

K4XL's **BAMA**

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SERVICE OR OPERATING QUESTIONS

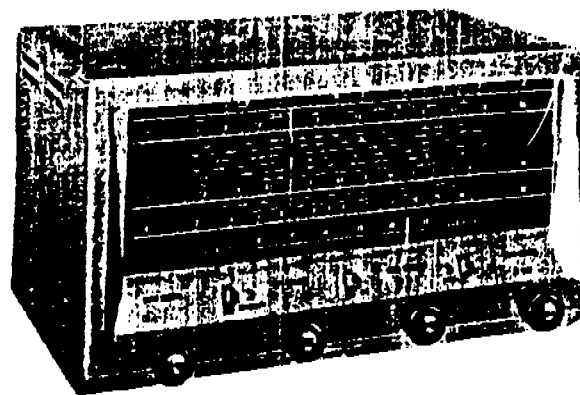
For any further information regarding operation or servicing of your unit, contact your Hallicrafters dealer. The Hallicrafters Co. maintains an extensive system of authorized service centers where any required service will be performed promptly and efficiently at a nominal charge. All Hallicrafters Authorized Service Centers display the sign shown at the right. For the location of the one nearest you, consult your dealer or telephone directory.

The Hallicrafters Company reserves the privilege of making revisions in current production of equipment, and assumes no obligation to incorporate these revisions in earlier models.



Owner's Guide

MODEL S-38E-EB-EM



GENERAL DESCRIPTION

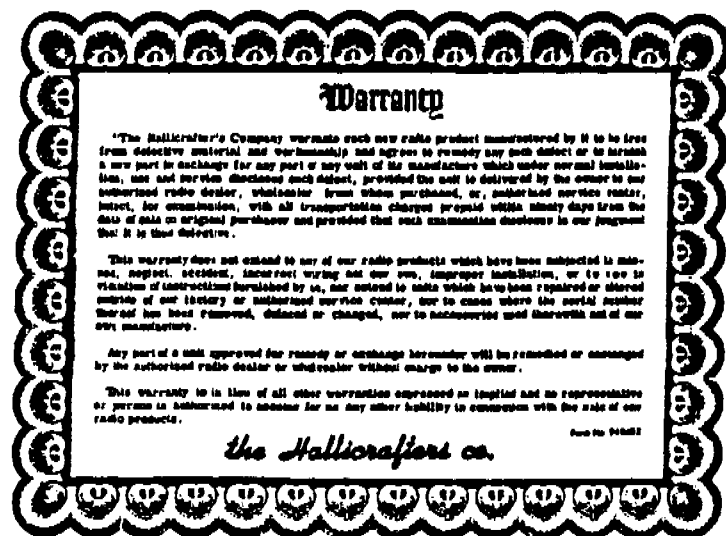
Your new Hallicrafters Receiver tunes from 540 kilocycles to 31 megacycles to bring you the finest in world-wide radio reception. You'll hear foreign and domestic shortwave broadcasts, amateurs, police, aircraft, ships, and countless other exciting distant stations ... as well as all your favorite programs on standard broadcast. The receiver employs the latest type superheterodyne circuit and provides for reception of AM (voice) and CW (code) signals over its entire tuning range. Special features in your receiver include an electrical bandspread dial for fine tuning of the amateur and shortwave bands, an AM/CW ratio control, a powerful built-in Alnico V permanent magnet speaker, provisions for headphone operation, and a receive-standby switch on the front panel that permits you to silence the receiver without turning it off. Your receiver has an unusually high degree of sensitivity necessary to receive weak and distant stations. Careless operation may result in excess noise or background hiss. These undesirable effects can be held to a minimum by careful adjustment of the tuning controls as well as the proper selection and arrangement of the antenna.

POWER SOURCE

The receiver is designed to operate on 105 to 125 volt 50/60 cycle, AC, or DC current. It may also be operated on 210 to 250 volt AC/DC current using Line Cord Adapter 037-20156C, available as an accessory from your Hallicrafters dealer. Power consumption is 30 watts.

