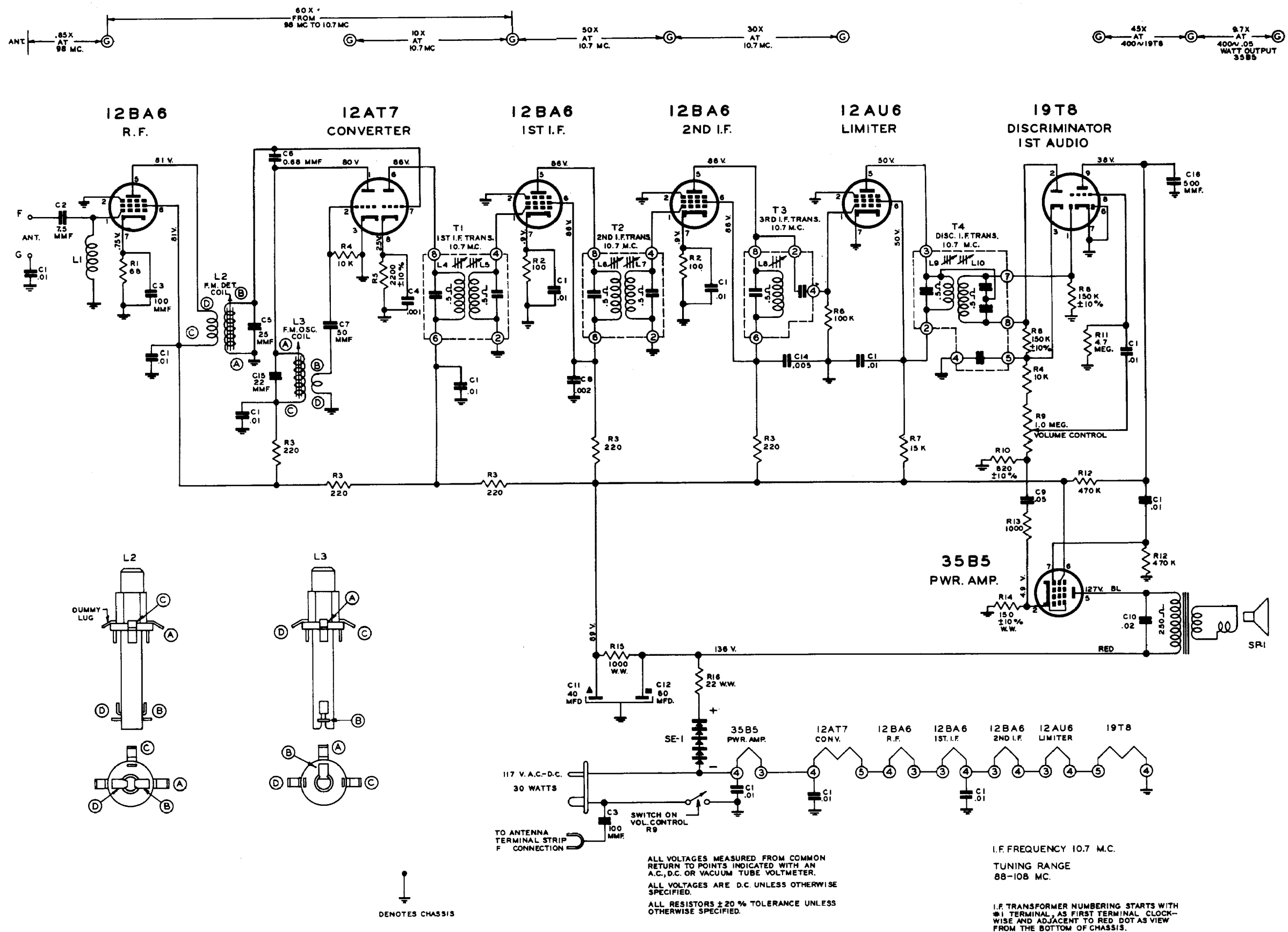
PARTS LIST--Continued

PART NO.	REF. NO.	DESCRIPTION	PART NO.	REF. NO.	DESCRIPTION
RESISTORS--Continued					
63-1871	R29	5600 Ohm (Insulated)	93-125		#6 Internal Shakeproof Lockwasher #1208.
63-1824	R13	8200 Ohm (Insulated)	93-126		#8 Internal Shakeproof Lockwasher #1208.
63-1841	R8	22M Ohm (Insulated)	93-665		Fibre Washer
63-1856	R11	47M Ohm (Insulated)	93-735		.012 x .093 x 1 1/64" Steel Washer - Cadmium.
63-1870	R10	100M Ohm (Insulated)	93-889		Insulating Washer.
63-1876	R16	150M Ohm (Insulated)	94-334		Speaker Mtg. Bushing
63-1884	R4	220M Ohm (Insulated)	94-485		Fibre Bushing.
63-1898	R12	470M Ohm (Insulated)	94-598		R.F. Plate Mtg. Bushing.
63-1926	R6	2.2 Megohm (Insulated)	95-1035		Output Transformer
63-1940	R17	4.7 Megohm (Insulated)	97-293		Insulating Stud (Chassis Mtg. Stud) (4 used)
			102-466		Dial Calibration Label
			110-130		Grille Cloth
			112-281		#10 x 3/4" Oval Binding Hd. Self Tapping Screw Type Z - Stat. Bronze
			114-26		#8 x 1/4" Hex Hd. Self Tapping Screw - Type Z - Cad.
			114-48		#6-32 x 1/4" Hex Acorn Hd. M.S., Steel N.P. (9 used)
			114-78		#8 x 5/16" Hex Hd. Slotted Self Tapping Screw (Wavemagnet Mtg.)
			114-92		#6 x 1-1/8" Hex Hd. Slotted Self Tapping Screw Type Z - Cad.
			114-157		#6 x 1/2" Hex Hd. Self Tapping Screw - Stan-Tap. Cad
			114-218		#10 x 7/8" Slotted Washer Hd. Self Tapping Screw (Chassis Mtg.)
			114-291		#8-32 x 7/16" Hex Hd. Slotted M. Screw - Steel, N.P.
			114-292		#6 x 5/8" Hex Hd. Slotted Self Tapping Screw Stan-Tap. - Cad.
			125-17		Rubber Grommet (4 used) (49-608)
			125-62		Rubber Grommet (Used on R.F. Plate) (4 used)
			126-554		Miniature Tube Shield.
			139-59		Speaker Baffle
			149-39		Iron Core (Used on all I.F. and Discriminator Transf.)
			149-64		Tuning Core.
			188-34		Retaining Ring
			202-506		F.M. Instruction Book.
			202-553		Instruction Book
			212-3		Selenium Rectifier (or 212-4).
			S-13977		Wavemagnet Assembly - Type 29D
			S-14128		Cabinet Back, A.C. Plug and Cord Assembly (7H820).
			S-14168		Bandswitch and Terminal Strip Assembly
			S-14358		Wavemagnet Cable Assembly.
			S-14562		Cabinet Back, A.C. Plug and Cord Assembly (7H820W)
MISCELLANEOUS					
12-1070		Wavemagnet Mounting Bracket.			
14-848		Model 820W - Plastic Cabinet (7H820W).			
14-1020		Model 820 - Bakelite Cabinet (7H820)			
19-139		Cabinet Back Retaining Clip (4 used)			
49-608		7 1/2" P. M. Speaker 208-608 and Voice Coil			
54-30		#8-32 x 5/16" x 7/64" Hex Nut - Steel N.P. (6 used).			
54-139		#3/8-32 x 9/16" Palmnut - Type 9N-Steel-Cad. (2 used)			
54-226		Speed Nut - Tinnerman #C518B-014-27 (3 used)			
57-1269		I.F. Transformer Terminal Plate.			
58-168		Two Prong Plug			
73-30		#6-32 x 1/4" Hex Hd. Set Screw - Cuppoint (2 used)			
78-782		Socket - Miniature Tube (7 Contact) (2 used)			
78-788		Socket - Miniature Tube (9 Contact)			
78-794		Socket - Miniature Tube (7 Contact) (3 used)			
78-795		Socket - Miniature Tube (7 Contact)			
83-1063		Threaded Insert (used on all I.F. Transformers).			
83-1064		Threaded Insert (used on all I.F. and Discriminator Transformers).			
83-1090		Insulating Strip (58-168)			
83-1479		Insulating Strip			
83-1480		Insulating Strip			
83-1503		Tone Arm Insulating Strip.			
85-417		Band Switch (use S-14168).			
93-2		.016 x .134 x 1/4" Brass Washer.			
93-94		Bakelite Shoulder Washer			

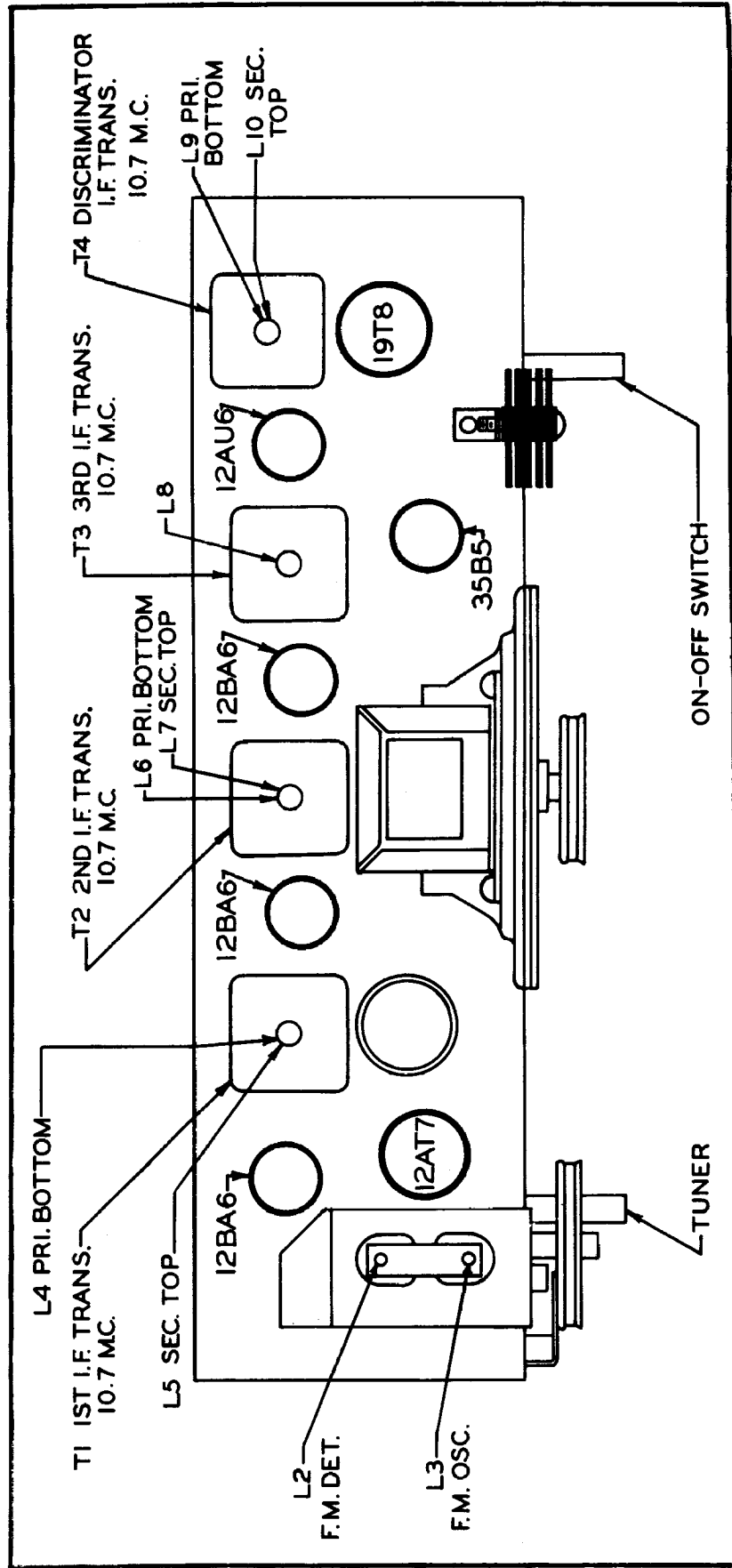
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**MODEL 7H918
CHASSIS 7F03**



MODEL 7H918 CHASSIS 7F03



TUBE AND TRIMMER LOCATION

To The Service Man:

The 7F03 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7F03 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

IF Alignment: The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

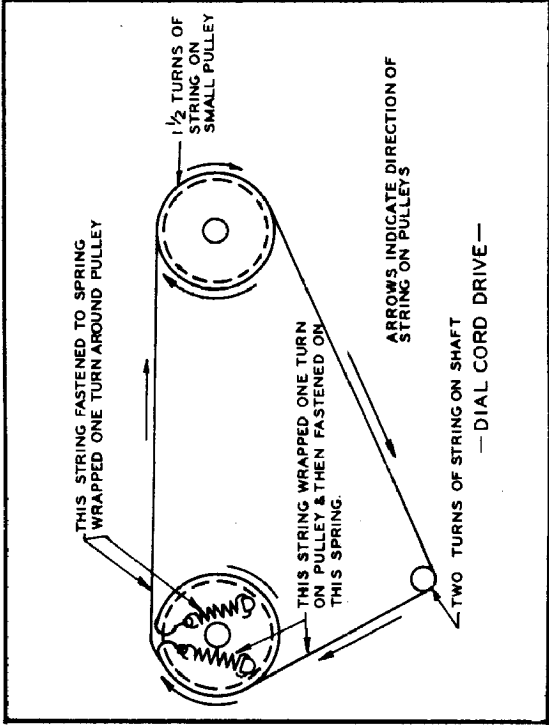
IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PART NO.	REF. NO.	DESCRIPTION
DIAL ASSEMBLY					
12-1605		Tuner Mounting Bracket.	63-686	R14	150 Ohm (Wirewound) 10% Ins. Res. ½ W.
26-423		Dial Scale & Escutcheon	63-1450	R16	22 Ohm (Wirewound) 20% Ins. Res. 1 W.
46-805		Volume Control and Tuning Knob (2 used)	63-1527	R15	1000 Ohm (Wirewound) 20% Ins. Res. 3 W.
54-292		Speed Nut (Tinnerman) (Used on S-15686)	63-1737	R1	68 Ohm 20% Ins. Res. ½ W.
57-1522		Emblem Plate.	63-1744	R2	100 Ohm 20% Ins. Res. ½ W.
59-228		Dial Pointer.	63-1758	R3	220 Ohm 20% Ins. Res. ½ W.
76-549		Tuning Control Shaft.	63-1782	R10	820 Ohm 10% Ins. Res. ½ W.
76-552		Tension Shaft (used with S-15745)	63-1786	R13	1000 Ohm 20% Ins. Res. ½ W.
80-402		Dial Cord Tension Spring.	63-1799	R5	2200 Ohm 10% Ins. Res. ½ W.
80-721		Shaft Tension Spring (used on S-15745).	63-1828	R4	10K Ohm 20% Ins. Res. ½ W.
83-1634		Pointer Pulley Mounting Strip	63-1835	R7	15K Ohm 20% Ins. Res. ½ W.
93-992		Bakelite Washer (used on dial).	63-1870	R6	100K Ohm 20% Ins. Res. ½ W.
94-670		Tuner Shaft Bushing	63-1876	R8	150K Ohm 10% Ins. Res. ½ W.
110-139		Grill Cloth	63-1898	R12	470K Ohm 20% Ins. Res. ½ W.
114-39		#8x½" Hex. Hd. S. T. Screw (used to mt. 12-1605).	63-1940	R11	4.7 Megohm 20% Ins. Res. ½ W.
188-32		Retaining Ring.	63-2035	R9	Volume Control and Switch
S-15686		Pointer Pulley & Shaft Assembly			
S-15688		Dial Cord Assembly.			
S-15745		Iron Core Drive Shaft & Pulley Assembly			
COILS AND CHOKES					
95-1150	T1	1st and 2nd I. F. Transformer	12-1612		Rectifier Mounting Bracket.
95-1152	T3	3rd I. F. Transformer	14-1118		Cabinet for 7H918 Plastic
95-1153	T4	Discriminator Transformer	49-666	SP-1	4" P.M. Speaker
S-15690	L1	Antenna Choke Coil Assembly	54-139		208-666 Cone & Voice Coil
S-15691	L3	F. M. Oscillator Coil Assembly.	54-267		206-666 Output Transformer.
S-15743	L2	F. M. Detector Coil Assembly.	58-128		#3/8-32x9/16" Palnut Steel Cad. (Used to Mt. 63-2035).
CONDENSERS					
22-3	C1	.01 Mfd. Ceramic.	54-128		#6-32x5/16" Palnut Steel Cad. (Used to Mt. I.F. Trans)
22-229	C14	.005 Mfd.	78-788		Two Prong Plug.
22-1158	C9	.05 Mfd.	78-806		Noval Miniature Tube Socket
22-1220	C8	.002 Mfd.	78-807		Miniature Tube Socket
22-1367	C7	50 Mmfd.	78-850		Miniature Tube Socket (4 used)
22-1379	C10	.02 Mfd.	83-1635		Noval Miniature Tube Socket
22-1506	C15	22 Mmfd. Ceramic.	93-35		Insulating Strip (used behind 63-2035).
22-1669	C3	.0001 Mfd. Ceramic.	93-125		.032x.144x3/8 Steel Washer (4 used on Mtg. Back)
22-1676	C4	.001 Mfd. Ceramic	93-993		#6 Internal Shakeproof Lockwasher #1206 (used on 212-7)
22-1700	C16	500 Mmfd. Ceramic	93-994		Volume Control Insulating Washer.
22-1757	C11	40 Mfd. - 80 Mfd. Elect.	112-131		Insulating Shoulder Washer.
22-1766	C6	.68 Mmfd. Molded.	112-697		#8-32x1/4" B.H.M.S. Steel (2 used on Back Terminals).
22-1852	C2	7.5 Mmfd. Ceramic	114-253		#6x7/16" Straight Side B.H.S.T. (4 used to mt. Back) (2 used to Mt. chassis)
22-2060	C5	25 Mmfd. Ceramic	114-308		#6x3/8 Hex. Hd. Sl. S.T.Screw (2 used to Mt. Sprk to cabinet).
MISCELLANEOUS					
			125-73		#6-32x1-1/8" Hex. Hd. Sl. M.S.Steel (used on 212-7).
			149-87		Rubber Grommet (Coil Mtg.).
			202-697		Iron Core & Spring (2 used)
			202-720		F.M. Instruction Book
			212-7	SE-1	Instruction Book.
			S-15682		Selenium Rectifier.
					Cabinet Back, Line Cord and Plug Assembly

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1 (a)	Pin 1 (grid) on 12AU6 limiter	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L9 coil slug Primary discr.	Align primary of discriminator for maximum reading.
2 (b)	Pin 1 (grid) on 12AU6 limiter	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
3 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L8 Prim. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
4 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 2nd IF trans.	Align 2nd IF transformer for maximum reading.
5 (c)	Pin 7 (grid) on 12AT7 converter tube socket	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L4 and L5 Prim. and Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading.
6 (c) (d)	Antenna Post FM (Remove line ant)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Osc. Coil Slug	Set Oscillator to dial scale
7 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L2 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

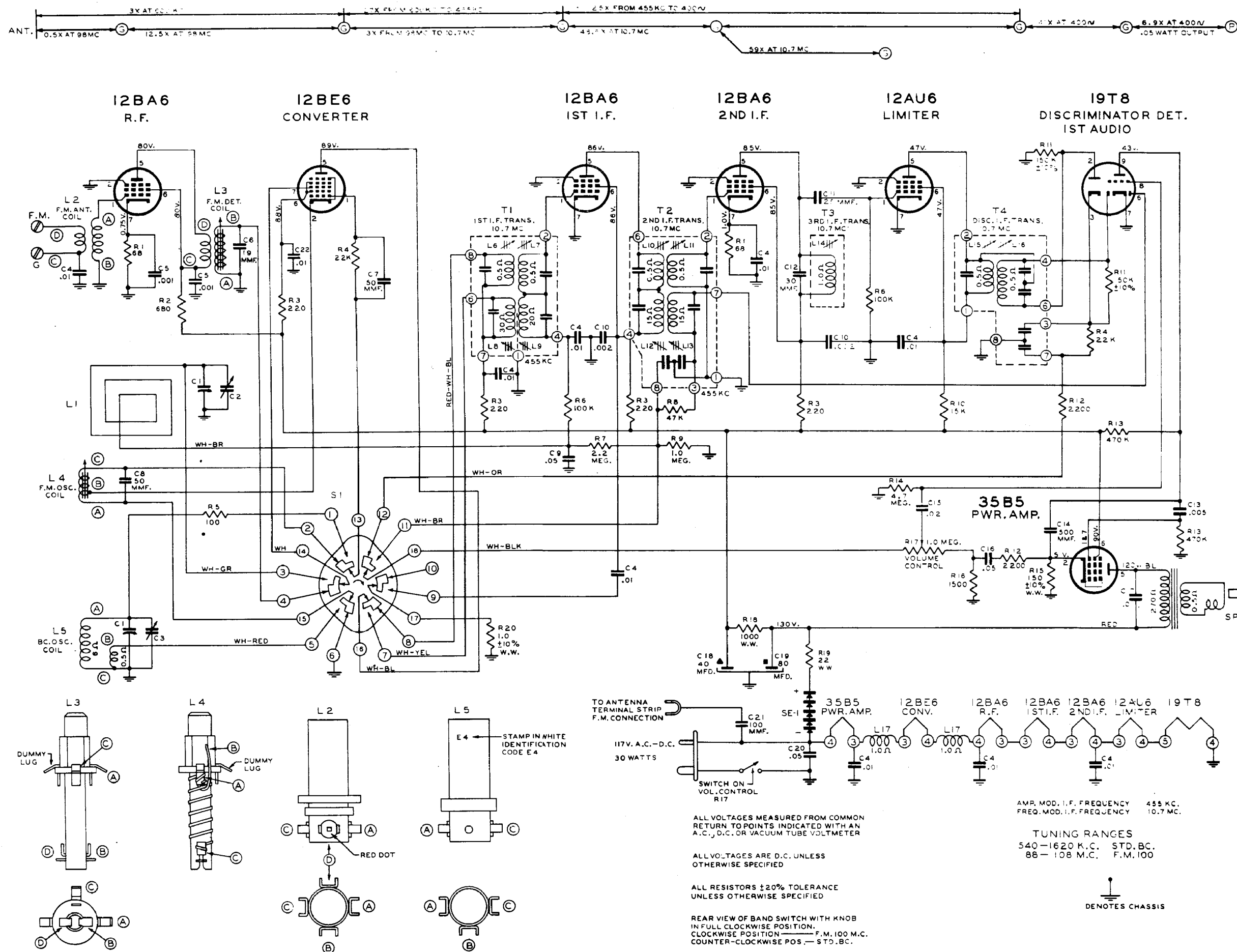
Correct alignment can only be made if the following procedure is followed:

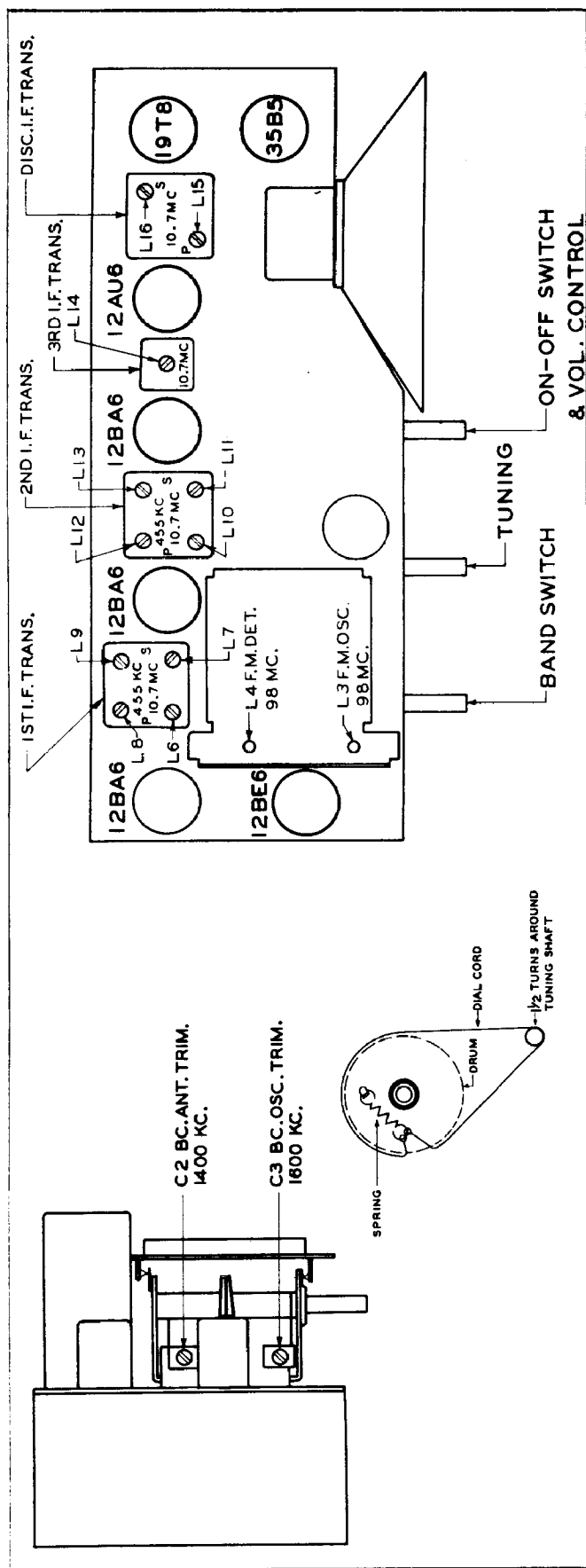
A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

The signal generator output should be kept just high enough to get an indication on the meter.

- (a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).
- (b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).
- (c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.
- (d) Loosen Slugs by applying a hot iron to the cement.

MODEL 7H921
CHASSIS 7F04





TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 7F04 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and one stage on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7F04 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for the AM IF Amplifier are used for the FM IF's. Observe the same precautions when making adjustments.

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 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

PARTS LIST

PART NO.	REF.NO.	DESCRIPTION	PRICE	PART NO.	REF.NO.	DESCRIPTION	PRICE
<u>DIAL ASSEMBLY</u>							
26-403		Dial Scale		63-1876	R11	150K "	.85
46-734		Tuning & Vol. Control Knob (2 Used)	.10	63-1898	R13	470K "	.21
46-735		Band Switch Knob	.20	63-1912	R9	1 Meg."	.21
46-769		Tuning & Vol. Control Knob (2 Used on W Model only)	.15	63-1926	R7	2.2 Meg. Ohm	.21
46-770		Band Switch Knob (W Model only)	.20	63-1940	R14	4.7 "	.21
57-1486		Cabinet Emblem Plate	.05	<u>MISCELLANEOUS</u>			
59-146		Dial Pointer	.24				
76-506		Tuning Control Shaft	.15	12-1070		Wavemagnet Mtg. Brkt.	.25
80-402		Dial Cord Tension Spring	.03	14-1022		Cabinet For Model 7H921	5.00
80-444		Tuner Arm Tension Spring	.05	14-855		" " " 7H921 White	6.50
80-580		" " Stop	.06	19-179		Coil Mtg. Clip (S-14509)	.06
80-581		" " Pressure "	.10	19-189		" Retaining Clip	
93-956		1/16 X 9/32 X 3/4" Black Felt Washer (Used on 59-146)	.01	49-667	SP-1	4" P.M. Speaker	6.00
114-271		#6 X 1/2" Hex Hd. Slotted S.T. Type Z N.P. (1 Used on 26-403)	.01	208-667		208-667 Cone & Voice Coil	1.73
188-32		Retaining Ring (76-506)	1.03C	206-667		206-667 Output Trans.	1.67
S-14523		Tuning Shaft Brkt. & Insulating Strip Assem.	.20	54-139		3/8-32 X 9/16" Palnut-Type 9 N Cad. (1 Used on Vol. Cont. - 1 Used on 85-430)	.01
S-14524		Condenser Pulley & Cam Assem.	.55	54-266		Speed Nut (1 Used S-13871 & 1 Used on S-14695)	.04
S-14525		Tuner Arm Assem.	.75	54-267		#6-32 X 5/16 Palnut Steel Cad. (Used on 26-403)	.45C
S-14526		Dial Cord & Eyelet Assem.	.05	54-269		#8-32 X 5/16 " " (1 Ea. Used on I. F.'s & Disc. Trans.)	.01
<u>COILS & CHOKES</u>							
S-13871	L3	F. M. Detector Coil Assem.	.75	54-271		#6-32 X 1/4" Palnut Steel Cad. (2 Used on S-14509)	.01
S-13973	T4	Discriminator Transformer Assem.	2.00	57-1269		I.F. Trans. Terminal Plate (6 Used)	.06
S-13997	L17	Filament Choke Coil Assem.	.40	58-128		Two Prong Plug	.15
S-14480	L2	F. M. Antenna Coil Assem.	.50	73-30		#6-32 X 1/4" Hex. Hd. Slotted Set Screw Cuppoint (2 Used)	.02
S-14481	L5	Broadcast Osc. Coil Assem.	.75	78-787		Two Contact Socket	.10
S-14509	T3	3rd. I. F. Coil Assem.	2.50	78-788		Miniature Tube Socket (9 Contact)	.35
S-14521	T1	1st. I. F. Trans. "	2.50	78-806		" " " "	.15
S-14522	T2	2nd. I. F. Trans. "	2.75	78-807		" " " " (5 Used)	.15
S-14695	L4	F. M. Osc. Coil Assem.	.60	83-1056		Wavemagnet Mtg. Strip	.03
<u>CONDENSERS</u>							
22-3	C22	.01 Mfd. (Ceramic)	.26	83-1090		Insulating Strip	.02
22-162	C21	100 " (Mica) (or 22-1669)	.20	83-1498		" " (3 hole strip over controls)	.04
22-229	C13	.005 " "	.20	83-1520		Rectifier Insulating Strip	.03
22-829	C9	.05 " "	.20	83-1545		Insulating Strip (1 Ea. Used on S-13973 - S-14521 & S-14522)	.02
22-830	C15	.02 " "	.20	83-1593		Felt Strip (2 Used on Dial Glass)	.01
22-854	C14	500 Mmfd.	.20	85-430	S1	Band Switch	1.50
22-1017	C20	.05 Mfd.	.20	93-125		#6 Int. Shakeprf. Lockwasher #1206 (6 Used)	.31C
22-1126	C17	.01 " "	.20	93-855		1/8" thick X 3/4" diameter Rubber Washer (mtg. on Speaker Flange)	.03
22-1158	C16	.05 " "	.20	93-910		Felt Washer - Brown (3 Used behind Knobs)	.01
22-1220	C10	.002 " (2 Used)	.20	97-293		Chassis Mtg. Stud (2 Used)	.18
22-1385	C4	.01 Mfd. (9 Used)	.27	112-281		#10 X 3/4" Oval Bind. Hd. S. T. Type Z Stat. {Bronze (2 Used to mount chassis) 1.20C	.02
22-1492	C8	50 Mmfd. (Ceramic)	.33	112-697		#6 X 7/16" Straight Side B.H.S.T. Steel Cad. Pl. (4 Used on S-14549)	.02
22-1507	C11	25 " " "	.33	113-26		#6-32 X 1/4" Hex. Hd. Slotted M.S. Steel {Shakeprf. Lock (2 Used)	.02
22-1511	C7	50 " " "	.40	114-92		#6 X 1-1/8" Hex. Hd. S.T. Type Z Cad. Pl. (1 Used on 212-3)	1.50C
22-1676	C5	.001 Mfd. (" ")	.30	114-293		#6 X 32 X 3/8" Hex Hd. Slotted M.S. Steel (1 Ea. Used on 26-403 & 139-79)	.02
22-1688	C6	19 Mmfd. (" ")	3.00	139-79		Speaker Baffle	.05
22-1742	C1	Two Section Variable	2.50	149-64		Iron Core & Spring (2 Used)	.40
22-1757	C18,19	Electrolytic Cond. 80-40 Mfd.	.20	149-65		" " " (1 Used on S-14509)	.10
22-1768	C12	30 Mmfd. (Ceramic)	.20	159-50		Cinch Plug Button-Black (4 Used to Mt. dial glass)	.01
<u>RESISTORS</u>							
63-686	R15	150 Ohm W.W. 1/2W 10% Ins.	.21	192-117		Dial Glass	.75
63-1223	R20	1 Ohm " " " "	.21	196-111		Speaker Gasket	.55
63-1450	R19	22 Ohm " " 1W 20% " "	.24	199-35		Dial Scale Spacer Sleeve	.05
63-1527	R18	1000 Ohm " " 3W " "	.39	202-697		F.M. Instruction Book	.10
63-1646	R17	Volume Control & Switch 1/2W 20% Ins.	1.81	202-721		Instruction Book	.06
63-1737	R1	68 Ohm " " " "	.21	212-3		Selenium Rectifier	2.00
63-1744	R5	100 " " " "	.21	S-14527	SE-1	Wavemagnet Lead & Stop Assem.	.20
63-1758	R3	220 " " " "	.21	S-14549		Cabinet Back, Socket & A.C. Cord Assem.	1.75
63-1779	R2	680 " " " "	.21	S-14957		Wavemagnet Assem.	1.25
63-1793	R16	1500 Ohm " " " "	.21	S-15325		Cabinet Back, Socket & A.C. Cord Assem.	2.00
63-1800	R12	2200 " " " "	.21	S-15739		Speaker Support Brkt. & Plate Assem.	.20
63-1835	R10	15K " " " "	.21				
63-1842	R4	22K " " " "	.21				
63-1856	R8	47K " " " "	.21				
63-1870	R6	100K " " " "	.21				

Prices Subject to change without notice.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 12BE6 Converter 2 turns loosely cpld. to wavemagnet	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 12, 13	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C6	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C5	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM		L15 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM		L16 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM		L14 Prim. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM		L10 and L11 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 12BE6 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Re- move line ant.)	270 ohms	98 Mc. Unmodulated	FM	98 Mc.	L3 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM	98 Mc.	L4 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

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 indication on the meter.

(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

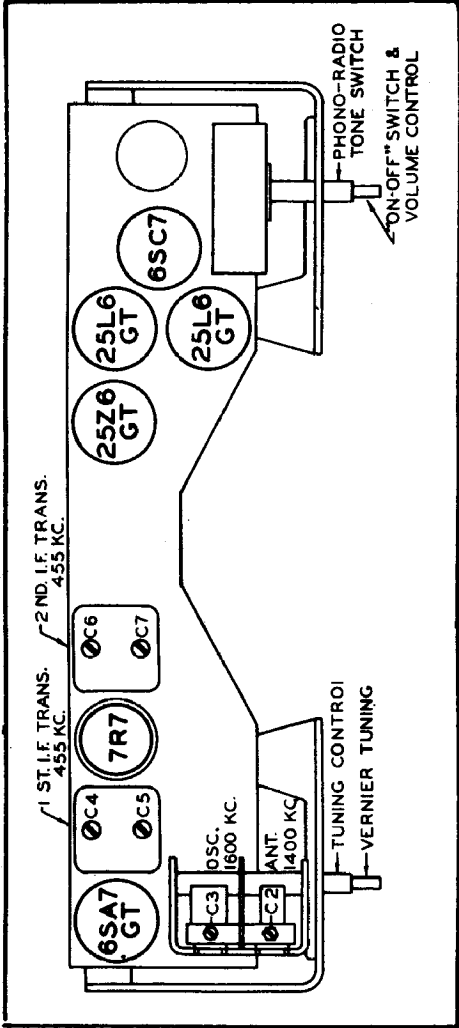
(d) Loosen Slugs by applying a hot iron to the cement.

MODEL 7R070
CHASSIS No. 6C06

TO THE SERVICEMAN:

The alignment of chassis 6C06 is conventional. None of the adjustments interlock, however, the most accurate alignment will be accomplished if the procedure is followed exactly. The IF frequency is 455 KC and all measurements, voltage, and resistance have been taken with an electronic volt ohm meter.

Stage by stage gain measurements are for reference purposes only. Gain measurements can seldom be duplicated, and are used only for comparison purposes.



TUBE AND TRIMMER LOCATION

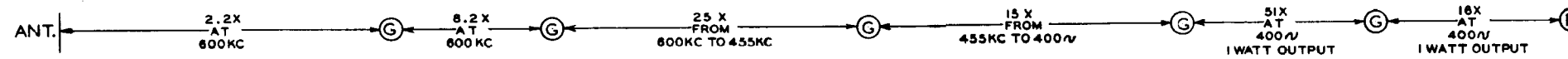
ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 MFD	455 KC	600 KC	C4, 5, 6, 7	Align IF
2	One turn Coupled to Loop		1600 KC	1600 KC	C3	Set Oscillator to Dial Scale
3			1400 KC	1400 KC	C2	Align Antenna

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE	PART NO.	REF. NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY				MISCELLANEOUS			
46-610		Tuning Control Knob	\$0.25	S12579	S3B	Insulator Strip Assembly. . .	\$----
46-611		Volume Control Knob	.45	S11458	S4	Solenoid.	----
46-612		Phono-Radio Knob.	.25	85-372	S5	3 Position Switch	----
46-613		Tuning Control Knob (Vernier)	.40	78-582	Soc 1, 2	Phono Socket.	----
46-614		Phono-Reject Knob	.20				
78-582		Socket-Phono (3 Contact).	.20	11-87		Line Cord and Plug (8 ft.). .	.65
188-53		Retaining Ring (Used on Volume Control and Phono-Radio Switch)	.01	12-1350		Line Cord Support Bracket . .	.15
188-54		Knob Retaining Ring (2 used)	.02	15-65		Plug Shield (used on S12734)	.27
188-93		Knob Retaining Ring (1 used on 46-613).	.02	15-67		Plug Cap and Insulator (used on S12734)	.08
196-83		Speaker Gasket.	.70	17-86		Record Locking Clamp.	.15
S12732		Control Linkage Assembly.	.35			(2 - 17-86 must be used with 188-99).	
COILS AND CHOKES				19-99		Coil Mounting Clip.	.03
95-970	T1	1st I.F. Transformer.	2.00	19-123		Phono Mounting Clip.	.10
95-971	T2	2nd I.F. Transformer.	2.00	24-392		Volume Control and Switch Cover	.15
S12389	L4	Antenna Loading Coil Assem.	.25	36-34		Cabinet Handle.	1.40
S12733	L2	Oscillator Coil Assembly.	.65	36-35		Cabinet Handle Insert for 36-34	1.50
CONDENSERS				40-38		Cabinet Lid Support	.85
22-188	C10	.02 Mfd. 400 V.	.20	49-559	SP1	6 1/2" P.M. Speaker.	10.00
22-196	C15	.01 Mfd. 600 V.	.20			206-559 Output Transformer.	2.21
22-326	C14	.003 Mfd. 400 V.	.20	52-372		208-559 Cone and Voice Coil	2.09
22-327	C12	.02 Mfd. 200 V.	.20	54-245		Speaker Socket and Cable.	.65
22-827	C28	.1 Mfd. 200 V.	.23	57-1195		#8-32 Speed Nut	.03
22-829	C4	.05 Mfd. 200 V.	.20	57-1196		Ventilation Plate	1.00
22-953	C9	.0002 Mfd. 600 V.	.16	57-1197		Front Panel (Plastic).	6.00
22-954	C13	350 Mmfd. 600 V.	.16	70-133		Chassis Front Plate.	.45
22-1017	C17	.05 Mfd. 400 V.	.20			#6 x 3/8" Phillips R. H. Wood Screw - Steel - Statuary Bronze (5 used).	.01
22-1049	C16	.03 Mfd. 400 V.	.20	72-68		#4 x 1/2" Phillips F. H. Wood Screw (8 used) (Front Panel Mtg. Screw).	.02
22-1362	C11	.004 Mfd. 600 V.	.20	72-69		#6 x 3/4" Flat Hd. W. Screw (10 used) Steel - Black Oxidize	.01
22-1381	C18, 19, 20	Electrolytic 40-40-40 Mfd. 150 V.	1.71	78-229		Socket - Electrolytic Cond.	.024
22-1541	C1	Two Gang Variable	4.00	78-401		Socket - Loktal (or 78-596) (8 contact)	.19
22-1775	C21	.047 Mfd. 400 V.	----	78-611		Socket - Tube (Octal - 8 contact).	.12
RESISTORS				80-512		Phono Unit Mounting Spring (Top) (4 used).	.03
63-311	R6	15M Ohm 1/4 W.	.09	80-541		Tone Arm Retaining Spring	.10
63-583	R1	1000 Ohm. 1/4 W.	.09	83-1228		Pin Jack Terminal Strip (Gang Condenser).	.10
63-589	R2	10M Ohm. 1/4 W.	.09	83-1347		Handle Name Strip.	.90
63-597	R7	470M Ohm. 1/4 W.	.09	83-1350		Insulating Strip (for 63-1511).	.04
63-600	R4	2.2 Megohm. 1/4 W.	.09	83-1491		Felt Strip.	.01
63-641	R9	10M Ohm. 1/4 W.	.09	84-66		Record Locking Clamp Support	.15
63-658	R8	390M Ohm. 1/4 W.	.09	85-388	S1	4 Position Switch (Phono-Radio).	1.00
63-976	R3	15 Megohm. 1/4 W.	.09	85-389	S2	Reject Switch.	.30
63-1070	R12	680 Ohm (Wirewound) (Insulated). 1 W.	.24	93-125		#6 Internal Shakeproof Lockwasher #1206 (7 used)	.31C
63-1366	R10	140 Ohm (Zipohm). 2-1/2 W.	.33	93-127		#10 Internal Shakeproof Lockwasher (4 used).	.43C
63-1474	R5	Volume Control & Switch	1.81	93-833		Shoulder Washer (Rubber) (4 used).	.10
63-1475	R11	100 Ohm (Wirewound) (Insulated). 2 W.	.33	93-853		#6 Countersunk Washer (10 used).	.03
63-1511	R13, R14	Candohm 22 ohm 1 W (WW), 60 Ohm, 7W (WW).	.65	94-295		Condenser Mounting Bushing (3 used).	.04
PRE-AMP PHONO UNIT				110-120		Grille Cloth.	.20
S14605	L3	Oscillator Coil Assembly (FM Phono).	2.02	112-187		#10-32 x 1-1/4" Phillips Oval Hd. M. Screw, Steel - Bronze (4 used) (Chassis Mtg.).	.03
S13198		Pre-Amp Phono Cable Assem.	1.50	112-544		Phono Unit Mounting Screw	.11
S13201		Pre-Amp Phono Unit (Compl.)	----	114-265		#10-32 x 1-1/4" Slotted Hex Acorn Hd. M.S. - N.P. (4 used) (Handle Mtg.).	.05
22-162	C25	100 Mmfd. 500 V.	.20	125-54		Rubber Grommet.	.02
22-448	C24	.004 Mfd. 600 V.	.20	126-379		Tube Shield (7R7).	.07
22-829	C4	.05 Mfd. 200 V.	.20	156-22		Cover Latch (Upper Half).	.87
22-1532	C23	50 Mmfd (Mica). 500 V.	.20	156-23		Cover Latch (Lower Half).	.87
22-1610	C26	40 Mfd. Electrolytic. 150 V.	1.50	166-40		Recess Bumper (4 used).	.03
22-1673	C27	20 Mmfd. (Ceramic). 500 V.	.25	188-99		Clamp Ring.	.60
58-133	P1, P2	Phono Plug (Used on S13198)	.12	202-450		Instruction Book.	.20
63-591	R21	22W Ohm 1/4 W.	.09	S12734	W1	Phono Cable Assembly.	1.15
63-597	R7	470M Ohm. 1/4 W.	.09	S12740	L1	Wavemagnet Assem. - Type 29C	1.25
63-604	R16	10 Megohm. 1/4 W.	.09	S13200		Non-Intermixer Record Changer	----
63-648	R20	47M Ohm. 1/4 W.	.09	S13270		Handle & Name Strip Assem.	3.80
63-659	R18	470M Ohm. 1/4 W.	.09				
63-710	R19	15M Ohm (Insulated). 1/4 W.	.19				
63-976	R3	15 Megohm. 1/4 W.	.09				
78-229		Electrolytic Socket	.03				
78-401		Tube Socket (or 78-596) (8 contact).	.19				
80-469		Mounting Spring (3 used).	.02				
126-523		Chassis Shield.	.60				
RECORD CHANGER							
141-104	B1	Phono Motor, 60 Cycle	7.50				
S12575	S3A	Trip Contact Assembly	----				

MODEL 7R070
CHASSIS No. 6C06



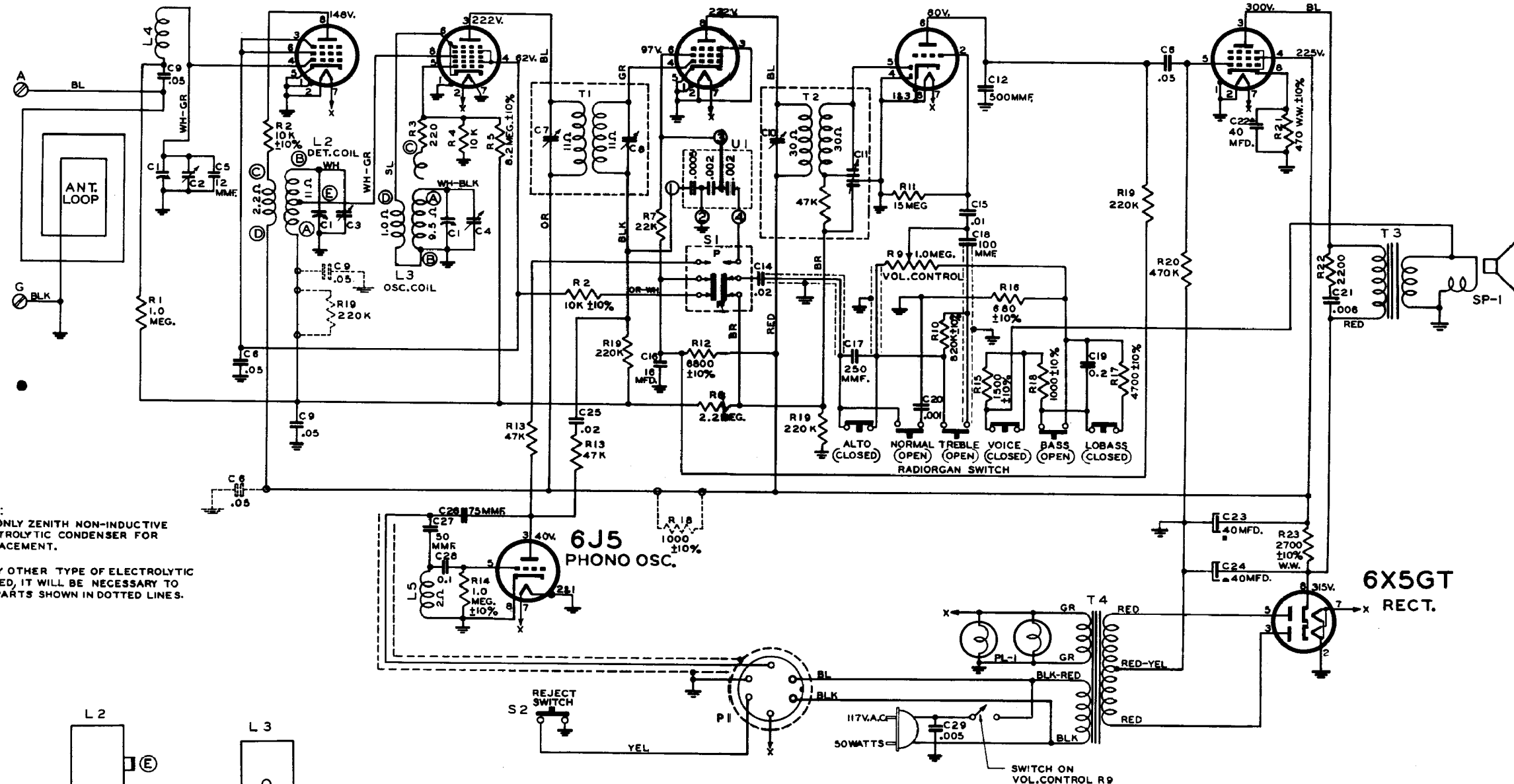
6SK7GT
R.F.

6SA7GT
CONVERTER

6SK7
I.F.

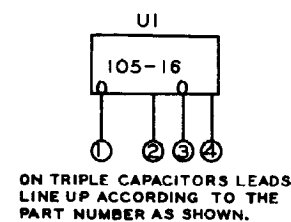
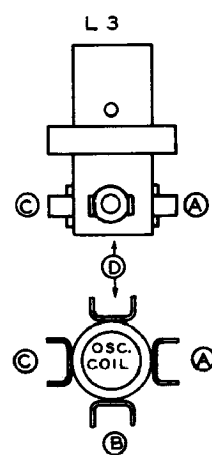
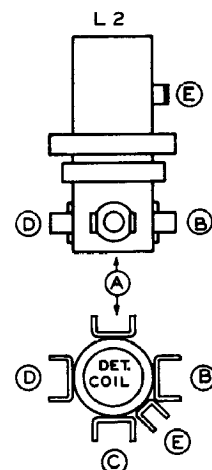
6SQ7GT
DET.-AMP.

6K6GT
PWR.-AMP.



NOTE:
USE ONLY ZENITH NON-INDUCTIVE
ELECTROLYTIC CONDENSER FOR
REPLACEMENT.

IF ANY OTHER TYPE OF ELECTROLYTIC
IS USED, IT WILL BE NECESSARY TO
ADD PARTS SHOWN IN DOTTED LINES.



ON TRIPLE CAPACITORS LEADS
LINE UP ACCORDING TO THE
PART NUMBER AS SHOWN.

ALL VOLTAGES MEASURED FROM COMMON
RETURN TO POINTS INDICATED WITH AN
A.C., D.C. OR VACUUM TUBE VOLTMETER

ALL VOLTAGES ARE D.C. UNLESS
OTHERWISE SPECIFIED

ALL RESISTORS $\pm 20\%$ TOLERANCE
UNLESS OTHERWISE SPECIFIED

DENOTES CHASSIS

I.F. FREQUENCY 455K.C.

TUNING RANGE
535 — 1620K.C.

MODEL 7R887
CHASSIS 7E22

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE	PART NO.	REF. NO.	DESCRIPTION	PRICE	PART NO.	REF. NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY											
26-402		DIAL SCALE	\$.40	63-1778	R16	680 OHM . . . (INSULATED)	1/2W.	93-125		#6 INT. SHAKEPROOF LOCKWASHER	
59-213		DIAL POINTER	.30	63-1785	R18	1000 OHM . . . (INSULATED)	1/2W.	93-392		#1206 (2 USED)	\$0.31C
76-501		TUNING CONTROL SHAFT	.25	63-1792	R15	1500 OHM . . . (INSULATED)	1/2W.			3/32" X 33/64" X 1" BROWN FELT	
188-33		DIAL LIGHT SOCKET	.60	63-1800	R22	2200 OHM . . . (INSULATED)	1/2W.			WASHER (2 USED)	1.20C
80-402		DIAL CORD TENSION SPRING	.03	63-1813	R17	4700 OHM . . . (INSULATED)	1/2W.			1/16" X 1.127 X 5/16" FIBRE WASHER	.65C
80-634		POINTER RETAINING SPRING	.02	63-1828	R4	10K OHM . . . (INSULATED)	1/2W.			1/16" X 13/64" X 1" STEEL WASHER	
93-690		BROWN FELT WASHER	.60	63-1842	R7	22K OHM . . . (INSULATED)	1/2W.			CAD	.04
94-371		POINTER PULLEY BUSHING (S11292)	.05	63-1855	R13	47K OHM . . . (INSULATED)	1/2W.			CONDENSER MOUNTING BUSHING	.04
100-36		DIAL LIGHT BULB - Mazda #44	.09	63-1884	R19	220K OHM . . . (INSULATED)	1/2W.			GANG CONDENSER PULLEY BUSHING	.20
188-32		RETAINING RING (TUNING SHAFT)	1.03	63-1908	R20	470K OHM . . . (INSULATED)	1/2W.			OUTPUT TRANSFORMER	2.25
188-34		RETAINING RING (POINTER PULLEY)	1.20	63-1911	R14	820 K OHM . . . (INSULATED)	1/2W.			POWER TRANSFORMER	8.50
S-11292		POINTER PULLEY & BUSHING ASSEM. (S9-213)	.16	63-1912	R1	1 MEGOHM . . . (INSULATED)	1/2W.			#6X1/4" HEX. HD. SELF TAPPING SCREW (2 USED)	.55C
S11358		DIAL CORD & EYELET ASSEM. (SHORT)	.05	63-1926	R8	2.2 MEGOHM . . (INSULATED)	1/2W.			#10X1-3/4" R.H. SELF TAPPING SCREW- Type Z	.03
S14475		PULLEY & BUSHING ASSEM.	.35	63-1950	R5	8.2 MEGOHM . . (INSULATED)	1/2W.			RECORD CHANGER MOUNTING SCREW (4 USED)	.08
S14477		DIAL PLATE & STUD ASSEM.	.70	63-1961	R11	15 MEGOHM . . (INSULATED)	1/2W.			#6X1/4" HEX. HD. SELF TAPPING SCREW	.55C
S14478		DIAL CORD & EYELET ASSEM. (LONG)	.06							#6-32-X3/8" HEX. ACORN HD. M.S.	.43C
COILS & CHOKES											
95-1091	T1	1ST. I. F. TRANSFORMER	1.95	2-133		CABINET BACK		114-128		#10X1-1/16" HEX. WASHER HD. SELF TAPPING SCREW (4 USED)	1.81C
95-1092	T2	2ND. I. F. TRANSFORMER	2.20	11-104		LINE CORD & PLUG - 7 FT. LONG.		125-17		RUBBER GROMMET (5 USED)	.03
S11163	L2	DETECTOR COIL ASSEMBLY	.71	12-886		DIAL PLATE BRACKET - R.H.		125-26		RUBBER GROMMET (2 USED)	.03
S12603	L5	PRE-AMP OSCILLATOR COIL ASSEMBLY	2.02	12-1187		DIAL PLATE BRACKET - L.H.		159-50		SNAP BUTTON-BLACK OXIDIZE FINISH (5 USED)	.01
S14195	L4	LOOP LOADING COIL ASSEMBLY	.65	15-82		PLUG CAP & INSULATOR		192-119		DIAL CRYSTAL	.25
S14654	L3	OSCILLATOR COIL ASSEMBLY	.50	19-169		RECORD CHANGER MOUNTING CLIP (4 USED)		196-81		DIAL CRYSTAL DUST GASKET	.40
CONDENSERS											
22-171	C6	.05MFD	600V.	46-697		TUNING & VOLUME CONTROL KNOB		202-602		INSTRUCTION BOOK (RADIO & PHONO)	.10
22-182	C17	.00025MFD. (or 22-1666)	.26	46-726		PHONO SWITCH KNOB		S-14004		NON-INTERMIXER RECORD CHANGER	.7
22-188	C14	.02MFD	400V.	49-636	SP-1	10" P.M. SPEAKER		S-14531		RECORD CHANGER COMPARTMENT HINGE ASSEM. (R.H.)	2.50
22-243	C15	.01MFD	400V.	54-30		208-636 CONE & VOICE COIL		S-14532		RECORD CHANGER COMPARTMENT HINGE ASSEM. (L.H.)	2.50
22-365	C18	.0001MFD	500V.	54-139		#8-32X5/16" HD. NUT-STEEL-N.P. (SPEAKER MTG.)		S-14557		RECORD CHANGER MTG. FRAME ASSEM.	3.50
22-458	C21	.006MFD	600V.	54-143		#3/8-32X9/16" PALNUT CAD					
22-530	C5	.12MFD	500V.	54-228		SPEED NUT (TRIM STRIP MTG.)					
22-829	C9	.05MFD	200V.	54-267		#6-32X5/16" PALNUT-STEEL-CAD. (4 USED)					
22-830	C25	.02MFD	600V.	57-1380		DIAL ESCUTCHEON					
22-854	C12	.0005MFD	600V.	70-83		#6X1/2" WASHER HD. WOOD SCREW (12 USED) (CABINET BACK)					
22-887	C20	.001MFD	600V.	72-59		#2X1/2" FLAT PHILLIPS HD. WOOD SCREW-STEEL BRASS PLATE					
22-1041	C29	.005MFD	400V.	73-35		#8-32X3/16" HEX. HD. SLOTTED SET SCREW-CUPPOINT (2 USED)					
22-1256	C26	.75MFD. (or 22-1748)	500V.	78-709		SOCKET-OCTAL TUBE					
22-1418	C28	.1MFD	200V.	78-750	P1	SOCKET-PHONO CABLE					
22-1531	C19	.2MFD	200V.	78-793		SOCKET-OCTAL TUBE (6 USED)					
22-1720	C22, 23, 24	ELECTROLYTIC 40MFD. -25V. X40-40MFD. 450V	3.85	80-504		RECORD CHANGER MTG. SPRING (4 USED)					
22-1785	C16	16MFD. ELECTROLYTIC	1.40	80-563		HINGE SPRING (2 USED)					
22-1761	C27	50MAMFD. CERAMIC	.20	83-765		ARMITE STRIP (3 USED)					
22-1772	C1	THREE GANG VARIABLE	3.50	83-1245		RECORD CHANGER TRIM STRIP					
105-16	U1	.0005 MFD - 400V		83-1501		ESCUTCHEON TRIM STRIP					
		.002 MFD - 400V		83-1521		DIAL CRYSTAL RUBBER STRIP					
		.002 MFD - 400V		85-1521		REJECT SWITCH					
RESISTORS											
63-1071	R2	10K OHM (INSULATED)	.24	85-422	S2	PHONO-RADIO SWITCH					
63-1534	R23	2700 OHM . . (INSULATED) W.W	.4W.	85-425	S1	.032 X 144 X 3/8" STEEL WASHER-N.P. (3 USED)					
63-1222	R21	470 OHM . . . (INSULATED) W.W	.24	93-35							
63-1571	R12	6800 OHM . . (INSULATED)	.33								
63-1648	R9	VOLUME CONTROL & SWITCH	1.81								
63-1758	R3	220 OHM . . . (INSULATED)	.21								

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

MODEL 7R887
CHASSIS 7E22

TO THE SERVICE MAN:

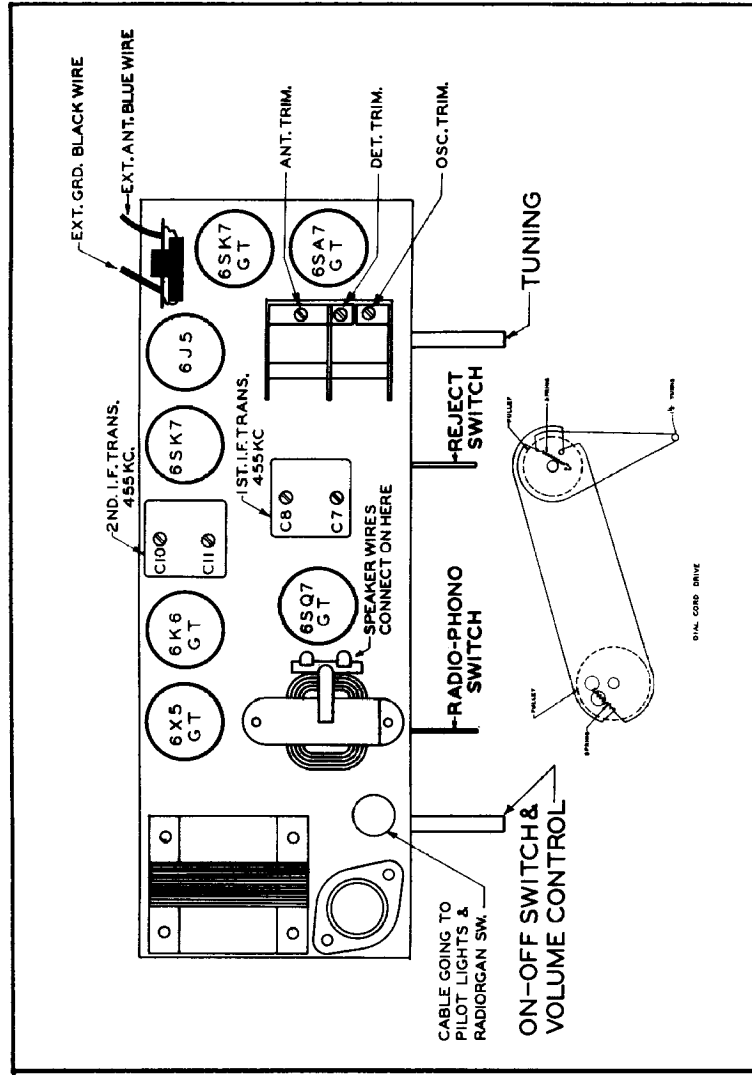
A feature of chassis 7E22 is a high gain tuned R.F. stage ahead of the conventional superheterodyne circuit.

When making repairs or adjustments on the chassis be sure to have the Phono-Radio switch in Radio position (button out).

The Radiogran tone control is of the low impedance type in which a portion of the audio voltage is taken from the speaker voice coil and fed back out of phase into the grid of the first audio. The characteristic of the feedback voltage is determined by the setting of the Radiorgan buttons. To attenuate the high notes, more highs are fed back. To attenuate the low notes, more lows are fed back. For normal reproduction, both highs and lows are fed back and results in no overall change in tone.

The 6SK7 1st IF tube is also the phono pre-amplifier. The output from the phono oscillator is fed to the grid of the 6SK7 through R13 and C25. The amplified output is taken from the screen grid and fed back through U1 and C14 into the volume control circuit and the grid of the 6SQ7GT 1st audio amplifier.

MODEL 7R887 CHASSIS 7E22



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C-7, C-8 C-10, C-11	Align I. F.
2	One turn loop loosely coupled to the wavemagnet	--	1600 Kc.	1600 Kc.	Oscillator Trimmer	Set Oscillator to Dial Scale
3		--	1400 Kc.	1400 Kc.	Detector Trimmer	Align Det.
4		--	1400 Kc.	1400 Kc.	Antenna Trimmer	Align Ant.



MODEL 8G005 CHASSIS 8C40

TO THE SERVICE MAN:

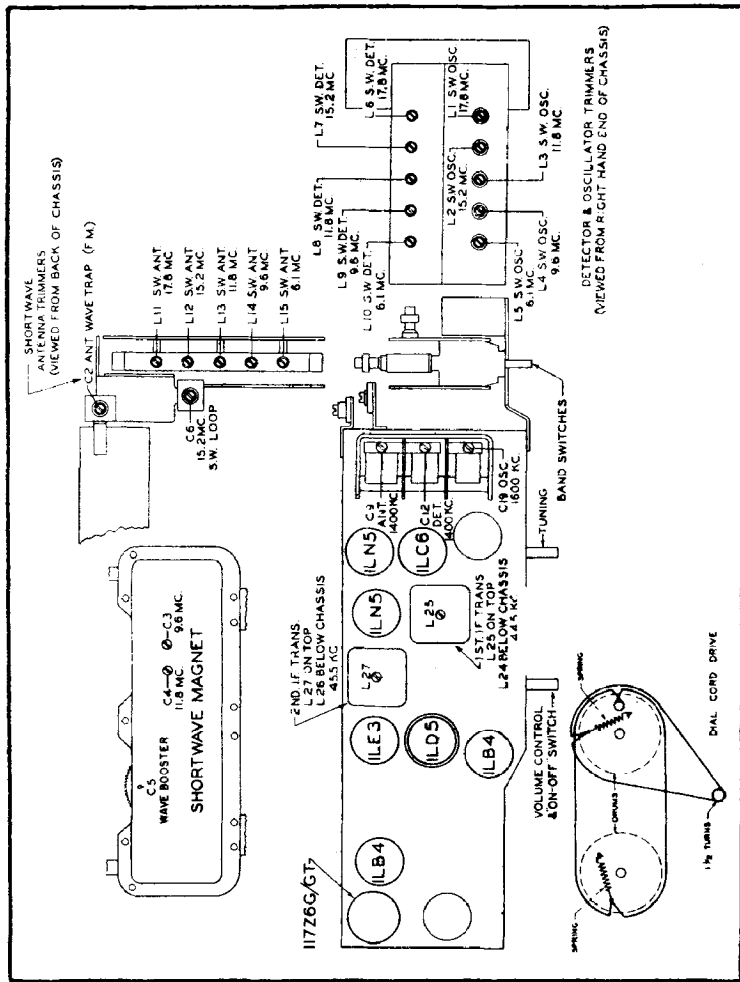
Chassis 8C40 features a high gain tuned RF stage ahead of a conventional superheterodyne circuit with band spread tuning on the 49, 31, 25, 19 and 16 meter bands.

The audio amplifier used in chassis 8C40 features phase inversion and push-pull power output.

If removal of the chassis from the cabinet ever becomes necessary this should be done with care.

The alignment of chassis 8C40 is conventional. However, care must be exercised when making adjustments, and the alignment procedure must be followed exactly. Set the chassis over a metal plate approximately the same distance the battery pack is from the bottom of the chassis when it is in the cabinet. This procedure will introduce the approximate amount of metal in the field of the RF and oscillator coils as when the chassis is in the cabinet. A signal generator of reasonable accuracy and good attenuation must be used. An output meter (AC) of the copper oxide rectifier type with a range of 1 to 30 volts in several steps is necessary to get accurate output readings. Alignment wrenches should be of the non-metallic type, especially when making adjustments at the higher frequencies.

When reinstalling the chassis in the cabinet be careful not to disturb the cabling between the short wave coil assembly and chassis. Tune in a weak broadcast signal near 1400 Kc. and touch up trimmer C9. This will insure maximum performance after alignment.



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

OPERATION	CONNECT	DUMMY INPUT SIG.	BAND	SET DIAL AT	TRIMMERS	PURPOSE
1	Oscillator to Converter	Grid	BC	800 Kc.	L-24, 25, 26, 27	Align I. F.
2	Grid		BC	1600 Kc.	C-19	Set Oscillator to Scale
3	One Turn Loop Coupled Loosely to Broadcast Wavemagnet		BC	1400 Kc.	C-12	Alignment of Detector Sec.
4			BC	1400 Kc.	C-9	Alignment of B.C. Wavemagnet
5*			49 Met.	6.1 Mc.	L-5, L-10, L-16	
6*			31 Met.	9.6 Mc.	L-4, L-9, L-14	
7*	3 Feet of wire Approx. 1 foot from Extended Waverod		25 Met.	11.8 Mc.	L-8, L-13	Alignment of S.W. Antenna, Detector and Oscillator
8*			19 Met.	15.2 Mc.	L-2, L-7, L-12	
9*			16 Met.	17.8 Mc.	L-1, L-6, L-11	
10	One Turn Loop Coupled Loosely to Shortwave Magnet, Waverod		19 Met.	15.2 Mc.	C-5, C-6	
11			25 Met.	11.8 Mc.	C-4	
12			31 Met.	9.6 Mc.	C-3	
13	When Receiving Normal Transmissions on the 49, 31, 25, 19 or 16 Meter Bands, if FI Interference is Experienced Adjust Wave Trap Trimmer C-2 for Minimum Response of the Interfering Signal.					Alignment of Short-wave Magnet

*NOTE: Rock tuning Condenser when Making Alignment Under Operations 5, 6, 7, 8 and 9.

PARTS LIST

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 8G005YT (Z1) — 8G005YT (Z2) **CHASSIS 8C40T (Z1) — 8C40T (Z2)**

TO THE SERVICE MAN:

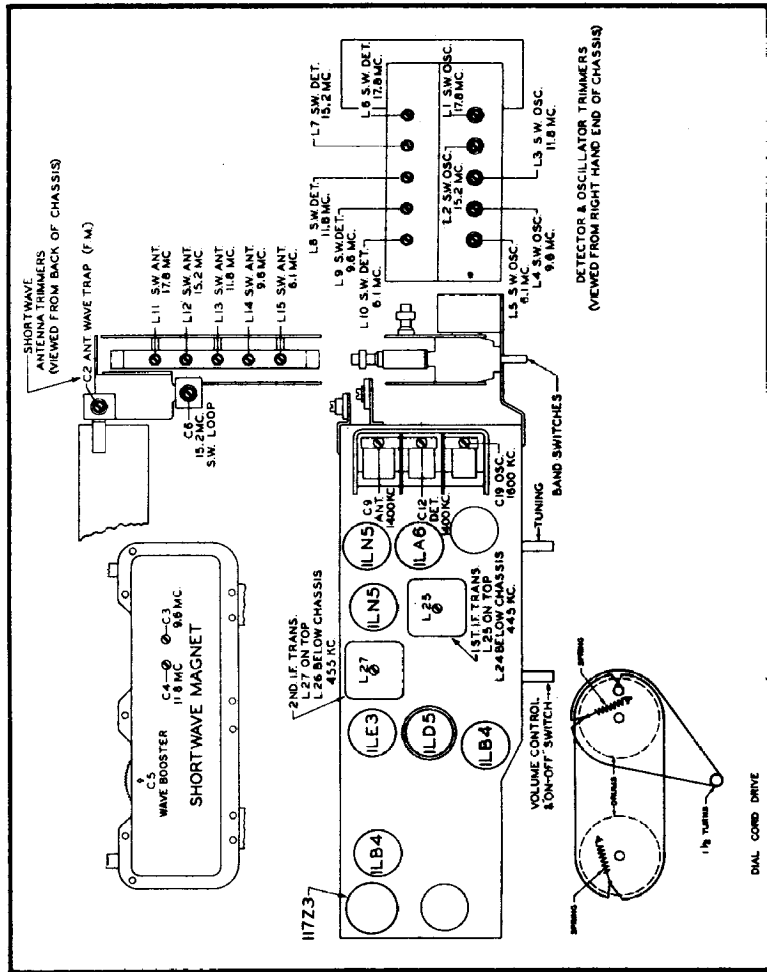
Chassis 8C40T (Z1) and 8C40T (Z2 Special Weather Band) feature a high gain tuned RF stage ahead of a conventional super-heterodyne circuit with band spread tuning on the 49, 31, 25, 19, and 16 meter bands.

The audio amplifier used in these chassis features phase inversion and push-pull power output.

If removal of the chassis from the cabinet ever becomes necessary this should be done with care.

The alignment of these chassis is conventional. However, care must be exercised when making adjustments, and the alignment procedure must be followed exactly. Set the chassis over a metal plate approximately the same distance the battery pack is from the bottom of the chassis when it is in the cabinet. This procedure will introduce the approximate amount of metal in the field of the RF and oscillator coils as when the chassis is in the cabinet. A signal generator of reasonable accuracy and good attenuation must be used. An output meter (AC) of the copper oxide rectifier type with a range of 1 to 30 volts in several steps is necessary to get accurate output readings. Alignment wrenches should be of the non-metallic type, especially when making adjustments at the higher frequencies.

When reinstalling the chassis in the cabinet be careful not to disturb the cabling between the short wave coil assembly and chassis. Tune in a weak broadcast signal near 1400 Kc. and touch up trimmer C9. This will insure maximum performance after alignment.



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING **ALIGNMENT PROCEDURE**

OPERATION	CONNECT OSCILLATOR TO ANTENNA	DUMMY GRID	INPUT SIG. FREQUENCY	BAND	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.1 mfd.	455 Kc.	BC	600 Kc.	L-24, 25, 26, 27	Align I. F.
2	One Turn Loop Coupled Loosely to Broadcast Wavemagnet		1600 Kc.	BC	1600 Kc.	C-19	Set Oscillator to Scale.
3			1400 Kc.	BC	1400 Kc.	C-12	Alignment of Detector Sec.
4			1400 Kc.	BC	1400 Kc.	C-9	Alignment of B. C. Wavemagnet
5*	For 8C40T (Z2)		6.1 Mc.	49 Met.	6.1 Mc.	L-5, L-10, L-15	Alignment of S.W. Antenna, Detector and Oscillator
6*	3 Feet of Wire.		9.6 Mc.	31 Met.	9.6 Mc.	L-4, L-3, L-14	
7*	Approx. 1 foot from Extended Wavetod		11.8 Mc.	25 Met.	11.8 Mc.	L-3, L-8, L-13	
8*			15.2 Mc.	19 Met.	15.2 Mc.	L-2, L-7, L-12	
9*			17.8 Mc.	16 Met.	17.8 Mc.	L-1, L-6, L-11	
10	One Turn Loop Coupled Loosely to Shortwave Magnet, Wavetod Collapsed.		15.2 Mc.	19 Met.	15.2 Mc.	C-5, C-6	Alignment of Short-wave Magnet.
11			11.8 Mc.	25 Met.	11.8 Mc.	C-4	
12			9.6 Mc.	31 Met.	9.6 Mc.	C-3	
13	When Receiving Normal Transmission on the 49, 31, 25, 18 or 16 Meter Bands, if FM Interference is Experienced Adjust Wave Trap Trimmer C-2 for Minimum Response of the Interfering Signal.						

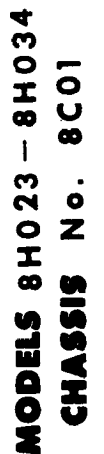
* NOTE: Rock Tuning Condenser When Making Alignment Under Operations 5, 6, 7, 8 and 9.

PARTS LIST FOR 8C40T (Z1)

PART NO.	DESCRIPTION	PRICE	PART NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY					
26-398	Dial Scale.		22-1739	150 Mmf.	
59-155	Dial Pointer.	.82	22-1740	150 Mmf. Silver on Ceramic	
59-195	"On-off" Indicator.		22-1744	.05 Mfd.	
76-415	Tuning Control Shaft.	.15	63-591	22 MOhm (R1) 1/4 Watt	.09
80-69	Drive Cord Tension Spring		83-1073	Dual Pin Jack Terminal.	.18
80-553	Indicator Tension Spring.		85-409	Band Selector Switch. (S3)	
188-32	Retaining Ring.	1.03C	85-225	Short Wave Switch	1.00
S11202	Drive Pulley and Rivet Assem. (on Gang)	.38	85-335	Antenna Switch.	
S11204	Dial Drive Cord and Eyelet Assem.	.06	S14398	16M Osc. Coil Assem. (L1)	
S11205	Pointer Pulley Cord and Eyelet Assem.	.05	S14399	19M Osc. Coil Assem. (L2)	
S11206	Pointer Drive Shaft and Pulley Assem.	.38	S14400	25M Osc. Coil Assem. (L3)	
S11207	Indicator Lever and Bushing Assem.	.19	S14401	31M Osc. Coil Assem. (L4)	
COILS AND CHOKES (CHASSIS)					
95-912	1st I.F. Transformer (T1)	3.45	S14402	49M Osc. Coil Assem. (L5)	
95-913	2nd I.F. Transformer (T2)	4.40	S14115	16M R.F. Coil Assem. (L6)	
S11210	Detector Coil Assem. (L20)	1.48	S14116	19M R.F. Coil Assem. (L7)	
S14404	Oscillator Coil Assem. (L23)		S14117	25M R.F. Coil Assem. (L8)	
S11821	Wave Trap Coil Assem. (L17)	.20	S14118	31M R.F. Coil Assem. (L9)	
S11822	R.F. Choke Coil Assem. (L22)	.30	S14119	49M R.F. Coil Assem. (L10)	
S14403	Choke Coil Assem. (L21)		S14120	16M Antenna Coil Assem. (L11)	
S11952	R.F. Shunt Coil Assem. (L28)	.20	S14121	19M Antenna Coil Assem. (L12)	
CONDENSERS (CHASSIS)					
22-147	500 Mmf. (C22) 600 V.	.26	S14122	25M Antenna Coil Assem. (L13)	
22-470	150 Mmf. (C26) 600 V.	.20	S14123	31M Antenna Coil Assem.	
22-805	.004 Mfd. (C27) 600 V.	.20	S14124	49M Antenna Coil Assem.	
22-811	.01 Mfd. (C24) 600 V.	.20	S14405	Frequency Band Switch & Coil Assem.	
22-813	.02 Mfd. (C20) 200 V.	.20	S11591	Antenna Loading Coil Assem. (L19)	.28
22-817	.05 Mfd. (C10) 200 V.	.20	S14471	Switch Mtg. Bracket and Socket Assem.	
22-818	.05 Mfd. (C29) 400 V.	.20	CABINET - WAVEMAGNET AND ANTENNA PARTS		
22-820	.1 Mfd. (C21) 200 V.	.23	14-905	Model 005Y Cabinet (Less Esc. and Front Panel)	28.50
22-953	.0002 Mfd. (C25) 600 V.	.16	17-61	Shortwave Tube Retaining Clamp (2 Used)	.04
22/1063	.001 Mfd. (C23) 600 V.	.20	17-67	Telescopic Ant. Rod Retaining Clamp (1 Used)	.08
22-1234	Dry Electrolytic - 40 Mfd. - 150 V. x 200 Mfd. - 10 V. (C33 and C34)	1.92	36-27	Cabinet Handle (Includes 36-28 Insert)	.64
22-1373	Three Gauge Variable (C1)	5.00	40-29	Back Cover Hinge (2 Used)	.10
22-1390	500 Mmf. (C7) 600 V.	.26	S11247	Front Cover Hinger (Right)	.35
22-1391	250 Mmf. (C8) 600 V.	.26	S11249	Front Cover Hinge (Left)	.35
22-1425	Ceramic Trimmer (Wave Trap) (C2)	.27	46-539	Band Sw. Knob (16M)	.10
22-1426	Dry Electrolytic - 40 x 20 x 10 Mfd. - 150 V. (C30, C31 and C42)	1.60	46-540	Band Sw. Knob (19M)	.10
22-1430	.05 Mfd. (C13) 200 V.	.20	46-541	Band Sw. Knob (25M)	.10
22-1437	.01 Mfd. (C28) 200 V.	.20	46-542	Band Sw. Knob (31M)	.10
RESISTORS (CHASSIS)					
63-238	1M Ohm (R15) 1/4 Watt 10%	.09	46-543	Band Sw. Knob (49M)	.10
63-245	1500 Ohm (R8) 1/4 Watt	.09	46-544	Band Sw. Knob (EC)	.10
63-271	1 Megohm (R2) 1/4 Watt	.09	46-545	Telescopic Ant. Knob.	.12
63-583	1M Ohm (R9) 1/4 Watt	.09	46-546	Tuning and Vol. Control Knob.	.18
63-585	2200 Ohm (R3) 1/4 Watt	.09	57-1052	Cabinet Front Panel	2.40
63-590	15M Ohm (R4) 1/4 Watt	.09	57-1053	Front Panel Escutcheon (Trans-Oceanic)	2.50
63-591	22M Ohm (R1) 1/4 Watt	.09	58-131	Three Prong Plug (S. W. Wavemagnet)	.05
63-592	33M Ohm (R16) 1/4 Watt	.09	83-1122	Push Button Felt Strip.	.02
63-600	2.2 Megohm (R5) 1/4 Watt	.09	93-684	Black Felt Washer (Large) (For Vol. and Tun. Knobs)	.01
63-602	4.7 Megohm (R10) 1/4 Watt	.09	93-721	Black Felt Washer (Small) (For Vol. and Tun. Knobs)	.01
63-654	180M Ohm (R7) 1/4 Watt	.09	110-107	Grille Cloth.	.15
63-771	120M Ohm (R13) 1/4 Watt (Insul.)	.19	114-197	# 10 x 3/4 Hex Washer Hd. Slotted S. T. Screw.	.02
63-1042	1 Megohm (R14) 1/4 Watt (Insul.)	.19	139-57	Baffle Board.	.05
63-1093	15 Megohm (R12) 1/4 Watt	.21	156-22	Door Latch - Upper Half	.87
63-1226	1220 Ohm (R17) 1/2 Watt	.21	156-23	Door Latch - Lower Half	.87
63-1343	Candohm (or 63-1359) (R19 and R20)	.63	157-7	Strike Fastener - Rear Door (Male)	.08
63-1344	Volume Control and Switch (R11)	1.81	157-12	Strike Fastener - Rear Door	.03
63-1567	56 Ohm W.W.		159-48	Snap Button (2 Used) (Also used on S10862)	.02
MISCELLANEOUS (CHASSIS)					
11-104	Line Cord and Plug.		159-49	Snap Button (2 Used) (Also used on S10862 and S11246)	.01
15-51	Battery Cable Plug Cap.		188-47	Handle Ring (2 Used)	.02
44-17	Phono Jack (J1)	.24	192-87	Dial Crystal.	.42
49-517	5/8 P.M. Speaker	9.00	202-579	Instruction and Log Book.	.75
73-8	Set Screw (Gang Drive Pulley)		S10862	Wavemagnet Cable Assem. (B. C.)	1.08
78-229	Socket Electrolytic	.03	S10865	Wavemagnet Suction Cup Assem. (or S12528)	.14
78-543	Socket Femal Battery (4 Contact)		S10867	Wavemagnet Snap Fastener (Front Cover) (Small)	.13
78-563	Socket Wavemagnet Plug.		S12382	Wavemagnet Snap Fastener (Front Cover) (Large)	.33
78-956	Socket Local Tube (5 Used)		S11246	Broadcast Wavemagnet Assem. (Type 27A) (L16)	3.43
78-803	Socket Local Tube (2 Used)		S11251	Telescopic Antenna Assem. (Complete)	7.85
78-781	Socket Miniature Tube		S11562	Short Wave Wavemagnet Assem. (L18)	2.71
85-332	Tone Switch (S4)	.75	S11586	Release Assem. for Telescopic Ant	.50
85-333	Power Change - Over Switch (S5)	.82	PARTS LIST 8C40T (Z2)		
126-379	Tube Shield	.07	SAME AS PARTS LIST FOR 8C40T (Z1)		
S14181	Adaptor Plate and Socket Assem.		EXCEPT:		
FREQUENCY BAND SWITCH AND COIL ASSEM.					
22-1390	500 Mmf. (C7) 600 V.	.26	OMIT	Dial Scale.	
22-1391	250 Mmf. (C8) 600 V.	.26	26-398	49M R.F. Coil Assembly.	
22-1392	25 Mmf. (C15) 500 V.	.33	S14119	49M Ant. Coil Assem.	
22-1415	Ceramic Trimmer (C6)	.22	S14124	49M Osc. Coil Assem.	
22-1437	.01 Mfd. (C28) 200 V.	.20	S14402	Frequency Band Switch and Coil Assembly	
22-1329	Short Wave Antenna Trimmer.		S14405		
ADD					
22-1390	500 Mmf. (C7) 600 V.	.26	26-400	Dial Scale.	
22-1391	250 Mmf. (C8) 600 V.	.26	202-609	Instruction Book Supplement	
22-1392	25 Mmf. (C15) 500 V.	.33	S14599	Frequency Band Switch and Coil Assembly	
22-1415	Ceramic Trimmer (C6)	.22	S14601	Osc. Coil Assem.	
22-1437	.01 Mfd. (C28) 200 V.	.20	S14602	R.F. Coil Assem.	
22-1329	Short Wave Antenna Trimmer.		S14603	Antenna Coil Assem.	

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

25M-4/48-CPC



DENOTES CHASSIS

ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.

PARTS LIST

PART NO.	DIAL ASSEMBLY	PRICE
26-326	DIAL SCALE.....	.50
76-441	TUNING CONTROL SHAFT.....	.20
78-600	DIAL LIGHT SOCKET & WIRE.....	.80
80-402	DIAL CORD TENSION SPRING.....	.03
80-444	TUNER ARM TENSION SPRING.....	.05
80-445	TUNER ARM PRESSURE SPRING.....	.10
100-67	DIAL LIGHT BULB.....	.10
188-30	RETAINING RING.....	1.20C
188-34	RETAINING RING (USED ON S-10953).....	1.20C
S-10945	DIAL MTG. PLATE & STUD ASSEM.....	.63
S-10953	POINTER & PULLEY ASSEM. (59-148).....	.40
S-11357	POINTER PULLEY CORD & EYELET ASSEM.....	.05
S-11358	DRIVE PULLEY CORD & EYELET ASSEM.....	.05
S-11810	TONE CONTROL SW. ARM & SLEEVE ASSEM.....	.25
S-12238	TUNER ARM & SPRING ASSEM.....	.90
S-12239	TUNING COND. PULLEY & CAM ASSEM.....	.36

COILS AND CHOKES

S-8326	WAVE TRAP COIL ASSEM. (L5).....	.28
S13564	B. C. DETECTOR COIL ASSEM. (L4).....	.47
S-11157	B. C. OSCILLATOR COIL ASSEM. (L6).....	.53
S-12249	1ST. I. F. TRANSFORMER ASSEM. (T1).....	3.47
S-13571	2ND I. F. TRANSFORMER ASSEM. (T2).....	3.72
S-12252	DISCRIMINATOR TRANSFORMER ASSEM. (T4).....	2.78
S-11256	A. C. LINE CHOKE COIL ASSEM. (L8).....	.35
S-12257	F. M. ANTENNA COIL ASSEM. (L2).....	.44
S-12258	F. M. DETECTOR COIL ASSEM. (L3).....	.45
S-12259	F. M. OSCILLATOR COIL ASSEM. (L7).....	.33
S-12488	3RD I. F. TRANSFORMER ASSEM. (T3).....	4.38

CONDENSERS

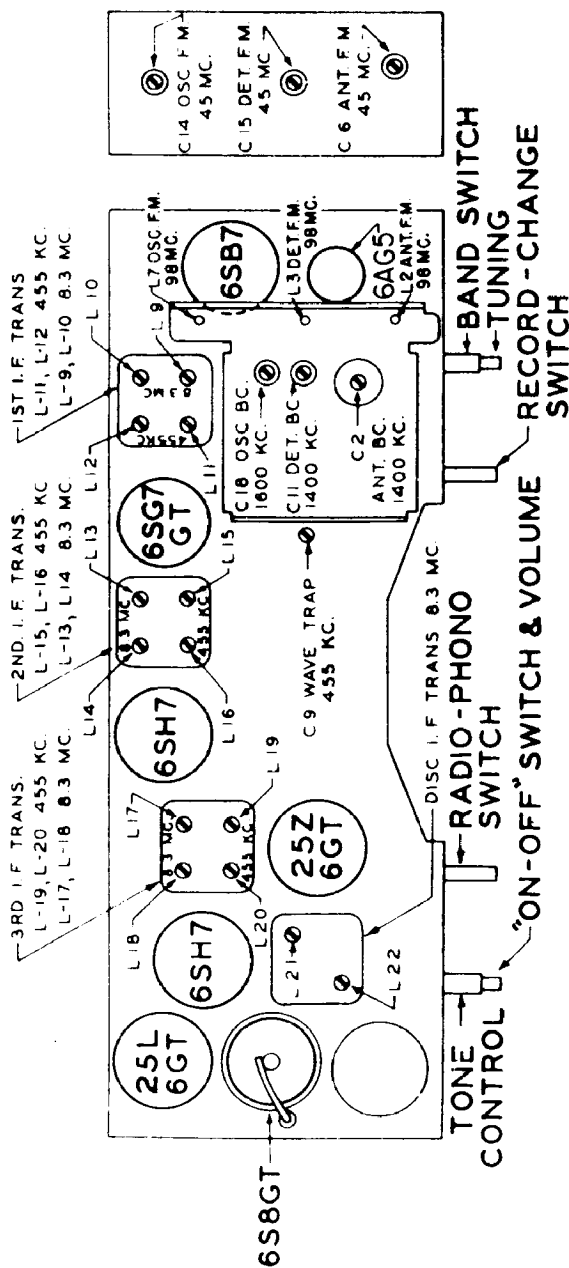
22-162	100 MMFD. (C10).....	600 V.	.20
22-182	250 MMFD. (C12).....	600 V.	.26
22-196	.01 MFD. (C22).....	600 V.	.20
22-288	.003 MFD. (C28).....	600 V.	.20
22-829	.05 MFD. (C19).....	200 V.	.20
22-830	.02 MFD. (C25).....	600 V.	.20
22-1017	.05 MFD. (C32).....	200 V.	.20
22-1127	.02 MFD. (C27).....	400 V.	.20
22-1138	500 MMFD. (C24).....	600 V.	.20
22-1359	THREE GANG VARIABLE (C1).....		5.50
22-1366	DRY ELECTROLYTIC - 40 X 40 MFD. 150 V. X 40 MFD. - 25 V. (C29, C30 & C31).....		1.70
22-1367	50 MMFD. (C16).....	500 V. (CERAMIC).....	.33
22-1385	.01 MFD. (C3).....	200 V.	.20
22-1386	.02 MFD. (C20).....	200 V.	.20
22-1388	TRIMMER (WAVE TRAP) (C9).....		.35
22-1439	.001 MFD. (C21).....	200 V.	.20
22-1485	TRIMMER (F. M. ANT.) (C6).....		.45
22-1486	TRIMMER (F. M. DET.) (C15).....		.45
22-1488	100 MMFD. (C4).....	300 V.	.28
22-1489	10 MMFD. (C8).....	500 V. (SILVER ON CERAMIC).....	.23
22-1490	18 MMFD. (C13).....	500 V. (SILVER ON CERAMIC).....	.32
22-1491	20 MMFD. (C5).....	500 V. (SILVER ON CERAMIC).....	.27
22-1513	50 MMF. CERAMIC (C17).....		
22-1509	52 MMF. CERAMIC (C33).....		.33
22-1531	.2 MFD. (C26).....	200 V.	.20
22-1646	TRIMMER (F.M.OSC) (C14).....		
22-1635	20 MFD. ELECTRO 150 V. (C23).....		

RESISTORS

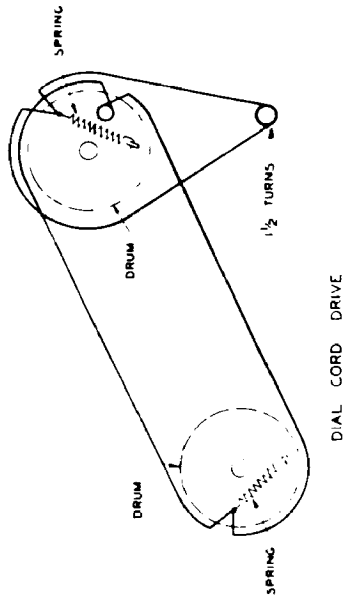
63-296	220 M (R11).....	$\frac{1}{4}$ W.	.09
63-445	100 M OHM (R12).....	$\frac{1}{4}$ W INSL.	.19
63-579	220 OHM (R7).....	$\frac{1}{4}$ W.	.09
63-582	680 OHM (R2).....	$\frac{1}{4}$ W.	.09
63-583	1000 OHM $\frac{1}{4}$ W (R22).....		
63-586	3300 OHM (R9).....	$\frac{1}{4}$ W.	.09
63-593	47M OHM (R8).....	$\frac{1}{4}$ W.	.09
63-597	470M OHM (R17).....	$\frac{1}{4}$ W.	.09

MODELS 8H023-8H034
CHASSIS No. 8C01

MODELS 8H023 - 8H034 **CHASSIS No. 8C01**



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING



TO THE SERVICE MAN:

The 8C01 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands. When adjustments are made on the 8C01 or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformer are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool (fiber screw driver) or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustments the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'s. Observe the same precautions when making adjustments. The second 8.3 Mc If Stage is overcoupled. Overcoupling gives a wide band pass with good sensitivity. When an overcoupled stage is aligned with an unmodulated signal, the stage must be loaded. A 300 ohm carbon resistor soldered across the secondary of the second IF transformer provides satisfactory load for this circuit. The resistor leads must be kept short to reduce the distributed capacity of the circuit.

When aligning a loaded stage, it will be found that considerable signal from the generator will be required, and that it will tune broadly. **THE LOAD RESISTOR MUST BE REMOVED AFTER ALIGNMENT.**

If the signal generator used does not have sufficient output to overcome the temporary loss caused by the load resistor, the load resistance may be increased or the signal fed into the preceding stage.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 6) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when this meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 8 on Converter Tube 6SE7 Socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L-11,12,15,16, 19 and 20	Align I.F. channel for maximum output
2	Pin 1 on R.F. tube 6AG5 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	C9	Adjust wavetrap for minimum output
3	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C18	Set oscillator to dial scale
4	2 turns loosely cpld. to wavemagnet	.05 Mfd.	1400 Kc. Modulated	BC	1400 Kc.	C11 & C2	Align det. and ant. stages.
5 (a)	Pin 4 (grid) on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L21 coil slug Primary discr.	Align primary of discriminator for maximum reading
6 (b)	Pin 4 (grid) on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L22 coil slug sec. of disc.	Adjust secondary of discrimi- nator for zero reading
7 (c)	Pin 4 (grid) on 6SH7 2nd IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L17 & L18 Prim. & Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading
8 (c) (d)	Pin 4 (grid) on 6SG7 1st IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L13 & L14 primary and sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading
9 (c) (d)	Pin 8 (grid) on 6SE7 converter tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L9 & L10 Primary & Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
10 (c)	Antenna Post (Re- move line ant.)	270 ohms	98 Mc. Unmodulated	FM	98 Mc.	L7 Osc. Coil slug	Set oscillator to dial scale
11 (c)	Antenna Post (Re- move line ant.)	270 ohms	98 Mc. Unmodulated	FM		L3 & L2 Det. and RF coil slugs	Align det. and ant. stages to maximum reading
12 (c)	Antenna Post (Re- move line ant.)	270 ohms	45 Mc. Unmodulated	FM	45 Mc.	C14	Set oscillator to dial scale
13 (c)	Antenna Post (Re- move line ant.)	270 ohms	45 Mc. Unmodulated	FM	45 Mc.	C15 & C6	Align detector & ant. stages for maximum reading.

IMPORTANT: Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 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 indication on the meter.

(a) Vacuum Tube Voltmeter pin 5 on discriminator transformer to chassis (half discriminator load.)

(b) Vacuum Tube Voltmeter pin 7 on discriminator transformer to chassis (full discriminator load.)

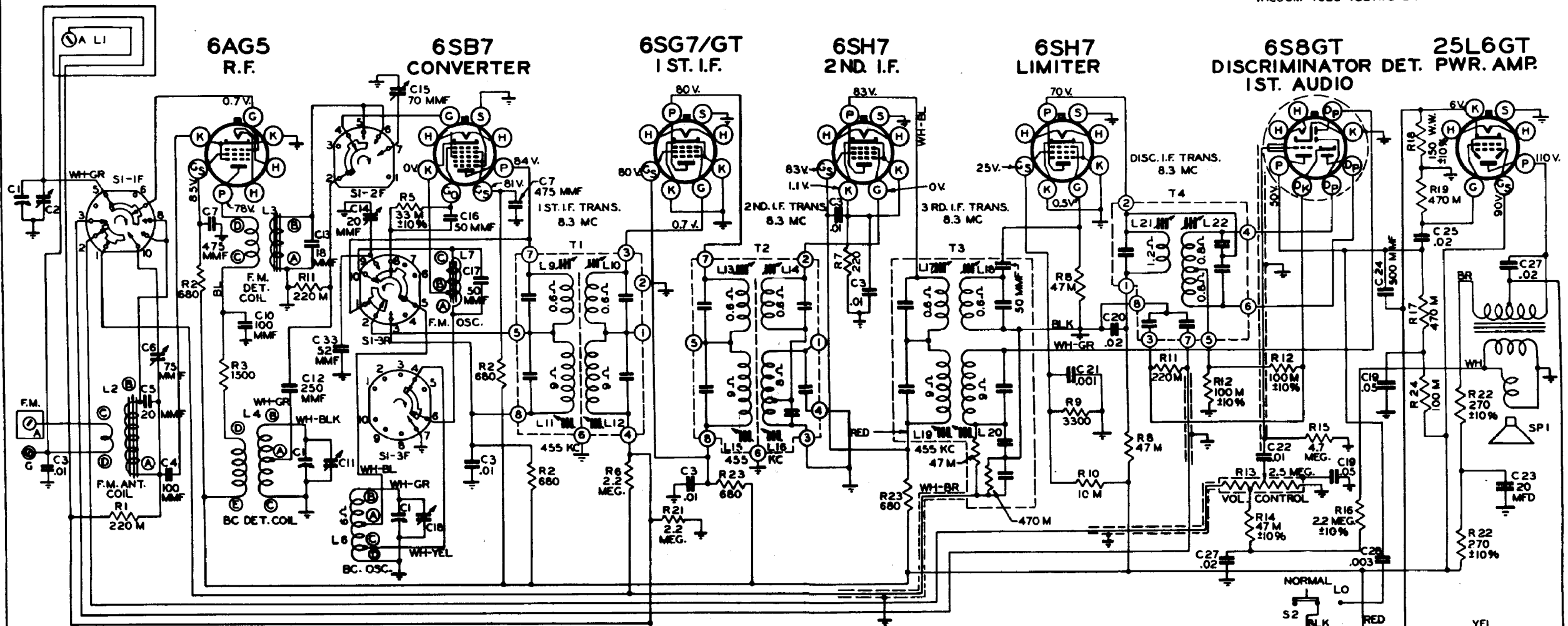
(c) Vacuum Tube Voltmeter 6SH7 limiter grid (pin 4) to chassis.

(d) 300 ohm 1/2 watt carbon resistor soldered across the secondary L14 (pin 2 and 3 of 2nd, IF trans.). The leads to the resistor must be as short as possible and the resistor removed before operation 10 is started.

ANT. 1.2X AT 600 KC 1.3X AT 98 MC 8.5X AT 600 KC 10.6X AT 98 MC 13X FROM 600 KC TO 455 KC 4X FROM 98 MC TO 8.3 MC 5.5X AT 455 KC 57X AT 8.3 MC 12X FROM 455 KC TO 400~ 34X AT 400~ 1 WATT OUTPUT

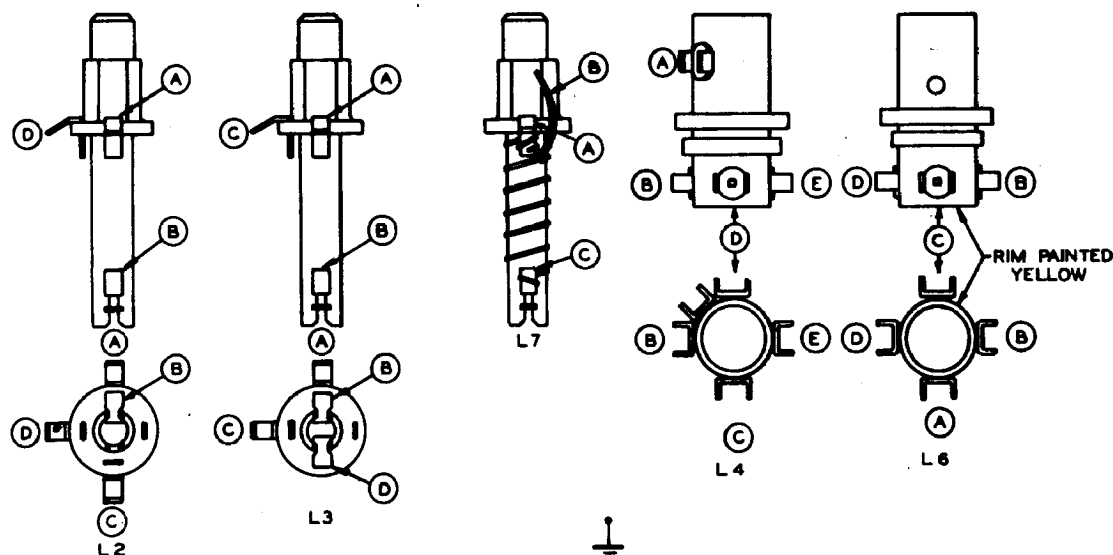
BOTTOM VIEW OF
TUBE SOCKETS.

ALL VOLTAGES MEASURED FROM
COMMON RETURN TO POINTS
INDICATED WITH AN A.C., D.C. OR
VACUUM TUBE VOLTMETER.



BAND SWITCH SI SHOWN IN STANDARD BROADCAST POSITION

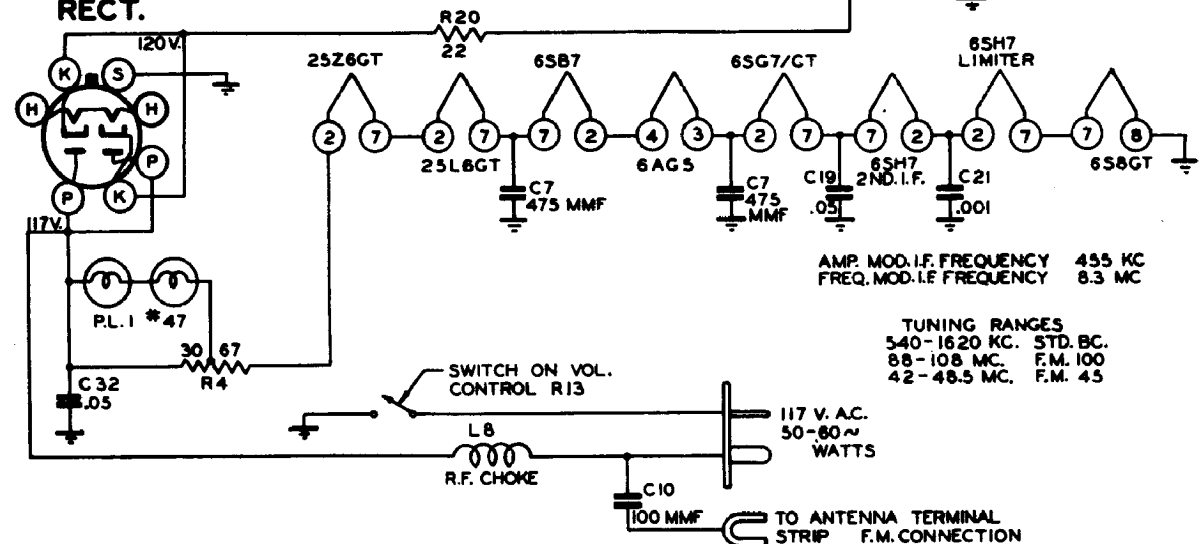
BAND SWITCH POSITIONS
1ST POSITION STD. BROADCAST
2ND POSITION F.M. 100 MC
3RD POSITION F.M. 45 MC



⊥ DENOTES CHASSIS

ALL RESISTORS 120% TOLERANCE
UNLESS OTHERWISE SPECIFIED.

25Z6GT
RECT.



AMP. MOD. I.F. FREQUENCY 455 KC
FREQ. MOD. I.F. FREQUENCY 8.3 MC

TUNING RANGES
540-1620 KC. STD. BC.
88-108 MC. F.M. 100
42-48.5 MC. F.M. 45

ALL VOLTAGES ARE D.C. UNLESS
OTHERWISE SPECIFIED.

MODELS 8H023Z - 8H034Z
CHASSIS 8C01Z

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 8 on Converter Tube 6SB7 Socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L-11,12,15,16, 19 and 20	Align I.F. channel for maximum output
2	Pin 1 on R.F. tube 6AG5 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	C9	Adjust wavetrap for minimum output
3	2 turns loosely cpd. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C18	Set oscillator to dial scale
4	2 turns loosely cpd. to wavemagnet	.05 Mfd.	1400 Kc. Modulated	BC	1400 Kc.	C11 & C2	Align det. and ant. stages.
5 (a)	Pin 4 (grid) on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L21 coil slug Primary discr.	Align primary of discriminator for maximum reading
6 (b)	Pin 4 (grid) on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L22 coil slug sec. of disc. L17 & L18	Adjust secondary of discriminator for zero reading
7 (c)	Pin 4 (grid) on 6SH7 2nd IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		Prim. & Sec. of 3rd IF trans. L13 & L14	Align 3rd IF transformer for maximum reading
8 (c)	Pin 4 (grid) on 6SG7 1st IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		primary and sec. of 2nd IF transformer L9 & L10	Align 2nd IF transformer for maximum reading
9 (c)	Pin 8 (grid) on 6SB7 converter tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		Primary & Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
10 (c) (d)	Antenna Post (Re-move line ant.)	270 ohms	98 Mc. Unmodulated	FM	98 Mc.	L7 Osc. Coil slug	Set oscillator to dial scale
11 (c) (d)	Antenna Post (Re-move line ant.)	270 ohms	98 Mc. Unmodulated	FM		L3 & L2 Det. and RF coil slugs	Align det. and ant. stages to maximum reading
12 (c)	Antenna Post (Re-move line ant.)	270 ohms	45 Mc. Unmodulated	FM		C14	Set oscillator to dial scale
13 (c)	Antenna Post (Re-move line ant.)	270 ohms	45 Mc. Unmodulated	FM	45 Mc.	C15 & C6	Align detector & ant. stages for maximum reading.

IMPORTANT: Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 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 indication on the meter.

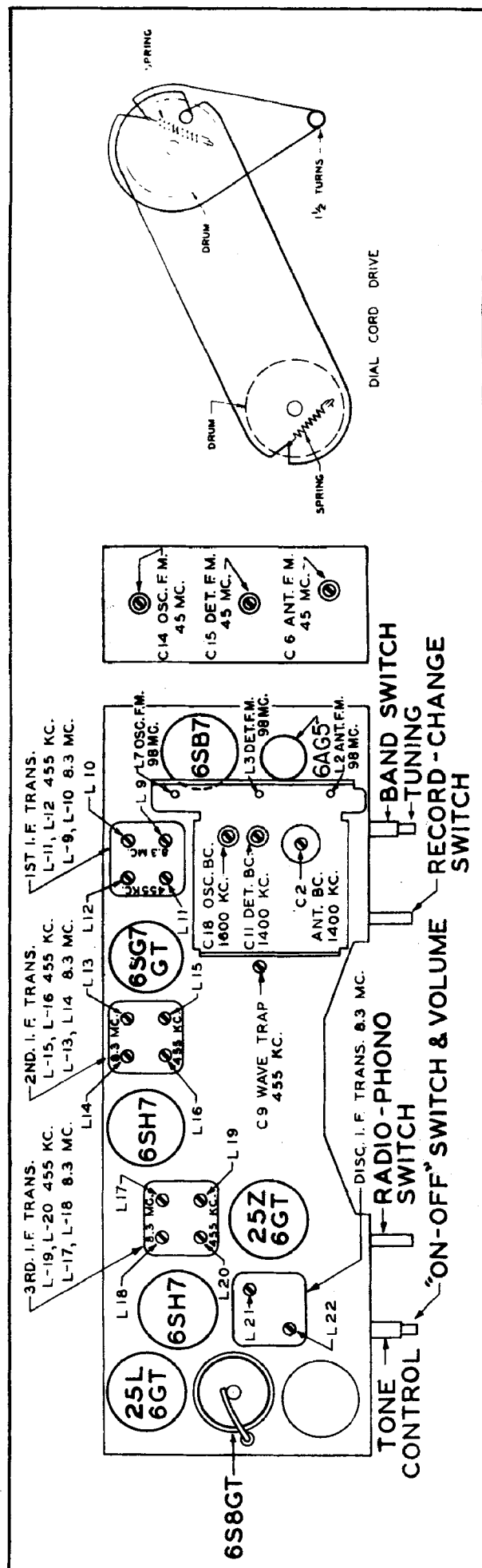
(a) Vacuum Tube Voltmeter pin 5 on discriminator transformer to chassis (half discriminator load.)

(b) Vacuum Tube Voltmeter pin 7 on discriminator transformer to chassis (full discriminator load.)

(c) Vacuum Tube Voltmeter 6SH7 limiter grid (pin 4) to chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

MODELS 8H023Z - 8H034Z **CHASSIS No. 8C01Z**



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

The 8C01Z chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands. When adjustments are made on the 8C01Z or any AC-DC chassis, a line isolation transformer (110 V input to 110 V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool (fiber screw driver) or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustments the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'s. Observe the same precautions when making adjustments.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 6) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when this meter starts to go to the left (negative) of zero will give the same results.

Part of the audio voltage from the voice coil is fed back to the first audio grid (6SB7) in phase through resistor R16 and R14 to a tap on the volume control R13. Capacitor C27 bypasses highs to ground. The overall result of this arrangement is to boost the bass tones. One side of the output transformer secondary is grounded. The side grounded determines the phase relationship of the feedback voltage, therefore, when replacing the output transformer be certain the proper end of the secondary is grounded or degeneration will result.

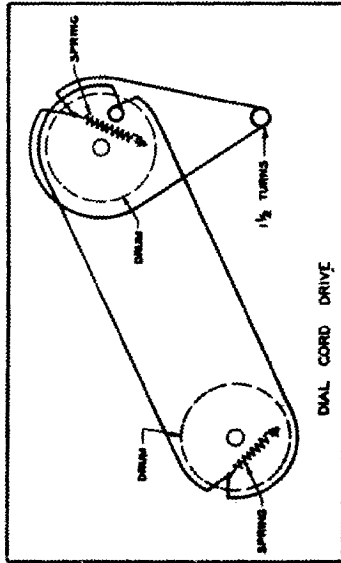
The filter circuits of chassis 8C01Z incorporate new features that should be well understood by the service man. An examination of the schematic drawing will show the output transformer tapped slightly off center. This tap is the B + connection from filter capacitor C31 off the cathode of the rectifier 25Z6GT to the 25L6GT plate. The lower connection of the output transformer feeds B + to the rest of the tubes in the receiver. Current flowing through the upper windings of the output transformer to the 25L6GT produces a magnetic field which is 180° out of phase with the magnetic field produced by current flowing in the opposite direction through the output transformer to the rest of the receiver, therefore, most of the AC hum is cancelled. Further reduction of hum is accomplished by filtering through resistors R22 and capacitor C23 and C29.

This development in filtering systems allows a higher effective plate voltage on the 25L6GT for increased power output.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 206-603 be sure to add the speaker code letter to the transformer Part Number when ordering replacements.

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY			
26-326		Dial Scale	.50
76-441		Tuning control shaft.	.20
78-600		Dial light socket & wire.	.80
80-402		Dial cord tension spring.	.03
80-444		Tuner arm tension spring.	.05
80-445		Tuner arm pressure spring	.10
100-67		Dial light bulb	.10
188-30		Retaining ring.	1.20C
188-34		Retaining ring (used on S-10953).	1.20C
S-10945		Dial mtg. plate & stud assem.	.63
S-10953		Pointer & pulley assem. (59-148).	.40
S-11357		Pointer pulley cord & eyelet assem.	.05
S-11358		Drive pulley cord & eyelet assem.	.05
S-11810		Tone control sw. arm & sleeve assem	.25
S-12238		Tuner arm & spring assem.	.90
S-12239		Tuning cond. pulley & cam assem	.36
COILS AND CHOKES			
S-8326	L5	Wave trap coil assem.	.28
S-13835	L4	B. C. detector coil assem.	.60
S-11157	L6	B. C. oscillator coil assem	.53
S-12249	T1	1st I. F. transformer assem	3.47
S-13571	T2	2nd I. F. transformer assem.. . . .	3.72
S-12252	T4	Discriminator transformer assem	2.78
S-11256	L8	A. C. line choke coil assem	.35
S-12257	L2	F. M. antenna coil assem.	.44
S-12258	L3	F. M. detector coil assem	.45
S-12259	L7	F. M. oscillator coil assem	.33
S-12488	T3	3rd I. F. transformer assem	4.38
CONDENSERS			
22-162	C10	100 mmfd. 500 Volt.	.20
22-182	C12	250 mmfd. 600 Volt.	.26
22-196	C22	.01 mfd 600 Volt.	.20
22-288	C28	.003 mfd. 600 Volt.	.20
22-829	C19	.05 mfd 200 Volt.	.20
22-830	C25	.02 mfd 600 Volt.	.20
22-1017	C32	.05 mfd 200 Volt.	.20
22-1127	C27	.02 mfd 400 Volt.	.20
22-1138	C24	500 mmfd. 600 Volt.	.20
22-1359	C1	Three gang variable	5.50
22-1366	C29, C30 & C31	Dry electrolytic - 40 x 40 mfd. 150 V. x 40 mfd. 25 V	1.70
22-1367	C16	50 mmfd 500 Volt.	.33
22-1385	C3	.01 mfd 200 Volt.	.20
22-1386	C20	.02 mfd 200 Volt.	.20
22-1388	C9	Trimmer (wave trap)	.35
22-1439	C21	.001 mfd. 200 Volt.	.20
22-1485	C6	Trimmer (F. M. ant.)	.45
22-1486	C15	Trimmer (F.M. det.)	.45
22-1488	C4	100 mmfd. 300 Volt.	.28
22-1489	C8	10 mmfd 500 Volt.	.23
22-1490	C13	18 mmfd 500 Volt.	.32
22-1491	C5	20 mmfd 500 Volt.	.27
22-1513	C17	50 mmf. ceramic	.28
22-1509	C33	52 mmf. ceramic	.33
22-1531	C26	.2 mfd. 200 Volt.	.20
22-1646	C14	Trimmer (F.M. osc).	.35
22-1635	C23	20 mfd. electro 150 Volt.	1.00
RESISTORS			
63-296	R11	220 M 1/4 Watt.	.09
63-445	R12	100 M ohm 1/4 Watt.	.19
63-579	R7	220 ohm 1/4 Watt.	.09
63-582	R2	680 ohm 1/4 Watt.	.09
63-583	R22	1000 ohm. 1/4 Watt.	.09
63-586	R9	3300 ohm. 1/4 Watt.	.09
63-593	R8	47M ohm 1/4 Watt.	.09
63-597	R17	470M ohm. 1/4 Watt.	.09



DIAL CABLE DRAWING

TUBE TRIMMER LOCATION

TO THE SERVICE MAN:

The 8C21 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands. AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool (fiber screw driver) or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustments the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'S. Observe the same precautions when making adjustments. The second 8.3 Mc IF stage is overcoupled. Overcoupling gives a wide band pass with good sensitivity. When an overcoupled stage is aligned with an unmodulated signal, the stage must be loaded. A 300 ohm carbon resistor soldered across the secondary of the second IF transformer provides a satisfactory load for this circuit. The resistor leads must be kept short to reduce the distributed capacity of the circuit.

When aligning a loaded stage, it will be found that considerable signal from the generator will be required, and that it will tune broadly. THE LOAD RESISTOR MUST BE REMOVED AFTER ALIGNMENT.

If the signal generator used does not have sufficient output to overcome the temporary loss caused by the load resistor, the load resistance may be increased or the signal fed into the preceding stage.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 6) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when this meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 8 on Converter Tube 6SB7 socket	.05 Mfd.	455 Kc.	BC	600 Kc.	L-14, 15, 18, 19, 22 and 23	Align I.F. channel for maximum output
2	Pin 1 on R.F. tube 6AG5 socket	.05 Mfd.	455 Kc.	BC	600 Kc.	C7	Adjust wavetrapp for minimum output
3	2 turns loosely cpd. to wavemagnet		1600 Kc.	BC	1600 Kc.	C9	Set oscillator to dial scale
4	2 turns loosely cpd. to wavemagnet		1400 Kc.	BC	1400 Kc.	C2 & C6	Align det. and ant. stages
5(a)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc.	FM		L-24 coil slug primary discriminator	Align primary of discriminator for maximum reading
6(b)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc.	FM		L-25 coil slug sec. of discriminator	Adjust secondary of discriminator for zero reading
7(c)	Pin 4 (grid) on 6SH7 2nd IF tube socket	.05 Mfd.	8.3 Mc.	FM		L20 & L21 Prim. & Sec. of 3rd IF transformer	Align 3rd IF transformer for maximum reading
8(c)(d)	Pin 4 (grid) on 6SC7 1st IF tube socket	.05 Mfd.	8.3 Mc.	FM		L16 & L17 Primary & Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading
9(c)(d)	Pin 8 grid on 6SB7 converter tube socket	.05 Mfd.	8.3 Mc.	FM		L12 & L13 Primary & Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
10(c)	Antenna Post (Remove line ant.)	270 Ohms	98 Mc.	FM	98 Mc.	L7 Oscillator coil slug	Set oscillator to dial scale
11(c)	Antenna Post (Remove line ant.)	270 Ohms	98 Mc.	FM	98 Mc.	L2 and L3 Det. and RF coil slugs	Align det. and ant. stages to maximum reading
12(c)	Antenna Post (Remove line ant.)	270 Ohms	45 Mc.	FM	45 Mc.	C29	Set oscillator to dial scale
13(c)	Antenna Post (Remove line ant.)	270 Ohms	45 Mc.	FM	45 Mc.	C5 and C30	Align detector & ant. stages for maximum reading

IMPORTANT: Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 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 indication on the meter.

(a) Vacuum Tube Voltmeter pin 5 on discriminator transformer to chassis (half discriminator load.)

(b) Vacuum Tube Voltmeter pin 7 on discriminator transformer to chassis (full discriminator load.)

(c) Vacuum Tube Voltmeter 6SH7 limiter grid (pin 4) to chassis.

(d) 300 ohm 1/2 watt carbon resistor soldered across the secondary L17 (pin 2 and 3 of 2nd, IF transformer. The leads to the resistor must be as short as possible and the resistor removed before operation 10 is started.

PARTS LIST

MODELS 8H032 - 8H050 - 8H050R - 8H051E - 8H052R

8H061 - 8H061G (Chassis 8C20)

PART NO.	PRICE	PART NO.	PRICE
DIAL ASSEMBLY			
26-361	DIAL SCALE.....	22-1138	500 MMFD. (C14).....600 V.. .20
59-171	DIAL POINTER.....	22-1367	50 MMFD. (C10).....500 V.. .33
76-441	TUNING CONTROL SHAFT.....	22-1368	THREE GANG VARIABLE (C1)..... 5.00
78-699	DIAL LIGHT SOCKET & WIRE.....	22-1382	DRY ELECTROLYTIC - 40 X 40 MFD.
80-402	DIAL CORD TENSION SPRING.....		450 V..
80-444	TUNER ARM TENSION SPRING.....		(C19, 20 & 21) 40 MFD.
80-445	TUNER ARM PRESSURE SPRING.....		25 V.. 3.25
100-36	DIAL LIGHT BULB.....	22-1385	.01 MFD. (C31).....200 V.. .20
149-54	F.M. TUNING IRON CORE & SPRING	22-1388	TRIMMER (85 MMFD.) (C7)..... .35
	(3 USED).....	22-1431	.001 MFD. (C8).....600 V.. .20
		22-1445	.002 MFD. (C15).....600 V..
188-30	RETAINING RING.....		(METAL CLAD)..... .87
188-34	RETAINING RING.....	22-1485	TRIMMER (90 MMFD.) (C5)..... .45
S11292	POINTER PULLEY & BUSHING ASSEM.	22-1486	TRIMMER (70 MMFD.) (C30)..... .45
S11357	POINTER PULLEY CORD & EYELET	22-1488	100 MMFD. (C26).....300 V.. .28
	ASSEM.....	22-1489	10 MMFD. (CERAMIC) (C27)..... .23
		22-1490	18 MMFD. (CERAMIC) (C28)..... .32
S11358	DRIVE PULLEY CORD & EYELET	22-1491	20 MMFD. (CERAMIC) (C25)..... .27
	ASSEM.....	22-1492	50 MMFD. (CERAMIC) (C11)..... .27
S12238	TUNER ARM ASSEM.....	22-1509	52 MMF CERAMIC (C37)..... .33
S12239	CONDENSER PULLEY & CAM ASSEM...	22-1646	20 MMFD. TRIMMER (C29).....
S12260	DIAL PLATE & STUD ASSEM.....		
		RESISTORS	
COILS & CHOKES		63-160	100 M OHM (R1).....1/4 WATT..... .10
S12253	WAVE TRAP COIL ASSEM. (L5).....	63-246	150 OHM (R15).....1/4 WATT..... .09
S11156	B. C. DETECTOR COIL ASSEM. (L4)...	63-296	220 M OHM (R10).....1/4 WATT..... .09
S11291	B. C. OSCILLATOR COIL ASSEM.	63-445	100 M OHM (R21).....1/4 WATT INSL. .19
	(L6).....	63-593	47M OHM (R9).....1/4 WATT..... .09
		63-595	100 M OHM (R13).....1/4 WATT..... .09
S12249	1ST I.F. TRANSFORMER ASSEM. (T1)...	63-597	470 M OHM (R3).....1/4 WATT..... .09
S12250	2ND I.F. TRANSFORMER ASSEM. (T2)...	63-639	6800 OHM (R2).....1/4 WATT..... .09
S12251	3RD I.F. TRANSFORMER ASSEM. (T3)...	63-648	47 M OHM. (R19).....1/4 WATT.....
S12252	DISCRIMINATOR TRANSFORMER	63-712	33 M OHM (R7).....1/4 WATT.....
	ASSEM. (T4).....	63-717	220 M OHM. (R12).....1/4 WATT INSL. .19
		63-722	2.2 MEGOHM (R6).....1/4 WATT INSL. .19
S12256	A.C. LINE CHOKE ASSEM. (L8).....	63-767	47M OHM (R8).....1/4 WATT INSL. .19
S12257	F.M. ANTENNA COIL ASSEM. (L2).....	63-803	2200 OHM (R5).....1/2 WATT..... .10
S12258	F.M. DETECTOR COIL ASSEM. (L3)...	63-976	15 MEGOHM (R14).....1/4 WATT..... .09
S12259	F.M. OSCILLATOR COIL ASSEM. (L7)...	63-1058	22 M OHM (R4).....2 WATT..... .24
S12389	ANTENNA LOADING COIL ASSEM. (L9)...	63-1099	33 OHM W.W. (R17).....1/2 WATT INSL. .24
		63-1172	100 OHM W.W. (R20).....1/2 WATT INSL. .24
		63-1222	470 OHM W.W. (R18).....1 WATT INSL. .24
		63-1225	68 M OHM W.W. (R11).....1/2 WATT INSL. .21
		63-1466	VOLUME CONTROL & SWITCH (R16).... 1.81
CONDENSERS			
22-162	.0001 MFD. (C22).....600 V.. .20	MISCELLANEOUS	
22-182	250 MMFD. (C24).....600 V.. .26	2-114	CABINET BACK (032)..... .50
22-188	.02 MFD. (C34).....400 V.. .20	11-87	LINE CORD & PLUG (8 FT.)..... .65
22-196	.01 MFD. (C33).....600 V.. .20	11-97	LINE CORD & PLUG (10 FT.)..... .95
22-288	.003 MFD. (C16).....600 V.. .20	27-87	SILVER MICA DISC (475 MMFD.)
22-448	.004 MFD. (C18).....600 V.. .20		(3 USED) (C4)..... .04
22-470	.00015 MFD. (C12).....600 V.. .20	46-522	CONTROL KNOB (DUMMY)..... .11
22-827	.1 MFD. (C17).....200 V.. .23	46-538	TUNING CONTROL KNOB..... .10
22-829	.05 MFD. (C3).....200 V.. .20		
22-830	.02 MFD. (C13).....600 V.. .20		
22-912	.002 MFD. (C36).....600 V.. .20		
22-1041	.005 MFD. (C23).....400 V.. .20		
22-1135	.005 MFD. (C35).....600 V.. .20		
22-1137	150 MMFD. (C32).....600 V.. .20		

PART NO.		PRICE
49-536	10" DYN. SPEAKER (061 & 061G) (OR 49-542).....	11.00
206-536	OUTPUT TRANS.....	2.57
207-536	FIELD COIL (NOT RE- PLACEABLE).....	---
208-536	CONE & VOICE COIL.....	3.41
49-544	6" X 9" OVAL DYN. SPEAKER (032).....	10.00
206-544	OUTPUT TRANS.....	2.57
207-544	FIELD COIL (NOT RE- PLACEABLE).....	---
208-544	CONE & VOICE COIL.....	2.63
49-564	10" DYN. SPEAKER (050-050R-051E- 052R).....	11.00
206-564	OUTPUT TRANS.....	2.57
207-564	FIELD COIL (NOT RE- PLACEABLE).....	---
208-564	CONE & VOICE COIL.....	3.41
57-1054	SPARK PLATE (3 USED).....	.10
57-1072	DIAL ESCUTCHEON (050-050R-061- 061G).....	5.25
57-1135	DIAL ESCUTCHEON (032-051E-052R).....	5.45
72-65	#2 X 5/8 FLAT HD. WOOD SCREW (ESC. MTG.).....	.66C
78-128	SOCKET - SPEAKER PLUG.....	.12
78-274	SOCKET - ELECTROLYTIC COND.....	.03
78-363	SOCKET - WAVEMAGNET PLUG.....	.07
78-439	SOCKET - MINIATURE TUBE.....	.12
78-611	SOCKET - OCTAL TUBE (8 CONTACT).....	.12
80-372	TUBE RETAINING SPRING.....	.10
85-378	BAND SWITCH (S1).....	3.00
93-168	RUBBER SHOULDER WASHER.....	.07
93-686	BAKELITE SHOULDER WASHER (3 USED ON S12335).....	.02
95-922	POWER TRANSFORMER (117 V. 50-60 CYCLE (T5).....	6.90
112-268	#6 X 7/8 R.H. SHAKEPROOF S.T. SCREW (SPK. MTG.).....	.02
114-128	#10 X 1-1/16 HEX. WASHER HD. S. T. SCREW (CHASSIS MTG).....	1.81C
114-132	#10 X 1-5/8 HEX. WASHER HD. S.T. SCREW (050R-051E-052R).....	.05
126-382	TUBE SHIELD.....	.08
159-27	PLUG BUTTON-STATUARY BRONZE (050R).....	.12
188-54	KNOB CLAMPING RING.....	.02
192-100	DIAL CRYSTAL.....	1.75
196-81	DUST GASKET (051E-052R).....	.40
202-389	INSTRUCTION BOOK.....	.06
S11558	VOLUME CONTROL KNOB ASSEM. (46-520).....	.28

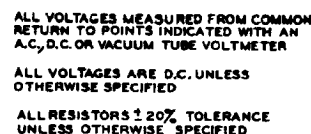
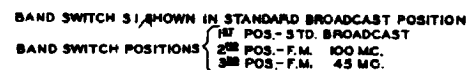
PART NO.		PRICE
S12305	BAND SW. KNOB & RING ASSEM. (46-598).....	.32
S12335	BAND SW. & SPARK PLATE COND. ASSEM.....	5.23

RADIOORGAN PARTS

57-1138	RADIOORGAN ESCUTCHEON (2 USED)....	.42
76-444	RADIOORGAN KNOB RETAINING PIN.....	.04
80-447	RADIOORGAN RETAINING SPRING.....	.05
S9595	RADIOORGAN STRIP & CONTACT ASSEM. (2 USED).....	.31
S11416	RADIOORGAN KNOB & EYELET ASSEM. (LO-BASS).....	.16
S11417	RADIOORGAN KNOB & EYELET ASSEM. (BASS).....	.16
S11418	RADIOORGAN KNOB & EYELET ASSEM. (ALTO).....	.16
S12267	RADIOORGAN BRACKET ASSEM. (2 USED).....	.72
S12286	RADIOORGAN KNOB & EYELET ASSEM. (TREBLE).....	.16
S12287	RADIOORGAN KNOB & EYELET ASSEM. (VOICE).....	.16
S12288	RADIOORGAN KNOB & EYELET ASSEM. (NORMAL).....	.16
S12289	RADIOORGAN ESCUTCHEON & KNOB ASSEM. (COMPLETE) (LO-BASS, BASS, ALTO).....	1.79
S12290	RADIOORGAN ESCUTCHEON & KNOB ASSEM. (COMPLETE) (TREBLE, VOICE, NORMAL).....	1.79

WAVEMAGNET PARTS

12-1138	WAVEMAGNET MTG. BRACKET (061 & 061G).....	.14
58-88	WAVEMAGNET THREE PRONG PLUG.....	.07
114-202	#8-32 X 1-1/8 HEX SLOTTED WASHER HD. S. T. SCREW.....	.03
S11461	WAVEMAGNET ASSEM. COMPLETE (#30B (050) (L1).....	1.00
S11589	WAVEMAGNET ASSEM. COMPLETE (#30D) (061-061G).....	4.00
S12113	WAVEMAGNET ASSEM. COMPLETE (30G) (050R).....	1.09
S12307	WAVEMAGNET ASSEM. COMPLETE (#29B) (#032).....	1.40
S12537	WAVEMAGNET ASSEM. COMPLETE (#30J) (051E-052R).....	1.36



5Y3GT
RECT.

TO ANTENNA
TERMINAL STRIP
P.M. CONNECTION

117V. A.C.
100 WATTS

SWITCH ON
VOL. CONTROL
R30

AMP. MOD. I.F. FREQUENCY 455 K.C.
FREQ. MOD. I.F. FREQUENCY 10.7 M.C.

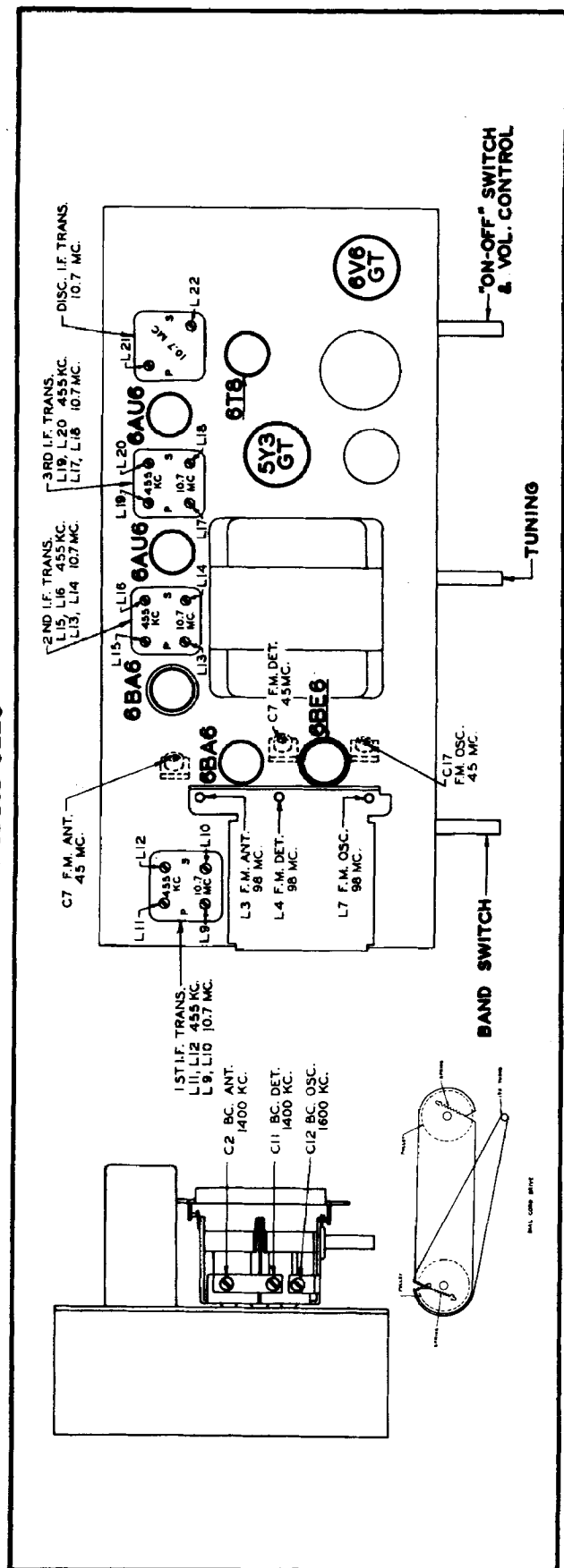
TUNING RANGES
540-1620 K.C. STD. B.C.
86- 108 M.C. F.M. 100
42- 48.5 M.C. F.M. 45

AMP. MOD.I.F.FREQUENCY 455 K.C.
FREQ.MOD.I.F.FREQUENCY 10.7 M.C.

TUNING RANGES

540-1620 K.C. STD. B.C.
88- 108 M.C. F.M. 100
42- 48.5 M.C. F.M. 45

MODELS 8H832 and 8H861 CHASSIS 8E20



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

The 8E20 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands. The Radiorgan tone control is of the low impedance type in which a portion of the audio voltage is taken from the speaker voice coil and fed back out of phase into the grid of the first audio. The characteristic of the feedback voltage is determined by the setting of the Radiorgan buttons. To attenuate the high notes, more highs are fed back. To attenuate the low notes, more lows are fed back. For normal reproduction, both highs and lows are fed back and results in no overall change in tone.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

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 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 95-1096. Be sure to add the speaker code letter to the transformer Part Number when ordering replacements.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 6BE6 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L-11, 12, 15, 16, 19 and 20.	Align I. F. channel for maximum output
2	2 turns loosely cpld. to wavemagnet.		1600 Kc. Modulated	BC	1600 Kc.	C12	Set oscillator to dial scale.
3			1400 Kc. Modulated	BC	1400 Kc.	C11 and C2	Align det. and ant. stages.
4 (a)	Pin 1 (grid) on 6AU6 Limiter	.05 Mfd.	10.7 Mc. Unmodulated	FM		L21 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)		.05 Mfd.	10.7 Mc. Unmodulated	FM		L22 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 6AU6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM		L17 and L18 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 6BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM		L13 and L14 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 6BE6 converter tube	.05 Mfd.	10.7 Mc. Unmodulated	FM		L9 and L10 Prim. and Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
9 (c)(d)		270 ohms	98 Mc. Unmodulated	FM	98 Mc.	L7 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c)(d)	FM Antenna Post (Re-move line ant.)	270 ohms	98 Mc. Unmodulated	FM	98 Mc.	L4 and L3 Det. and RF coil Slugs	Align det. and ant. stages to maximum reading.
11 (c)		270 ohms	45 Mc. Unmodulated	FM	45 Mc.	C17	Set oscillator to dial scale.
12 (c)		270 ohms	45 Mc. Unmodulated	FM	45 Mc.	C7 Det., C7 Ant.	Align detector and ant. stages for maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 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 indication on the meter.

(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter Lug 3 on 3rd IF transformer (Limiter Grid).

(d) Loosen Slugs by applying a hot iron to the cement.

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY			
26-396		Dial Scale	\$0.95
59-209		Dial Pointer	.30
76-498		Pointer Shaft	.08
76-499		Tuning Control Shaft	.25
78-797		Dial Light Socket	.30
80-69		Dial Cord Tension Spring	.02
80-209		Dial Cord Tension Spring	.03
80-444		Tuner Arm Tension Spring	.05
80-580		Tuner Arm Stop Spring	.06
80-581		Tuner Arm Pressure Spring	.10
93-721		Black Felt Dial Washer	.01
100-36	PL-1	Dial Light Bulb Mazda #44	.09
149-64		Tuning Core & Spring	.40
188-32		Retaining Ring (76-499)	1.03C
S-14254		Pointer Pulley Assembly	.25
S-14256		Pulley & Bushing Assembly	.50
S-14268		Dial Cord & Eyelet Assembly (Short)	.05
S-14269		Dial Cord & Eyelet Assembly (Long)	.06
S-14270		Dial Scale & Strip Assembly (26-396)	1.15
S-14429		Tuner Arm Assembly	.80

COILS AND CHOKES			
S-11157	L8	Broadcast Oscillator Coil Assembly	.53
S-12256	L24	A. C. Line Choke Coil Assembly	.35
S-12259	L7	F. M. Oscillator Coil Assembly	.33
S-13800	L23	Tone Choke Assembly	.60
S-13871	L4	F. M. Detector Coil Assembly	.75
S-13970	T1	1st. I. F. Transformer Assembly	2.50
S-13971	T2	2nd. I. F. Transformer Assembly	2.75
S-13972	T3	3rd. I. F. Transformer Assembly	3.00
S-13973	T4	Discriminator Transformer Assembly	2.00
S-13974	L6	Broadcast Detector Coil Assembly	1.00
S-14126	L5	R. F. Choke Coil Assembly	.35
S-14192	L3	F. M. Antenna Coil Assembly	.70

CONDENSERS			
22-171	C26	.05 MFD. 600 V.	.26
22-196	C32	.01 MFD. 600 V.	.20
22-348	C15	.001 MFD. 500 V.	.26
22-365	C24	100 MMFD. (or 22-1670)	.20
22-829	C4	.05 MFD. 200 V.	.20
22-830	C21	.02 MFD. 600 V.	.20
22-1041	C38	.005 MFD. 400 V.	.20
22-1136	C31	250 MMFD. (or 22-1745)	.20
22-1220	C20	.002 MFD. 600 V.	.20
22-1256	C28	.75 MMFD. (or 22-1746)	.20
22-1367	C14	50 MMFD. (Ceramic)	.33
22-1385	C19	.01 MFD. 200 V.	.20
22-1506	C8	22 MMFD. (Ceramic)	.33
22-1507	C22	25 MMFD. (Ceramic)	.33
22-1531	C29	.2 MFD. 200 V.	.20
22-1573	C34	40 MFD. Electrolytic	2.25
22-1669	C3	100 MMFD. (Ceramic)	.20
22-1676	C6	.001 MFD. (Ceramic)	.40
22-1678	C1	Three Gang Variable	4.35
22-1685	C7	Single Section Trimmer	.45
22-1686	C17	Single Section Trimmer	.35
22-1688	C9	19 MMFD. (Ceramic)	.30
22-1689	C13	48 MMFD. (Ceramic)	.30
22-1691	C16	55 MMFD. (Silver on Ceramic)	.30
22-1705	C5	30 MMFD. (Ceramic)	.20
22-1706	C10	.005 MMFD. (Ceramic) (Disc Type)	.30
22-1717	C18	.001 MFD. 200 V.	.20
22-1718	C27	.01 MFD. (Shielded)	.40
22-1720	C35, 36, 37	Three Section Electrolytic 40 MFD. -25V x 40-40 MFD. 450 V.	3.85
22-1754	C39	.0022 MFD. 600 V.	.26

RESISTORS			
63-957	R4	33M Ohm (Insulated)	.24
63-1369	R28	270 Ohm (Insulated) W. W	.24
63-1566	R21	22M Ohm (Insulated)	.33
63-1588	R30	Volume Control & switch	1.81
63-1589	R37, B8	Two Section Candohm	.60
63-1722	R33	33 Ohm (Insulated)	.21
63-1737	R2	68 Ohm (Insulated)	.21
63-1768	R34	390 Ohm (Insulated)	.21
63-1771	R5	470 Ohm (Insulated) 10%	.21
63-1772	R7	470 Ohm (Insulated) 20%	.21
63-1778	R32	680 Ohm (Insulated)	.21
63-1800	R10	2200 Ohm (Insulated)	.21

PART NO.	REF. NO.	DESCRIPTION	PRICE
RESISTORS--Continued			
63-1810	R22	3900 Ohm . (Insulated)	\$0.21
63-1813	R31	4700 Ohm . (Insulated)	.21
63-1824	R20	8200 Ohm . (Insulated)	.21
63-1841	R16	22K Ohm . (Insulated) 10%	.21
63-1842	R8	22K Ohm . (Insulated) 20%	.21
63-1848	R23	33K Ohm . (Insulated)	.21
63-1856	R19	47K Ohm . (Insulated)	.21
63-1869	R13	100K Ohm . (Insulated) 10%	.21
63-1870	R18	100K Ohm . (Insulated) 20%	.21
63-1876	R25	150K Ohm . (Insulated)	.21
63-1883	R26	220K Ohm . (Insulated) 10%	.21
63-1884	R9	220K Ohm . (Insulated) 20%	.21
63-1897	R28	470K Ohm . (Insulated)	.21
63-1912	R3	1 Megohm . (Insulated)	.21
63-1918	R35	1.5 Megohm (Insulated)	.21
63-1926	R11	2.2 Megohm (Insulated)	.21
63-1961	R24	15 Megohm (Insulated)	.21

MISCELLANEOUS

2-134		Cabinet Back	.75
11-104		Line Cord & Plug (7 ft.)	.65
46-697		Volume & Tuning Control Knob (2 used)	.10
46-718		Bandswitch Knob	.15
49-641	SP-1	5 1/4" P. M. Speaker (2 used)	6.00
		208-641 Cone & Voice Coil	1.73
54-30		#8-32 x 5/16" Hex Nut - Steel - N.P. (4 used)	.31C
54-31		#10-32 x 3/8" x 1/8" Hex Nut (4 used on 95-1062)	.43C
54-139		#3/8-32 x 9/16" Palmnut-Cads (used on 63-1588)	.01
54-226		Speed Nut (3 used)	.01
54-262		Speed Nut	.01
57-1353		Diffusing Plate	.90
57-1386		Dial Escutcheon	6.00
70-83		#6 x 1/2" Washer Hd. Wood Screw (8 used) (Cabt. Back Mtg.)	.55C
72-58		#2 x 3/8" Phillips Flat Hd. Wood Screw (6 used) (Escutcheon Mtg.)	.02
78-250		Electrolytic Capacitor Socket	.07
78-782		Miniature Tube Socket (2 used)	.25
78-788		Miniature Tube Socket (9 Contact)	.35
78-793		Octal Tube Socket (2 used)	.15
78-794		Miniature Tube Socket (3 used) (7 Contact)	.20
85-424	S1	Bandswitch	3.60
93-125		#6 Int. Lockwasher	.31C
93-127		#10 Int. Lockwasher (4 used on 95-1062)	.43C
93-392		3/32" x 33/64" x 1 Brown Felt Washer	1.20C
93-719		.031 x 3/16" x 7/16" Steel Washer	.01
95-1062		Pwr. Transformer	13.00
95-1096		Output Transformer	2.50
112-56		#6 x 1/4" Hex. Hd. Self Tapping Screw	.55C
112-142		#8-32 x 1-1/8" Swedged Hd. M.S. (4 used)	.02
114-43		#10-32 x 3/8" Hex. Washer Hd. M.S.-Steel-N.P.	.72C
114-128		#10 x 1-1/16" Hex. Washer Hd. Self Tapping Screw (4 used) (Chassis Mtg.)	1.81C
114-159		#6 x 1/4" Hex. Hd. Self Tapping Screw-Type A-Cad. Pl.	.72C
114-270		#8 x 1/2" Hex. Hd. Slotted Self Tapping Screw	.02
114-292		#6 x 5/8" Hex. Hd. Slotted Self Tapping Screw	.01
125-62		Rubber Grommet (4 used)	.02
166-46		Rubber Bumper (4 used) (Rubber Feet)	.03
192-115		Dial Glass	1.50
196-109		Dial Dust Gasket	.75
202-506		F. M. Instruction Book	.10
202-610		Instruction Book	.10
S-14647	L1	Wavemagnet Assembly Type 29E	1.50
S-14648		Wavemagnet and Back Assembly	2.25

RADIOORGAN PARTS

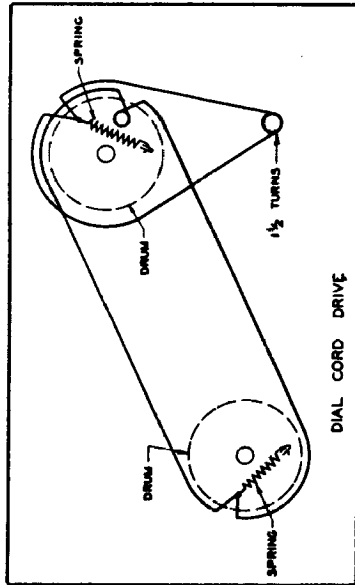
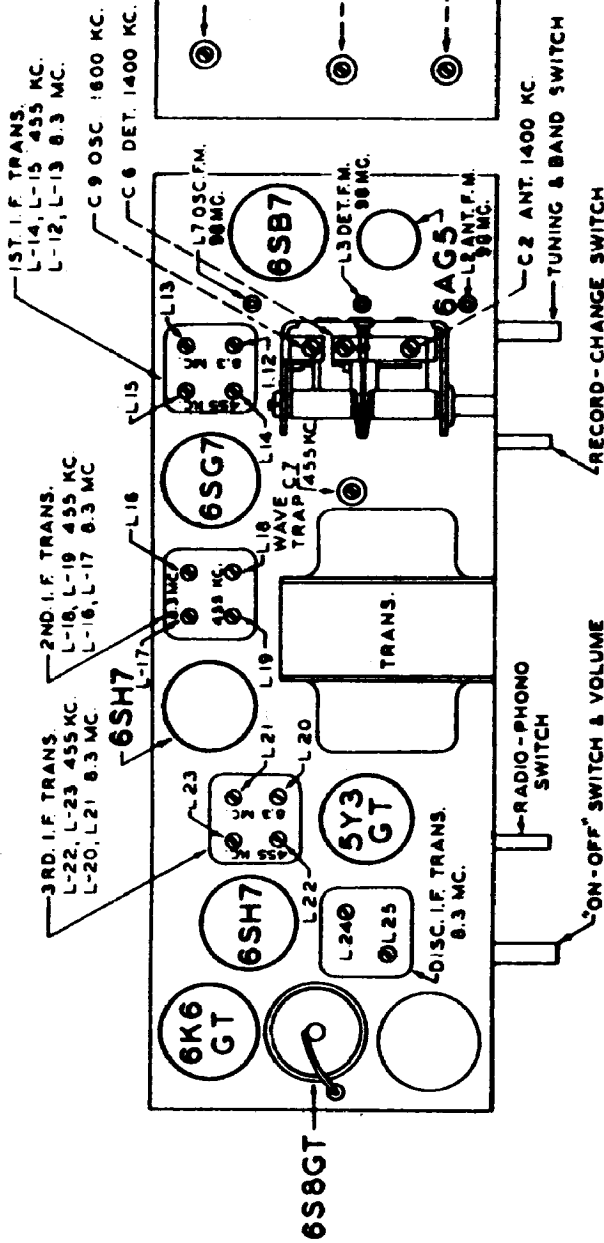
57-1351		Radiorgan Escutcheon (L.H.)	.50
57-1352		Radiorgan Escutcheon (R.H.)	.50
76-444		Radiorgan Knob Retaining Shaft (2 Used)	.04
80-595		Radiorgan Mounting Spring (2 Used)	.05
S-13800		Tone Choke Assembly	.60
S-14255		Radiorgan Mounting Bracket Assembly (2 Used)	.15
S-14260		Radiorgan Strip and Contact Assembly (R.H.)	.15
S-14261		Radiorgan Strip and Contact Assembly (L.H.)	.15
S-14273		Radiorgan Knob and Eyelet Assembly (Lo-Bass)	.20
S-14274		Radiorgan Knob and Eyelet Assembly (Bass)	.20
S-14275		Radiorgan Knob and Eyelet Assembly (Voice)	.20
S-14276		Radiorgan Knob and Eyelet Assembly (Treble)	.20
S-14277		Radiorgan Knob and Eyelet Assembly (Alto)	.20
S-14278		Radiorgan Knob and Eyelet Assembly (Normal)	.20
S-14310		Radiorgan Escutcheon and Knob Assembly (L. H.) (Lo-Bass, Bass, Voice)	1.50
S-14311		Radiorgan Escutcheon and Knob Assembly (R.H.) (Treble, Alto, Normal)	1.50

25M-648-CPC

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 9H079 - 9H081 - 9H082 - 9H085 - 9H088

CHASSIS No. 8C21



DIAL CABLE DRAWING

TO THE SERVICE MAN:

The 8C21 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool (fiber screw driver) or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustments the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM I.F.'S. Observe the same precautions when making adjustments. The second 8.3 Mc IF stage is overcoupled. Overcoupling gives a wide band pass with good sensitivity. When an overcoupled stage is aligned with an unmodulated signal, the stage must be loaded. A 300 ohm carbon resistor soldered across the secondary of the second IF transformer provides a satisfactory load for this circuit. The resistor leads must be kept short to reduce the distributed capacity of the circuit.

When aligning a loaded stage, it will be found that considerable signal from the generator will be required, and that it will tune broadly. **THE LOAD RESISTOR MUST BE REMOVED AFTER ALIGNMENT.**

If the signal generator used does not have sufficient output to overcome the temporary loss caused by the load resistor, the load resistance may be increased or the signal fed into the preceding stage.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 6) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when this meter starts to go to the left (negative) of zero will give the same results.

TUBE TRIMMER LOCATION

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 8 on Converter Tube 6SB7 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L-14, 15, 18, 19, 22 and 23	Align I.F. channel for maximum output
2	Pin 1 on R.F. tube 6AG5 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	C7	Adjust wavetrap for minimum output
3	2 turns loosely cpd. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C9	Set oscillator to dial scale
4	2 turns loosely cpd. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C2 & C6	Align det. and ant. stages
5(a)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L-24 coil slug primary discriminator	Align primary of discriminator for maximum reading
6(b)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L-25 coil slug sec. of discriminator	Adjust secondary of discriminator for zero reading
7(c)	Pin 4 (grid) on 6SH7 2nd IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L20 & L21 Prim. & Sec. of 3rd IF transformer	Align 3rd IF transformer for maximum reading
8(c)(d)	Pin 4 (grid) on 6SG7 1st IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L16 & L17 Primary & Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading
9(c)(d)	Pin 8 grid on 6SB7 converter tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L12 & L13 Primary & Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
10(c)	Antenna Post (Remove line ant.)	270 Ohms	98 Mc. Unmodulated	FM	98 Mc.	L7 Oscillator coil slug	Set oscillator to dial scale
11(c)	Antenna Post (Remove line ant.)	270 Ohms	98 Mc. Unmodulated	FM	98 Mc.	L2 and L3 Det. and RF coil slugs	Align det. and ant. stages to maximum reading
12(c)	Antenna Post (Remove line ant.)	270 Ohms	45 Mc. Unmodulated	FM	45 Mc.	C29	Set oscillator to dial scale
13(c)	Antenna Post (Remove line ant.)	270 Ohms	45 Mc. Unmodulated	FM	45 Mc.	C5 and C30	Align detector & ant. stages for maximum reading

IMPORTANT: Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 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 indication on the meter.

(a) Vacuum Tube Voltmeter pin 5 on discriminator transformer to chassis (half discriminator load.)

(b) Vacuum Tube Voltmeter pin 7 on discriminator transformer to chassis (full discriminator load.)

(c) Vacuum Tube Voltmeter 6SH7 limiter grid (pin 4) to chassis.

(d) 300 ohm ½ watt carbon resistor soldered across the secondary L17 (pin 2 and 3 of 2nd, IF transformer. The leads to the resistor must be as short as possible and the resistor removed before operation 10 is started.

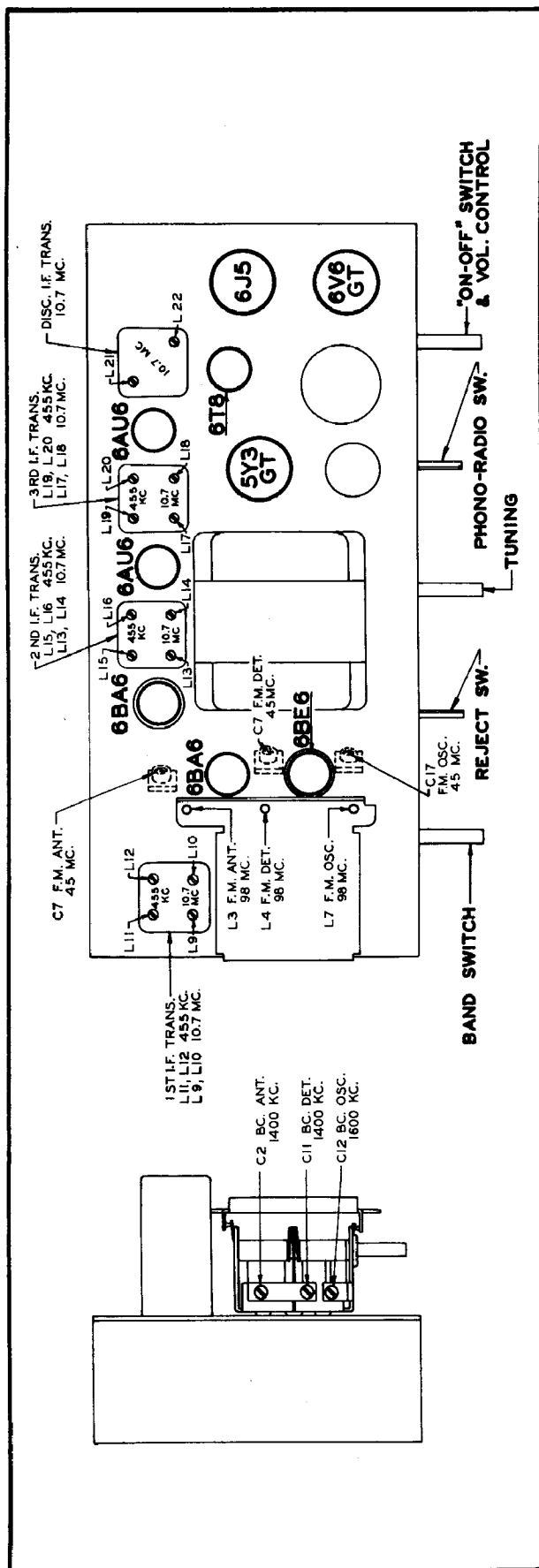
MODELS 9H079 - 9H081 - 9H082 - 9H085 - 9H088
CHASSIS No. 8C21

MODELS 9H079 - 9H081 - 9H082 - 9H085 - 9H088
CHASSIS No. 8C21

PARTS LIST

PART NO.	PRICE	PART NO.	PRICE
*49-537	13.50	196-81	.40
12" DYNAMIC SPEAKER.....	2.63	202-426	.12
206-537 OUTPUT TRANSFORMER.....	4.60	INSTRUCTION BOOK.....	.12
207-537 FIELD COIL (NOT RE-PLACEABLE).....	5.80	VOL. CON. KNOB & RING ASSEM. (46-520).....	.28
208-537 CONE & VOICE COIL.....	.07	PRE-AMP. ASSEM.....	---
57-1134 DIAL ESCUTCHEON.....	.07	INTER-MIXER RECORD CHANGER ASSEM.....	---
58-88 THREE PRONG WAVEMAGNET PLUG.....	.12	BAND SW. KNOB & RING ASSEM. (46-598).....	.32
58-133 NINE PRONG PLUG (USED ON S12605).....	.55C	WAVEMAGNET ASSEM. (#30C).....	1.67
70-83 #6 X 1/2 R.H. WASHER TYPE WOOD SCREW (CAB. BACK MTG.).....	.02	BALL BEARING SHAFT & WASHER ASSEM.....	5.53
72-59 #2 X 1/2 FLAT PHILLIPS HD. WOOD SCREW (ESC. MTG.).....	.20	MOTOR & MOTOR MTG. BRKT. ASSEM. (141-91).....	34.50
78-582 NINE PRONG SOCKET (USED ON S12606).....	.02	PHONO UNIT MTG. FRAME & BRKT. ASSEM.....	7.00
80-407 PHONO UNIT MTG. SPRING.....	.84	DRIVE OUT SWITCH, PLUG & CABLE ASSEM.....	5.29
83-1150 RUBBER TRIM STRIP.....	.03	INTERCONNECTING CABLE ASSEM.....	5.06
112-420 1/4-28 SPECIAL OVAL HD. M.S. (PHONO UNIT MTG.).....	.33		
112-489 HANDLE MTG. SCREW (36-31).....	.03	MODEL 9H088R (Chassis 8C21)	
114-148 CHASSIS MTG. SCREW (4 USED).....	1.20C	WAVEMAGNET MTG. BRKT.....	.14
114-202 #8-32 X 1-1/8 SLOTTED HEX WASHER HD. S.T. SCREW.....	.03	PLUG CAP & INSULATOR (USED ON S12604).....	.06
114-233 PHONO SHIPPING SCREW.....	.07	PLUG CAP & INSULATOR (USED ON S12604).....	.27
159-52 PLUG BUTTON (4 USED).....	.09	PLUG CAP & INSULATOR (USED ON S12604).....	.08
188-48 KNOB DECORATIVE RING.....	.04	PHONO UNIT MTG. CLIP (4 USED).....	.10
188-54 KNOB CLAMPING RING.....	.02	RECORD CHANGER COMPARTMENT COVER.....	.86
192-100 DIAL CRYSTAL.....	1.75	CONTROL KNOB (DUMMY).....	.11
202-426 PHONO INSTRUCTION BOOK.....	.12	TUNING CONTROL KNOB.....	.10
202-440 INSTRUCTION BOOK.....	.12	RADIO-PHONO REJECT KNOB (2 USED).....	.07
S11454 RECORD CHANGER MTG. FRAME ASSEM.....	5.45	12" DYNAMIC SPEAKER.....	13.50
S11558 VOL. CON. KNOB & RING ASSEM. (46-520).....	.28	206-550 OUTPUT TRANSFORMER.....	2.63
S11607 WAVEMAGNET ASSEM. (#30C).....	3.57	207-550 FIELD COIL (NOT RE-PLACEABLE).....	---
S11640 PRE-AMP. ASSEM.....	---	208-550 CONE & VOICE COIL.....	4.60
S11680 INTER-MIXER RECORD CHANGER ASSEM.....	---	57-1134 DIAL ESCUTCHEON.....	5.80
S12305 BAND SW. KNOB & RING ASSEM. (46-598).....	.32	58-88 THREE PRONG WAVEMAGNET PLUG.....	.07
S12606 INTERCONNECTING CABLE ASSEM.....	5.47	58-133 NINE PRONG PLUG (USED ON S12604).....	.12
S12864 PHONO FRAME DRIVE WHEEL & TIRE ASSEM. (2 USED).....	.24	70-96 #10 X 1-3/4 R.H. WOOD SCREW (SUPPORT BRKT. MTG.).....	.02
S13135 CABINET F. M. DIPOLE ANTENNA ASSEM.....	.70	72-59 #2 X 1/2 FLAT PHILLIPS HD. WOOD SCREW (EXC. MTG.).....	.02
*NOTE: FOR CONVERSION TO P.M. SPEAKER SEE SUPPLEMENTARY LIST.			
		78-582 NINE PRONG SOCKET (USED ON S12604).....	.20
		80-407 PHONO UNIT MTG. SPRING (4 USED).....	.02
		80-450 SPRING.....	.19
		83-1150 RUBBER TRIM STRIP.....	.84
		83-1230 NOISE REDUCER STRIP.....	.06
		112-268 SPEAKER PLUG RETAINING SCREW.....	.02
		112-420 1/4-28 SPECIAL OVAL HD. M.S. (PHONO UNIT MTG.) (OR SUB 112-611).....	.33
		114-148 CHASSIS MTG. SCREW (4 USED).....	1.20C
		114-202 #8-32 X 1-1/8 SLOTTED HEX WASHER HD. S.T. SCREW.....	.03
		114-257 PHONO UNIT SHIPPING SCREW (OR SUB 114-263).....	.03
		188-48 KNOB DECORATIVE RING.....	.04
		188-54 KNOB CLAMPING RING.....	.02
		192-100 DIAL CRYSTAL.....	1.75
		202-426 PHONO INSTRUCTION BOOK.....	.12
		202-440 INSTRUCTION BOOK.....	.12
		S10796 LID SUPPORT ARM, HINGE PLATE & BRKT. ASSEM. (R.H.).....	1.85
		S10797 LID SUPPORT ARM, HINGE PLATE & BRKT. ASSEM. (L.H.).....	1.85
		S11429 RECORD CHANGER SUPPORT FRAME & ARM ASSEM.....	10.08
		S11558 VOL. CON. KNOB & RING ASSEM. (46-520).....	.28
		S11640 PRE-AMP. ASSEM.....	---
		S11680 INTER-MIXER RECORD CHANGER ASSEM.....	---
		S12112 WAVEMAGNET ASSEM. (#30C).....	3.43
		S12305 BAND SW. KNOB & RING ASSEM. (46-598).....	.32
		S12545 PHONO LIFT SPRING & BUSHING ASSEM.....	.43
		S12604 INTERCONNECTING CABLE ASSEM.....	5.54
		S13135 CABINET F.M. DIPOLE ANTENNA ASSEM.....	.70
		*NOTE: FOR CONVERSION TO P.M. SPEAKER SEE SUPPLEMENTARY LIST.	
		MODELS 9H079-79E-79R-081-85R-88R	
		TO REPLACE THE ELECTRO DYNAMIC SPEAKER WITH A P.M. TYPE THE FOLLOWING ADDITIONAL PARTS ARE NECESSARY.	
		S13289 10" P.M. SPKR. ASSEM. COMPLETE (ALT. FOR 49-534) (079-79E-79R).....	---
		S13297 12" P.M. SPKR. ASSEM. COMPLETE (ALT. FOR 49-537) (081-85R).....	---
		S13298 12" P.M. SPKR. ASSEM. COMPLETE (ALT. FOR 49-550) (9H088R).....	---
		22-1611 ELECT. COND. 40 MFD. - 450 VOLT (C33).....	1.81
		49-580 12" P.M. SPKR. (081-85R-88R).....	---
		49-581 10" P.M. SPKR. (079-79E-79R).....	---
		58-158 SPEAKER PLUG.....	.14
		63-1189 RESISTOR 200 OHM W.W. 2 WATT.....	.36
		63-1529 RESISTOR 1500 OHM W.W. 5 WATT.....	.43
		83-1236 TERMINAL STRIP.....	.15
		95-1007 SPKR. OUTPUT TRANSFORMER (079-79E-79R-081-85R).....	---
		95-1012 SPKR. OUTPUT TRANSFORMER (088R).....	---
		237-1 CABLE CLAMP.....	.02
125-56	.05		
126-518	.08		
126-519	.08		
143-44	.45		
188-48	.04		
188-54	.02		
192-100	1.75		
125-56	.05		
126-518	.08		
126-519	.08		
143-44	.45		
188-48	.04		
188-54	.02		
192-100	1.75		

MODELS 9H881, 9H882R, 9H885 and 9H888R **CHASSIS 9E21**



TUBE AND TRIMMER LOCATION

TO THE SERVICE MAN:

The 9E21 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands. The Radiogran tone control is of the low impedance type in which a portion of the audio voltage is taken from the speaker voice coil and fed back out of phase into the grid of the first audio. The characteristic of the feedback voltage is determined by the setting of the Radiogran buttons. To attenuate the high notes, more highs are fed back. To attenuate the low notes, more lows are fed back. For normal reproduction, both highs and lows are fed back and results in no overall change in tone.

The 6BA6 1st IF tube is also the phono pre-amplifier. The output from the phono oscillator is fed to the grid of the 6BA6 through C21 and R14. The amplified output is taken from the screen grid and fed back through R12 and C20 into the volume control circuit and the grid of the 6T8 1st audio amplifier.

AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: The same coil slug arrangement which tunes the 100 MC FM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM IF's. Observe the same precautions when making adjustments.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 95-1063. Be sure to add the speaker code letter to the transformer Part Number when ordering replacements.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 6BE6 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L-11, 12, 15, 16, 19 and 20.	Align I. F. channel for maximum output
2	2 turns loosely cpld. to wavemagnet.		1600 Kc. Modulated	BC	1600 Kc.	C12	Set oscillator to dial scale.
3			1400 Kc. Modulated	BC	1400 Kc.	C11 and C2	Align det. and ant. stages.
4 (a)	Pin 1 (grid) on 6AU6 Limiter	.05 Mfd.	10.7 Mc Unmodulated	FM 45		L21 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)		.05 Mfd.	10.7 Mc Unmodulated	FM 45		L22 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 6AU6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 45		L17 and L18 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 6BA6 1st IF.	.05 Mfd.	10.7 Mc Unmodulated	FM 45		L13 and L14 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 6BE6 converter tube	.05 Mfd.	10.7 Mc. Unmodulated	FM 45		L9 and L10 Prim. and Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading.
9 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L7 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)	FM Antenna Post (Re-move line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 and L3 Det. and RF coil Slugs	Align det. and ant. stages to maximum reading.
11 (c)		270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C17	Set oscillator to dial scale.
12 (c)		270 ohms	45 Mc. Unmodulated	FM 45	45 Mc.	C7 Det., C7 Ant.	Align detector and ant. stages for maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless a IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 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 indication on the meter.

(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter Lug 3 on 3rd IF transformer (Limiter Grid).

(d) Loosen Slugs by applying a hot iron to the cement.

