

**SERVICE MANUAL**

**AND**

**PARTS LIST**

**FOR**

**CLAIRTONE**

**STEREOPHONIC**

**RADIO-PHONOGRAPH**

**Model**

**Model S-601 - EMPRESS**

Printed in Canada

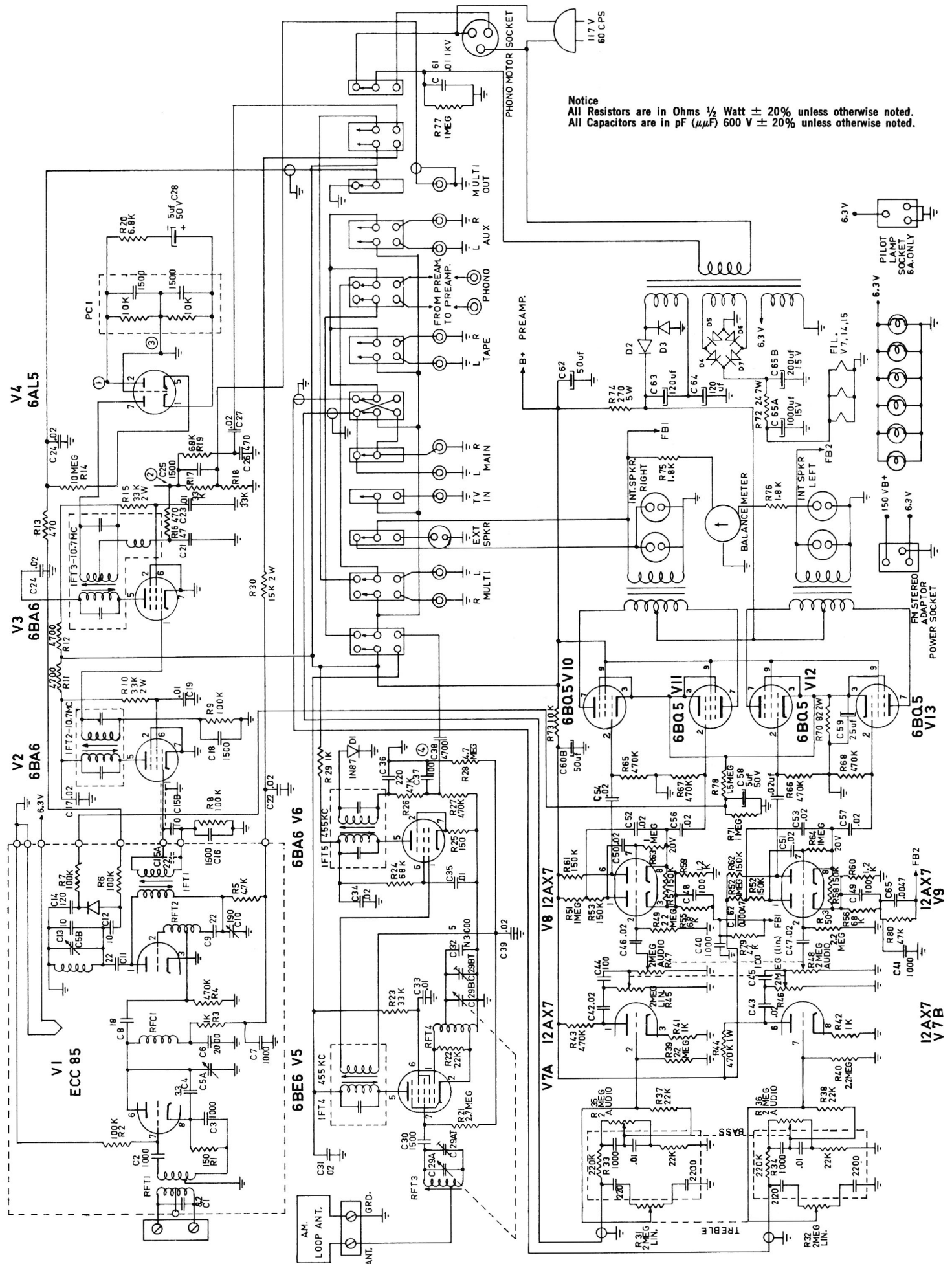
**EFFECTIVE DATE**  
**NOV. 28/61**

# PARTS LIST

| Schematic Location                                                                              | Part Number  | Description                 |
|-------------------------------------------------------------------------------------------------|--------------|-----------------------------|
| <b>CAPACITORS</b>                                                                               |              |                             |
| C15                                                                                             | 32-250950-52 | 10 pF $\pm$ 5%              |
| C16, 18, 25, 30                                                                                 | 32-9575-18   | 1500 pF GMV                 |
| C17, 20, 22, 24, 27, 31, 34, 39, 40, 43, 46, 47, 50, 51, 52, 53, 54, 55, 56, 57, 66, 67, 72, 73 | 32-200044-43 | .02 $\mu$ F GMV             |
| C19, 23, 33, 35                                                                                 | 32-200044-68 | .01 $\mu$ F                 |
| C21                                                                                             | 32-200044-1  | 47 pF                       |
| C26                                                                                             | 32-250950-10 | 470 pF                      |
| C28, 58                                                                                         | 32-254587-2  | 5 $\mu$ F 50 V Electrolytic |
| C29A, AT, B, BT                                                                                 | 38-254594-1  | AM tuning condensor         |
| C36                                                                                             | 32-250950-41 | 220 pF                      |
| C37, 44, 45, 48, 49                                                                             | 32-250950-44 | 100 pF                      |
| C38, 62, 65                                                                                     | 32-250950-42 | 4700 pF GMV                 |
| C60A, B                                                                                         | 32-254599-11 | 50/50 $\mu$ F 300 V         |
| C61                                                                                             | 32-250950-43 | .01 $\mu$ F 1.4 KV          |
| C64, 72                                                                                         | 32-254587-9  | 120 $\mu$ F 200 V           |
| C65, AB                                                                                         | 32-254599-12 | 1000 / 200 $\mu$ F 20 V     |
| C68, 69                                                                                         | 32-250950-68 | 22 pF                       |
| C70, 71                                                                                         | 32-200044-35 | 150 pF                      |
| C73                                                                                             | 32-254599-10 | 50 $\mu$ F 300 V            |
| <b>RESISTORS</b>                                                                                |              |                             |
| R8, 9, 93, 94                                                                                   | 33-41035     | 100 K                       |
| R10, 15                                                                                         | 33-31565     | 15 K 2 W                    |
| R11, 12, 16                                                                                     | 33-14735     | 470                         |
| R13, 27, 65, 66, 67, 68                                                                         | 33-44735     | 470 K                       |