HEADPHONES

Connections are provided at the rear of the receiver for connecting headphones. Any commercial headphones ranging from 50 to 10,000 ohms may be used. For headphone operation, place the Speaker-Phone selector switch at "PHONE".



the hallicrafters co.

4401 W. FIFTH AVENUE • CHICAGO 34, ILLINOIS

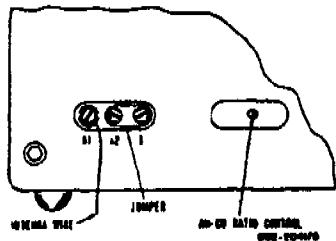


Fig. 1. Single-Wire Antenna

SINGLE-WIRE ANTENNA

In most localities, satisfactory results throughout the entire tuning range can be obtained with the 15-foot antenna wire included with the receiver. Simply attach one end of this wire to terminal "A1", connect the jumper link between "A2" and "G", and then run the wire about the room in any convenient manner (See Fig. 1). In steel constructed buildings or where receiving conditions are exceptionally poor, an outside antenna 50 to 100 feet long may be necessary. In some locations, reception may be improved by connecting a ground wire (ordinary copper wire) from terminal "G" to a cold water pipe or outside ground rod. While the use of an outside ground rod installed in accordance with Insurance Underwriter's Laboratories requirements is adequate protection against lightning, we strongly recommend an additional connection to the nearest cold water pipe to eliminate any shock hazard.

HALF-WAVE DOUBLET ANTENNA

For top performance, especially on the shortwave and amateur bands, the use of a half-wave doublet or other type of tuned antenna employing a 52 to 600 ohm transmission line is recommended. The doublet antenna should be cut to the proper length for the most used frequency or band of frequencies. The overall length in feet of a doublet antenna is determined by the following formula:

$$\text{Length in feet} = \frac{468}{\text{Frequency in megacycles}}$$

For maximum signal pickup, the doublet antenna should be erected with its length at right angles to the desired station. When a transmission line such as "twin lead" or a twisted pair is used, the transmission line connects to terminals "A1" and "A2", and the jumper link between "A2" and "G" is disconnected (See Fig. 2). The doublet antenna provides optimum performance only at the frequency for which it is cut. Therefore, it may be desirable for reception on frequencies remote from the antenna frequency to utilize the antenna as a single wire type. This is accomplished by connecting the two transmission line leads together and connecting them to terminal "A1". The jumper link in this case should be connected between terminals "A2" and "G".

TUNING DIAL

The top dial scale is the standard broadcast band. To convert the readings on this band to kilocycles simply add one zero. For example: 70 on the dial is 700 kilocycles. The shortwave bands are marked 2, 3, and 4. The reading on these bands are in megacycles. The standard broadcast band is marked with a "CD" emblem and a dot at 640 and 1240 kilocycles to indicate the two official civil defense frequencies. In a civil defense emergency, tune to either of these two frequencies for official civil defense news, instructions, and information.

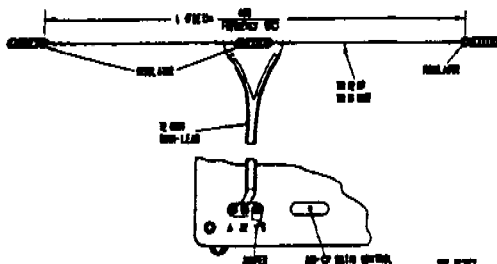


Fig. 2. Doublet Antenna Using Twin-Lead Transmission Line

RECEIVE-STANDBY SWITCH

This switch is normally set at "RECEIVE". When set at "STANDBY", the receiver is silenced but the tubes remain at operating temperature for instant use. To resume reception at any time, simply return the switch to "RECEIVE" position.

AM-CW SWITCH

Set this switch at "AM" to listen to voice or musical broadcasts. Set it at "CW" only if you wish to hear code signals.