PARTS LIST

PART NUMBER	REF. NUMBER	DESCRIPTION	PRICE	PART NUMBER	REF. NUMBER	DESCRIPTION	PRICE
DIAL ASSEMBLY							
12-1434		Dial Light Mounting Bracket.		63-1856	R19	47M ohm (Insulated)	1/2 W. .21
26-396		Dial Scale (use S-14270)		63-1869	R13	100M ohm (Insulated)	1/2 W. .21
59-209		Dial Pointer		63-1870	R18	100M ohm (Insulated)	1/2 W. .21
76-499		Tuning Control Shaft		63-1876	R25	150M ohm (Insulated)	1/2 W. .21
78-797		Dial Light Socket		63-1883	R26	220M ohm (Insulated)	1/2 W. .21
80-69		Dial Cord Tension Spring	\$0.02	63-1884	R9	220M ohm (Insulated)	1/2 W. .21
80-209		Dial Cord Tension Spring	.03	63-1897	R27	470M ohm (Insulated)	1/2 W. .21
80-444		Tuner Arm Tension Spring	.05	63-1911	R17	1 Megohm (Insulated)	1/2 W. .21
80-580		Tuner Arm Stop Spring	.06	63-1912	R3	1 Megohm (Insulated)	1/2 W. .21
80-581		Tuner Arm Pressure Spring	.10	63-1918	R35	15 Megohm (Insulated)	1/2 W. .21
100-36		Dial Light Bulb-Mazda 44	.09	63-1926	R11	2.2 Megohm (Insulated)	1/2 W. .21
188-32		Retaining Ring (76-499)	1.03c	63-1961	R24	15 Megohm (Insulated)	1/2 W. .21
196-109		Dial Dust Gasket		MISCELLANEOUS			
S14254		Pointer Pulley Assembly		11-106		Line Cord and Plug (9 ft. long) (or 11-101)	
S14256		Cam Pulley and Bushing Assembly (Gang Cond)		54-226		Speed Nut-Tinnerman	\$0.01
S14268		Dial Cord & Eyelet Assembly (Short)		78-709		Socket-Octal Tube	
S14269		Dial Cord & Eyelet Assembly (Long)		78-782		Socket-Miniature Tube (2 used)	.25
S14270		Dial Scale and Strip Assembly (26-396)		78-788		Socket-Neval Miniature (9 contact)	.35
S14429		Tuner Arm Assembly		78-791		Socket-Phono Cable (7 contact)	
COILS AND CHOKES				78-793		Socket-Octal Tube (2 used)	
S11157	L8	Broadcast Oscillator Coil Assembly	.53	78-794		Socket-Miniature Tube (7 contact)	.20
S12256	L24	A.C. Line Choke Coil Assembly	.35	85-421	S2	Phono-Radio Switch	.90
S12259	L7	F.M. Oscillator Coil Assembly	.33	85-422	S3	Phono-Reject Switch	.40
S12603	L25	Phono Oscillator Coil Assembly	2.02	85-424	S1	Band Switch	
S13800	L23	Tone Choke Assembly		94-295		Phono Switch Mounting Bushing	.04
S13871	L4	F.M. Detector Coil Assembly		94-598		R.F. Plate Mounting Bushing (4 used)	.01
S13970	T1	1st I.F. Transformer Assembly		95-1062	T6	Power Transformer	
S13971	T2	2nd I.F. Transformer Assembly		95-1063	T5	Output Transformer	
S13972	T3	3rd I.F. Transformer Assembly		125-17		Rubber Grommet (2 used (1 on 85-421) (1 on 85-422))	.03
S13973	T4	Discriminator Transformer Assembly		125-62		Rubber Grommet (4 used)	.02
S13974	L6	Broadcast Detector Coil Assembly		126-553		Miniature Tube Shield (Metal)	.11
S14126	L5	R.F. Choke Coil Assembly		126-554		Miniature Tube Shield (Paper)	.10
S14192	L3	F.M. Antenna Coil Assembly		126-569		Heat Shield	
CONDENSERS				149-64		Tuning Core and Spring (3 used)	.40
22-171	C26	.05MFD.	.26	RADIOORGAN ESCUTCHEON PARTS			
22-196	C32	.01MFD.	.20	57-1351		Radiorgan Escutcheon (L.H.)	
22-348	C15	.001MFD. (Mica)	.26	57-1352		Radiorgan Escutcheon (R.H.)	
22-365	C24	100MMFD. (or 22-1670)	.20	76-444		Radiorgan Knob Retaining Shaft (2 used)	.04
22-629	C4	.05MFD.	.20	80-595		Radiorgan Mounting Spring (2 used)	
22-830	C21	.02MFD.	.20	114-159		#6x1/4 Hex.Hd. Self Tapping Screw (2 used)	.72c
22-1041	C42	.005MFD.	.20	S14255		Radiorgan Mounting Bracket Assembly (2 used)	
22-1136	C31	250MMFD. (or 22-1745)	.20	S14260		Radiorgan Strip and Contact Assembly (R.H.)	
22-1220	C20	.002MFD.	.20	S14261		Radiorgan Strip and Contact Assembly (L.H.)	
22-1256	C28	75MMFD. (or 22-1746)	.20	S14274		Radiorgan Knob and Eyelet Assembly (Bass)	
22-1367	C14	50MMFD. (Ceramic)	.33	S14273		Radiorgan Knob and Eyelet Assembly (Lo-Bass)	
22-1385	C19	.01MFD.	.20	S14275		Radiorgan Knob and Eyelet Assembly (Voice)	
22-1418	C38	.1MFD.	.20	S14276		Radiorgan Knob and Eyelet Assembly (Treble)	
22-1489	C30	10MMFD. (Ceramic)	.33	S14277		Radiorgan Knob and Eyelet Assembly (Alto)	
22-1506	C8	22MMFD. (Ceramic)	.33	S14278		Radiorgan Knob and Eyelet Assembly (Normal)	
22-1507	C22	25MMFD. (Ceramic)	.33	S14310		Radiorgan Escutcheon & Knob Assembly (L.H.) (Lo-Bass--Bass-Voice)	
22-1531	C29	.2MFD.	.20	S14311		Radiorgan Escutcheon and Knob Assembly (R.H.) (Treble-Alto-Normal)	
22-1532	C40	50MMFD. (or 22-1674)	.20	MODEL 9H881 CABINET PARTS			
22-1664	C39	50MMFD. (Ceramic)	.20	15-82		Plug Cap and Insulator (used on S14353)	
22-1669	C3	100MMFD. (Ceramic)	.20	19-123		Record Changer Mounting Clip (3 used)	.10
22-1676	C6	.001MFD. (Ceramic)	.40	27-81		Shaft Bearing Disc	.05
22-1678	C1	Three Gang Variable		36-39		Record Changer Frame Handle	.30
22-1685	C7	Single Section Trimmer	.45	40-43		Cabinet Hinge (R.H.)	.30
22-1686	C17	Single Section Trimmer	.35	40-44		Cabinet Hinge (L.H.)	.30
22-1688	C9	19MMFD. (Ceramic)	.30	46-648		Door Pull (2 used)	.55
22-1689	C13	48MMFD. (Ceramic)	.30	46-697		Volume and Tuning Control Knob (2 used)	
22-1691	C16	55MMFD. (Silver on Ceramic)	.30	46-718		Band Switch Knob	.15
22-1705	C5	30MMFD. (Ceramic)	.20	46-726		Phono Switch Knob	
22-1706	C10	.005MFD. (Ceramic Disc Type)	.45V. .30	49-624		12" P.M. Speaker	
22-1717	C18	.001MFD.	.20V.	57-1336		208-624 Cone and Voice Coil	
22-1718	C27	.01MFD. (Shielded)	.40V.	57-1353		Dial Escutcheon	
22-1719	C33, C34	Two Section Electrolytic 15-40MFD	.45V.	58-169		Diffusing Plate	
22-1720	C35, C36	Three Section Electrolytic 40MFD.-25V.x40-40MFD.-450.	.45V.	72-58		Seven Prong Plug (used on S-14353)	
22-1754	C43	.0022MFD.	.60V.	78-798		#2 x 3/8 Phillips Flat Hd. Wood Screw-Steel Brass Plate (Esc.Mtg.)	.02
RESISTORS				80-463		Seven Contact Socket (used on S-14353)	
63-957	R4	33M ohm (Insulated)	.1 W. .24	83-1244		Record Changer Mounting Spring (4 used)	.03
63-1065	R6	15M ohm (Insulated)	.1 W. .24	93-392		Record Changer Trim Strip	1.00
63-1369	R28	270 ohm (Insulated-WW)	.1 W. .24	112-489		3/32 x 33/64" Brown Felt Washer (3 used)	1.20c
63-1565	R36	4700 ohm (Insulated)	.1 W. .24	112-682		#8 x 1/2" Phillips R.H. Self Tapping Screw-cad. (Handle Mtg. Screw)	.03
63-1566	R21	22M ohm (Insulated)	.2 W. .24			Record changer Mounting Screw (4 used)	.06
63-1588	R30	Volume Control and Switch					
63-1589	R37, R38	Two Section Candohm (1000 ohm WW 5W., 200 ohm WW 3W)	1/2 W. .21				
63-1722	R33	33 ohm (Insulated)	1/2 W. .21				
63-1737	R2	68 ohm (Insulated)	1/2 W. .21				
63-1768	R34	390 ohm (Insulated)	1/2 W. .21				
63-1771	R5	470 ohm (Insulated)	1/2 W. .21				
63-1772	R7	470 ohm (Insulated)	1/2 W. .21				
63-1778	R32	680 ohm (Insulated)	1/2 W. .21				
63-1779	R12	680 ohm (Insulated)	1/2 W. .21				
63-1800	R10	2200 ohm (Insulated)	1/2 W. .21				
63-1810	R22	3900 ohm (Insulated)	1/2 W. .21				
63-1813	R31	4700 ohm (Insulated)	1/2 W. .21				
63-1824	R20	8200 ohm (Insulated)	1/2 W. .21				
63-1827	R14	10M ohm (Insulated)	1/2 W. .21				
63-1841	R16	22M ohm (Insulated)	1/2 W. .21				
63-1842	R8	22M ohm (Insulated)	1/2 W. .21				
63-1848	R23	33M ohm (Insulated)	1/2 W. .21				

PART NUMBER	REF. NUMBER	DESCRIPTION	PRICE
114-148		#10 x 7/8" Hex Washer Hd. Self-Tapping Screw (4 used) (Chassis Mtg.)	\$1.20c
114-233		#14 x 1-1/4" Slotted Hex Washer Hd. Self-Tapping Screw, Cad.	.07
125-56		Rubber Grommer (4 used) (Spk. Mtg.)	.05
138-25		Metal Grille	
159-52		Plug Button (4 used)	.09
165-13		Metal Glide (4 used)	
166-31		Rubber Bumper	
188-91		Rubber Ring (2 used)	
192-115		Dial Glass	
202-506		F. M. Instruction Book	.10
202-566		Instruction Book	
SI2864		Drive Wheel & Pin Assembly (2 used)	.24
SI4002		Intermixer Record Changer	
SI4195		Loading Coil Assembly (9H881, 9H885, 9H888)	
SI4305	L1	Low Impedance Loop Assembly (9H881, 9H885, 9H888)	
SI4352		Record Changer Mtg. Frame Assembly (complete)	
SI4353		Interconnecting Cable Assembly	

MODEL 9H882R CABINET PARTS

12-1183		Door Stop Bracket	.06
15-64		Pin Plate Plug	.27
15-65		Plug Cap & Insulator (used on SI2591)	
15-82		Plug Cap & Insulator (used on SI4539)	
19-123		Record Changer Mounting Clip	.10
22-1240		Wavemagnet Trimmer Condenser	.20
22-1501		Electrolytic Capacitor, 150 Mfd. 60V.	3.40
36-39		Record Changer Frame Handle	
40-54		Cabinet Hinge	
46-697		Volume & Tuning Control Knob (2 used)	.15
46-718		Band Switch Knob	
46-726		Phono Switch Knob (2 used)	
49-637		10" P.M. Speaker	
52-188		208-637 Cone & Voice Coil	.24
57-1336		Plug & Wire (used on SI4539)	
57-1353		Dial Escutcheon	
58-86		Diffusing Plate	
58-132		Two Prong Plug (used on SI2591)	.12
58-169		6 Prong Plug	.12
70-126		7 Prong Plug (used on SI4539)	
72-58		#10 x 1-7/8" R.H. Wood Screw-Steel N.P.	
78-555		#2 x 3/8" Phillips Flat Hds. Wood Screw (Esc. Mtg.) (6 used)	.02
78-798		Six Contact Socket (used on SI2591)	.11
80-407		Seven Contact Phono Socket (used on SI4539)	
80-443		Motor Mounting Spring (8 used)	.02
80-463		Cabinet Door Return Spring	.18
80-570		Record Changer Mtg. Spring (4 used)	.03
83-1244		Shaft Tension Spring	
83-1431		Record Changer Trim Strip	1.00
85-351		Plastic Strip	
85-382		Drive Out Control Switch (used on SI2591)	1.90
93-168		S.P.D.T. Switch (used on SI2591)	1.10
93-392		Rubber Shoulder Washer (6 used)	.07
93-540		Brown Felt Washer (3 used)	1.20c
94-502		Rubber Washer (4 used)	.10
112-490		Motor Mounting Bushing	.028
112-611		#8 x 5/8" Phillips R.H. Self Tapping Screw (Handle Mtg.)	
112-682		Record Changer Mtg. Screw (3 used)	.33
114-132		Record Changer Mtg. Screw (1 used)	.06
125-50		#10 x 1-5/8" Hex Washer Hd. Self-Tapping Screw (Chassis Mtg.)	.05
125-51		Rubber Grommet (2 used)	
125-56		Rubber Grommet (8 used)	
143-44		Rubber Grommet (4 used) (Spk. Mtg.)	.05
165-12		Drive Out Coupling	.45
192-115		Ball Bearing Caster (4 used)	
202-506		Dial Glass	
202-566		F. M. Instruction Book	.10
S-12389	L2	Instruction Book (Radio & Phono)	
S-12411		Wavemagnet Loading Coil Assembly	.25
S-12412		Ball Bearing Shaft & Washer Assembly	5.53
S-12591		Phono Drive Out Motor, Mtg. Brkt. & Cable Assembly	44.50
S-14002		Drive Out Switch, Plug & Cable Assembly	5.29
S-14445	L1	Intermixer Record Changer	
S-14538		Wavemagnet Assembly-Type 30N	
S-14539		Record Changer Mounting Frame Assembly	
S-12583		Interconnecting Cable Assembly	
		Phono Drive Out Motor & Plug (141-91) Induction Motor)	42.00

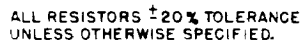
MODEL 9H885 CABINET PARTS

15-82		Plug Cap & Insulator (used on S-14306)	
19-123		Record Changer Mounting Clip (3 used)	.10
40-42		Knife Hinge (R.H.)	.25
40-65		Knife Hinge (L.H.)	.25
46-662		Key Escutcheon (2 used)	.70
46-697		Volume & Tuning Knob (2 used)	.15
46-718		Band Switch Knob	
46-725		Door Pull (2 used)	
46-726		Phono Switch Knob (2 used)	

PART NUMBER	REF. NUMBER	DESCRIPTION	PRICE
49-624		12" P.M. Speaker	\$
57-1336		208-624 Cone & Voice Coil	
57-1353		Dial Escutcheon	
58-169		Diffusing Plate	
70-96		Seven Prong Plug (7 used on S-14306)	
72-58		#10 x 1-3/4" R.H.W.S. Steel N.P. (6 used)	.02
78-798		#2 x 3/8" Phillips Flat Hd. Wood Screw (Esc. Mtg.) (6 used)	.015
80-423		Seven Contact Socket (used on S-14306)	
80-463		Chassis Lift Spring (2 used)	.21
83-1244		Record Changer Mounting Spring (4 used)	.03
93-392		Record Changer Trim Strip	1.00
112-558		3/32" x 33/64" x 1" Brown Felt Washer (3 used)	
112-611		#10-32 x 7/8 Flat Phillips Hd. M.S. Steel-Statuary Bronze (Pinch Pt.)	.04
112-682		Record Changer Mtg. Screw (3 used)	.33
114-257		Record Changer Mtg. Screw (1 used)	.06
125-49		#10 x 1-3/8" Hex Slotted Washer Hd. Sheet, Metal Screw	.03
125-56		Rubber Grommet (4 used)	.05
159-61		Rubber Grommet (4 used) (49-624)	.05
165-9		Plug Button-Statuary Bronze	.03
192-115		Metal Glides	
202-506		Dial Glass	
202-566		F. M. Instruction Book	.10
S-10796		Instruction Book (Radio & Phono)	
S-10797		Lid Support Arm, Hinge Plate & Brkt. (R.H.)	1.85
S-11429		Lid Support Arm, Hinge Plate & Brkt. (L.H.)	1.85
S-12545		Record Changer Mounting Frame Assembly	10.08
S-14002		Phono Lift Spring & Bushing Assembly	.43
S-14195		Intermixer Record Changer Assembly	
S-14305		Loop Loading Coil Assembly	
S-14306		Low Impedance Loop Assembly	
S-14433		Interconnecting Cable Assembly (Phono.)	
S-14434		Chassis Compartment Hinge Assembly (R.H.)	
		Chassis Compartment Hinge Assembly (L.H.)	

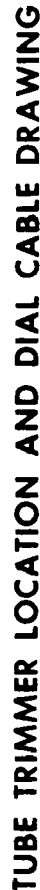
MODEL 9H888R CABINET PARTS

15-82		Plug Cap & Insulator (used on S-14306)	
19-123		S-14306	
40-42		Record Changer Mounting Clip (3 used)	.10
40-65		Knife Hinge (R.H.)	.25
46-648		Knife Hinge (L.H.)	.25
46-659		Door Pull (2 used)	.55
46-697		Key Escutcheon	
46-718		Volume & Tuning Control Knob (2 used)	.15
46-726		Band Switch Knob	
49-624		Phono Switch Knob	
57-1336		12" P.M. Speaker	
57-1353		208-624 Cone & Voice Coil	
58-169		Dial Escutcheon	
70-96		Diffusing Plate	
72-58		Seven Prong Plug (used on SI4306)	
78-798		#10 x 1-3/4" R.H.W.S.-Steel N.P. (6 used)	.02
80-423		#2-3/8" Phillips Flat Hds. Wood Screw	.02
80-463		Seven Contact Socket (used on SI4306)	
83-1244		Chassis Lift Spring (2 used)	.21
93-392		Record Changer Mtg. Screw (4 used)	.03
112-558		Record Changer Trim Strip	1.00
112-611		3/32" x 33/64" x 1 Brown Felt Washer (3 used)	1.20c
112-682		#10-32 x 7/8 Flat Phillips Hd. M. Screw-Steel-Statuary-Bronze (Pinch Pt.)	.04
114-257		Record Changer Mounting Screw (3 used)	.33
125-49		Record Changer Mounting Screw (1 used)	.06
125-56		#10 x 1-3/8" Hex Slotted Washer Hd. Sheet Metal Screw	.03
138-26		Rubber Grommet	.05
159-61		Rubber Grommet	
165-9		Metal Grille	
192-115		Plug Button-Statuary Bronze	.03
202-506		Metal Glides (4 used)	
202-566		Dial Glass	
S-10796		F.M. Instruction Book	.10
S-10797		Instruction Book (Radio & Phono)	
S-11429		Lid Support Arm, Hinge Plate & Brkt. (R.H.)	1.85
S-12545		Lid Support Arm, Hinge Plate & Brkt. (L.H.)	1.85
S-14002		Record Changer Mtg. Frame Assembly	10.08
S-14195		Phono Lift Spring & Bushing Assembly	.43
S-14305		Intermixer Record Changer	
S-14306		Loop Loading Coil Assembly	
		Low Impedance Loop Assembly	
		Interconnecting Cable Assembly (Phono.)	
S-14433		Chassis Compartment Hinge Assembly (R.H.)	
S-14434		Chassis Compartment Hinge Assembly (L.H.)	



The audio amplifier is a push pull parallel system, with a power output of approximately 20 watts. When servicing the amplifier be sure to replace components with exact duplicates.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 9) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when this meter starts to go to the left (negative) of zero will give the same results.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 8 on Converter Tube 6SB7 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L15, L16, L19, 20, 23 and 24	Align I.F. channel for maximum output
2	Pin 1 on R.F. tube 6BA6 socket	.05 Mfd.	455 Kc. Modulated	Aut	Press any button on Auto.	C10	Adjust wavetraps to minimum
3	2 Turns loosely coupled to wavenag.		1600 Kc. Modulated	BC	1600 Kc.	C17	Set oscillator to dial scale
4	2 Turns loosely coupled to wavenag.		1400 Kc. Modulated	BC	1400 Kc.	C15 & C4	Align det. and ant. stages.
5	Antenna Post (Re-move line ant.)	400 ohms	11.7 Mc. Modulated	SW	11.7 Mc.	C16	Set oscillator to dial scale
6	Antenna Post (Re-move line ant.)	400 ohms	11.7 Mc. Modulated	SW	11.7 Mc.	C9	Align ant. stage
7	Antenna Post (Re-move line ant.)	400 ohms	9.7 Mc. Modulated	SW	11.7 Mc.	C8	Align ant. stage Repeat Oper. 6 for maximum output
8 (a)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM	9.7 Mc.	L25 coil slug primary disc.	Align primary of discriminator for maximum reading
9 (b)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L26 coil slug sec. of disc.	Adjust secondary of discr. for zero reading
10 (c)	Pin 6 (grid) on 7W7 2nd IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L21 & L22 prim. & sec. of 3rd IF transformer	Align 3rd IF transformer for maximum reading
11 (c) (d)	Pin 4 (grid) on 6SG7 1st IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L17 & L18 prim. & sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading
12 (c) (d)	Pin 8 (grid) on 6SB7 converter tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L13 & L14 prim. & sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
13 (c)	Antenna Post (Re-move line ant.)	270 ohms	98 Mc. Unmodulated	FM	98 Mc.	L10 Osc. coil Slug	Set oscillator to dial scale
14 (c)	Antenna Post (Re-move line ant.)	270 ohms	98 Mc. Unmodulated	FM	98 Mc.	L5 and L3 Det. and RF coil slugs	Align det. and Ant. stage to maximum reading
15 (c)	Antenna Post (Re-move line ant.)	270 ohms	45 Mc. Unmodulated	FM	45 Mc.	C22	Set oscillator to dial scale
16 (c)	Antenna Post (Re-move line ant.)	270 ohms	45 Mc. Unmodulated	FM	45 Mc.	C14 and C6	Align detector and ant. stages for maximum reading

IMPORTANT: Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

A correct alignment can only be made if the following procedure is followed.

A vacuum tube voltmeter with an isolation resistor of 200,000 ohms in series with the hot lead will serve for FM adjustments. This lead must be shielded

An ordinary 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 indication on the meter.

(a) Vacuum Tube Voltmeter pin 5 on discriminator transformer to chassis (half discriminator load.)

(b) Vacuum Tube Voltmeter pin 7 on discriminator transformer to chassis (full discriminator load.)

(c) Vacuum Tube Voltmeter 6SH7 limiter grid (pin 4 to chassis).

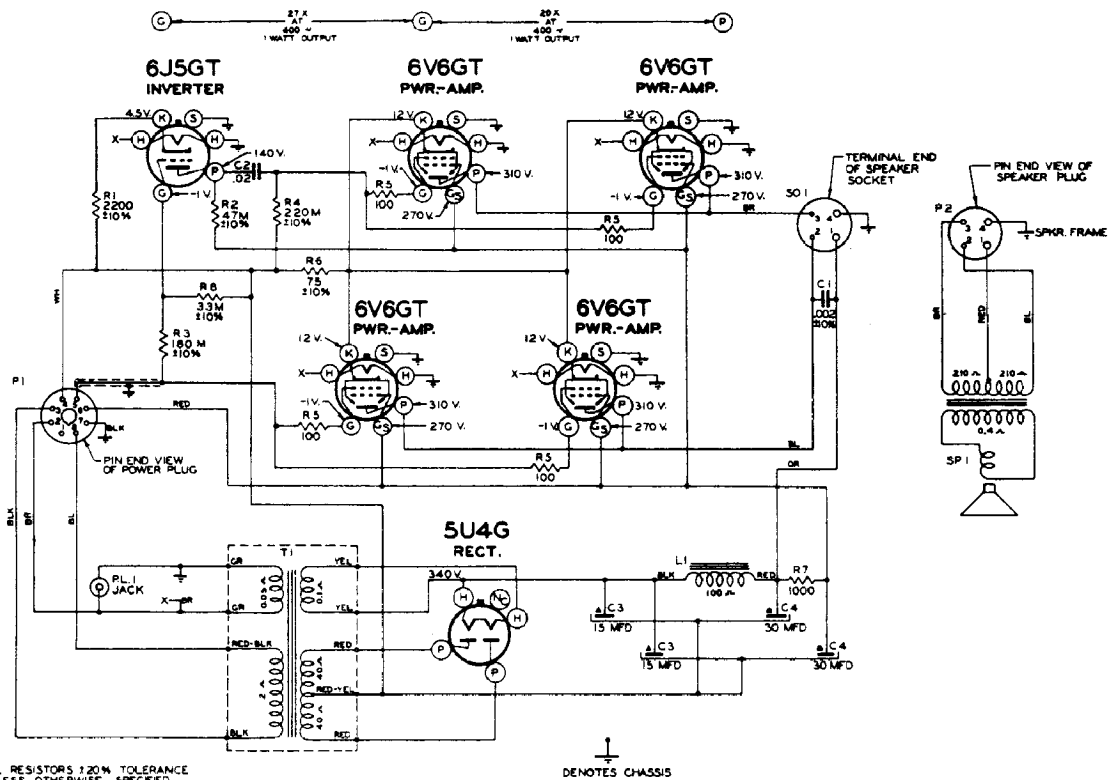
(d) 300 ohm $\frac{1}{2}$ watt carbon resistor soldered across the secondary L18 (pin 2 and 3 of 2nd IF trans.). The leads to the resistor must be as short as possible and the resistor removed before operation 13 is started.

PARTS LIST

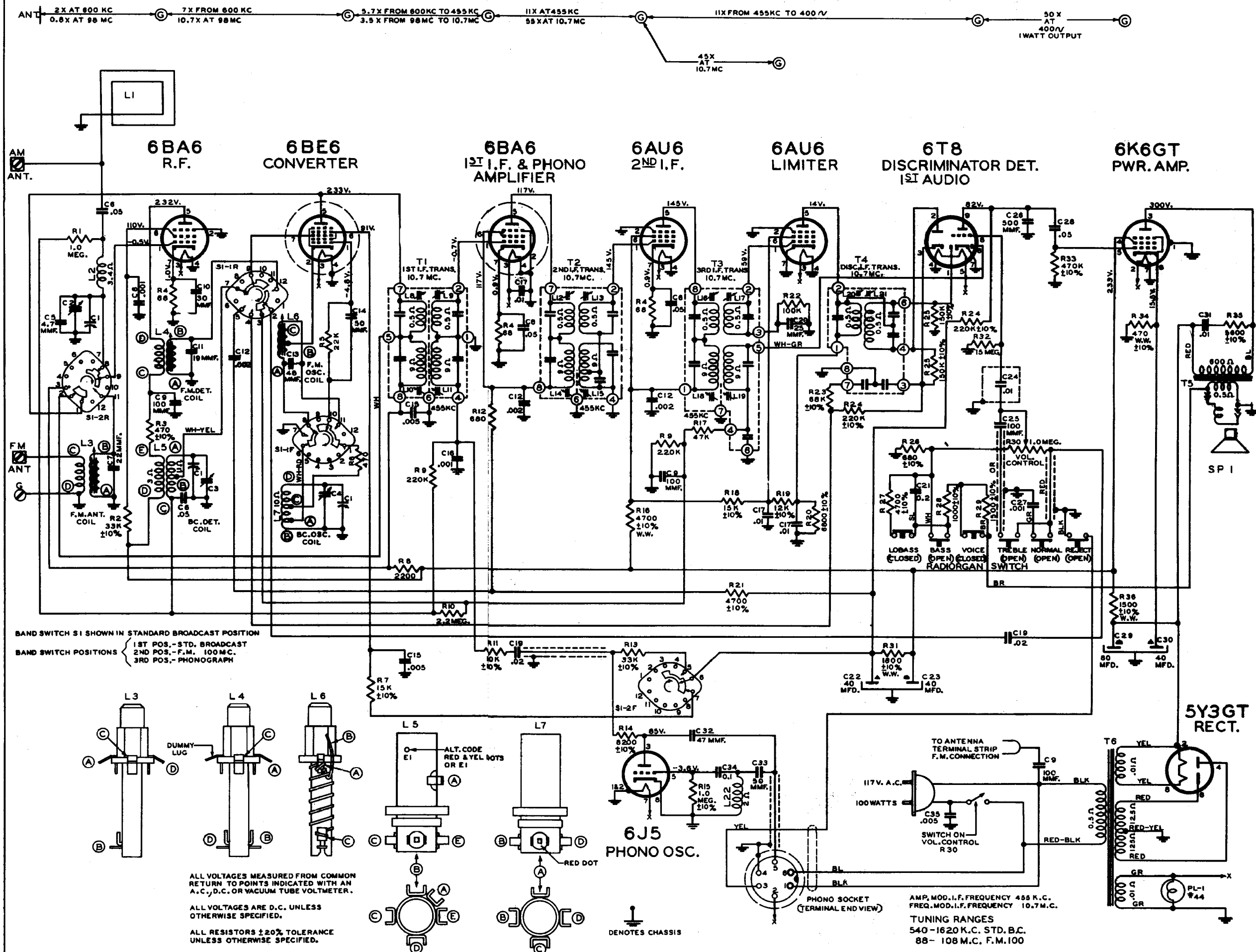
PART NO.	REF. NO.	DESCRIPTION	PRICE	PART NO.	REF. NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY				63-510	R7	18M OHM (INSULATED)	2 W. .36
59-159		DIAL POINTER	\$1.00	63-579	R8	220 OHM	1/4 W. .09
76-417		BAND SWITCH DRIVE SHAFT	.24	63-585	R26	2200 OHM	1/4 W. .09
76-418		TUNING CONTROL SHAFT	.30	63-586	R25	3300 OHM	1/4 W. .09
78-585		DIAL LIGHT SOCKET AND WIRE ASSEMBLY	.20	63-592	R13	33M OHM	1/4 W. .09
78-586		DIAL LIGHT SOCKET AND WIRE ASSEMBLY	.22	63-593	R5	47M OHM	1/4 W. .09
80-85		INDICATOR TENSION SPRING	.10	63-595	R20	100M OHM	1/4 W. .09
80-402		DIAL CORD TENSION SPRING	.03	63-600	R10	2.2 MEGOHM	1/4 W. .09
80-445		TUNER ARM PRESSURE SPRING	.10	63-605	R9	1M OHM	1/2 W. .10
80-446		TUNER ARM TENSION SPRING	.06	63-607	R1	15M OHM	1/2 W. .10
100-36		DIAL LIGHT BULB	.09	63-620		33 OHM	1/4 W. .09
188-32		RETAINING RING	1.03C	63-626		120 OHM	1/4 W. .09
S-11330		DIAL CORD AND EYELET ASSEMBLY	.09	63-651	R22	82M OHM	1/4 W. .09
S-12242		IDLER BRACKET AND SHAFT ASSEMBLY	.20	63-712	R6	33M OHM (INSULATED)	1/4 W. .19
S-12243		BUSHING, GEAR AND INDICATOR ASSEMBLY	.59	63-715	R2	100M OHM (INSULATED)	1/4 W. .19
S-12245		GEAR AND BUSHING ASSEMBLY	.33	63-752	R15	1800 OHM (INSULATED)	1/4 W. .19
S-12248		CAPACITOR PULLEY BUSHING AND CAM ASSEMBLY	.62	63-803	R3	2200 OHM	1/2 W. .10
S-12266		IDLER WHEEL AND RUBBER RING ASSEMBLY	.25	63-1166	R11	33M OHM	1/2 W. .10
S-12294		DIAL SCALE AND BRACING STRIP ASSEMBLY (26-338)	1.98	63-960	R19	68M OHM	1/2 W. .10
S-12296		TUNER ARM ASSEMBLY	.87	63-976	R21	15 MEGOHM	1/4 W. .09
S-12297		RESONANCE INDICATOR SOCKET AND CABLE ASSEMBLY	.69	63-1349		VOLUME CONTROL AND SWITCH	1.81
COILS AND CHOKES				63-1446	R12	1200 OHM	1/2 W. .10
S-11344	L12	OSCILLATOR COUPLER COIL ASSEM. (B.C. AND AUTOMATIC)	1.06	63-1447	R14	120 OHM	1/2 W. .10
S-11591		WAVEMAGNET LOADING COIL ASSEM. (USED ON S-12356)	.28	63-1448	R4	5600 OHM	1/2 W. .10
S-12249	T1	1ST I.F. TRANSFORMER ASSEMBLY	3.47	AUDIO POWER SUPPLY			
S-12250	T2	2ND I.F. TRANSFORMER ASSEMBLY	3.72	22-1128	C2	.02 MFD	.600 V. .20
S-12251	T3	3RD I.F. TRANSFORMER ASSEMBLY	3.00	22-1134	C1	.002 MFD.	1000 V. .26
S-12252	T4	DISCRIMINATOR TRANSFORMER ASSEMBLY	2.78	22-1515	C3, C4	TWO SECTION ELECTROLYTIC 15 MFD. .30 MFD.	.450 V. 2.50
S-12256	L27	A.C. LINE CHOKE COIL ASSEMBLY	.35	58-149	P1	MOULDED PLUG - 7 PRONG (POWER CABLE)	.22
S-12281	L8	WAVE TRAP COIL ASSEMBLY	.49	63-577	R5	100 OHM	1/4 W. .09
S-12282	L4	S.W. ANTENNA COIL ASSEMBLY	.29	63-648	R2	47M OHM	1/4 W. .09
S-12291	L7	S.W. DETECTOR COIL ASSEMBLY	.32	63-776		330M OHM (INSULATED)	1/4 W. .19
S-12292	L11	S.W. OSCILLATOR COIL ASSEMBLY	.40	63-797		2200 OHM	1/2 W. .10
S-12293	L9	BROADCAST DETECTOR COIL ASSEMBLY	.61	63-1551		CANDOHM RESISTOR	.70
S-12301	L3	F.M. ANTENNA COIL ASSEMBLY	.49	63-1848	R8	33M OHM	1/2 W. .21
S-12302	L5	F.M. DETECTOR COIL ASSEMBLY	.49	63-1880		180M OHM (INSULATED)	1/2 W. .21
S-12303	L10	F.M. OSCILLATOR COIL ASSEMBLY	.37	63-1883		220M OHM (INSULATED)	1/2 W. .21
S-12529	L2	ANTENNA LOADING COIL ASSEMBLY	.48	78-274		SOCKET - ELECTROLYTIC CAPACITOR (2 USED)	.03
CONDENSERS				78-611		SOCKET - OCTAL TUBE (8 USED)	.12
22-162	C24	100 MMFD.	.600 V. .20	78-644	P.L.I.	SOCKET - SINGLE CONTACT	.12
22-171	C28	.05 MFD	.600 V. .26	78-732	S01	SOCKET - SPEAKER PLUG	.15
22-188		.02 MFD	.400 V. .20	95-956	T1	POWER TRANSFORMER	15.50
22-196	C12	.01 MFD	.600 V. .20	95-957	L1	FILTER CHOKE	4.50
22-242	C36	750 MMFD.	.500 V. .26	S-13489		INTERNAL CABLE ASSEMBLY	.45
22-289	C33	50 MMFD	.600 V. .20	S-13490		EXTERNAL CABLE ASSEMBLY	2.75
22-319	C34	.005 MFD.	.200 V. .20	AUTOMATIC TUNING UNIT			
22-365	C27	100 MMFD.	.600 V. .20	12-900		AUTOMATIC TUNING UNIT MTC. BRKT.	.18
22-448	C30	.004 MFD.	.600 V. .20	22-846		AUTOMATIC TUNING UNIT TRIMMER	.20
22-829	C23	.05 MFD	.200 V. .20	22-847		AUTOMATIC TUNING UNIT TRIMMER	.26
22-830	C25	.02 MFD	.600 V. .20	22-848		AUTOMATIC TUNING UNIT TRIMMER	.33
22-912		.002 MFD.	.600 V. .20	22-859	C37	AUTOMATIC TUNING UNIT TRIMMER	.26
22-1041	C38	.005 MFD.	.600 V. .20	22-868		480 MMFD. SILVER MICA	.38
22-1126	C32	.01 MFD	.400 V. .20	22-873		AUTOMATIC TUNING UNIT TRIMMER	.33
22-1127	C31	.02 MFD	.400 V. .20	24-287		AUTOMATIC TUNING UNIT CARDBOARD COVER	.04
22-1135	C35	.005 MFD.	.600 V. .20	85-370		AUTOMATIC TUNING UNIT SWITCH.	4.70
22-1138	C26	500 MMFD.	.600 V. .20	112-223		ADJUSTING SCREW AND CORE (4 USED)	.12
22-1169	C19	.001 MFD.	.600 V. .26	112-292		ADJUSTING SCREW AND CORE (1 USED)	.12
22-1257		.005 MFD.	1000 V. .26	S-6928		AUTOMATIC TUNING COIL (RED)	.21
22-1362	C29	.004 MFD.	.600 V. .20	S-6929		AUTOMATIC TUNING COIL (GREEN)	.21
22-1363	C1	THREE GANG VARIABLE	6.20	S-7021		AUTOMATIC TUNING COIL (YELLOW)	.21
22-1367	C18	50 MMFD. (CERAMIC)	.500 V. .33	S-7859		AUTOMATIC TUNING COIL (BLUE)	.28
22-1386		.02 MFD	.200 V. .20	S-10100		AUTOMATIC TUNING COIL (WHITE)	.28
22-1431		.001 MFD.	.600 V. .20	S-12331		AUTOMATIC TUNING UNIT COMPLETE	11.82
22-1493	C6	TRIMMER (F.M. ANT.)	.45	AUTOMATIC ESCUTCHEON PARTS			
22-1494	C14	TRIMMER (F.M. DET.)	.47	46-674		AUTOMATIC STATION SELECTOR KNOB (5 USED)	.10
22-1497	C-8-9-10	TRIMMER (S.W. ANTENNA AND WAVE TRAP)	1.25	46-681		PHONO REJECT KNOB	.15
22-1502	C16	TRIMMER (S.W. OSC.)	.38	57-1293		AUTOMATIC PLASTIC ESCUTCHEON PLATE ONLY	.20
22-1503	C7	150 MMFD.	.300 V. .38	76-342		AUTOMATIC KNOB RETAINING SHAFT	.05
22-1504	C3	10 MMFD. (CERAMIC)	.500 V. .33	83-984		RUBBER STRIP	.04
22-1505	C13	17 MMFD. (CERAMIC)	.500 V. .33	83-1112		TRIM STRIP	.60
22-1506	C5	22 MMFD. (CERAMIC)	.500 V. .33	S-12399		AUTOMATIC BRACKET AND LATCH ASSEMBLY	.90
22-1507	C2	25 MMFD. (CERAMIC)	.500 V. .33	S-13671		AUTOMATIC TUNING KNOB AND ESCUTCHEON ASSEMBLY COMPLETE	3.50
22-1508	C11	35 MMFD. (CERAMIC)	.500 V. .33				
22-1509	C20	52 MMFD. (CERAMIC)	.500 V. .33				
22-1514	C22	TRIMMER (F.M. OSC.)	.38				
RESISTORS							
63-260	R18	100M OHM	1/4 W. .09				
63-296	R16	220M OHM	1/4 W. .09				
63-380	R17	100M OHM	1 W. .12				
63-441		1 MEGOHM	1/4 W. .90				
63-503	R23	15M OHM (INSULATED)	1/4 W. .09				

PARTS LIST--Continued

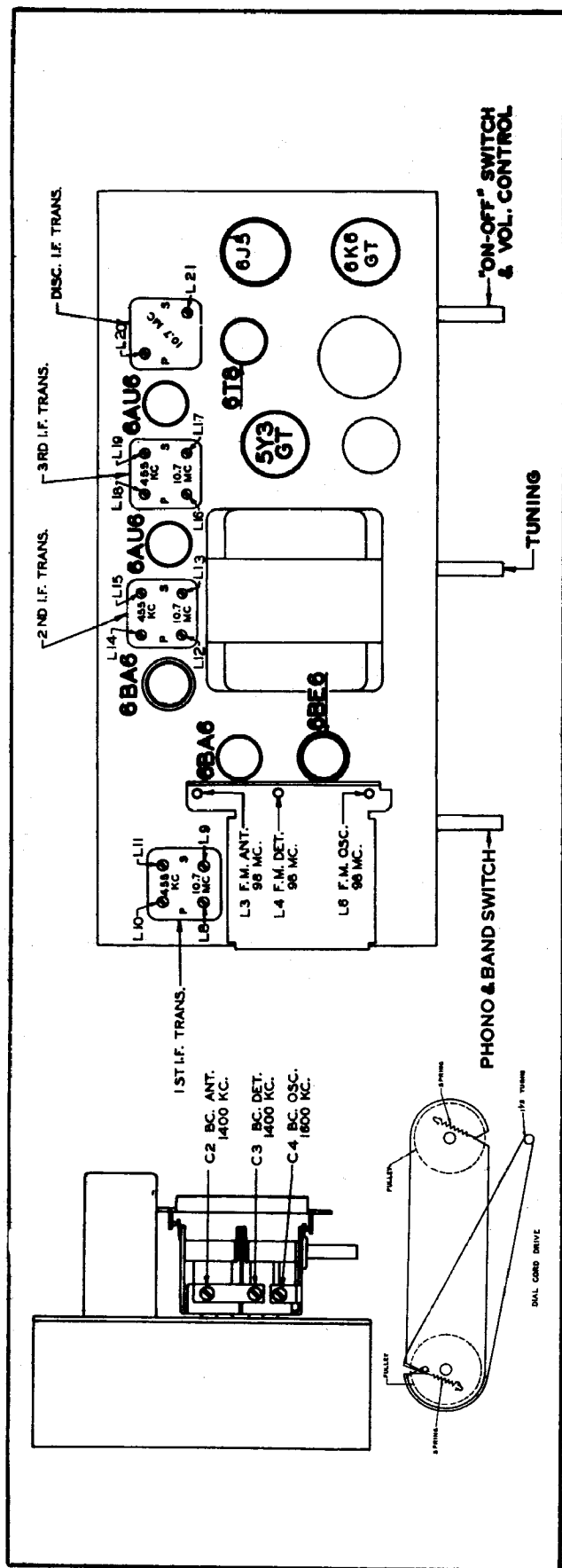
PART NO.	REF. NO.	DESCRIPTION	PRICE	PART NO.	REF. NO.	DESCRIPTION	PRICE
RADIOORGAN ESCUTCHEON PARTS				CABINET PARTS			
57-1294		RADIOORGAN ESCUTCHEON PLATE ONLY	\$1.20	19-123		PHONO UNIT MTG. CLIP (3 USED)	.10
76-342		RADIOORGAN KNOB SHAFT.	.05	24-388		RECORD CHANGER COMPARTMENT COVER	.86
83-1112		RADIOORGAN ESCUTCHEON TRIM STRIP	.60	49-600	SP1	12" P.M. SPEAKER.	15.40
S-9606		RADIOORGAN STRIP AND CONTACT ASSEMBLY.	.36	57-1066		206-600 OUTPUT TRANSFORMER.	2.63
S-12397		RADIOORGAN ESCUTCHEON BRACKET AND LATCH ASSEMBLY.	1.04	57-1289		208-600 CONE AND VOICE COIL.	4.60
S-13472		RADIOORGAN KNOB AND EYELET ASSEMBLY - NORMAL	.20			DIAL ESCUTCHEON PLATE	4.85
S-13475		RADIOORGAN KNOB AND EYELET ASSEMBLY - ALTO	.20	69-193		ORNAMENTAL PLATE (ZENITH) (USED ON S-13484)	.85
S-13476		RADIOORGAN KNOB AND EYELET ASSEMBLY - VOICE.	.20	78-761		1/4.20 x 2" R.H.M.S. (2 USED ON S-12545)	.04
S-13667		RADIOORGAN ESCUTCHEON AND KNOB ASSEMBLY COMPLETE	4.00	80-423		PILOT LIGHT SOCKET.	.50
S-13668		RADIOORGAN KNOB AND EYELET ASSEMBLY - LO-BASS.	.20	80-463		CHASSIS LIFT SPRING (2 USED).	.21
S-13669		RADIOORGAN KNOB AND EYELET ASSEMBLY - BASS	.20			PHONO UNIT MTG. SPRING (4 USED)	.03
S-13670		RADIOORGAN KNOB AND EYELET ASSEMBLY - TREBLE	.20	83-1244		RECORD CHANGER TRIM STRIP	1.00
				90-367		PILOT LIGHT TUBE	.01
MISCELLANEOUS				93-392		3-32 x 33/64 x 1" BROWN FELT WASHER (3 USED)	1.20C
11-87		LINE CORD AND PLUG.	.65	100-36		PILOT LIGHT BULB HD	.09
27-87	C21	SILVER MICA DISC (475 MMF.)	.03	112-558		#10.32 x 7/8" PHILLIPS FLAT HD. M.S. (CHASSIS MTG.) (4 USED).	.04
57-1054		SPARK PLATE	.10	112-670		RECORD CHANGER MTG. SCREW (1 USED).	.07
58-133		NINE PRONG PLUG (USED ON S-13677).	.12	112-671		RECORD CHANGER MTG. SCREW (3 USED).	.11
78-363		SOCKET - WAVEMAGNET PLUG.	.07	114-257		#10 x 1-3/8" SLOTTED HEX HD. SELF TAPPING SCREW (2 USED ON S-13675)	.03
78-376		SOCKET - OCTAL BASE TUBE (8 CONTACT).	.12	171-7		PILOT LIGHT LENS.	.20
78-580		SOCKET - NINE CONTACT (PHONO)	.22	192-96		DIAL CRYSTAL.	2.50
78-582		SOCKET - NINE CONTACT (2 USED ON S-13677)	.20	202-506		F.M. INSTRUCTION BOOK	.10
78-684		SOCKET - OCTAL BASE TUBE (MOULDED)	.28	202-512		PHONO INSTRUCTION BOOK.	.20
78-685		SOCKET - MINIATURE TUBE	.26	202-514		UNPACKING INSTRUCTIONS.	.03
80-451		TUBE RETAINING RING	.12	202-515		INSTRUCTION BOOK.	.20
125-49		CHASSIS MTG. RUBBER GROMMET	.05	202-517		STATION IDENTIFICATION TABS	.40
126-379		LOKAL TUBE SHIELD.	.07	S-12545		PHONO LIFT SPRING AND BUSHING ASSEMBLY (2 USED)	.43
149-54		F.M. IRON CORE AND SPRING (3 USED)	.60	S-13058		F.M. DIPOLE AND SHORT WAVE ANTENNA ASSEMBLY.	.75
197-15		LIGHT DIFFUSING CUP	.40	S-13484		RECORD CHANGER SUPPORT FRAME AND ARM ASSEMBLY.	10.65
S-12356	S1	BAND SWITCH AND SHIELD ASSEMBLY (85-340).	11.17	S-13672		TUNING KNOB AND RING ASSEMBLY (46-680) (3 USED)	.25
S-12360		FILAMENT CABLE ASSEMBLY #1.	.39	S-13673		WAVEMAGNET AND HINGE ASSEMBLY (COMPLETE) (TYPE 36A)	5.00
S-12361		CABLE ASSEMBLY #2	.44	S-13675		RECORD CHANGER (INTERMIXER)	----
				S-13677		INTERCONNECTING CABLE ASSEMBLY.	4.00



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MODELS 9H984, 9H984LP



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

TO THE SERVICE MAN:

The 9F22 chassis incorporates a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all bands. The Radiorgan tone control is of the low impedance type in which a portion of the audio voltage is taken from the speaker voice coil and fed back out of phase into the grid of the first audio. The characteristic of the feedback voltage is determined by the setting of the Radiorgan buttons. To attenuate the high notes, more highs are fed back. To attenuate the low notes, more lows are fed back. For normal reproduction, both highs and lows are fed back and results in no overall change in tone.

The 6BA6 1st IF tube is also the phono pre-amplifier. The output from the phono oscillator is fed to the grid of the 6BA6 through C19 and R11. The amplified output is taken from the screen grid and fed back through R12, and C12 into the volume control circuit and the grid of the 6T8 1st audio amplifier. AM Alignment: The alignment of this chassis on the standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: A coil slug arrangement tunes the 100 MC FM band. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF Amplifier are used for the FM IF's. Observe the same precautions when making adjustments. FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

NOTE: The output transformer must be replaced with an exact duplicate, Part No. 95-1063. Be sure to add the speaker code letter to the transformer Part Number when ordering replacements.

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 800 Signal Generator (Form 28001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 7 6BE6 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L-10, 11, 14, 15 16, 18 and 19.	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavenagnet.		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3			1400 Kc. Modulated	BC	1400 Kc.	C3 and C2	Align det. and ant. stages.
4 (a)	Pin 1 (grid) on 6AU6 Limiter	.05 Mfd.	10.7 Mc Unmodulated	FM		L20 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)		.05 Mfd.	10.7 Mc Unmodulated	FM		L21 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 6AU6 2nd IF.	.05 Mfd.	10.7 Mc Unmodulated	FM		L16 and L17 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 6BA6 1st IF.	.05 Mfd.	10.7 Mc Unmodulated	FM		L12 and L13 Prim. and Sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 7 (grid) on 6BE6 converter tube	.05 Mfd.	10.7 Mc Unmodulated	FM		L8 and L9 Prim. and Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading.
9 (c) (d)	FM Antenna Post (Re-move line ant.)	270 ohms	98 Mc. Unmodulated	FM	98 Mc.	L6 Osc. Coil Slug L4 and L3 Det. and RF coil Slugs	Set Oscillator to dial scale. Align det. and ant. stages to maximum reading.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM	98 Mc.		

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 200,000 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 adjustment-

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 6 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 3 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter Lug 3 on 3rd IF transformer (Limiter Grid).

(d) Loosen Slugs by applying a hot iron to the cement.

PART NUMBER	REF. NUMBER	DESCRIPTION	PRICE
DIAL ASSEMBLY			
12-1434		Dial Light Mtg. Bracket.	\$.02
26-418		Dial Scale use S 15394	
59-209		Dial Pointer	.30
76-499		Tuning Control Shaft	.25
78-797		Dial Light Socket.	.30
80-69		Dial Cord Tension Spring	.012
80-209		Dial Cord Tension Spring	.024
80-444		Tuner Arm Tension Spring	.05
80-581		Pressure Arm Tension Spring.	.10
93-721		Black Felt Washer (used on 59-209)	.005
100-36		Dial Light Bulb.	.09
188-32	PL-1	Retaining Ring	1.03 C
S-14254		Pointer Pulley Assy (76-498)	.25
S-14256		Pulley & Bushing Assy.	.50
S-14268		Dial Cord & Eyelet Assy (short).	.05
S-14269		Dial Cord & Eyelet Assy (long)	.06
S-14429		Tuner Arm Assy.	.80
S-15394		Dial Scale & Strip Assy. (26-418)	
COILS & CHOKES			
S-11157	L7	B.C. Oscillator Coil Assy.	.53
S-12259	L6	F.M. Oscillator Coil Assy.	.33
S-12603	L22	Phono Oscillator Coil Assy.	.75
S-13871	L4	F.M. Detector Coil Assy.	.75
S-13970	T1	1st I.F. Transformer Assy.	2.50
S-13971	T2	2nd I.F. Transformer Assy.	2.75
S-13972	T3	3rd I.F. Transformer Assy.	3.00
S-13974	L5	B.C. Detector Coil Assy.	1.00
S-14192	L3	F.M. Antenna Coil Assy.	.70
S-14984	T4	Discriminator Trans. Assy.	
CONDENSERS			
22-171	C28	.05 Mfd.	.600 V.
22-348	C16	.001 Mfd.	.500 V.
22-365	C25	100 MMFD (or 22-1670)	.500 V.
22-929	C6	.05 Mfd.	.200 V.
22-830	C19	.02 Mfd.	.600 V.
22-854	C26	.0005 Mfd.	.600 V.
22-1041	C35	.005 Mfd. (molded)	.400 V.
22-1220	C12	.002 Mfd.	.600 V.
22-1367	C14	50 MMFD (ceramic)	.500 V.
22-1385	C17	.01 Mfd.	.200 V.
22-1418	C34	.1 Mfd.	.200 V.
22-1506	C7	22 MMFD (ceramic)	.500 V.
22-1507	C20	25 MMFD (ceramic)	.500 V.
22-1516	C5	4.7 MMFD (molded)	.200 V.
22-1531	C21	.2 Mfd.	.200 V.
22-1532	C32	50 MMFD. (or 22-1674)	.500 V.
22-1627	C31	.01 Mfd. (or 22-1651)	.600 V.
22-1664	C33	50 MMFD (ceramic)	.500 V.
22-1669	C9	100 MMFD (ceramic)	.500 V.
22-1676	C8	.001 MMFD (ceramic)	.500 V.
22-1677	C1	Three gang variable	.40
22-1688	C11	19 MMFD (ceramic)	.500 V.
22-1689	C13	48 MMFD (ceramic)	.500 V.
22-1705	C10	30 MMFD (ceramic)	.500 V.
22-1706	C15	.005 Mfd. (ceramic) (disc type)	.450 V.
22-1717	C27	.001 Mfd.	.200 V.
22-1718	C24	.01 Mfd. (shielded)	.400 V.
22-1884	C22,23	Two Sect. Electrolytic 40 Mfd.	.350VX.
22-1885	C29,30	Two Sect. Electrolytic 40 Mfd.-25VX 80 Mfd.-450 V.	.450 V.
RESISTORS			
RADIOORGAN ESC. ASSEMBLY			
57-1351		Radiorgan Esc.	.50
57-1352		Radiorgan Esc.	.50
76-444		Radiorgan Knob Retaining Shaft (2 used)	.04
80-595		Radiorgan Mtg. Spring (2 used)	.05
80-595		Knob Tension Spring	.04
112-533		#6 x 1/4" Rd. Phill. Hd. S.T. Screw Type #25 CAD. (2 each used with S-15449 & S-15397)	
114-159		#6 x 1/4" Hex. Hd. S.T. Screw Type A CAD (2 each used with S-15449 & S-15397)	.72 C
S-14255		Radiorgan Mtg. Bracket Assy.	.15
S-14261		Radiorgan Strip & Contact Assy.	.15
S-14273		Radiorgan Knob & Eyelet Assy. (Lo-Bass)	.20
S-14274		Radiorgan Knob & Eyelet Assy. (Bass)	.20
S-14663		Radiorgan Knob & Eyelet Assy. (Voice)	.20
S-14276		Radiorgan Knob & Eyelet Assy. (Treble)	.20
S-14278		Radiorgan Knob & Eyelet Assy. (Normal)	.20
S-15397		Radiorgan Esc. & Knob Assy. (R.H.)	
S-15449		Radiorgan Esc. & Knob Assy. (L.H.)	
TUBES			
2 6BA6			
1 6BE6			
2 6AU6			
1 6T8			
1 6K6GT.			
1 6J5			
1 5Y3GT.			
CABINET PARTS			
2-139		Cabinet Back.	2.00
12-1547		Tone Arm Rest Bracket	
19-9		Cable Clip.	
19-88		Cable Clip.	
19-169		Record Changer Mtg. Clip (4 used)	.02
19-171		Loop Connector Clip (2 used)	.07
27-81		Shaft Bearing Disc.	.015
36-39		Record Changer Frame Handle	.60
46-697		Tuning Control Knob (2 used)	.10
46-718		Band Switch Knob.	.15
46-786		Band Switch Knob.	.15
49-624		Speaker 12" P.M.	13.00
57-1353		Diffusing Plate.	4.60
57-1469		Dial Escutcheon	.90
MISCELLANEOUS			
11-108		Line Cord and Plug (9 ft. long)	.80
54-226		Speed Nut - Tinnerman.	.01
57-1269		I.F. Trans. Terminal Plate	.06
78-709		Octal Tube Socket.	.20
78-750		Six Contact Socket.	.25
78-782		Miniature Tube Socket (2 used)	.25
78-788		Novel Miniature Socket	.35
78-793		Octal Tube Socket (2 used)	.15
78-794		Miniature Tube Socket (3 used)	.20
83-1545		Insulating Strip (4 used)	.02
85-442	S1	Band Switch.	2.75
95-1063	T5	Output Transformer	2.50
95-1117	T6	Power Transformer	13.00
125-26		Rubber Grommet (2 used) (mts. 78-709)	.025
125-62		Rubber Grommet (4 used)	.02
126-553		Metal Tube Shield.	.11
126-569		Heat Shield.	.15
149-64		Tuning Core & Spring (3 used)	.40
S-15193		Phono Cable Assy. (or S-15467)	

22-1385	C17	.01 Mfd.	200 V.	.20
22-1418	C34	.1 Mfd.	200 V.	.20
22-1506	C7	22 MMFD (ceramic)	500 V.	.33
22-1507	C20	25 MMFD (ceramic)	500 V.	.33
22-1516	C5	4.7 MMFD (molded)	500 V.	.20
22-1531	C21	.2 Mfd.	200 V.	.20
22-1532	C32	50 MMFD. (or 22-1674)	500 V.	.20
22-1627	C31	.01 Mfd. (or 22-1651)	.600 V.	.20
22-1664	C33	50 MMFD (ceramic)	500 V.	.25
22-1669	C9	100 MMFD (ceramic)	500 V.	.20
22-1676	C8	.001 MMFD (ceramic)	500 V.	.40
22-1677	C1	Three gang variable	500 V.	4.35
22-1688	C11	18 MMFD (ceramic)	500 V.	.30
22-1689	C13	48 MMFD (ceramic)	500 V.	.30
22-1705	C10	30 MMFD (ceramic)	500 V.	.20
22-1706	C15	.005 Mfd. (ceramic) (disc type)	450 V.	.30
22-1717	C27	.001 Mfd.	200 V.	.20
22-1718	C24	.01 Mfd. (shielded)	400 V.	.40
22-1884	C22.23	Two Sect. Electrolytic 40 Mfd.	350VX.	3.50
22-1885	C29.30	Two Sect. Electrolytic 40 Mfd. -25VX 80 Mfd. -450 V.	450 V.	4.00

RESISTORS

33-943	R21	4700 Ohm Insulated Resistor 10%.	.1 W.	.24
63-957	R2	33K Ohm Insulated Resistor 10%.	.1 W.	.24
63-1065	R7	15K Ohm Insulated Resistor 10%.	.1 W.	.24
63-1222	R34	470 Ohm Insulated W. W. Resistor 10%.	.1 W.	.24
63-1588	R30	Volume Control & Switch.		1.81
63-1681	R36	Two Section Candohm.		.55
63-1691	R31	1800 Ohm W.W. Zipohm 10%.	.2 W.	.30
63-1737	R4	68 Ohm Ins. Res. 20%.	1/2 W.	.21
63-1771	R3	470 Ohm Ins. Res. 10%.	1/2 W.	.21
63-1772	R6	470 Ohm Ins. Res. 20%.	1/2 W.	.21
63-1778	R26	680 Ohm Ins. Res. 10%.	1/2 W.	.21
63-1779	R12	680 Ohm Ins. Res. 20%.	1/2 W.	.21
63-1795	R28	1 K Ohm Ins. Res. 10%.	1/2 W.	.21
63-1792	R29	1500 Ohm Ins. Res. 10%.	1/2 W.	.21
63-1800	R8	2200 Ohm Ins. Res. 20%.	1/2 W.	.21
63-1813	R27	4700 Ohm Ins. Res. 10%.	1/2 W.	.21
63-1817	R35	5600 Ohm Ins. Res. 10%.	1/2 W.	.21
63-1820	R20	6800 Ohm Ins. Res. 10%.	1/2 W.	.21
63-1824	R14	8200 Ohm Ins. Res. 10%.	1/2 W.	.21
63-1827	R11	10K Ohm Ins. Res. 10%.	1/2 W.	.21
63-1831	R19	12K Ohm Ins. Res. 10%.	1/2 W.	.21
63-1834	R18	15K Ohm Ins. Res. 10%.	1/2 W.	.21
63-1842	R5	22K Ohm Ins. Res. 20%.	1/2 W.	.21
63-1848	R13	33K Ohm Ins. Res. 10%.	1/2 W.	.21
63-1856	R17	47K Ohm Ins. Res. 20%.	1/2 W.	.21
63-1862	R23	68K Ohm Ins. Res. 10%.	1/2 W.	.21
63-1870	R22	100K Ohm Ins. Res. 20%.	1/2 W.	.21
63-1876	R25	150K Ohm Ins. Res. 10%.	1/2 W.	.21
63-1883	R24	220K Ohm Ins. Res. 10%.	1/2 W.	.21
63-1884	R9	220K Ohm Ins. Res. 20%.	1/2 W.	.21
63-1897	R33	470K Ohm Ins. Res. 10%.	1/2 W.	.21
63-1911	R15	1 Megohm Ins. Res. 10%.	1/2 W.	.21
63-1912	R1	1 Megohm Ins. Res. 20%.	1/2 W.	.21
63-1926	R10	2.2 Megohm Ins. Res. 20%.	1/2 W.	.21
63-1961	R32	15 Megohm Ins. Res. 20%.	1/2 W.	.21
63-1998	R16	4700 Ohm W.W. Ins. Res. 10%.	.2 W.	.33

CABINET PARTS

2-139	2-139	Cabinet Back.		2.00
12-1547	12-1547	Tone Arm Rest Bracket		
19-9	19-9	Cable Clip.		.02
19-88	19-88	Cable Clip.		.07
19-169	19-169	Record Changer Mtg. Clip (4 used)		.05
19-171	19-171	Loop Connector Clip (2 used)		.60
27-81	27-81	Shaft Bearing Disc.		.10
36-39	36-39	Record Changer Frame Handle		.15
46-897	46-897	Tuning Control Knob (2 used)		.15
46-718	46-718	Band Switch Knob.		13.00
46-786	46-786	Band Switch Knob.		4.60
49-624	49-624	Speaker 12" P.M.		.90
57-1353	57-1353	208-624 Cone & Voice Coil		
57-1469	57-1469	Diffusing Plate.		
70-83	70-83	Dial Escutcheon		
72-55	72-55	6 x 1/2" Washer Hd. Wood Screw Steel Stat.Br. (10 used to mount cab. back)		.55 C
72-58	72-58	#6 x 3/8" Phill. Fl-Hd. Wood Screw Steel N.P. (2 used with 27-81)		.013
80-678	80-678	#2 x 3/8" Phill. Fl. Hd. Wood Screw Steel Brass Pl. (6 used to mount 57-1469)		.015
83-1247	83-1247	Record Changer Mtg. Spring (4 used)		.04
93-392	93-392	Brown Felt Washer - 3/32 x 33/64 x 1"		.25
112-489	112-489	Trim Strip.		1.20 C
112-712	112-712	Record Changer Mtg. Screw (4 used)		
113-17	113-17	#8 x 1/2" Phill. R.H.S.T. ShakeProof #25 Cad. (used with 46-697 & 46-718)		.028
114-78	114-78	Record Changer Mtg. Screw (4 used)		.08
114-148	114-148	6-32 x 1/4" R.H.M.S. Steel N.P. Lockwasher Attached (2 used to mount 12-1547 on L.P. only)		
114-233	114-233	#8 x 5/16 Hex. Hd. Slotted S.T. Type Z N.P. (used with 19-88)		1.40 C
159-52	159-52	#10 x 7/8" Hex. Washer Hd. S.T. Type Z CAD. Pl. (4 used chassis mtg.)		1.20 C
188-91	188-91	#14 x 1-1/4" Slotted Hex. Washer Hd. S.T. Type Z CAD		.07
192-115	192-115	Plug Button (4 used)		.09
196-109	196-109	Rubber Ring (2 used)		.03
202-683	202-683	Dial Glass		1.50
202-684	202-684	Dial Glass Dust Gasket		.75
202-685	202-685	Radio Instruction Book.		.10
S-12864	S-12864	Phono Instruction Book (L.P. Only)		.20
S-14004	S-14004	Drive Wheel & Pin Assy.		.10
S-14012	S-14012	Non-Intermixer Record Changer		.24
S-14305	S-14305	Low Impedance Loop.		.45
S-15386	S-15386	Knob & Eyelet Assy (46-776)		
S-15395	S-15395	Record Changer Mtg. Frame Assy (complete)		.80
S-15396	S-15396	Loading Coil Assy.		

L2

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 9) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when this meter starts to go to the left (negative) of zero will give the same results.



ALIGNMENT PROCEDURE

Opera- tion	Connect Oscillator to	Dummy Antenna	Input Signal - Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 8 on Converter Tube 6SB7 socket	.05 Mfd.	455 Kc.	BC	600 Kc.	L15, 16, 19, 20, 23 and 24	Align I.F. channel for maximum output
2	Pin 1 on R.F. tube 6AG5 socket	.05 Mfd.	Modulated 455 Kc.	Aut.	Press any but- ton on Auto.	C10	Adjust wavetrup to minimum
3	2 Turns loosely coupled to wavemag.		1600 Kc.				Set oscillator to dial scale
4	2 Turns loosely coupled to wavemag.		Modulated 1400 Kc.	BC	1600 Kc.	C17	
5	Antenna Post (Re- move line ant.)	400 ohms	Modulated 11.7 Mc.	BC	1400 Kc.	C15 & C4	Align det. and ant. stages.
6	Antenna Post (Re- move line ant.)	400 ohms	Modulated 11.7 Mc.	SW	11.7 Mc.	C16	Set oscillator to dial scale
7	Antenna Post (Re- move line ant.)	400 ohms	Modulated 9.7 Mc.	SW	11.7 Mc.	C9	Align ant. stage
8 (a)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc.	SW	9.7 Mc.	C8	Align ant. stage Repeat Oper. 6 for maximum output
9 (b)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	Unmodulated 8.3 Mc.	FM		L25 coil slug primary disc.	Align primary of discrimi- nator for maximum reading
10 (c)	Pin 6 (grid) on 7W7 2nd IF tube socket	.05 Mfd.	Unmodulated 8.3 Mc.	FM		L26 coil slug sec. of discr.	Adjust secondary of discr. for zero reading
11 (c) (d)	Pin 4 (grid) on 6SG7 1st IF tube socket	.05 Mfd.	Unmodulated 8.3 Mc.	FM		L21 & L22 prim. & sec. of 3rd IF transformer	Align 3rd IF transformer for maximum reading
12 (c) (d)	Pin 8 (grid) on 6SB7 converter tube socket	.05 Mfd.	Unmodulated 8.3 Mc.	FM		L17 & L18 prim. & sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading
13 (c)	Antenna Post (Re- move line ant.)	270 ohms	8.3 Mc. Unmodulated 98 Mc.	FM		L13 & L14 prim. & sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
14 (c)	Antenna Post (Re- move line ant.)	270 ohms	Unmodulated 98 Mc.	FM	98 Mc.	L10 Osc. coil Slug	Set oscillator to dial scale
15 (c)	Antenna Post (Re- move line ant.)	270 ohms	Unmodulated 45 Mc.	FM	98 Mc.	L5 and L3 Det. and RF coil slugs	Align det. and Ant. stage to maximum reading
16 (c)	Antenna Post (Re- move line ant.)	270 ohms	Unmodulated 45 Mc.	FM	45 Mc.	C22	Set oscillator to dial scale
	Antenna Post (Re- move line ant.)	270 ohms	Unmodulated	FM	45 Mc.	C14 and C6	Align detector and ant. stages for maximum reading

IMPORTANT: Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

A correct alignment can only be made if the following procedure is followed.

A vacuum tube voltmeter with an isolation resistor of 200,000 ohms in series with the hot lead will serve for FM adjustments. This lead must be shielded.

An ordinary 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 indication on the meter.

(a) Vacuum Tube Voltmeter pin 5 on discriminator transformer to chassis (half discriminator load.)

(b) Vacuum Tube Voltmeter pin 7 on discriminator transformer to chassis (full discriminator load.)

(c) Vacuum Tube Voltmeter 6SH7 limiter grid (pin 4 to chassis).

(d) 300 ohm 1/4 watt carbon resistor soldered across the secondary L18 (pin 2 and 3 of 2nd IF trans.). The leads to the resistor must be as short as possible and the resistor removed before operation is started.

PARTS LIST

[illegible]

S11415	RADIOORGAN KNOB & EYELET ASSEM. (NORMAL).....	16
S11416	RADIOORGAN KNOB & EYELET ASSEM. (LO-BASS).....	16
S11417	RADIOORGAN KNOB & EYELET ASSEM. (BASS).....	16
S11418	RADIOORGAN KNOB & EYELET ASSEM. (ALTO).....	16
S11419	RADIOORGAN KNOB & EYELET ASSEM. (VOICE).....	16
S11420	RADIOORGAN KNOB & EYELET ASSEM. (TREBLE).....	16
S11422	RADIOORGAN ESC. & KNOB ASSEM. COMPLETE (PART OF S2).....	3.41
S12397	RADIOORGAN ESC. BRACKET & LATCH ASSEM.....	1.04

MISCELLANEOUS

11-97	LINE CORD & PLUG (10 FT.).....	.95
27-87	SILVER MICA DISC (475 MMFD.) (C21)....	.03
57-1054	SPARK PLATE.....	.10
68-1	AUTOMATIC TUNING ADJUSTMENT WRENCH....	.03
78-363	SOCKET - WAVEMAGNET PLUG.....	.07
78-376	SOCKET - OCTAL TUBE (8 CONTACT).....	.12
78-580	SOCKET - NINE CONTACT.....	.22
78-684	SOCKET OCTAL (MOULDED).....	.28
78-685	SOCKET - MINIATURE TUBE.....	.26
78-708	SOCKET - OCTAL (SPECIAL).....	.16
80-451	TUBE RETAINING SPRING.....	.12
93-168	RUBBER CUSHION WASHER.....	.07
93-215	RUBBER CUSHION WASHER.....	.07
93-392	BROWN FELT KNOB WASHER (3 USED).....	1.20C
125-49	CHASSIS MTG. RUBBER GROMMET.....	.05
125-56	SPEAKER MTG. RUBBER GROMMET.....	.05
126-379	LOKAL TUBE SHIELD.....	.07
149-54	F. M. IRON CORE & SPRING (3 USED)....	.60
188-48	TUNING KNOB DECORATIVE RING (USED ON S11558).....	.04
197-15	LIGHT DIFFUSING CUP.....	.40
202-426	PHONO INSTRUCTION BOOK.....	.12
202-427	INSTRUCTION BOOK & CALL LETTER TABS....	.40
S11558	TUNING KNOB & RING ASSEM. (3 USED)....	.28
S12356	BAND SW. & SHIELD ASSEM. (85-340) (S1).....	11.17
S12360	FILAMENT CABLE #1.....	.39
S12361	CABLE ASSEM. #2.....	.44

CABINET PARTS - 12H090-092R-094E

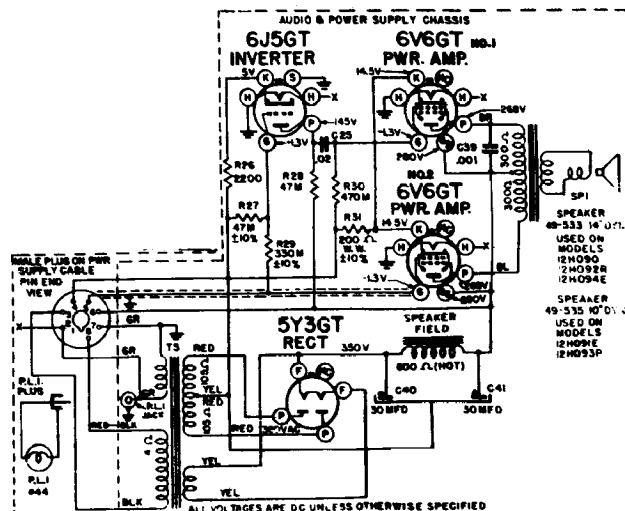
12-1138	WAVEMAGNET MTG. BRKT.	.14
15-23	CAP & INSULATOR (MALE) (USED ON S12393).....	.12
15-62	CAP & INSULATOR (FEMALE) (USED ON S12393).....	.22
19-123	PHONO UNIT MTG. CLIP (4 USED).....	.10
49-533	14 INCH DYNAMIC SPEAKER (SP1).....	16.00
	206-533 OUTPUT TRANSFORMER.....	3.29
	207-533 FIELD COIL (NOT REPLACEABLE).....	5.26
	208-533 CONE & VOICE COIL.....	4.85
57-1066	DIAL ESCUTCHEON PLATE.....	.07
58-75	CONNECTOR PLUG (USED ON S12377).....	.07
58-88	THREE PRONG WAVEMAGNET PLUG.....	.12
58-133	NINE PRONG MALE PLUG (USED ON S12393).....	.04
69-193	1/2 - 20 X 2" R.H.M.S. (2 USED).....	.02
69-230	#8-32 X 2" R.H.M.S. (1 USED).....	.02
71-74	#10-32 X 7/8 FLAT PHILLIPS HD. M. S. (CHASSIS MTG.) (4 USED).....	.02
72-38	#2 X 3/8 PHILLIPS FLAT HD. WOOD SCREW (ESC. MTG.).....	.02
78-582	NINE PRONG FEMALE SOCKET (USED ON S12393).....	.20
80-423	CHASSIS LIFT SPRING (2 USED).....	.21
80-463	PHONO UNIT MTG. SPRING (4 USED).....	.03
83-1150	TRIM STRIP.....	.84
83-1220	CABINET DIAL LIGHT SOCKET MTG. STRIP.....	.03
90-367	CABINET DIAL LIGHT TUBE.....	.01
94-479	SPRING BUSHING (2 USED).....	.38
112-420	1/2 - 28 SPECIAL OVAL HD. M. S. (4 USED ON INTERMIXER).....	.33
114-202	WAVEMAGNET MTG. BRKT. SCREW (2 USED).....	.03

114-251	AMPLIFIER CHASSIS MTG. SCREW (4 USED).....	.03
171-7	CABINET PILOT LIGHT LENS.....	.20
192-96	DIAL CRYSTAL.....	2.50
196-67	DIAL CRYSTAL DUST GASKET.....	.78
S10796	LID SUPPORT ARM HINGE PLATE & BRKT. (R.H.) (092R-094E).....	1.85
S10797	LID SUPPORT ARM HINGE PLATE & BRKT. (L.H.) (092R-094E).....	1.85
S11429	RECORD CHANGER SUPPORT FRAME & ARM ASSEM.	10.08
S11918	HINGE ARM ASSEM. (R.H.) (090).....	1.06
S11919	HINGE ARM ASSEM. (L.H.) (090).....	1.06
S12111	WAVEMAGNET ASSEM. (TYPE 30E) (L1).....	3.28
S12327	HINGE PLATE & BRKT. ASSEM. (R.H.) (090).....	1.85
S12328	HINGE PLATE & BRKT. ASSEM. (L.H.) (090).....	1.85
S12393	INTER-CONNECTING CABLE ASSEM. (OR S12604).....	9.61
S12545	PHONO LIFT SPRING & BUSHING (2 USED).....	.43
S13058	CABINET F. M. DIPOLE & S. W. ANTENNA ASSEM.	.75
S12377	CABINET PILOT LIGHT SOCKET, WIRE & PLUG ASSEM.	.86

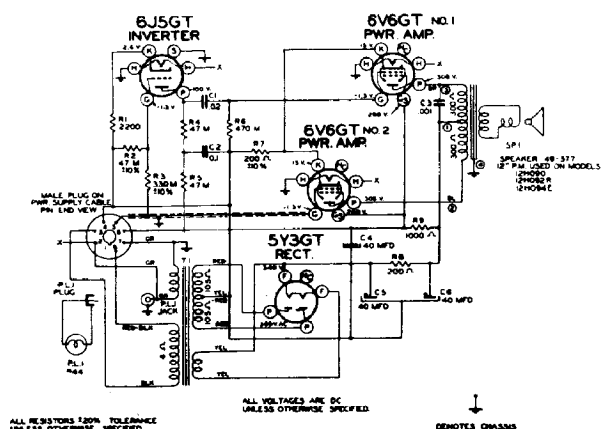
CABINET PARTS - 12H091E - 083R

15-62	CAP & INSULATOR (FEMALE) USED ON S12584).....	.22
15-64	CAP & INSULATOR (USED ON S12584).....	.06
19-123	PHONO UNIT MTG. CLIP (4 USED).....	.10
22-1501	DRY ELECTROLYTIC - 150 MFD. 60V.	3.40
49-535	10 INCH DYNAMIC SPEAKER (SP1).....	11.00
	206-535 OUTPUT TRANSFORMER.....	2.57
	207-535 FIELD COIL (NOT REPLACEABLE).....	3.41
	208-535 CONE & VOICE COIL.....	3.41
52-188	TWO CONTACT SOCKET & WIRE (USED ON S12584).....	.24
57-1066	DIAL ESCUTCHEON PLATE.....	4.85
58-86	TWO PRONG PLUG.....	.12
58-88	THREE PRONG WAVEMAGNET PLUG.....	.07
58-132	SIX CONTACT MALE PLUG (USED ON S12583).....	.12
58-134	NINE PRONG PLUG (USED ON S12584).....	.12
78-555	SIX CONTACT SOCKET.....	.11
78-582	NINE PRONG SOCKET (USED ON S12584).....	.20
80-443	PHONO DOOR RETURN SPRING.....	.18
80-463	RECORD CHANGER MTG. SPRING (4 USED).....	.03
83-1240	TRIM STRIP.....	.75
85-351	DRIVE OUT CONTROL SWITCH.....	1.90
85-382	LIFT LIMITING TOGGLE SWITCH.....	1.10
94-502	MOTOR MTG. BUSHING (USED ON S12412).....	.03
112-420	1/2 W-28 SPECIAL OVAL HD. M. S. (4 USED ON INTERMIXER).....	.33
114-61	#10-32 X 1 1/2 SLOTTED HEX WASHER HD. M. S. (2 USED).....	.04
114-132	#10 X 1 5/8 SLOTTED HEX WASHER HD. S. T. SCREW (2 USED).....	.05
143-44	DRIVE OUT COUPLING.....	.45
192-96	DIAL CRYSTAL.....	2.50
196-67	DIAL CRYSTAL DUST GASKET.....	.78
S11614	MOTOR MTG. BRACKET ASSEM. (USED ON S12412).....	.72
S12394	WAVEMAGNET ASSEM. (TYPE 30K) (L1).....	1.67
S12411	BALL BEARING SHAFT ASSEM.	5.53
S12412	PHONO DRIVE OUT MOTOR, MTG. BRKT. & CABLE ASSEM.	34.50
S12413	PHONO UNIT MTG. FRAME & BRKT. ASSEM.	7.00
S12583	PHONO DRIVE OUT MOTOR & PLUG ASSEM. (141-91 INDUCTION MOTOR).....	32.00
S12584	INTER-CONNECTING CABLE ASSEM. (OR S12605).....	5.21
S12865	FILTER CONDENSER SHIELD & CLAMP ASSEM.	.21
S13093	CABINET F. M. DIPOLE & S. W. ANTENNA ASSEM. (OR S13058).....	.71

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



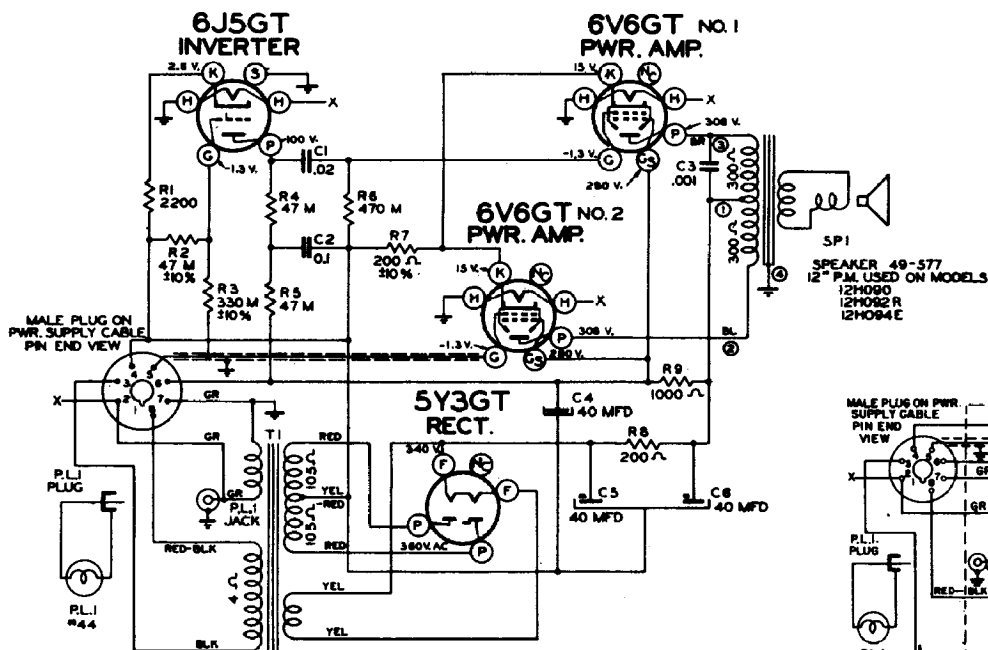
POWER SUPPLY 11C21 CHASSIS



POWER SUPPLY 11C21Z CHASSIS

CHANGING CHASSIS 11C21 POWER SUPPLY FOR OPERATION WITH P.M. TYPE SPEAKERS

This P.M. speaker will replace electro-dynamic speakers, part number 49-533, and 49-535. These electro-dynamic speakers were used in chassis 11C21. Chassis 11C21Z uses P.M. speakers. To change over the 11C21 to 11C21Z it will be necessary to add two resistors, (1000 ohm 3 watt and a 200 ohm 5 watt), and one 40 MFD. filter capacitor. Change capacitors C40, and C41 to 40 MFD. See the schematics below for complete details.

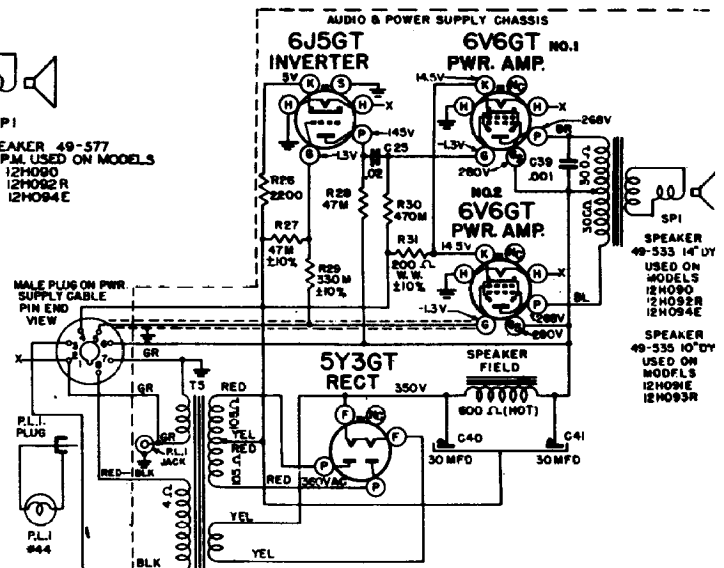


ALL RESISTORS ±20% TOLERANCE
UNLESS OTHERWISE SPECIFIED.

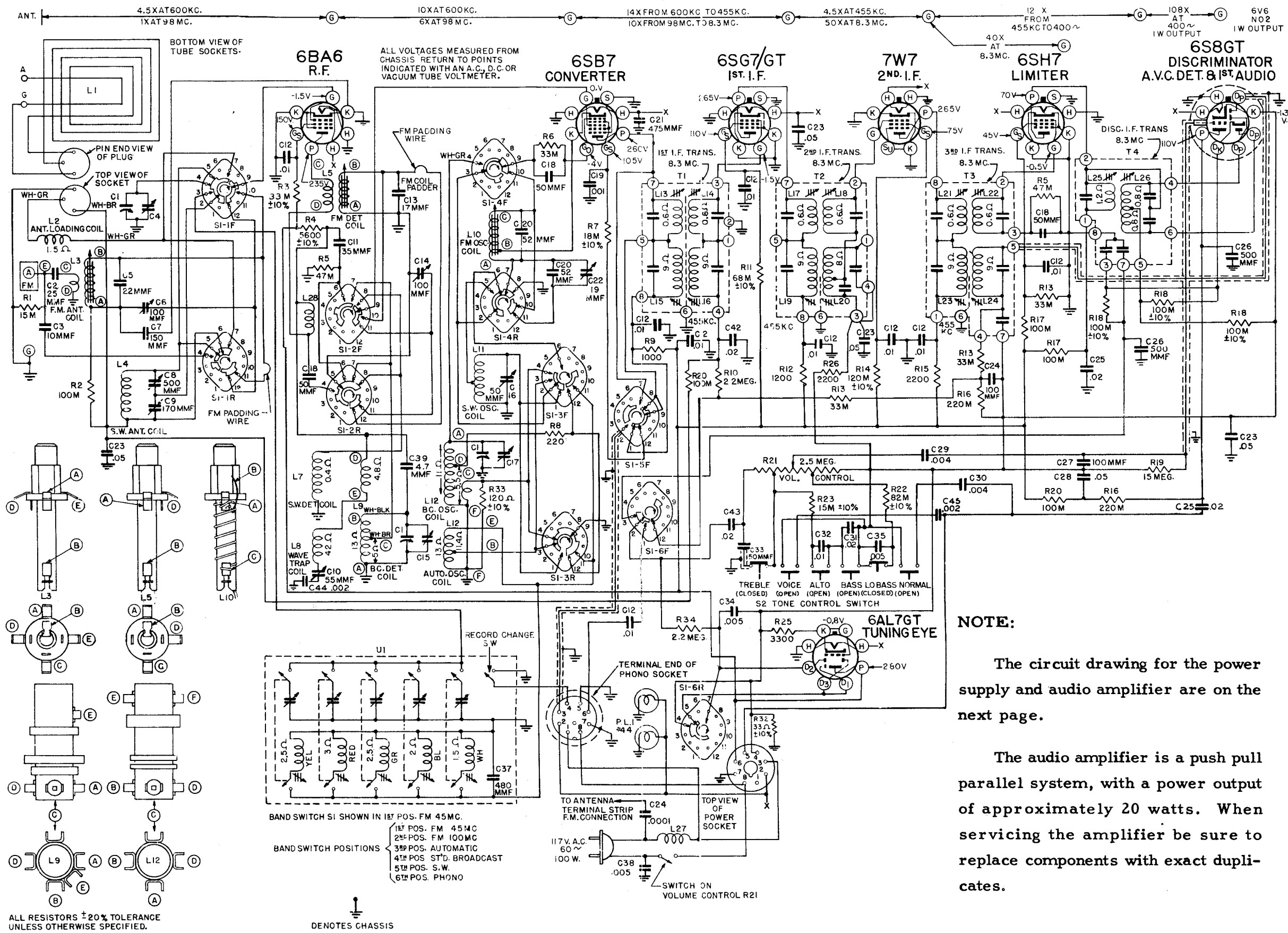
ALL VOLTAGES ARE DC
UNLESS OTHERWISE SPECIFIED.

⏏ DENOTES CHASSIS

11C21Z POWER SUPPLY
WIRED FOR P.M.
SPEAKERS



11C21 POWER SUPPLY
WIRED FOR ELECTRO-DYNAMIC
SPEAKERS



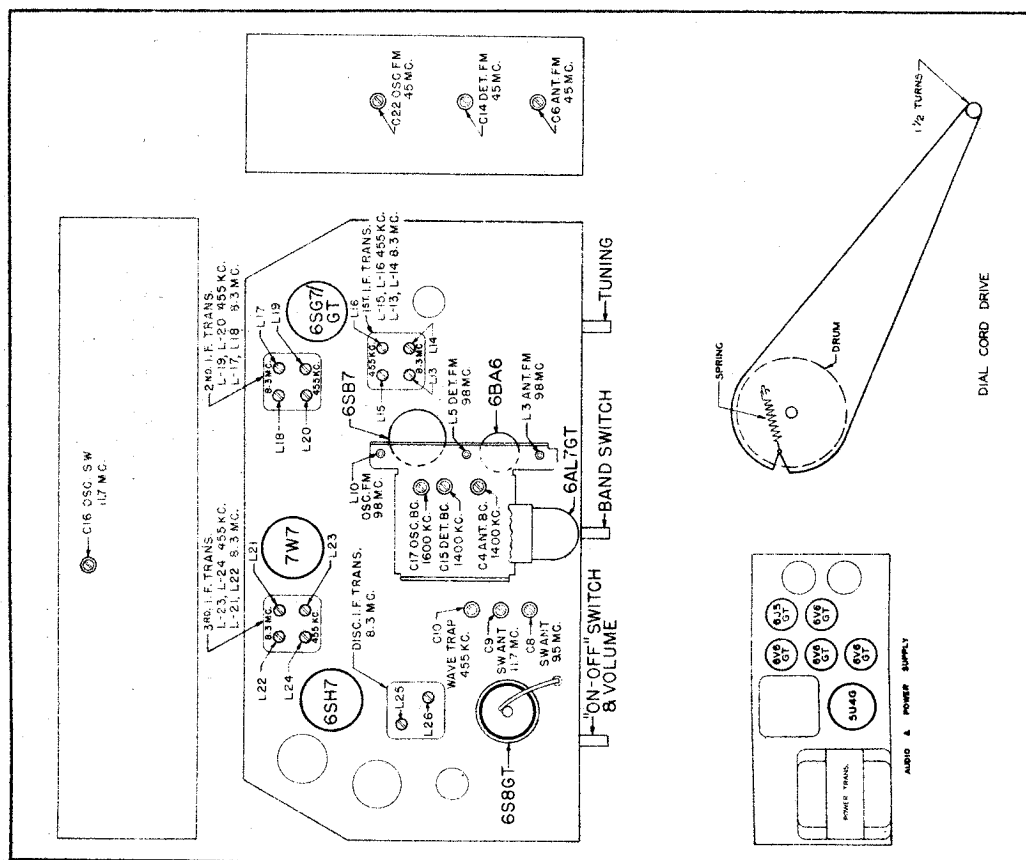
MODEL 14H789
CHASSIS 13D22

NOTE:

The circuit drawing for the power supply and audio amplifier are on the next page.

The audio amplifier is a push pull parallel system, with a power output of approximately 20 watts. When servicing the amplifier be sure to replace components with exact duplicates.

TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING



The 11C21 chassis incorporate a superheterodyne circuit with two stages of IF, and one stage of RF amplification on all hands.

AM Alignment: The alignment of this chassis on the short wave and standard broadcast band is conventional. The alignment slugs in the IF transformers are threaded and screw into the coil forms. The slugs are slotted for a small size fiber screw driver. Do not press hard on the aligning tool ((fiber screw driver) or the threads in the coil forms will strip and adjustment will be impossible.

FM RF Alignment: .The same coil slug arrangement which tunes the 100 MC FWM band also tunes the 45 MC band. However, on 45 MC the band switch connects trimmer condensers in parallel and padding wires in series with the 100 MC coils. The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustments the shafts must be secured with a drop of speaker cement.

FM IF Alignment: The same type of tuning slugs for aligning the AM IF amplifier are used for the FM I.F. s. Observe the same precautions when making adjustments. The second 8.3 Mc IF stage is overcoupled. Overcoupling gives a wide band pass with good sensitivity. When an overcoupled stage is aligned with an unmodulated signal, the stage must be loaded. A 300 ohm carbon resistor soldered across the secondary of the second IF transformer provides a satisfactory load for this circuit. The resistor leads must be kept short to reduce the distributed capacity of the circuit.

When aligning a loaded stage, it will be found that considerable signal from the generator will be required, and that it will tune broadly. THE LOAD RESISTOR MUST BE REMOVED AFTER ALIGNMENT.

If the signal generator used does not have sufficient output to overcome the temporary loss caused by the load resistor, the load resistance may be increased or the signal fed into the preceding stage.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 9) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when this meter starts to go to the left (negative) of zero will give the same results.

ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 8 on Converter Tube 6SB7 socket	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L15, 16, 19, 20, 23 and 24	Align I.F. channel for maximum output
2	Pin 1 on R.F. tube 6AG5 socket	.05 Mfd.	455 Kc. Modulated	Aut.	Press any button on Auto.	C10	Adjust wavetrap to minimum
3	2 Turns loosely coupled to wavemag.		1600 Kc. Modulated	BC	1600 Kc.	C17	Set oscillator to dial scale
4	2 Turns loosely coupled to wavemag.		1400 Kc. Modulated	BC	1400 Kc.	C15 & C4	Align det. and ant. stages. Set oscillator to dial scale
5	Antenna Post (Re-move line ant.)	400 ohms	11.7 Mc. Modulated	SW	11.7 Mc.	C16	
6	Antenna Post (Re-move line ant.)	400 ohms	11.7 Mc. Modulated	SW	11.7 Mc.	C9	Align ant. stage
7	Antenna Post (Re-move line ant.)	400 ohms	9.7 Mc. Modulated	SW	9.7 Mc.	C8	Align ant. stage Repeat Oper. 6 for maximum output
8 (a)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L25 coil slug primary disc.	Align primary of discriminator for maximum reading
9 (b)	Pin 4 grid on 6SH7 limiter socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L26 coil slug sec. of discr.	Adjust secondary of discr. for zero reading
10 (c)	Pin 6 (grid) on 7W7 2nd IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L21 & L22 prim. & sec. of 3rd IF transformer	Align 3rd IF transformer for maximum reading
11 (c) (d)	Pin 4 (grid) on 6SG7 1st IF tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L17 & L18 prim. & sec. of 2nd IF transformer	Align 2nd IF transformer for maximum reading
12 (c) (d)	Pin 8 (grid) on 6SE7 converter tube socket	.05 Mfd.	8.3 Mc. Unmodulated	FM		L13 & L14 prim. & sec. of 1st IF transformer	Align 1st IF transformer for maximum reading
13 (c)	Antenna Post (Re-move line ant.)	270 ohms	98 Mc. Unmodulated	FM	98 Mc.	L10 Osc. coil Slug	Set oscillator to dial scale
	Antenna Post (Re-move line ant.)	270 ohms	98 Mc. Unmodulated	FM	98 Mc.	L5 and L3 Det. and RF coil slugs	Align det. and Ant. stage to maximum reading
14 (c)	Antenna Post (Re-move line ant.)	270 ohms	45 Mc. Unmodulated	FM	45 Mc.	C22	Set oscillator to dial scale
15 (c)	Antenna Post (Re-move line ant.)	270 ohms	45 Mc. Unmodulated	FM	45 Mc.	C14 and C6	Align detector and ant. stages for maximum reading
16 (c)							

IMPORTANT: Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

A correct alignment can only be made if the following procedure is followed.

A vacuum tube voltmeter with an isolation resistor of 200,000 ohms in series with the hot lead will serve for FM adjustments.

This lead must be shielded

An ordinary 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 indication on the meter.

(a) Vacuum Tube Voltmeter pin 5 on discriminator transformer to chassis (half discriminator load.)

(b) Vacuum Tube Voltmeter pin 7 on discriminator transformer to chassis (full discriminator load.)

(c) Vacuum Tube Voltmeter 6SH7 limiter grid (pin 4 to chassis).

(d) 300 ohm 1/2 watt carbon resistor soldered across the secondary L18 (pin 2 and 3 of 2nd IF trans.). The leads to the resistor must be as short as possible and the resistor removed before operation 13 is started.

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY			
59-159		DIAL POINTER.	\$1.00
76-417		BAND SWITCH DRIVE SHAFT.	.24
76-418		TUNING CONTROL SHAFT.	.30
78-585		DIAL LIGHT SOCKET AND WIRE ASSEMBLY.	.20
78-586		DIAL LIGHT SOCKET AND WIRE ASSEMBLY.	.22
80-85		INDICATOR TENSION SPRING.	.10
80-402		DIAL CORD TENSION SPRING.	.03
80-445		TUNER ARM PRESSURE SPRING.	.10
80-446		TUNER ARM TENSION SPRING.	.06
100-36		DIAL LIGHT BULB.	.09
188-32		RETAINING RING.	1.03C
S-11330		DIAL CORD AND EYELET ASSEMBLY.	.09
S-12242		IDLER BRACKET AND SHAFT ASSEMBLY.	.20
S-12243		BUSHING, GEAR AND INDICATOR ASSEMBLY.	.59
S-12245		GEAR AND BUSHING ASSEMBLY.	.33
S-12248		CAPACITOR PULLEY BUSHING AND CAM ASSEMBLY.	.62
S-12266		IDLER WHEEL AND RUBBER RING ASSEMBLY.	.25
S-12294		DIAL SCALE AND BRACING STRIP ASSEMBLY (26-338).	1.98
S-12296		TUNER ARM ASSEMBLY.	.87
S-12297		RESONANCE INDICATOR SOCKET AND CABLE ASSEMBLY.	.89

COILS AND CHOKES

S-11344	L12	OSCILLATOR COUPLER COIL ASSEM. (B.C. AND AUTOMATIC)	1.06
S-11591		WAVEMAGNET LOADING COIL ASSEM. (USED ON S-12356).	.28
S-12249	T1	1ST I.F. TRANSFORMER ASSEMBLY	3.47
S-12250	T2	2ND I.F. TRANSFORMER ASSEMBLY	3.72
S-12251	T3	3RD I.F. TRANSFORMER ASSEMBLY	3.00
S-12252	T4	DISCRIMINATOR TRANSFORMER ASSEMBLY.	2.78
S-12256	L27	A.C. LINE CHOKE COIL ASSEMBLY	.35
S-12281	L8	WAVE TRAP COIL ASSEMBLY.	.49
S-12282	L4	S.W. ANTENNA COIL ASSEMBLY.	.29
S-12291	L7	S.W. DETECTOR COIL ASSEMBLY.	.32
S-12292	L11	S.W. OSCILLATOR COIL ASSEMBLY	.40
S-12293	L9	BROADCAST DETECTOR COIL ASSEMBLY.	.61
S-12301	L3	F.M. ANTENNA COIL ASSEMBLY.	.49
S-12302	L5	F.M. DETECTOR COIL ASSEMBLY.	.49
S-12303	L10	F.M. OSCILLATOR COIL ASSEMBLY	.37
S-12529	L2	ANTENNA LOADING COIL ASSEMBLY	.48

CONDENSERS

22-162	C24	100 MMFD.	.600 V. .20
22-171	C28	.05 MFD.	.600 V. .26
22-188		.02 MFD.	.400 V. .20
22-196	C12	.01 MFD.	.600 V. .20
22-242	C36	750 MMFD.	.500 V. .26
22-289	C33	50 MMFD.	.600 V. .20
22-319	C34	.005 MFD.	.200 V. .20
22-365	C27	100 MMFD.	.600 V. .20
22-448	C30	.004 MFD.	.600 V. .20
22-829	C23	.05 MFD.	.200 V. .20
22-830	C25	.02 MFD.	.600 V. .20
22-912		.002 MFD.	.600 V. .20
22-1041	C38	.005 MFD.	.600 V. .20
22-1126	C32	.01 MFD.	.400 V. .20
22-1127	C31	.02 MFD.	.400 V. .20
22-1135	C35	.005 MFD.	.600 V. .20
22-1138	C26	500 MMFD.	.600 V. .20
22-1169	C19	.001 MFD.	.600 V. .26
22-1257		.005 MFD.	1000 V. .26
22-1362	C29	.004 MFD.	.600 V. .20
22-1363	C1	THREE GANG VARIABLE	6.20
22-1367	C18	50 MMFD. (CERAMIC).	.500 V. .33
22-1386		.02 MFD.	.200 V. .20
22-1431		.001 MFD.	.600 V. .20
22-1493	C6	TRIMMER (F.M. ANT.)	.45
22-1494	C14	TRIMMER (F.M. DET.)	.47
22-1497	C-8-9-10	TRIMMER (S.W. ANTENNA AND WAVE TRAP)	1.25
22-1502	C16	TRIMMER (S.W. OSC.)	.38
22-1503	C7	150 MMFD.	.300 V. .38
22-1504	C3	10 MMFD. (CERAMIC).	.500 V. .33
22-1505	C13	17 MMFD. (CERAMIC).	.500 V. .33
22-1506	C5	22 MMFD. (CERAMIC).	.500 V. .33
22-1507	C2	25 MMFD. (CERAMIC).	.500 V. .33
22-1508	C11	35 MMFD. (CERAMIC).	.500 V. .33
22-1509	C20	52 MMFD. (CERAMIC).	.500 V. .33
22-1514	C22	TRIMMER (F.M. OSC.)	.38

RESISTORS

63-260	R18	100M OHM.	1/4 W. .09
63-296	R16	220M OHM.	1/4 W. .09
63-380	R17	100M OHM.	1 W. .12
63-441		1 MEGOHM.	1/4 W. .90
63-503	R23	15M OHM (INSULATED).	1/4 W. .09

PART NO.	REF. NO.	DESCRIPTION	PRICE
63-510	R7	18M OHM (INSULATED).	2 W. .36
63-579	R8	220 OHM.	1/4 W. .09
63-585	R26	2200 OHM.	1/4 W. .09
63-586	R25	3300 OHM.	1/4 W. .09
63-592	R13	33M OHM.	1/4 W. .09
63-593	R5	47M OHM.	1/4 W. .09
63-595	R20	100M OHM.	1/4 W. .09
63-600	R10	2.2 MEGOHM.	1/4 W. .09
63-605	R9	1M OHM.	1/2 W. .10
63-607	R1	15M OHM.	1/2 W. .10
63-620		33 OHM.	1/4 W. .09
63-626		120 OHM.	1/4 W. .09
63-651	R22	82M OHM.	1/4 W. .09
63-712	R6	33M OHM (INSULATED).	1/4 W. .19
63-715	R2	100M OHM. (INSULATED).	1/4 W. .19
63-752		1800 OHM (INSULATED).	1/4 W. .19
63-803	R15	2200 OHM.	1/2 W. .10
63-1166	R3	33M OHM.	1/2 W. .10
63-960	R11	68M OHM.	1/2 W. .10
63-976	R19	15 MEGOHM.	1/4 W. .09
63-1349	R21	VOLUME CONTROL AND SWITCH.	1.81
63-1446	R12	1200 OHM.	1/2 W. .10
63-1447	R14	120 OHM.	1/2 W. .10
63-1448	R4	5600 OHM.	1/2 W. .10

AUDIO POWER SUPPLY

22-1128	C2	.02 MFD.	.600 V. .20
22-1134	C1	.002 MFD.	1000 V. .26
22-1515	C3, C4	TWO SECTION ELECTROLYTIC 15 MFD..30 MFD.	.450 V. 2.50
58-149	P1	MOULDED PLUG - 7 PRONG (POWER CABLE)	.22
63-577	R5	100 OHM.	1/4 W. .09
63-648	R2	47M OHM.	1/4 W. .09
63-776		330M OHM. (INSULATED).	1/4 W. .19
63-797		2200 OHM.	1/2 W. .10
63-1551		CANDOHM RESISTOR.	.70
63-1848	R8	33M OHM.	1/2 W. .21
63-1880		180M OHM (INSULATED).	1/4 W. .21
63-1883		220M OHM (INSULATED).	1/2 W. .21
78-274		SOCKET - ELECTROLYTIC CAPACITOR (2 USED).	.03
78-611		SOCKET - OCTAL TUBE (6 USED).	.12
78-644	P.L.I.	SOCKET - SINGLE CONTACT	.12
78-732	S01	SOCKET - SPEAKER PLUG	.15
95-956	T1	POWER TRANSFORMER	15.50
95-957	L1	FILTER CHOKE.	4.50
S-13489		INTERNAL CABLE ASSEMBLY	.45
S-13490		EXTERNAL CABLE ASSEMBLY	2.75

AUTOMATIC TUNING UNIT

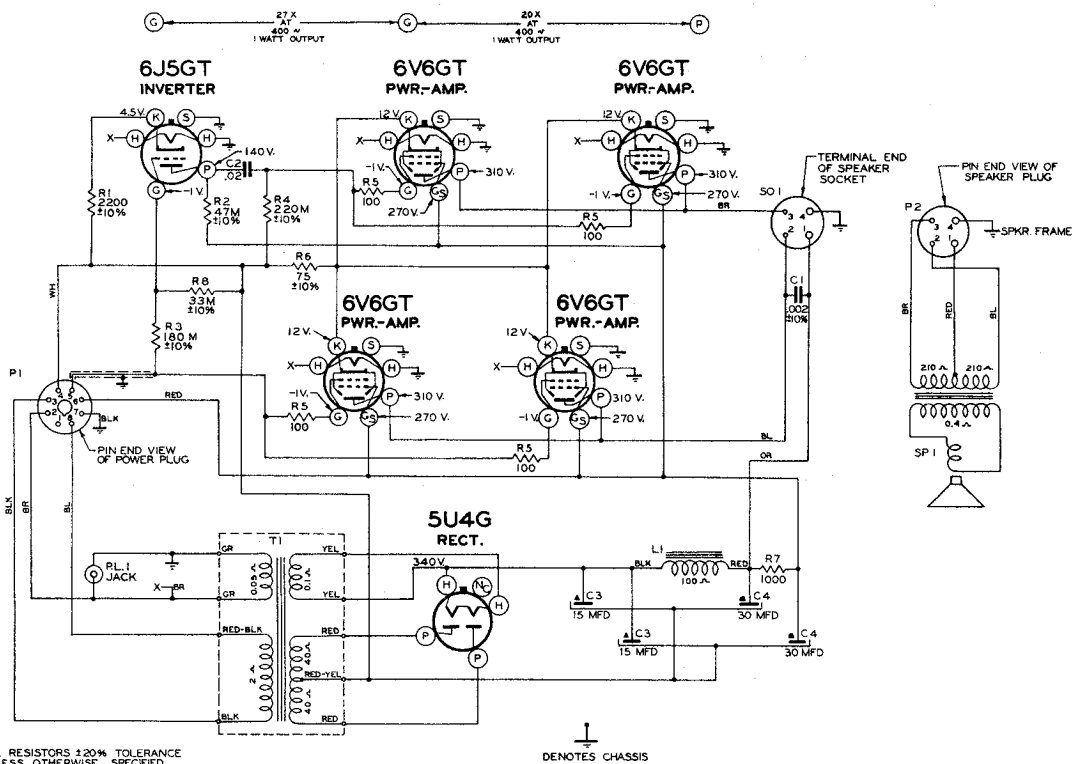
12-900		AUTOMATIC TUNING UNIT MTG. BRKT.	.18
22-846		AUTOMATIC TUNING UNIT TRIMMER	.20
22-847		AUTOMATIC TUNING UNIT TRIMMER	.26
22-848		AUTOMATIC TUNING UNIT TRIMMER	.33
22-859		AUTOMATIC TUNING UNIT TRIMMER	.26
22-868	C37	480 MMFD. SILVER MICA	.38
22-873		AUTOMATIC TUNING UNIT TRIMMER	.33
24-287		AUTOMATIC TUNING UNIT CARDBOARD COVER	.04
85-370		AUTOMATIC TUNING UNIT SWITCH.	4.70
112-223		ADJUSTING SCREW AND CORE (4 USED).	.12
112-292		ADJUSTING SCREW AND CORE (1 USED).	.12
S-6928		AUTOMATIC TUNING COIL (RED).	.21
S-6929		AUTOMATIC TUNING COIL (GREEN).	.21
S-7021		AUTOMATIC TUNING COIL (YELLOW).	.21
S-7859		AUTOMATIC TUNING COIL (BLUE).	.28
S-10100		AUTOMATIC TUNING COIL (WHITE).	.28
S-12331		AUTOMATIC TUNING UNIT COMPLETE.	11.82

AUTOMATIC ESCUTCHEON PARTS

46-674		AUTOMATIC STATION SELECTOR KNOB (5 USED).	.10
46-681		PHONO REJECT KNOB	.15
57-1293		AUTOMATIC PLASTIC ESCUTCHEON PLATE ONLY.	1.20
76-342		AUTOMATIC KNOB RETAINING SHAFT	.05
83-984		RUBBER STRIP.	.04
83-1112		TRIM STRIP.	.60
S-12399		AUTOMATIC BRACKET AND LATCH ASSEMBLY.	.90
S-13671		AUTOMATIC TUNING KNOB AND ESCUTCHEON ASSEMBLY COMPLETE.	3.50

PARTS LIST--Continued

PART NO.	REF. NO.	DESCRIPTION	PRICE	PART NO.	REF. NO.	DESCRIPTION	PRICE
RADIOORGAN ESCUTCHEON PARTS				CABINET PARTS			
57-1294		RADIOORGAN ESCUTCHEON PLATE ONLY.	\$1.20	19-123		PHONO UNIT MTG. CLIP (3 USED)	.10
76-342		RADIOORGAN KNOB SHAFT.	.05	24-388		RECORD CHANGER COMPARTMENT COVER	.86
83-1112		RADIOORGAN ESCUTCHEON TRIM STRIP	.60	49-600	SP1	12" P.M. SPEAKER.	15.40
S-9606		RADIOORGAN STRIP AND CONTACT ASSEMBLY.	.36	57-1066		206-600 OUTPUT TRANSFORMER.	2.63
S-12397		RADIOORGAN ESCUTCHEON BRACKET AND LATCH ASSEMBLY.	1.04	57-1289		208-600 CONE AND VOICE COIL	4.60
S-13472		RADIOORGAN KNOB AND EYELET ASSEMBLY - NORMAL	.20	69-193		DIAL ESCUTCHEON PLATE (ZENITH) (USED ON S-13484)	.85
S-13475		RADIOORGAN KNOB AND EYELET ASSEMBLY - ALTO	.20	78-761		1/4-20 x 2" R.H.M.S. (2 USED ON S-12545)	.04
S-13476		RADIOORGAN KNOB AND EYELET ASSEMBLY - VOICE.	.20	80-423		PILOT LIGHT SOCKET.	.50
S-13667		RADIOORGAN ESCUTCHEON AND KNOB ASSEMBLY COMPLETE.	4.00	80-463		CHASSIS LIFT SPRING (2 USED).	.21
S-13668		RADIOORGAN KNOB AND EYELET ASSEMBLY - LO-BASS.	.20	83-1244		PHONO UNIT MTG. SPRING (4 USED)	.03
S-13669		RADIOORGAN KNOB AND EYELET ASSEMBLY - BASS.	.20	90-367		RECORD CHANGER TRIM STRIP	1.00
S-13670		RADIOORGAN KNOB AND EYELET ASSEMBLY - TREBLE	.20	93-392		PILOT LIGHT TUBE.	.01
MISCELLANEOUS				100-36		3-32 x 33/64 x 1" BROWN FELT WASHER (3 USED)	1.20C
11-87		LINE CORD AND PLUG.	.65	112-558		PILOT LIGHT BULB HD.	.09
27-87	C21	SILVER MICA DISC (475 MMF.)	.03	112-670		#10-32 x 7/8" PHILLIPS FLAT HD. M.S. (CHASSIS MTG.) (4 USED).	.04
57-1054		SPARK PLATE.	.10	112-671		RECORD CHANGER MTG. SCREW (1 USED)	.07
58-133		NINE PRONG PLUG (USED ON S-13677).	.12	114-257		RECORD CHANGER MTG. SCREW (3 USED)	.11
78-363		SOCKET - WAVEMAGNET PLUG.	.07	171-7		#10 x 1-3/8" SLOTTED HEX HD. SELF TAPPING SCREW (2 USED ON S-13675)	.03
78-376		SOCKET - OCTAL BASE TUBE (8 CONTACT).	.12	192-96		PILOT LIGHT LENS.	.20
78-580		SOCKET - NINE CONTACT (PHONO)	.22	202-506		DIAL CRYSTAL.	2.50
78-582		SOCKET - NINE CONTACT (2 USED ON S-13677)	.20	202-512		F.M. INSTRUCTION BOOK.	.10
78-684		SOCKET - OCTAL BASE TUBE (MOULDED)	.28	202-514		PHONO INSTRUCTION BOOK.	.20
78-685		SOCKET - MINIATURE TUBE	.26	202-515		UNPACKING INSTRUCTIONS.	.03
80-451		TUBE RETAINING RING.	.12	202-517		INSTRUCTION BOOK.	.20
125-49		CHASSIS MTG. RUBBER GROMMET	.05	S-12545		STATION IDENTIFICATION TABS	.40
126-379		LOKAL TUBE SHIELD.	.07	S-13058		PHONO LIFT SPRING AND BUSHING ASSEMBLY (2 USED)	.43
149-54		F.M. IRON CORE AND SPRING (3 USED)	.60	S-13484		F.M. DIPOLE AND SHORT WAVE ANTENNA ASSEMBLY.	.75
197-15		LIGHT DIFFUSING CUP.	.40	S-13672		RECORD CHANGER SUPPORT FRAME AND ARM ASSEMBLY.	10.65
S-12356	S1	BAND SWITCH AND SHIELD ASSEMBLY (85-340).	11.17	S-13673		TUNING KNOB AND RING ASSEMBLY (46-680) (3 USED)	.25
S-12360		FILAMENT CABLE ASSEMBLY #1.	.39	S-13675		WAVEMAGNET AND HINGE ASSEMBLY (COMPLETE) (TYPE 36A)	5.00
S-12361		CABLE ASSEMBLY #2.	.44	S-13677		RECORD CHANGER (INTERMIXER) INTERCONNECTING CABLE ASSEMBLY.	4.00



SERVICE MANUAL

MODEL S-11468

AUTOMATIC RECORD CHANGER



GENERAL

TO THE SERVICE MAN:

This Service Manual has been prepared for the purpose of assisting the Service Man in his work of caring for the Record Changer mechanism, whether he is called to remedy some difficulty, or to insure continued satisfactory operation. The Zenith Automatic Record Changers are constructed with a minimum of working parts, and in operation are simple and reliable. However, as is the case with all mechanical units, misalignment and trouble may occasionally develop. The information presented in this book will enable the Service Man to render quick and accurate service. For convenience, the Operating Instructions supplied with each Record Changer are summarized as follows:

The Record changer will automatically play up to twelve 10 inch or ten 12 inch records at one loading. The Record

Stack rests on the Spindle and the Record Shelf. The Selector Sprocket drives the Ejector Plate which pushes the records off the Shelf and Spindle allowing them to drop on the Turntable. To load for automatic operation, set the Record Size Selector Knob to 10 or 12, raise the Pressure Bar, press down lightly and turn the Spindle counter-clockwise to the load position, place the stack of records on the Spindle, lower the Pressure Bar until it rests on the Record Stack. Set the AUTO-MAN-OFF switch to AUTO and press the Record Change Button. The Changer will play the entire selection of records and will repeat the last record until it is turned off. For manual operation set the AUTO-MAN-OFF switch to MAN and play the records singly as on a non-automatic record player.

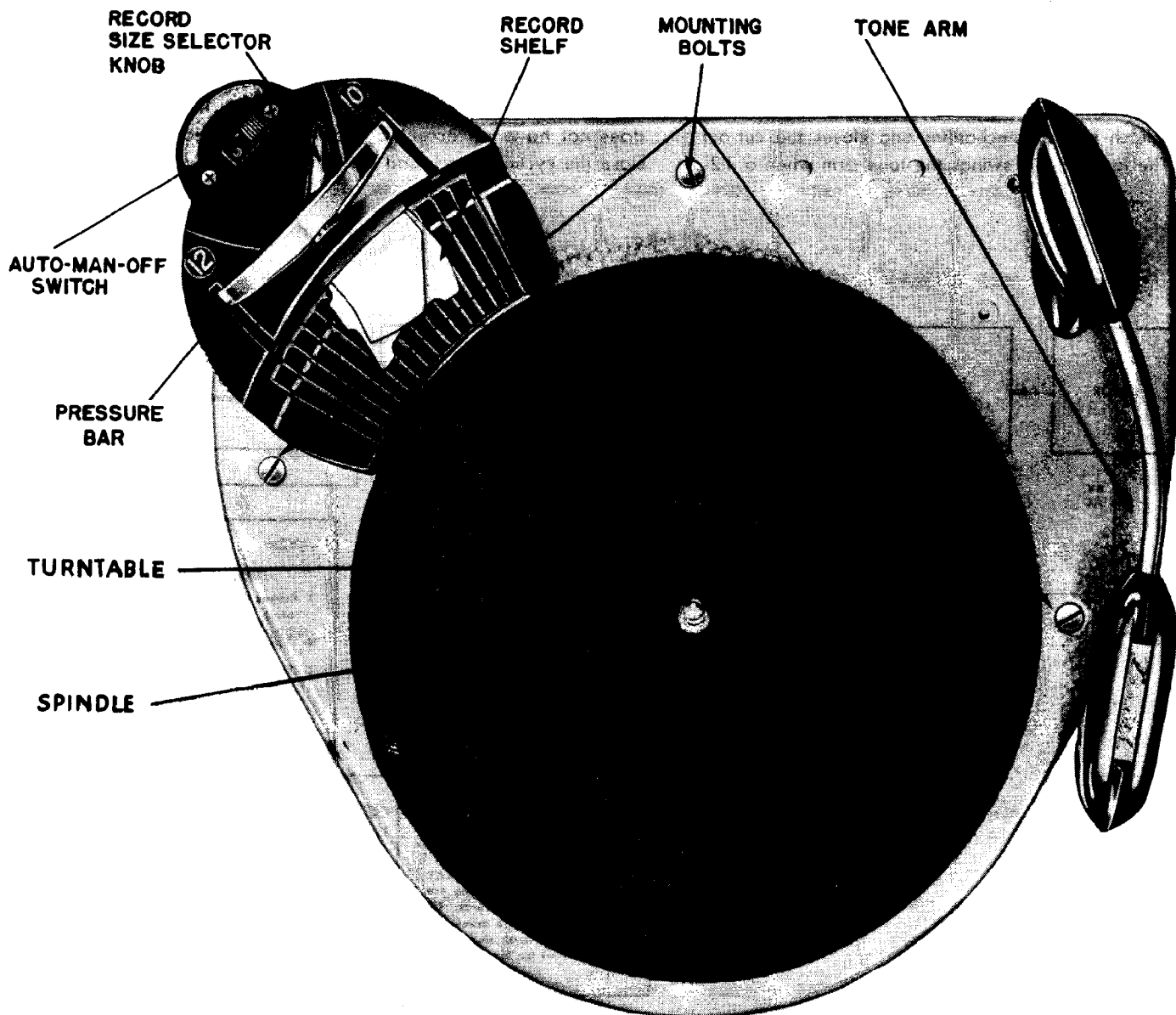


Fig. 1. Top View of Record Changer.

DESCRIPTION OF CYCLING

The motor drives an idler wheel which rim drives the turntable and the lower clutch section. The spindle is fixed and does not turn with the turntable. The solenoid energizing voltage is obtained from a 6 volt winding on the motor.

When the record change button on the receiver panel is pressed, the electric trip circuit is completed, solenoid is energized and the trigger pulled. (Fig. 4.) When the trigger is pulled, the trip plate return spring forces the trip plate down and opens the cut-out switch. The trip plate hits a stud on the clutch arm, raises the arm and engages the clutch. When the clutch is engaged, the chain drive sprocket is set into motion and drives the chain, selector sprocket and the timing sprocket. Through 360° rotation, the timing sprocket has eight functions which are as follows: 1. Raises the lift pin and tone arm off the record. The lift pin is in the groove of the timing sprocket when it is down and on the surface when up. 2. An emboss applies the brake to the tone arm. The brake consists of a friction plate which is pressed against the tone arm control lever to prevent coasting and erratic landing. 3. The locating pin hits the tone arm control lever and swings the tone arm laterally off the record. 4. The emboss resets the clutch trigger mechanism and closes the cut-out switch. 5. The locating pin swings the tone arm when a 12-

inch record is played. On 10 inch records, the tone arm must swing an additional inch nearer the spindle and the greater diameter bushing, which is pushed upward by the record size lever, rides against the tone arm control lever. 6. Lift pin rides into the groove and lowers the tone arm over the starting groove of the record. 7. The emboss releases the brake. 8. Tip of the clutch arm drops into the synchronizing notch, releases the clutch arm and disengages the clutch.

The selector sprocket operates the record ejector plate and is timed with the timing sprocket to drop the record on the turntable when the tone arm is at its greatest outward swing. This is immediately after the number 3 function of the timing sprocket.

When the record is playing, the tone arm is moving toward the center of the record and the pawl on the tone arm control lever is moving toward the cycling switch trip lever ratchet. As the pawl enters the ratchet, the oscillating action, produced by the eccentric groove on the record, causes the cycling switch to close, complete the circuit through the solenoid and repeat the cycle. If the record does not have an eccentric groove, the position trip will close the cycling switch and start the next cycle.

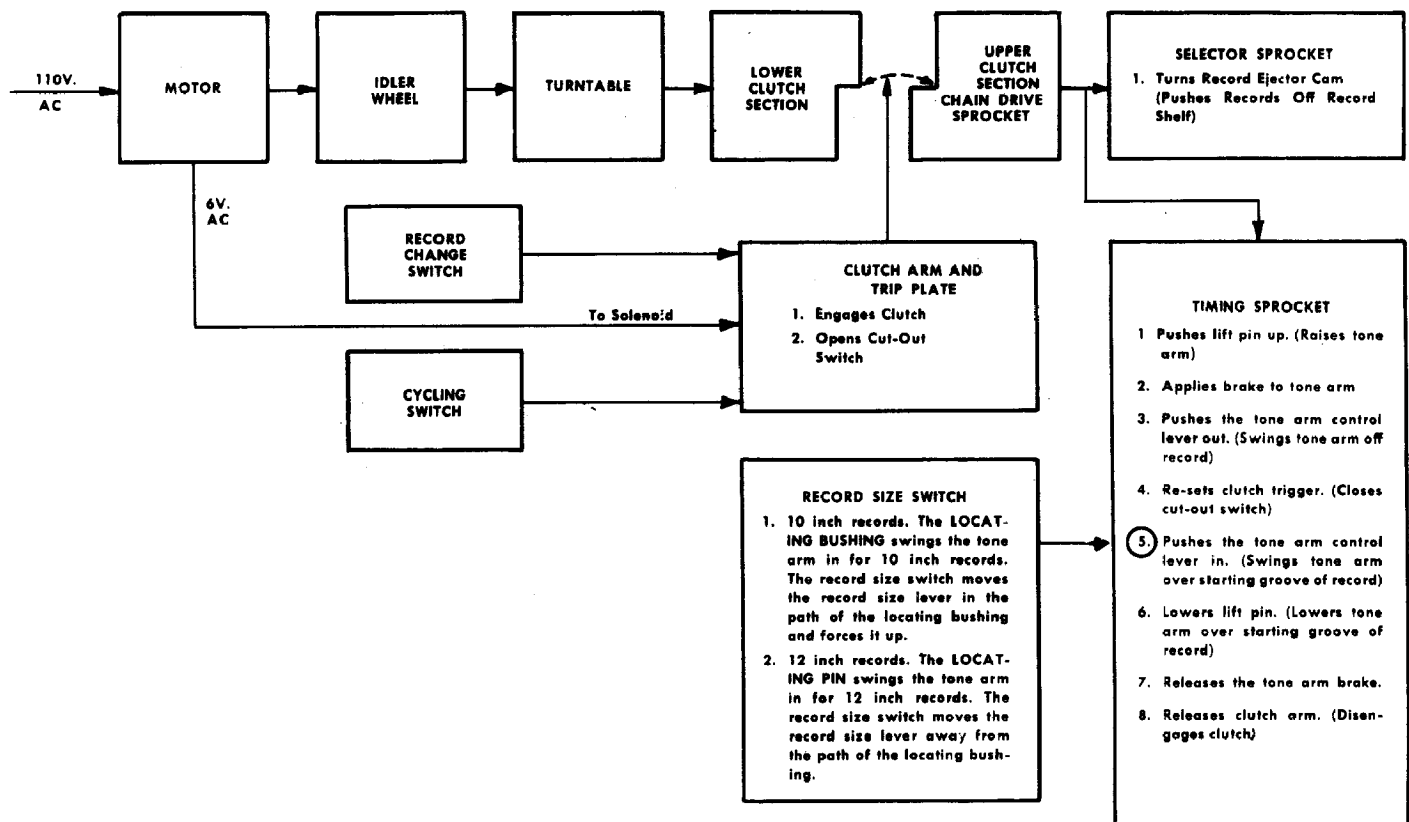


Fig. 2. Sequence of Operation—Zenith Record Changers.

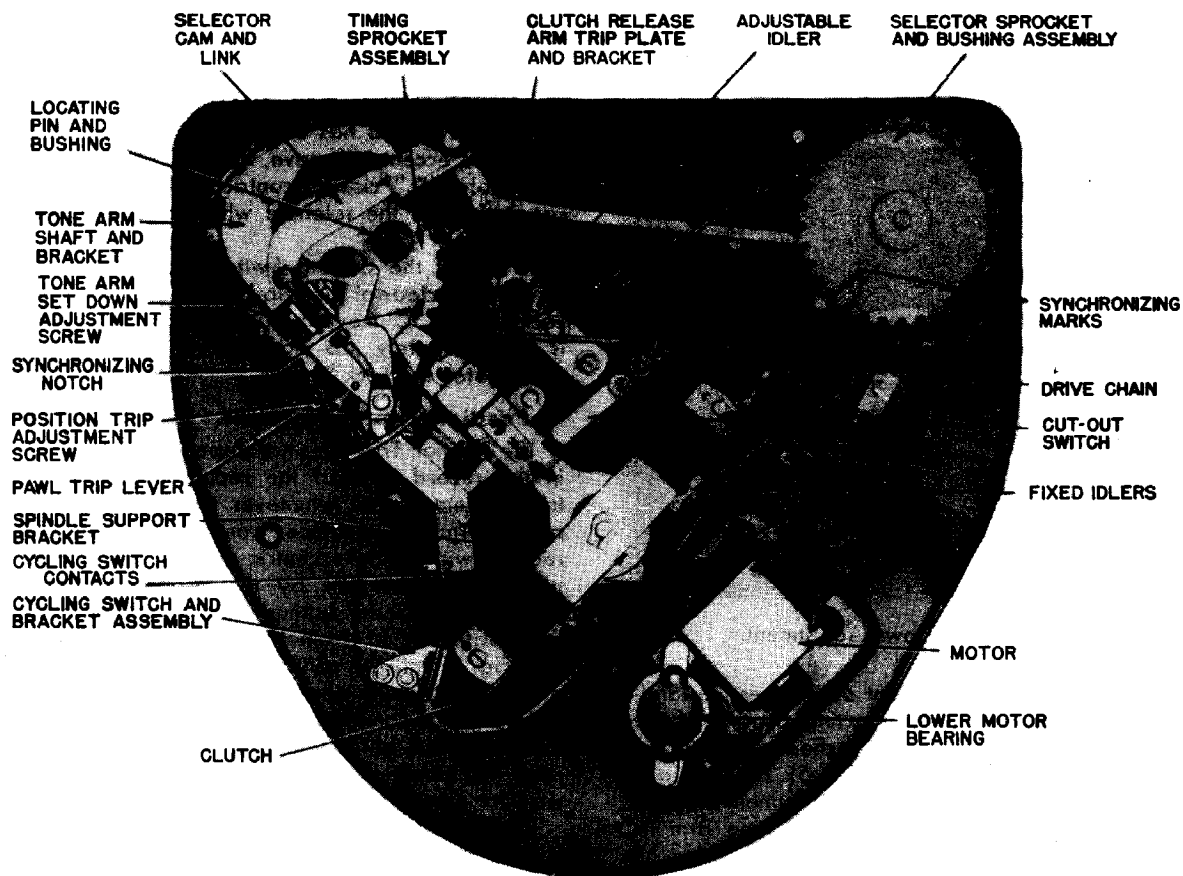
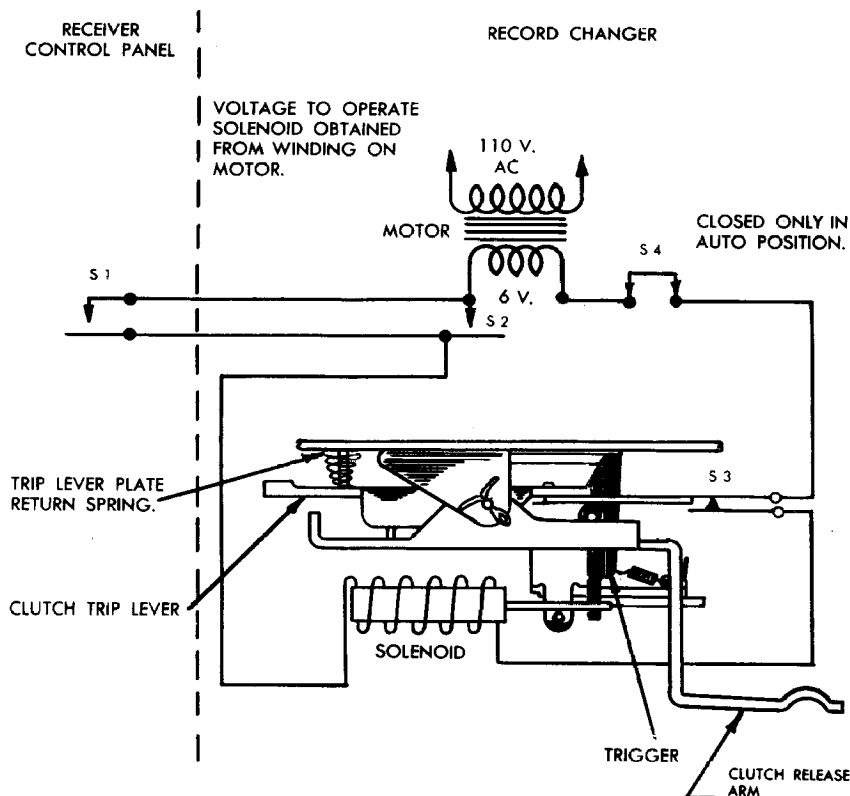


Fig. 3. Bottom View of Record Changer.



- S1—Record Change Switch on Receiver Control Panel (Normally Open)
- S2—Cycling Switch (Normally Open)
- S3—Cut-Out Switch (Normally Closed)
- S4—OFF-MAN-AUTO Switch (Closed in Auto Position)

Fig. 4. Electric Trip Circuit

The parallel switches S1 and S2 are in series with S3 and S4. Closing either S1 or S2 allows current flow through the solenoid, energizing it. When the solenoid is energized, the armature and trigger are pulled. This action releases the clutch trip lever and allows the trip lever plate spring to force the trip lever down against a stud on the clutch arm, raising the arm and engaging the clutch. The insulated strip which is riveted to the clutch trip lever operates the cut-out switch S3.

The clutch trip lever is re-set after one-half cycle by an emboss on the timing sprocket riding against the clutch trip lever. Re-setting of the clutch trip lever before the cycle is completed is possible because the clutch is held engaged by the tension of the timing sprocket against the tip of the clutch arm. The clutch cannot release until the timing sprocket travels completely around and the synchronizing notch slides underneath the tip of the clutch arm allowing it to drop through and release the clutch.

ADJUSTMENTS

1. Tone Arm Set Down Adjustment.

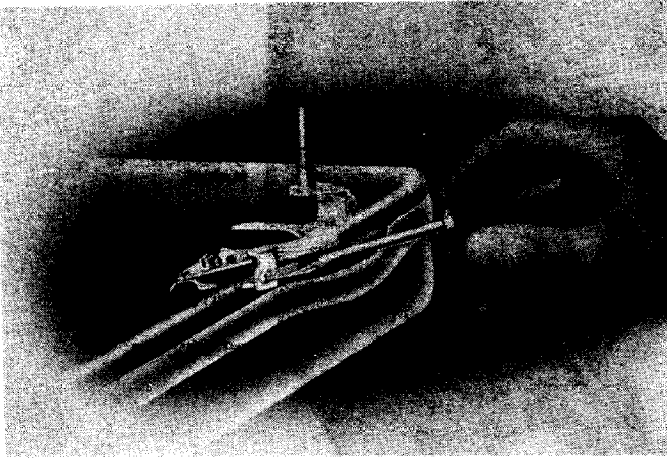


Fig. 5. Tone Arm Set Down Adjustment.

The Tone Arm Set Down Adjustment determines the landing position of the needle on the starting groove of the record. The adjustment screw can be reached with a screwdriver by pushing aside the trim strip (Fig. 5). The tone arm must be held in the rest position while the adjustment is made. Clockwise rotation of the screw moves the tone arm in, while counter-clockwise rotation moves it out.

2. Tone Arm Height Adjustment.

The Tone Arm vertical rise is governed by the Lift Pin. The Lift Pin is adjustable (see Fig. 6). Too long a Lift Pin will cause the Tone Arm to hit the underside of the records on the Spindle. If the Lift Pin is short the needle will not clear twelve records on the Turntable. To make the proper adjustment, trip the Clutch by hand and rotate the Turntable clockwise until the Tone Arm starts to swing toward the Spindle. Gently push the Tone Arm as close to the Spindle as it will go, place a record on the Spindle and observe the spacing between it and the Tone Arm. The spacing "A" (Fig. 7), should be approximately the thickness of a record. If the spacing is incorrect, lift the Tone Arm, remove the Lift Pin, loosen the Lock Nut and adjust the Lift Pin to the proper length. Make certain that the Lock Nut is tightened after adjustment.



Fig. 6. Lift Pin.

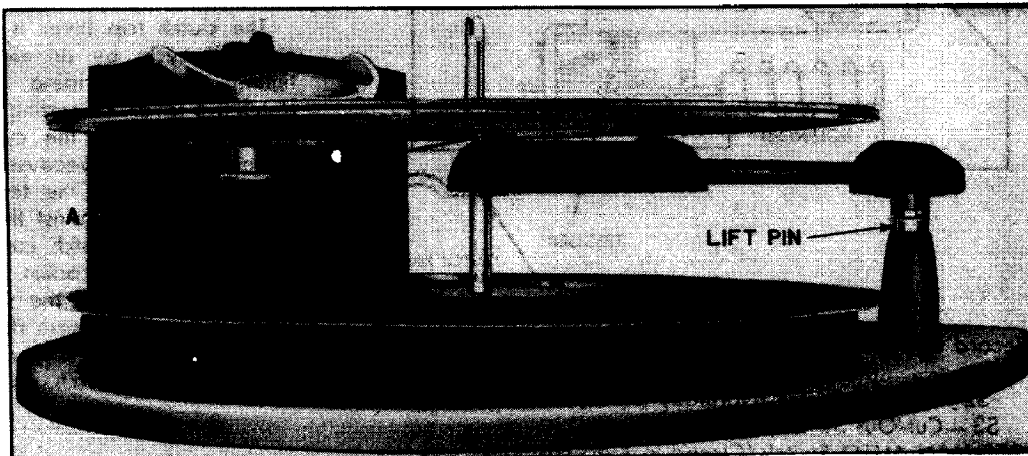


Fig. 7. Tone Arm Height Adjustment.

3. Cycling Switch Adjustment.

When a record has completed its play and the needle enters the eccentric groove, Pawl "C" (Fig. 8) engages the Trip Plate "D," closing contacts "A" and completing the circuit through the solenoid which trips the record change mechanism.

To adjust the Cycling Switch, move the Tone Arm until Pawl "C" is clear of the Trip Lever Plate "D." Loosen the two Lock Screws "B," move the Cycling Switch bracket until there is approximately .03 inch spacing between contacts "A" and tighten the Lock Screws.

4. Position Trip Adjustment.

The Position Trip does not depend on an eccentric groove in the record to start the record change cycle, but will trip the mechanism whenever the needle comes within a pre-determined distance from the Spindle. Older type records without an eccentric groove can in most cases be played automatically by the proper adjustment of the Position Trip. Under normal conditions with the needle approximately $1\frac{7}{8}$ " from the center of the Spindle adjust "E" (Fig. 8) until the contacts "A" close. This distance is generally satisfactory since no modern record will be cut off before it has completed its play, and none will fail to trip the mechanism at the end. In special cases screw the adjustment "E" clockwise for earlier tripping and counter-clockwise for later tripping as the individual cases may be.

It may be impossible to find an adjustment that will always trip the mechanism and never cut off on all type records, and in these special cases the record must be played manually.

5. Synchronization.

When the chain is removed or replaced, the selector sprocket must be synchronized with the timing sprocket. When the changer is properly timed, the synchronizing mark on the selector sprocket (see Fig. 3) will be in line with the mark on the base plate at the same time that the clutch release arm tip is in the timing sprockets synchronizing notch.

To synchronize, turn the timing sprocket until the clutch release arm tip drops into the synchronizing notch. The tip must not be pulled out of the notch during the remaining operations. Thread the chain over the drive sprocket, two fixed idlers, timing sprocket and the adjustable idler. Hold the loose end of the chain above the selector sprocket and turn this sprocket until the synchronizing mark is lined up with the mark in the base plate. The chain can now be threaded over the selector sprocket. Set the adjustable idler for medium tension on the chain, but be certain that the synchronizing marks are not pulled out of line. Tighten the lock screws after adjustment.

LUBRICATION

Sta-Put grease No. 512 (light grease of the vaseline type) and light machine oil of No. 10 consistency are used for lubrication throughout.

Figures 9 and 10 indicate the points to be lubricated and the type of lubricant to use. The Motor has two oil wicks which should be saturated with oil. The Record Spindle Guide Bearing, Idler Wheel Bearing, Lower Drive Shaft Bearing, Drive Shaft Thrust Bearing and the Motor Bearings are of the OILITE type and require very little attention. If squeaks develop, be certain that they are not caused by friction between the Spindle and records on the Turntable. A thin coat of wax on the Spindle will remedy this condition.



Fig. 8. Cycling Switch and Position Trip Adjustments.



Fig. 9. Lubrication Top of Record Changer.

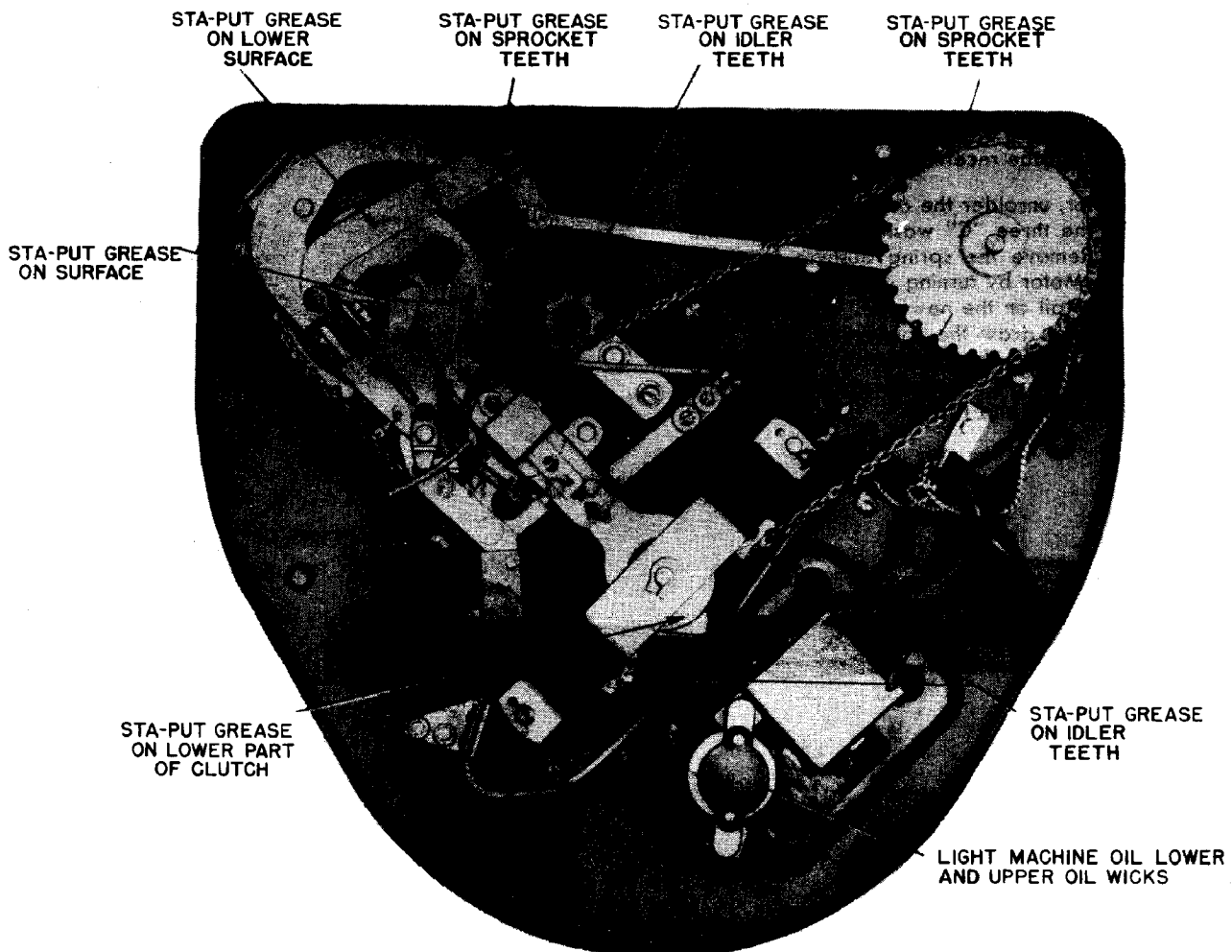


Fig. 10. Lubrication Bottom of Record Changer.

REMOVING THE TURNTABLE

To remove the Turntable, hold the Clutch with one hand and apply a twisting, pulling force to the turntable with the other hand (see Fig. 11).

To avoid damage when the Turntable is replaced, see that the Idler Wheel is pushed inside the rim before the Turntable is seated.

REPLACING THE CHAIN

To replace the Chain, loosen the adjustable idler (Screws "D" Fig. 12) and remove the Chain. Open a link, and pull the Chain out. Open a link in the replacement Chain and thread it in place. Be certain that the open ends of the links face outward from the Base Plate (see Fig. 12). (This will prevent the Chain from being installed in reverse.) Carefully close the link in the new Chain and be certain that there is no stiffness in its action. Read the paragraph on synchronization before the Chain is permanently installed.

REPLACING THE MOTOR

Early models used the 141-92 and 141-94 motors. The 141-92 motor is unmarked while the 141-94 motor has "GI" stamped underneath the lower bearing support bracket. These motors are interchangeable except for the spring drive bushings. The 141-92 motor uses a 80-452 bushing for 50 cycle operation and a 80-453 bushing for 60 cycles. The 141-94 motor uses a 80-543 bushing for 50 cycles and a 80-549 bushing for 60 cycles. Later releases use a 141-104 motor for 60 cycle operation, and 141-103 motor for 50 cycle use. These motors can be used to replace the early models.

When a replacement Motor is ordered, include the line voltage and frequency of the receiver.

To replace the Motor, unsolder the connecting leads, remove the Turntable, the three "C" washers and allow the Motor to drop out. Remove the spring bushing from the shaft of the defective Motor by turning it against the direction of wind and re-install on the new one. When the new Motor is installed do not draw the connecting leads tight as this will prevent the Motor from "floating" on its spring mounts. Be certain that the "C" washers are crimped and the leads securely soldered and taped.



Fig. 11. Removing the Turntable.



Fig. 12. Replacing the Chain.

TROUBLE SHOOTING

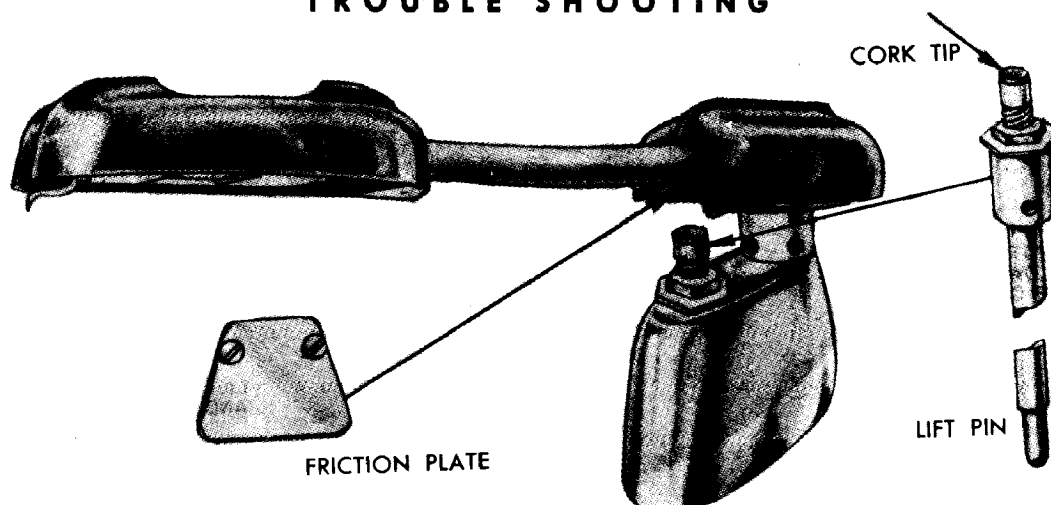


Fig. 13

ERRATIC LANDING OF THE NEEDLE.

In the first production of S-11468 non-intermixer record changers, a neoprene cork tipped lift pin, part No. S-13056 was used to stabilize the set down or landing of the needle on the run-in groove of the record. The weight of the tone arm and the friction plate, riding on the neoprene tip of the lift pin was relied on to provide effective braking action. Grease or oil on the neoprene tip of the lift pin could cause erratic landing of the tone arm on the record. To remove the oil or grease, clean the pin tip and friction plate with carbon tetrachloride and roughen with fine sand paper.

Later production S-11468 changers have a spring type brake on the tone arm shaft and use an all metal lift pin, part No. S-13086.

Erratic landing, where the arm swings sharply to the center of the record or beyond, may be caused by the locating bushing. Replace with a 94-415 bushing.

LOCATING BUSHING

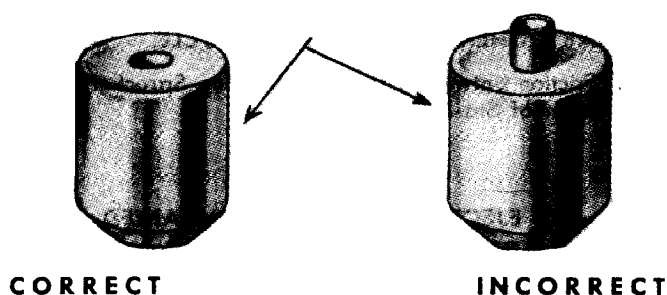


Fig. 14

tone arm skips grooves and repeats.

The vertical hinge on the tone arm may be too tight, causing the arm to hang slightly. This prevents the needle from exerting enough pressure on the record to follow the

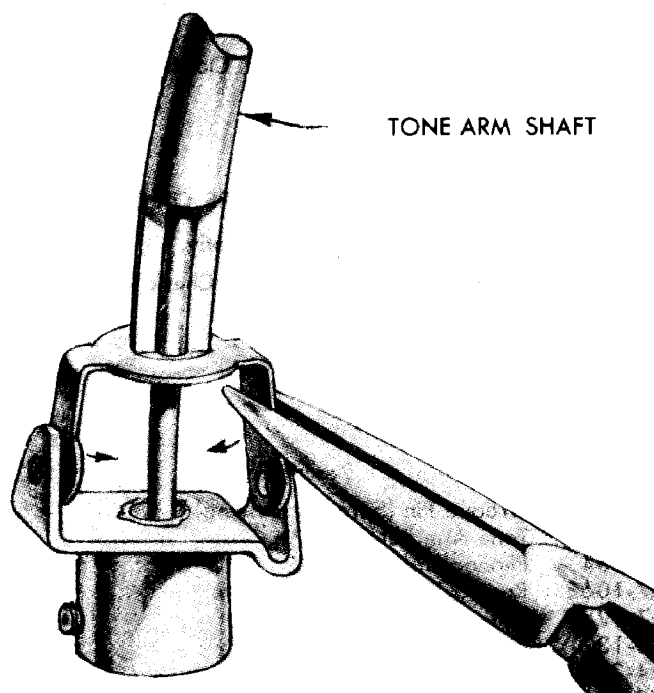


Fig. 15

record grooves. To free the hinge, use a pair of long nose pliers and bend the horizontal spring "U" bracket until it pivots freely. Be certain that the connecting lead to the

crystal cartridge is dressed so that it does not interfere with either the vertical or horizontal movement of the tone arm. THIS IS IMPORTANT.

tone arm sticks near end of record.

Burrs on the trip pawl (Fig. 3) could cause the pawl to hang up in the ratchet. Remove the burrs with a sandstone.

LOOSE DRIVE BUSHING.

If the spring drive bushing runs partially off the motor shaft and scrapes the Turntable, apply a thin coat of speaker cement to the motor shaft and reinstall the bushing. Be very careful to wipe off all excess cement otherwise a rough surface may be formed which could cause rumble.

SQUEAKS OR NOISES DURING PLAYING OF RECORDS.

- Friction between the records on the turntable and the spindle will occasionally cause squeaks. A thin coat of wax applied to the spindle will remedy this condition.
- Check lubrication.

MECHANISM STARTS SLOWLY AND MOTOR GETS HOT.

- Check line voltage and frequency.
- Check lubrication.
- Motor windings damaged.
- Room temperature abnormally low.

PRESSING RECORD CHANGE BUTTON ON RECEIVER PANEL DOES NOT START RECORD CHANGE CYCLE.

- See that the AUTO-MAN-OFF switch is set to AUTO.
- Check Record Change Switch.
- Check Cut-out Switch.
- Check electrical continuity of solenoid circuit.
- Check solenoid energizing voltage on motor.

MOTOR FAILS TO RUN EVEN WHEN IT IS ENTIRELY DISCONNECTED FROM CHANGER AND PROPER VOLTAGE AND FREQUENCY APPLIED DIRECTLY TO THE TWO INPUT LEADS OF THE WINDING.

- Open windings.
- Damaged or frozen bearings.
- Lower Bearing Support Bracket bent. Remove and straighten bracket—Re-center armature.

RUMBLE AND MICROPHONICS DURING REPRODUCTION.

- Changer not "floated" properly. Loosen mounting bolts.
- Motor mounting washers rubbing on the idler wheel.
- Motor leads pulled tight preventing motor from "floating" freely on its springs.
- Bump on Idler wheel.

NEEDLE SETS DOWN PROPERLY ON RECORD BUT SLIDES OVER THE RECORD GROOVES.

- a. Cabinet tilted.
- b. Badly worn or broken needle.

NEEDLE FAILS TO CLEAR MAXIMUM LOAD OF RECORDS ON THE TURNTABLE.

- a. Check Tone Arm height adjustment. (Adjustment 2.)

CHANGER CYCLES WITH AUTO-MAN-OFF SWITCH ON MAN.

- a. Check AUTO-MAN-OFF switch.
- b. Chain too tight.
- c. Check Trigger Spring. (Fig. 4)

TONE ARM FALLS OFF RECORD.

- a. Check Tone Arm set down adjustment. (Adjustment 1)
- b. Check Tone Arm mounting screws.
- c. Changer not level.

TONE ARM SET-DOWN POSITION VARIES.

- a. Loose Tone Arm set down adjustment lock screw.
- b. Loose Tone Arm mounting screw.

RECORD IS NOT HEARD ALTHOUGH CHANGER OPERATES.

- a. See that the Phono Radio switch is on Phono.
- b. Check receiver audio by listening to radio.
- c. Check Crystal Cartridge.
- d. Check Tone Arm Housing for broken leads.

TONE ARM SETS DOWN TOO FAR IN OR OUT ON RECORD.

- a. Check Tone Arm set down adjustment. (Adjustment 1).

CHANGER CONTINUES TO CYCLE.

- a. Check Cycling switch adjustment. (Adjustment 3.)
- b. Check Record Change switch.
- c. Clutch release mechanism sticks.
- d. Tight drive chain.

CHANGER WILL NOT CYCLE UPON COMPLETION OF RECORD.

- a. See that the AUTO-MAN-OFF switch is set to AUTO.
- b. Be certain the record has an eccentric center groove.
- c. Check Cycling switch.
- d. Check Cut-out switch. (Normally closed.)
- e. Check Clutch Release Arm for freedom of action.

SQUEAKS WHEN CHANGER IS IN CYCLE.

- a. Friction between Lift Pin and Timing Sprocket. Apply a thin coat of Sta-Put.

FAILS TO EJECT RECORDS ACCOMPANIED BY A CLICKING SOUND.

- a. Clutch slips. A slight upward bend of the Clutch Release Arm will correct this condition.

TONE ARM STICKS OR HANGS UP DURING CYCLE.

- a. Clutch Release Arm pressure on Timing Sprocket too great. Loosen the solenoid bracket and insert a very thin shim between it and the base plate. If the condition still prevails, increase the thickness of the shim.
- b. Burrs in synchronizing notch or Clutch Release Arm Tip. Remove with a file.

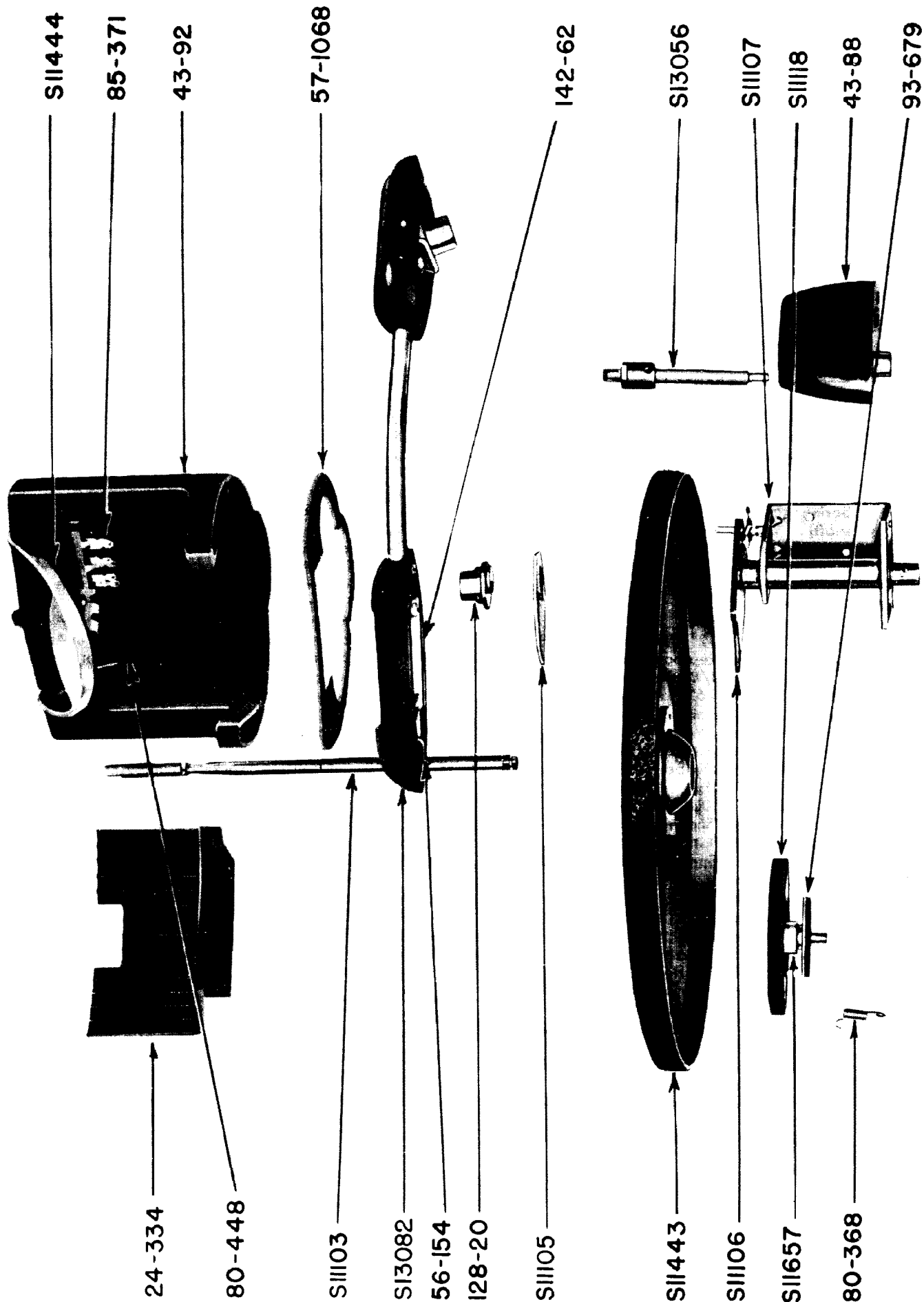
MOTOR RUNS BUT TURNTABLE SLIPS OR STOPS.

- a. Turntable not fully seated. Tap gently.
- b. Motor shaft slips on idler wheels. Check idler wheel.

NUMERICAL PARTS LIST

Part No.	Description	Part No.	Description
12-1228	10 and 12 inch Selector Stop Bracket.	56-128	Groove Pin (Sprocket Bushing)
12-1065	Record Spindle Support Bracket	56-143	Tone Arm Retaining Pin
19-123	Phono Frame Mounting Clips (3)	56-154	Phonograph Needle
24-334	Record Ejector Housing Cover	57-1068	Record Ejector Housing Plate
27-67	Cork Tip for S-11100 and S-13056 Lift Pins	57-1247	Tone Arm Lift Plate
43-88	Tone Arm Support Housing	58-132	6 Prong Connector
43-92	Record Ejector Housing	64-259	Brass Eyelet N. P.
46-563	Record Selector Knob	73-24	No. 8-32 x 1/4" Hex Head Set Screw
52-318	Shielded Lead	73-71	No. 8-32 x 5/16" Allen Head Set Screw—Steel Conepoint
54-30	8-32 x 5/16" x 7/64" Hex Nut—Steel N. P.	73-72	No. 8-32 x 5/8" Allen Head Set Screw—Steel Conepoint
54-66	No. 10-32 x 5/16" x 1/8" Hex Nut—Steel N. P.	73-86	No. 8-32 x 3/16" Allen Head Set Screw
56-122	Record Selector Bracket Pin		

Part No.	Description	Part No.	Description
76-409	Record Ejector Cam Shaft	112-579	No. 8-32 x 3/8" R.H. Shakeproof Type 1—Self Tapping Screw—Steel Cad. Pl.
80-138	Idle Wheel Retaining Spring	112-614	Lift Pin Spring Holding Screw
80-317	Trip Lever Plate Return Spring	114-192	No. 6-20 x 7/16" Hex. Hd. Slotted Self Tapping Screw—Shakeproof Type 25—Steel Cad. Pl.
80-367	Toggle Spring	114-200	No. 6-32 x 5/16" Hex Head Slotted "STAN-TAP" Self Tapping Screw—Cad. Pl.
80-368	Idle Wheel Tension Spring	114-201	No. 8-32 x 5/16" Hex Head Slotted "STAN-TAP" Self Tapping Screw—Cad. Pl.
80-369	Record Spindle Compression Spring	114-217	No. 8-32 x 1/4" Hex Head Slotted "STAN-TAP" Self Tapping Screw—Cad. Pl.
80-384	Locating Stud Return Spring	114-253	No. 6-20 x 3/8" Hex Head Slotted Shakeproof (Type 25) Self Tapping Screw—Steel—Cad.
80-406	Trip Lever Pawl Spring	117-85	Record Selector Lever
80-407	Record Changer Mounting Springs	117-106	Position Trip Lever
80-448	Pressure Arm Spring	128-20	Record Ejector Cam
80-452	Spring (50 Cycle Operation 141-92 Motor Shaft)	141-92/94	Phono Motors (Early Models)
80-453	Spring (60 Cycle Operation 141-92 Motor Shaft)	141-103	50 cycle Phono Motor (Replaces 141-92 or 141-94 on 50 Cycle current)
80-458	Trip Contact Spring	141-104	60 cycle Phono Motor (Replaces 141-92 or 141-94 on 60 Cycle current)
80-460	Trip Lever Tension Spring	142-62	Crystal Cartridge
80-464	Pawl Spring	166-29	Pressure Bar Rubber Bumper
80-465	Contact Spring	188-27	Record Spindle Retaining Washer
80-466	Contact Spring	188-32	Motor Mounting "C" Washer
80-467	Trip Contact Spring	188-55	Selector Coupling Arm Retaining Washer
80-468	Motor Mounting Spring (2-End)	214-1	Sprocket Drive Chain
80-469	Motor Mounting Spring (Center)	S-10730	Timing Sprocket Assembly
80-472	Trip Lever Plate Actuating Spring	S-10732	Idle Assembly
80-520	Lift Pin Holding Spring	S-10753	Tone Arm Pivot Shaft and Bracket Assembly
80-531	Brake Spring	S-11103	Record Spindle Assembly
80-543	Spring (50 cycle operation 141-94 motor shaft)	S-11104	Turntable
80-549	Spring (60 cycle operation 141-94 motor shaft)	S-11105	Record Ejector Plate and Pin Assembly
83-461	2 Lug Terminal Strip	S-11106	Record Support Plate—Shaft and Pin Assembly
83-1091	Insulating Strip	S-11107	Record Support and Ejector Bracket Assembly
83-1107	Insulator Strip	S-11109	Selector Sprocket and Bushing Assembly
83-1346	3 Lug Terminal Strip	S-11110	Selector Cam and Link Assembly
85-371	3 Position Slide Switch	S-11118	Idle Wheel Assembly
93-35	3/8" x .144 x .032" Flat Washer—N. P.	S-11441	Record Changer Lever and Stud Assembly
93-126	No. 8 Internal Shakeproof Lockwasher No. 1208	S-11444	Record Pressure Arm Assembly
93-487	1/16" x .144 x 3/8" Steel Washer—Cad. Pl.	S-11458	Solenoid and Bracket Assembly (Part of S-11599)
93-582	.025 x .129 x 5/16" Flat Washer—Cad. Pl.	S-11580	Trip Contact and Support Strip Assembly
93-617	Sprocket Shaft Retaining Washer	S-11599	Clutch Release Arm—Trip Plate and Bracket Assembly
93-673	Idle Wheel Stud Washer—Threaded	S-11604	Trip Contact Assembly
93-677	Idle Wheel Stud Fishpaper Washer (large)	S-11608	Base Plate Sprocket and Drive Shaft Bearing Assembly
93-678	Idle Wheel Stud Fishpaper Washer (small)	S-11657	Idle Stud and Washer Assembly
93-679	Idle Wheel Stud Felt Washer (large)	S-11951	Cable and Plug Assembly
93-719	7/16 x 3/16" x .031" Flat Washer—N. P.	S-12010	Tone Arm only (less parts)
93-764	Spring Washer—Shakeproof No. 3759-14	S-12333	Cable and Plug Assembly
93-819	Motor Mounting Flat Washer	S-12489	Tone Arm Pivot Shaft and Bracket Assembly
93-821	Spring Washer—Spring Mount Timing Sprocket	S-12541	Contact Assembly
94-415	Locating Bushing	S-12542	Contact Assembly
94-505	Insulated Bushing	S-12891	Trip Contact and Bracket Assembly
97-213	Motor Mounting Stud	S-13080	Tone Arm Swivel Bracket and Bushing Assembly
112-378	Needle Holding Screw	S-13082	Tone Arm complete
112-413	Weight Lever Pivot Screw	S-13086	Tone Arm Lift Pin Assembly
112-415	No. 8-32 x 3/8" Flat Head Shakeproof Type 1—Self Tapping Screw—Steel Cad.	S-13134	Power Input Cable for testing Record Changers
112-420	Record Changer Mounting Screw	S-13196	Cable and Plug Assembly
112-450	No. 4-40 1/8" Phillips Binding Hd. M. S. Steel Cad. Pl.		
112-562	No. 4-40 x 7/8" R.H. "STAN-TAP" Self Tapping Screw—Cad. Pl.		
112-563	No. 8-32 x 1/4" Recessed Stove H.M.S.—Steel—Bronze Pl.		
112-578	No. 6-32 x 1/4" Oval V.H.M.S.—Steel N. P.		



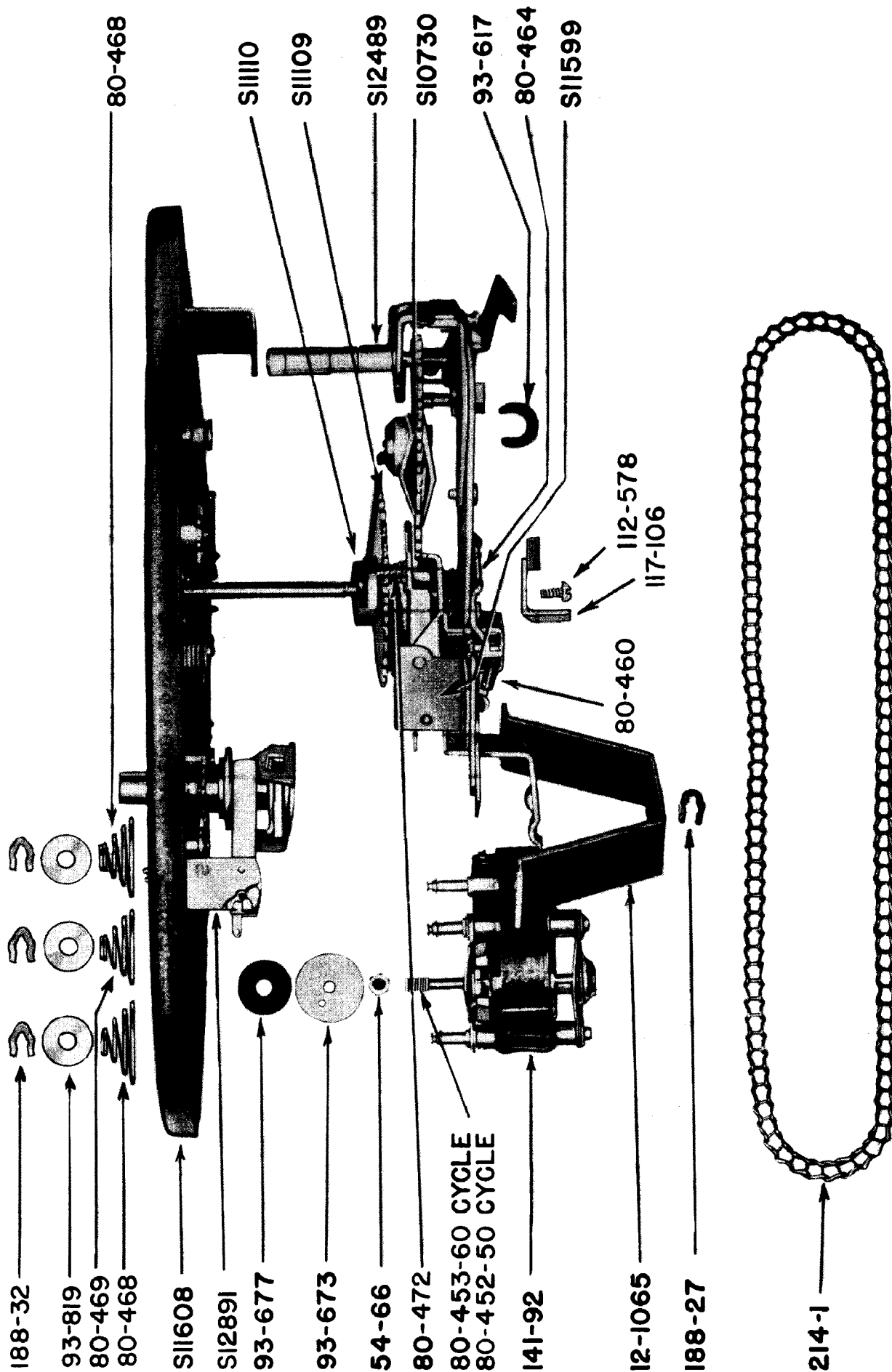
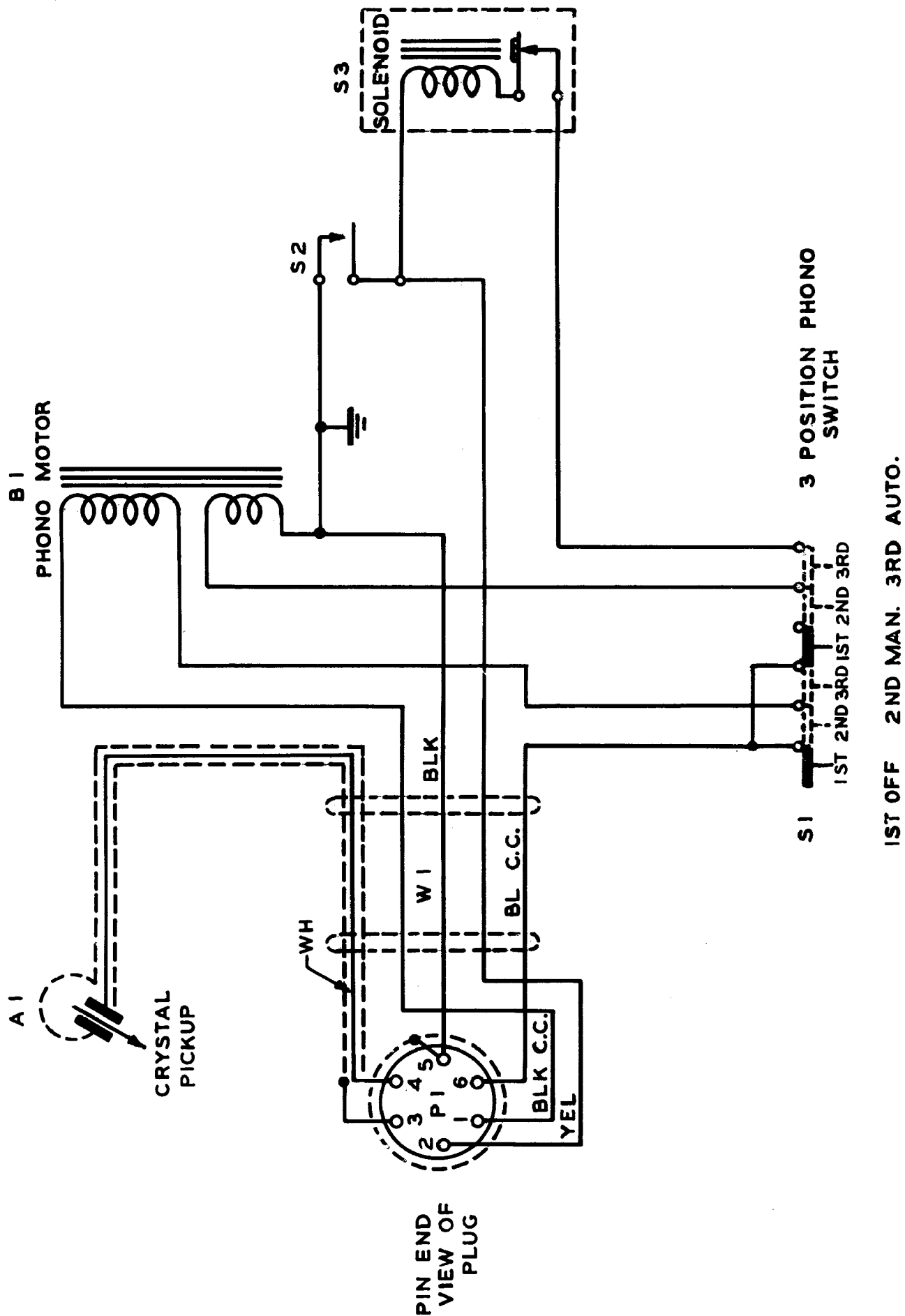


Fig. 16 Exploded View of Record Changer.