| R14                                                                                             | 33-61035     | 10 Meg                      |
| R17, 18                                                                                         | 33-33335     | 33 K                        |
| R19, 55, 56                                                                                     | 33-36835     | 68 K                        |
| R20                                                                                             | 33-26833     | 6.8 K $\pm$ 10%             |
| R21                                                                                             | 33-52733     | 2.7 Meg $\pm$ 10%           |
| R22, 37, 38                                                                                     | 33-32235     | 22 K                        |
| R23                                                                                             | 33-23933     | 3.9 K $\pm$ 10%             |
| R24                                                                                             | 33-25633     | 5.6 K $\pm$ 10%             |
| R25                                                                                             | 33-11535     | 150                         |
| R26, 79, 80                                                                                     | 33-34735     | 47 K                        |
| R28                                                                                             | 33-54735     | 4.7 Meg                     |
| R29, 41, 42                                                                                     | 33-21035     | 1 K                         |
| R31, 32                                                                                         | 33-254595-8  | 2 Meg Treble control lin.   |
| R33, 34                                                                                         | 33-42235     | 220 K                       |
| R35, 36                                                                                         | 33-254595-7  | 2 Meg Bass control audio    |
| R30                                                                                             | 33-31565     | 15 K 2 W                    |
| R39, 40, 49, 50, 91, 92                                                                         | 33-52235     | 2.2 Meg                     |
| R45, 46                                                                                         | 33-254595-9  | 2 Meg Balance control lin.  |
| R47, 48                                                                                         | 33-254595-6  | 2 Meg Volume control audio  |
| R51, 52, 63, 64, 71, 77                                                                         | 33-51035     | 1 Meg                       |
| R53, 54, 57, 58, 61, 62                                                                         | 33-41535     | 150 K                       |
| R59, 60                                                                                         | 33-21233     | 1.2 K $\pm$ 10%             |
| R70                                                                                             | 33-08263     | 82 2 W                      |
| R72                                                                                             |              | 24 7 W                      |
| R73                                                                                             | 33-31035     | 10 K                        |
| R74                                                                                             | 33-254644-7  | 270 5 W                     |
| R75, 76                                                                                         | 33-21833     | 1.8 K                       |