BAND SELECTOR CONTROL

Set this control for the band you wish to tune. The four positions of this control correspond to the band numbers at the left side of the dial.

OFF-VOLUME CONTROL

Turn this control clockwise to turn the receiver on and to increase volume. Allow about one minute for the tubes to warm up. When operating on DC (direct current), reverse the power plug in the wall outlet if the receiver does not operate after the one minute warm up, as the receiver will operate ONLY with the plug in one position. When operating on AC (alternating current), try reversing the power plug for minimum hum after the receiver is in operation. To turn the receiver off, simply rotate the Off-Volume control fully counter-clockwise, until a click is heard.

TUNING AND BANDSPREAD CONTROLS

Wide tuning is performed with the Tuning control and fine tuning with the Bandspread control. To tune the receiver, set the Bandspread dial pointer at "0" and then slowly turn the Tuning control to the desired station. When trying to locate weak distant stations, it is suggested that the Off-Volume control be initially set near maximum and then readjusted for the desired level after the station has been tuned in. For CW (code) reception, adjust the Tuning control for the desired pitch when tuning in the station. The dial readings will correspond to the station frequencies only if the Bandspread dial pointer is set at "0".

The Bandspread control is an electrical fine tuning adjustment which permits you to accurately tune in stations on crowded bands by spreading them out. It may be used in two different ways. The first method of tuning is used when it is desired to tune in a single signal with precision accuracy. The Bandspread dial pointer is set at about "5", then the signal is located with the Tuning control, and finally the signal is accurately tuned in by "rocking" the Bandspread control (turning it a few degrees to the left and right) until the signal is loudest and clearest. The second method of tuning is used when it is desired to tune through a range of frequencies, such as the amateur bands. Set the bandspread dial pointer at "0", set the Tuning control for the high end of the selected band or range of frequencies, and then tune through the range with the Bandspread control. Turning the Bandspread control from "0" to "100" tunes the receiver progressively lower in frequency.

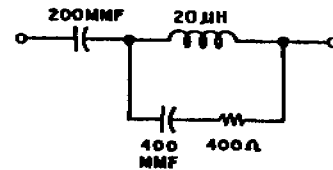
CW ADJUSTMENT

Your receiver has a provision on the rear panel for setting the AM-CW ratio (See Fig. 1). This adjustment is pre-set at the factory, but may be easily reset at any time by the operator for personal preference as well as for the intended use of the receiver.

The AM-CW ratio adjustment procedure is as follows: With the receiver turned on and in the "RECEIVE" and "AM" positions, use on band 4, select a fairly strong CW signal. Turn the AM-CW ratio control on the rear panel to its complete counter-clockwise position. Then place the AM-CW switch on the front panel to the "CW" position and rotate the AM-CW ratio control clockwise until the CW signal is heard as clear audio tone. With this accomplishment, advance the control slightly beyond this point and the adjustment is complete.

ALIGNMENT PROCEDURE

- Use an amplitude modulated generator covering 455 KC to 30 MC.
- Use a modulated output for every step except Step 2.
- Connect output meter across speaker voice coil.
- Use a non-metallic alignment tool.
- Standard RETMA dummy antenna as shown in Fig. 3.
- Set the AM/CW switch at AM, (except for BFO adjustment), SPEAKER/PHONES switch at SPEAKER, VOLUME control at maximum. RECEIVE/STANDBY switch at RECEIVE and the BAND SPREAD control at 0.
- See Figs. 4 and 5 for location of alignment adjustments.

