

MODELS 18, 20,
Ch. 132.877

TECHNICAL INFORMATION

Specifications

Power Supply
105-120 Volts AC 50 WattsFrequency Range
Broadcast 540-1600 Kc
FM 88- 108 McPower Output
Undistorted 1.0 Watt
Maximum 2.5 Watt

Speaker Voice Coil Impedance 3.2 ohms

AM Tuning range - 540 Kc to 1600 Kc. Intermediate Frequency - 455 Kc. I.F. and R.F. measurements made at 500 milliwatts output - approximately 1.27 volts on a rectifier type voltmeter connected across speaker voice coil.

Approximately input for 500 MW output: I.F. 300 uv; R.F. with standard loop: at 600 Kc, 1200 uc/m; at 1000 Kc, 1050 uv/m; at 1400 Kc, 800 uv/m.

FM Tuning range - 88 megacycles to 108 megacycles. Intermediate Frequency 10.7 megacycles. I.F. and R.F. measurements made at 500 milliwatts output - approximately 1.27 volts on a rectifier type voltmeter connected across speaker voice coil. Approximate input for 500 MW output: I.F. 300 uv; R.F. "Absolute Measurements": 91 megacycles, 125 uv; 105 megacycles, 100 uv.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection	-----	Across speaker voice coil.
Output meter reading to indicate 500 MW	-----	1.27 volts.
Generator Modulation	-----	30%, 400 cycles.
Position of volume control	-----	Fully clockwise.
Set dial pointer	-----	Horizontal, variable condenser closed.
Set band switch	-----	To left for AM alignment, to right for FM alignment.

AM ALIGNMENT

Position of Variable	Generator Frequency	Dummy Ant.	Generator Connection (high)	Generator Connection Ground Lead	Adjust Trimmer In Order Shown For Max. Output	Trimmer Function
Open	455 Kc	.05 mfd.	Mixer Grid	Chassis	A1, A2, A3, A4,	I.F. Oscillator
Open	1850 Kc		*Test Loop	Test Loop	A5	Antenna
1400 Kc	1400 Kc		*Test Loop	Test Loop	A6	Antenna
**600 Kc	600 Kc		*Test Loop	Test Loop	Check Point	

* Connect generator lead to a Standard Hazeltine Test Loop, Model 1150, placed two feet from the set loop, or three turns of wire about six inches in diameter, placed about one foot from the set loop. Or the generator can be connected with the high side lead to the AM antenna screw terminal and the ground lead to the chassis.

** With a generator signal of 600 Kc, tune the set to the point where maximum output is obtained, which should be approximately 600 Kc on the dial. Adjust antenna section places of variable for maximum output.

The alignment procedure should be repeated in the original order for greatest accuracy.
Always keep the output from the signal generator at its lowest possible value to make the A. V. C. action of the receiver ineffective.

FM ALIGNMENT

Detector and I.F. alignment using Signal Generator and Oscilloscope.

1. Connect FM Generator, High side, to grid (pin 1) of 6BA6 2nd I.F. tube through .005 mfd. dummy.
2. Set generator frequency to 10.7 Mc. modulated either 60 cycles or 400 cycles, 250 Kc sweep (125 Kc. deviation).
3. Connect vertical input of scope across volume control of receiver (grounded terminal to chassis, ungrounded terminal to high side of control).
4. Set scope switch for internal synchronization and set horizontal oscillator to 2X frequency of modulating voltage of generator. (120 or 800 cycles)
5. Turn variable condenser fully open, and band switch to right (FM).
6. Adjust frequency vernier of horizontal oscillator on scope until the pattern becomes stationary.
7. Adjust ratio detector primary slug No. A7 for maximum vertical sweep of the scope pattern.
8. Adjust ratio detector secondary slug No. A8 to center the cross over point of the pattern. Pattern should look like Fig. 1, with the same amount of curve on both ends, and the cross over point in the center.
9. Connect generator, high side, to center antenna screw terminal on bottom of chassis.
10. Adjust I.F. slugs A9, A10 and A11 for the greatest vertical sweep of the pattern, consistent with linearity. If the I.F. slugs are adjusted for maximum sweep of the pattern, the pattern may become non-linear. Therefore, adjustment should be made for the greatest sweep which can be obtained and still have all four ends of the "X" pattern similar in size and shape.
11. Check the alignment of the I.F. and detector circuits by varying the signal generator frequency above and below the center frequency of 10.7 Mc. If the receiver is perfectly aligned, two smaller "X" patterns of similar size and shape will result, one on either side of the center frequency. See Figure 2.

