

**JERROLD****MANUAL NO. 1704 . . . ADDENDUM**  
**FIELD STRENGTH METER****MODEL 704A**

The Model 704A, Field Strength Meter incorporates all the proven features of its predecessor, Model 704, with various design improvements.

**TUNER:**

The tuner has been redesigned using ruggedized 5654 tubes for the RF amplifier and mixer. An excellent 72 ohm input impedance match has been achieved with a vswr better than 1.06 to 1. This match holds true with or without the input attenuators switched into the circuit. Therefore, it is unnecessary to use an external attenuator pad when measuring signals less than 500 uv from an unknown impedance source as was suggested for Model 704.

Coupling between the tuner and I.F. sections is accomplished with inductively coupled, tuned circuits, thereby eliminating the mixer transformer to improve the physical construction of the tuner.

A schematic of the new tuner and service information are given on page 4.

**I. F.:**

Ruggedized 5749 tubes replace the 6AB6 in the three I.F. stages.

**POWER SUPPLY:**

Improved B+ regulation is obtained over all meter ranges, particularly the 0-100 and 0-300 ranges, by incorporation of a two section range switch, which automatically changes the voltage regulator (VR-150)

load resistor when changing from the higher to the two lower ranges. The VR tube is kept in constant operation despite the increase in plate current drain. (See new schematic, Main Chassis, page 3).

**CABINET:**

The cabinet interior has been modified to facilitate removal of the instrument for alignment and service. All control designations on the front panel have been photo-etched into the metal for appearance and durability.

**INSTRUCTION MANUAL REVISIONS:**

All sections of the instruction manual apply to Model 704A as well as Model 704, with the exception of a new I.F. alignment procedure and minor changes in schematics and parts lists.

The I.F. alignment procedure is explained on page 2 in this addendum, which can be pasted in the manual over page 14.

Specific changes involving tube complement and schematic components are noted on page 3. The reader may find it desirable to incorporate relevant changes on the I.F. schematic, page 21 of the manual.

Also note that reference in the manual to insertion of built-in or external attenuator for precision measurements (page 7 and page 9, par. 4) is outdated because of excellent tuner vswr discussed above.

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## I. F. ALIGNMENT

1. Adjust line voltage to 117V a-c.
2. Set instrument controls as follows:
  - a. Range switch to  $\%$  modulation.
  - b. Variable control adjusted for maximum gain (see note 1).
  - c. Function switch to "Signal Strength".
  - d. Meter zero, adjusted for zero with no signal input.
3. Connect a crystal detector to a Jerrold D-84 or similar, from the grid (Pin #1) of V2 (5749) to ground and connect the rectified output of the detector to an oscilloscope.
4. Remove tube shield from the 5654 mixer tube on the tuner. (Center tube)
5. With a coupling jig to a Jerrold AJ-106 or similar, couple in over the mixer tube a sweep generator signal with a center frequency of 25 mc (see note 2).
- 6a. If an internal marker is available from the sweep generator, adjust the marker to 25.0 mc.
- 6b. An external 25.0 mc marker may be used by loosely coupling in with a small loop of wire between the shield and tube of V1 (5749).
- 7a. Adjust L5 on the tuner and L1 on the I.F. strip to obtain a double tuned flat top response, with the 25 mc marker in the center, and a bandwidth of approximately 1 mc at the minus 1 db level (Figure 5a).

**Note 1:** The setting of the variable control should be adjusted for maximum possible gain without overloading or flattening the response curve.

- 7b. L2 may be adjusted to have the least loading effect on the response to obtain maximum gain.
- 7c. The coupling coil on L1 from the tuner is set at the factory and should not require readjustment.

**Note 2:** In the event that the sweep generator has low output, or the oscilloscope has insufficient gain to obtain a suitable response, the gain of the tuner may be utilized by connecting a sweep generator to the ANT. input of the Model 704A and adjusting the sweep generator and the 704A tuner to approximately Channel 9. Since the RF response of the tuner at the high channels is relatively broad, it will have little effect on the I.F. response. Adjustment of the first I.F. is made as in steps 6b and 7.