1ST OFF 2ND MAN. 3RD AUTO.

Fig. 17. Schematic Diagram of Record Changer

SERVICE MANUAL

MODEL S-11680

AUTOMATIC RECORD CHANGER



GENERAL

TO THE SERVICE MAN:

This Service Manual has been prepared for the purpose of assisting the Service Man in his work of caring for the Record Changer mechanism, whether he is called to remedy some difficulty, or to insure the continued satisfactory operation. The Zenith Automatic Record Changers are constructed with a minimum of working parts, and in operation are simple and reliable. However, as is the case with all mechanical units, misalignment and trouble may occasionally develop. The information presented in this book will enable the Service Man to render quick and accurate service. For convenience, the Operating Instructions supplied with each Record Changer are summarized as follows:

The Record Changer will automatically play up to fourteen 10 inch or twelve 12 inch records at one loading, or up

to twelve 10 and 12 inch records intermixed. The Record Stack rests on the Spindle and the Record Shelf. The Selector Sprocket drives the Ejector Cam which pushes the records off the Shelf and Spindle allowing them to drop on the Turntable. To load for automatic operation, swing the Pressure Bar to the right, place the stack of records on the Spindle, swing the Pressure Bar to the left until it rests on the record stack, set the OFF-MAN-AUTO switch to AUTO and press the Record Change button. The Changer will play the entire selection of records and will repeat the last record until it is turned off. For manual operation set the OFF-MAN-AUTO switch to MAN and play the records singly as on a non-automatic record player.

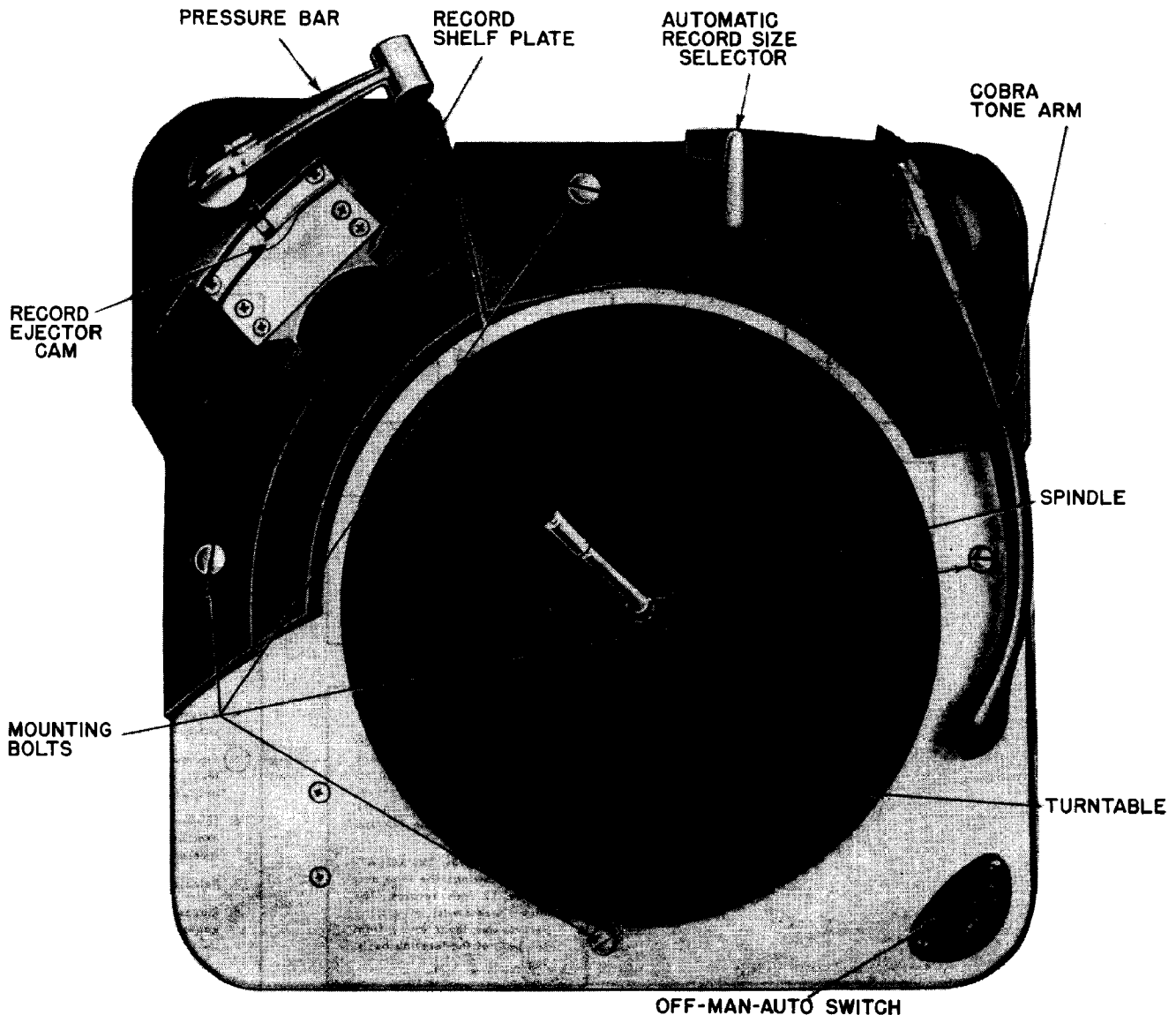


Fig. 1. Top View of Record Changer.

DESCRIPTION OF CYCLING

The motor drives an idler wheel which rim drives the turntable and the lower clutch section. The spindle is fixed and does not turn with the turntable. The solenoid energizing voltage is obtained from a 6 volt winding on the motor.

When the record change button on the receiver panel is pressed, the electric trip circuit is completed, solenoid is energized and the trigger pulled. (Fig. 4.) When the trigger is pulled, the trip plate return spring forces the trip plate down and opens the cut-out switch. The trip plate hits a stud on the clutch arm, raises the arm, engages the clutch, and closes the muting switch. When the clutch is engaged, the chain drive sprocket is set into motion and drives the chain, selector sprocket and the timing sprocket. Through 360° rotation the timing sprocket has eight functions which are as follows: 1. Raises the lift pin and tone arm off the record. The lift pin is in the groove of the timing sprocket when it is down and on the surface when up. 2. An emboss applies the brake to the tone arm. The brake consists of a friction plate which is pressed against the tone arm control lever to prevent coasting and erratic landing. 3. The locating pin hits the tone arm control lever and swings the tone arm laterally off the record. 4. The emboss resets the clutch trigger mechanism and closes the cut-out switch. 5. The locating pin swings the tone arm when a 12 inch record is played. On 10 inch records, the tone arm must swing an additional inch nearer the spindle and the greater diam-

eter bushing, which is pushed upward by the record size lever, rides against the tone arm control lever. 6. Lift pin rides into the groove and lowers the tone arm over the starting groove of the record. 7. The emboss releases the brake. 8. Tip of the clutch arm drops into the synchronizing notch and releases the clutch arm, disengages the clutch and opens the muting switch.

The selector sprocket operates the record ejector plate and is timed with the timing sprocket to drop the record on the turntable when the tone arm is at its greatest outward swing. This is immediately after the number 3 function of the timing sprocket.

When the record is playing, the tone arm is moving toward the center of the record and the pawl on the tone arm control lever is moving toward the cycling switch trip lever ratchet. As the pawl enters the ratchet, the oscillating action, produced by the eccentric groove on the record, causes the cycling switch to close, complete the circuit through the solenoid and repeat the cycle. If the record does not have an eccentric groove, the position trip will close the cycling switch and start the next cycle.

During the record change cycle, the muting switch S4 connects C1 across the output of the pre-amp. The low reactance of C1 by-passes the audio to ground and makes the amplifier inoperative during the change cycle.

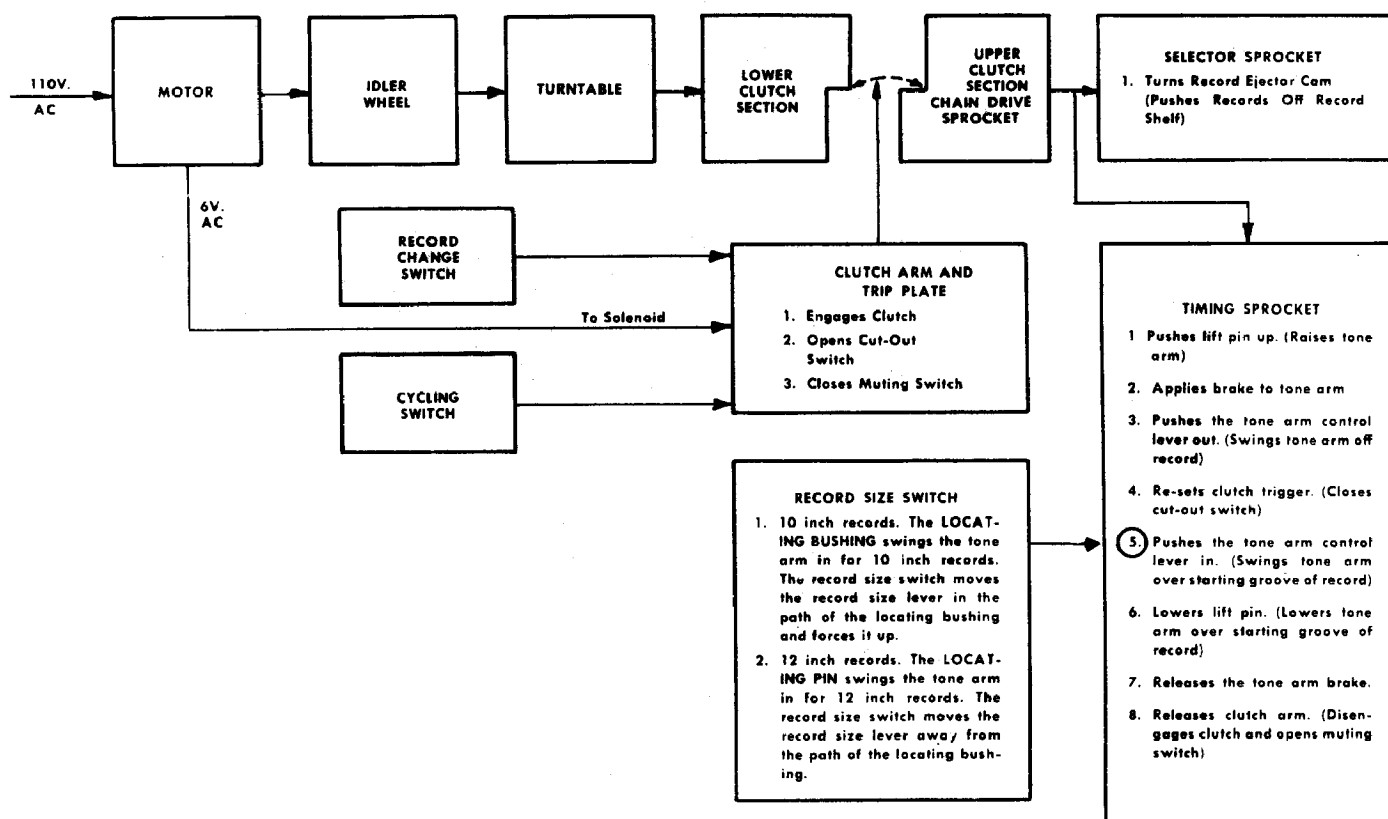


Fig. 2. Sequence of Operation—Zenith Record Changers.

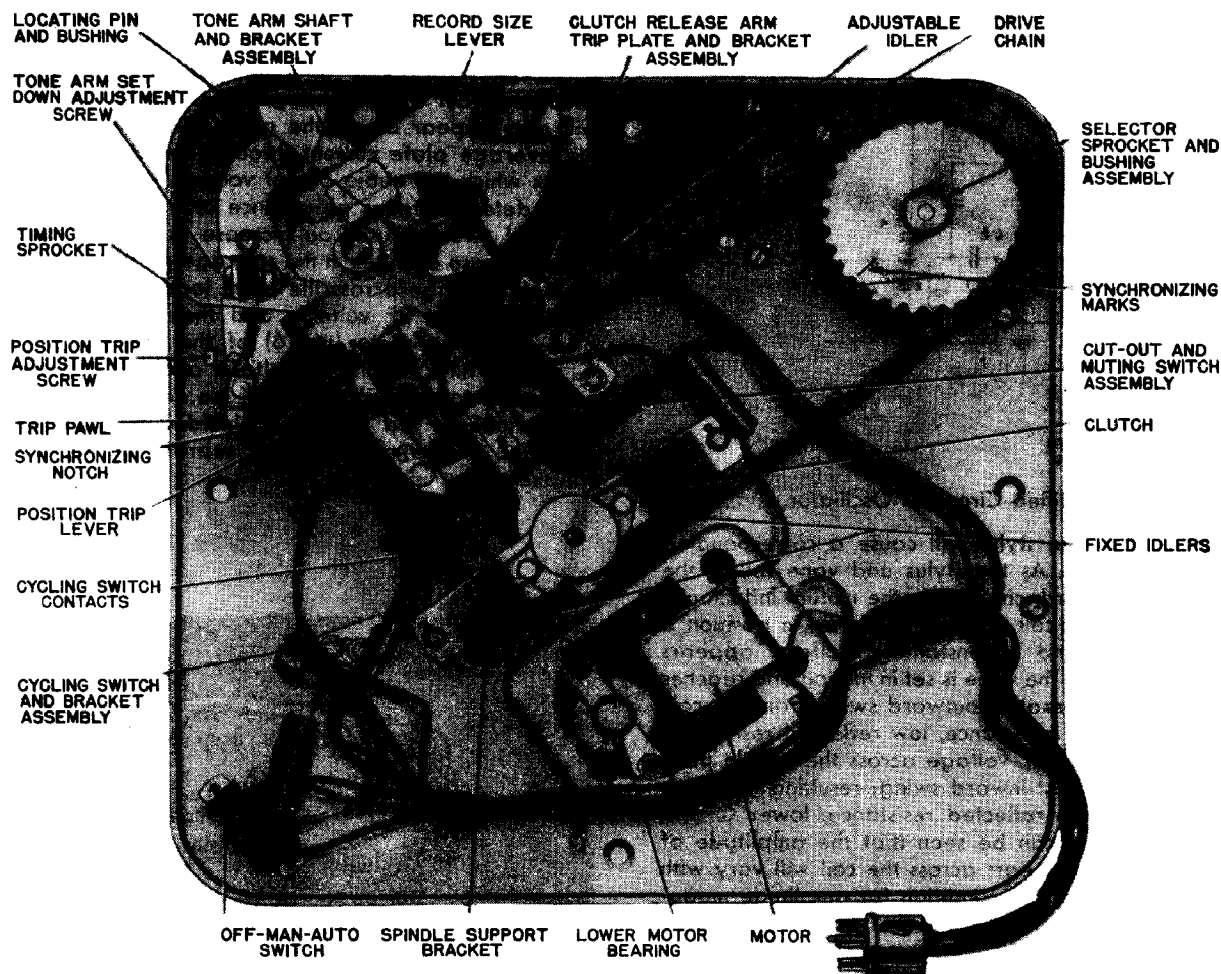
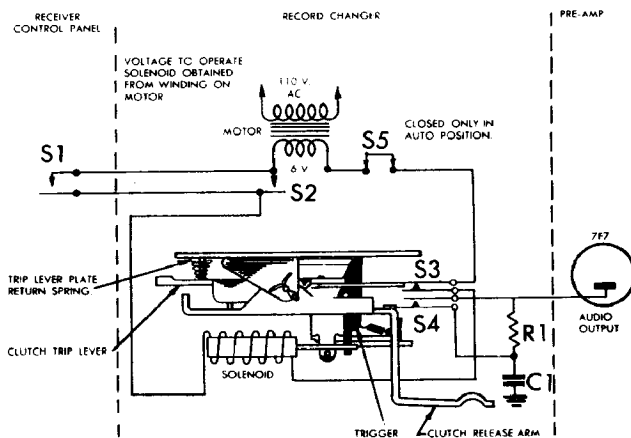


Fig. 3. Bottom View of Record Changer.



- S1—Record Change Switch on Receiver Control Panel (Normally Open)
 S2—Cycling Switch (Normally Open)
 S3—Cut-Out Switch (Normally Closed)
 S4—Muting Switch (Normally Open)
 S5—OFF-MAN-AUTO Switch (Closed in Auto Position)

Fig. 4. Electric Trip Circuit

The parallel switches S1 and S2 are in series with S3 and S5. Closing either S1 or S2 allows current flow through the solenoid causing it to become energized. When the solenoid is energized, the armature and trigger are pulled. This action releases the clutch trip lever and allows the trip lever plate spring to force the trip lever down against a stud on the clutch arm, raising the arm and engaging the clutch. The insulated strip which is riveted to the clutch trip lever operates the cut-out switch S3. The muting switch S4 is operated by the clutch arm.

The clutch trip lever is reset after one-half cycle by an emboss on the timing sprocket which rides against the clutch trip lever. Resetting of the clutch trip lever before the cycle is completed is possible because the clutch is held engaged by the tension of the timing sprocket against the tip of the clutch arm. The clutch cannot release until the timing sprocket travels completely around and the synchronizing notch slides underneath the tip of the clutch arm allowing it to drop through and release the clutch.

THEORY OF THE COBRA RADIONIC PICKUP

The operation of the Cobra pickup is considerably different from Crystal and Dynamic pickups. These pickups generate audio power, while the Cobra controls power generated by a radio frequency oscillator. The 7F7 twin triode tube is a modulated oscillator, detector and audio amplifier. The oscillator operates at a frequency of 2.5 Mc. Modulation is accomplished by changing the energy losses in a tuned circuit. These losses may be represented by an equivalent resistance in series with the reactance of the coil. The ratio of the resistance to the reactance determines the efficiency or Q of the coil. The amplitude of the RF voltage developed across this coil by an oscillator will vary with changes in Q.

The grid coil L_1 and other components of the oscillator are mounted in the oscillator pre-amp chassis, while the plate coil L_2 is in the Needle Cartridge with the vane and needle assembly. The coil is fixed and has 40 turns of No. 40 wire (approximate DC resistance $2\frac{1}{2}$ ohms). The stainless steel vane, which is in the field of the coil, is spot welded to the osmium-iridium tipped stylus.

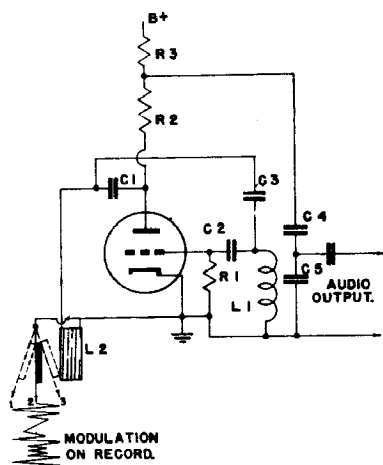


Fig. 5. Simplified Circuit of Oscillator.

Any movement of the stylus will cause a corresponding movement of the vane. As the stylus and vane follow the modulations in the record, changes in the mutual inductance between the vane and coil occur (see Fig. 5). In position 2 the vane is at rest, and a constant RF voltage appears across the plate coil. As the vane is set in motion and reaches position 1, it is at its greatest outward swing from the coil, resulting in low mutual inductance, low reflected resistance, higher Q, and a higher RF voltage across the coil. In position 3 it is at its greatest inward swing; resulting in a high mutual inductance, high reflected resistance, lower Q and a lower RF voltage. It can be seen that the amplitude of the RF voltage which appears across the coil will vary with changes in Q, satisfying the condition for amplitude modulation. The position of the vane changes both the Q and L of the coil. Changes in L shift the frequency slightly, and a certain amount of frequency modulation is present, but since there is no frequency discrimination it remains undetected.

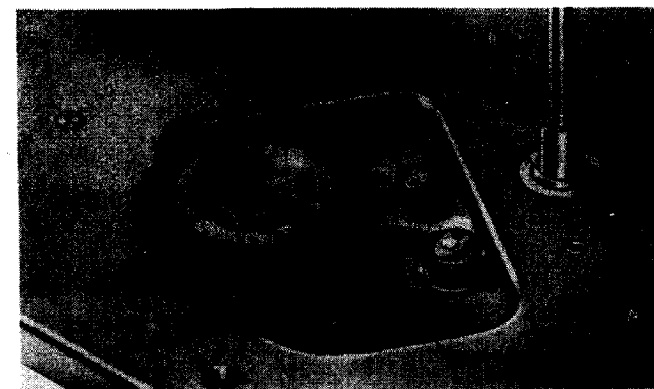


Fig. 6. Lubrication Top of Record Changer.

STA-PUT GREASE ON SPROCKET TEETH AND SURFACE STA-PUT GREASE ON LOWER SURFACE STA-PUT GREASE ON LOWER CLUTCH SURFACE STA-PUT GREASE ON SPROCKET TEETH

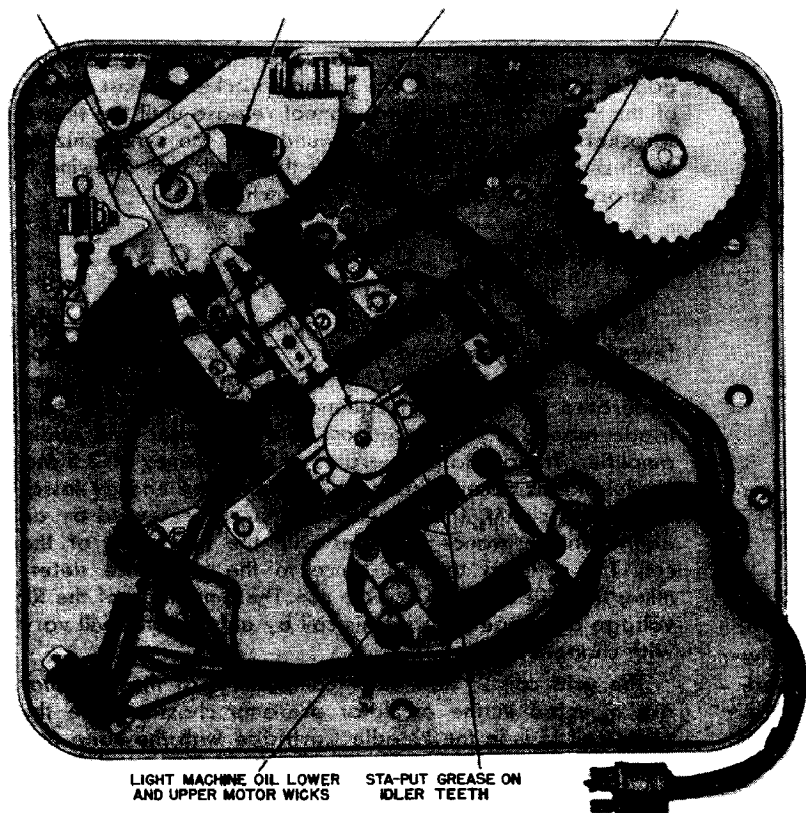


Fig. 7. Lubrication Bottom of Record Changer.

Since the grid and plate coils are part of a single tuned circuit any variations of amplitude of the RF voltage brought about by the changes in Q across the plate coil will also appear across the grid Coil L₁ causing a shift in the average plate current through the plate load resistor across which the audio output voltage is developed. Plate bend detection takes place since only the positive half of the grid swing causes an increase in the average plate current. These changes in the average plate current appear as audio voltage across the plate load resistor.

The 2.5 Mc. RF voltage and the audio voltage both appear at the plate (pin 6) of the oscillator triode. R₂, C₄ and C₅ filter out the RF voltage allowing only the audio component to the grid (pin 4) of the amplifier triode where it is amplified, fed through a shielded lead to the audio amplifier of the receiver and reproduced by the loud-speaker.

LUBRICATION

Sta-Put grease No. 512 (light grease of the vaseline type) and light machine oil of No. 10 consistency are used for lubrication throughout.

Figures 6 and 7 indicate the points to be lubricated and the type of lubricant to use. The Motor has two oil wicks which should be saturated with oil. The Record Spindle Guide Bearing, Idler Wheel Bearing, Lower Drive Shaft Bearing, Drive Shaft Thrust Bearing and the Motor Bearings are of the OILITE type and require very little attention. If squeaks develop, make certain that they are not caused by friction between the Spindle and records on the Turntable. A thin coat of wax on the Spindle will remedy this condition.

ADJUSTMENTS

1. Tone Arm Set Down Adjustment.

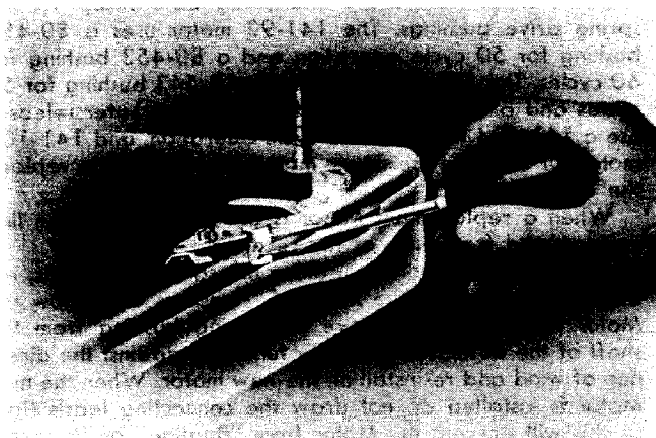


Fig. 8. Tone Arm Set Down Adjustment.

The Tone Arm Set Down Adjustment determines the landing position of the needle on the starting groove of the record. The adjustment screw can be reached with a screwdriver by pushing aside the trim strip (Fig. 8). The tone arm must be held in the rest position while the adjustment is made. Clockwise rotation of the screw moves the tone arm in, while counter-clockwise rotation moves it out.

2. Tone Arm Height Adjustment.

The Tone Arm vertical rise is governed by the Lift Pin. The Lift Pin is adjustable (see Fig. 9). Too long a Lift Pin will cause the Tone Arm to hit the underside of the records on the Spindle. If the Lift Pin is short the needle will not clear fourteen records on the Turntable. To make the proper adjustment, trip the Clutch by hand and rotate the Turntable clockwise until the Tone Arm starts to swing toward the Spindle. Gently push the Tone Arm as close to the Spindle as it will go, place a record on the Spindle and observe the spacing between it and the Tone Arm. The spacing "A" (Fig. 10), should be approximately the thickness of a record. If the spacing is incorrect, lift the Tone Arm, remove the Lift Pin, loosen the Lock Nut and adjust the Lift Pin to the proper length. Be certain that the Lock Nut is tightened after adjustment.



Fig. 9. Lift Pin.

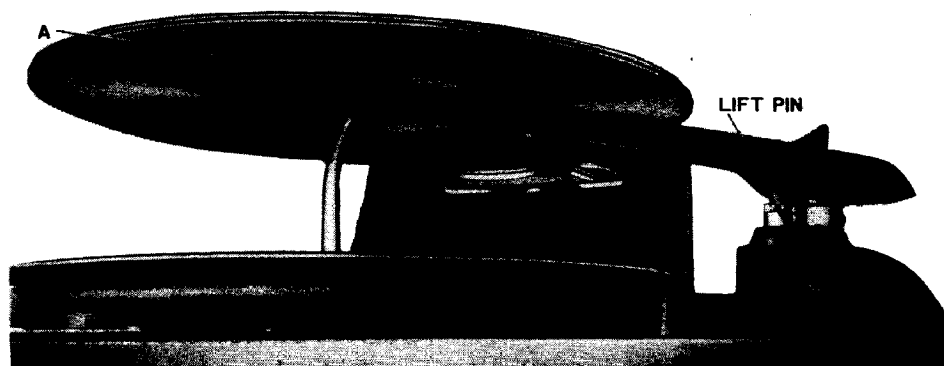


Fig. 10. Tone Arm Height Adjustment.

3. Cycling Switch Adjustment.

When a record has completed its play and the needle enters the eccentric groove, Pawl "C" (Fig. 11) engages the Trip Plate "D," closing contacts "A" and completing the circuit through the solenoid which trips the record change mechanism.

To adjust the Cycling Switch, move the Tone Arm until Pawl "C" is clear of the Trip Lever Plate "D" (as shown in Fig. 11). Loosen the two Lock Screws "B," move the Cycling Switch bracket until there is approximately .03 inch spacing between contacts "A" and tighten the Lock Screws.

4. Position Trip Adjustment.

The Position Trip does not depend on an eccentric groove in the record to start the record change cycle, but will trip the mechanism whenever the needle comes within a pre-determined distance from the Spindle. Older type records that do not have an eccentric groove can in most cases be played automatically by the proper adjustment of the Position Trip. Under normal conditions with the needle approximately $1\frac{1}{8}$ " from the center of the Spindle adjust "E" (Fig. 11) until the contacts "A" close. This distance is generally satisfactory since no modern record will be cut off before it has completed its play, and none will fail to trip the mechanism at the end. In special cases screw the adjustment "E" clockwise for earlier tripping and counter-clockwise for later tripping as the individual cases may be.

It may be impossible to find an adjustment that will always trip the mechanism and never cut off on all type records, and in these special cases the record must be played manually.

5. Synchronization.

When the chain is removed or replaced, the selector sprocket must be synchronized with the timing sprocket. When the changer is properly timed, the synchronizing mark on the selector sprocket (see Fig. 3) will be in line with the mark on the base plate at the same time that the clutch release arm tip is in the timing sprockets synchronizing notch.

To synchronize, turn the timing sprocket until the clutch release arm tip drops into the synchronizing notch. The tip must not be pulled out of the notch during the remaining operations. Thread the chain over the drive sprocket, two fixed idlers, timing sprocket and the adjustable idler. Hold the loose end of the chain above the selector sprocket and turn this sprocket until the synchronizing mark is lined up with the mark in the base plate. The chain can now be threaded over the selector sprocket. Set the adjustable idler for medium tension on the chain, but be certain that the synchronizing marks are not pulled out of line. Tighten the lock screws after adjustment.

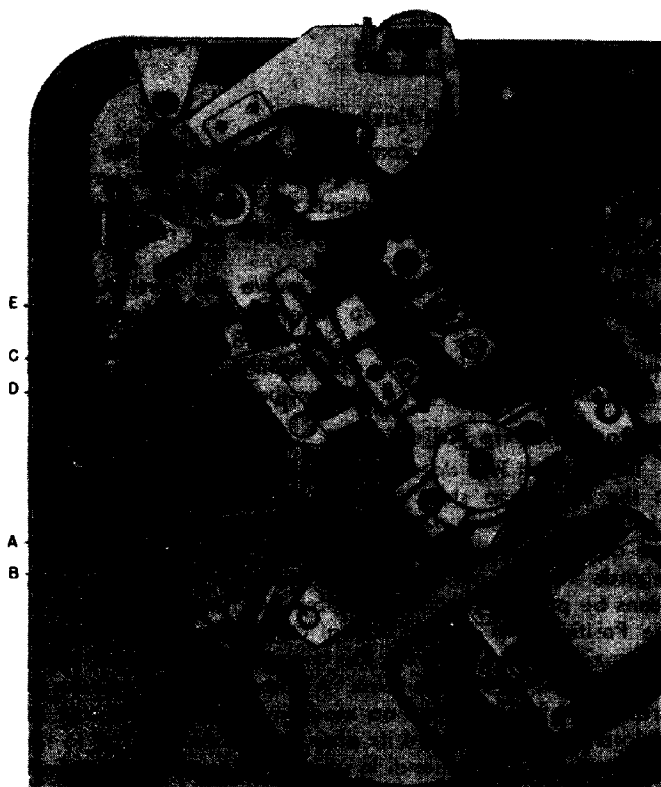


Fig. 11. Cycling Switch and Position Trip Adjustments.

REMOVING THE TURNTABLE

To remove the Turntable, hold the Clutch with one hand and turn the Turntable with the other (see Fig. 12).

To avoid damage when the Turntable is replaced, be certain that the Idler Wheel is pushed inside the rim before the Turntable is seated.

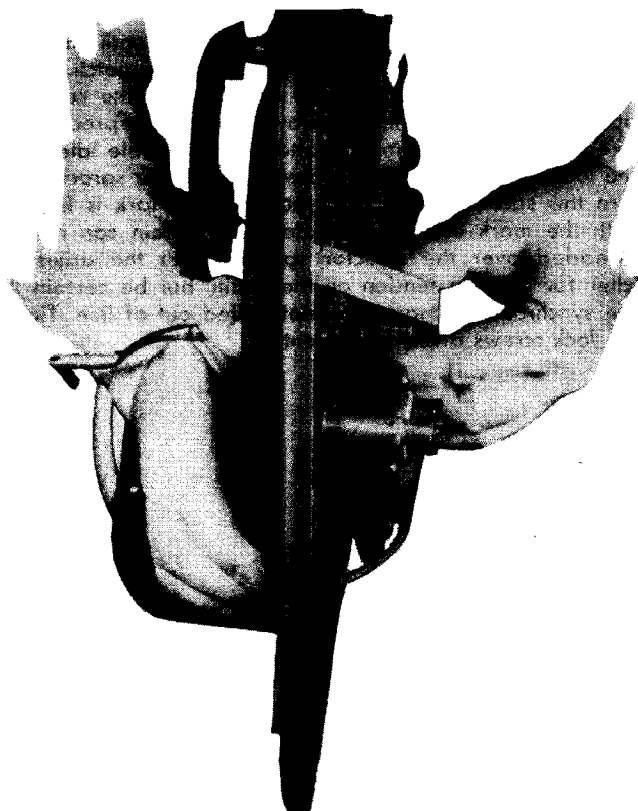


Fig. 12. Removing the Turntable.

REPLACING THE MOTOR

Early models used the 141-92 and 141-94 motors. The 141-92 motor is unmarked while the 141-94 motor has "GI" stamped underneath the lower bearing support bracket. These motors are interchangeable except for the spring drive bushings. The 141-92 motor uses a 80-452 bushing for 50 cycle operation and a 80-453 bushing for 60 cycles. The 141-94 motor uses a 80-543 bushing for 50 cycles and a 80-549 bushing for 60 cycles. Later releases use a 141-104 motor for 60 cycle operation, and 141-103 motor for 50 cycle use. These motors can be used to replace the early models.

When a replacement Motor is ordered, include the line voltage and frequency of the receiver.

To replace the Motor, unsolder the connecting leads, remove the Turntable, the three "C" washers and allow the Motor to drop out. Remove the spring bushing from the shaft of the defective Motor by turning it against the direction of wind and re-install on the new motor. When the new Motor is installed do not draw the connecting leads tight as this will prevent the Motor from "floating" on its spring mounts. Be certain that the "C" washers are crimped and the leads securely soldered and taped.

REPLACING THE CHAIN

To replace the Chain, loosen the adjustable idler (Screws "D" Fig. 13) and remove the Chain. Open a link, and pull the Chain out. Open a link in the replacement Chain and thread it in place. Be certain that the open ends of the links face outward from the Base Plate (see Fig. 13). (This will prevent the Chain from being installed in reverse.) Carefully close the link in the new Chain and be certain that there is no stiffness in its action. Read the paragraph on synchronization before the Chain is permanently installed.

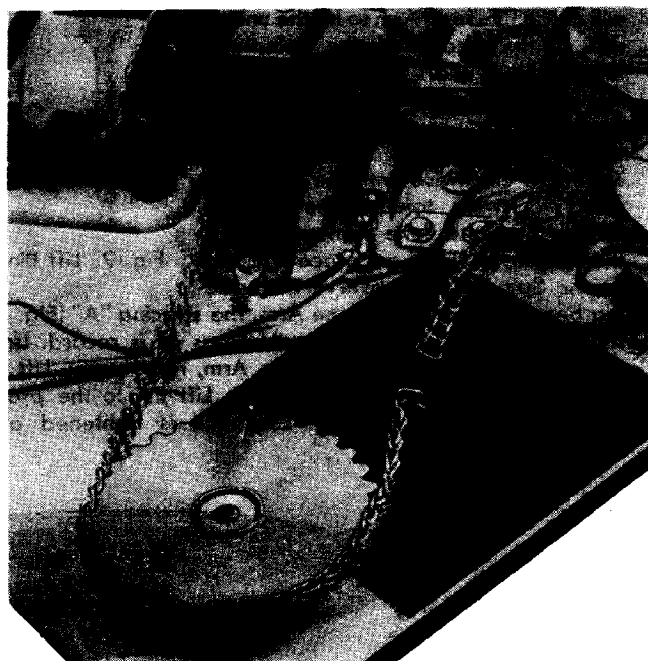


Fig. 13. Replacing the Chain.

TROUBLE SHOOTING

SQUEAKS OR NOISES DURING PLAYING OF RECORDS.

a. Friction between the records on the turntable and the spindle will occasionally cause squeaks. A thin coat of wax applied to the spindle will remedy this condition.

b. Check lubrication.

MECHANISM STARTS SLOWLY AND MOTOR GETS HOT.

- a. Check line voltage and frequency.
- b. Check lubrication.
- c. Motor windings damaged.
- d. Room temperature abnormally low.

PRESSING RECORD CHANGE BUTTON ON RECEIVER PANEL DOES NOT START RECORD CHANGE CYCLE.

- a. See that the OFF-AUTO-MAN switch is set to AUTO.
- b. Check Record Change Switch.
- c. Check Cut-out Switch.
- d. Check electrical continuity of solenoid circuit.
- e. Check solenoid energizing voltage on motor.

MOTOR FAILS TO RUN EVEN WHEN IT IS ENTIRELY DISCONNECTED FROM CHANGER AND PROPER VOLTAGE AND FREQUENCY APPLIED DIRECTLY TO THE TWO INPUT LEADS OF THE WINDING.

- a. Open windings.
- b. Damaged or frozen bearings.
- c. Lower Bearing Support Bracket bent. Remove and straighten bracket—Re-center armature.

RUMBLE AND MICROPHONICS DURING REPRODUCTION.

- a. Changer not "floated" properly. Loosen mounting bolts.
- b. Motor mounting Spring Clips rubbing on the idler wheel.
- c. Motor leads pulled tight preventing motor from "floating" freely on its springs.
- d. Pre-amp not floated.
- e. Noisy 7F7 tube.
- f. Impression on Idler Wheel.

NEEDLE SETS DOWN PROPERLY ON RECORD BUT SLIDES OVER THE RECORD GROOVES.

- a. Cabinet tilted.
- b. Badly worn or broken needle cartridge.

NEEDLE FAILS TO CLEAR MAXIMUM LOAD OF RECORDS ON THE TURNTABLE.

- a. Check Tone Arm height adjustment. (Adjustment 2.)

CHANGER CYCLES WITH OFF-AUTO-MAN SWITCH ON MAN.

- a. Check AUTO-MAN-OFF switch.
- b. Chain too tight.
- c. Check Trigger Spring. (Fig. 4)

TONE ARM FALLS OFF RECORD.

- a. Check Tone Arm set down adjustment. (Adjustment 1)
- b. Check Tone Arm mounting screws.
- c. Changer not level.

TONE ARM SET-DOWN POSITION VARIES.

- a. Loose Tone Arm set down adjustment lock screw.
- b. Loose Tone Arm mounting screw.

RECORD IS NOT HEARD ALTHOUGH CHANGER OPERATES.

- a. See that the Phono Radio switch is on Phono.
- b. Check receiver audio by listening to radio.
- c. Check 7F7 tube.
- d. Check Needle Cartridge.
- e. Check Tone Arm Housing for broken leads.

TONE ARM SETS DOWN TOO FAR IN OR OUT ON RECORD.

- a. Check Tone Arm set down adjustment. (Adjustment 1.)

CHANGER CONTINUES TO CYCLE.

- a. Check Cycling switch adjustment. (Adjustment 3.)
- b. Check Record Change switch.
- c. Clutch release mechanism sticks.
- d. Tight drive chain.

CHANGER WILL NOT CYCLE UPON COMPLETION OF RECORD.

- a. See that the OFF-AUTO-MAN switch is set to AUTO.
- b. Be certain the record has an eccentric center groove.
- c. Check Cycling switch.
- d. Check Cut-out switch. (Normally closed.)
- e. Check Clutch Release Arm for freedom of action.

SQUEAKS WHEN CHANGER IS IN CYCLE.

- a. Friction between Lift Pin and Timing Sprocket. Apply a thin coat of Sta-Put.

FAILS TO EJECT RECORDS ACCOMPANIED BY A CLICKING SOUND.

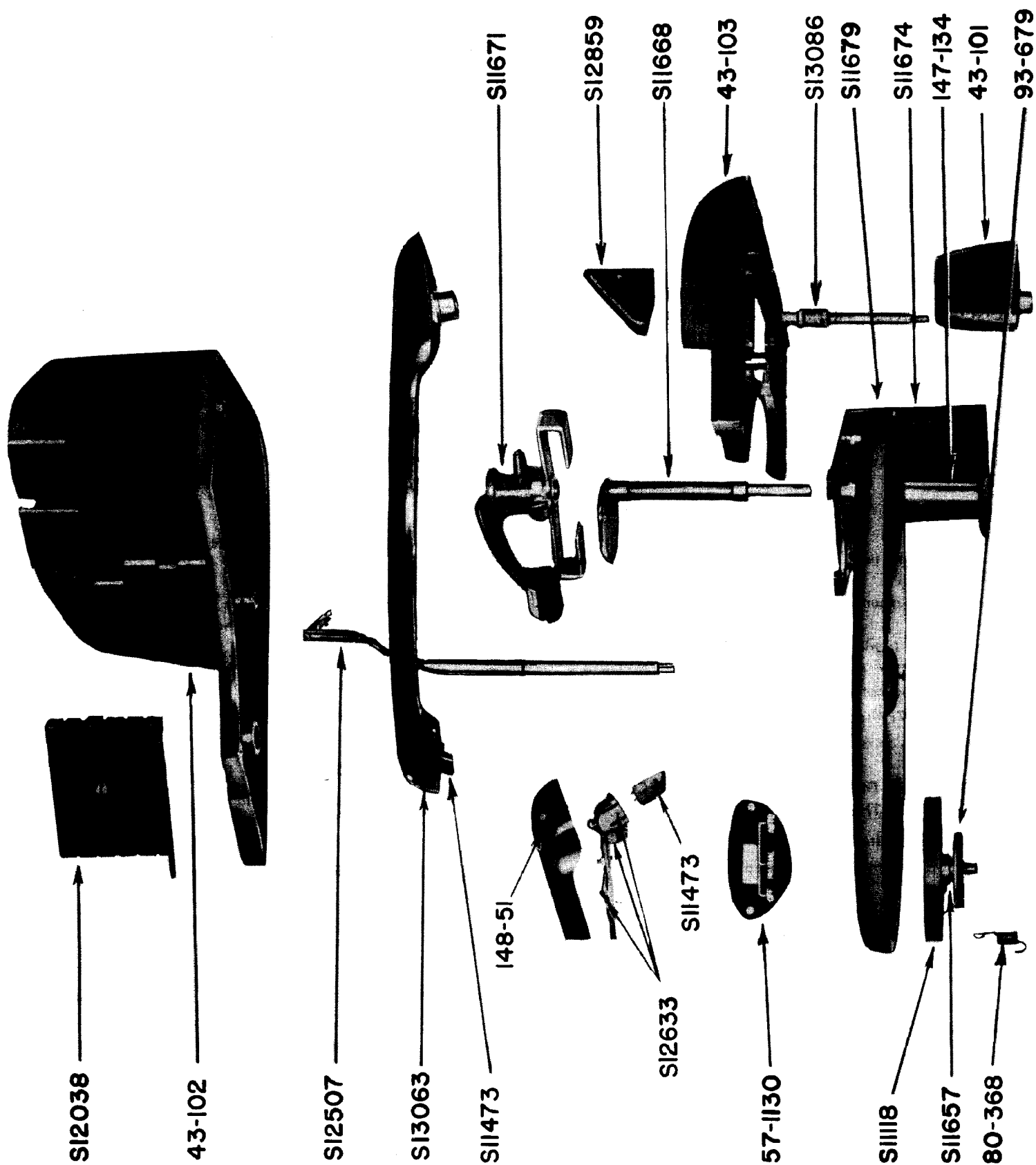
- a. Clutch slips. A slight upward bend of the Clutch Release Arm will correct this condition.

TONE ARM STICKS OR HANGS UP DURING CYCLE.

- a. Clutch Release Arm pressure on Timing Sprocket too great. Loosen the solenoid bracket and insert a very thin shim between it and the base plate. If the condition still prevails, increase the thickness of the shim.
- b. Burrs in synchronizing notch or Clutch Release Arm Tip. Remove with a file.

MOTOR RUNS BUT TURNTABLE SLIPS OR STOPS.

- a. Turntable not fully seated. Tap gently.
- b. Defective Idler Wheel.



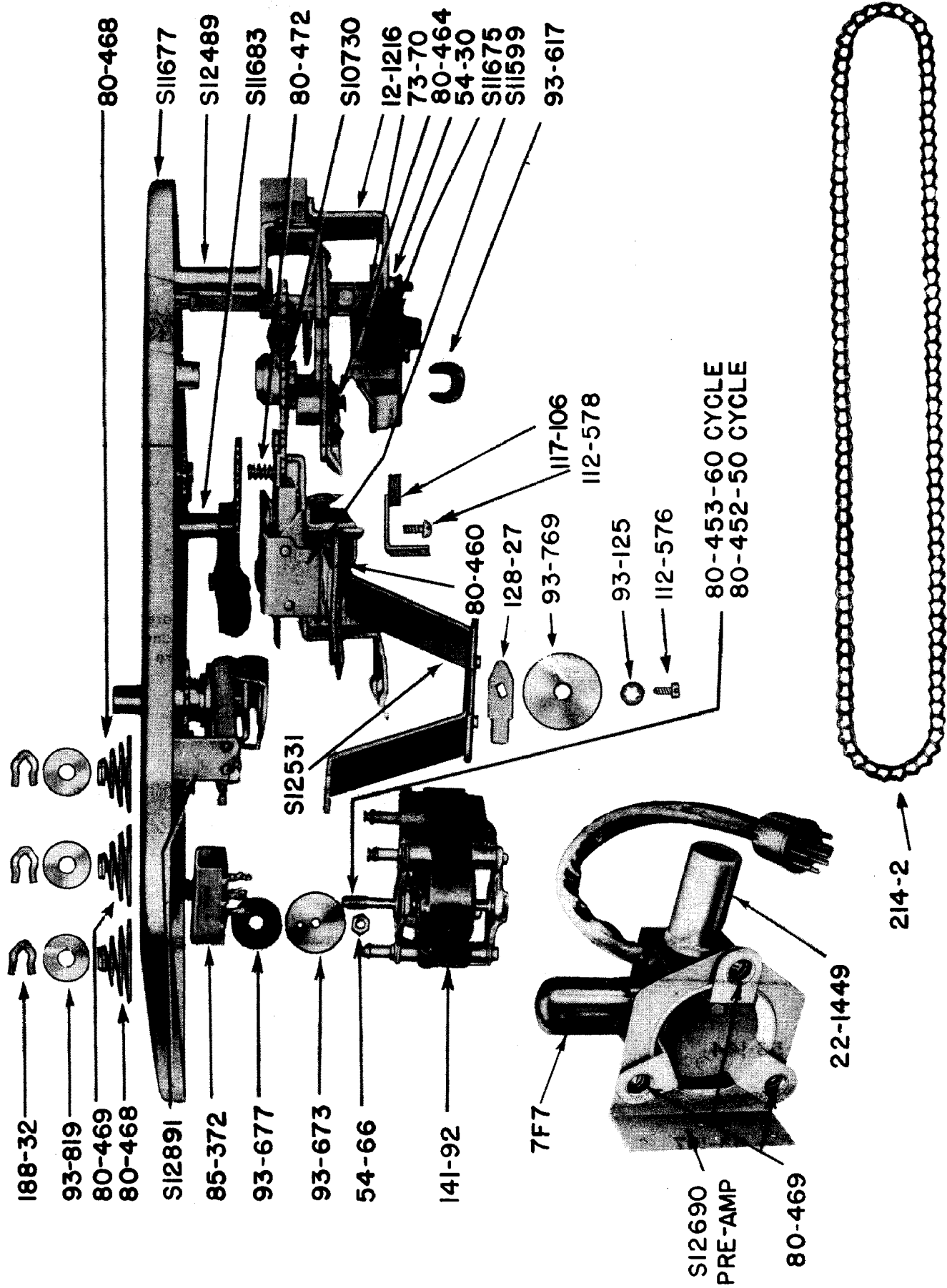


Fig. 14. Exploded View of Record Changer

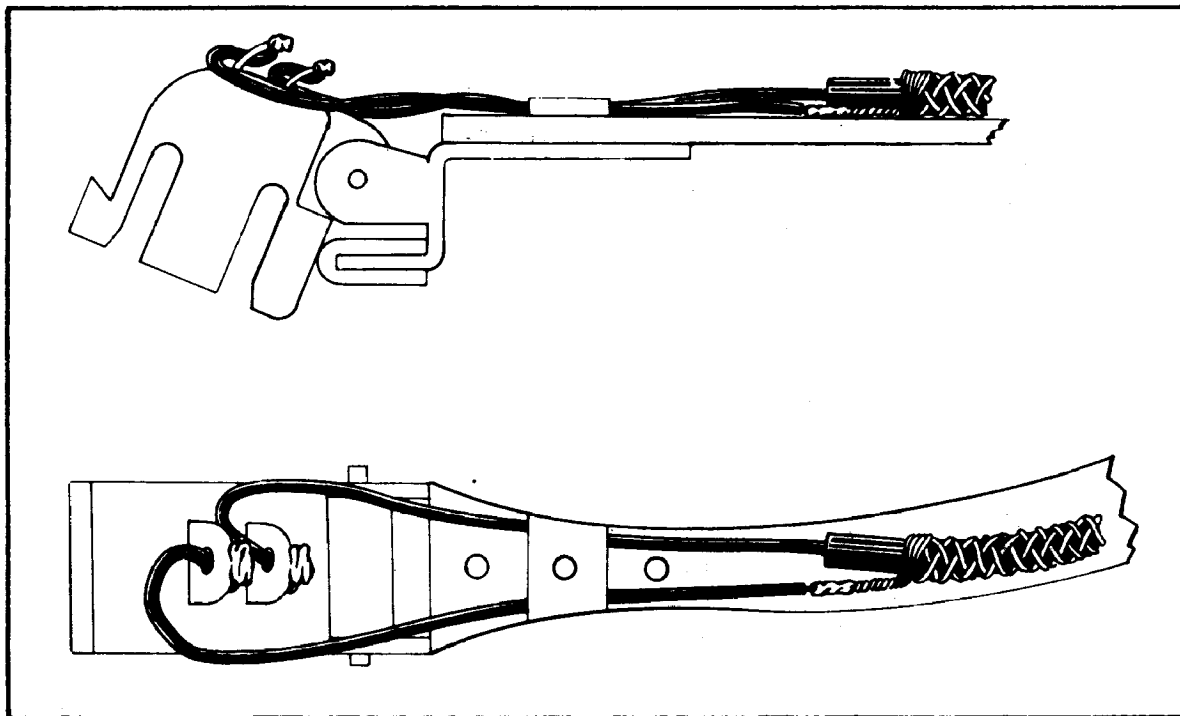


FIGURE 15

Fig. 15 shows how the leads are connected to the Needle Cartridge Socket. The lead and insulation are run through the hole in the contact and the lead is soldered with a light soldering iron. Great care must be exercised, and very little heat applied as the socket is made of lucite and will burn easily. The complete lead, socket and bracket are supplied as S-12633

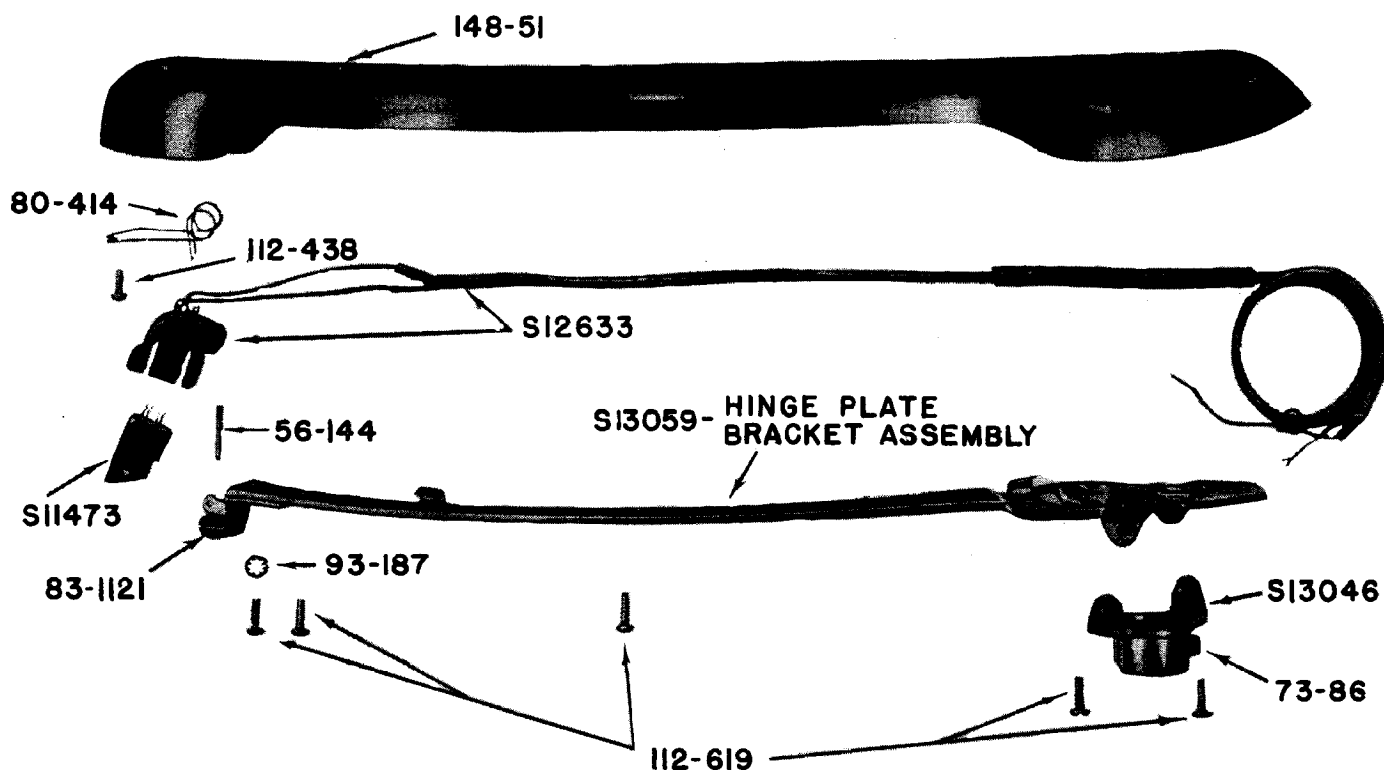


Fig. 16. Exploded View, Cobra Tone Arm.

NUMERICAL PARTS LIST

Part No.	Description	Part No.	Description
S-10730	Timing Sprocket Assembly	80-460	Trip Lever Tension Spring
S-10732	Idle Assembly	80-462	Cam Spring
S-11118	Idle Wheel Assembly	80-464	Pawl Spring
S-11458	Solenoid and Bracket Assembly	80-465	Contact Spring
S-11473	Needle Cartridge	80-466	Contact Spring
S-11580	Trip Contact and Support Strip Assembly	80-468	Motor Mounting Spring (2 End)
S-11599	Clutch Release Arm—Trip Plate and Bracket Assembly	80-469	Motor Mounting Spring (Center)
S-11638	Pre-Amp Chassis Base Assembly	80-472	Trip Lever Plate Actuating Spring
S-11640	Pre-Amp. Phono Unit Assembly	80-479	Spring (Spindle Dog)
S-11657	Idle Wheel Stud and Washer Assembly	80-510	Trip Contact Spring
S-11668	Record Ejector Cam and Shaft Assembly	80-531	Brake Spring
S-11671	Pressure Arm and Bracket Assembly	80-532	Contact Spring
S-11674	Record Support Plate and Bracket Assembly	80-538	Landing Adjustment Spring
S-11675	Discriminator Lever and Bracket Assembly	80-543	Spring (60 cycle Operation)
S-11677	Base Plate, Sprocket and Drive Shaft Bearing Assembly	80-543	Spring (50 cycle Operation 141-94 Motor Shaft)
S-11683	Selector Sprocket and Bushing Assembly	80-549	Spring (60 cycle Operation 141-94 Motor Shaft)
S-12038	Record Ejector Housing Cover Assembly	83-341	Single Lug Terminal Strip
S-12489	Tone Arm Pivot Shaft and Bracket Assembly	83-420	Three Lug Terminal Strip
S-12493	Spring Contact and Insulator Assembly	83-1091	Insulating Strip
S-12507	Record Spindle Assembly	83-1107	Insulator Strip
S-12531	Bracket and Spring Assembly	83-1121	Phono Cartridge Socket Felt Bumper
S-12541	Contact Assembly	83-1240	Record Changer Trim Strip
S-12542	Contact Assembly	84-65	Tone Arm Rest
S-12633	"Cobra" Socket and Cable Assembly	85-372	Slide Switch (3 Position)
S-12859	Discriminator Knob and Plate Assembly	86-81	Shakeproof Lug No. 2101-8
S-12891	Trip Contact and Bracket Assembly	93-35	3/8 x .144 x .032 Flat Washer—N.P.
S-13046	Swivel Bracket, Bushing and Pin Assembly	93-125	No. 6 Internal Shakeproof Lockwasher
S-13063	Complete Cobra Tone Arm Assembly with Needle Cartridge	93-126	No. 8 Internal Shakeproof Lockwasher
S-13086	Tone Arm Lift Pin Assembly	93-415	No. 6 External Shakeproof Lockwasher
S-13371	Turntable and Record Locating Stud Assembly	93-582	5/16 x .129 x .025 Steel Washer—Cad. Pl.
12-1216	Tone Arm Pivot Bracket	93-617	Sprocket Shaft Retaining Washer
12-1224	Pre-Amp Mounting Bracket	93-673	Idle Wheel Stud Washer—Small
19-123	Phono Frame Mounting Clips	93-677	Idle Wheel Stud Fishpaper Washer—Large
22-417	.1 Mfd. Paper Dielectric Capacitor	93-678	Idle Wheel Stud Fishpaper Washer—Small
22-1449	30 Mfd. Electrolytic Capacitor	93-679	Idle Wheel Stud Flat Washer—Large
22-1570	.05 Mfd. Paper Dielectric Capacitor 400 v.	93-719	7/16 x 3/16 x .031 Flat Washer—N.P.
43-101	Tone Arm Support Housing (Casting)	93-754	No. 4 Internal Shakeproof Lockwasher
43-102	Record Ejector Housing (Black Polystyrene)	93-767	Cam Spacer Washer
43-103	Tone Arm Housing (Black Polystyrene)	93-769	7/8 x .140 x .043 Steel Washer Cad. Pl.
54-30	8-32 x 5/16 x 7/64 Hex Nut—Steel N.P.	93-819	Motor Mounting Washers (3)
54-34	No. 6-32 x 1/4 Hex Nut—Steel N.P.	93-1121	Phono Cartridge Socket Felt Bumper
54-66	No. 10-32 x 5/16 Hex Nut—Steel N.P.	94-334	Mounting Bushing
56-149	Phono Cartridge Socket Retaining Pin	94-415	Locating Bushing
56-167	Locating Bushing Pin	94-505	Insulating Bushing (Cutout Contact)
57-1117	Discriminator Trip Plate	94-582	Drive Bushing 141-103 Motor
57-1130	Switch Escutcheon	97-213	Motor Mounting Stud
63-582	680 Ohm Carbon Resistor—1/4 W. $\pm$ 20%	112-415	8-32 x 3/8 Flat Head Screw
63-589	10,000 Ohm Carbon Resistor—1/4 W.	112-420	Record Changer Mounting Bolts
63-604	10 Megohm Carbon Resistor—1/4 W.	112-438	Needle Cartridge Socket Tension Spring Mounting Screw
69-36	8-32 x 1/4 R.H.M.S.—Steel N.P.	112-548	6-32 x 1/2 Recessed Stove Head M.S.
71-71	No. 6-32 x 1/4 Phillips Flat Head M.S.	112-562	4-40 x 7/8 R.H. Stan-Tap Screw
73-59	8-32 x 5/16 Slotted Headless Set Screw	112-576	5-40 x 1/4 Oval B.H.M.S. Steel N.P.
73-70	No. 8-32 x 1/2 Allen Head Set Screw	112-578	6-32 x 1/4 Oval B.H.M.S. Steel N.P.
73-86	Cobra Tone Arm Mounting Screw	112-579	8-32 x 3/8 R.H. Shakeproof Type Screw
73-88	Set Screw for 94-582 Drive Bushing	112-581	6-20 x 3/8 R.H. Self Tapping Screw
80-138	Idle Wheel Retaining Spring	112-619	Cobra Tone Arm Mounting Screws (5)
80-368	Idle Wheel Tension Spring	114-89	8-32 x 5/16 Hex Acorn Head M.S. Steel N.P.
80-406	Trip Lever Pawl Spring	114-180	No. 6 x 1/4 Hex Head Slotted Screw
80-414	Needle Cartridge Socket Tension Spring	114-199	6 x 3/16 Hex Head Slotted Screw
80-418	Pressure Arm Tension Spring	114-200	6-32 x 5/16 Hex Head Slotted Screw
80-452	Spring (50 cycle Operation 141-92 Motor Shaft)	114-201	8-32 x 5/16 Hex Head Slotted Screw
80-453	Spring (60 cycle Operation 141-92 or 105 Motor Shaft)	114-217	8-32 x 1/4 Hex Head Slotted Screw
80-458	Trip Contact Spring	114-248	6-20 x 5/16 Hex Head Slotted Screw
		115-24	4-40 x 3/16 Fillister H.M.S.—Steel N.P.
		117-106	Position Trip Lever
		125-16	Gum Rubber Grommet
		126-470	Pre-Amp Chassis Shield

Part No.	Description	Part No.	Description
128-27	Cam	147-134	Cylindrical Spacer (Drive Shaft Bracket)
141-92, or 94	50/60 cycle Phono Motor	148-51	Tone Arm Housing
141-103	50 cycle Phono Motor (Replaces 141-92, 94 Motors 50 cycle Operation)	166-30	Pressure Arm Rubber Bumper
141-105	60 cycle Phono Motor (Replaces 141-92, 94 Motors 60 cycle Operation)	188-27	Record Spindle Retaining Washer
		188-32	Motor Mounting Retaining Rings (3)
		214-2	Sprocket Drive Chain

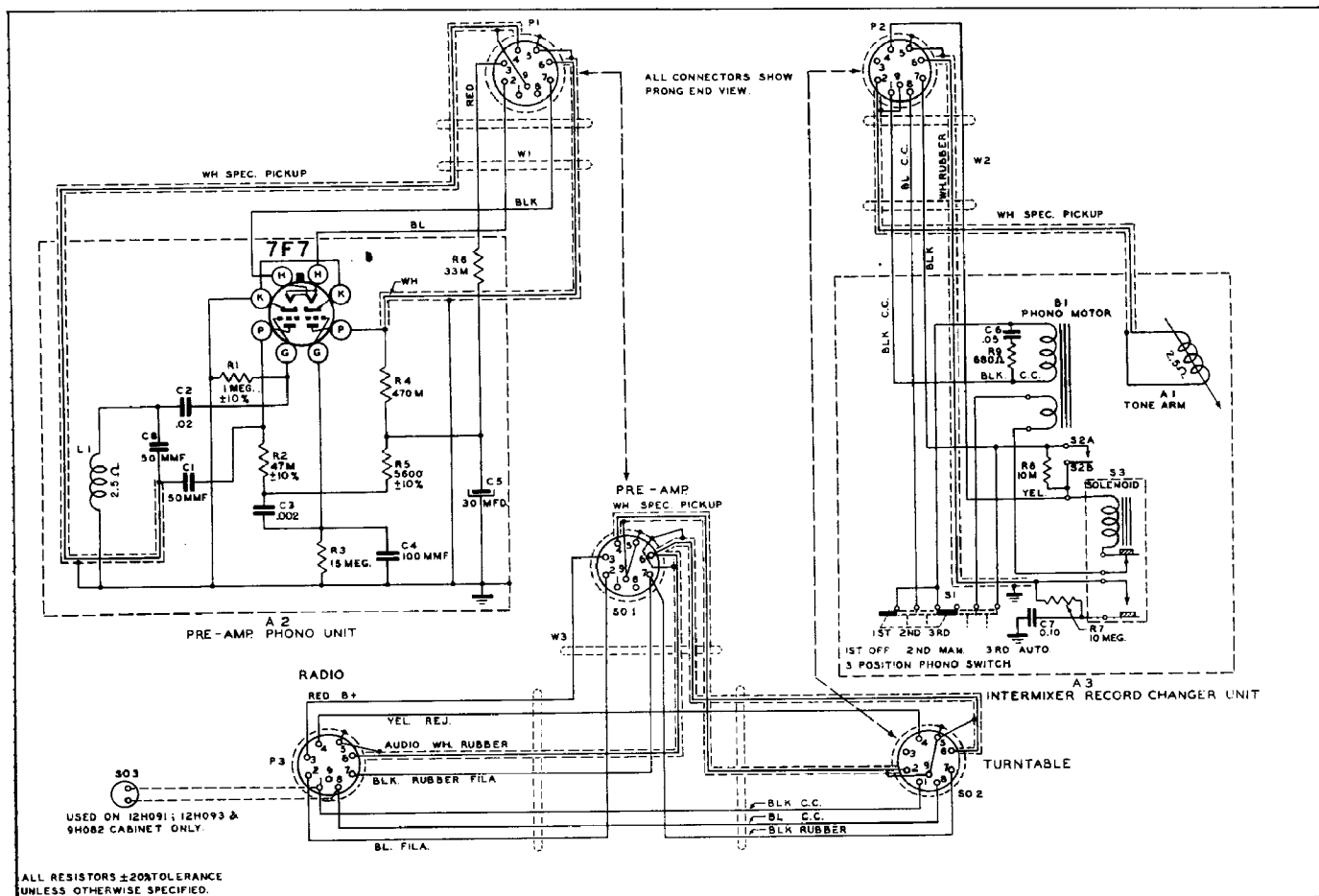


Fig. 17. Schematic Diagram of Record Changer and Pre-Amp.

Diag. No.	Part No.	Description	Diag. No.	Part No.	Description	Diag. No.	Part No.	Description
C1	22-1532	50 MMF. 500V.	R8	63-589	10 M OHM ¼ W.	SO3	52-188	2 Prong Receptacle
C2	22-327	.02 MFD. 200V.	R9	63-582	680 OHM ¼ W.	S1	85-372	3 Pos. Switch
C3	22-1220	.002 MFD. 600V.	A1	S13063	Tone Arm Complete	S2A	S12891	Trip Contact Assembly
C4	22-162	100 MMF. 600V.	A2	S11640	Pre-Amp. Phono Unit	S2B	S12579	Insulator Strip "
C5	22-1449	30 MFD. Electro. 300V.	A3	S11680	Intermixer Record Changer Unit 60~	S3	S11458	Solenoid Mag. "
C6	22-1570	.05 MFD. 400V.	A3	S13300	Changer Unit 25~	W1	S12601	Cable Assembly
C7	22-417	0.10 MFD. 600V.	B1	141-105	Phono Motor 60~	W2	S12602	Cable Assembly
C8	22-367	50 MMF. 500V.	B1	141-99	Phono Motor 25~	W3	S12604	Cable—Used on Models 12H090; 12H092; 12H094; 9H088
R1	63-441	1 MEGOHM ¼ W.	L1	S12603	42.5 Micro Henry	W3	S12605	Cable—Used on Models 12H091; 12H093
R2	63-648	47 MOHM ¼ W.	P1	58-133	Phono Plug	W3	S12606	Cable—Used on Models 9H081; 9H079
R3	63-976	15 MEGOHM ¼ W.	P2			W3	S12607	Cable—Used on Model 9H082
R4	63-597	470 MOHM ¼ W.	P3					
R5	63-638	5600 OHM ¼ W.	SO1	78-582	Phono Socket			
R6	63-592	33 MOHM ¼ W.	SO2	78-582	Phono Socket			
R7	63-604	10 MEGOHM ¼ W.						

SERVICE MANUAL

**MODELS S-13675 S-14002
S-14006 S-14008**

AUTOMATIC RECORD CHANGERS



GENERAL

TO THE SERVICE MAN:

This Service Manual has been prepared for the purpose of assisting the Service Man in his work of caring for the Record Changer mechanism, whether he is called to remedy some difficulty, or to insure the continued satisfactory operation. The Zenith Automatic Record Changers are constructed with a minimum of working parts, and in operation are simple and reliable. However, as is the case with all mechanical units, misalignment and trouble may occasionally develop. The information presented in this book will enable the Service Man to render quick and accurate service.

Service notes for models S-13675, S-14002, S-14006, and S-14008 have been combined in this manual. Except for slight mechanical, electrical and color variations, these models are alike. The adjustments that the serviceman will be called to make will be the same for all models.

Models S-13675 (maroon) and S-14006 (black) have the automatic shut-off feature and are identical mechanically. Models S-14002 (maroon) and S-14008 (black) have slight electrical differences.

For convenience, the Operating Instructions supplied with each Record Changer are summarized as follows: The Record Changer will automatically play up to fourteen 10 inch or twelve 12 inch records at one loading, or up to twelve 10 and 12 inch records intermixed. The Record Stack rests on the Spindle and the Record Shelf. The Selector Sprocket drives the Ejector Cam which pushes the records off the Shelf and Spindle allowing them to drop on the Turntable. To load for automatic operation, swing the Pressure Bar to the right, place the stack of records on the Spindle, swing the Pressure Bar to the left until it rests on the record stack, set the OFF-MAN-AUTO switch to AUTO and press the Record Change button. Models S-14002 and S-14008 will play the entire selection of records and repeat the last record until turned off. Models S-13675 and S-14006 will automatically shut off after the last record is played.

For manual operation set the OFF-MAN-AUTO switch to MAN and play the records singly as on a non-automatic record player.

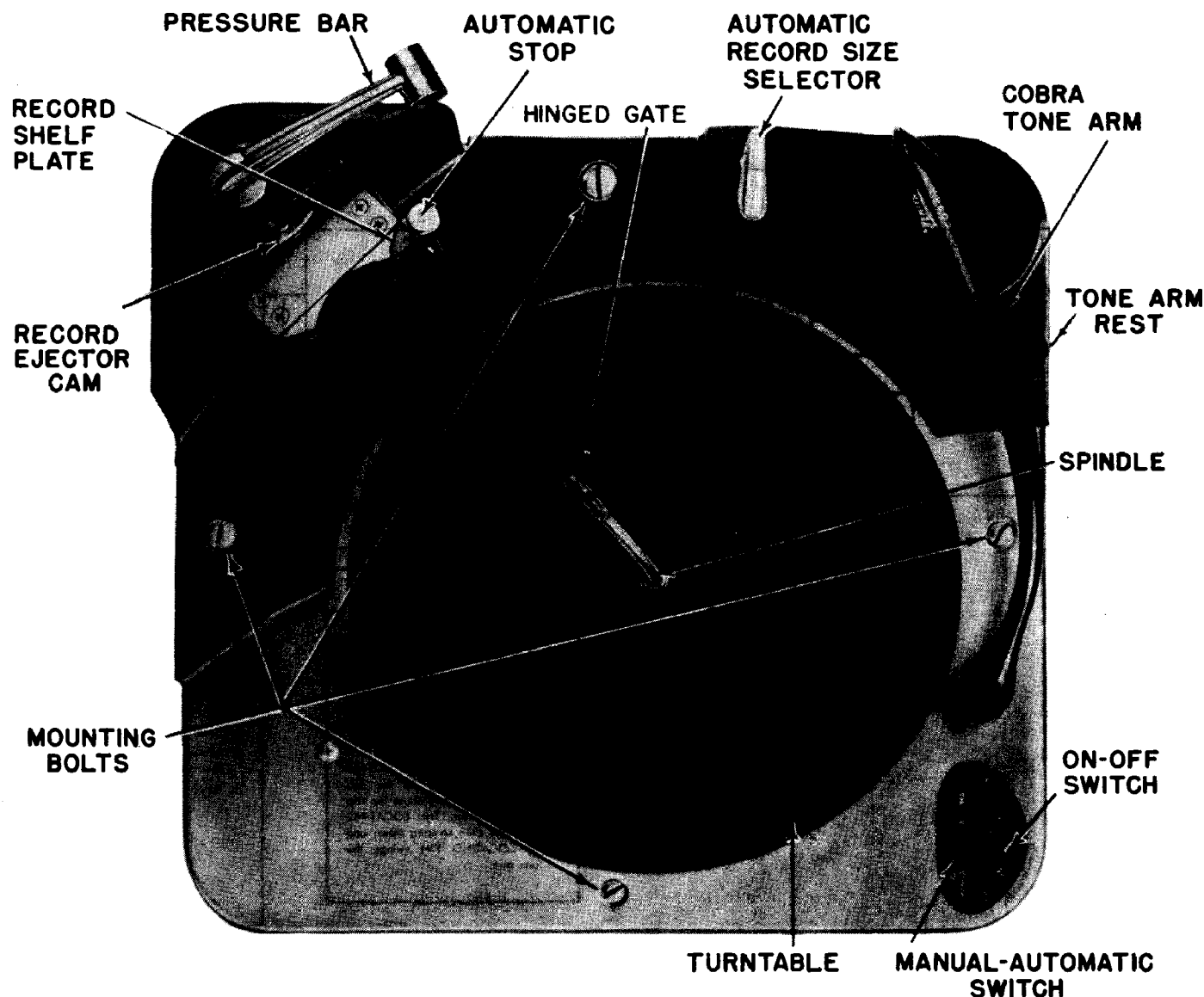


Fig. 1. Top View S-13675 and S-14006 Record Changers.

DESCRIPTION OF CYCLING

The phono motor friction drives the idler wheel. The idler wheel rim drives the turntable, and the turntable shaft. To the turntable shaft is attached the segmented clutch drive plate. The pawl on the clutch drive sprocket assembly engages the drive plate, causing the sprocket to rotate. The pawl pusher lever on the clutch release arm assembly causes the clutch to engage or disengage.

Closing either the trip switch or the record change switch energizes the solenoid. The magnetic flux of the solenoid attracts the clutch release lever causing the mechanism to trip and move the pawl pusher lever away from the clutch pawl. This action allows the clutch pawl spring to pull the pawl into position for the drive plate segment to engage and start the clutch sprocket rotating. The clutch sprocket is meshed with the chain drive sprocket and the chain drives the selector and timing sprockets.

The timing sprocket completes 7 functions through 360° rotation. These functions are as follows: 1. Applies the tone arm brake. The brake lever is actuated by the brake stud on the timing sprocket. The brake prevents coasting and erratic landing of the needle. 2. The inclined groove pushes the lift pin upward. The lift pin raises and lowers the tone arm. 3. The locating pin laterally swings the tone arm off the record stack. 4. The locating pin or bushing swings the tone arm over the starting groove of the record. With 12" records, the locating pin swings the tone arm in while the locating bushing swings the tone arm with 10" records. The

locating bushing is pushed upward by the discriminator trip plate. 5. The reset stud resets the clutch trip mechanism and moves the pawl pusher lever in the path of the clutch pawl. 6. The lift pin lowers the tone arm over the starting groove of the record. 7. The brake stud releases the brake. When the clutch pawl hits the pawl pusher lever, the clutch is disengaged.

The selector sprocket actuates the record ejector cam, and must be timed with the timing sprocket to drop the records on the turntable when the tone arm is at its greatest outward swing. This occurs immediately after the No. 3 function of the timing sprocket.

As the record is played, the tone arm gradually moves toward the center. The ratchet on the tone arm control lever moves toward the pawl on the trip switch lever. As the ratchet comes in contact with the pawl, the oscillating action produced by the eccentric groove on the record causes the trip switch to close, complete the solenoid circuit and repeat the cycle. If the record does not have an eccentric groove, the position trip will close the trip switch and start the next cycle.

Noise and microphonics are eliminated by muting the phono pre-amplifier during the record change cycle. The tone arm brake lever actuates the muting switch. When the contacts are closed, a low reactance capacitor is connected across the audio output making the amplifier inoperative during the change cycle.

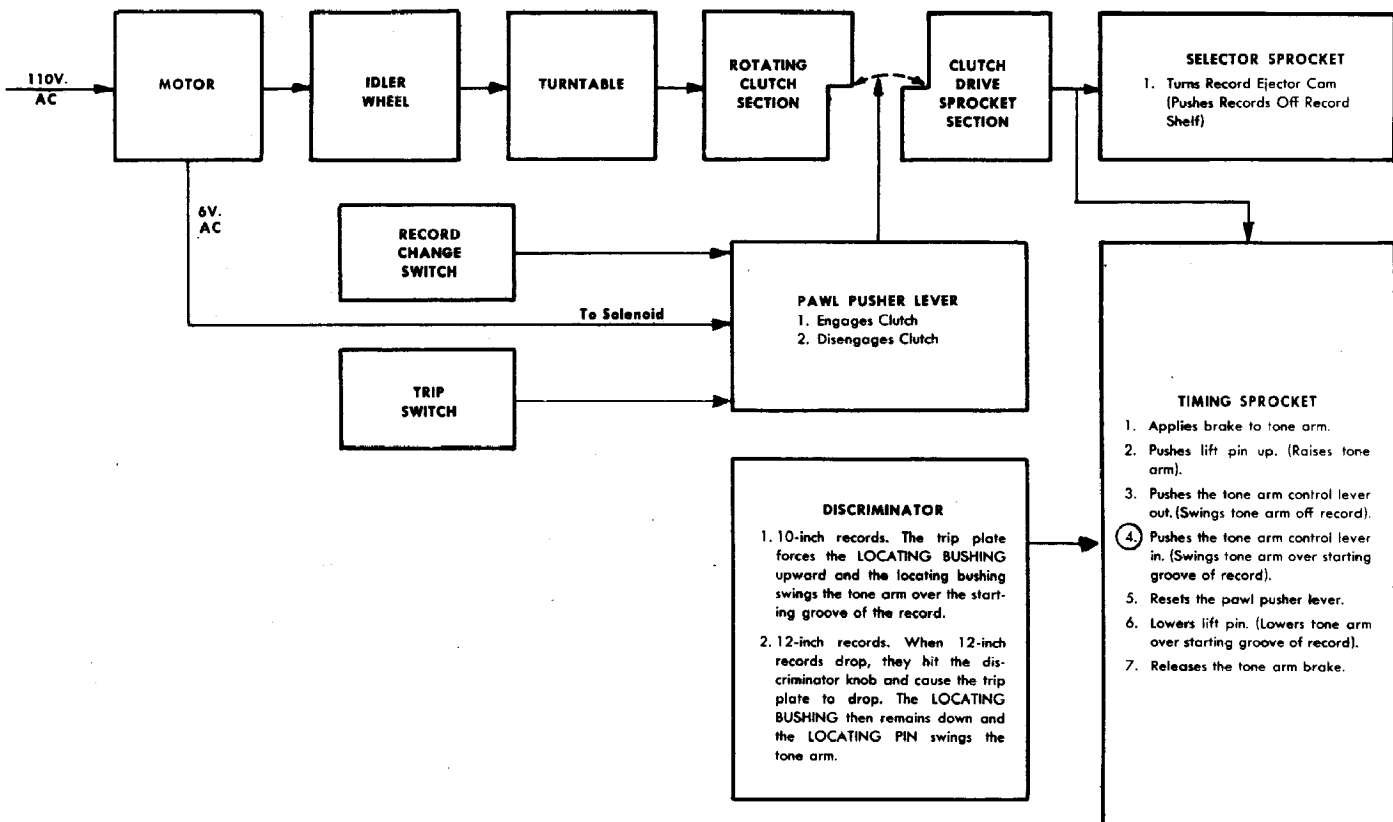


Fig. 2. Sequence of Operation—Zenith Record Changers.

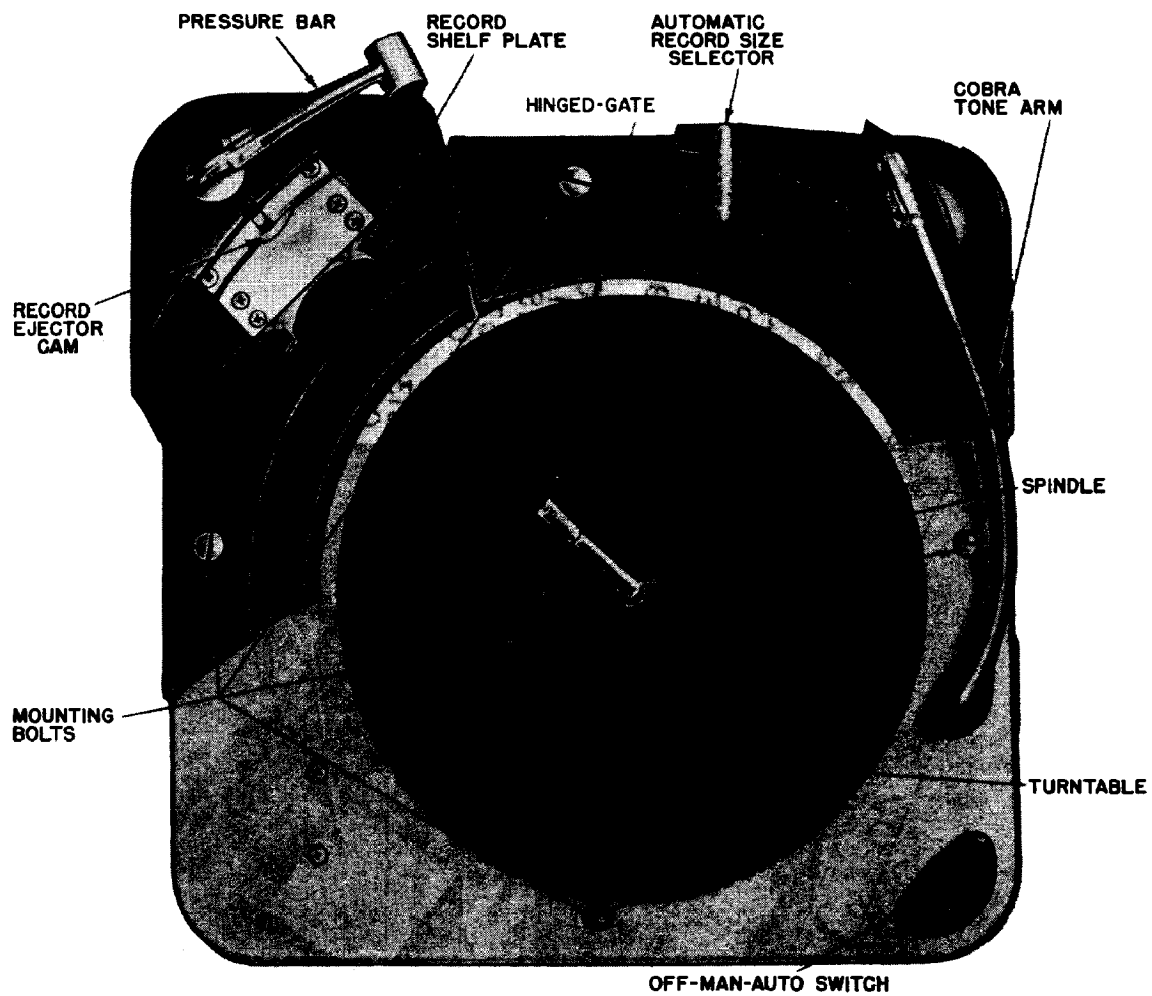


Fig. 3. Top View S-14002 and S-14008 Record Changers.

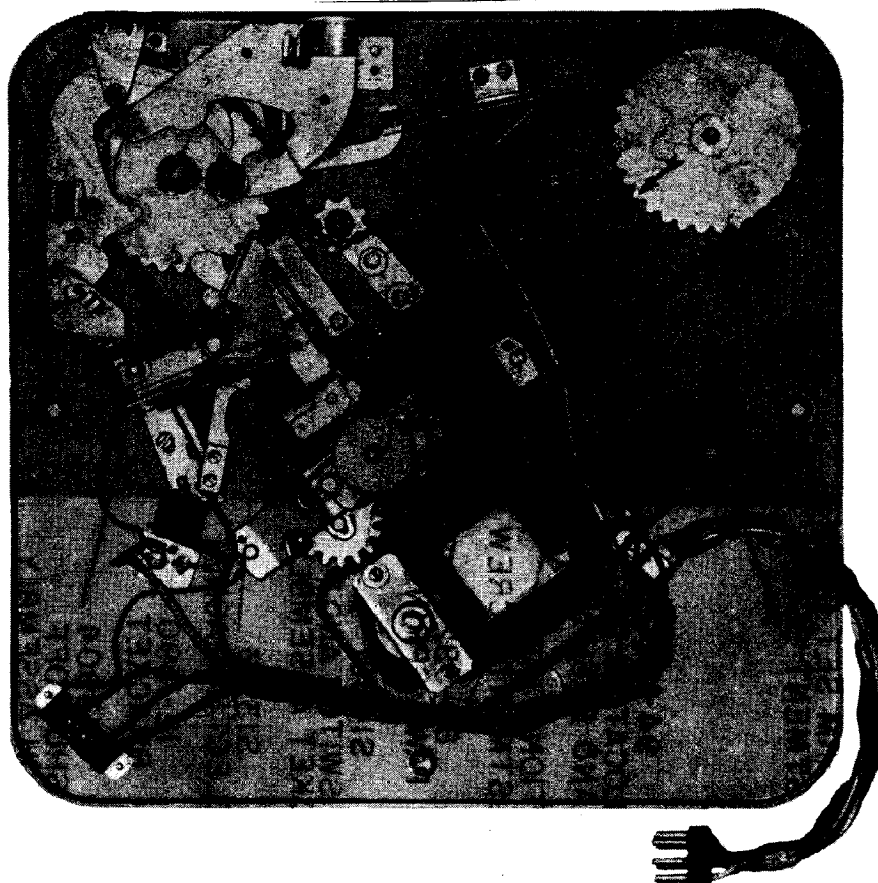


Fig. 4. Bottom View S-14002 and S-14008 Record Changers.

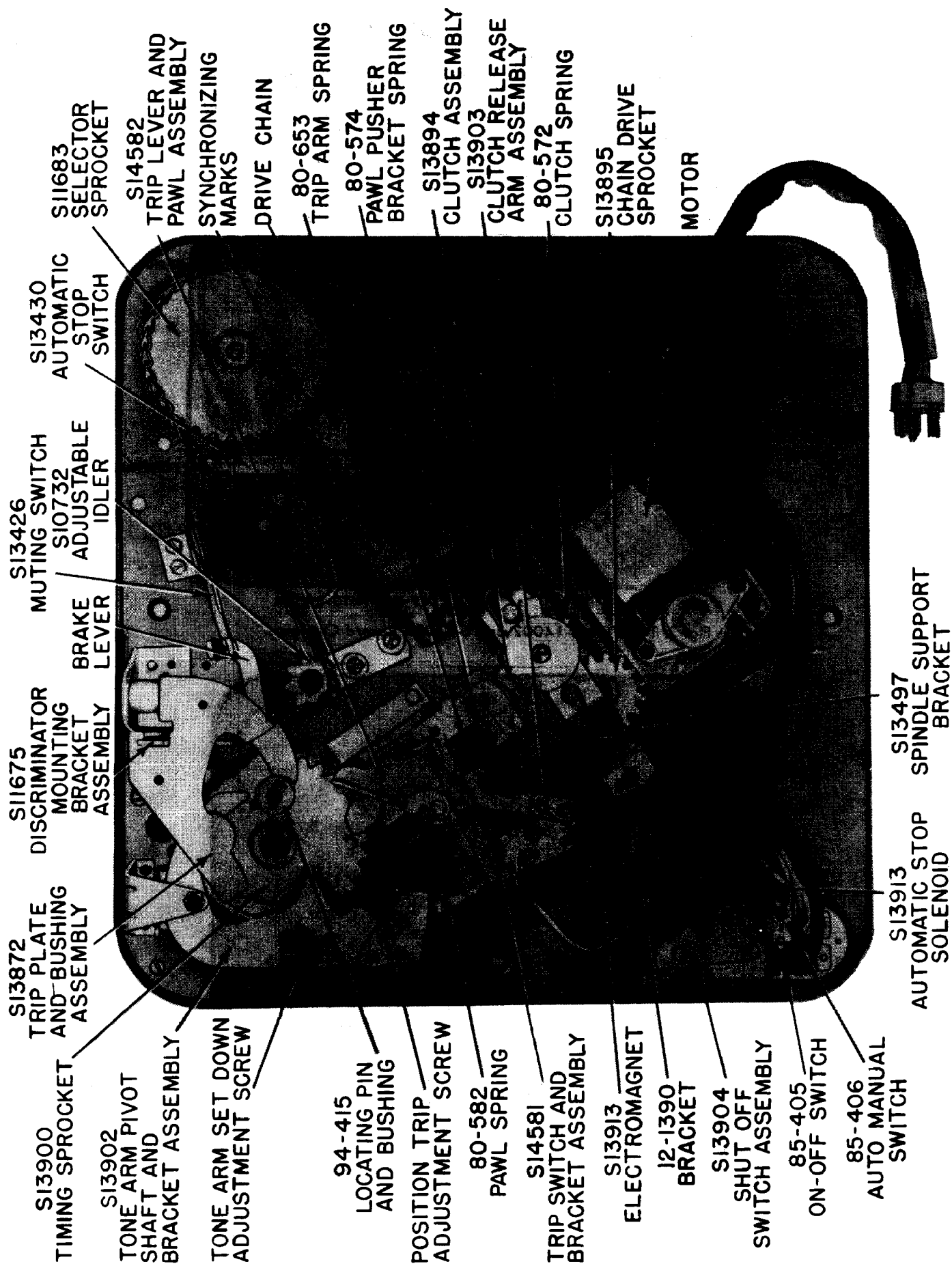


Fig. 5. Bottom View of S-13675 and S-14006 Record Changers.

LUBRICATION

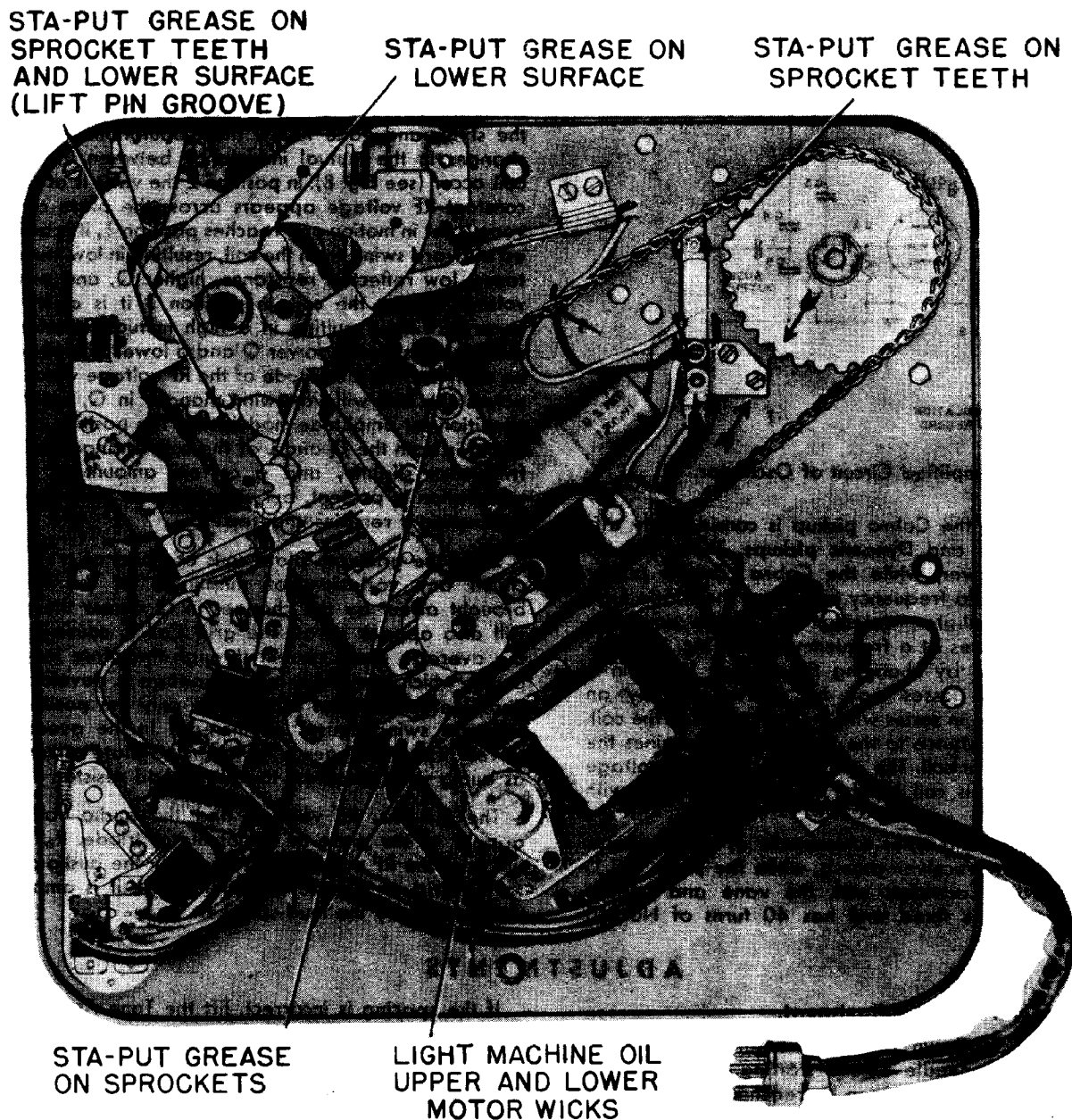


Fig. 6. Lubrication Bottom of Record Changer.

Sta-Put grease No. 512 (light grease of the vaseline type) and light machine oil of No. 10 consistency are used for lubrication throughout.

Figures 6 and 7 indicate the points to be lubricated and the type of lubricant to use. The Motor has two oil wicks, which should be saturated with oil. The Record Spindle Guide Bearing, Idler Wheel Bearing, Lower Drive Shaft Bearing, Drive Shaft Thrust Bearing and the Motor Bearings are of the OILITE type and require very little attention. If squeaks develop, be certain that they are not caused by friction between the Spindle and records on the Turntable. A thin coat of wax on the Spindle will remedy this condition.

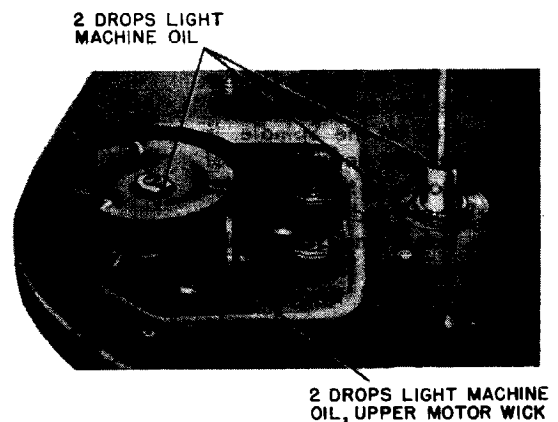


Fig. 7. Lubrication Top of Record Changer.

THEORY OF THE COBRA RADIONIC PICKUP

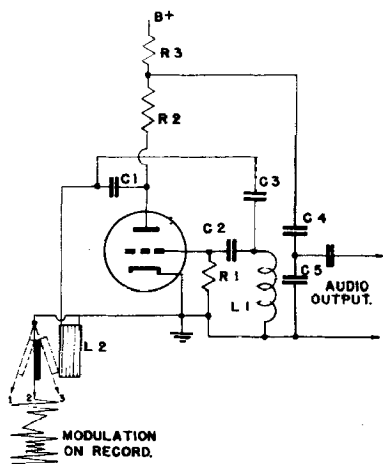


Fig. 8. Simplified Circuit of Oscillator.

The operation of the Cobra pickup is considerably different from Crystal and Dynamic pickups. These pickups generate audio power, while the Cobra controls power generated by a radio frequency oscillator. The triode tube is a modulated oscillator, detector and audio amplifier. The oscillator operates at a frequency of 2.5 Mc. Modulation is accomplished by changing the energy losses in a tuned circuit. These losses may be represented by an equivalent resistance in series with the reactance of the coil. The ratio of the resistance to the reactance determines the efficiency or *Q* of the coil. The amplitude of the RF voltage developed across this coil by the oscillator will vary with changes in *Q*.

The grid coil *L*₁ and other components of the oscillator are mounted in the receiver chassis, while the plate coil *L*₂ is in the Needle Cartridge with the vane and needle assembly. The coil is fixed and has 40 turns of No. 40

wire (approximate DC resistance 2½ ohms). The stainless steel vane, which is in the field of the coil, is spot welded to the osmium-iridium tipped stylus. Any movement of the stylus will cause a corresponding movement of the vane. As the stylus and vane follow the modulations in the record, changes in the mutual inductance between the vane and coil occur (see Fig. 8). In position 2 the vane is at rest, and a constant RF voltage appears across the plate coil. As the vane is set in motion and reaches position 1, it is at its greatest outward swing from the coil, resulting in low mutual inductance, low reflected resistance, higher *Q*, and a higher RF voltage across the coil. In position 3 it is at its greatest inward swing; resulting in a high mutual inductance, high reflected resistance, lower *Q* and a lower RF voltage. It can be seen that the amplitude of the RF voltage which appears across the coil will vary with changes in *Q*, satisfying the condition for amplitude modulation. The position of the vane changes both the *Q* and *L* of the coil. Changes in *L* shift the frequency slightly, and a certain amount of frequency modulation is present, but since there is no frequency discrimination it remains undetected.

Since the grid and plate coils are part of a single tuned circuit any variations of amplitude of the RF voltage brought about by the changes in *Q* across the plate coil will also appear across the grid Coil *L*₁ causing a shift in the average plate current through the plate load resistor across which the audio output voltage is developed. Plate bend detection takes place since only the positive half of the grid swing causes an increase in the average plate current. These changes in the average plate current appear as audio voltage across the plate load resistor.

The 2.5 Mc. RF voltage and the audio voltage both appear at the plate of the oscillator triode. *R*₂, *C*₄ and *C*₅ filter out the RF voltage allowing only the audio component to the grid of the pre-amplifier where it is amplified and reproduced by the loud-speaker.

ADJUSTMENTS

1. Tone Arm Set Down Adjustment.

The Tone Arm Set Down Adjustment determines the landing position of the needle on the starting groove of the record. The adjustment screw can be reached with a screwdriver (Fig. 10). The tone arm must be held in the rest position while the adjustment is made. Clockwise rotation of the screw moves the tone arm in, while counter-clockwise rotation moves it out.

2. Tone Arm Height Adjustment.

The Tone Arm vertical rise is governed by the Lift Pin. The Lift Pin is adjustable (see Fig. 9). Too long a Lift Pin will cause the Tone Arm to hit the underside of the records on the Spindle. If the Lift Pin is short, the needle will not clear fourteen records on the Turntable. To make the proper adjustment, trip the Clutch by hand and rotate the Turntable clockwise until the Tone Arm starts to swing toward the Spindle. Gently push the Tone Arm as close to the Spindle as it will go, place a record on the Spindle and observe the spacing between it and the Tone Arm. The spacing "A" (Fig. 11), should be approximately the thickness of a record.



Fig. 9. Lift Pin.

If the spacing is incorrect, lift the Tone Arm, remove the Lift Pin, and adjust the Lift Pin to the proper length.

3. Trip Switch Adjustment.

As the record is played, the ratchet on the tone arm pivot shaft engages the trip pawl. The oscillating action developed by the eccentric groove on the record closes the trip switch contacts and allows the solenoid to become energized. The magnetic flux attracts the trip lever which moves the pawl pusher lever from the path of the clutch pawl. This allows the clutch to engage and start the next cycle.

The gap between the trip switch contacts should be approximately 1/16". If the spacing is incorrect, bend the contact spring. If the contact spring tension is too great, the needle may not follow the oscillating groove on the record. To adjust the spring tension, insert a screwdriver between the contact and guide springs and bend the contact spring (Fig. 10) until an approximate pressure of one ounce is necessary to move the contact spring from the guide spring. Be certain that the contact spring exerts some pressure on the guide spring after adjustment.

The spacing between the trip magnet and trip lever should be approximately 3/32".

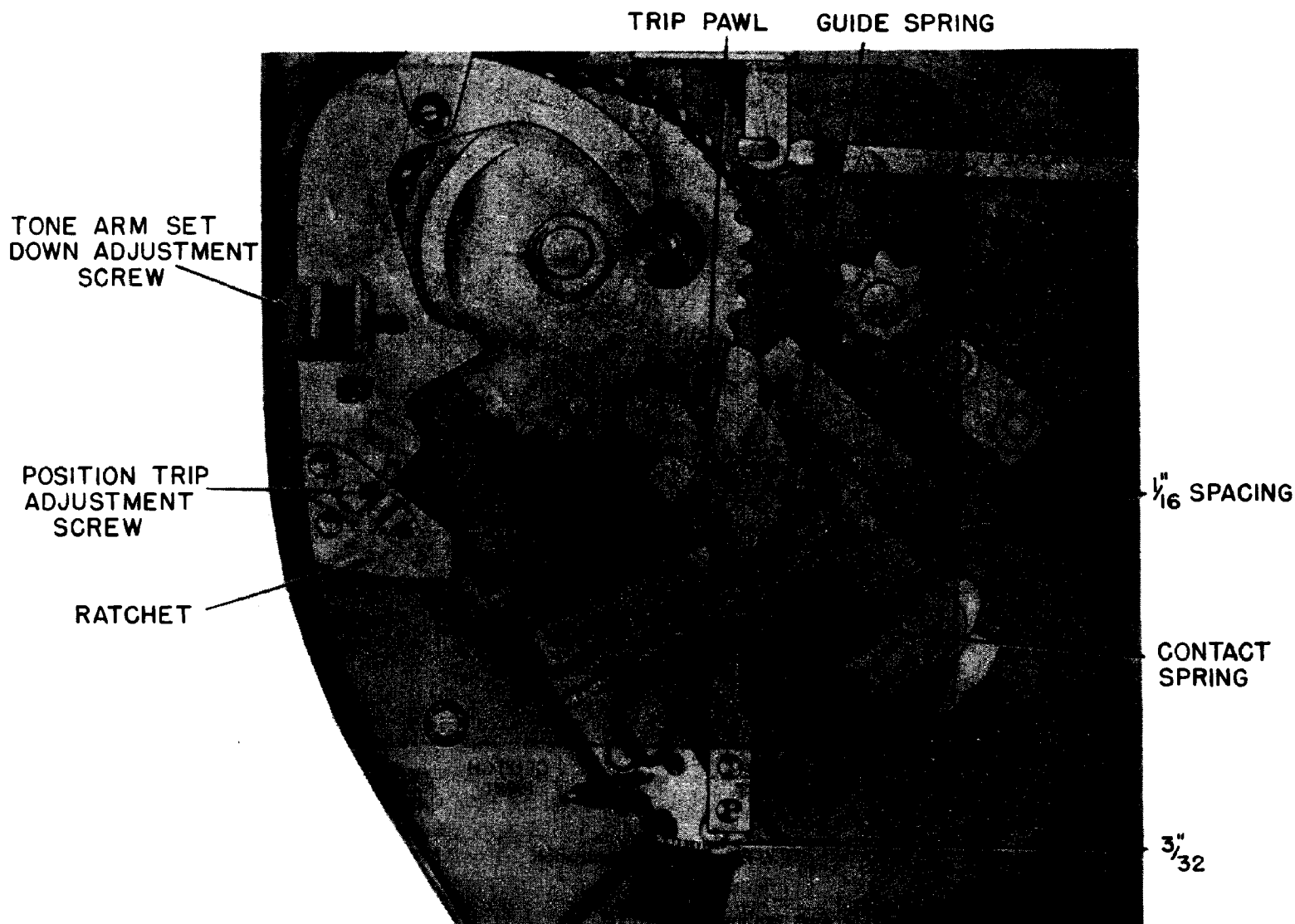


Fig. 10. Tone Arm Set Down, Position Trip and Trip Switch Adjustments.

4. Position Trip Adjustment.

The Position Trip does not depend on an eccentric groove in the record to start the record change cycle, but will trip the mechanism whenever the needle comes within a pre-determined distance from the Spindle. Older type records that do not have an eccentric groove can in most cases be played automatically by the proper adjustment of the Position Trip. Under normal conditions with the needle approximately $1\frac{7}{8}$ " from the center of the Spindle, adjust the Position Trip Adjustment Screw (Fig. 10) until the Trip

Switch contacts close. This distance is generally satisfactory since no modern record will be cut off before it has completed its play, and none will fail to trip the mechanism at the end. In special cases, screw the Position Trip Adjustment Screw clockwise for earlier tripping and counter-clockwise for later tripping as the individual case may be.

It may be impossible to find an adjustment that will always trip the mechanism and never cut off on all type records, and in these special cases the record must be played manually.



Fig. 11. Tone Arm Height Adjustment.

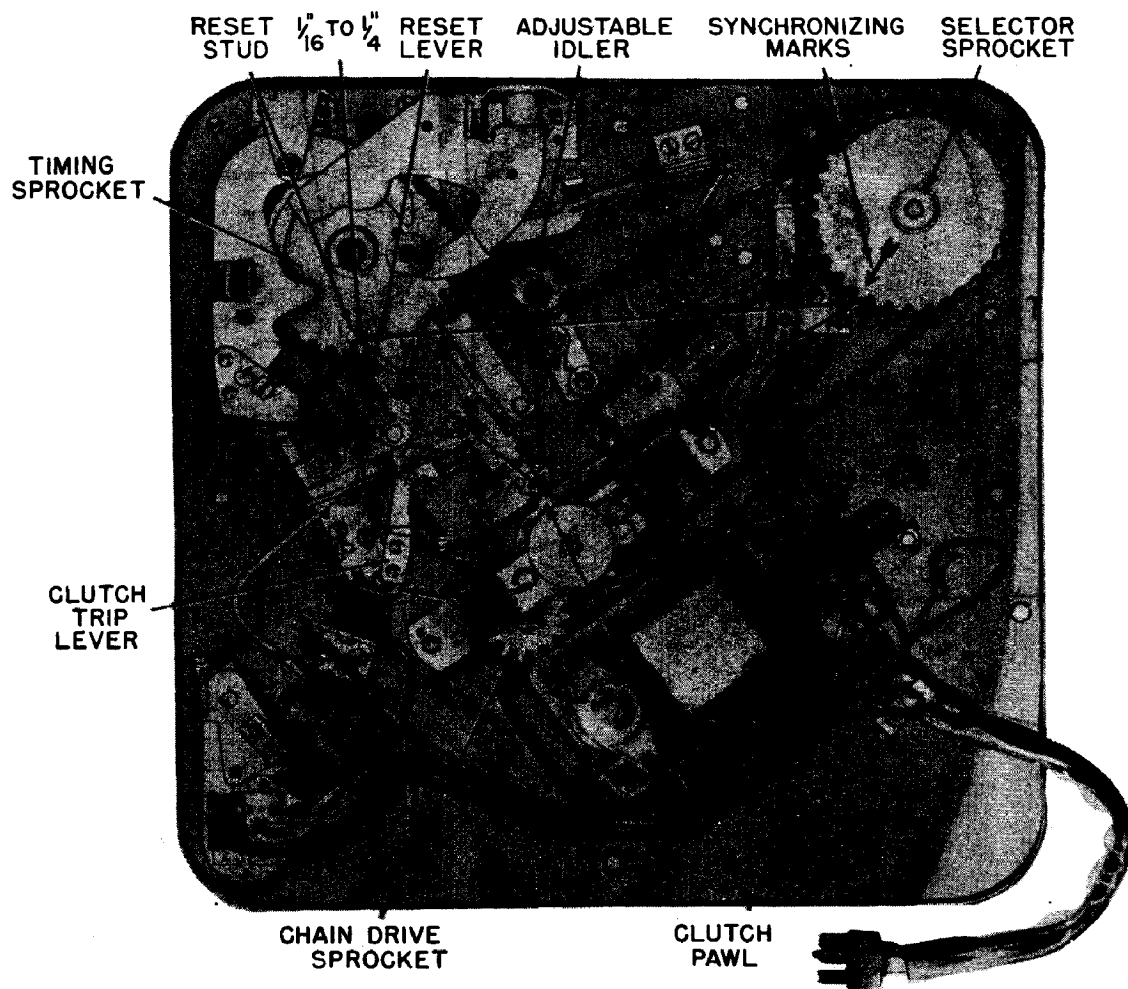


Fig. 12. Synchronization.

5. Synchronization.

A properly timed changer drops records on the turntable when the tone arm is at its greatest outward swing. Improper timing results in the records hitting the tone arm. The record changer is kept in time by the drive chain. If the chain is removed, the changer must be synchronized.

Fig. 12 indicates the correct position of the timing sprocket, selector sprocket and the clutch. To synchronize, study Fig. 12 and proceed as follows:

1. Reset the clutch trip lever.
2. Turn the timing sprocket until the reset stud is approximately $\frac{1}{16}$ " from the reset lever (1). Turn the selector sprocket until the synchronizing mark lines up with the mark on the base plate (2). THESE POSITIONS MUST BE MAINTAINED DURING THE NEXT OPERATION.
3. Thread the chain over the timing sprocket, chain drive sprocket, adjustable idler, selector sprocket and set the adjustable idler for medium tension of the chain. Check the position of the synchronizing marks and the reset stud.
4. Remove the retaining washer and lift the chain drive sprocket until the gears disengage.
5. Turn the clutch until the clutch pawl touches the pawl pusher lever (3).
6. Lower the chain drive sprocket until it engages the clutch gears and reinsert the retaining washer.

REMOVING THE TURNTABLE

Hold the clutch by inserting a wide blade screwdriver against the spindle bracket and a segment of the drive plate. Apply a twisting, pulling force to the turntable.

Before seating the turntable, be certain that the idler wheel is pushed inside the turntable rim.

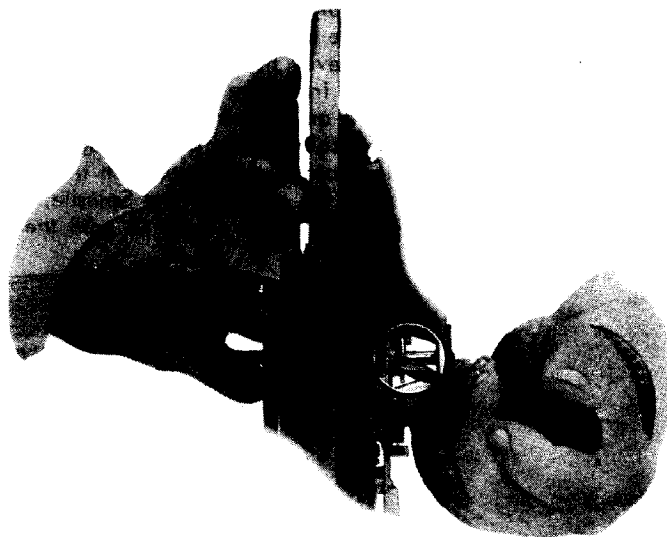


Fig. 13. Removing the Turntable.

REPLACING THE MOTOR

When a replacement Motor is ordered, include the line voltage and frequency of the receiver.

To replace the Motor, unsolder the connecting leads, remove the Turntable, the three retaining washers and allow the Motor to drop out. When the Motor is installed do not draw the connecting leads tight as this will prevent the Motor from "floating" on its mounts. Be certain that the retaining washers are crimped and the leads securely soldered and taped.

REPLACING THE CHAIN

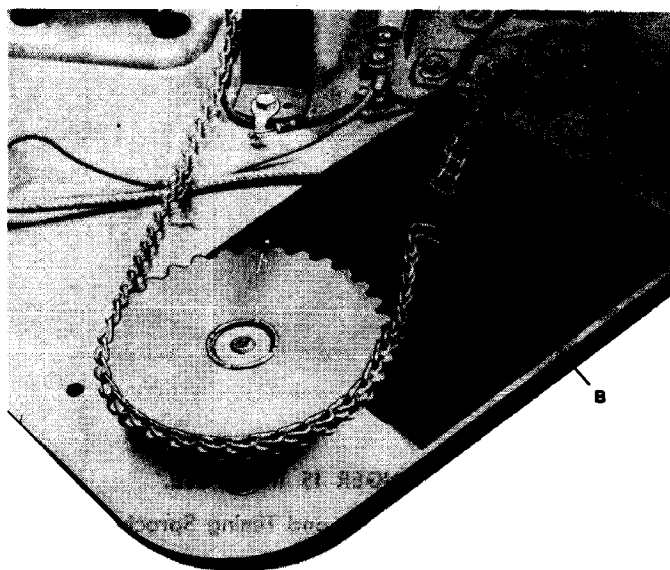


Fig. 14. Replacing the Chain.

The chain may be removed by loosening the adjustable idler (Screws "D," Fig. 14), and opening one of the links (B). It will be noted that on some models the open ends of the links face inward while on others outward as in Fig. 14. The reason for this is to get the quietest operation. Normally the open ends of the links will face outward with all replacement chains.

After the chain is threaded in place, carefully close the open link and be certain that there is no stiffness in its action. Read the paragraph on Synchronization before the chain is permanently installed.

TROUBLE SHOOTING

SQUEAKS OR NOISES DURING PLAYING OF RECORDS.

- Friction between the records on the turntable and the spindle will occasionally cause squeaks. A thin coat of wax applied to the spindle will remedy this condition.
- Check lubrication.

MECHANISM STARTS SLOWLY AND MOTOR GETS HOT.

- Check line voltage and frequency.
- Check lubrication.
- Motor windings damaged.
- Room temperature abnormally low.

PRESSING RECORD CHANGE BUTTON ON RECEIVER PANEL DOES NOT START THE RECORD CHANGE CYCLE.

- See that the OFF-MAN-AUTO switch is set to AUTO.
- Check Record Change Switch.
- Check electrical continuity of solenoid circuit.
- Check the solenoid energizing voltage.

MOTOR FAILS TO RUN EVEN WHEN IT IS DISCONNECTED FROM CHANGER AND PROPER VOLTAGE AND FREQUENCY APPLIED DIRECTLY TO THE TWO INPUT LEADS OF THE WINDING.

- Open windings.
- Damaged or frozen bearings.
- Lower Bearing Support Bracket bent. Remove and straighten bracket—Re-center armature.

RUMBLE AND MICROPHONICS DURING REPRODUCTION.

- Changer not "floated" properly. Loosen mounting bolts.
- Motor retaining rings rubbing on the idler wheel.
- Motor leads pulled too tight preventing motor from "floating" freely.
- Noisy Phono Oscillator tube.
- Impression on Idler Wheel.

NEEDLE SETS DOWN PROPERLY ON RECORD BUT SLIDES OVER THE RECORD GROOVES.

- Cabinet tilted.
- Badly worn or broken needle cartridge.

NEEDLE FAILS TO CLEAR MAXIMUM LOAD OF RECORDS ON THE TURNTABLE.

- Check Tone Arm height adjustment. (Adjustment 2.)

CHANGER CYCLES WITH OFF-MAN-AUTO SWITCH ON MAN.

- Check OFF-MAN-AUTO switch.
- Reset stud does not engage clutch reset lever.

TOPE ARM FALLS OFF RECORD.

- Check Tone Arm set down adjustment. (Adjustment 1.)
- Check Tone Arm Pivot Bracket.
- Changer not level.

TOPE ARM SET-DOWN POSITION VARIES.

- Check Tone Arm Brake and Spring.
- Tight Tone Arm Connecting Leads.

RECORD IS NOT HEARD ALTHOUGH CHANGER OPERATES.

- See that the Phono Radio switch is on Phono.
- Check receiver audio by listening to radio.
- Check the phono oscillator tube.
- Check Needle Cartridge.
- Check Tone Arm Housing for broken leads.

TOPE ARM SETS DOWN TOO FAR IN OR OUT ON RECORD.

- Check Tone Arm set down adjustment. (Adjustment 1.)

CHANGER CONTINUES TO CYCLE.

- Check Trip switch adjustment. (Adjustment 3.)
- Check Record Change switch.
- Clutch release mechanism sticks.
- Pawl pusher lever not reset by reset stud.

CHANGER WILL NOT CYCLE UPON COMPLETION OF RECORD.

- See that the OFF-MAN-AUTO switch is set to AUTO.
- Be certain the record has an eccentric center groove.
- Check Trip switch.



Fig. 15. Checking Spindle Centering.

RECORD CENTER HOLE WEAR.

- a. Record centers oversize.
- b. A bent spindle will cause center hole wear due to impeded record injection. To check the spindle position, place a 10" record as shown in Fig. 15. If the spindle is properly centered, a triangle will be formed with the metal ends of the record shelf plate.

SQUEAKS WHEN CHANGER IS IN CYCLE.

- a. Friction between Lift Pin and Timing Sprocket. Apply a thin coat of Sta-Put.

MOTOR RUNS BUT TURNTABLE SLIPS OR STOPS.

- a. Turntable not fully seated. Tap gently.

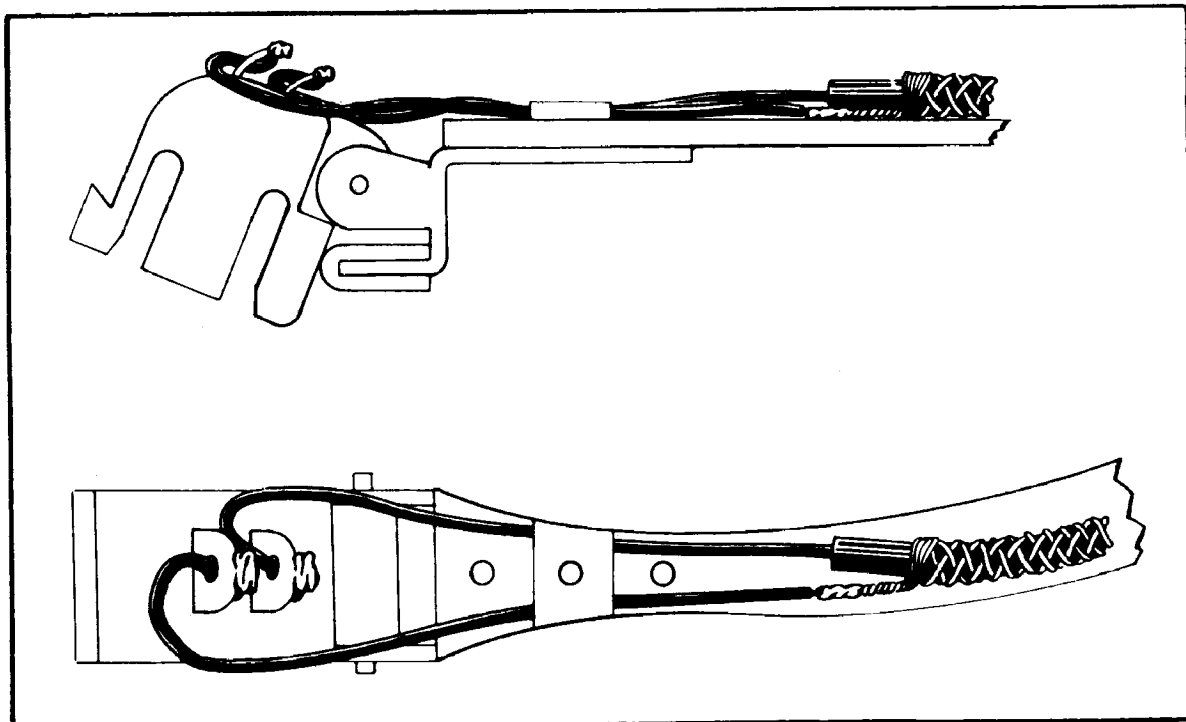


Fig. 16. Needle Cartridge Socket Connection.

Fig. 16 shows how the leads are connected to the Needle Cartridge Socket. The lead and insulation are run through the hole in the contact and the lead is soldered with a light soldering iron. Great care must be exercised, and very little heat applied as the socket is made of lucite and will burn easily. The complete lead and socket are supplied as S-12633.

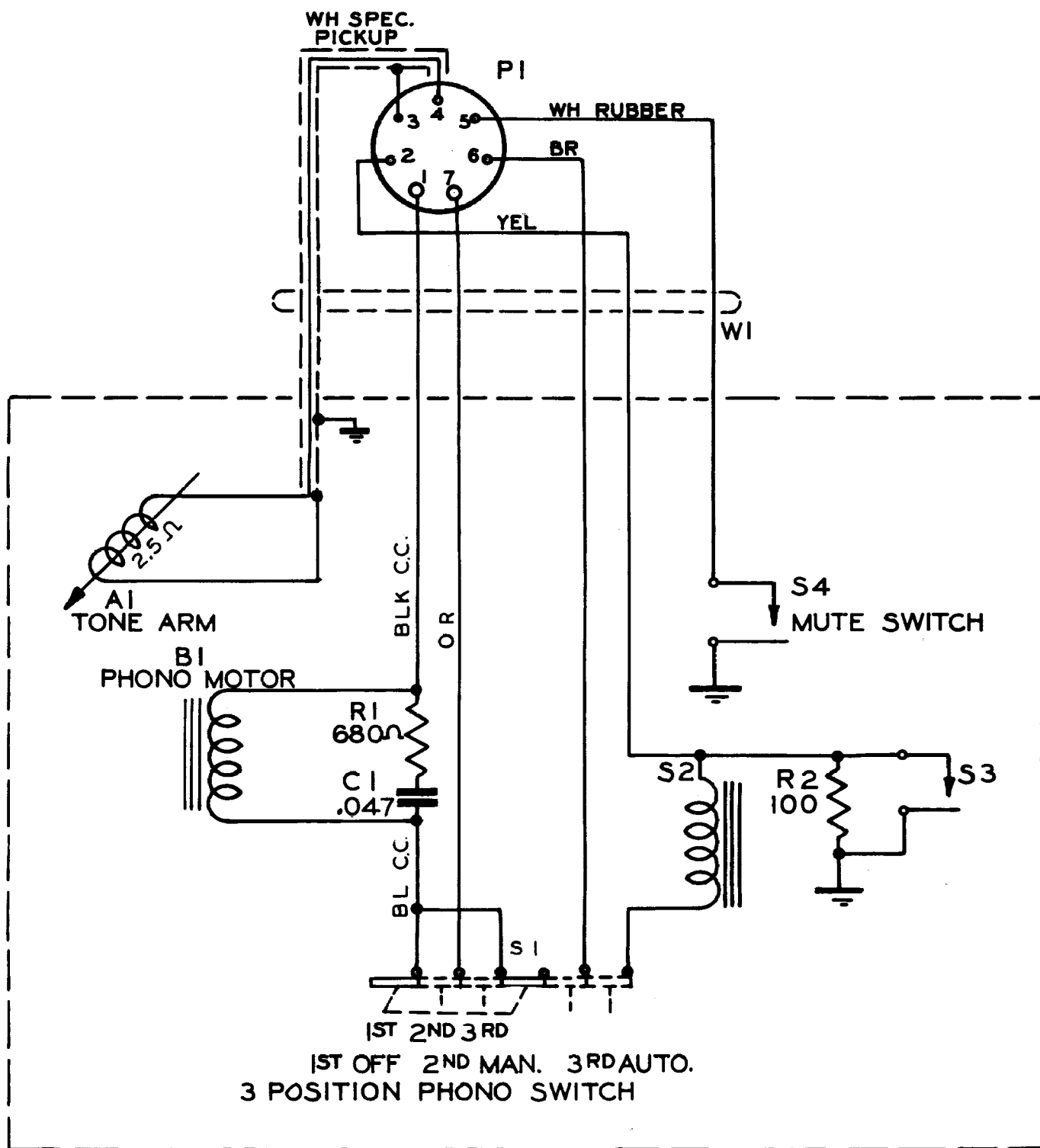
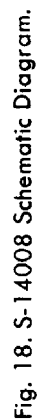


Fig. 17. S-14002 Schematic Diagram.



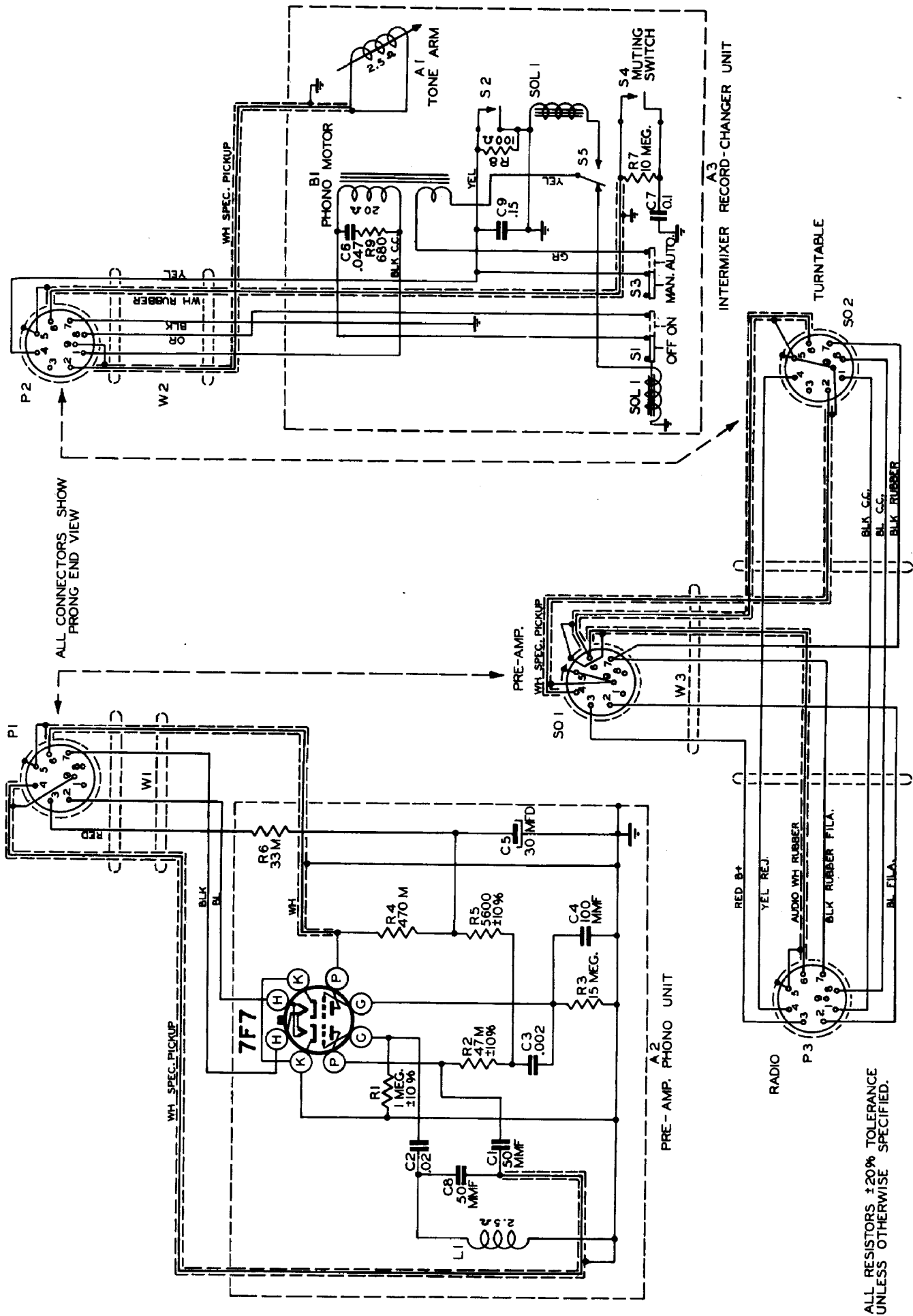


Fig. 19. S-13675 and S-14006 Schematic Diagram.

NUMERICAL PARTS LIST

12-1124	Record Ejector Plate Mounting Bracket (S-13675, S-14006)	80-462	Cam Spring
12-1216	Tone Arm Pivot Bracket	80-479	Spring (Spindle Dog)
12-1340	Record Ejector Plate Mounting Bracket (S-11674)	80-531	Brake Spring
12-1390	Solenoid Mounting Bracket	80-538	Landing Adjustment Spring (S-13902)
15-64	Plug Cap and Insulator	80-544	Contact Spring
19-88	Cable Clip	80-545	Contact Spring
19-150	Housing Cover Clip	80-572	Clutch Spring (S-13894)
22-417	.1 Mfd. Paper Dielectric Capacitor 600 V.	80-574	Pawl Pusher Bracket Spring (S-13903)
22-1570	.05 Mfd. Paper Dielectric Capacitor 400 V.	80-582	Pawl Spring (S-13901)
24-354	Record Ejector Housing Cover (S-14006, S-14008)	80-584	Tone Arm Lift Pin Spring
24-432	Record Ejector Housing Cover (S-13675, S-14002)	80-605	Cobra Cartridge Socket Tension Spring (S-13675, S-14006)
43-103	Tone Arm Housing (S-14006, S-14008)	80-649	Shut-Off Lever Spring (S-13675, S-14006)
43-147	Record Ejector Housing (S-13675, S-14002)	80-650	Shut-Off Pawl Spring
43-148	Tone Arm Housing (S-13675, S-14002)	80-653	Trip Arm Spring (S-13903)
43-156	Tone Arm Support Housing (S-14006, S-14008)	83-343	Three Lug Terminal Strip
43-157	Tone Arm Support Housing (S-13675, S-14002)	83-1106	Two Lug Terminal Strip
43-164	Record Ejector Housing (S-14006, S-14008)	83-1301	Two Lug Terminal Strip
54-30	No. 8-32 x $\frac{3}{16}$ " x $\frac{7}{64}$ " Hex Nut—Steel N.P.	83-1349	Tone Arm Shipping Strip
54-66	No. 10-32 x $\frac{5}{16}$ " Hex Nut—Steel N.P.	83-1423	Cobra Needle Guard Strip
54-246	No. 4-40 x $\frac{3}{16}$ " x $\frac{3}{32}$ " Hex Nut (S-13675, S-14006)	84-65	Tone Arm Rest (S-14006, S-14008)
56-146	Spring Retaining Pin (Pressure Arm)	84-68	Tone Arm Rest (S-13675, S-14002)
56-226	Tone Arm Lift Pin—Lower	85-372	Three Position Slide Switch (S-14002, S-14008)
56-227	Tone Arm Lift Pin—Upper	85-405	On-Off Switch (S-13675, S-14006)
57-1290	Switch Escutcheon (S-13675)	85-406	Auto-Man Switch (S-13675, S-14006)
57-1323	Turntable Shaft Plate	86-81	Shakeproof Terminal No. 2101-8
57-1324	Clutch Drive Plate	86-190	Terminal—Cinch No. 1483
57-1355	Switch Plate (S-14002, S-14008)	93-125	No. 6 Int. Shakeproof Lockwasher No. 1206
57-1397	Switch Escutcheon (S-14006)	93-126	No. 8 Int. Shakeproof Lockwasher No. 1208
58-133	Phono Plug (S-13675, S-14006, S-14008)	93-216	.015 x .255 x $\frac{7}{16}$ " Steel Washer—Cad.
58-169	Phono Plug (S-14002)	93-415	No. 6 Ext. Shakeproof Lockwasher No. 1106
63-1744	100 Ohm Carbon Resistor $\frac{1}{2}$ W. $\pm 20\%$ —Insulated	93-536	$\frac{5}{8}$ " x $\frac{5}{16}$ " x .031 Steel Washer—Cad. Pl.
63-1779	680 Ohm Carbon Resistor $\frac{1}{2}$ W. $\pm 20\%$ —Insulated	93-617	Sprocket Shaft Retaining Washer
63-1954	10 Megohm Carbon Resistor $\frac{1}{2}$ W. $\pm 20\%$ —Insulated (S-13675, S-14006, S-14008)	93-655	.012 x .098 x $\frac{5}{32}$ " Steel Washer—N.P.
69-38	No. 8-32 x $\frac{3}{4}$ " R.H.M.S.—Steel N.P.	93-672	Idler Wheel Stud Washer—Large
69-43	No. 8-32 x $\frac{3}{8}$ " R.H.M.S.—Steel N.P.	93-673	Idler Wheel Stud Washer—Small
69-217	No. 4-40 x $\frac{3}{16}$ " R.H.M.S. (S-13675, S-14006)	93-677	Idler Wheel Stud Fishpaper Washer—Large
69-238	No. 4-40 x $\frac{5}{8}$ " R.H.M.S.—Steel Cad.	93-678	Idler Wheel Stud Fishpaper Washer—Small
71-70	No. 6-32 x $\frac{3}{16}$ " Phillips Flat Hd. M.S.—Steel—Bright N.P.	93-679	Idler Wheel Stud Felt Washer
71-71	No. 6-32 x $\frac{1}{4}$ " Phillips Flat Hd. M.S.—Steel N.P.	93-719	$\frac{7}{16}$ " x $\frac{3}{16}$ " x .031 Flat Washer—Cad.
71-81	No. 8-32 x $2\frac{3}{4}$ " Flat Hd. M.S.—Steel N.P.	93-764	Spring Washer—Shakeproof No. 3759-14
73-99	No. 8-32 x $\frac{1}{4}$ " Slab Hd. Set Screw—Steel—Concpoint	93-767	Cam Spacer Washer (.020 x .385 x $\frac{5}{8}$ " Steel—Cad. Pl.)
73-100	No. 8-32 x $\frac{1}{2}$ " Slab Hd. Set Screw—Steel—Concpoint	93-769	Steel Washer—Cad. Pl.
80-368	Idler Wheel Tension Spring	93-844	No. 5 External Shakeproof Lockwasher
80-418	Tension Spring (Pressure Arm)	93-876	Fibre Washer
		93-900	Fibre Washer
		93-903	Steel Washer
		94-415	Tone Arm Locating Bushing
		94-416	Timing Sprocket Bushing
		112-56	No. 6 x $\frac{1}{4}$ " Hex. Hd. Self Tapping Screw—Type Z—Cadmium
		112-483	No. 6-32 x $\frac{3}{8}$ " B.H.M.S.—Steel N.P.
		112-576	No. 5-40 x $\frac{1}{4}$ " Oval B.H.M.S.—Steel N.P.

NUMERICAL PARTS LIST—Continued

112-581	No. 6 x $\frac{3}{8}$ " R.H. Self Tapping Screw—Shake-proof Type 25—Cadmium	S-12038	Record Ejector Housing Cover Assembly (S-14006, S-14008)
112-585	No. 6 x $\frac{3}{8}$ " R.H. Self Tapping Screw—Type FZ—Cadmium	S-12507	Record Spindle Assembly
112-619	Cobra Tone Arm Housing Mounting Screws	S-12633	Needle Cartridge Socket and Cable Assembly
112-637	No. 4-40 x $\frac{1}{4}$ " B.H.M.S.—Steel N.P.	S-12686	Cam and Washer Assembly
112-706	No. 4-40 x $\frac{3}{16}$ " R.H.M.S.—Steel N.P. (SEMS)	S-12859	Discriminator Knob and Plate Assembly
112-719	No. 6 x $\frac{3}{8}$ " Flat Hd. Self Tapping Screw—Shakeproof Type 25—Steel Cad. Pl.	S-13060	Cobra Tone Arm Hinge Plate and Swivel Bracket Assembly
114-88	No. 8-32 x $\frac{1}{2}$ " Hex. Acorn Hd. M.S.—Steel N.P.	S-13062	Cobra Tone Arm Hinge Plate, Swivel Bracket, Needle Cartridge Socket and Cable Assembly
114-89	No. 8-32 x $\frac{5}{16}$ " Hex. Acorn Hd. M.S.—Steel N.P.	S-13063	Cobra Tone Arm Assembly (S-14006, S-14008)
114-201	No. 8 x $\frac{1}{16}$ " Hex. Hd. Slotted Self Tapping Screw—STAN-TAP—Cad. Pl.	S-13423	Record Support Plate and Bracket Assembly (S-13675)
114-248	No. 6-20 x $\frac{1}{16}$ " Hex. Hd. Slotted Self Tapping Screw—Shakeproof Type 25—Steel Cad. Pl.	S-13426	Muting Switch Assembly (S-13675, S-14006, S-14008)
114-262	No. 8 x $\frac{1}{16}$ " Hex. Hd. Slotted Self Tapping Screw—STAN-TAP—Cadmium	S-13430	Automatic Stop Switch Assembly (S-13675, S-14006)
117-132	Shut-Off Switch Lever (S-13675, S-14006)	S-13461	Record Ejector Housing Cover Assembly (S-13675, S-14002)
125-61	Rubber Grommet—Motor Mtg.	S-13466	Cobra Tone Arm Assembly (S-13675, S-14002)
128-21	Record Ejector Cam (S-11668)	S-13494	Record Support Plate Mounting Bracket Assembly (S-13675)
141-108	A.C. Phono Motor—60 Cycles	S-13496	Discriminator Mounting Bracket Assembly (S-13675)
141-109	A.C. Phono Motor—60 Cycles (S-14002)	S-13497	Bracket and Spring Assembly
148-83	Cobra Tone Arm Housing (S-13675, S-14006)	S-13872	Trip Plate and Bushing Assembly
148-51	Bakelite Housing	S-13894	Clutch Pawl Assembly
166-30	Rubber Bumper	S-13895	Drive Sprocket and Bushing Assembly
166-41	Rubber Bumper	S-13896	Turntable Drive Shaft Bearing Assembly
187-9	Push Rod (Automatic Stop S-13675, S-14006)	S-13900	Timing Sprocket Assembly
188-27	Retaining Ring	S-13901	Trip Switch Assembly
188-32	Retaining Ring	S-13902	Tone Arm Pivot Shaft and Bracket Assembly
188-52	Retaining Ring	S-13903	Clutch Release Arm Assembly
214-4	Sprocket Drive Chain	S-13904	Shut-Off Switch Assembly (S-13675, S-14006)
S-10732	Idler Assembly	S-13913	Magnet Assembly
S-11111	Turntable Shaft and Bearing Assembly	S-13915	Cable Assembly (S-13675, S-14006, S-14008)
S-11118	Idler Wheel Assembly	S-13929	Main Base Plate Assembly (S-13675)
S-11473	Cobra Needle Cartridge	S-13931	Turntable Assembly
S-11657	Idler Wheel Stud and Washer Assembly	S-14229	Cable Assembly (S-14002)
S-11668	Record Ejector Cam and Shaft Assembly	S-14312	Main Base Plate Assembly
S-11671	Pressure Arm and Bracket Assembly	S-14313	Muting Switch Assembly (S-14002)
S-11672	Record Support Plate Assembly	S-14314	Main Base Plate Assembly (S-14008)
S-11674	Record Support Plate Mounting Bracket Assembly	S-14581	Trip Lever Mounting Bracket Assembly
S-11675	Discriminator Mtg. Bkt. Assembly (S-14002, S-14006 and S-14008)	S-14582	Trip Lever and Pawl Assembly
S-11683	Selector Sprocket and Bushing Assembly	S-14665	Main Base Plate Assembly (S-14006)
S-11983	Idler Wheel and Rubber Drive Ring Assembly	S-14666	Record Support Plate Mounting Bracket Assembly (S-14006)

Unless Specified, Parts Apply to All Models.

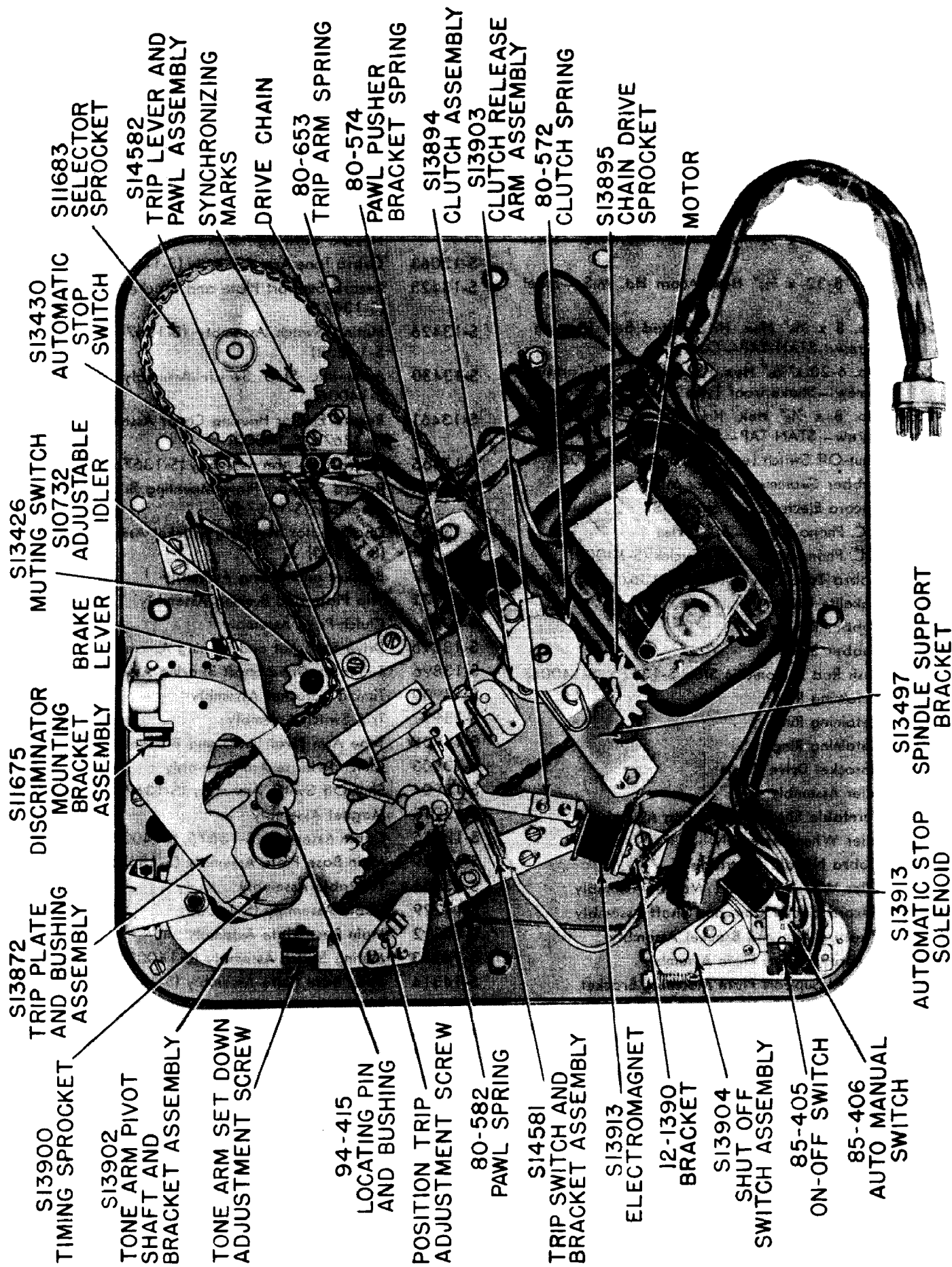
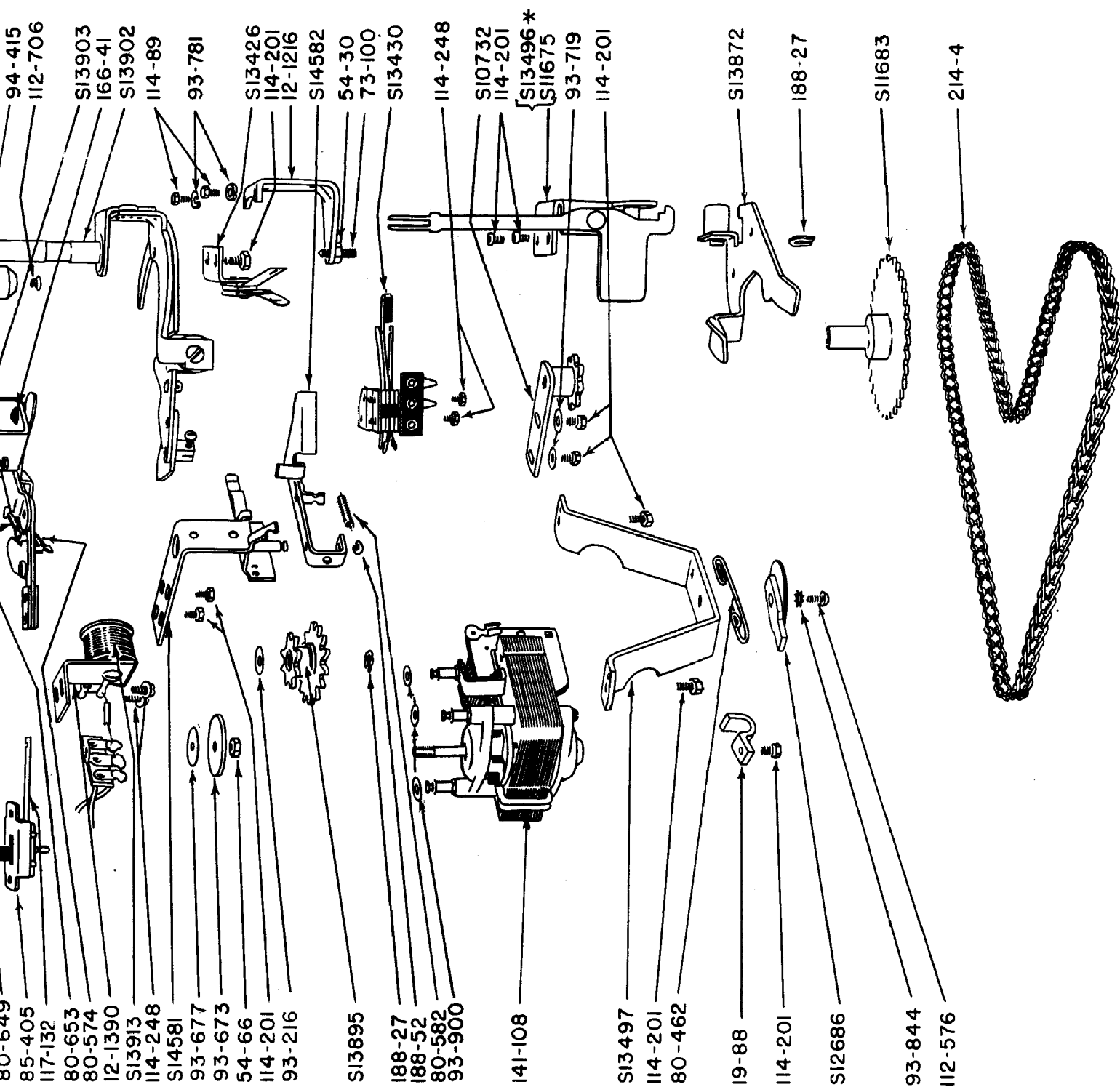
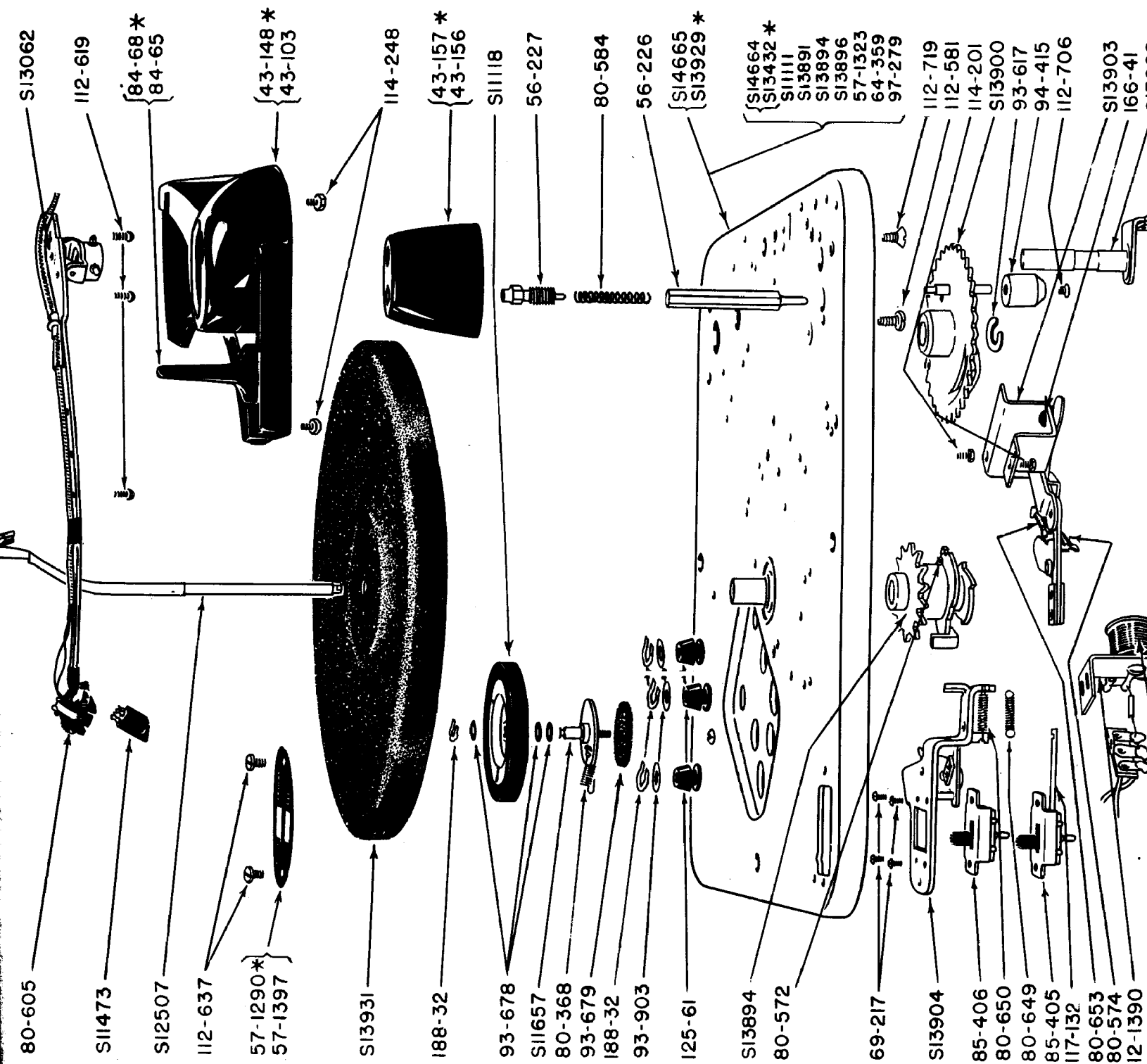
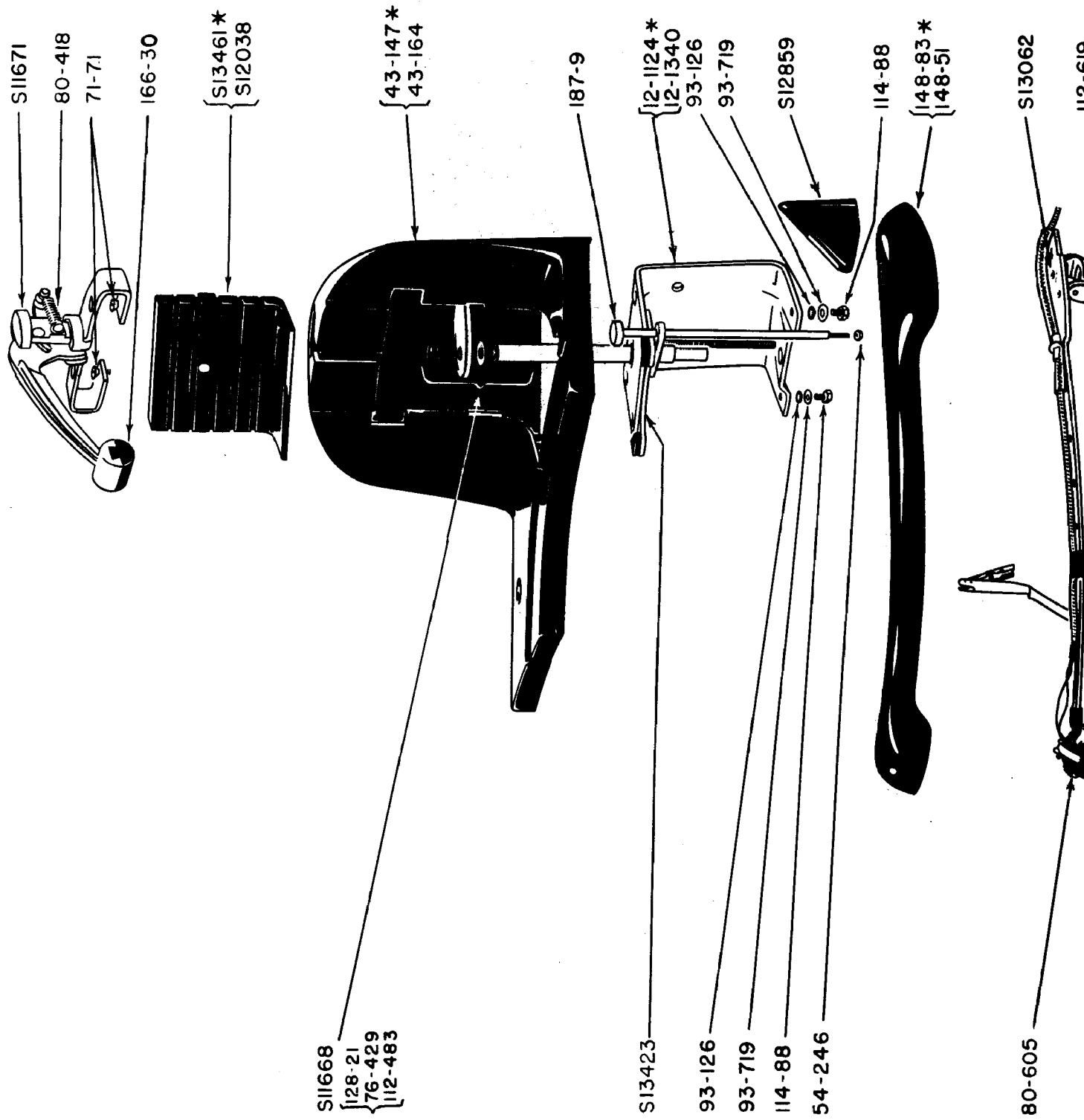


Fig. 20. Bottom View S-13675 and S-14006 Record Changers.



* APPLY TO SI3675 ONLY

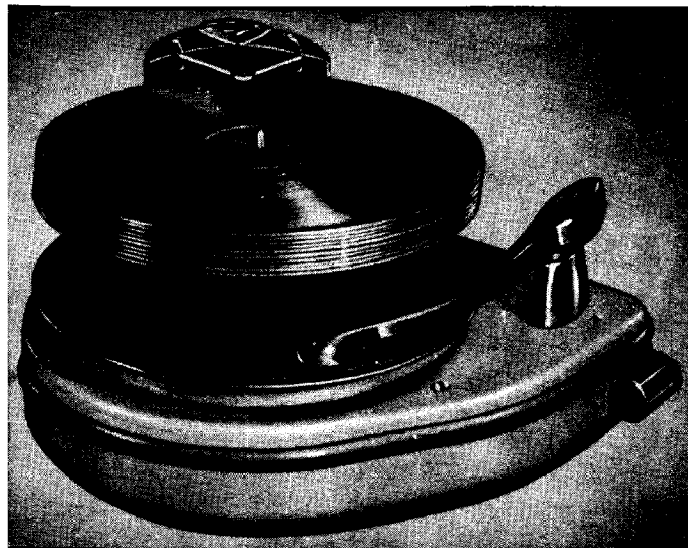




SERVICE MANUAL

MODEL S-14001

AUTOMATIC RECORD CHANGER



GENERAL

TO THE SERVICE MAN:

This Service Manual has been prepared for the purpose of assisting the Service Man in his work of caring for the Record Changer mechanism, whether he is called to remedy some difficulty, or to insure the continued satisfactory operation. The Zenith Automatic Record Changers are constructed with a minimum of working parts, and in operation are simple and reliable. However, as is the case with all mechanical units, misalignment and trouble may occasionally develop. The information presented in this book will enable the Service Man to render quick and accurate service. For convenience, the Operating Instructions supplied with each Record Changer are summarized as follows:

The Record Changer will automatically play up to twelve

10 inch or ten 12 inch records at one loading. The Record Stack rests on the Spindle and the Record Shelf. The Selector Sprocket drives the Ejector Plate which pushes the records off the Shelf and Spindle allowing them to drop on the Turntable. To load for automatic operation, set the Record Size Selector Knob to 10 or 12, raise the Pressure Bar, place the stack of records on the Spindle, lower the Pressure Bar until it rests on the Record Stack. Set the AUTO-MAN-OFF switch to AUTO and press the Record Change Button. The Changer will play the entire selection of records and will repeat the last record until it is turned off. For manual operation set the AUTO-MAN-OFF switch to MAN and play the records singly as on a non-automatic record player.

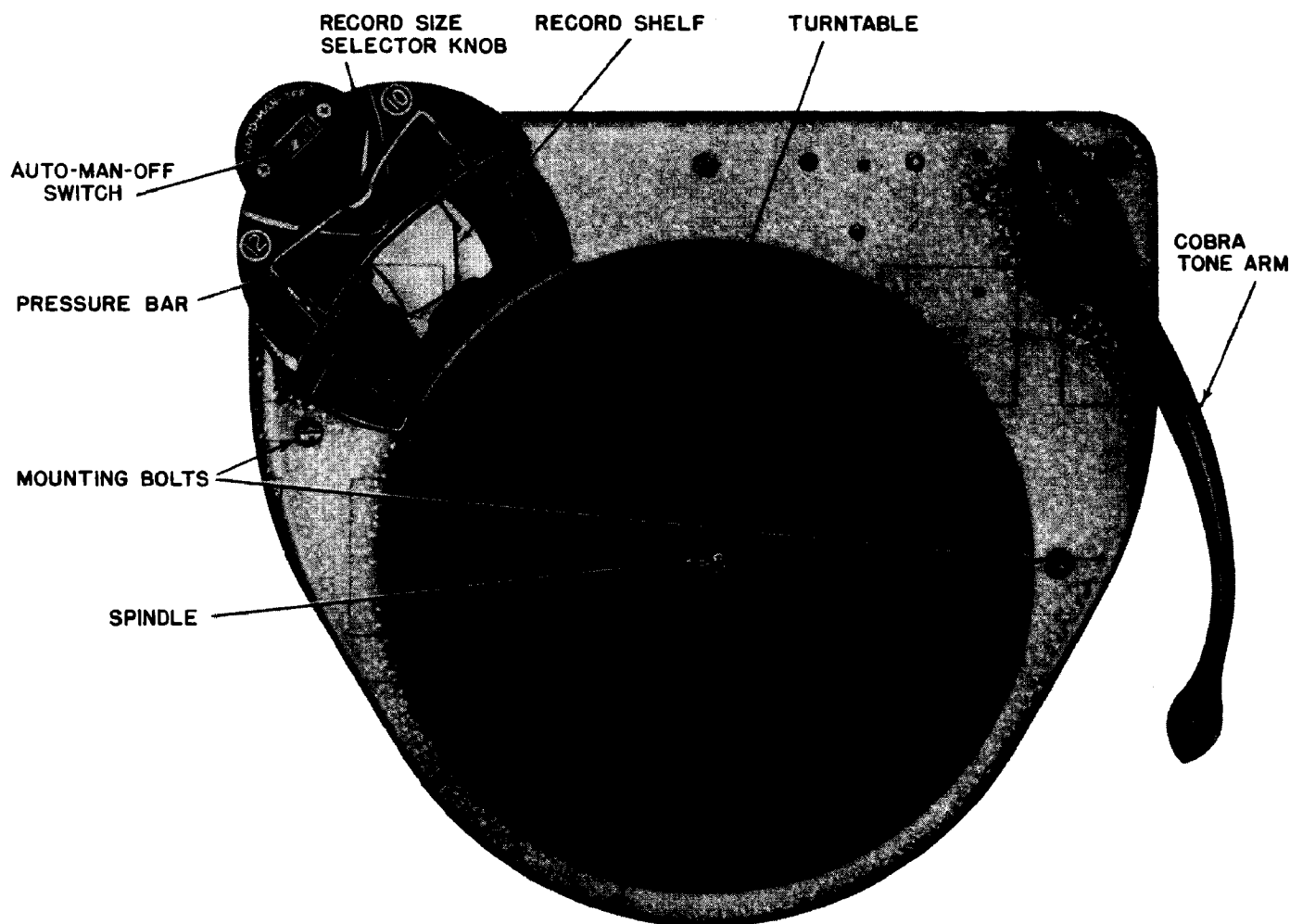


Fig. 1. Top View of Record Changer.

DESCRIPTION OF CYCLING

The phono motor friction drives the idler wheel. The idler wheel rim drives the turntable, and the turntable shaft. To the turntable shaft is attached the segmented clutch drive plate. The pawl on the clutch drive sprocket assembly engages the drive plate causing the sprocket to rotate. The pawl pusher lever on the clutch release arm assembly causes the clutch to engage or disengage.

Closing either the trip switch or the record change switch energizes the solenoid. The magnetic flux of the solenoid attracts the clutch release lever causing the mechanism to trip and move the pawl pusher arm away from the clutch pawl. This action allows the clutch pawl spring to pull the pawl into position for the drive plate segment to engage and start the clutch sprocket rotating. The clutch sprocket is meshed with the chain drive sprocket and the chain drives the selector and timing sprockets.

The timing sprocket completes 7 functions through 360° rotation. These functions are as follows: 1. Applies the tone arm brake. The brake lever is actuated by the brake stud on the timing sprocket. The brake prevents coasting and erratic landing of the needle. 2. The inclined groove pushes the lift pin upward. The lift pin raises and lowers the tone arm. 3. The locating pin laterally swings the tone arm off the record stack. 4. The locating pin or bushing swings the

tone arm over the starting groove of the record. With 12" records, the locating pin swings the tone arm in while the locating bushing swings the tone arm with 10" records. The locating bushing is pushed upward by the record selector lever. 5. The reset stud resets the clutch trip mechanism. Moves the pawl pusher arm in the path of the clutch pawl. 6. The lift pin lowers the tone arm over the starting groove of the record. 7. The brake stud releases the brake. When the clutch pawl hits the pawl pusher arm, the clutch selector disengages.

The selector sprocket actuates the record ejector plate and must be timed with the timing sprocket to drop the records on the turntable when the tone arm is at its greatest outward swing. This occurs immediately after the No. 3 function of the timing sprocket.

As the record is played, the tone arm gradually moves toward the center. The ratchet on the tone arm control lever moves toward pawl on the trip switch lever. As the ratchet comes in contact with the pawl, the oscillating action produced by the eccentric groove on the record causes the trip switch to close, complete the solenoid circuit and repeat the cycle. If the record does not have an eccentric groove, the position trip will close the trip switch and start the next cycle.

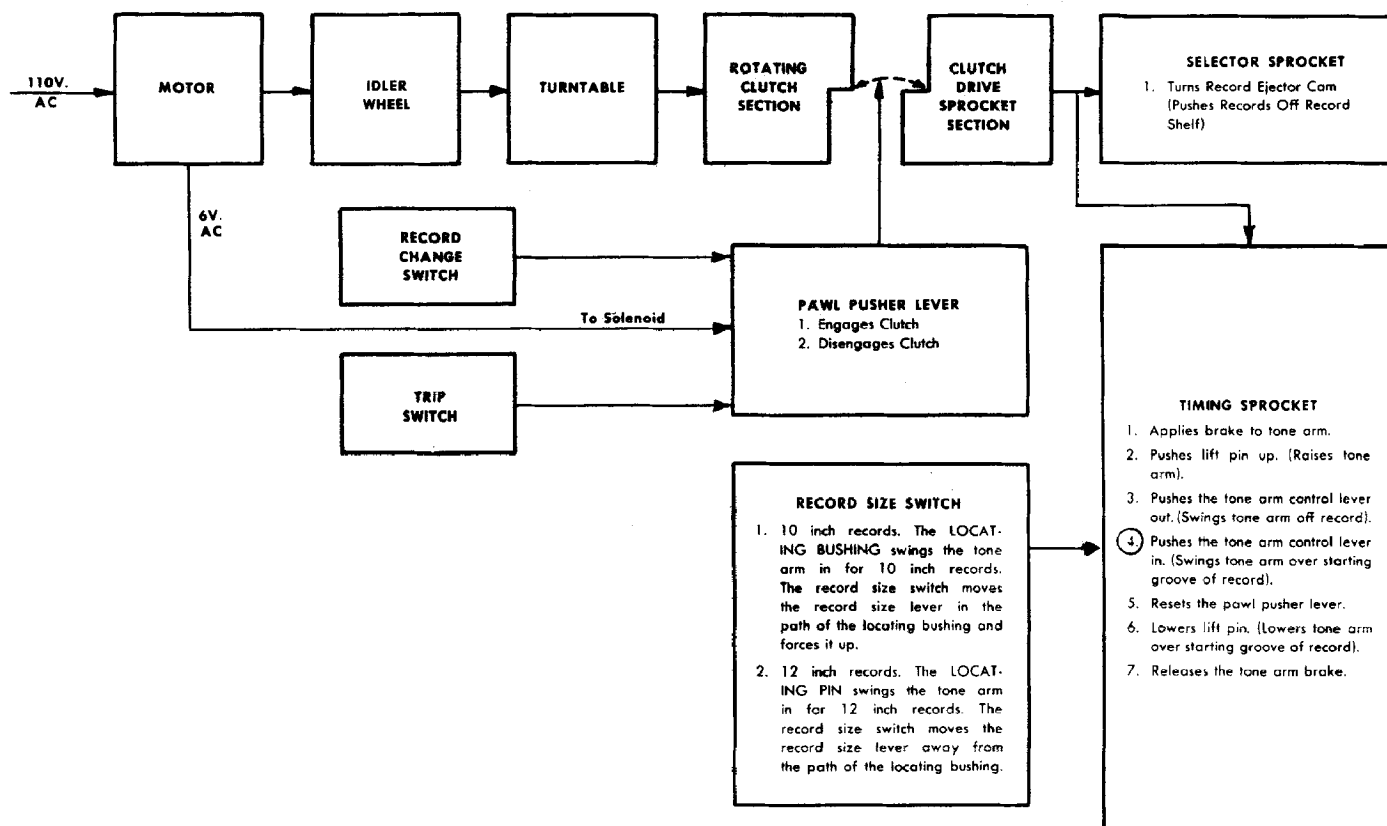


Fig. 2. Sequence of Operation—Zenith Record Changers.

