GENERAL ELECTRIC

MODEL 11R22

5 TUBE AM/FM RECEIVER

SPECIFICATIONS		
ELECTRICAL RATING:	105 - 120 Volt AC-DC 45 Watts	
TUNING RANGE:	AM 540-1600 KC FM 88-108 MC	
I.F. :	AM 455 KC FM 10.7 MC	
POWER OUTPUT:	Undistorted: 1 Watt Maximum: 2 Watts	
TUBE COMPLEMENT:	V1 - FM RF Amp. and FM Osc-Mixer V2 - AM FM I.F. Amp. V3 - AM Dect. FM I.F. Amp. and Audio Amp. V4 - AM Conv. V5 - Power Amp.	19JN8 12BA6 19HV8 12BE6 50HK6

CHASSIS REMOVAL

1. Pull all knobs off control shafts on front of cabinet.
2. Remove three 1/4" hex-head screws from cabinet back.
3. Lift right hand side of cabinet back, disengaging interlock, and then slide out to the right and out.
4. Remove six hex-head screws from cabinet bottom securing chassis and output transformer to cabinet.
5. Label and unsolder wires going to the speaker and pilot light bulbs.
6. Slide out chassis.

AM ALIGNMENT

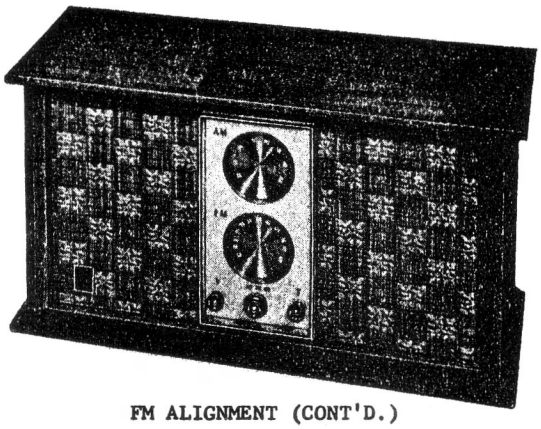
The AM alignment can be accomplished with a VTVM or an oscilloscope connected across the speaker voice coil as the output monitor. All VTVM output readings will be observed on an AC volt scale. See the alignment chart for the step by step procedure.

Set the band switch to "AM" position. Turn volume control to maximum volume position and adjust the signal generator output control for alignment signal. The position of the receiver should not be changed during alignment to prevent possible errors in output readings.

FM ALIGNMENT

The proper method for FM alignment of this receiver requires the use of an oscilloscope, a signal sweep generator, and a marker generator (or crystals may be used for the necessary marker pips of 98 mcs, 108 mcs and 10.7 mcs. The crystals can be inserted into the crystal marker receptacles on most signal sweep generators).

1. Set band switch to FM position.
2. Set volume control to minimum position.
3. In peak alignment, a 470K resistor is used in series with the positive test lead of the VTVM. (Note: Wire length from resistor to end of lead



FM ALIGNMENT (CONT'D.)

should not exceed one-half inch). In aligning the FM, IF and RF sections, the signal input should be reduced so that the VTVM reads approximately -1 VDC.

4. In sweep alignment, set the sweep width control on the sweep generator to 500KC.
5. The marker generator output, when used, may be inductively coupled as near to the sweep input point as possible or inserted into the marker input jack on the signal sweep generator.
6. The frequency setting of the marker generator is the same as the sweep generator setting for each step as shown in the FM alignment chart.

Marker pips should always be kept at minimum amplitude to prevent distortion of the response curve.

The position of the receiver should not be changed during alignment to prevent possible error in output readings.

CAUTION: Before radio chassis is secured in cabinet be certain AM and FM tuning discs are aligned properly.

When replacing FM components in the tuner section, mount replacement part exactly as the original and carefully dress leads to the components.

All leads must be kept as short as possible. Test points on dip-soldered side of the circuit board have a looped wire so that test equipment can be directly attached with the shortest leads possible.

FM OSCILLATOR COIL

The FM oscillator coil, L3, may require adjustment if components, other than tubes, are changed in the FM oscillator-mixer section. Check the band end frequencies. If the set tunes through 108 and 88 MC do not touch the coil. If the oscillator frequency is low, adjust L3 by spreading the turns slightly. (This raises the dial reading.) If the oscillator frequency is high adjust L3 by squeezing the turns together slightly. (This lowers the dial reading.)