8. Remove crystal detector for remainder of I.F. alignment. I.F. coils L2, L3 and L4 are tuned using a 25 mc signal from a signal generator, or the marker oscillator of the sweep generator. The meter swing of the instrument itself serves as the peaking meter.
- 9a. Connect the signal generator to the ANT. input and remove the 6AB4 oscillator.
- 9b. Where method 9a does not work, because signal generator has insufficient output to force 25 mc signal through the tuner, remove tube shield from 5654 mixer and loosely couple the generator over the tube with a one-turn loop of wire (or use an AJ-106 coupling jig or similar).
10. With signal generator adjusted for 25 mc output, tune L2, L3 and L4 for peak meter swing, using variable control to keep needle on scale.

Check the sensitivity of the instrument, which should be about 50 to 80 uv, for a full scale deflection. If sensitivity reads low, check for weak tubes and incorrect voltages.

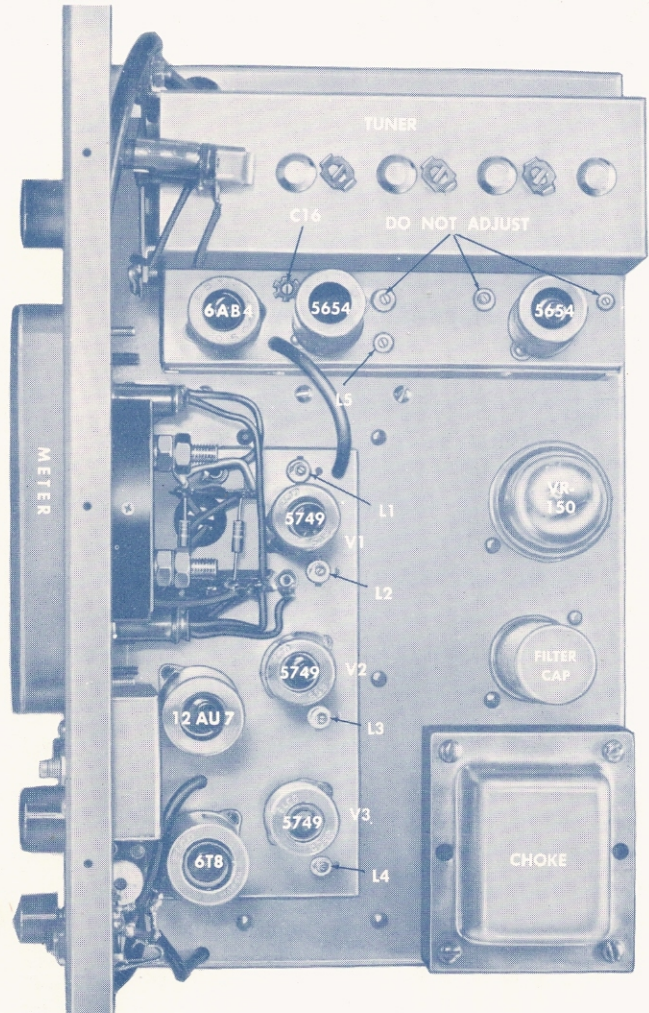


FIG. 5. TUBE AND TUNING CORE LOCATION (TOP VIEW OF CHASSIS)

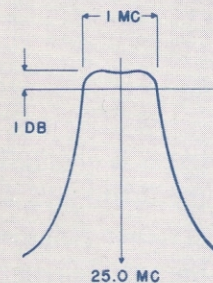


FIG. 5a. TUNER I.F. COUPLING RESPONSE



## REFERENCE DATA

Page 6 and Figure 2, Page 7

Tube Complement Should Read:

2..... 5654	1..... 6T8
1..... 6AB4	1..... 12AU7
3..... 5749	1..... OD3 (VR-150)
	1..... 5V4

## PARTS LIST and SCHEMATIC

Page 20, Changes as Follows:

Symbol	New Description	New Part #
A1	RF Attenuator Section	704-A2
C-26	5 mmf, 600V, Composition	101
J2	6 Pin Male Jones Plug	1045
P1	6 Pin Female Jones Plug	1046
P2	6 Pin Female Jones Plug	1046
R1	15K Ohm $\pm$ 10%, 1/2 W	2459
R16	500 Ohm Var, 1/2 W	3406
R25	500 Ohm Var, 1/2 W	3407
R38	1750 Ohm $\pm$ 10%, 20 W	2862
R39	1250 Ohm $\pm$ 10%, 20 W	2857
S1	2 Section Rotary, 7 Position	3715-16-17-18
TU-1	Jerrold Tuner	704 TU-2
V1	5749 Vacuum Tube	4523
V2	5749 Vacuum Tube	4523
V3	5749 Vacuum Tube	4523

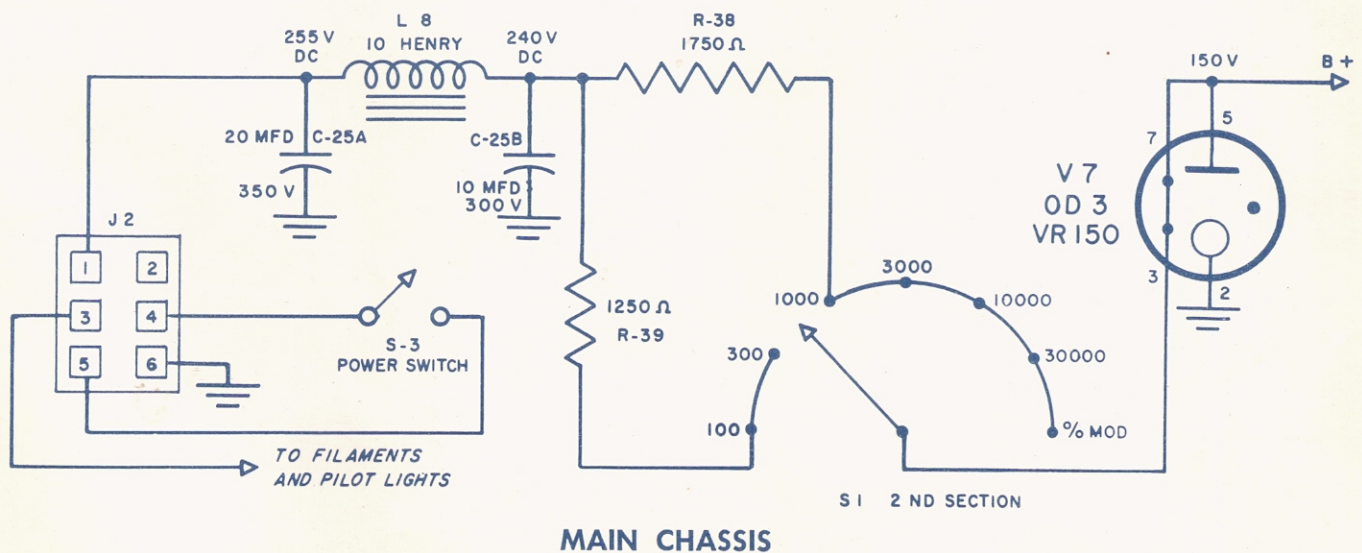
### Schematic of I. F. and Meter Circuits, Page 21

A condenser, C-26, has been added in parallel with L1 to form one tuned circuit of the coupling network between the tuner and the I.F.

### Power Supply Schematics, Page 22

P1 and P2 in the 117V a-c supply and the 6V d-c supply have been changed to female Jones sockets to accommodate J2 (male Jones plug) of the main chassis.

The new 6V d-c supply, Model 704A-6V, incorporates these changes and should be ordered for use with the 704A.





