



SERVICE MANUAL

MODEL "ROYAL 3000-1"

ALL TRANSISTOR TRANSOCEANIC PORTABLE RECEIVER

CHASSIS 12KT40Z8

To the Serviceman

GENERAL

Royal 3000-1 Transistor Portable covers a wide range of frequencies; FM, Longwave, Standard Broadcast, and six shortwave bands. It operates on eight 1½ volt "D" cells which give up to 300 hours of performance under normal operating conditions. A 4" x 6" oval speaker (voice coil impedance 3.2 ohms) is used for excellent reproduction and delivers undistorted power output of 500 milliwatts. This instrument can also be used as an FM-AM tuner in conjunction with high-fidelity audio equipment.

An earphone jack has been provided so that one can use a set of Zenith low impedance headphones, or a Zenith hearing aid type low impedance earphone.

A monopole antenna which is concealed in the handle, is used on both the FM and Shortwave bands. The Standard Broadcast and Longwave band have a built-in Wavemagnet in the top of the cabinet which eliminates the need for an external antenna under average conditions.

FM SECTION

A separate tuner is used on the FM band which consists of a Tuned RF stage, and an autodyne stage (converter – oscillator).

The circuitry for FM operation is as follows: RF amplifier, autodyne stage, three I.F. stages, Ratio detector, first audio, audio driver, and push-pull class B audio output. The R.F. and autodyne stages operate with common base circuits. The three I.F. stages have

common emitter circuits and are neutralized. The I.F. transformers operate at 10.7 megacycles and are slug tuned. To eliminate overloading and resultant distortion in the I.F. pass band and the S curve of the Ratio Detector, AGC is obtained from the collector of the 2nd I.F. thru a 6 mmf. capacitor to diode detector and is fed to the base of the RF transistor. The I.F. signal is reduced to audio with a conventional Ratio Detector incorporating two matched solid state diodes (Part of Ratio Detector Assembly)

As with all high frequency oscillators, stability is important and as a feature, it is desirable to provide automatic frequency control, which is guided by voltages, directly related to oscillator frequency shift. This is accomplished by taking D.C. voltage from the tertiary winding of the Ratio Detector and feeding it back to the X101 diode which is a voltage sensitive variable capacitor. This diode is connected across the oscillator portion of the autodyne circuit and acts as a frequency controlling device. If the oscillator shifts frequency, this causes ratio detector unbalance and a D.C. voltage is fed back to the diode, so its changing capacity will automatically adjust the frequency of the oscillator circuit to compensate for original oscillator shift. In this manner, we have continuous automatic oscillator frequency control.

The lock-in range of the AFC circuit is approximately 700 KC at 100 micro-volts. Should you desire to receive a weak FM station within the AFC pull-in range of a strong FM station, an AFC disabling switch has been provided in the receiver circuitry. The AFC voltage is removed from the oscillator when the AFC switch is in FM position.

To obtain proper AFC action, place AFC switch in FM position and tune to the exact desired station frequency, then put the AFC switch to AFC-FM position..this will insure proper AFC action.

AM SECTION

On AM operation this instrument utilizes a conventional superheterodyne circuit using an individual mixer and oscillator to produce the 455 KC intermediate frequency. The I.F. frequency amplifiers are conventional. It is necessary to use neutralization in the I.F. amplifier stages as in circuits using a triode tube. The diode (part of T11 assembly) is used as a detector and AGC voltage source. This is then followed by a first audio amplifier and a driver stage for the class B push-pull output.

The RF and Oscillator transistors use common base circuitry, while the mixer and the I.F. transistors have common emitter circuitry.

AGC voltage is supplied from the AM diode detector to the base of the RF transistor. The AGC voltage is then taken from the RF emitter and fed to the base of the mixer and first I.F. transistor.

AUDIO SYSTEM

The audio system is common to both FM and AM. The output from either the Ratio Detector or the Am Detector is fed directly to the base of the first audio, and then on through the driver and into the push-pull class "B" output stage.

Provision has been made, for use of this receiver as a tuner in conjunction with high-fidelity equipment through the use of an output jack on the back of the chassis. The volume control on the Royal 3000-1 must be at minimum position to eliminate sound from the receiver's speaker.

OUTPUT TRANSISTORS

MATCHING GROUP
A
B-D
C-E-G
F-H-J
I-K-M
L-N-P
O-Q

The output transistor matching identification will be letters. Transistors in any one chassis must be matched according to group chart.

Letters can be intermixed but must be from the same group.

COMPONENT REPLACEMENT

When soldering components at the base of a transistor socket, it is suggested that the transistor be removed to avoid any possibility of excessive heat transfer through the pin connection to the transistor. When soldering the low voltage electrolytics and germanium

diodes, the wire should be held with a pair of long nose pliers. The long nose pliers will act as a heat sink.

SIGNAL TRACING

A technique used in radio repair commonly known as "Screw driver testing" in which the B plus at the plate of the tube or collector of a transistor is shorted to ground to check for "clicks" in the speaker, is definitely not recommended. This practice would be comparable to shorting the collector of a transistor to ground which could damage the transistor. Standard point to point signal checking with the proper RF, IF and audio signals, should only be used.

Wrenches Zenith part number 68-32 and 68-37 may be used for aligning this receiver.

Power Supply.....Eight Zenith Z4NL 1½ volt or standard "D" type flashlight batteries. Approximate battery life 300 hours. One Zenith Z4NL battery is used for the dial lights. Normal no signal current drain is approximately 25 milliamperes.

AC OPERATION

This receiver may be operated from the standard 120 volt alternating current (50/60 cycle) supply. To operate this receiver from an AC outlet Zenith engineers have created a 12 volt DC power supply (part number S-64352 for 120 volts - part number S-65074 for 230/115 volts), which can be obtained through your Zenith dealer.

To connect this unit, insert its output plug into the Jack (J-5) on the side of the receiver cabinet. The battery will be automatically disconnected when the plug is inserted.

IMPORTANT: IF THE RECEIVER IS NOT TO BE OPERATED ON BATTERIES FOR SEVERAL WEEKS, THE BATTERIES SHOULD BE REMOVED.

Tuning Ranges			
BAND	METERS (M)	MEGACYCLES (Mc)	KILOCYCLES (Kc)
FM	3.4 to 2.8	88 to 108	88000 to 108000
LW	2000 to 750	.15 to .4	150 to 400
BC	555 to 188	.54 to 1.6	540 to 1600
2-4	150 to 75	2 to 4	2000 to 4000
4-9	75 to 33	4 to 9	4000 to 9000
31	31	9.4 to 10.1	9400 to 10100
25	25	11.4 to 12.3	11400 to 12300
19	19	14.6 to 15.8	14600 to 15800
16	16	17.1 to 18.5	17100 to 18500

Intermediate Frequency.....AM-(455 KC)
FM-(10.7 MC)