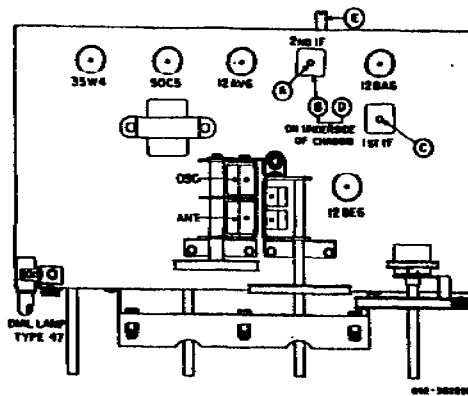


092-101549

Figure 3. RETMA Dummy Antenna

Step	Signal Generator Connections	Generator Frequency	Band Selector Setting	Receiver Dial Setting	Adjust
IF ALIGNMENT					
*1	High side thru a .01 mfd. capacitor to stator plates of front section of TUNING gang. Low side to chassis.	455 KC (30% Mod.)	1	1.0 MC	A, B, C and D for maximum output. Keep reducing gen. output so that the reading on the output meter does not exceed 50 milliwatts.
BFO ADJUSTMENT					
2	Same as Step 1. Set generator for 50 MW reference output, turn off generator mod., and place receiver BFO on.	455 KC (No Mod.)	1	1.0 MC	AM/CW control until a CW note is heard as a clear audio tone. Advance control until an output level of 50 MW is obtained.
RF ALIGNMENT					
2	High side thru RETMA antenna to terminal A1 on back of chassis. Low side to chassis. Connect jumper between A2 and G.	30 MC	4	30 MC	F and G for maximum output as in Step 1.
4	Same as Step 3.	14 MC	3	14 MC	H and J for maximum output as in Step 1.
5	Same as Step 3.	5 MC	2	5 MC	K and L for maximum output as in Step 1.
6	Same as Step 3.	1500 KC	1	1.5 MC	M and N for maximum output as in Step 1.
		600 KC	1	.6 MC	P for maximum output as in Step 1.

* Before beginning IF alignment procedure, rotate AM/CW ratio control to its full counterclockwise position.