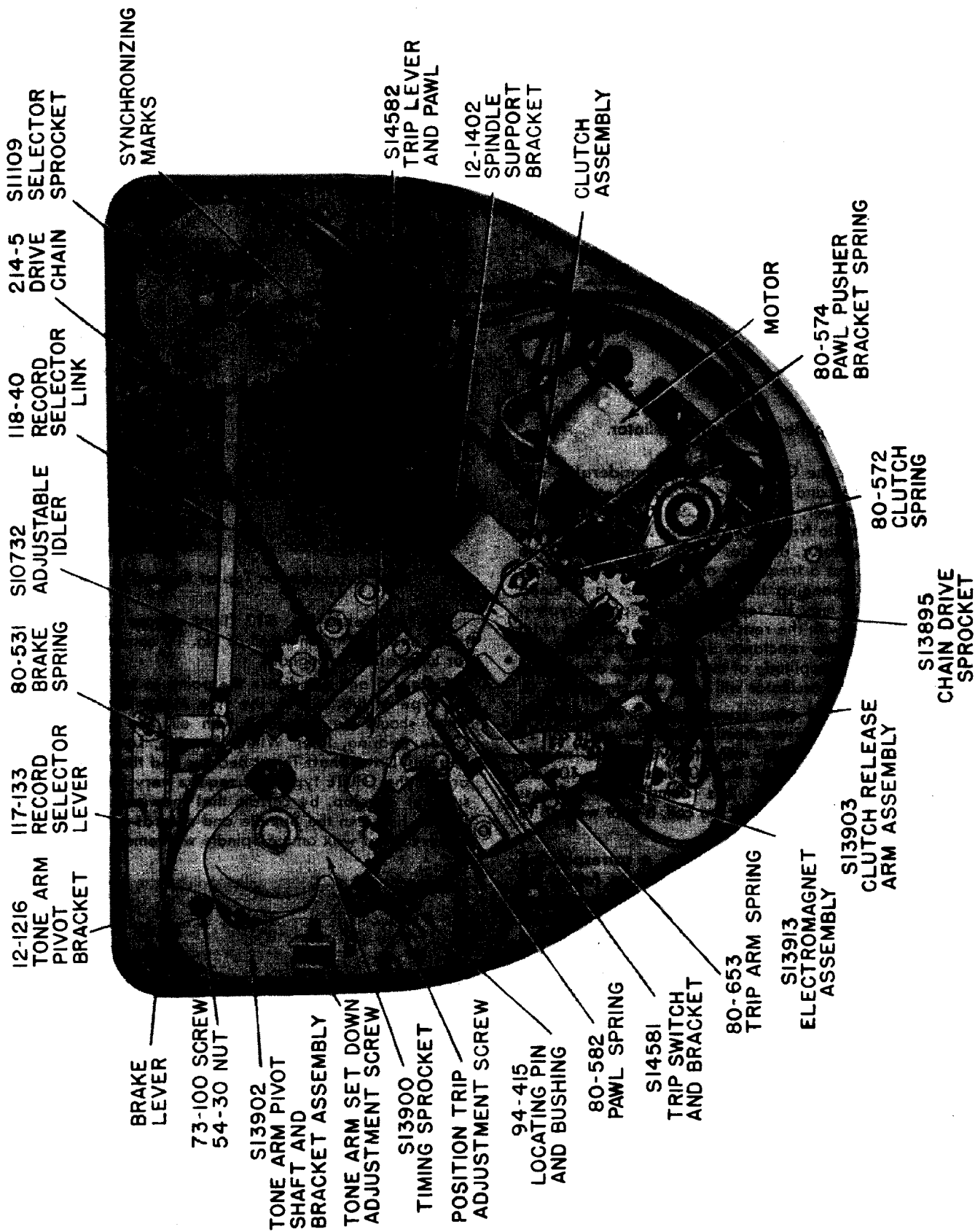


Fig. 3. Bottom View of Record Changer.

THEORY OF THE COBRA RADIONIC PICKUP

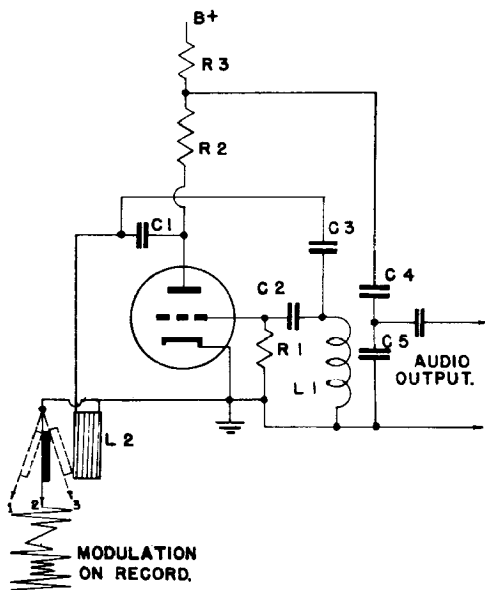


Fig. 4. Simplified Circuit of Oscillator.

The operation of the Cobra pickup is considerably different from Crystal and Dynamic pickups. These pickups generate audio power, while the Cobra controls power generated by a radio frequency oscillator. The triode tube is a modulated oscillator, detector and audio amplifier. The oscillator operates at a frequency of 2.5 Mc. Modulation is accomplished by changing the energy losses in a tuned circuit. These losses may be represented by an equivalent resistance in series with the reactance of the coil. The ratio of the resistance to the reactance determines the efficiency or Q of the coil. The amplitude of the RF voltage developed across this coil by the oscillator will vary with changes in Q.

The grid coil L_1 and other components of the oscillator are mounted in the receiver chassis, while the plate coil L_2 is in the Needle Cartridge with the vane and needle assembly. The coil is fixed and has 40 turns of No. 40 wire (approximate DC resistance $2\frac{1}{2}$ ohms). The stainless steel vane, which is in the field of the coil, is spot welded to the osmium-iridium tipped stylus.

Any movement of the stylus will cause a corresponding movement of the vane. As the stylus and vane follow the modulations in the record, changes in the mutual inductance between the vane and coil occur (see Fig. 4). In position 2 the vane is at rest; and a constant RF voltage appears across the plate coil. As the vane is set in motion and reaches position 1, it is at its greatest outward swing from the coil, resulting in low mutual inductance, low reflected resistance, higher Q, and a higher RF voltage across the coil. In position 3 it is at its greatest inward swing; resulting in a high mutual inductance, high reflected resistance, lower Q and a lower RF voltage. It can be seen that the amplitude of the RF voltage which appears across the coil will vary with changes in Q, satisfying the condition for amplitude modulation. The position of the vane changes both the Q and L of the coil. Changes in L shift the frequency slightly, and a certain amount of frequency modulation is present, but since there is no frequency discrimination it remains undetected.

Since the grid and plate coils are part of a single tuned circuit, any variations of amplitude of the RF voltage brought about by the changes in Q across the plate coil will also appear across the grid Coil L_1 causing a shift in the average plate current through the plate load resistor

across which the audio output voltage is developed. Plate bend detection takes place since only the positive half of the grid swing causes an increase in the average plate current. These changes in the average plate current appear as audio voltage across the plate load resistor.

The 2.5 Mc. RF voltage and the audio voltage both appear at the plate of the oscillator triode. R_2 , C_4 and C_5 filter out the RF voltage allowing only the audio component to the grid of the phono amplifier where it is amplified and reproduced by the loud-speaker.

LUBRICATION

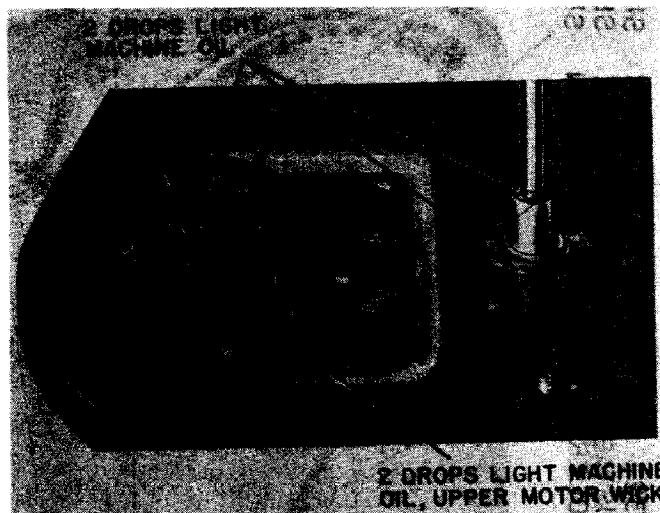


Fig. 5. Lubrication Top of Record Changer.

Sta-Put grease No. 512 (light grease of the vaseline type) and light machine oil of No. 10 consistency are used for lubrication throughout.

Figures 5 and 6 indicate the points to be lubricated and the type of lubricant to use. The Motor has two oil wicks which should be saturated with oil. The Record Spindle Guide Bearing, Idler Wheel Bearing, Lower Drive Shaft Bearing, Drive Shaft Thrust Bearing and the Motor Bearings are of the OILITE type and require very little attention. If squeaks develop, be certain that they are not caused by friction between the Spindle and records on the Turntable. A thin coat of wax on the Spindle will remedy this condition.

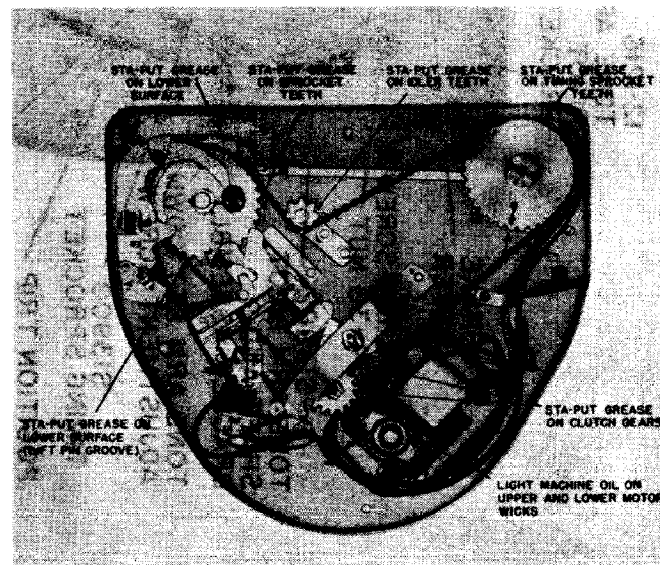


Fig. 6. Lubrication Bottom of Record Changer.

ADJUSTMENTS

1. Tone Arm Set Down Adjustment.

The Tone Arm Set Down Adjustment determines the landing position of the needle on the starting groove of the record. The adjustment screw can be reached with a screwdriver (Fig. 7). The tone arm must be held in the rest position while the adjustment is made. Clockwise rotation of the screw moves the tone arm in, while counter-clockwise rotation moves it out.

2. Position Trip Adjustment.

The Position Trip does not depend on an eccentric groove in the record to start the record change cycle, but will trip the mechanism whenever the needle comes within a pre-determined distance from the Spindle. Older type records that do not have an eccentric groove can in most cases be played automatically by the proper adjustment of the Position Trip. Under normal conditions with the needle approximately $1\frac{7}{8}$ " from the center of the Spindle, adjust the Position Trip Adjustment Screw (Fig. 7) until the trip switch contacts close. This distance is generally satisfactory since no modern record will be cut off before it has completed its play, and none will fail to trip the mechanism at the end. In special cases, screw the Position Trip Adjustment Screw clockwise for earlier tripping and counter-clockwise for later tripping as the individual case may be.

It may be impossible to find an adjustment that will always trip the mechanism and never cut off on all type records, and in these special cases the record must be played manually.

3. Trip Switch Adjustment.

As the record is played, the ratchet on the tone arm pivot shaft engages the trip pawl. The oscillating action developed by the eccentric groove on the record closes the trip switch contacts and allows the solenoid to become energized. The magnetic flux attracts the trip lever which moves the pawl pusher lever from the path of the clutch pawl. This allows the clutch to engage and start the next cycle.

The gap between the trip switch contacts should be approximately $\frac{1}{16}$ inch. If the spacing is incorrect, bend the contact spring. To adjust the contact spring tension, insert a screwdriver between the contact and guide springs and bend the contact spring so that an approximate pressure of one ounce is necessary to move the contact spring from the guide spring. Be certain that the contact spring exerts some pressure on the guide spring after adjustment.

The spacing between the trip magnet solenoid and trip lever should be approximately $\frac{3}{32}$ ". (See Fig. 7.)

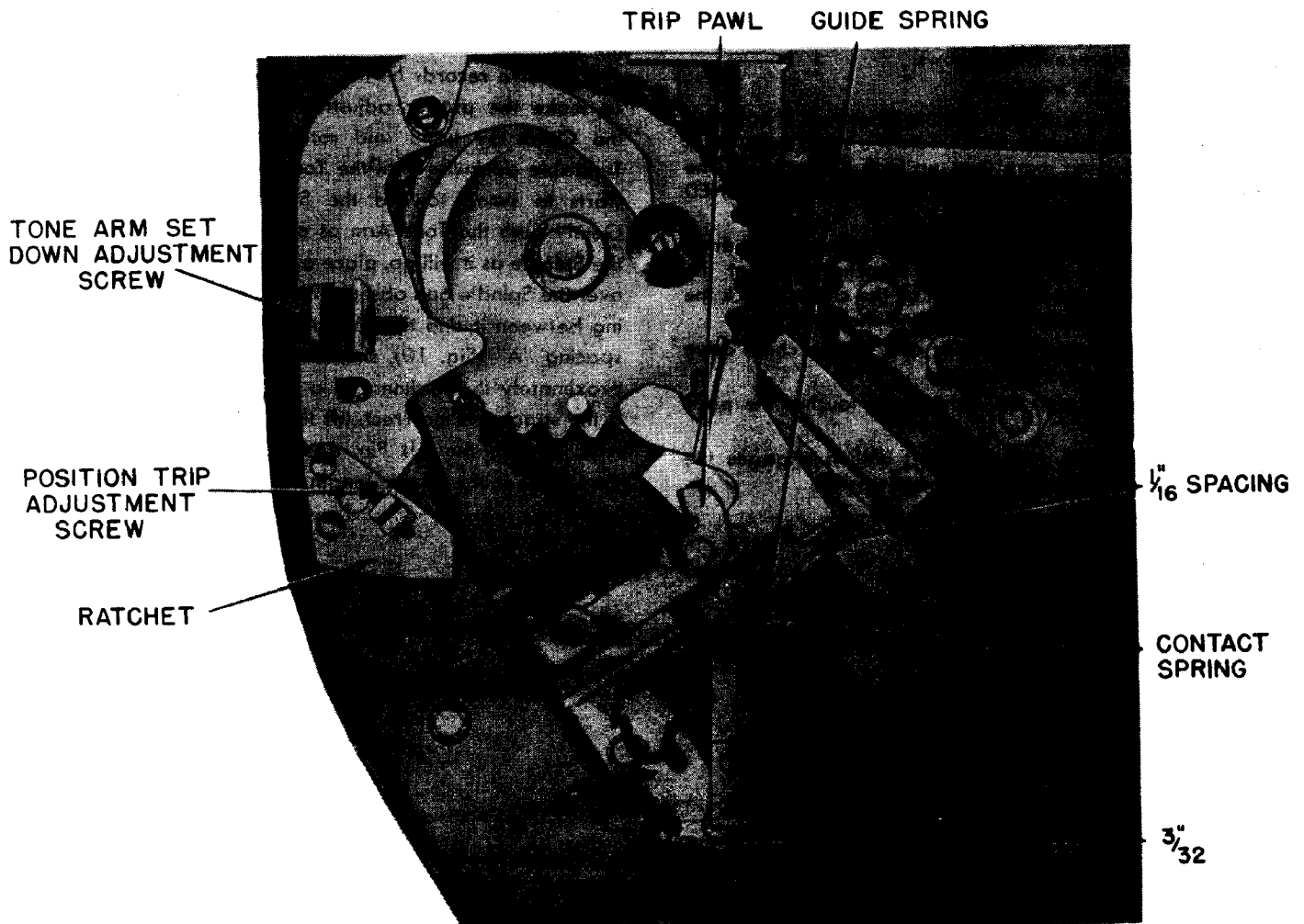


Fig. 7. Tone Arm Set Down, Position Trip and Trip Switch Adjustments.

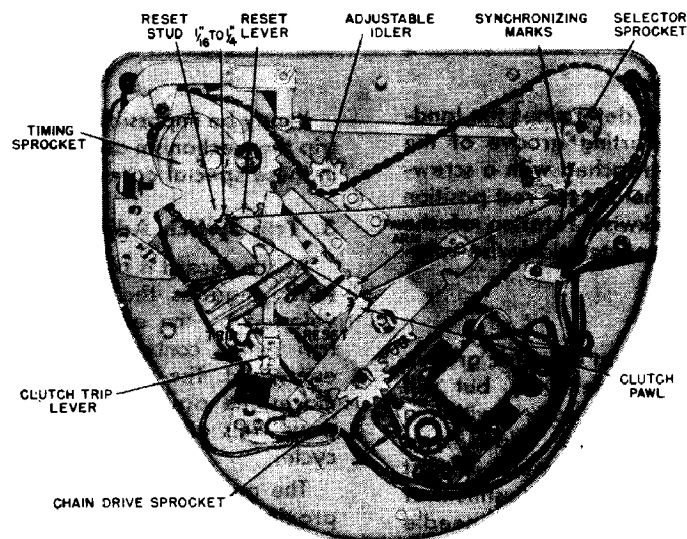


Fig. 8. Synchronization.

4. Synchronization.

A properly timed changer drops records on the turntable when the tone arm is at its greatest outward swing. Improper timing results in the records hitting the tone arm. The record changer is kept in time by the drive chain. If the chain is removed, the changer must be synchronized.

Fig. 8 indicates the correct position of the timing sprocket, selector sprocket and the clutch. To synchronize, study Fig. 8 and proceed as follows:

1. Reset the clutch trip lever.
2. Turn the timing sprocket until the reset stud is approximately $\frac{1}{16}$ " from the reset lever (1). Turn the selector sprocket until the synchronizing mark lines up with the mark on the base plate (2). THESE POSITIONS MUST BE MAINTAINED DURING THE NEXT OPERATION.
3. Thread the chain over the timing sprocket, chain drive sprocket, adjustable idler, selector sprocket and set the adjustable idler for medium tension of the chain. Check the position of the synchronizing marks and the reset stud.
4. Remove the retaining washer and lift the chain drive sprocket until the gears disengage.
5. Turn the clutch until the clutch pawl touches the pawl pusher arm (3).
6. Lower the chain drive sprocket until it engages the clutch gears and reinsert the retaining washer.

5. Tone Arm Height Adjustment.

The Tone Arm vertical rise is governed by the Lift Pin. The Lift Pin is adjustable (see Fig. 9). Too long a Lift Pin will cause the Tone Arm to hit the underside of the records on the Spindle. If the Lift Pin is short the needle will not clear twelve records on the Turntable. To make the proper adjustment, trip the Clutch by hand and rotate the Turntable clockwise until the Tone Arm starts to swing toward the Spindle. Gently push the Tone Arm as close to the Spindle as it will go, place a record over the Spindle and observe the spacing between it and the Tone Arm. The spacing "A" (Fig. 10), should be approximately the thickness of a record. If the spacing is incorrect, lift the Tone Arm, remove the Lift Pin, and adjust the Lift Pin to the proper length.



Fig. 9. Lift Pin.

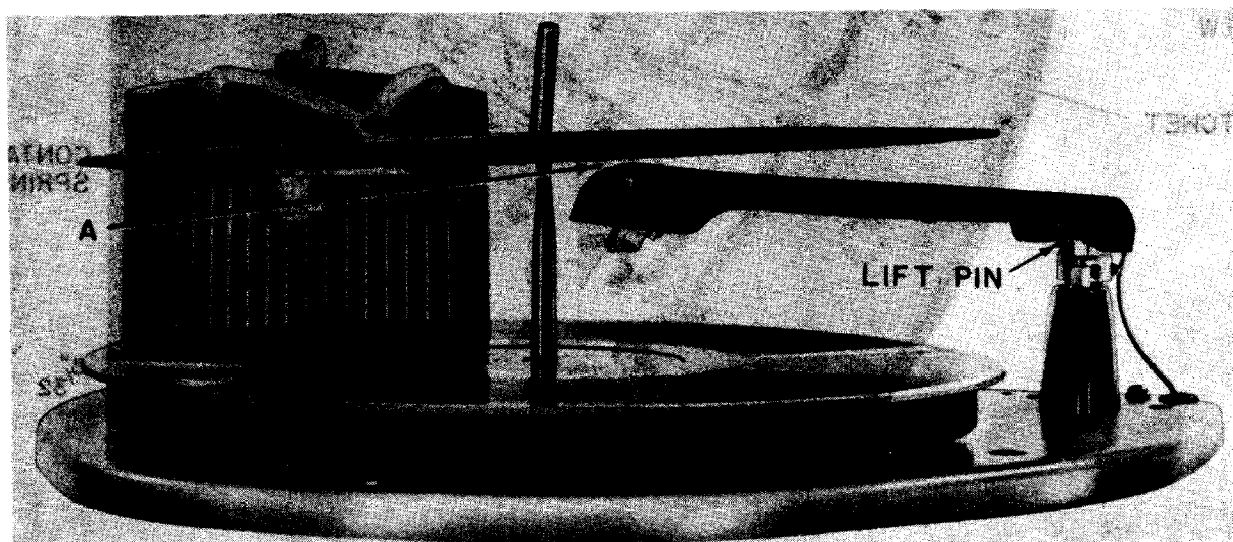


Fig. 10. Tone Arm Height Adjustment.

REMOVING THE TURNTABLE

Hold the clutch by inserting a wide blade screwdriver against the spindle bracket and a segment of the drive plate. Apply a twisting, pulling force to the turntable.

Before seating the turntable, be certain that the idler wheel is pushed inside the turntable rim.

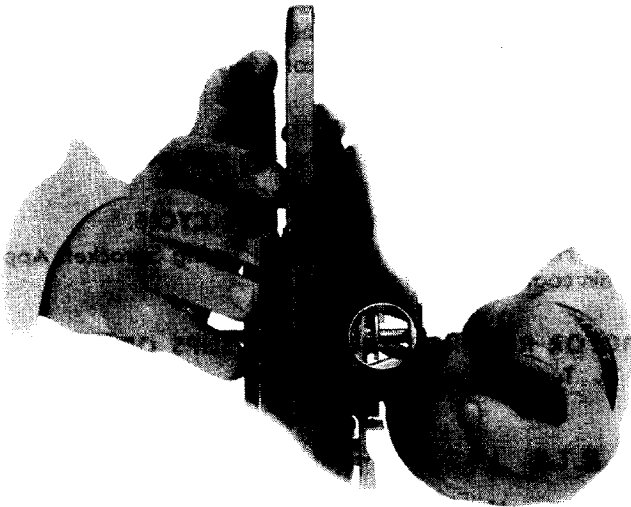


Fig. 11. Removing the Turntable.

REPLACING THE MOTOR

When a replacement Motor is ordered, be certain that the line voltage and frequency of the receiver are given.

To replace the Motor, unsolder the connecting leads, remove the Turntable, the three retaining washers and allow the Motor to drop out. When the Motor is installed do not draw the connecting leads tight as this will prevent the Motor from "floating" on its mounts. Be certain that the retaining washers are crimped and the leads securely soldered and taped.

REPLACING THE CHAIN

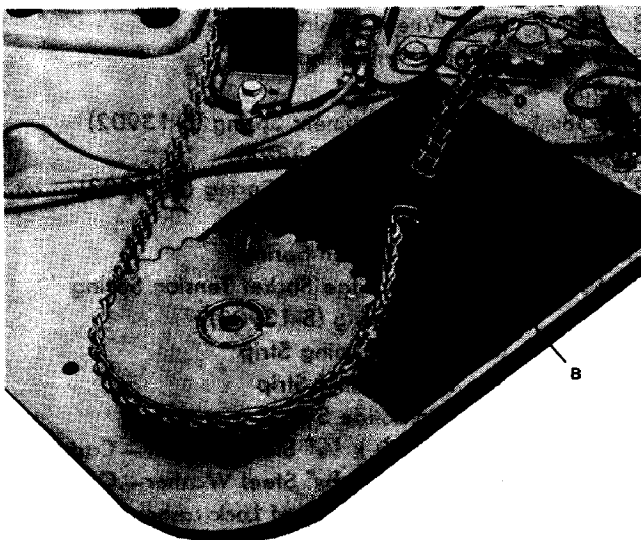


Fig. 12. Replacing the Chain.

The chain may be removed by loosening the adjustable idler (Screws "D", Fig. 12), and opening one of the links (B) It will be noted that on some models the open ends of the links face inward while on others outward as in Fig. 12. The reason for this is to get the quietest operation. Normally the open ends of the links will face outward with all replacement chains.

After the chain is threaded in place, carefully close the open link and be certain that there is no stiffness in its action. Read the paragraph on Synchronization before the chain is permanently installed.

TROUBLE SHOOTING

SQUEAKS OR NOISES DURING PLAYING OF RECORDS.

a. Friction between the records on the turntable and the spindle will occasionally cause squeaks. A thin coat of wax applied to the spindle will remedy this condition.

b. Check lubrication.

MECHANISM STARTS SLOWLY AND MOTOR GETS HOT.

- a. Check line voltage and frequency.
- b. Check lubrication.
- c. Motor windings damaged.
- d. Room temperature abnormally low.

PRESSING RECORD CHANGE BUTTON ON RECEIVER PANEL DOES NOT START RECORD CHANGE CYCLE.

- a. See that the AUTO-MAN-OFF switch is set to AUTO.
- b. Check Record Change Switch.
- c. Check electrical continuity of solenoid circuit.
- d. Check the solenoid energizing voltage.

MOTOR FAILS TO RUN EVEN WHEN IT IS DISCONNECTED FROM CHANGER AND PROPER VOLTAGE AND FREQUENCY APPLIED DIRECTLY TO THE TWO INPUT LEADS OF THE WINDING.

- a. Open windings.
- b. Damaged or frozen bearings.
- c. Lower Bearing Support Bracket bent. Remove and straighten bracket—Re-center armature.

RUMBLE AND MICROPHONICS DURING REPRODUCTION.

- a. Changer not "floated" properly. Remove packing strip. Loosen mounting bolts.
- b. Motor retaining rings rubbing on the idler wheel.
- c. Motor lead: pulled too tight preventing motor from "floating" freely.
- d. Noisy phono oscillator tube.
- e. Impression on Idler Wheel.

NEEDLE SETS DOWN PROPERLY ON RECORD BUT SLIDES OVER THE RECORD GROOVES.

- a. Cabinet tilted.
- b. Badly worn or broken needle cartridge.

NEEDLE FAILS TO CLEAR MAXIMUM LOAD OF RECORDS ON THE TURNTABLE.

- a. Check Tone Arm height adjustment. (Adjustment 5.)

CHANGER CYCLES WITH AUTO-MAN-OFF SWITCH ON MAN.

- a. Check AUTO-MAN-OFF switch.
- b. Reset stud does not engage clutch reset lever.

tone arm falls off record.

- a. Check Tone Arm set down adjustment. (Adjustment 1.)
- b. Check Tone Arm Pivot Bracket.
- c. Changer not level.

tone arm set-down position varies.

- a. Check Tone Arm Brake and Spring.
- b. Loose Tone Arm mounting screw.

record is not heard although changer operates.

- a. See that the Phono Radio switch is on Phono.
- b. Check receiver audio by listening to radio.
- c. Check the phono oscillator tube.
- d. Check Needle Cartridge.
- e. Check Tone Arm Housing for broken leads.

tone arm sets down too far in or out on record.

- a. Check Tone Arm set down adjustment. (Adjustment 1.)

changer continues to cycle.

- a. Check the trip switch adjustment. (Adjustment 3.)
- b. Check Record Change switch.
- c. Clutch release mechanism sticks.

changer will not cycle upon completion of record.

- a. See that the AUTO-MAN-OFF switch is set to AUTO.
- b. Be certain that the record has an eccentric center groove.
- c. Check the Trip Switch.
- d. Check the solenoid energizing voltage.

squeaks when changer is in cycle.

- a. Friction between Lift Pin and Timing Sprocket. Apply a thin coat of Sta-Put.

motor runs but turntable slips or stops.

- a. Turntable not fully seated. Tap gently.

NUMERICAL PARTS LIST

S-10732	Idler Assembly	54-30	No. 8-32 x 3/16" Hex Nut—Steel N.P.
S-11105	Record Ejector Plate and Pin Assembly	54-66	No. 10-32 x 3/16" x 1/8" Hex Nut—Steel N.P.
S-11106	Record Support Plate—Shaft and Pin Assembly	56-128	Groove Pin (Sprocket Bushing)
S-11107	Record Support and Ejector Bracket Assembly	56-226	Tone Arm Lift Pin—Lower
S-11109	Selector Sprocket and Bushing Assembly	56-227	Tone Arm Lift Pin—Upper
S-11111	Turntable Shaft and Bearing Assembly	57-1323	Turntable Shaft Plate
S-11118	Idler Wheel Assembly	58-158	Five Prong Plug (for S-14172)
S-11441	Record Change Lever and Stud Assembly	63-1744	100 Ohm Carbon Resistor 1/2 W. Insulated
S-11473	Cobra Needle Cartridge	69-38	No. 8-32 x 3/4" R.H.M.S.—Steel N.P.
S-11657	Idler Stud and Washer Assembly	69-43	No. 8-32 x 3/8" R.H.M.S.—Steel N.P.
S-12633	Needle Cartridge Socket and Cable Assembly	73-90	No. 8-32 x 3/16" Hex Head Slotted Set Screw—Conepoint
S-13060	Cobra Tone Arm Hinge Plate and Swivel Bracket Assembly	73-99	No. 8-32 x 1/4" Slab Head Set Screw—Steel Conepoint
S-13062	Cobra Tone Arm Hinge Plate, Swivel Bracket, Needle Cartridge Socket and Cable Assembly	73-102	No. 8-32 x 7/16" Slab Head Set Screw—Steel—Conepoint
S-13466	Cobra Tone Arm Assembly	76-409	Record Ejector Cam Shaft
S-13894	Clutch Pawl Assembly	80-367	Toggle Spring (S-11106)
S-13895	Drive Sprocket and Bushing Assembly	80-368	Idler Wheel Tension Spring
S-13896	Turntable Drive Shaft Bearing Assembly	80-448	Pressure Arm Spring
S-13900	Timing Sprocket Assembly	80-531	Brake Spring
S-13901	Trip Switch Assembly	80-538	Landing Adjustment Spring (S-13902)
S-13902	Tone Arm Pivot Shaft and Bracket Assembly	80-572	Clutch Spring (S-13894)
S-13903	Clutch Release Arm Assembly	80-574	Pawl Pusher Bracket Spring (S-13903)
S-13913	Magnet Coil Assembly	80-582	Pawl Spring (S-13901)
S-13931	Turntable Assembly	80-584	Tone Arm Lift Pin Spring
S-13933	Main Base Plate Assembly	80-605	Cobra Cartridge Socket Tension Spring
S-14140	Record Spindle Assembly	80-653	Trip Arm Spring (S-13903)
S-14172	Cable Assembly	83-1349	Tone Arm Shipping Strip
S-14581	Trip Lever Mounting Bracket Assembly	83-1453	Two Lug Terminal Strip
S-14582	Trip Lever and Pawl Assembly	85-371	3 Position Slide Switch
12-1216	Tone Arm Pivot Bracket	93-10	.025 x .260 x 5/8" Steel Washer—Cadmium
12-1390	Magnet Mounting Bracket	93-216	.015 x .255 x 7/16" Steel Washer—Cadmium
12-1402	Record Spindle Support Bracket	93-125	No. 6 Int. Shakeproof Lockwasher No. 1206
17-81	Cable Clamp	93-126	No. 8 Int. Shakeproof Lockwasher No. 1208
23-22	AC Wire Connector	93-617	Sprocket Shaft Retaining Washer
24-445	Record Ejector Housing Cover	93-673	Idler Wheel Stud Washer
43-152	Record Ejector Housing	93-677	Idler Wheel Stud Fishpaper Washer (Large)
43-157	Tone Arm Support Housing		
46-695	Record Selector Knob		

93-678	Idle Wheel Stud Fishpaper Washer (Small)	114-88	No. 8-32 x 1/2" Hex Acorn Hd. M.S.—Steel N.P.
93-679	Idle Wheel Stud Felt Washer (Large)	114-201	No. 8-32 x 3/16" Hex Head Slotted—STAN-TAP—Thread Forming Screw—Cad. Pl.
93-764	Spring Washer—Shakeproof	114-248	No. 6-20 x 3/16" Hex Head Slotted—Self Tapping Screw
93-900	Fibre Washer (Motor Mtg.)	117-133	Record Selector Lever
93-901	Spring Washer Shakeproof	118-40	Record Selector Link
93-903	Steel Washer—Copper Flash (Motor Mtg.)	125-45	Rubber Grommet
93-905	Spring Washer—Shakeproof No. 3502-16-01	125-60	Pressure Arm Grommet
94-415	Tone Arm Locating Bushing	125-61	Rubber Grommet
112-450	No. 4-40 x 1/8" Phillips Binding Hd. M.S. Steel Cad. Pl.	128-20	Record Ejector Cam
112-451	No. 8 x 3/16" B.H. Self Tapping Screw—Stan-Tap—Cad.	128-40	Record Selector Cam
112-581	No. 6 x 3/8" R.H. Self Tapping Screw	141-108	A.C. Motor—60 Cycles
112-619	Cobra Tone Arm Housing Mtg. Screws	148-83	Cobra Tone Arm Housing
112-687	Pivot Screw	148-87	Record Pressure Arm
112-688	No. 8 x 3/8" Flat Hd. Screw—Shakeproof Type 25—Cad. Pl.	166-41	Rubber Bumper
112-689	No. 8 x 3/8" R.H. Screw—Shakeproof Type 25—Cad. Pl.	188-27	Record Spindle Retaining Washer
112-706	No. 4-40 x 3/16" Ig. R.H.M.S. (Sems)—Steel N.P.	188-32	Retaining Ring
112-719	No. 6 x 3/8" Flat Head Screw—Self Tapping.	188-52	Retaining Ring
		214-5	Sprocket Drive Chain

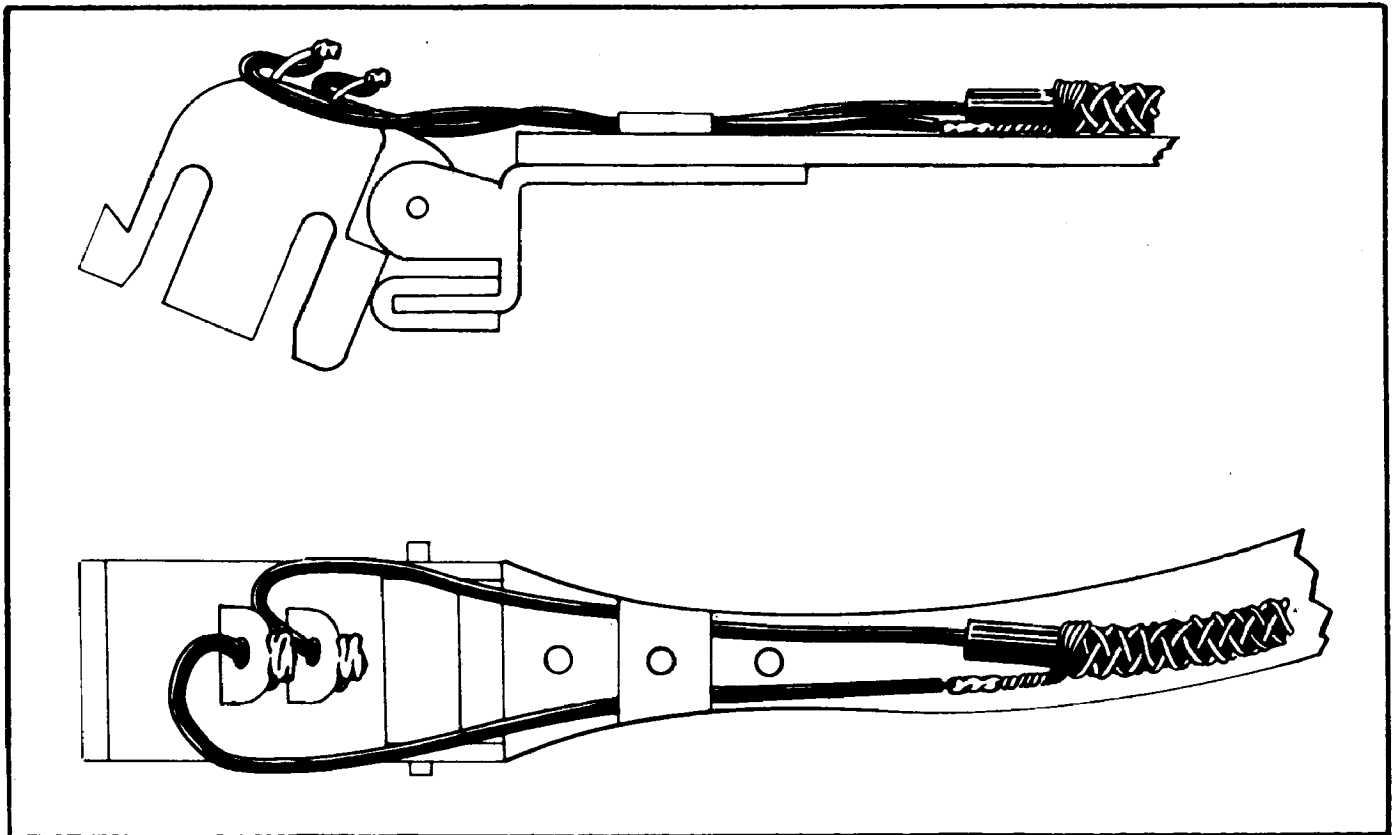


Fig. 13. Needle Cartridge Socket Connections.

Fig. 13 shows how the leads are connected to the Needle Cartridge Socket. The lead and insulation are run through the hole in the contact and the lead is soldered with a light soldering iron. Great care must be exercised, and very little heat applied as the socket is made of lucite and will burn easily. The complete lead, socket and bracket are supplied as S13062.

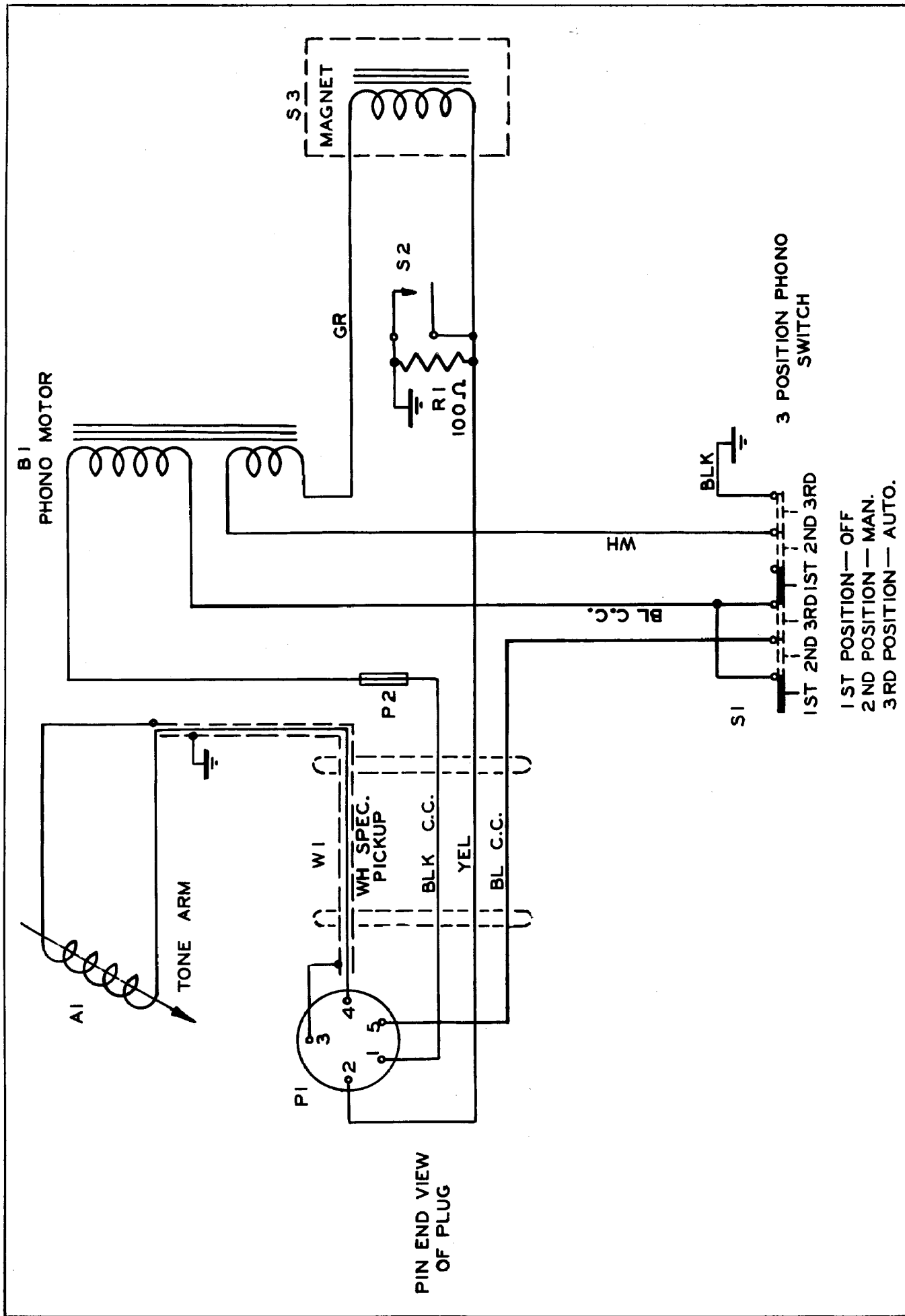


Fig. 14. Schematic Diagram of Record Changer

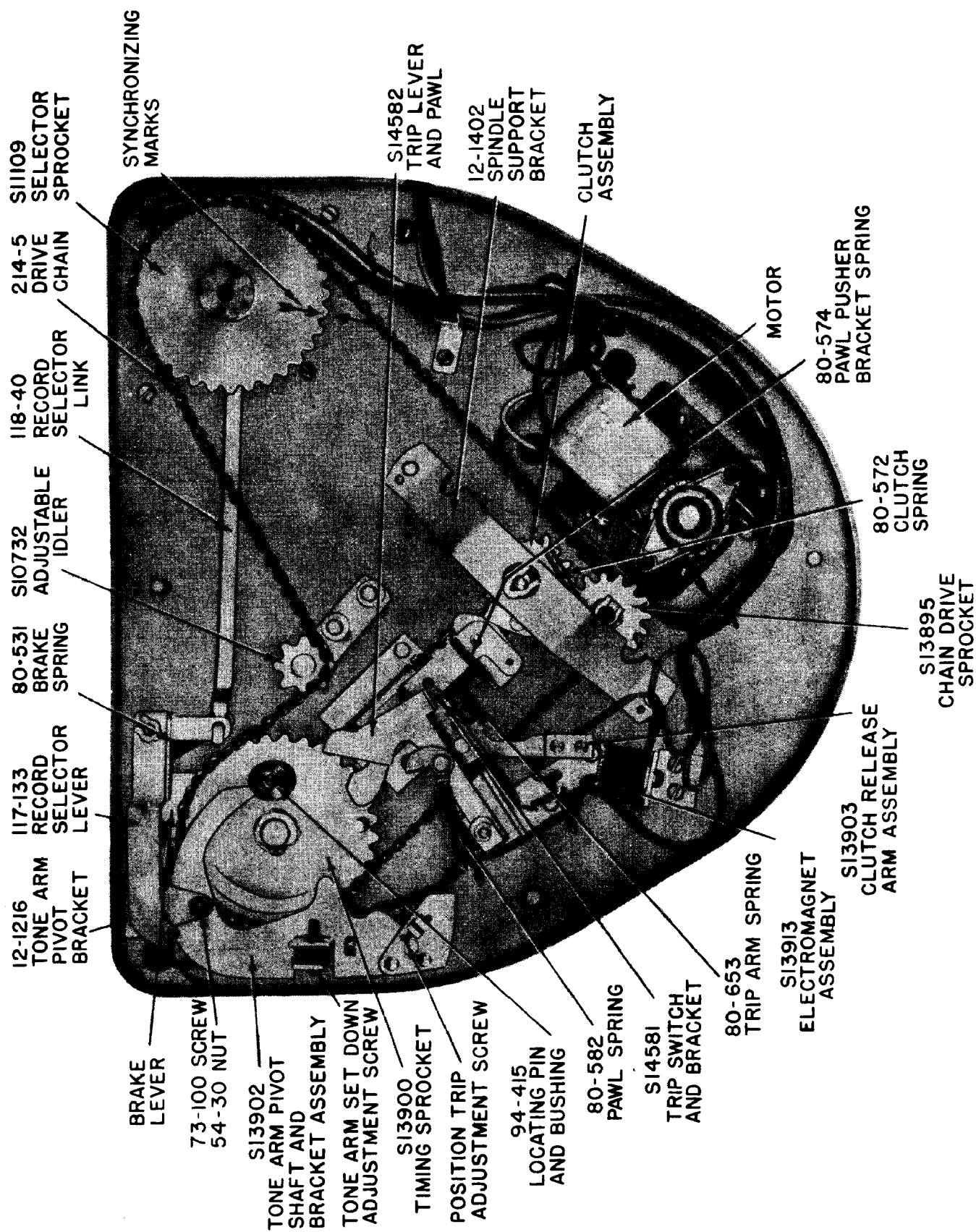
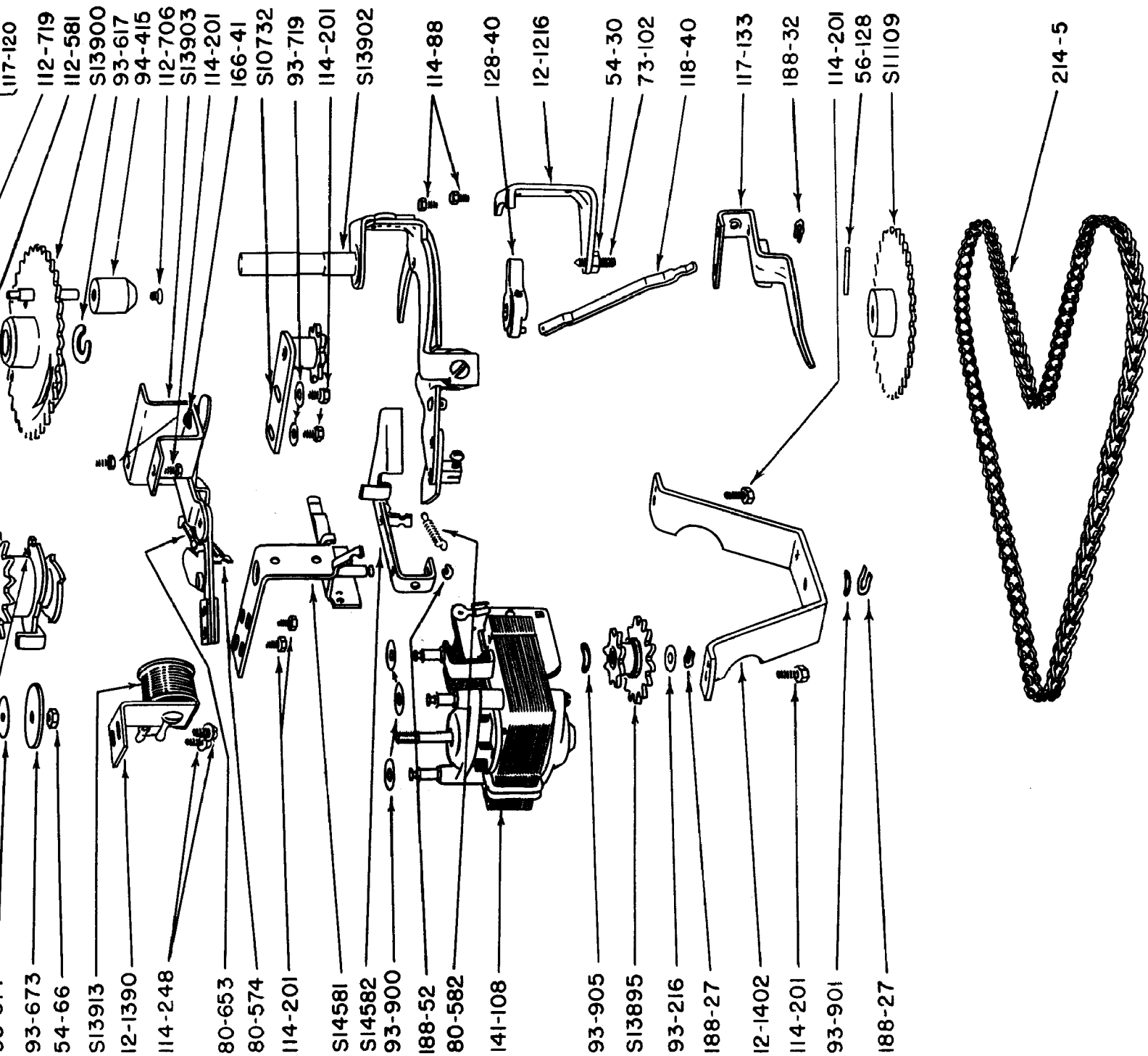
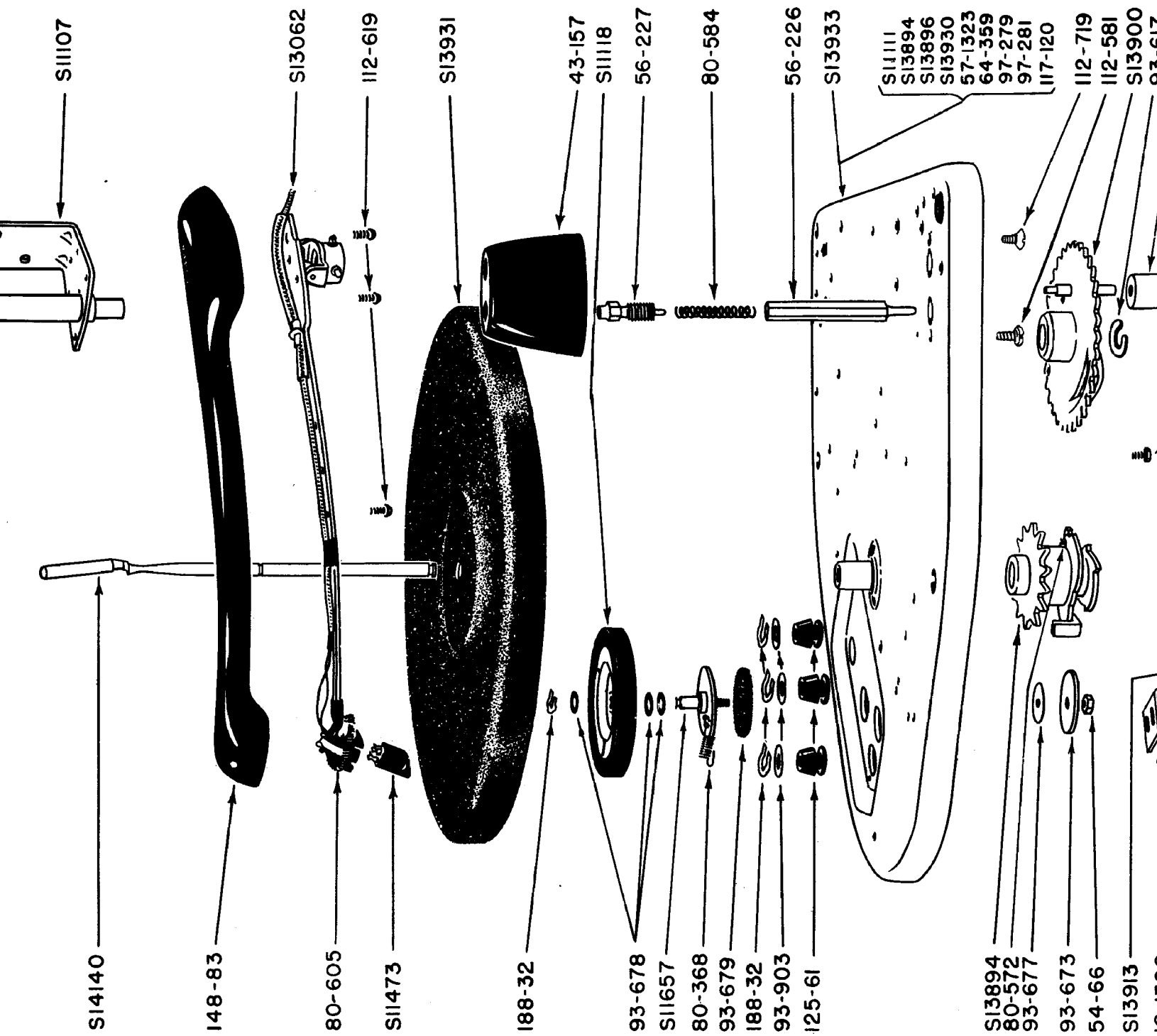
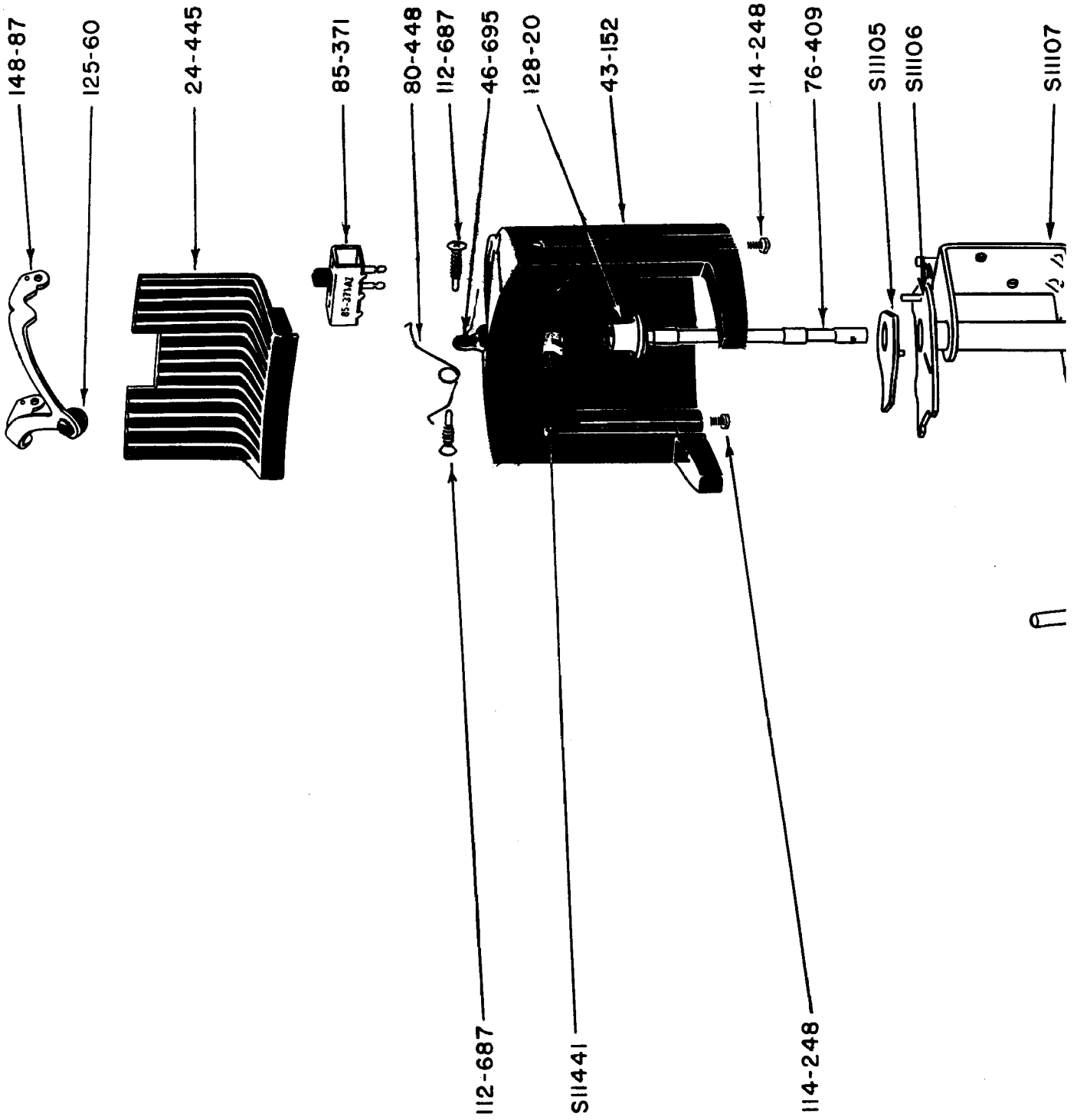


Fig. 15. Bottom View of Record Changer.







A



SERVICE MANUAL

MODELS S14004 AND S14007 AUTOMATIC RECORD CHANGERS

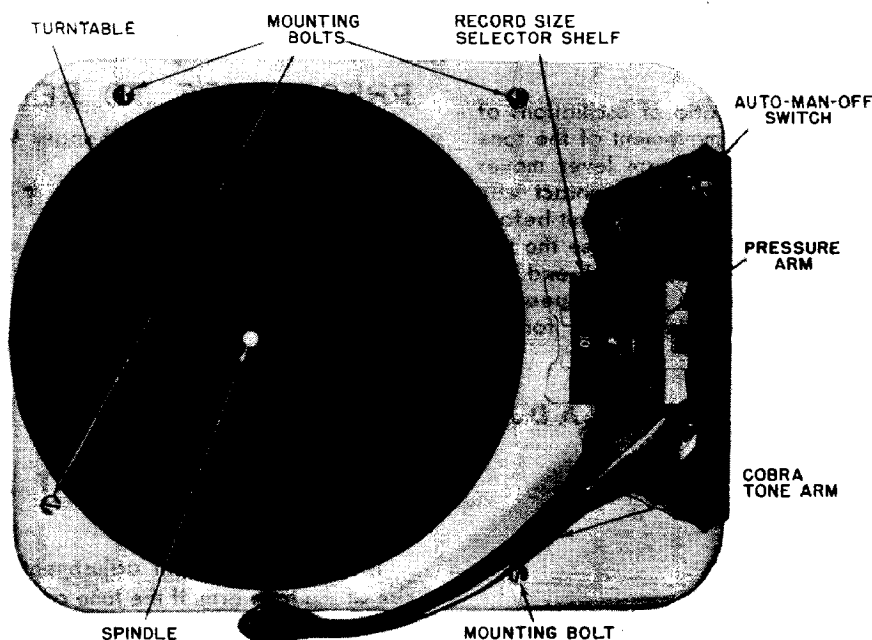


Fig. 1. S14004 and S14007 Record Changers.

GENERAL

The Models S14004 and S14007 record changers are used in Zenith Models 7R887 and 6R880 respectively. These changers are designed to play 12 ten inch or 10 twelve inch records automatically. Odd size and warped records must be played manually. Mechanically the changers are alike. There are slight electrical differences. Model S14004 receives the solenoid energizing voltage from the receiver proper while the S14007 supplies its own energizing voltage from a separate winding on the motor. When servicing these changers, check the schematic diagrams as to the electrical differences. The mechanical operation and adjustments of both changers are identical. To load for automatic operation, set the record size

selector shelf to either ten or twelve, depending on the size of the records to be played. Lift the pressure arm and place a stack of records over the spindle. Lower the pressure arm until it rests on the record stack. Set the AUTO-MAN-OFF switch to AUTO and press the record change button on the receiver panel. The record changer will play the complete selection of records, and will repeat the last record until turned off. For manual operation set the AUTO-MAN-OFF switch to MAN, place a record on the turntable and set the needle on the starting groove of the record. To turn the changer off, set the AUTO-MAN-OFF switch to OFF, and place the tone arm in the rest position.

DESCRIPTION OF CYCLING

The motor driven idler wheel rim drives the turntable. Closing the contacts of the trip switch or the record change switch allows current to flow through the solenoid. The magnetic field of the energized solenoid attracts the trip pawl lever which releases the gear pawl tooth and allows it to engage the rotating turntable gear. This action starts the clutch gear to turn. A stud on the clutch gear engages the tone arm lift lever which engages the tone arm stud and raises the tone arm. The tone arm lift lever also applies the tone arm brake which prevents coasting and erratic landing of the needle. The clutch gear moves the tone arm actuating lever and laterally swings the tone arm off the turntable. During the lateral swing of the tone arm, the record ejector link and arm assembly operates the record push plate and when the tone arm moves to its maximum outward position, the record push plate ejects the record and allows it to drop on the turntable. The clutch gear then moves the tone arm actuating lever which swings the tone arm over the starting groove of the record. The tone arm swings 1 inch nearer the spindle with 10 inch records than it does with 12 inch. This difference in inward swing is controlled by the discriminator lever assembly. When the record size selector shelf is turned to the 10 or 12 inch position, its shaft moves the discriminator cam and sets the discriminator lever assembly for the correct inward swing of the tone arm. After the tone arm swings over the starting groove of the record, the tone arm lift lever lowers it and releases the brake. As the clutch gear completes the revolution, the gear pawl tooth bracket hits the trip pawl and the action removes the gear pawl tooth from the path of the turntable gear, causing the clutch gear to stop and complete the cycle.

The velocity trip depends on the ratio of oscillations of the trip switch contact to the rate of movement of the tone arm. As the record is played, the tone arm lever moves slowly inward. The oscillating lever comes in contact with the ratchet on the tone arm lever and then moves out before the ratchet can drag the oscillating lever and close the trip switch contacts. When the record is completed and the needle enters the oscillating groove, the inward speed of the tone arm increases. This makes it impossible for the

oscillating lever to move out of the ratchet in time and as a result is dragged inward, closing the trip switch contacts and starting the next cycle.

The S14004 and S14007 record changers use the famous Cobra pickup. Previously published service manuals Z800 and Z801 explain in detail the theory and operation of the Cobra pickup. If these manuals are not available, they may be obtained from your Zenith distributor.

RECORD CHANGER MOUNTING CLIPS

Clamp on pivot clips are used to mount the record changer in the cabinet. The changer is released by applying an upward pressure to the slotted ends of the clips (see Fig. 3) until the clips pivot to a vertical position. When the changer is installed, the clips are pivoted back to the horizontal or holding position.

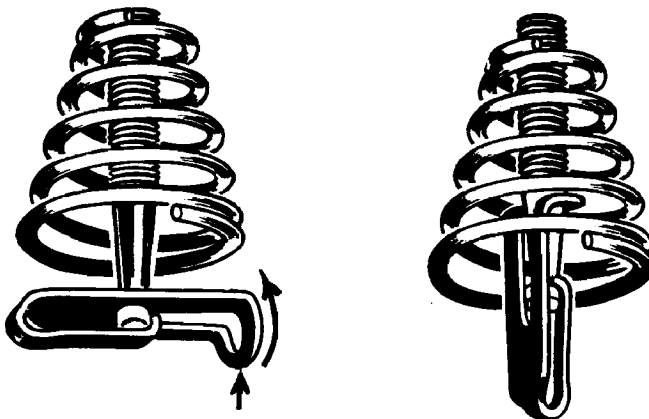


Fig. 3. Record Changer Mounting Clip.

LUBRICATION

Sta-Put grease No. 512 (light grease of the vaseline type) is used for lubrication throughout. Fig. 5 indicates the various lubrication points. Do not apply grease to the top surface or teeth of the clutch gear.

ADJUSTMENTS

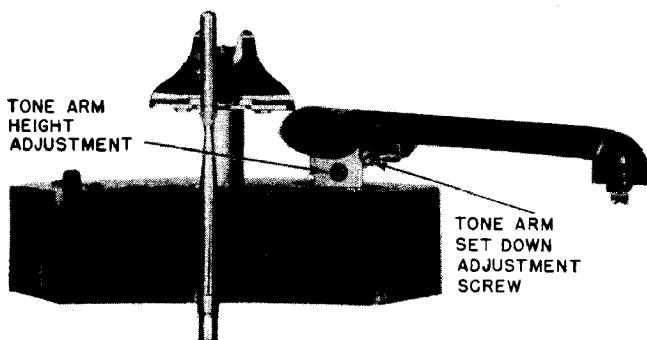


Fig. 2. Tone Arm Set Down and Height Adjustment.

TONE ARM SET DOWN ADJUSTMENT

The landing position of the needle on the record is determined by the setting of the tone arm set down adjustment screw (see Fig. 2). Clockwise rotation of the screw moves the tone arm in, while counter-clockwise rotation moves it out.

TONE ARM HEIGHT ADJUSTMENT

The tone arm height adjustment determines the vertical rise of the tone arm. If the tone arm does not rise sufficiently, the record changer will not play a full load of 12 ten inch records. If, on the other hand, the tone arm is raised too high, it may hit the records on the record shelf. Set the adjustment screw so that the needle clears 12 unwarped ten inch records on the turntable. The tone arm housing must not hit the underside of the records on the record shelf when the changer is cycled after adjustment.

TRIP SWITCH ADJUSTMENT

The tone arm lever must be moved so that its ratchet does not engage the oscillating switch lever. With a pair of long nose pliers simultaneously bend the stationary contact and guide spring until the spacing between the trip switch contacts is $\frac{1}{16}$ inch to $\frac{3}{32}$ inch. The contact spring must always rest against the heavier guide spring after adjustment.

NUMERICAL PARTS LIST

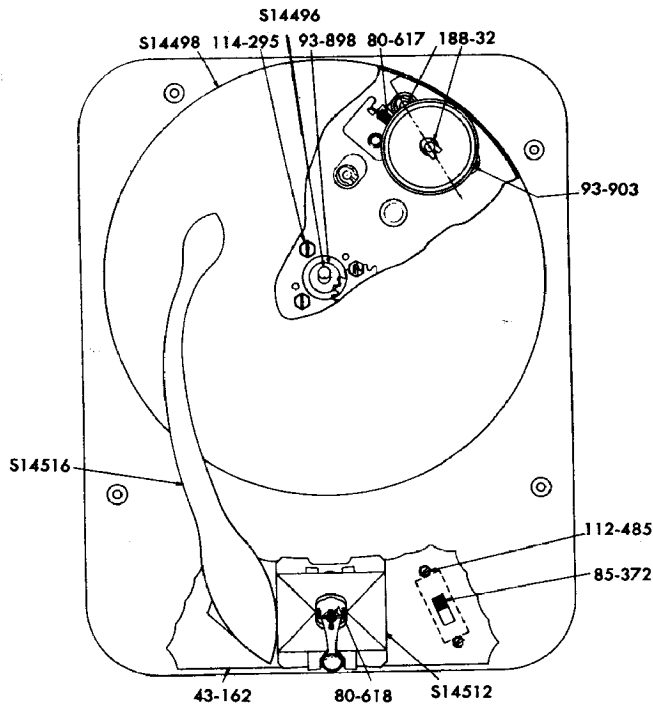


Fig. 6. Parts Identification, Top View.

12-1444	Socket Mounting Bracket	80-616	Tone Arm Link Spring (Short)
12-1477	Tone Arm Mounting Bracket (Upper)	80-617	Idler Wheel Spring
56-144	Socket Retaining Pin	80-618	Pressure Arm Spring
78-561	Cartridge Socket	80-619	Tone Arm Swivel Spring
80-605	Socket Tension Spring	80-645	Tone Arm Height Adjusting Spring
80-609	Landing Adjusting Spring	85-372	Three Position Slide Switch
83-1121	Felt Strip (Bumper)	93-53	$\frac{1}{4}$ x $\frac{1}{4}$ in. x $\frac{3}{8}$ in. Steel Washer—N.P.
93-899	Steel Washer—N.P.	93-125	No. 6 Int. Lockwasher
112-619	No. 2-32 x $\frac{5}{16}$ in. R.H. Self Tapping Screw—Steel—Cad. Pl.	93-381	$\frac{1}{2}$ in. x $\frac{1}{2}$ in. x $\frac{3}{8}$ in. Steel Washer—Cad.
17-81	Cable Clamp (S14004)	93-678	Idler Wheel Stud Fishpaper Washer—Small
17-88	Cable Clamp (S14007)	93-781	No. 8 Split Lockwasher—Steel N.P.
23-22	A.C. Wire Connector	93-876	Fibre Washer
24-458	Switch Cover (S14007)	93-898	Steel Washer
43-160	Turntable Gear Housing	93-900	Fibre Washer (3 used)
43-162	Record Ejector Housing	93-903	Steel Washer—Copper Flash (3 used)
56-239	Groove Pin Type No. 4 ($\frac{3}{32}$ in. D X $\frac{3}{8}$ in. lg.) (S14004)	93-927	Idler Wheel Stud Washer—Large
56-240	Groove Pin Type No. 2 ($\frac{1}{16}$ in. D X $\frac{1}{4}$ in. lg.) (S14004)	93-928	Idler Wheel Stud Washer—Small
58-166	6 Prong Plug (S14004)	93-929	Idler Wheel Stud Fishpaper Washer—Large
60-18	Trip Pawl	93-930	Idler Wheel Stud Felt Washer
61-125	Idler Wheel	94-620	Stop Bushing
63-1744	Resistor	97-298	Trip Pawl Stud
69-43	No. 8-32 x $\frac{3}{8}$ in. R.H.M.S.—Steel N.P.	97-301	Clutch Gear Retaining Stud
69-141	No. 5-40 x $\frac{1}{4}$ in. R.H.M.S.—Steel N.P.	112-485	No. 4-40 x $\frac{1}{4}$ in. B.H.M.S.—Steel—Black Zinc Plate (2 used)
69-184	No. 8-32 x $\frac{1}{4}$ in. R.H.M.S.—Steel—Cad.	114-248	No. 6-20 x $\frac{3}{32}$ in. Hex. Hd. Slotted S.T. Screw—Steel—Cad. (4 used)
69-262	No. 8-32 x $\frac{1}{2}$ in. Phillips R.H.M.S.—Steel	114-295	No. 8-32 x $\frac{5}{16}$ in. Hex. Hd. Slotted S.T. Screw—Steel—Cad. (4 used)
73-99	No. 8-32 x $\frac{1}{4}$ in. Slab Hd. Set Screw—Cone-point (2 used)	117-144	Brake Lever
73-112	No. 8-32 x $\frac{1}{2}$ in. Slab Hd. Set Screw—Cup-point (2 used)	117-145	Tone Arm Lift Lever
80-582	Pawl Spring (3 used)	125-61	Rubber Grommet (3 used)
80-610	Switch Contact Spring	125-65	Pressure Arm Grommet
80-613	Lift Pin Lever Spring	128-45	Discriminator Cam
80-614	Brake Spring	141-120	A.C. Phono Motor—110 V. 60 cycle (S14004)
80-615	Tone Arm Link Spring (Long)	141-126	A.C. Phono Motor—110 V. 60 Cycle (S14007)
		148-83	Tone Arm Housing only
		S11473	Cobra Cartridge and Needle Assembly
		S14516	Cobra Tone Arm Assembly—complete
		S14673	Hinge Plate Socket and Stop Assembly
		S14674	Hinge Plate Assembly—complete
		S14675	Shielded Wire Cable
		148-96	Record Ejector Arm
		148-97	Record Pressure Arm
		149-60	Magnet Core
		188-32	Retaining Ring (5 used)
		199-85	Tone Arm Sleeve
		S13913	Magnet Coil Assembly (Solenoid)
		S14487	Clutch Gear Assembly
		S14488	Oscillating Lever and Gear Assembly
		S14490	Tone Arm Actuating Lever Assembly
		S14491	Discriminator Lever Assembly
		S14493	Trip Switch Assembly
		S14494	Record Ejector Link and Arm Assembly
		S14495	Tone Arm Lever Assembly
		S14496	Record Spindle Assembly
		S14498	Turntable Assembly (Flock Finish)
		S14499	Ejector Cam Shaft Assembly
		S14510	Record Support Plate and Post Assembly
		S14512	Pressure Arm and Mounting Assembly
		S14513	Tone Arm Shaft Assembly
		S14514	Tone Arm Bracket and Lift Pin Assembly
		S14515	Cable and Plug Assembly (S14004)
		S14682	Idler Wheel Stud and Washer Assembly
		S14691	Cable and Plug Assembly (S14007)

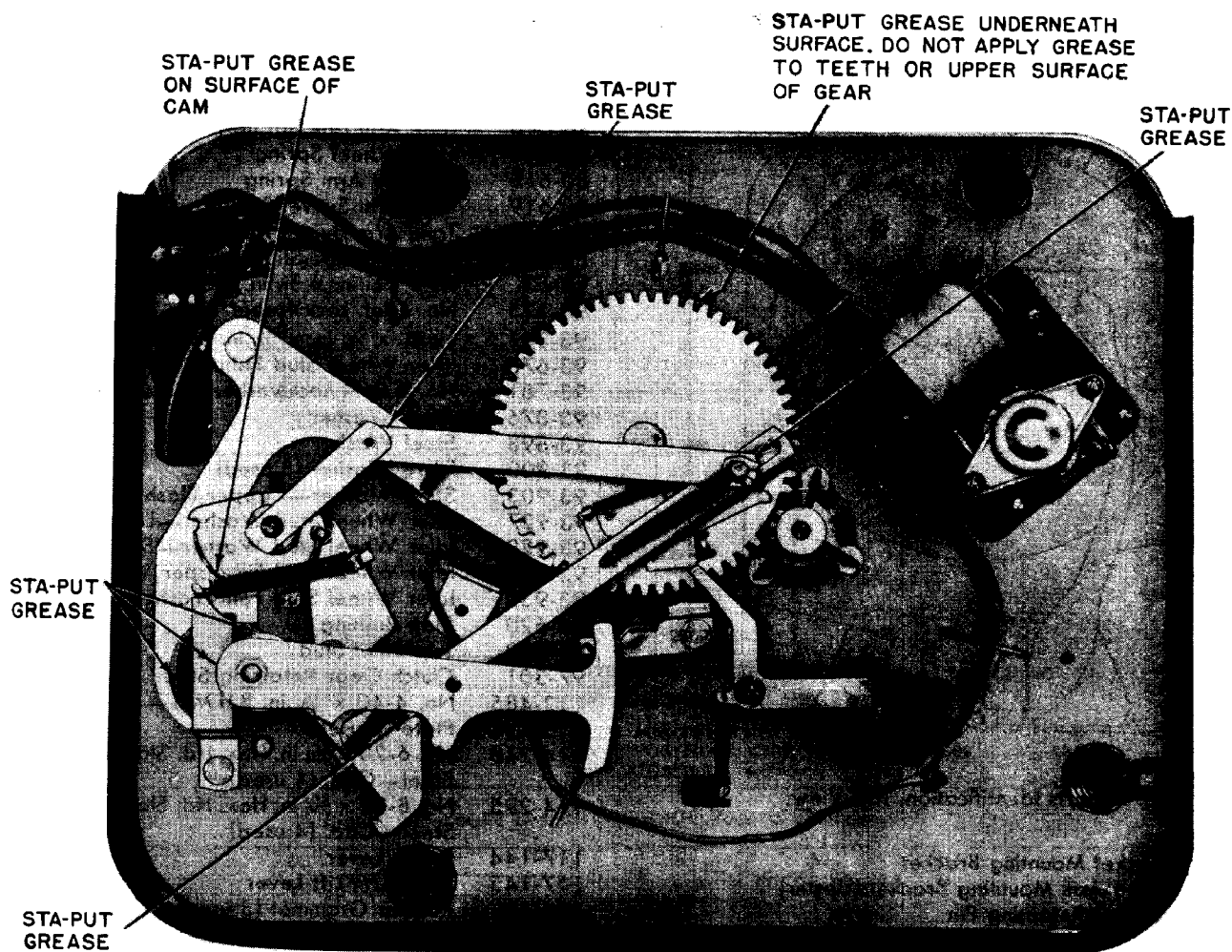


Fig. 5. Lubrication.

TROUBLE SHOOTING

SQUEAKS OR NOISES DURING PLAYING OF RECORDS.

- Friction between the records on the turntable and the spindle will occasionally cause squeaks. A thin coat of wax applied to the spindle will remedy this condition.
- Check lubrication.

RECORD IS NOT HEARD ALTHOUGH CHANGER OPERATES.

- See that the Phono Radio switch is on Phono.
- Check receiver audio by listening to radio.
- Check the phono oscillator tube.
- Check Needle Cartridge.
- Check Tone Arm Housing for broken leads.

PRESSING RECORD CHANGE BUTTON ON RECEIVER PANEL DOES NOT START RECORD CHANGE CYCLE.

- See that the AUTO-MAN-OFF switch is set to AUTO.
- Check Record Change Switch.
- Check electrical continuity of solenoid circuit.
- Check the solenoid energizing voltage.

RUMBLE AND MICROPHONICS DURING REPRODUCTION.

- Changer not "floated" properly. Remove packing strip. Loosen mounting bolts.
- Motor retaining rings rubbing on the idler wheel.
- Motor leads pulled too tight preventing motor from "floating" freely.
- Noisy phono oscillator tube.
- Impression on Idler Wheel.

NEEDLE FAILS TO CLEAR MAXIMUM LOAD OF RECORDS ON THE TURNTABLE.

- Check Tone Arm height adjustment.

TONE ARM SETS DOWN TOO FAR IN OR OUT ON RECORD.

- Check Tone Arm set down adjustment.

TONE ARM SET-DOWN POSITION VARIES.

- Check Tone Arm Brake and Spring.
- Tone Arm pivots loosely.

CHANGER CONTINUES TO CYCLE.

- Check the trip switch adjustment.
- Check Record Change switch.
- Trip Pawl sticks.

CHANGER WILL NOT CYCLE UPON COMPLETION OF RECORD.

- See that the AUTO-MAN-OFF switch is set to AUTO.
- Be certain that the record has an eccentric center groove.
- Check the Trip Switch.

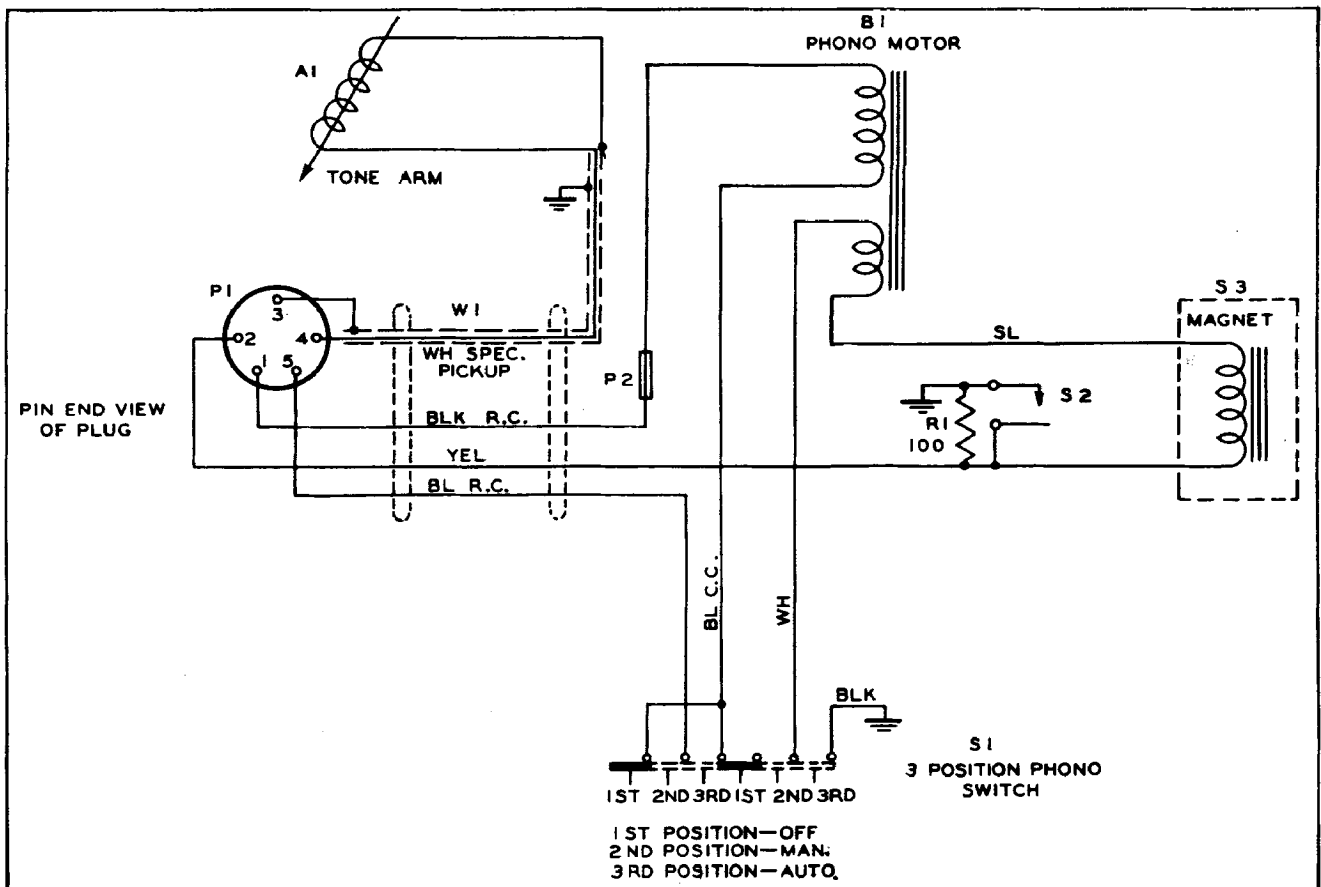
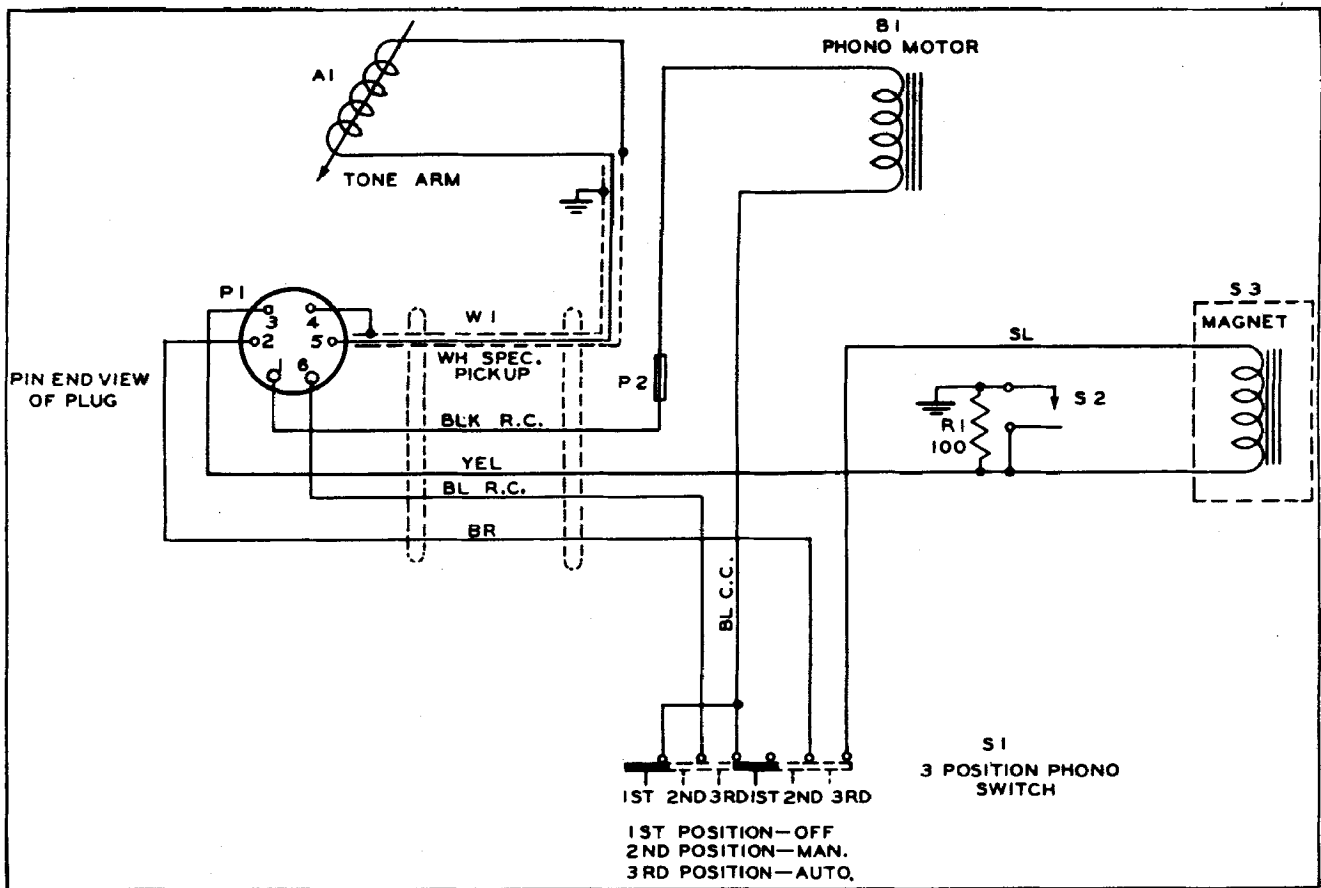
- Check the solenoid energizing voltage.

SOLENOID FAILS TO TRIP MECHANISM

- Check the pawl lever positioning stud. The tip of the pawl must be in approximately the same position in relation to the gear pawl tooth lever as indicated at "A" in Fig. 4. If the position is not the same as indicated, the positioning stud can be bent slightly.
- Tension on the trip pawl actuating spring too high.

MECHANISM JAMS

- Burr or sharp point on the gear pawl tooth. Smooth out with a small file.



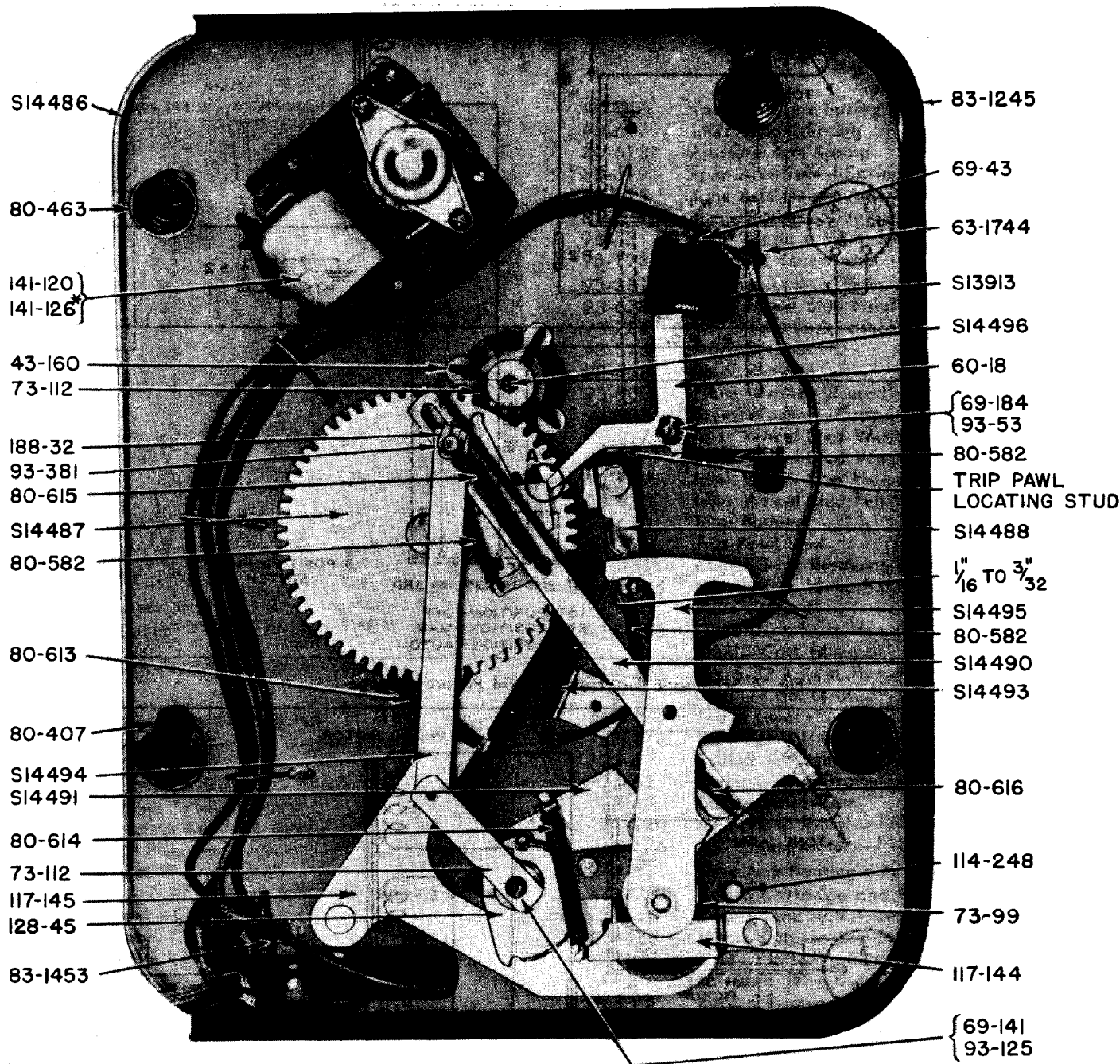


Fig. 4. Bottom View.

SLAB HEAD SET SCREWS

For maximum rigidity, the spindle, discriminator cam and tone arm lever are locked in position with slab head screws. A slab head set screw wrench is available as Zenith part No. 68-8.

REMOVING THE TONE ARM ASSEMBLY

The complete tone arm assembly can be removed by loosening the two slab head holding screws and pulling the unit out. When the tone arm assembly is installed, the cone points of the slab head screws must enter the indentations previously made. A new assembly does not have these indentations, and must be assembled as follows:

1. See that the changer mechanism is out of cycle.
2. Turn the tone arm set down adjustment screw (see Fig. 2) as far as it will go in the clockwise direction.

3. Insert the tone arm support shaft through its mounting hole.
4. Place a 12 inch record on the turntable and hold the Cobra tone arm housing against the edge of the record. Move the tone arm lever (Part No. S14495) to its maximum outward position. These two positions must be maintained during the next operation.
5. See that the tone arm lever bushing has approximately .005 inch play and tighten the slab head screws.
6. Adjust the tone arm set down adjustment screw (see Fig. 2) for proper landing of the needle.

REMOVING THE RECORD SHELF

The record shelf is removed by unscrewing the slab head screw at the bottom of its shaft and the machine screw which holds the record ejector link. When the unit is assembled, see that the changer is out of cycle and turn the slotted shaft until the record push off plate is retracted into its housing before attaching the record ejector link.

SERVICE MANUAL



Model 5MX080
Crosley Auto Radio

Made for CROSLEY MOTORS by ZENITH RADIO CORPORATION,
Chicago 39, Illinois, U. S. A.

Electrical Specifications

TUNING RANGE:.....540-1600 Kc.

SPEAKER:.....6" x 9" oval, instrument
panel mounting.

INTERMEDIATE FREQUENCY:.....265 Kc.

SENSITIVITY:.....10 microvolts at one
watt output.

CURRENT CONSUMPTION:.....5. amperes

UNDISTORTED POWER OUTPUT:.....
2 watts measured at the voice coil.

TUBE COMPLEMENT:.....
7Q7 converter, 7B7 I.F., 7C6 detector and
1st audio, 6V6GT Power output, 0Z4
rectifier.

MAXIMUM POWER OUTPUT:.....
4.25 watts measured at the voice coil.

IMPORTANT

The warranty tag must be filled in by the car dealer at time of sale and accompany each receiver to be serviced at established warranty rates during the guarantee period. Otherwise regular charges for labor and material prevail. All repairs, whether in or out of warranty, are for the account of the car dealer or customer. DO NOT send claims to the Zenith Radio Corporation.

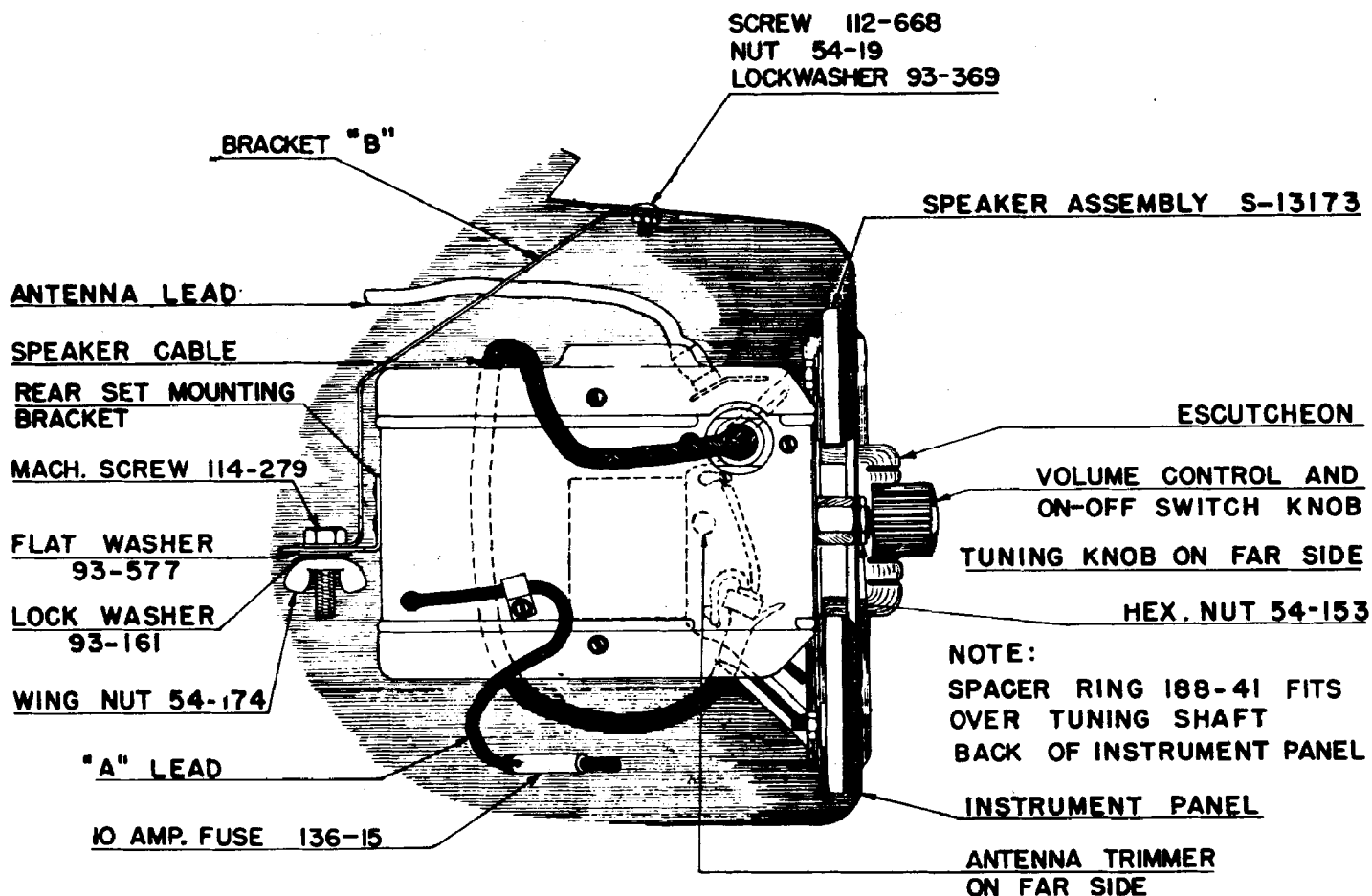


Fig. 1. Installation

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the installed receiver, the escutcheon plate, and the control knobs, are given here to assist in the removal and reinstallation of this receiver when service is necessary.

To take the receiver from the car, remove the control knobs and mounting nuts from the front panel, and remove the wing-nut, 54-174, lock washer 93-161, flat washer 93-577, and machine screw 114-279 from the set mounting bracket "B."

The speaker is held to the rear of the panel by four hex. nuts.

OFF-ON SWITCH AND VOLUME CONTROL

To turn the receiver on, turn the volume control knob to the right until it clicks and the dial is illuminated. Allow the receiver to reach operating temperature. (Approximately 20 seconds.) To increase the volume, continue to rotate this knob to the right. To turn the receiver off turn the volume control knob to the left until it clicks. (Fig. 2.)

TUNING

Turn the tuning knob (Fig. 1) to tune in the desired station. Tune to the exact frequency to prevent distortion. The pointer in front of the illuminated dial scale indicates the frequency to which the receiver is tuned. (Fig. 2.)

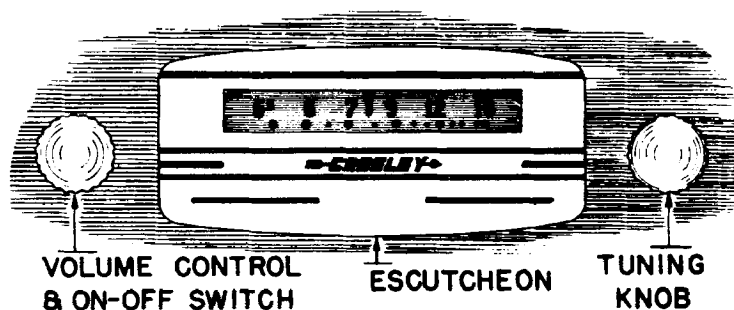


Fig. 2. Front View

INTERFERENCE ELIMINATION

There should be no interference from the ignition system if the receiver has been installed according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

IMPORTANT: Be sure that good contacts are made between the car frame, or body, and the interference condensers. If necessary, clean away paint or dirt with emery paper. Be sure all nuts and bolts are tightened securely.

The distributor suppressor No. 63-1046 and the flexible ground strap No. 83-1335 should be connected as shown in figure 3.

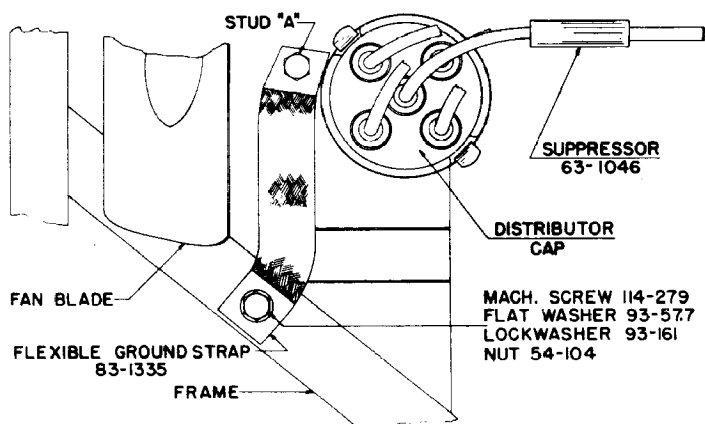


Fig. 3

The fuel gauge condenser No. 22-919 should be installed as shown in figure 4.

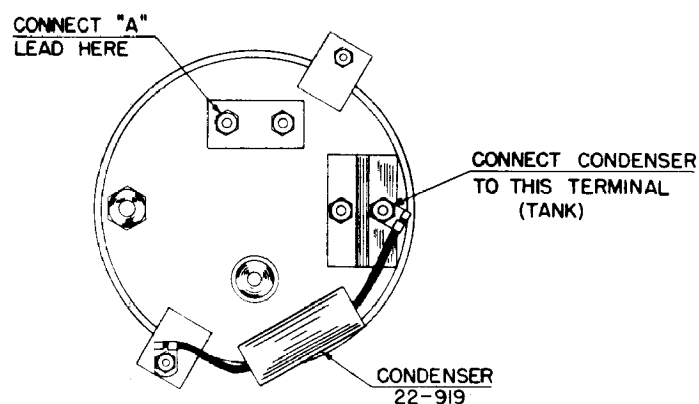


Fig. 4

The generator condenser No. 22-920 should be installed as shown below in figure 5.

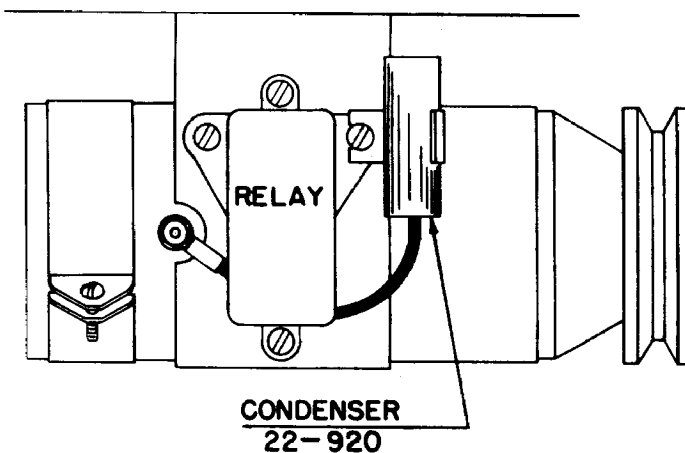


Fig. 5

The motor hood bond spring No. 80-145 should be installed as shown in Figure 6. Note that the sharp extrusions are facing down toward the front of the car before the hood grounding strip is bent back.

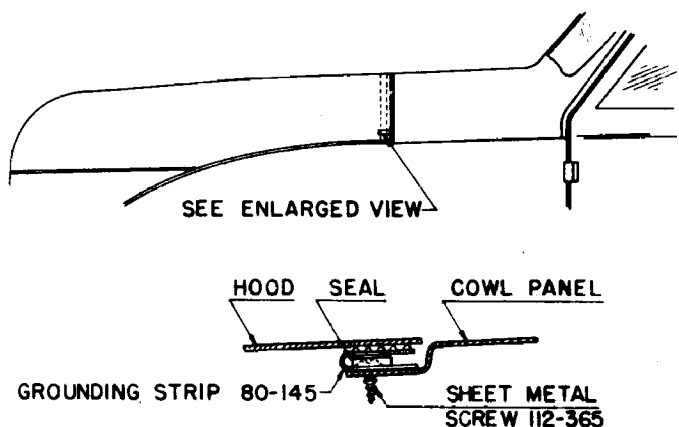


Fig. 6

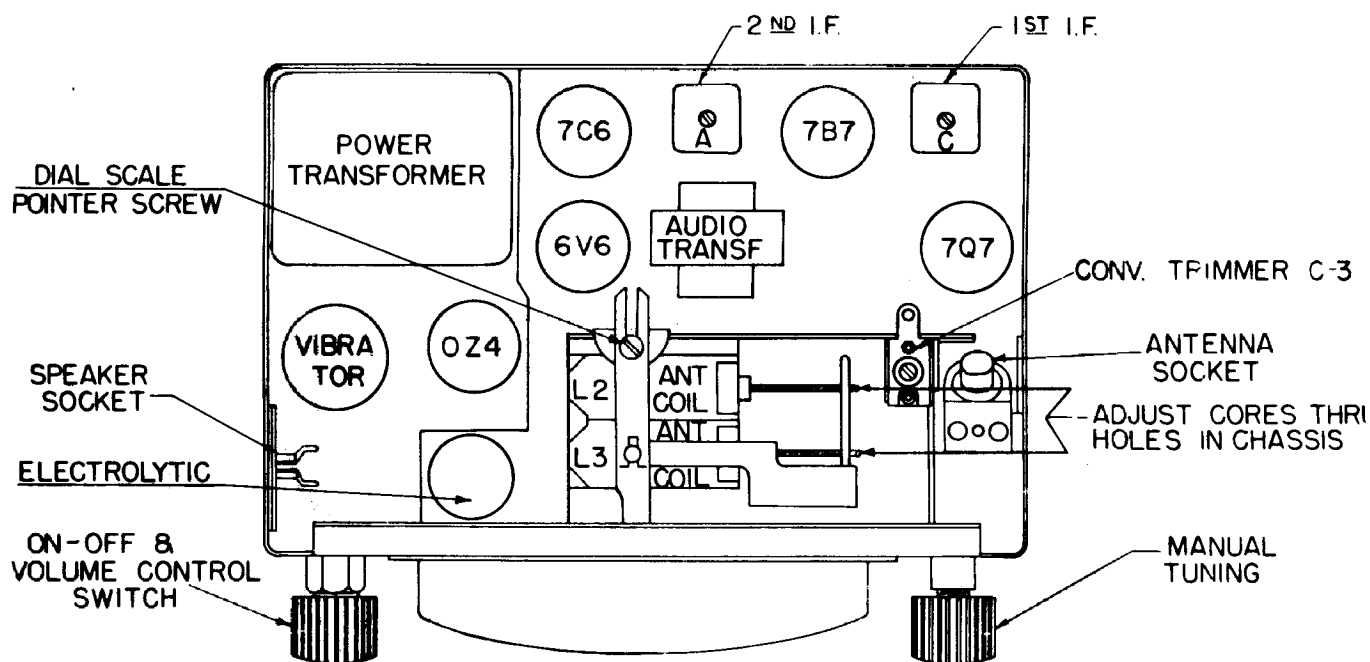


Fig. 7. Top View of Chassis

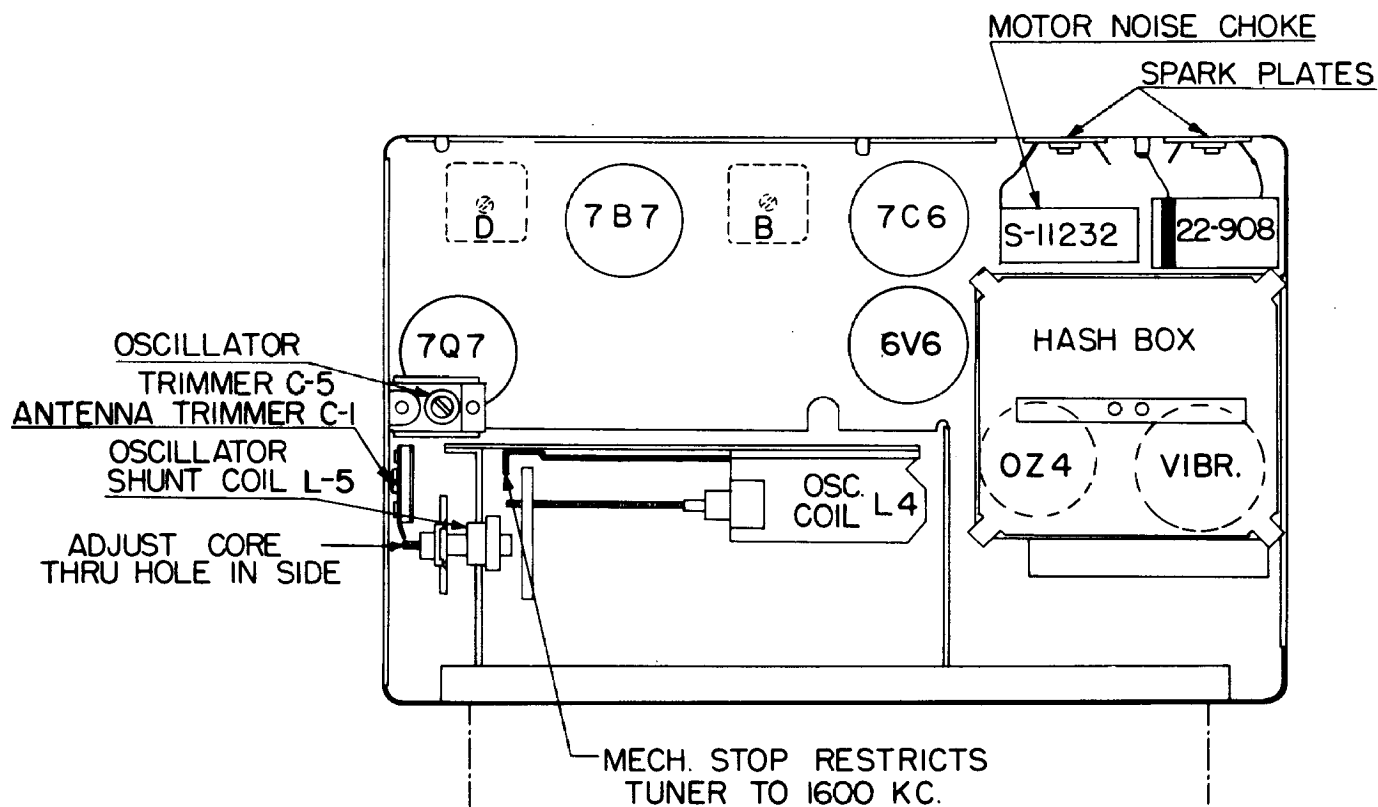


Fig. 8. Bottom View of Chassis

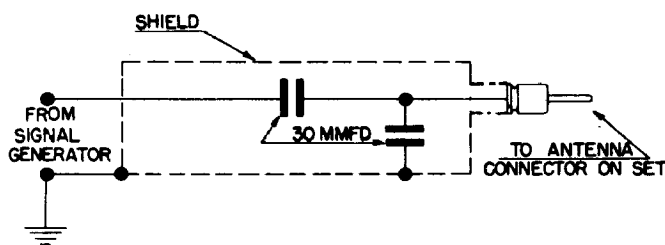


Fig. 9. Dummy Antenna

Fig. 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control set at maximum. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I. F. ALIGNMENT PROCEDURE

- 1—Remove top and bottom covers from receiver.
- 2—Set signal generator to 265 Kc.
- 3—Apply signal from generator through a .1 Mfd. dummy to 7Q7 converter grid. (Pin No. 6 on socket.)
- 4—Adjust I.F. slugs A, B, C and D (Figs. 7 and 8), in the order named for maximum output. Repeat the operation to assure accurate alignment.

R. F. AND OSCILLATOR ALIGNMENT

- 1—Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver. This is important.
- 2—Set signal generator to 535 Kc.
- 3—Set dial to 535 Kc. (End of travel, against the stop.)
- 4—Adjust oscillator trimmer C-5 (Fig. 8) for maximum response.
- 5—Set signal generator to 1200 Kc.
- 6—Tune set to 1200 Kc.
- 7—Adjust converter trimmer C-3 (Fig. 7) and Ant. trimmer C-1 (Fig. 8) for maximum response.
- 8—If dial calibration is off after making above adjustments, a correction can be made by turning eccentric screw at fulcrum of dial pointer. (Fig. 7.)

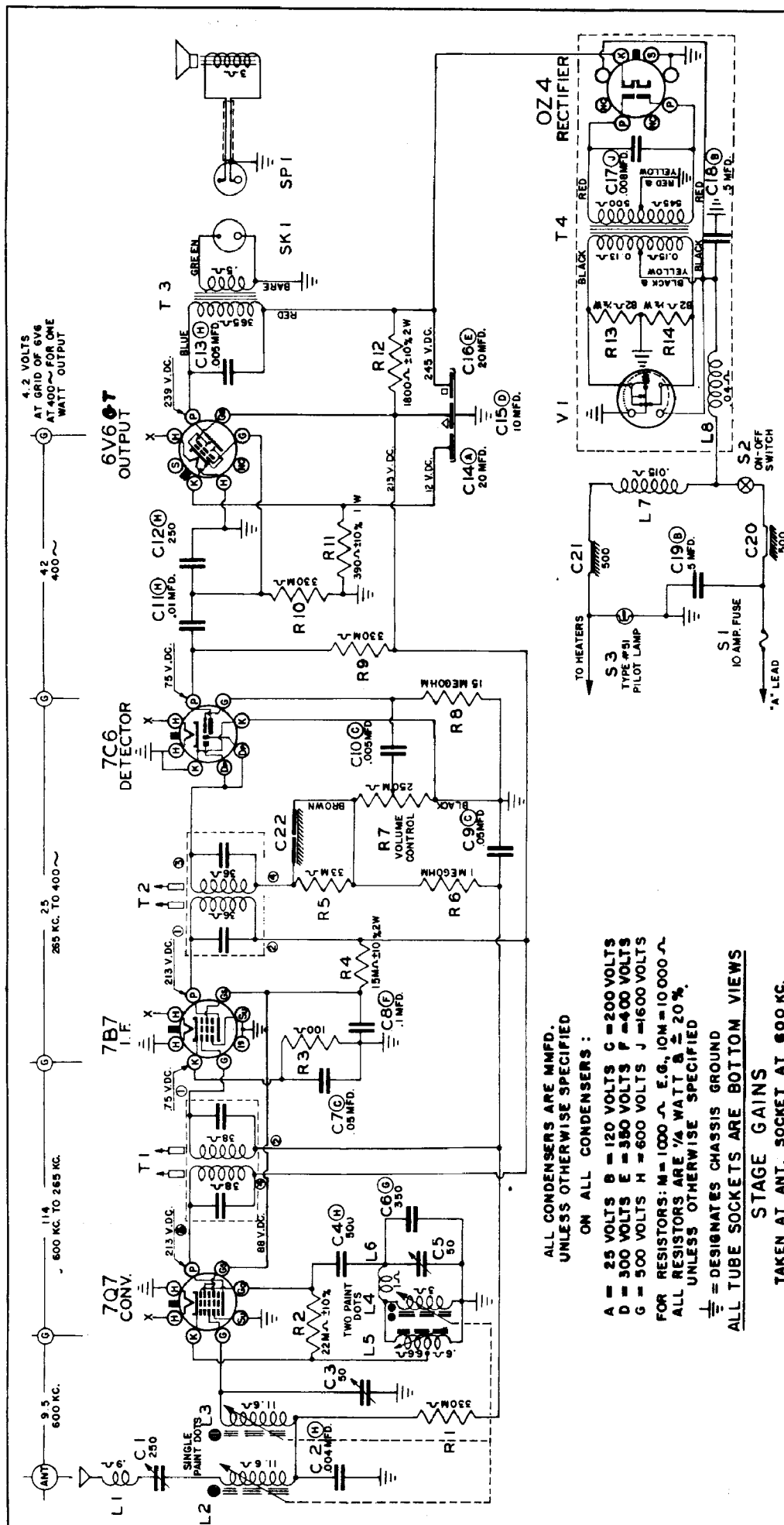
CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

- 1—Replace coil or core.
- 2—Set signal generator to 1675 Kc.
- 3—Connect signal generator leads through dummy, illustrated in Figure 9, to antenna receptacle on the receiver. This is important.
- 4—Set receiver dial to 1600 Kc. (maximum high frequency end of dial.)
- 5—Break cement loose on all cores and, using the special tuning wrench part No. S-13064, screw the core completely out of the antenna coil, the converter coil, and the oscillator coil.
- 6—Adjust oscillator trimmer C-5 (Fig. 8) at 1675 Kc.
- 7—Adjust converter trimmer C-3 and antenna trimmer C-1 (Fig. 7 and 8) for maximum output reading.
- 8—Replace cores to their approximate original position.
- 9—Set generator and receiver dial to 1200 Kc.
- 10—Adjust oscillator core L-4 (Fig. 8) to scale at 1200 Kc.
- 11—Adjust the two antenna cores L2 and L3 (Fig. 7) for maximum output reading. Do not adjust trimmers.
- 12—Set signal generator to 600 Kc.
- 13—If necessary, "rock in" shunt oscillator core L-5 (Fig. 8) for maximum output reading. This should be done only as a last resort, as the core has been set and sealed and should not require adjustment.
- 14—Check receiver at 1200 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.
- 15—After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station near 1200 Kc.



**SCHEMATIC DIAGRAM FOR 5 TUBE
CROSLLEY 5MX080**

I. F. 265 KC.
TUNING RANGE 540 KC. TO 1600 KC.
ZENITH RADIO CORPORATION
CHICAGO 39, ILLINOIS
U. S. A.

SCHEMATIC

Fig. 10

PARTS LIST CROSLEY AUTOMOTIVE RECEIVER

MODEL 5MX080 (CHASSIS 5C80)

DIAL AND TUNING MECHANISM ASSEMBLY

Diagram No.	Part No.	Description
	26-380	Dial scale
	57-1228	Escutcheon
	59-180	Dial pointer
	80-329	Gear indexing spring
	80-331	Cross arm return spring
	80-379	Pointer retainer spring
S-3	100-32	Dial light bulb
	149-44	Adjusting spring and core (3 used)
	188-45	Turret screw lock ring
	S10826	Solenoid end plug and brkt. assem.
	S12439	Pointer mtg. brkt. and stud assem.
	S12440	Pointer drive brkt. and stud assem.
	S12447	Dial light socket and wire assem.
	S12594	Manual tuner assem. (final)
	S13156	Tuning and vol. con. knob assem. (46-639 red)
	S13161	Tuning shaft and gear assem.
	S13162	Mtg. plate and retaining strip assem.
	S13178	Cross arm assem.
	S13238	Turret assem.

CHOKES AND COILS

L8	20-213	Main hash choke
T1	95-1003	1st I.F. transformer
T2	95-1004	2nd I.F. transformer
L1	S8819	Ant. motor noise choke assem.
	S11040	R. F. coil and shield assem.
L6	S11229	Osc. series coil assem.
L7	S11232	Motor noise choke coil assem.
L4	S12053	Osc. tuning coil assem.
L2		
L3	S12060	R. F. coil tuning assem. (2 used)
L5	S13155	Osc. shunt coil assem.
	S13160	Ant. coil and shield assem.

CONDENSERS

C- 8	22-170	.1 mfd.	400 volt
C-12	22-182	250 mmfd.	600 volt
C- 9	22-250	.05 mfd.	200 volt
C- 4	22-716	500 mmfd.	600 volt
C-13	22-838	.005 mfd.	600 volt
C-10	22-906	.005 mfd.	200 volt
C-18			
C-19	22-908	.5 mfd.	120 volt
C-11	22-1170	.01 mfd.	600 volt
C-22	22-1076	Dual 250 mmfd.	100 volt
C- 7	22-250	.05 mfd.	200 volt
C- 2	22-1244	.004 mfd.	600 volt
C- 3	22-1376	Detector trimmer	
C- 5	22-1378	Oscillator trimmer	
C-14	22-1387	Dry electrolytic—20 mfd.—25 v. x	
C-15		10 mfd.—300 v. x 20 mfd.—	
C-16		350 volt	
C- 1	22-1420	Antenna trimmer	
C-17	22-1448	.008 mfd.	1600 volt
C- 6	22-1641	350 mmfd.	500 volt

RESISTORS

R- 4	63-942	15M ohm	2 watt insl.
R-12	63-1368	1800 ohm W.W.	2 watt insl.
R-11	63-1372	390 ohm W.W.	1 watt insl.

Diagram

No.	Part No.	Description	
R- 6	63-1390	1 megohm	¼ watt insl.
R- 5	63-1391	33M ohm	¼ watt insl.
R- 1			
R- 9	63-1392	330M ohm	¼ watt insl.
R-10			
R- 2	63-1395	22M ohm	¼ watt insl.
R-13			
R-14	63-1399	82 ohm	½ watt insl.
R- 8	63-1400	15 megohm	¼ watt insl.
R- 3	63-1414	100 ohm	¼ watt insl.
R- 7	63-1513	Vol. con. and sw.	

MISCELLANEOUS

	52-294	Vol. con. cable
	52-397	Speaker cable and plug
	52-417	Battery cable (set to fuse)
	52-418	Battery cable (fuse to ammeter)
	54-184	Set spacer nut (used on 63-1513)
	78-281	Vibrator socket
	78-596	Loktal base tube socket (8 contact)
	78-684	Octal base tube socket (moulded)
	78-749	Speaker plug socket
	78-756	Loktal base tube socket
	78-758	Octal base tube socket
	93-456	Vibrator cushion washer
T-3	95-915	Output transformer
T-4	95-1002	Power transformer
S-1	136-15	10 amp. fuse (3AG)
V-1	190-20	Vibrator
	202-486	Instruction book
	S11391	Ant. con. socket and brkt. assem.

SPEAKER AND GASKET ASSEMBLY

	S13173	Speaker and gasket assem. (comp.)
SP-1	49-576	6" x 9" P.M. speaker
	196-91	Speaker gasket and screen
	208-576	Cone and voice coil assem.

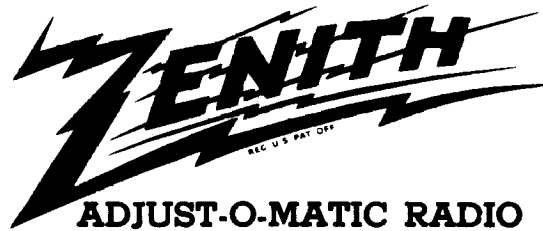
KNOB KIT

	S13171	Knob kit (complete)
	S13156	Tuning and vol. con. knob assem. (46-639 red)

SET INSTALLATION KIT

	S13172	Set installation kit (complete)
	12-1293	Set mtg. brkt.
	22-919	Fuel gauge cond.
	22-920	Generator cond.
	54-19	No. 10—32 x 3/8 x 3/16 Thick hex nut
	54-104	¼—20 x ½ x 3/16 hex nut (1 used)
	54-153	7/16—28 x 1 1/32 x 120 hex nut (2 used)
	54-174	¼—20 wing nut (1 used)
	63-1046	Distributor suppressor
	80-145	Motor hood bond spring
	83-1335	Grounding strip
	93-161	¼" external shakeproof lockwasher
	93-369	No. 10 internal shakeproof lockwsh'r
	93-577	.062 x 1 1/4 x 3/4 steel washer
	112-365	No. 8 x ½ B.H. sheet metal screw
	112-668	No. 10—32 x 3/8 B.H.M.S.
	114-279	¼—20 x 1 hex hd. M.S.
	188-41	Set spacer ring

SERVICE MANUAL



Model
6MF080
Ford Part
51A-18805-A1

Made for FORD by ZENITH RADIO CORPORATION, Chicago 39, Illinois, U. S. A.

Electrical Specifications

TUNING RANGE:.....	540-1600 Kc.	SPEAKER:.....	6" x 9" oval, instrument panel mounting.
INTERMEDIATE FREQUENCY:.....	265 Kc.	CURRENT CONSUMPTION:.....	7.5 amperes
SENSITIVITY:.....	6 microvolts at one watt output.	INSTANTANEOUS CURRENT CON- SUMPTION DURING AUTOMATIC CHANGE CYCLE:	20 amperes
UNDISTORTED POWER OUTPUT:	2.5 watts measured at the voice coil.	TUBE COMPLEMENT:.....	7A7 R.F., 7B8 converter, 7A7 I.F., 7B6 detector and 1st audio, 7C5 power output, 7Y4 rectifier.
MAXIMUM POWER OUTPUT:.....	4.5 watts measured at the voice coil.		

IMPORTANT

The Warranty Tag must be filled in, by car dealer, at the time of sale and must accompany each receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail.

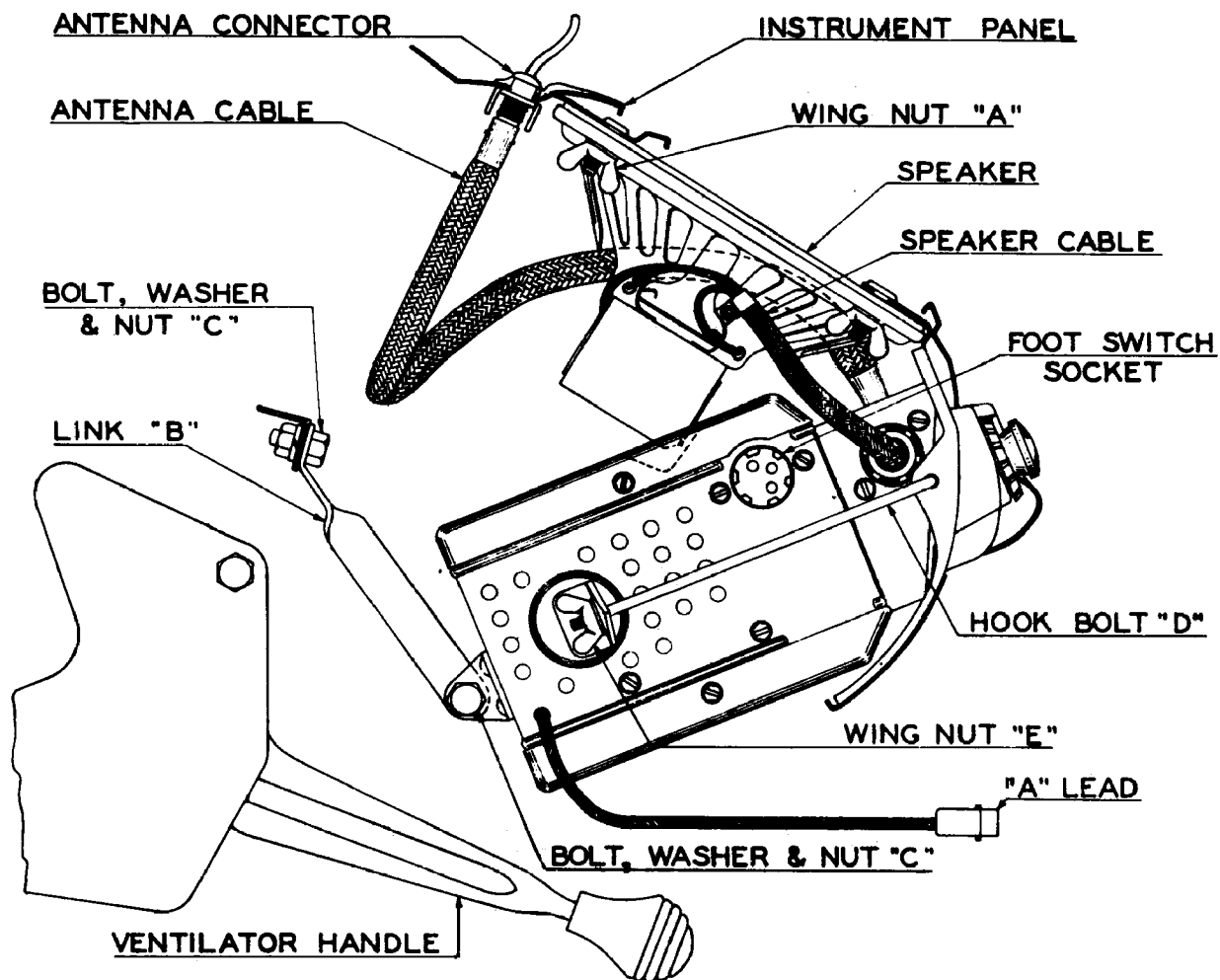


Fig. 1. Set Installed, Cut Away View.

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the installed receiver, the escutcheon plate, and the control knobs, are given here to facilitate removal and reinstallation of this receiver when service or repair is necessary. To take the receiver from the car, remove the link "B" and loosen the hook bolts "D."

MANUAL TUNING

1. Press station selector touch bar (Fig. 2) several times or until the letter "M" appears in indicator window.
2. Pull manual tuning control knob (right hand) outward and turn to tune in desired station. Be sure to tune to exact frequency to assure the best tone quality.

VOLUME—Adjust left hand control knob for desired volume.

tone control—The tone control is located behind the volume control knob. Turn in either direction for most pleasing tone.

ADJUST-O-MATIC TUNING

There are five automatic tuning positions which may be adjusted to five desired stations. If these positions have not been previously adjusted proceed as follows:

1. Press station selector touch bar until number 1 appears in station indicator window.

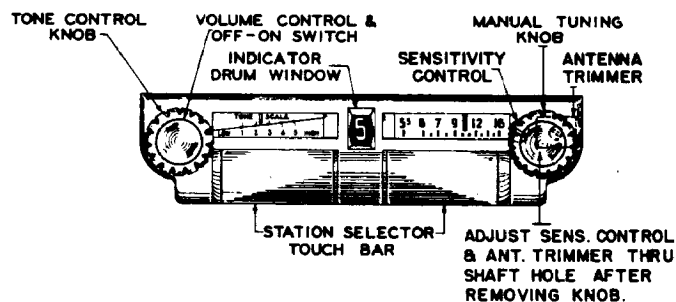


Fig. 2. Front Panel View

2. Pull manual tuning knob outward to engage the adjust-o-matic mechanism.
3. Select the station desired and tune to its frequency by turning the tuning knob. Tune very carefully for clearest reception.
4. Press station selector bar, pull manual tuning knob outward and tune in station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five adjust-o-matic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the station selector bar to return to dial tuning, or to only one of the stations set up on the Adjust-o-Matic.

DELAYED AUTOMATIC MUTING CIRCUIT

Pressing either the touch-bar or the foot control switch automatically mutes the receiver for the duration of the change cycle. This action is accomplished by applying 6 volts negative to the 7B6 first audio grid through the 1 megohm resistor R-21. (See schematic diagram.) This negative voltage blocks the grid of the 7B6 until the voltage bleeds off through the 15 megohm resistor R-14. Then the receiver will again operate normally.

NOTE: If the battery polarity is reversed the receiver will not mute and it may become distorted during the change cycle. Always connect the positive (+) terminal of the storage battery or power supply to the receiver case when checking the receiver.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition system if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The circuit breaker condenser No. 22-1148 should be installed as shown in Figure 3.

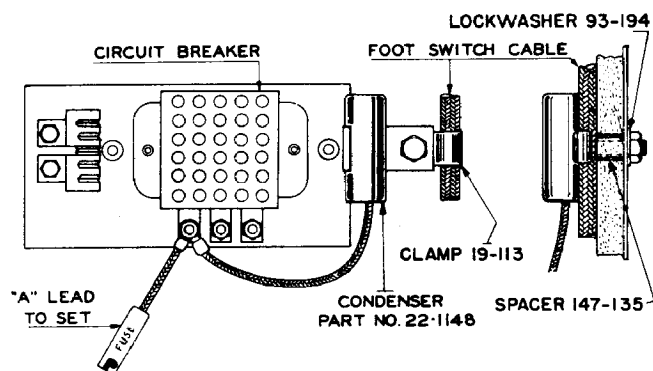


Fig. 3

The voltage regulator condenser No. 22-1148 and the ground strap should be installed as shown in Figure 4 below.

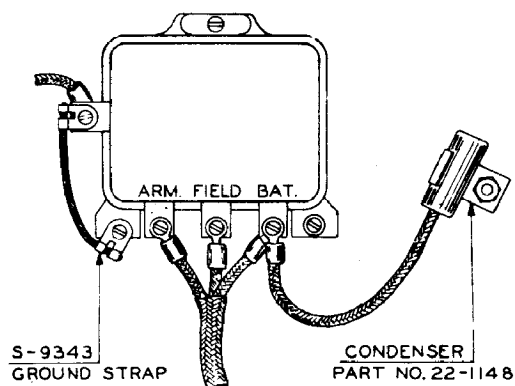


Fig. 4

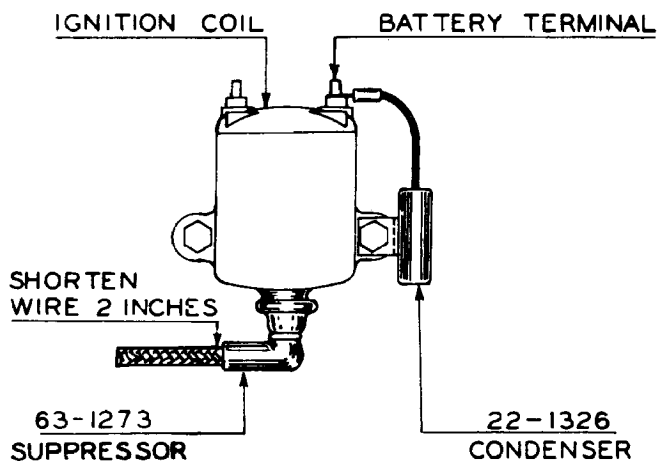
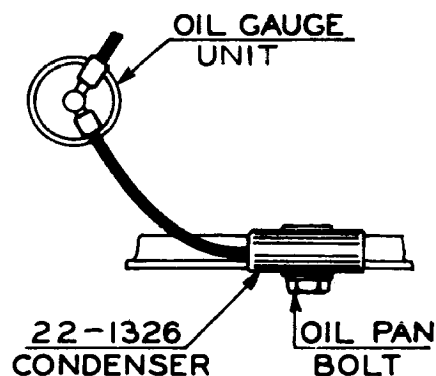
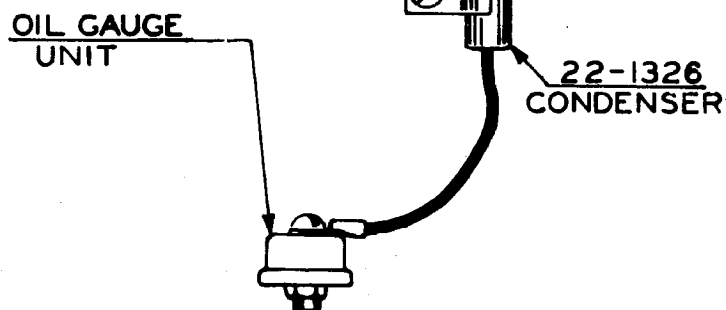


Fig. 5

The ignition coil condenser No. 22-1326 and suppressor with rubber nipple No. S-10408 should be installed as shown above in Figure 5. The oil gauge condenser No. 22-1326 should be installed as shown in Figure 6. Note the different locations for 6 and 8 cylinder cars.



6 CYLINDER CAR
SCREW INTO
FIREWALL



8 CYLINDER CAR

Fig. 6

Be sure the inside windshield divider trim strip, the antenna connector and all the instrument panel bolts are tight in order to make a good ground contact with the car body.

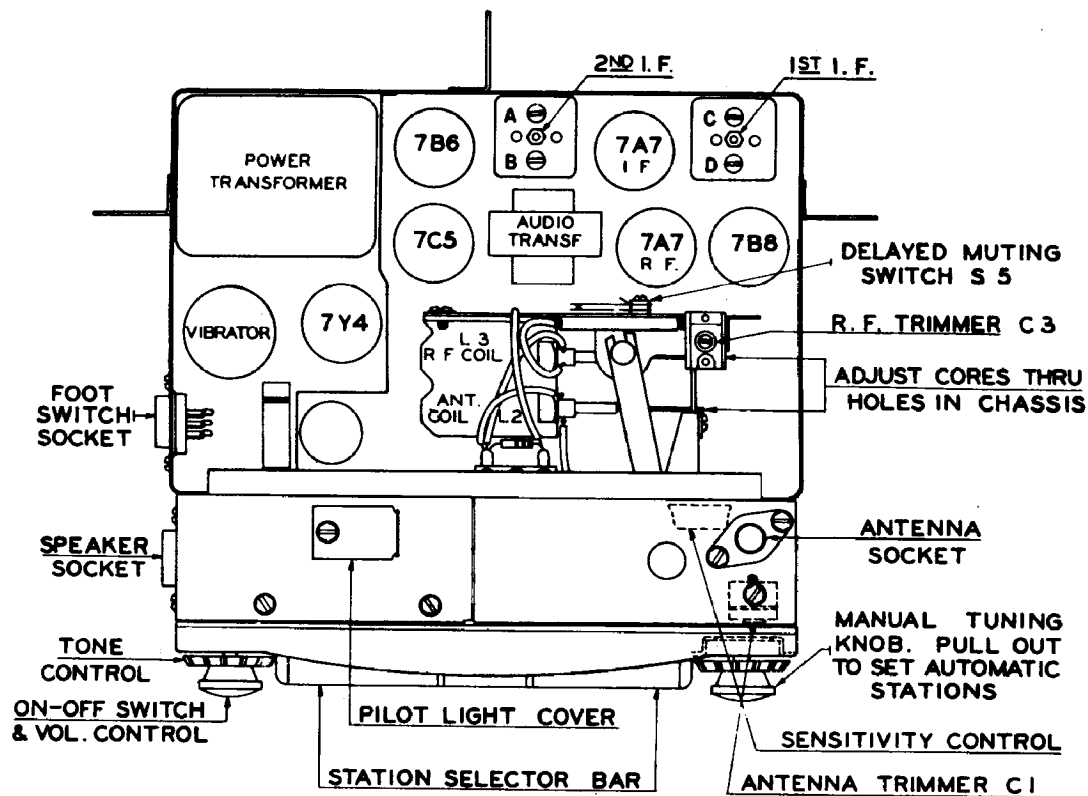


Fig. 7. Top View of Chassis

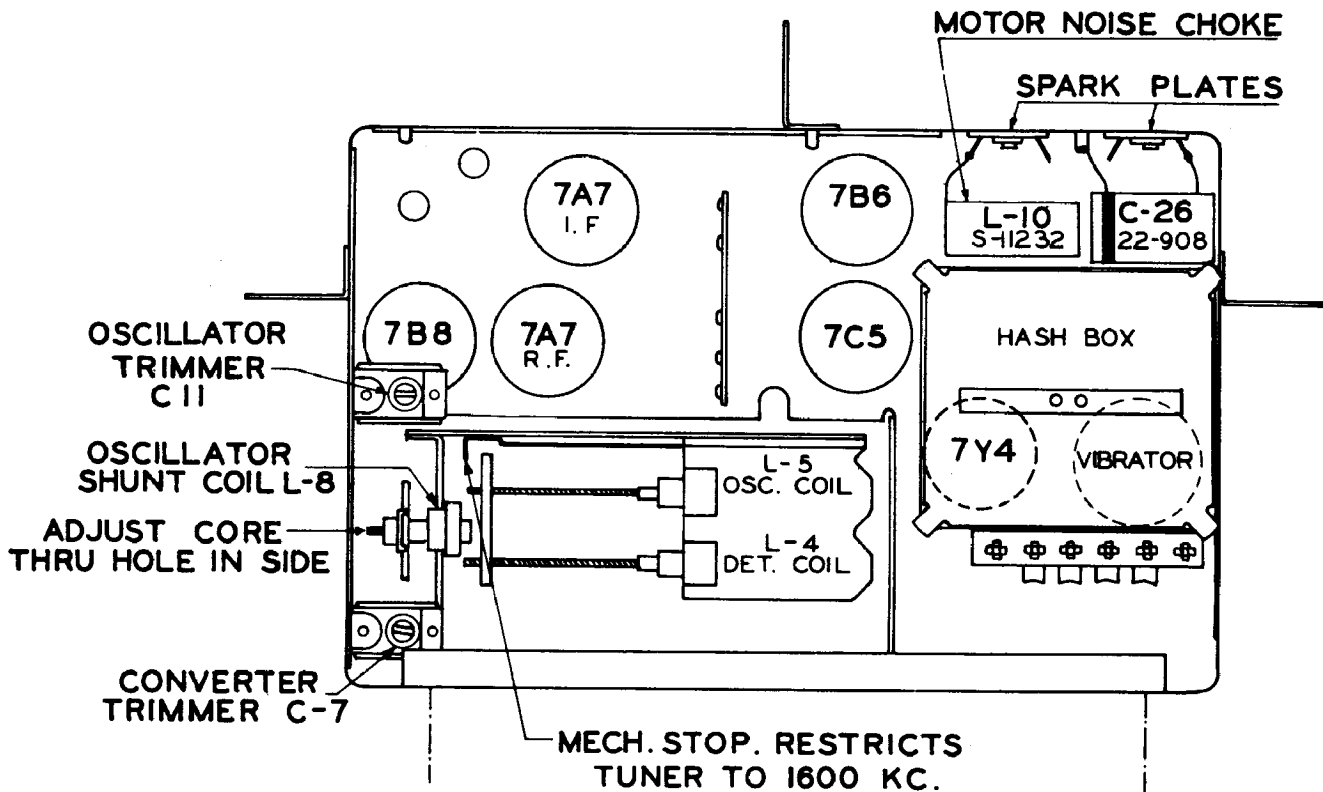


Fig. 8. Bottom View of Chassis

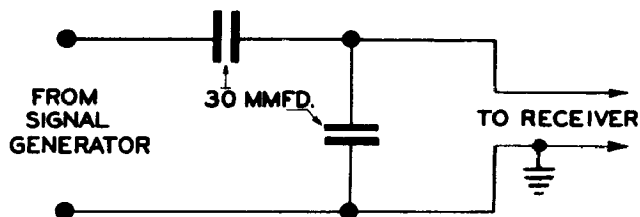


Fig. 9. Dummy Antenna

Fig. 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

- 1—Remove top and bottom covers from receiver.
- 2—Set signal generator to 265 Kc.
- 3—Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
- 4—Adjust I.F. trimmers A, B, C and D (Fig. 7) in the order named for maximum output. Repeat the operation to assure accurate alignment.

R.F. AND OSCILLATOR ALIGNMENT

- 1—Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver.
- 2—Set signal generator to 535 Kc.
- 3—Place set in manual tuning position and set dial to 535 Kc.
- 4—Adjust oscillator trimmer C-11 (Fig. 8) for maximum response.
- 5—Set signal generator to 1200 Kc.
- 6—Tune set to 1200 Kc.
- 7—Adjust converter trimmer C-7 (Fig. 8) and R.F. trimmer C-3 (Fig. 7) for maximum response.
- 8—If dial calibration is off after making above adjustments, a correction can be made by loosening dial scale mounting screws and sliding scale to desired position.

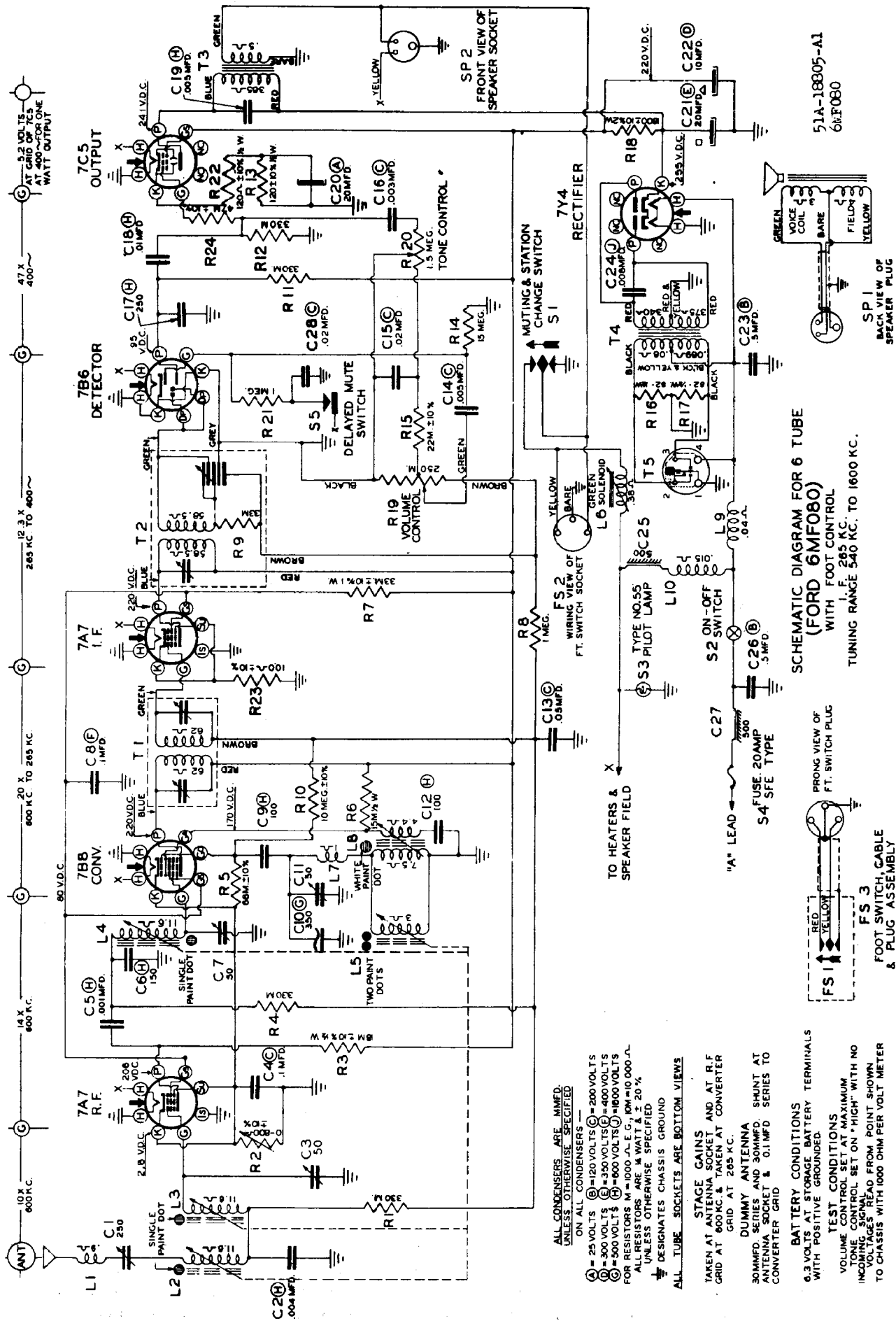
CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

- 1—Replace coil or core.
- 2—Set signal generator to 1700 Kc.
- 3—Connect signal generator leads through dummy, illustrated in Figure 9, to antenna receptacle on the receiver.
- 4—Set receiver dial to 1600 Kc. (maximum high frequency end of dial.)
- 5—Screw the core completely out of the antenna coil, the R.F. coil, the converter coil, and the oscillator coil.
- 6—Adjust oscillator trimmer C-11 (Fig. 8) at 1700 Kc.
- 7—Adjust converter trimmer C-7, R.F. trimmer C-3, and antenna trimmer C-1 (Fig. 7 and 8) for maximum output reading.
- 8—Replace cores to their approximate original position.
- 9—Set generator dial and receiver dial to 1200 Kc.
- 10—Adjust oscillator core L-5 (Fig. 8) to scale at 1200 Kc.
- 11—Adjust the antenna core, R.F. core, and converter core (Fig. 7 and 8) for maximum output reading.
- 12—Set signal generator to 600 Kc.
- 13—"Rock in" shunt oscillator coil L-8 (Fig. 8) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a ganged condenser receiver.
- 14—Check receiver at 1200 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.
- 15—After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1200 Kc.



PARTS LIST MODEL 6MFO80 (CHASSIS 6C80)

1946 FORD ADJUST-O-MATIC 51A-18805-A1

COILS AND CHOKES

Diagram No.	Part No.	Description
L 9	20-213	Main hash choke
T 1	95-916	1st I.F. transformer
T 2	95-942	2nd I.F. transformer
L 1	S8819	Antenna motor noise choke assem.
L 7	S11229	Oscillator series coil assem.
L 8	S11231	Oscillator shunt coil assem.
L10	S11232	Motor noise choke coil assem.
L 2 } L 3 }	S11040	Ant. & R.F. Coil Assem. (Right Hand)
L 4 } L 5 }	S11041	Osc. & Converter Coil Assem. (Left Hand)

Note: In ordering coils marked *, be sure to give color code information.

CONDENSERS

C 9 } C12 }	22-162	100 mmfd. 600 volt
C 8	22-170	.1 mfd. 400 volt
C17	22-182	250 mmfd. 600 volt
C 4	22-190	.1 mfd. 200 volt
C13	22-250	.05 mfd. 200 volt
C19	22-838	.005 mfd. 600 volt
C14	22-906	.005 mfd. 200 volt
C23 } C26 }	22-908	.5 mfd. 120 volt
C 6	22-1137	150 mmfd. 600 volt
C 5	22-1169	.001 mfd. 600 volt
C18	22-1170	.01 mfd. 600 volt
C16	22-1180	.003 mfd. 200 volt
C 2	22-1244	.004 mfd. 600 volt
C15 } C28 }	22-1270	.02 mfd. 200 volt
C 1	22-1375	Antenna trimmer
C 3	22-1376	R.F. trimmer
C 7	22-1377	Detector trimmer
C11	22-1378	Oscillator trimmer
C20 } C21 } C22 }	22-1387	20 MFD. 25 W.V. Electrolytic 20 MFD. 350 W.V. Electrolytic 10 MFD. 300 W.V. Electrolytic
C24	22-1448	.008 mfd. 1600 volt
C10	22-1478	350 mmfd. compensator

RESISTORS

R19 } R20 } S 2 }	63-1333	Tone control, vol. control & sw.
R18	63-1368	1800 ohm 2 watt W.W.
R 2	63-1379	Sensitivity control
R 8 } R21 }	63-1390	1 megohm 1/4 watt
R 1 } R 4 } R11 } R12 }	63-1392	330 M ohm 1/4 watt
R15	63-1395	22 M ohm 1/4 watt
R 5	63-1396	68 M ohm 1/4 watt

Diagram No.	Part No.	Description
R 7	63-1398	33 M ohm 1 watt
R16 } R17 }	63-1399	82 ohm 1/2 watt
R14	63-1400	15 megohm 1/4 watt
R 6	63-1401	15 M ohm 1/2 watt
R22 } R13 }	63-1410	120 ohm 1/2 watt
R 3	63-1411	1800 ohm 1/2 watt
R10	63-1413	10 meg. 1/4 watt
R23	63-1414	100 ohm 1/4 watt
R24	63-1417	47,000 ohm 1/4 watt

MISCELLANEOUS

SP1	49-539	6" x 9" dynamic speaker
	52-200	Battery cable (fuse to ammeter)
	52-251	Antenna cable
	52-284	Battery cable (set to fuse)
	78-251	Antenna connector socket
	78-281	Vibrator socket
	78-596	Tube socket—Loktal base (8 cont.)
SP2	78-645	Speaker plug socket
FS2	78-646	Foot switch cable plug socket
	93-456	Vibrator cushion washer
T4	95-914	Power transformer
T3	95-915	Output transformer
S4	136-12	Fuse—20 amp.
	159-54	Plug button
T5	190-20	Vibrator
	196-54	Speaker gasket and screen
	202-374	Instruction book
S1	S11270	Hand selector & muting switch assem.
FS3	S12040	Foot switch, cable & plug assem.

DIAL AND TUNING MECHANISM ASSEMBLY

26-330	Dial scale (manual tuning)
34-132	Indexing disc
34-133	Ratchet gear
34-140	Volume control gear
34-141	Idler gear
46-524	Tone control knob
46-527	Volume control knob
46-528	Selector knob—L.H.
46-583	Selector knob—R.H.
57-1029	Escutcheon
59-151	Dial pointer
59-169	Tone control pointer
73-02	No. 6-32 x 3/16 headless set screw
80-232	Knob retaining spring
80-329	Gear indexing spring
80-331	Cross arm return spring
80-332	Cam lever spring
80-336	Ratchet gear return spring

DIAL AND TUNING MECHANISM ASSEMBLY**(Continued)**

Diagram No.	Part No.	Description
S3	80-341	Kick-off spring
	80-342	Tuning shaft spring
	80-343	Solenoid switch spring
	80-344	Solenoid switch contact spring
	80-378	Selector knob spring
	80-379	Pointer return spring
	80-426	Pointer drive tension spring
	80-442	Selector knob spring
	100-31	Dial light bulb
	126-481	Dial glass shield
L6	149-44	Adjusting spring and core
	188-45	Turret screw lock ring
	192-82	Dial glass (2 used)
	S10826	Solenoid end plug & bracket assem.
	S10829	Solenoid and terminal assem.
	S10831	Ratchet and bracket assem.
	S10834	Mounting plate & lever assem.
	S10836	Cross arm assem.
	S11031	Dial drum and bracket assem.
	S11033	Tuning & trim knob assem. (46-525 & 526)
	S11051	Tuning shaft and gear assem.
	S11082	Turret assem.
	S11971	Dial light socket & wire assem.
	S11972	Selector knobs, housing & clamp assem.
	S12050	Tone control dial & pulley assem. (26-351)
	S12120	Dial cord and eyelet assem.

MOTOR NOISE SUPPRESSION KIT

Diagram No.	Part No.	Description
	S11278	Motor noise suppression kit complete
	22-1148	Voltage regulator & circuit breaker condenser
	22-1326	Distributor & oil gauge condenser
	54-68	5/16 - 18 x 9/16 x 7/32 hex nut
	63-1273	Distributor suppressor
	93-194	5/16 internal shakeproof lockwasher
	112-323	No. 12 x 1/2 R.H. S.T. screw
	114-249	5/16 x 18 x 1 3/4 hex Hd. M.S.
	147-135	Spacer

INSTALLATION PARTS

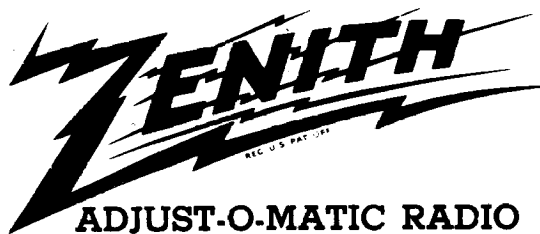
S11279	Set installation kit complete
19-113	Foot switch cable retaining clip
19-114	Foot switch cable retaining clip
54-123	No. 10-24 wing nut
54-157	1/4-20 x 7/16 x 3/32 hex nut
54-189	No. 8-32 wing nut
93-43	Ground strap
93-161	1/4" ext. shakeproof lockwasher
112-310	No. 10 x 1/2 R.H. S.M. screw
112-360	Set installation screw
114-175	1/4-20 x 1/2 hex. Hd. M.S.
118-30	Set installation link used on first 1500 sets only
118-36	Set installation link

SERVICE MANUAL

MERCURY
Model
6MM790
Mercury Part
59A-18805-A1

FORD
Model
6MF780
Ford Part
51A-18805-A1

MERCURY EXPORT
Model
6MM790-E
Mercury Part
59AF-18805



FORD EXPORT
Model
6MF780-E
Ford Part
51AF-18805

Made by ZENITH RADIO CORPORATION, Chicago 39, Illinois, U. S. A.

Electrical Specifications

TUNING RANGE:.....540-1600 Kc.

SPEAKER:.....6" x 9" oval, instrument
panel mounting.

INTERMEDIATE FREQUENCY:.....265 Kc.

CURRENT CONSUMPTION:.....6 amperes

SENSITIVITY:.....4 microvolts at one
watt output.

INSTANTANEOUS CURRENT CON-
SUMPTION DURING AUTOMATIC
CHANGE CYCLE:.....18.5 amperes

UNDISTORTED POWER OUTPUT:.....
2 watts measured at the voice coil.

TUBE COMPLEMENT:.....7A7 R.F.,
7B8 converter, 7A7 I.F., 7B6 detector
and 1st audio, 7C5 power output, 7Y4
rectifier.

MAXIMUM POWER OUTPUT:.....
4.5 watts measured at the voice coil.

IMPORTANT

The Warranty Tag must be filled in, by car dealer, at the time of sale and must accompany each receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail.

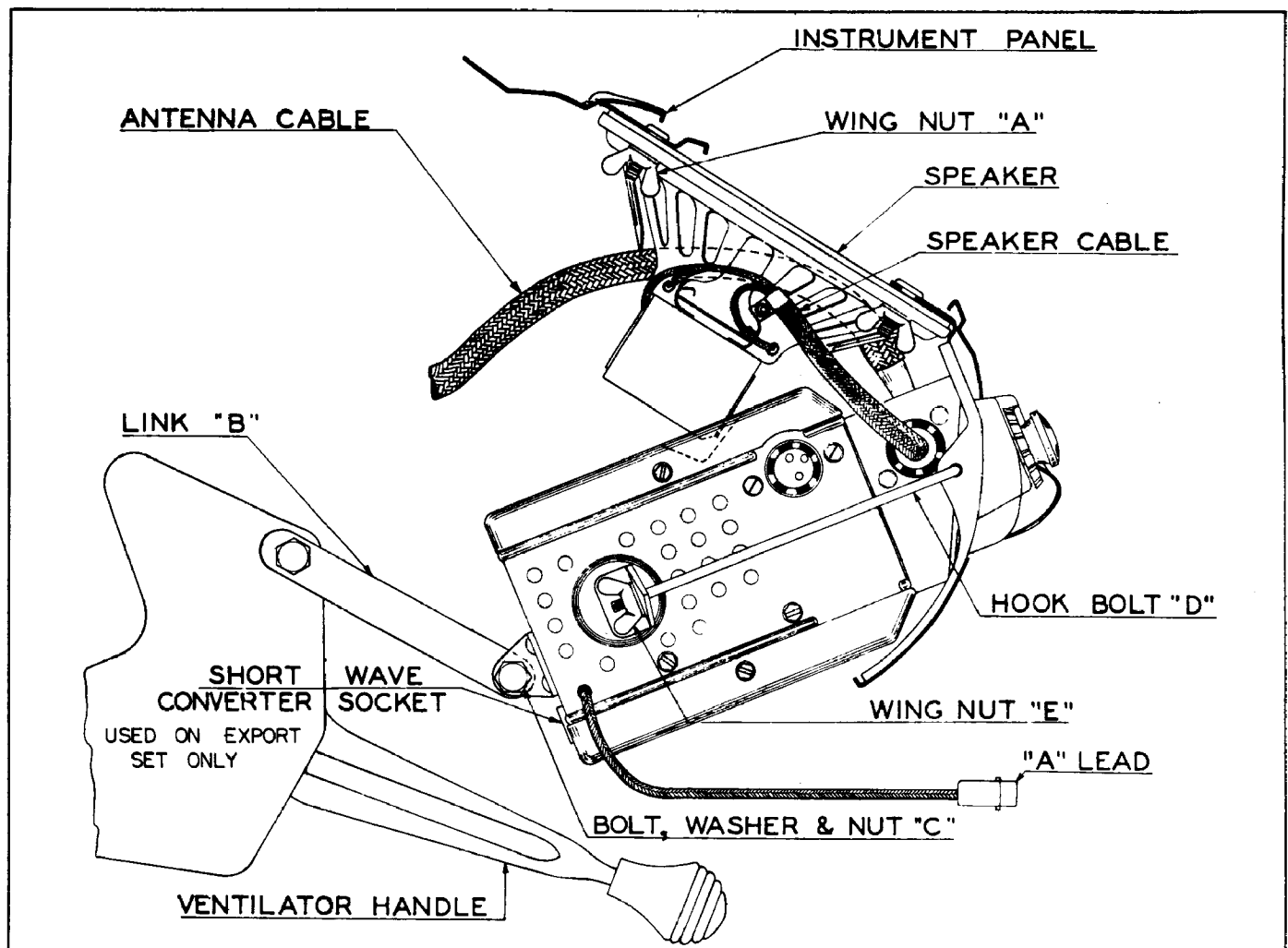


Fig. 1. Set Installed, Cut Away View.

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the installed receiver, the escutcheon plate, and the control knobs, are given here to facilitate removal and reinstallation of this receiver when service or repair is necessary. To take the receiver from the car, remove the link "B" and loosen the hook bolts "D."

MANUAL TUNING

1. Press station selector touch bar (Fig. 2) several times or until the letter "M" appears in indicator window.
2. Pull manual tuning control knob (right hand) outward and turn to tune in desired station. Be sure to tune to exact frequency to assure the best tone quality.

VOLUME—Adjust left hand control knob for desired volume.

tone control—The tone control is located behind the volume control knob. Turn in either direction for most pleasing tone.

ADJUST-O-MATIC TUNING

There are five automatic tuning positions which may be adjusted to five desired stations. If these positions have not been previously adjusted proceed as follows:

1. Press station selector touch bar until number 1 appears in station indicator window.

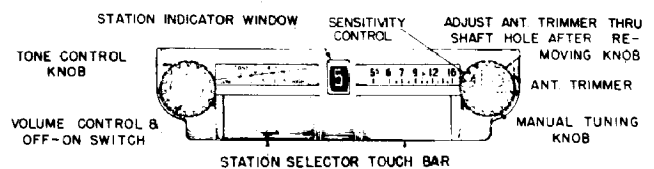


Fig. 2. Front Panel View

2. Pull manual tuning knob outward to engage the Adjust-o-Matic mechanism.
3. Select the station desired and tune to its frequency by turning the tuning knob. Tune very carefully for clearest reception.
4. Press station selector bar, pull manual tuning knob outward and tune in station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five adjust-o-matic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the station selector bar to return to manual tuning, or to any one of the stations set up on the Adjust-o-Matic.

DELAYED AUTOMATIC MUTING CIRCUIT

Pressing the touch-bar automatically mutes the receiver for the duration of the change cycle. This action is accomplished by applying 6 volts negative to the 7B6 first audio grid through the 1 megohm resistor R-21. (See schematic diagram.) This negative voltage blocks the grid of the 7B6 until the voltage bleeds off through the 15 megohm resistor R-13. Then the receiver will again operate normally.

NOTE: Delayed automatic muting circuit was omitted from sets, serial numbers ZF 185392 to ZF 240216 inclusive.

If the battery polarity is reversed the receiver will not mute and it may become distorted during the change cycle. Always connect the positive (+) terminal of the storage battery or power supply to the receiver case when checking the receiver.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The circuit breaker condenser No. 22-1148 should be installed as shown in figure 3 (Export only.)

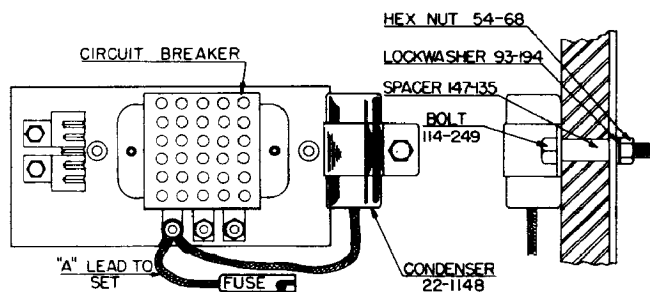
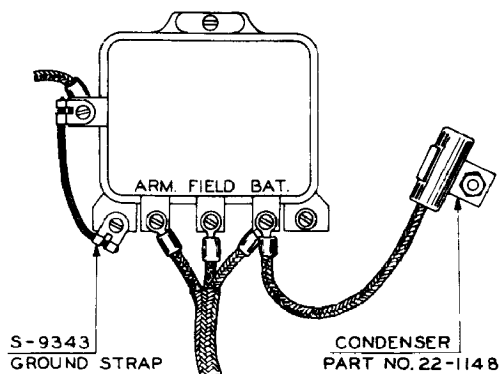


Fig. 3

The voltage regulator condenser No. 22-1148 and the ground strap should be installed as shown in figure 4 below.



CONDENSER ON VOLT. REGULATOR

Fig. 4

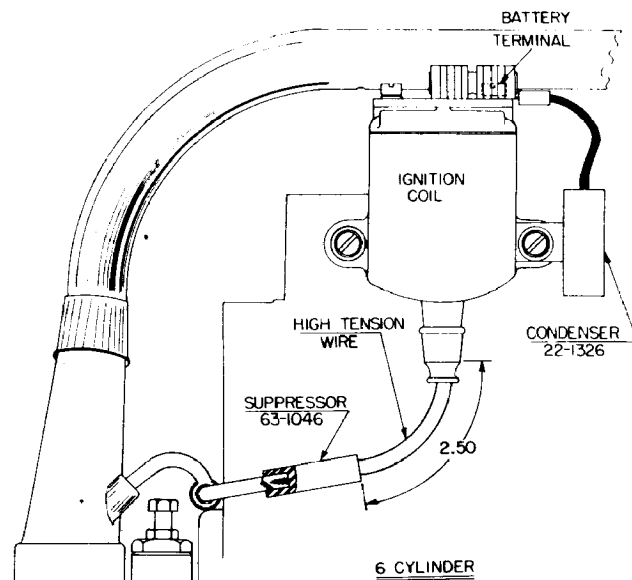


Fig. 5

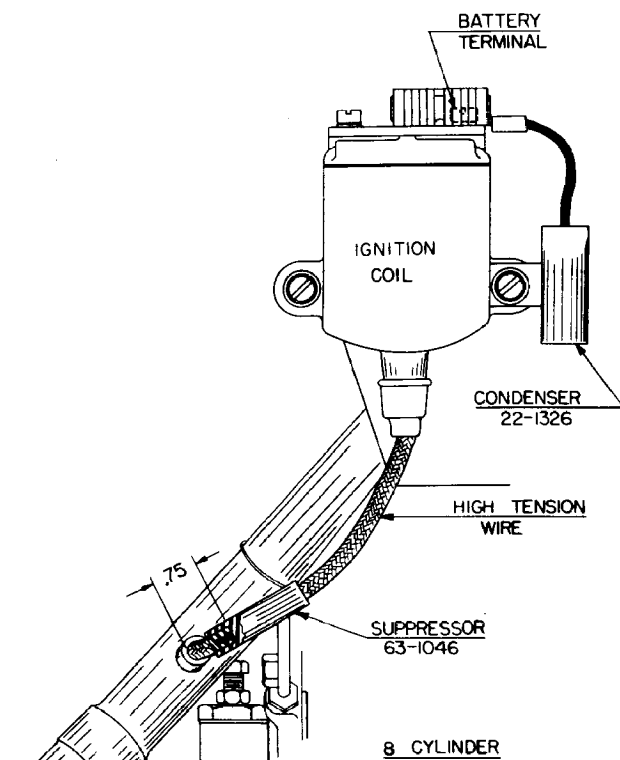


Fig. 6

The suppressor, No. 63-1046, and condenser, No. 22-1326, should be installed as shown in figure 5, for six cylinder cars, or as shown in figure 6, for eight cylinder cars.

If ignition interference is still present, check to make sure that the inside center windshield trim strip is grounded to the car body, and does not touch the antenna roof tube nut. Be certain the antenna wing nut and all the instrument panel bolts are tight.