PART NO.	DESCRIPTION	PRICE	PART NO.	DESCRIPTION	PRICE
MODEL 3000-1					
12KT40Z8 CHASSIS PARTS					
12-3515	Slide Stop Bracket	.03	63-4262	68K Ohm Resistor - 1/4 W 10%	.17
12-3517	Tuner Slide Bracket	.35	63-4273	120K Ohm Resistor - 1/4 W 10%	
19-322	Coil Mounting Clip (5 req'd.)	.05	63-4537	6.8 Ohm Resistor - 1/2 W 20%	
19-442	Coil Mounting Clip (18 req'd.)	.05	63-5020	Volume Control & Switch	2.05
20-1256	10.7 MC Trap Coil (2 req'd.)	.50	63-5021	Tone Control	1.40
22-1392	25 Pf. Disc Capacitor - 500 V (2 req'd.)	.33	68-32	Adjusting Wrench	.60
22-1665	5 Pf. Ceramic Capacitor - 500 V	.25	73-24	8-32 x 1/4 Slotted Hex Hd. Set Screw - Cuppoint (2 part of S-58124)	
22-1761	50 Pf. Ceramic Capacitor - 500 V (2 req'd.)	.25	78-644	Connector Socket	.15
22-2381	6 Mmfd. Disc Capacitor - 500 V	.25	78-1063	Transistor Socket - 3 Contact (4 req'd.)	.35
22-2549	4 Pf. Disc Capacitor - 500 V	.25	78-1096	Transistor Socket - 4 Contact (6 req'd.)	.35
22-2594	17 Pf. Disc Capacitor - 500 V (3 req'd.)	.25	78-1346	Transistor Socket - 4 Contact (2 req'd.)	.30
22-2596	2.4 Pf. Gimmick Capacitor - 500 V (2 req'd.)	.25	78-1528	Wavemagnet Socket (part of S-58151)	.20
22-2883	50 Mf. Electrolytic Capacitor - 12 V	1.10	80-209	Drive Cord Tension Spring	.10
22-2979	60 Pf. Ceramic Capacitor - 500 V	.30	80-1189	Drive Cord Tension Spring (Pointer)	.15
22-2981	2700 Pf. Mica Capacitor - 100 V	1.00	80-1772	Drive Cord Tension Spring (Pointer)	.05
22-2982	4300 Pf. Mica Capacitor - 100 V	1.50	83-2770	Seven Lug Terminal Strip (part of S-58087)	.20
22-2983	Trimmer Capacitor	.35	83-2822	Antenna Terminal Strip (part of S-58087)	.50
22-2985	500 Mf. Electrolytic Capacitor - 12 V	2.00	83-2918	Four Lug Terminal Strip	.15
22-2987	.1 Mf. Mylar Capacitor - 50 V	.35	83-2975	Three Lug Terminal Strip (2 req'd.)	.10
22-3066	10 Pf. Gimmick Capacitor	.20	83-3024	Rubber Strip	.03
22-3113	120 Pf. Ceramic Capacitor - 500 V	.50	83-3586	Twelve Lug Terminal Strip	.20
22-3256	10 Mf. Electrolytic Capacitor - 6 V	1.00	83-3641	Five Lug Terminal Strip	.10
22-3326	2 x .001 Mf. Disc Capacitor - 25 V	.40	83-4604	Blanking Strip	.10
22-3538	125 Pf. Mica Capacitor - 100 V	.25	85-756	Slide Switch - Momentary Contact (part of S-58147)	.50
22-3621	22 Pf. Disc Capacitor	.25	85-747	Slide Switch - AFC (part of S-58147)	.50
22-3743	Three Section Variable Capacitor	5.50	85-758	Bandswitch	11.00
22-3744	Five Section Trimmer Capacitor	3.25	86-306	Terminal (3 req'd.)	.03
22-3745	Six Section Trimmer Capacitor	4.00	86-329	Connector Terminal (1 used on ea. yellow and black wires)	.03
22-3749	1000 Pf. Mica Capacitor - 100 V	.90	93-966	Lockwasher (3 used on S-69066)	.03
22-3752	38 Pf. Disc Capacitor	.25	93-1043	Spring Washer (used on S-58152)	.10
22-3787	Trimmer Capacitor	.50	94-334	Capacitor Mounting Bushing (3 req'd.)	.03
22-3791	42 Pf. Disc Capacitor	.25	94-613	Iron Core Bushing (3 req'd.)	.10
22-3902	Single Section Trimmer Capacitor	1.00	95-2002	1st I.F. Transformer (Primary)	2.50
22-3955	.1 Mfd. Capacitor - 50 V	.30	95-2003	1st I.F. Transformer (Secondary)	2.50
54-139	3/8-32 x 9/16 Hex Nut (1 used on ea. 63-5021, 63-5020 & S-69066)	.03	95-2004	2nd I.F. & 3rd I.F. Transformer - AM - Primary (2 req'd.)	3.50
54-227	4-40 x 1/4 x 3/32 Hex Nut (2 used on S-69066)	.03	95-2005	2nd I.F. & 3rd I.F. Transformer - AM - Secondary (2 req'd.)	3.50
54-421	Transistor Socket Retaining Nut (10 req'd.)	.03	95-2006	4th I.F. Transformer (Primary)	3.50
54-476	1/4-32 x 3/8 Hex Nut - Brass (used on 344-1 or 44-34)		95-2010	Ratio Detector Transformer (FM)	5.35
57-2385	Switch Mounting Plate	.20	95-2028	Output Transformer	
58-235	Three Prong Plug	.15	95-2029	Driver Transformer	
59-330	Dial Pointer	.50	95-2247	2nd & 3rd I.F. Transformer - FM (2 req'd.)	
63-1719	27 Ohm Resistor - 1/2 W 10%	.17	100-218	Dial Light Lamp - GE No. 123 (2 req'd.)	.17
63-1740	82 Ohm Resistor - 1/2 W 10% (2 req'd.)	.17	103-31	Crystal Diode (part of S-52650)	.75
63-1743	100 Ohm Resistor - 1/2 W 10% (2 req'd.)	.17	105-96	Integnet	
63-1761	270 Ohm Resistor - 1/2 W 10%	.17	113-8	6-32 x 1/4 x 1/4 Hex Hd. Mach. Screw - Internal Shakeproof Lockwasher (1 used on 22-3744 & 2 used on 22-3745)	.03
63-1764	330 Ohm Resistor - 1/2 W 10%	.17	113-9	8-32 x 1/4 x 1/4 Hex Hd. Mach. Screw - Internal Shakeproof Lockwasher (3 used on S-58147)	.03
63-1771	470 Ohm Resistor - 1/2 W 10% (4 req'd.)	.17	113-10	6-32 x 3/16 x 1/4 Hex Hd. Mach. Screw - Internal Shakeproof Lockwasher (2 used on S-58151)	.03
63-1772	470 Ohm Resistor - 1/2 W 20%	.17	113-13	6-32 x 7/16 x 1/4 Hex Hd. Mach. Screw - External Shakeproof Lockwasher (3 used on 22-3743)	.03
63-1775	560 Ohm Resistor - 1/2 W 10% (3 req'd.)	.17	113-121	6-32 x 7/32 Phillips Rd. Hd. Mach. Screw - Internal Lockwasher Attached (used on 22-3902)	.03
63-1778	680 Ohm Resistor - 1/2 W 10%	.17	113-123	4-40 x 3/16 Phillips Rd. Hd. Mach. Screw - Cadmium - Internal Shakeproof Lockwasher (joins 12-3515 & 12-3517)	.03
63-1779	680 Ohm Resistor - 1/2 W 20%	.17	114-39	8-32 x 1/4 x 1/4 Hex Hd. Self-tap. Screw - Cadmium (16 req'd.)	.03
63-1786	1000 Ohm Resistor - 1/2 W 20%	.17	114-193	8-32 x 3/16 x 1/4 Hex Hd. Self-tap. Screw - Cadmium	.03
63-1793	1500 Ohm Resistor - 1/2 W 20% (2 req'd.)	.17	114-456	8-32 x 1/4 Hex Hd. Mach. Screw - Cadmium Flat Washer Attached (2 used on S-58155)	.03
63-1796	1800 Ohm Resistor - 1/2 W 10% (2 req'd.)	.17	114-571	4-24 x 3/16 x 3/16 Hex Slotted Hd. Self-tap. Screw - Stat. Bronze (2 used on S-58152)	.03
63-1799	2200 Ohm Resistor - 1/2 W 10% (5 req'd.)	.17	121-349	Transistor - R.F. (AML)	
63-1806	3300 Ohm Resistor - 1/2 W 10%	.17	121-350	Transistor - Oscillator (AM)	
63-1817	5600 Ohm Resistor - 1/2 W 10%	.17	121-351	Transistor - Mixer (AM)	
63-1820	6800 Ohm Resistor - 1/2 W 10%	.17	121-352	Transistor - 1st - 2nd - 3rd I.F.	
63-1827	10K Ohm Resistor - 1/2 W 10% (2 req'd.)	.17	121-373	Transistor - Output - Matched (2 req'd.)	
63-1834	15K Ohm Resistor - 1/2 W 10%	.17	121-374	Transistor - Audio	
63-1879	180K Ohm Resistor - 1/2 W 5%	.34	121-375	Transistor - Driver	
63-1897	470K Ohm Resistor - 1/2 W 10%	.17	125-94	Rubber Grommet (3 used on 22-3743)	.03
63-3392	1500 Ohm Resistor - 1/10 W 10%	.17	126-857	Coil Shield (part of S-69066)	.05
63-4157	220 Ohm Resistor - 1/4 W 10% (2 req'd.)	.17	126-983	Coil Shield (part of S-52650)	.15
63-4161	270 Ohm Resistor - 1/4 W 10%	.17			
63-4171	470 Ohm Resistor - 1/4 W 10% (3 req'd.)	.17			
63-4178	680 Ohm Resistor - 1/4 W 10% (2 req'd.)	.17			
63-4182	820 Ohm Resistor - 1/4 W 10%	.17			
63-4185	1000 Ohm Resistor - 1/4 W 10%	.17			
63-4186	1000 Ohm Resistor - 1/4 W 20%	.17			
63-4189	1200 Ohm Resistor - 1/4 W 10%	.17			
63-4196	1800 Ohm Resistor - 1/4 W 10%	.17			
63-4217	5600 Ohm Resistor - 1/4 W 10% (2 req'd.)	.17			
63-4224	8200 Ohm Resistor - 1/4 W 10%	.17			
63-4234	15K Ohm Resistor - 1/4 W 10%	.17			
63-4238	18K Ohm Resistor - 1/4 W 10% (2 req'd.)	.17			
63-4241	22K Ohm Resistor - 1/4 W 10% (part of S-69066)	.17			
63-4259	56K Ohm Resistor - 1/4 W 10%	.17			