4 Top View Chassis

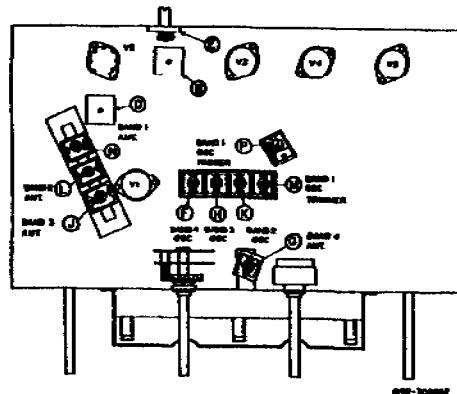


Figure 5. Bottom View Chassis

SERVICE PARTS LIST

Schematic Symbol	Description	Hallcrafters Part Number	Schematic Symbol	Description	Hallcrafters Part Number	Schematic Symbol	Description	Hallcrafters Part Number
CAPACITORS			*RESISTORS (CONTINUED)			TUBES AND DIAL LAMP (CONTINUED)		
C1, 2, 3	Trimmer, 2-25 mmfd.; 5 Section, Compression Mica	044-200129	R9	2 megohm, VOLUME Control; Inc. On-Off Switch S-2	025-201478	V3	12AV6; Detector and Audio	090-801197
C4	20-120 mmfd.; Ceramic Trimmer	044-100424	R10	10 megohm	451-252106	V4	50C5; Audio Output	090-800541
C5	2700 mmfd., 500V., 5%; Mica	470-412272	R11	220K ohm	451-252224	V6	3DW4, Rectifier	090-900884
C5A, C	Variable Capacitor, BAND-SPREAD	046-300410	R13	100 ohm	451-252101	LM1	Lamp, Dial Type 447	030-100004
C5B, D	Variable Capacitor, MAIN TUNING	040-30037E	R14, 15, 17	15 ohm	451-252150	MISCELLANEOUS		
C7, 12	220 mmfd., 500V., 10%; Mica	470-213221	R16, 18	22 ohm	451-252320	Back, Cabinet		
C8, 13, 27	.022 mfd., 600V.; Tubular Paper	499-034223	R19	220 ohm, 1 watt	451-302121	Bracket, Mtr., Pulley, and Dial Lamp		
C9	.047 mfd., 600V.; Tubular Paper	499-034473	R20	1K ohm	451-252102	Bracket, Pulley Mtg.		
C10, 20, 33	.01 mfd., 450V.; Ceramic Disc	047-100224	R23, 25	470 ohm	451-252471	Bracket, Switch Mtg.		
C11A, B, C	Printed Circuit Plate, .005 mfd., 220 mmfd., .002 mfd., 500 WVDC	047-100581	R26	1500 ohm, AM-CW RATIO Control	025-201751	Bushing, Tuning, and Band Spread Shaft		
C13	.01 mfd., 800V.; Tubular Paper	499-034103	R27	680K ohm	451-252084	Cabinet, S-38E		
C14A, B	20 mfd. @ 25V; 00-40-40	046-300091	*All Resistors 10%, 1/2 watt, carbon type, unless otherwise specified.			Cabinet, S-38EB		
C, D	mfd. @ 150V; Electrolytic		COILS AND TRANSFORMERS			Cabinet, S-38EM		
C16	83 mmfd., 10%, N750; Ceramic Tubular	491-000820-95	**L1, C1, 2	Coil and Trimmer Assembly, Antenna; Bands 1, 2, and 3	051-302132	Clip, IF Mtg.		
C17	425-625 mmfd.; Mica Trimmer	044-100349	L2	Coil, Antenna; Band 4	031-201015	Clip, Dial Lamp Mtg.		
C18	4700 mmfd., 500V., 5%; Mica	470-412472	**L3, C20, 21, 22, 23	Coil and Trimmer Assembly, Oscillator; All Bands	051-302133	Cover, Cabinet Bottom		
C19	3600 mmfd., 500V., 5%; Mica	478-412303	LA	Choke; RF 540 oh	023-100107	Dial Cord (Specify Length)		
C20, 21, 22, 23	Trimmer, 6.5-70 mmfd.; 3.5-30 mmfd.; 2.5-16 mmfd.; 3.5-30 mmfd.; 4 Section, Compression Mica	044-200158	T1	Transformer, 1st IF	050-300531	Foot, Mtg.		
C24	.047 mfd., 400V., 20%; Tubular Paper	499-024473	T2	Transformer, 2nd IF	050-300532	Gasket, Rubber		
C25, 26	.005 mfd., 450V.; Ceramic Disc	047-100188	T3	Transformer, Audio Output	055-300247	Glass, Dial Window		
C31	.005 mfd., 500V., 20%; Ceramic Disc	047-100442	**The Trimmer Capacitor Assemblies are also available separately. See "CAPACITORS".			Knob, Band Selector (S-38E)		
C32	.01 mfd., 400V.; Tubular Paper	499-034153	SWITCHES			Knob, Band Selector (S-38EB, EM)		
*RESISTORS			S1A, B	BAND SELECTOR	058-300081	Knob, BANDSPREAD, OFF-VOLUME or MAINTUNING (S-38E)		
R1, 24	10K ohm	451-252103	C, D	SPEAKER-PHONE, AM-CW, and RECEIVE-STANDBY On-Off; Part of R9	046-100477	Knob, BANDSPREAD, OFF-VOLUME, or MAIN TUNING (S-38EB, EM)		
R2, 5	2.2 megohm	451-252225	S2, 4, 6	SPEAKER-PHONE, AM-CW, and RECEIVE-STANDBY On-Off; Part of R9	046-100477	Line Cord and Plug		
R3	22K ohm	451-252223	S3	SPEAKER-PHONE, AM-CW, and RECEIVE-STANDBY On-Off; Part of R9	046-100477	Line Cord Lock (Male Section)		
R4	270 ohm	451-252371	SOCKETS AND CONNECTORS			Line Cord Lock (Female Section)		
R6	330 ohm	451-252371	T31	Terminal Strip, Antenna	068-100071	Pointer, Band-Spread (S-38E)		
R7	47K ohm	451-252473	T32	Terminal Strip, Phone	068-100071	Pointer, Band-Spread (S-38EB, EM)		
R8, 12, 21, 22	470K ohm	451-252474	Twin Jack Strip, Phone			Pointer, Main Tuning (S-38E, EM)		
			Socket, Dial Lamp (Inc. Leads)			Pulley, 3.125" O. D.		
			Socket, 7 Pin Miniature			Shield, Tube		
			TUBES AND DIAL LAMP			Shield, Dial Lamp		
			V1	12BE6; Converter	066-000040	Speaker, 3" PM; 3.3 ohm voice coil		
			V2	12BA6; IF Amplifier and BFO	050-900039			