| Schematic Location                    | Part Number   | Description                                         |
|---------------------------------------|---------------|-----------------------------------------------------|
| R82, 84                               | 33-22235      | 2.2 K                                               |
| R83, 95, 96                           | 33-24735      | 4.7 K                                               |
| R85, 86                               | 33-36873      | 68 K 1 W                                            |
| R89, 90                               | 33-43935      | 390 K                                               |
| R78                                   | 33-51535      | 1.5 Meg                                             |
| <b>TRANSFORMERS, COILS AND DIODES</b> |               |                                                     |
| 1.F.T.2                               | 1607-4        | 10.7 Mc I.F. Transformer                            |
| 1.F.T.3                               | 2607-5        | 10.7 Ratio detector                                 |
| 1.F.T.4 }                             |               |                                                     |
| 1.F.T.5 }                             | 1655-6        | 455 Kc I.F. Transformer                             |
| RFT3                                  | 83A254591-1   | B.C. Antenna coil                                   |
| RFT4                                  | 83A254592-2   | B.C. Oscillator coil                                |
| D1                                    | 63-251913-6   | Germanium diode 1N87                                |
| D2, 3, 4, 5, 6, 7                     | 78-254566-1   | Silicon diode PT5                                   |
|                                       | 75-254564-6   | Power transformer                                   |
|                                       | 75-254565-1   | Audio output transformer                            |
| <b>COUPLATES</b>                      |               |                                                     |
| PC1                                   | 32A270034-1   | Ratio detector load                                 |
| PC2-3                                 | 32A254557-1   | Tone couplate                                       |
| <b>MISCELLANEOUS</b>                  |               |                                                     |
|                                       | 52-254704-1   | Balance meter                                       |
|                                       | 116-254724-2  | FM tuner                                            |
| AFC, T.V.                             | 58-254780-1   | Switch SPST                                         |
| ext. Speaker                          | 58-254780-3   | Switch SPDT                                         |
| Phono. CH.                            |               |                                                     |
| Reverse.                              |               |                                                     |
| Multi. AM                             | 58-254780-4   | Switch DPDT                                         |
| FM, Aux. Tape                         | 58-254780-5   | Switch DPST                                         |
| On-Off                                | 58-254780-6   | Switch SPDT 3A                                      |
|                                       | 122-254783-2  | Dial pointer assembly                               |
|                                       | 49-270223-4   | Dial glass                                          |
|                                       | 103A2005-TB-1 | Push button                                         |
|                                       | 79A254785-6   | Phono socket panel                                  |
|                                       | 79-254578-1   | Speaker socket                                      |
|                                       | 15-254577-1   | FM antenna terminal board                           |
|                                       | 15-254577-2   | AM antenna terminal board                           |
|                                       | 79-254578-4   | Socket 3 prong Pilot light                          |
|                                       | 79-254578-6   | Socket 3 prong Multiplex                            |
|                                       | 79-254578-3   | Socket 3 prong Phono motor                          |
| <b>CABINET PARTS</b>                  |               |                                                     |
| 12ALM7D-2                             |               | Garrard Type A Changer c/w with Shure M7D cartridge |
| 14-149-2                              |               | EM1 Woofer C100-138 (92390T)                        |
| 14-212-23                             |               | EM1 Tweeter TW 34-2 (97492J)                        |
| 20-22                                 |               | Faceplate 401-103D                                  |
| 22-16-1                               |               | Knob with dot                                       |
| 22-16-2                               |               | Knob without dot                                    |
| 24-2                                  |               | .5 mfd 25 V A.C. capacitor                          |
| 30-14                                 |               | Pilot light assembly                                |
| 33-5-10                               |               | 3 pin power plug for changer                        |
| 35-1                                  |               | Pilot light lens                                    |
| 35-4                                  |               | Stereo indicator lens                               |
| 10L61-T                               |               | Doors, oiled teak (left & right)                    |
| 10L61-W                               |               | Doors, oiled walnut (left & right)                  |
| 10TLS C-O/W                           |               | Lift Lids Supports                                  |

Notice  
All Resistors are in Ohms  $\frac{1}{2}$  Watt  $\pm 20\%$  unless otherwise noted.  
All Capacitors are in pF ( $\mu\mu\text{F}$ ) 600 V  $\pm 20\%$  unless otherwise noted.