ALL PRICES SHOWN ARE SUG

ROYAL 3000-1 CHASSIS 12KT40Z8 PARTS LIST

PART NO.	DESCRIPTION	PRICE	PART NO.	DESCRIPTION	PRICE	PART NO.	DESCRIPTION
126-1027	Interstage Shield (2 req'd.)	.15	S-58095	FM Tuning Coil Assembly (3 req'd.)	.60	57-2380	Trim
126-1028	Coil Shield (part of S-69066)	.10	S-58151	Wave Magnet Socket & Bracket Assembly	.50	57-23 86	Hint
149-74	Iron Core (1 part of ea. S-45000)		S-68075	Oscillator Coil Assembly (2-4 M.C.)		S-4	
149-86	Iron Core (part of S-42080)	.10	S-68076	Oscillator Coil Assembly (4-9 M.C.)		57-2416	Trim
149-211	Iron Core (part of ea. S-42084, S-42085, S-42086, S-42087, S-42089, S-42090, S-42091, S-42092, S-42093, S-42094, S-42097, S-42098, S-42099, S-42100, S-42101, S-42102, S-68075, & S-68076 and 2 part of ea. S-43363 & S-43364)	.10	S-69067	FM Tuner		57-4019	Nan
149-316	Iron Core & Spring (3 req'd.)	.25		22-2731 10 Pf. Disc Capacitor (2 req'd.)	.25	57-4022	Nan
184-26	Wooden Bead (2 req'd.)	.05		22-2732 1000 Pf. Feed-Thru Capacitor (4 req'd.)	.30	57-4023	Esc
188-232	Clamping Ring (3 req'd.)	.03		24-1170 FM Tuner Cover	.25	57-4024	Esc
199-330	Paper Sleeve (part of S-52650)	.03		63-4157 220 Ohm Resistor 1/4 W 10%	.17	57-4461	Emk
322-3	.01 Mf. Disc Capacitor - 25 V (2 req'd.)	.15		63-4168 390 Ohm Resistor 1/4 W 10%	.17	58-233	Sev
or				63-4175 560 Ohm Resistor 1/4 W 10%	.17		S-
22-3393	.01 Mf. Disc Capacitor - 25 V (2 req'd.)	.25		63-4192 1500 Ohm Resistor 1/4 W 10%	.17	69-312	6-32
322-9	.001 Mf. Disc Capacitor - 25 V (2 req'd.)			63-4224 8200 Ohm Resistor 1/4 W 10% (2 req'd.)	.17		(1
or				80-1467 Retaining Spring	.05	69-348	6-32
22-2729	.001 Mf. Disc Capacitor - 25 V (2 req'd.)	.25		80-1672 Spring	.20		Br
322-19	.02 Mf. Disc Capacitor - 25 V			86-331 Insulated Feed-Thru (3 req'd.)	.05	76-954	Rel
or				95-2246 1st I.F. Transformer (FM)			Sh
22-3394	.02 Mf. Disc Capacitor - 25 V	.40		103-39 Silicon Diode	3.00	78-1101	Thru
322-20	.05 Mf. Disc Capacitor - 25V (17 req'd.)			112-1467 2-56 x 5/16 Phillips Pan Hd. Mach Screw (used on S-64842)	.03	80-1094	Con
or				113-10 6-32 x 3/16 x 1/4 Hex Hd. Mach Screw - Internal Shakeproof	.03	80-1176	Sele
22-3689	.05 Mf. Disc Capacitor - 25 V (17 req'd.)	.30		113-33 4-40 x 1/4 x 7/32 Hex Hd. Mach. Screw - Internal Shakeproof	.03	80-1181	Ten
322-22	5 Mf. Electrolytic Capacitor - 12 V (4 req'd.)	.35		121-294 Transistor - R.F. (FM)		80-1228	Spr
or				121-295 Transistor - Oscillator-Mixer (FM)		83-2741	Trin
22-2884	5 Mf. Electrolytic Capacitor - 12 V (4 req'd.)	1.50		322-3 .01 Mf. Disc Capacitor - 25 V. (3 req'd.)	.15	83-2742	Supp
322-27	.0033 Mf. Disc Capacitor - 500 V (2 req'd.)			or			S-
or				22-3393 .01 Mf. Disc Capacitor - 25 V (2 req'd.)	.25	83-2780	Doo
22-13	.0033 Mf. Disc Capacitor (2 req'd.)	.25		322-45 2.2 Pf. Gimmick Capacitor		83-2781	Doo
322-37	20 Mf. Electrolytic Capacitor - 3 V	.75		or		83-2785	Rub
22-3753	20 Mf. Electrolytic Capacitor			22-2468 2.2 Pf. Gimmick Capacitor	.25	83-2865	Spa
322-40	.001 Mf. Disc Capacitor - 1000 V			Pulley & Bushing Assembly	.80	83-2903	Prot
or				Control Mounting Bracket Assembly	1.50	83-3234	Pap
22-17	.001 Mf. Disc Capacitor - 1000 V	.25	S-58142	Dial Drum Assembly	5.00		S-
322-75	.33 Mfd. Mylar Capacitor - 50M		S-58147	Pulley & Bracket Assembly	.75	83-3235	Pap
or			S-58152	Drive Cord & Eyelet Assembly - Pointer 11 3/4"	.15	83-3289	Felt
22-3897	.33 Mfd. Mylar Capacitor	.50	S-58155	Drive Cord & Eyelet Assembly - Pointer 20"	.15	83-4328	Retu
322-76	.22 Mfd. Mylar Capacitor - 50 V		S-58159	Drive Cord & Eyelet Assembly - 14 1/4" (2 req'd.)	.15	83-4354	Trin
or				S-58160			S-
22-3267	.22 Mfd. Mylar Capacitor	.60		FM Tuner Drive Shaft Assembly	2.00	83-4355	Trin
322-82	.0022 Mfd. Disc Capacitor			Bandswitch & Coil Assembly		83-4819	Pap
or						86-149	Ter
22-18	.0022 Mfd. Disc Capacitor - 500 V	.25	S-58179			86-221	Shal
344-1	Miniature Jack	.35	S-64842			86-306	Wire
or			S-69066			86-310	Ter
44-34	Miniature Jack	.90				86-323	Spa
403-1	Diode	.35				93-166	Loc
or						93-565	.29C
103-44	Diode	.50					(1
S-42080	Antenna Loading Coil Assembly	.60	Z4NL	1 1/2 V Battery (9 req'd.)		93-1289	Fibr
S-42084	Oscillator Coil Assembly (31M)	1.25	12-2604	Support Bracket	.95	93-1572	Spa
S-42085	Oscillator Coil Assembly (25M)	1.25	12-3233	Battery Stop Bracket	.05	93-1606	Stee
S-42086	Oscillator Coil Assembly (19M)	1.25	12-3656	Chassis Support Bracket	.05	94-985	Spa
S-42087	Oscillator Coil Assembly (16M)	1.25	12-3697	Rear Door Locking Bracket	.15	101-158	Trat
S-42089	Antenna Coil Assembly (2-4 M.C.)	1.00	12-4281	Dial Scale Backing Bracket		110-348	Viny
S-42090	Antenna Coil Assembly (4-9 M.C.)	1.00	15-108	Socket Cap (part of S-48171)			S-
S-42091	Antenna Coil Assembly (31M)	1.00	15-191	Plug Cap		110-352	Viny
S-42092	Antenna Coil Assembly (25M)	1.00	16-2824	Carton Filler			(pe
S-42093	Antenna Coil Assembly - 18M (part of S-69066)	1.00	16-2908	Packing Carton		110-451	Viny
S-42094	Antenna Coil Assembly - 16M (part of S-69066)	1.00	19-373	Cable Clamp (part of S-48171)			(pe
S-42097	Mixer Coil Assembly (2-4 M.C.)	1.25	24-1001	Battery Case Cover (part of S-48171)	1.00	110-452	Viny
S-42098	Mixer Coil Assembly (4-9 M.C.)	1.25	36-205	Handle - Bottom Section	1.25	110-528	Viny
S-42099	Mixer Coil Assembly (31M)	1.25	43-311	Wavemagnet Housing (Fixed)	.75		S-
S-42100	Mixer Coil Assembly (25M)	1.00	44-54	Sub-Miniature Jack	.75	112-1113	4-40
S-42101	Mixer Coil Assembly - 19 M (part of S-69066)	1.25	46-1810	Release Knob	1.25		Sc
S-42102	Mixer Coil Assembly - 16M (part of S-69066)	1.25	46-1812	Antenna Knob (part of S-42207)	.25	112-1156	4-24
S-42148	Dial Light Socket & Wire Assembly	1.25	46-1825	Selector Knob (part of S-58033)	1.25		tag
S-42653	Drive Cord, Eyelet & Spring Assembly	.35	49-988	4" x 6" PM Speaker	8.00	112-1190	5-20
S-43363	Oscillator Coil Assembly (B.C. & L.W.)	2.75	54-12	6-32 x 1/4 Hex Nut (3 used on ea. S-41853 & S-64592)	.03	112-1205	2-56
S-43364	Mixer Coil Assembly (B.C. & L.W.)	2.00	54-445	Tinnerman Speed Nut (2 used on S-58115)	.05		Sc
S-45000	Series Antenna Coupling Coil Assembly (2 req'd.)	.75	54-455	Tinnerman Speed Nut (5 used on ea. 57-4023 & 83-4355)	.03	112-1215	4-24
S-49339	Antenna Coil Assembly		54-467	Tinnerman Speed Nut (4 used on 49-988 & 8 used on S-58117)	.03		tag
S-50171	Base & Terminal Assembly	.35	54-578	Fastener (part of S-69029)	.35	112-1225	4-40
S-52650	Diode & Filter Assembly	2.50	54-586	10-48 Hex Nut (used on 44-54)	.03		Sc
S-58087	R.F. Shelf Bracket & Terminal	1.25	54-605	Tinnerman Speed Nut (5 used on 192-236)	.03	112-1332	8-18
			57-2371	Cabinet Top Plate	5.25		Sc
			57-2379	Trim Plate - Band Selector (part of S-41853)	1.25	112-1451	6-20
							Sc
							43-