Note: A small change in the space between any 2 turns of L3 shifts the frequency approximately 1 MC.

Price 25¢

AM ALIGNMENT

Step	Signal Generator Input Point	Gen. Setting	Receiver Tuning	Connect VTVM Across	Adjust the following (VTVM OUTPUT)	Connect Scope Across	Adjust the following (OSCILLOSCOPE OUTPUT)
1	High side to Test Point 2 in series with a .01mf., low side to chassis.	455 KC 30% Mod. with 400 cycles	Gang	Voice	Top and bottom cores of T3 for max. output	Voice	Top and bottom cores of T3 for max. ampl. of curve. See Fig. 1
2	High side to Test Point 6 in series with a .01mf., low side to chassis		Closed	Coil	Top and bottom cores of T5 for max. output	Coil	Top and bottom cores of T5 for max. ampl. of curve. See Fig. 1
3	Repeat steps 1 and 2.						
4	Inductively coupled to AM Antenna	1620KC	1620KC	Voice	AM osc (C33E) for max. output	Voice	AM osc (C33E) for max. ampl.
5		1500KC	1500KC	Coil	AM ant (C33C) for max. output	Coil	AM ant (C33C) for max. ampl.
6	Repeat steps 1, 2, 3, and 4.						

IMPORTANT: SIGNAL INPUT MUST BE CLOSELY CONTROLLED TO PREVENT MISALIGNMENT. KEEP SIGNAL INPUT AT LEVEL WHICH WILL PRODUCE .5 V AT TEST POINT 4 (TP4) AS READ ON THE OSCILLOSCOPE OR VTVM. ALIGN WITH SWITCH 2 IN FM POSITION.

CAUTION: TP1 is B+.

FM ALIGNMENT

Step	Step Generator Input Point Keep Sweep Output Low	Sweep Generator And Marker Setting	Tuning Condenser Setting	SWEEP ALIGNMENT: Connect Scope To Following In Series With 470K	SWEEP ALIGNMENT: Adjust	PEAK ALIGNMENT: Connect VTVM To Following In Series With 470K Resistor	PEAK ALIGNMENT: Adjust
1	TP3 in series with .01mfd. Low side to Chassis	10.7 MC unmodulated	Closed	TP4 (Disconnect one side of C21)	T4 Top and bottom slug for max. amp. and symmetry (see Fig. 2)	TP4	T4 for max. DC volts
2	TP2 in series with .01mfd. Low side to Chassis	10.7 MC unmodulated	Closed	TP4 (Disconnect one side C21)	T2 Top and bottom slug for max. amp. and symmetry (see Fig. 2)	TP4	T2 for max. DC volts
3	TP1 in series with .01mfd. Low side to Chassis	10.7 MC unmodulated	Closed	TP4 (Disconnect one side of C21)	T1, T2, T4 Top and bottom slugs for max. amp. and symmetry (Fig. 2)	TP4	T1, T2, T4 for max. DC volts
4	TP1 in series with .01mfd.	10.7 MC unmodulated	Closed	TP5 (C21 back in circuit)	T4 Top slug for cross-over (Fig. 3) T4 bottom slug for amp. and symmetry (Fig. 3)	TP5 pos. lead, neg. lead to GND	T4 Top slug for 0 volts
5	Recheck Steps 3 and 4						
6	High side to left antenna terminal in series with .001mfd. Low side to bottom antenna terminal (GND End)	108 MC unmodulated	Open	TP4 (Disconnect one side of C21)	Osc. Coil (L3) Center marker on peak (See Fig. 2)	TP4 (Disconnect one side of C21)	Osc. Coil (L3) for max.
		108 MC unmodulated	Tune to 108 MC	TP4 (Disconnect one side of C21)	RF Coil (L2) for max. (See Fig. 2)	TP4 (Disconnect one side of C21)	RF Coil (L2) for max. DC volts