# ALIGNMENT PROCEDURE

## Preliminary:

Alignment is an exacting procedure and should be undertaken only when necessary. The following equipment is required:

1. Signal generator with a frequency range of at least from 455 kc to 1640 kc.
2. Signal generator with a frequency range covering 10.7 mc. for FM-I.F. alignment.
3. Vacuum tube voltmeter,  
OR
2. F.M. (sweep) signal generator usable at 10.7 mc
3. 10.7 Crystal or other accurate marker generator
4. Oscilloscope

**Notes:** Allow at least five minutes for the set to warm up before attempting alignment. An (8 ohm) speaker or dummy load (5-10 ohms) must be connected across the audio output transformer secondaries at all times.

F.M. DETECTOR CURVE

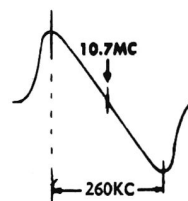


FIG. 1

F.M. I.F. PASSBAND

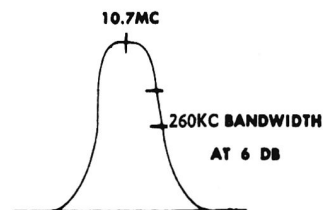


FIG. 2

## AM IF & RF ALIGNMENT

| Step | Signal Generator Coupling                               | Signal Generator Frequency | Band Switch Position | Radio Dial Setting              | Connect VTVM                               | Adjust                    | Remarks                                                |
|------|---------------------------------------------------------|----------------------------|----------------------|---------------------------------|--------------------------------------------|---------------------------|--------------------------------------------------------|
| 1.   | High Side to Pin 7 of V6 (6BE6)<br>Low Side to Chassis. | 455 KC                     | A.M.                 | Tuning Gang Fully Open          | High Side to Point 4, Low side to Chassis. | T4-T5<br>TOP AND BOTTOM   | Adjust for maximum deflection.                         |
| 2.   | Loop (Radiated)                                         | 535 KC                     | A.M.                 | 535 KC (A.M. Gang Fully Closed) | Same as in Step 1                          | RFT-4                     | Adjust for maximum deflection.                         |
| 3.   | Same as in Step 2                                       | 1625 KC                    | A.M.                 | 1625 KC (A.M. Gang Fully Open)  | Same as in Step 1                          | A.M. Osc. Trimmer C 29 BT | Adjust for maximum deflection.                         |
| 4.   |                                                         |                            |                      |                                 |                                            |                           | Repeat steps 2 & 3 until no further increase is noted. |
| 5.   | Same as in Step 2                                       | 1400 KC                    | A.M.                 | 1400 KC                         | Same as in Step 1                          | A.F.-R.F. Trimmer C 29 AT | Adjust for maximum deflection.                         |
| 6.   | Same as in Step 2                                       | 600 Kc                     | A.M.                 | 600 KC                          | Same as in Step 1                          | RFT-3                     | Adjust for maximum deflection.                         |