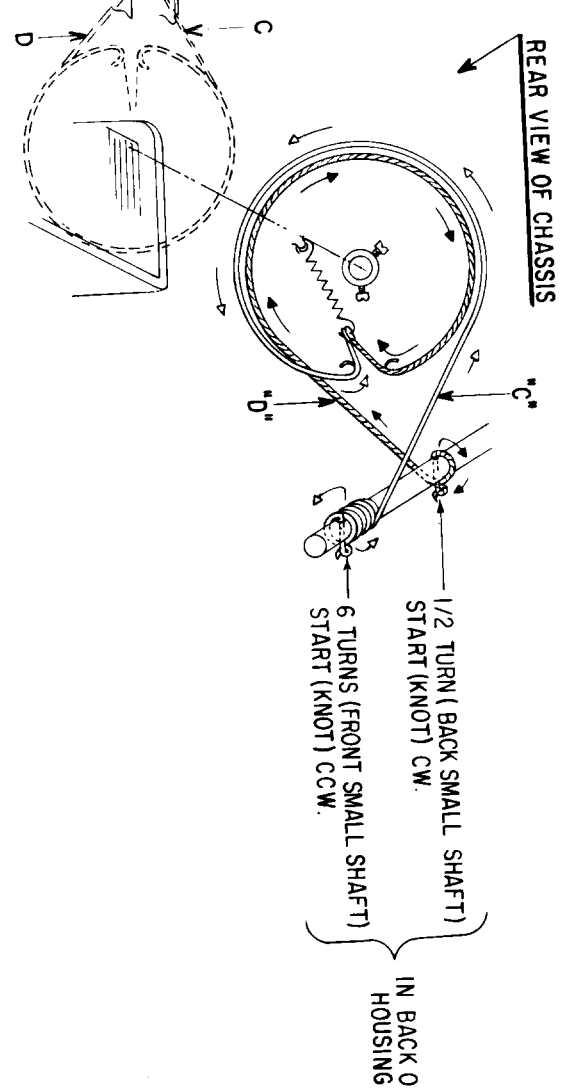
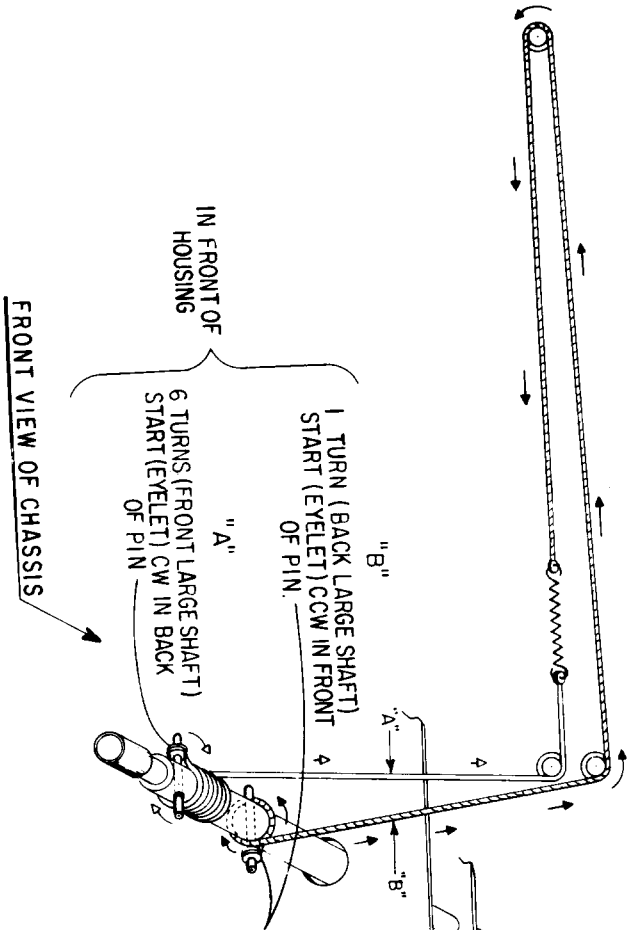
CABINET PARTS