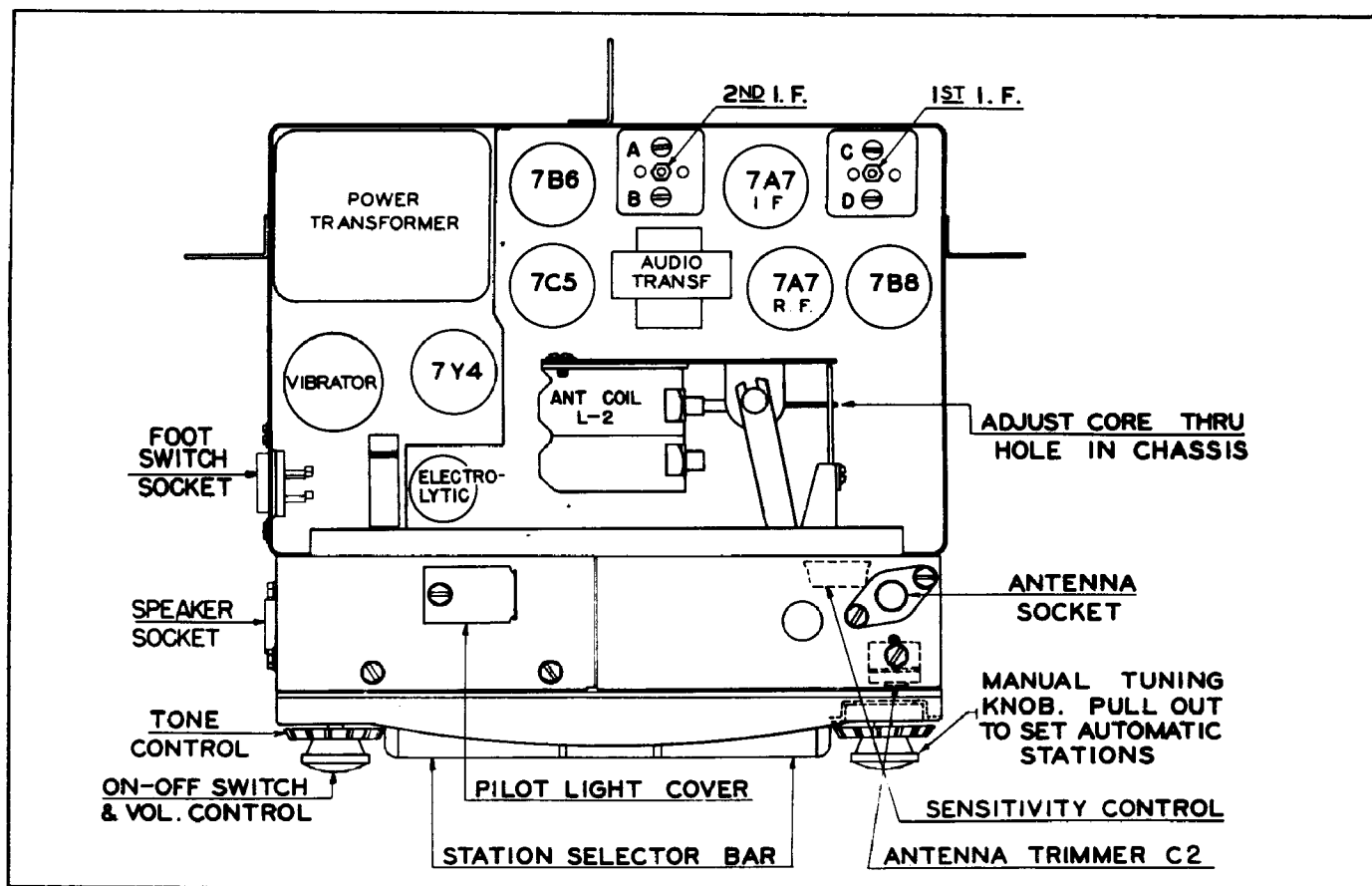


Fig. 7. Top View of Chassis

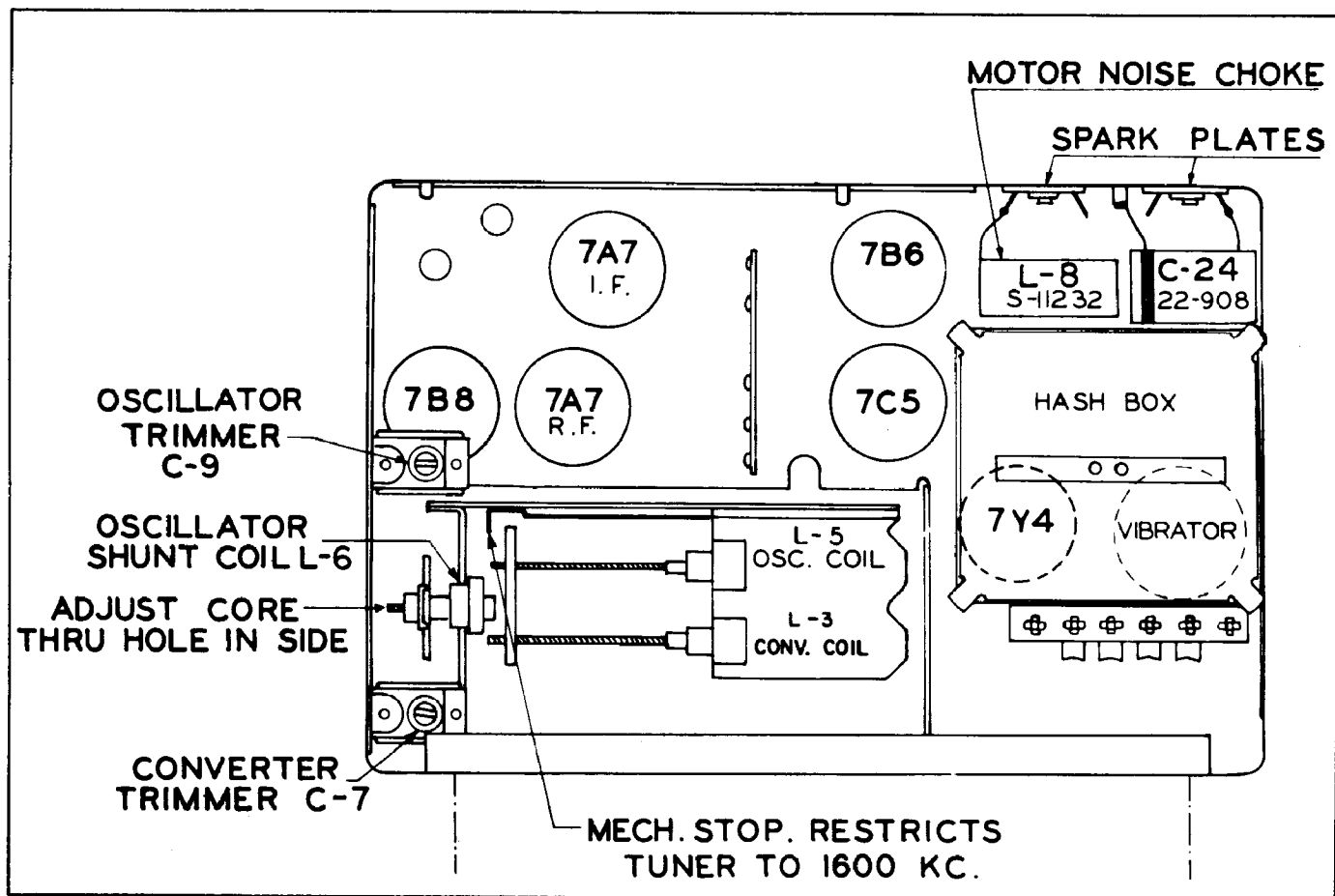


Fig. 8. Bottom View of Chassis

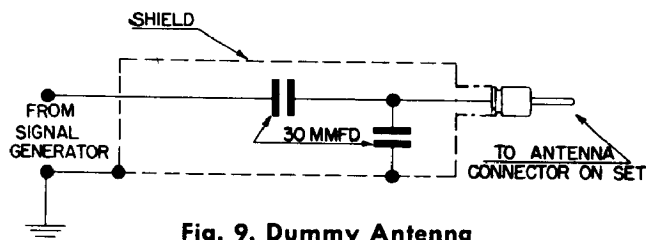


Fig. 9. Dummy Antenna

Fig. 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I. F. ALIGNMENT PROCEDURE

- 1—Remove top and bottom covers from receiver.
- 2—Set signal generator to 265 Kc.
- 3—Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
- 4—Adjust I.F. trimmers, A, B, C and D (Fig. 7) in the order named for maximum output. Repeat the operation to assure accurate alignment.

R. F. AND OSCILLATOR ALIGNMENT

- 1—Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver. This is important.
- 2—Set signal generator to 535 Kc.
- 3—Place set in manual tuning position and set dial to 535 Kc.
- 4—Adjust oscillator trimmer C-9 (Fig. 8) for maximum response.
- 5—Set signal generator to 1200 Kc.
- 6—Tune set to 1200 Kc.
- 7—Adjust converter trimmer C-7 (Fig. 8) and antenna trimmer C-2 (Fig. 7) for maximum response.
- 8—If dial calibration is off after making above adjustments, a correction can be made by loosening dial scale mounting screws and sliding scale to desired position.

CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

- 1—Replace coil or core.
- 2—Set signal generator to 1700 Kc.
- 3—Connect signal generator leads through dummy, illustrated in figure 9, to antenna receptacle on the receiver.
- 4—Set receiver dial to 1600 Kc. (maximum high frequency end of dial.)
- 5—Screw the core completely out of the antenna coil, the converter coil, and the oscillator coil.
- 6—Adjust oscillator trimmer C-9 (Fig. 8) at 1700 Kc.
- 7—Adjust converter trimmer C-7, and antenna trimmer C-2 (Fig. 7 and 8) for maximum output reading.
- 8—Replace cores to their approximate original position.
- 9—Set signal generator dial and receiver dial to 1200 Kc.
- 10—Adjust oscillator core L-5 (Fig. 8) to scale at 1200 Kc.
- 11—Adjust the antenna core L-2, and converter core L-3 (Fig. 7 and 8) for maximum output reading.
- 12—Set signal generator to 600 Kc.
- 13—"Rock in" shunt oscillator coil L-6 (Fig. 8) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a ganged condenser receiver.
- 14—Check receiver at 1200 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.
- 15—After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1200 Kc.



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PARTS LIST MODEL 6MF780 (CHASSIS 6D80)

COILS AND CHOKES

Diagram No.	Part No.	Description	Price
L9	20-213	Main Hash Choke Coil.....	\$.35
T1	95-916	1st I.F. Transformer.....	1.75
T2	95-942	2nd I.F. Transformer.....	2.05
L1	S-8819	Antenna Motor Noise Choke Assembly.....	.26
L5	S-11041	Oscillator, Converter Coil & Shield Assembly (Left Hand).....	2.09
L4	S-11229	Oscillator Series Coil Assembly.....	.30
L8	S-11232	Motor Noise Choke Coil Assembly.....	.22
L6	S-13646	Oscillator Shunt Coil Assembly.....	1.80
L2	S-13650	R.F. Coil & Shield Assembly (Right Hand).....	1.50

CONDENSERS

C5			
C10	22-162	100 Mmfd. 600 V.....	.20
C11			
C13	22-170	.1 Mfd. 400 V.....	.26
C16	22-182	250 Mmfd. 600 V.....	.26
C4	22-190	.1 Mfd. 200 V.....	.23
C12	22-250	.05 Mfd. 200 V.....	.20
C3	22-365	100 Mmfd. 500 V.....	.20
C19	22-838	.005 Mfd. 600 V.....	.20
C14	22-906	.005 Mfd. 200 V.....	.20
C23 & C24	22-908	.5 Mfd. 120 V.....	.23
C6	22-1136	250 Mmfd. 500 V.....	.20
C1 & C17	22-1170	.01 Mfd. 600 V.....	.20
C18	22-1180	.003 Mfd. 200 V.....	.20
C15-C27	22-1270	.02 Mfd. 200 V.....	.20
C7	22-1377	Detector Trimmer.....	.33
C9	22-1378	Oscillator Trimmer.....	.32
C22	22-1448	.008 Mfd. 1600 V.....	1.00
C8	22-1478	350 Mmfd. Compensator.....	.32
C20-C21	22-1554	Two Section Electrolytic— 10 Mfd. 300 V. x 20 Mfd.—350 V.....	1.38
	22-1643	Antenna Trimmer.....	.45
C20-C21	22-1644	20 Mfd. 350 W. V.—10 Mfd. 300 W.V. Electrolytic.....	1.38

RESISTORS

R11			
R16	63-1333	Tone Control, Volume Control & Switch.....	3.01
S2			
R18	63-1368	1800 Ohm, W.W. Insul., 2 W.....	.33
R17	63-1369	270 Ohm, W.W. Insul., 1 W.....	.22
R2	63-1379	Sensitivity Control (or 63-1267).....	.35
R9	63-1390	1 Megohm, Insul., ¼ Watt.....	.19
R1, R4, R14, R15	63-1392	330,000 Ohm, Insul., ¼ Watt.....	.19
R12	63-1395	22,000 Ohm, Insul., ¼ Watt.....	.19
R8	63-1398	33,000 Ohm, Insul., 1 Watt.....	.24
R19-R20	63-1399	82 Ohm, Insul., ½ Watt.....	.21
R13	63-1400	15 Megohm, Insul., ¼ Watt.....	.19
R7	63-1401	15,000 Ohm, Insul., ½ Watt.....	.21

Diagram No.	Part No.	Description	Price
R6	63-1406	15 Megohm, Insul., ¼ Watt.....	\$.19
R3	63-1411	18,000 Ohm, Insul., ½ Watt.....	.21
R5	63-1431	56,000 Ohm, Insul., ¼ Watt.....	.19

MISCELLANEOUS

	19-87	Cable Retaining Clip.....	.01
	49-539	6" x 9" Dynamic Speaker & Cable (S-11277).....	7.75
SP1	49-574	6" x 9" P.M. Speaker & Cable (S-13128).....	7.75
	52-200	Battery Cable (Fuse to Ammeter).....	.24
	52-284	Battery Cable (Set to Fuse).....	.23
	52-294	Volume Control Cable.....	.85
	78-251	Antenna Connector Socket.....	.12
	78-281	Vibrator Socket (or 78-732-733).....	.12
	78-596	Loktal Base Tube Socket (or 78-717-726-729-730-756-762).....	.18
FS1	78-646	Foot Switch Socket (or 78-406).....	.21
SK1	78-728	Speaker Plug Socket.....	.18
	83-1076	Single Lug Terminal Strip.....	.05
	83-1125	Two Lug Terminal Strip.....	.06
T4	95-1023	Power Transformer (or 95-1024).....	7.00
T3	95-1026	Output Transformer.....	2.50
S4	136-12	20 Amp. Fuse Type SFE.....	.12
V1	190-20	Vibrator.....	3.85
	196-54	Speaker Gasket & Screen.....	.78
	202-523	Instruction Book.....	.04
S1	S-11270	Hand Selector & Muting Sw. Assem.....	.67

MOTOR NOISE SUPPRESSION KIT

S-13742	Motor Noise Suppression Kit (Complete).....	2.50
22-1148	Voltage Regulator Capacitor.....	.64
22-1326	Distributor Capacitor.....	.58
63-1046	Distributor Suppressor.....	.31
114-249	⅝-18 x 1 ¾" Hex. Hd. M.S. Steel.....	.03
S-9343	Regulator Ground Lead Assembly.....	.07

INSTALLATION PARTS

S-11279	Set Installation Kit (Complete).....	.47
54-123	No. 10-24 Wing Nut.....	.03
54-157	¼-20 x ⅞" x ⅜" Hex. Nut.....	.07
54-189	No. 8-32 Wing Nut.....	.02
93-161	¼" External Shakeproof Lockwasher.....	.01
112-360	Set Installation Screw.....	.03
114-175	¼-20 x ½" Hex. Hd. M.S.....	.02
118-30	Set Installation Link (or 118-36).....	.19

Prices Subject to Change Without Notice.

DIAL AND TUNING MECHANISM ASSEMBLY

Diagram No.	Part No.	Description	Price
	26-330	Dial Scale.....	\$.25
	34-132	Indexing Disc.....	.02
	34-138	Tuning Gear.....	.20
	34-140	Indicator Drive Gear.....	.07
	34-141	Idler Gear.....	.20
	34-158	Ratchet Gear.....	.34
	46-524	Tone Control Knob.....	.25
	46-527	Volume Control Knob.....	.37
	46-528	Selector Knob—L.H.....	.37
	46-583	Selector Knob—R.H.....	.37
	57-1029	Escutcheon.....	4.50
	59-151	Dial Pointer.....	.25
	59-169	Tone Control Pointer.....	.28
	73-2	No. 6-32 x 3/16" Hdless. Set Screw.....	.03
	80-232	Knob Retaining Spring (46-527).....	.02
	80-331	Cross Arm Return Spring.....	.04
	80-332	Cam Lever Spring.....	.03
	80-336	Ratchet Gear Return Spring.....	.01
	80-341	Kick-Off Spring.....	.01
	80-342	Tuning Shaft Spring.....	.01
	80-343	Switch Spring.....	.01
	80-344	Switch Spring.....	.03
	80-379	Pointer Retaining Spring.....	.03
	80-426	Pointer Drive Tension Spring.....	.01
S3	80-476	Selector Knob Spring—L.H.....	.04
	80-477	Selector Knob Spring—R.H.....	.04
	100-31	Dial Light Bulb.....	.08

Diagram No.	Part No.	Description	Price
	126-481	Dial Glass Shield (2 used)...	\$.02
	149-44	Adjusting Spring & Core (3 used).....	.40
	192-82	Dial Glass (2 used).....	.38
L7	S-10826	Solenoid End Plug & Bracket Assembly.....	.30
	S-10829	Solenoid & Terminal Assembly.....	.79
	S-10831	Ratchet & Bracket Assembly.....	.63
	S-10834	Mounting Plate & Lever Assembly.....	.59
	S-11029	Drive Arm Bracket & Stud Assembly.....	.19
	S-11030	Pointer Bracket Assembly.....	.15
	S-11031	Dial Drum & Bracket Assembly (35-8).....	.80
	S-11051	Tuning Shaft & Gear Assembly.....	.89
	S-11082	Turret Assembly.....	3.34
S5	S-11237	Escutcheon, Dial Glass & Selector Knob Assembly.....	9.47
	S-11270	Mute Switch Assembly.....	.67
	S-11971	Dial Light Socket & Wire Assembly.....	.24
	S-11972	Selector Knobs, Housing & Clamp Assembly.....	2.06
	S-12050	Tone Control Dial & Pulley Assembly (26-351).....	.76
	S-12120	Dial Cord & Eyelet Assembly.....	.06
	S-13649	Cross Arm Assembly.....	1.10
	S-13711	Tuning & Trim Knob Assembly (46-525 & 682).....	1.00

PARTS LIST MODEL 6MF780E (CHASSIS 6D80E)

The parts list for Model 6MF780E is the same as for Model 6MF780 with the following parts omitted and added.

ADD

Diagram No.	Part No.	Description	Price
T3	95-1027	Output Transformer.....	\$2.70
SK2	78-219	Short Wave Converter Socket.....	.12
	S-13744	Motor Noise Suppression Kit.....	3.25
	202-526	Instruction Book.....	.05

OMIT

Part No.	Description	Price
95-1026	Output Transformer.....	\$2.50
S-13742	Motor Noise Suppression Kit.....	2.50
202-523	Instruction Book.....	.05

PARTS LIST MODEL 6MM790 (CHASSIS 6D90)

The parts list for Model 6MM790 is the same as for Model 6MF780 with the following parts omitted and added.

ADD

Part No.	Description	Price
202-539	Instruction Book.....	\$.05

OMIT

Part No.	Description	Price
202-523	Instruction Book.....	\$.05

PARTS LIST MODEL 6MM790E (CHASSIS 6D90E)

The parts list for Model 6MM790E is the same as for Model 6MF780 with the following parts omitted and added.

ADD

Diagram No.	Part No.	Description	Price
	202-543	Instruction Book.....	\$.05
T3	95-1027	Output Transformer.....	2.70
SK2	78-219	Shortwave Converter Socket.....	.12
	S-13744	Motor Noise Suppression Kit.....	3.25

OMIT

Diagram No.	Part No.	Description	Price
	202-523	Instruction Book.....	\$.05
T3	95-1026	Output Transformer.....	2.50
	S-13742	Motor Noise Suppression Kit.....	2.50

Prices Subject to Change Without Notice.

SERVICE MANUAL

FOR
1946 HUDSON AUTOMOBILE RECEIVER
SPECIFICATIONS AND CIRCUIT FEATURES
MODEL DB46—PART No. 208815
 WITH
FOOT SWITCH AND VOLUME CONTROL

TUBE COMPLEMENT: 7A7 R.F., 7B8 Converter, 7A7 I.F., 7B6 Detector, A.V.C., 1st Audio, 7C5 Beam Power Output, 7Y4 Rectifier.

TUNING RANGE: 540 to 1600 Kilocycles.

AUTOMATIC POSITIONS: 5 Plus "M" (manual).

SPEAKER: 6" Dynamic externally mounted behind instrument panel. Voice coil impedance 3.2 ohms at 400 cycles. Field resistance 4 ohms cold.

tone control: Continuously variable.

POWER OUTPUT: Maximum 5.5 watts. Measured at voice coil.

VIBRATOR: Non-synchronous.

POWER RATING: Current drain 7.5 amperes. Fuse—20 amperes.

SENSITIVITY: 4 Microvolts at one watt output.

I.F. FREQUENCY: 265 Kilocycles.

WARRANTY AND SERVICE

The 1946 Hudson Receiver is covered by warranty against defect in material and workmanship for a period of 90 days after retail delivery.

This warranty covers a receiver installed at the factory or a receiver installed in the field as an accessory.

All warranty claims must be made to the Hudson Dealer. Do NOT send claims to the radio manufacturer.

OPERATING INSTRUCTIONS

This radio incorporates the new Hudson Automatic Touch Tuning with Foot Volume and Selector Control. The purpose and position of each control is shown in figure 1.

TO TURN RADIO ON

Press the push button on right side below ON-OFF indicator window and allow receiver to reach operating temperature. (Approximately 20 seconds.)

MANUAL TUNING

1. Press the automatic tuning push button on the left side beneath automatic indicator window several times or until the letter "M" appears on the automatic indicator.
2. Pull manual tuning (right hand) control knob outward and turn to tune in desired stations. Tune to exact frequency for the best tone quality.

VOLUME

Adjust left hand control knob for desired volume.

TONE CONTROL

The tone control is located directly behind the volume control knob (Fig. 1). Rotating this control to the right or left will change the tone of the receiver. Turning to the right will emphasize the high notes, while turning to the left will emphasize the bass notes.

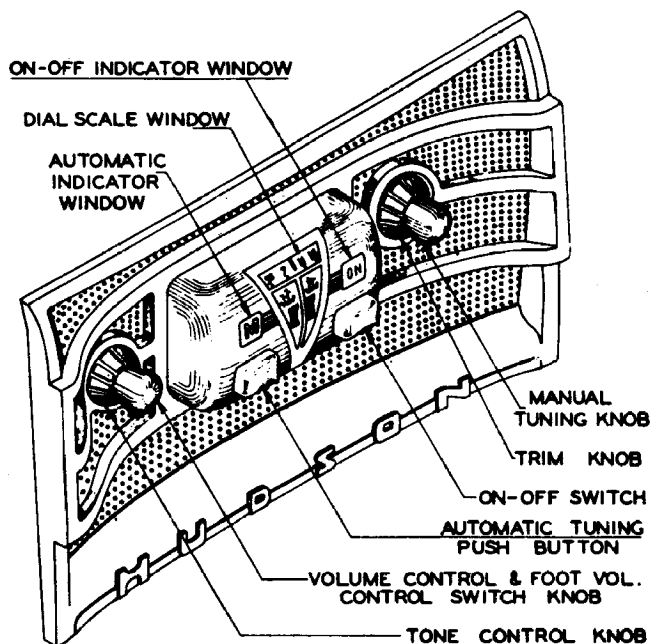


Fig. 1. Operating Controls.

AUTOMATIC TUNING

There are five automatic tuning positions which may be adjusted to five desired stations. If these positions have not been previously adjusted, proceed as follows:

1. Press the automatic tuning push button (on the left side) until Number 1 appears in the automatic indicator window.
2. Pull the manual tuning knob OUTWARD to engage the automatic mechanism.
3. Select the station desired and tune to its frequency by turning the tuning knob. Tune very carefully for clearest reception. CAUTION: DO NOT ATTEMPT TO FORCE TUNING KNOB IN. Knob will return to the "IN" position when the automatic tuning push-button is pressed.
4. Press the automatic station selector push button, pull manual tuning knob outward, and tune in station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five automatic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the AUTOMATIC button to return to MANUAL tuning, or to any one of the stations selected on the automatic.

FOOT CONTROL

The Foot Control provides a convenient means of selecting stations, controlling the volume, and muting the set without taking the hands off the steering wheel or the eyes from the road. Its function is identical to that of the station selector push button and the volume control knob combined. The foot control requires no set up or other adjustment. Press the foot control button all the way down to change stations. Press lightly to silence radio during conversation. Turn the knob with the shoe tip to adjust the volume to any desired point. When using the foot volume control feature turn the panel volume control fully to the left, or until it clicks.

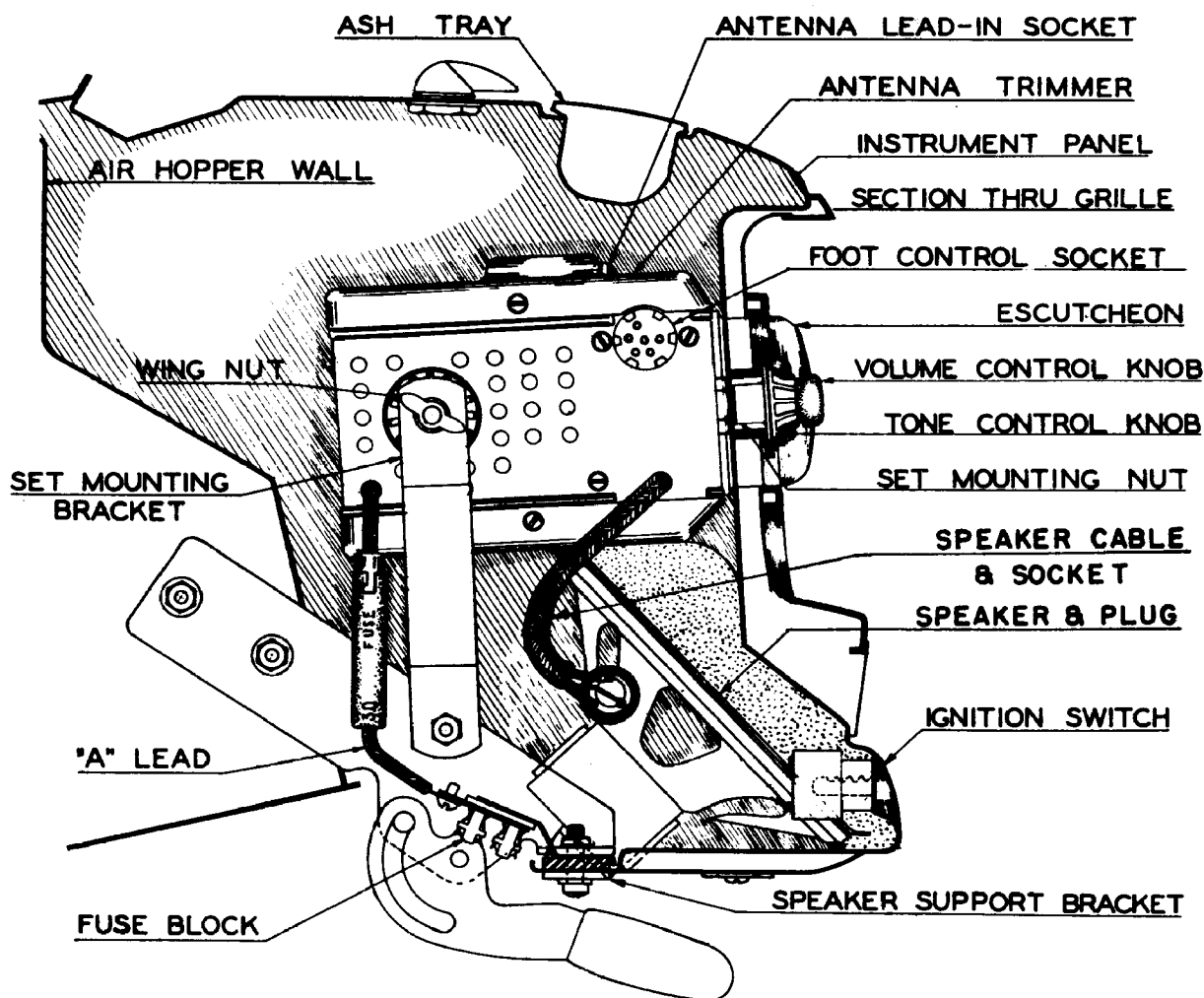


Fig. 2. Mounting Details and Connections

RADIO INSTALLATION INSTRUCTIONS

1. Install the antenna. Complete instructions are packed with each antenna kit.
2. Remove the decorative plate, in the center of the grille, covering the radio opening.
3. Remove the floor mat around the clutch and brake pedals. Place the foot control over the holes provided in the floor board. Fasten it with the three No. 8 R.H. self-tapping screws furnished in the installation kit (Fig. 3).
4. Dress the foot control lead to the left of the clutch pedal and up behind the fire wall pad.
5. Lift the cap from the foot control. Replace the floor mat and cut a hole for the foot control button. To replace the foot control cap, press it firmly and turn until the notches in the cap slip into the flanges on the foot control button.
6. Remove accessory switch bracket.
7. Plug the foot control cable into the socket provided on the left end of the receiver. With this end of the receiver down and the control shafts to the right, push the receiver up between the instrument panel and the air hopper as far as it will go. Turn the radio clockwise until the knob shafts point downward. Lift the front of the receiver up until the shafts slide through the slots provided below the shaft openings in the instrument panel. Bring the receiver forward so that the knob shafts protrude through the shaft openings.
8. Fit the knob shaft bushing nuts on the shafts and tighten as much as possible with the fingers. Place the tips of long nose pliers in the holes in the nuts and tighten securely.
9. Attach set mounting bracket by fastening one end to the side of the receiver case with the wing nut. Fasten the other end of the radio mounting bracket to the cowl ventilator handle bracket with $\frac{1}{4}$ " x $\frac{3}{4}$ " M.S., flat washer, and nut. (Fig. 2.)
10. Remove cardboard protector from speaker unit and fasten speaker and bracket assembly in place with two $\frac{1}{4}$ " x $\frac{3}{4}$ " M.S. flat washers, two lock washers, and two nuts provided. (Fig. 2.) Plug the speaker cable into the socket provided on the speaker frame.
11. Fasten the controls in place as shown in figure 1.
NOTE: Tuning knob must be placed $\frac{3}{16}$ " away from the instrument panel in order to rotate freely in the automatic position.
12. Fasten the accessory switch bracket back in place.
13. Remove the ash tray assembly and plug the antenna lead into the socket provided on the top of the receiver.
14. Fasten the "A" lead to the fuse block as indicated in figure 2.
15. Turn the receiver on and allow it to operate for approximately fifteen minutes in order for it to reach normal operating temperature. Tune in a weak station near 1200 Kc. Reach through the ash tray opening with a small screw driver and adjust the antenna trimmer, located on the top of the receiver, for maximum volume. (Fig. 2.) Replace ash tray.

INTERFERENCE ELIMINATION

IMPORTANT: Use the utmost care in the following operations to insure freedom from motor noise. Be sure that good ground contacts are made between the interference condensers and the car body. If necessary, clean away paint or dirt with emery paper. Tighten all nuts and bolts securely.

1. Remove the top mounting screw of the horn relay near the voltage regulator and under this screw mount the condenser No. 22-1537. Connect the lead to the voltage regulator battery terminal. (Fig. 4.)
2. Install suppressor in center hole of distributor cap. Place high tension lead in the top of suppressor. Be sure the suppressor and the lead are fastened securely. (Fig. 5.)
3. On the six cylinder car, remove the bolt, above the ignition coil, from the firewall. Mount the condenser No. 22-1537 under this bolt. Connect the lead to the coil terminal as shown in figure 6A.

On the eight cylinder car, remove the bottom screw from the ignition coil mounting bracket. Install the condenser No. 22-1537 under the screw. Connect the lead to the coil terminal as shown in figure 6B.

4. Loosen the upper rear cap screw of the engine water jacket plate. **CAUTION: Do not REMOVE cap screw.** Slide the slotted bracket of the condenser No. 22-1260 under the head of this screw. Tighten the screw.

Attach the condenser lead to the water temperature element in the head. (Fig. 7A.)

5. Remove the tape from the hole (located near the left rear cylinder head nut) in the dash. Fasten the flat ground strip to this hole with a sheet metal screw and lock washer. On the six cylinder car, place the other end of the strip on top of the regular stud nut, and fasten it in place with the special nut furnished in the installation kit. (Fig. 7A.) On the eight cylinder cars, bolt the other end of the strap under the regular stud nut. (Fig. 7B.)

6. Install the motor hood bond spring No. 80-145 as shown in Figure 8. Fasten with No. 8 sheet metal screw. Part No. 112-365.

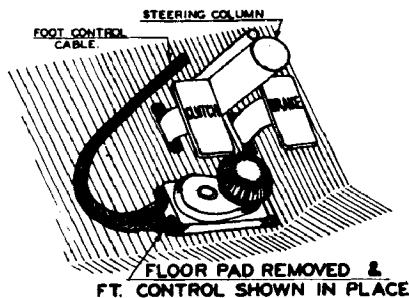


Fig. 3.

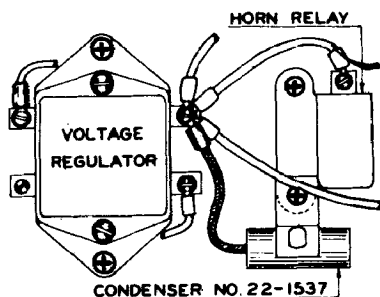


Fig. 4.

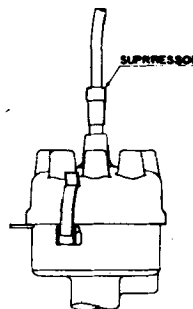


Fig. 5.

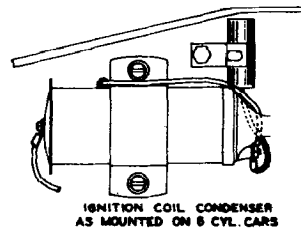


Fig. 6A.

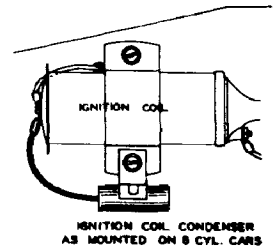


Fig. 6B.

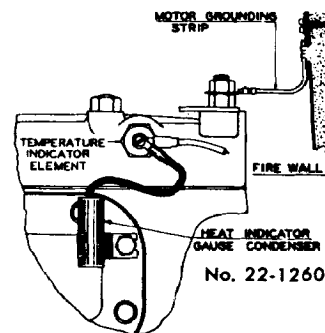


Fig. 7A.

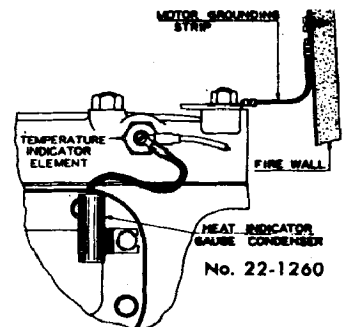


Fig. 7B.

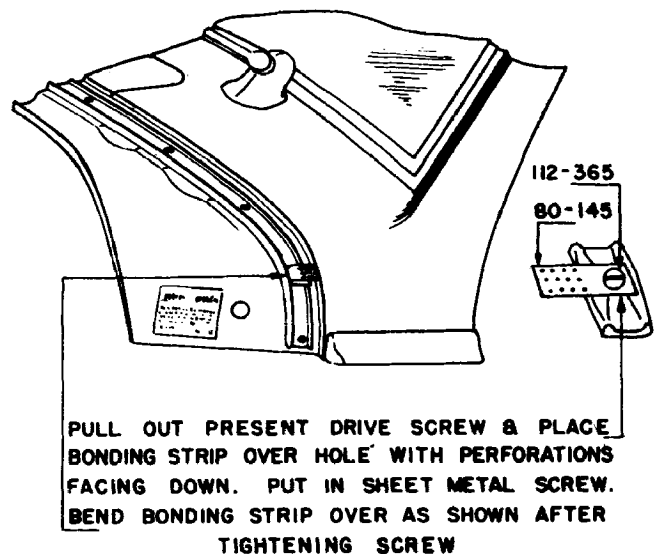


Fig. 8.

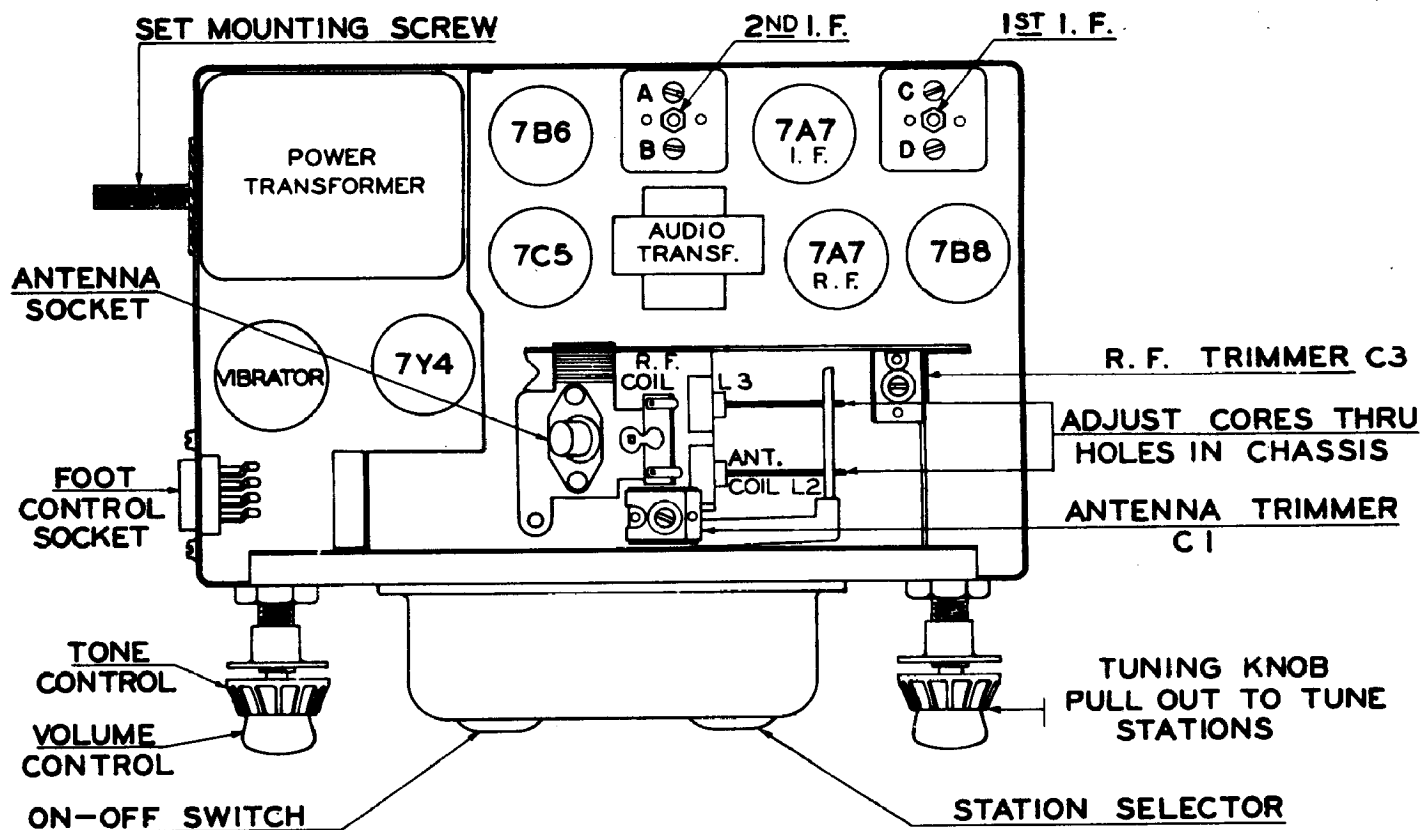


Fig. 10. Top View of Chassis

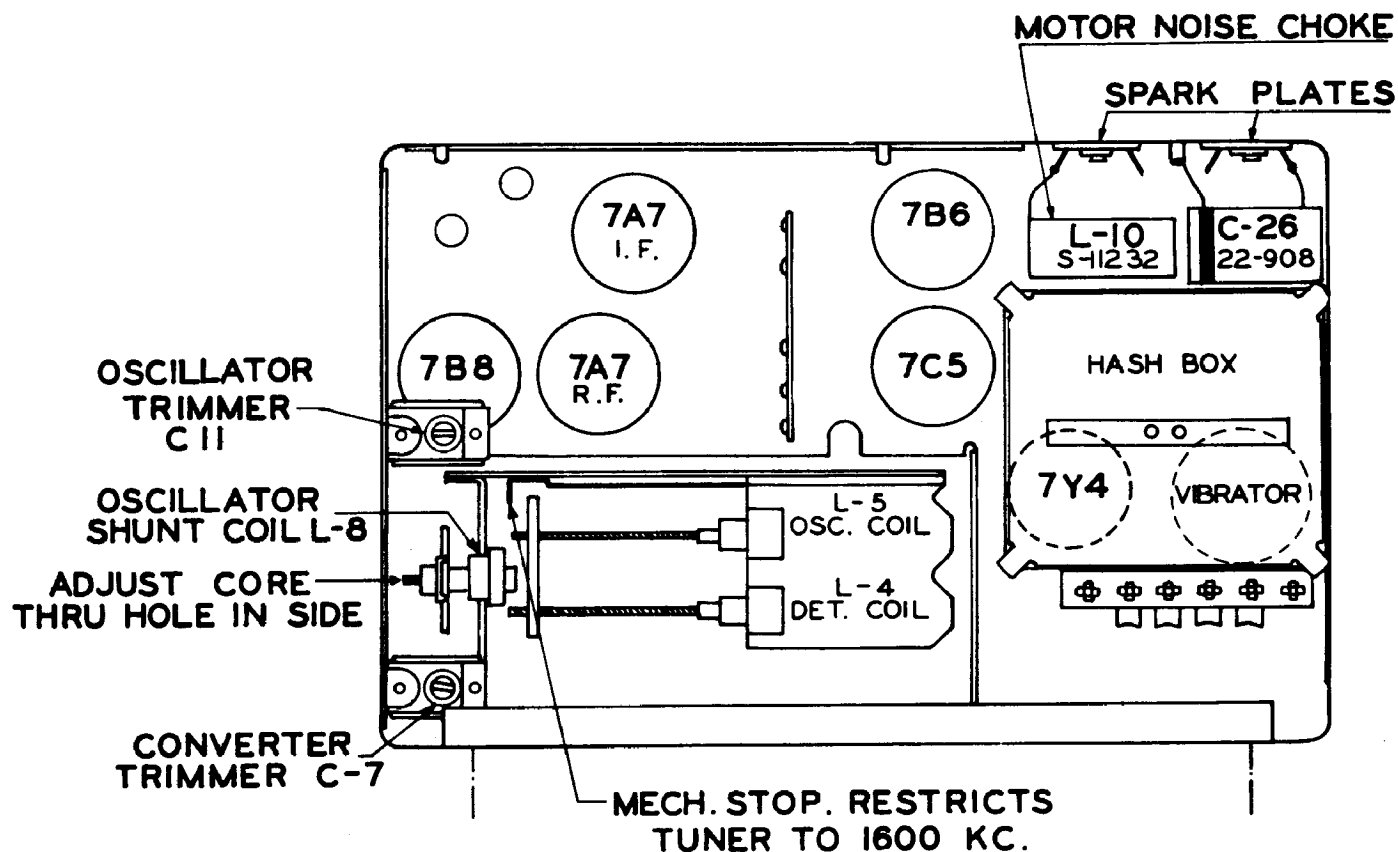


Fig. 11. Bottom View of Chassis

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; so follow these instructions carefully.

CAUTION: Make all adjustments on the receiver with volume control turned full on and foot volume control cable plugged into its socket. Reduce signal intensity as much as possible at signal generator. Connect output meter across voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C and D (Fig. 10), in the order named for maximum output. Repeat the operation to assure accurate alignment.

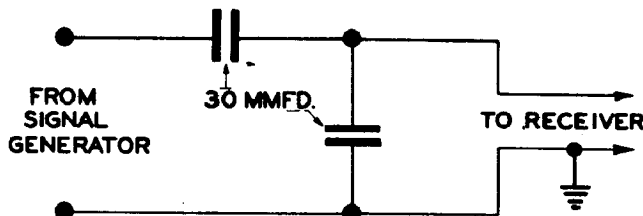


Figure 12. Dummy Antenna

Figure 12 shows the schematic of a recommended dummy antenna closely resembling actual antenna capacity to be used when aligning the R.F. section of the receiver.

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy illustrated in figure 12 to antenna lead in socket on receiver.
2. Set signal generator to 535 Kc.
3. Place set in manual tuning position and set dial to 535 Kc.
4. Adjust oscillator trimmer C-11 (Fig. 11) for maximum response.
5. Set signal generator to 1200 Kc.
6. Tune set to 1200 Kc.
7. Adjust converter trimmer C-7 (Fig. 11) and R.F. trimmer C-3 (Fig. 10) for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by loosening dial scale mounting screws and sliding scale to desired position.

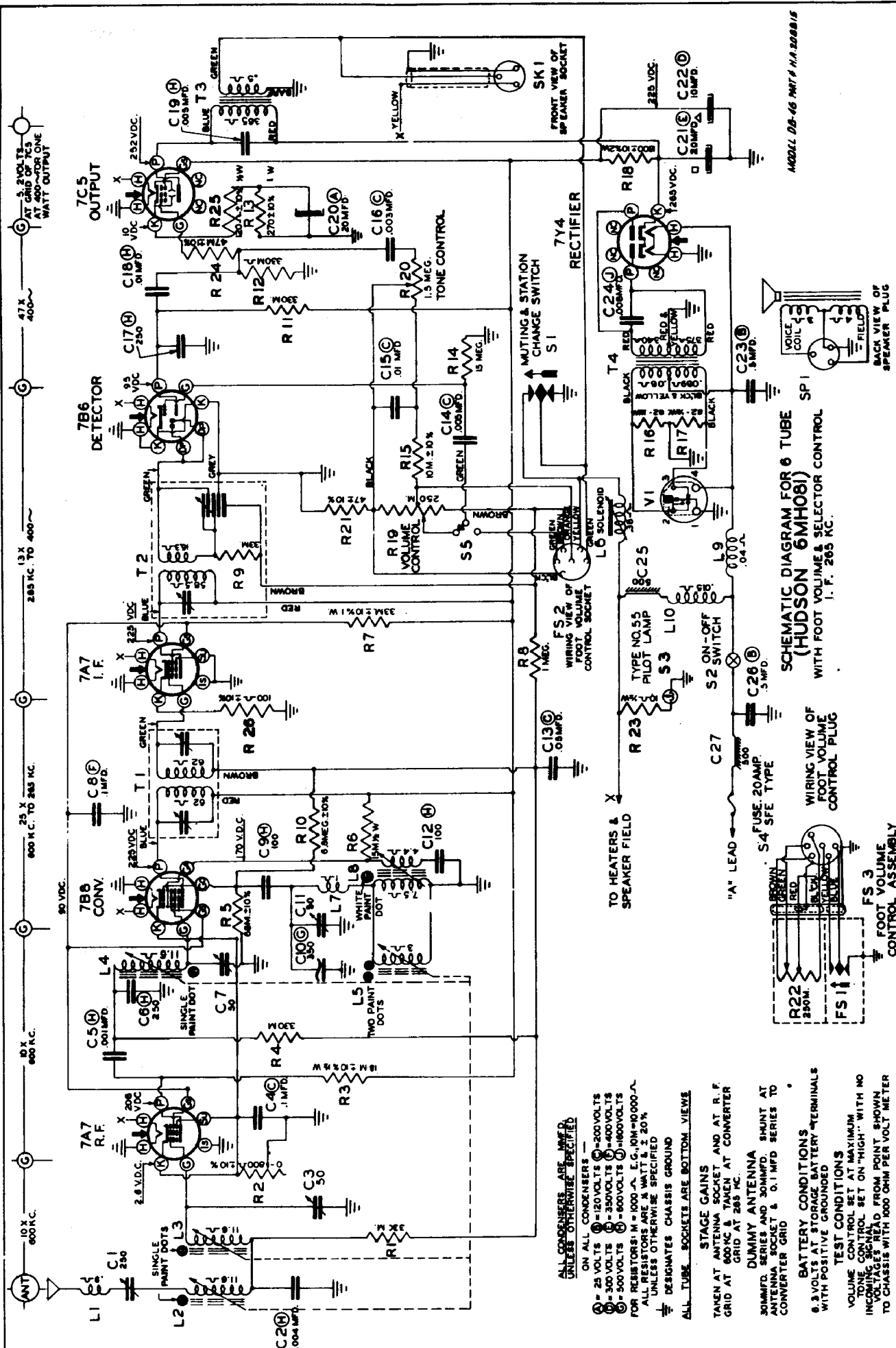
CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made **ONLY** if a core or coil is replaced.

1. Replace coil or core.
2. Set signal generator to 1700 Kc.
3. Connect signal generator leads through dummy illustrated in figure 12 to antenna receptacle on the receiver.
4. Set receiver dial to 1600 KC. (Maximum high frequency end of dial.)
5. Screw the core completely out of the antenna coil, the R.F. Coil, the converter coil, and the oscillator coil.
6. Adjust oscillator trimmer C-11 (Fig. 11) at 1700 Kc.
7. Adjust converter trimmer C-7, R.F. trimmer C-3, and antenna trimmer C-1 (Fig. 10 and 11) for maximum output reading.
8. Replace cores to their approximate original positions.
9. Set generator dial and receiver dial to 1200 Kc.
10. Adjust oscillator core (Fig. 10) to scale at 1200 Kc.
11. Adjust the antenna core, R.F. core, and converter core (Fig. 10 and 11), for maximum output reading.
12. Set signal generator to 600 Kc.
13. "Rock in" Shunt oscillator coil (Fig. 10) for maximum output reading. (This should only be done as a last resort.) This is the same as rocking in the padder condenser on a ganged condenser receiver.
14. Check receiver at 1200 Kc. for calibration and gain. If receiver is off scale or weak, repeat operations 9, 10 and 11.
15. After alignment is complete, the maximum high frequency tuning range should be checked: If the range is greater or less than 1605 Kc. the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Check the antenna trimmer alignment on a weak station at approximately 1200 Kc. Extend antenna to maximum before adjusting the antenna trimmer.



PARTS LIST

1946 RADIO RECEIVER KIT * Model DB 46 (Part Number 208815)

Items included in kit are:

Radio receiver
Mounting bracket, screws, lockwashers, knobs
Speaker and bracket assembly
Foot volume control and switch assembly
Distributor suppressor
Temperature gauge condenser
Ignition coil and generator condenser
Motor hood bonding spring
Motor bond strap
Sheet metal screw
Nut for 6 cyl. cars
Lockwasher

RADIO ANTENNA KITS *

Part No. 209558—66" Telescopic Antenna including all installation parts.

Part No. 209762—92" Telescopic Antenna including all installation parts.

Part No. 205451—Vacuum Operated Antenna including all installation parts.

(See antenna kits for full installation instructions.)

NOTE: Kits marked * are not available from the radio manufacturer. See your Hudson dealer.

COILS AND CHOKES

Diag. No.	Zenith Part No.	Hudson Part No.	Description
L9	20-213	204890	Main hash choke
T1	95-916	209569	1st I.F. transformer
T2	95-917	209570	2nd I.F. transformer
L1	S8819	209741	Antenna motor noise choke assembly
L7	S11229	209568	Oscillator series coil assembly
L8	S11231	209576	Oscillator shunt coil assembly
L10	S11232	209571	Motor noise choke coil assembly
L5	S12053 *	209574	Oscillator tuning coil assembly
L2	S12060 *	209572	Antenna tuning coil assem.
L3	S12060 *	209572	R.F. tuning coil assembly
L4	S12060 *	209572	Detector tuning coil assem.

Note: In ordering coils marked (*), be sure to give color code information.

CONDENSERS

C 9 } C12 }	22-162	204900	100 mmfd.	600 V.
C 8	22-170	204901	.1 mfd.	400 V.
C17	22-182	204902	250 mmfd.	600 V.
C 4	22-190	209577	.1 mfd.	200 V.
C13	22-250	204904	.05 mfd.	200 V.
C19	22-838	204905	.005 mfd.	600 V.
C14	22-906	204906	.005 mfd.	200 V.

Diag. No.	Zenith Part No.	Hudson Part No.	Description
C23 } C26 } C25 } C27 }	22-908	204907	.5 mfd. 120 V.
C 6	22-1076	204909	Dual spark plate
C 5	22-1136	209585	250 mmfd. 600 V.
C18	22-1169	209584	.001 mfd. 600 V.
C16	22-1170	204910	.01 mfd. 600 V.
C 2	22-1180	209587	.003 mfd. 200 V.
C 3	22-1244	204915	.004 mfd. 600 V.
C 7	22-1376	209583	R.F. trimmer
C11	22-1377	209582	Detector trimmer
C20 }	22-1378	209581	Oscillator trimmer
C21 }	22-1387	209578	Dry electrolytic - 20 mfd. - 25 V. x 10 mfd. - 300 V. x 20 mfd. - 350 V.
C22 }	22-1448	209579	.008 mfd. 1600 V.
C 1	22-1462	209580	Antenna trimmer
C15	22-1466	209754	.01 mfd. 200 V.
C10	22-1478	209919	350 mmfd. compensator

RESISTORS

R19 } R20 } S 5 }	63-1334	209672	Vol. control, and SW. tone control
R18	63-1368	209920	1800 ohm 2 watt W.W.
R 2	63-1379	207877	Sensitivity control. 0-800 ohm
R 8	63-1390	209922	1 megohm ¼ watt
R 1 } R 4 } R11 }	63-1392	209923	330M ohm ¼ watt
R12 }	63-1393	209924	47 ohm ¼ watt
R15	63-1394	209925	10M ohm ¼ watt
R 5	63-1396	209926	68M ohm ¼ watt
R 7	63-1398	209928	33M ohm ¼ watt
R16 }	63-1399	209929	82 ohm ½ watt
R17 }	63-1400	209930	15 megohm ¼ watt
R14	63-1401	209931	15M ohm ½ watt
R13	63-1369	209921	270 ohm 1 watt W.W.
R25	63-1410	208649	120 ohm ½ watt W.W.
R26	63-1414	208709	100 ohm ¼ watt
R10	63-1416	207939	6.8 megohm ¼ watt
R24	63-1417	207940	47000 ohms ¼ watt
R23	63-1419	208591	10 ohm ½ watt W.W.
R 3	63-1411	208000	18000 ohm ¼ watt

MISCELLANEOUS

	52-202	204935	Battery cable (set to fuse)
	52-254	209551	Battery cable (fuse to fuse block)
SK1	52-279	209968	Speaker cable and plug
	78-281	209745	Vibrator socket
FS2	78-551	209683	Foot switch cable plug socket
	78-596	209746	Tube socket - loktal base (8 contact)
S2	85-339	209747	On-Off switch
	93-456	209748	Vibrator cushion washer
T4	95-914	209684	Power transformer
T3	95-915	209685	Output transformer
S4	136-12	18269	Fuse - 20 amp.
V1	190-20	209686	Vibrator

PARTS LIST (Continued)

Diag. No.	Zenith Part No.	Hudson Part No.	Description
	202-420	209749	Installation instruction book
S1	S11269	209566	Hand selector and muting switch assembly
	S11310	209934	Antenna socket, bracket & terminal assembly
FS3	S11758	208812	Foot switch, vol. control & cable assembly

SPEAKER AND MOUNTING COMPONENTS

SP1	12-937	204020	Speaker support bracket
	49-538	208826	6" dynamic speaker
	54-30	170567	No. 8/32 x 5/16 x 7/64 hex nut
	57-945	204022	Speaker cover plate
	114-88	205287	No. 8/32 x 1/2 hex hd. M.S.
	114-167	205288	No. 10/32 x 5/16 hex acorn hd. M.S.
	196-53	204024	Rubber speaker gasket
	208-538*	209751	Cone & voice coil assem.

Note: When ordering cone and voice coil assembly marked *, be sure to give manufacturer's code letter.

INSTALLATION PARTS AND KNOBS

S11321	209753	Installation kit complete
12-938	204021	Set mounting bracket
22-1260	152021	Temperature gauge cond.
22-1537	208592	Generator and ignition coil condenser
46-459	205293	Tone control knob
54-157	70874	1/4-20 x 7/16 x 3/16 hex nut
54-173	205283	Set mounting nut
54-174	205289	1/4-20 wing nut
63-1252	205281	Distributor suppressor
80-145	205282	Motor hood bond spring
80-232	209752	Knob retaining spring
112-310	170687	Foot Sw. mtg. screw
112-365	170304	No. 8 x 1/2" B.H.S.M. screw
114-168	70872	1/4-20 x 3/4 hex hd. M.S.
S12271	209936	Tuning control & trim. knob assem. (46-550 & 584)
S12272	209937	Volume control knob and spring assem. (46-549)

Diag. No.	Zenith Part No.	Hudson Part No.	Description
	93-577	12857	.062 x 17/64 x 3/4 steel washer
	83-986	204481	Motor bond strap
	112-361	71707	No. 8 self tapping screw
	93-575	170395	Lock washer
	54-188	170859	Hex nut (for 6 cyl. cars only)

DIAL AND TUNING MECHANISM ASSEMBLY

	26-337	209682	Dial scale (manual tuning)
	34-132	209691	Indexing disc
	34-133	209692	Ratchet gear
	34-135	209789	Volume control gear
	46-581	209553	Selector knob (2 used)
	57-1061	209560	Escutcheon
	57-1151	209694	Name plate
	59-158	204040	Dial pointer
	80-329	209695	Gear indexing spring
	80-331	209681	Cross arm return spring
	80-332	209696	Cam lever spring
	80-336	209697	Ratchet gear return spring
	80-340	209698	Lever spring
	80-341	209699	Kick-off spring
	80-342	209700	Tuning shaft spring
	80-343	209701	Solenoid switch spring
	80-344	209702	Solenoid switch contact spring
S3	80-425	209703	Knob return spring
	100-31	71550	Dial light bulb
	149-44*	209799	Adjusting spring & core
	188-45	209705	Turret screw lock ring
	S10826	209706	Solenoid end plug and bracket assembly
L6	S10829	209567	Solenoid and terminal assembly
	S10831	209707	Ratchet and bracket
	S10836	209708	Cross arm assembly
	S11052	204025	Tuning shaft and gear assembly
	S11082	209709	Turret assembly
	S11313	209738	Dial drum and bracket assembly
	S11494	209739	Mounting plate and lever assembly
	S11976	209740	Dial light socket and wire assembly

Note: In ordering Adjusting Spring and Core marked (*), be sure to give color code information.

SERVICE MANUAL

FOR

HUDSON AUTOMOBILE RECEIVER

SPECIFICATIONS AND CIRCUIT FEATURES

MODEL DB47—PART No. 206990 and 206991

WITH

FOOT SELECTOR CONTROL

TUBE COMPLEMENT: 7A7 R.F., 7B8 Converter, 7A7 I.F., 7B6 Detector, A.V.C., 1st Audio, 7C5 Beam Power Output, 7Y4 Rectifier.

TUNING RANGE: 540 to 1600 Kilocycles.

AUTOMATIC POSITIONS: 5 Plus "M" (manual).

SPEAKER: 6" Permanent magnet externally mounted behind instrument panel. Voice coil impedance 3.2 ohms at 400 cycles.

tone control: Continuously variable.

POWER OUTPUT: Maximum 4.5 watts. Measured at voice coil.

VIBRATOR: Non-synchronous.

POWER RATING: Current drain 6 amperes.

FUSE: 10 amperes. Type MDL-10 fusetron.

SENSITIVITY: 4 Microvolts at one watt output.

I.F. FREQUENCY: 265 Kilocycles.

WARRANTY AND SERVICE

The DB47 Hudson Receiver is covered by warranty against defect in material and workmanship for a period of 90 days after retail delivery.

This warranty covers a receiver installed at the factory or a receiver installed in the field as an accessory.

IMPORTANT

A warranty registration tag is furnished with each receiver. This tag must be filled in and attached to the unit at the time of retail delivery and must accompany the receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail. All warranty labor claims must be made to the Hudson Dealer. Do NOT send claims to the radio manufacturer. Defective parts in warranty will be replaced, no charge to you, by the nearest Zenith Distributor.

OPERATING INSTRUCTIONS

This radio incorporates the new Hudson automatic touch tuning with foot selector control. The purpose and position of each control is shown in figure 1.

TO TURN RADIO ON

Press the on-off switch button, on right side below on-off indicator window, and allow receiver to reach operating temperature. (Approximately 20 seconds.)

MANUAL TUNING

1. Press the automatic tuning push button, on the left side beneath the automatic indicator window, several times or until the letter "M" appears in the automatic indicator window.
2. Pull manual tuning (right hand) control knob outward and turn to tune in desired stations. Tune to exact frequency for the best tone quality.

VOLUME

Adjust left hand control knob for desired volume.

tone control

The tone control is located directly behind the volume control knob (Fig. 1). Rotating this control to the right or left will change the tone of the receiver. Tuning to the right will emphasize the high notes, while tuning to the left will emphasize the bass notes.

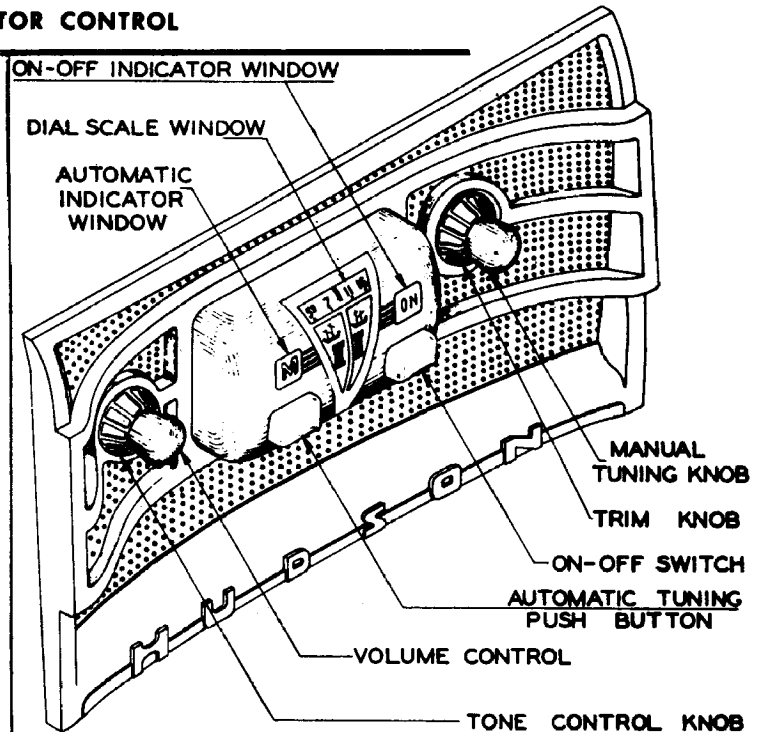


Fig. 1. Operating Controls.

AUTOMATIC TUNING

There are five automatic tuning positions which may be adjusted to five desired stations. If these positions have not been previously adjusted, proceed as follows:

1. Press the automatic tuning push button (on the left side) until Number 1 appears in the automatic indicator window.
2. Pull the manual tuning knob OUTWARD to engage the automatic mechanism.
3. Select the station desired and tune to its frequency by turning the tuning knob. Tune very carefully for clearest reception. CAUTION: DO NOT attempt to FORCE TUNING KNOB IN. Knob will return to the "IN" position when the automatic tuning push-button is pressed.
4. Press the automatic station selector push button, pull manual tuning knob outward, and tune in station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five automatic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the AUTOMATIC button to return to MANUAL tuning, or to any one of the stations selected on the automatic.

FOOT CONTROL

The foot control provides a convenient means of selecting stations, and muting the set without taking the hands off the steering wheel or the eyes from the road. Its function is identical to that of the station selector push button. The foot control requires no set up or other adjustment. Press the foot control button all the way down to change stations. Press lightly to silence radio during conversation.

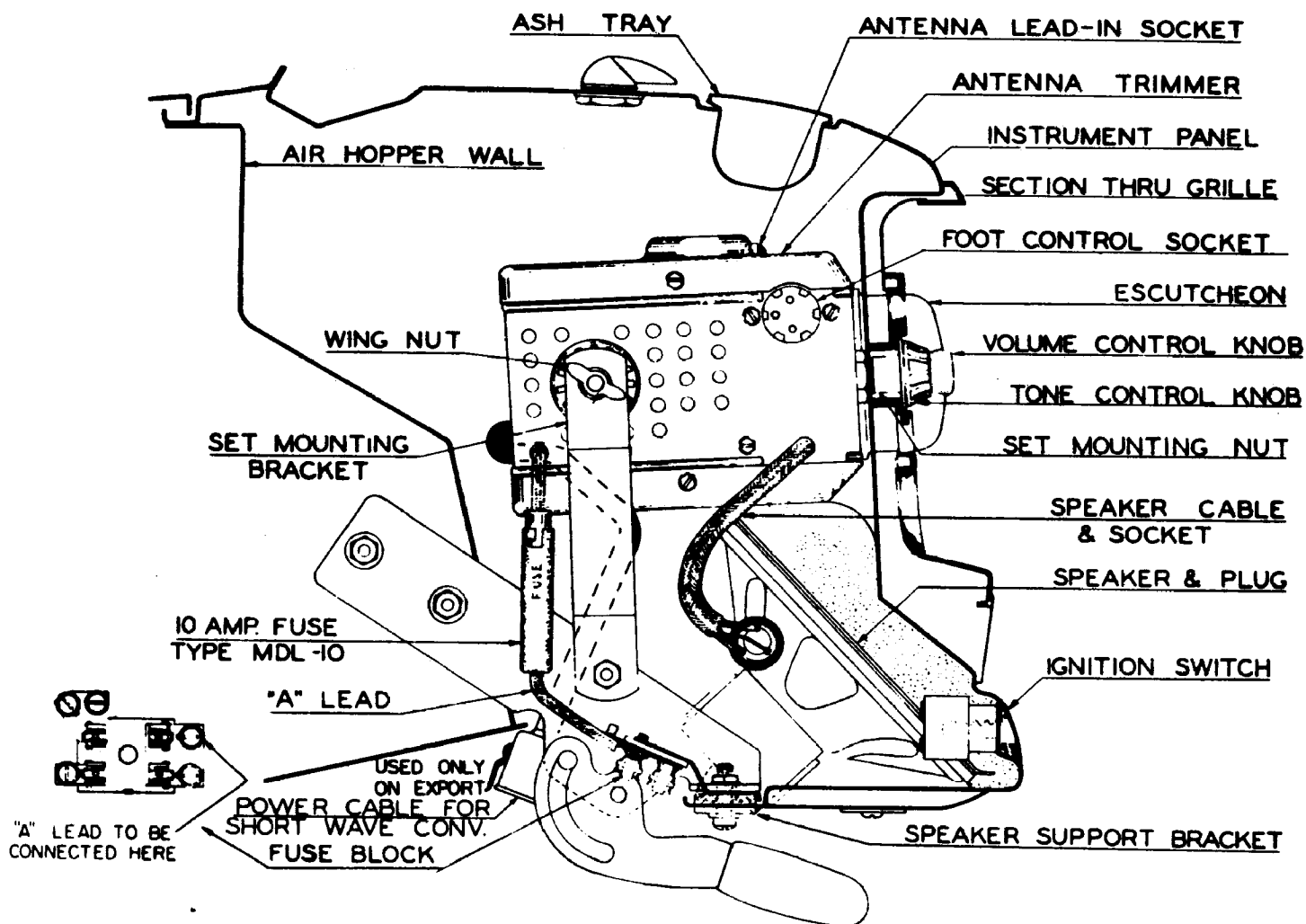


Fig. 2. Mounting Details and Connections

RADIO INSTALLATION INSTRUCTIONS

1. Install the antenna. Complete instructions are packed with each antenna kit.
2. Remove the decorative plate, in the center of the grille, covering the radio opening.
3. Remove the floor mat around the clutch and brake pedals. Place the foot control over the holes provided in the floor board. Fasten it with the three No. 8 R.H. self-tapping screws furnished in the installation kit (Fig. 3).

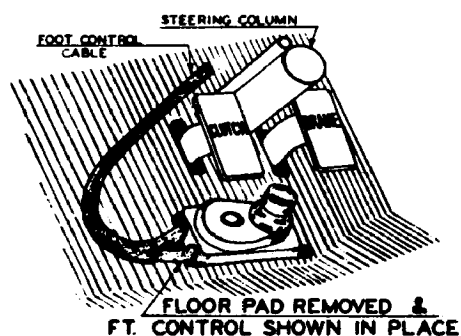


Fig. 3.

4. Dress the foot control lead to the left of the clutch pedal and up behind the fire wall pad.
5. Replace the floor mat and cut a hole for the foot control button.

6. Remove accessory switch bracket.
7. Plug the foot control cable into the socket provided on the left end of the receiver. With this end of the receiver down and the control shafts to the right, push the receiver up between the instrument panel and the air hopper as far as it will go. Turn the radio clockwise until the knob shafts point downward. Lift the front of the receiver up until the shafts slide through the slots provided below the shaft openings in the instrument panel. Bring the receiver forward so that the knob shafts protrude through the shaft openings.
8. Fit the knob shaft bushing nuts on the shafts and tighten as much as possible with the fingers. Place the tips of long nose pliers in the holes in the nuts and tighten securely.
9. Attach set mounting bracket by fastening one end to the side of the receiver case with the wing nut. Fasten the other end of the radio mounting bracket to the cowl ventilator handle bracket with $\frac{1}{4}$ " x $\frac{3}{4}$ " M.S. flat washer, and nut. (Fig. 2.)
10. Remove cardboard protector from speaker unit and fasten speaker and bracket assembly in place with two $\frac{1}{4}$ " x $\frac{3}{4}$ " M.S. flat washers, two lock washers, and two nuts provided. (Fig. 2.) Plug the speaker cable into the socket provided on the speaker frame.
11. Fasten the controls in place as shown in figure 1.
NOTE: Tuning knob must be placed $\frac{3}{16}$ " away from the instrument panel in order to rotate freely in the automatic position.
12. Fasten the accessory switch bracket back in place.

13. Remove the ash tray assembly and plug the antenna lead into the socket provided on the top of the receiver.
14. Fasten the "A" lead to the unfused terminal of the fuse block as indicated in figure 2.

IMPORTANT: Turn the receiver on and allow it to operate for approximately fifteen minutes in order for it to reach normal operating temperature. Tune in a weak station near 1200 Kc. Remove the ash tray from the instrument panel of the car. Reach through the ash tray opening with a small screw driver and adjust the antenna trimmer, located on the top of the receiver, for maximum volume. (Fig. 2.) Replace the ash tray.

INTERFERENCE ELIMINATION

IMPORTANT: Use the utmost care in the following operations to insure freedom from motor noise. Be sure that good ground contacts are made between the interference condensers and the car body. If necessary, clean away paint or dirt with emery paper. Tighten all nuts and bolts securely.

1. Remove the top mounting screw of the horn relay, near the voltage regulator, and under this screw mount the condenser No. 22-1537. Connect the lead to the voltage regulator battery terminal. (Fig. 4.)
2. Install suppressor, No. 63-1252, in the center hole of the distributor cap. Place high tension lead in the top of suppressor. Be sure the suppressor and the lead are fastened securely. (Fig. 5.)
3. On the six cylinder car, remove the bolt, above the ignition coil, from the firewall. Mount the condenser No. 22-1537 under this bolt. Connect the lead to the coil terminal as shown in figure 6A.
On the eight cylinder car, remove the bottom screw from the ignition coil mounting bracket. Install the condenser No. 22-1537 under the screw. Connect the lead to the coil terminal as shown in figure 6B.
4. Loosen the upper rear cap screw of the engine water jacket plate. **CAUTION: Do not REMOVE cap screw.** Slide the slotted bracket of the condenser No. 22-1260 under the head of this screw. Tighten the screw. Attach the condenser lead to the water temperature element in the head. (Fig. 7.)
5. Fasten the motor bond strap, No. 83-986, to the left rear cylinder head stud with the special nut furnished. Remove the tape from the hole in the dash, located near the left rear cylinder head nut, and fasten the loose end of the motor bond strap to the hole with washer, No. 93-575, and sheet metal screw # 112-361. (Fig. 7)
6. Install the motor hood bond spring No. 80-145 as shown in Figure 8. Fasten with No. 8 sheet metal screw. Part No. 112-365.

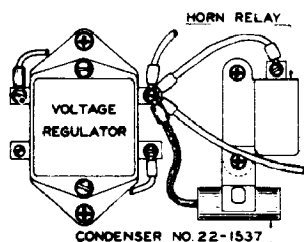


Fig. 4.

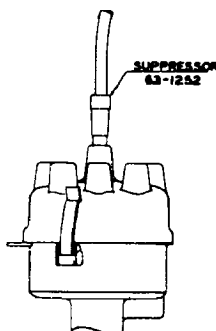


Fig. 5.

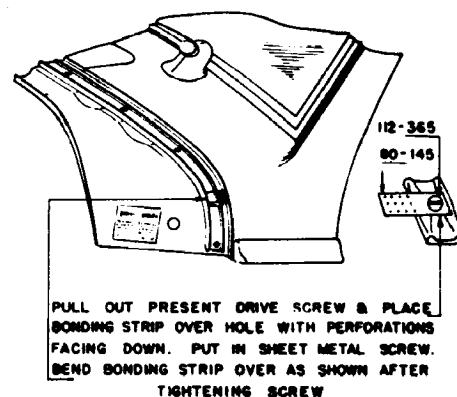
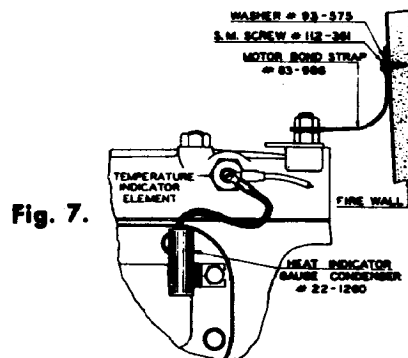
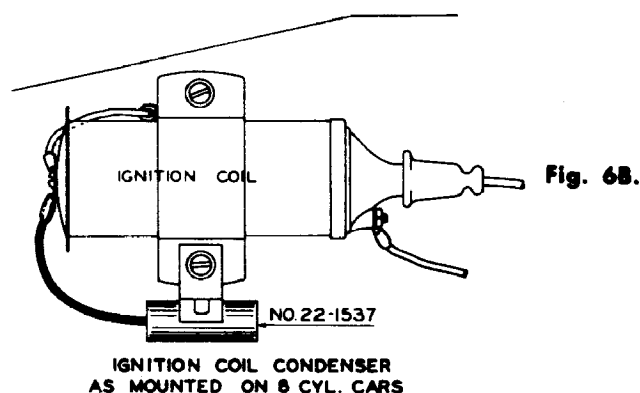
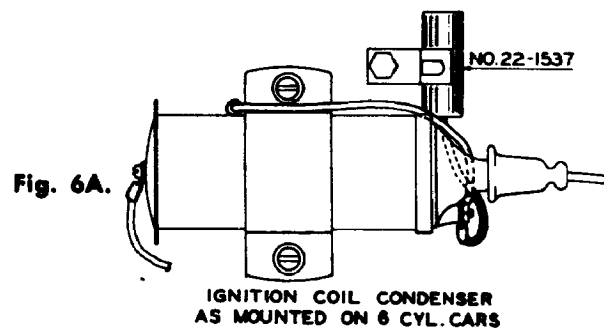


Fig. 8.

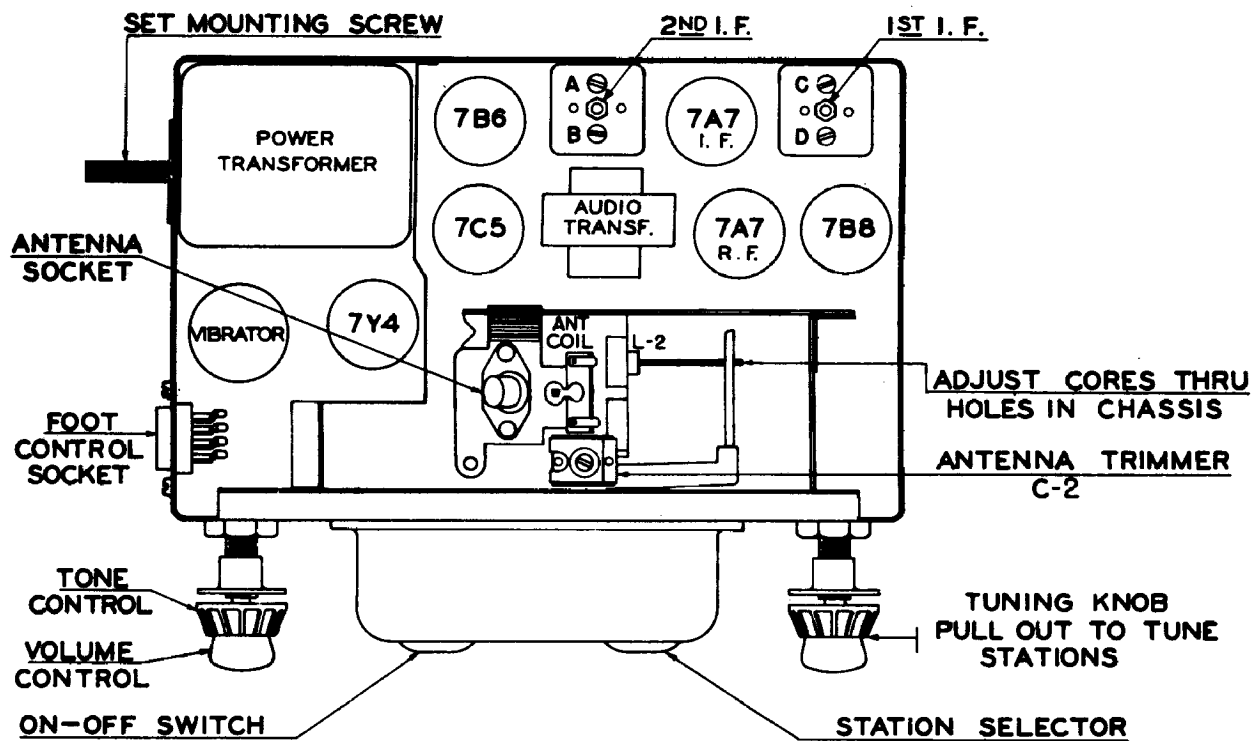


Fig. 9. Top View of Chassis

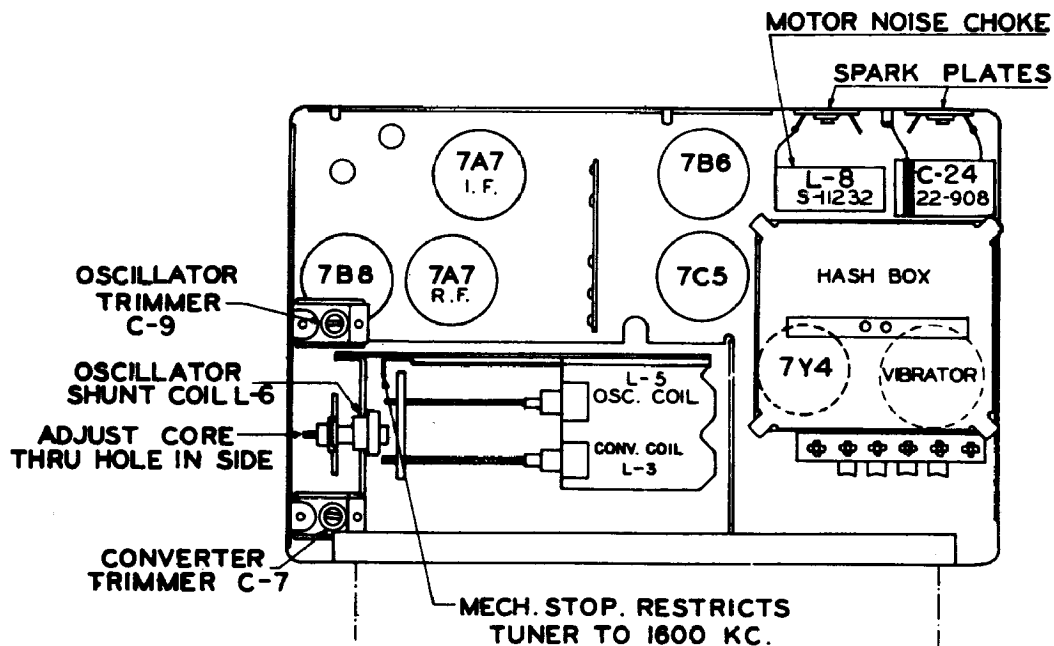


Fig. 10. Bottom View of Chassis

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; so follow these instructions carefully.

CAUTION: Make all adjustments on the receiver with volume control set at maximum. Reduce signal intensity as much as possible at signal generator. Connect output meter across voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C and D (Fig. 9), in the order named for maximum output. Repeat the operation to assure accurate alignment.

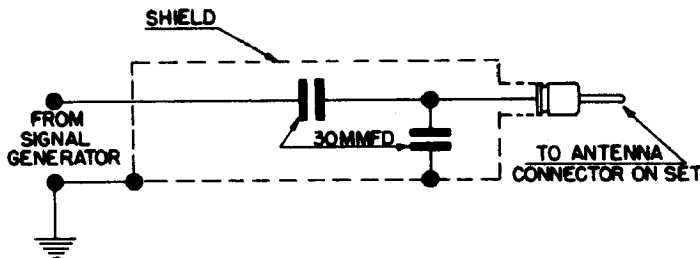


Figure 11. Dummy Antenna

Figure 11 shows the schematic of a recommended dummy antenna closely resembling actual antenna capacity to be used when aligning the R.F. section of the receiver.

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy illustrated in figure 11 to antenna lead in socket on receiver.
2. Set signal generator to 535 Kc.
3. Place set in manual tuning position and set dial to 535 Kc.
4. Adjust oscillator trimmer C-9 (Fig. 10) for maximum response.
5. Set signal generator to 1200 Kc.
6. Tune set to 1200 Kc.
7. Adjust converter trimmer C-7 (Fig. 10) and antenna trimmer C-2 (Fig. 9) for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by loosening dial scale mounting screws and sliding scale to desired position.

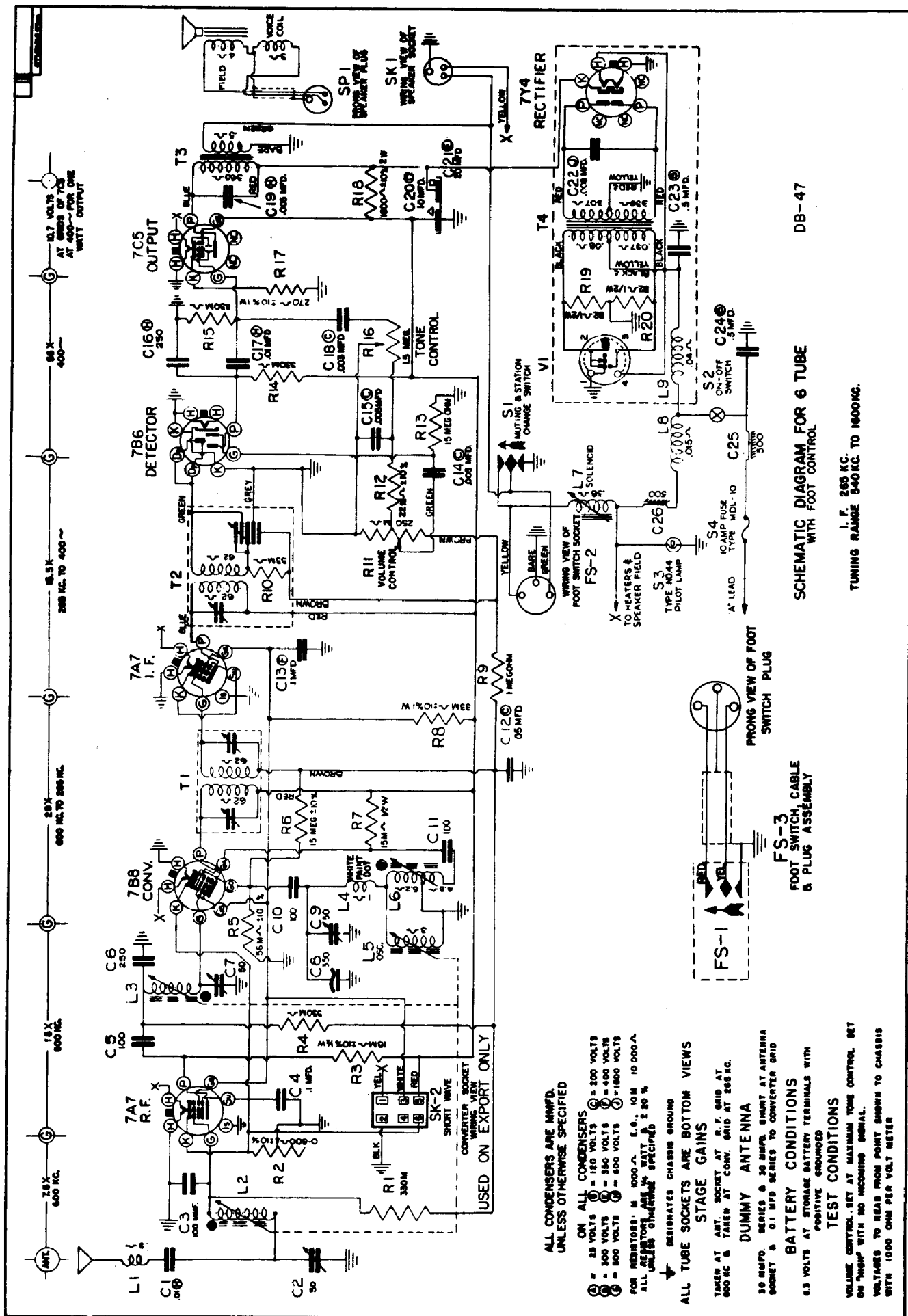
CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made **ONLY** if a core or coil is replaced.

1. Replace coil or core.
2. Set signal generator to 1700 Kc.
3. Connect signal generator leads through dummy illustrated in figure 11 to antenna receptacle on the receiver.
4. Set receiver dial to 1600 KC. (Maximum high frequency end of dial.)
5. Screw the core completely out of the antenna coil, the converter coil, and the oscillator coil.
6. Adjust oscillator trimmer C-9 (Fig. 10) at 1700 Kc.
7. Adjust converter trimmer C-7, and antenna trimmer C-2 (Fig. 9 and 10) for maximum output reading.
8. Replace cores to their approximate original positions.
9. Set generator dial and receiver dial to 1200 Kc.
10. Adjust oscillator core L-5 (Fig. 10) to scale at 1200 Kc.
11. Adjust the antenna core, L-2 and converter core L-3 (Fig. 9 and 10), for maximum output reading.
12. Set signal generator to 600 Kc.
13. "Rock in" Shunt oscillator coil L-6 (Fig. 10) for maximum output reading. (This should only be done as a last resort.) This is the same as rocking in the padder condenser on a ganged condenser receiver.
14. Check receiver at 1200 Kc. for calibration and gain. If receiver is off scale or weak, repeat operations 9, 10 and 11.
15. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc. the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in car allow it to operate for approximately 15 minutes in order for each part to reach normal operating temperature. Extend the antenna to maximum and align the antenna trimmer C2 on a weak station near 1200 Kc.



Schematic

PARTS LIST

HUDSON DOMESTIC AUTO RADIO PART No. HA206990

Zenith Model 6MH089 (Chassis 6C89)

RADIO RECEIVER KIT Model DB-47

Radio receiver	Temperature gauge con-
Screws, lockwashers, knobs	denser
Foot selector switch	Ignition coil condenser
assembly	Motor hood bonding spring
Speaker and bracket	Support bracket and at-
assembly	taching parts
Distributor suppressor	Ground strap and attach-
Voltage regulator con-	ing parts
denser	

RADIO ANTENNA KITS

- Part No. 209558—60" Telescopic Antenna including all installation parts.
Part No. 209762—90" Telescopic Antenna including all installation parts.
Part No. 205451—Vacuum Operated Antenna including all installation parts.

NOTE: The above kits are not available from the radio manufacturer. See your Hudson dealer.

COILS AND CHOKES

Diag. No.	Zenith Part No.	Hudson Part No.	Description	Price
L9	20-213	204890	Main Hash Choke.....	.35
T1	95-916	209569	1st I.F. Transformer.....	1.75
T2	95-942	207301	2nd I.F. Transformer.....	2.05
L1	S-8819		Antenna Motor Noise	
		209741	Choke Assembly	.26
L4	S-11229		Oscillator Series Coil	
		209568	Assembly	.30
L8	S-11232		Motor Noise Choke	
		209571	Coil Assembly	.22
L3)	S-11041		Left Hand Coil and	
L5)			Shield Assembly	
		206668	(Osc. & Converter)....	2.09
L6	S-13646		Oscillator Shunt Coil	
		206657	Assembly	1.80
L2	S-13650		Right Hand Coil and	
		206669	Shield Assembly (R.F.)	1.50

CONDENSERS

C5 }				
C10 }	22-162	204900	100 Mmfd. 600 V.	.20
C11 }				
C13	22-170	204901	.1 Mfd. 400 V.	.26
C16	22-182	204902	250 Mmfd. 600 V.	.26
C4	22-190	209577	.1 Mfd. 200 V.	.23
C12	22-250	204904	.05 Mfd. 200 V.	.20
C3	22-365	206741	100 Mmfd. 500 V.	.20
C19	22-838	204905	.005 Mfd. 600 V.	.20
C14 }				
C15 }	22-906	204906	.005 Mfd. 200 V.	.20
C23 }				
C24 }	22-908	204907	.5 Mfd. 120 V.	.33
C6	22-1136	209585	250 Mmfd. 600 V.	.20
C1 }				
C17 }	22-1170	204910	.01 Mfd. 600 V.	.20
C18	22-1180	209587	.003 Mfd. 200 V.	.20
C7	22-1377	209582	Detector Trimmer	.33
C9	22-1378	209581	Oscillator Trimmer	.32
C22	22-1448		.008 Mfd. (or 22-1651)	
		209579	1600 V.	1.00
C8	22-1478		350 Mmfd. Compensator	.32
		209919		

Diag. No.	Zenith Part No.	Hudson Part No.	Description	Price
C20)	22-1644		Two Section Electro-	
C21)			lytic 10 Mfd.—300 V.X	
			20 Mfd.—350 V.	
			(or 22-1554)	1.38
C2	22-1679	206742 206660	Antenna Trimmer	.45

RESISTORS

R18	63-1368		1800 Ohm W.W.	
		209920	2 Watt	.33
R17	63-1369		270 Ohm W.W.	
		209921	1 Watt	.22
R2	63-1379	207877	Sensitivity Control	.35
R9	63-1390		1 Megohm	
		209922	1/4 Watt	.19
R1 }				
R4 }				
R14 }	63-1392		330M Ohm	
R15 }		209923	1/4 Watt	.19
R12	63-1395	206743	22M Ohm	1/4 Watt .19
R8	63-1398	209928	33M Ohm	1 Watt .24
R19)				
R20)	63-1399	209929	82 Ohm	1/2 Watt .21
R13	63-1400		15 Megohm	
		209930	1/4 Watt	.19
R7	63-1401		15M Ohm.	
		209931	1/2 Watt	.21
R6	63-1406		15 Megohm	
		206661	1/4 Watt	.19
R3	63-1411	208000	18M Ohm	1/2 Watt .21
R5	63-1431	206744	56M Ohm	1/4 Watt .19
R11	63-1539		Volume and Tone Con-	
		206996	trol (or 63-1334)	3.01

MISCELLANEOUS

	52-202		Battery Cable (Set to Fuse)	.19
		204935	Battery Cable (Fuse to Ammeter)	.24
	52-279	209968	Speaker Cable & Plug.	.96
	52-294	206745	Volume Control Cable	.85
	78-281	209745	Vibrator Socket	.12
	78-596		Loktal Base Tube Socket (8 contact).....	.18
		209746	Foot Switch Cable Plug	
FS-2	78-646		Socket	.21
		206997	On-Off Switch	.55
S2	85-339	209747	Vibrator Cushion	
	93-456		Washer	.02
		209748	Power Transformer (or 95-1024)	7.00
T4	95-1023	206662	Output Transformer	2.50
T3	95-1026	206663	Fuse—20 Amp.	.12
	136-12	18269	Vibrator	3.85
V1	190-20	209686	Installation Instruction	
	202-548		Book	.10
		206665	Hand Selector & Mut-	
S1	S-11270		ing Switch Assembly	.67
		206658	Antenna Socket, Bracket & Terminal Strip	
	S-11310		Assembly	.43
		209934	Foot Switch	
FS-3	S-13246		Assembly	3.40
		206994		

PARTS LIST (Continued)

SPEAKER AND MOUNTING COMPONENTS				
Diag. No.	Zenith Part No.	Hudson Part No.	Description	Price
	12-937		Speaker Support Bracket	.25
SPI	49-538	204020	6" Dynamic Speaker (Field Coil Not Replaceable)	7.00
SPI	49-586	208826	6" P.M. Speaker (Alt. for 49-538)	7.00
	54-30	206666	8-32 x 5/16 x 7/64 Hex Nut	.01
	57-945	170567	Hex Nut	.01
			Speaker Cover Plate	.90
	114-88	204022	8-32 x 1/2" Hex Hd. Machine Screw	.01
	114-167	205287	#10-32 x 5/16" Hex Acorn Hd. Machine Screw	.01
		205288	Rubber Speaker Gasket	.48
	196-53	204024		

DIAL AND TUNING MECHANISM ASSEMBLY

	26-337		Dial Scale (Manual Tuning)	.22
	34-132	209682	Indexing Disc	.02
	34-145	209691	Indicator Drive Gear	.11
	34-158	209693	Ratchet Gear	.34
	46-581	206664	Selector Knob (2 used)	.20
	57-1061	209553	Escutcheon	4.40
	57-1151	209560	Name Plate	.10
	59-158	209694	Dial Pointer	.46
	80-329	204040	Gear Indexing Spring	.03
	80-331	209695	Cross Arm Return Spring	.04
	80-332	209681	Cam Lever Spring	.03
	80-336	209696	Ratchet Gear Return Spring	.01
	80-340	209697	Lever Spring	.01
	80-341	209698	Kick-Off Spring	.01
	80-342	209699	Tuning Shaft Spring	.01
	80-343	209700	Solenoid Switch Spring	.01
	80-344	209701	Solenoid Switch Contact Spring	.03
	80-425	209702	Knob Return Spring	.07
S3	100-36	209703	Dial Light Bulb—Mazda Type #44	.10
	149-44	171113	Adjusting Spring and Core	.40
		209799		

Zenith Part No.	Hudson Part No.	Description	Price
188-45		Turret Screw Lock Ring	.02
S-10826	209705	Solenoid End Plug and Bracket Assembly	.30
L7 S-10829	209706	Solenoid and Terminal Assembly	.79
S-10831	209567	Ratchet and Bracket Assembly	.63
S-11052	209707	Tuning Shaft and Gear Assembly	1.34
S-11082	204025	Turret Assembly	3.34
S-11313	209709	Dial Drum and Bracket Assembly (35-9)	.99
S-11494	209738	Mounting Plate and Lever Assembly	.59
S-11976	209739	Dial Light Socket and Wire Assembly	.27
S-13649	209740	Cross Arm Assembly	1.10
	206656		

INSTALLATION PARTS AND KNOBS

S-13413	206659	Complete Installation Kit—	5.50
22-1260		Temperature Gauge	
	152021	Condenser	.38
22-1537		Generator & Ignition Coil Condenser	.77
46-459	208592	Tone Control Knob	.19
54-173	205293	Set Mounting Nut (Trim Washer)	.24
54-174	205283	1/4-20 Wing Nut	.03
63-1252	205289	Distributor Suppressor	.48
80-145	205281	Motor Hood Bond Spring	.02
112-310	205282	Foot Switch Mounting Screw	.02
112-365	170687	#8 x 1/2" B.H.S.M. Screw	.01
S-12271	170304	Tuning Control & Trim Knob Assembly (46-550 and 584)	1.28
S-12272	209936	Volume Control Knob & Spring Assembly (46-549)	.26
	209937		

Prices Subject to Change Without Notice.

PARTS LIST Zenith Model 6MHO89E (Chassis 6C89E) (DB47)

HUDSON EXPORT AUTO RADIO PART No. HA-206991

The parts listed for radio, part number HA 206991, is the same as for part number HA 206990 with the following parts omitted and added.

ADD

Diag. No.	Zenith Part No.	Description	Price
SK2	52-419	Short wave Converter cable and socket	
T3	95-1027	Output transformer	2.70
	202-549	Instruction Book	.10

OMIT

Diag. No.	Zenith Part No.	Description	Price
T3	95-1026	Output transformer	2.50
	202-548	Instruction Book	.10

SERVICE MANUAL

FOR

HUDSON AUTOMOBILE RECEIVER

SPECIFICATIONS AND CIRCUIT FEATURES

MODEL 6MH889—CHASSIS 6E89

TUBE COMPLEMENT: 7A7 R.F., 7B8 Converter, 6BA6 I.F., 7B6 Detector, A.V.C., 1st Audio, 6V6GT Beam Power Output, 7Y4 Rectifier.

TUNING RANGE: 540 to 1600 Kilocycles.

AUTOMATIC POSITIONS: 6.

SPEAKER: 6" x 9" Oval Permanent Magnet externally mounted behind instrument panel. Voice coil impedance 3.2 ohms at 400 cycles.

TONE CONTROL: Continuously variable.

POWER OUTPUT: Maximum 4.5 watts. Measured at voice coil.

VIBRATOR: Non-synchronous.

POWER RATING: Current drain 6 amperes.

FUSE: 14 amperes. Type SFE-14.

SENSITIVITY: 4 Microvolts at one watt output.

I.F. FREQUENCY: 265 Kilocycles.

WARRANTY AND SERVICE

The DB48 Hudson Receiver is covered by warranty against defect in material and workmanship for a period of 90 days after retail delivery.

This warranty covers a receiver installed at the factory or a receiver installed in the field as an accessory.

IMPORTANT

A warranty registration tag is furnished with each receiver. This tag must be filled in and attached to the unit at the time of retail delivery and must accompany the receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail. All warranty labor claims must be made to the Hudson Dealer. Do NOT send claims to the radio manufacturer. Defective parts in warranty will be replaced, no charge to you, by the nearest Zenith Distributor.

OPERATING INSTRUCTIONS

OFF-ON SWITCH AND VOLUME CONTROL

To turn the receiver on, turn the volume control knob to the right until it clicks and the dial is illuminated. Allow the receiver to reach operating temperature. (Approximately 20 seconds.) To increase the volume, continue to turn this control knob to the right. To turn the receiver off turn the volume control knob to the left until it clicks.

TONE CONTROL

The tone control is located directly behind the volume control knob (Fig. 1). Rotating this control to the right or left will change the tone of the receiver. Tuning to the right will emphasize the high notes, while turning to the left will emphasize the bass notes.

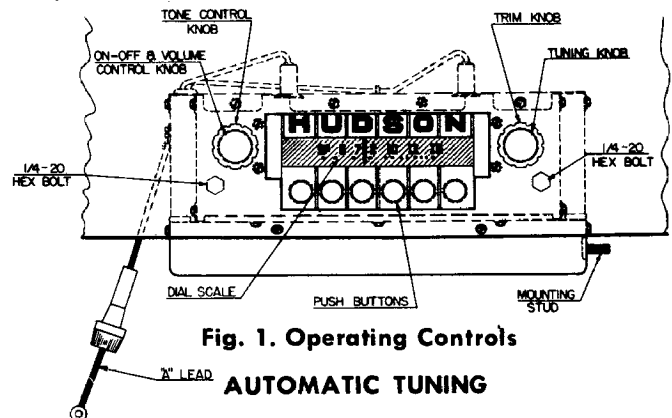


Fig. 1. Operating Controls

AUTOMATIC TUNING

There are six automatic tuning positions, each of which may be adjusted to any desired station. In order to simplify the identification of the stations, it is advisable to set the automatic tuning mechanism in sequence according to frequencies of the stations, beginning with the station broadcasting on the lowest frequency, and progressing to the station broadcasting on the highest frequency. If the positions have not been previously adjusted, proceed as follows:

1. Loosen the first push button by turning it counter-clockwise with your fingers, not more than two turns. If the push button is completely unscrewed, the plunger assembly, inside the receiver, may fall apart. Then it will be necessary to remove the radio from the car, open the case, and reassemble the plunger.
2. Turn the manual tuning control knob (Fig. 1) to tune in the desired station. Carefully tune to the middle of the signal for clearest reception.
3. Push the first push button in as far as it will go. Release the button, and tighten securely by turning it clockwise with the fingers.
4. Repeat the above procedure for the remaining five push buttons.

MANUAL TUNING

To tune manually it is only necessary to turn the manual tuning knob (on the right side of the receiver, see Fig. 1). Tune to exact frequency for the best tone quality. This can be done at any time without disturbing the automatic setting.

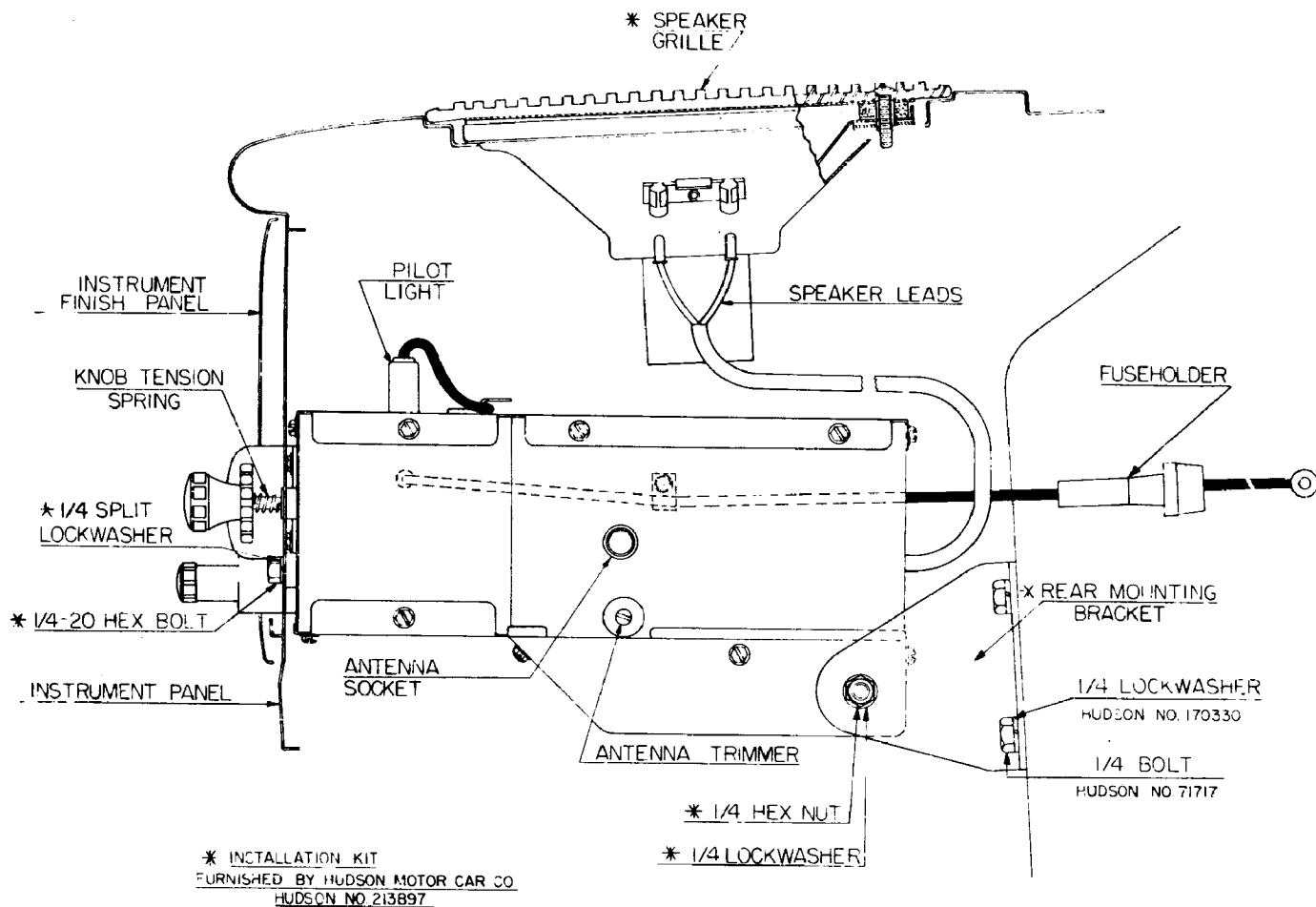


Fig. 2. Mounting Details and Connections

INSTALLATION INSTRUCTIONS

1. Install the antenna. (Complete instructions are furnished with each kit.)
2. Remove door on left hand side of instrument panel by removing the three screws from the back.
3. Remove ornament from center of trim panel above radio opening by means of removing the two face screws.
4. Remove the instrument finish panel and remove the escutcheon plug from the panel.
5. Remove the two bolts, Hudson No. 71717, from the fire wall and install the rear mounting bracket No. 12-1410. Do not tighten the bracket at this time. (Fig. 2.)
6. With the dial end of the receiver up, push the receiver up between the instrument panel and the air hopper. Turn the radio until the knob shafts slide through the openings in the instrument panel and the tapped spacers provided on the front plate of the set line up with the two corresponding holes in the instrument panel. Bring the receiver forward as far as it will go. (Fig. 2.)
7. With the receiver held in this position start the two $\frac{1}{4} \times 20 \times \frac{1}{2}$ fillister head screws, with lockwashers, into the holes.
8. Slip the elongated hole in mounting bracket over the stud on the set and install lockwasher and nut.
9. Before locking the receiver securely in position, place the instrument finish panel into position over the clock and speedometer and note whether or not the radio and trim panel are centered correctly. If not, move the radio until the dash trim panel and radio dial escutcheon assembly are in alignment. Then permanently fasten set in position by tightening the two front screws and the nut and bolts on the rear mounting bracket. Replace instrument finish panel and fasten securely.
10. Connect the "A" lead of the set to the battery terminal of the circuit breaker, mounted on the instrument panel brace over the steering column (Fig. 3).

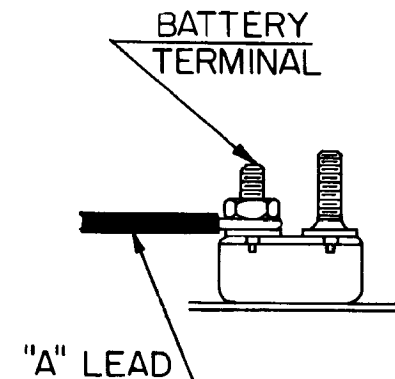


Fig. 3

11. Plug in antenna cable (Fig. 2).
12. Remove speaker cover plate, and pull speaker leads through opening in dash.
13. Plug speaker leads into pin jack mounted on speaker. Make sure green lead plugs into green spotted pin jack.
14. Lower speaker into position, and line up with holes in the instrument panel. Place speaker grille, included in radio package, over speaker, making sure the mounting holes line up, then fasten securely with the four chrome plated screws provided in kit.
15. Place tone control knob onto shaft, put on volume control knob, tighten set screw (Fig. 1). Be sure there is no binding.
16. Place knob tension spring No. 80-594 over the tuning shaft. Put on trim ring and press on tuning control knob as far as it will go. Tighten set screw (Fig. 1).
17. Replace ornament and door.
18. **IMPORTANT:** Turn the receiver on and allow it to operate for approximately fifteen minutes in order for it to reach normal operating temperature. Tune in a weak station near 1200 Kc. With a small screw driver adjust the antenna trimmer, located on the right side of the receiver for maximum volume (Fig. 2).

INTERFERENCE ELIMINATION

IMPORTANT: Use the utmost care in the following operations to insure freedom from motor noise. Be sure that good ground contacts are made between the interference condensers and the car body. If necessary, clean away paint or dirt with emery paper. Tighten all nuts and bolts securely.

1. Remove the mounting screw of the voltage regulator and under this screw mount the condenser No. 22-1537. Connect the lead to the voltage regulator "A" terminal. (Fig. 4.)
2. Install suppressor No. 63-1252 in center of hole of distributor cap. Place high tension lead in top of suppressor. Be sure the suppressor and the lead are fastened securely. (Fig. 5.)
3. Remove bolt on the right side of the ignition coil. Mount condenser No. 22-1537 under this bolt. Connect lead to coil terminal marked (—). (Fig. 6.)

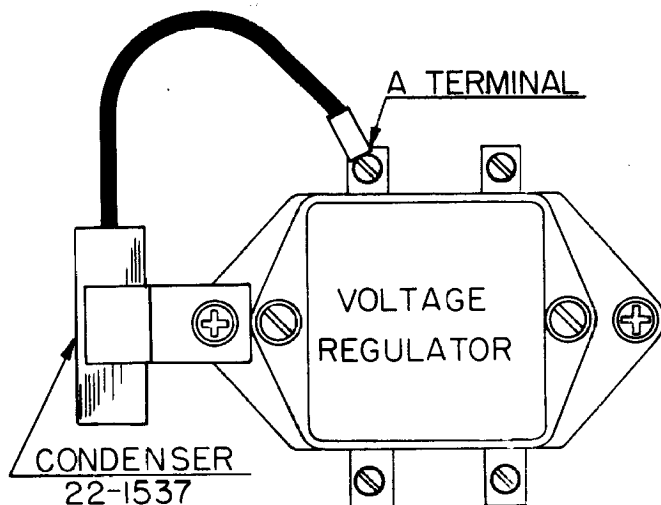


Fig. 4

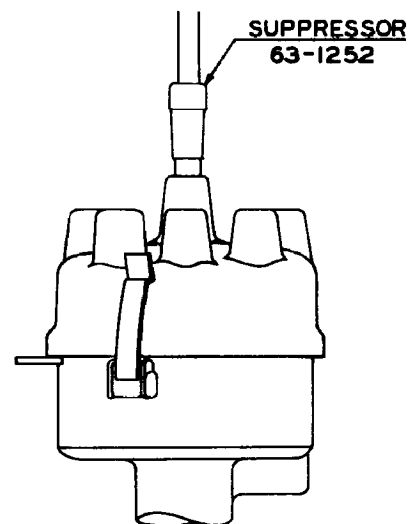


Fig. 5

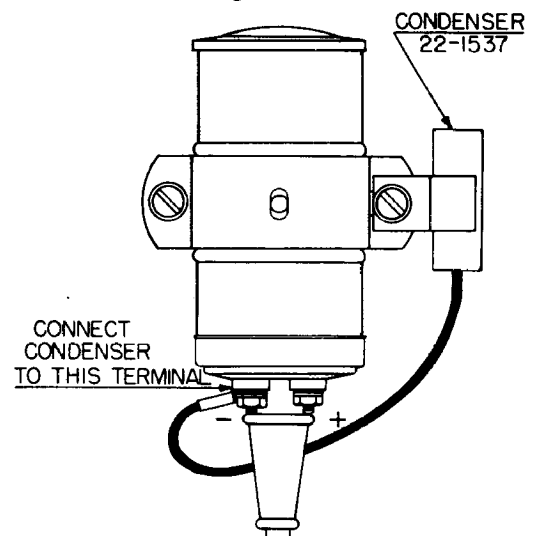


Fig. 6

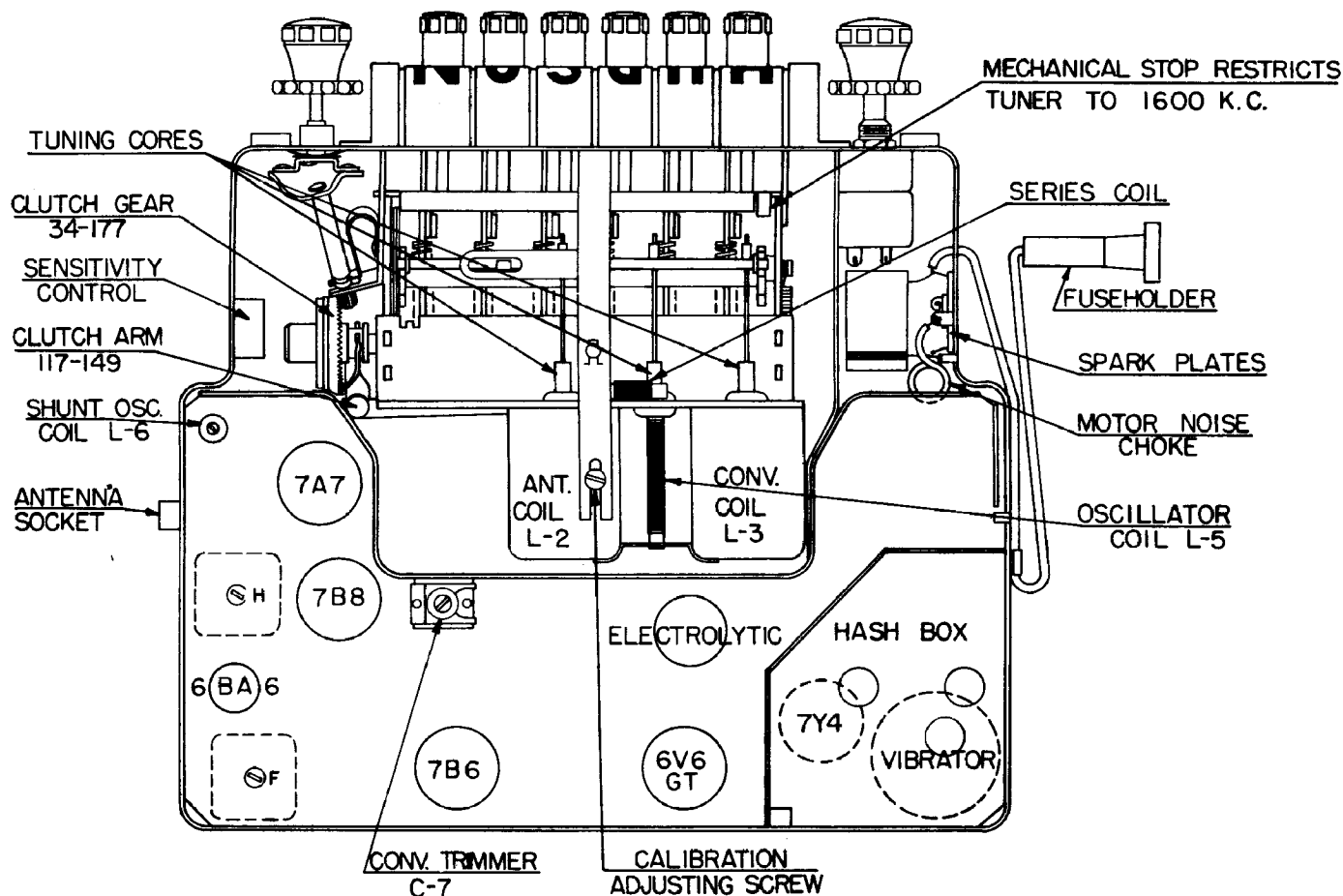


Fig. 7. Top View of Chassis

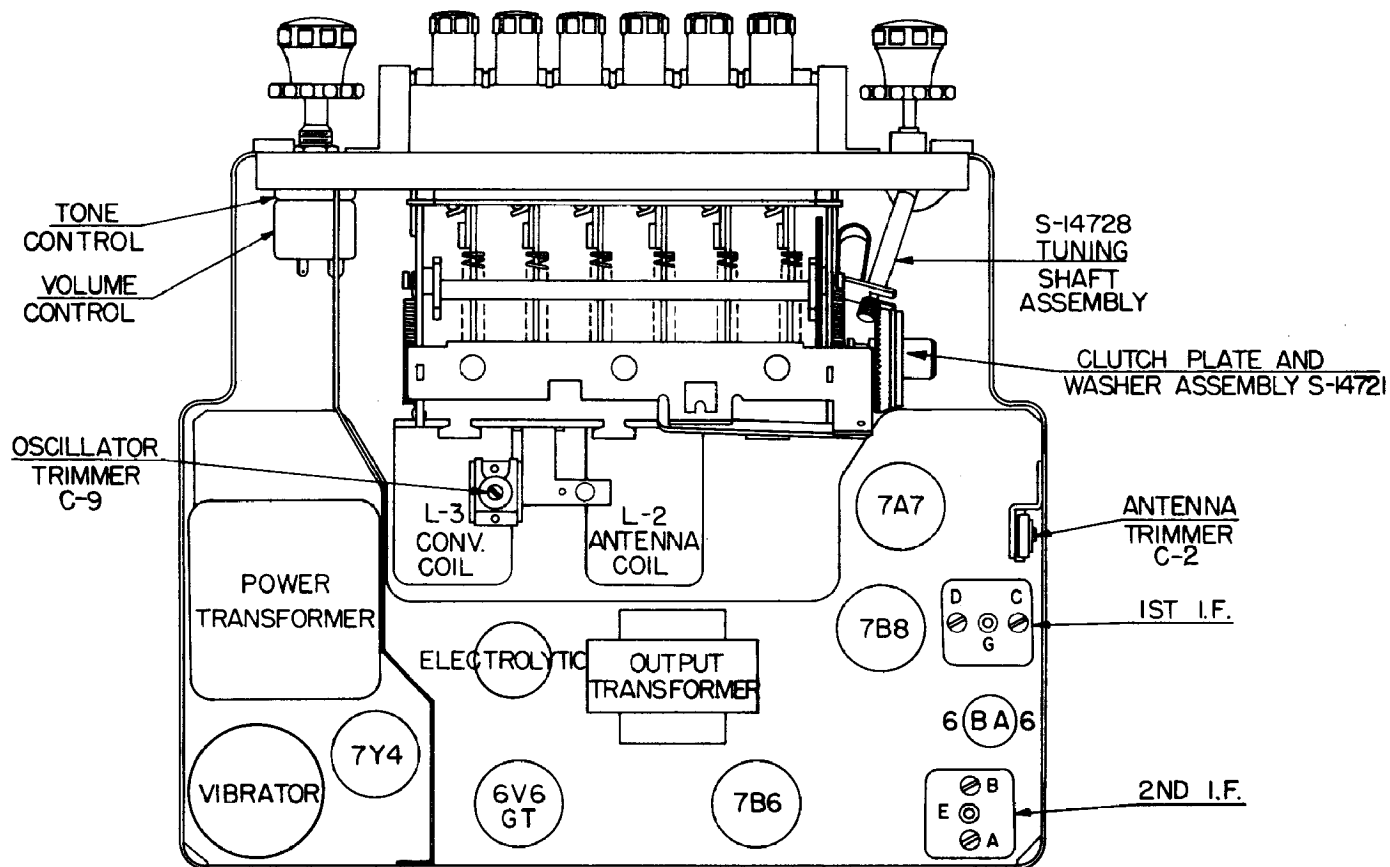


Fig. 8. Bottom View of Chassis

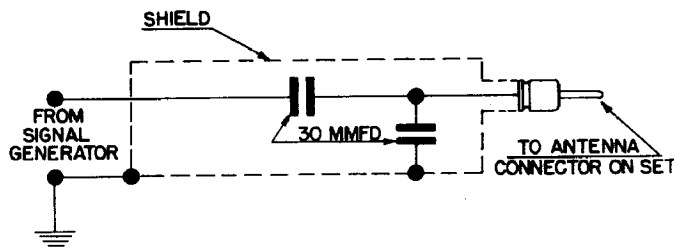


Fig. 9. Dummy Antenna

Fig. 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustment to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C, and D in order named for maximum output. Repeat the operation to assure accurate alignment. Some units have I.F. transformers that are slug tuned. In this case adjust I.F. slugs E, F, G, and H in order named for maximum output and repeat the operation to assure accurate alignment. (Figs. 7-8.)

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver. This is important.
2. Set signal generator to 535 Kc.
3. Tune set to 535 Kc.
4. Adjust oscillator trimmer C-9 (Fig. 8) for maximum response.
5. Set signal generator to 1400 Kc.
6. Tune set to 1400 Kc.
7. Adjust converter trimmer C-7 (Fig. 8) and antenna trimmer C-2 (Fig. 7) for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by tuning eccentric screw at fulcrum of dial pointer. (Fig. 7.)

CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

The steel clamp collar normally grips the core spring and before a core is screwed in or out this tension must be released.

TO REMOVE CORE:

Remove the steel clamp collar using stubby nosed pliers by pressing the lugs of the collar together. Using core alignment tool, part number S-13064, screw the core spring down to the support bracket. With your fingers, screw the core spring past the bracket and lift out of the coil.

TO REPLACE CORE:

Place the core in the coil, screw the core spring into and past the support bracket. Use core tuning wrench, part number S-13064.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (maximum high frequency end of dial).
4. Screw the cores completely out of the antenna coil, the converter coil, and the oscillator coil.
5. Adjust oscillator trimmer C-9 (Fig. 8) at 1675 Kc.
6. Adjust converter trimmer C-7, and antenna trimmer C-2 (Figs. 7 and 8) for maximum output reading.
7. Replace cores to their approximate original position.
8. Set signal generator dial and receiver dial to 1400 Kc.
9. Adjust oscillator core L-5 (Fig. 8) to scale at 1400 Kc.
10. Adjust the antenna core L-2, and converter core L-3 (Fig. 7) for maximum output reading.
11. Set signal generator to 600 Kc.
12. "Rock in" shunt oscillator coil L-6 (Fig. 8) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a general condenser receiver.
13. Check receiver at 1400 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop near the volume control should be bent to limit the frequency coverage to 1605 Kc.
15. Replace the steel clamp collar over the threaded insulating bushing.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1400 Kc.

PARTS LIST
HUDSON DOMESTIC AUTO RADIO PART No. HA213898
Zenith Model 6MH889 (Chassis 6E89)
DB-48 (H. A. 213898)

Diag. No.	Zenith Part No.	Hudson Part No.	Description	Price	Diag. No.	Zenith Part No.	Hudson Part No.	Description	Pri
COILS AND CHOKES					RESISTORS				
L8	20-213	204890	Main Hash Choke.....	\$.36	R2	63-1379	209877	Sensitivity Control (or 63-1267).....	\$.50
T1	95-1087	215456	1st I.F. Transformer (or 95-1077).....	1.75	R8	63-1398	209929	33M Ohm.....1 W.	.2
T2	95-1088	215457	2nd I.F. Transformer (or 95-1060).....	2.00	S2	63-1587	215473	Volume Control, Switch and Tone Control.....	3.0
L1	S-8819	209741	Antenna Motor Noise Choke Assembly.....	.40	R11				
L7	S-11232	209571	Motor Noise Choke Coil Assembly.....	.22	R16				
L2	S-14219	215458	Tuner Coil Unit Assembly (Ant., R.F. and Osc.)....	4.75	R18	63-1620	215474	1800 Ohm.....2 W.	.3
L3					R17	63-1621	215475	270 Ohm.....1 W.	.2
L5					R19	63-1740	215476	82 Ohm.....½ W.	.2
L6	S-14225	215459	Oscillator Shunt Coil Assembly.....	.80	R20				
L4	S-14226	215460	Oscillator Series Coil Assembly.....	.35	R21	63-1750	215477	150 Ohm.....½ W.	.2
L2	S-14227	215462	Antenna Coil Assembly.....	.90	R7	63-1835	215478	15M Ohm.....½ W.	.2
L3	S-14227	215462	R.F. Coil Assembly.....	.90	R3	63-1838	215479	18M Ohm.....½ W.	.2
L5	S-14228	215461	Oscillator Coil Assembly.....	.75	R12	63-1841	215480	22M Ohm.....½ W.	.2
CONDENSERS					R10	63-1849	215481	33M Ohm.....½ W.	.2
C13	22-170	204901	.1 Mfd.....400 V.	.26	R5	63-1862	215482	68M Ohm.....½ W.	.2
C16	22-182	204902	250 Mmfd.....500 V.	.26	R1	63-1891	215483	330M Ohm.....½ W.	.2
C4	22-190	209577	.1 Mfd.....200 V.	.23	R4				
C12	22-250	204904	.05 Mfd.....200 V.	.20	R14				
C3	22-365	215465	100 Mmfd.....500 V.	.20	R15	63-1912	215484	1 Megohm.....½ W.	.2
C19	22-838	204905	.005 Mfd.....600 V.	.20	R9				
C1	22-906	204906	.005 Mfd.....200 V.	.20	R6	63-1834	215485	15M Ohm.....½ W.	.2
C14					R13	63-1961	215486	15 Megohm.....½ W.	.2
C6	22-1136	209505	250 Mmfd.....500 V.	.20	MISCELLANEOUS				
C17	22-1170	204910	.01 Mfd.....600 V.	.20		19-158		I.F. Transformer Mtg. Clip.	.0
C18	22-1180	209587	.003 Mfd.....200 V.	.20	SP1	49-623	213880	P.M. Speaker (6" x 9" Oval Type) (S-14205).....	7.7
C15	22-1270	215465	.02 Mfd.....200 V.	.20		52-455	215489	Volume Control Cable.....	.7
C22	22-1448	209579	.008 Mfd.....1600 V.	1.00		52-452	213873	Battery Cable—Fuse to Ammeter (or 52-474)...	.5
C20	22-1644	215466	Electrolytic—20 Mfd. 350 V. x 10 Mfd. 300 V. (or 22-1554).....	1.60		52-472	215488	Speaker Cable and Plug...	.2
C21						52-473	215487	Battery Cable—Fuse to Set	.3
C8	22-1712	215467	260 Mmfd. Compensating.	.50		74-49	213881	Speaker Screen.....	.7
C2	22-1714	215468	Single Section Trimmer (Antenna—50 Mmfd.)...	.35		78-596	215490	Loktal Tube Socket (4 used)	.1
C7	22-1715	215469	Single Section Trimmer (Converter—50 Mmfd.)...	.35		78-782	215492	Miniature Tube Socket.....	.2
C9	22-1716	215470	Single Section Trimmer (Oscillator—50 Mmfd.)...	.35		78-796	215493	Antenna Connector Socket.	.2
C23	22-1728	215471	.5 Mfd.....100 V.	.55		78-801	215491	Octal Tube Socket.....	.1
C24						78-804	215494	Vibrator Socket.....	.2
C5	22-1730	215472	100 Mmfd. (Ceramic).....500 V.	.20		93-888	215486	Vibrator Cushion Washer...	.0
C10					T3	95-1030	215497	Output Transformer.....	2.4
C11					T4	95-1066	215498	Power Transformer.....	7.2
						125-16	171277	Rubber Grommet.....	.0
						125-63	171273	Rubber Grommet (3 used on S-14219).....	.0
						114-199	171252	6-32 x ¾" Hex. H.D. Slotted S.T. Screw.....	.0

PARTS LIST (Continued)

Diag. No.	Zenith Part No.	Hudson Part No.	Description	Price	Diag. No.	Zenith Part No.	Hudson Part No.	Description	Price
	126-553	215499	Miniature Tube Shield	\$.11		93-885	215437	1/2 x .191 x 3/8" Bakelite Washer (2 used on S-14454)	\$.01
	138-24	211640	Speaker Grille (Hudson No. 211640) Supplied by Hudson						
	149-62	215436	Iron Core and Screw (used on S-14225)	.10	S3 S5	100-36	171113	Dial Light Bulb—Mazda No. 44	.09
V1	190-22	215495	Vibrator	4.15		112-699	171251	No. 4-40 x 3/16" R.H.S.T. Screw—Stan-Tap-Cad. Pl. (57-1341)	.01
	202-562	213879	Instruction Book (Owner's Manual)	.10		149-63	215453	Iron Core and Screw (3 used)	.40
	202-591	215438	Noise Suppression Supplement Sheet	.05		192-114	215444	Escutcheon Window	.20
	S-14205		Speaker and Screen Assembly	9.25		S-14212	215449	Tuner Unit Assembly	12.50
	S-14210	215439	Case Cover Set Mtg. Stud and Spring Assembly	.95		S-14215	215451	Pointer Bracket and Stud Assembly	.30
	S-14458	213897	Installation Parts Kit (Hudson No. 213897) . Supplied by Hudson			S-14216	215452	Pointer Drive Link and Stud Assembly	.15
INSTALLATION PARTS						S-14217	215453	Dial Light Socket and Wire Assembly	.70
	S-14203	213898	Installation Kit—Complete	1.50		S-14224	215454	Cross Arm and Bushing Assembly	.80
	46-698	213896	Trim Knob	.35		S-14721		Clutch Plate and Washer	.65
	46-699	213895	Tone Control Knob	.35		S-14728		Tuning Shaft, Pinion Gear and Coupling Assembly	.50
	52-452	213873	Battery Cable—Fuse to Ammeter	.50				Muting Switch Assembly	.05
	80-594	213894	Knob Tension Spring	.01	S1	S-14733		Cam Lock	.03
S4	136-11	170480	14 Ampere Fuse—Type SFE-14	.12		17-102		Clutch Gear	.70
DIAL AND TUNING MECHANISM ASSEMBLY						34-177		.088 D x 5/32" Rivet	.01
	S-14756	215434	Push Button Knob Assembly (6 required)	.65		64-162		No. 6-32 x 1/4" Hex Head Slotted Set Screw	.02
	26-391	215440	Dial Scale	.90		73-118		Yoke Tension Spring	.08
	56-228	215442	Cross Arm Guide Rod	.15		80-640		Clutch Release Bar Spring	.01
	57-1340	215443	Escutcheon	3.00		80-641		Clutch Spring	.02
	57-1341	215445	Escutcheon Window Retaining Plate	.30		80-642		Tuning Shaft Steel Washer	.02
	59-207	215446	Dial Pointer	.30		93-921		Tuning Shaft Spring Washer	.02
	80-379	215447	Pointer Retaining Spring	.03		93-922		Fishpaper Washer	.01
	80-586	215455	Cross Arm Tension Spring (2 used)	.07		93-923		Clutch Arm Stud	.03
	80-594	213894	Knob Tension Spring	.01		97-305		Clutch Lever	.15
	80-625	215448	Pointer Link Tension Spring	.08		117-149		Retaining Ring	.02
						188-111			

Prices Subject to Change Without Notice

SERVICE MANUAL

Built for
NASH MOTORS
Division of
Nash-Kelvinator Corp.,
Kenosha, Wis.



For Models
6MN082
6MN088
6MN788
6MN887

Made by ZENITH RADIO CORPORATION, Chicago 39, Illinois, U. S. A.

Electrical Specifications

TUNING RANGE:.....540-1600 Kc.

INTERMEDIATE FREQUENCY:.....265 Kc.

SENSITIVITY:.....4 microvolts at one
watt output.

POWER OUTPUT:.....5.5 watts measured
at the voice coil.

SPEAKER:.....8" round, instrument
panel mounting.

CURRENT CONSUMPTION:.....7.5 amperes

**INSTANTANEOUS CURRENT CON-
SUMPTION DURING AUTOMATIC
CHANGE CYCLE:**.....20 amperes

TUBE COMPLEMENT:.....7A7 R.F.,
7B8 converter, 7A7 I.F., 7B6 detector
and 1st audio, 7C5 Power output, 7Y4
rectifier.

IMPORTANT

The warranty tag must be filled in by the car dealer at time of sale and accompany each receiver to be serviced at established warranty rates during the guarantee period. Otherwise regular charges for labor and material prevail. All repairs, whether in or out of warranty, are for the account of the car dealer or customer. DO NOT send claims to the Zenith Radio Corporation.

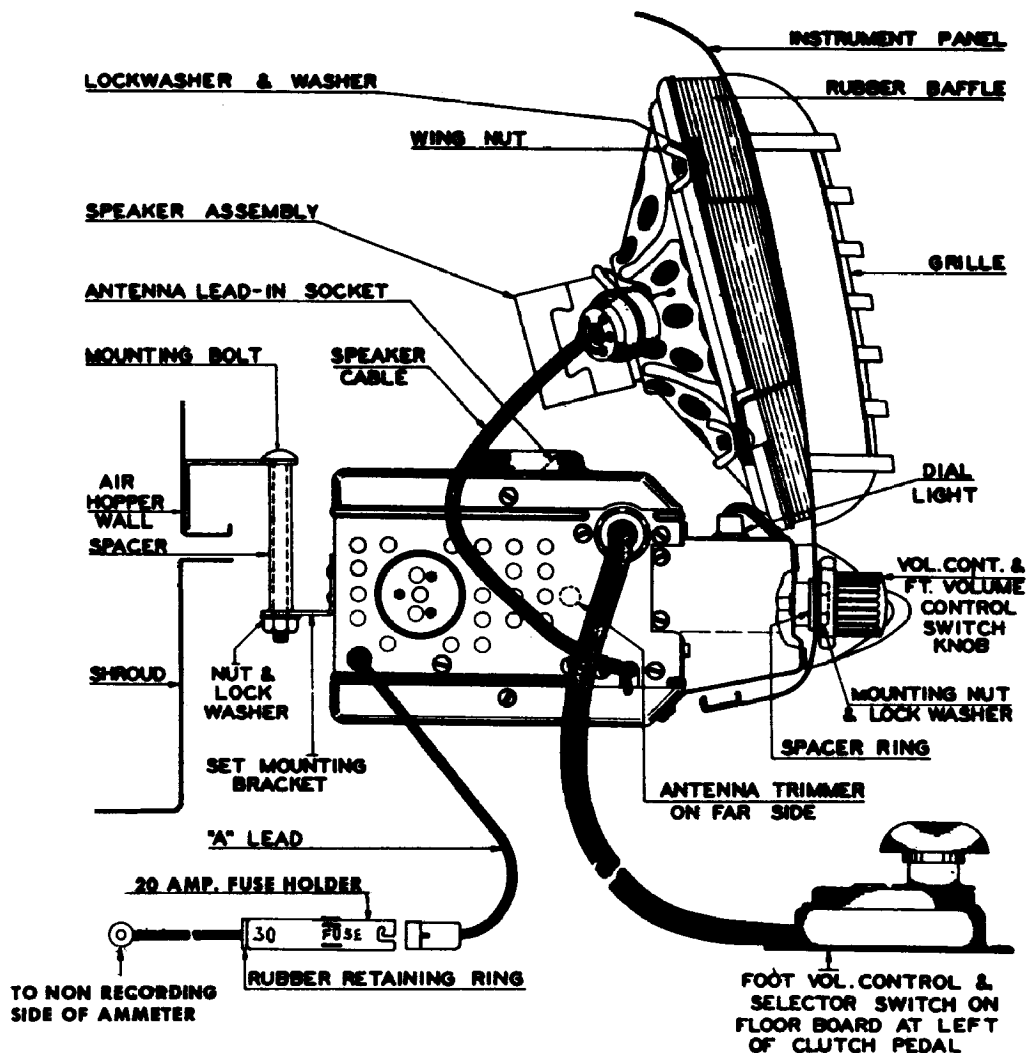


Fig. 1. Installation

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the installed receiver, the escutcheon plate, and the control knobs, are given here to facilitate removal and reinstallation of this receiver when service or repair is necessary.

To take the receiver from the car, remove the control knobs and mounting nuts from the front panel, and remove the nut, lock washer, bolt, and spacer from the set mounting bracket.

MANUAL TUNING

1. Press Automatic Tuning Station Selector (Fig. 2) several times or until the letter "M" appears in indicator window.
2. Pull Manual tuning control knob (right hand) outward and turn to tune in desired station. Be sure to tune to exact frequency to assure the best tone quality.

VOLUME—Adjust left hand control knob for desired volume.

TONE CONTROL—The tone control is located behind the volume control knob. Turn in either direction for most pleasing tone.

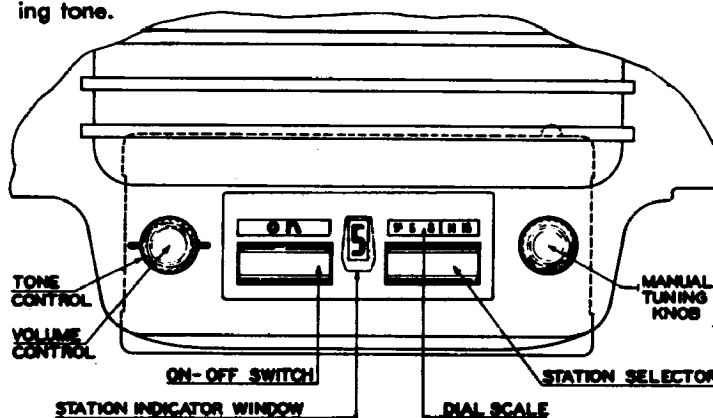


Fig. 2. Front View

AUTOMATIC TUNING.

There are five automatic tuning positions which may be adjusted to five desired stations. If these positions have not been previously adjusted proceed as follows:

1. Press station selector bar until number 1 appears in station indicator window.
2. Pull manual tuning knob outward to engage the automatic mechanism.
3. Select the station desired and tune to its frequency by turning tuning knob. Tune very carefully for clearest reception.
4. Press station selector bar, pull manual tuning knob outward, and tune in station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five automatic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the station selector bar to return to dial tuning, or any one of the stations adjusted on the Automatic.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The generator condenser No. 22-920 should be installed as shown below in Figure 3.

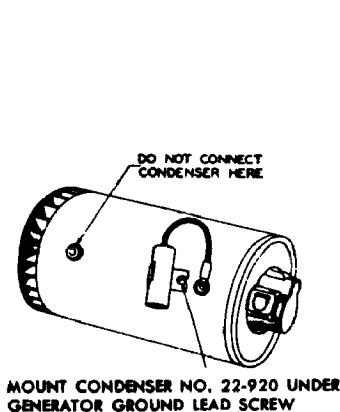


Fig. 3

The distributor suppressor No. 63-1046 should be connected as shown above in Figure 4.

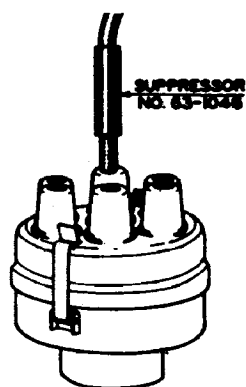


Fig. 4

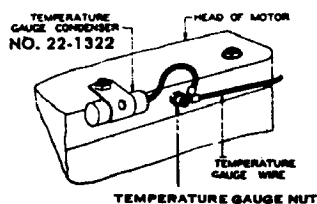


Fig. 5

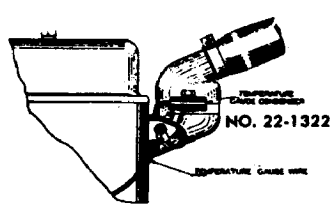


Fig. 6

The No. 22-1322 temperature gauge condenser should be installed as shown in Figure 5 for Nash 600 series cars and Figure 6 for Ambassador cars.

The ammeter and fuel gauge condensers No. 22-919 should be installed as shown in Figure 7.

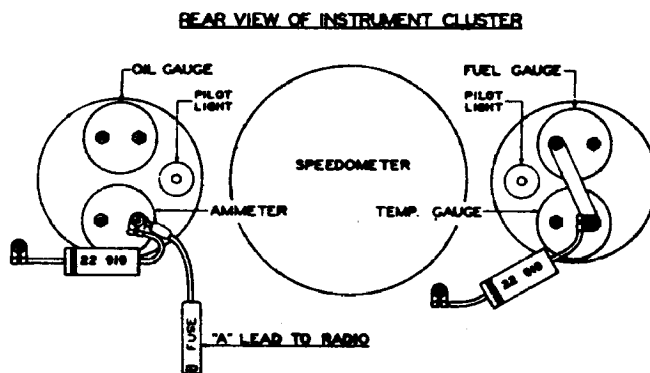


Fig. 7

The motor hood bond spring No. 80-145 should be installed as shown in Figure 8. Note that the sharp extrusions are facing down toward the front of the car before the hood grounding strip is bent back. Make sure the instrument panel bolts and chassis mounting bolts are tight.

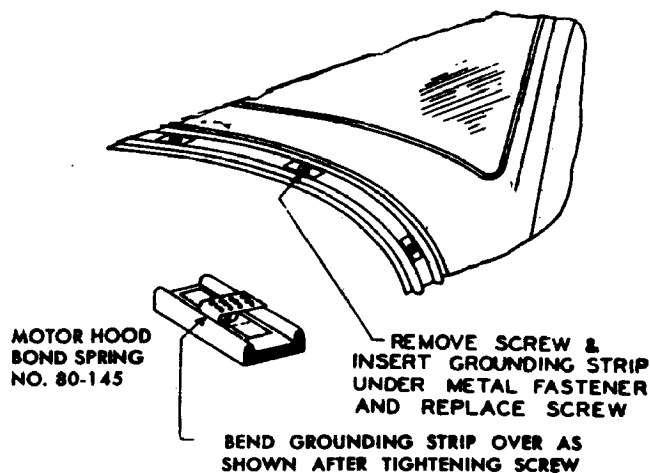


Fig. 8

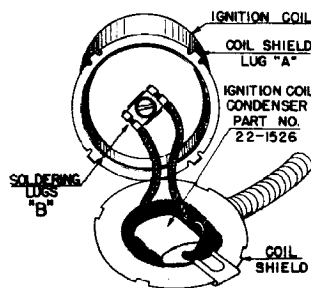


Fig. 9. Ign. Coil Cond.

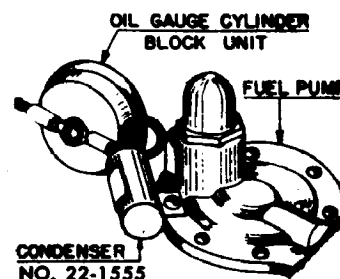


Fig. 9A. Oil Gauge Cond.

Straighten coil shield lugs "A" on back of ignition coil. Remove shield. Condenser should be installed as shown in Fig. 9. When replacing shield be sure to bend lugs down tightly to insure good connection between shield and coil, and be careful that the soldering lugs do not short against the ignition coil. The oil gauge condenser should be installed as shown in Fig. 9A.

DELAYED AUTOMATIC MUTING CIRCUIT

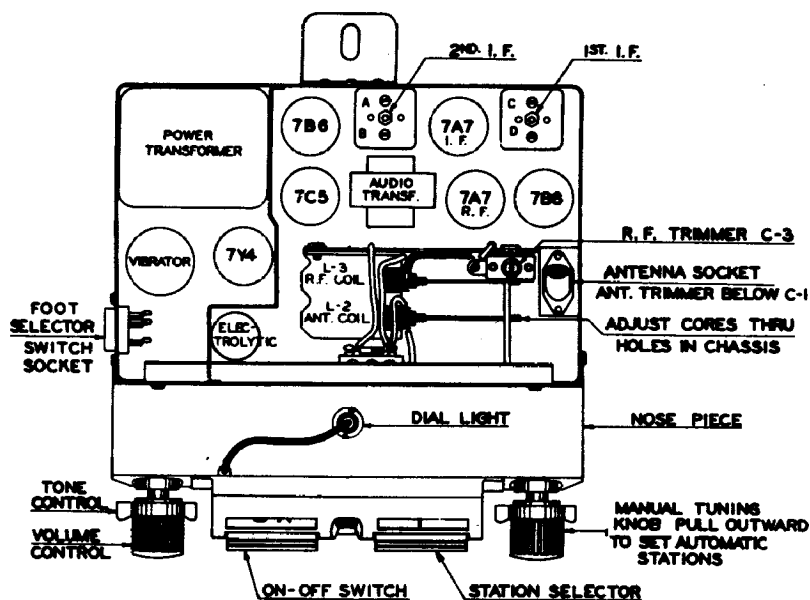


Fig. 10. Top View of Chassis.

Pressing either the Push-bar or the foot control switch automatically mutes the receiver for the duration of the change cycle. This action is accomplished by applying 6 volts negative to the 7B6 first audio grid through the 1 megohm resistor R-22. (See schematic diagram.) This negative voltage blocks off the grid of the 7B6 until the voltage bleeds off through the 15 megohm resistor R-14. Then the receiver will again operate normally. NOTE: If the battery polarity is reversed the receiver will not mute and it may become distorted during the change cycle. Always connect the positive (+) terminal of the storage battery or power supply to the receiver case when checking the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all adjustments on the receiver with

volume control turned full on and foot volume control cable plugged into its socket. Reduce signal intensity as much as possible at signal generator. Connect output meter across voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C, and D (Fig. 10), in the order named for maximum output. Repeat the operation to assure accurate alignment.

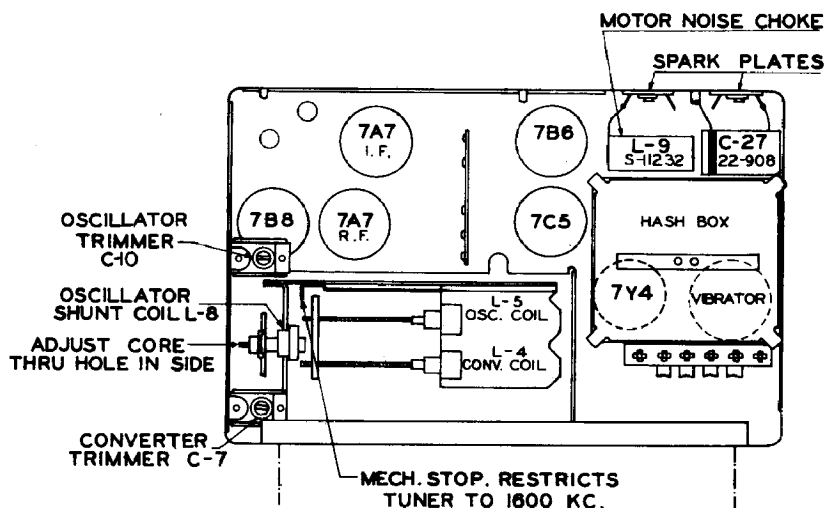


Fig. 11. Bottom View of Chassis.

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy illustrated in Fig. 12 to antenna lead in socket on receiver.
2. Set signal generator to 535 Kc.
3. Place set in manual tuning position and set dial to 535 Kc.
4. Adjust oscillator trimmer C-11 (Fig. 11), for maximum response.
5. Set signal generator to 1200 Kc.
6. Tune set to 1200 Kc.
7. Adjust converter trimmer C-7 (Fig. 11) and R.F. trimmer C-3 (Fig. 10) for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by loosening dial scale mounting screws and sliding scale to desired position.

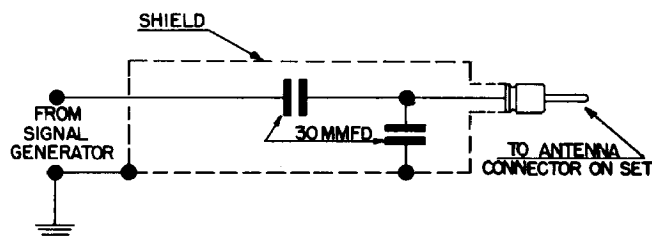


Fig. 12. Dummy Antenna

Fig. 12—Schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

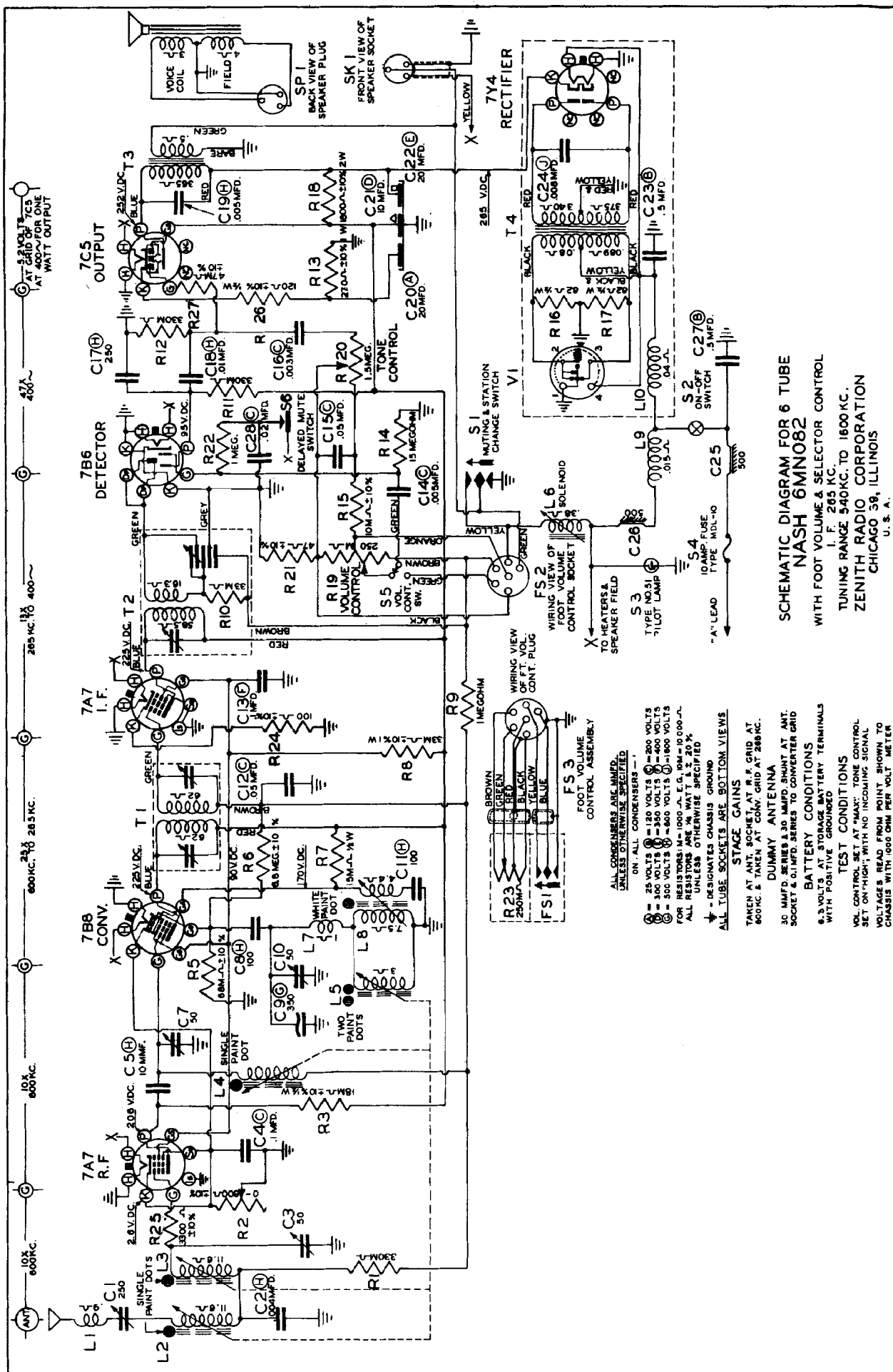
1. Replace coil or core.
2. Set signal generator to 1700 Kc.
3. Connect signal generator leads through dummy illustrated in Figure 12 to antenna receptacle on the receiver.

4. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
5. Screw the core completely out of the antenna coil, the R. F. Coil, the converter coil, and the oscillator coil.
6. Adjust oscillator trimmer C-10 (Fig. 11), at 1700 Kc.
7. Adjust converter trimmer C-7, R.F. trimmer C-3, and antenna trimmer C-1 (Fig. 10 and 11) for maximum output reading.
8. Replace cores to their approximate original positions.
9. Set generator dial and receiver dial to 1200 Kc.
10. Adjust oscillator core (Figure 10) to scale at 1200 Kc.
11. Adjust the antenna core, R.F. core, and converter core (Fig. 10 and 11), for maximum output reading.
12. Set signal generator to 600 Kc.
13. "Rock in" shunt oscillator coil (Fig. 11) for maximum output reading. (This should only be done as a last resort.) This is the same as rocking in the padder condenser on a ganged condenser receiver.
14. Check receiver at 1200 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.
15. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc. the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

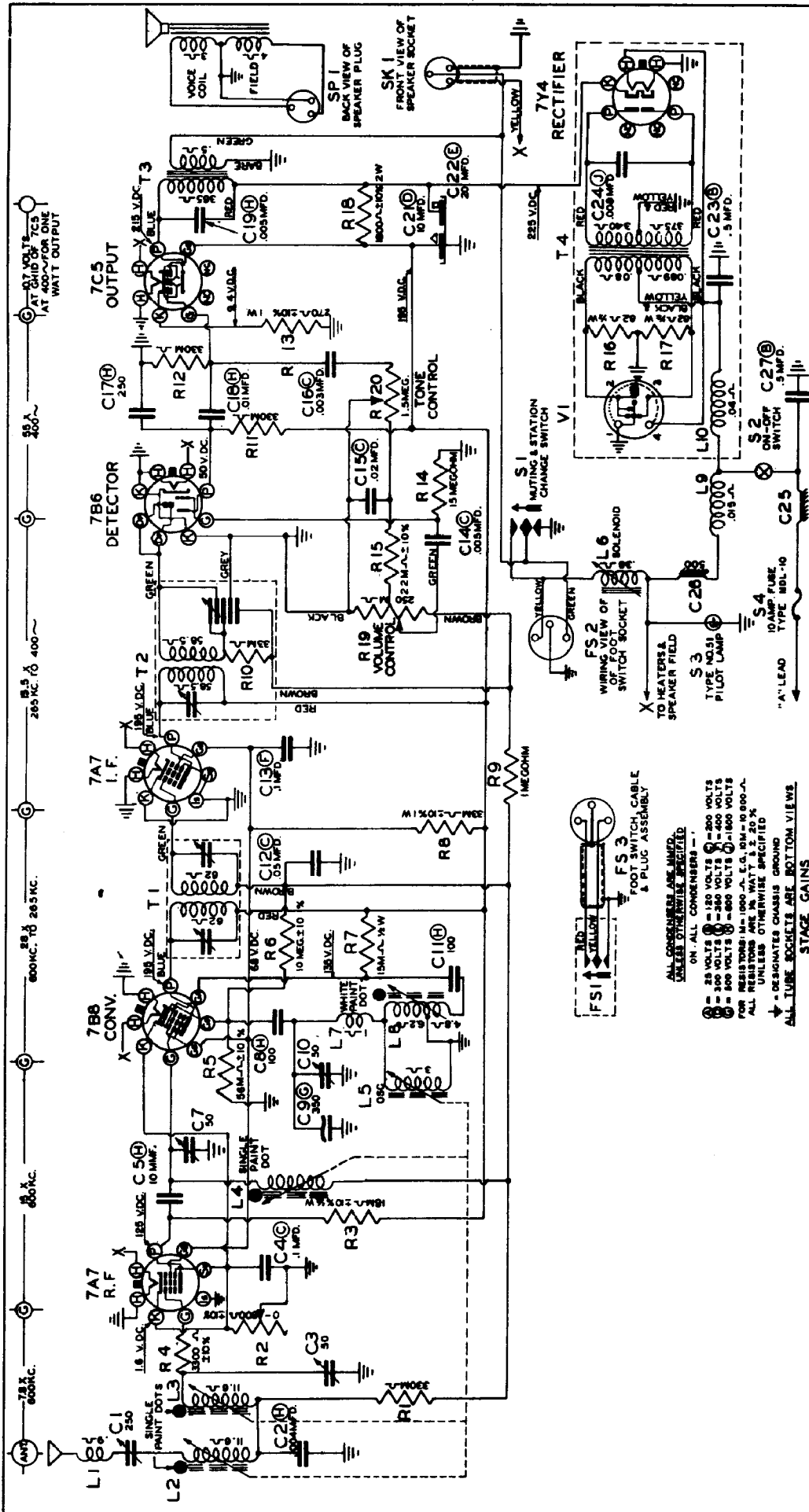
After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Check the antenna trimmer alignment on a weak station at approximately 1200 Kc. Extend antenna to maximum before adjusting the antenna trimmer.

The approximate voltages are measured with a 1000 ohm per volt meter between the socket terminals and the chassis as shown on the circuit diagram. The Volume Control is set at maximum with no signal. Battery voltage is 6.3



Circuit Diagram



SCHEMATIC DIAGRAM FOR 6 TUBE
NASH 6MN888 - 6MN788 - 6MN887

WITH FOOT CONTROL

I. F. 265 KC.

TUNING RANGE 540 KC. TO 1600 KC.

ZENITH RADIO CORPORATION

CHICAGO 39, ILLINOIS

U. S. A.

ALL COMPONENTS ARE MINIMUM
 UNLESS OTHERWISE SPECIFIED

ON ALL CONDENSERS -

1 = 25 VOLTS 2 = 125 VOLTS 3 = 250 VOLTS
 4 = 350 VOLTS 5 = 500 VOLTS 6 = 600 VOLTS
 7 = 800 VOLTS 8 = 1000 VOLTS 9 = 1500 VOLTS
 10 = 2000 VOLTS 11 = 2500 VOLTS 12 = 3000 VOLTS
 13 = 3500 VOLTS 14 = 4000 VOLTS 15 = 4500 VOLTS
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 19 = 6500 VOLTS 20 = 7000 VOLTS 21 = 7500 VOLTS
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PARTS LIST MODEL 6MN082 (CHASSIS 6C82)

1946 NASH LONG DISTANCE RADIO AC-6016

COILS AND CHOKES

Diagram No.	Part No.	
L10	20-213	Main hash choke
T 1	95-916	1st I.F. transformer
T 2	95-917	2nd I.F. transformer
L 1	S8819	Antenna motor noise choke assem.
L 7	S11229	Oscillator series coil assem.
L 8	S11231	Oscillator shunt coil assem.
L 9	S11232	Motor noise choke coil assem.
L 2 } L 3 }	S11040	Antenna & R.F. coil assem.
L 4 } L 5 }	S11041	Osc. & conv. coil assem.

Diagram

No.	Part No.	
R15	63-1394	10M ohm ¼ watt
R 5	63-1396	68M ohm ¼ watt
R 8	63-1398	33M ohm 1 watt
R16 } R17 }	63-1399	82 ohm ½ watt
R14	63-1400	15 megohm ¼ watt
R 7	63-1401	15M ohm ½ watt
R26	63-1410	120 ohm ½ watt
R 3	63-1411	18M ohm ½ watt
R24	63-1414	100 ohm ¼ watt
R 6	63-1416	6.8 megohm ¼ watt
R27	63-1417	47,000 ohm ¼ watt
R25	63-1418	3300 Ohm ¼ watt

CONDENSERS

C 8 } C11 }	22-162	100 mmfd. 600 volt
C13	22-170	.1 mfd. 400 volt
C17	22-182	250 mmfd. 600 volt
C 4	22-190	.1 mfd. 200 volt
C12	22-250	.05 mfd. 200 volt
C19	22-838	.005 mfd. 600 volt
C14	22-906	.005 mfd. 200 volt
C27 } C23 }	22-908	.5 mfd. 120 volt
C18	22-1170	.01 mfd. 600 volt
C16	22-1180	.003 mfd. 200 volt
C 2	22-1244	.004 mfd. 600 volt
C28	22-1270	.02 mfd. 200 volt
C15	22-1374	.05 mfd. 200 volt
C 3	22-1376	R.F. trimmer
C 7	22-1377	Detector trimmer
C10	22-1378	Oscillator trimmer
C20 } C21 } C22 }	22-1387	20MFD. 25 W.V. Electrolytic 20 MFD. 350 W.V. Electrolytic 10 MFD. 300 W.V. Electrolytic
C 1	22-1420	Antenna trimmer
C24	22-1448	.008 mfd. 1600 volt
C 5	22-1456	10 mmfd. 600 volt mica
C 9	22-1478	350 mmfd. compensator

RESISTORS

R19 } R20 } S 5 }	63-1342	Tone control vol. control & sw.
R18	63-1368	1800 ohm 2 watt W.W.
R13	63-1369	270 ohm 1 watt W.W.
R 2	63-1379	800 ohm sensitivity control
R 8 } R22 }	63-1390	1 megohm ¼ watt
R10	63-1391	33M ohm ¼ watt
R 1 } R11 } R12 }	63-1392	330M ohm ¼ watt
R21	63-1393	47 ohm ¼ watt

MISCELLANEOUS

SK1	52-280	Speaker cable & socket
	52-311	Battery cable (set to fuse)
	52-312	Battery cable (fuse to ammeter)
	78-281	Vibrator socket
FS2	78-551	Foot switch cable plug socket
	78-596	Tube socket—Loktal base (8 contact)
	80-374	Knob spring—L.H.
	80-375	Knob spring—R.H.
S2	85-353	On-off switch
	93-456	Vibrator cushion washer
T4	95-914	Power transformer
T3	95-915	Output transformer
S4	136-12	Fuse—20 amp.
V1	190-20	Vibrator
	192-86	Dial crystal
	202-406	Instruction book
S1	S11270	Hand selector & muting switch assem.
	S11391	Antenna connector socket & bracket assem.
	S11392	Front housing & mtg. bushing assem.
	S11395	Escutcheon dial crystal & key plate assem.
FS3	S12348	Foot switch, vol. control, cable & plug assem.
	63-1287	Foot vol. control
	S11922	Foot switch rubber cap assembly

SPEAKER AND SPEAKER MOUNTING PARTS

SP1	49-500	8" dynamic speaker & plug
	54-30	No. 8/32 x 5/16 x 7/64 Hex nut
	57-862	Speaker mounting plate
	112-298	No. 8/32 x ½ B.H. M.S.
	147-102	Speaker mounting spacer
	196-38	Speaker gasket

DIAL AND TUNING MECHANISM ASSEMBLY**Diagram**

No.	Part No.	Description
S3	100-32	Dial light bulb
L6	S10829	Solenoid & terminal assem.
	26-333	Dial scale (manual tuning)
	34-132	Indexing disc
	34-143	Idler gear
	34-154	Ratchet gear
	34-135	Volume control gear
	57-1046	Key plate (4 used)
	59-154	Dial pointer
	59-168	On-off indicator
	80-329	Gear indexing spring
	80-331	Cross arm return spring
	80-332	Cam lever spring
	80-336	Ratchet gear return spring
	80-340	Lever spring
	80-341	Kick-off spring
	80-342	Tuning shaft spring
	80-343	Solenoid switch spring
	80-344	Solenoid switch contact spring
	149-44	Adjusting spring & core
	188-45	Turret screw lock ring
	S10826	Solenoid end (plug & bracket assem.)
	S10831	Ratchet & bracket assem.
	S10834	Mounting plate & lever assem.
	S10836	Cross arm assem.
	S11053	Tuning shaft & gear assem.
	S11082	Turret assem.
	S11179	Dial drum & bracket assem.
	S11627	Dial light socket & wire assem.

MOTOR NOISE SUPPRESSION KIT**Part No.**

S11399	Motor noise suppression kit complete
22-919	Ammeter & fuel gauge condenser
22-920	Generator condenser
22-1322	Temperature gauge condenser
22-1526	Ignition coil condenser
22-1555	Oil gauge condenser
63-1046	Distributor suppressor
80-145	Motor hood bond spring

KNOBS AND INSTALLATION PARTS

S11400	Set installation kit complete
S11394	Tuning knob trim knob & set screw (46-536 & 537)
46-485	Volume control knob
46-534	Tone control knob
54-146	No. 10/32 wing nut
54-148	1/4-20 x 1/2 x 1/4 Hex nut
54-153	7/16-28 x .120 hex. nut
80-232	Knob retaining spring
93-127	No. 10 internal shakeproof lockwasher
93-173	1/4 internal shakeproof lockwasher
93-416	1/32 x 13/64 x 5/8 steel washer
112-310	Foot switch mounting screw
144-20	Set mounting bolt
147-101	Set mounting spacer
188-41	Spacer ring

PARTS LIST MODEL 6MN088 (CHASSIS 6C88)

The parts list for Model 6MN088 is the same as for Model 6MN082 with the following parts omitted and added.

ADD**Diagram**

No.	Part No.	Description
FS3	S-13246	Foot Switch Assembly
T2	95-942	I.F. Transformer
FS2	78-646	Foot Switch Socket

OMIT

Part No.	Description
S-12348	Foot Control and Switch Assembly
95-917	I.F. Transformer
78-551	Foot Switch Socket

PARTS LIST MODEL 6MN788 (CHASSIS 6D88)

The parts listed for Model 6MN788 is the same as for Model 6MN082 with the following parts omitted and added.

ADD**Diagram**

No.	Part No.	Description
C20, C21, C22	22-1644	Electrolytic Condenser
FS3	S-13246	Foot Switch Assembly
	S-13398	Escutcheon Dial Crystal and Key Plate Assembly
	S-13443	Tuning Knob and Set Screw Assembly
	46-642	Volume Control Knob
T3	95-1026 } 95-1024 }	Output Transformer
T4	95-1023 } S-13444 }	Power Transformer Installation Kit Assembly

OMIT

Part No.	Description
22-1387	Electrolytic Condenser
S-12348	Foot Control and Switch Assembly
S-11395	Escutcheon Dial Crystal and Key Plate Assembly
S-11394	Tuning Knob and Set Screw Assembly
46-485	Volume Control Knob
95-915	Output Transformer
S-11400	Installation Kit Assembly

PARTS LIST MODEL 6MN887 (CHASSIS 6D87)

The parts listed for Model 6MN887 is the same as Model 6MN788 with the following parts omitted and added.

ADD**Diagram**

No.	Part No.	Description
	S-11394	Tuning Knob and Set Screw Assembly
	46-485	Volume Control Knob

OMIT

Part No.	Description
S-13443	Tuning Knob and Set Screw Assembly
46-642	Volume Control Knob

SERVICE MANUAL

Built for
NASH MOTORS
Division of
Nash-Kelvinator Corp.,
Kenosha, Wis.



For Model
6MN988
(Nash Part No.
A.C.-149-1)

ZENITH RADIO CORPORATION, Chicago 39, Illinois, U. S. A.

Electrical Specifications

TUNING RANGE:.....540-1600 Kc.

INTERMEDIATE FREQUENCY:.....265 Kc.

SENSITIVITY.....4 microvolts at one
watt output.

POWER OUTPUT:.....5.0 watts measured
at the voice coil.

SPEAKERS:.....6" round front speaker
6" x 9" oval, rear speaker

CURRENT CONSUMPTION:.....6.5 amperes

INSTANTANEOUS CURRENT CON-
SUMPTION DURING AUTOMATIC
CHANGE CYCLE.....20 amperes

TUBE COMPLEMENT:.....7A7 R.F.,
7B8 converter, 7A7 I.F., 7B6 detector
and 1st audio, 7C5 power output, 7Y4
rectifier.

IMPORTANT

The warranty tag must be filled in by the car dealer at time of sale and accompany each receiver to be serviced at established warranty rates during the guarantee period. Otherwise regular charges for labor and material prevail. All repairs, whether in or out of warranty, are for the account of the car dealer or customer. DO NOT send claims to the Zenith Radio Corporation.