## F.M. - I.F. ALIGNMENT USING UNMODULATED SIGNAL GENERATOR AND VTVM

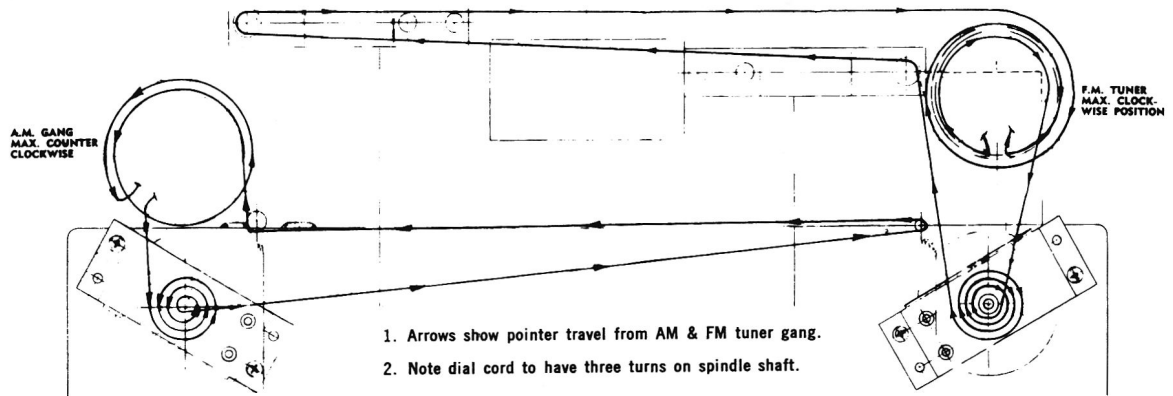
|     |                                   |               |      |                           |                                                |                                                             |                                                                                                             |
|-----|-----------------------------------|---------------|------|---------------------------|------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| 1A. | HIGH AND LOW SIDE TO F.M. ANTENNA | 10.7 (Unmod.) | F.M. | Point of Non-Interference | D.C. Probe to Point 1. Common lead to Chassis. | T3 Primary only (bottom)<br>T2 PRI & Sec.<br>GT1 PRI & Sec. | Adjust for maximum deflection.                                                                              |
| 2A. | Same as in Step 1A                | 10.7 (Unmod.) | F.M. | Same as in Step 1A        | D.C. Probe to Point 2. Common lead to Point 3  | T3 Secondary (TOP)                                          | Adjust for zero reading a positive and Negative reading will be obtained on either side of correct setting. |

## F.M. - I.F. ALIGNMENT USING F.M. SIGNAL GENERATOR AND OSCILLOSCOPE

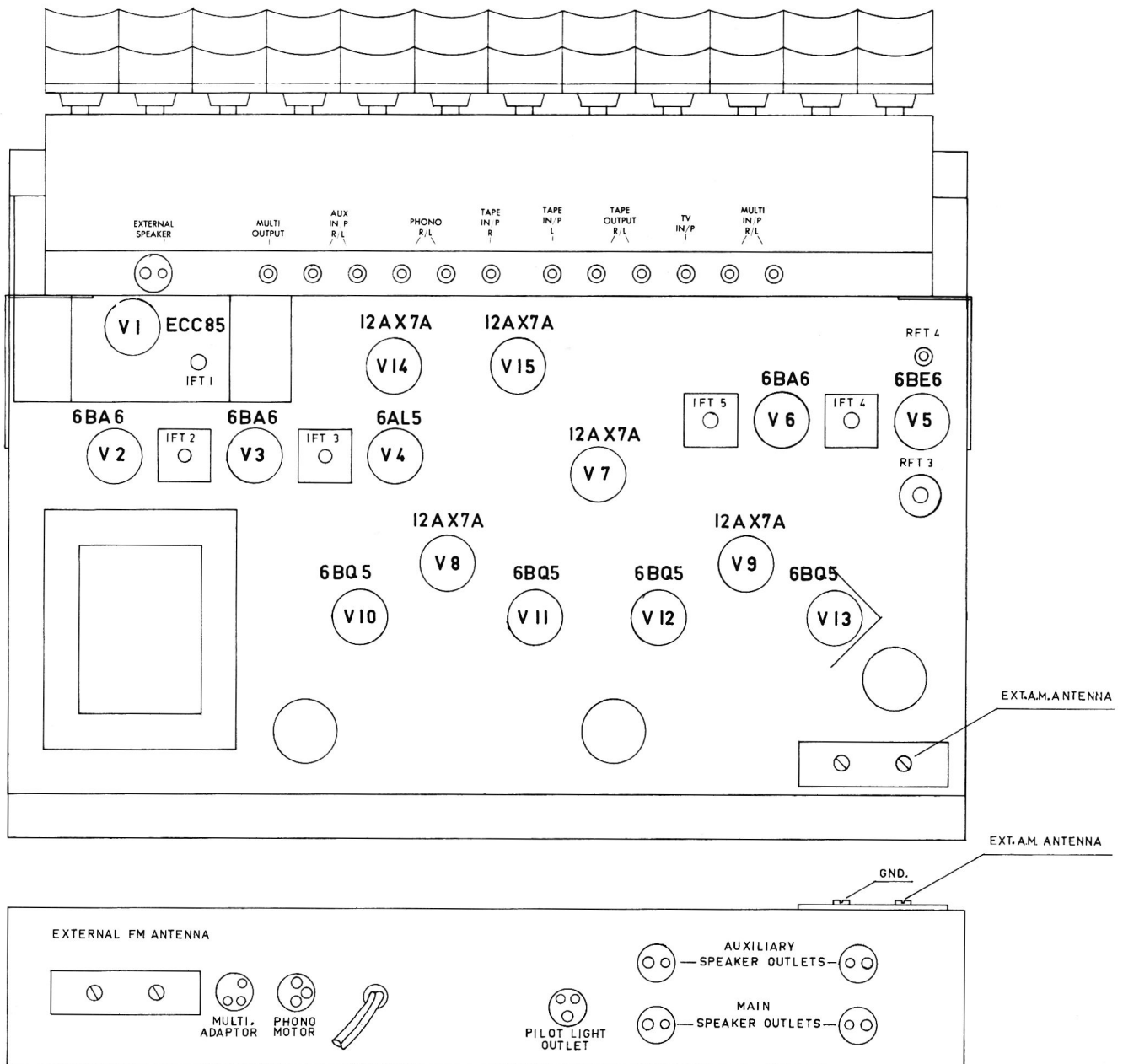
FREQUENCY MODULATE THE I.F. SIGNAL WITH 60 CYCLE SINE WAVE TO A TOTAL DEVIATION OF 450 KC. ADJUST THE SCOPE INTERNAL HORIZONTAL DEFLECTION VOLTAGE TO 120 CYCLES, AND SYNCHRONIZE IT WITH THE 60 CYCLE SINE WAVE.