ESTIMATED U.S. RETAIL WHICH INCLUDE U.S. MANUFACTURERS' EXCISE TAX, WHERE APPLICABLE, AND ARE SUBJECT TO CHANGE WITHOUT NOTICE.

DESCRIPTION	PRICE	PART NO.	DESCRIPTION	PRICE
Trim Plate (part of S-64592)	1.50	112-1509	Special Screw (Retains 54-578 part of S-69029)	.05
Hinge Plate (1 part of ea. S-41853 & S-64592)	.25	113-136	6-20 x 1/4 x 1/4 Hex Hd. Self-tap. Screw	
Trim Plate - Tuning (part of S-56299)	.80		External Shakeproof Lockwasher	
Nameplate Overlay (part of S-58122)	.50		(used on 46-1810)	.03
Nameplate - Escutcheon (part of S-58122)	1.25	113-152	8-32 x 1/4 x 1/4 Hex Hd. Self-tap. Screw - Cadmium - Internal Shakeproof Lockwasher (used on 12-3697)	.03
Escutcheon Plate	1.50			
Escutcheon Plate Overlay	.85	114-68	8-32 x 1/4 x 1/4 Hex Hd. Self-tap. Screw - Stat. Bronze (used on 12-3697)	
Emblem Plate (part of S-58124)	.50	114-77	6-20 x 5/16 x 1/4 Hex Hd. Self-tap. Screw - Stat. Bronze (used on 12-3233)	.03
Seven Prong Connector Plug (used on S-58117)	.55	114-87	8-18 x 1/2 x 1/4 Hex Hd. Self-tap. Screw - Stat. Bronze (2 used on 12KT40Z8)	.03
6-32 x 5/16 Phillips Rd. Hd. Mach. Screw (1 used on ea. 166-97)	.03	114-615	6-20 x 5/16 x 1/4 Hex Hd. Self-tap. Screw - Cadmium (2 used on S-56299)	.03
6-32 x 3/16 Phillips Rd. Hd. Mach. Screw - Bright Chrome (used on 166-97)	.03	114-770	8-32 x 1/4 x 1/4 Slotted Hex Hd. Mach. Screw - Cadmium (used on S-58033)	.03
Release Lever & Antenna Pivot Housing Shaft (2 req'd.)	.15	114-775	4-24 x 5/32 x 3/16 Hex Hd. Self-tap. Screw - Cadmium (1 part of ea. S-41853 & S-64592)	.03
Three Contact Socket (part of S-48171)	.20	114-785	6-32 x 5/16 x 1/4 Special Hex Hd. Mach. Screw (3 part of ea. S-50774 & S-64592)	.03
Contact Spring (part of S-48171)	.20	114-911	6-32 x 5/16 Slotted Hex Hd. Mach. Screw - Flat Washer Attached - Cadmium (2 used on 12KT40Z8)	.05
Selector Knob Spring (part of S-58033)	.10		Handle Release Lever	1.75
Tension Spring (used on 76-954)	.15	117-206	Background Grille	1.50
Spring (Handle)	.30	138-433	Grille	3.25
Trim Strip	.50	138-434	Handle Support Block	.60
Support Strip (1 part of ea. S-41853 & S-64592)	.25	152-292	Plastic Bumper (4 req'd.)	.05
Door Mounting Strip - Left	1.60	166-97	Rubber Bumper (6 required)	.03
Door Mounting Strip - Right	1.60	166-105	Bumper (2 req'd.)	.03
Rubber Strip (2 req'd.)	.05	166-106	Knob Clamping Ring (1 part of ea. S-58423 & S-65523)	.03
Spacer Strip (5 req'd.)	.03	188-177	Plastic Bag	2.50
Protective Cover Strip	.40		Dial Crystal	6.00
Paper Strip (1 part of ea. S-41853 & S-64592)	.10	189-276	Trim Plate Gasket (part of S-56299)	.15
Paper Strip (part of S-41853)	.40	192-236	Instruction Book	1.00
Felt Strip (2 used on 12KT40Z8)	.10	196.302	Shortwave Chart Book	3.05
Retaining Strip	.03	202-2402	Spring & Stud Assembly - R.H. (part of S-41853)	.30
Trim Strip - Trans-Oceanic (part of S-58124)	2.50	202-2595	Spring & Stud Assembly - L.H. (part of S-64592)	.30
Trim Strip	1.50	S-41778	End Plate Assembly (Right)	
Paper Strip (part of S-64592)	.35	S-41780	Antenna Pivot Housing, Sleeve & Shaft Assembly	2.50
Terminal	.05	S-41853	Telescopic Antenna Assembly	5.50
Shakeproof Terminal (part of S-48171)	.03	S-42206	Handle & Pin Assembly	1.00
Wire Retaining Terminal	.03		Wavemagnet Winding Assembly	4.50
Terminal	.05		Battery Case & Wire Assembly	4.25
Spade Terminal	.03		Trim Plate (Tuning) & Gasket Assembly	1.25
Lockwasher (1 used on ea. 54-12)	.03		Band Selector Knob Assembly	3.35
.290 x 9/16 x .031 Washer - Cadmium (1 used on ea. 112-1451)	.03		Cabinet Support Bracket Assembly	5.00
Fibre Washer (part of S-48171)	.03		Wavemagnet Mounting Strip & Latch Spring Assembly	.80
Spacer Washer (2 req'd.)	.05		Log Chart Retaining Plate & Compass Disc Assembly	5.00
Steel Washer (used on 344-1 or 44-34)	.03		Lower Door Assembly	12.50
Spacer Bushing (4 used on 57-2371)	.05		Top Door Assembly	7.50
Transistor Layout Label			Knob & Ring Assembly - Volume & Tone (2 req'd.)	1.25
Vinyl Material - End Plates (part of S-41853)	.30		End Plate Assembly (Left)	
Vinyl Material - Inside Top Door (part of S-58124)	.55		Tuning Knob & Ring Assembly	1.75
Vinyl Material - Lower Front Door (part of S-58122)	1.25		Rear Door Assembly	
Vinyl Material - Cabinet Support Bracket	1.50			
Vinyl Material - End Plates (part of S-64592)	.50			
4-40 x 7/32 Phillips Truss Hd. Mach. Screw - Bright Chrome (2 used on ea. 12-2604 & 76-954)	.03			
2-32 x 11/32 Fillister Hd. Self-tap. Screw (5 req'd.)	.03			
4-24 x 11/32 Special Fillister Hd. Self-tap. Screw - Black Zinc Plate (4 req'd.)	.03			
4-40 x 1/4 Special Phillips Rd. Hd. Mach. Screw - Brass (1 used on ea. S-58122 & S-58124)	.03			
4-24 x 1/4 Special Phillips Flat Hd. Self-tap. Screw (4 part of S-58122)	.05			
5-20 x 3/16 Phillips Pan Hd. Self-tap. Screw (6 used on S-69029)	.03			
2-56 x 3/16 Slotted Pan Hd. Self-tap. Screw (4 Mount S-58120)	.03			
4-24 x 3/8 Phillips Fillister Hd. Self-tap. Screw (5 used on 83-2741)	.03			
4-40 x 3/16 Special Phillips Hd. Mach. Screw (2 part of ea. S-41853 & S-64592)	.03			
8-18 x 1/4 Phillips Rd. Hd. Self-tap. Screw (4 used on S-58117)	.05			
6-20 x 1/2 Phillips Pan Hd. Self-tap. Screw - Cadmium (4 join S-58117 & 43-311)	.03			