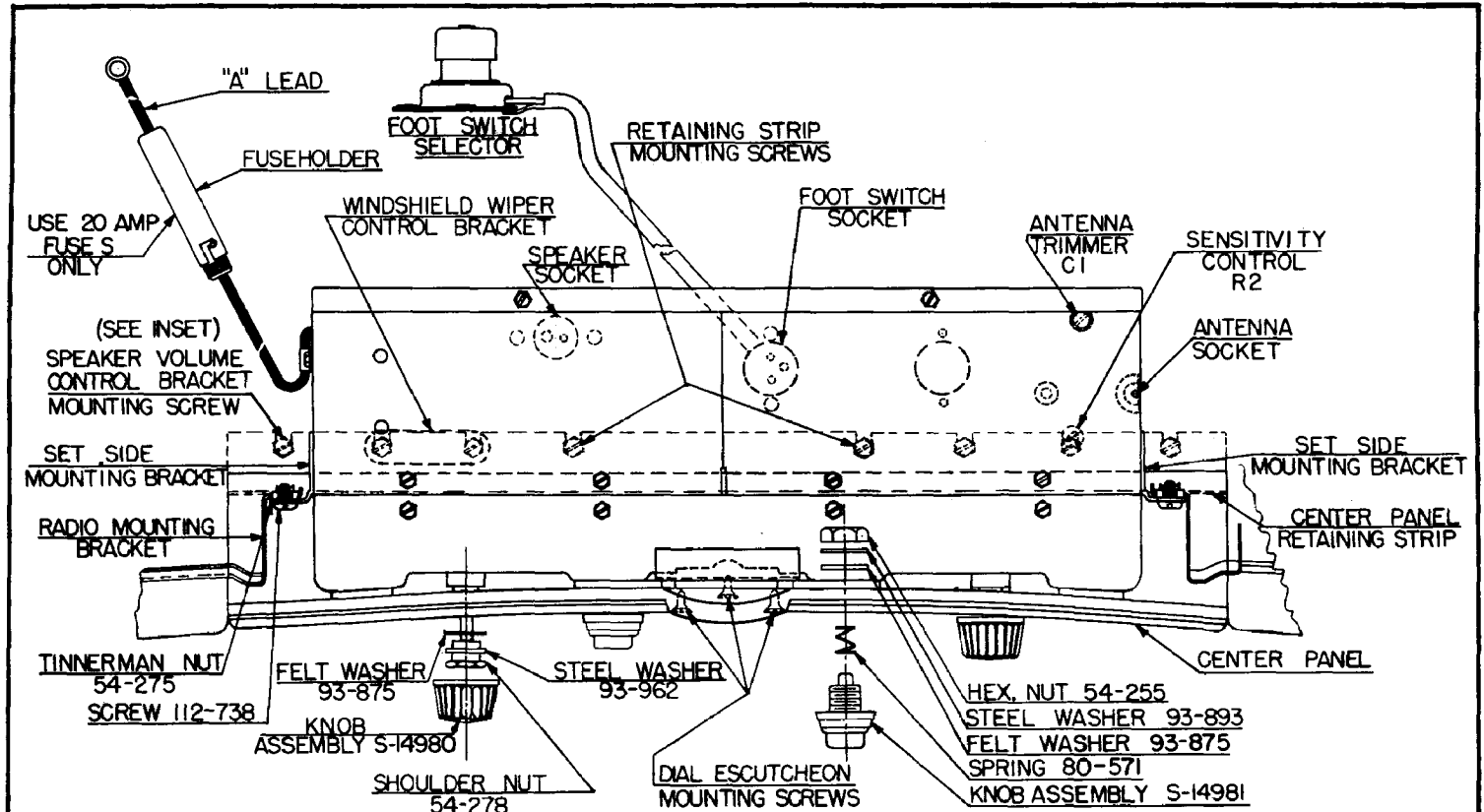
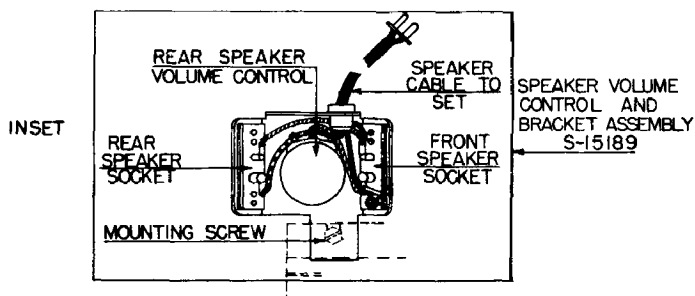


Fig. 1

antenna cable, and foot switch control cable. Remove the control knobs and mounting nuts, and washers from the center panel. Loosen the 8/32 hex-head retaining strip mounting screws and remove the center panel. Remove the four #112-738 10/32 machine screws from the car radio mounting brackets. (Fig. 1)



RECEIVER INSTALLATION

Figures 1 and 4, illustrating the installed receiver, the escutcheon plate, and the control knobs, are given here to facilitate removal and reinstallation of this receiver when service or repair is necessary.

To take the receiver from the car, disconnect the rear speaker control bracket, the 'A' lead, speaker cable,

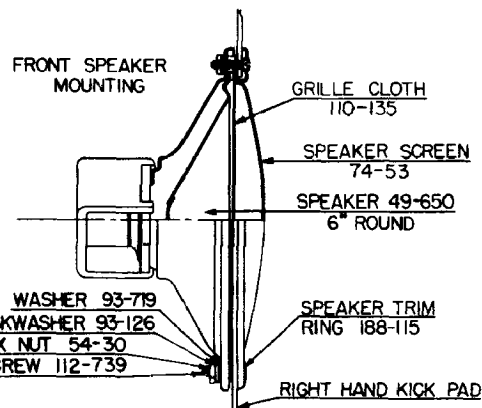


Fig. 2

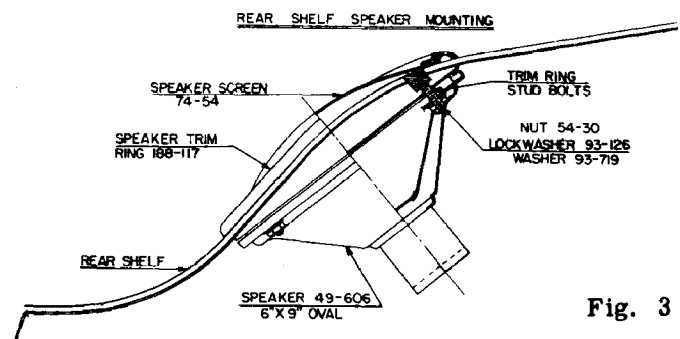


Fig. 3

SPEAKER INSTALLATIONS

To take out front speaker, remove the right side kick pad, and remove the four lock washers #93-126, four nuts #54-30, four screws #112-739, and trim ring #188-115, that holds the speaker to the kick pad. Figure 2.

To take out the rear speaker, remove the four flat washers #93-719, four lock-washers #93-126, and four hex-nuts #54-30, that holds the speaker to the underside of the rear shelf. Figure 3.

OPERATION

The purpose and position of each control is shown in Fig. 3. To turn the receiver on, turn the volume control knob to the right until it clicks and the dial is illuminated. Rotation of the knob to the right increases the volume. To turn the receiver off, turn the volume control knob to the left until it clicks.

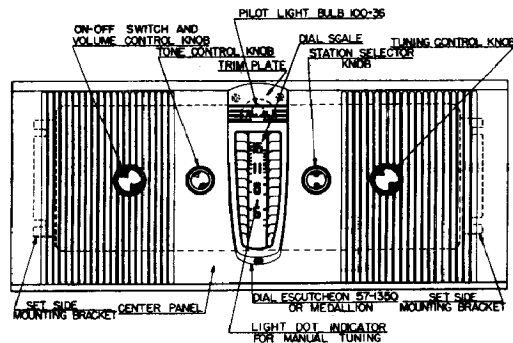


Fig. 4

MANUAL TUNING

To tune set manually, push the station selector knob until the light dot on the dial scale is illuminated. It is only necessary for the manual tuning knob to be turned to select stations.

TONE CONTROL

The tone control has four positions. Any one of these positions can be selected by pushing the tone control knob.

MUTING CIRCUIT

Lightly pressing either the station selector knob or the foot control switch mutes the receiver. This action is accomplished by shorting out the speaker voice coil.

REPLACEMENT OF DIAL LIGHT

NOTE: The top dial light can be replaced while the set is installed in the car by removing the escutcheon trim plate.

When replacing this light, be careful to adjust the black cardboard shield to a position where the slot

directs the light on the dial pointer and not on the scale background. (Fig. 4)

AUTOMATIC TUNING

Pressing the station selector knob repeatedly will cause the tuning mechanism to change through a cycle of six positions. The five automatic positions may be set for favorite local stations, while the sixth position at which the light dot on the dial scale is illuminated, may be used for selecting stations manually.

Using the manual tuning position as a reference point, the remaining five positions may be adjusted in succession to any desired dial setting. However in order to simplify the identification of the stations, it is advisable to set the tuner in sequence according to the frequencies of the stations, beginning with the station broadcasting at the lowest frequency and progressing to the station broadcasting at the highest frequency.

Turn the receiver on and allow it to operate for at least 15 minutes in order for each part to reach normal operating temperature before making the proper setting.

1. Press the station selector knob repeatedly until the light dot on the dial scale appears. Press the station selector knob once more to get the tuner to the No. 1 position.
2. To select the station desired, pull the tuning control knob outward and turn at the same time. Tune very carefully for clearest reception.
3. Press station selector knob, pull and hold tuning control knob outward, and tune in station desired for No. 2 position. Use same procedure for positions No. 3, 4, and 5.

INTERFERENCE ELIMINATION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The "A" lead should be connected to the terminal block near the steering column behind instrument panel as shown in figure 5.

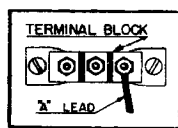


FIG. 5

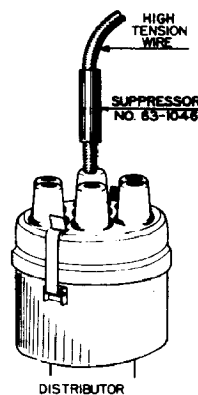


FIG. 6

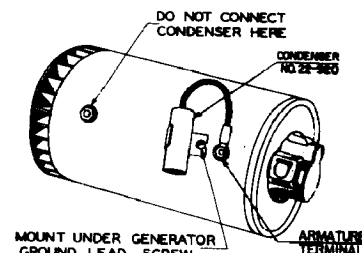


FIG. 7

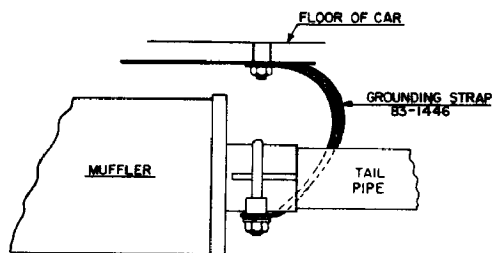


FIG. 10

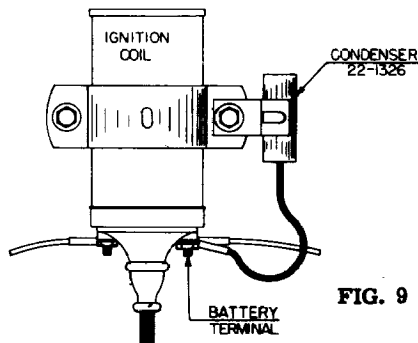


FIG. 9

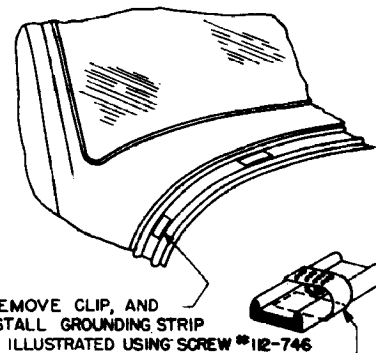


FIG. 8

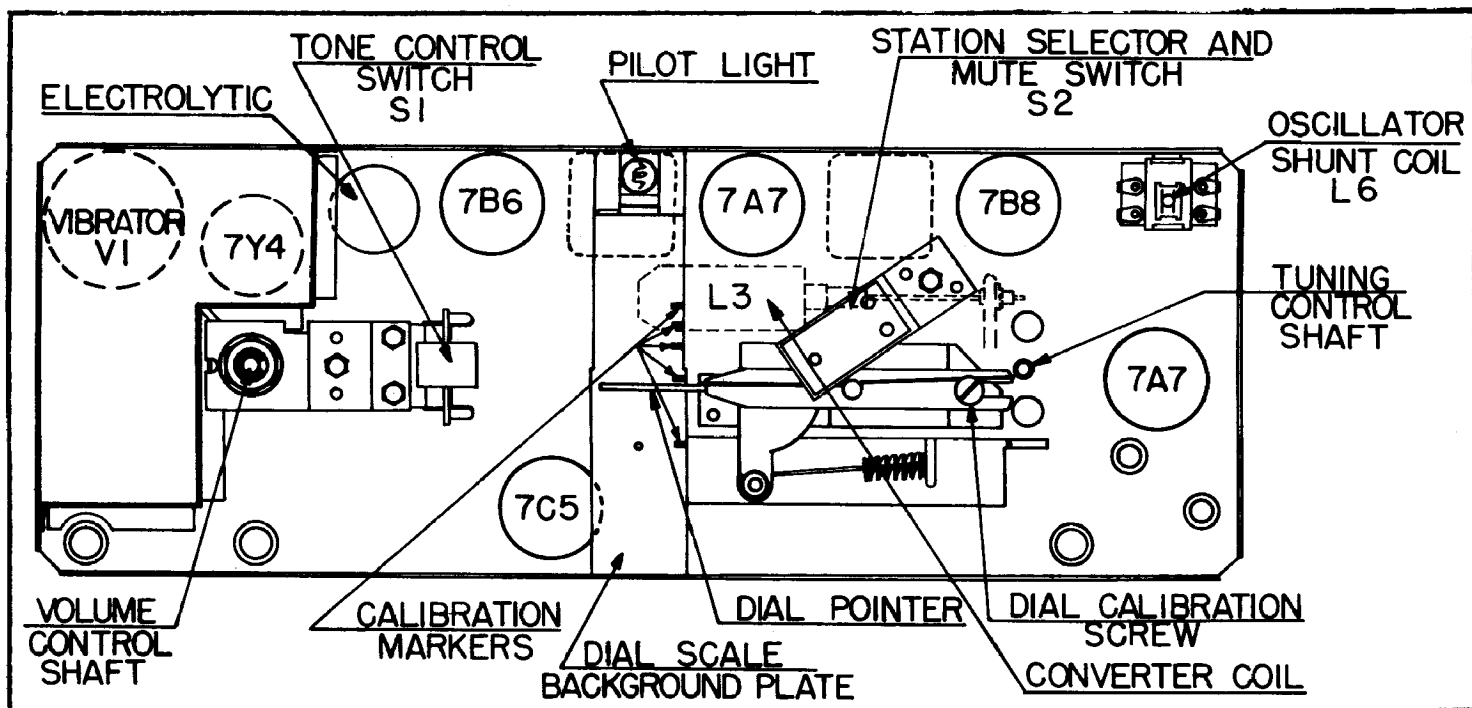


Fig. 11 Front View of Chassis

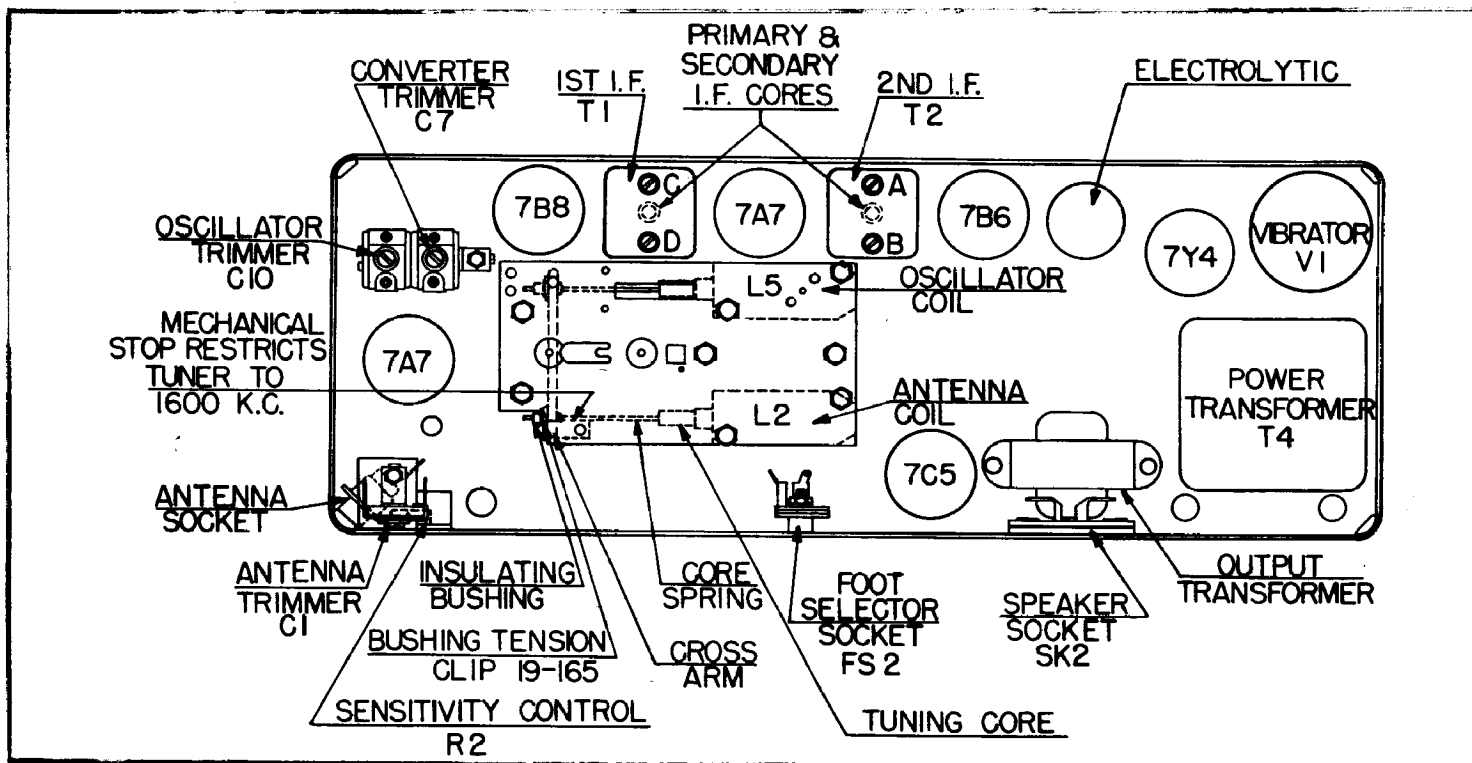


Fig. 12 Rear View of Chassis

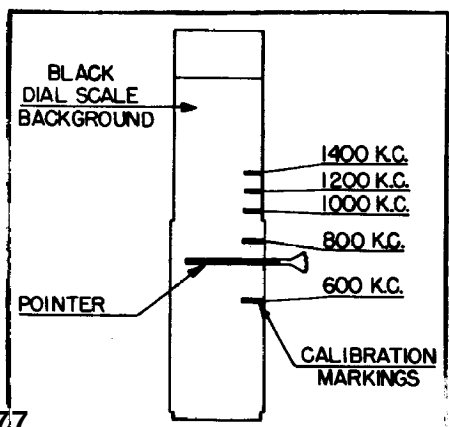


Fig. 13

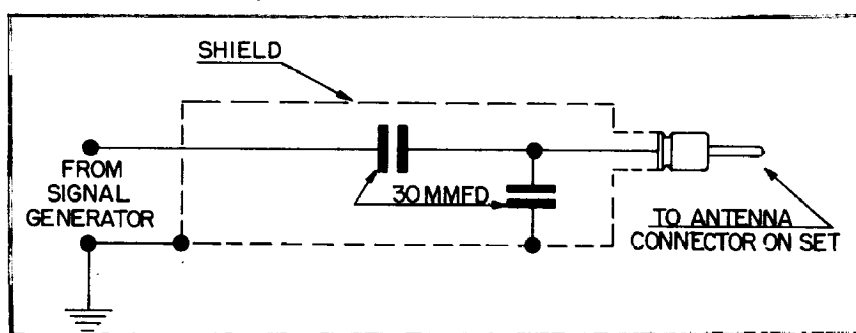


Fig. 14

Figure 14 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R. F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver, therefore follow these instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control set at maximum. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove front and rear covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket)
4. Adjust I.F. trimmers, A, B, C, and D in order named for maximum output. (Fig. 12) Some units have I.F. transformers that are core tuned. In this case adjust primary and secondary I.F. cores from the top of the I.F. cans with core alignment tool 68-7. Repeat the operation to assure accurate alignment.

R.F. AND OSCILLATOR ALIGNMENT

Use the markings on the dial scale background as calibration points during alignment. Figure 13

1. Connect signal generator leads through dummy, illustrated in Fig. 14, to antenna lead in socket on receiver. This is important.
2. Set signal generator to 600 Kc.
3. Tune set to 600 Kc.
4. Adjust oscillator trimmer C-10 (Fig. 12), for maximum response.
5. Set signal generator to 1400 Kc.
6. Tune set to 1400 Kc.
7. Adjust converter trimmer C-7, and antenna trimmer C-1 (Fig. 12) for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by tuning eccentric screw at fulcrum of dial pointer. (Fig. 11)

TO ADJUST OR REPLACE THE ADJUSTING SPRING AND CORE

1. Remove the top cover from the receiver.
2. Remove 7A7 R.F. tube, 7B8 converter tube, and 7A7 I.F. tube.
3. When bushing tension clips 19-165 are used, remove them from the cross arm insulating bushing with bent nose pliers. (Fig. 12)
4. Put automatic tuner in manual position and set the tuner carriage all the way out to the high frequency position or with the cores out of the coils.
5. With core alignment tool, No. S-13064, screw the antenna core back all the way, at the same time using the fingers to guide it out of the automatic unit. With the fingers, remove core by turning core spring past and through the cross arm insulating bushing.

6. Screw the converter and oscillator cores completely out of the coils. Set antenna tuner carriage to half way position. Screw the converter and oscillator cores back all the way, at the same time using the fingers to guide them between the I.F. cans and out of the tuner unit. With the fingers, remove the cores by turning them past and through the cross arm insulating bushing.
7. To replace cores, set tuner carriage at half way position. With the fingers, guide the oscillator and converter cores between the I.F. coils and screw the core springs through the cross arm insulating bushing. Set tuner carriage to high frequency position and also using the fingers, screw the antenna core spring through the cross arm insulating bushing. Use core alignment tool No. S 13064 for further adjustments.
8. Replace tubes and top cover.
9. After all adjustments or replacements are completed, be sure to replace the bushing tension clip. When bushing clips are not used, glue core springs with speaker cement.

ALIGNMENT PROCEDURE AFTER CORE OR COIL REPLACEMENT.

WARNING: The following adjustments are to be made only after a core or coil is replaced.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 14 to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
4. Screw the cores completely out of the antenna coil, the converter coil, and the oscillator coil.
5. Adjust the oscillator trimmer C-10 (Fig. 12) at 1675 Kc.
6. Adjust the converter trimmer C-7, and antenna trimmer C-1 (Fig. 12) for maximum output reading.
7. Set signal generator dial and receiver dial to 1400 Kc.
8. Replace cores to their approximate original position (so that the cores project about 11/16 of an inch from the end of the coil form).
9. Adjust the oscillator core L-5 (Fig. 12) s scale at 1400 Kc.
10. Adjust the antenna core L-2, and converter core L-3 (Figs. 11 and 12) for maximum output reading.
11. Set signal generator at 600 Kc.
12. "Rock in" shunt oscillator coil L-6 (Fig. 11) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a gang condenser receiver.
13. Check receiver at 1400 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10, and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop should be bent to limit the frequency coverage to 1605 Kc. (Fig. 12)

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1400 Kc.



PARTS LIST MODEL 6MN988 NASH PART No. A. C. 149-1

Diag. No.	Part No.	Description	Price	Diag. No.	Part No.	Description	Price
<u>COILS & CHOKES</u>				<u>MISCELLANEOUS</u>			
L9	20-213	Main Hash Choke Coil	\$.36	19-87	Cable Retaining Clip	\$.01	
T1	95-1056	1st I.F. Transformer	1.80	19-165	Bushing Tension Clip	.03	
T2	95-1057	2nd I.F. Transformer	2.10	46-485	Rear Spkr. Vol. Cont. Knob	.19	
L1	S-8819	Ant. Motor Noise Choke Assem.	.40	49-606	6"x 9" P.M. Speaker	7.75	
L4	S-11229	Osc. Series Coil Assy.	.35	49-650	6" P.M. Speaker	7.00	
L5	S-12053	Osc. Coil Assy.	.84	52-486	Bat. Cable (Set to Fuse)	.30	
L2	S-12060	R.F. Coil Assy. (2 used)	.96	52-510	Rear Spkr. Cable & Plug		
L6	S-13998	Osc. Shunt Coil Assy.	1.10	52-511	Rear Spkr. Cont. Cable & Plug	.30	
L8	S-13999	Motor Noise Choke Assy.	.35	54-34	#6-32 X 1/4 X 3/32 Hex Nut	.01	
L2	S-14176	R.F. Coil & Shield Assy.	1.25	57-1054	Spark Plate Capacitor	.10	
L3	S-14177	Osc. & Converter Coil &		73-36	8-32 X 3/8 Headless Set Screw	.02	
L5		Shield Assem.	2.10	74-53	Speaker Screen	.50	
<u>CONDENSERS</u>				74-54	Rear Speaker Screen	.90	
C16	22-182	250 MMFD 600 V.	.26	FS2 78-406	Ft. Sw. Cable Plug Socket	.12	
C6	22-1136	250 MMFD 600 V.	.20	78-559	Ant. Connector Socket	.18	
C3	22-1256	75 MMFD 500 V.	.20	78-596	Loktal Base Tube Socket	.18	
C22	22-1448	.008 MFD 1600 V.	1.00	78-804	Vibrator Socket	.20	
C9	22-1478	350 MMFD Compensator	.53	SK2 78-833	Speaker Plug Socket	.15	
C21	22-1644	Dry Electrolytic 10 MFD.		80-232	Knob Retaining Spring	.02	
C10		300 V. X 20 MFD. 350 V.	1.60	80-276	Socket Ground Spring	.07	
C7	22-1680	Trimmer (Osc. & Conv.)	.60	80-585	Pointer Overthrow Spring	.02	
C1	22-1704	Ant. Trimmer	.35	83-1437	Top Cover Spacer Strip	.05	
C23				S1 85-414	Tone Control Switch	1.25	
C24	22-1728	.5 MFD 100 V.	.55	S2 85-415	Selector Switch	.75	
C5		100 MMFD. Ceramicon		93-125	6 Int. Lockwasher	.01	
C8	22-1730	500 V. (or 22-162)	.20	93-297	1/32 X .136 X 3/8 Steel Washer	.01	
C11				93-456	Vibrator Cushion Washer	.02	
C13	22-1748	.1 MFD. 400 V. (or 22-170)	.26	93-686	Bakelite Shoulder Washer	.02	
C14	22-1777	.1 MFD. 200 V. (or 22-190)	.26	T3 95-1028	Output Transformer	2.65	
C12	22-1778	.047 MFD. 200 V. (or 22-250)	.26	T4 95-1065	Power Transformer	7.25	
C2	22-1779	.01 MFD. 600 V. (or 22-1170)	.26	110-135	Grille Cloth	.10	
C18	22-1780	.0033 MFD. 400 V. (or 22-1180)	.26	114-49	6-32 X 5/8 Acorn Hd. M.S.	.01	
C15	22-1781	.022 MFD. 200 V. (or 22-1270)	.26	114-297	6-32 X 1/4 Hex.Hd.Slotted S.T.		
C19	22-1782	.0047 MFD. 600 V. (or 22-838)	.26		Screw (Used on 19-87)	.01	
C14	22-1783	.0047 MFD. 400 V. (or 22-906)	.20	125-58	Strain Relief Grommet	.15	
<u>RESISTORS</u>				125-59	Strain Relief Grommet	.15	
R22	63-1375	5.1 ohm W.W. 2 W. Insl. (10%)	.33	147-102	Socket Mtg. Spacer	.03	
R2	63-1379	Sensitivity Control	.56	159-50	Plug Button	.01	
R8	63-1398	33 M ohm 1 W. Insl.	.24	188-30	Drive Arm Retaining Ring	.02	
S3				188-115	Speaker Trim Ring	1.00	
R11	63-1586	Volume Control & Switch	1.81	188-117	Speaker Trim Ring	2.75	
R18	63-1620	1800 ohm 2 W. Insl.	.36	V1 190-20	Vibrator	4.15	
R17	63-1621	270 ohm 1 W. Insl.	.24	193-31	Footswitch Template	.10	
	63-1683	Vol. Control (Rear Spkr.)	1.20	196-102	Rubber Gasket for Top Cover	.30	
R19				196-103	Felt Gasket for Top Cover	.30	
R20	63-1740	82 ohm 1/2 W. Insl.	.21	202-556	Instruction Book (Owners Manual)	.15	
R23	63-1744	100 ohm 1/2 W. Insl.	.21	S-13536	Turret Assem.	2.65	
R6	63-1827	10M ohm 1/2 W. Insl. (10%)	.21	S-13926	Top Cover Assem.	2.15	
R7	63-1835	15M ohm 1/2 W. Insl.	.21	S-14144	Vol. Con. Brkt. & Lug Assy.	.05	
R3	63-1838	18M ohm 1/2 W. Insl.	.21	S-14157	Vol. Con. Cable Assy.	.06	
R12	63-1841	22M ohm 1/2 W. Insl. (10%)	.21	S-14158	Sensitivity Con., Capacitor,		
R10	63-1849	33M ohm 1/2 W. Insl.	.21		Socket & Choke Assem.	2.00	
R21	63-1856	47M ohm 1/2 W. Insl.	.21	S-14166	Bottom Cover Assy.	.65	
R5	63-1859	56M ohm 1/2 W. Insl.	.21	FS3 S-14607	Footswitch Assem.	3.00	
R16	63-1870	100M ohm 1/2 W. Insl.	.21	S-15189	Rear Spkr. Vol. Con. Assy.	3.00	
R1				<u>INSTALLATION KIT</u>			
R4				S-14162	Installation Kit Assy (Comp.)	1.00	
R14	63-1891	330M ohm 1/2 W. Insl.	.21	52-485	Battery Cable (Fuse to Ammeter)	.50	
R15				54-30	8-32 X 5/16 X 7/64 Hex. Nut	.01	
R9	63-1912	1 Megohm 1/2 W. Insl.	.21	54-278	3/8 - 32 X 9/16 Hex Shoulder		
R13	63-1961	15 Megohm 1/2 W. Insl.	.21		Nut (2 used)	.05	

Prices subject to change without notice.

SERVICE MANUAL

Built for
WILLYS OVERLAND
Motors, Inc.
Toledo, Ohio



For Model
6MW083

Made by ZENITH RADIO CORPORATION, Chicago 39, Illinois, U. S. A.

Electrical Specifications

TUNING RANGE:.....	540-1600 Kc.	CURRENT CONSUMPTION:.....	7.5 amperes
INTERMEDIATE FREQUENCY:.....	265 Kc.	INSTANTANEOUS CURRENT CON-	
SENSITIVITY:.....	4 microvolts at one	SUMPTION DURING AUTOMATIC	
	watt output.	CHANGE CYCLE:.....	20 amperes
POWER OUTPUT:.....	5.5 watts measured	TUBE COMPLEMENT:.....	7A7 R.F.,
	at the voice coil.		7B8 converter, 7A7 I.F., 7B6 detector
SPEAKER:.....	8" round, mounted		and 1st audio, 7C5 power output, 7Y4
	on firewall.		rectifier.

IMPORTANT

The warranty tag must be filled in by the car dealer at time of sale and accompany each receiver to be serviced at established warranty rates during the guarantee period. Otherwise regular charges for labor and material prevail. All repairs, whether in or out of warranty, are for the account of the car dealer or customer. DO NOT send claims to the Zenith Radio Corporation.

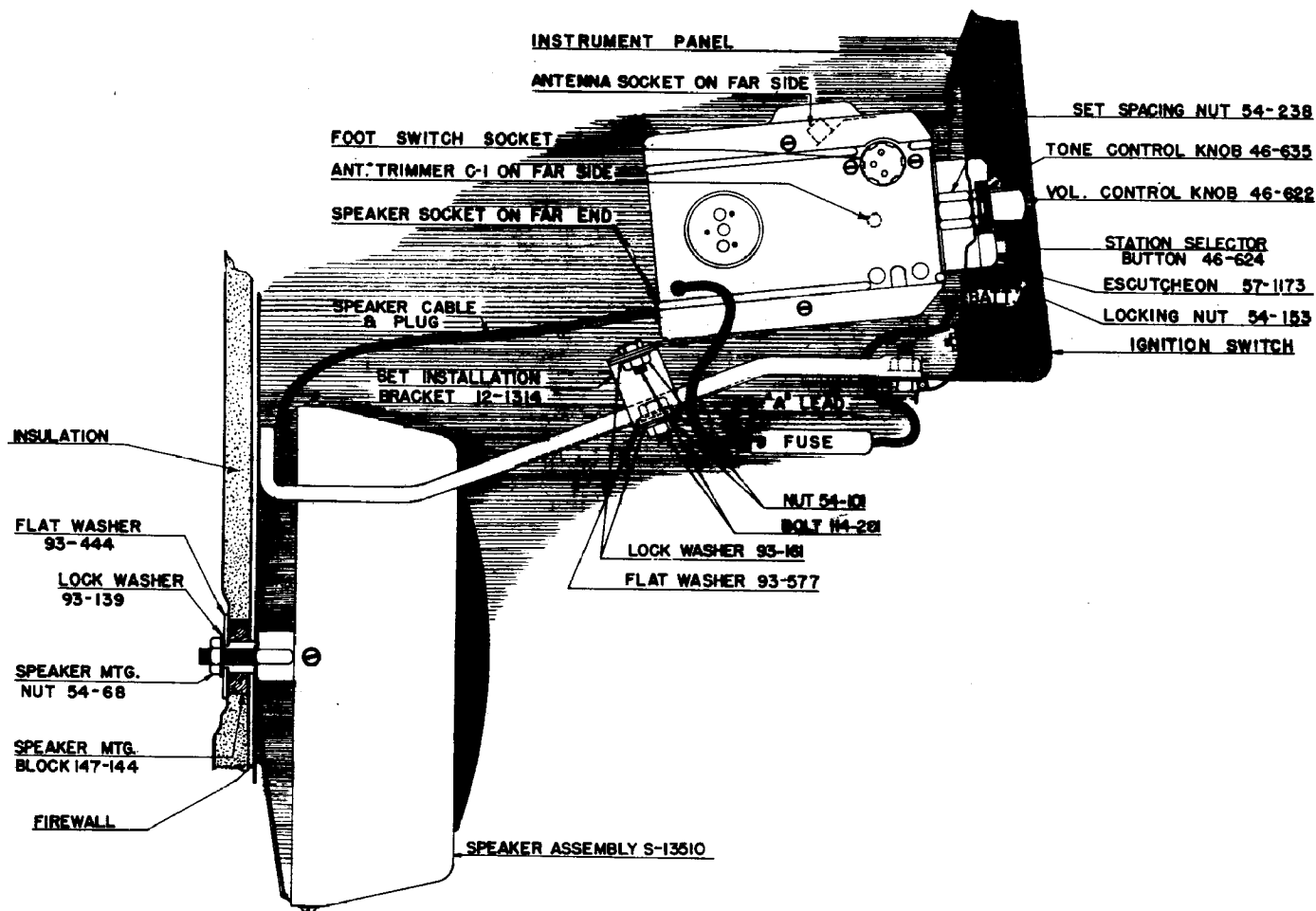


Fig. 1. Installation

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the installed receiver, the escutcheon plate, and the control knobs, are given here to facilitate removal and reinstallation of this receiver when service or repair is necessary.

To take the receiver from the car, remove the control knobs and mounting nuts from the front panel, and remove the set installation Bracket No. 12-1314 from the rear set mounting bracket.

MANUAL TUNING

1. Press the Station Selector push button (Fig. 2) several times or until the green dot in the dial scale is illuminated.
2. Pull the Manual Tuning control knob (right hand) outward and turn to tune in desired station. Be sure to tune to exact frequency to assure the best tone quality.

VOLUME—Adjust the left hand control knob for desired volume.

TONE CONTROL—The tone control is located behind the volume control knob. Turn in either direction for the most pleasing tone.

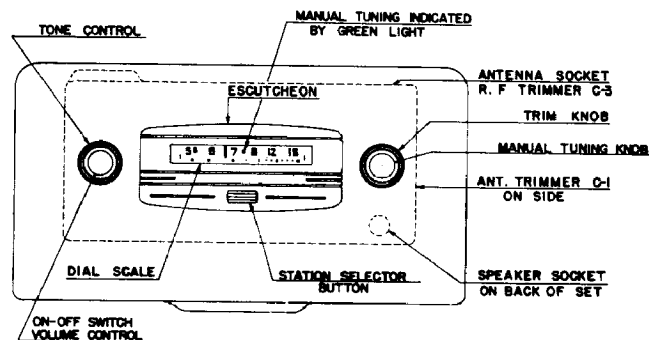


Fig. 2. Front View

AUTOMATIC TUNING

There are five automatic tuning positions which may be adjusted to five desired stations. If these positions have not been previously adjusted proceed as follows:

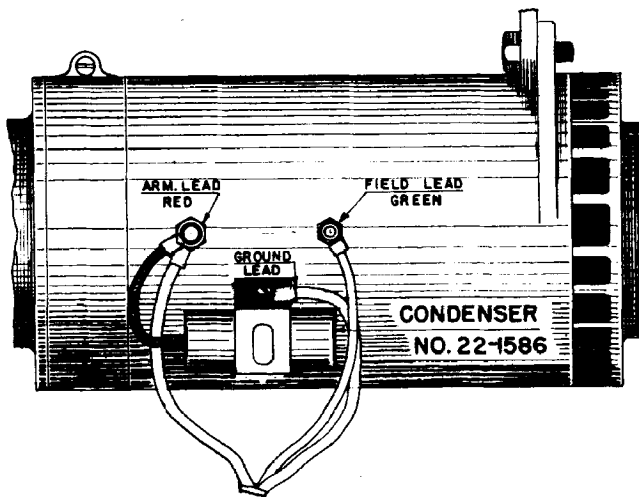
1. Press the station selector push button repeatedly until the green dot in the dial scale is illuminated.
2. Press the button once more to move the mechanism to the No. 1 Position.
3. Pull manual tuning knob outward to engage the automatic mechanism.
4. Select the station desired and tune to its frequency by turning the tuning knob. Tune very carefully for clearest reception.
5. Press the station selector push button, pull the manual tuning knob outward, and tune in the station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five automatic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the station selector push button to return to dial tuning, or any one of the stations adjusted on the Automatic.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The generator condenser No. 22-1586 should be installed as shown below in figure 3.



MOUNT CONDENSER NO. 22-1586 UNDER GENERATOR GROUND LEAD SCREW

Fig. 3

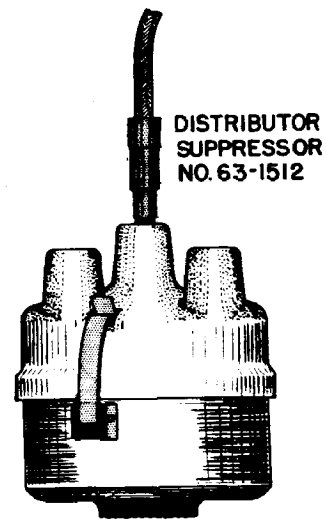


Fig. 4

The distributor suppressor No. 63-1512 should be connected as shown above in figure 4.

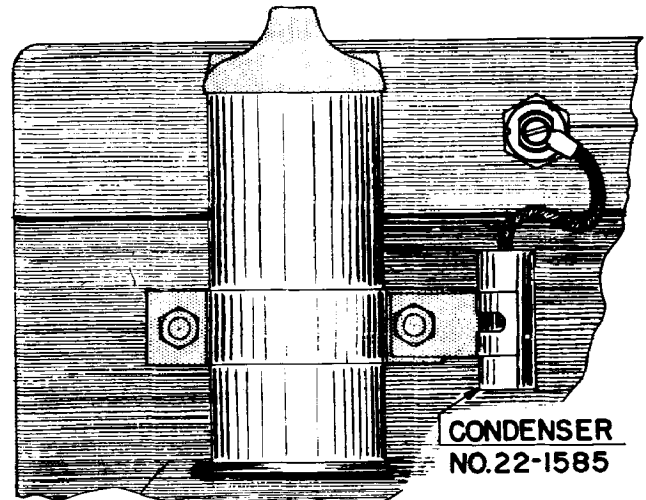


Fig. 5

The No. 22-1585 temperature gauge condenser should be installed as shown in figure 5.

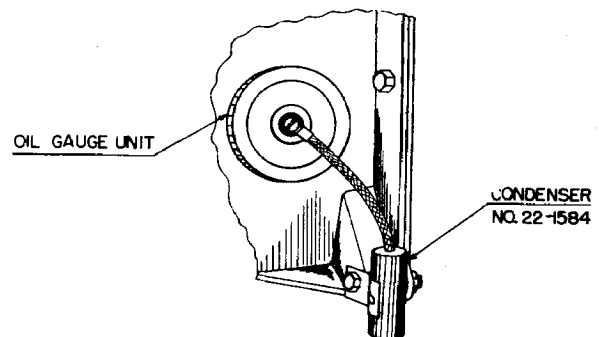


Fig. 6. Oil Gauge Cond.

The oil gauge condenser should be installed as shown in figure 6.

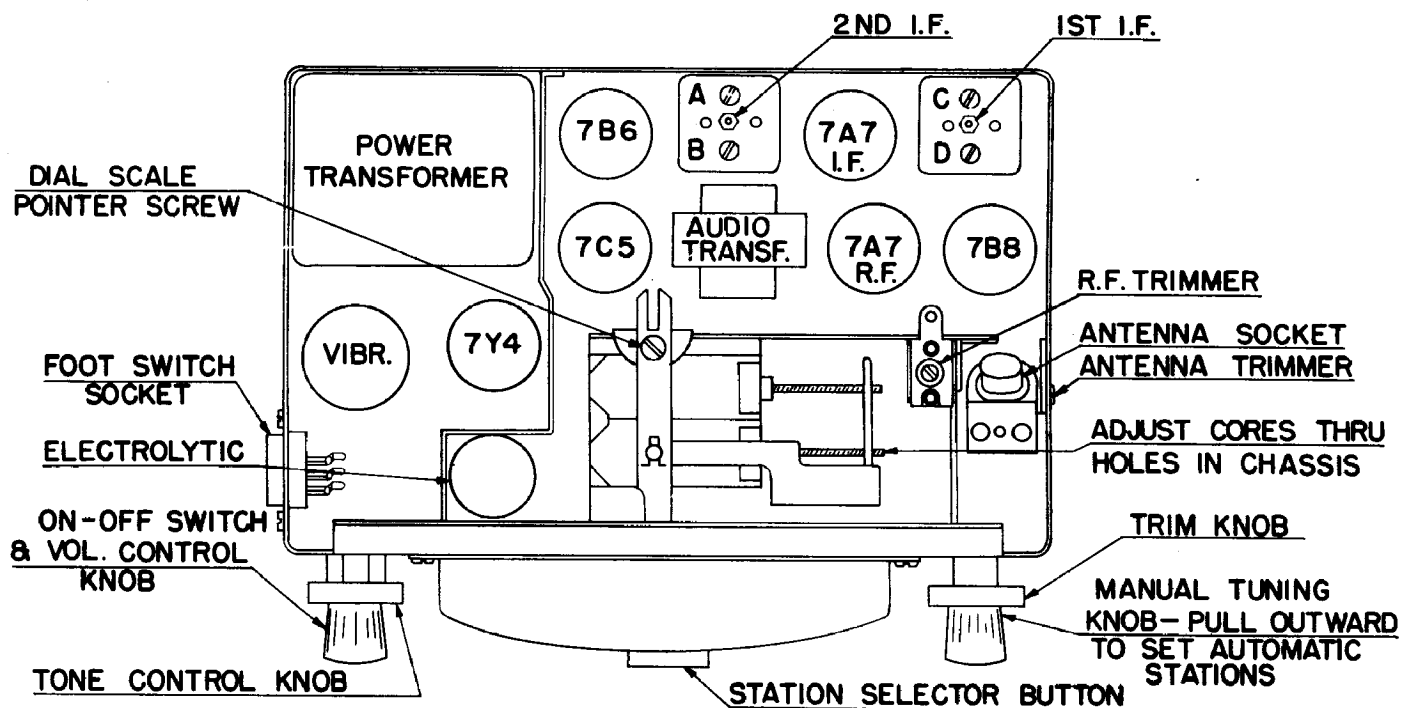


Fig. 7. Top View of Chassis

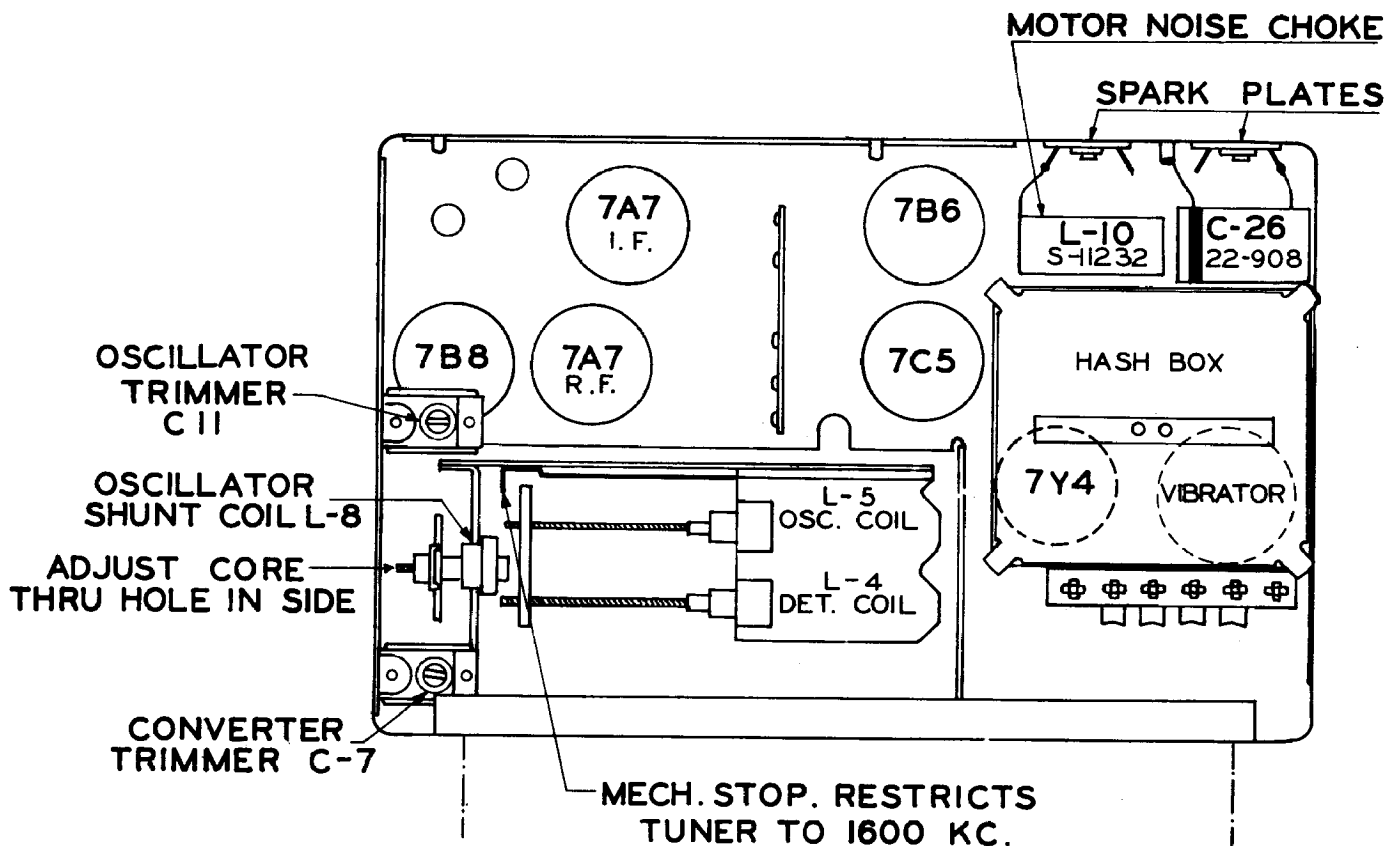


Fig. 8. Bottom View of Chassis

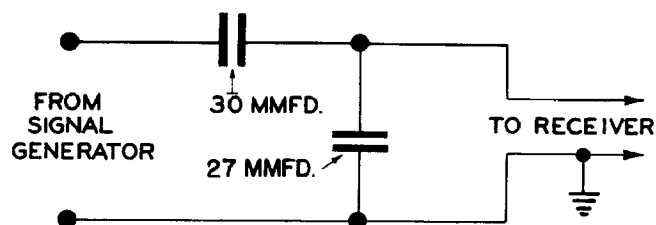


Fig. 9. Dummy Antenna

Fig. 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

- 1—Remove top and bottom covers from receiver.
- 2—Set signal generator to 265 Kc.
- 3—Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
- 4—Adjust I.F. trimmers, A, B, C and D (Fig. 7) in the order named for maximum output. Repeat the operation to assure accurate alignment.

R.F. AND OSCILLATOR ALIGNMENT

- 1—Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver.
- 2—Set signal generator to 535 Kc.
- 3—Place set in manual tuning position and set dial to 535 Kc.
- 4—Adjust oscillator trimmer C-11 (Fig. 8) for maximum response.
- 5—Set signal generator to 1200 Kc.
- 6—Tune set to 1200 Kc.
- 7—Adjust converter trimmer C-7 (Fig. 8) and R.F. trimmer C-3 (Fig. 7) for maximum response.
- 8—If dial calibration is off after making above adjustments, a correction can be made by turning the slotted brass screw at the rear of the pointer bracket.

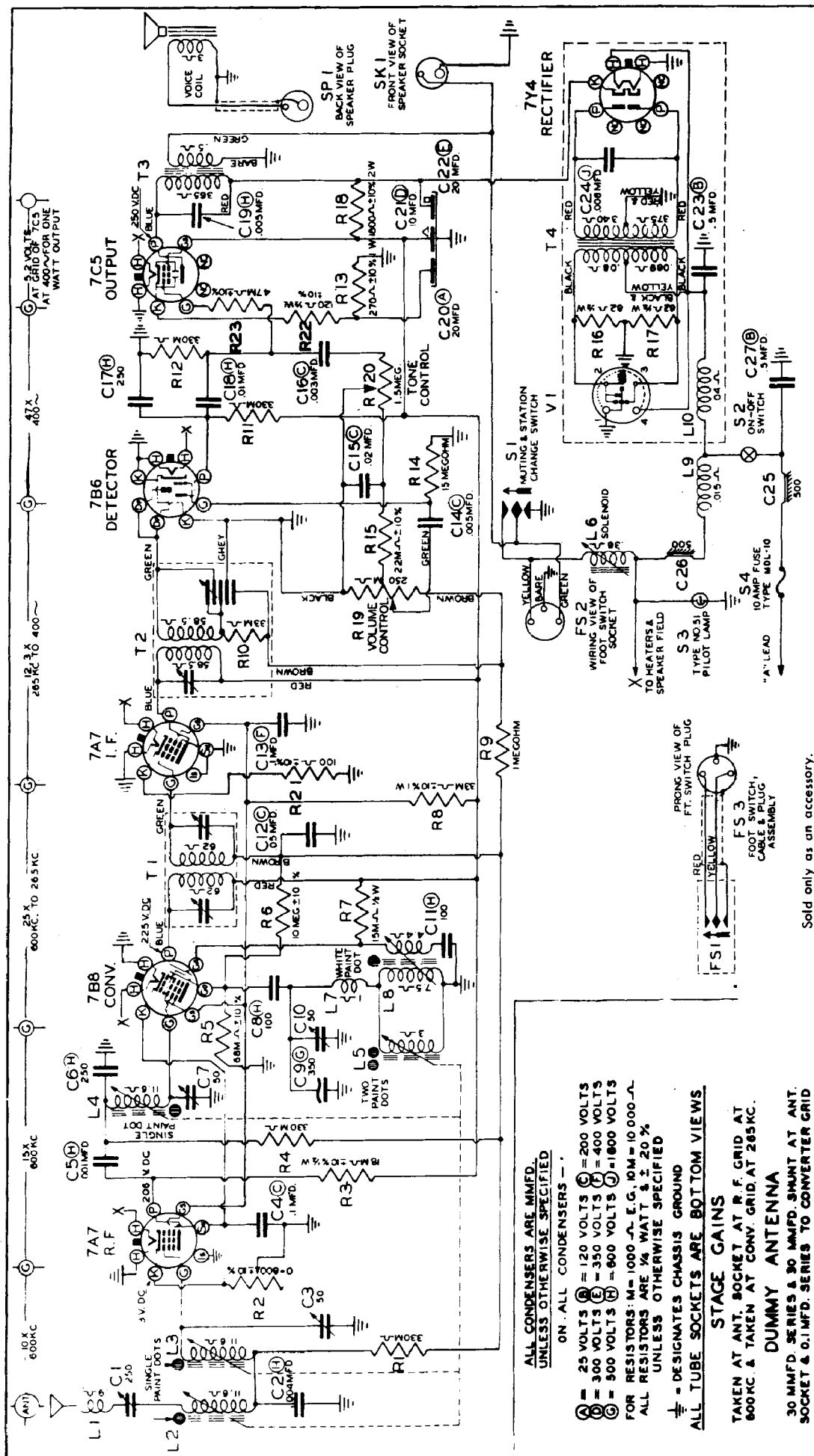
CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

- 1—Replace coil or core.
- 2—Set signal generator to 1700 Kc.
- 3—Connect signal generator leads through dummy, illustrated in Figure 9, to antenna receptacle on the receiver.
- 4—Set receiver dial to 1600 Kc. (maximum high frequency end of dial.)
- 5—Screw the core completely out of the antenna coil, the R.F. coil, the converter coil, and the oscillator coil.
- 6—Adjust oscillator trimmer C-11 (Fig. 8) at 1700 Kc.
- 7—Adjust converter trimmer C-7, R.F. trimmer C-3, and antenna trimmer C-1 (Fig. 7 and 8) for maximum output reading.
- 8—Replace cores to their approximate original position.
- 9—Set generator dial and receiver dial to 1200 Kc.
- 10—Adjust oscillator core L-5 (Fig. 8) to scale at 1200 Kc.
- 11—Adjust the antenna core, R.F. core, and converter core (Fig. 7 and 8) for maximum output reading.
- 12—Set signal generator to 600 Kc.
- 13—"Rock in" shunt oscillator coil L-8 (Fig. 8) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a ganged condenser receiver.
- 14—Check receiver at 1200 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.
- 15—After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station near 1200 Kc.



SCHEMATIC DIAGRAM FOR 6 TUBE
WILLY'S 6MW083
WITH FOOT CONTROL
TUNING RANGE 540 KC. TO 1600 KC.
ZENITH RADIO CORPORATION
CHICAGO 39, ILLINOIS
U.S.A.

SCHEMATIC

PARTS LIST MODEL 6MW083 (CHASSIS 6C83)

1946 WILLYS OVERLAND LONG DISTANCE RADIO

COILS AND CHOKES

Diagram No.	Part No.	Description
L 9	20-213	Main Hash Choke
T 1	95-916	1st I.F. Transformer
T 2	95-942	2nd I.F. Transformer
L 1	S8819	Ant. Motor Noise Choke Assem.
L 2 } L 3 }	S11040	Ant. & R.F. Coil Assem. (Right Hand)
L 4 } L 5 }	S11041	Osc. & Converter Coil Assem. (Left Hand)
L 7	S11229	Osc. Series Coil Assem.
L 8	S11231	Osc. Shunt Coil Assem.
L10	S11232	Motor Noise Choke Coil Assem.

CONDENSERS

C 8 } C11 }	22-162	100 Mmfd.	600 V.
C13	22-170	.1 Mfd.	400 V.
C17	22-182	250 Mmfd.	600 V.
C 4	22-190	.1 Mfd.	200 V.
C12	22-250	.05 Mfd.	200 V.
C19	22-838	.005 Mfd.	600 V.
C14	22-906	.005 Mfd.	200 V.
C23 } C27 }	22-908	.5 Mfd.	120 V.
C 6	22-1136	250 Mmfd.	600 V.
C 5	22-1169	.001 Mfd.	600 V.
C18	22-1170	.01 Mfd.	600 V.
C16	22-1180	.003 Mfd.	600 V.
C 2	22-1244	.004 Mfd.	600 V.
C15	22-1270	.02 Mfd.	200 V.
C 3	22-1376	R.F. Trimmer	
C 7	22-1377	Det. Trimmer	
C10	22-1378	Osc. Trimmer	
C20 } C21 } C22 }	22-1387	Dry Electrolytic—20 Mfd. 25 V. x 10 Mfd.—300 V. x 20 Mfd. 350 V.	
C 1	22-1420	Ant. Trimmer	
C24	22-1448	.008 Mfd.	1600 V.
C 9	22-1478	350 Mmfd. Compensator	
	22-1553*	Dry Electrolytic—20 Mfd.—25 V.	
	22-1554*	Dry Electrolytic—10 Mfd.—300 V. x 20 Mfd.—350 V.	
C25	27-87	Spark Plate	
C26	27-87	Spark Plate	

*Note: It is necessary to use one each 22-1553 and 22-1554 to replace one 22-1387.

RESISTORS

R 2	63-1267	Sensitivity Control (Sub. for 63-1379)
R18	63-1368	1800 Ohm, 2 Watt Insl. W.W.
R13	63-1369	270 Ohm, 1 Watt Insl. W.W.
R 2	63-1379	Sensitivity Control
R 9	63-1390	1 Megohm ¼ Watt.

Diagram No.

Diagram No.	Part No.	Description
R 1		
R 4	63-1392	330M Ohm ¼ Watt.
R11 } R12 }		
R15	63-1395	22M Ohm ¼ Watt.
R 5	63-1396	68M Ohm ¼ Watt.
R 8	63-1398	33M Ohm 1 Watt.
R16 } R17 }	63-1399	82 Ohm ½ Watt.
R14	63-1400	15 Megohm ¼ Watt.
R 7	63-1401	15M Ohm ½ Watt.
R22	63-1410	120 Ohm ½ Watt.
R 3	63-1411	18M Ohm ½ Watt.
R 6	63-1413	10 Megohm ¼ Watt.
R21	63-1414	100 Ohm ¼ Watt.
R23	63-1417	47M Ohm ¼ Watt.
R19 } R20 }	63-1508	Tone Con., Vol. Con. & Switch

MISCELLANEOUS

	19-114	Foot Sw. Cable Retaining Clip
	46-624	Selector Sw. Knob
	52-294	Vol. Con. Cable
	52-398	Battery Cable (Set to Fuse)
	52-399	Battery Cable (Fuse to Ammeter)
	57-1173	Escutcheon
	78-281	Vibrator Socket (or 78-732-733)
	78-596	Loktal Tube Socket (or 78-717-726-729-730)
FS 2	78-646	Foot Sw. Cable Socket (or 78-406)
SK 1	78-728	Speaker Cable Socket
	80-232	Vol. Con. Knob Retaining Spring
	80-454	Selector Knob Spring
T 4	95-914	Power Transformer (Alt. for 95-1013)
T 3	95-915	Output Transformer
T 4	95-1013	Power Transformer
	112-310	Foot Sw. Mtg. Screw
S 4	136-14	Fuse—10 Amp.—Type MDL—10
V 1	190-20	Vibrator
	202-430	Instruction Book
FS 3	S12042	Foot Sw., Cable & Plug Assem.
FS 1	S-9458	Foot Switch & Plate Assembly

*Note: Not used in production. Sold only as an accessory.

DIAL AND TUNING MECHANISM ASSEMBLY

26-385	Dial Scale
34-132	Indexing Disc
34-138	Tuning Gear
34-158	Ratchet Gear
56-174	Indicator Pin
57-1077	Protector Plate
59-180	Dial Pointer
76-378	Guide Rod
80-329	Gear Indexing Spring

DIAL AND TUNING MECHANISM ASSEMBLY (Continued)

Diagram No.	Part No.	Description
S3	80-331	Cross Arm Return Spring
	80-332	Cam Lever Spring
	80-336	Ratchet Gear Return Spring
	80-340	Lever Spring
	80-341	Kick-off Spring
	80-342	Tuning Shaft Spring
	80-379	Pointer Retainer Spring
	80-445	Flag Spring
	83-1030	Return Spring Retainer Strip
	83-1039	Solenoid Insulating Strip
	86-30	#6 Shakeproof Terminal
	93-125	#6 Internal Shakeproof Lockwasher
	93-501	#4 Internal Shakeproof Lockwasher
	93-631	Retainer Washer
	93-650	Brass Washer (.010 x $\frac{3}{16}$ x $\frac{7}{16}$)
	93-706	Neoprene Washer (.020 x $\frac{7}{16}$ x $\frac{3}{4}$)
	93-822	Brass Washer (.008 x .125 x $\frac{7}{32}$)
	93-849	Shim Washer
	94-438	Spacing Bushing
	97-193	Lever Stud
	97-236	Flag Stud
	100-32	Dial Light Bulb
	114-63	#6-32 x $\frac{3}{16}$ Hex Acorn Hd. M.S.
	114-69	#4-40 x $\frac{1}{4}$ Hex Acorn Hd. M.S.
	114-150	#6-32 x $\frac{5}{32}$ Hex Acorn Hd. M.S.
	117-83	Tuning Shaft Locking Lever
	128-26	Dial Indicator Cam
	147-126	Gear & Disc Spacer
	149-44	Adjusting Spring & Core
	S10826	Solenoid End Plug & Bracket Assem.
	S10829	Solenoid & Terminal Assem.
	S10381	Ratchet & Bracket Assem.
	S10836	Cross Arm Assem.
	S11056	Tuning Shaft & Gear Assem.
	S11076	Push-Pull Tuner Assem. (complete)
	S11082	Turret Assem.
S1	S11271	Solenoid Sw. Assem. (Hand Selector & Muting)
	S11391	Antenna Connector Socket & Bracket Assembly
	S12438	Mounting Plate & Lever Assem.
	S12439	Pointer Mounting Bracket & Stud Assem.
	S12440	Pointer Drive Bracket & Stud Assem.
	S12447	Dial Light Socket & Wire Assem.
	S12909	Indicator Flag & Bracket Assem. (59-186)
	S12911	Front Plate & Bushing Assem.

SET INSTALLATION AND SUPPRESSION KIT

Diagram Part No.	Description
S13597	Set Installation & Suppression Kit (complete)
12-1314	Set Installation Bracket
22-1584	Oil Gauge Cond. (.5 Mfd.—200 V.)
22-1585	Temp. Gauge Cond. (.5Mfd.—200 V.)
22-1586	Generator Cond. (1 Mfd.—200 V.)
54-68	$\frac{5}{16}$ x $\frac{9}{16}$ x $\frac{7}{32}$ Hex Nut
54-104	$\frac{1}{4}$ -20 x $\frac{1}{2}$ x $\frac{3}{16}$ Hex Nut
54-153	$\frac{7}{16}$ -28 x $\frac{19}{32}$ x .120 Hex Nut
63-1512	Distributor Suppressor
80-145	Motor Hood Bond Spring
93-139	$\frac{5}{16}$ External Shakeproof Lockwasher
93-161	$\frac{1}{4}$ External Shakeproof Lockwasher
93-444	$\frac{1}{16}$ x $\frac{3}{8}$ x $1\frac{3}{4}$ Steel Washer
93-577	.062 x $1\frac{1}{4}$ x $\frac{3}{4}$ Steel Washer
112-365	#8 x $\frac{1}{2}$ B.H. Sheet Metal Screw
114-281	$\frac{1}{4}$ -20 x $\frac{5}{8}$ Hex Hd. M.S.
147-144	Specker Mounting Spacer
188-41	Spacer Ring

KNOB KIT

S13174	Knob Kit (complete)
S12910	Tuning & Trim Knob Assem.
S13-239	Vol. Con. Knob & Spring Assem.
46-635	Tone Con. Knob

SPEAKER AND SPEAKER MOUNTING PARTS

SP 1	43-131	Speaker Housing
	49-566	7.6" PM Speaker & Cable
	208-566	Cone & Voice Coil
	54-30	$\frac{9}{32}$ x $\frac{5}{16}$ x $\frac{7}{64}$ Hex Nut
	74-41	Speaker Screen
	93-126	#8 Internal Shakeproof Lockwasher
	93-783	Stat. Bronze Steel Washer ($\frac{1}{32}$ x $\frac{3}{16}$ x $\frac{3}{8}$)
	112-248	#8-32 x $\frac{5}{8}$ Oval B.H.M.S.
	147-85	Spacer
	S13066	Speaker Mounting Bracket & Stud Assem.
	S13510	Complete Speaker & Housing Assem.

Note: When ordering cone and voice coil marked * be sure to add manufacturers' code letter that follows base part number.

SERVICE MANUAL



Model
7ML080

Lincoln Part No. 5EH-18805-A

ADJUST-O-MATIC RADIO

Model
7ML081

Continental Part No. 5EH-18805-B

Made for LINCOLN by ZENITH RADIO CORPORATION, CHICAGO 39, ILL., U.S.A.

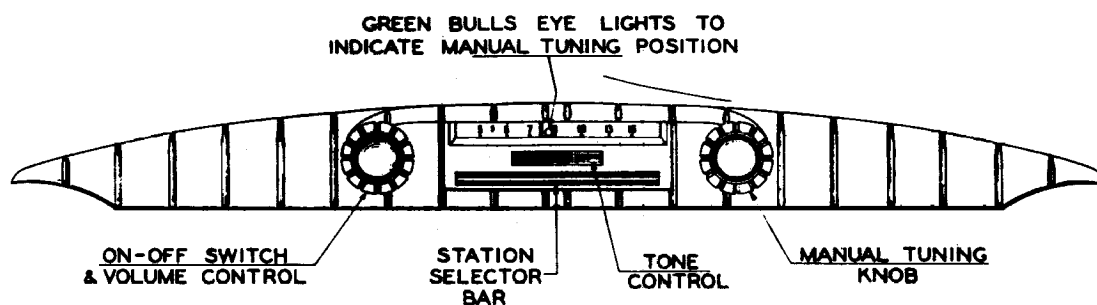


Fig. 1. Lincoln

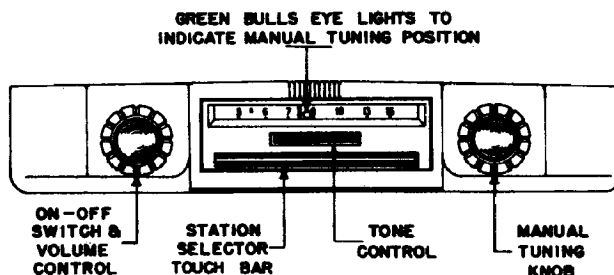


Fig. 1A. Continental

Electrical Specifications

TUNING RANGE:..... 540-1600 Kc.
INTERMEDIATE FREQUENCY:..... 265 Kc.
SENSITIVITY:..... 6 microvolts at one watt output.
UNDISTORTED POWER OUTPUT:.....
7.5 watts measured at the voice coil.
SPEAKER:..... 6" x 9" oval, instrument panel mounting.

CURRENT CONSUMPTION:..... 8.5 amperes
INSTANTANEOUS CURRENT CONSUMPTION DURING AUTOMATIC CHANGE CYCLE:..... 20 amperes
TUBE COMPLEMENT:..... 7A7 R.F., 7B8 converter, 7A7 I.F., 7E6 detector and 1st audio, 2-7C5 push pull power output, 7Y4 rectifier.

IMPORTANT

The Warranty Tag must be filled in, by car dealer, at the time of sale and must accompany each receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail.

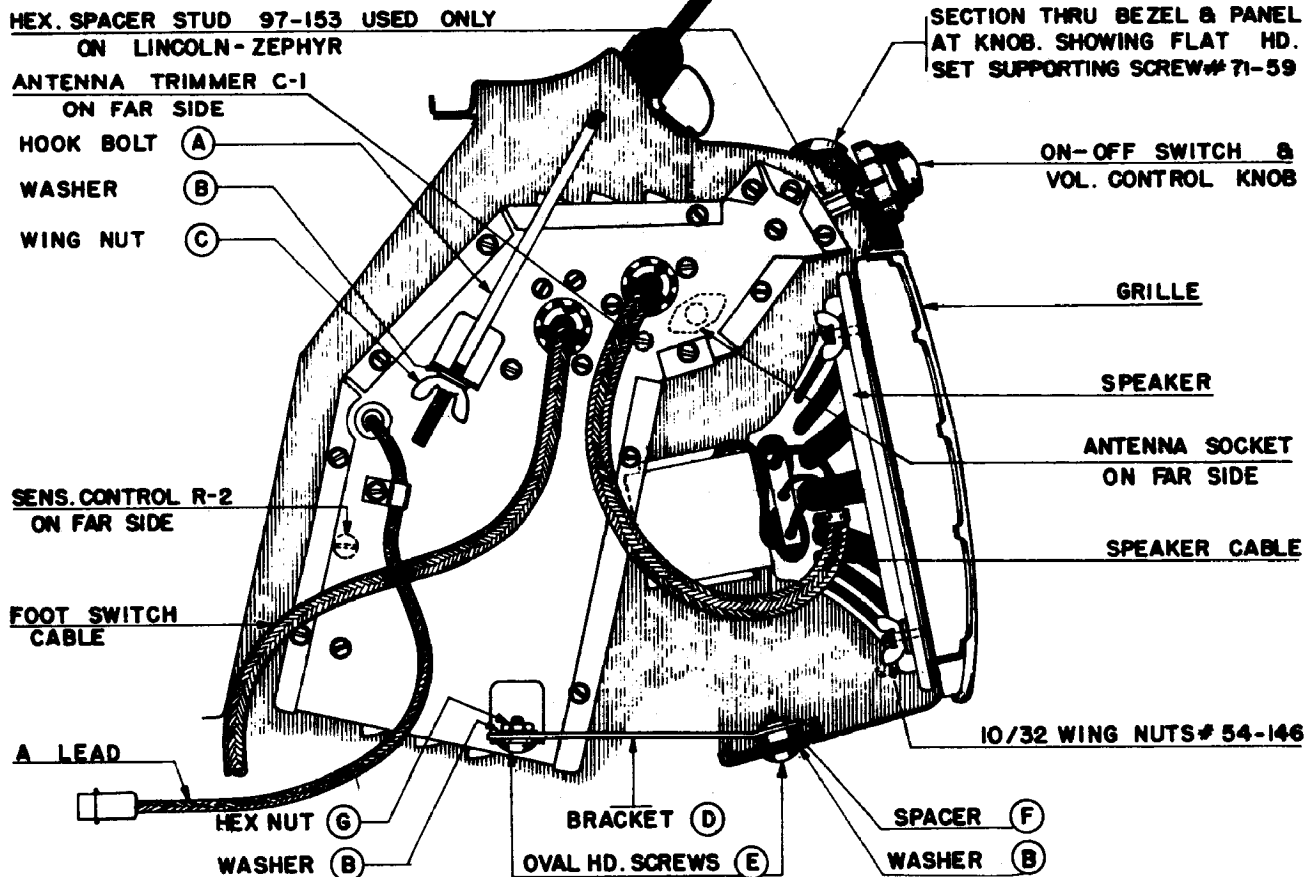


Fig. 2. Lincoln

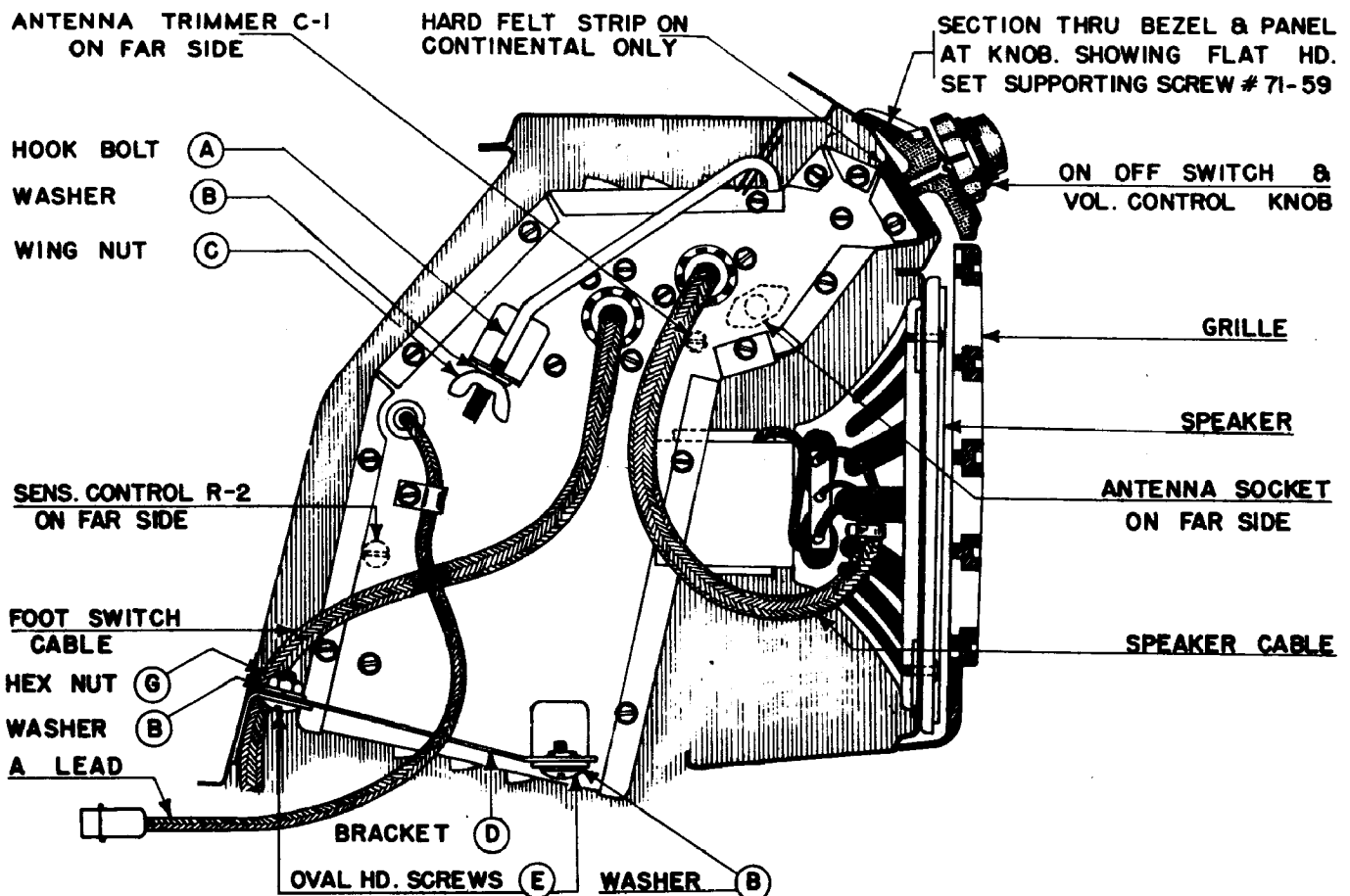


Fig. 2A. Continental

RECEIVER INSTALLATIONS

Figures 1, 1A, 2 and 2A, illustrating the escutcheon plates, control knobs and the installed receivers, are given here to facilitate removal and reinstallation of the receivers when service or repair is necessary.

To take the receiver from the car, remove the tuning and volume control knobs. Remove the 8-32 flathead screws that support the receiver at the top. Remove the lower support brackets "D" and finally loosen the hook bolts "A."

To remove the Continental speaker, remove grille (held in place by four nuts on back side of instrument panel). Then remove four machine screws No. 69-84 holding the speaker to the front of the instrument panel. (Fig. 2A.)

The Lincoln speaker is held to the rear of the panel by four wing nuts No. 54-146. (Fig. 2.)

MANUAL TUNING

1. Press station selector touch-bar (Fig. 1) several times or until the green dot appears in the back ground of the dial.
2. Pull manual tuning (right hand) control knob outward and turn to tune in desired station. Be sure to tune to exact frequency to assure the best tone quality.

VOLUME—Adjust left hand control knob for desired volume.

TONE CONTROL—The tone control is located under dial scale. (Fig. 1.) Turn in either direction for most pleasing tone.

ADJUST-O-MATIC TUNING

If not previously set up for Adjust-O-Matic operation, proceed as follows:

1. Press station selector touch bar (Fig. 1) until green dot appears in dial scale background. Press the touch bar once more to advance Adjust-O-Matic mechanism to the No. 1 position.
2. Pull manual tuning knob outward to engage the Adjust-O-Matic mechanism.
3. Select the station desired and tune to its frequency by turning the tuning knob. Tune very carefully for clearest reception.
4. Press station selector bar, pull tuning knob outward and tune in station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five Adjust-O-Matic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the selector bar to return to dial tuning or to any one of the stations selected on the Adjust-O-Matic.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The two ignition coil condensers No. 22-1147 should be installed as shown in Figure 3 below.

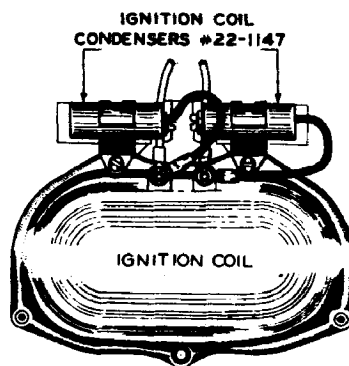


Fig. 3

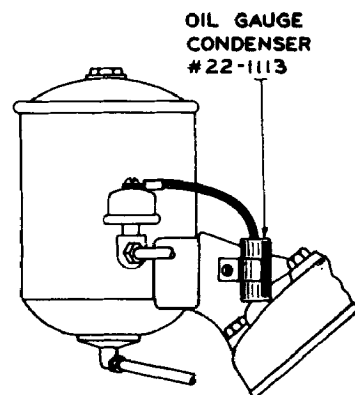


Fig. 4

The oil gauge condenser No. 22-1113 should be installed as shown in Figure 4.

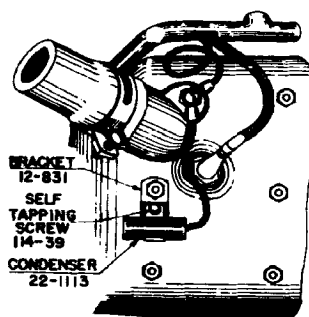


Fig. 5

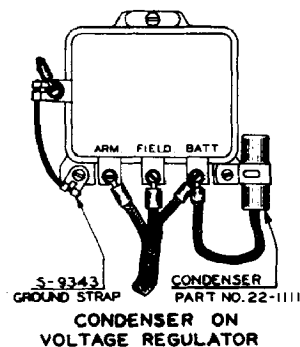


Fig. 6

The temperature gauge condenser No. 22-1113 should be installed with its bracket fastened under one of the cylinder head nuts as shown in Figure 5.

The voltage regulator condenser and ground strap should be installed as shown in Figure 6.

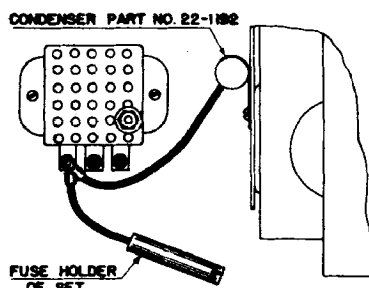


Fig. 7

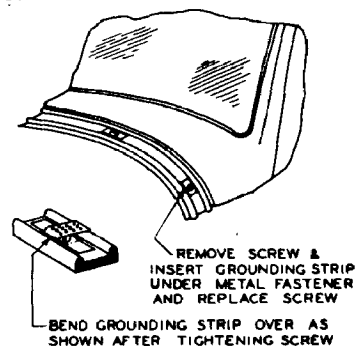


Fig. 8

The No. 22-1192 condenser and the "A" lead should be connected together at the circuit breaker inside the car above the steering column as shown in Figure 7.

The No. 80-145 motor hood bond spring should be installed as illustrated in Figure 8.

DELAYED AUTOMATIC MUTING CIRCUIT

Pressing the touch-bar or the foot control switch automatically mutes the receiver during the station changing cycle. After the hand or foot pressure is removed, the noise of tuning through stations on the return stroke is eliminated automatically. This special circuit applies a large negative voltage to the 1st audio grid to bias it beyond cut off. When the tuner is operated, the delayed muting switch S3 on the back of the tuner connects the grid side of the con-

denser C19 to ground and charges it positively. As soon as the tuner starts its return stroke, the switch grounds the positive terminal of the condenser and ungrounds the grid side. The grid side now becomes negative with respect to ground and cuts off the 1st audio tube. The charge rapidly leaks off through R12 and R14, and the receiver operates normally after the change cycle.

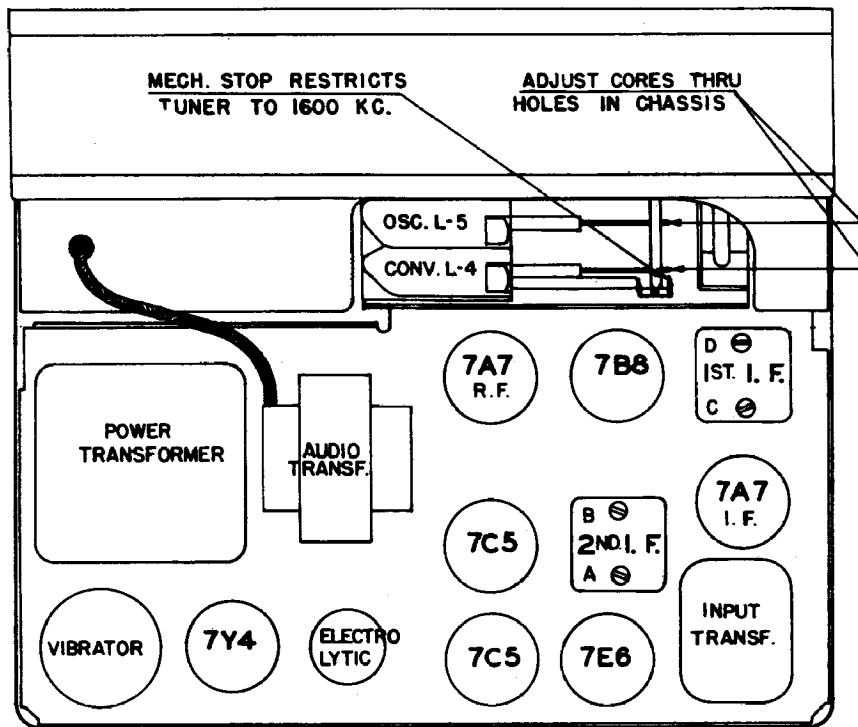


Fig. 9. Top View of Chassis

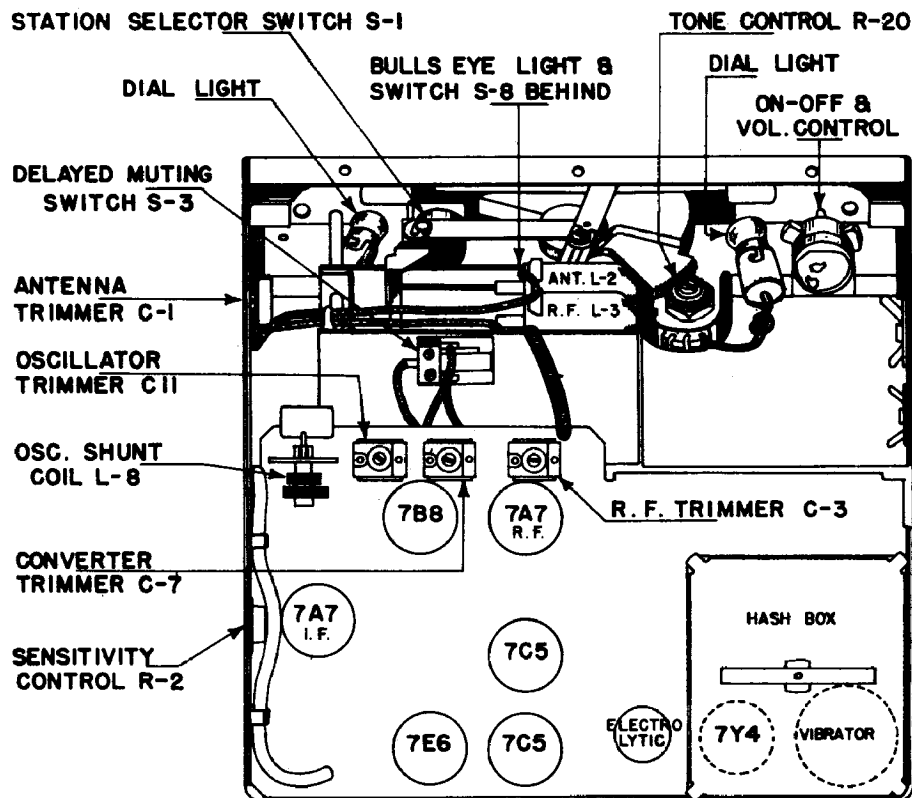


Fig. 10. Bottom View of Chassis

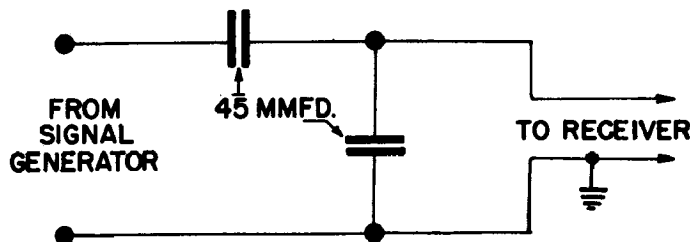


Fig. 11

Figure 11 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control set at maximum and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C and D (Fig. 9) in the order named for maximum output. Repeat the operation to assure accurate alignment.

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy illustrated in Fig. 11 to antenna lead in socket on receiver.
2. Set signal generator to 535 Kc.
3. Place set in manual tuning position and set dial to 535 Kc.
4. Adjust oscillator trimmer C-11 (Fig. 10) for maximum response.
5. Set signal generator to 1200 Kc.
6. Tune set to 1200 Kc.
7. Adjust converter trimmer C-7 (Fig. 10) and R.F. trimmer C-3 (Fig. 10) for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by turning eccentric screw at fulcrum of dial pointer.

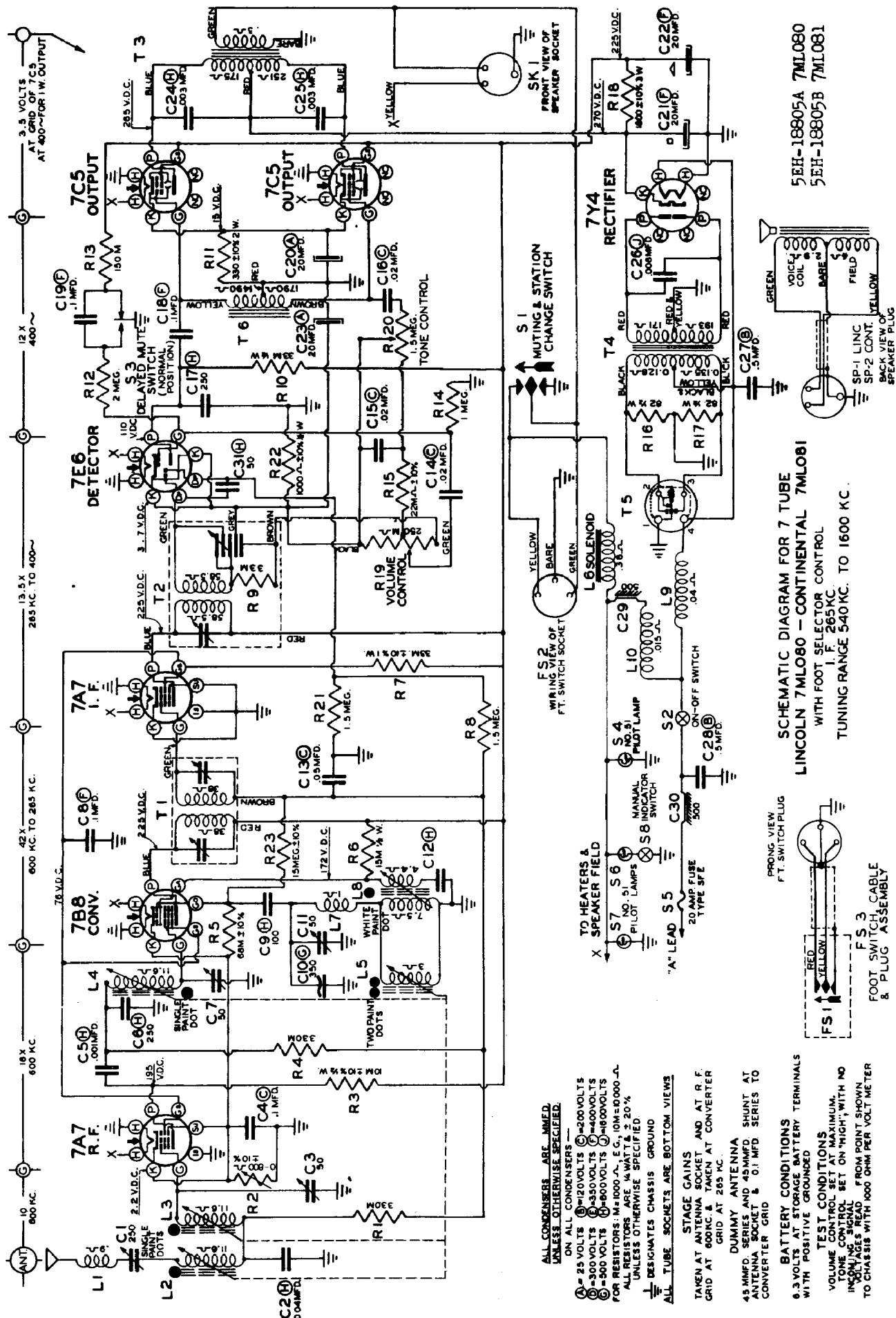
CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

1. Replace coil or core.
2. Set signal generator to 1700 Kc.
3. Connect signal generator leads through dummy illustrated in Figure 11 to antenna receptacle on the receiver.
4. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
5. Screw the core complete out of the antenna coil, the R.F. coil, the converter coil, and the oscillator coil.
6. Adjust oscillator trimmer C-11 Fig. 10 at 1700 Kc.
7. Adjust converter trimmer C-7, R.F. trimmer C-3, and antenna trimmer C-1 (Fig. 10) for maximum output reading.
8. Replace cores to their approximate original positions.
9. Set generator dial and receiver dial to 1200 Kc.
10. Adjust oscillator core L5 (Figure 9) to scale at 1200 Kc.
11. Adjust antenna, R.F. and converter cores (Figures 9 and 10) for maximum output reading.
12. Set signal generator to 600 Kc.
13. "Rock in" shunt oscillator coil L8 (Fig. 10) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a ganged condenser receiver.
14. Check receiver at 1200 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.
15. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1200 Kc.



SCHEMATIC

PARTS LIST LINCOLN MODEL 7MLO80 (CHASSIS 7C80)

1946 ADJUST-O-MATIC RADIO

COILS AND CHOKES

Diagram No.	Part No.	Description
L 9	20-313	Main hash choke
T 1	95-944	1st I.F. transformer
T 2	95-945	2nd I.F. transformer
L 1	S8819	Antenna motor noise choke assem.
L 7	S11229	Oscillator series coil assem.
L 5	S12053*	Oscillator tuning coil assem.
L 2	S12060*	Antenna tuning coil assem.
L 3	S12060*	R.F. tuning coil assem.
L 4	S12060*	Converter tuning coil assem.
L 8	S11231*	Oscillator shunt coil assem.
L10	S12233	Motor noise choke coil assem.

Note: In ordering coils marked *, be sure to give color code information.

Diagram No.	Part No.	Description
R 1 } R 4 }	63-1392	330M ohm ¼ watt
R15	63-1395	22M ohm ¼ watt
R 5	63-1396	68M ohm ¼ watt
R 7	63-1398	33M ohm 1 watt
R16 } R17 }	63-1399	82 ohm ½ watt
R 6	63-1401	15M ohm ½ watt
R 3	63-1402	10M ohm ½ watt
R10	63-1404	33M ohm ½ watt
R12	63-1405	2 megohm ¼ watt
R23	63-1406	15 megohm ¼ watt
R 8 } R21 }	63-1407	1.5 megohm ¼ watt
R13	63-1408	150M ohm ¼ watt
R22	63-1409	1M ohm ½ watt

CONDENSERS

C 9 } C12 }	22-162	100 mmfd. 600 volt
C 8 } C19 }	22-170	.1 mfd. 400 volt
C-17	22-182	250 mmfd. 600 volt
C- 4	22-190	.1 mfd. 200 volt
C-13	22-250	.05 mfd. 200 volt
C-31	22-289	50 mmfd. 600 volt
C-27 } C-28 }	22-908	.5 mfd. 120 volt
C- 6	22-1136	250 mmfd. 600 volt
C- 5	22-1169	.001 mfd. 600 volt
C 2	22-1244	.004 mfd. 600 volt
C14 } C15 } C16 }	22-1270	.02 mfd. 200 volt
C 1	22-1420	Antenna trimmer
C26	22-1448	.008 mfd. 1600 volt
C10	22-1478	350 mmfd. compensator
C 7 } C11 }	22-1479	Oscillator and converter trimmer
C 3	22-1480	R.F. trimmer
C24 } C25 }	22-1481	.003 mfd. 600 volt
C18	22-1482	.1 mfd. 400 volt
C23	22-1483	Dry electrolytic—20 mfd.—25 volt
C20 } C21 } C22 }	22-1484	Dry electrolytic 20 mfd.—25 V. x 20 mfd.-400 V. x 20 mfd.-400 V.

RESISTORS

R18	63-1370	1800 ohm 3 watt
R11	63-1371	330 ohm 2 watt
R 2	63-1379	Sensitivity control
R20	63-1384	Tone control
R19 } S 2 }	63-1385	Volume control and switch
R14	63-1390	1 megohm ¼ watt

MISCELLANEOUS

	19-87	Cable clip
SP1	49-543	6" x 9" dynamic speaker
	52-200	Battery cable fuse to ammeter
	52-350	Battery cable set to fuse
	78-477	Vibrator socket
	78-596	Tube socket—Loktal base (8 cont.)
SK1	78-645	Speaker plug socket
FS2	78-646	Foot switch cable plug socket
	78-251	Antenna connector socket
	93-456	Vibrator cushion washer
T 6	95-946	Input transformer
T 3	95-947	Output transformer
T 4	95-948	Power transformer
	97-235	Set installation mounting stud
S 5	136-12	Fuse—20 amp.
T 5	190-22	Vibrator
	202-418	Instruction book
S 1	S11269	Hand selector & muting switch assem.
FS3	S12041	Foot switch cable & plug assem.
	208-543*	Cone and voice coil assembly

DIAL AND TUNING MECHANISM ASSEMBLY

	12-970	Selector bar support bracket
	12-1160	Light rod retaining bracket
	26-353	Dial scale
	34-122	Tone control gear
	34-132	Indexing disc
	34-133	Ratchet gear
	57-1132	Dial scale back plate
	57-1133	Escutcheon
	73-69	No. 6-32 x 5/16 Allen head set screw
	80-329	Gear indexing spring
	80-331	Cross arm return spring
	80-332	Cam lever spring

DIAL AND TUNING MECHANISM ASSEMBLY (Continued)

Diagram No.	Part No.	Description
	80-336	Ratchet gear return spring
	80-340	Lever spring
	80-341	Kick-off spring
	80-342	Tuning shaft spring
	80-343	Solenoid switch spring
	80-344	Solenoid switch contact spring
	80-429	Indicator switch contact spring
	80-430	Indicator switch contact spring
	80-431	Selector bar tension spring
	97-156	Tone control knob retaining stud
S 4 } S 6 } S 7 }	100-32	Dial light bulb (3 used)
	118-34	Pointer drive link
	126-497	Manual indicator light shield
	126-498	Dial light shield
	128-22	Indicator cam
	149-44*	Adjusting spring and core
	187-7	Manual indicator light rod
	188-43	Retaining ring
	188-45	Turret screw lock ring
L 6	S10826	Solenoid end plug & bracket assem.
	S10829	Solenoid and terminal assem.
	S10831	Ratchet and bracket assem.
	S10836	Cross arm assem.
	S11054	Tuning shaft and gear assem.
	S11084	Turret assem.
	S12068	Tuning & volume control knob assem.
	S12069 }	Selector key bar & bracket assem. (46-588)
	S12073	Pointer and stud assem. (59-170)
	S12075	Pointer drive bracket & stud assem.
	S12183	Mounting plate and lever assem.
	S12195	Dial light socket & wire assem.—L.H.

Diagram No.

Part No.	Description
S12196	Dial light socket & wire assem.—R.H.
S12197	Dial light socket & wire assem.— Manual ind.
S12232 }	Tone control knob & bushing assem. (46-589)

Note: In ordering Adjusting Spring and Core marked *, be sure to give color code information.

MOTOR NOISE SUPPRESSION KIT

S12125	Motor noise suppression kit complete
S-9343	Ground strap
12-831	Suppressor condenser mtg. bracket
22-1111	Voltage regulator condenser
22-1113	Water gauge & oil gauge condenser
22-1147	Ignition coil condenser
22-1192	"A" lead condenser
80-145	Motor hood bond spring
114-39	No. 8 x 1/4 hex head S.T. screw

INSTALLATION PARTS

S12126	Set installation kit complete
12-972	Set installation bracket
19-114	Foot switch cable clip
54-99	No. 12-24 x 7/16 hex nut
54-146	No. 10-32 wing nut (4 used)
54-151	No. 12-24 wing nut (2 used)
64-141	Foot switch installation eyelet
68-4	No. 6 Allen head set screw wrench
71-59	No. 8-32 x 1/2 flat head M.S.
93-340	3/32 x .255 x 1/2 washer (steel)
93-372	No. 12 int. shakeproof lockwasher
93-524	Foot switch installation washer
112-310	No. 10 x 2 R.H. S.M. screw
112-342	No. 12-24 x 5/8 B.H. M.S.
112-348	Set installation screw

PARTS LIST CONTINENTAL MODEL 7ML081 (CHASSIS 7C80) 1946 ADJUST-O-MATIC RADIO

The parts list for Model 7ML081 is the same as for Model 7ML080 with the following parts omitted and added:

ADD

Diagram No.	Part No.	Description
SP2	49-539	6" x 9" dynamic speaker
	112-545	Set installation screw L.H.
	112-546	Set installation screw R.H.
	69-84	10/32 x 1/4 R.H. M.S.
	71-29	8/32 x 7/8 F.H. M.S.
	93-369	No. 10 internal shakeproof lockwasher
	93-593	7/16 external shakeproof lockwasher
	208-539*	Cone and voice coil

OMIT

Diagram No.	Part No.	Description
SP1	49-543	6" x 9" dynamic speaker
	97-235	Set installation mounting stud
	54-146	10/32 wing nut (4 used)
	71-59	8/32 x 1/2 flat head M.S.
	112-348	Set installation screw
	208-543	Cone and voice coil

When ordering cone and voice coil assembly marked*, be sure to give manufacturer's code letter that follows base number.

**LINCOLN AUTOMOTIVE RECEIVER 7ML780
(CHASSIS 7D80) 6H-18805-A.**

Same as Model 7ML080 (Chassis 7C80) except:

OMIT

26-353	Dial Scale
57-1132	Dial Scale Back Plate
63-464	1 Megohm 1/4 W. Insl.
63-763	22M Ohm 1/4 W. Insl.
63-769	68M Ohm 1/4 W. Insl.
63-1370	1800 Ohm 3 W. Insl. W.W.
100-32	Dial Light Bulb
196-91	Speaker Screen & Gasket
202-418	Instruction Book
S-11231	Oscillator Shunt Coil Assem.

ADD

26-388	Dial Scale
57-1321	Dial Scale Back Plate
63-1368	1800 Ohm 2 W. Insl. W.W.
74-44	Speaker Screen
97-235	Set Installation Mtg. Stud
100-36	Dial Light Bulb
196-95	Speaker Gasket
202-529	Instruction Book
S-13449	Oscillator Shunt Coil Assem.

**LINCOLN-CONTINENTAL AUTOMOTIVE RECEIVER MODEL 7ML781
(CHASSIS 7D80) 6H-18805-B.**

Same as Model 7ML780 (Chassis 7D80) except:

OMIT

49-539	6 "x 9" Dynamic Spkr. (or 49-543-599)
74-44	Speaker Screen
97-235	Set Installation Mtg. Stud
196-95	Speaker Gasket
S-12041	Foot Switch Assem.
S-12126	Set Installation Kit

ADD

49-573	6 "x 9" Dynamic Spkr. (or 49-609)
83-968	Speaker Protection Strip
83-1231	Set Cushion Strip (2 used)
S-12043	Foot Switch Assem.
S-12484	Set Installation Kit

SERVICE MANUAL



Models
8MF880
and
8MF980

Ford Part No.
8A-18805-B

Made by ZENITH RADIO CORPORATION, CHICAGO 39, ILLINOIS, U.S.A.

Electrical Specifications

TUNING RANGE:.....540-1600 Kc.

INTERMEDIATE FREQUENCY:.....265 Kc.

SENSITIVITY:.....5 microvolts at one
watt output.

UNDISTORTED POWER OUTPUT:.....
6 watts measured at the voice coil.

SPEAKER:.....6" x 9" oval, instrument
panel mounting.

CURRENT CONSUMPTION:.....8 amperes

TUBE COMPLEMENT, Model 8MF980: 6BA6
R.F., 6SA7GT converter, 6BA6 I.F.,
6SR7GT detector and 1st audio, 6SN7GT
driver and phase-inverter, 2-6V6GT push
pull power output, and 6X5GT rectifier.

TUBE COMPLEMENT, Model 8MF880: 7A7
R.F., 7B8 converter, 6BA6 I.F., 7E6 or
6SR7GT detector and 1st audio, 7AF7
driver and phase-inverter, 2-6V6GT push
pull power output, and 7Y4 rectifier.

IMPORTANT

The Warranty Registration Tag must be filled in, by car dealer, at the time of sale and must accompany each receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail.

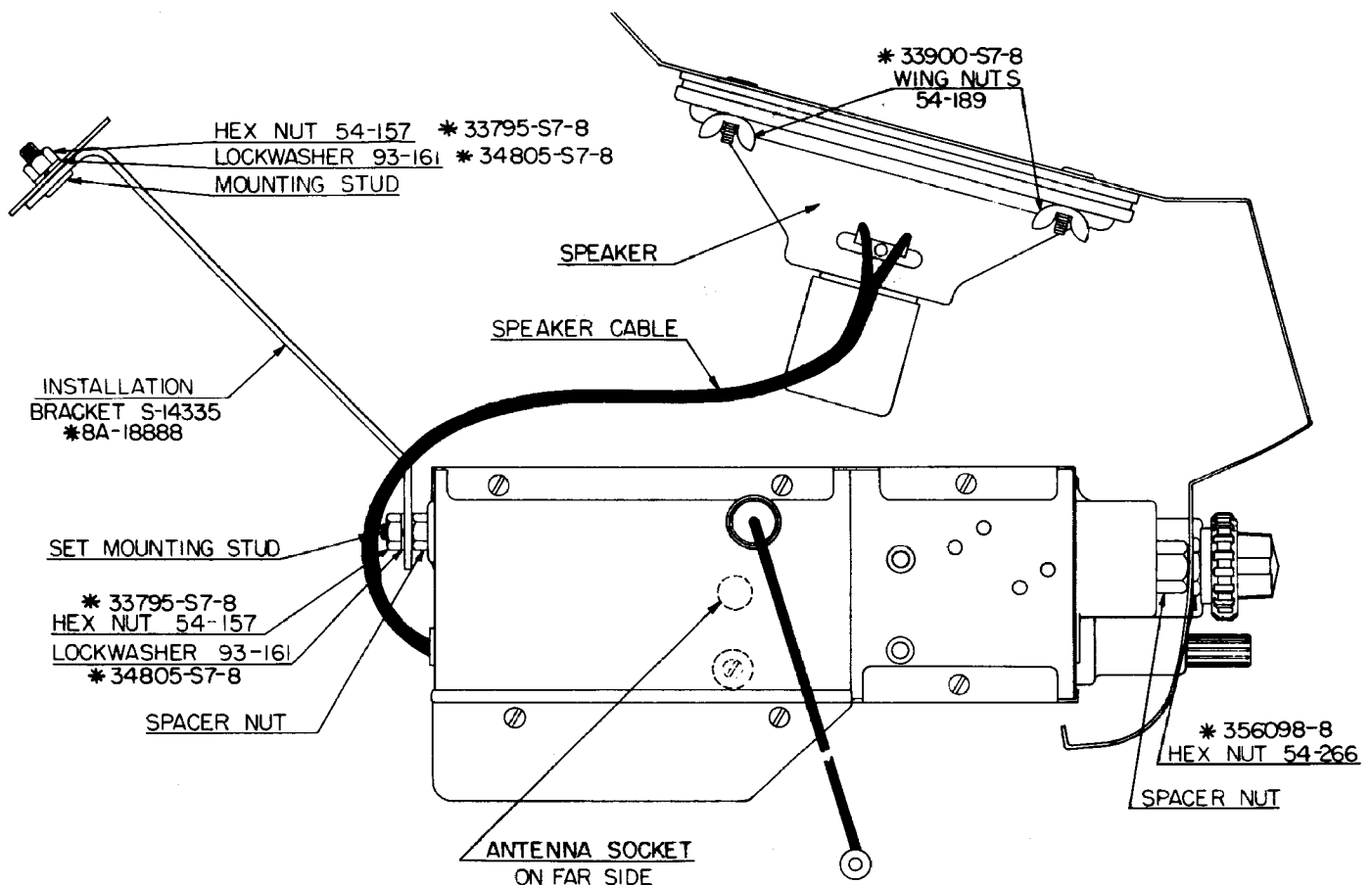


Fig. 1. Set Installed, Cut Away View

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the escutcheon plate, control knobs and the installed receiver, are given here to facilitate removal and reinstallation of the receiver when service or repair is necessary.

1. Disconnect the "A" lead, the speaker cable, and the antenna from the receiver. (Fig. 1.)
2. Remove the volume control, tone control, trim and tuning knobs from the set. Remove the two front hex-nuts 54-266. Disconnect the bottom of the set rear mounting bracket S-14335 by removing the hex-nut 54-157, and lockwasher 93-161 from the set rear mounting stud, and take the set from its position behind the instrument panel. (Fig. 1.)
3. To take the speaker from behind the instrument panel remove the four 8-32 wing-nuts No. 54-189. (Fig. 1.)

OPERATING INSTRUCTIONS

TO TURN RADIO ON:

The radio is connected to the accessory terminal of the ignition switch, therefore, it is necessary to turn the ignition key to the left, if the engine is not running, before turning the radio on. Press any one of the five automatic push buttons. (Fig. 2.) Allow approximately 20 seconds for the receiver to reach operating temperature.

To turn the receiver off, press the "Off" push button (Fig. 2).

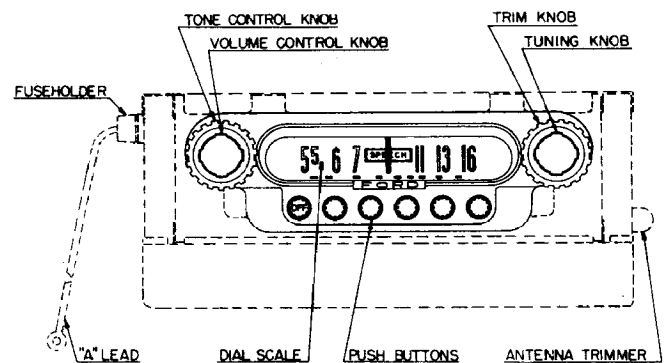


Fig. 2. Front Panel View

MANUAL TUNING:

To operate the manual tuning control simply turn the tuning knob. (Fig. 2.) When tuning in a station, be sure to tune to the exact frequency for the best tone quality.

VOLUME CONTROL:

Turn the volume control knob for the desired volume. (Fig. 2.)

TONE CONTROL:

The tone control knob is located directly behind the volume control knob. Turning this control to the right or left will change the tone of the receiver. The control has four positions. The position to which the control is set is indicated in the window in the center of the dial scale.

* Indicates Ford part number.

AUTOMATIC TUNING:

There are five automatic tuning push buttons located to the right of the "Off" push button. (Fig. 2.)

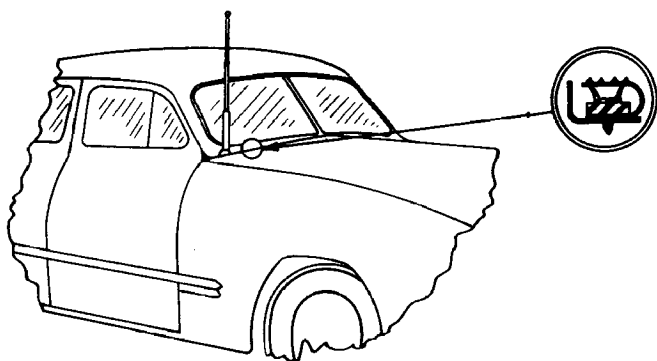
The five buttons may be adjusted in succession to any desired dial setting. To simplify the identification of the stations, it is advisable to set the buttons in sequence according to the frequencies of the stations, beginning with the station broadcasting at the lowest frequency and progressing to the station broadcasting at the highest frequency.

To adjust the automatic tuning push buttons:

1. Turn the receiver on and allow it to operate for at least 15 minutes in order for each part to reach normal operating temperature.
2. Tune in the station desired for number 1 position by turning the tuning knob. (Fig. 2.) Be sure to tune to the exact frequency to insure the best tone.
3. Loosen the number one push button, located nearest the "OFF" push button (Fig. 2) by turning it counterclockwise with your fingers not more than two turns. If the push button is completely unscrewed, the plunger assembly, inside the receiver, may come apart. Then it will be necessary to remove the radio from the car, open the case, and reassemble the plunger.
4. Press the button in as far as it will go.
5. Release the number 1 button and tighten it by turning it clockwise with your fingers.
6. Use the same procedure for adjusting positions 2, 3, 4, and 5. When the five automatic tuning push buttons have been adjusted to the five desired stations, any one of the five stations can be instantly tuned in by pressing the automatic push button that is adjusted to it.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:



REMOVE SCREW FROM HOOD PAD ON COWL AT LOCATION SHOWN AND INSTALL HOOD BONDING SPRING 80-145 WITH SCREW 112-365. *51A-18870
*32923-S7-8

Fig. 3

The hood bonding spring No. 80-579 should be installed on the cowl at the location shown in Fig. 3.

The generator condenser, No. 22-1601, should be mounted under the top assembly bolt on the rear end plate of the generator, and the lead connected to the ARMATURE terminal of the generator. (Fig. 4.)

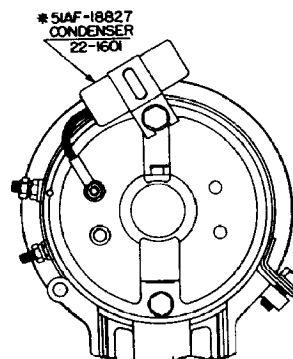


Fig. 4

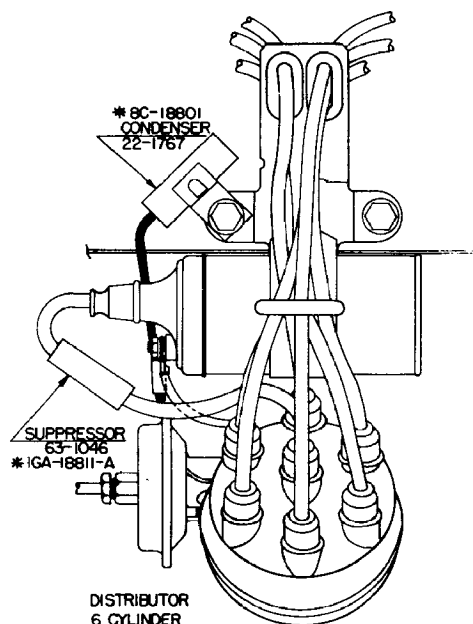


Fig. 5

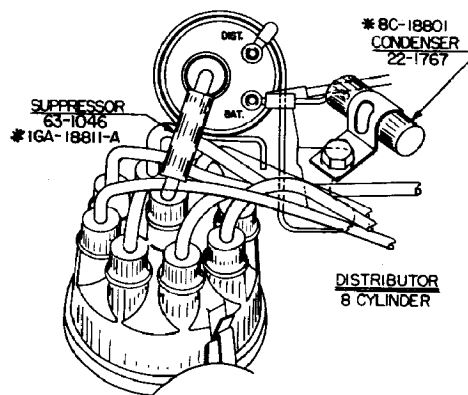


Fig. 6

The suppressor, No. 63-1046, should be in the high tension wire, approximately 1½ inches from the distributor cap. (Figs. 5 and 6.) The ignition coil condenser, No. 22-1767, should be connected to the BAT, terminal of the ignition coil. (Figs. 5 and 6.)

* Indicates Ford part number.

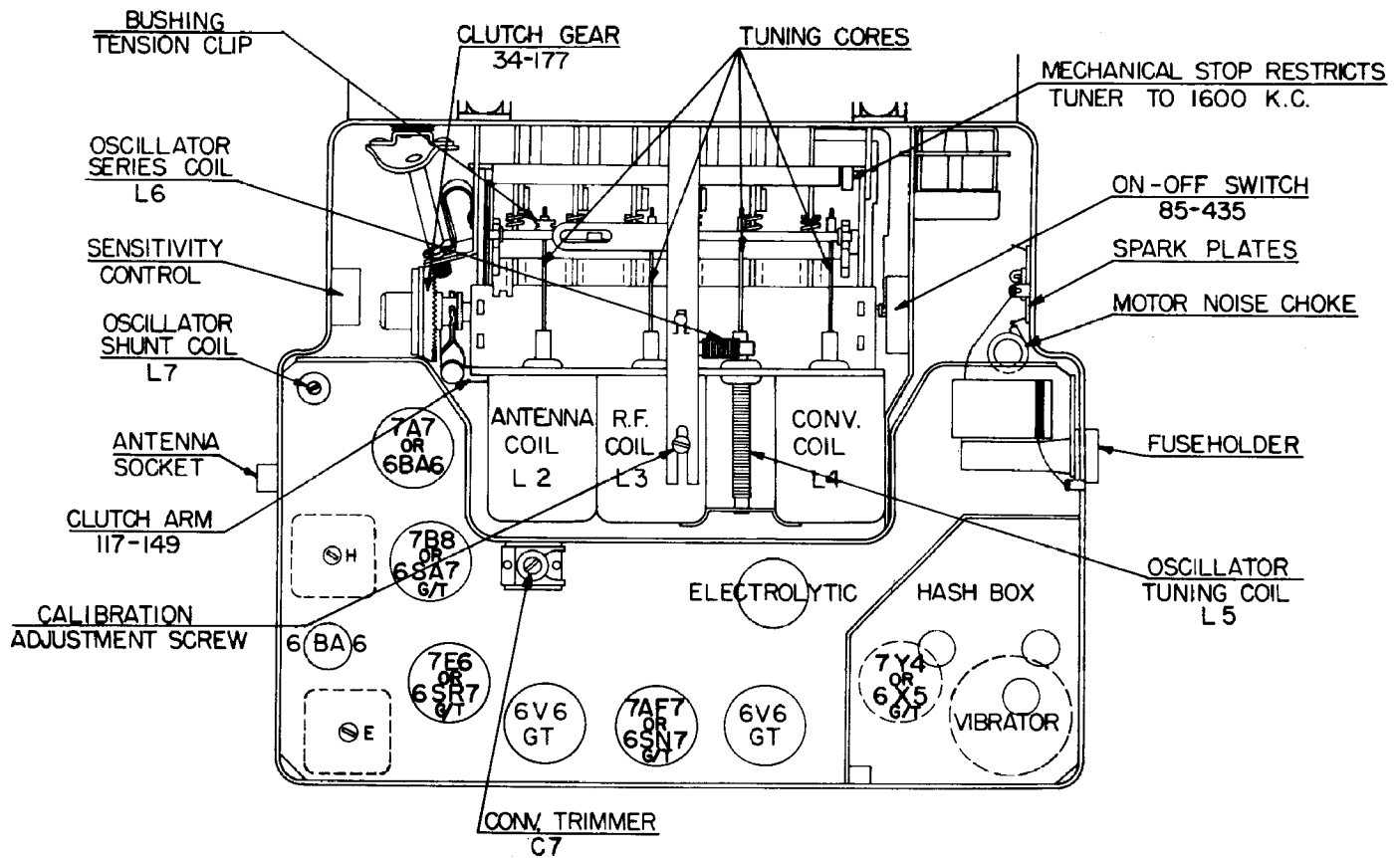


Fig. 7. Top View
of Chassis

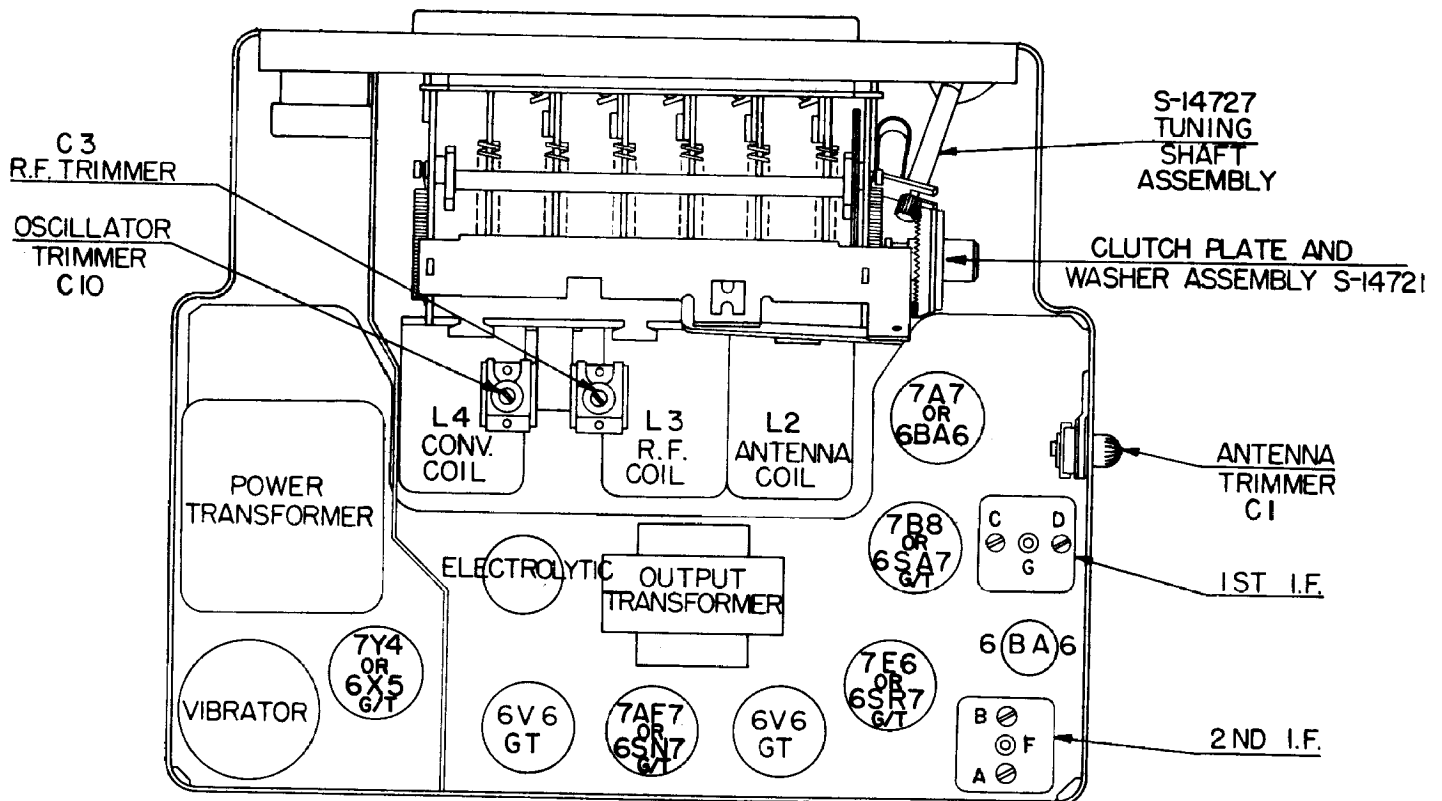


Fig. 8. Bottom View
of Chassis

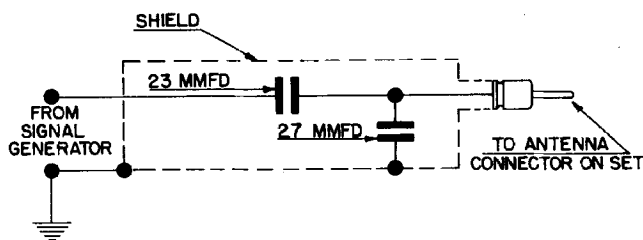


Fig. 9. Dummy Antenna

Figure 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustment to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C, and D in order named for maximum output. (Fig. 8.) Some units have I.F. transformers that are slug tuned. In this case adjust I.F. slugs E, F, G, and H in order named. Repeat the operation to assure accurate alignment. (Figs. 7 and 8.)

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver. This is important.
2. Set signal generator to 535 Kc.
3. Tune set to 535 Kc.
4. Adjust oscillator trimmer C-10 (Fig. 8), for maximum response.
5. Set signal generator to 1300 Kc.
6. Tune set to 1300 Kc.
7. Adjust converter trimmer C-7, R.F., trimmer C3 and antenna trimmer C-1 (Fig. 8) for maximum response (Figs. 7 and 8).
8. If dial calibration is off after making above adjustments, a correction can be made by tuning eccentric screw at fulcrum of dial pointer. (Fig. 7.)

TO ADJUST OR REPLACE THE ADJUSTING SPRING AND CORE

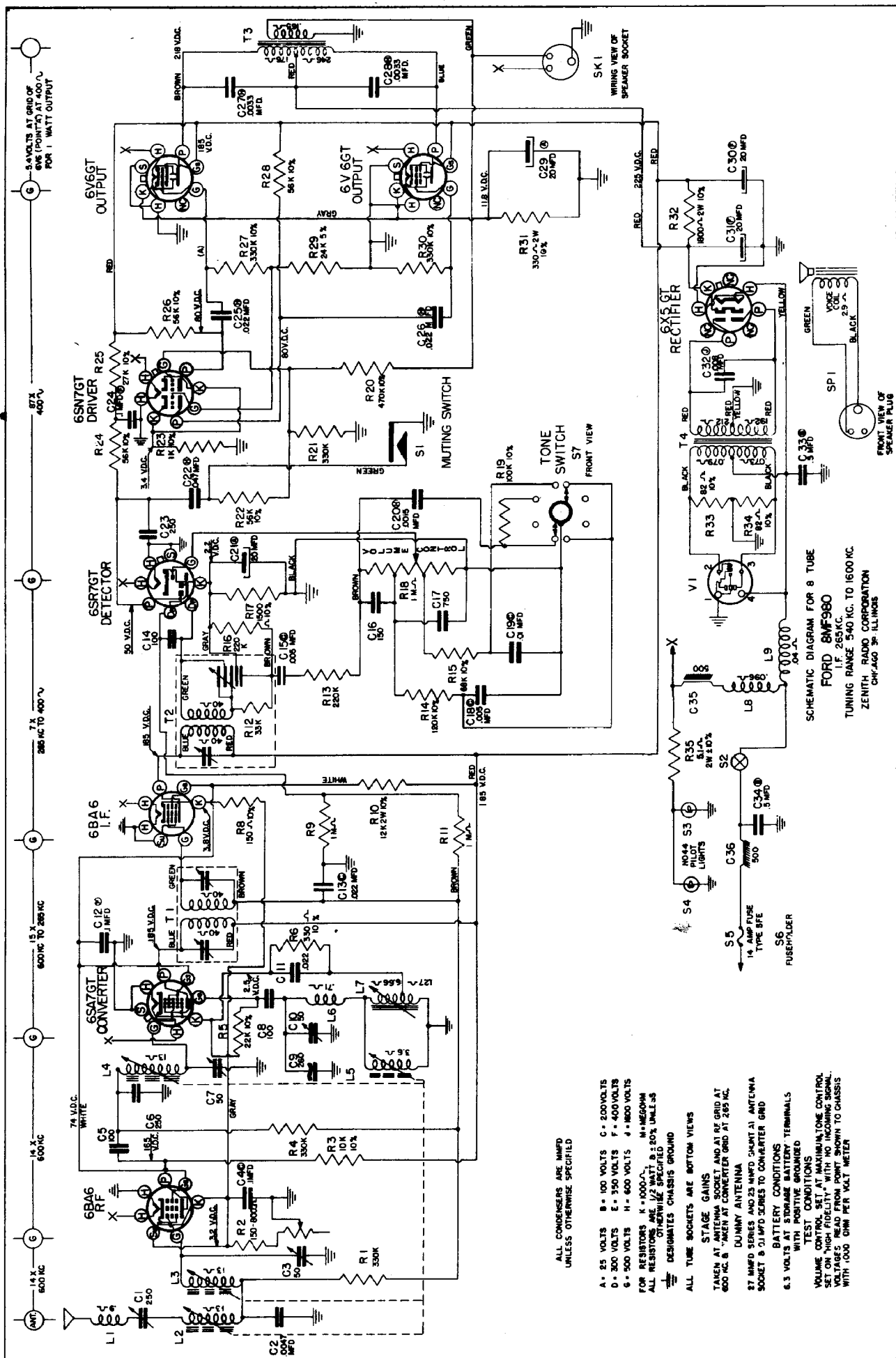
1. Remove the top and bottom covers from the receiver. Remove the escutcheon assembly.
2. With pliers remove the bushing tension clip from the cross arm insulating bushing.
3. With core alignment tool, part No. S-13064, screw the core in, or out, to the desired position.
4. After all adjustments or replacements are completed, be sure to replace the bushing tension clip.

ALIGNMENT PROCEDURE AFTER CORE OR COIL REPLACEMENT

WARNING: The following adjustments are to be made only after a core or coil is replaced.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
4. Screw the cores completely out of the antenna coil, the R.F. coil, the converter coil, and the oscillator coil.
5. Adjust the oscillator trimmer C-10 (Fig. 8) at 1675 Kc.
6. Adjust the converter trimmer C-7, R.F. trimmer C3, and antenna trimmer C-1 (Figs. 7 and 8) for maximum output reading.
7. Set signal generator dial and receiver dial to 1300 Kc.
8. Replace cores to their approximate original position (so that the cores project about $1\frac{1}{8}$ of an inch from the end of the coil form).
9. Adjust the oscillator core L-5 (Fig. 7) to scale at 1300 Kc.
10. Adjust the antenna core L-2, R.F. core L3, and converter core L-4 (Fig. 7) for maximum output reading.
11. Set signal generator to 600 Kc.
12. "Rock in" shunt oscillator coil L-7 (Fig. 7) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a gang condenser receiver.
13. Check receiver at 1300 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10, and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop near the volume control should be bent to limit the frequency coverage to 1605 Kc.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1300 Kc.





PARTS LIST FORD AUTOMOTIVE RECEIVER

MODELS 8MF880 and 8MF980

Part No. 8A-18805-B

Diagram No.	Part No.	Description	Price
COILS AND CHOKES			
L 9	20-213	Main Hash Choke	\$.36
T 1	95-1077	1st I.F. Transformer	1.85
T 2	95-1078	2nd I.F. Transformer	2.00
L 1	S-8819	Antenna Motor Noise Choke Assembly	.40
L 8	S-11232	Motor Noise Choke Assembly	.22
L 7	S-14225	Oscillator Shunt Coil Assembly	.80
L 6	S-14226	Oscillator Series Coil Assembly	.35
L 3	S-14227	RF Coil Assembly	.90
L 2	S-14227	Antenna Coil Assembly	.90
L 4	S-14227	Converter Coil Assembly	.90
L 5	S-14228	Oscillator Coil Assembly	.75
L 2	S-14295	Tuner Coil Unit Assembly	6.25
L 3			
L 4			
L 5			
CONDENSERS			
C12	22-170	.1 Mfd.	400 V. .26
C23	22-182	250 Mmfd.	400 V. .26
C 4	22-190	.1 Mfd.	200 V. .23
C17	22-242	750 Mmfd.	500 V. .26
C15	22-906	.005 Mfd.	200 V. .20
C18			
C 6	22-1136	250 Mmfd.	500 V. .20
C16	22-1137	150 Mmfd.	500 V. .20
C34	22-1238	.5 Mfd.	120 V. .50
C19	22-1466	.01 Mfd.	200 V. .20
C29	22-1484	Electrolytic 20 Mfd.—25 V. x20-20 Mfd.	400 V. 2.10
C30			
C31			
C21	22-1553	20 Mfd. Electrolytic	25 V. .80
C 9	22-1712	260 Mmfd. Compensating	.50
C32	22-1713	.007 Mfd.	1600 V. 1.00
C 7	22-1715	Single Section Trimmer (Converter)	.35
C 1	22-1721	Single Section Trimmer (Antenna)	.55
C 3	22-1722	Two Section Trimmer (R.F. and Osc.)	.60
C10			
C33	22-1728	.5 Mfd.	100 V. .55
C 5	22-1730	100 Mmfd. Ceramic (or 22-162)	500 V. .20
C11			
C14	22-1743	.0015 Mfd.	600 V. .20
C20			
C27	22-1747	.0033 Mfd.	600 V. .26
C28			
C24	22-1748	.1 Mfd.	400 V. .26
C22	22-1749	.047 Mfd.	600 V. .35
C25	22-1750	.022 Mfd.	600 V. .26
C26			
C13	22-1751	.022 Mfd.	200 V. .20
C 2	22-1752	.0047 Mfd. (or 22-1022)	600 V. .26
RESISTORS			
R 2	63-1379	Sensitivity Control	.56
R10	63-1398	33M Ohm (Insulated)	1 W. .24
S 7	63-1590	Volume Control and Tone Switch	2.50
R18			
R32	63-1620	1800 Ohm (Insulated)	2 W. .36

Diagram No.	Part No.	Description	Price
R31	63-1622	330 Ohm (Insulated)	2 W. \$.36
R33	63-1740	82 Ohm (Insulated)	1/2 W. .21
R34			
R 8	63-1771	470 Ohm (Insulated)	1/2 W. .21
R23	63-1785	1000 Ohm (Insulated)	1/2 W. .21
R17	63-1792	1500 Ohm (Insulated)	1/2 W. .21
R 3	63-1827	10M Ohm (Insulated)	1/2 W. .21
R 7	63-1835	15M Ohm (Insulated)	1/2 W. .21
R25	63-1845	27M Ohm (Insulated)	1/2 W. .21
R29	63-1846	30M Ohm (Insulated)	1/2 W. .21
R12	63-1849	33M Ohm (Insulated)	1/2 W. .21
R22	63-1859	56M Ohm (Insulated)	1/2 W. .21
R24			
R26			
R28			
R 5	63-1862	68M Ohm (Insulated)	1/2 W. .21
R19	63-1869	100M Ohm (Insulated)	1/2 W. .21
R14	63-1873	120M Ohm (Insulated)	1/2 W. .21
R13	63-1884	220M Ohm (Insulated)	1/2 W. .21
R16			
R27	62-1890	330M Ohm (Insulated)	1/2 W. .21
R30			
R 1	63-1891	330M Ohm (Insulated)	1/2 W. .21
R 4			
R21	63-1897	470M Ohm (Insulated)	1/2 W. .21
R20			
R 9	63-1912	1 Megohm (Insulated)	1/2 W. .21
R11			
R 6	63-1838	18M Ohm	1/2 W. .21
MISCELLANEOUS			
	46-715	Antenna Trimmer Knob (used on 22-1721)	.07
SP 1	49-627	P.M. Speaker (6" x 9" Oval) (See S-14303)	7.75
S 6	52-451	Battery Cable—Fuse to Set—Fuse-holder	.35
	52-455	Volume Control Cable	.70
	52-470	Speaker Cable and Plug	.45
	73-50	No. 6-32 x 1/4" Headless Slotted Set Screw—Cuppoint	.02
	78-596	Socket—Loktal Tube	.18
SK 1	78-728	Socket—Speaker	.20
	78-782	Socket—Miniature Tube	.25
	78-796	Socket—Antenna Connector	.20
	78-801	Socket—Octal Base Tube	.15
	78-804	Socket—Vibrator	.20
	93-888	Vibrator Cushion Washer	.04
T 4	95-1071	Power Transformer	7.50
T 3	95-1079	Output Transformer	4.00
	125-63	Rubber Grommet (used on S-14295)	.03
	126-553	Miniature Tube Shield	.11
	149-62	Iron Core and Screw	.10
	149-63	Iron Core and Spring (4 used)	.40
V 1	190-22	Vibrator	4.15
	196-91	Speaker Gasket and Screen	1.30
	199-81	Tone Gear Sleeve	.02
	202-575	Instruction Book (Owner's Manual)	.07
	202-605	Interference Elimination Instruction Sheet	.08

Diagram No.	Part No.	Description	Price
	S-14303	Speaker and Gasket Assembly (use 49-627 and 196-91)	

INSTALLATION PARTS

	S-14330	Installation Kit Assembly (complete).....	\$.70
	52-458	Battery Cable—Fuse to Ammeter.....	.40
	54-157	1/4-20 x 7/16" x 3/16" Hex Nut— Steel—Cad. Pl. (4 used).....	.07
S 5	136-11	14 Ampere Fuse—Type S.F.E. No. 14.....	.12
	54-266	1/2-28 x 1 1/16" x 1/8" Hex Nut.....	.04
	54-189	No. 8-32 Wing Nut.....	.02
	93-161	1/4" External Lockwasher.....	.01
	S-14335	Installation Bracket Assembly.....	.25

MOTOR NOISE SUPPRESSION KIT

S-14331	Motor Noise Suppression Kit As- sembly (complete).....	3.10
22-1110	Fuel Gauge Capacitor.....	.33
22-1601	Generator Capacitor.....	1.20
22-1767	Ignition Coil Capacitor.....	1.00
63-1046	Distributor Suppressor.....	.31
80-145	Motor Hood Bond Spring.....	.02
112-365	No. 8 x 1/2" B.H. Sheet Metal Screw.....	.01

DIAL ASSEMBLY

12-1437	Dial Scale Retaining Bracket.....	.08
19-165	Insulating Bushing Tension Clip (4 used).....	.03
19-167	Window Retaining Clip (R.H.).....	.03
19-168	Window Retaining Clip (L.H.).....	.03
26-397	Dial Scale.....	.70
46-711	Tone Control Knob.....	.55
46-714	"Off" Switch Knob.....	.35
56-228	Cross Arm Guide Rod.....	.15
57-1357	Escutcheon.....	3.60
59-210	Dial Pointer.....	.50
80-232	Knob Retaining Spring.....	.02
80-651	Pointer Retaining Spring.....	.03
80-586	Cross Arm Tension Spring (2 used).....	.07
80-625	Pointer Link Tension Spring.....	.08
83-1523	Light Diffusion Strip.....	.15
94-607	Tuning Shaft Bushing.....	\$.20
94-608	Volume Control Bushing.....	.20
94-609	Cross Arm Insulating Bushing.....	.05

Diagram No.	Part No.	Description	Price
S 3 } S 4 }	100-36	Dial Light Bulb—Mazda No. 44	\$.09
	112-699	No. 4-40 x 3/16" R.H. Self Tapping Screw—Stan Top—Steel—Cad	.01
	114-294	No. 6-20 x 1/4" Hex Hd. Self Tapping Screw Type No. 25 (Escutcheon Mtg.)	.02
	192-116	Dial Window	.50
	S-14215	Pointer Support Bracket and Stud Assembly	.30
	S-14216	Pointer Drive Link and Stud Assembly	.15
	S-14300	Cross Arm and Bushing Assembly	1.00
	S-14659	Dial Light Socket and Wire Assembly	.30
	S-14660	Dial Light Socket and Wire Assembly	.30
	S-14307	Tone Gear and Bushing Assembly	.10
	S-14308	Tone Drum Shaft and Gear Assembly (26-390)	.50
	S-14333	Tuning Control and Knob Assembly	1.00
	S-14334	Volume Control Knob and Spring Assembly	.50
	S-14281	Tuner Unit Assembly	11.50
S 2	85-435	"On-Off" Switch (on Tuner)	.50
	S-14754	Automatic Knob and Screw Assembly	.50
	S-14721	Clutch Plate and Washer	.65
	S-14727	Tuning Shaft, Pinion Gear and Coupling Assembly	.50
	17-102	Cam Lock (5 used)	.03
	34-177	Clutch Gear	.70
	64-162	.088 D x 5/32" Rivet (2 used on S-14733)	.01
	73-118	No. 6-32 x 1/4" Hex Hd. Slotted Set Screw (2 used)	.02
	80-640	Yoke Tension Spring (2 used)	.08
	80-641	Clutch Release Bar Spring	.01
	80-642	Clutch Spring	.02
	93-921	Tuning Shaft Steel Washer	.02
	93-922	Tuning Shaft Spring Washer	.02
	93-923	Fishpaper Washer (2 used)	.01
	97-305	Clutch Arm Stud	.03
	117-149	Clutch Lever	.15
	188-32	Retaining Ring	.01
S 1	S-14733	Mute Switch Assembly	.05

PARTS LIST MODEL 8MF980

The parts list for model 8MF980 is the same as for model 8MF880 with the following parts added and omitted:

ADD			
Diag.No.	Part No.	Description	Price
C 1	22-1812	Antenna Trimmer.....	
C11	22-1751	.022Mfd Condenser.....	\$.20
C32	22-1448	Buffer Condenser.....	1.00
R 2	63-1662	Sensitivity Control.....	
R 5	63-1841	22K Ohm 1/2 W.....	.21
R 6	63-1764	330 Ohm 1/2 W.....	.21
R 8	63-1750	150 Ohm 1/2 W.....	.21
R10	63-1623	12K Ohm 2W.....	.36
R29	63-1843	24K 1/2 W.....	.21
L 7	S-14846	Oscillator Shunt Coil.....	
L 8	S-14761	Motor Noise Choke.....	
T 4	95-1073	Power Transformer.....	
	202-637	Instruction Book.....	.07
S-14836		Tone Drum Shaft & Gear Assembly.....	.50
26-439		Dial Scale.....	.70
63-1375		5.1 ohm W. W. resistor.....	.33

OMIT			
Diag.No.	Part No.	Description	Price
C 1	22-1721	Antenna Trimmer.....	\$.55
C11	22-1730	100 Mmf Condenser.....	.20
C32	22-1713	Buffer Condenser.....	1.00
R 2	63-1379	Sensitivity Control.....	.56
R 5	63-1862	68K Ohm 1/2 W. Resistor.....	.21
R 6	63-1838	18K Ohm 1/2 W. Resistor.....	.21
R 7	63-1835	15K Ohm 1/2 W. Resistor.....	.21
R 8	63-1771	470 Ohm 1/2 W. Resistor.....	.21
R10	63-1398	33K Ohm 1 W. Resistor.....	.24
R29	63-1846	30K Ohm 1/2 W. Resistor.....	.21
L 7	S-14225	Oscillator Shunt Coil.....	.80
L 8	S-11232	Motor Noise Choke.....	.22
T 4	95-1071	Power Transformer.....	7.50
	202-575	Instruction Book.....	.07
S-14308		Tone Drum Shaft & Gear Assembly.....	.50
26-397		Dial Scale.....	.70

(Prices subject to change without notice)

SERVICE MANUAL



Model
8MF881

Ford Truck Part No.
8C-18805-B

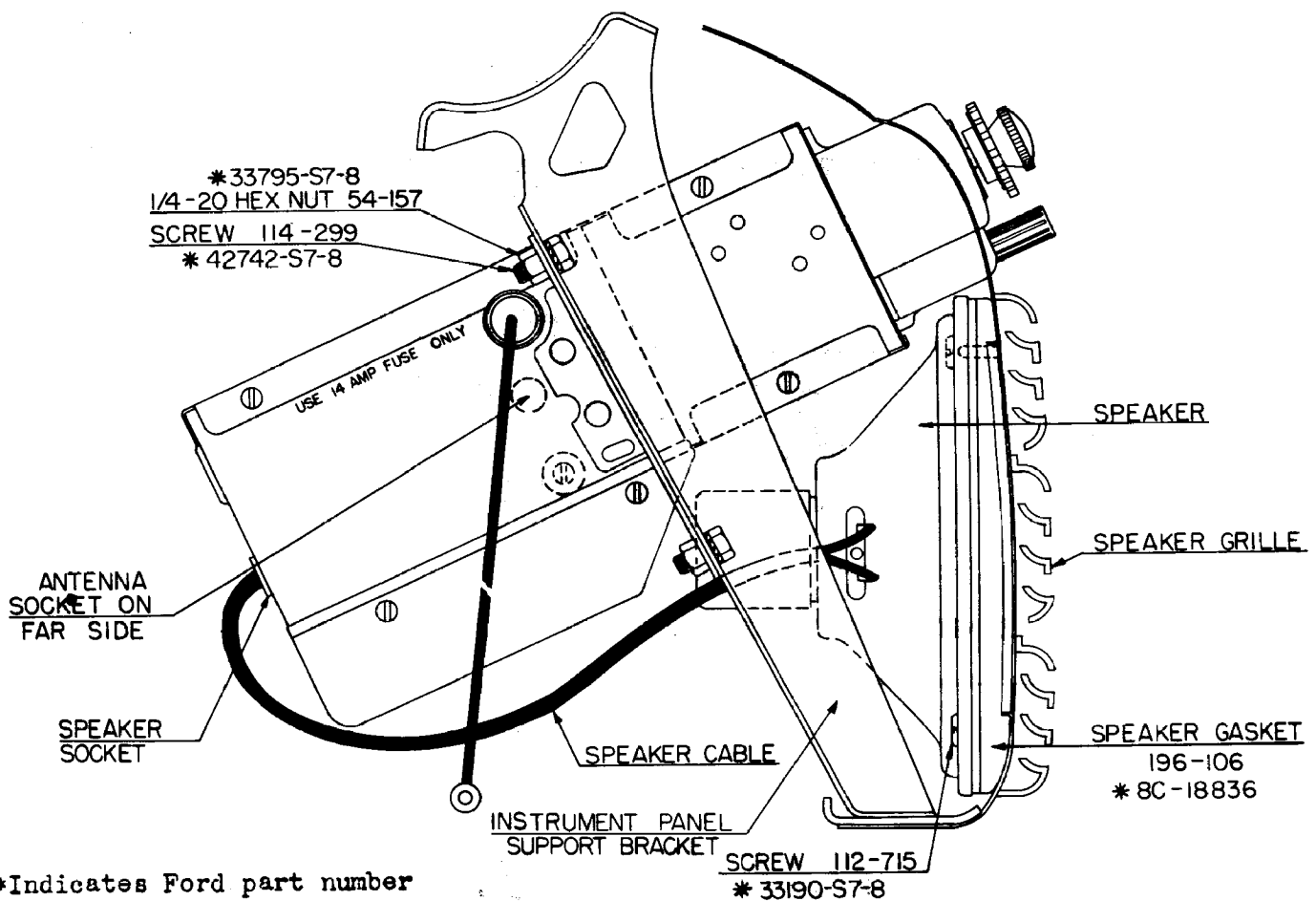
Made by ZENITH RADIO CORPORATION, CHICAGO 39, ILLINOIS, U.S.A.

Electrical Specifications

TUNING RANGE:.....540-1600 Kc.	SPEAKER:.....6" x 9" oval, instrument panel mounting.
INTERMEDIATE FREQUENCY:.....265 Kc.	CURRENT CONSUMPTION:.....8 amperes
SENSITIVITY:.....5 microvolts at one watt output.	TUBE COMPLEMENT:.....7A7 R.F., 7B8 converter, 6BA6 I.F., 7E6 or 6SR7GT detector and 1st audio, 7AF7 driver and phase-inverter, 2-6V6GT push pull power output, and 7Y4 rectifier.
UNDISTORTED POWER OUTPUT:..... 6 watts measured at the voice coil.	

IMPORTANT

The Warranty Registration Tag must be filled in, by car dealer, at the time of sale and must accompany each receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail.



*Indicates Ford part number

Fig. 1. Set Installed, Cut Away View

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the escutcheon plate, control knobs and the installed receiver, are given here to facilitate removal and reinstallation of the receiver when service or repair is necessary.

1. Disconnect the "A" lead, the speaker cable, and the antenna from the receiver. (Fig. 1.)
2. Remove the four 1/4" screws No. 114-299, and take the set from its position behind the instrument panel. (Fig. 1.)
3. To take the speaker from behind the instrument panel remove the two screws No. 112-715. (Fig. 1.)

OPERATING INSTRUCTIONS

TO TURN RADIO ON:

The radio is connected to the accessory terminal of the ignition switch, therefore, it is necessary to turn the ignition key to the left, if the engine is not running, before turning the radio on. Press any one of the five automatic push buttons. (Fig. 2.) Allow approximately 20 seconds for the receiver to reach operating temperature.

To turn the receiver off, press the "Off" push button (Fig. 2.)

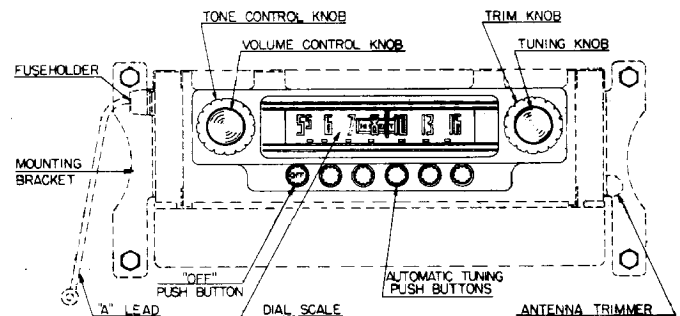


Fig. 2. Front Panel View

MANUAL TUNING:

To operate the manual tuning control simply turn the tuning knob. (Fig. 2.) When tuning in a station, be sure to tune to the exact frequency for the best tone quality.

VOLUME CONTROL:

Turn the volume control knob for the desired volume. (Fig. 2.)

TONE CONTROL:

The tone control knob is located directly behind the volume control knob. Turning this control to the right or left will change the tone of the receiver. The control has four positions. The position to which the control is set is indicated in the window in the center of the dial scale.

AUTOMATIC TUNING:

There are five automatic tuning push buttons located to the right of the "Off" push button. (Fig. 2.)

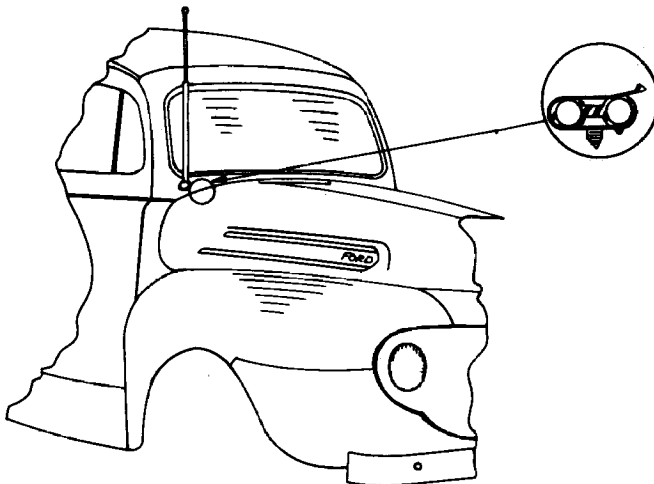
The five buttons may be adjusted in succession to any desired dial setting. To simplify the identification of the stations, it is advisable to set the buttons in sequence according to the frequencies of the stations, beginning with the station broadcasting at the lowest frequency and progressing to the station broadcasting at the highest frequency.

To adjust the automatic tuning push buttons:

1. Turn the receiver on and allow it to operate for at least 15 minutes in order for each part to reach normal operating temperature.
2. Tune in the station desired for number 1 position by turning the tuning knob. (Fig. 2.) Be sure to tune to the exact frequency to insure the best tone.
3. Loosen the number one push button, located nearest the "OFF" push button (Fig. 2) by turning it counterclockwise with your fingers not more than two turns. If the push button is completely unscrewed, the plunger assembly, inside the receiver, may fall apart. Then it will be necessary to remove the radio from the car, open the case, and reassemble the plunger.
4. Press the button in as far as it will go.
5. Release the number 1 button and tighten it by turning it clockwise with your fingers.
6. Use the same procedure for adjusting positions 2, 3, 4, and 5. When the five automatic tuning push buttons have been adjusted to the five desired stations, any one of the five stations can be instantly tuned in by pressing the automatic push button that is adjusted to it.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:



REMOVE SCREW FROM HOOD PAD ON COWL AT LOCATION SHOWN AND INSTALL HOOD BONDING SPRING 80-579 *51A-18870 WITH SCREW 112-365 *32923-S7-8

Fig. 3

The hood bonding spring No. 80-579 should be installed on the cowl at the location shown in Fig. 3.

The generator condenser, No. 22-1601, should be mounted under the top assembly bolt on the rear end plate of the generator, and the lead connected to the ARMATURE terminal of the generator. (Fig. 4.)

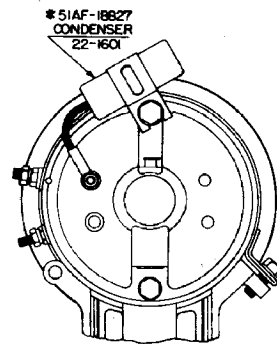


Fig. 4

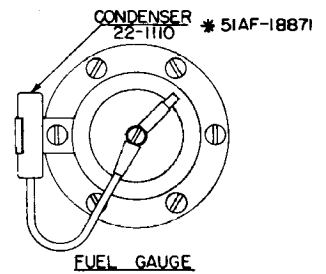


Fig. 5

A condenser, Part No. 22-1110, should be connected to the fuel gauge tank unit. (Fig. 5.)

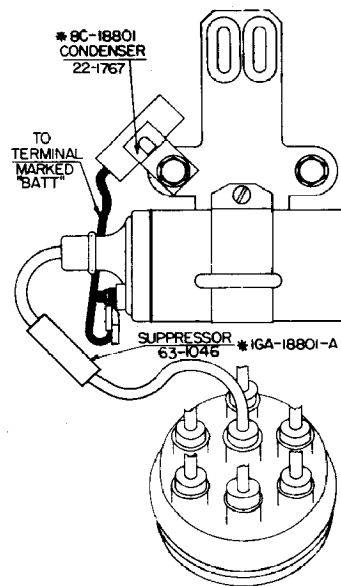


Fig. 6

DISTRIBUTOR
6 CYLINDER

DISTRIBUTOR
FOR TRUCKS WITH 8 CYLINDER
REQ. ENGINES 145 HP

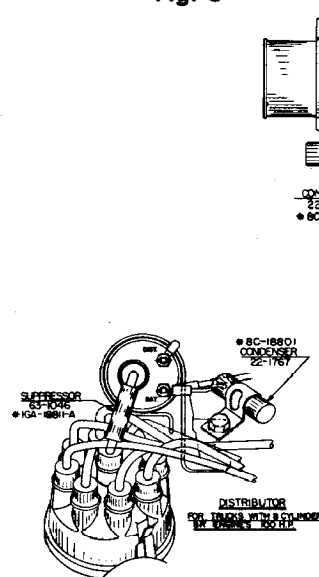


Fig. 6A

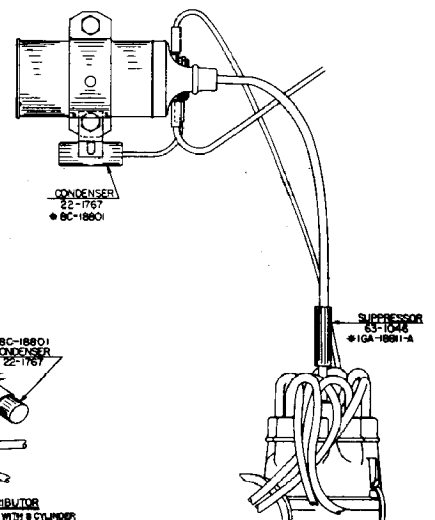


Fig. 6B

The suppressor, No. 63-1046, should be in the high tension wire, approximately 1½ inches from the distributor cap. (Figs. 6, 6A and 6B.) The ignition coil condenser, No. 22-1767, should be connected to the BAT, terminal of the ignition coil. (Figs. 6, 6A and 6B.)

*Indicates Ford part number

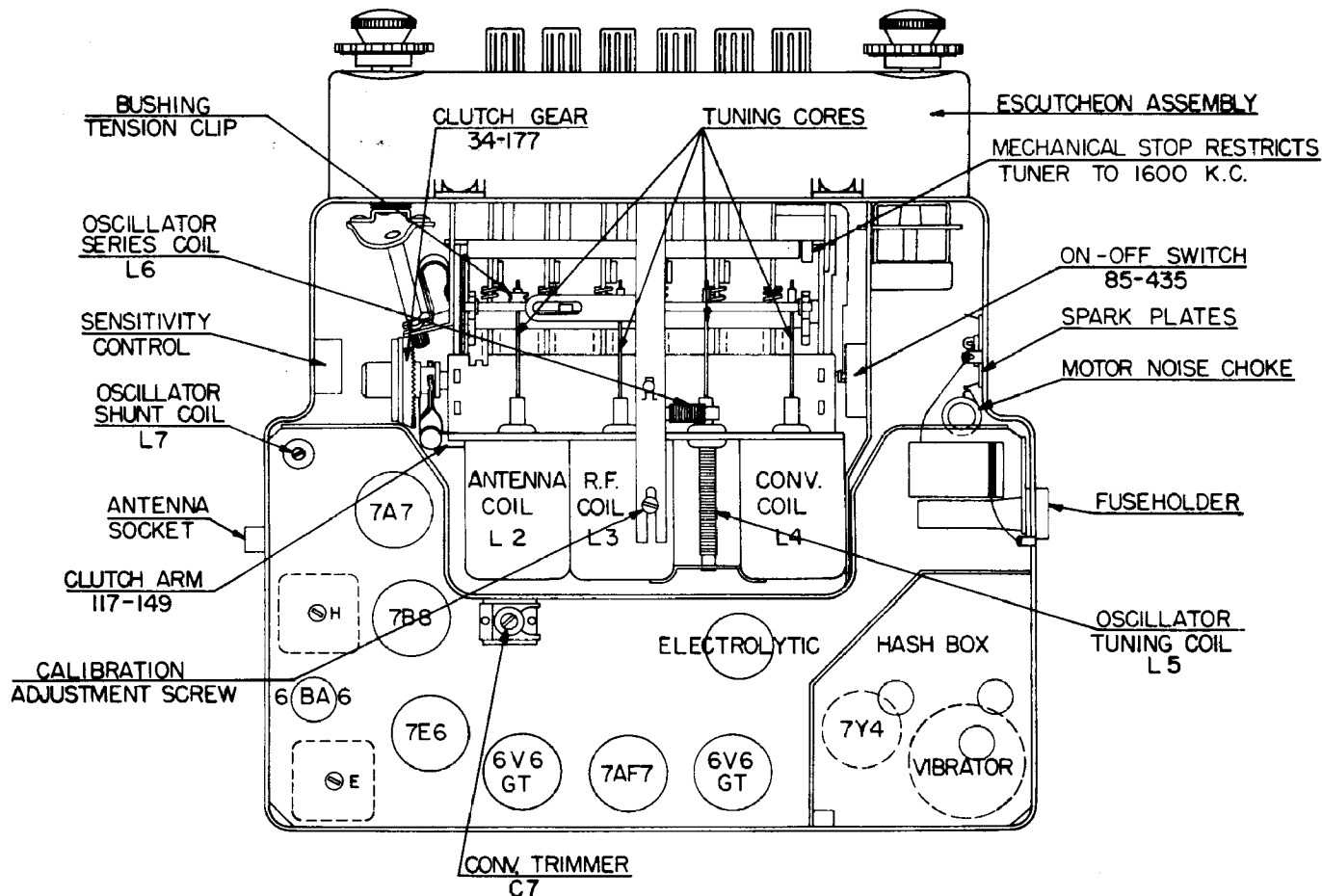


Fig. 7. Top View of Chassis

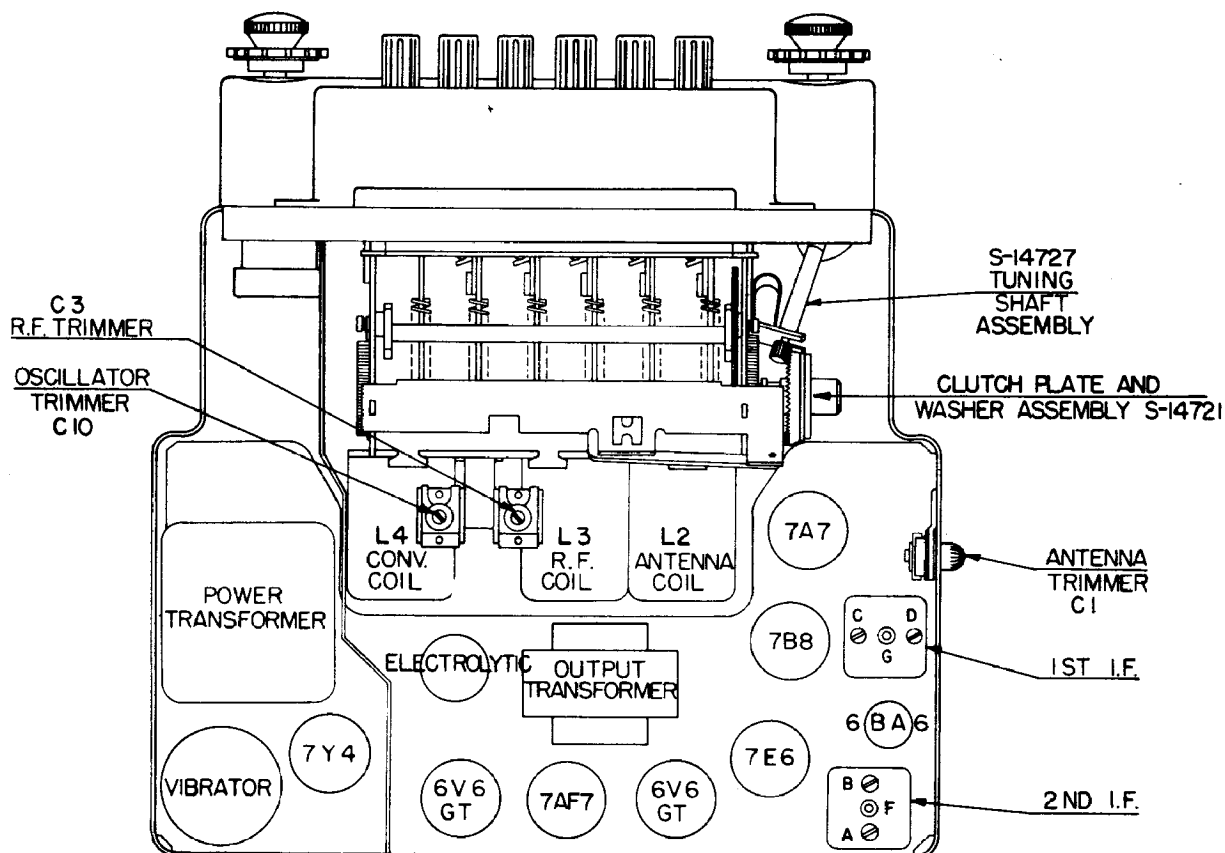


Fig. 8. Bottom View of Chassis

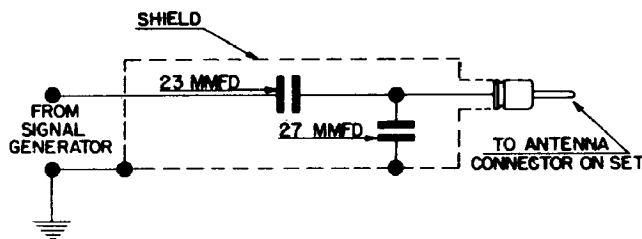


Fig. 9. Dummy Antenna

Figure 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustment to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C, and D in order named for maximum output. (Fig. 8.) Some units have I.F. transformers that are slug tuned. In this case adjust I.F. slugs E, F, G, and H in order named. Repeat the operation to assure accurate alignment. (Figs. 7 and 8.)

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver. This is important.
2. Set signal generator to 535 Kc.
3. Tune set to 535 Kc.
4. Adjust oscillator trimmer C-10 (Fig. 8), for maximum response.
5. Set signal generator to 1300 Kc.
6. Tune set to 1300 Kc.
7. Adjust converter trimmer C-7, R.F. trimmer C3 and antenna trimmer C-1 (Fig. 8) for maximum response (Figs. 7 and 8).
8. If dial calibration is off after making above adjustments, a correction can be made by turning eccentric screw at fulcrum of dial pointer. (Fig. 7.)

TO ADJUST OR REPLACE THE ADJUSTING SPRING AND CORE

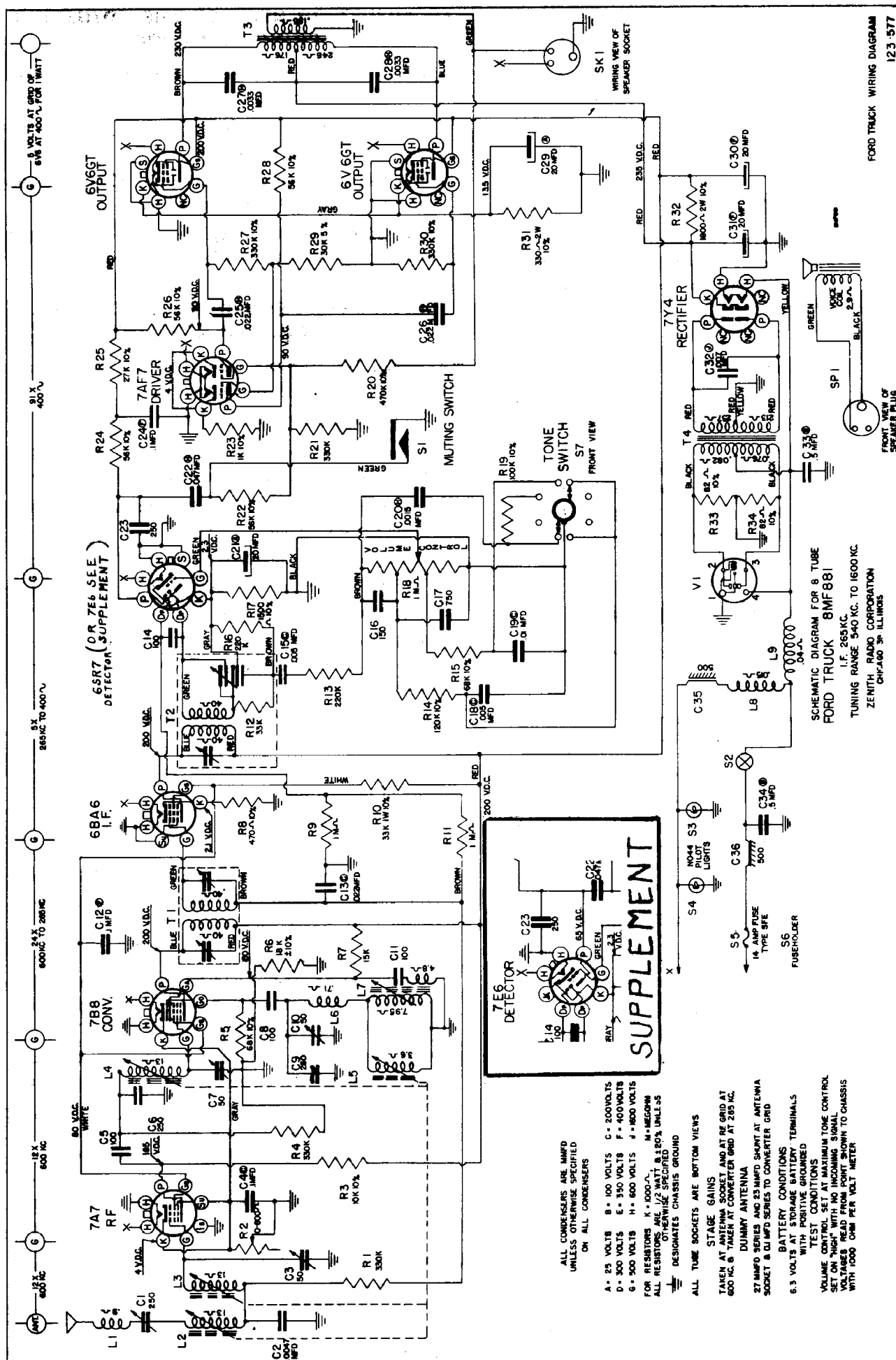
1. Remove the top and bottom covers from the receiver. Remove the escutcheon assembly.
2. With pliers remove the bushing tension clip from the cross arm insulating bushing.
3. With core alignment tool, part No. S-13064, screw the core in, or out, to the desired position.
4. After all adjustments or replacements are completed, be sure to replace the bushing tension clip.

ALIGNMENT PROCEDURE AFTER CORE OR COIL REPLACEMENT

WARNING: The following adjustments are to be made only after a core or coil is replaced.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
4. Screw the cores completely out of the antenna coil, the R.F. coil, the converter coil, and the oscillator coil.
5. Adjust the oscillator trimmer C-10 (Fig. 8) at 1675 Kc.
6. Adjust the converter trimmer C-7, R.F. trimmer C3, and antenna trimmer C-1 (Figs. 7 and 8) for maximum output reading.
7. Set signal generator dial and receiver dial to 1300 Kc.
8. Replace cores to their approximate original position (so that the cores project about $\frac{1}{16}$ of an inch from the end of the coil form).
9. Adjust the oscillator core L-5 (Fig. 7) to scale at 1300 Kc.
10. Adjust the antenna core L-2, R.F. core L3, and converter core L-4 (Fig. 7) for maximum output reading.
11. Set signal generator to 600 Kc.
12. "Rock in" shunt oscillator coil L-7 (Fig. 7) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a gang condenser receiver.
13. Check receiver at 1300 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10, and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop near the volume control should be bent to limit the frequency coverage to 1605 Kc.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1300 Kc.



