REOUIRED TEST EQUIPMENT

The following equipment is required to completely test and align modern high-fidelity amplifiers, tuners, and receivers.

- Line Voltage Auto-transformer or Voltage Regulator
- DC Vacuum Tube Voltmeter
- Accurately Calibrated AC Vacuum Tube Voltmeter
- Oscilloscope (1Flat to 100 kHz Minimum)
- Low-Distortion Audio Line (Wav) Generator
- Intermodulation Distortion Analyzer
- Harmonic Distortion Analyzer
- 2 - Load resistors, 3-Ohms, 100 Watt (Minimum Rating)
- AM/FM Signal Generator
- 10.7 MHz Sweep Generator
- Multiplex Generator (preferably with RF output – FISHER 200)
- 455 kHz Sweep Generator
- Ferrite Test Loop Stick
- 2 - Full Range Speakers for Listening Tests
- Stereo Source – Turntable, Tape Recorder, etc.
- Soldering Iron with Small Tip, Fully Insulated from AC Line
- Suction Desoldering Tool

CAUTION: This precision high-fidelity instrument should be serviced only by qualified personnel, trained in the repair of transistor equipment and printed circuitry.

Many of these items are included only as a reminder — they are normal procedures for experienced technicians. Shortcuts may be taken, but these often cause additional damage to transistors, circuit components, or printed circuit boards.

SOLDERING: A well-tinned, hot, clean soldering iron tip will make soldering easier, without causing damage to the printed circuit board or the components mounted on it. Regular use of a sponge cleaner will maintain a clean soldering surface. The heat available at the tip, not the wattage of the iron, is important. Some 50-watt irons reach temperatures of 1,000°F, while others will hardly melt solder. Small-diameter tips should be used for single solder connections, pyramid and chisel tips for large areas.

Always disconnect the AC power cord from the line when soldering. Turning the power switch OFF is not sufficient. Power-line leakage paths, through the heating element of the iron, may destroy transistors.

PARTS REMOVAL: If a part is not being returned for warranty factory replacement, it may be cut in half (with diagonal cutting pliers) to make removal easier. Multiple terminal parts, such as IF transformers, or electrolytic capacitors, should be removed using special de-soldering tips made especially for this purpose. Removing solder from terminals, reduces the possibility of breaking the printed circuit board when the part is removed.

ACCIDENTAL SHORTS: A clean working area, free of metal particles, screws, etc., is an important preventive in avoiding servicing problems. Screws, removed from the chassis during servicing, should be stored in a box until needed. While a set is operating, it takes only an instant for a base-to-collector short to destroy a transistor (and others direct-connected to it). In the time it takes for a dropped machine screw, washer, or screwdriver, to contact a pair of socket terminals (or terminal and chassis), a transistor can be ruined.

SOLID-STATE DEVICES: Integrated Circuits contain the equivalent of many circuit parts, including transistors, diodes, resistors, and capacitors. The preferred troubleshooting procedure requires isolating the trouble to one stage using AC signal tracing methods. Once the suspected stage is located, the DC voltages at the input and output leads are measured to give an accurate indication of the operating conditions of the IC. DO NOT use an ohmmeter to check continuity with the IC mounted on the printed circuit board. Forward biasing the internal junctions within the IC may burn out the transistors. DO NOT replace a defective IC until all external resistors, capacitors, and transformers are checked first, to prevent the replacement IC from failing immediately due to a defect in the connecting components. Solder and unsolder each lead separately using a pliers or other heat sink on the lead to prevent damage from excessive heat. Check that the leads are connected to the correct locations on the printed circuit board before turning the set on.

Whenever possible, a transistor tester should be used to determine the condition of a transistor or diode. Ohmmeter checks do not provide conclusive data, and may even destroy the junctional within the device.

Never attempt to repair a transistor power amplifier module until the power supply filter-capacitors are fully discharged.

If an output or driver transistor becomes defective (opens or shorts), always check ALL direct-coupled transistors and diodes in that channel. In addition, check the bias pot, and other parts in the bias network, before replacing output transistors. All output and driver transistors in one channel may be destroyed if the bias network is defective. After parts replacement, always check the bias adjustment for specified idling current.

In some applications, replacement of transistors must be made from the same beta group as the original type. The beta group is indicated by a colored marking on the transistor. Be sure to include this information when ordering replacement transistors.