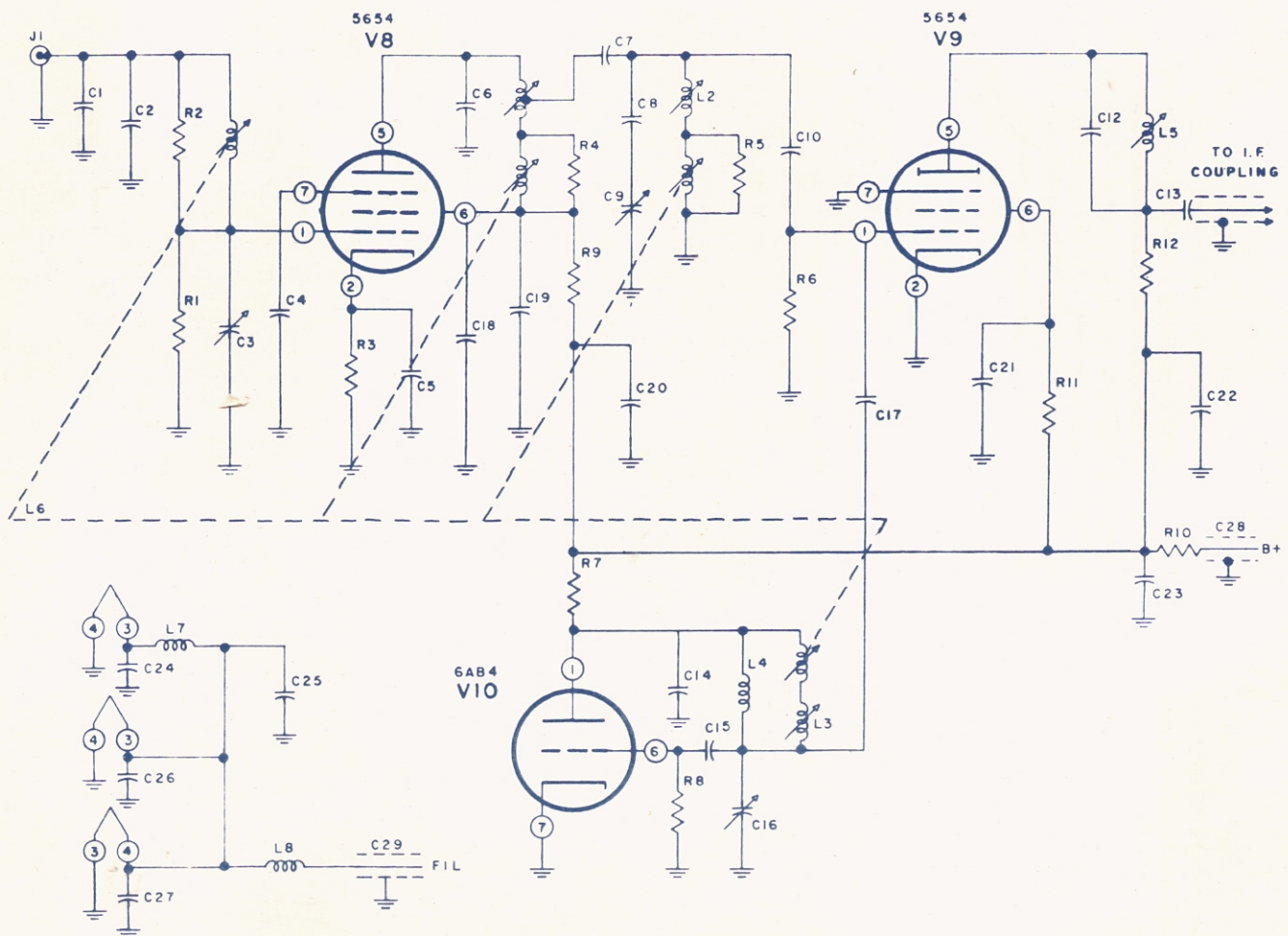
# TUNER

This schematic of the tuner is given for reference purposes. In the event of a component failure in the tuner section the instrument should be returned to Jerrold Electronics for repair.

## Tube Replacement

If either the 5654 RF amplifier or 5654 mixer are replaced, the calibration of the instrument should be checked. If the 6AB4 oscillator is replaced, trimmer C-16 can be adjusted to correct the tuner tracking using a crystal calibrated signal generator as follows:

1. The I.F. alignment should be correct at 25 mc.
2. Adjust Model 704A to Channel 13 sound carrier mark on dial.
3. Connect the signal generator to the ANT input of Model 704A. Tune signal generator to Channel 13 sound carrier, 215.75 mc.
4. Adjust C-16 for peak meter deflection. (See figure 5, addendum page 2.)



SCHMATIC OF TUNER