DIAL CORD DRIVE

SHOWN IN FULL COUNTERCLOCKWISE POSITION



Chassis 12KT40Z8	F.M.-R.F.	FM-Osc. Mixer	AM-RF	AM-Mixer	AM- Oscillator	AM-FM 1st IF.	AM-FM 2nd IF.	AM-FM 3rd IF.	1st Audio	Driver	Output Matched Pair	Supplier
Zenith Part No.	121-294	121-295	121-44	121-351	121-350	121-352	121-352	121-352	121-374	121-375	121-373	Amperex
EIA No.	2N2654	2N2654	2N2089	2N2092	2N2089	2N2089	2N2089	2N2089	2N2439	2N2438	2N2431	

FM (88 - 108 MC) ALIGNMENT PROCEDURE

OPER.	INPUT SIGNAL FREQUENCY	CONNECT GENERATOR TO	SET DIAL AT	ADJUST TRIMMERS	PURPOSE	PLACE V.T.V.M. METER
1.	10.7 MC modulated	* Test Point "B"	98 MC	L105, L106, L28, L29, L32, L33, L-36	For I.F. alignment	Across voice coil & reduce input so output is not greater than .4 volts.
2.	10.7 MC modulated	* Test Point "B"	98 MC	Adjust L37 for zero DC reading on center indicating DC VTVM	Align ratio detector	Place probe on pin 6 of Ratio Detector & adjust L37 to zero after determining that there is a symmetrical swing around this zero point.
3.	98 MC modulated	** FM antenna terminals	98 MC	L103	Set oscillator to dial scale.	Across voice coil
4.	98 MC modulated	** FM antenna terminals	98 MC	L101, L102	Align antenna & detector stages	Across voice coil.

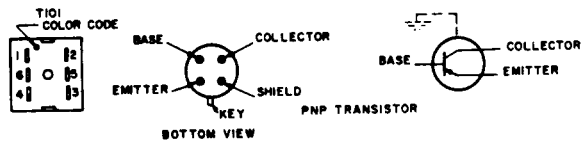
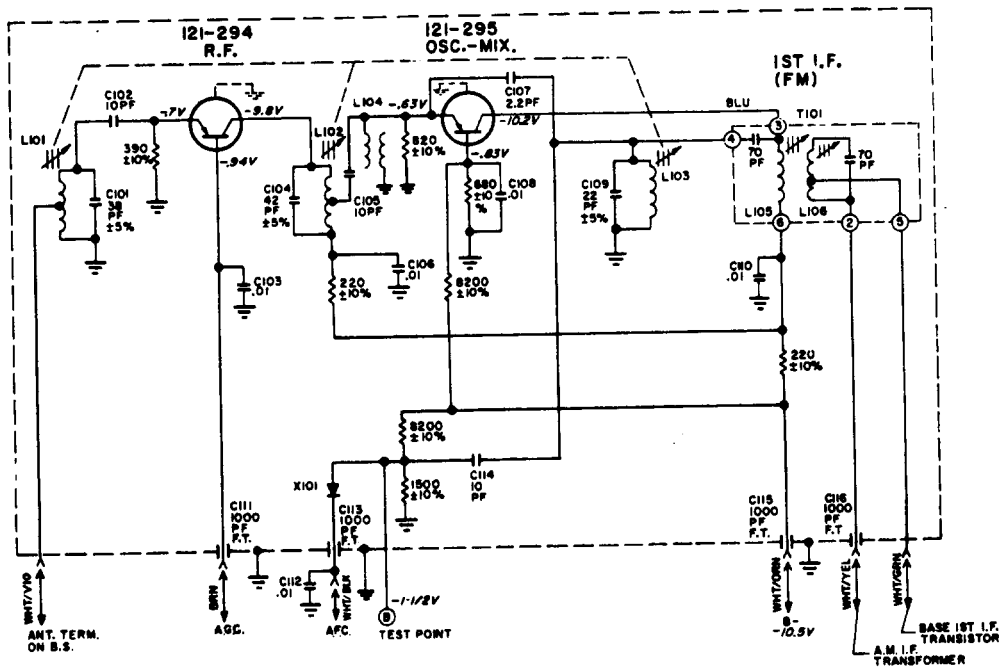
* Probe from generator should be isolated through A .05 MFD. capacitor.