When mounting a replacement power transistor, be sure the bottom of the flange, mise insulation, and the surface of the heat sink, are free of foreign matter. Dust and grit will prevent flat contact, reducing heat transfer to the heat sink. Metallic particles can puncture the insulation, cause a short, and destroy the transistor.

Silicone grease must be used between the transistor and the mise insulation, and between the mise and the heat sink, for best heat transfer. Use Dow-Corning DC-3, or an equivalent compound made for power transistor heat conduction.

Use care when making connections to speakers and output terminals. To reduce the possibility of shorts, lug should be used on the exposed ends, or stranded wire should be tinned to prevent frayed wire ends. Current in the speakers and output circuitry is quite high — poor contacts, or small sized wire, can cause significant power losses in the system. For wire lengths greater than 30 feet, 16 AWG, or heavier, should be used.

VOLTAGE MEASUREMENTS: All voltages are measured with the line voltage adjusted to 120 volts. All measured voltages are ±10%. DC voltages are measured to ground with a VVTM, with no signal input unless otherwise noted. AC signal voltages are measured under the conditions specified on the schematic.

ALIGNMENT PROCEDURES: DO NOT attempt realignment unless the required test equipment is available, and the alignment procedure is thoroughly understood.

BECAUSE ITS PRODUCTS ARE SUBJECT TO CONTINUOUS IMPROVEMENT, FISHER RADIO CORPORATION RESERVES THE RIGHT TO MODIFY ANY DESIGN OR SPECIFICATION WITHOUT NOTICE AND WITHOUT INCURRING ANY OBLIGATION.
REMOVING DRESS PANEL
1. Disconnect AC power cord.
2. Remove the screws which hold the top and bottom covers to the chassis. (On 260-T, 24R chassis, also remove screws holding top cover to heat sink.) Remove the covers.
3. Gently pull the eight leads off the terminal pins behind the TONE-MATIC dial assembly. These push-on terminal leads connect the panel-mounted dial assembly to the chassis circuitry and must be disconnected in order to remove the dress panel. Label each lead with its associated pin location to make replacement easier later.
4. Gently pull all knobs off the front dress panel control shafts. Remove the hex nuts from the shafts and remove panel by pulling forward over the shafts.
5. Reverse procedure for reassembly.

REMOVING DIAL GLASS ASSEMBLY
1. Remove dress panel. Refer to REMOVING DRESS PANEL procedure.
2. Gently pull the four leads from the terminal pins on the top rear of the meter and label each lead with its associated pin location for easy replacement later.
3. Gently pull the two pairs of dial lamp leads from the terminal pins on the rear of the clock.
4. Gently pull the pair of meter leads from the terminal pins on the clock back and label.
5. Note: These ten push-on terminal leads which connect the dial glass panel to the chassis must be disconnected in order to remove the dial glass panel.
6. Remove the screws holding the dial glass panel. Remove the panel with the dial glass, pilot lamps and meter attached by tilting out the bottom of the panel and sliding downward.
7. Be careful to avoid deforming dial pointer.
8. Reverse procedure for reassembly.

REPLACING DIAL LAMPS
1. Remove dress panel. Refer to REMOVING DRESS PANEL procedure.
2. Snap out the defective lamp from the spring clip. Place the new lamp in the socket making sure that the unshaded portion of the lamp face is 90 degrees from the top of the dial glass.
3. Replace the front dress panel and secure with the hex nuts removed previously. Replace the knobs on the control shafts.
4. Reconnect the terminal leads (removed previously) to the respective terminal pins behind the TONE-MATIC assembly.

REPLACING DIAL GLASS ASSEMBLY
1. Remove dress panel. Refer to REMOVING DRESS PANEL procedure.
2. Remove dial glass assembly. Refer to REMOVING DIAL GLASS ASSEMBLY procedure.
3. Gently pry the meter off the dial glass panel, and scrape the residual adhesive off the panel.
4. Peel the backing from one side of the replacement adhesive mounting pad (IFRC Part No. ESTA2198) and affix it to the replacement meter. Peel the backing from the remaining side of the adhesive, align the meter face over the dial panel contours, and firmly press the meter to the back of the glass plate.
5. Remove the dial glass assembly.
6. Reassemble the dress panel. Reconnect all leads (remove previously) to their respective terminal pins.
7. Check meter calibration. Refer to TUNING METER CALIBRATION procedure.
8. Remove top and bottom covers removed previously.