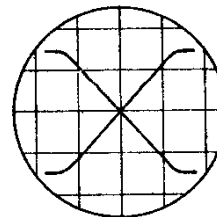
X PATTERN
CENTER FREQUENCY

FIG 1

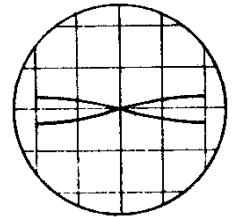
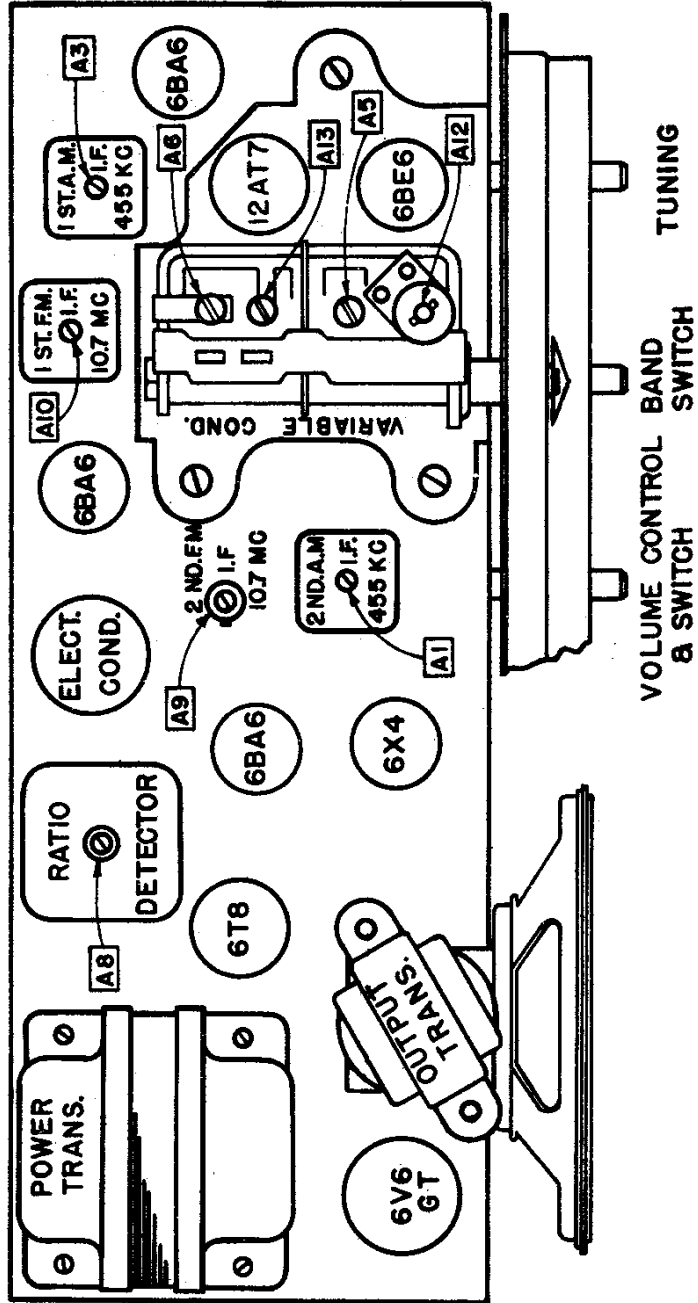
SMALL X PATTERN
ABOVE AND BELOW
CENTER FREQUENCY