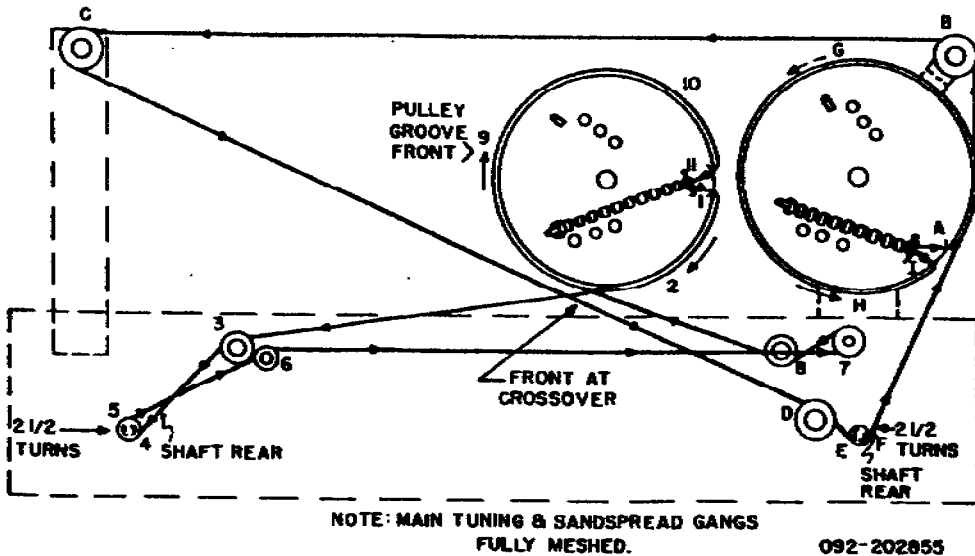
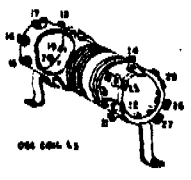
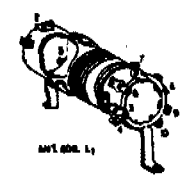
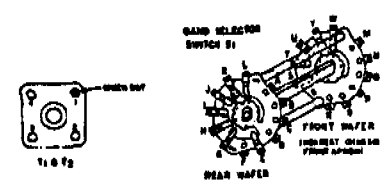
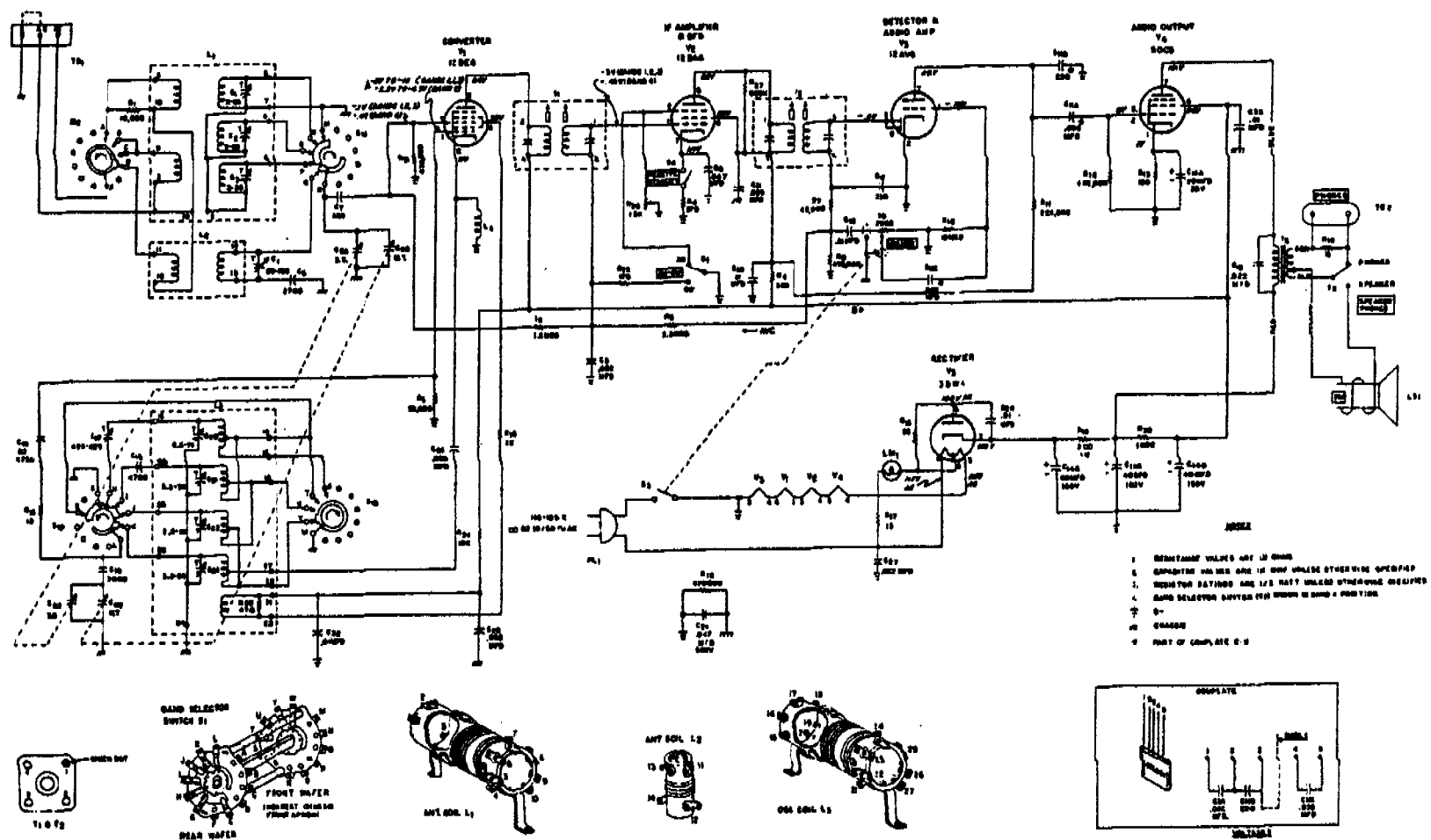
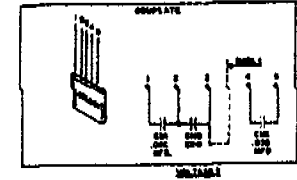


Figure 7. Main Tuning and Bandspread Gang Pointer Drive Stringing Diagrams



NOTE: VALUES IN TELETYPE SWITCH ARE NOMINAL AND VARIATIONS MAY BE FOUND. IT IS RECOMMENDED THAT THE VALUES OF ANY REPLACEMENT COMPONENTS BE TO THE NOMINAL VALUE OF THE PART MARKED THEREON.



- 1. ALL VOLTAGE ARE MEASURED BY TYPING THE HEAT THERMAL AND 0-1 (PFD) OF (PFD) WITH SWITCHED TERMINALS SWITCH, ADJUST SWITCH AT RECEIVE.
- 2. GND VOLTAGE - 0V TO 10 V.
- 3. ALL RELAYERS WERE MEASURED WITH A MEDIUM WAVE VOLTAGE (10V) AND ARE ON AND POSITIVE VOLTAGE OTHERWISE SPECIFIED.
- 4. VARIOUS WITH TUNING BAND SETTING.

Figure 6. Schematic Diagram