** Probe from generator should be terminated with proper resistor to match 72 ohm line impedance.

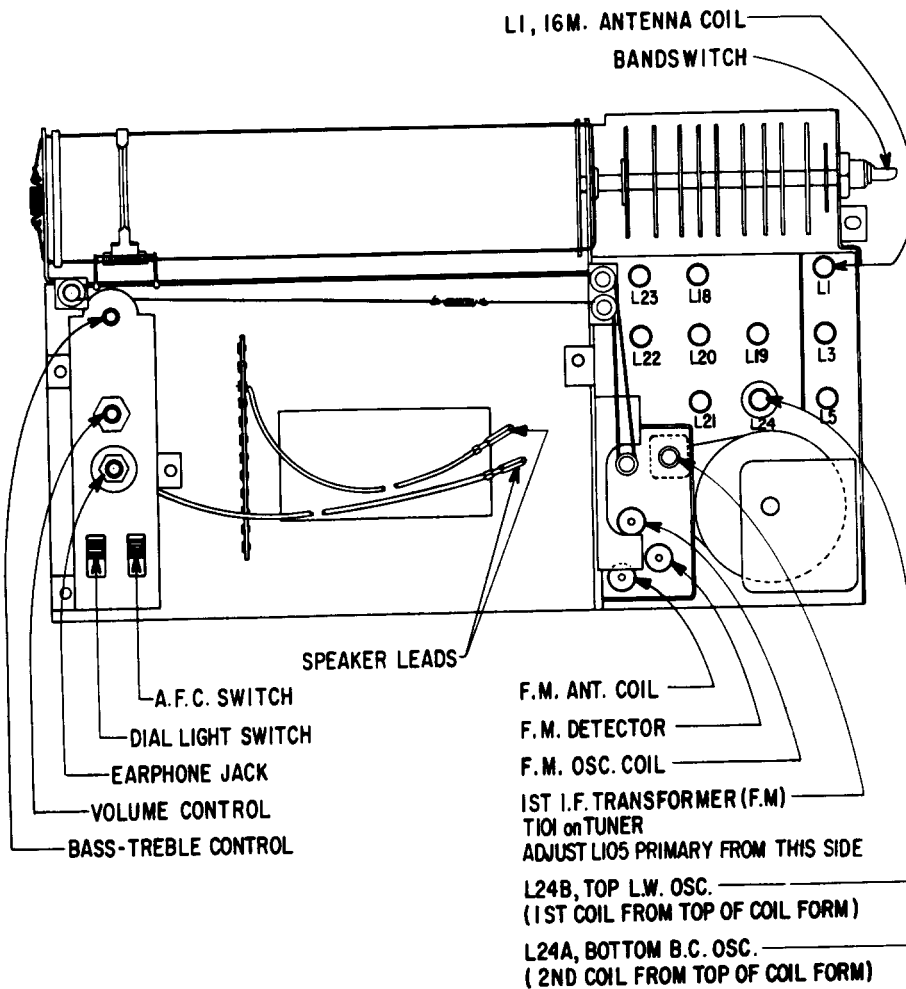
AM ALIGNMENT PROCEDURE

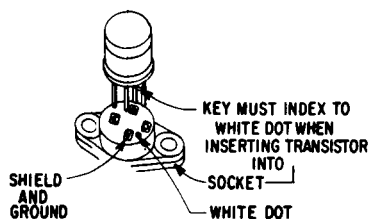
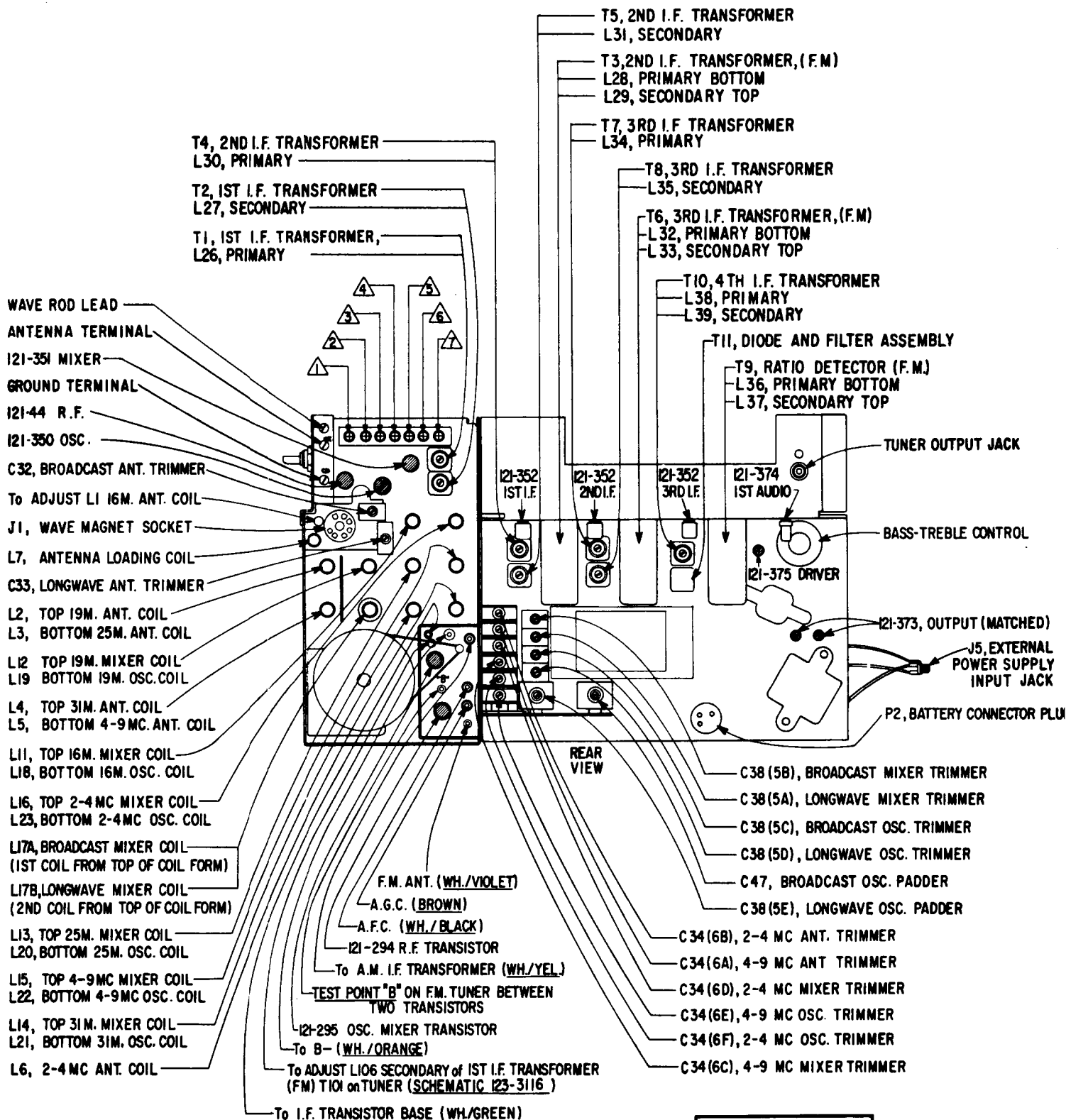
OPER.	CONNECT GEN. TO DUMMY ANTENNA	INPUT SIG. FREQUENCY	BAND	SET DIAL AT	TRIMMERS	PURPOSE	
1	One turn loop coupled loosely to Broadcast Wavemagnet	455 Kc	BC	1600 Kc	T1, T2, T4, T5, T7, T8, T10	Align I.F.	
*2	One turn coupled loosely to Long Wave Wavemagnet	160 Kc	LW	160 Kc	Rock Gang, Adjust 5E	Alignment of LW at 160 Kc	
*3	One Turn Loop Loosely to Long Wave Wavemagnet	400 Kc	LW	400 Kc	5D	Set osc. to scale	
4		REPEAT OPERATIONS 2 & 3					
*5		160 Kc	LW	160 Kc	Rock, adjust L17B	Alignment LW mixer at 160 Kc	
*6		375 Kc	LW	375 Kc	5A	Alignment LW mixer	
7		REPEAT OPERATIONS 5 & 6					
*8	One turn loop coupled loosely to Broadcast Wavemagnet	375 Kc	LW	375 Kc	C33	Alignment of LW antenna	
*9		600 Kc	BC	600 Kc	Rock Gang, Adjust C47	Alignment of BC at 600 Kc	
10		1600 Kc	BC	1600 Kc	5C	Set osc. to scale	
11		REPEAT OPERATIONS 9 & 10					
*12		600 Kc	BC	600 Kc	Rock, adjust L17A	Alignment of BC mixer at 600 Kc	
13	Coupled Loosely to Broadcast Wavemagnet	1400 Kc	BC	1400 Kc	5B	Alignment BC mixer	
14		REPEAT OPERATIONS 12 & 13					
15		1400 Kc	BC	1400 Kc	C32	Alignment of BC antenna	
*16		2.1 Mc	2-4 Mc	2.1 Mc	Rock L23, L17, L6	Alignment of SW osc., mixer & antenna	
17		3.9 Mc	2-4 Mc	3.9 Mc	6F, 6D, 6B	Alignment of SW osc., mixer & antenna	
18	3 Feet of Wire Approximately 1 Foot and Parallel from Extended Waverod	REPEAT OPERATIONS 17 & 18					
*19		4.25 Mc	4-9 Mc	4.25 Mc	Rock L22, L15, L5	Alignment of Short Wave Oscillator, Mixer and Antenna	
20		8.75 Mc	4-9 Mc	8.75 Mc	6E, 6C, 6A		
21		REPEAT OPERATIONS 20 & 21					
22		9.7 Mc	31 meters	9.7 Mc	L21, L14, L4		
23		11.8 Mc	25 meters	11.8 Mc	L20, L13, L3		
24		15.2 Mc	19 meters	15.2 Mc	L19, L12, L2		
25		17.8 Mc	16 meters	17.8 Mc	L18, L11, L1		

* NOTE: Rock tuning condenser when making alignment under Operations 2, 3, 5, 6, 8, 9, 12, 16 & 19.