FIG 2

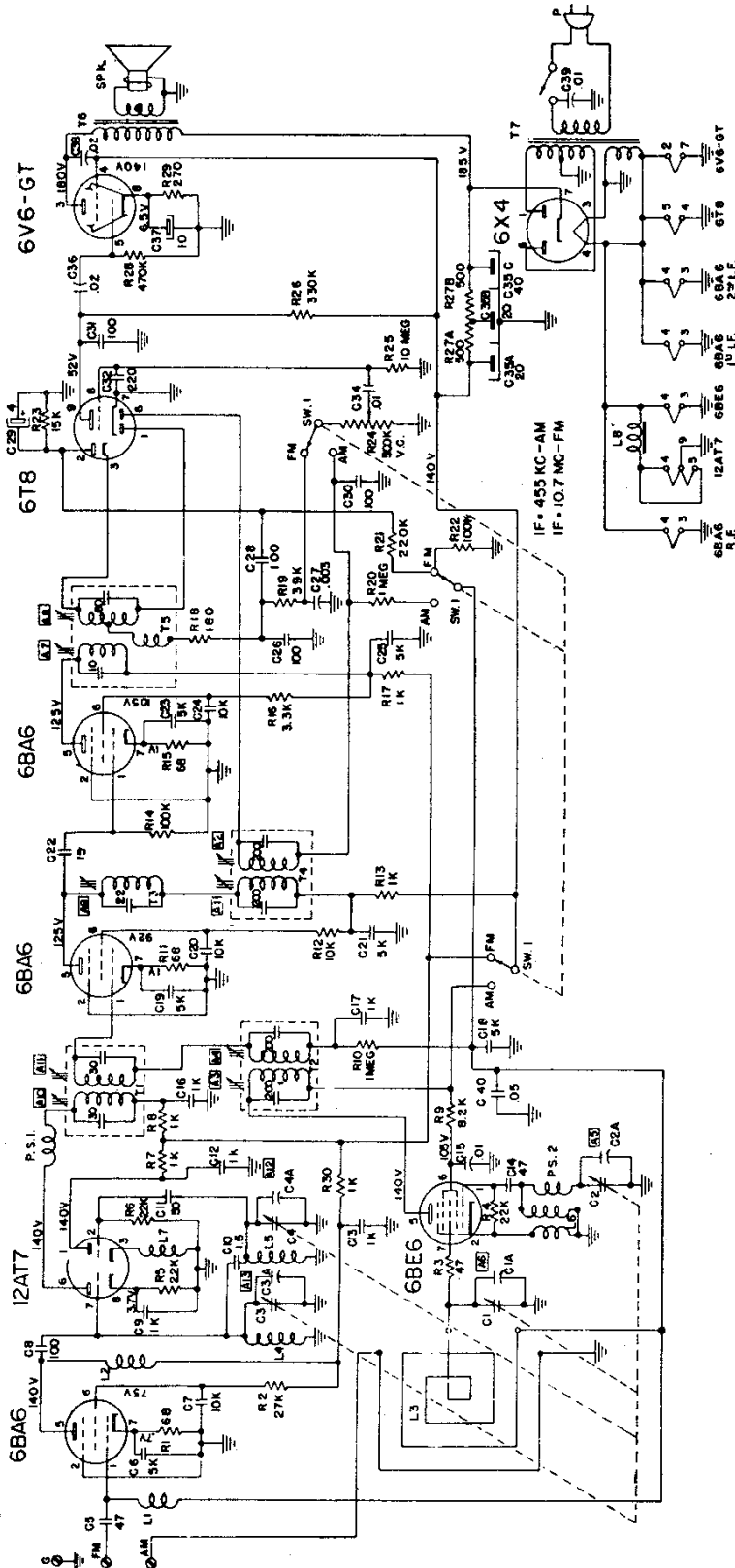
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Position of Variable	Generator Frequency	Dummy Ant.	RF Generator Connection	Generator Connection	Adjust Trimmers	Trimmer Function
Fully Open	108.5 Mc.	*300 ohm	Ant. (FM) Terminal	High Side Ground (G) Terminal	A12	Oscillator
Fully Closed	87.5 Mc.	*300 ohm	Ant. (FM) Terminal	Ground (G) Terminal	Check Point A13	Oscillator R.F.
105 Mc.	105 Mc.	*300 ohm	Ant. (FM) Terminal	Ground (G) Terminal	Check Point	
91 Mc.	91 Mc.	*300 ohm	Ant. (FM) Terminal	Ground (G) Terminal	Check Point	R.F.

For R.F. alignment use FM generator signal modulated with 400 cycles 45 Kc. sweep (22.5 Kc.) deviation.
* The 300 ohm dummy resistors should be made up to two 150 ohm resistors, one placed in each lead at the receiver antenna terminals



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ALL VOLTAGE MEASUREMENTS ARE MADE WITH AN ELECTRONIC VOLT-METER WITH A LINE VOLTAGE OF 117V. AC WITH NO SIGNAL.
ALL VOLTAGE READINGS GIVEN ARE POSITIVE.
⊃ INDICATES MICA OR CERAMIC COND. VALUES SHOWN IN MMFD.
⊃ INDICATES PAPER TUBULAR COND. VALUES SHOWN IN MFD.
⊃ INDICATES ELECTROLYTIC COND. VALUES SHOWN IN MFD.