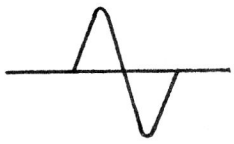


FIG. 1

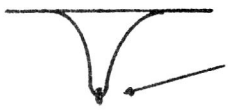


FIG. 2

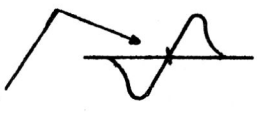
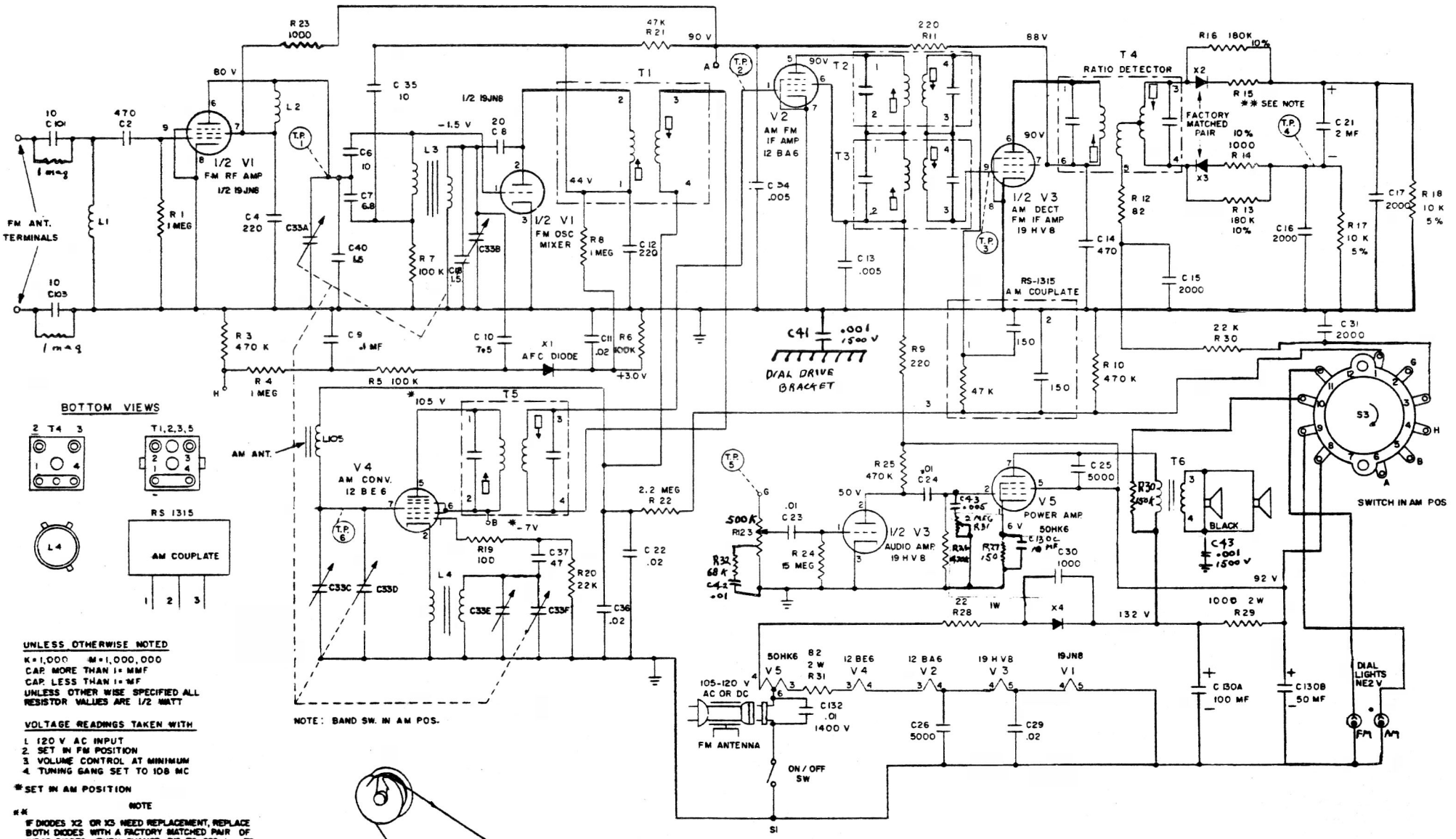


FIG. 3



UNLESS OTHERWISE NOTED
K = 1,000 M = 1,000,000
CAP. MORE THAN 1 = MMF
CAP. LESS THAN 1 = MF
UNLESS OTHER WISE SPECIFIED ALL RESISTOR VALUES ARE 1/2 WATT