REPLACING METER
1. Remove dress panel. Refer to REMOVING DRESS PANEL procedure.
2. Remove dial glass assembly. Refer to REMOVING DIAL GLASS ASSEMBLY procedure.
3. Gently pry the meter off the dial glass panel, and scrape the residual adhesive off the panel.
4. Peel the backing from one side of the replacement adhesive mounting pad (IFRC Part No. ESTA2198) and affix it to the replacement meter. Peel the backing from the remaining side of the adhesive, align the meter face over the dial panel contours, and firmly press the meter to the back of the glass plate.
5. Remove the dial glass assembly.
6. Reassemble the dress panel. Reconnect all leads (remove previously) to their respective terminal pins.
7. Check meter calibration. Refer to TUNING METER CALIBRATION procedure.
8. Reverse the top and bottom covers removed previously.
9. Run the dial cord through the slot in the rim of the drive drum and set in the underside of groove 3.
10. Pull dial cord past and wrap 2 turns CW around turning shaft. See Figure 2.
11. Guide the dial cord under and around pulleys "A", "B" and "C". Keep the dial cord taut during this procedure.
12. Rotate the drive-drum to its maximum CW position, allowing the cord to wind onto the drive drum. Keep the dial cord taut during this procedure.
13. Guide the dial cord under the dial drum and into groove 5. Bring the dial cord around groove 6 and into the slot in the drive drum. See Figure 3.
14. With the machine screws loosened, place the cord under the beveled washer, pull the dial cord taut, and tighten the screws.
15. Turn the turning shaft to rotate the drive-drum fully CCW and fully CW to distribute tensioning along the dial cord.
16. Repeat steps (11) and (12) until dial spring is tensioned.
17. Remove dial glass panel assembly using the four mounting screws removed previously.
18. Reconnect the ten leads (removed previously) to their respective terminal pins.
19. Place the dial cord over and under the tabs on the rear of the dial pointer (see detail), and place the pointer on the top of the dial glass panel rail.
20. Remove the glass panel assembly, and orient the pointer so that the pointer is 90 degrees from the top of the drive drum.
21. Inspect the pointer's pointer to the respective terminal pins behind the TONE-MATIC assembly.
22. Check dial calibration. Refer to TUNING METER CALIBRATION procedure.
23. Reverse procedure for reassembly.

REPLACING STEREO BEACON AND METER LAMPS
1. Disconnect AC power cord.
2. Remove the screws which hold the top cover to the chassis. (On 260-T, 24R chassis, also remove screws holding top cover to heat sink.) Remove the cover.
3. Gently pull the four wires off the terminal pins on the top rear of the meter. Label each wire with its associated pin location to make replacement easier later.
4. Gently pull the four wires to their associated terminal pins on the replacement lamp assembly.
5. Replace the top cover on the chassis and secure with the screws removed previously.

CLEANING FRONT PANEL
WARNING: Use only plain lukewarm water for maintaining a freshly laundered, soft lint-free cloth to clean the front control panel.

DIAL STRINGING
1. Remove dress panel. Refer to REMOVING DRESS PANEL procedure.
2. Remove dial pointer.
3. Remove dial glass assembly. Refer to REMOVING DIAL GLASS ASSEMBLY procedure.
4. Gently pry the meter off the dial glass panel, and scrape the residual adhesive off the panel.
5. Peel the backing from one side of the replacement adhesive mounting pad (IFRC Part No. ESTA2198) and affix it to the replacement meter. Peel the backing from the remaining side of the adhesive, align the meter face over the dial panel contours, and firmly press the meter to the back of the glass plate.
6. Remove the dial glass assembly.
7. Reassemble the dress panel. Reconnect all leads (remove previously) to their respective terminal pins.
8. Check meter calibration. Refer to TUNING METER CALIBRATION procedure.
9. Reverse the top and bottom covers removed previously.
10. Run the dial cord through the slot in the rim of the drive drum and set in the underside of groove 3.
11. Pull dial cord past and wrap 2 turns CW around turning shaft. See Figure 2.
12. Guide the dial cord under and around pulleys "A", "B", "C". Keep the dial cord taut during this procedure.
13. Rotate the drive-drum to its maximum CW position, allowing the cord to wind onto the drive drum. Keep the dial cord taut during this procedure.
14. Guide the dial cord under the dial drum and into groove 5. Bring the dial cord around groove 6 and into the slot in the drive drum. See Figure 3.
15. With the machine screws loosened, place the cord under the beveled washer, pull the dial cord taut, and tighten the screws.
16. Turn the turning shaft to rotate the drive-drum fully CCW and fully CW to distribute tensioning along the dial cord.
17. Repeat steps (11) and (12) until dial spring is tensioned.
18. Remove dial glass panel assembly using the four mounting screws removed previously.
19. Reconnect the ten leads (removed previously) to their respective terminal pins.
20. Place the dial cord over and under the tabs on the rear of the dial pointer (see detail), and place the pointer on the top of the dial glass panel rail.
21. Turn the turning shaft fully CCW. Slide the dial pointer to zero (0) calibration mark on the logging scale while holding turning shaft fully CCW. Cement dial pointer to dial cord to prevent slippage. Allow cement to thoroughly dry.
22. Reinstall the dress panel and knobs. Reconnect the leads (removed previously) to their respective terminal pins behind the TONE-MATIC assembly.
23. Check dial calibration. Refer to TUNING METER CALIBRATION procedure.
24. Reverse the top and bottom covers removed previously.