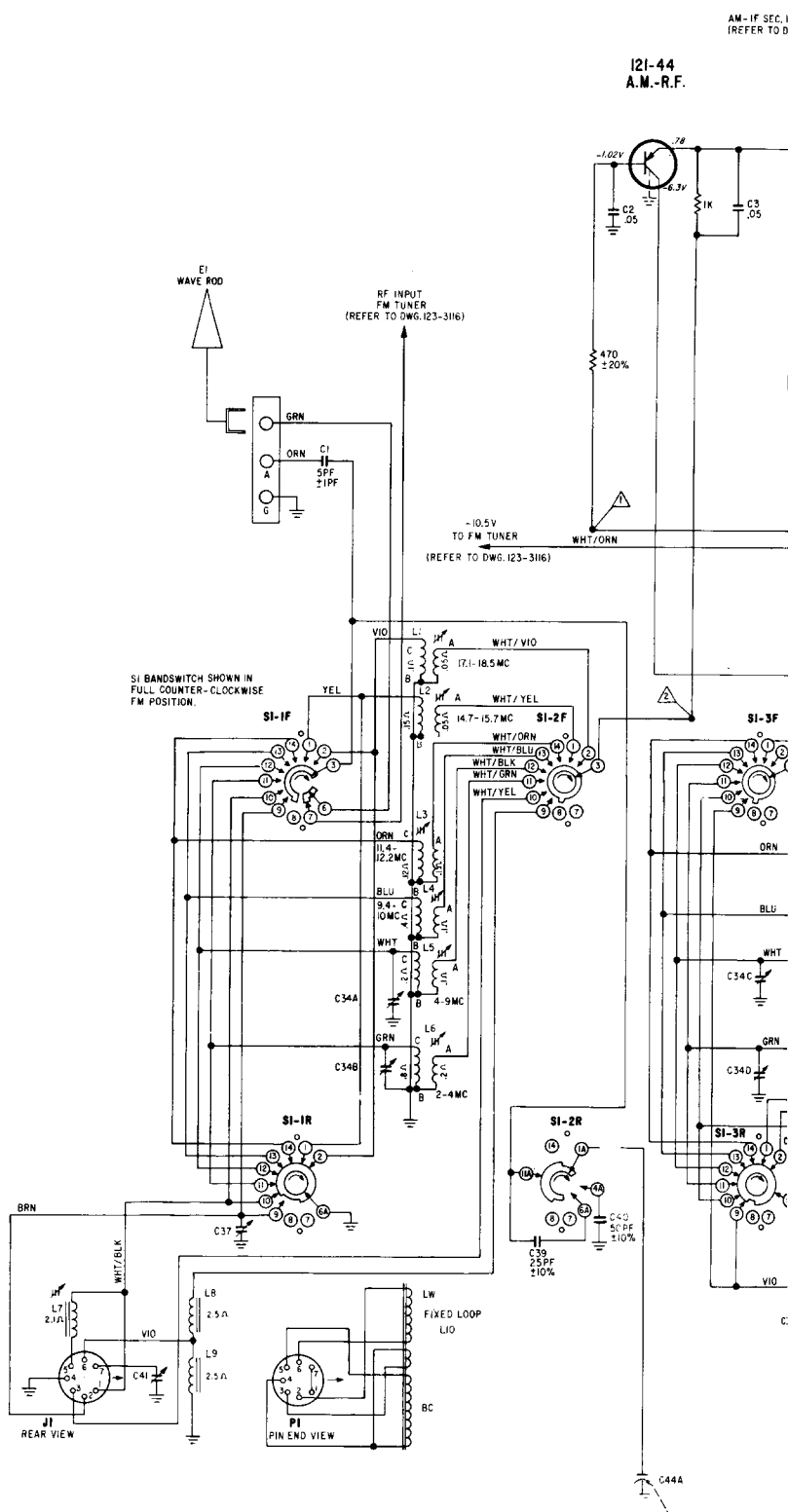
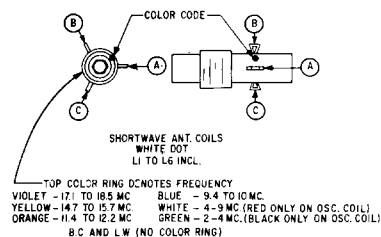
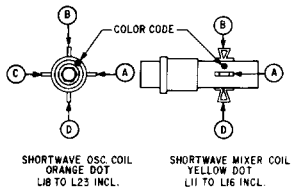
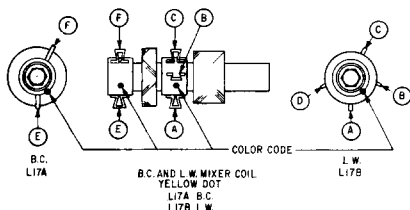
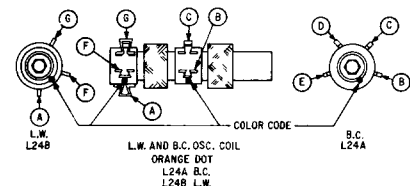
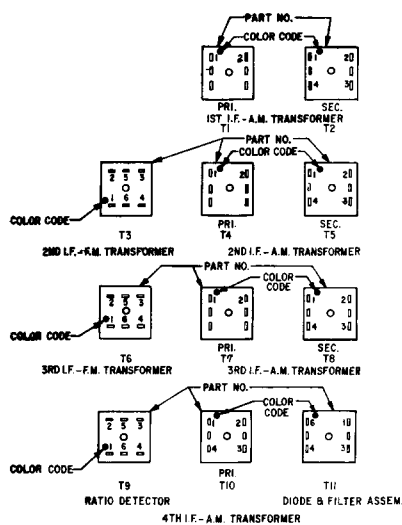
- NOTES:
1. ALL RESISTORS 2205 TOLERANCE, 1/4 WATT, CARBON UNLESS OTHERWISE SPECIFIED.
 2. RESISTANCE VALUES IN OHMS, CAPACITANCE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
 3. ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
 4. D.C. VOLTAGES SHOULD BE MEASURED WITH NO SIGNAL USING A VACUUM TUBE VOLTMETER.
 5. NO SIGNAL GRID IS 5 MM.
- ⊕ DENOTES CHASSIS

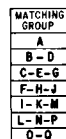




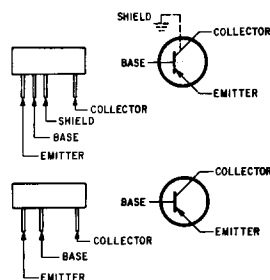
TEST POINT VOLTAGES (NO SIGNAL)

	F.M.	AM
1	-.08	-1.06
2	-.88	0
3	-.88	-.78
4	0	-.05
5	-.38	10.2
6	-.41	-6.9
7	-.55	-6.7





THE OUTPUT TRANSISTOR MATCHING IDENTIFICATION WILL BE LETTERS. TRANSISTORS USED IN ANY ONE CHASSIS MUST BE MATCHED ACCORDING TO GROUP CHART. LETTERS CAN BE INTERMIXED BUT MUST BE FROM THE SAME GROUP.



TRANSISTORS PNP

- NOTES:
1. ALL RESISTORS 10% TOLERANCE, 1/2 WATT, CARBON UNLESS OTHERWISE SPECIFIED.
 2. RESISTANCE VALUES IN OHMS, CAPACITANCE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
 3. ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
 4. D.C. VOLTAGES SHOWN ARE MEASURED WITH NO SIGNAL USING A VACUUM TUBE VOLTMETER.
-  NUMBERS IN TRIANGLES INDICATE VOLTAGE TEST POINTS. TEST POINTS TO NUMBERS IN TRIANGLES ON I23-3116, TRANSISTOR AND TRIMMER LAYOUT.
- NO SIGNAL CURRENT DRAIN IS 25 MA.
5. USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSERS FOR REPLACEMENT. IF ANY OTHER TYPE OF ELECTROLYTIC IS USED, IT MUST BE SPECIALLY IDENTIFIED BY THE PART NUMBER, CAPACITANCE, VOLTAGE AND C36 SHOWN IN DOTTED LINES.

DENOTES CHASSIS