VOLTAGE READINGS TAKEN WITH

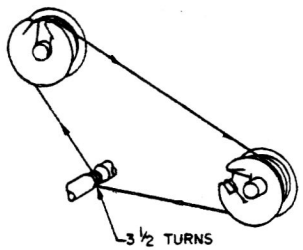
1. 120 V AC INPUT
2. SET IN FM POSITION
3. VOLUME CONTROL AT MINIMUM
4. TUNING GANG SET TO 108 MC

*SET IN AM POSITION

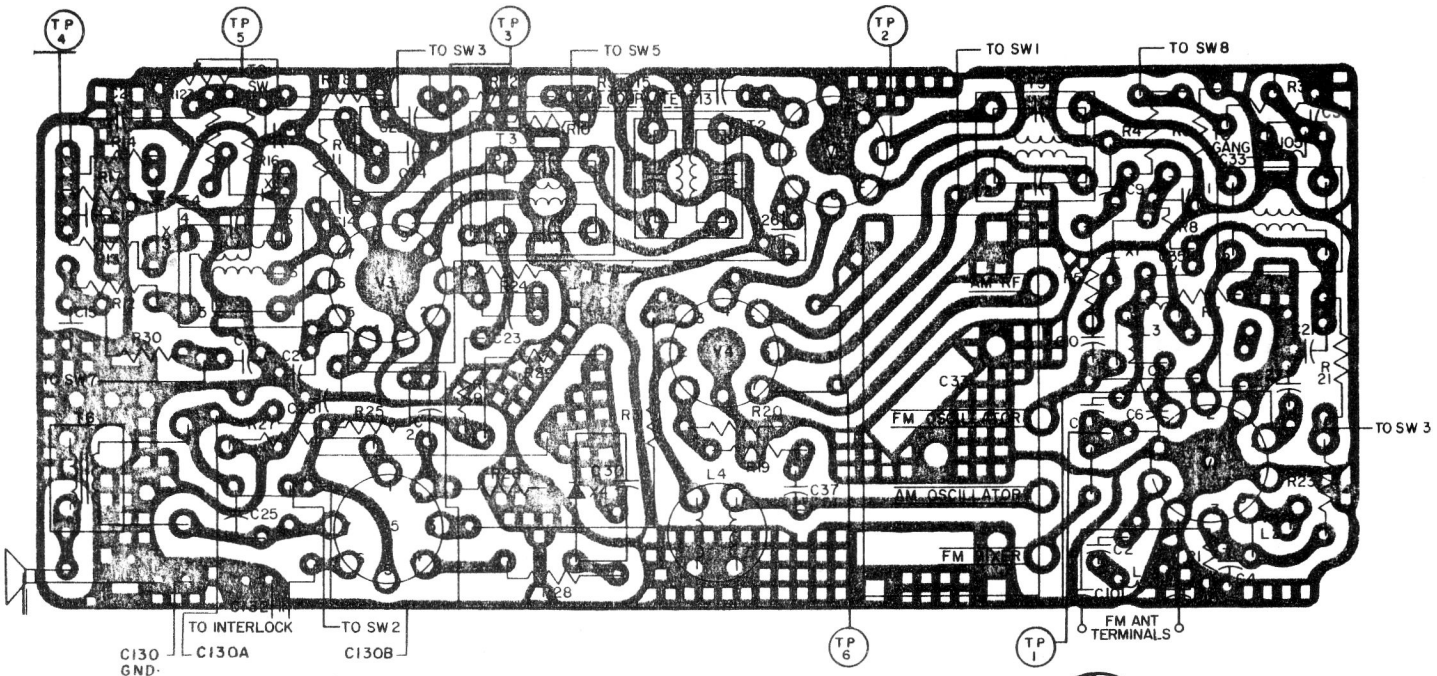
NOTE

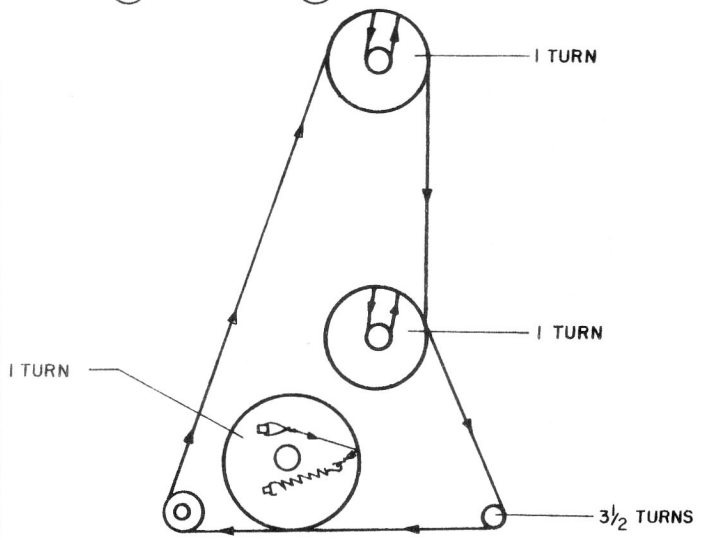
** IF DIODES X2 OR X3 NEED REPLACEMENT, REPLACE BOTH DIODES WITH A FACTORY MATCHED PAIR OF 1N542 DIODES. THEN CHANGE R15 TO 680 ohms TO ACHIEVE MAXIMUM PERFORMANCE. AS RECEIVED, R15 MAY BE ANY VALUE FROM 180 TO 820 ohms WHICH WAS SELECTED WITH THE DIODES PAIR CURRENTLY IN THE RECEIVER.

NOTE: BAND SW. IN AM POS.



STRINGING DIAGRAM





Cat.#	Symbol	Description
COILS, CHOKES AND TRANSFORMERS		
R6132	L105	Antenna - AM Ferrite Loop
R6302	L4	Coil - AM Oscillator
R6239	T6	Transformer - Audio Output
R6303	T1	Transformer - 1st FM IF
R6104	T2	Transformer - 2nd FM IF
R6105	T3	Transformer - 1st AM IF
R6107	T5	Transformer - 2nd AM IF
R6106	T4	Transformer - Ratio Detector
MISCELLANEOUS ELECTRICAL		
R6289	R123	Control - Volume
R6112	RC1	Couplate - A M
R6108	X1	Diode - AFC pair)
R5862	X2,X3	Diodes - Detector (1N541 matched
R6110	X4	Rectifier - Selenium 200 ma.
R6111	R28	Resistor 22 ohm 1 watt
R5849	R29	Resistor 1000 ohm 2 watt
MISCELLANEOUS MECHANICAL		
R6290		Dial Assembly - Tuning
R1129		Compression ring for above
