TABLE OF CONTENTS

Required Test Equipment .......................................................... 2
AM-FM-Tuner Alignment Procedure and Layout .......................... 3
Tape Player exploded View, Parts List and Alignment Procedure .......... 4
Parts List for Chassis and all PC-Boards .................................... 5
Part of overall Schematic Diagram ........................................... 6
Part of overall Schematic Diagram ........................................... 7

REQUIRED EQUIPMENT

The following test equipment is required to align and to service the Receiver:
• Line Voltage Autotransformer or Voltage Regulator
• AC DC Multimeter
• Accurately Calibrated AC Voltmeter
• Oscilloscope (Flat to 100kHz Minimum)
• Low-Distortion Audio Sine-Wave Generator
• Harmonic Distortion Analyzer
• Two (2) Load Resistors, 8-ohms, 50 Watts (Minimum Rating)
• Low-Distortion AM-FM Signal Generator
  10.7 MHz Sweep Generator
• Multiplex Generator
• 455 kHz Sweep Generator

CAUTION: This precision high-fidelity instrument should be serviced only by qualified personnel, trained in the repair of transistorized equipment and printed circuitry.
TAPE DECK AZIMUTH AND HEAD HEIGHT ALIGNMENT

1. Preset Bass, Treble and Balance controls to their mechanical center position. Volume Control to minimum.
2. Push in the TAPE button.
3. Connect Oscilloscope or AC VTVM to the Recorder Out Jack marked L.
4. Insert prewound test tape, (RCA No. 376 or equivalent), into tape player.
5. Select Tape Program Number 2.
6. Adjust Head Height Crosstalk Adjustment screw for minimum output as indicated on VTVM or Oscilloscope.
7. Connect Oscilloscope or AC VTVM to the Recorder Out Jack marked R.
8. Adjust Azimuth Adjustment Screw for maximum output as indicated on VTVM or Oscilloscope.
9. Repeat Head Height and Azimuth adjustment procedures until no further improvement is obtained.

*Not Available*
### FM-Tuner Alignment

**SELECTOR to FM, AFC to OFF, VOLUME MINIMUM**

Maintain generator output as low as possible for suitable indication.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>GENERATOR</th>
<th>DIAL SETTING</th>
<th>INDICATOR</th>
<th>PROCEDURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>IF ALIGNMENT</strong></td>
<td>Connect 10.7 MHz sweep generator to TP1. Connect ground lead to TPS. Markers are not required.</td>
<td>Position of non-interference.</td>
<td>Scope vertical input TP2 through 100K resistor and 100pF capacitor as shown. Connect ground lead to chassis.</td>
<td>Adjust T101 for maximum gain. See FIGURE 1</td>
</tr>
<tr>
<td>2. <strong>PRELIMINARY DETECTOR ALIGNMENT</strong></td>
<td>As above</td>
<td>As above</td>
<td>Scope vertical input to TP3 through a 100K resistor and 100pF capacitor as shown.</td>
<td>Adjust T103, T104 for maximum gain and symmetry. See FIGURE 2</td>
</tr>
<tr>
<td>3. <strong>FRONT END ALIGNMENT</strong></td>
<td>Open Line Ant. Link. Tuning knob fully CDW.</td>
<td>Center dial pointer on 0 and cement it in place.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Connect FM RF generator through two 120-ohm resistors to FM ANT screw terminals. Set generator to 90 kHz, modulate with 400 Hz to provide ± 75 deviation. Set generator output attenuator as low as possible.</td>
<td>Center of 90 MHz calibration mark on dial.</td>
<td>Scope vertical input and AC-VTVM to Recorder Output.</td>
<td>Adjust L103 for maximum. Adjust L102 then L101 for maximum gain. Repeat the two steps above as required.</td>
</tr>
<tr>
<td>5.</td>
<td>Change generator setting to 106 MHz.</td>
<td>Center of 106 MHz calibration mark on dial.</td>
<td>As above</td>
<td>Adjust TC105 for maximum. Adjust TC102, then TC101 for maximum gain. Repeat the two steps above as required.</td>
</tr>
<tr>
<td>6. <strong>FINAL DETECTOR ALIGNMENT</strong></td>
<td>As above, except set to position of non-interference near 100 MHz. Set generator output attenuator to 2mV.</td>
<td>Position of non-interference near 100 MHz.</td>
<td>Scope vertical input and distortion meter to Recorder Output.</td>
<td>Adjust T104 for minimum distortion.</td>
</tr>
<tr>
<td>7. <strong>STEREO SEPARATION</strong></td>
<td>As above, (Step 6) except modulation. Modulate LEFT Channel ± 67.5KHz - 400Hz audio and ± 7.5KHz - 19KHz pilot carrier.</td>
<td>As above Step 6 Scopes and AC-VTVM to Right Recorder output.</td>
<td>Adjust VR101 for minimum output.</td>
<td></td>
</tr>
</tbody>
</table>

### AM-FM-Tuner Layout

**SELECTOR to AM, VOLUME MINIMUM.**

Maintain generator output as low as possible for suitable indication.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>GENERATOR</th>
<th>DIAL SETTING</th>
<th>INDICATOR</th>
<th>PROCEDURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>AM IF</strong></td>
<td>Connect 456 kHz sweep generator to AM EXT terminals. Note: After each adjustment reduce generator output as required.</td>
<td>Position of non-interference.</td>
<td>Scope vertical input to TP4. See FIGURE 3</td>
<td>Adjust T105 for maximum gain. Adjust T102 primary and secondary for maximum gain. Repeat above two steps as required.</td>
</tr>
<tr>
<td>2. <strong>AM FRONT END ALIGNMENT</strong></td>
<td>AM generator to EXT AM ANT and GND terminals. Set to 800 kHz. Modulate with 30%, 1KHz.</td>
<td>Center of 800 kHz calibration mark on dial.</td>
<td>Scope and VTVM to RCDR OUT jack.</td>
<td>Adjust L104 (OSC) and L105 (Loop ANT) for maximum.</td>
</tr>
<tr>
<td>3. <strong>AM FRONT END ALIGNMENT</strong></td>
<td>Change frequency to 1400 kHz.</td>
<td>Center of 1400 kHz calibration mark on dial.</td>
<td>As above</td>
<td>Adjust TC104 (OSC) and TC105 (ANT) for maximum. Repeat steps 2 and 3 until optimum alignment is reached.</td>
</tr>
</tbody>
</table>