PARTS LIST FORD TRUCK RECEIVER

MODEL 8MF881

Diagram No.	Part No.	Description	Price	Diagram No.	Part No.	Description	Price
COILS AND CHOKES				RESISTORS			
L 9	20-213	Main Hash Choke	\$.36	R 2	63-1379	Sensitivity Control	\$.56
T 1	95-1077	1st I.F. Transformer	1.85	R10	63-1398	33M Ohm (Insulated) . . . 1 W.	.24
T 2	95-1078	2nd I.F. Transformer	2.00	S 7	63-1590	Volume Control and Tone Switch	2.50
L 1	S-8819	Antenna Motor Noise Choke Assembly	.40	R18	63-1620	1800 Ohm (Insulated) . . . 2 W.	.36
L 8	S-11232	Motor Noise Choke Assembly	.22	R31	63-1622	330 Ohm (Insulated) . . . 2 W.	.36
L 7	S-14225	Oscillator Shunt Coil Assembly	.80	R33	63-1740	82 Ohm (Insulated) . . . 1/2 W.	.21
L 6	S-14226	Oscillator Series Coil Assembly	.35	R34	63-1771	470 Ohm (Insulated) . . . 1/2 W.	.21
L 3	S-14227	RF Coil Assembly	.90	R 8	63-1785	1000 Ohm (Insulated) . . . 1/2 W.	.21
L 2	S-14227	Antenna Coil Assembly	.90	R23	63-1792	1500 Ohm (Insulated) . . . 1/2 W.	.21
L 4	S-14227	Converter Coil Assembly	.90	R17	63-1827	10M Ohm (Insulated) . . . 1/2 W.	.21
L 5	S-14228	Oscillator Coil Assembly	.75	R 3	63-1835	15M Ohm (Insulated) . . . 1/2 W.	.21
L 2 }				R 7	63-1845	27M Ohm (Insulated) . . . 1/2 W.	.21
L 3 }	S-14295	Tuner Coil Unit Assembly	6.25	R25	63-1846	30M Ohm (Insulated) . . . 1/2 W.	.21
L 4 }				R29	63-1849	33M Ohm (Insulated) . . . 1/2 W.	.21
L 5 }				R12			
CONDENSERS				R22			
C12	22-170	.1 Mfd. 400 V.	.26	R24	63-1859	56M Ohm (Insulated) . . . 1/2 W.	.21
C23	22-182	250 Mmfd. 400 V.	.26	R26			
C 4	22-190	.1 Mfd. 200 V.	.23	R28			
C17	22-242	750 Mmfd. 500 V.	.26	R 5	63-1862	68M Ohm (Insulated) . . . 1/2 W.	.21
C15 }	22-906	.005 Mfd. 200 V.	.20	R19	63-1869	100M Ohm (Insulated) . . . 1/2 W.	.21
C18 }				R14	63-1873	120M Ohm (Insulated) . . . 1/2 W.	.21
C 6	22-1136	250 Mmfd. 500 V.	.20	R13	63-1884	220M Ohm (Insulated) . . . 1/2 W.	.21
C16	22-1137	150 Mmfd. 500 V.	.20	R16			
C34	22-1238	.5 Mfd. 120 V.	.50	R27	63-1890	330M Ohm (Insulated) . . . 1/2 W.	.21
C19	22-1466	.01 Mfd. 200 V.	.20	R30			
C29 }	22-1484	Electrolytic 20 Mfd.—25 V. x20-		R 1	63-1891	330M Ohm (Insulated) . . . 1/2 W.	.21
C30 }		20 Mfd. 400 V.	2.10	R 4			
C31 }				R21	63-1897	470M Ohm (Insulated) . . . 1/2 W.	.21
C21	22-1553	20 Mfd. Electrolytic. . . . 25 V.	.80	R20	63-1912	1 Megohm (Insulated) . . . 1/2 W.	.21
C 9	22-1712	260 Mmfd. Compensating	.50	R11	63-1838	18M Ohm 1/2 W.	.21
C32	22-1713	.007 Mfd. 1600 V.	1.00	R 6			
C 7	22-1715	Single Section Trimmer (Converter)	.35	MISCELLANEOUS			
C 1	22-1721	Single Section Trimmer (Antenna)	.55	12-1423	Set Mounting Bracket.	.15	
C 3 }	22-1722	Two Section Trimmer (R.F. and		12-1424	Set Mounting Bracket.	.15	
C10 }		Osc.)	.60	46-715	Antenna Trimmer Knob (used on		
C33	22-1728	.5 Mfd. 100 V.	.55		22-1721)	.07	
C 5 }	22-1730	100 Mmfd. Ceramic (or 22-162)		SP 1	49-627	P.M. Speaker (6" x 9" Oval) . . .	7.75
C11 }						(See S-14344.	
C14 }		500 V.	.20	S 6	52-451	Battery Cable—Fuse to Set—	
C20	22-1743	.0015 Mfd. 600 V.	.20			Fuse-holder	.35
C27 }	22-1747	.0033 Mfd. 600 V.	.26		52-455	Volume Control Cable	.70
C28 }					52-470	Speaker Cable and Plug	.45
C24	22-1748	.1 Mfd. 400 V.	.26		73-50	No. 6-32 x 1/4" Headless Slotted	
C22	22-1749	.047 Mfd. 600 V.	.35			Set Screw—Cuppoint	.02
C25 }	22-1750	.022 Mfd. 600 V.	.26		78-596	Socket—Loktal Tube	.18
C26 }				SK 1	78-728	Socket—Speaker	.20
C13	22-1751	.022 Mfd. 200 V.	.20		78-782	Socket—Miniature Tube	.25
C 2	22-1752	.0047 Mfd.			78-796	Socket—Antenna Connector	.20
		(or 22-1022) 600 V.	.26		78-801	Socket—Octal Base Tube	.15

Diagram No.	Part No.	Description	Price
	78-804	Socket—Vibrator.....	\$.20
	93-888	Vibrator Cushion Washer.....	.04
	93-891	Tone Control Knob Washer.....	.01
T 4	95-1071	Power Transformer.....	7.50
T 3	95-1079	Output Transformer.....	4.00
	125-63	Rubber Grommet (used on S-14295).....	.03
	126-553	Miniature Tube Shield.....	.11
	149-62	Iron Core and Screw.....	.10
	149-63	Iron Core and Spring (4 used)....	.40
V 1	190-22	Vibrator.....	4.15
	196-106	Speaker Gasket.....	1.30
	199-81	Tone Gear Sleeve.....	.02
	202-577	Instruction Book (Owner's Manual)	.07
	202-606	Interference Elimination Instruction Sheet.....	.08
	S-14344	Speaker and Gasket Assembly (use 49-627 and 196-106)	

INSTALLATION PARTS

	S-14339	Installation Kit Assembly (complete).....	.70
	52-458	Battery Cable—Fuse to Ammeter	.40
	54-157	1/4-20 x 7/16" x 3/16" Hex Nut—Steel—Cad. Pl. (4 used).....	.07
	112-715	No. 8 x 5/8" Binding Hd. Self Tapping Screw.....	.013
	114-299	1/4-20 x 1/2" Hex. Hd. M. Screw—Steel—Cad. Pl.....	.04
S 5	136-11	14 Ampere Fuse—Type S.F.E. No. 14.....	.12

MOTOR NOISE SUPPRESSION KIT

	S-14340	Motor Noise Suppression Kit Assembly (complete).....	3.10
	22-1110	Fuel Gauge Capacitor.....	.33
	22-1601	Generator Capacitor.....	1.20
	22-1767	Ignition Coil Capacitor.....	1.00
	63-1046	Distributor Suppressor.....	.31
	80-579	Motor Hood Bond Spring.....	.09
	112-365	No. 8 x 1/2" B.H. Sheet Metal Screw.....	.01

DIAL ASSEMBLY

	12-1435	Dial Scale Retaining Bracket (2 used).....	.01
	19-165	Insulating Bushing Tension Clip (4 used).....	.03
	26-395	Dial Scale.....	3.00
	46-727	Tone Control Knob.....	.20
	46-714	"Off" Switch Knob.....	.35

Diagram No.	Part No.	Description	Price
	56-228	Cross Arm Guide Rod.....	\$.15
	57-1349	Escutcheon.....	3.00
	57-1344	Dial Background Plate.....	.50
	59-208	Dial Pointer.....	.40
	80-232	Knob Retaining Spring.....	.02
	80-379	Pointer Retaining Spring.....	.03
	80-586	Cross Arm Tension Spring (2 used)	.07
	80-625	Pointer Link Tension Spring.....	.08
	94-609	Cross Arm Insulating Bushing	.05
S 3 } S 4 }	100-36	Dial Light Bulb—Mazda No. 44 ..	.09
	112-699	No. 4-40 x 3/16" R.H. Self Tapping Screw—Stan Top—Steel—Cad	.01
	114-294	No. 6-20 x 1/4" Hex Hd. Self Tapping Screw Type No. 25 (Escutcheon Mtg.).....	.02
	S-14215	Pointer Support Bracket and Stud Assembly.....	.30
	S-14216	Pointer Drive Link and Stud Assembly.....	.15
	S-14300	Cross Arm and Bushing Assembly.	1.00
	S-14304	Dial Light Socket and Wire Assembly.....	.35
	S-14307	Tone Gear and Bushing Assembly	.10
	S-14308	Tone Drum Shaft and Gear Assembly (26-390).....	.50
	S-14342	Tuning Control and Knob Assembly	.75
	S-14343	Volume Control Knob and Spring Assembly.....	.40
	S-14386	Tuner Unit Assembly.....	12.50
S 1	S-14534	Tuner Unit Final Assembly	
S 2	85-435	"On-Off" Switch (on Tuner).....	.50
	S-14754	Automatic Knob and Screw Assembly.....	.50
	S-14721	Clutch Plate and Washer.....	.65
	S-14729	Tuning Shaft, Pinion Gear and Coupling Assembly.....	.50
	17-102	Cam Lock (5 used).....	.03
	34-177	Clutch Gear.....	.70
	64-162	.088 D x 5/32" Rivet (2 used on S-14733).....	.01
	73-118	No. 6-32 x 1/4" Hex Hd. Slotted Set Screw (2 used).....	.02
	80-640	Yoke Tension Spring (2 used)....	.08
	80-641	Clutch Release Bar Spring.....	.01
	80-642	Clutch Spring.....	.02
	93-921	Tuning Shaft Steel Washer.....	.02
	93-922	Tuning Shaft Spring Washer	.02
	93-923	Fishpaper Washer (2 used)	.01
	97-305	Clutch Arm Stud.....	.03
	117-149	Clutch Lever.....	.15
	188-111	Retaining Ring (2 used).....	.02

(Prices subject to change without notice)

SERVICE MANUAL

Model
8ML882

Lincoln Part No.
8L-18805-A



Model
8ML882Z

Lincoln Part No.
8H-18805-A

Made by ZENITH RADIO CORPORATION, CHICAGO 39, ILLINOIS, U.S.A.

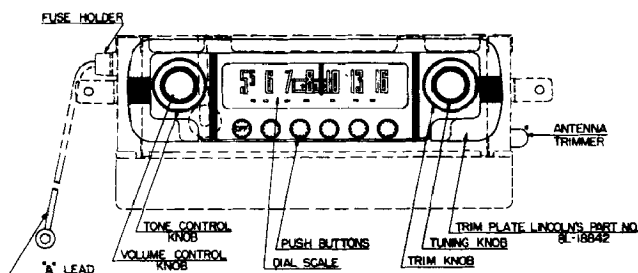


Fig. 1. 8ML882

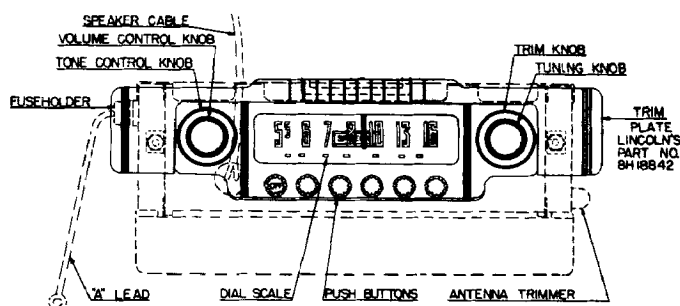


Fig. 1A. 8ML882Z

Electrical Specifications

TUNING RANGE:.....540-1600 Kc.

INTERMEDIATE FREQUENCY:.....265 Kc.

SENSITIVITY:.....5 microvolts at one
watt output.

UNDISTORTED POWER OUTPUT:.....
6 watts measured at the voice coil.

SPEAKER:.....6" x 9" oval, instrument
panel mounting.

CURRENT CONSUMPTION:.....8 amperes

TUBE COMPLEMENT:.....7A7 R.F.,
7B8 converter, 6BA6 I.F., 7E6 detector
and 1st audio, 7AF7 driver and phase-
inverter, 2-6V6GT push pull power out-
put, and 7Y4 rectifier.

IMPORTANT

The Warranty Registration Tag must be filled in, by car dealer, at the time of sale and must accompany each receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail.

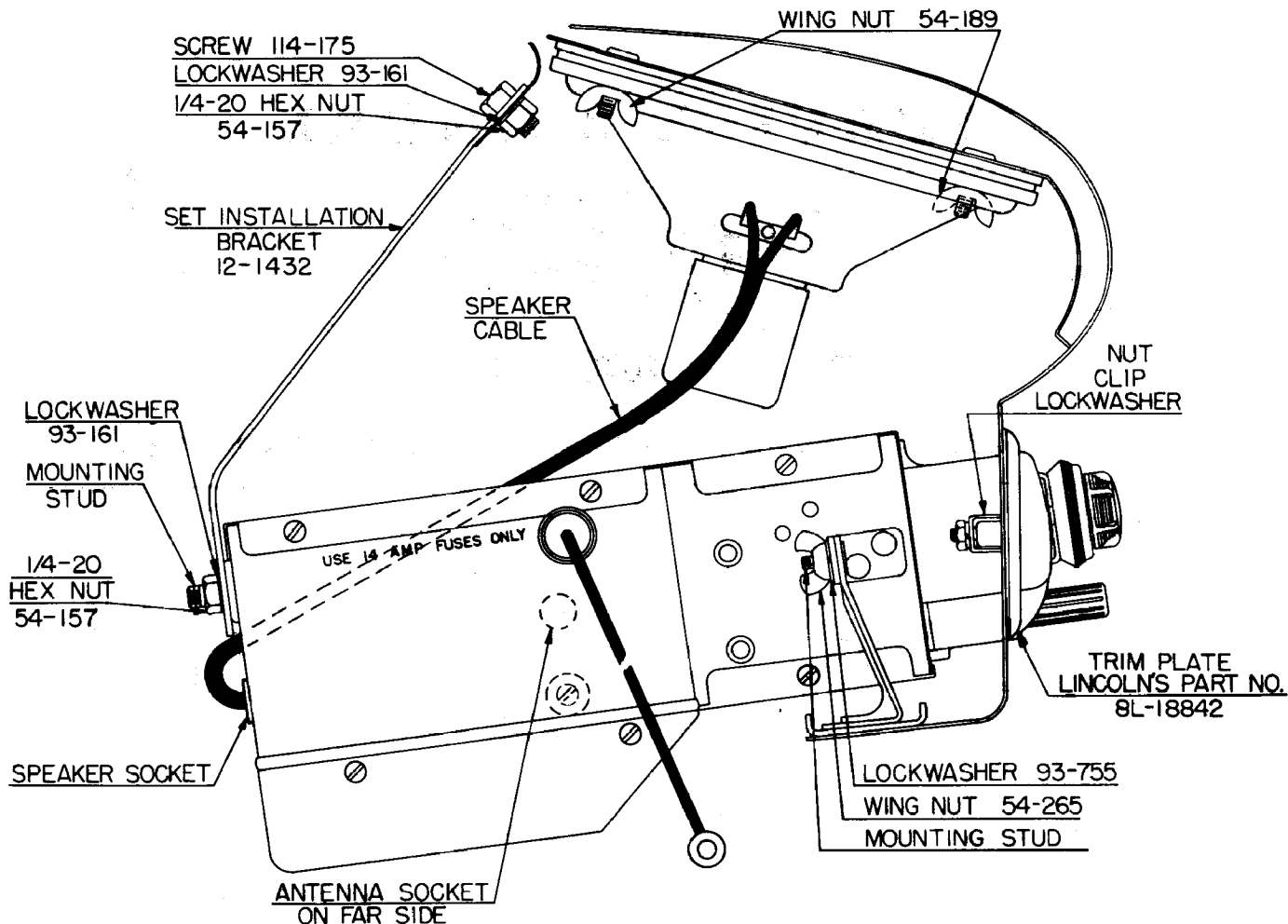


Fig. 2. Model 8ML882

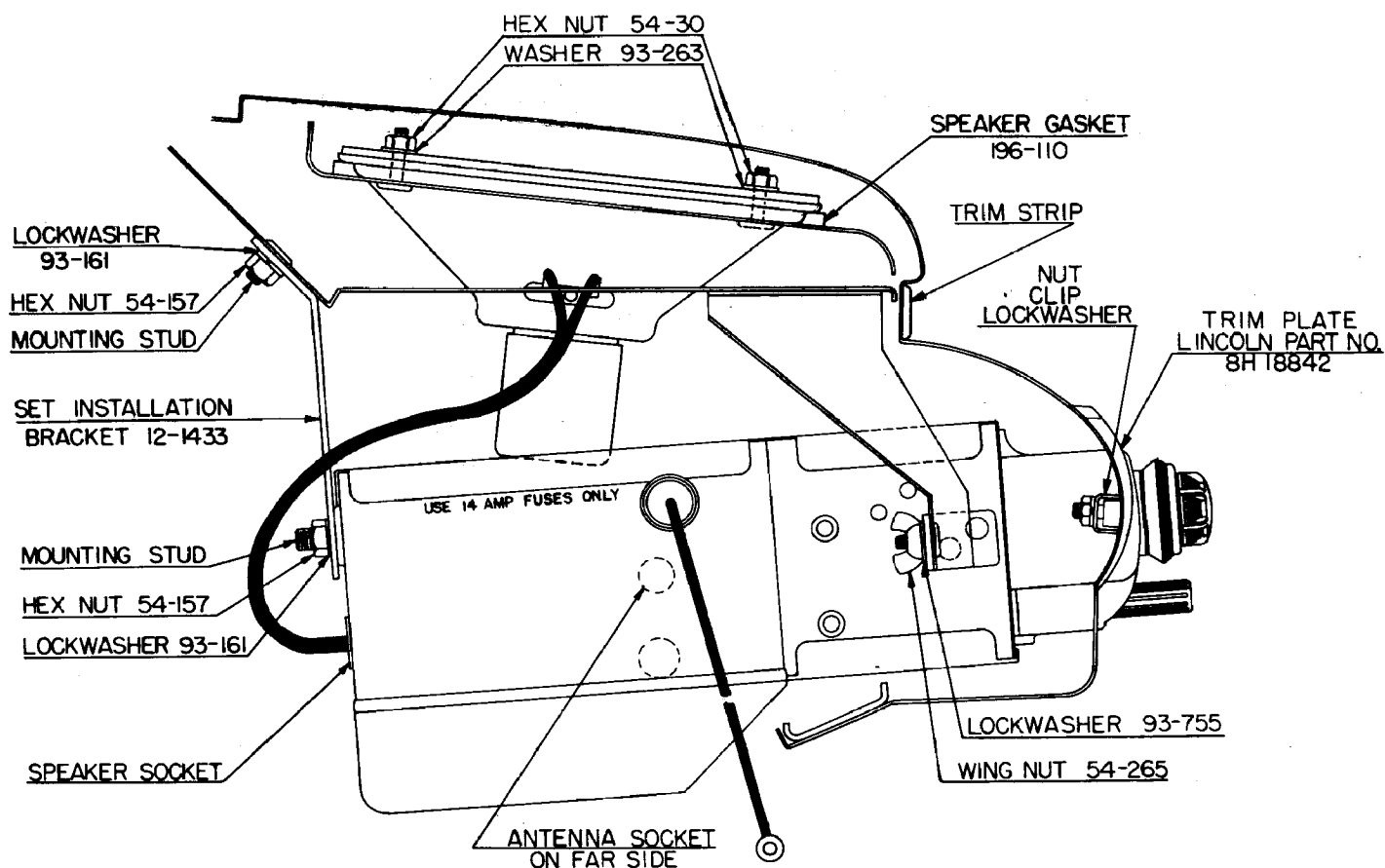


Fig. 2A. Model 8ML882Z

RECEIVER INSTALLATIONS

Figures 1, 1A, 2 and 2A, illustrating the escutcheon plates, control knobs and the installed receivers, are given here to facilitate removal and reinstallation of the receivers when service or repair is necessary.

To take the receiver from the car:

1. Remove the plenum chamber of the heater (Model 8L Lincoln only), by removing the two sheet metal screws at each end of the chamber.
2. Disconnect the "A" lead at the set. Remove the speaker plug from the set and disconnect the antenna.
3. Loosen the top of the set installation bracket, and remove the bottom of the bracket from the set. (Figs. 2-2A.)
4. Remove the 8/32 wingnuts and lockwashers from the instrument panel support brackets. (Figs. 2-2A.)

To take the speaker from the Model 8H Lincoln, pry off the trim strip along the bottom edge of the speaker grille. Remove the three sheet metal screws from the lower edge of the speaker grille, and remove the grille. Remove the two 8/32 hex nuts and flat washers holding the speaker in place. (Fig. 2A.)

To take the speaker from the Model 8L Lincoln, remove the two stamped wingnuts from the stud bolts on the rear of the instrument panel. (Fig. 2.)

OPERATING INSTRUCTIONS

TO TURN RADIO ON:

The radio is connected to the accessory terminal of the ignition switch, therefore, it is necessary to turn the ignition key to the left, if the engine is not running, before turning the radio on. Press any one of the five automatic push buttons. (Figs. 1, 1-A.) Allow approximately 20 seconds for the receiver to reach operating temperature.

To turn the receiver off, press the "Off" push button. (Fig. 1.)

MANUAL TUNING:

To operate the manual tuning control simply turn the tuning knob. (Figs. 1, 1A.) When tuning in a station, be sure to tune to the exact frequency for the best tone quality.

VOLUME CONTROL:

Turn the volume control knob for the desired volume. (Figs. 1, 1A.)

TONE CONTROL:

The tone control knob is located directly behind the volume control knob. Turning this control to the right or left will change the tone of the receiver. The control has four positions. The position to which the control is set is indicated in the window in the center of the dial scale.

AUTOMATIC TUNING:

There are five automatic tuning push buttons located to the right of the "Off" push button. (Figs. 1, 1A.)

The five buttons may be adjusted in succession to any desired dial setting. To simplify the identification of the stations, it is advisable to set the buttons in sequence according to the frequencies of the stations, beginning with the station broadcasting at the lowest frequency and progressing to the station broadcasting at the highest frequency.

To adjust the automatic tuning push buttons:

1. Turn the receiver on and allow it to operate for at least

15 minutes in order for each part to reach normal operating temperature.

2. Tune in the station desired for number 1 position by turning the tuning knob. (Fig. 1.) Be sure to tune to the exact frequency to insure the best tone.
3. Loosen the number one push button, located nearest the "OFF" push button (Fig. 1), by turning it counterclockwise with your fingers not more than two turns. If the push button is completely unscrewed, the plunger assembly, inside the receiver, may fall apart. Then it will be necessary to remove the radio from the car, open the case, and reassemble the plunger.
4. Press the button in as far as it will go.
5. Release the number 1 button and tighten it by turning it clockwise with your fingers.
6. Use the same procedure for adjusting positions 2, 3, 4, and 5. When the five automatic tuning push buttons have been adjusted to the five desired stations, any one of the five stations can be instantly tuned in by pressing the automatic push button that is adjusted to it.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The hood bonding spring No. 80-579 should be installed on the cowl at the location shown in Fig. 3.

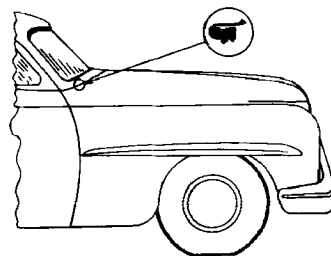


Fig. 3

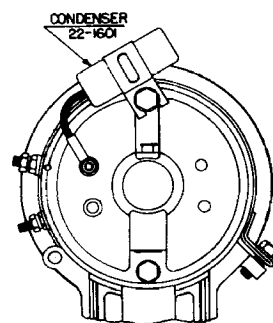


Fig. 4

The generator condenser, No. 22-1601, should be mounted under the top assembly bolt on the rear end plate of the generator, and the lead connected to the ARMATURE terminal of the generator. (Fig. 4.)

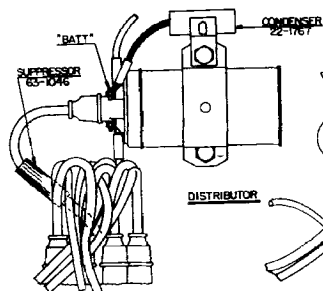


Fig. 5

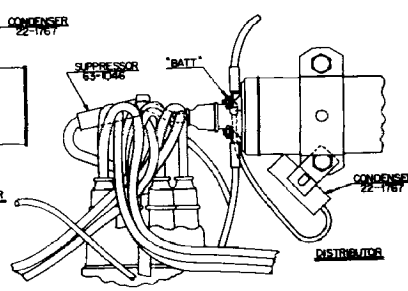


Fig. 6

The suppressor, No. 63-1046, should be in the high tension wire, approximately 1½ inches from the distributor cap. (Figs. 5 and 6.) The ignition-coil condenser, No. 22-1767, should be connected to the BAT. terminal of the ignition coil. (Figs. 5 and 6.)

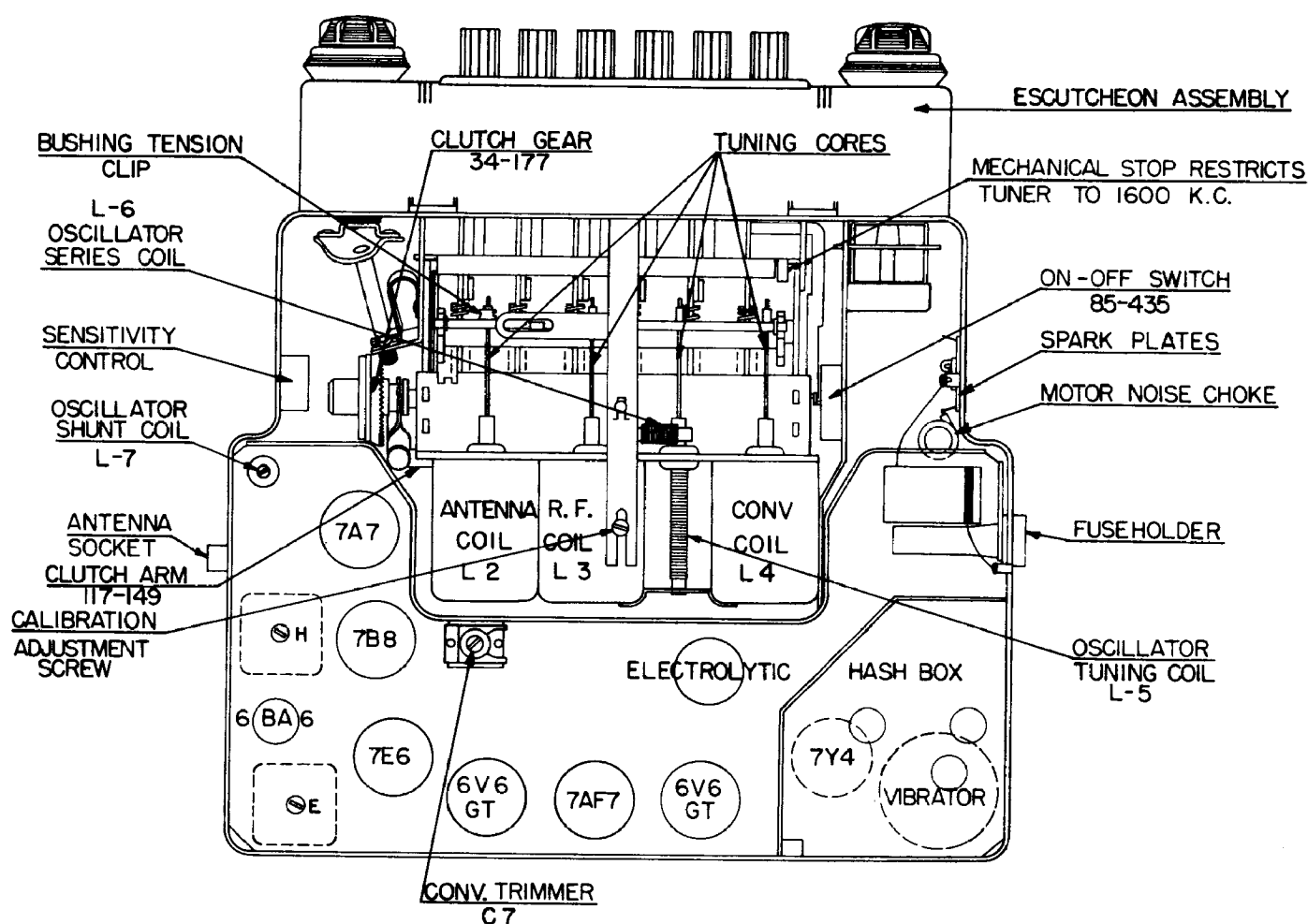


Fig. 7. Top View
of Chassis

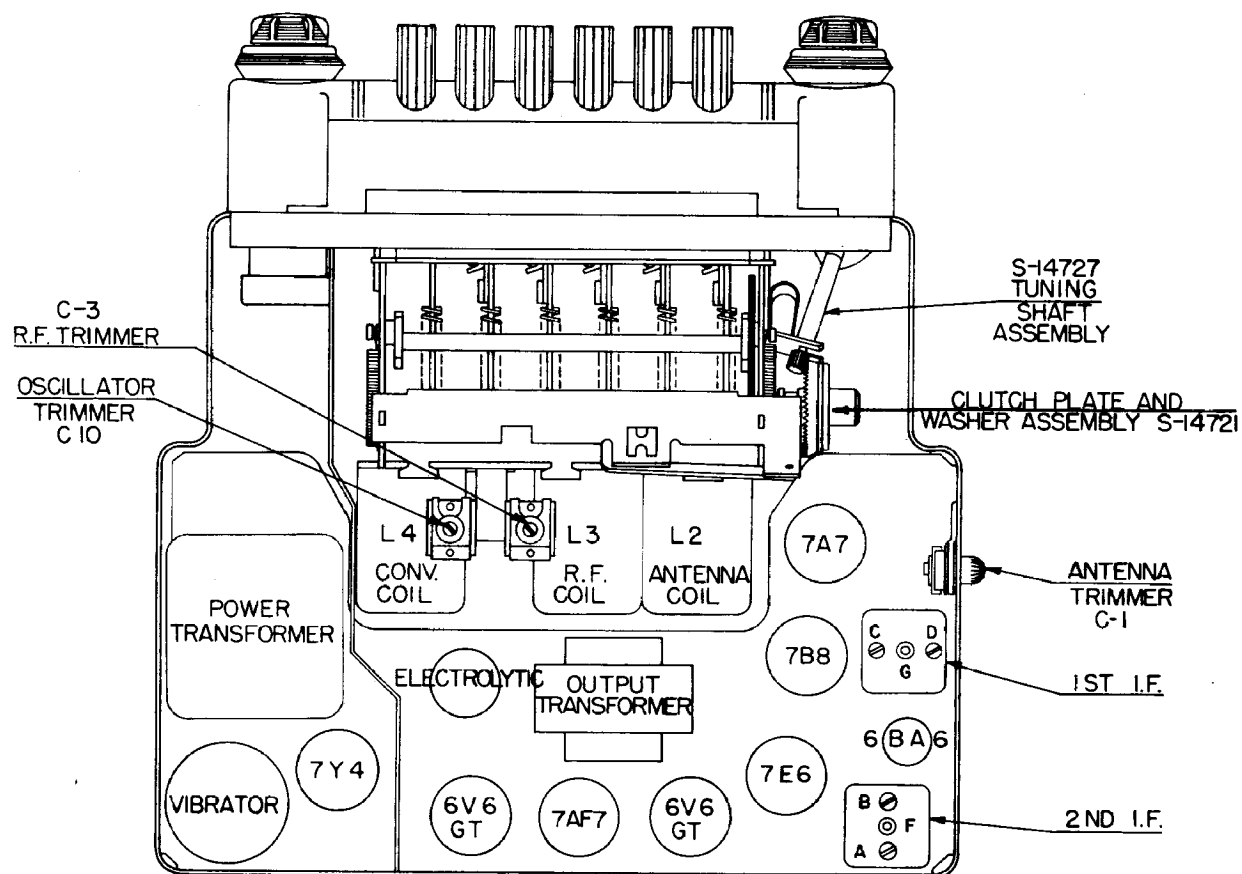


Fig. 8. Bottom View
of Chassis

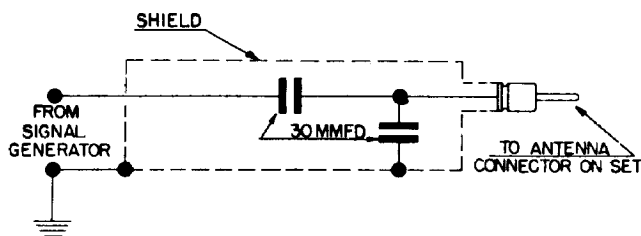


Fig. 9. Dummy Antenna

Figure 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustment to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C, and D in order named for maximum output. (Fig. 8.) Some units have I.F. transformers that are slug tuned. In this case adjust I.F. slugs E, F, G, and H in order named. Repeat the operation to assure accurate alignment. (Figs. 7 and 8.)

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver. This is important.
2. Set signal generator to 535 Kc.
3. Tune set to 535 Kc.
4. Adjust oscillator trimmer C-10 (Fig. 8), for maximum response.
5. Set signal generator to 1300 Kc.
6. Tune set to 1300 Kc.
7. Adjust converter trimmer C-7, R.F. trimmer C3 and antenna trimmer C-1 (Fig. 8) for maximum response (Figs. 7 and 8).
8. If dial calibration is off after making above adjustments, a correction can be made by tuning eccentric screw at fulcrum of dial pointer. (Fig. 7.)

TO ADJUST OR REPLACE THE ADJUSTING SPRING AND CORE

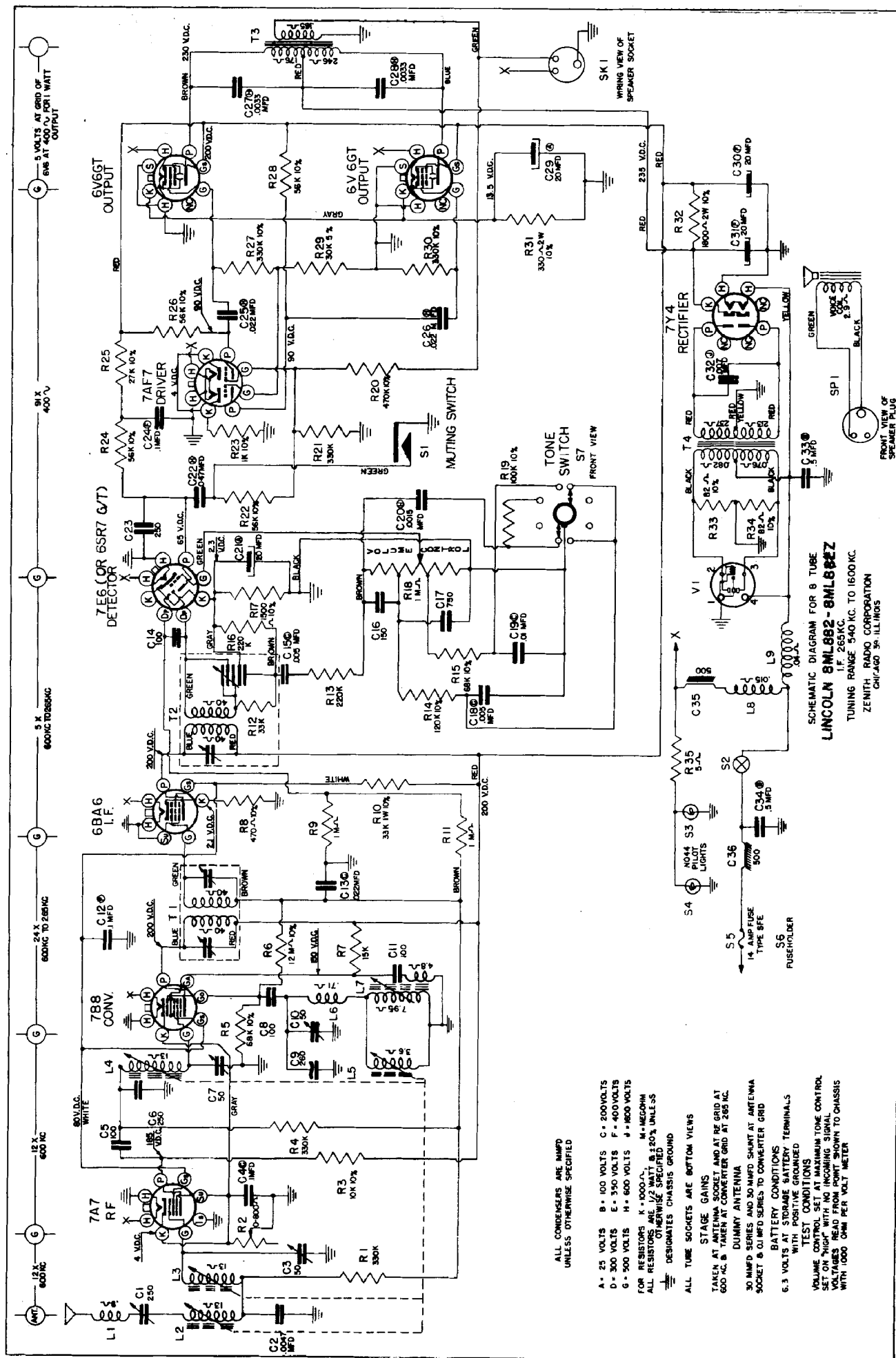
1. Remove the top and bottom covers from the receiver. Remove the escutcheon assembly.
2. With pliers remove the bushing tension clip from the cross arm insulating bushing.
3. With core alignment tool, part No. S-13064, screw the core in, or out, to the desired position.
4. After all adjustments or replacements are completed, be sure to replace the bushing tension clip.

ALIGNMENT PROCEDURE AFTER CORE OR COIL REPLACEMENT

WARNING: The following adjustments are to be made only after a core or coil is replaced.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
4. Screw the cores completely out of the antenna coil, the R.F. coil, the converter coil, and the oscillator coil.
5. Adjust the oscillator trimmer C-10 (Fig. 8) at 1675 Kc.
6. Adjust the converter trimmer C-7, R.F. trimmer C3, and antenna trimmer C-1 (Figs. 7 and 8) for maximum output reading.
7. Set signal generator dial and receiver dial to 1300 Kc.
8. Replace cores to their approximate original position (so that the cores project about $\frac{1}{16}$ of an inch from the end of the coil form).
9. Adjust the oscillator core L-5 (Fig. 7) to scale at 1300 Kc.
10. Adjust the antenna core L-2, R.F. core L3, and converter core L-4 (Fig. 7) for maximum output reading.
11. Set signal generator to 600 Kc.
12. "Rock in" shunt oscillator coil L-7 (Fig. 7) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a gang condenser receiver.
13. Check receiver at 1300 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10, and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop near the volume control should be bent to limit the frequency coverage to 1605 Kc.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1300 Kc.



SCHEMATIC

PARTS LIST MODEL 8ML882 (Chassis 8E82)

Diagram No.	Part No.	Description	Price
COILS AND CHOKES			
L 9	20-213	Main Hash Choke	\$.36
T 1	95-1077	1st I.F. Transformer	1.85
T 2	95-1078	2nd I.F. Transformer	2.00
L 1	S-8819	Antenna Motor Noise Choke Assembly	.40
L 8	S-11232	Motor Noise Choke Coil Assembly	.22
L 7	S-14225	Oscillator Shunt Coil Assembly	.80
L 6	S-14226	Oscillator Series Coil Assembly	.35
L 3	S-14227	R.F. Coil Assembly	.90
L 2	S-14227	Antenna Coil Assembly	.90
L 4	S-19227	Converter Coil Assembly	.90
L 5	S-14228	Oscillator Coil Assembly	.75
L 2	S-14295	Tuner Coil Unit Assembly	6.25
L 3			
L 4			
L 5			

CONDENSERS			
C12	22-170	.1 Mfd.	400 V. .26
C23	22-182	250 Mmfd.	500 V. .26
C 4	22-190	.1 Mfd.	200 V. .23
C17	22-242	750 Mmfd.	500 V. .26
C15	22-906	.005 Mfd.	200 V. .20
C18			
C 6	22-1136	250 Mmfd.	500 V. .20
C16	22-1137	150 Mmfd.	500 V. .20
C34	22-1238	.5 Mfd.	120 V. .50
C19	22-1466	.01 Mfd.	200 V. .20
C29	22-1484	Electrolytic 20 Mfd. 25 V. x 20-20 Mfd.	400 V. 2.10
C30			
C31			
C21	22-1553	20 Mfd. Electrolytic	25 V. .80
C 9	22-1712	260 Mmfd. Compensating	.50
C32	22-1713	.007 Mfd.	1600 V. 1.00
C 7	22-1715	Single Section Trimmer (Converter)	.35
C 1	22-1721	Single Section Trimmer (Antenna)	.55
C 3	22-1722	Two Section Trimmer (R.F. and Osc.)	.60
C10			
C33	22-1728	.5 Mfd.	100 V. .55
C 5	22-1730	100 Mmfd. Ceramic (or 22-162)	500 V. .20
C11			
C14			
C20	22-1743	.0015 Mfd.	600 V. .20
C27	22-1747	.0033 Mfd.	600 V. .26
C28			
C24	22-1748	.1 Mfd.	400 V. .26
C22	22-1749	.047 Mfd.	600 V. .35
C25	22-1750	.022 Mfd.	600 V. .26
C26			
C13	22-1751	.022 Mfd.	200 V. .20
C 2	22-1752	.0047 Mfd. (or 22-1022)	600 V. .26

Diagram No.	Part No.	Description	Price
RESISTORS			
R35	63-1375	5 Ohm (Wirewound)	2 W. \$.33
R 2	63-1379	Sensitivity Control	.56
R10	63-1398	33M Ohm	1 W. .24
R18	63-1590	Volume Control and Tone Switch	2.50
S 7			
R32	63-1620	1800 Ohm	2 W. .36
R31	63-1622	330 Ohm	2 W. .36
R34	63-1740	82 Ohm	1/2 W. .21
R35			
R 8	63-1771	470 Ohm	1/2 W. .21
R23	63-1785	1000 Ohm	1/2 W. .21
R17	63-1792	1500 Ohm	1/2 W. .21
R 3	63-1827	10M Ohm	1/2 W. .21
R 7	63-1835	15M Ohm	1/2 W. .21
R25	63-1845	27M Ohm	1/2 W. .21
R29	63-1846	30M Ohm	1/2 W. .21
R12	63-1849	33M Ohm	1/2 W. .21
R22	63-1859	56M Ohm	1/2 W. .21
R24			
R26			
R28			
R 5	63-1862	68M Ohm	1/2 W. .21
R15			
R19	63-1869	100M Ohm	1/2 W. .21
R14	63-1873	120M Ohm	1/2 W. .21
R13	63-1884	220M Ohm	1/2 W. .21
R16			
R27	63-1890	330M Ohm	1/2 W. .21
R30			
R 1	63-1891	330M Ohm	1/2 W. .21
R 4			
R21	63-1897	470M Ohm	1/2 W. .21
R20			
R 9	63-1912	1 Megohm	1/2 W. .21
R11			
R 6	63-1960	15 Megohm	1/2 W. .21

MISCELLANEOUS			
	12-1414	Set Mounting Bracket (2 used)	.03
	12-1432	Set Installation Bracket	.15
	46-715	Antenna Trimmer Knob (used on 22-1721)	.07
SP 1	49-627	P.M. Speaker (6" x 9" Oval)	7.75
S 6	52-451	Battery Cable—Fuse to Set—Fuse Holder	.35
	52-455	Volume Control Cable	.70
	52-470	Speaker Cable and Plug	.45
	73-50	No. 6-32 x 1/4" Headless Slotted Set Screw—Cuppoint	.02
	78-596	Socket—Loktal Tube	.18
SK 1	78-728	Socket—Speaker	.20
	78-782	Miniature Tube Socket	.25
	78-796	Socket—Antenna Connector	.20
	78-801	Socket—Octal Base Tube	.15
	78-804	Socket—Vibrator	.20
	93-888	Vibrator Cushion Washer	.04

Diagram No.	Part No.	Description	Price
T 4	95-1071	Power Transformer	\$7.50
T 3	95-1079	Output Transformer	4.00
	125-63	Rubber Grommet (used on S-14295)	.03
	126-553	Miniature Tube Shield	.11
	149-63	Iron Core and Spring (4 used)	.40
V 1	190-22	Vibrator	4.15
	196-91	Speaker Gasket	1.25
	199-81	Tone Gear Sleeve	.02
	202-567	Instruction Book (Owner's Manual)	.08
	202-607	Interference Elimination Instruction Sheet	.12
	S-14303	Speaker and Gasket Assembly (Use 49-627 and 196-91)	

DIAL ASSEMBLY

	12-1435	Dial Scale Retaining Bracket (2 used)	.01
	19-165	Insulating Bushing Tension Clip (4 used)	.03
	26-392	Dial Scale	3.00
	46-708	Tone Control Knob	.45
	46-714	"Off" Switch Knob	.35
	56-228	Cross Arm Guide Rod	.15
	57-1338	Escutcheon	2.00
	57-1356	Dial Background Plate	.60
	59-208	Dial Pointer	.40
	80-232	Knob Retaining Spring	.02
	80-379	Pointer Retaining Spring	.03
	80-586	Cross Arm Tension Spring (2 used)	.07
	80-625	Pointer Link Tension Spring	.08
S 3-S 4	Dial Light Bulb—Mazda No. 44		.04
	112-699	No. 4-40 x 3/16" R.H. Self Tapping Screw — Stan Top — Steel — Cad.	.01
	114-294	No. 6-20 x 1/4" Hex Hd. Self Tapping Screw—Type No. 25 (Escutcheon Mtg.)	.02
	126-566	Dial Light Shield	.07
	S-14215	Pointer Support Bracket and Stud Assembly	.30
	S-14216	Pointer Drive Link and Stud Assembly	.15
	S-14281	Tuner Unit Assembly	11.50
	S-14300	Cross Arm and Bushing Assembly	1.00
	S-14304	Dial Light Socket and Wire Assembly	.35
	S-14307	Tone Gear and Bushing Assembly	.10
	S-14308	Tone Drum Shaft and Gear Assembly (26-392)	.50

Diagram No.	Part No.	Description	Price
	S-14320	Tuning Control and Trim Knob Assembly (46-705-707)	\$1.00
	S-14321	Volume Control Knob and Spring Assembly (46-706)	.50
S 2	85-435	On-Off Switch (on tuner)	.50
	S-14754	Automatic Knob and Screw Assembly	.50
	S-14721	Clutch Plate and Washer	.65
	S-14727	Tuning Shaft, Pinion Gear and Coupling Assembly	.50
S 1	S-14733	Muting Switch Assembly	.05
	17-102	Cam Lock (5 used)	.03
	34-177	Clutch Gear	.70
	64-162	.088 D x 3/32" Rivet (2 used on S-14733)	.004
	73-118	No. 6-32 x 1/4" Hex Head Slotted Set Screw (2 used)	.02
	80-640	Yoke Tension Spring (2 used)	.08
	80-641	Clutch Release Bar Spring	.007
	80-642	Clutch Spring	.02
	93-921	Tuning Shaft Steel Washer	.02
	93-922	Tuning Shaft Spring Washer	.02
	93-923	Fishpaper Washer (2 used)	.004
	97-305	Clutch Arm Stud	.03
	117-149	Clutch Lever	.15
	118-111	Retaining Ring (2 used)	.015

INSTALLATION PARTS

	S-14317	Installation Kit Assembly (complete)	.70
	52-458	Battery Cable (Fuse to Ammeter)	.40
	54-157	1/4-20 x 7/16" x 3/16" Hex Nut	.07
	54-189	No. 8-32 Wing Nut	.02
	54-265	No. 8-32 Wing Nut (Forged)	.04
	93-161	1/4" External Shakeproof Lockwasher	.01
	93-755	No. 8 External Shakeproof Lockwasher	.01
	114-175	1/4-20 x 1/2" Hex Hd. M. Screw	.02
S 5	136-11	14 Amp. Fuse (Type SFE-14)	.12

MOTOR NOISE SUPPRESSION KIT

S-14285	Motor Noise Suppression Kit Assembly (complete)	2.50
22-1601	Generator Capacitor	1.20
22-1767	Ignition Coil Capacitor	1.00
63-1046	Distributor Suppressor	.31
80-579	Motor Hood Bond Spring	.09
112-365	No. 8 x 1/2" B.H. Sheet Metal Screw	.01

PARTS LIST MODEL 8ML882Z (Chassis 8E82)

The parts list for Model 8ML882Z is the same as for Model 8ML882 with the following parts omitted and added:

ADD

Part No.	Description	Price
196-110	Speaker Gasket	\$.01
202-573	Instruction Book	.12
202-615	Interference Elimination Sheet	.12
49-627	P.M. Speaker (6" x 9" oval)	7.75
S-14325	Installation Kit Assembly	.70

OMIT

Part No.	Description
196-91	Speaker Gasket
202-567	Instruction Book
202-607	Interference Elimination Sheet
S-14303	Speaker and Gasket Assembly
S-14317	Installation Kit Assembly

(Prices subject to change without notice)

See Other Side For Information Concerning Parts List

PARTS LIST MODELS 8ML982-8ML982Z

The parts list for models 8ML982-8ML982Z is the same as for models 8ML882-8ML882Z with the following parts added and omitted.

ADD

OMIT

Diag. N O.	Part N O.	Description	Price	Diag. No.	Part No.	Description	Price
C 1	22-1812	Antenna Trimmer		C 1	22-1721	Antenna Trimmer	.55
C 11	22-1751	.022 MFD Condenser	.20	C 11	22-1730	100 MMF Condenser	.20
C 32	22-1448	Buffer Condenser	1.00	C 32	22-1713	Buffer Condenser	1.00
R 2	63-1662	Sensitivity Control		R 2	63-1379	Sensitivity Control	.56
R 5	63-1841	22K ohm 1/2 W.	.21	R 5	63-1862	68K ohm 1/2 W. resistor	.21
R 6	63-1764	330 ohm 1/2 W.	.21	R 6	63-1838	18K ohm 1/2 W. resistor	.21
				R 7	63-1835	15K ohm 1/2 W. resistor	.21
R 8	63-1750	150 ohm 1/2 W.	.21	R 8	63-1771	470 ohm 1/2 W. resistor	.21
R 10	63-1623	12K ohm 2 W.	.36	R 10	63-1398	33K ohm 1 W. resistor	.24
R 29	63-1843	24K 1/2 W.	.21	R 29	63-1846	30K ohm 1/2 W. resistor	.21
L 7	S-14846	Oscillator Shunt Coil		L 7	S-14225	Oscillator Shunt Coil	.80
L 8	S-14761	Motor Noise Choke		L 8	S-11232	Motor Noise Choke	.22
T 4	95-1073	Power Transformer		T 4	95-1071	Power Transformer	7.50
	202-641	Instruction Book	.07		202-567	Instruction Book	.07
	202-643	Instruction Book	.07		202-573	Instruction Book	.07

SERVICE MANUAL



Model 8MM890
Lincoln-Mercury Part No.
8M-18805-B

Made by ZENITH RADIO CORPORATION, CHICAGO 39, ILLINOIS, U.S.A.

Electrical Specifications

TUNING RANGE:.....540-1600 Kc.

SPEAKER:.....6" x 9" oval, instrument
panel mounting.

INTERMEDIATE FREQUENCY:.....265 Kc.

CURRENT CONSUMPTION:.....8 amperes

SENSITIVITY:.....5 microvolts at one
watt output.

TUBE COMPLEMENT:.....7A7 R.F.,
7B8 converter, 6BA6 I.F., 7E6 detector
and 1st audio, 7AF7 driver and phase-
inverter, 2-6V6GT push pull power out-
put, and 7Y4 rectifier.

UNDISTORTED POWER OUTPUT:.....
6 watts measured at the voice coil.

IMPORTANT

The Warranty Registration Tag must be filled in, by car dealer, at the time of sale and must accompany each receiver when service during the warranty period is expected by the customer or dealer. Otherwise regular charges for labor and material prevail.

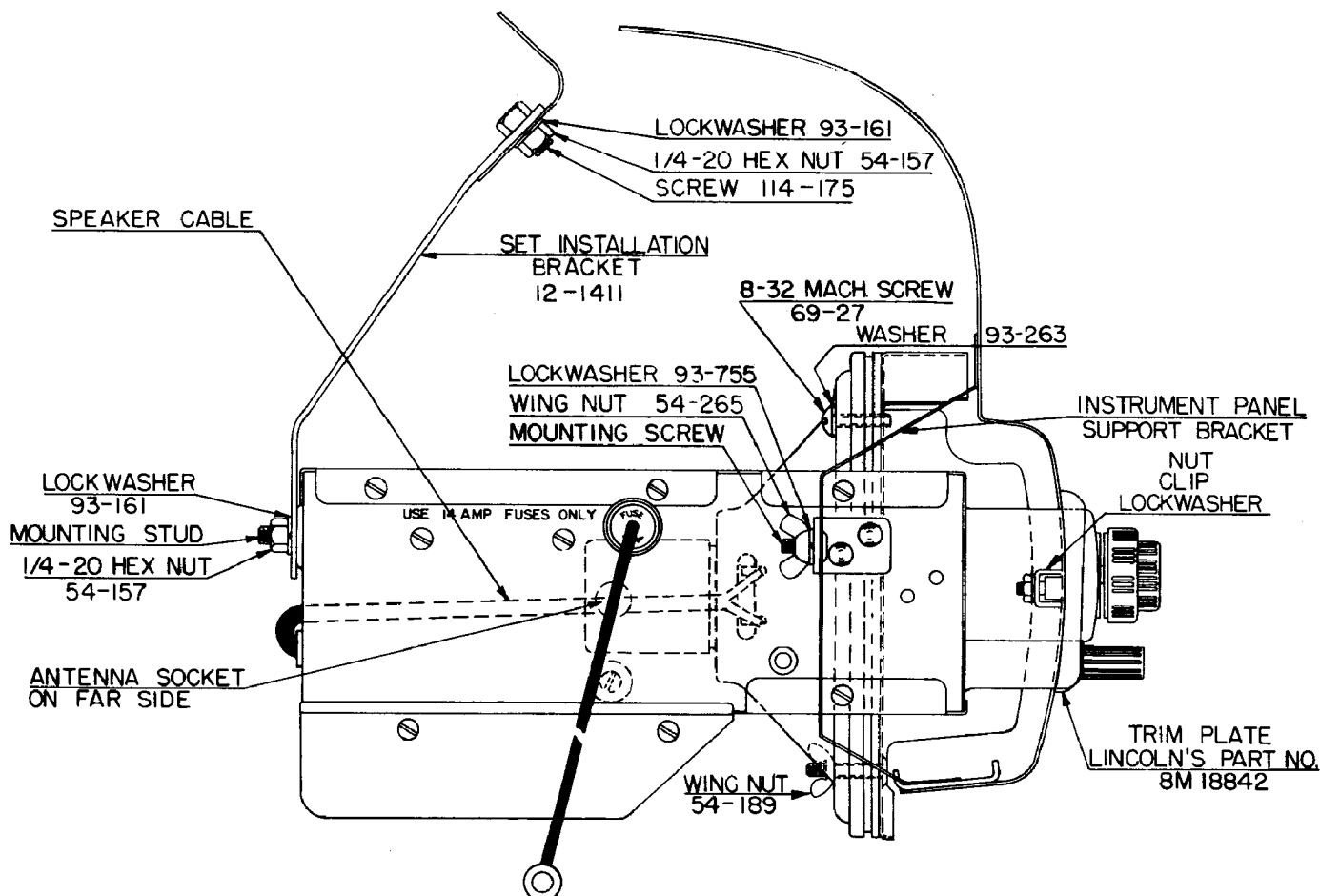


Fig. 1. Set Installed, Cut Away View

RECEIVER INSTALLATIONS

Figures 1 and 2, illustrating the escutcheon plate, control knobs and the installed receiver, are given here to facilitate removal and reinstallation of the receivers when service or repair is necessary.

1. Disconnect the "A" lead at the set. Remove the speaker plug from the set and disconnect the antenna.
2. Loosen the top of the set installation bracket, and remove the bottom of the bracket from the set. (Fig. 1.)
3. Remove the 8/32 wingnuts and lockwashers from the instrument panel support brackets. (Fig. 1.)

To take the speaker from the car, remove the stamped wingnut and the 8/32 machine screws from the rear of the instrument panel. (Fig. 1.)

OPERATING INSTRUCTIONS

TO TURN RADIO ON:

The radio is connected to the accessory terminal of the ignition switch, therefore, it is necessary to turn the ignition key to the left, if the engine is not running, before turning the radio on. Press any one of the five automatic push buttons. (Fig. 2.) Allow approximately 20 seconds for the receiver to reach operating temperature.

To turn the receiver off, press the "Off" push button (Fig. 2.)

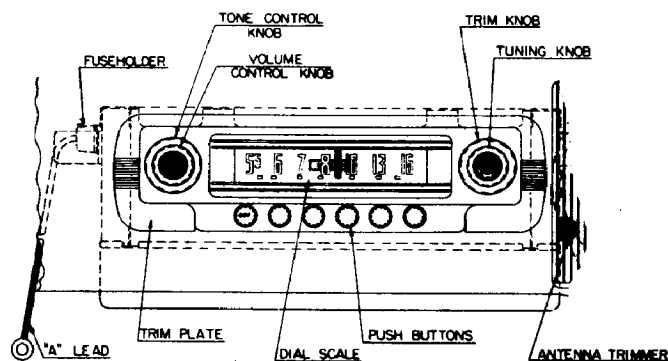


Fig. 2. Front Panel View

MANUAL TUNING:

To operate the manual tuning control simply turn the tuning knob. (Fig. 2.) When tuning in a station, be sure to tune to the exact frequency for the best tone quality.

VOLUME CONTROL:

Turn the volume control knob for the desired volume. (Fig. 2.)

TO NE CONTROL:

The tone control knob is located directly behind the volume control knob. Turning this control to the right or left will change the tone of the receiver. The control has four positions. The position to which the control is set is indicated in the window in the center of the dial scale.

AUTOMATIC TUNING:

There are five automatic tuning push buttons located to the right of the "Off" push button. (Fig. 2.)

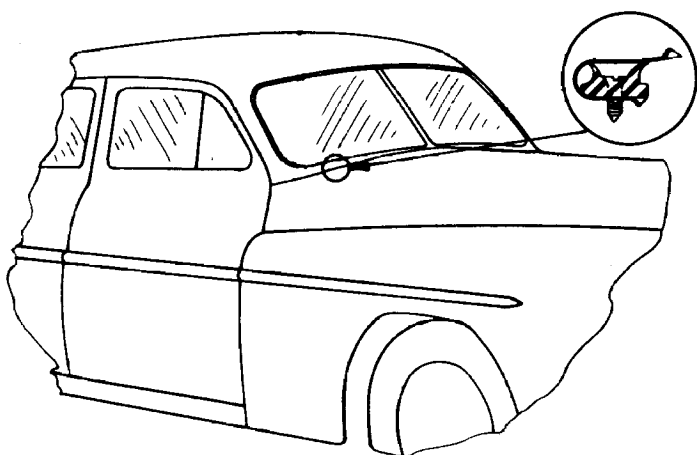
The five buttons may be adjusted in succession to any desired dial setting. To simplify the identification of the stations, it is advisable to set the buttons in sequence according to the frequencies of the stations, beginning with the station broadcasting at the lowest frequency and progressing to the station broadcasting at the highest frequency.

To adjust the automatic tuning push buttons:

1. Turn the receiver on and allow it to operate for at least 15 minutes in order for each part to reach normal operating temperature.
2. Tune in the station desired for number 1 position by turning the tuning knob. (Fig. 2.) Be sure to tune to the exact frequency to insure the best tone.
3. Loosen the number one push button, located nearest the "OFF" push button (Fig. 2) by turning it counterclockwise with your fingers not more than two turns. If the push button is completely unscrewed, the plunger assembly, inside the receiver, may fall apart. Then it will be necessary to remove the radio from the car, open the case, and reassemble the plunger.
4. Press the button in as far as it will go.
5. Release the number 1 button and tighten it by turning it clockwise with your fingers.
6. Use the same procedure for adjusting positions 2, 3, 4, and 5. When the five automatic tuning push buttons have been adjusted to the five desired stations, any one of the five stations can be instantly tuned in by pressing the automatic push button that is adjusted to it.

INTERFERENCE SUPPRESSION

There should be no motor noise or interference from the ignition circuit if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:



REMOVE SCREW FROM HOOD PAD
ON COWL AT LOCATION SHOWN
AND INSTALL HOOD BONDING SPRING
80-579 WITH SCREW 112-365

Fig. 3

The hood bonding spring No. 80-579 should be installed on the cowl at the location shown in Fig. 3.

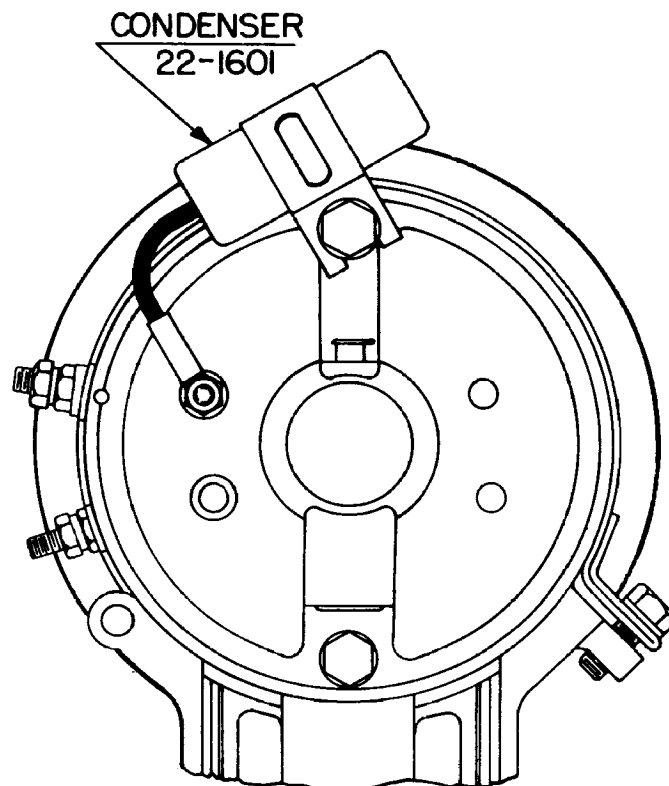


Fig. 4

The generator condenser, No. 22-1601, should be mounted under the top assembly bolt on the rear end plate of the generator, and the lead connected to the ARMATURE terminal of the generator. (Fig. 4.)

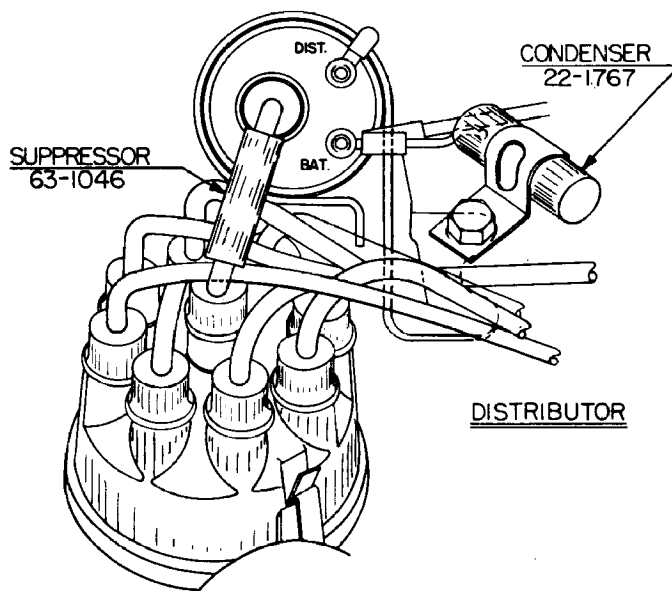


Fig. 5

The suppressor, No. 63-1046, should be in the high tension wire, approximately 1½ inches from the distributor cap (Fig. 5). The ignition coil condenser, No. 22-1767, should be connected to the BAT. terminal of the ignition coil. (Fig. 5.)

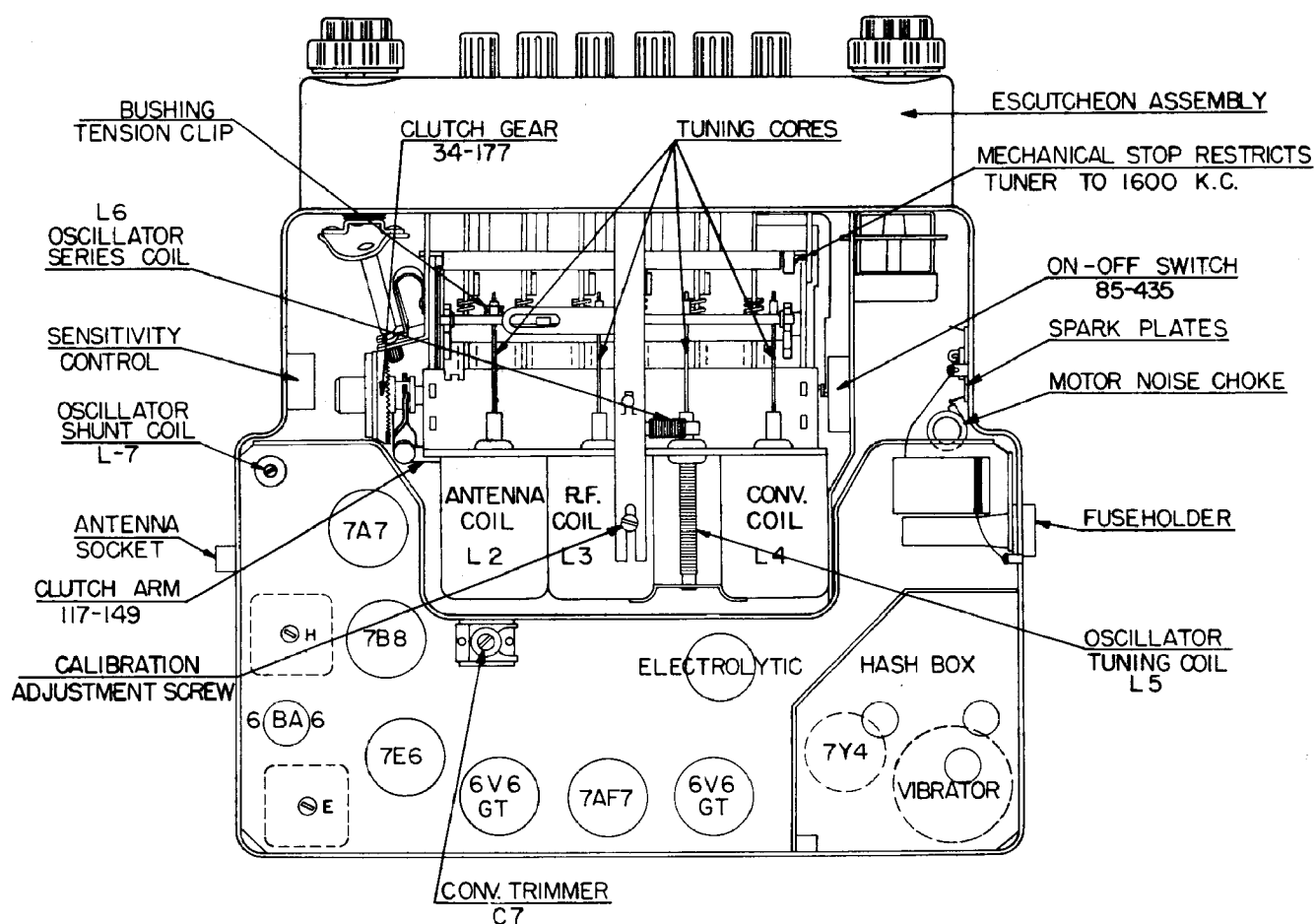


Fig. 6. Top View of Chassis

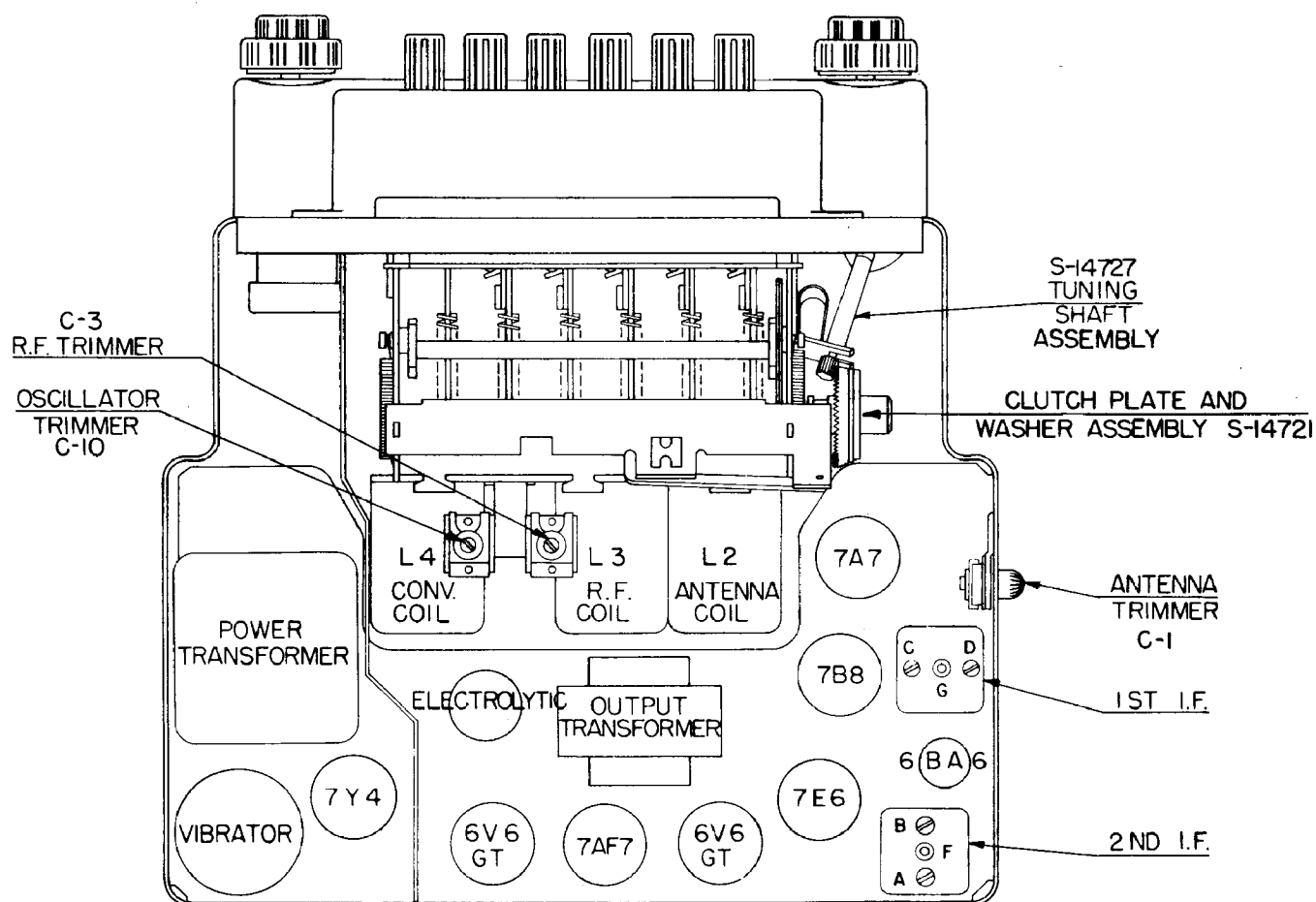


Fig. 7. Bottom View of Chassis

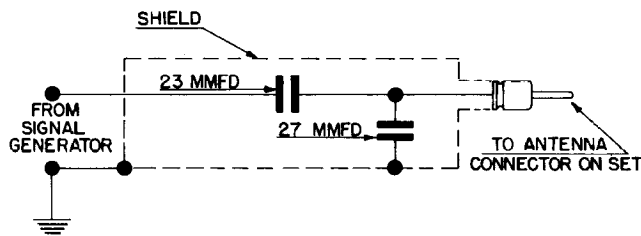


Fig. 8 Dummy Antenna

Figure 8 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustment to the receiver with the volume control set at maximum, and the tone control in the treble position. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

1. Remove top and bottom covers from receiver.
2. Set signal generator to 265 Kc.
3. Apply signal from generator through a .1 Mfd. dummy to 7B8 converter grid. (Pin No. 6 on socket.)
4. Adjust I.F. trimmers A, B, C, and D in order named for maximum output (Fig. 7). Some units have I.F. transformers that are slug tuned. In this case adjust I.F. slugs E, F, G, and H in order named for maximum output. Repeat the adjustments to assure accurate alignment. (Figs. 6 and 7.)

R.F. AND OSCILLATOR ALIGNMENT

1. Connect signal generator leads through dummy, illustrated in Fig. 8, to antenna lead in socket on receiver. This is important.
2. Set signal generator to 535 Kc.
3. Tune set to 535 Kc.
4. Adjust oscillator trimmer C-10 (Fig. 7), for maximum response.
5. Set signal generator to 1300 Kc.
6. Tune set to 1300 Kc.
7. Adjust converter trimmer C-7, R.F. trimmer C3 (Figs. 6 and 7) and antenna trimmer C-1 (Fig. 7) for maximum response.
8. If dial calibration is off after making above adjustments, a correction can be made by tuning eccentric screw at fulcrum of dial pointer. (Fig. 6.)

TO ADJUST OR REPLACE THE ADJUSTING SPRING AND CORE

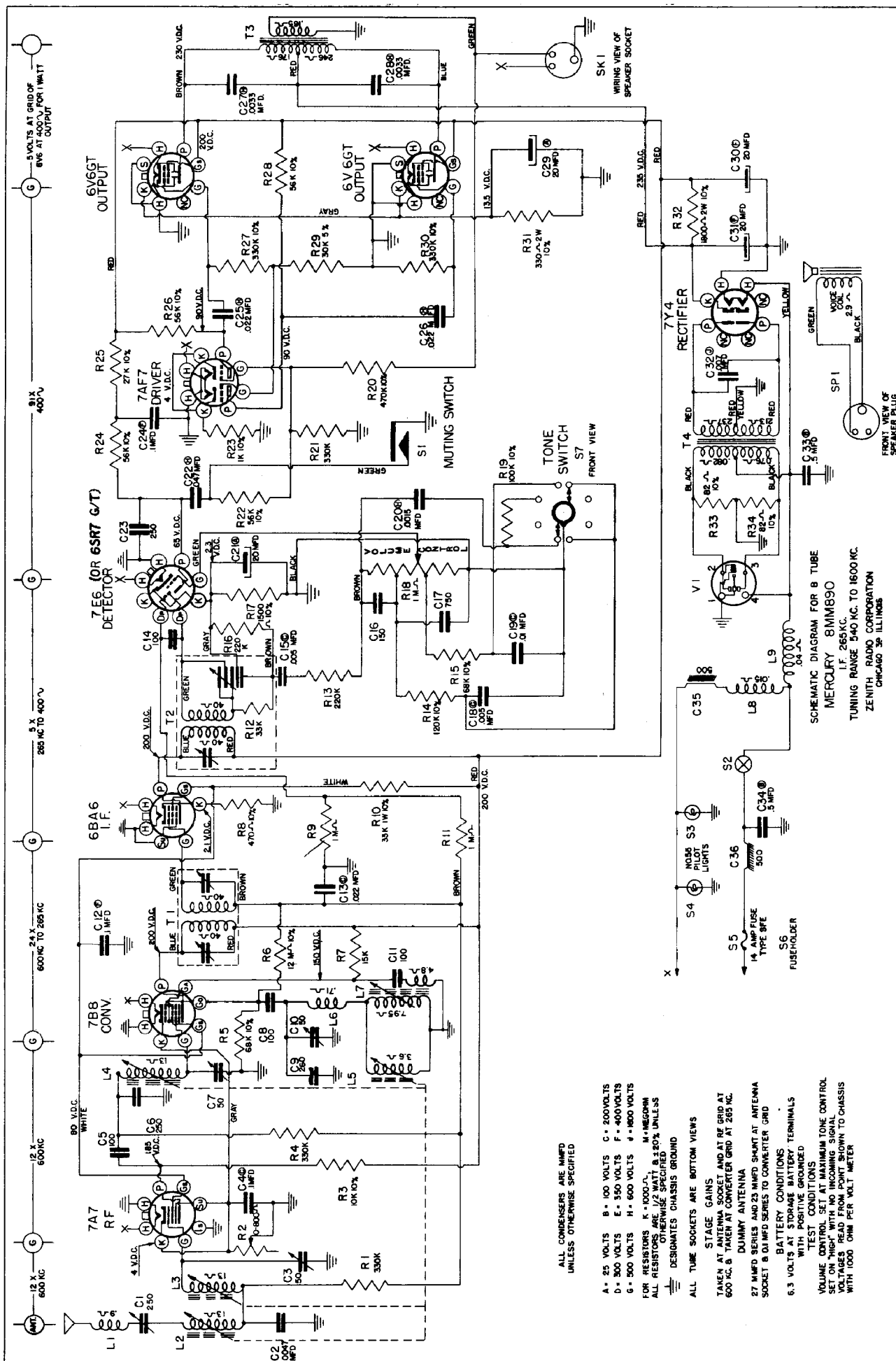
1. Remove the top and bottom covers from the receiver. Remove the escutcheon assembly.
2. Remove, with pliers, the bushing tension clip from the cross arm insulating bushing.
3. With core alignment tool, part No. S 13064, screw the core in, or out, to the desired position.
4. After all adjustments or replacements are completed, be sure to replace the bushing tension clip.

ALIGNMENT PROCEDURE AFTER CORE OR COIL REPLACEMENT

WARNING: The following adjustments are to be made only after a core or coil is replaced.

1. Set signal generator to 1675 Kc.
2. Connect signal generator leads through dummy, illustrated in Fig. 8, to antenna receptacle on the receiver.
3. Set receiver dial to 1600 Kc. (Maximum high frequency end of dial.)
4. Screw the cores completely out of the antenna coil, R.F. coil, the converter coil, and the oscillator coil.
5. Adjust oscillator trimmer C-10 (Fig. 7) at 1675 Kc.
6. Adjust converter trimmer C-7, R.F. trimmer C3, and antenna trimmer C-1 (Figs. 6 and 7) for maximum output reading.
7. Set signal generator dial and receiver dial to 1300 Kc.
8. Replace cores to their approximate original position (so that the cores project about $1\frac{1}{8}$ of an inch from the end of the coil form).
9. Adjust oscillator core L-5 (Fig. 6) to scale at 1300 Kc.
10. Adjust the antenna core L-2, R.F. core L3, and converter core L-4 (Fig. 6) for maximum output reading.
11. Set signal generator to 600 Kc.
12. "Rock in" shunt oscillator coil L-7 (Fig. 6) for maximum output reading. This should be done only as a last resort. This is the same as rocking in the padder condenser on a gang condenser receiver.
13. Check receiver at 1300 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10, and 11.
14. After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc., the lug stop near the volume control should be bent to limit the frequency coverage to 1605 Kc.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station at approximately 1300 Kc.



ALL CONDENSERS ARE MFD
UNLESS OTHERWISE SPECIFIED

A • 25 VOLTS B • 100 VOLTS C • 200 VOLTS
D • 300 VOLTS E • 350 VOLTS F • 400 VOLTS
G • 500 VOLTS H • 600 VOLTS I • 800 VOLTS
FOR RESISTORS K • 1000 Ω M • MEGOHM
ALL RESISTOR VALUES ARE SPECIFIED UNLESS
OTHERWISE SPECIFIED

DESIGNATES CHASSIS GROUND

ALL TUBE SOCKETS ARE BOTTOM VIEWS

STAGE GAINS

TAKEN AT ANTENNA SOCKET AND AT RF GRID AT

600 KC. B TAKEN AT CONVERTER GRID AT 265 KC.

DUMMY ANTENNA

27 MFD SERIES AND 23 MFD SHUNT AT ANTENNA

SOCKET B 0.1 MFD SERIES TO CONVERTER GRID

BATTERY CONDITIONS

6.3 VOLTS AT STORAGE BATTERY TERMINALS

WITH POSITIVE GROUND

TEST CONDITIONS

VOLUME CONTROL SET AT MAXIMUM TONE CONTROL

SET AT MAXIMUM TONE CONTROL

VOLTAGES READ FROM POINT SHOWN TO CHASSIS

WITH 1000 OHM PER VOLT METER

SCHEMATIC

PARTS LIST MERCURY DE LUXE AUTOMOTIVE RECEIVER

MODEL 8MM890 (CHASSIS 8E90)

Diagram No.	Part No.	Description	Price	Diagram No.	Part No.	Description	Price	
COILS AND CHOKES				RESISTORS				
L 9	20-213	Main Hash Choke.....	\$.36	R 2	63-1379	Sensitivity Control.....	\$.56	
T 1	95-1077	1st I.F. Transformer.....	1.85	R10	63-1398	33M Ohm (Insulated).... 1 W.	.24	
T 2	95-1078	2nd I.F. Transformer.....	2.00	R18	63-1590	Volume Control and Tone Switch.	2.50	
L 1	S-8819	Antenna Motor Noise Choke.....		R32	63-1620	1800 Ohm (Insulated).... 2 W.	.36	
		Assembly.....	.40	R31	63-1622	330 Ohm (Insulated).... 2 W.	.36	
L 8	S-11232	Motor Noise Choke Assembly.....	.22	R33 }	63-1740	82 Ohm (Insulated)..... ½ W.	.21	
L 7	S-14225	Oscillator Shunt Coil Assembly.....	.80	R34 }				
L 6	S-14226	Oscillator Series Coil Assembly ..	.35	R 8	63-1771	470 Ohm (Insulated)..... ½ W.	.21	
L 3	S-14227	RF Coil Assembly.....	.90	R23	63-1785	1000 Ohm (Insulated).... ½ W.	.21	
L 2	S-14227	Antenna Coil Assembly.....	.90	R17	63-1792	1500 Ohm (Insulated).... ½ W.	.21	
L 4	S-14227	Converter Coil Assembly.....	.90	R 3	63-1827	10M Ohm (Insulated).... ½ W.	.21	
L 5	S-14228	Oscillator Coil Assembly.....	.75	R 7	63-1835	15M Ohm (Insulated).... ½ W.	.21	
L 2 }	S-14295	Tuner Coil Unit Assembly.....	6.25	R25	63-1845	27M Ohm (Insulated).... ½ W.	.21	
L 3 }				R29	63-1846	30M Ohm (Insulated).... ½ W.	.21	
L 4 }				R12	63-1849	33M Ohm (Insulated).... ½ W.	.21	
L 5 }				R22 }	63-1859	56M Ohm (Insulated).... ½ W.	.21	
CONDENSERS				R24 }				
C12	22-170	.1 Mfd.....	400 V.	.26				R26 }
C23	22-182	250 Mmfd.....	400 V.	.26				R28 }
C 4	22-190	.1 Mfd.....	200 V.	.23	R 5 }	63-1862	68M Ohm (Insulated).... ½ W.	.21
C17	22-242	750 Mmfd.....	500 V.	.26	R17 }			
C15 }	22-906	.005 Mfd.....	200 V.	.20	R19	63-1869	100M Ohm (Insulated).... ½ W.	.21
C18 }					R 4	63-1873	120M Ohm (Insulated).... ½ W.	.21
C 6	22-1136	250 Mmfd.....	500 V.	.20	R13 }	63-1884	220M Ohm (Insulated).... ½ W.	.21
C16	22-1137	150 Mmfd.....	500 V.	.20	R16 }			
C34	22-1238	.5 Mfd.....	120 V.	.50	R27 }	63-1890	330M Ohm (Insulated).... ½ W.	.21
C19	22-1466	.01 Mfd.....	200 V.	.20	R30 }			
C29 }	22-1484	Electrolytic 20 Mfd.—25 V. x20- 20 Mfd.....	400 V.	2.10	R 1	63-1891	330M Ohm (Insulated).... ½ W.	.21
C30 }					R 4 }			
C31 }					R21 }	63-1897	470M Ohm (Insulated).... ½ W.	.21
C21	22-1553	20 Mfd. Electrolytic.....	25 V.	.80	R20 }			
C 9	22-1712	260 Mmfb. Compensating.....	.50	R 9 }	63-1912	1 Megohm (Insulated).... ½ W.	.21	
C32	22-1713	.007 Mfd.....	1600 V.	1.00				R11 }
C 7	22-1715	Single Section Trimmer (Converter)	.35		63-1957	12 Megohm (Insulated).... ½ W.	.21	
C 1	22-1721	Single Section Trimmer (Antenna)	.55	MISCELLANEOUS				
C 3 }	22-1722	Two Section Trimmer (R.F. and Osc.).....	.60	12-1414	Set Mounting Bracket (2 used)...	.03		
C10 }				46-715	Antenna Trimmer Knob (used on 22-1721).....	.07		
C33	22-1728	.5 Mfd.....	100 V.	.55	SP 1	49-627	P.M. Speaker (6" x 9" Oval)....	7.75
C 5 }	22-1730	100 Mmfd. Ceramic (or 22-162)	500 V.	.20		(See S-14303)		
C11 }					S 6	52-451	Battery Cable—Fuse to Set— Fuse-holder.....	.35
C14 }						52-455	Volume Control Cable.....	.70
C20	22-1743	.0015 Mfd.....	600 V.	.20		52-470	Speaker Cable and Plug.....	.45
C27 }	22-1747	.0033 Mfd.....	600 V.	.26		73-50	No. 6-32 x ¼" Headless Slotted Set Screw—Cuppoint.....	.02
C28 }						78-596	Socket—Loktal Tube.....	.18
C24	22-1748	.1 Mfd.....	400 V.	.26	SK 1	78-728	Socket—Speaker.....	.20
C22	22-1749	.047 Mfd.....	600 V.	.35		78-782	Socket—Miniature Tube.....	.25
C25 }	22-1750	.022 Mfd.....	600 V.	.26		78-796	Socket—Antenna Connector.....	.20
C26 }						78-801	Socket—Octal Base Tube.....	.15
C13	22-1751	.022 Mfd.....	200 V.	.20				
C 2	22-1752	.0047 Mfd. (or 22-1022).....	600 V.	.26				

Diagram No.	Part No.	Description	Price
	78-804	Socket—Vibrator.....	\$.20
	93-888	Vibrator Cushion Washer.....	.04
T 4	95-1071	Power Transformer.....	7.50
T 3	95-1079	Output Transformer.....	4.00
	125-63	Rubber Grommet (used on S-14295).....	.03
	126-553	Miniature Tube Shield.....	.11
	149-62	Iron Core and Screw.....	.10
	149-63	Iron Core and Spring (4 used)....	.40
V 1	190-22	Vibrator.....	4.15
	196-91	Speaker Gasket.....	1.25
	199-81	Tone Gear Sleeve.....	.02
	202-587	Instruction Book (Owner's Manual)	.07
	202-608	Interference Elimination Instruction Sheet.....	.08
	S-14303	Speaker and Gasket Assembly (use 49-627 and 196-91)	

INSTALLATION PARTS

	S-14284	Installation Kit Assembly (complete).....	.80
	12-1411	Set Installation Bracket.....	.10
	52-456	Battery Cable—Fuse to Ammeter	.40
	54-157	No. 1/4-20 x 7/16" x 3/16" Hex Nut—Steel, Cad. Pl.....	.07
	54-189	No. 8-32 Wing Nut.....	.02
	54-265	No. 8-32 Wing Nut (Forged)....	.04
	69-27	No. 8-23 x 5/8" R.H.M.S.—Steel, N.P.....	.01
	93-161	1/4 Ext. Shakeproof Lockwasher No. 1114.....	.01
	93-263	1/32 x .136 x 3/8" Steel Washer—Cad. Pl.....	.01
	93-755	No. 8 External Shakeproof Lockwasher.....	.01
	114-175	1/4-20 x 1/2" Hex Hd. M.S., Steel—Zinc Plate.....	.01
S 5	136-11	14 Ampere Fuse—Type S.F.E. No. 14.....	.12

MOTOR NOISE SUPPRESSION KIT

	S-14285	Motor Noise Suppression Kit Assembly (complete).....	2.50
	22-1601	Generator Capacitor.....	1.50
	22-1767	Ignition Coil Capacitor.....	1.00
	63-1046	Distributor Suppressor.....	.31
	80-579	Motor Hood Bond Spring.....	.09
	112-365	No. 8 x 1/2" B.H. Sheet Metal Screw.....	.01

DIAL ASSEMBLY

	12-1435	Dial Scale Retaining Bracket (2 used).....	.01
	19-165	Insulating Bushing Tension Clip (4 used).....	.03

Diagram No.	Part No.	Description	Price
	26-395	Dial Scale.....	\$3.00
	46-701	Tone Control Knob.....	.45
	46-714	"Off" Switch Knob.....	.35
	56-228	Cross Arm Guide Rod.....	.15
	57-1339	Escutcheon.....	2.50
	57-1344	Dial Background Plate.....	.50
	59-208	Dial Pointer.....	.40
	80-232	Knob Retaining Spring.....	.02
	80-379	Pointer Retaining Spring.....	.03
	80-586	Cross Arm Tension Spring (2 used)	.07
	80-625	Pointer Link Tension Spring.....	.08
S 3 } S 4 }	100-31	Dial Light Bulb—Mazda No. 55	.08
	112-699	No. 4-40 x 3/16" R.H. Self Tapping Screw—Stan Top—Steel—Cad	.01
	114-294	No. 6-20 x 1/4" Hex Hd. Self Tapping Screw Type No. 25 (Escutcheon Mtg.).....	.02
	S-14215	Pointer Support Bracket and Stud Assembly.....	.30
	S-14216	Pointer Drive Link and Stud Assembly.....	.15
	S-14281	Tuner Unit Assembly.....	11.50
	S-14300	Cross Arm and Bushing Assembly	1.00
	S-14301	Tuning Control and Trim Knob Assembly.....	1.00
	S-14302	Volume Control Knob and Spring Assembly.....	.40
	S-14304	Dial Light Socket and Wire Assembly.....	.35
	S-14307	Tone Gear and Bushing Assembly	.10
	S-14308	Tone Drum Shaft and Gear Assembly (26-390).....	.50
S 1	S-14534	Tuner Unit Final Assembly	
S 2	85-435	"On-Off" Switch (on Tuner).....	.50
	S-14754	Automatic Knob and Screw Assembly.....	.50
	S-14721	Clutch Plate and Washer.....	.65
	S-14727	Tuning Shaft, Pinion Gear and Coupling Assembly.....	.50
S 1	S-14733	Muting Switch Assembly.....	.05
	17-102	Cam Lock (5 used).....	.03
	34-177	Clutch Gear.....	.70
	64-162	.088 D x 1/32" Rivet (2 used on S-14733).....	.004
	73-118	No. 6-32 x 1/4" Hex Hd. Slotted Set Screw (2 used).....	.02
	80-640	Yoke Tension Spring (2 used)....	.08
	80-641	Clutch Release Bar Spring.....	.007
	80-642	Clutch Spring.....	.02
	93-921	Tuning Shaft Steel Washer.....	.02
	93-922	Tuning Shaft Spring Washer.....	.02
	93-923	Fishpaper Washer (2 used).....	.004
	97-305	Clutch Arm Stud.....	.03
	117-149	Clutch Lever.....	.15
	188-111	Retaining Ring (2 used).....	.015

(Prices subject to change without notice)

SCHEMATIC DIAGRAM FOR 8 TUBE
MERCURY 8MM990
I.F. 265 KC.
TUNING RANGE 540 KC. TO 1600 KC.
ZENITH RADIO CORPORATION
CHICAGO 30, ILL. U.S.A.

PARTS LIST MODEL 8MM990

The parts list for model 8MM990 is the same as for model 8MM890 with the following parts added and omitted.

ADD

OMIT

Diag. No.	Part No.	Description	Price	Diag. No.	Part No.	Description	Price
C 1	22-1812	Antenna Trimmer		C 1	22-1721	Antenna Trimmer	.55
C 11	22-1751	.022 MFD Condenser	.20	C 11	22-1730	100 MMF Condenser	.20
C 32	22-1448	Buffer Condenser	1 .00	C 32	22-1713	Buffer Condenser	1 .00
R 2	63-1662	Sensitivity Control		R 2	63-1379	Sensitivity Control	.56
R 5	63-1841	22K ohm 1/2 W.	.21	R 5	63-1862	68K ohm 1/2 W. resistor	.21
R 6	63-1764	330 ohm 1/2 W.	.21	R 6	63-1838	18K ohm 1/2 W. resistor	.21
				R 7	63-1835	15K ohm 1/2 W. resistor	.21
R 8	63-1750	150 ohm 1/2 W.	.21	R 8	63-1771	470 ohm 1/2 W. resistor	.21
R 10	63-1623	12K ohm 2 W.	.36	R 10	63-1398	33K ohm 1 W. resistor	.24
R 29	63-1843	24K 1/2 W.	.21	R 29	63-1846	30K ohm 1/2 W. resistor	.21
L 7	S-14846	Oscillator Shunt Coil		L 7	S-14225	Oscillator Shunt Coil	.80
L 8	S-14761	Motor Noise Choke		L 8	S-11232	Motor Noise Choke	
T 4	95-1073	Power Transformer		T 4	95-1071	Power Transformer	7.50
	202-645	Instruction Book	.07		202-587	Instruction Book	.07

FORD MERCURY INTEGRAL AERIAL

FOR 1946 CLOSED CARS

INSTALLATION INSTRUCTIONS

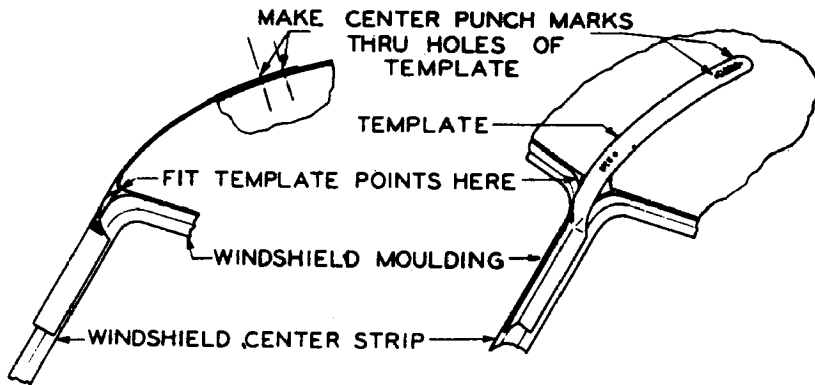


FIGURE 1

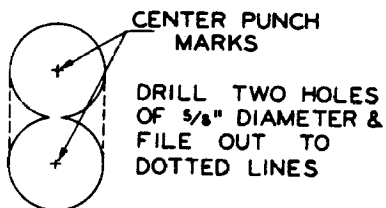


FIGURE 2

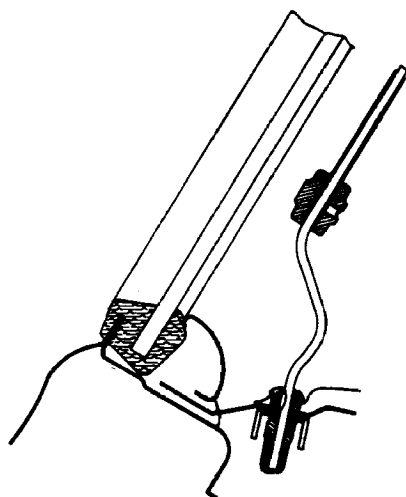
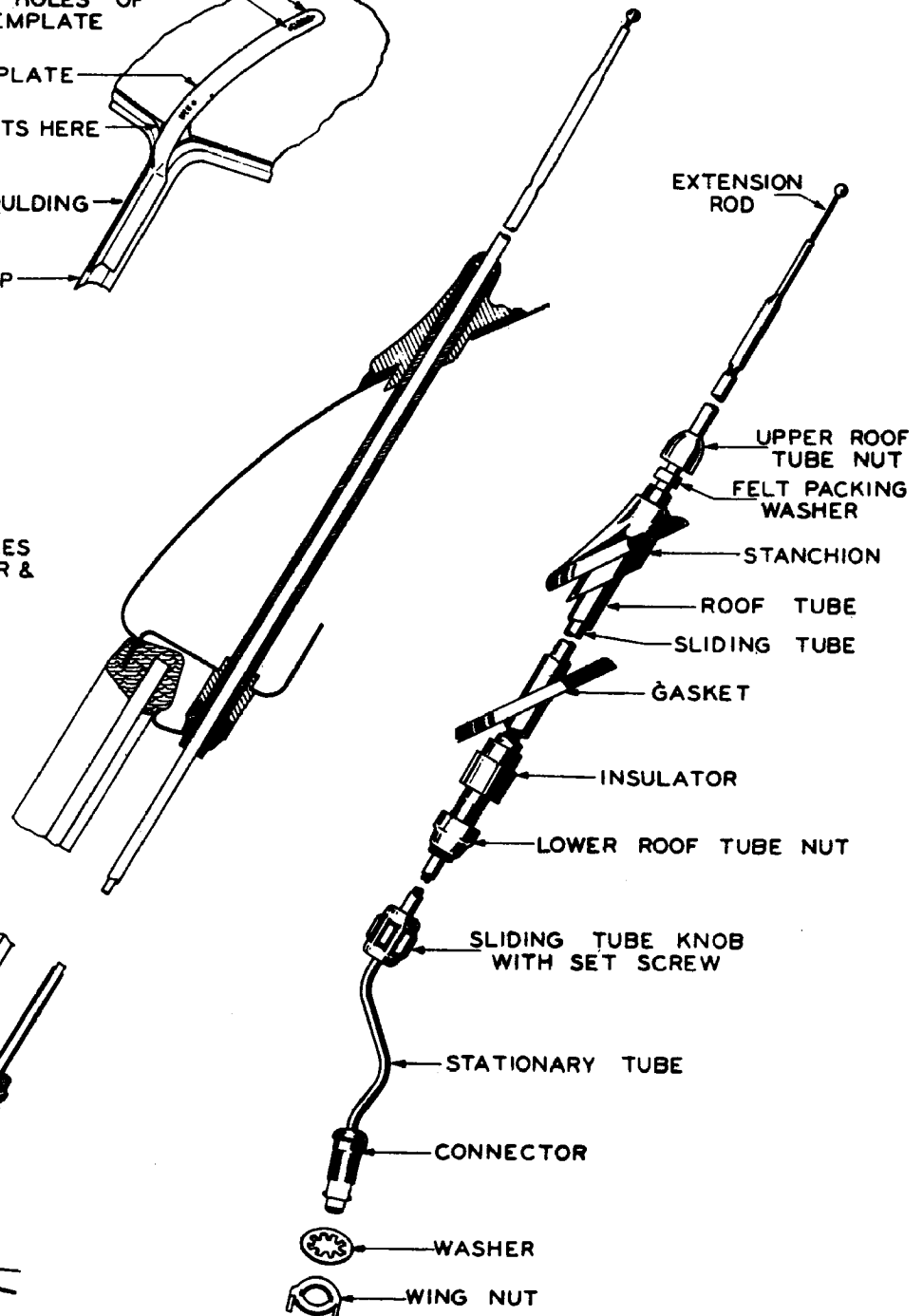


FIGURE 3



EXPLODED VIEW

FIGURE 4

FORD - MERCURY CLOSED CAR

INTEGRAL ANTENNA

46S10989	Adjusting Knob Assem. (46-523)	.62
S11008	Roof Tube Assem.	.88
S11011	Extension Tube & Rod Assem.	1.21
S11024	Insulator & Stationary Tube Assem.	2.85
46-387	Stanchion	.24
54-154	Upper Roof Tube Nut (Gland Nut)	.24
54-155	Lower Roof Tube Nut (Gland Nut)	.24
54-196	Wing Nut	.022
68-4	#6 Allen Set Screw Wrench	.12
73-40	#6-32 X 1/8 Allen Set Screw - Cuppoint	.19
93-143	3/8" Internal Shakeproof Lockwasher	.670
93-787	Felt Packing Washer	.700
94-352	Roof Tube Insulator Bushing	.12
184-5	Ball Tip	.15
193-14	Template (Roof Hole)	.19
196-42	Rubber Gasket	.12
202-416	Instruction Sheet	.01



**HOUSEHOLD RECEIVER
SERVICE BULLETIN
NUMBER 1**

**CHASSIS NO. 5C01, 6C01, 6C05, 6C40,
8C01, 8C05, 8C20, 8C21, 11C21, 11C21Z**

**ZENITH RADIO CORPORATION
CHICAGO, U. S. A.**

CHASSIS 5C01-6C01-6C05

DISTORTION AND POOR SENSITIVITY

Distortion and poor sensitivity usually caused by a short between turns on the wavemagnet.

Poor sensitivity and set fails to operate on low frequency end of dial - replace oscillator coil.

UNCONTROLLED OSCILLATION

A 470,000 ohm carbon resistor soldered across the secondary of the first IF transformer will correct this condition.

CHASSIS 6C40 MODEL 6G001

BLOCKING

The A.C. plug being inserted in the battery saver switch socket while the on-off switch is on may cause the set to block and become dead. Switching the set off and on will relieve this blocked condition and return the set to normal operation.

CHASSIS 8C01 ACDC MODEL 8H023-34

MODULATION HUM

Under humid conditions, the insulating material inside the power socket riveted to the back cover would absorb moisture. If the solder lug is in contact with this material some of the AC voltage would leak into the back cover. Since this back cover is next to the loop, hum modulation would be evident.

To remedy this condition, remove the back from the receiver, and open the AC connector, and bend the solder lug away from the insulating wall. A vinylite sleeve over the solder lugs will insure good insulation.

HUM COMES UP AS VOLUME CONTROL IS ADVANCED

Hum in the 8C01 chassis may be caused by an open .05-200V condenser which is connected between the metal shell of the volume control and chassis.

AUDIO HOWL ON FM

1. 83-1328 plastic spacer installed between the centers of the oscillator and detector slug shafts. This prevents the slugs from vibrating.
2. Float speaker on rubber grommets.
3. 166-36 felt cushion placed between the back of the gang and IF transformer.
4. To improve floating of the gang, remove the support screw nearest the dial.

CHASSIS 8C20-8C21-8H0-9H0 SERIES

BUZZ IN DIAL ESCUTHEON 8H0 AND 9H0 SERIES

If the dial assembly comes in contact with the power transformer a buzz will result and a 83-1331 felt spacer should be added between the dial and transformer.

INCREASING BASS RESPONSE OF PHONO

To increase the bass response on records the value of R 5 in the phono pre-amplifier may be increased. Do not increase the value to over 10,000 ohms or audio howl may be heard.

PM SPEAKERS 8H0 AND 9H0 SERIES

Some of the earlier 8C20-21 chassis are wired for electro dynamic speakers only. Later production sets are wired for either electro dynamic or PM speakers which have the filter unit attached to the speaker frame. These chassis are identified by a dot of black paint on or near the speaker socket. To use the PM speakers on the earlier sets, it will be necessary to run a lead from B- (Center Tap of high voltage winding) to a lug on the speaker socket which connects to the negative side of the filter on the speaker.

HUM COMPLAINT ON 9H0 SERIES

Check audio and AC leads to the volume control. The leads from the tone control must be dressed away from the AC leads. The high voltage secondary leads from the power transformer must be dressed away and close to the chassis from the 47,000 resistor on the tap points.

CHASSIS 8C20-8C21-8H0-9H0 SERIES (Continued)

IMPROVING FM RECEPTION ON 8H0 AND 9H0 SERIES

In FM Consoles, a cabinet FM antenna may be added in addition to the line antenna. This antenna is made up of two 28 inch lengths of wire. One wire is connected to the FM antenna post, the other to chassis. The two wires are then tacked in the cabinet in opposite directions, and should not come in contact with ground.

WAVE TRAP TRIMMER SHORTING OUT

A .002 MFD volt capacitor in series with the grounded side of the wave trap will remove the D.C. potential from the trap. This will eliminate the possibility of a breakdown.

AUDIO HOWL AS VOLUME CONTROL IS ADVANCED (FM RECEPTION)

FM howl may be caused by the speaker vibrating the oscillator slug. A fiber spacer between the oscillator, and detector slug shafts in the FM tuner will eliminate vibration. A thin rubber band tied to the center of the oscillator slug shaft and upper frame will also eliminate the howl.

HOWL ON AM 8H0 SERIES

Howl due to vibrations transmitted into the oscillator sections of the gang condenser by the speaker. To remedy this condition, a felt strip can be placed between the rear of the gang, and the first IF transformer. It may also be necessary to move the oscillator section lead underneath the gang slightly to reduce tension.

STRIPPED IF SLUG INSERTS

Damaged IF slug thread inserts may be replaced by unscrewing the slug and pushing out the old insert.

Two types of inserts are used, 83-1063 short and 83-1069 long.

CHASSIS 8C40 MODEL 8G005

MICROPHONICS

Howl caused by a microphonic 1LD5 tube. These tubes have been improved, and all tubes after F6E (June '46) are non-microphonic and should replace the older type.

CHASSIS 11C21-11C21Z-12H0 SERIES

DIFFERENCES IN 11C21-11C21Z CHASSIS

Sets using chassis 11C21Z are equipped with PM speakers. PM speakers cannot be used on 11C21 chassis. When ordering speaker replacements specify 11C21 or 11C21Z chassis.

IMPROVING FM RECEPTION

In FM Consoles a cabinet FM antenna may be added in addition to the line antenna. This antenna is made up of two 28 inch lengths of wire. One wire is connected to the FM antenna post, the other to chassis. The two wires are then tacked in the cabinet in opposite directions, and should not come in contact with ground.

HOWL ON FM

FM howl may be caused by the speaker vibrating the oscillator slug. A fiber spacer between the oscillator, and detector slug shafts in the FM tuner will eliminate vibration. A thin rubber band tied to the center of the oscillator slug shaft and upper frame will also eliminate the howl.

INCREASING BASS RESPONSE ON PHONO

To increase the bass response on records the value of R 5 in the phono-pre-amplifier may be increased. Do not increase the value to over 10,000 ohms or audio howl may be heard.

STRIPPED IF THREAD INSERTS

Damaged IF slug thread inserts may be replaced by unscrewing the slug, and pushing out the old insert. Two types of inserts are used, 83-1063 short, and 83-1069 long.

WAVE TRAP TRIMMER SHORTS OUT

A .002 MFD volt capacitor in series with the grounded side of the wave trap will remove the D.C. potential from the trap. This will eliminate the possibility of a breakdown.

HUM COMPLAINT

Check for excessive length of the AC line cord inside the main chassis between the point of entrance and the solder lugs. This slack may be in close proximity of the tone control leads.



HOUSEHOLD RECEIVER SERVICE BULLETIN NUMBER 2

AUTOMATIC RECORD CHANGER

MODELS S-11468 and S-11680

CHASSIS No. 4C21, 5C01, 5C02, 5C04, 6C01,
6C05, 6C40, 8C01, 8C20, 8C21, 8C40, 11C21, 11C21Z

**ZENITH RADIO CORPORATION
CHICAGO, U. S. A.**

MODEL S11468 RECORD CHANGER

ERRATIC LANDING OF THE NEEDLE

In the first production of S-11468 non-intermixer record changers, a neoprene cork tipped lift pin, part No. S-13056 was used to stabilize the set down or landing of the needle on the run-in groove of the record. The weight of the tone arm and the friction plate, riding on the neoprene tip of the lift pin was relied on to provide effective braking action. Grease or oil on the neoprene tip of the lift pin will cause erratic landing of the tone arm on the record. To remove the oil or grease, clean the pin tip and friction plate with carbon tetrachloride and roughen with fine sand paper.

Later production S-11468 changers have a spring type brake on the tone arm shaft and use an all metal lift pin, part No. S-13086.

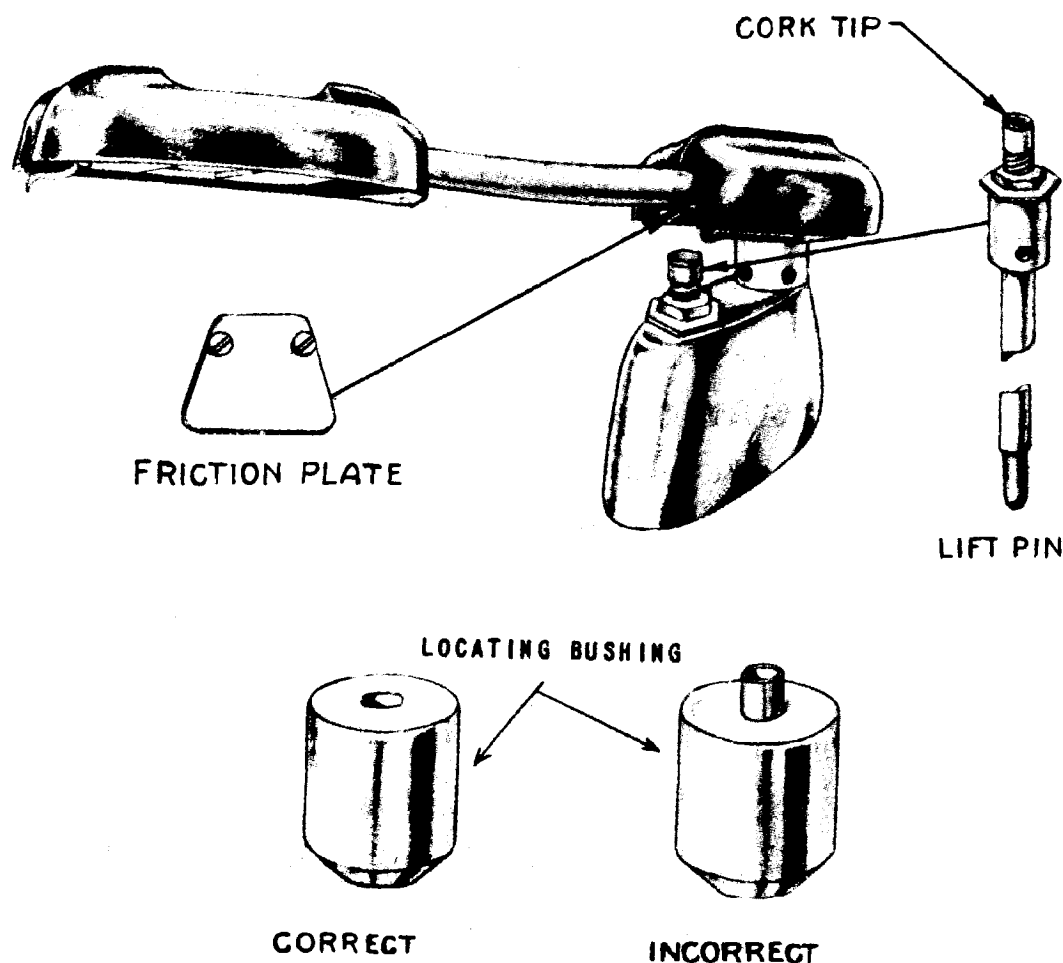


Fig. 1

Erratic landing, where the arm swings sharply to the center of the record or beyond, may be caused by the locating bushing. Replace with a 94-415 bushing.

TONE ARM SKIPS GROOVES AND REPEATS

The vertical hinge on the tone arm may be too tight, causing the arm to hang slightly. This prevents the needle from exerting enough pressure on the record to follow the record grooves. To free the

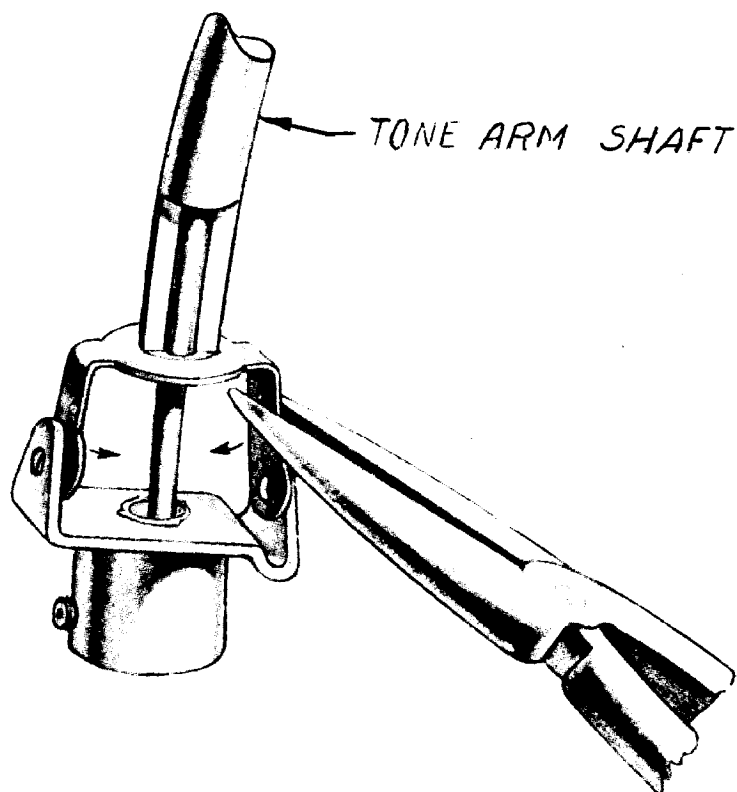


Fig. 2

hinge, use a pair of long nose pliers and bend the horizontal spring "U" bracket until it pivots freely. Be certain that the connecting lead to the crystal cartridge is dressed so that it does not interfere with either the vertical or horizontal movement of the tone arm. THIS IS IMPORTANT.

TONE ARM STICKS NEAR END OF RECORD

Burrs on the trip pawl (Figure 2 Service Manual) will cause the pawl to hang up in the ratchet. Remove the burrs with a sandstone.

MODELS S12600 RECORD DEMONSTRATORS

S11468 AND S11680 RECORD CHANGERS

MOTOR TYPES

Two types of motors are used, Wincharger and General Industries. The Wincharger motor is unmarked. The General Industries motor can be identified by the letters GI stamped underneath the lower bearing support bracket. They are interchangeable except for the following:

DRIVE BUSHINGS

The two motors do not have the same diameter shafts, the spring bushings are also different. The Wincharger motor uses a 80-453 bushing for 60 cycle AC and a 80-452 for 50 cycles. The GI motor (141-94) uses a 80-549 bushing for 60 cycle AC and 80-543 bushing for 50 cycles.

LOOSE DRIVE BUSHING

If the spring drive bushing runs partially off the motor shaft and scrapes the turn-table, apply a thin coat of speaker cement on the motor shaft and reinstall the bushing. Be very careful to wipe off all excess cement otherwise a rough surface may be formed which could cause rumble.

CHANGE IN TRIP MECHANISM

The trip pawl and spring has been removed from latest production changers. The position trip is now used on all production of Models S-11468 and S-11680 changers.

S11680 AND S11468 RECORD CHANGERS

ENLARGEMENT OF RECORD CENTER HOLES

Excessive center hole wear on records is caused by a sharp edge or burrs on the spindle shelf. The edge of the record shelf must be perfectly smooth and slightly rounded. Check the edge, and if sharp, smooth out with fine sandpaper.

CHASSIS 4C21 MODEL S12600 RECORD DEMONSTRATOR

REMOVING THE TURNTABLE

Take out the spindle by prying underneath its flange with a wide, sharp edge screwdriver. When the spindle is removed, insert a punch in the hole and while prying up on the turntable with the fingers, tap the punch until the turntable slips off.

TO DECREASE BASS BOOST

Replace capacitor C7, .02 Mfd. in series with R8, with a .04 Mfd. 200 volt capacitor and take out capacitor C8 (.002 Mfd. 6SC7 plate to ground.)

CHASSIS 5C01, 5C02 AND 5C04 - 5D0 AND 5R0 SERIES

TUBE COMPLEMENT

Alternate tubes used in 5C01 chassis. A single chassis may contain octal, lock-in and miniature button tubes.

<u>Original</u>	<u>Alternate</u>	<u>Alternate</u>
12SA7GT	12BE6	14Q7
35Z5GT	35W4	
12SK7	12BA6	
12SQ7	12AT6	
50L6GT	50B5	

OSCILLATOR SHIFTS

Replace R8 (220 ohms) with a 1,000 ohm resistor.

OSCILLATOR DROPS OUT AT LOW END OF BAND

Remove resistor R1 from common return and connect to cathode of converter.

AUDIO OSCILLATION

Disconnect C13 from the negative return and connect to the cathode of 50L6GT output tube. Take out C20 (plate of 50L6GT to cathode).

ALUMINUM CHASSIS

The letter "V" (5C01V) after a chassis number indicates that an aluminum chassis is used.

HUM AND MICROPHONICS

Check for a grounded tuning capacitor frame to the cabinet ventilator plate.

CHASSIS 6C01 - 6D0 SERIES

TUBE COMPLEMENT

There will be variations in the tube line-up for different 6C01 chassis. A single chassis may contain octal, lockin and miniature button tubes. If an original tube is replaced with an alternate, the socket must also be replaced.

<u>Original</u>	<u>Alternate</u>
35Z5G/GT	35W4
12SQ7GT	12AT6

LOW PITCH HUM

When replacing speakers, use a speaker with the same code letter (49U, AG etc.) as the original. If a speaker with a different code is used, R10 (feedback resistor) may have to be changed. With 49U, H or AG speakers, R10 is 390,000 ohms. When using a 49CS549 speaker, R10 must be 680,000 ohms. R10 is 330,000 ohms for all other speakers.

HOWL

Change Microphonic 14C7 tube.

OSCILLATION, HUM AND POOR SENSITIVITY

Check for grounded tuning capacitor frame. Correct by inserting a rubber pad between the capacitor frame and chassis. Cement in place.

6C05 CHASSIS - 6D0 SERIES

TUBE COMPLEMENT

There will be variations in the tube line-up for different 6C05 chassis. A single chassis may contain octal, lock-in and miniature button tubes.

If an original tube is replaced with an alternate, the socket must also be replaced.

<u>Original</u>	<u>Alternate</u>	<u>Alternate</u>
12SJ7GT		
12SA7GT	12BE6	14Q7
12BA6		
12SQ7GT	12AT6	
35L6GT		
35Z5GT	35W4	

OSCILLATOR SHIFTS

Replace R3 (220 ohms) with a 1000 ohm resistor.

OSCILLATOR DROPS OUT AT LOW END OF BAND

Disconnect R1 (10,000 ohms) from negative return and connect to cathode of converter.

AUDIO OSCILLATION

Disconnect C14 from the negative return and connect to the cathode of the 35L6GT. Take out C21 (plate to cathode 35L6GT).

OSCILLATION AT 910 KC

Change C5 (negative return to chassis) from .05 to .1 MFD.

OSCILLATION, HUM, POOR SENSITIVITY

Check for grounded tuning capacitor frame. Correct by inserting cork or rubber pad between rear capacitor frame and chassis. Cement in place.

ALUMINUM CHASSIS

The letter V (6C05V) indicates an aluminum chassis is used.

CHASSIS 6C40 - 8C40 - 8G001 - 8G005 MODEL

POWER TUBE FAILURE

The ON-OFF switch must be in the OFF position whenever the line plug is inserted into the changeover switch on the rear of the chassis. Failure to do this may cause flashing and possible burn-out of the output tubes.

CUTS OUT

Wavemagnet snap connectors sprung, causing a poor contact. Poor wavemagnet contact through the cabinet hinge.

CABINET CHANGE

The letter X after the model number (6G001YX, 8G005YX) indicates that an aluminum cabinet is used.

CHASSIS 8C01 MODELS 8H023-34

CHASSIS 8C20-8C21 MODELS 8H0-9H0 SERIES

CHASSIS 11C21-11C212 MODELS 12H0 SERIES

NOISY

Rushing noise when volume control is turned to minimum is caused by a poor connection from the grid element to grid cap of the 6S8GT tube. A hot iron and a little flux on the grid cap will remove the high resistance solder joint.

FM OSCILLATOR DRIFTS

Check for a red dot on the oscillator tuning slug wire. If the wire is unmarked, replace with one which has a red dot.

CHASSIS 8C01 MODELS 8H023-34

FLUTTERS ON FM

Installing a 22-1635 20 MFD-150V condenser and two quarter watt resistors, 63-583 1000 ohm and 63.600 2.2 Meg, will eliminate the flutter, see drawing.

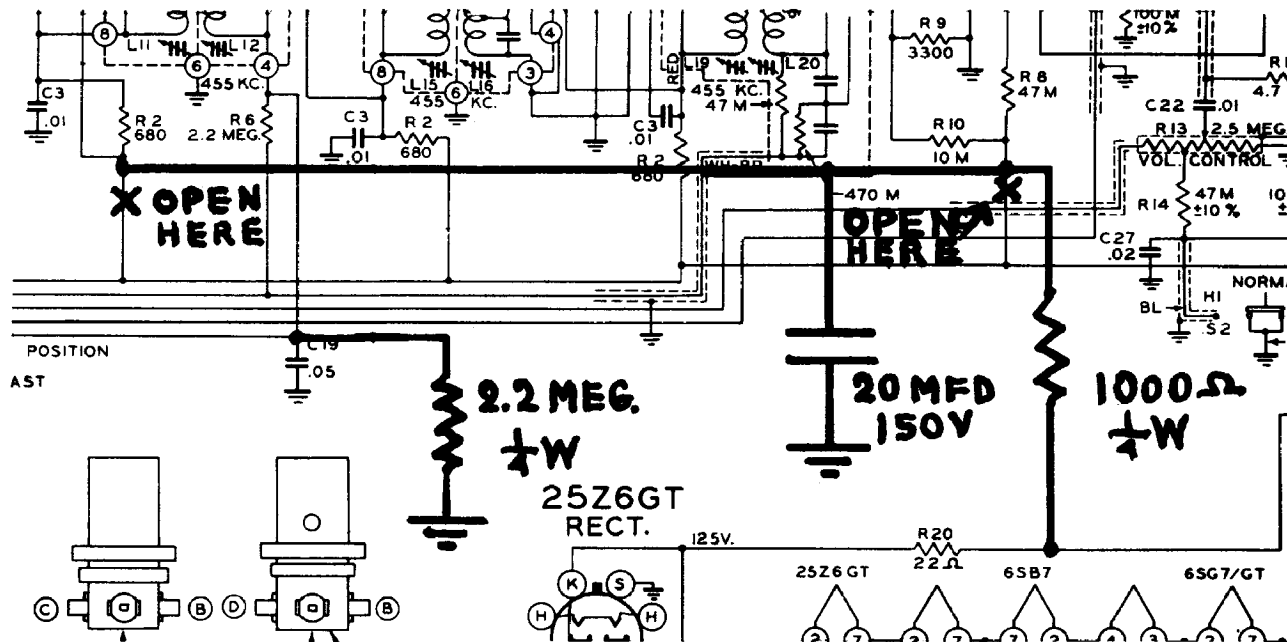


Fig. 3



HOUSEHOLD RECEIVER SERVICE BULLETIN NUMBER 3

AUTOMATIC RECORD CHANGER

MODELS S-11468 and S-11680

CHASSIS No. 4C21, 5C02, 5C04, 5C40, 5C40Z, 5C40ZZ

6C05, 6C05Z, 6C22, 6C22Z, 6C22ZZ, 6C40, 6C40Z, 6C41, 6C41Z,

8C01, 8C20, 8C21, 11C21, 11C21Z

ZENITH RADIO CORPORATION
CHICAGO, U. S. A.

HOUSEHOLD SERVICE BULLETIN NO. 3
S11468 AND S11680 RECORD CHANGERS

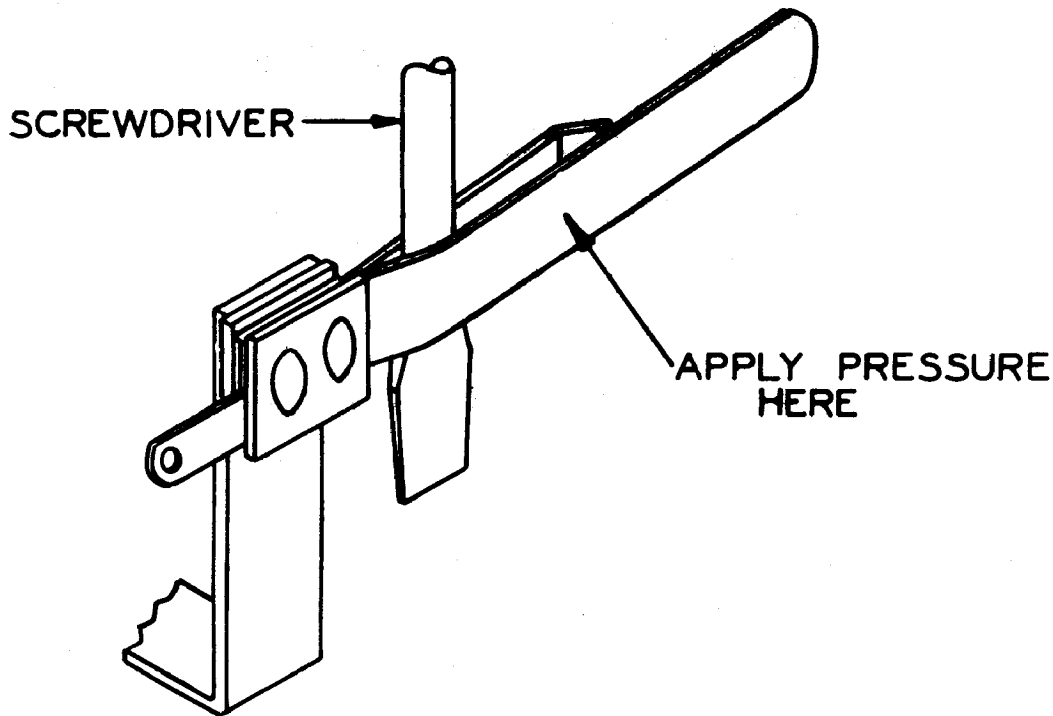
MOTORS FOR 60 CYCLE 117 VOLT AC OPERATION

Motor Part No. 141-104 is now used on the S11468 record changer. The model S11680 record changer uses Motor Part No. 141-105. These motors are alike except for the lead lengths and may be used to replace the earlier 141-92 and 141-94 motors.

MOTORS FOR 50 CYCLE 117-130 VOLT AC OPERATION

Motor Part No. 141-103 is designed for 50 cycle AC operation and can be used to replace the earlier motor types 141-92 and 141-94. Record changers with the 141-92 motors may be operated on 50 cycle AC by inserting a 30 ohm 20 watt resistor in series with the field and replacing the spring drive bushing. Motor Part No. 141-94 may be used on 50 cycle AC by changing the spring drive bushing.

tone arm fails to follow the oscillating groove on manual and jumps at the beginning of the change cycle caused by too much tension on the cycling switch spring contact.



Insert a screwdriver between the contact and guide springs and bend the contact spring so that an approximate pressure of one ounce is necessary to move the contact spring from the guide spring. Be certain that the contact spring exerts some pressure on the guide spring after adjustment.

RUMBLE AND MICROPHONICS

Check the idler wheel for a "bump" and replace if necessary.

CHASSIS 4C21 - MODEL S12600

The high frequency tonal range of early production Cobra Demonstrators may be extended by incorporating the change indicated by the schematic and pictorial diagrams. All later releases have this change.

RUSHING AND CRACKLING NOISE

The rushing and crackling noise may be caused by the break-down of the 50 MMF silver mica capacitor (C1) in the plate circuit of the oscillator. Replace capacitor.

CHASSIS 5C02-5C04 MODELS 5R080-5R086

OSCILLATOR DROPS OUT ON LOW END OF BAND

Replace the oscillator coil.

UNCONTROLLED OSCILLATION

Connect a 470,000 ohm resistor across the secondary of the 1st IF transformer.

CHASSIS 5C40-5C40Z-5C40ZZ MODELS 5G003-5G003Z-5G003ZZ

DIFFERENCES IN 5C40, 5C40Z AND 5C40ZZ CHASSIS

Chassis 5C40Z is similar to the 5C40 chassis except that a selenium rectifier is used in place of the 117Z3.

Chassis 5C40ZZ is similar to the 5C40Z except for changes in the oscillator coil, gang capacitor and wavemagnet. Chassis 5C40ZZ uses a S13765 oscillator coil, 22-1653 two section gang and a S13767 cabinet back and wavemagnet assembly.

CHASSIS 6C05-6C05Z MODELS 6D015-6D030-6D015 -6D030Z

OSCILLATOR DROPS OUT ON LOW END OF BAND

Replace oscillator coil.

CHASSIS 6C22-6C22Z-6C22ZZ MODELS 6R087-6R087Z-6R087ZZ

DIFFERENCES IN 6C22, 6C22Z AND 6C22ZZ CHASSIS

The 6C22Z chassis is similar to the 6C22 except for the resistive capacitive filter and PM speaker. The 6C22ZZ chassis is similar to the 6C22Z except for differences in the wavemagnet, tuning gang and oscillator coil.

CHASSIS 6C40-6C40Z MODELS 6G001-6G001Z

INSUFFICIENT POWER OUTPUT

To improve power output, replace R17 (870 ohm WW resistor) with 820 ohms.

CHASSIS 6C41-6C41Z MODELS 6G004Y-6G004YZ

INSUFFICIENT POWER OUTPUT

To improve power output, replace R11 (870 ohm WW resistor) with 820 ohms.

CHASSIS 8C01 MODELS 8H023-8H034

OSCILLATOR SHIFTS ON 45 MC FM

Replace the 22-1571 oscillator trimmer with 22-1646 and connect a 22-1509 ceramic capacitor in parallel with 22-1646.

MODULATION HUM AND DISTORTION

To eliminate modulation hum and distortion disconnect R22 (the 1000 ohm resistor connected to the rectifier side of the speaker field - yellow lead) and reconnect to the opposite end (black lead) of the field. Check capacity of C23.

140 MC AMATEUR INTERFERENCE

Connect a 500 MMFD capacitor from each leg of the 6S8GT filament to chassis and another from grid to chassis.

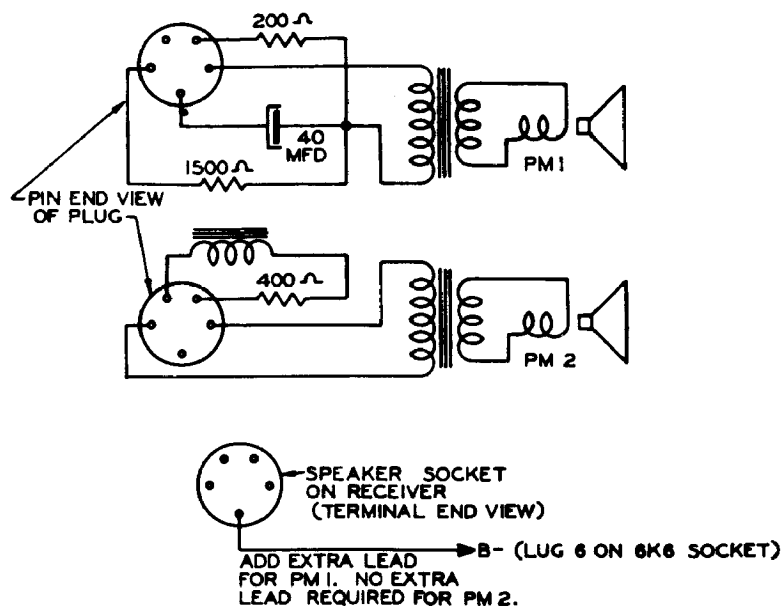
CHASSIS 8C20-8C21 MODELS 8H0-9H0 SERIES

OVERLOADING AND DISTORTION ON STRONG LOCAL SIGNALS

1. Connect pin 7 of the 6AG5 socket to chassis.
2. Replace R1 with 33,000 ohms.
3. Replace R17 with 22 ohms.
4. Replace the 6AG5 tube with a 6BA6.

PM SPEAKERS 8H0 AND 9H0 SERIES

Some of the earlier 8C20-21 chassis are wired for electro dynamic speakers only. Later production sets are wired for either electro dynamic or PM speakers which have the filter unit attached to the speaker frame. These chassis are identified by a spot of black paint on or near the speaker socket. To use the PM speakers on the earlier sets, it will be necessary to run a lead from B- (Center Tap of high voltage winding) to a lug on the speaker socket which connects to the negative side of the filter on the speaker.



140 MC AMATEUR INTERFERENCE

Connect a 500 MMFD capacitor from the grid of the 6S8GT tube to ground.

RESIDUAL HUM

Connect a .002 MFD capacitor from the transformer side of the line antenna choke to ground.

OSCILLATOR SHIFTS ON 45 MC FM

Replace the 22-1571 oscillator trimmer with 22-1646 and connect a 22-1509 ceramic capacitor in parallel with 22-1646.

RUSHING, CRACKLING NOISE ON BROADCAST BAND

Replace the 10 MMFD ceramic capacitor C27.

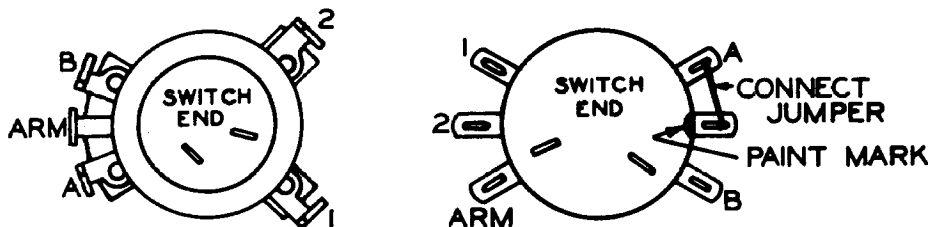
RUSHING AND CRACKLING NOISE ON PHONO (8C21 CHASSIS)

Replace the 50 MMFD capacitor in the plate circuit of the phono pre-amplifier (pin 6, 7F7 socket).

CODING ON THE 63-1466 AND 63-1349 VOLUME CONTROLS

The 63-1466 volume control used on the 8C20 and 8C21 chassis, has the code letter Y or EX stamped after the part number. Electrically the Y and EX controls are identical while physically they differ in the placement of the connecting lugs. To interchange these controls, follow the below diagrams and be certain that the numbers and letters match (A to A, 1 to 1 etc.). The Y control has an extra lug which connects to the internal shield. This lug is marked with a yellow paint mark and must be connected to lug A.

The above also applies to the 63-1349 volume control which is used in the 11C21 chassis.



CHASSIS 11C21-11C21Z
MODELS 12H0-12H0Z SERIES

OVERLOADING AND DISTORTION ON STRONG LOCAL SIGNALS

1. Connect pin 2 of the 6AG5 socket to chassis.
2. Replace R3 with a 33,000 ohm resistor.
3. Replace the 6AG5 tube with a 6BA6.

RESIDUAL HUM

1. Check the 6J5GT tube.
2. Connect a .002 MFD capacitor from the transformer end of the line antenna choke to chassis.

RUSHING AND CRACKLING NOISE ON PHONO

Replace the 50 MMFD capacitor in the plate circuit of the phono pre-amplifier (pin 6, 7F7 socket).

140 MC AMATEUR INTERFERENCE ON RADIO AND PHONO

Connect a 500 MMFD capacitor from the grid of the 6S8GT tube to chassis.

POOR SENSITIVITY ON THE BROADCAST BAND

Check the wavemagnet. The paint mark on the wavemagnet must match the mark on the chassis. Replace with wavemagnet of proper inductance.



HOUSEHOLD RECEIVER SERVICE BULLETIN NUMBER 4

RECORD CHANGER MODELS S13675, S14001, S14002, S14006 and S14008.

CHASSIS No. 4E41, 5C40, 5C50, 6E02, 7E01, 8C21, 8C40,
9E21, 11C21 and 13D22.

ZENITH RADIO CORPORATION
CHICAGO, U. S. A.

HOUSEHOLD SERVICE BULLETIN NO. 4

RECORD CHANGERS

S 13675, S 14001, S 14002, S 14006, S 14008

NOISY DURING CYCLE

Remove the 10,000 ohm resistor from the trip switch and replace with 63-1744 100 ohm $\frac{1}{2}$ watt carbon resistor.

RECORD CENTER HOLE WEAR

A bent spindle impedes record ejection and causes center Hole wear. The position of the spindle may be checked with a 10" record as shown. A properly centered spindle will form a triangle with the outer tips of the record shelf plate.



MODEL S 14001 SPINDLE RATTLES

Add a 93-901 spring washer underneath the spindle retaining ring.

CHASSIS 4E41 MODEL 4G800

DISTORTION

On some 4E41 chassis a 63-1583 candohm (R19 and R20) was used. A 2500 ohm resistor was paralleled with R20 to give the proper filament distribution. If the 2500 ohm resistor is omitted, the filament voltage will be low and distortion will result. All later production receivers use the 63-1647 candohm. If the 63-1583 candohm is replaced with 63-1647, the parallel resistor must be omitted or the filament voltage will become dangerously high.

CABINET SCRATCHES

Cabinet scratches may be removed by applying Simoniz Cleaner with a cheesecloth pad. The cleaner is applied with a circular motion.

SWOLLEN OR LEAKING BATTERIES

It is common knowledge that a dry battery may leak or swell when subjected to extreme service conditions. A direct "short" across the battery circuit in a receiver, or a receiver in which the battery switch has been left on for a continuously long period, completely exhausting the batteries, may cause this condition. This is particularly true with "A" batteries.

CHASSIS 5C40 MODEL 5G003

CABINET SCRATCHES

Apply Simoniz Cleaner with a cheesecloth pad. Rub with a circular motion.

CHASSIS 5C50 MODEL 5K037

OSCILLATOR STOPS

Replace the 63-581 470 ohm $\frac{1}{2}$ watt resistor with a 63-1786 1000 ohm $\frac{1}{2}$ watt resistor.

CHASSIS 6E02 MODEL 6R886

HISSING AND FRYING NOISE ON PHONO

Replace the 50 MMFD capacitor in the phono oscillator plate circuit with a 22-1664 50 MMFD ceramic capacitor.

PHONO DEAD

Check the 6C4 phono oscillator tube. The filament of this tube can collapse and still complete the filament circuit.

CHASSIS 7E01
MODEL 7H820

PILOT LIGHT HEATS CABINET

Apply a 2" width of Minnesota Mining Aluminum Foil to the front inside of the cabinet in front of the pilot light. The foil should also be applied to the inside top directly above the pilot light and extending to the rear of the cabinet. The aluminum foil will reflect the heat to the rear of the cabinet.

FRYING AND CRACKLING NOISE

A noise similar to atmospherics has been traced to the 110 volt pilot light. Replace.

CHASSIS 8C21
MODELS 9H079, 9H082, 9H085 AND 9H088.

PHONO DEAD OR CUTS OUT

Increase in resistance of the phono pre-amplifier 470,000 ohm plate resistor under load. Replace.

HISSING AND FRYING NOISE ON PHONO

Replace the 50 MMFD capacitor in the phono oscillator plate circuit with a 22-1664 50 MMFD ceramic capacitor.

CHASSIS 8C40T
MODEL 8G005

DISTORTION AND LOW AUDIO OUTPUT

Increase in resistance of the 4.7 megohm 1LD5 screen resistor under load. Replace.

DIFFERENCES BETWEEN 8C40T, 8C40TZ AND 8C40TZ1

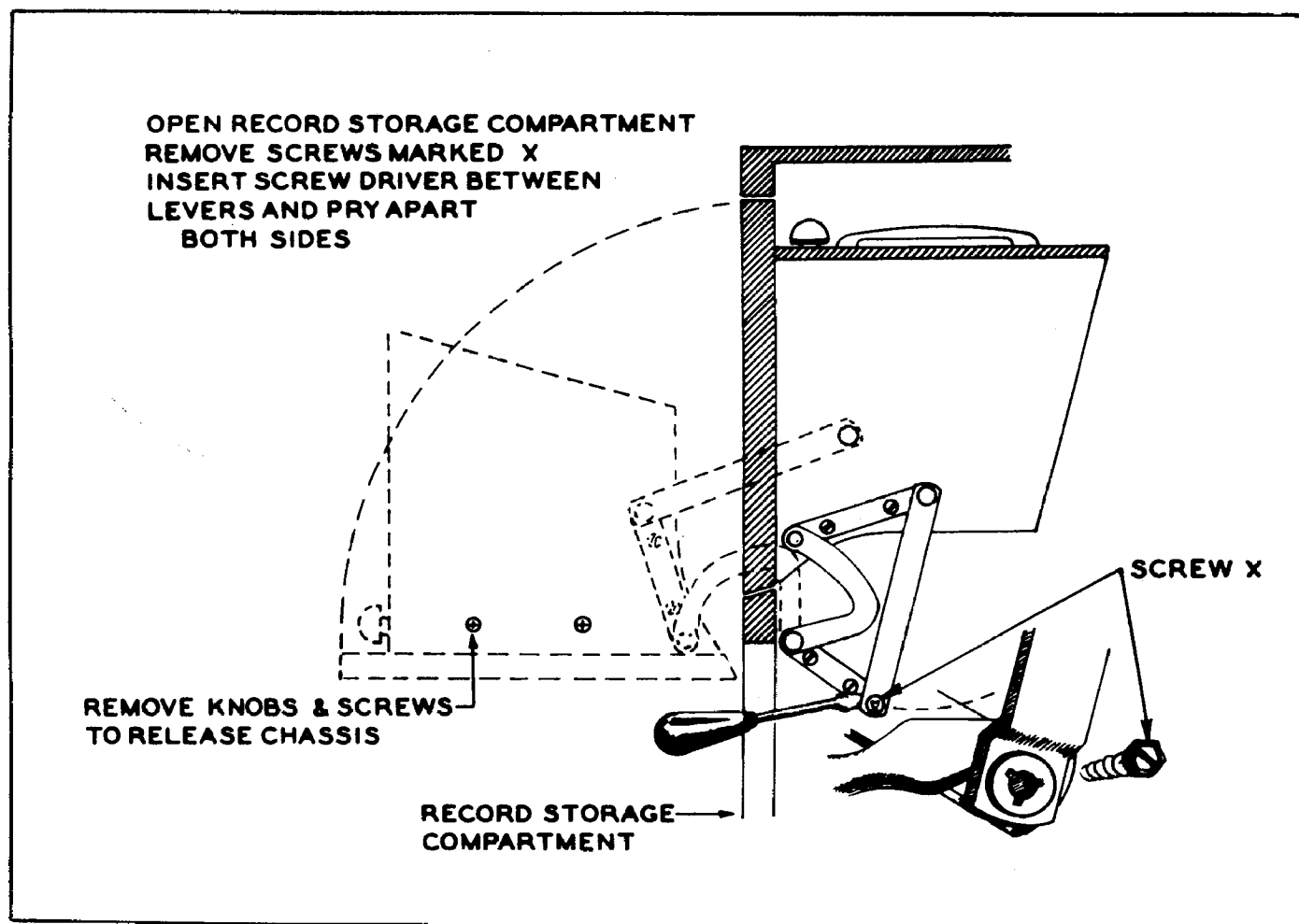
Chassis 8C40TZ has a change in band switch and coils. Chassis 8C40TZ1 has the new band switch plus a change in tube line-up. The 117Z6 has been replaced by a 117Z3 and the converter tube changed from 1LC6 to 1LA6. When checking these receivers be sure to use the correct schematic.

CHASSIS 9E21
MODELS 9H881, 9H885, 9H888.

RADIORGAN

Heretofore the LO BASS and TREBLE Radiorgan buttons were effective when pulled out. The Radiorgan on Models 9H881, 9H885, and 9H888 is different in that these buttons are effective when DEPRESSED. Starting with all the buttons up, the degree of bass is increased by first depressing LO BASS, then VOICE and then NORMAL. With all these buttons depressed, the greatest degree of bass is reproduced. Conversely the degree of TREBLE is increased by starting with all the buttons up and depressing TREBLE, then BASS and then ALTO. With these three buttons depressed the greatest degree of brightness is attained. It is from this basic analysis of Radiorgan action that all the other combinations of tone are made.

CABINETS



Except for the first release of models 9H885 and 9H888, these models will have collapsible hinges to facilitate removal of the chassis from the front of the cabinet. To remove the chassis, open the record storage compartment and take out the two screws marked "X". Insert a screwdriver between the two plates as shown and pry apart. The bin will come forward and the chassis can be easily removed. These models also have a cinch cap which may be removed for RF trimmer adjustments while the chassis is mounted in the cabinet.

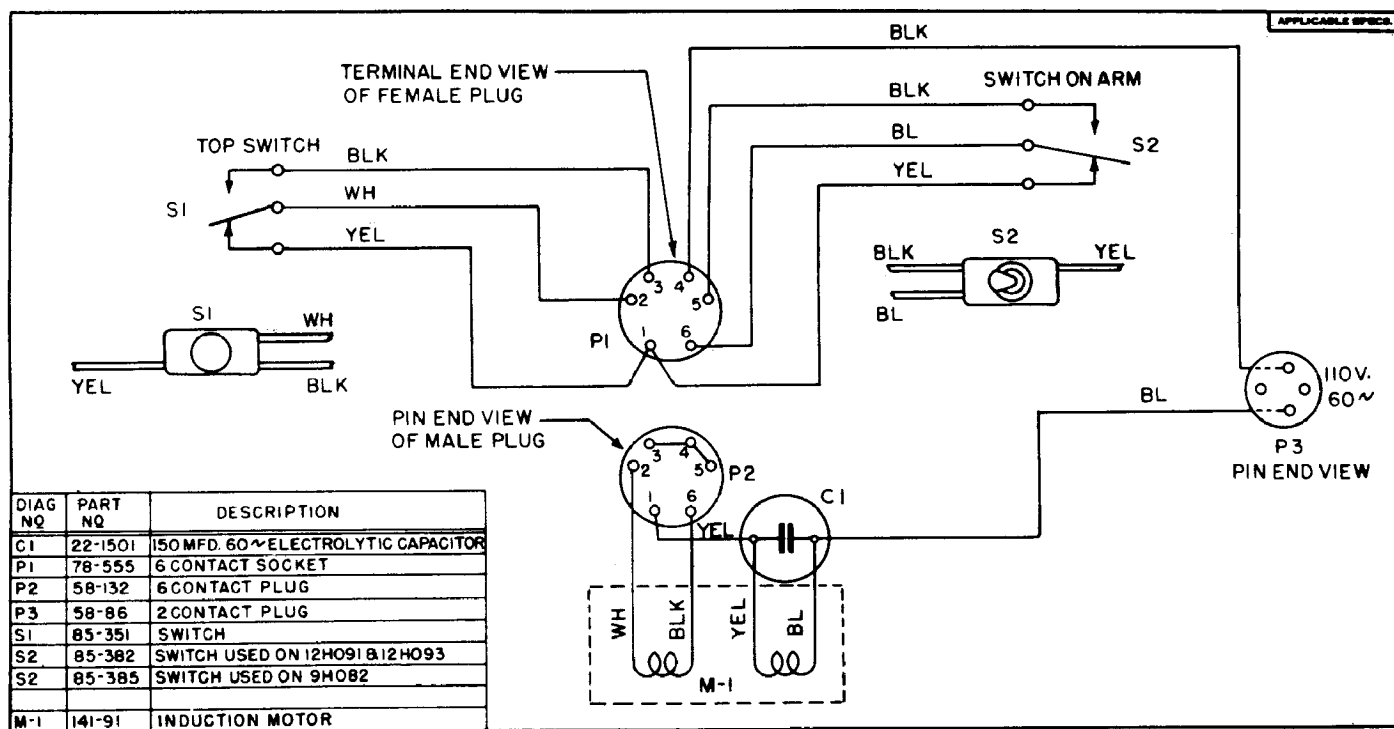
CHASSIS 11C21 - 11C21Z MODELS 12H090, 12H091, 12H092, 12H093, 12H094.

PHONO DEAD OR CUTS OUT

Increase in resistance of the 470,000 ohm phono pre-amplifier plate resistor under load. Replace.

HISSING AND FRYING NOISE ON PHONO

Replace the 50 MMFD capacitor in the phono oscillator plate circuit with a 22-1664 50 MMFD ceramic capacitor.



MODELS 9H082, 12H091 AND 12H093 SWITCH AND MOTOR DRIVE-OUT CIRCUIT
CHASSIS 13D22 MODEL 14H789

DISTORTION AND OVERHEATING OF 6V6GT TUBES

Check the grid resistors in the audio power supply chassis. The two resistors connected to the 6J5GT inverter grid (pin 5) should be 63-1848 33M (was 47M) and 63-1880 180M (was 330) ohms. The resistor on the grid side of the 6J5GT plate coupling capacitor should be 63-1883 220M (was 470M) ohms.

APPLYING DI-NOC AND MEYERCORD PHOTOSTAT TRANSFERS

To simplify application of transfers to cabinets, we suggest that you proceed as follows:

1. Do not try to make application on bare wood. Be sure that the surface to be repaired is smooth and free from wax or polish. Fill in dents and scratches with stick shellac, and resurface with lacquer.
2. Immerse the transfers in water until the backing is loosened. Strip the paper backing from the transfer.
3. Apply the water soaked transfer to the cabinet area to be covered, move it around into position. Keep the transfer wet with water during this operation.
4. When the transfer is in the exact position to be covered, sponge off the excessive water.
5. Lift and fold over half of the transfer, and apply welding solution to the surface of the cabinet uncovered, lay the transfer back into position and squeegee out the air bubbles, and the excessive welding solution. Repeat the operation on the other half of the transfer to be welded to the surface.

Welding a portion of the transfer to the cabinet at one time simplifies the application. To remove small air bubbles from under the transfer that cannot be squeegeed out, puncture the bubble with a pin, or the sharp edge of a razor blade. Overlapping edges of the transfer can be removed by scraping the edge of the panel with a razor blade or sandpaper. Remove excess solution with damp cloth and dry face of cabinet.

CLEANING DIAL CRYSTALS

Remove the dial crystal and clean with Parkers Perfect Polish. The polish neutralizes static charges, which attract dust particles.

Your ideas and suggestions are of great assistance in compiling these Service Bulletins. Please continue to write us whenever you have something of interest.



HOUSEHOLD RECEIVER SERVICE BULLETIN NUMBER 5

CHASSIS NO. 4E41, 6E02, 6E02Z, 6E40, 7E01, 7E01Z,
7E02Z, 7E22, 8E20, 9E21, and 9E21Z.

ZENITH RADIO CORPORATION
CHICAGO, U. S. A.

HOUSEHOLD SERVICE BULLETIN NO.5

MODEL 4G800
CHASSIS 4E41

BATTERY DRAIN

The On-Off switch #85-433 does not completely break contact on some receivers when the lid is closed. To correct this condition, saw one plastic switch knob 46-736 into $1/16$ " lengths and place one on switch shaft as illustrated. This will force switch down far enough to break contact and disconnect the batteries when the receiver is not in use. See Fig. 1.

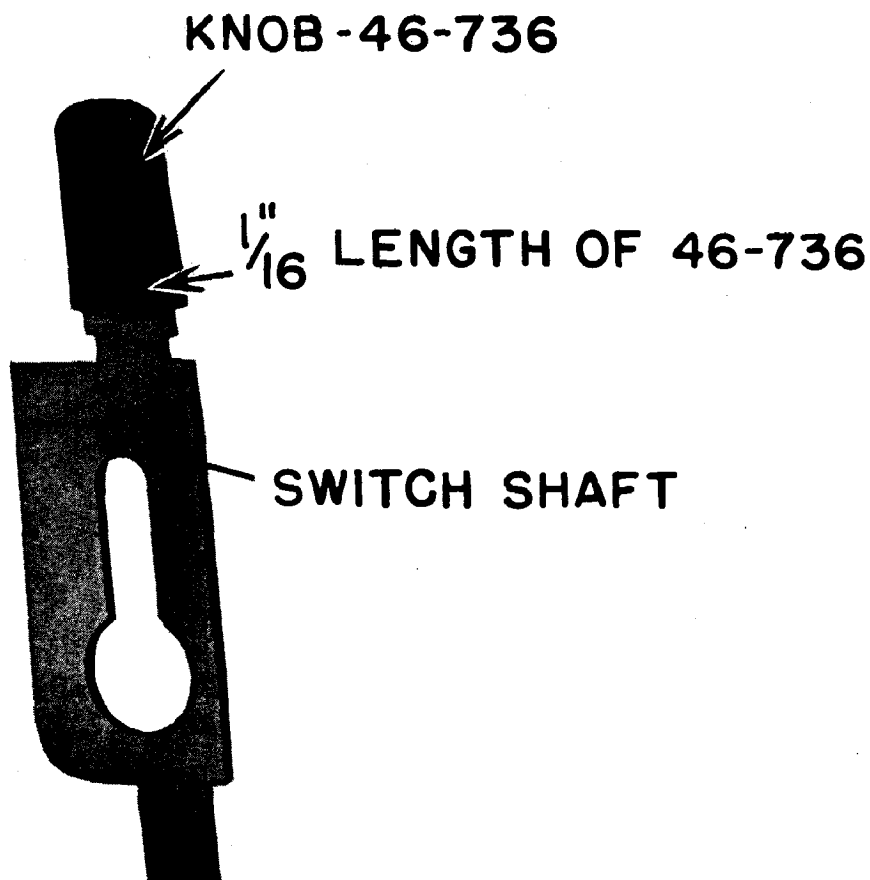


Fig. 1 On-Off Switch Showing Knob Extension Section

HUM

In some cases the calibration pointer touches the metal front of the cabinet, thus putting the gang at an AC potential. To correct this condition place a fibre washer #93-323 between the pointer and the metal dial front. This fibre washer between the metal front panel and the dial pointer, completely prevents this "shorting" condition. See Fig. 2.

In very rare cases, when hum is encountered and cannot be corrected in any other manner, we suggest changing the 1S5 tube. Sometimes this tube breaks down internally and hum results.

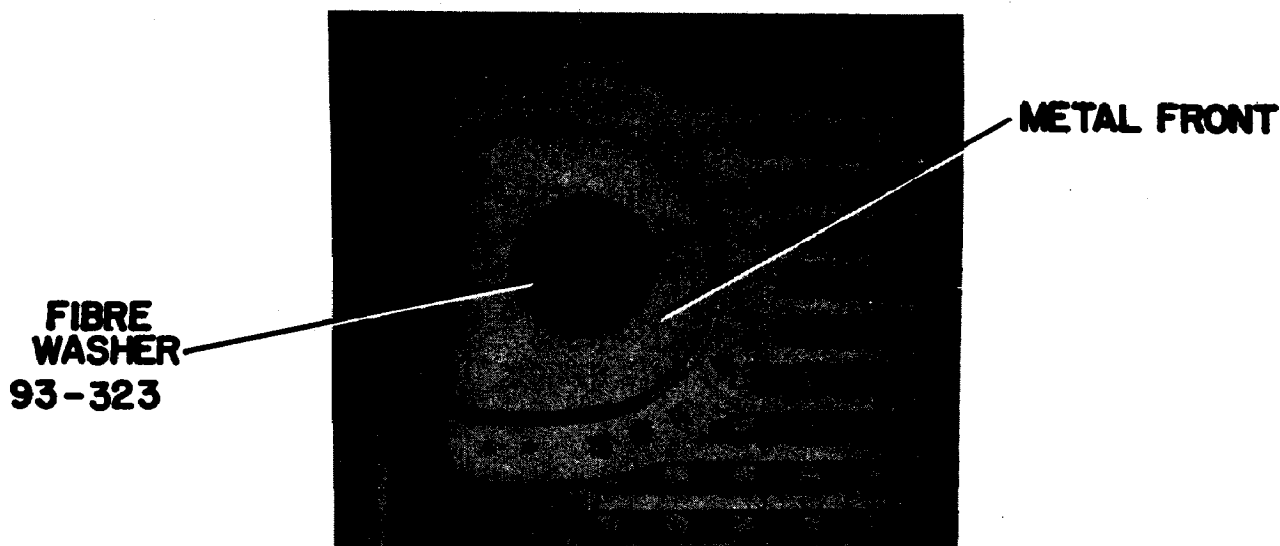


Fig. 2 Position of Insulating Washer

TUBE COMPLEMENT

On later runs the 3Q4 tube was replaced with a 3V4 tube. The circuit remains the same in this case. However, the wiring to the tube base has been altered. The 3Q4 is not interchangeable with the 3V4 because of socket connections.

CUTOUT

In some cases when the front lid of the receiver is open, the receiver will cut in and out or sometimes be entirely dead. The wire from the wavemagnet to the front door hinge may break at the hinge connection. To correct this condition, remove the handle and resolder these leads, being quite certain that solder is not allowed to run back on the antenna lead and that enough extra antenna lead is allowed for flexing to prevent breakage when the door is open. See Fig. 3.

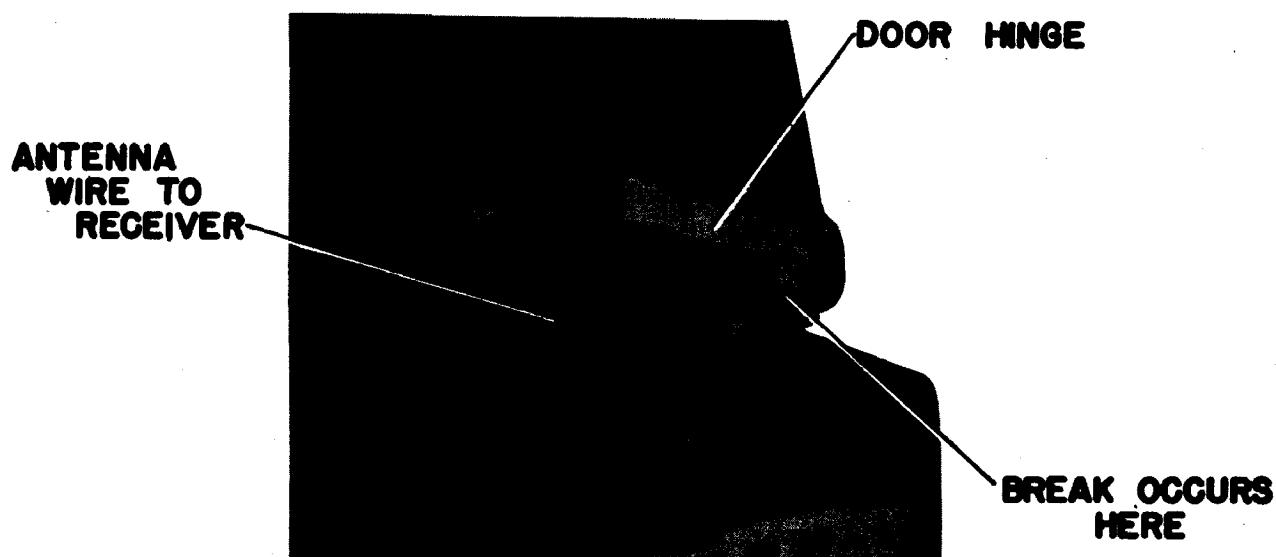


Fig. 3 Wavemagnet Hinge Connection

**MODEL 6R886
CHASSIS 6E02**

MICROPHONICS

In some cases when microphonics are encountered, replacing of the 6C4 mounted at the top of the chassis, alleviates this condition. The 6C4 is easily made accessible by removing the screen in the record changer compartment.

**MODEL 6R886Z
CHASSIS 6E02Z**

CIRCUIT CHANGE

In later runs of the 6E02, a tone control was added and the chassis number became 6E02Z. The additions and deletions to the circuit due to this tone control addition are all included in the diagram contained herein. See Fig. 9.

**ADDED PARTS LIST
FOR THE 6E02Z.**

<u>Part No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Description</u>
S-14667	Dial Pointer & Pulley Assy.	63-1653	Tone Control
S 14670	Tone Control Brkt & Lug Assy.	78-793	Socket-Octal Tube
12-1490	Cover Plate Support	85-438	Phono-Radio Switch
22-827	.1 MFD. 200 V.	125-66	Rubber Grommet
46-688	Tone Control Knob	166-41	Rubber Bumper
57-1398	Escutcheon	188-34	Retaining Ring

**MODEL 6G801
CHASSIS 6E40**

MICROPHONICS

In some cases when microphonics are encountered in this receiver they can be eliminated by replacing one or more of the tubes. The offending tube can be located by turning your set on with the volume advanced and the set tuned to an off-station position. Then gently tap each tube, the one that emits the loudest "ping" is the defective item.

**MODEL 7H820
CHASSIS 7E01**

COMPONENT CHANGES

On some of the later run 7E01 chassis, the wax by-pass condensers were replaced with molded condensers. In case any of these molded condensers are required, their part numbers are as follows: 22-1778 .047 Mfd. 200 volt molded condenser - 22-1750 .022 Mfd. 600 volt molded condenser - 22-1754 .0022 Mfd. 600 volt molded condenser - 22-1809 .01 Mfd. 200 volt molded condenser - 22-1810 .1 Mfd. 200 volt molded condenser - 22-1811 .0047 Mfd. 400 volt molded condenser.

**MODEL 7H820Z
CHASSIS 7E01Z**

BAND COVERAGE

On the 7E01Z the 45 megacycle FM band has been removed. The receiver now has the broadcast band and the 100 megacycle FM band only. The new schematic and parts list contained herein, give a complete explanation as to its operation. Balancing procedure is the same as for the 7E01. However, the procedure for balancing the 45 megacycle band is omitted. See Fig. 6 for circuit diagram.

**ADDED PARTS LIST
FOR THE 7E01Z**

<u>Part No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Description</u>
22-1775	.047 MFD. 400 V.	83-1545	Insulating Strip
22-1778	.047 MFD. 200 V.	85-443	Bandswitch
22-1809	.01 MFD. 200 V.	93-690	Felt Washer
22-1810	.1 MFD. 200 V.	93-719	.031 x 3/16" x 7/16"
22-1811	.0047 MFD. 400 V.		Steel Washer
22-1813	.022 MFD. 600 V.	93-961	Ins. Shoulder Washer
22-1814	.0022 MFD. 600 V.	114-160	6x7/8" Hex. Hd. S. T. Screw
58-128	Two Prong Plug	114-277	8-32x9/16" Hex. Hd. M. S.
74-52	Plastic Speaker Screen	202-671	Instruction Book

**MODEL 7H822Z
CHASSIS 7E02Z**

CIRCUIT CHANGE

On the 7E02Z receiver a tone control has been added and a neon bulb on-off indicator. Fig. 7 shows all circuit additions and deletions and the added parts list shows all the new components included in this receiver.

**ADDED PARTS LIST
FOR CHASSIS 7E02Z**

<u>Part No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Description</u>
12-1546	Indicator Socket Brkt.	63-1884	220K Ohm Ins. Res. 20% 1/2 W.
14-857	Model 822Z Plastic Cab.	63-2008	Tone Control
14-858	Model 822WZ Plastic Cab.	78-585	Indicator Socket
22-1025	.15 MFD. 200 V.	80-402	Dial Cord Tension Spring
22-1511	50 MMFD. Ceramic 500 V.	83-1593	Felt Strip (2 used)
26-419	Dial Scale	83-1595	Spacer Strip
46-769	Tuning & Vol. Con. Knob	93-961	Ins. Shoulder Washer
46-770	Band Switch Knob	100-105	Neon Indicator Bulb
46-780	Tone Control Knob	199-35	Dial Scale
46-781	Tone Control Knob	202-687	Instruction Book
63-1744	100 Ohm Ins. Res. 20% 1/2W.	S-15325	Cab. Back & Plug Cover Assy.

**MODEL 7R887
CHASSIS 7E22**

OSCILLATION

When replacing defective or burned out tubes in this receiver, care must be taken that the IF amplifier, 6SK7 be replaced only with another 6SK7. Use of 6SK7 GT or G will result in extreme oscillation which can be controlled only by the use of the 6SK7 metal tube.

**MODEL 8H832
CHASSIS 8E20**

SPEAKER REPLACEMENT

If replacement of one of the speakers is required, care should be taken when connecting the new speaker in the circuit so the speakers are properly phased. Whether or not the speakers are in phase can be determined by listening to the receiver. If the speakers are out of phase all bass notes will be absent and also distortion will be very dominant. This condition can be corrected by reversing the voice coil wires on the newly replaced speaker.

**MODEL 9H881-2-5-8
CHASSIS 9E21**

WEAK SIGNAL

If the C-4 .05 condenser in series with the wavemagnet is open, the signals will be weak and the addition of an external antenna will not appreciably improve signal strength. The replacing of this condenser with a new .05 usually clears up the trouble.

PHONO DEAD

Check resistor R-14, 10,000 ohm 1/2 watt for intermittent operation. Due to movement of the RF shelf when the band switch is operated, this resistor sometimes becomes intermittent thus opening up the phono circuit.

ALIGNMENT - CAUTION

In most cases it is not necessary to change or make any alterations in the IF or discriminator trimmers in this receiver. They are quite stable and the only change in alignment recommended is that of the RF section.

DIAL DRIVE BINDING

Be quite sure to dress the tone control wires away from the pulley and dial string. If these are not dressed away, binding and dial slipping will result.

STATIC WHEN TUNING

If, when tuning in a station, static is prevalent, check and see if the silver foil on the paper tube shield is tightly wrapped on the cardboard form. Sometimes this foil unwraps from the cardboard form and lays against the gang plates, creating this static.

CHASSIS 9E21Z

BAND COVERAGE

On the 9E21Z the 45 megacycle FM band has been removed. The receiver now has the broadcast band and the 100 megacycle FM band only. New circuit and parts list contained herein, give a complete explanation as to its operation. Balancing procedure is the same as for the 9E21, however, the procedure for balancing the 45 megacycle band can be omitted. See Fig. 8 for circuit diagram.

ADDED PARTS LIST FOR THE 9E21Z

<u>Part No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Description</u>
26-418	Dial Scale	85-447	Band Switch
93-721	Black Felt Washer	125-26	Rubber Grommet
S-15394	Dial Scale & Strip Assy.	112-533	6x1/4 Phill.R.H.S.T.Screw
22-1418	0.1 MFD. 200 V.	57-1471	Dial Escutcheon
22-1489	10 MMFD. (Ceramic)500V.	78-798	Seven Contact Socket
22-1505	17 MMFD. (Ceramic)500V.	80-423	Chassis Lift Spring
22-1884	2 Section Elect. 40 MFD. 350V-40MFD. 450 V.	83-1246	Record Changer Trim Strip
63-1198	10K Ohm Ins. Res. 10% 2W.	112-611	Record Changer Mtg. Screw
63-1911	1 Megohm Ins. Res. 10% 1/2W	159-61	Plug Button
63-1970	3300 Ohm Ins. Res.20% 2W.	196-109	Dial Dust Gasket
11-108	Line Cord & Plug	202-686	Instruction Book
57-1269	I.F. Trans. Terminal Plate	S-14009	Dual Spd.Intermixer Rec.Chgr.
		S-14306	Interconnecting Cable Assy.