R4585		Plug - Power Cord Interlock
RS-3451	V1	Socket - 9 pin tube
R4437	V2,V4	Socket - 7 pin tube
RS-1308	V3	Socket - 9 pin tube
R4748	V5	Socket - 7 pin tube
R6288	S3,R31	Switch - Band & Tone Control
CABINET AND CABINET MOUNTED PARTS		
R6295		Control Panel - Pearl Buff Plastic
R6292		Escutcheon - Control Panel
R6297		Knob - Volume,Tuning,Band Switch
R6298		Spring for above knob
R6299		Knob - Tone
R4018		Speaker - 6" PM
R6293		Window - AM Dial Scale
R6294		Window - FM Dial Scale
R6296		Medallion - GE
R6358	NE2V	Neon Lamp - Dial Illumination

Cat.#	Symbol	Description
CAPACITORS (Ceramic unless otherwise noted)		
R6355	C33A,B,C,D,E,F	Tuning Capacitor
R5847	C18,C40	1.5 mmf. 20% N.P.O.
R4293	C7	6.8 mmf.
R3033	C101,C103	10 mmf. 10% 3000V N750
R2346	C6,C35	10 mmf. 5% N750
R3607	C8	20 mmf. 10% 500V N.P.O.
R1528	C37	47 mmf. 20% 500V N2200
R3701	C4,C12	220 mmf. 10% 500V
R3730	C2,C14,C57	470 mmf. 10% 500V
R4826	C30	1000 mmf. GMV 2000V
R4886	C15,16,17,31	2000 mmf. 450V
R5323	C13,26,29 C34,49,120	.005 mf. 500V
R4931	C25	.005 mf. GMV 1000V
R4111	C23,C24,C42	.01 mf. 450V
R4685	C132	.01 mf. GMV 1400V
R4888	C22,C36	.02 mf. 450V
R2941	C11	.05 mf. 100V
R5183	C9	.1 mf. 20% 50V Mylar
R6036	C21	2 mf. 25 volt Electrolytic
R6354	C130A,B,C	100/50 mf. 150V 10 mf.15V Electro.