|     |                                                            |                                            |      |                           |                                                |                          |                                                                                                                                                                           |
|-----|------------------------------------------------------------|--------------------------------------------|------|---------------------------|------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1B. | High Side to Pin. 1 of V3 (second 6BA6 F/M—I.F. Amplifier) | 10.7 mc<br>450 KC<br>Total Sweep Deviation | F.M. | Point of non-interference | Vert. Amp. Input to Point 1, Common to Chassis | T3 Primary only (bottom) | Adjust for curve of maximum amplitude and symmetry.                                                                                                                       |
| 2B. | Same as in Step 1B                                         | Same                                       | F.M. | Same as in Step 1B        | Vert. Amp. Input to Point 2, Common to Chassis | T3 Secondary only (top)  | Adjust so that 10.7 mc. occurs at centre of cross-over lines, similar to Fig. 1. Slightly re-touch T4 Primary for maximum amplitude and straightness of cross-over lines. |
| 3B. | Repeat Step No. 1B                                         |                                            |      |                           |                                                |                          |                                                                                                                                                                           |
| 4B. | High Side to Pin 1 of V2 (first 6BA6 F/M—I.F. Amplifier)   | Same                                       | F.M. | Same as in Step 1B        | Vert. Amp. Input to point 1, Common to Chassis | T2 Primary & Secondary   | Adjust T2. Top and Bottom for maximum amplitude and symmetry similar to Fig. 2.                                                                                           |
| 5B. | HIGH AND LOW SIDE TO F.M. ANTENNA                          | Same                                       | F.M. | Same as in Step 1B        | Same as in Step 4                              | T1 Primary & Secondary   | Adjust for maximum amplitude and symmetry.                                                                                                                                |
| 6B. | Same as in Step 5B                                         | Same                                       | F.M. | Same as in Step 1B        | Vert. Amp. Input to Point 2, Common to Chassis | T3 Secondary (Top)       | Trim Secondary for maximum symmetry while maintaining 10.7 mc. at cross-over lines (Fig. 1).                                                                              |
| 7B. | Repeat Step No. 2A using V.T.V.M.                          |                                            |      |                           |                                                |                          | Adjust for zero reading a positive and Negative reading will be obtained on either side of correct setting.                                                               |