POLISH FOR WOOD CABINETS

Zenith offers a perfect polish for all lacquer and varnish finishes and especially recommended for use where a high gloss finish is desired. Will not show fingerprints. Easy to apply. Adds long life and beauty to all furniture and woodwork.

ANTI-STATIC POLISH AND CLEANER FOR ALL PLASTICS

This Zenith product is particularly useful on plastic dial crystals because of its anti-static proper ties which prevent clouding and attraction of dust and dirt. Excellent for cleaning Microgroove (long play) and other high quality phonograph records.

ZENITH SCRATCH STICK

In cases where cabinets are accidentally scratched or marred, Zenith offers an easy to use scratch remover with built in dauber. Designed for use on walnut and dark finish cabinets.

INSTRUCTIONS FOR CONNECTING ANTENNA TRANSFORMER 95-1127 TO ZENITH RECEIVERS.

On receivers using normal high impedance wavemagnets, proceed as follows:

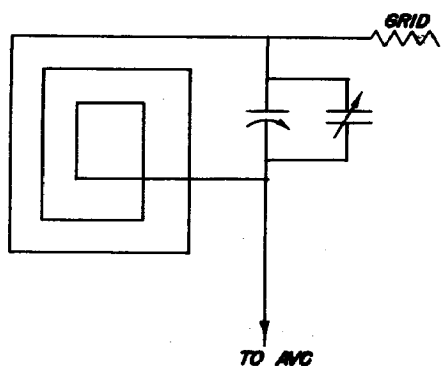
1. Disconnect the wavemagnet from the receiver.
2. Substitute the secondary of the antenna transformer at points where the wavemagnet connections were removed, green wire to grid connection and brown wire to AVC connection. (See Fig. 4)
3. Connect blue primary wire to an external antenna.
4. Connect black primary wire to a good external ground.
5. Align the antenna transformer by following the instructions outlined in the alignment procedure.

On receivers using a low impedance wavemagnet wherein a loading coil is in series with the wavemagnet, the connections are as follows:

1. Disconnect the wavemagnet.
2. Disconnect loading coil.
3. Remove 10-12 MMFD. gang shunt capacitor (this is necessary in order to resonate the 1400 Kc. trimmer in the antenna transformer).
4. Connect green wire from antenna transformer to the grid input side of the antenna section of the gang capacitor. (See Fig. 5)
5. Connect brown wire to AVC line and bypass it to ground with a .05 MFD. capacitor. (See Fig. 2)
6. Blue wire goes to an external antenna and black wire goes to ground.
7. Align the antenna transformer by following the instructions outlined in the alignment procedure.

ALIGNMENT PROCEDURE					
Operation	Connect Osc. To.	Input Sig. Frequency	Set Dial To	Procedure	Purpose
1	One turn loop loosely coupled to blue lead on ant. trans.	600 Kc.	600 Kc.	Adjust L1 to resonance	Align antenna transformer.
2		1400 Kc.	1400 Kc.	Adjust C1 to resonance	

NORMAL CIRCUIT USING HIGH IMPEDANCE WAVEMAGNET



MODIFIED CIRCUIT USING ANT TRANSFORMER

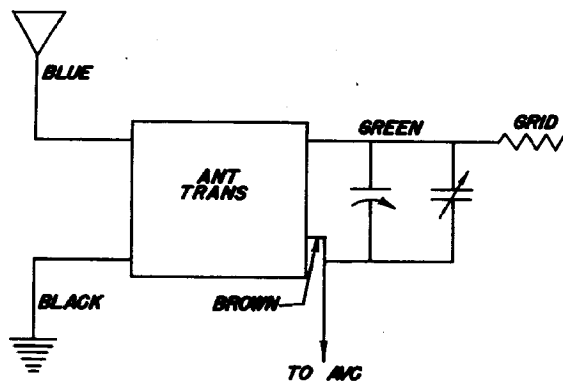
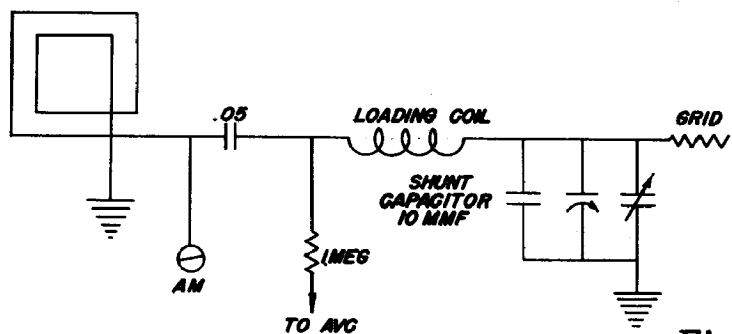


Fig. 4

NORMAL CIRCUIT USING LOW IMPEDANCE WAVEMAGNET



MODIFIED CIRCUIT USING ANT TRANSFORMER

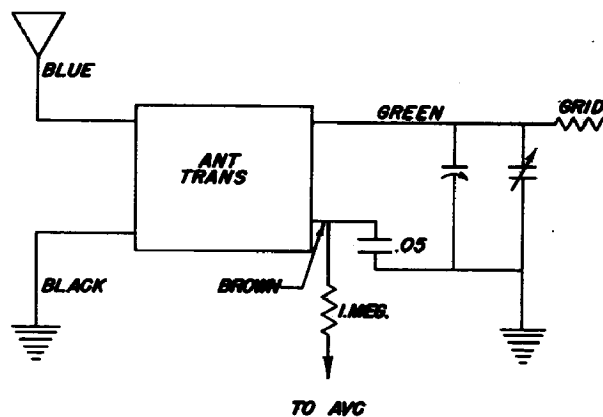
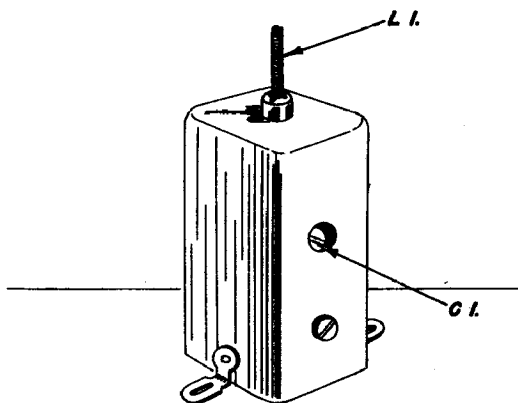


Fig. 5



**1946, 1947 and 1948 Zenith Radio Phonograph Combinations
and types of Record Changers used.**

<u>MODEL</u>	<u>RECORD CHANGERS</u>	<u>MODEL</u>	<u>RECORD CHANGERS</u>
S 12600	S 12650 (Player)	12H990LP	S 14010
5R080	S 11302 (Player)	12H091	S 11680
5R086	S 11468		S 14006
6R084	S 11468		S 14008
6R087	S 11468	12H991LP	S 14010
6R880	S 14007	12H092	S 11680
6R886	S 14001		S 14008
7R070	S 13200		S 14006
7R887	S 14004	12H992LP	S 14010
9H079	S 11680	12H093	S 11680
9H081	S 11680		S 14006
9H082	S 11680		S 14008
9H088	S 11680	12H993LP	S 14010
9H881	S 14002	12H094	S 11680
9H981LP	S 14009		S 14006
9H882	S 14002		S 14008
9H883LP	S 14009	12H994LP	S 14010
9H885	S 14002	14H789	S 13675
9H985LP	S 14009	14H989LP	S 14011
9H888	S 14002		
9H988LP	S 14009		
	S 11680		
12H090	S 14006		
	S 14008		
		<u>EXPORT</u>	
		6S071	S 11970
		9S076	S 11680

FORMING RECORD CHANGER TRIM STRIPS

To replace plastic trim strips on the bottom of record changers, it is necessary to have these plastic strips remain in position without undue stress. This can be accomplished by heating this plastic with a 100 to 300 watt infra red heating lamp, and can be done in the following manner.

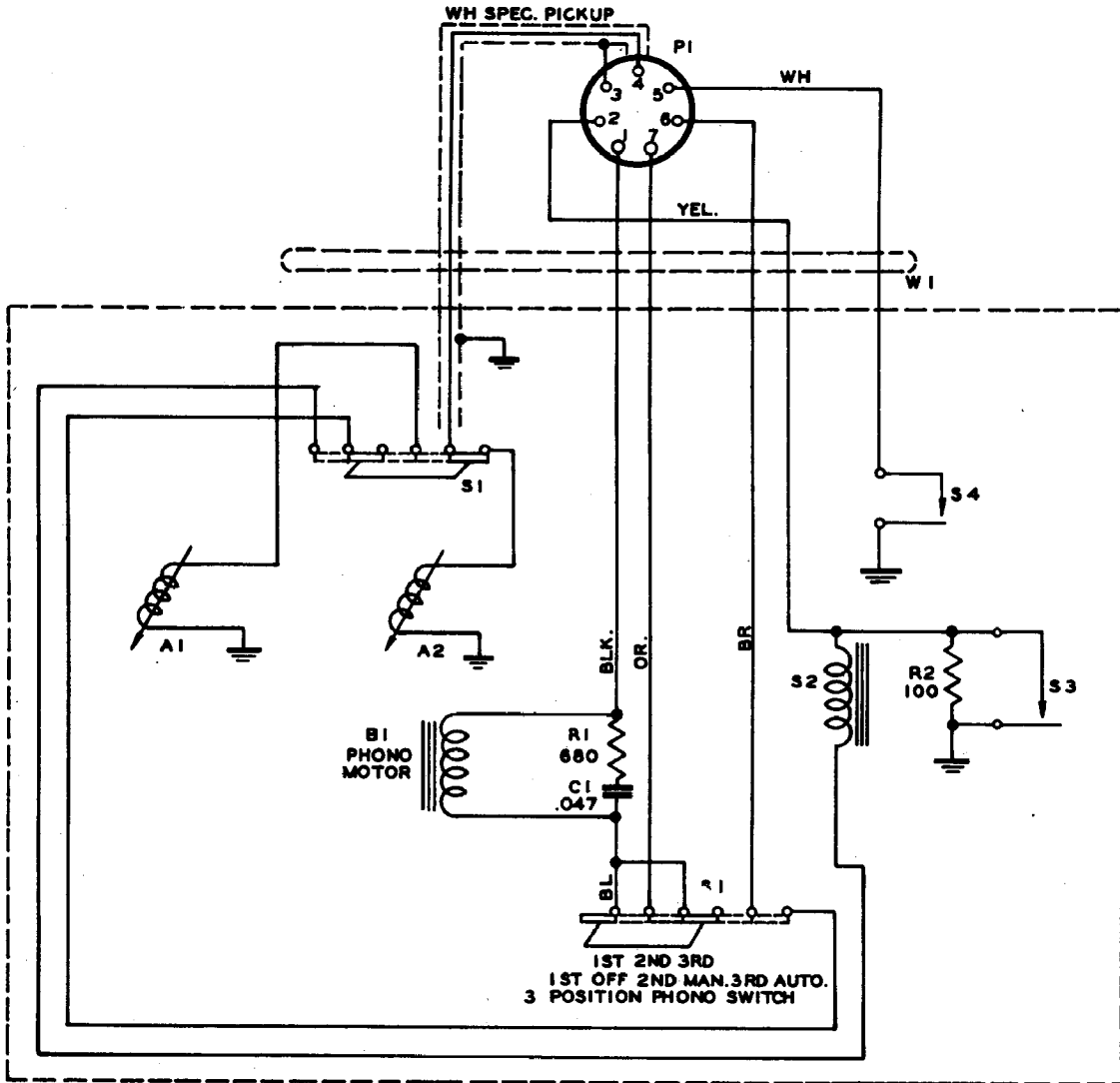
Place the trim strip on the bottom edge of the record changer, bending it to conform with the record changer and then hold it over the heat lamp until it becomes pliable; with fingers, form this to the curvature of the record changer corners. After removing this heat lamp the plastic will remain in this shape.

THE CARE OF PLASTIC CABINETS

It is imperative that these polystyrene cabinets not be left in a confined area where the temperature will rise above 150°, as these conditions will damage the cabinets. The result will be warping and shrinkage.

They should not be exposed to exterminating gas of the chlorinated hydro-carbon variety inasmuch as this will completely destroy the velvet finish.

SCHEMATIC DIAGRAM FOR S14009 INTERMIXER TWO SPEED RECORD CHANGER



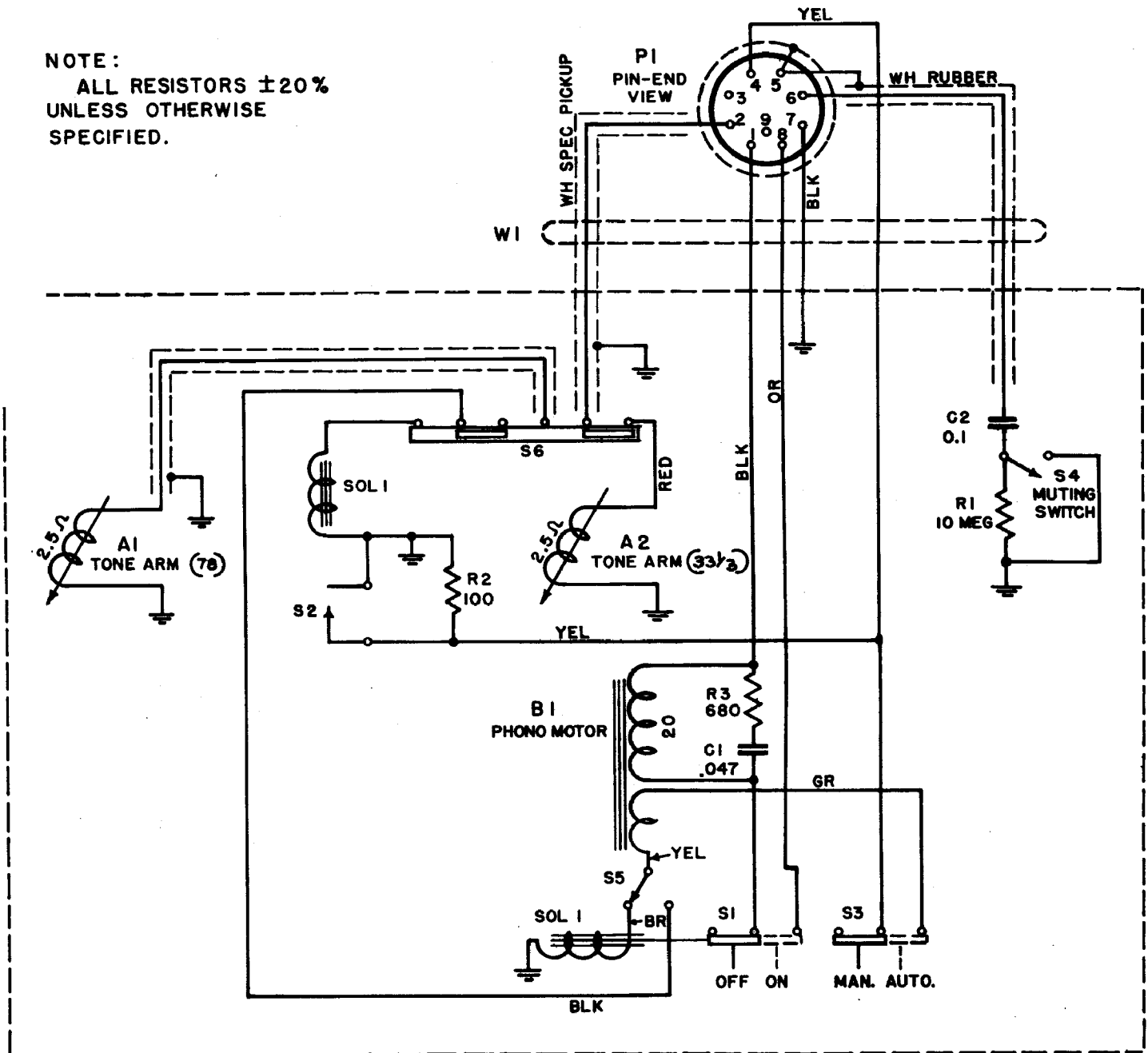
PARTS LIST FOR S14009

<u>Diag.</u> <u>No.</u>	<u>Part</u> <u>No.</u>	<u>Description</u>	<u>Diag.</u> <u>No.</u>	<u>Part</u> <u>No.</u>	<u>Description</u>
C1	22-1775	.047 MFD. 400 V.	B1	S-15230	Phono Motor Assy.
R1	63-1779	680 Ohm 1/2 W.	S1	85-372	3 Position Switch
R2	63-1744	100 Ohm 1/2 W.	S2	S-13913	Electro Magnet
A1	S-15313	Tone Arm Assy. (78 R.P.M.)	S3	S-13901	Trip Switch Assy.
A2	S-15224	Tone Arm Assy. (33 1/3 R.P.M.)	S4	S-14313	Muting Switch Assy.
			W1	S-14229	Cable Assy.
			P1	58-169	Phono Plug

SCHEMATIC DIAGRAM FOR S14010 AND S14011 AUTO. STOP TWO SPEED RECORD CHANGERS.

NOTE:

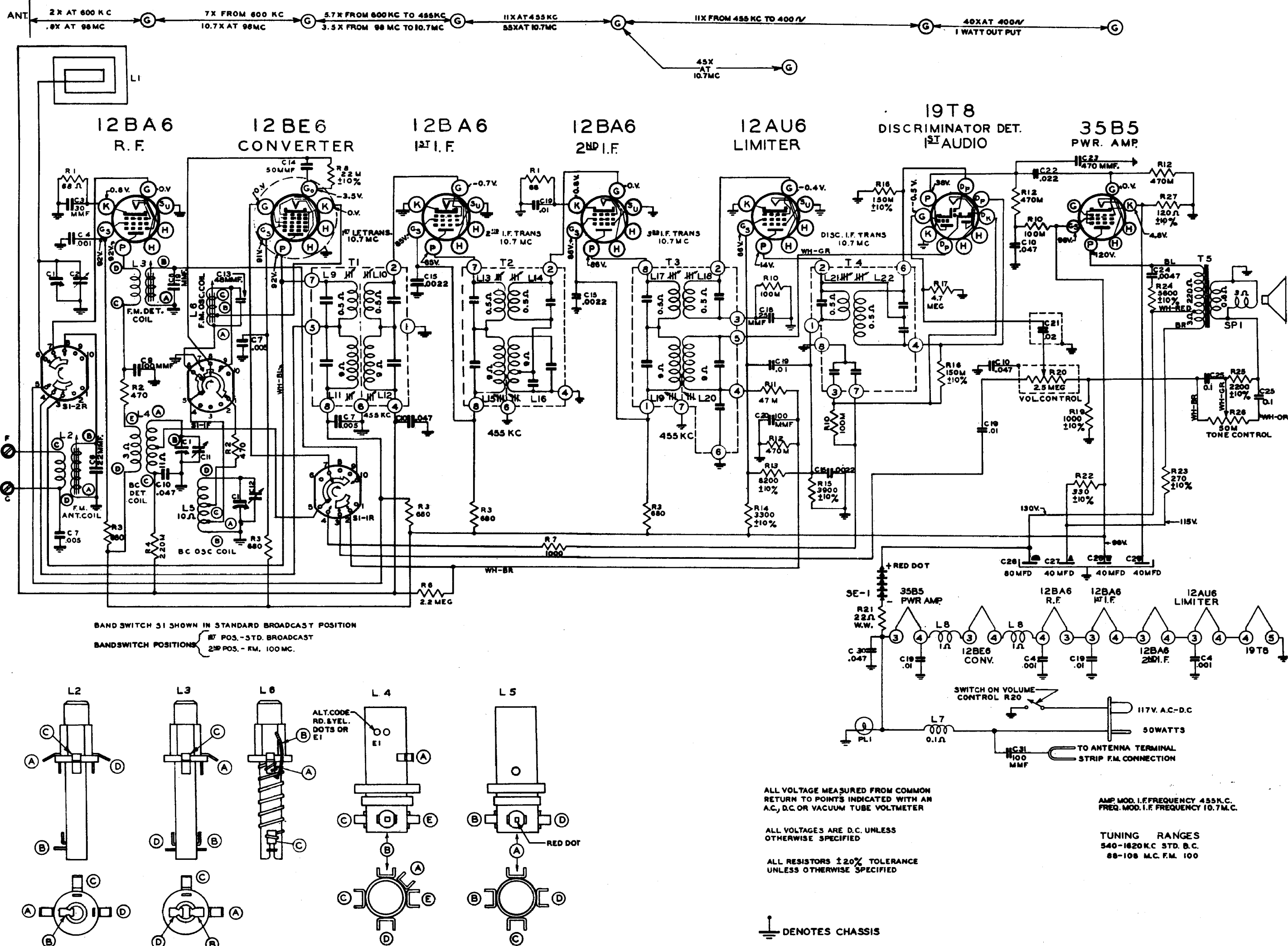
ALL RESISTORS $\pm 20\%$
UNLESS OTHERWISE
SPECIFIED.



PARTS LIST For S14010 & S14011

Diag. No.	Part No.	Description	Diag. No.	Part No.	Description
C1	22-1775	.047 MFD. 400 V.	P1	58-133	Phono Plug
C2	22-417	0.1 MFD. 600 V.	S1	85-405	Trip Switch Assy.
R1	63-1954	10 Megohm 1/2 W.	S3	85-406	S.P.S.T. Switch
R2	63-1744	100 Ohm 1/2 W.	S4	S-13426	Muting Switch
R3	63-1779	680 Ohm 1/2 W.	S5	S-13430	Auto-Stop Switch
A1	S-15338	Tone Arm Comp. Blk.	S6	85-372	Switch
A1	S-15313	Tone Arm Comp. Br.	Soli	S-13913	Magnet Coil Assy.
A2	S-15224	Tone Arm Comp. Gr.	W1	S-13915	Cable Assembly
B1	S-15229	Phono Motor Assy.			

Fig. 6 7E01Z Schematic



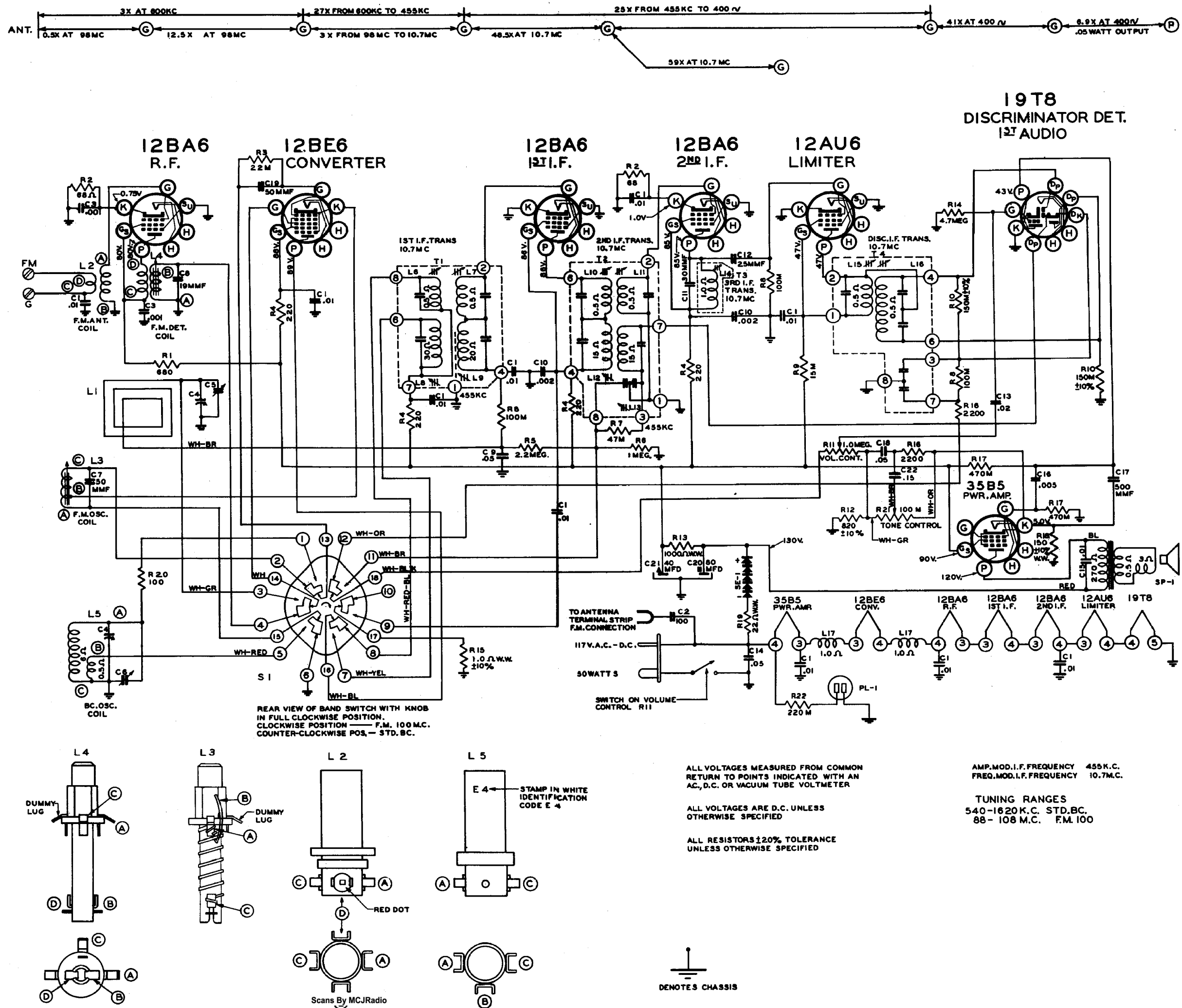


Fig. 7 7E02Z Schematic

Fig. 8 9E21Z Schematic

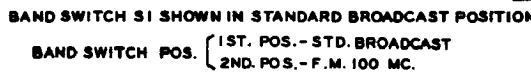
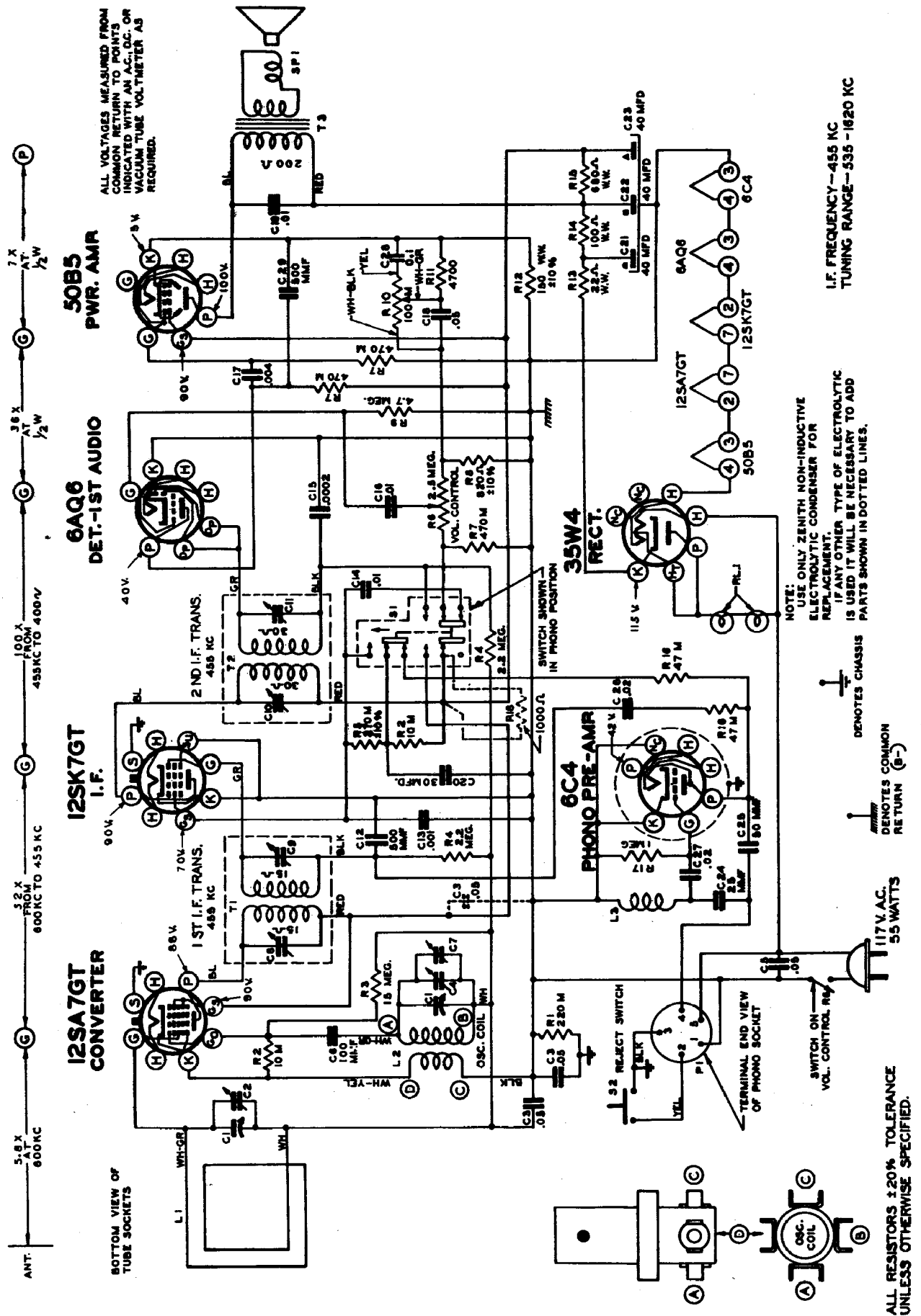


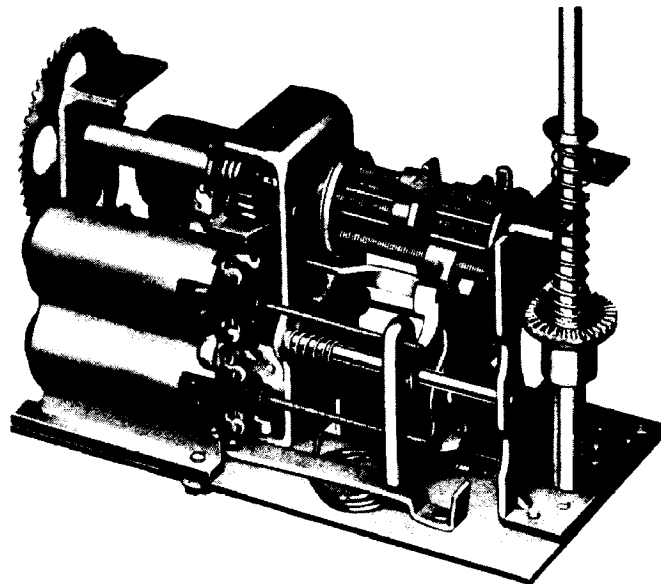
Fig. 9 6E02Z Schematic



SERVICE MANUAL



1946 AUTO RADIO PERMEABILITY TUNING UNIT



This bulletin was prepared to assist the service man in servicing the permeability tuning units of the 1946 automobile radios manufactured by the Zenith Radio Corporation for the various motor car companies.

The operating principle and the mechanical adjustments of the tuning units are the same in all receivers. There is, however, a variation on the front plate, dial pointer, and escutcheon assemblies. This bulletin gives a step by step procedure for replacing both the ratchet gear and the solenoid on each model. A Parts List is supplied for each model. An exploded view of the tuning mechanism listing each part by number makes the identification of parts and part numbers positive. Causes of failure with suggestions for servicing are also included in this bulletin.

ZENITH RADIO CORPORATION
CHICAGO 39, U.S.A.

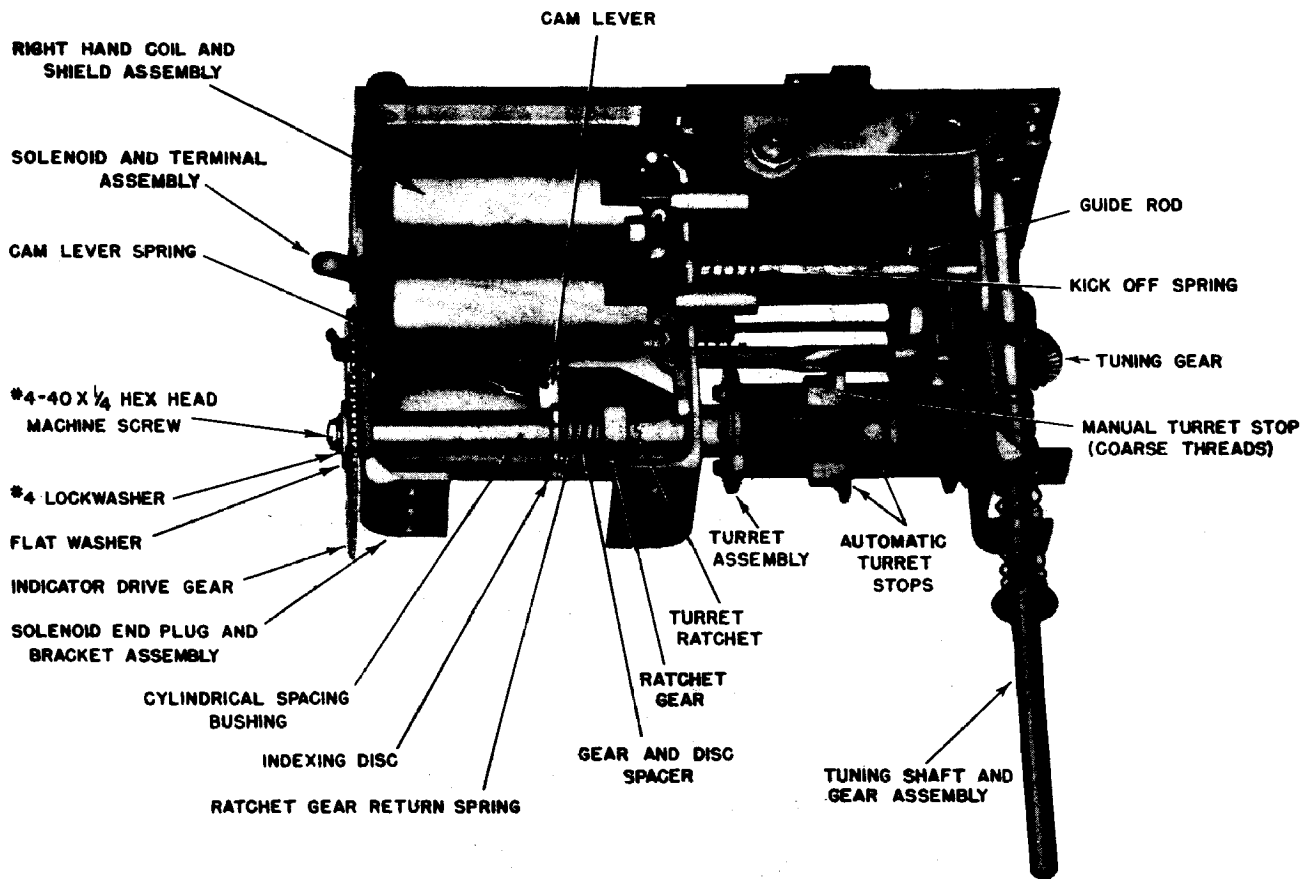


FIG. 1

OPERATING PRINCIPLE

When the station selector push button or foot switch is depressed all the way, the solenoid (Fig. 1) is energized by current from the car battery. The cross arm assembly is pulled from the right or resting position from any one of the six turret stops on the turret assembly to the left or closed position. As this assembly approaches the closed position, the ratchet cam shaft (Fig. 2) turns the ratchet drive gear clockwise. The ratchet drive gear turns the ratchet gear counter clockwise 60° or until it engages the ratchet teeth on the turret shaft. The detent lever (inset Fig. 2) prevents the turret assembly from turning counter clockwise during this operation. At the same time a cam on the hub of the ratchet drive gear lifts the cam lever from its locking position in the indexing disc (inset Fig. 2). This will allow the turret assembly (Fig. 2) to be turned clockwise. The tuning unit will remain in the closed position until the push button or foot switch is released.

When the push button or foot switch is released the cross arm return spring pulls the cross arm assembly back to the resting position. As this assembly starts the return stroke to the resting position, the ratchet camshaft turns the ratchet drive gear counter clockwise. The ratchet drive gear turns the ratchet gear clockwise 60°. As the ratchet gear turns it rotates the turret assembly clockwise 60°. When the turret assembly has been turned 60°, the cam lever is pulled into locking position in the indexing disc, preventing the turret assembly from moving farther.

There are six turret stops, one for each of the five automatic tuning positions, which may be adjusted to five desired stations, and one to be used for tuning the radio manually. For information concerning setting up the five automatic tuning positions refer to Owner's Manual or the Service Manual for the radio in question.

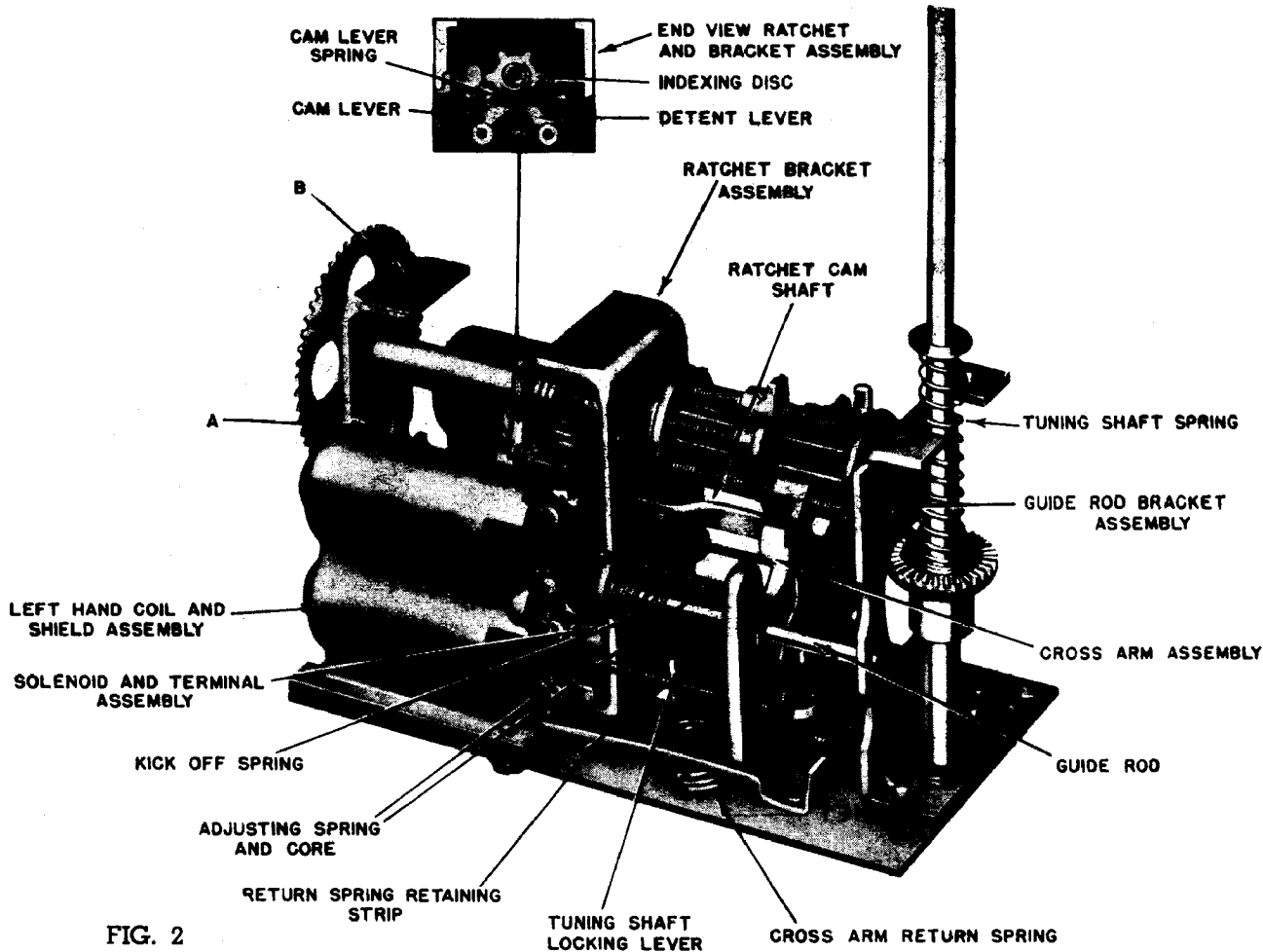


FIG. 2

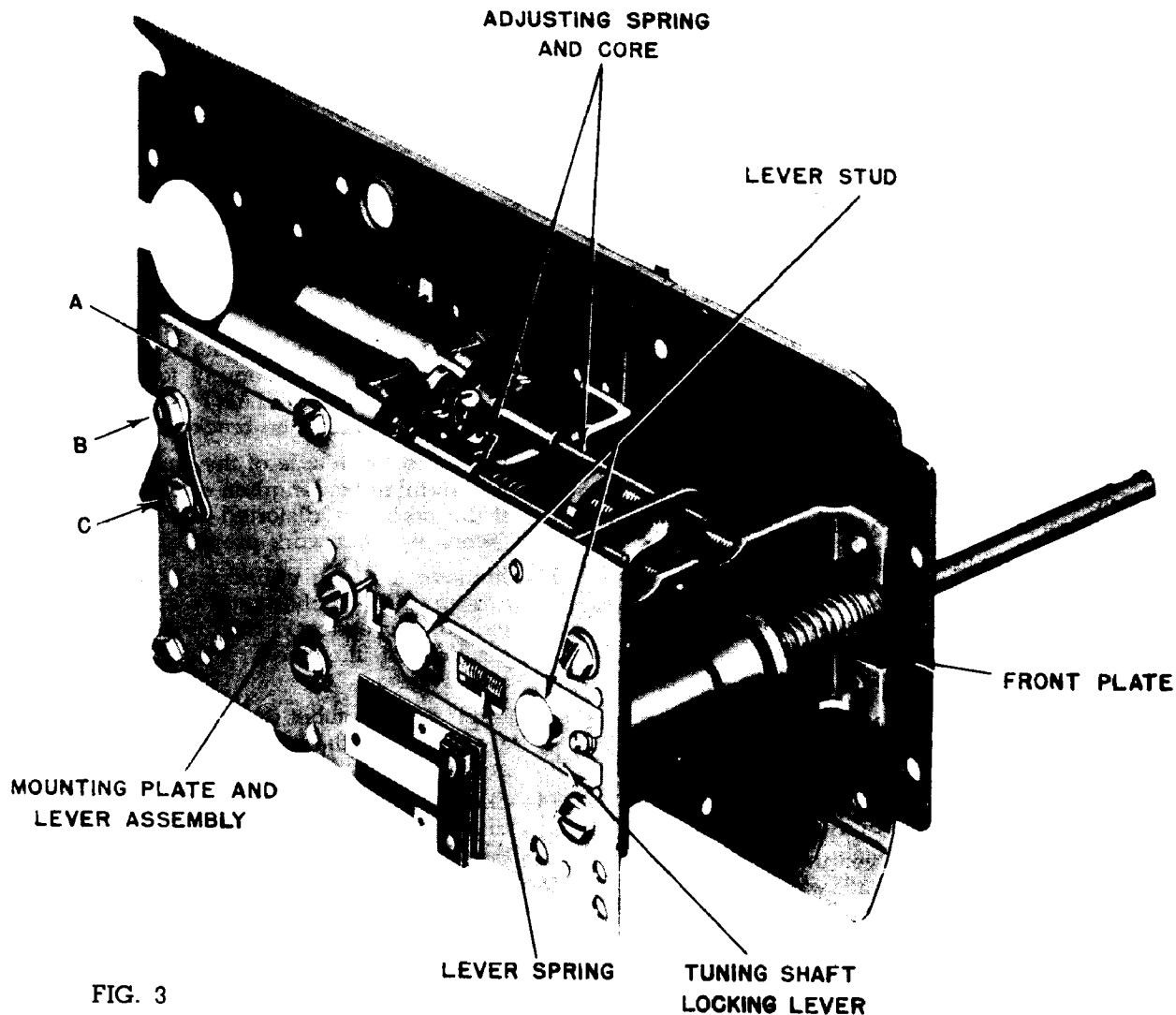
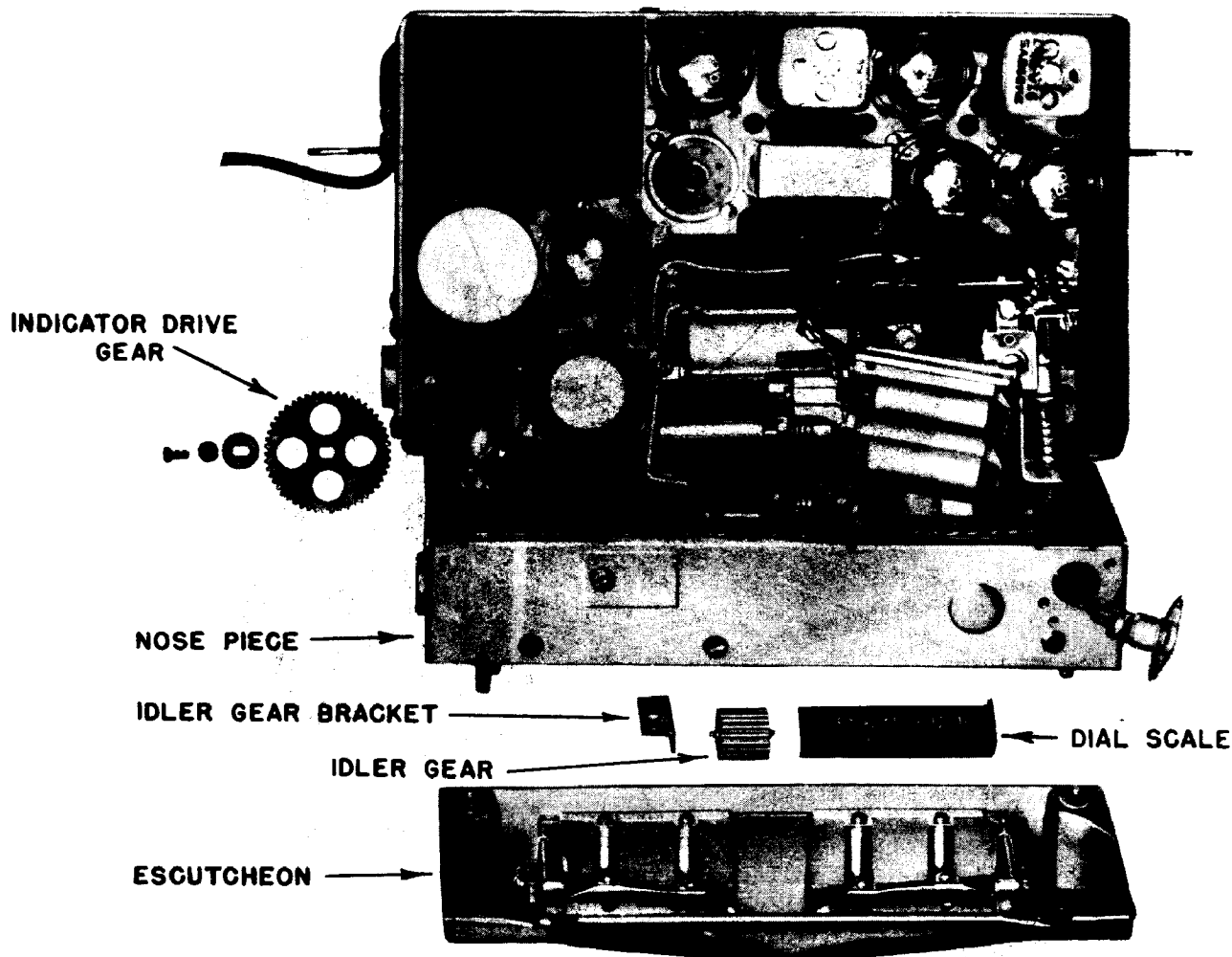


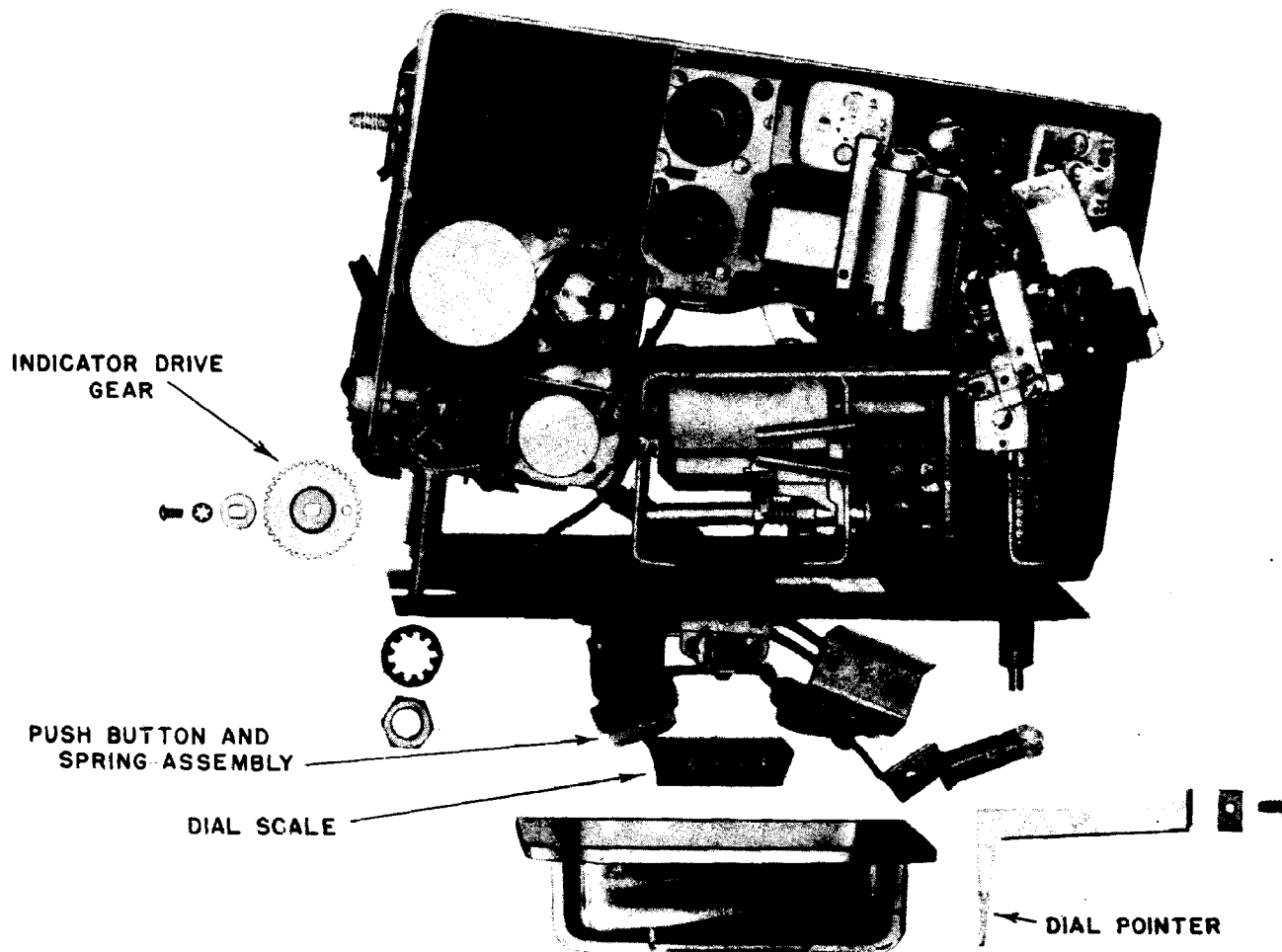
FIG. 3



HOW TO CHANGE THE RATCHET GEAR IN MODEL 6MF080

Before starting the following operations BE SURE THE TUNER IS ON MANUAL. Set Dial at 16.

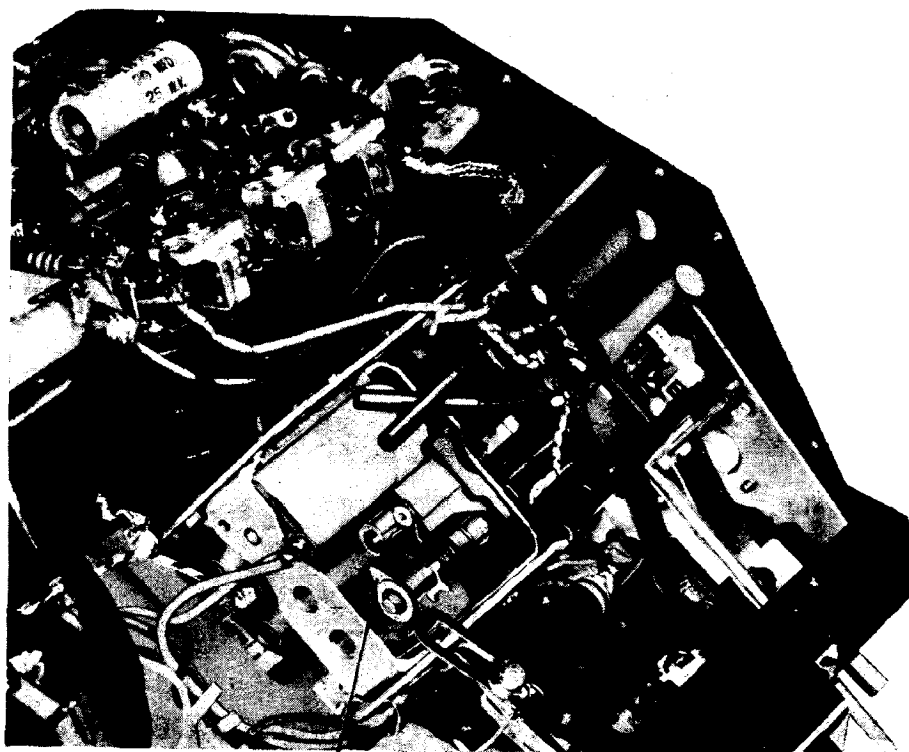
- 1—Remove the top and bottom covers of the receiver. Remove 7C5 and 7B6 tubes. Take off knobs.
- 2—Remove the complete escutcheon assembly.
- 3—Loosen the antenna socket and trimmer from the nose piece. NOTE: On this receiver the nose piece and front plate are welded together.
- 4—Loosen the speaker socket on the left hand of the nose piece.
- 5—Remove the drum dial idler gear and bracket, also the dial scale.
- 6—Loosen the tuner assembly from the front plate.
- 7—Loosen the front plate and nose piece from receiver.
- 8—Remove the two assembly screws in the back plate of the tuner holding the top right coil and shield assembly. Slip the coils toward the left end of the receiver until clear of the tuner slugs. This will allow access to the turret shaft and gear.
- 9—Remove the screw lock washer, flat washer and brass indicator drive gear from the end of turret shaft.
- 10—Remove the screw holding the solenoid end plug and bracket assembly to the back plate of the tuner. IMPORTANT: Remove only the one screw holding the bracket to the rear plate.
- 11—Disconnect one side of the small lever spring. Be careful not to lengthen or distort this spring. If the spring is distorted the detent and cam levers may not work properly after assembly.
- 12—Remove the long cylindrical brass spacer, indexing disc, ratchet return spring and short cylindrical spacer. IMPORTANT: Note the position of the teeth before removing the ratchet gear.
- 13—Replace the ratchet gear. Make sure the teeth are in exactly the same position as the original gears.
- 14—Be sure the tuning mechanism and indicator drum is in the "M" position when replacing the indicator idler gear.
- 15—Reassemble the tuner unit in reverse order. Replace front plate and dial scale.



HOW TO CHANGE THE RATCHET GEAR IN MODEL 6MH081

BE SURE THE TUNER IS ON MANUAL. Set Dial at 16.

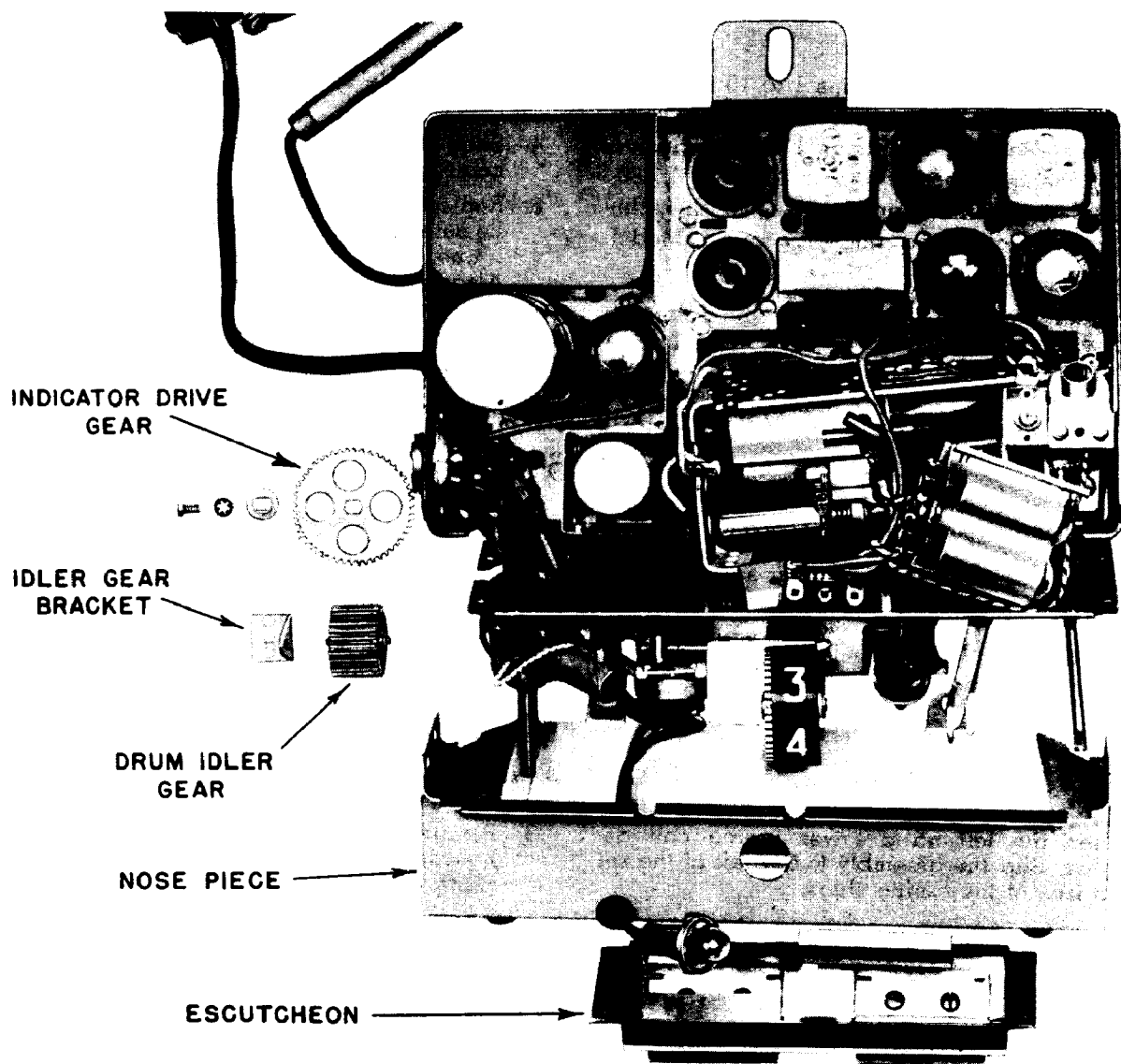
- 1—Remove the top and bottom covers of the receiver. Remove 7C5 and 7B6 tubes.
- 2—Remove the knobs and the complete escutcheon from the front plate.
- 3—Loosen the front plate from the receiver.
- 4—Remove the $\frac{3}{8}$ " nut and lock washer from the volume control shaft.
- 5—Remove the dial pointer from the tuner assembly.
- 6—Remove the automatic station selector switch, and pilot light bracket from the front plate.
- 7—Remove plastic push buttons and spring assembly.
- 8—Remove the screws holding the front plate to the tuner.
- 9—Remove the dial scale from its mounting to avoid scratching.
- 10—Remove front plate from receiver.
- 11—Pull the front plate from the left end of the receiver until it clears the volume control shaft.
- 12—Loosen the antenna socket and bracket from the tuning assembly.
- 13—Loosen the right hand top two turret coils. Slip the coils to the left end of the set until free of the tuning slugs. This will allow access to the turret shaft and gear.
- 14—Remove the screw and lock washer, and flat washer from the end of the turret shaft. Remove the brass indicator drive gear.
- 15—Remove the rear assembly screw from the solenoid end plug and bracket assembly.
- 16—Push the solenoid end plug and bracket assembly toward the left of the receiver until it clears the turret shaft.
- 17—Disconnect one side of the small lever spring. Be careful not to distort or lengthen this spring. The detent and cam levers may not operate properly when the unit is reassembled if this spring is bent or distorted.
- 18—Remove the long cylindrical brass spacer, indexing disc, spring and short cylindrical spacer. **IMPORTANT:** Note the position of the teeth before removing the ratchet gear.
- 19—Replace the ratchet gear. Make sure the teeth are in exactly the same position as the original gear. The tuning mechanism and the indicator drum must be on "M" position when replacing the indicator drive gear.
- 20—Reassemble the tuner unit in reverse order. Replace the front plate, dial scale, automatic push button switch and pilot light bracket.



INDICATOR CAM

HOW TO CHANGE THE RATCHET GEAR IN MODEL 7ML080-7ML081

- 1—Remove the top cover of the receiver.
- 2—Remove the screw, lock washer and flat washer and indicator cam from the turret shaft. This can be accomplished by inserting a small screw driver through a hole in the solenoid end bracket.
- 3—Disconnect the cam lever spring. Be careful not to stretch or distort this spring. If this spring is distorted the detent and cam levers may not operate properly when tuner is reassembled.
- 4—Remove the brass cylindrical spacer, indexing disc, brass spacer and spring. **IMPORTANT:** Note the position of the teeth in the ratchet gear before it is removed.
- 5—Replace ratchet gear. Make sure the ratchet gear teeth engage exactly the same as the original gear.
- 6—Reassemble the brass spacer spring, long cylinder spacer, flat washer, etc., to turret shaft. Replace detent spring.



HOW TO CHANGE THE RATCHET GEAR IN MODEL 6MN082

BE SURE THE TUNER IS ON MANUAL. Set Dial at 16.

- 1—Remove the top and bottom covers. Loosen dial light from the nose piece. Remove 7C5 and 7B6 tubes.
- 2—Remove the escutcheon from the nose piece.
- 3—Remove the nose piece from the front plate. Remove dial scale from nose piece.
- 4—Remove the indicator dial idler gear and bracket. This is necessary to get at the solenoid bracket and plug front assembly screw.
- 5—Remove the two remaining assembly screws holding the tuner unit to the front plate.
- 6—Loosen the front plate from the receiver, and pull forward as far as possible.
- 7—Remove the brass drum indicator drive gear from the turret drive shaft.
- 8—Remove the rear assembly screw holding the solenoid end plug and bracket assembly to the back plate.
- 9—Push the solenoid end plug bracket assembly toward the left end of the receiver.
- 10—Remove the mounting screws from the top tuner coil assembly, and push the coil assembly toward the left end of the receiver until the coils are free of the tuner slug.
- 11—Disconnect one side of lever spring. Be careful not to distort or lengthen this spring. If the spring is distorted the detent and cam levers may not operate properly when reassembled.
- 12—Remove the long brass cylindrical spacer, indexing disc, and ratchet return spring, and short brass spacer. **IMPORTANT:** Note the position of the teeth before removing the ratchet gear.
- 13—Replace the ratchet gear. Make sure the teeth are in exactly the same position as the original gear. Also be sure the tuning mechanism and the indicator drum is in the "M" position when replacing the idler gear and bracket.
- 14—Replace the ratchet gear. Reassemble tuner unit. Replace the front plate, nose piece, dial scale and escutcheon.

CHANGING THE SOLENOID IN MODELS 6MF080, 6MH081 AND 6MN082 AUTO RECEIVERS

- 1—(a) Nash—Perform operations 1 to 10 inclusive under changing ratchet gear in Model 6MN082.
(b) Ford—Perform operations 1 to 10 inclusive under changing ratchet gear in Model 6MF080.
(c) Hudson—Perform operations 1 to 16 inclusive under changing ratchet gear in Model 6MH081.
- 2—Unsolder the yellow wires from the solenoid and terminal assembly.
- 3—Remove the solenoid bracket and plug assembly.
- 4—Slide solenoid toward the left end of the receiver until free of the solenoid magnet core.
- 5—Replace solenoid and reassemble tuning unit. Be sure to check the position of the ratchet gear—one tooth engaging the ratchet drive gear. Also make sure the tuning mechanism and the indicator drum are in the "M" position.

CHANGING THE SOLENOID IN MODELS 7ML080 AND 7ML081 AUTO RECEIVERS

- 1—Remove top cover from the receiver.
- 2—Set the tuner to manual position and tune set to 16 on the dial.
- 3—Unsolder the yellow wires from the solenoid.
- 4—Remove solenoid end plug and bracket assembly.
- 5—Slide solenoid toward the left end of receiver until free of the solenoid magnet core.
- 6—Replace solenoid and reassemble tuning unit.

REPLACING THE RATCHET AND BRACKET ASSEMBLY

- 1—Loosen the left hand lower tuning coil assembly. Slip the assembly to the left of the set until free of the tuning slugs.
- 2—Follow the procedure outlined above for removing the solenoid.
- 3—Remove the ratchet and bracket assembly, held in place by one screw through the front plate, and one screw through the front plate.
- 4—With replacement ratchet and bracket assembly, reassemble the tuner in reverse order.

LUBRICATION

The ratchet gear must engage freely with the ratchet on the turret assembly. It, therefore, must be clean and lubricated with a good grade of clock oil. **WARNING:** Do not use a heavy grade of lubricant.

The points of friction on the guide rods, dial

pointer, solenoid magnet core, and the hub of the station indicator drum must also be lubricated with clock oil.

All other points of friction should be lubricated with Texaco RCX-148 low temperature grease No. 67 or its equivalent.

TROUBLE SHOOTING

Mechanism fails to move from one position to the next or jams tightly between two positions

- 1—Be sure the "A" battery supply is capable of delivering 5.5 volts at 20 amperes.
- 2—Check lubrication of ratchet gear and guide rods.
- 3—Check dial pointer and indicator drum and drive gear assemblies for binding or warped parts.
- 4—Teeth on ratchet gear are worn or damaged. Replace gear.
- 5—Lever spring missing from ratchet and bracket assembly. Replace spring.
- 6—Detent lever or cam lever broken from ratchet and bracket assembly. Replace ratchet and bracket assembly.

**Mechanism fails to return all the way to resting position
or 16 on the dial when tuned manually**

- | | |
|---|---|
| 1—Check lubrication of guide rods. | 3—Be sure of proper distance between holes and slot in pointer. |
| 2—Be sure pointer does not rub on dial glass or dial scale. | |

**Tuning knob will not remain in the "Out" position when it is
pulled out to set up the stations or to tune manually**

- | | |
|--|---|
| 1—Tuning shaft locking lever bent. Bend lever back to original position. (Fig. 3). | 2—Shoulder rivet pulled out. Replace rivet, or replace mounting plate and lever assembly. |
|--|---|

**Knob fails to return to the "In" position when the push
button or foot switch is pressed**

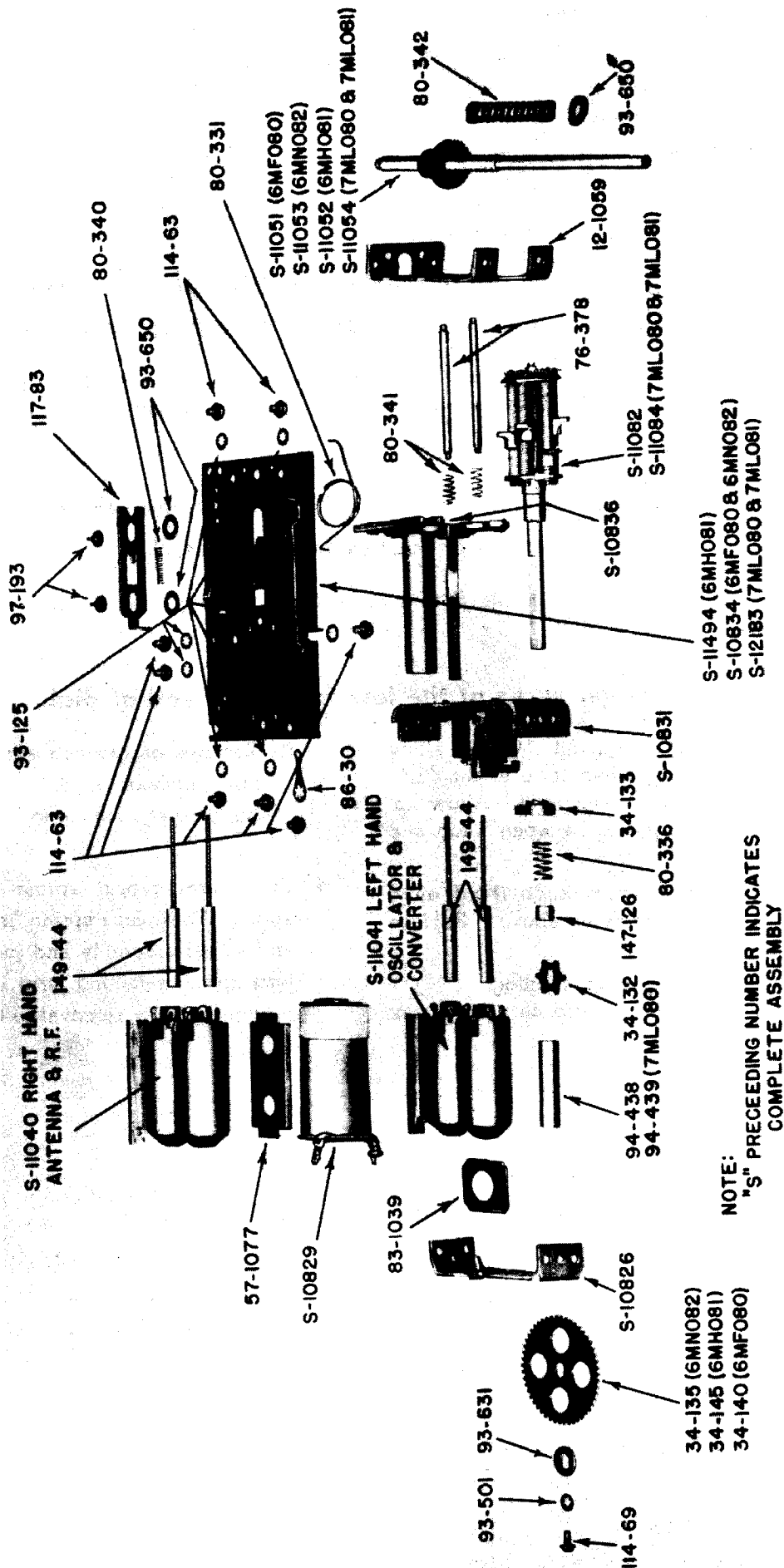
- 1—End broken from lever (Fig. 2). Replace lever or replace complete mounting plate and lever assembly.

Pointer sticks at the low frequency end of dial

- | | |
|--|---|
| 1—Tuning knob too close to panel. Will not allow knob to rotate freely when it is in the "IN" position. Loosen knob, and re-fit. Allow approximately $\frac{1}{8}$ " clearance between knob and panel. | (b) Remove escutcheon and check drive gear and indicator drum to make sure they do not bind against the idler gear or front plate. |
| 2—Plastic ring loosened from knob (Ford only) allowing same conditions as above. Replace knob. | |
| 3—Idler gear or indicator drum binding.
(a) Be sure drum does not rub on escutcheon. | 4—Cross arm return spring broken. Replace spring. To replace spring, loosen left hand coil and shield assembly and pull loose end of return spring retaining strip upward. This will permit the easy removal of the spring. (Fig. 2.) |

NOTE: MOUNTING PLATE AND LEVER ASSEMBLIES S-10834, S-12183 AND S-11494, INCLUDE PARTS NO. 97-193, 117-83, 80-340 AND 93-650. THESE CAN BE PURCHASED SEPARATELY.

NOTE: 6MN082 SAME AS 6MN088.
6MH081 SAME AS 6MH089.



NOTE:
"S" PRECEDING NUMBER INDICATES
COMPLETE ASSEMBLY

EXPLODED VIEW

PARTS LIST

FORD MODEL 6MF080 (CHASSIS No. 6C80)

"PUSH-PULL" AUTO TUNER COMPONENTS

S-10826	Solenoid End Plug & Bracket Assembly
S-10829	Solenoid & Terminal Assembly
S-10831	Ratchet & Bracket Assembly
S-10834*	Mounting Plate & Lever Assembly
S-10836	Cross Arm Assembly
S-11040	Right Hand Coil & Shield Assembly
S-11041	Left Hand Coil & Shield Assembly
S-11051	Tuning Shaft & Gear Assembly
S-11071	Push-Pull Tuner Assembly (Final)
S-11082	Turret Assembly
34-132	Indexing Disc
34-133	Ratchet Gear
34-140	Indicator Drive Gear
57-1077	Protector Plate
76-378	Guide Rod
80-331	Cross Arm Return Spring
80-332	Cam Lever Spring
80-336	Ratchet Gear Return Spring
80-340	Lever Spring
80-341	Kick-Off Spring
80-342	Tuning Shaft Spring
83-1039	Solenoid Insulating Strip
86-30	No. 6 Shakeproof Terminal
93-125	No. 6 Internal Shakeproof Lockwasher
93-501	No. 4 Internal Shakeproof Lockwasher
93-573	Shoulder Washer
93-631	Retaining Washer
93-650	.010 x 3/16 x 7/16" Brass Washer
94-431	Cross Arm Insulating Bushing
94-438	Cylindrical Spacing Bushing
97-193	Lever Stud
114-63	No. 6-32 x 3/16" Hex. Acorn Hd. Mach. Screw, Steel, N.P.
114-69	No. 4-40 x 1/4" Hex. Acorn Hd. Mach. Screw, Steel, Cad. Plate
114-150	No. 6-32 x 5/32" Hex. Acorn Hd. Mach. Screw, Steel, N.P.
117-83	Tuning Shaft Locking Lever
147-126	Gear & Disc Spacer
149-44	Adjusting Spring & Core

NASH MODEL 6MN082 (Chassis No. 6C82)

"PUSH-PULL" AUTO TUNER COMPONENTS

S-10826	Solenoid End Plug & Bracket Assembly
S-10829	Solenoid & Terminal Assembly
S-10831	Ratchet & Bracket Assembly
S-10834*	Mounting Plate & Lever Assembly
S-10836	Cross Arm Assembly
S-11040	Right Hand Coil & Shield Assembly
S-11041	Left Hand Coil & Shield Assembly
S-11053	Tuning Shaft & Gear Assembly
S-11073	Push-Pull Tuner Assembly (Complete)
S-11082	Turret Assembly
S-11180	Front Plate & Clamping Strip Assembly
34-132	Indexing Disc
34-133	Ratchet Gear
34-135	Indicator Drive Gear
57-1077	Protector Plate
76-378	Guide Rod
80-331	Cross Arm Return Spring
80-332	Cam Lever Spring
80-336	Ratchet Gear Return Spring
80-340	Lever Spring
80-341	Kick-Off Spring
80-342	Tuning Shaft Spring
83-1039	Solenoid Insulating Strip
86-30	No. 6 Shakeproof Terminal
93-125	No. 6 Internal Shakeproof Lockwasher
93-501	No. 4 Internal Shakeproof Lockwasher,
93-631	Retaining Washer
93-650	Brass Washer
94-431	Cross Arm Insulating Bushing
94-438	Spacing Bushing
97-193	Lever Stud
112-484	No. 6-32 x 3/16" B.H.M.S.
114-63	No. 6-32 x 3/16" Hex. Acorn Hd. M.S.
114-69	No. 4-40 x 1/4" Hex Acorn Hd. M.S.
114-150	No. 6-32 x 5/32" Hex. Acorn Hd. M.S.
117-83	Tuning Shaft Locking Lever
147-126	Gear & Disc Spacer
149-44	Adjusting Spring & Core

NOTE: Parts marked * include Parts No. 97-193, 117-83, 80-340, and 93-650. These parts can be purchased separately.

PARTS LIST

LINCOLN MODELS 7ML080 AND 7ML081 (CHASSIS No. 7C80)

"PUSH-PULL" AUTO TUNER COMPONENTS

S-10826	Solenoid End Plug & Bracket Assembly
S-10829	Solenoid & Terminal Assembly
S-10831	Ratchet & Bracket Assembly
S-10836	Cross Arm Assembly
S-11040	Right Hand Coil & Shield Assembly
S-11041	Left Hand Coil & Shield Assembly
S-11054	Tuning Shaft & Gear Assembly
S-11074	Push-Pull Tuner Assembly (Final)
S-11084	Turret Assembly
S-12183*	Mounting Plate & Lever Assembly
34-132	Indexing Disc
34-133	Ratchet Gear
54-34	No. 6-32 x 1/4 x 3/32" Hex. Nut, Steel, N.P.
57-1077	Protector Plate
64-146	.088 dia. x 5/32" long Tubular Rivet
64-315	.088 dia. x 3/8" long Tubular Rivet
69-163	No. 4-36 x 3/8" R.H.M.S., Steel, N.P.
76-378	Guide Rod
80-331	Cross Arm Return Spring
80-332	Cam Lever Spring
80-336	Ratchet Gear Return Spring
80-340	Lever Spring
80-341	Kick-Off Spring
80-342	Tuning Shaft Spring
80-429	Indicator Switch Contact Spring
80-430	Indicator Switch Contact Spring
83-1039	Solenoid Insulating Strip
86-30	No. 6 Shakeproof Terminal No. 2101-6
93-125	No. 6 Internal Shakeproof Lockwasher
93-501	No. 4 Internal Shakeproof Lockwasher
93-650	.010 x 3/16 x 7/16" Brass Washer
93-706	.020 x 7/16 x 3/4" Neoprene Washer
93-715	Split Insulating Washer
93-748	.018 x .096 x 1/4" Washer, Steel, N.P.
94-431	Cross Arm Insulating Bushing
94-439	Cylindrical Spacing Bushing
97-193	Lever Stud
97-220	Pointer Stud
114-48	No. 6-32 x 1/4" Hex. Acorn Hd. M.S., Steel, N.P.
114-63	No. 6-32 x 3/16" Hex. Acorn Hd. Mach. Screw, Steel, N.P.
114-69	No. 4-40 x 1/4" Hex. Acorn Hd. Mach. Screw, Steel, Cad. Plate
114-150	No. 6-32 x 5/32" Hex. Acorn Hd. Mach. Screw, Steel, N.P.
117-83	Tuning Shaft Locking Lever
128-22	Indicator Cam
147-126	Gear & Disc Spacer
148-45	Cross Arm
149-44	Adjusting Spring & Core

HUDSON MODEL 6MH081 (CHASSIS No. 6C81)

"PUSH-PULL" AUTO TUNER COMPONENTS

S-10826	Solenoid End Plug & Bracket Assembly
S-10829	Solenoid & Terminal Assembly
S-10831	Ratchet & Bracket Assembly
S-10836	Cross Arm Assembly
S-11040	Right Hand Coil & Shield Assembly
S-11041	Left Hand Coil & Shield Assembly
S-11072	Push-Pull Tuner Assembly (Final)
S-11082	Turret Assembly
S-11308	Front Plate & Bushing Assembly
S-11494*	Mounting Plate & Lever Assembly
17-69	Pointer Retaining Clip
34-132	Indexing Disc
34-133	Ratchet Gear
34-145	Indicator Drive Gear
57-1077	Protector Plate
59-158	Pointer
64-146	.088 dia. x 5/32" long — Tubular Rivet
76-378	Guide Rod
80-329	Gear Indexing Spring
80-331	Cross Arm Return Spring
80-332	Cam Lever Spring
80-336	Ratchet Gear Return Spring
80-340	Lever Spring
80-341	Kick-Off Spring
80-342	Tuning Shaft Spring
83-1039	Solenoid Insulating Strip
86-30	No. 6 Shakeproof Terminal Lug
93-125	No. 6 Internal Shakeproof Lockwasher
93-501	No. 4 Internal Shakeproof Lockwasher
93-631	Retaining Washer
93-650	.010 x 3/16 x 7/16" Brass Washer
94-438	Cylindrical Spacing Bushing
94-463	Tuning Shaft Bushing
97-193	Lever Stud
114-63	No. 6-32 x 3/16" Hex. Acorn Hd. Mach. Screw, Steel, N.P.
114-69	No. 4-40 x 1/4" Hex. Acorn Hd. Mach. Screw, Steel, Cad. Plate
114-150	No. 6-32 x 5/32" Hex. Acorn Hd. Mach. Screw, Steel, N.P.
114-159	No. 6 x 1/4" Hex. Hd. Self Tapping Screw, Steel, Cad. Plate
117-83	Tuning Shaft Locking Lever
147-126	Gear & Disc Spacer
149-44	Adjusting Spring & Core

NOTE: Parts marked * include Parts No. 97-193, 117-83, 80-340 and 93-650. These parts can be purchased separately.

ZENITH RADIO CORPORATION

PHONE
BERKSHIRE 7500



CABLE ADDRESS
"ZENITHRAD"
ALL CODES

6001 DICKENS AVENUE CHICAGO 39, ILLINOIS

ZENITH AUTO RADIO SERVICE BULLETIN #1

REPLACEMENT OF DEFECTIVE PARTS AND TUBES AND THE PURCHASE OF PARTS FOR 1946 ZENITH AUTO RADIOS.

To obtain no-charge replacement of defective parts and tubes in the 90 day warranty, attach a Zenith warranty replacement tag No. 203-26 to each defective item, and forward it to the Zenith distributor in your territory. Do not send warranty replacement tags or warranty tags with service report. (To identify the distributor in your territory, see your Zenith Auto Radio Service Station Official Directory.)

You may purchase new parts from your distributor. If the distributor does not have parts needed in stock, he can order them for you from the Zenith factory.

We manufacture the antenna for the Ford and Mercury closed car only. We are bound by contract to sell the antenna to no one except the Ford Motor Company. However, we supply parts to our distributor for this antenna. For parts and information concerning all other antennas used with the Zenith auto radios, consult the car dealer.

SERVICING FORD-MERCURY ANTENNAS

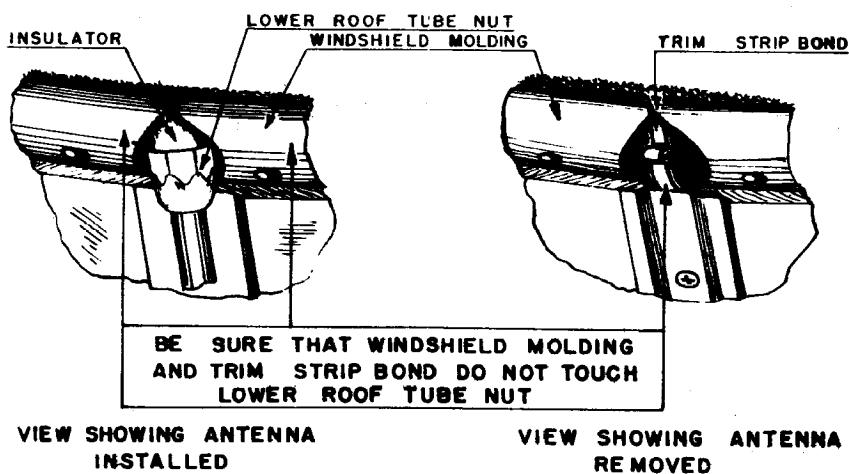


Fig.1.

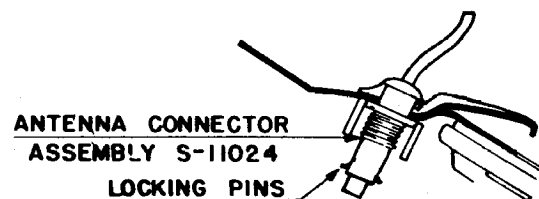


Fig.2.

RADIONIC PRODUCTS EXCLUSIVELY - WORLD'S LEADING MANUFACTURER

In some cases, the Ford-Mercury radio will fail to operate because of faulty installation of the antenna, or because of poor connection in the antenna lead.

Therefore, before removing the radio from the car for service, the antenna should be thoroughly checked.

1. Be sure the antenna lower roof tube nut does not touch the trim strip bond or the end of the windshield moulding. (Fig.1.) The trim strip bond can be easily bent away from the nut with a small screwdriver. If the end of the moulding touches the nut, remove the rear vision mirror, loosen the ends of the moulding, and with a half-round file, or a pair of large cutters, trim away the ends of the moulding. Allow approximately 1/8" clearance between the nut and the moulding. When the mirror is replaced, be sure the mirror bracket does not touch the antenna nut.

2. Be sure the antenna lead is properly fastened to the antenna connector at the instrument panel. In order to repair a loose antenna lead, the receiver and speaker should be removed from the car. The loose connection may be caused by either the antenna cable socket spreading open, or the locking pins breaking from the antenna connector. The cable socket can be easily reshaped with a pair of pliers. If the locking pins are broken (Fig.2.), the connector, insulator and stationary tube assembly No. S-11024 must be replaced.

SERVICING AUTOMATIC TUNING MECHANISM

Sometimes the automatic tuning mechanism fails to change from one station to the next, or jams between two stations. If it fails to change, or jams when operated by the automatic tuning switch, but works perfectly by hand, the trouble is probably with the ratchet gear No. 34-133. However, before servicing this gear, check for obvious trouble such as loose, missing or binding parts.

To service the ratchet gear, thoroughly clean the gear, turret ratchet and the turret shaft with naphtha. Lubricate them with a good grade of clock oil. If this does not relieve the condition, replace the ratchet gear.

To replace the ratchet gear:

1. Remove the escutcheon assembly, and loosen the front plate.
2. Remove the indicator drive gear.

CAUTION: DO NOT TURN THE INDICATOR DRUM OR THE TURRET ASSEMBLY WHEN THE DRIVE GEAR IS OFF.

3. Remove the solenoid end plug and bracket assembly which is held in place by one screw on the face plate, and one screw on the rear mounting plate and lever assembly.

4. Remove the cylindrical spacing bushing, indexing disc, ratchet gear return spring, ratchet spacer, and finally the ratchet gear.

5. Install the new ratchet gear. The teeth must be in the same position as the teeth on the original gear in order that the tuning gear mesh with the turret gear properly.

6. Oil the moving parts with a good grade of clock oil, and reassemble the mechanism.

In case either the ratchet lever or the detent lever, that holds the indexing disc in position, is broken or missing, replace the ratchet and bracket assembly, part number S-10831, available at your distributor for a list price of approximately 63 cents. The procedure for changing the ratchet and bracket assembly is similar to the procedure for changing the ratchet gear.

REPAIRS TO I.F. TRIMMERS IN 1946 ZENITH AUTO RADIOS

In many cases intermittent operation of the I.F. transformers in the 1946 Zenith auto radio is caused by the trimmers. Often the trimmers can be easily repaired. If, however, a careful check does not reveal the trouble, it is advisable to replace the transformer. Listed below are a few suggestions for checking and repairing the trimmers.

1. Remove the cover from the transformer.
2. Scrape all burrs, sharp edges and other foreign matter from the plate of the trimmers.
3. Replace any mica insulator that is cracked or punctured.
4. Be sure all connections are properly soldered. Make certain there is no excess solder.
5. When replacing the cover, be sure the transformer is properly spaced in the shield to prevent the trimmers or wires from shorting.

MISCELLANEOUS SERVICE TIPS

On the Nash set, be sure the ring spacers are placed on the tuning and volume control shaft before installing the receiver. This will help prevent rattles in the instrument panel caused by the tone control and the escutcheon assembly.

A tuning core wrench, part number S-13064, is almost a necessity when aligning the cores in these receivers. A special wrench for this job is available from your distributor. The distributor will also soon stock the dummy antennas recommended in our service manuals.

ZENITH AUTOMOBILE RADIO SERVICE BULLETIN #2

Model #6MF080, 6MN082, 6MH081,
#7ML080, 7ML081.

Complaints of "Blurp" or Motor Boating As The Set Warms Up.

Check the oscillator grid return, R 5. This should be connected to ground as shown in the Hudson Service Manual instead of to Cathode as shown in all the other manuals.

Changing the resistor R 5 to ground does not affect the operation of the oscillator circuit.

Dead or Intermittent Oscillator

1. Check the 7B8 tube. Be sure the tube is defective before replacing. In some cases a new tube will cause the set to operate temporarily.
2. Check the compensator C-10, the trimmer C-11, and coupler C-9, on Models 6MH081-6MF080-7ML080 (C-8 on Model 6MN082).
3. Carefully measure the resistance of all coils (shunt, series, and tuning). Refer to service schematic for values.

Resistance values within plus or minus 5% of that indicated on the schematic must be obtained for satisfactory operation. This can be done by removing insulation and resoldering, or replacing the damaged part.

Buffer Replacement

When replacing the vibrator it is advisable to check the buffer condenser which is across the secondary of the power transformer. Many vibrator failures are caused by defective buffers. Be sure the capacity checks .008 $\pm$ 5% as marked on the wrappers. This is a special metal clad oil impregnated capacitor designed for this job. Therefore, if replacement is necessary, be sure to use the genuine Zenith capacitor #22-1448.

Fuse Replacement

Replace burned out fuses with Zenith part #136-14. This is a new 10 ampere fusetron type MDL10 fuse made by the Bussman Mfg. Co. This new fuse will stand, for several seconds, the overload necessary to operate the automatic tuning mechanism but a small steady

overload will cause it to burn out. This will protect the power transformer when the vibrator sticks or the buffer shorts out.

Lincoln, Dial Pointer Sticks

This complaint is caused by the pointer binding on the upper edge of the Lucite dial scale. Warping of the Lucite causes this condition. A reenforcing strip, part number 83-1352 is available thru your Zenith Distributor. The strip is easily installed by removing the Escutcheon and placing the strip under the upper edge of the dial scale in such a manner that the holes in the foot of the strip align with the 2 rear Escutcheon mounting holes. Replace the Escutcheon with care so that no tension is applied to dial scale. Crimp the two bottom lugs to an angle that will make the bracket clear the pointer. Clearance will occur when the lugs are resting at the center of the top ridge of the Lucite dial scale. Present Lincoln radios are equipped with the reenforcing strip.

Noisy Sets

Many good tubes are being replaced in receivers because they appear noisy when the receiver is jarred. Before replacing the tube, check the socket contacts and clean the tube pins with emery paper.

Intermittent Reception Ford Auto Radio (6MF080)

The customer complains that when driving over car tracks or rough roads the set cuts out. If the car is equipped with a Ford closed car antenna, look for an intermittent short in the connector at the upper end of the lead in, where it contacts the stationary tube of the antenna. An oversize brass washer at the end of the polystyrene insulator in the mounting ferrule touches the sleeve of the lead in, grounding the antenna. To eliminate this condition remove the stationary tube and carefully file or grind down the brass washer until it is smaller than the insulator. Another cause of intermittent or noisy reception, when the set is jarred, is too close spacing of the muting switch located on the tuner mounting plate and lever assembly.

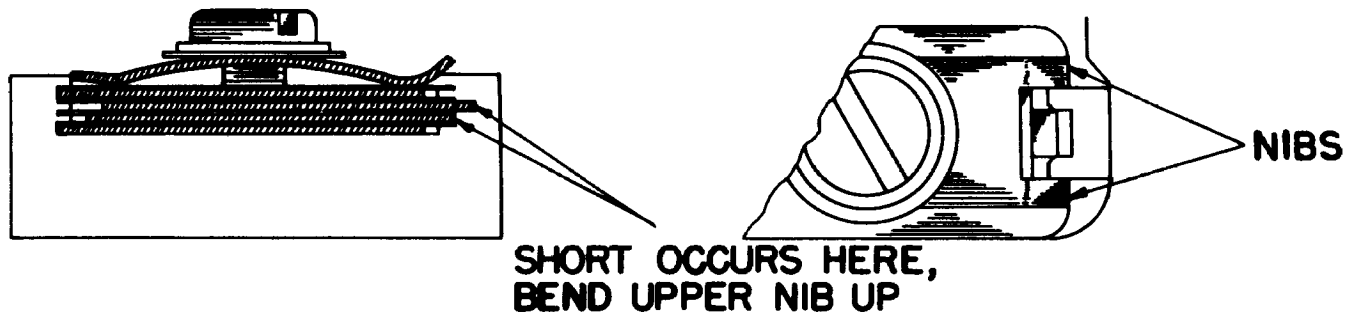
2nd IF Transformer, Part Nos. 95-942 & 95-917

Many cases of trouble due to apparently shorted or open diode sections of 2nd I.F. can be corrected and a permanent repair effected by following the procedure outlined below.

1. If the trouble is suspected in the 2nd I.F., clip or unsolder the ground lead (black, grey wire), which comes out of 2nd I.F. can. If the set then comes to life the trouble is a short between the nibs of the trimmer plates. See illustration. This trouble can be cured by following the procedure outlined below:

1. Remove the I.F. can from the coil, leaving the coils connected in the set.

2. Remove 7B6 and 7A7 tubes adjacent, for easy access to trimmer.



3. Use a pointed instrument, bend up nibs, as indicated on the drawing on both sides of condenser plates, being careful not to damage mica between plates. This will usually result in a permanent repair, if carefully done.

4. Check your work after re-soldering black wire by applying the B + (250V) of the set momentarily to the diode plate contact of 7B6 tube socket (tube out of socket). No current or arc should occur.

Tire Static

There will be an anti-static powder available in a short time. This material may be obtained from your Zenith Parts Distributor. Instructions for its use are contained in the package.

ZENITH AUTO RADIO SERVICE BULLETIN #3

Distortion in 1946 Ford, Nash and Hudson Receivers.

In some cases intermittent distortion occurs in the 1946 Zenith built Ford, Nash and Hudson radios. This condition is difficult to locate during a bench test. It usually appears when the car has been driven, with the radio operating, for a period of from 15 to 45 minutes.

The trouble is usually caused by the 7C5 output tube drawing grid current when the car battery voltage is raised by continuous charging. Few tube testers will reveal this defect in the 7C5 tubes. It is advisable to check for distortion each 1946 Ford, Hudson, and Nash receiver, brought in for service, by connecting it to an 8 volt (4 cell) storage battery, or a power pack capable of delivering a minimum 7.5 volts, under full load, to the filaments of the tubes.

If distortion occurs after 15 minutes of operation on this excessive battery voltage, replace the 7C5 tube. Check the replacement tube in the same manner as described above.

Tuning Core Replacement.

Your distributor will furnish, for replacement purposes, tuning cores, part #149-44, color coded with one yellow dot. The cores marked with one yellow dot are in the center of the permeability tolerance and are, therefore, suited for replacement in all 1946 and 1947 Zenith auto radios regardless of the color code of the original part. After replacing the core, be sure to realign the receiver as directed in the service manual.

Hudson Pilot Light Bulb.

Replace burned out pilot light bulb with Zenith bulb #100-32, or Mazda #55. Be sure the dial pointer does not touch this larger bulb. The larger bulb #100-32 is used on later production Hudson sets because it gives more light, and longer service.

IMPORTANT PRODUCTION CHANGES

1947 FORD MODEL 6MF780 AFTER SERIAL NO. 240,000

1947 HUDSON MODEL DB-47 AFTER SERIAL NO. 55,450

The antenna tuning coil and tuning core have been omitted. Sensitivity remains the same, however, a slight decrease in image rejection ratio results, which may cause whistle or code interference in some localities. In cases where this condition is objectionable to the customer, it is permissible to shift the I. F. not more than 2 or 3 KC either way, which will minimize or correct the tendency.

Not all Ford and Nash receivers were manufactured with a muting switch on the tuning unit and therefore may be somewhat noisier on the automatic cycle.

There have been no important changes in the Nash, Lincoln, Willys, or Crosley sets. The service material you now have is valid for the above mentioned 1947 sets.

REPAIRING AND ADJUSTING PUSH PULL PERMEABILITY TUNING UNITS.

The tuning assemblies for the various 1947 models, are similar, and carry the same part numbers as in 1946. The only difference being the omission of one coil and tuning core in the Ford and Hudson.

It is well worth while to carefully study the tuning mechanism. With the help of the permeability tuning unit service manual (form 2), completely dismantle, and reassemble a unit. You will find the job is more simple than appears at first glance. You will handle the maintenance of these receivers for the next several years, and customers may object to paying 18 to 20 dollars for a new tuner unit which you can profitably repair for 6 or 7 dollars.

Many servicemen are replacing the complete push pull tuner unit unnecessarily. It is recommended that, whenever possible, parts, rather than the complete unit be changed. Any part of the unit is replaceable in from 20 to 30 minutes once the unit is disconnected from the radio. However, in the majority of cases, it is not necessary to remove the entire unit. There are three principle parts subject to failure. They are: ratchet and bracket assembly, part number S 10831, ratchet gear, part number 34-133, and turret assembly, part number S 11082.

An occasional cause of trouble is a bent tuning shaft locking lever, this is caused by attempting to push the tuning knob or shaft in after it has been pulled out into the locked position to tune the receiver manually or set up the automatic positions. Occasionally the retaining rivets will be broken out. To repair this damage, replace the back plate (S 10834), or if only slightly bent, straighten, without removing.

Tuning cores and adjusting screws are easily replaced. We recommend that a tuning wrench (Part No. S 13064) be purchased from your Zenith Parts Distributor for aligning the cores. CAUTION: Be sure to cement core adjusting screws securely after final adjustment.

HUDSON PILOT LIGHT BULB

It has been determined that part number 100-36 (Mazda No. 44), has a longer life expectancy than part number 100-32, (Mazda No. 44). Therefore, when replacing burned out pilot bulbs use part number 100-36, (Mazda No. 44). Be sure the dial pointer does not touch the new bulb, as it is somewhat larger in diameter.

IGNITION INTERFERENCE

In some areas, remote from broadcasting stations, ignition interference may be loud enough to be annoying after the standard interference suppression equipment has been installed. In such cases, the following procedure will relieve this condition:

NASH

- 1 - Install a heavy battery ground strap bond 85-1446, connecting together the timing gear cover plate and frame member (Fig. 1).
- 2 - Bond the steering column, at the floor board, to the firewall.
- 3 - Bond the steering column, at the instrument panel, to the steering column support bracket.
- 4 - Bond the exhaust pipe, near the front of the muffler, to the floor board of the car, using a battery ground strap.

HUDSON

- 1 - Install a bond 83-1364 between the rear muffler support bolt and the car frame. (Fig. 2)

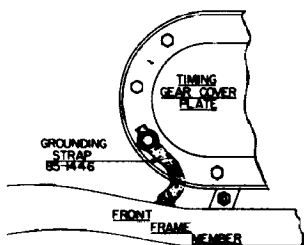


Fig. 1

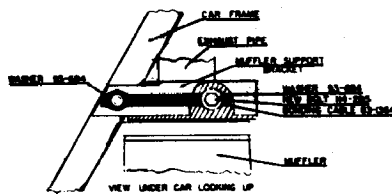


Fig. 2

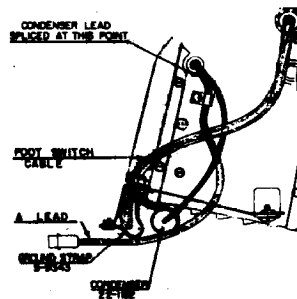


Fig. 3

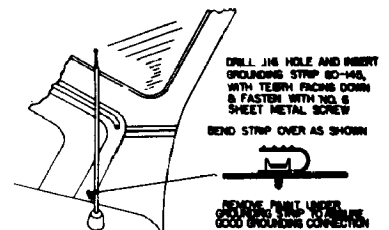


Fig. 4

LINCOLN

1 - Remove the lower left hand rear cover screw from the receiver, see figure 3, and under this screw mount a .5mfd. interference condenser. Also under this screw fasten a two inch piece of heavy copper braid. Splice the lead of the condenser to the "A" lead of the receiver as close to the point where it enters the radio as possible. Connect the loose end of the copper braid, with a sheet metal screw, to the air hopper directly behind the radio. You will find a hole in the hopper that will conveniently accommodate the sheet metal screw.

2 - Add a motor hood bond spring, figure 4, to the body of the car so it will make contact with the lower, rear, left hand tip of the hood.

3 - Remove the left "kick pad" of the car. Remove the antenna from the receiver, and dress the lead up and over the hand brake lever, over the defroster hose, and over the receiver into the antenna socket. Remove a small portion of the rubber sheathing and bond the antenna shield to the car body with a heavy piece of copper braid.

FORD-MERCURY

1 - The oil gauge capacitor No. 22-1326 is not necessary on the average installation. It has, therefore, been eliminated from the Suppression Kit. In some cases it may be necessary to install this condenser. It is available at your Zenith jobber.

Following is a list of parts used on the 1947 models, over and above those used on the 1946 models.

FORD MODEL 6MF780

22-162	100 MMFD 500 V. Mica Condenser
22-1679	Antenna Trimmer
22-1644	Two Section Electrolytic Condenser
S-13646	Oscillator Shunt Coil Assembly
S013650	Right Hand Coil & Shield Assembly (RF)
95-1026	Output Transformer
202-523	Installation Instruction Book
100-36	Dial Light Bulb --- Mazda Type #44
95-1023	Power Transformer
95-1024	(alternate) Power Transformer

HUDSON MODEL DB-47 6MH089

22-162	100 MMFD 500 V. Mica Condenser
22-1679	Antenna Trimmer
22-1644	Two Section Electrolytic Condenser
S-13646	Oscillator Shunt Coil Assembly
S-13650	Right Hand Coil & Shield Assembly (RF)
S-11270	Hand Selector & Muting Switch Assembly
95-1026	Output Transformer
202-548	Installation Instruction Book
100-36	Dial Light Bulb --- Mazda Type #44
95-1023	Power Transformer
95-1024	(alternate) Power Transformer

NASH MODEL 6MN788

S-13398	Escutcheon, Dial Crystal & Key Plate Assembly
S-13443	Tuning Knob & Set Screw Assembly
46-642	Volume Control Knob
95-1026	Output Transformer
95-1023	Power Transformer
95-1024	Power Transformer (alternate)
S-13444	Installation Kit Assembly
22-1644	Two Section Electrolytic Condenser

LINCOLN MODEL 7ML780 -7ML781

26-388	Dial Scale
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ZENITH RADIO CORPORATION

PHONE
BERKSHIRE 7500



CABLE ADDRESS:
"ZENITHRAD"
ALL CODES

6001 DICKENS AVENUE CHICAGO 39, ILLINOIS

AUTO RADIO SERVICE BULLETIN #4

IMPORTANT PRODUCTION CHANGES

1947 FORD MODEL 6MF780 AFTER SERIAL NO. 240,000

1947 HUDSON MODEL DB-47 AFTER SERIAL NO. 55,450

The antenna tuning coil and tuning core have been omitted. Sensitivity remains the same, however, a slight decrease in image rejection ratio results, which may cause whistle or code interference in some localities. In cases where this condition is objectionable to the customer, it is permissible to shift the I. F. not more than 2 or 3 KC either way, which will minimize or correct the tendency.

Not all Ford and Nash receivers were manufactured with a muting switch on the tuning unit and therefore may be somewhat noisier on the automatic cycle.

There have been no important changes in the Nash, Lincoln, Willys, or Crosley sets. The service material you now have is valid for the above mentioned 1947 sets.

REPAIRING AND ADJUSTING PUSH PULL PERMEABILITY TUNING UNITS.

The tuning assemblies for the various 1947 models, are similar, and carry the same part numbers as in 1946. The only difference being the omission of one coil and tuning core in the Ford and Hudson.

It is well worth while to carefully study the tuning mechanism. With the help of the permeability tuning unit service manual (form 2), completely dismantle, and reassemble a unit. You will find the job is more simple than appears at first glance. You will handle the maintenance of these receivers for the next several years, and customers may object to paying 18 to 20 dollars for a new tuner unit which you can profitably repair for 6 or 7 dollars.

Many servicemen are replacing the complete push pull tuner unit unnecessarily. It is recommended that, whenever possible, parts, rather than the complete unit be changed. Any part of the unit is replaceable in from 20 to 30 minutes once the unit is disconnected from the radio. However, in the majority of cases, it is not necessary to remove the entire unit. There are three principle parts subject to failure. They are: ratchet and bracket assembly, part number S 10831, ratchet gear, part number 34-133, and turret assembly, part number S 11082.

An occasional cause of trouble is a bent tuning shaft locking lever, this is caused by attempting to push the tuning knob or shaft in after it has been pulled out into the locked position to tune the receiver manually or set up the automatic positions. Occasionally the retaining rivets will be broken out. To repair this damage, replace the back plate (S 10834), or if only slightly bent, straighten, without removing.

Tuning cores and adjusting screws are easily replaced. We recommend that a tuning wrench (Part No. S 13064) be purchased from your Zenith Parts Distributor for aligning the cores. CAUTION: Be sure to cement core adjusting screws securely after final adjustment.

HUDSON PILOT LIGHT BULB

It has been determined that part number 100-36 (Mazda No. 44), has a longer life expectancy than part number 100-32, (Mazda No. 44). Therefore, when replacing burned out pilot bulbs use part number 100-36, (Mazda No. 44). Be sure the dial pointer does not touch the new bulb, as it is somewhat larger in diameter.

IGNITION INTERFERENCE

In some areas, remote from broadcasting stations, ignition interference may be loud enough to be annoying after the standard interference suppression equipment has been installed. In such cases, the following procedure will relieve this condition:

NASH

- 1 - Install a heavy battery ground strap bond 85-1446, connecting together the timing gear cover plate and frame member (Fig. 1).
- 2 - Bond the steering column, at the floor board, to the firewall.
- 3 - Bond the steering column, at the instrument panel, to the steering column support bracket.
- 4 - Bond the exhaust pipe, near the front of the muffler, to the floor board of the car, using a battery ground strap.

HUDSON

- 1 - Install a bond 83-1364 between the rear muffler support bolt and the car frame. (Fig. 2)

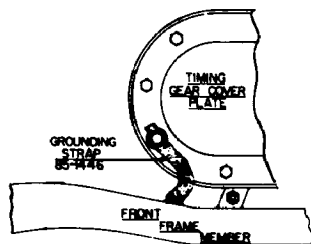


Fig. 1

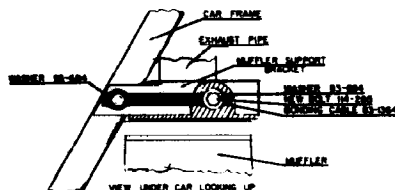


Fig. 2

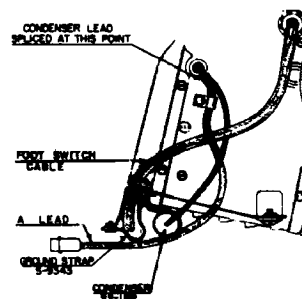


Fig. 3

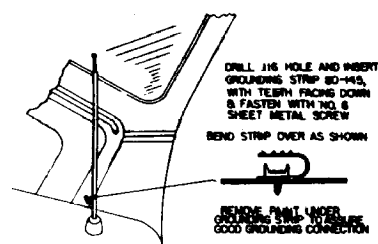


Fig. 4

LINCOLN

1 - Remove the lower left hand rear cover screw from the receiver, see figure 3, and under this screw mount a .5mfd. interference condenser. Also under this screw fasten a two inch piece of heavy copper braid. Splice the lead of the condenser to the "A" lead of the receiver as close to the point where it enters the radio as possible. Connect the loose end of the copper braid, with a sheet metal screw, to the air hopper directly behind the radio. You will find a hole in the hopper that will conveniently accommodate the sheet metal screw.

2 - Add a motor hood bond spring, figure 4, to the body of the car so it will make contact with the lower, rear, left hand tip of the hood.

3 - Remove the left "kick pad" of the car. Remove the antenna from the receiver, and dress the lead up and over the hand brake lever, over the defroster hose, and over the receiver into the antenna socket. Remove a small portion of the rubber sheathing and bond the antenna shield to the car body with a heavy piece of copper braid.

FORD-MERCURY

1 - The oil gauge capacitor No. 22-1326 is not necessary on the average installation. It has, therefore, been eliminated from the Suppression Kit. In some cases it may be necessary to install this condenser. It is available at your Zenith jobber.

PARTS STOCK

Some warranty service stations are not keeping adequate stocks of parts on hand to give prompt service and are depending on the Zenith Distributor to make immediate shipment of small single items. It is requested that you keep an adequate stock of parts on hand to cover your needs for at least a period of 60 days. Your distributor may be temporarily out of stock and not be able to supply you on a moments notice.

Following is a list of parts used on the 1947 models, over and above those used on the 1946 models.

FORD MODEL 6MF780

22-162	100 MMFD 500 V. Mica Condenser
22-1679	Antenna Trimmer
22-1644	Two Section Electrolytic Condenser
S-13646	Oscillator Shunt Coil Assembly
S013650	Right Hand Coil & Shield Assembly (RF)
95-1026	Output Transformer
202-523	Installation Instruction Book
100-36	Dial Light Bulb --- Mazda Type #44
95-1023	Power Transformer
95-1024	(alternate) Power Transformer

HUDSON MODEL DB-47 6MH089

22-162	100 MMFD 500 V. Mica Condenser
22-1679	Antenna Trimmer
22-1644	Two Section Electrolytic Condenser
S-13646	Oscillator Shunt Coil Assembly
S-13650	Right Hand Coil & Shield Assembly (RF)
S-11270	Hand Selector & Muting Switch Assembly
95-1026	Output Transformer
202-548	Installation Instruction Book
100-36	Dial Light Bulb --- Mazda Type #44
95-1023	Power Transformer
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NASH MODEL 6MN788

S-13398	Escutcheon, Dial Crystal & Key Plate Assembly
S-13443	Tuning Knob & Set Screw Assembly
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95-1026	Output Transformer
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95-1024	Power Transformer (alternate)
S-13444	Installation Kit Assembly
22-1644	Two Section Electrolytic Condenser

LINCOLN MODEL 7ML780 -7ML781

26-388	Dial Scale
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- I M P O R T A N T -

FORD AND MERCURY RECEIVERS WERE ENAMEL PAINTED A DARK MAROON COLOR IN 1946. LATE IN 1946 THE PAINTING WAS DISCONTINUED IN FAVOR OF CADMIUM PLATING AND THE USE OF ALUMINUM.

YOU SHOULD WATCH THE SERIAL NUMBERS OF ALL FORD AND MERCURY RADIOS WHICH ARE ENAMEL PAINTED. THEY ARE NOW OUT OF WARRANTY. WARRANTY HAS ALSO EXPIRED ON HUDSON AND NASH RECEIVERS WITH FOOT VOLUME CONTROL.

I. F. Failure

This trouble was overcome last October. You are requested to furnish the code numbers on defective I.F. transformers you are now replacing. Code numbers appear on the side of the shield can and will be a six digit number. Please include this number on the Warranty Service Report.

The practice of sending auto radios to the factory for service must be discontinued except in extreme cases, and then only on written authority from the Service Department. Otherwise you may be billed for repairs and parts. If you have difficult cases of trouble on Zenith auto radios or are in doubt about procedure, please feel free to write to us. Your letters will receive prompt attention.

May we request that if for any reason you discontinue accepting Zenith built auto radios for warranty service that you advise us. The Service Department appreciates your position in regards to warranty service and takes this opportunity to thank you for doing a good job.

Service Division
Zenith Radio Corporation
Chicago 39, Illinois

ZENITH RADIO CORPORATION

PHONE
BERKSHIRE 7500



CABLE ADDRESS
"ZENITHRAD"
ALL CODES

6001 DICKENS AVENUE CHICAGO 39, ILLINOIS

ZENITH AUTOMOBILE RADIO SERVICE BULLETIN #5.

May 1, 1948

Automatic Tuning

The new 1948 line of Zenith auto radios employs a simplified push-button system of automatic tuning in place of the solenoid driven turret mechanism used in previous models. This system is so simple and fool proof, that complete replacement should seldom, if ever, be necessary. The various small parts that may require renewal because of wear or abuse are listed individually in the parts list. However, the complete tuner unit assembly is available should it ever be required.

Do not unscrew the push buttons more than one or two turns. Two turns are sufficient to unlock and reset. If they are completely unscrewed, a cam lock on the plunger assembly will drop out of place. It will then be necessary to open the case, locate the cam lock, and reinsert it on the plunger assembly.

Tube Change

The schematics in the new Lincoln and Mercury service manuals show the tube socket of a 7E6 detector, and the Ford Truck service manual shows the socket of a 6SR7 detector, and the socket of a 7E6 as an alternate. The receivers may actually have either a 7E6 or a 6SR7 detector.

Although the two types of tubes are identical electrically, they are not interchangeable because they require different sockets. When it becomes necessary to service the detector circuit of a Lincoln or Mercury set that employs a 6SR7 tube, refer to the Ford Truck radio service manual.

Warranty Procedure and Service

Auto radio service bulletins Nos. 1, 2, 3 and 4 give valuable service information, and they explain in detail the procedure to follow when performing warranty service for the various car dealers we serve. If any of the above bulletins are missing from your files, please feel free to request new copies from us.

Labor Claims

In the past there has been some misunderstanding and confusion among our service stations in regard to filling out the labor claims. In the lower right-hand corner there is a space marked "Customer's Signature" - meaning, whoever you deliver the receiver to after it has been repaired. It may be the car owner, the car dealer, the car dealer's employee, or the pick-up driver.

Serial Numbers

Care should be exercised in filling out labor claims, particularly in regard to model and serial numbers. As you doubtless realize, we have to draw the line somewhere or pay labor claims indiscriminately. We use the serial number as a guide to the length of time a particular radio has been in use. At this time, serial numbers below those listed are considered out of warranty.

On Ford	250,000
On Nash	60,000
On Mercury	15,000
On Lincoln	10,000

We suggest, therefore, that whenever a car dealer tenders an auto radio with lower serial number as within the warranty, you question it. You should refuse to handle the job on a warranty basis, unless some responsible person in the dealership is willing to go on record in writing to the effect that it is within the warranty. Include such information from the car dealer with your labor claim when the serial number indicates the particular radio is beyond the warranty.

Antennas

Since the war, Zenith has supplied only one type auto radio antenna, namely: Zenith Part No. S-11018, Ford Part No. 51A-18813-A1. This antenna mounted at the center of the windshield and projected up through the top of the car. It is the only antenna covered by our warranty, and the only antenna on which we are in a position to supply parts. The car dealer should be referred to his factory for service adjustments or parts on other antennas.

Circuit Change

The oscillator grid return circuit on early production Lincoln, Hudson, Ford and Ford Truck receivers, is shown in Fig. 1. On later production sets R6 is changed to 18,000 ohms and the circuit connected, as shown in Fig. 2.

The purpose of the change was to equalize the gain at all points on the broadcast band. While there is a slight improvement, we do not recommend making this change in the field.

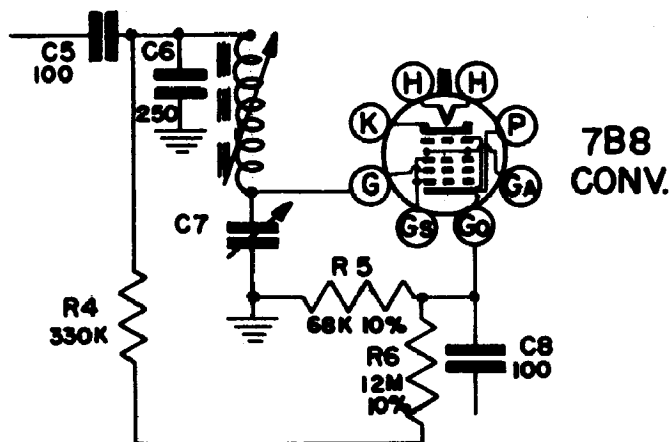


Fig. 1

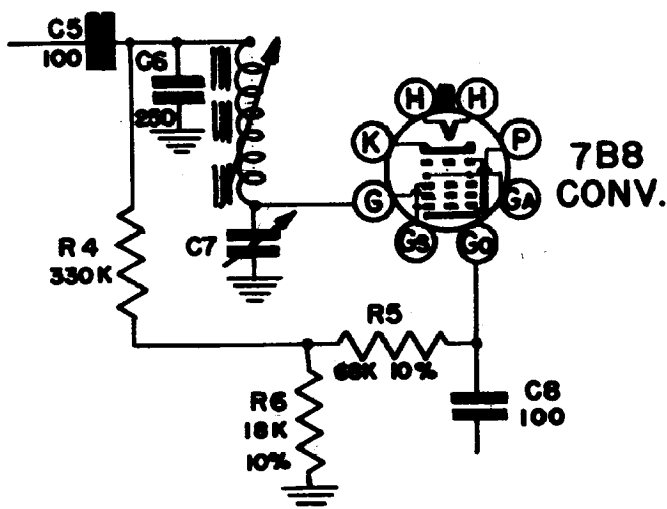


Fig. 2

Dead or Intermittent Oscillators in all Post War Auto Sets

1. Check the 7B8 tube. Be sure the tube is defective before replacing. In some cases, simply replacing the tube will cause the set to operate temporarily, even though the real cause of the trouble has not been eliminated.

2. Check the compensator capacitor, the trimmer capacitor and the coupler capacitor. Check the 15 thousand ohm oscillator plate resistor. Carefully measure the resistance of the oscillator shunt coil, oscillator tuning coil and oscillator series coil. Refer to service schematic for values.

Values within plus or minus 5% of that indicated on the schematic must be obtained for satisfactory operation. To obtain a tolerance of plus or minus 5%, replace the part, or in some case the proper resistance on the coils can be obtained by scraping the paint or insulation from the tips of the wires and resoldering.

SERVICE DIVISION
ZENITH RADIO CORPORATION
CHICAGO 39, ILLINOIS.

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					12H092Z	1946-47-48	11C21Z	3	140-145
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* Indicates automotive receivers.

CHASSIS VERSUS MODELS 1936 - 1942 RECEIVERS

Serial Number

CODE A (GREEN SERIAL TAG)

From	To	Chassis	From	To	Chassis
A-100001	A-101400	8A02	A-193801	A-198800	10A1
A-101401	A-102950	12A1	A-198801	A-199800	6A13
A-102951	A-103450	11A1	A-199801	A-202800	6A02
A-103451	A-105450	6A08	A-202801	A-207000	7A02
A-105451	A-106450	6A14	A-207001	A-208000	6A05
A-106451	A-107450	6A02	A-208001	A-215000	8A02
A-107451	A-107950	6A05	A-215001	A-216600	12A1
A-107951	A-108950	6A08	A-216601	A-217100	6A08
A-108951	A-115050	7A02	A-217101	A-217600	6A04
A-115051	A-118550	12A1	A-217601	A-217850	10A3
			A-217851	A-218850	6A02
A-118551	A-120550	6A13	A-218851	A-220350	7A02
A-120551	A-121050	6A14	A-220351	A-220850	10A3
A-121051	A-123050	6A02	A-220851	A-221850	6A02
A-123051	A-126300	7A02	A-221851	A-224350	7A02
A-126301	A-127800	6A08	A-224351	A-229350	10A1
A-127801	A-128800	7A02	A-229351	A-230350	12A1
A-128801	A-130300	6A13	A-230351	A-230850	7A02
A-130301	A-131800	6A14	A-230851	A-235850	6A05R
A-131801	A-138300	6A20	A-235851	A-238850	7A11
A-138301	A-140300	7A02			
A-140301	A-142300	7A04	A-238851	A-241850	10A2R
A-142301	A-143300	10A3	A-241851	A-243350	10A3R
A-143301	A-144300	8A04	A-243351	A-245350	6A05R
A-144301	A-144550	10A2	A-245351	A-255350	10A1
A-144551	A-146550	7A04	A-255351	A-256550	10A2R
A-146551	A-147050	7A02	A-256551	A-258550	7A11
A-147051	A-148550	12A1	A-258551	A-260550	6A05R
A-148551	A-154550	7A02	A-260551	A-265550	10A1
A-154551	A-155550	6A05	A-265551	A-266750	10A2R
A-155551	A-158550	12A1	A-266751	A-267750	12A6
			A-267751	A-270250	10A1
A-158551	A-163550	6A20	A-270251	A-271250	10A2R
A-163551	A-164550	10A3	A-271251	A-271850	10A3R
A-164551	A-164950	6A04	A-271851	A-272350	7A11
A-164951	A-166300	6A08	A-272351	A-279350	10A1
A-166301	A-169800	6A13	A-279351	A-282350	10A2R
A-169801	A-170800	6A14	A-282351	A-284350	7A11
A-170801	A-171050	10A1	A-284351	A-294350	7B01
A-171951	A-172050	6A05	A-294351	A-299350	6B02
A-172051	A-172300	12A1	A-299351	A-314350	7B01
A-172301	A-174300	6A20			
A-174301	A-176300	7A04	A-314351	A-333350	6B08
A-176301	A-183800	8A02	A-333351	A-383350	10B1
A-183801	A-184800	6A13	A-383351	A-398350	6B06
A-184801	A-185800	6A14	A-398351	A-423350	8B01
A-185801	A-187300	6A02	A-423351	A-438350	10B2
A-187301	A-188800	7A02	A-438351	A-453350	7B02
A-188801	A-189800	6A08	A-453351	A-454850	12B2
A-189801	A-191800	6A20	A-454851	A-456350	6B06
A-191801	A-192800	8A04	A-456351	A-462350	7B02
A-192801	A-193800	6A05	A-462351	A-467350	12B1

Serial Number

From	To	Chassis	From	To	Chassis
A-467351	A-470350	6B02	A-954451	A-954500	6B23BT
A-470351	A-473350	6B06	A-954501	A-955950	5B10CT
A-473351	A-478350	12B2	A-955851	A-956300	6B16BT
A-478351	A-478850	22B1	A-956301	A-956350	6B23BT
A-478851	A-479850	7B01	A-956351	A-959050	5B09BT
A-479850	A-482350	6B08	A-959051	A-961350	5B09CT
A-482351	A-487350	12B1	A-961351	A-962350	5B10BT
A-487351	A-488350	8B01	A-962351	A-963350	6B16BT
A-488351	A-488850	12B1	A-963351	A-963500	8B94BT
A-488851	A-489850	6B06			
A-489851	A-490850	7B02		Code K	
A-490851	A-490875	9B01	K-1001	K-4000	5401
A-490876	A-491625	14B1	K-4001	K-4500	5402
A-491626	A-494625	6B08	K-4501	K-6500	5903
A-494626	A-504625	7B01R	K-6501	K-7500	5903A
A-504626	A-511125	7B02		Code N	
A-511126	A-511625	12B1	N-24001	N-29750	5621
A-512126	A-514125	12B2	N-29751	N-34750	5403
A-514126	A-514175	6B25	N-34751	N-36150	5513
A-514176	A-514275	7B02	N-36161	N-36250	5513A
A-514276	A-516275	6B08	N-36251	N-41000	5619
A-516276	A-520275	7B01R	N-41001	N-44150	5704
A-520276	A-530275	7B02	N-44151	N-44250	5704A
A-530276	A-536275	10B2	N-44251	N-46350	5903
A-536276	A-541775	12B2	N-46351	N-56500	5903A
A-541776	A-544775	6B06	N-46501	N-47800	1202
A-544776	A-555775	7B01R			
A-555776	A-559775	7B02	N-47801	N-48000	1202A
A-559776	A-565275	8B01	N-48001	N-50000	5405
A-565276	A-575275	10B1	N-50001	N-50900	5404E
A-575276	A-580275	10B2	N-50901	N-51000	5404A
A-580276	A-584775	12B1	N-51001	N-71319	5619
A-584776	A-586275	12B2	N-84701	N-89200	5403
A-586276	A-586475	14B1	N-89201	N-92700	5513
A-586476	A-586775	22B1	N-92701	N-97750	5619
A-586776	A-587275	12B2	N-97751	N-97750	5405
A-586276	A-589275	10B2	N-99751	N-100250	1601
A-589276	A-591305	12B2			
A-591306	A-592805	12B1	N-100251	N-100325	1601A
A-592806	A-601805	7B02	N-100326	N-100825	1601
A-601806	A-604805	6B06	N-100826	N-100900	1601A
A-604806	A-607805	10B2	N-100901	N-105900	5403
A-607806	A-610305	12B2	N-105901	N-108400	5513
A-950001	A-950851	8B04BT	N-108401	N-112900	5619
A-950852	A-951351	8B04AT	N-112901	N-114400	5704
A-951351	A-951825	5B16BT	N-114401	N-116600	5903
A-951826	A-951850	5B16CT	N-116601	N-118600	1202
A-951851	A-953350	6B16BT	N-118601	N-121600	5405
A-953351	A-954450	5B10BT			

Serial Number

From	To	Chassis	From	To	Chassis
N-520526	N-528600	1004	N-667801	N-670800	5518
N-528601	N-528875	1004A	N-670801	N-677600	5519
N-528876	N-531275	1203	N-677601	N-677850	5707E
N-531276	N-531375	1203A	N-677851	N-679850	5518
N-531376	N-538375	5407	N-679851	N-680850	5635
N-538376	N-543375	5518	N-680851	N-689350	5516R
N-543376	N-544875	5636	N-630351	N-691600	5516AR
N-544876	N-546875	5708	N-691601	N-692300	5517
N-546876	N-548375	5517A	N-692301	N-698300	5634
N-548376	N-548875	5802	N-698301	N-699800	5634A
N-548876	N-553875	5519	N-699801	N-708100	5801
N-553876	N-558875	5407	N-708101	N-709800	5801A
N-558876	N-561375	5518	N-709801	N-711000	5802A
N-561376	N-562375	5516AR	N-711001	N-716300	1004
N-562376	N-563175	5634A	N-716301	N-717100	1004A
N-563176	N-567675	5801	N-717101	N-718050	1203
N-567676	N-568375	5801A	N-718051	N-718250	1203A
N-568576	N-568875	5802	N-718251	N-725150	5519
N-568876	N-569875	1004	N-725151	N-725250	5519A
N-569876	N-570575	1004A	N-725251	N-729750	5518
N-579576	N-579575	5516R	N-729751	N-734250	5635
N-579576	N-582725	5634	N-734251	N-738250	5520
N-582626	N-583325	5634A	N-738251	N-744250	5637
N-583326	N-587575	5801	N-744251	N-745250	5803
N-587576	N-588075	5801A	N-745251	N-747750	5519
N-588076	N-590975	1004	N-747751	N-748750	5516R
N-590976	N-593975	5635	N-748751	N-750750	5634
N-593976	N-595975	5518	N-750751	N-752250	1004
N-595976	N-598975	5406	N-752251	N-752750	5634
N-598976	N-601975	5633	N-752751	N-754250	5634
N-601976	N-608975	5516R	N-754251	N-755750	5801
N-608976	N-611675	5634	N-755751	N-756800	1004
N-611676	N-617675	5801	N-756801	N-756900	1004A
N-617676	N-621725	1004	N-756901	N-759400	5406
N-621726	N-624725	5635	N-759401	N-760900	5407
N-621726	N-624725	5407	N-760901	N-763900	5520
N-624726	N-624725	5407	N-763901	N-769900	5637
N-631726	N-632225	5801A	N-769901	N-770900	5803
N-632226	N-642225	5516R	N-770901	N-772900	5520
N-642226	N-642725	5516AR	N-772901	N-779900	5637
N-647226	N-650405	5634	N-779901	N-780900	5803
N-650401	N-650675	5634A	N-780901	N-782400	5520
N-650676	N-651875	5707	N-782401	N-788400	5637
N-651876	N-752075	5519A			
N-652076	N-657275	5801			
N-657376	N-657650	5801A			
N-657651	N-662450	1004			
N-662451	N-662950	1004A			
N-662951	N-666450	5635			
N-666451	N-667800	5517A			
			Code P		
			(White with Red Ink Serial Tag)		
			P-1001	P-11000	S-4680
			P-24001	P-29000	S-4680
			P-100001	P-155250	6A10

Serial Number

From	To	Chassis	From	To	Chassis
N-121601	N-124100	5621	N-296301	N-297800	5516A
N-124101	N-139609	1202	N-297801	N-309800	5634
N-126567	N-143185	5621	N-209801	N-310800	5634A
N-143401	N-146400	5513	N-310801	N-313800	5801
N-146401	N-151400	5619	N-313801	N-314300	5801A
N-151401	N-153900	1202	N-314301	N-319300	1004
N-153901	N-154900	5903	N-319301	N-319800	1004A
N-154901	N-155900	5904A	N-319801	N-322800	1203
N-155901	N-165900	5619	N-322801	N-323050	1203A
N-165901	N-169799	5704	N-323051	N-331550	5406
N-171901	N-176400	5513	N-331551	N-336550	5635
N-176401	N-182900	5619	N-336551	N-345450	5633
N-182901	N-183900	5704	N-345451	N-347025	5707
N-183901	N-184900	5903	N-347026	N-348725	5707E
N-184901	N-185900	1202	N-348726	N-353975	5516
N-185901	N-190900	5405	N-353976	N-355475	5516A
N-190901	N-196900	5621	N-355476	N-359225	5634
N-196901	N-201900	5513	N-359226	N-359825	5634A
N-201901	N-204400	5619	M-359826	N-361625	5801
N-204401	N-205650	5903	N-361626	N-361825	5801A
N-205651	N-208650	5405	N-361826	N-367325	1004
N-208651	N-209650	5514A	N-367326	N-367650	1004A
N-213651	N-215150	5903	N-367651	N-369050	1203
N-215151	N-217150	5405	N-369051	N-369125	1203A
N-217151	N-217650	1202	N-369126	N-374125	5633
N-217651	N-219650	5619	N-374126	N-390125	5516
N-219651	N-221650	5513	N-390126	N-407625	5634
N-221651	N-223150	5621	N-407626	N-410125	5801
N-223151	N-223650	5629	N-410126	N-416375	1004
N-223651	N-223750	Spec.	N-416376	N-418375	1203
N-223751	N-224750	5514A	N-418376	N-428375	5633
N-224751	N-226750	5513	N-428376	N-429375	5707
N-226751	N-228750	5619	N-429376	N-443575	5516
N-228751	N-230750	5405	N-443576	N-444125	5516A
N-230751	N-233750	5621	N-444126	N-461175	5634
N-233751	N-235500	5630	N-461176	N-461875	5634A
N-235501	N-235750	5631	N-461876	N-472125	5801
N-235751	N-236750	5706	N-472126	N-472375	5801A
N-236751	N-237750	5425	N-472376	N-477725	1004
N-237751	N-238750	5513	N-477726	N-477875	1004A
N-238751	N-239750	5619	N-477876	N-480775	1203
N-239751	N-240250	5903	N-480776	N-480875	1203A
N-240251	N-240750	5705A	N-480876	N-483875	5406
N-266201	N-271200	5633	N-483876	N-489375	5635
N-271301	N-276300	5707	N-489376	N-501575	5516
N-276301	N-277800	5632	N-501576	N-501975	5516A
N-277801	N-279800	5630	N-501976	N-510975	5634
N-279801	N-280800	5631	N-510976	N-511275	5634A
N-280801	N-281300	5706	N-511276	N-520275	5801
N-281301	N-296300	5516	N-520276	N-520525	5801A

Serial Number

From	To	Chassis	From	To	Chassis
R-100001	R-143000	5521	R-458976	R-459975	5644AT
R-143001	R-144000	5521A	R-459976	R-486675	5638
R-144001	R-172100	5638	R-486676	R-486925	5638A
R-172101	R-172400	5638A	R-486926	R-491390	5709
R-172401	R-179650	5639	R-491391	R-493640	5709AT
R-179651	R-193750	5709	R-493641	R-518265	5905
R-198751	R-194400	5709A	R-518226	R-519665	5905AT
R-194401	R-198400	5710	R-519666	R-526215	1204
R-198401	R-232500	5905	R-526216	R-526265	1204A
R-232501	R-232900	5905A	R-526266	R-530715	5524
R-232901	R-251450	1204	R-530716	R-531715	5524T
R-251451	R-251650	1204A	R-531716	R-533965	5642
R-251651	R-265000	5526	R-533966	R-535965	5711
R-265001	R-265650	5526A	R-535966	R-536965	5711T
R-265651	R-271500	1501	R-536966	R-537815	5710
R-271501	R-271650	1501A	R-537816	R-544815	5526
R-271651	R-279150	5409	R-544816	R-548315	5521
R-279151	R-284150	5408	R-548316	R-555215	5638
R-284151	R-291150	5522	R-555216	R-555315	5638A
R-291151	R-296150	5642	R-555316	R-557265	5644
R-296151	R-299150	5711	R-557266	R-557315	5644AT
R-299151	R-323900	5644	R-557316	R-573415	5905
R-323901	R-324150	5644A	R-573416	R-573565	5905AT
R-324151	R-327650	5524	R-573566	R-575565	5524
R-327651	R-335250	5521	R-575566	R-584965	5644
R-335451	R-339100	5709	R-584966	R-585565	5644AT
R-339151	R-241150	5408	R-585566	R-595865	5638
R-339101	R-339150	5709A	R-595866	R-584965	5638
R-339151	R-241150	5408	R-595766	R-597165	5638A
R-341151	R-344150	5409	R-597166	R-598565	5711
R-344151	R-345150	5522	R-598566	R-599565	5711T
R-345151	R-366150	5644	R-599566	R-601565	5642
R-366151	R-366400	5644A	R-601566	R-602065	5640AT
R-366401	R-380650	5638	R-602066	R-602565	5804AT
R-380651	R-380850	5638A	R-602566	R-605565	5521
R-380851	R-393250	5905	R-605566	R-606965	5709
R-393251	R-393400	5905A	R-606966	R-610965	5524
R-393401	R-403800	1204	R-610966	R-613465	5642
R-403801	R-403900	1204A	R-613466	R-614465	5711
R-403901	R-405775	1501	R-614466	R-614715	5639
R-405776	R-405800	1501A	R-614716	R-614965	5710
R-405801	R-406800	5642	R-614966	R-619965	5526
R-406801	R-408050	5525A	R-619966	R-620465	5526AT
R-408051	R-410550	5640AT	R-620466	R-626065	5521
R-410551	R-412250	5804AT	R-626066	R-626665	5521AT
R-412251	R-423425	5521	R-626666	R-629665	5644
R-423426	R-425475	5521AT	R-629666	R-633815	5638
R-425476	R-433050	5526	R-633816	R-634140	5905
B-433051	R-433875	5526AT	R-634141	R-635140	5905AT
B-433876	R-458975	5644	R-635141	R-635370	1204

Serial Number

From	To	Chassis	From	To	Chassis
R-635371	R-637470	5640AT	R-857051	R-859050	5653
R-637471	R-638670	5804AT	R-859051	R-860300	5654
R-638671	R-639670	5524	R-860301	R-862300	5715
R-639671	R-640670	5711T	R-862301	R-872300	5646
R-640671	R-640920	5709AT	R-872301	R-880100	5647
R-640921	R-641220	5639	R-880101	R-889600	5528
R-641221	R-641520	5710	R-889601	R-899600	5529
R-641521	R-642520	5527	R-899601	R-901200	5647
R-642521	R-643770	5645	R-901201	R-905100	5528
R-643771	R-643920	5638	R-905101	R-91125	5529
R-643921	R-643945	5905	R-911926	R-915825	5651
R-643946	R-643971	5521	R-915826	R-926725	5714
R-643972		5523	R-926726	R-928225	5410
R-643973	R-643984	5524	R-928226	R-929225	5411
R-643985		5525A	R-929226	R-931225	5654
R-643986		5526A	R-931226	R-932725	5410
R-643987	R-643996	5642	R-932726	R-933225	5410S
R-643997	R-644000	1204A	R-933226	R-934225	5653
R-644001	R-645000	5527	R-934226	R-936625	5529
R-650001	R-652000	5530	R-936626	R-937725	5714
R-652001	R-653000	5650	R-937726	R-940225	5907
R-653001	R-654500	5527	R-940226	R-946925	5646
R-654501	R-656500	5530	R-946926	R-949425	5647
R-656501	R-657750	5645	R-949426	R-951225	5651
R-657751	R-659750	5527	R-951226	R-957700	5714
R-659751	R-661250	5645	R-957701	R-959200	1206
R-661251	R-671050	5907	R-959201	R-960200	1502
R-671051	R-673050	5530	R-960201	R-962200	5646
R-673051	R-678050	5714	R-962201	R-963200	5651
R-678051	R-679650	1206	R-963201	R-965000	5528
R-679651	R-680450	1502	R-965001	R-965700	5907A
R-680451	R-689950	5907	R-965701	R-965800	5528A
R-689951	R-690950	1206	R-965801	R-965850	5529A
R-690951	R-691450	1502	R-965851	R-966350	5714A
R-691451	R-695500	5907	R-966351	R-966550	1206A
R-695501	R-699925	1206	R-966551	R-966750	1502A
R-699926	R-729900	5646	R-966751	R-967500	5651A
R-729901	R-733850	5651	R-967501	R-968500	5528A
R-733851	R-750350	5646	R-968901	R-969550	5714A
R-750351	R-751350	5647	R-969551	R-970100	5651A
R-751351	R-768350	5528	R-970101	R-971200	5529A
R-768351	R-794350	5646	R-971201	R-971500	5907A
R-794351	R-802350	5647	R-971701	R-971725	5714A
R-802351	R-816950	5528	R-971726	R-972300	5715
R-816951	R-838500	5714	R-972301	R-972900	5653
R-838501	R-843550	5651	R-973001	R-973750	5528A
R-843551	R-849050	5529	R-973751	R-974200	5529A
R-849051	R-851050	5528	R-974201	R-974400	5714A
R-851051	R-853550	5410	R-974401	R-974825	5907A
R-853551	R-854550	5410S	R-974826	R-975425	5529A
R-854051					

Amended (2/22/45)

Serial Number

From	To	Chassis	From	To	Chassis
R-975426	R-975525	5051A	S-113151	S-115150	5411
R-975526	R-976125	5529A	S-115151	S-126650	5714
R-976126	R-976325	5714A	S-126651	S-132450	5646
R-976326	R-976725	5907A	S-132451	S-134050	5528
R-976726	R-976925	5651B	S-135551	S-138050	5907
R-977126	R-977325	5907B	S-138051	S-143300	5646
R-976926	R-977125	5714B			
R-977326	R-977625	5528B			
R-977626	R-978425	5529B	S-143301	S-146300	5647
R-978426	R-978625	5714B	S-146301	A-150300	5528
			S-150301	S-156050	5714
R-978626	R-978850	5907B	S-156051	S-156550	5410
R-979101	R-979225	5529B	S-156551	S-157050	5410 S
R-979226	R-979600	5529A	S-157051	S-158050	5654
R-979601	R-979700	5651	S-158051	S-161050	5646
R-979701	R-980100	5651B	S-161051	S-162550	5647
R-980101	R-980600	5908T	S-162551	S-165400	5528
R-980601	R-981050	5532BT	S-165401	S-168425	5529
R-901051	R-981100	5532AT			
R-981101	R-981150	5807A	S-168426	S-169625	5651
R-982951	R-984950	5535B	S-169626	S-170625	5412
			S-170626	S-174625	5646
R-985011	R-985610	5907BT	S-174626	S-176175	5528
R-985611	R-990610	5657U	S-176176	S-178325	5529
R-990611	R-992610	5535B	S-178326	S-183825	5714
R-992611	R-992719	5807A	S-183826	S-186225	5907
R-992711	R-992910	5908T	S-186226	S-197225	5646
R-992911	R-994410	5535B	S-197226	S-200725	5647
R-994411	R-995610	5669BT	S-200726	S-202725	5528
R-995611	R-996410	5669AT			
R-996411	R-996960	5720AT	S-202726	S-212725	5714
R-996901	R-998110	5720BT	S-212726	S-216725	5907
R-998111	R-998610	5723AT	S-216726	S-218725	5529
			S-218726	S-237225	5646
			S-237226	S-239225	9647
			S-239226	S-243725	5520
			S-243726	S-244975	5651
			S-244976	S-251075	5714
			S-251076	S-252175	5907
			S-252176	S-252675	1206
Code S (Green Serial Tag)					
S-100001	S-103400	5528			
S-103401	S-109450	5529			
S-109451	S-113150	5907			

Serial Number

From	To	Chassis	From	To	Chassis
S-252676	S-255175	5412	S-408636	S-409635	5412
S-255176	S-275275	5647	S-409636	S-409885	5412S
S-257276	S-261475	5528	S-409886	S-411885	5415
S-261476	S-264275	5529	S-411886	S-412885	5647
S-264276	S-269775	5714	S-412886	S-413885	5528
S-269776	S-272775	5907	S-413886	S-414385	5529
S-272776	S-275775	5415	S-414386	S-417885	5657
S-275776	S-276275	5412S	S-417886	S-418885	5412
S-276276	S-281275	5657	S-418886	S-421385	5416
S-281276	S-285775	5646	S-421386	S-423885	5657
S-285776	S-288775	5528	S-423886	S-424985	5646
S-288776	S-292775	5714	S-424986	S-425485	5415
S-292776	S-293775	5907	S-425486	S-425715	1204
S-293776	S-295725	5807	S-425716	S-428215	5657
S-295726	S-296725	5415	S-428216	S-429465	5714
S-296726	S-298725	5412	S-430466	S-431965	5415
S-298726	S-298925	5412S	S-431966	S-439465	5416
S-298926	S-319325	5646	S-439466	S-440065	5907
S-319326	S-320925	5647	S-440066	S-463065	5719
S-320926	S-320225	5528	S-463066	S-470840	5721
S-320226	S-322285	5651	S-470841	S-474065	5725
S-329486	S-339485	5657	S-474066	S-477765	5719
S-339486	S-343485	5807	S-477766	S-488065	5724
S-343486	S-346985	5646	S-477766	S-513065	5808
S-346986	S-349485	5657	S-513066	S-528065	1005
S-349486	S-352985	5528	S-528066	S-546265	1207
S-352986	S-355985	5529	S-546266	S-561265	5678
S-355986	S-359485	5714	S-561266	S-562015	1503
S-359486	S-360485	5907	S-562016	S-573015	5724
S-360486	S-362985	5412	S-573016	S-576315	5725
S-362986	S-363235	5412S	S-576316	S-588315	5808
S-363236	S-365735	5415	S-588316	S-605315	1005
S-365736	S-368735	5807	S-605316	S-620315	1103
S-368736	S-369035	5412	S-620316	S-640315	5808
S-369036	S-369135	5412S	S-640316	S-655315	1005
S-369136	S-369735	5415	S-655316	S-670315	5678
S-373786	S-376735	5646	S-670316	S-672290	5725
S-376786	S-381735	5657	S-672291	S-680290	1103
S-381736	S-382735	5647	S-680291	S-690290	5678
S-382736	S-384235	5528	S-690291	S-714290	1005
S-384235	S-385235	5714	S-714291	S-740190	5808
S-385236	S-386235	5907	S-740191	S-750190	1005
S-386236	S-389235	5807	S-750191	S-762463	5810
S-389236	S-390235	5415	S-762464	S-765380	5811
S-390236	S-399235	5646	S-765381	S-770380	5678
S-399236	S-402735	5657	S-770381	S-780380	1005
S-402736	S-404235	5529	S-780381	S-781230	5808
S-404236	S-406235	5714	S-781231	S-786230	7A01
S-406236	S-407635	5807	S-786231	S-788230	8A01
S-407636	S-408635	5907	S-788231	S-804230	6A02

Serial Number

From	To	Chassis	From	To	Chassis
S-804231	S-805230	8A01	S-965301	S-967300	5A04BT
S-805231	S-808230	6A04	S-967301	S-967550	5A06BT
S-808231	S-829730	7A02	S-967551	S-967800	5A06AT
S-829731	S-836730	8A02	S-967801	S-969800	6A11BT
S-836731	S-843230	10A1	S-969801	S-970100	6A11AT
S-843231	S-849230	6A05	S-970101	S-980300	8A05AT
S-840231	S-859230	7A04	S-970301	S-971100	8A05BT
S-859231	S-862230	8A03	S-971101	S-971850	5A06BT
S-862231	S-865230	10A2	S-971851	S-972100	5A08BT
S-865231	S-870180	12A3	S-972101	S-973300	5A04BT
S-870181	S-870730	12A4	S-973301	S-973550	5A06AT
S-871000	S-871730	6A08	S-973551	S-974150	5A06BT
S-871731	S-873730	8A03	S-974151	S-975450	6A11BT
S-873731	S-874730	10A4	S-975451	S-976250	8A05BT
S-874731	S-877730	6A02	S-976251	S-976750	5A04BT
S-877731	S-881730	6A14	S-976751	S-977300	6A11BT
S-881731	S-883730	6A16	S-977301	S-977400	6A11AT
S-883731	S-884730	6A08	S-977401	S-977650	8A05BT
S-884731	S-889730	8A02	S-977651	S-977750	8A05AT
S-889731	S-890730	8A03	S-977751	S-987500	5A04BT
S-890731	S-893230	7A04	S-978501	S-979500	6A11BT
S-893231	S-893730	7A02	S-979501	S-979850	6A11AT
S-893731	S-894000	6A08	S-979851	S-980100	5A08BT
S-894001	S-903000	6A02	S-989101	S-980350	6A11AT
S-903001	S-904000	6A13	S-980351	S-980600	6A11BT
S-904001	S-906500	6A05	S-980601	S-980850	8A05AT
S-906501	S-910500	6A12	S-980851	S-981350	5B08AT
S-910501	S-911500	6A02	S-981351	S-983850	5B08BT
S-911501	S-916500	6A14	S-983851	S-984050	5B08CT
S-916501	S-924900	7A02	S-984051	S-984550	8A05BT
S-924901	S-925400	7A04	S-984551	S-986550	5B09BT
S-925401	S-926400	10A2	S-986551	S-986750	5B09CT
S-926401	S-950000	8A02	S-986751	S-987050	5B10AT
S-950001	S-951500	5535BT	S-987051	S-988550	5B10BT
S-951501	S-952450	5910BT	S-988551	S-988650	5B10CT
S-952451	S-953000	5910AT	S-988651	S-989150	6B16AT
S-953001	S-954000	5535ZBT	S-989150	S-991850	6B16BT
S-954001	S-954750	1102AT	S-991851	S-992150	6B16CT
S-954751	S-955750	5669BT	S-992151	S-994150	5B09BT
S-955751	S-956750	5535ZBT	S-994151	S-994650	6B16BT
S-956751	S-957750	5720BT	S-994651	S-994850	5B09CT
S-957751	S-958750	5910BT	S-994851	S-995050	5B10AT
S-958751	S-960750	5535ZBT	S-995051	S-995650	5B10BT
S-960751	S-961250	5669BT	S-995651	S-995850	5B10CT
S-961251	S-961500	5669AT	S-995851	S-997800	6B16BT
S-961501	S-961800	5669BT	S-997801	S-998350	6B16AT
S-961801	S-962800	5535ZBT	S-998351	S-999999	8B04BT
S-962801	S-963800	5535BT			
S-963801	S-964800	5535ZBT			
S-964801	S-965300	5535ABT			

CODE T (PALE BLUE SERIAL TAG)

Serial Number

From	To	Chassis	From	To	Chassis
T-100001	T-115000	5537	T-351551	T-354300	6A19
T-115001	T-115350	5718T	T-354301	T-355800	6A18
T-115351	T-116350	5538	T-355801	T-360800	5A03
T-116351	T-123850	5419	T-360801	T-370800	6A19
T-123851	T-126850	5539	T-370801	T-371800	5A07T
T-126851	T-130850	5537	T-371801	T-377150	5A03
T-130851	T-133350	5539	T-377151	T-384250	6A19
T-133351	T-143350	5537	T-384251	T-386250	5A10
T-143351	T-146850	5536	T-386251	T-398250	6A19
T-146851	T-151850	5537	T-398251	T-400250	5A10
T-151851	T-162850	5420	T-400251	T-405250	5A03
T-162851	T-165350	5417	T-405251	T-421000	5A10
T-165351	T-175350	5537	T-421001	T-431000	4B01
T-175351	T-176350	5541T	T-431001	T-434000	5A10
T-176351	T-176850	5417	T-434001	T-444000	6A19
T-176851	T-178350	5679	T-444001	T-444500	5A07T
T-178351	T-178850	5417	T-444501	T-445300	6A18T
T-178851	T-181850	5420	T-445301	T-446300	5A10
T-181851	T-188850	5420S	T-446301	T-448800	6A25
T-188851	T-189850	5722	T-448801	T-453300	5A10
T-189851	T-191850	5420	T-453301	T-454350	7A10T
T-191851	T-194850	5420S	T-454351	T-475450	6A19
T-194851	T-195850	5417	T-475451	T-494350	6B07
T-195851	T-197050	5417S	T-494351	T-504350	4B01
T-197051	T-297050	5537	T-504351	T-510350	5A10
T-207051	T-208050	5722T	T-510351	T-520350	6A19
T-208051	T-214050	5537	T-520351	T-522750	5A10
T-214051	T-215550	5420	T-522751	T-527750	5B03
T-215551	T-217550	5420S	T-527751	T-530250	6B03
T-217551	T-218300	5541T	T-530251	T-532550	5A10
T-218301	T-219800	5420	T-532551	T-532800	5A05T
T-219801	T-22300	5420S	T-532801	T-533050	5A07T
T-222301	T-232300	5A01	T-533051	T-533300	6A18T
T-232301	T-233300	4A01	T-533301	T-562400	6B03
T-233301	T-234300	4A03	T-562401	T-567400	4B02
T-234301	T-239300	4A02	T-567401	T-573400	4B03
T-239301	T-246300	4A04	T-573401	T-579400	5B05
T-246301	T-246300	5A01	T-579401	T-580400	4B04
T-256301	T-260300	5A02	T-580401	T-582900	6B09
T-260301	T-290300	5A01	T-582901	T-585900	5B06
T-290301	T-291300	4A02	T-585901	T-588400	5B04
T-291301	T-294300	4A04	T-588401	T-590900	4B05
T-294301	T-299300	5A01	T-590901	T-605900	5B07
T-299301	T-300700	5A05T	T-605901	T-606200	5A05T
T-300701	T-301050	5A07T	T-606201	T-606450	5A07T
T-301051	T-316050	5A01	T-606451	T-606610	6A18T
T-316051	T-316550	5722	T-606611	T-606860	6B03
T-316551	T-331550	6A19	T-606861	T-681360	6B03
T-331551	T-336550	5A03	T-681361	T-686360	4B01
T-336551	T-346550	6A19	T-686361	T-687360	5B11T
T-346551	T-351550	5A10	T-687361	T-688360	5B12T

Serial Number

From	To	Chassis	From	To	Chassis
T-688361	T-689860	6B17T	U-261251	U-264250	6A16
T-639861	T-690860	5B11T	U-264251	U-278750	6A01
T-690861	T-691860	5B12T	U-278751	U-282250	6A16
T-691861	T-693060	6B17T	U-282251	U-301250	6A01
T-693861	T-694710	7B06T	U-301251	U-306250	6A24
T-694711	T-704710	4B02	U-306251	U-329250	6A26
T-704711	T-712710	4B03	U-329251	U-378250	5B01
T-712711	T-713710	5B04	U-378251	U-393250	6A26
T-713711	T-714710	5B05	U-393251	U-405250	5B01
T-714711	T-715710	5B06	U-405251	U-455250	5B02
			U-455251	U-473250	6B01
T-715711	T-778710	6B03	U-473251	U-508250	6B04
T-778711	T-785710	4B03	U-508251	U-528501	6B05
T-785711	T-788710	4B02	U-528251	U-533250	5B01
T-788711	T-791210	4B03	U-533251	U-537250	6A26
T-791211	T-792719	5B05	U-537251	U-530250	6A24
T-792711	T-794210	5B06	U-539251	U-544250	5B02
T-794211	T-844210	6B03	U-544251	U-549250	6B04
T-844211	T-846010	6B09	U-549251	U-550450	6A24
T-846011	T-847010	5B12T	U-550451	U-555450	5B13
T-847011	T-857010	7B04			
			U-555451	U-560450	6B01
T-858011	T-859010	7B06T	U-560451	U-460950	6B12T
T-859011	T-860260	5B12T	U-560951	U-561450	6B13T
T-860261	T-880260	7B04	U-561451	U-581450	5B02
T-880261	T-885260	6B03	U-581451	U-591450	6B04
T-885261	T-890260	7B04	U-591451	U-621450	6B01
			U-621451	U-636450	6B05
			U-636451	U-646450	5B14
			U-646451	U-647450	7B05T
			U-647451	U-655950	6B14
			U-655951	U-656450	6B12T
			U-656451	U-656950	6B13T
			U-656951	U-658950	5B13
			U-658951	U-663950	5B14
			U-663951	U-666950	6B01
			U-666951	U-669950	6B04
			U-669951	U-672950	6B05
			U-672951	U-675950	6B14
			U-675951	U-676450	6B05T
			U-676451	U-636450	5B02
			U-686451	U-689450	5B14
			U-689451	U-691950	5B13
			U-691951	U-706950	6B01
			U-606951	U-716950	6B05
			U-716951	U-721950	6B14
			U-721951	U-722450	6B12T
			U-722451	U-722950	6B13T
			U-722951	U-723200	7B05T
			U-723201	U-723450	6B13T
			U-723451	U-738450	5B02

Code U (White Serial Tag)

U-100001	U-100500	5809T
U-100501	U-101500	5680T
U-101501	U-102000	1006T
U-102001	U-103000	5680T
U-103001	U-103500	5809T
U-103501	U-152500	6A01
U-152501	U-153400	6A06T
U-153401	U-153750	6A12T
U-153751	U-181750	6A01
U-181751	U-199750	6A16
U-199751	U-200750	7A05T
U-200751	U-210750	6A01
U-210751	U-211750	6A12T
U-211751	U-214760	6A01
U-214751	U-217750	6A16
U-217751	U-229750	6A01
U-229751	U-232750	6A16
U-232751	U-239750	6A01
U-239751	U-248250	6A16
U-248251	U-261250	6A01

Serial Number

From	To	Chassis	From	To	Chassis
U-738451	U-743450	6B01	Record Players		
U-743451	U-748450	6B05	1	3000	S-6622
U-748451	U-753450	6B14	3001	3500	S-6622R
U-753451	U-758450	5B14	3501	4500	S-7000
			4501	5500	S-7001
			5501	6500	S-7002
			6501	7500	S-7003
			7501	9500	S-8500
			9501	10500	S-8501
			10501	13500	S-8500Z
			13501	15500	S-8501Z
			16001	17000	S-8501Z
			15501	16000	S-9000
			17001	18000	S-9000
			18001	20000	S-9002
			20001	25000	S-9001
			Auto Sets		
			H-1001	H-21600	6MH699
			W-100001	W-102500	6MW693
			Z-100001	Z-155200	6MN390
			Z-160001	Z-258000	6MF490
			Z-500001	Z-501500	6MN495
			Z-506501	Z-510000	6MN495
			Z-510001	Z-514000	6MN496
			Z-514001	Z-523016	6MN495
			Z-525001	Z-527500	7MN596
			Z-527501	Z-530000	6MN595
			Z-530001	Z-537111	7MN596
			Z-550001	Z-536000	6MN595
			Z-260001	Z-385000	6MF590
			Z-285001	Z-295000	6MF591
			Z-295001	Z-397500	6MF590
			Z-400001	Z-410400	7ML592
			Z-410401	Z-410500	7ML592E
			Z-410501	Z-416900	7ML592
			Z-450001	Z-470000	6MF593
			Z-570001	Z-585000	6MN695
			Z-600001	Z-642000	6MF690
			Z-750001	Z-756000	8ML692
Code V (Orange Serial Tag)					
V-100001	V-125000	5659			
V-125001	V-137000	5660			
V-137001	V-151000	5661			
V-151001	V-162000	5662			
V-162001	V-164000	5659			
V-164001	V-210000	5660			
V-210001	V-216000	5652			
V-216001	V-226000	5659U			
V-226001	V-275000	5659			
V-275001	V-282500	5419			
V-282501	V-284000	5419			
V-286501	V-317500	5659			
V-317501	V-319500	5675			
V-319501	V-336500	5660			
V-336501	V-344000	5662			
V-350001	V-360000	5659			
V-360001	V-364906	5672P			
V-364907	V-368811	5675			
V-368812	V-371111	5419			
V-371112	V-372611	5670			
V-372612	V-373611	5674			
V-373612	V-378511	5659U			
V-378512	V-380937	5661			
V-388938	V-418937	5660			
V-418938	V-479839	5659			
V-479840	V-491339	5662			
V-491340	V-493839	5659U			

CHASSIS VERSUS MODELS 1936 - 1942 RECEIVERS

Chassis	Used in Models	Diagram on Page & Vol.	Chassis	Used in Models	Diagram on Page & Vol.
1004	10S-130 10S-147 10S-153 10S-155 10S-156 10S-157 10S-160	342-1	1503	15S-479 15S-495	606-1
			1601-C	16A-61	279-1
			1601-P	16A-63	279-1
1005	10S-443 10S-452 10S-464 10S-470 10S-491 10S-492	600-1	5401	4P-26 4P-51	235-1
			5403	4T-26 4T-51	239-1
1103	11S-474	602-1	5405	4V-31 4V-59	271-1
1202	12A-57 12A-58	263-1	5406	4B-106 4B-131 4B-132 4B-127	328-1
1203	12U-158 12U-159	346-1	5407	4F-133	359-1
1204	12S-205 12S-232 12S-245 12S-265 12S-266 12S-267 12S-268 12S-374	428-1	5408	4F-227	400-1
			5409	4B-231	402-1
			5410	4B-313	462-1
			5411	4B-314 4B-317	464-1
1206	12S-345 12S-370 12S-371	492-1	5412	4K-310 4K-355	515-1
1207	12S-445 12S-453 12S-471 12S-475 12S-494	604-1	5413	4K-329	517-1
			5414	4K-332 4K-354	515-1
1501	15U-246 15U-269 15U-270 15U-271 15U-272 15U-273	430-1	5416	4K-400	526-1
			5417	4B-422 4B-437 4B-466 4B-468	580-1
1502	15S-308 15S-346 15S-372 15S-373	494-1	5419	4K-402	530-1
			5420	4K-422 4K-435 4K-465	582-1

Chassis	Used in Models	Diagram on Page & Vol.	Chassis	Used in Models	Diagram on Page & Vol.
5510	5M-90	312-1	5530	5M-294	448-1
5513	5S-29 5S-56	247-1	5536	5G-438 5G-467	584-1
5516	5S-119 5S-126 5S-127 5S-150 5S-151 5S-161	352-1	5537	5G-401 5G-403 5G-405 5G-442 5G-461	532-1
5518	5F-134 5F-166	363-1	5538	5G-484	536-1
5519	5R-123 5R-135 5R-165	375-1	5539	5G-441 5G-442 5G-461	532-1
5520	5M-191	378-&-393-1	5619	6S-27 6S-52	251-1
5521	5S-201 5S-218 5S-220 5S-228 5S-237 5S-250 5S-252	404-1	5621	6V-27 6V-62	275-1
5522	5F-233 5F-251 5F-230	410-1	5630	6M-90-S 6M-90-D	316-1
5523	5X-230 5X-248 5X-274	437-1	5631	6M-91-S 6M-91-D	318-1
5524	5J-217 5J-247 5J-255	408-1	5632	6M-92	314-1
5526	5R-216 5R-226 5R-236	406-1	5633	6D-116 6D-117 6D-118	334-1
5527	5M-291	446-1	5634	6S-128 6S-137 6S-147 6S-152 6S-157	338-1
5528	5R-303 5R-312 5R-316 5R-317 5R-337	466-1	5635	6B-107 6B-129 6B-164	330-1
5529	5S-319 5S-327 5S-330 5S-338 5S-339	468-1	5637	6M-192 6M-193 6M-194	381-1 & 394-1 384-1 & 395-1 395-1
			5638	6S-203 6S-222 6S-223 6S-229 6S-239 6S-241	414-1

Chassis	Used in Models	Diagram on Page & Vol.	Chassis	Used in Models	Diagram on Page & Vol
5639	6D-202 6D-219 6D-221 6D-238	412-1	5660	6D-426 6D-427 6D-446 6D-455 6D-456	540-1
5642	6J-230 6J-257	416-1	5661	6P-416 6P-417 6P-428	542-1
5644	6S-254 6S-256	418-1	5662	6P-418 6P-419 6P-429 6P-430 6P-447 6P-448 6P-457	544-1
5645	6M-292 6M-293	450-1	5663-UP	6R-480	
5646	6D-302 6D-311 6D-326 6D-336 6D-360	470-1	5670	6R-1470	
5647	6D-312 6D-316 6D-317 6D-337	472-1	5672	6R-485	586-1
5648	6S-330 6S-361	476-1	5673	6MN-495	
5649	6S-341 6S-350 6S-351 6S-352 6S-362	478-1	5675	6R-481	588-1
5650	6M-295	452-1	5676	6MN-496	
5651	6S-301 6S-304 6S-305 6S-306 6S-321 6S-322 6S-340	474-1	5678	6S-439 6S-469	590-1
5653	6B-318 6B-356	480-1	5679	6J-436 6J-463	
5654	6J-322 6J-357	482-1	5704	7S-28 7S-53 7S-54	255-1
5659	6D-419 6D-411	538-1	5706	7M-91S 7M-91D	320-1
5659U	6D-425 6D-4100 6D-4111 6D-4225		5707	7D-119 7D-126 7D-127 7D-138 7D-148 7D-151 7D-162 7D-168	336-1
5660	6D-413 6D-414	540-1	5709	7S-204 7S-232 7S-240 7S-242 7S-258 7S-260 7S-261	422-1

Chassis	Used in Models	Diagram on Page & Vol.	Chassis	Used in Models	Diagram on Page & Vol.
5710	7D-203 7D-222 7D-223 7D-229 7D-239 7D-241 7D-243 7D-253 7D-255	420-1	5808	8S-451 8S-451 8S-463	598-1
5711	7J-232 7J-259 7J-260	424-1	5810	8S-432 8S-433 8S-434 8S-449 8S-450 8S-458 8S-459 8S-460 8S-461 8S-462	616-1
5713	7D-321 7D-301 7D-368 7D-305 Amended (2/22/45)		5811 Revised 5721	8S-487 8S-488 8S-490	
5714	7S-323 7S-342 7S-343 7S-363 7S-364	486-1	5903	9S-30 9S-54 9S-55	259-1
5715	7J-323 7J-358 7J-368		5905	9S-204 9S-232 9S-242 9S-244 9S-262 9S-263 9S-264	426-1
5719	7S-432 7S-433	546-1	5906	9S-365	488-1
5724	7S-432 7S-434 7S-449 7S-450 7S-458 7S-459 7S-460 7S-461 7S-462	594-1	5907	9S-307 9S-324 9S-344 9S-367 9S-369	490-1
5725	7S-487 7S-488 7S-490		4A01	4B-515	4-2
5801	8S-129 8S-154 8S-128 8S-147 8S-157	340-1	4A02	4K-515	6-2
5803	8M-195	386 & 396-1	4A03	4B-536	
5807	8S-359	521-1	4A04	4K-535 4K-570	6-2
5808	8S-443	598-1	4B01	4K-600	129-2
			4B02	4K-616 4K-2616	165-2
			4B03	4K-635 4K-658	
			4B04	4B-639	167-2

Chassis	Used in Models	Diagram on Page & Vol.	Chassis	Used in Models	Diagram on Page & Vol.
4B05	4K-640	169-2	6A17	6MF-595	41-2
5A01	5G-500	8-2	6A19	6G-505	75-2
5A02	5G-537 5G-572	10-2	6A20	6S-596 6S-597	77-2
5A03	5G-504	69-2	6A21	6MF-591	
5A10	5G-510 5G-534		6A24	6D-516	133-2
5B01	5D-610 5D-625	131-2	6A23	6MF-593	
5B02	5D-611 5D-627 5D-2611	171-2	6A25	6G-533 6G-560	137-2
5B03	5R-680	173-2	6A26	6D-520 6D-538	135-2
5B04	5K-637	175-2	6B01	6D-614 6D-2614 6D-629	185-2
5B05	5G-617 5G-2617	177-2	6B02	6R-631	187-2
5B06	5G-636		6B03	6G-601	189-2
5B07	5G-636		6B04	6D-612 6D-2612 6D-622 6D-628	191-2
5B07	5G-603	179-2	6B05	6D-615 6D-2615 6D-630	193-2
5B13	5R-686		6B06	6R-683 6R-684 6R-687 6R-688	175-2
6A01	6D-510 6S-518	10-2	6B08	6S-632 6S-646 6S-656	197-2
6A02	6S-527	14-2	6B09	6G-638 6G-660	199-2
6A04	6S-580	14- & 31-2	6B11	6MH-699	292-2
6A05	6S-546 6S-556	16-2	6B14	6D-620 6D-2620 6D-644	309-2
6A05R	6S-532	139-2	6B19	6MF-690	261-2
6A08	6R-583	13 & 30-2	6B21	6MF-693	269-2
6A10	6D-525 6D-526	12-2			
6A13	6S-511	14-a			
6A14	6S-511W	14-2			
6A16	6D-512 6D-539	73-2			

Chassis	Used in Models	Diagram on Page & Vol.	Chassis	Used in Models	Diagram on Page & Vol.
6B25	S-9005	319-2	10A1	10S-531 10S-549 10S-566 10S-567	26-2
7A01	7S-585	18-2	10A2	10S-589 10S-590	26 & 32-2
7A02	7S-529 7S-530 7S-547 7S-557 7S-558 7S-559	20-2	10A2R	10S-599	144-2
7A04	7S-581 7S-582 7S-584 7S-591 7S-591J	20 & 31-2	10A3	10H-551 10H-571	81-2
7A08	6MN-596	41-2	10A3R	10H-571R 10H-573	143-2
7A09	7ML-592	57-2	10B1	10S-668 10S-669	207-2
7A11	7S-598	141-2	10B2	10S-690	207-2
7B01	7S-633 7S-634 7S-657	201-2	12A1	12S-550Z 12S-568E 12S-568Z 12S-569Z	83-2
7B01R	7S-633R 7S-634R 7S-657R	201-2	12A2	12S-595Z	85-2
7B02	7S-681 7S-682 7S-685	203-2	12A3	12S-550 12S-568 12S-569	28-2
8A01	8S-586	22-2	12A4	12S-595	28 & 32-2
8A02	8S-531 8S-548 8S-563 8S-563S	24-2	12A6	12H-678 12H-679	209-2
8A03	8S-587 8S-588	24 & 31-2	12B1	12H-650 12H-670	211-2
8A04	8S-593 8S-594	79-2	12B2	12H-689 12H-691 12H-695 12H-696	213-2
8B01	8S-647 8S-661	205-2	14B1	14H-697	313-2
			22B1	22H-698 22H-699	315 & 317-2