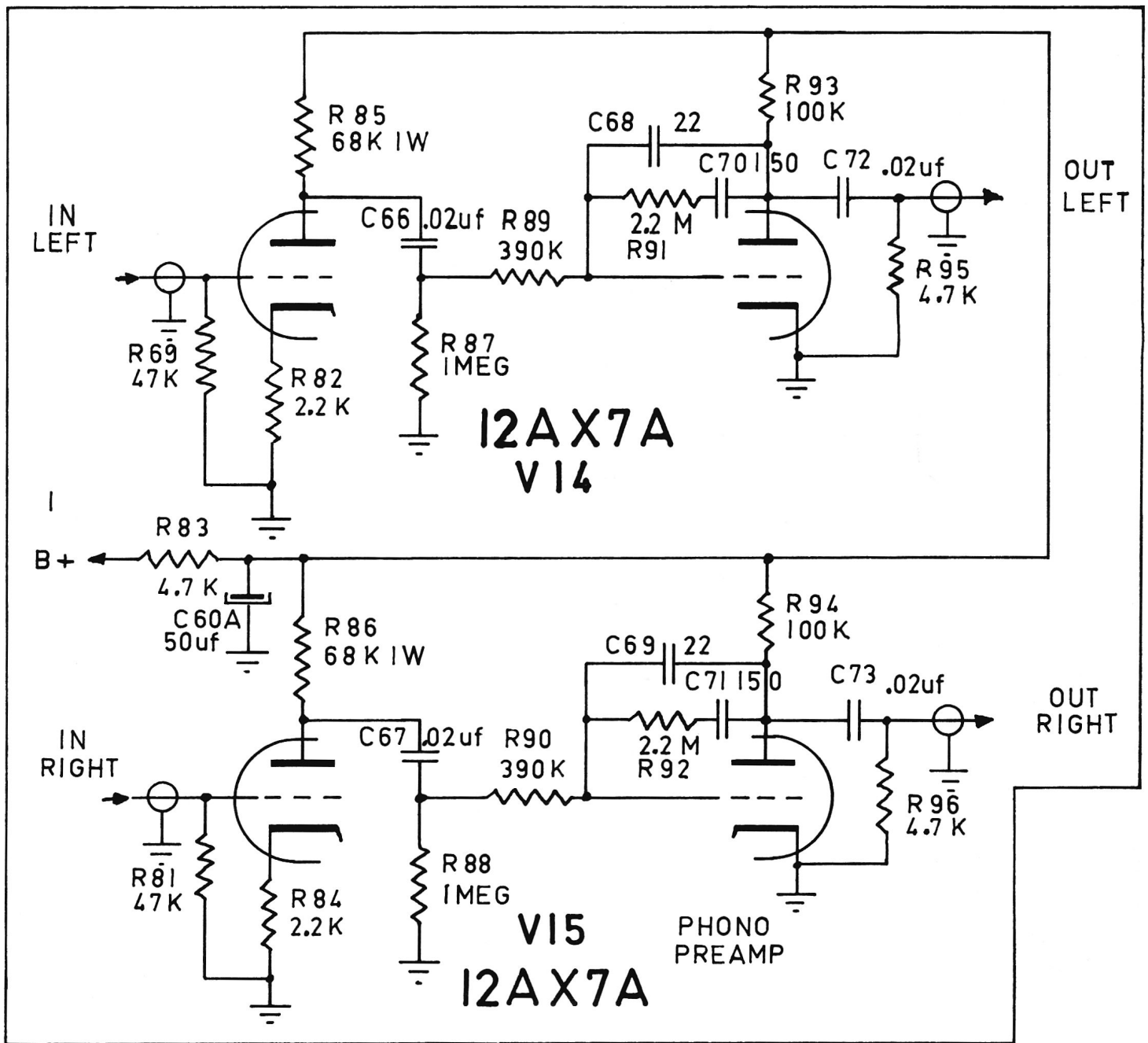
## A. M.— F. M. DIAL STRINGING



## TOP VIEW OF CHASSIS



## BACK VIEW OF CHASSIS



Pre-Amp Schematic Diagram