SERVICING INTEGRATED CIRCUITS
Integrated Circuits are used in this unit to approach the theoretical maximum of AM supernumerary and noise limiting. These IC's contain the equivalent of many circuit parts, including transistors, diodes, resistors, and capacitors. These integrated circuits are high-reliability devices, requiring minimum servicing. In the unlikely event that an IC requires servicing, it should be serviced in the same way as a transistor.

The preferred troubleshooting procedure requires isolating the trouble to one stage using AC signal tracing methods. Once the suspected stage is isolated, the defective circuit can be checked by measuring the DC voltages at the input and output leads of the IC using a DC VTM. These DC voltage measurements give the most accurate indications of the operating conditions of the integrated circuit.

WARNING: Do not use an ohmmeter to check continuity with the IC mounted on the printed circuit board. Forward biasing the internal junctions within the IC may burn out the transistors.
POWER OUTPUT MEASUREMENT

The output amplifier of this unit is designed to deliver its full-rated power with program material loaded into 8-ohm loads for an indefinite period of time. When a constant audio tone is used as a signal to measure the maximum continuous RMS power output, the following precautions must be taken:

1. Measure the power output of one channel at a time.
2. Limit the measurement period to 10 minutes with a load resistance of 8 ohms.
3. 250-724: Use a load resistor with a power rating of at least 50 watts.
4. 380-724: Use a load resistor with a power rating of at least 100 watts.

WARNING: If the power output of both channels is measured simultaneously, use a load resistor of 4 ohms per channel and limit measurements to a period not longer than 5 minutes.

NOTE: The 400-724 uses a high-temperature output switch to protect the amplifier against damage resulting from overheating. The switch disables the amplifier by eliminating drive signal in the audio control amplifier. When the amplifier cools to normal operating temperature, the cutout switch automatically resets.

HARMONIC DISTORTION TEST

Set BALANCE, BASS, and TREBLE controls to their center positions. Set SELECTOR switch to AUX. Depress MAIN SPKRS pushbutton switch; release all other pushbutton switches to test position.

1. Connect an 8 ohm, 100-watt resistor across the LEF NT SPEAKERS MAIN terminals. In parallel with the load, connect the input leads of an HD analyzer and the input leads of an accurately calibrated AC VTVM.
2. Connect a low-distortion noiseless signal generator, set to 100 Hz, to the left channel AUX IN jack.

NOTE: Allow at least 10 minutes warm-up time before making measurements.

3. Rose the VOLUME control to maximum.
4. 250-724: Increase audio generator level to 30 watts output (16.5 V RMS across 8 ohm load). HD analyzer should read 0.5% or less.
5. 400-724: Increase audio generator level to 50 watts output (20.0 V RMS across 8 ohm load). HD analyzer should read 0.5% or less.
6. Repeat preceding steps for right channel.

POWER AMPLIFIER CENTER VOLTAGE TEST

NOTE: Allow set to warm up at least 10 minutes before making measurements or adjustments. Power amplifier center voltage test should be performed starting before this procedure.

1. Connect ground lead of DC VTVM to pin 80 of left-channel of predriver/driver board. Connect probe of DC VTVM to pin 82 on predriver/driver board. (2A) 250-724, 240; Adjust pot. R815 (OUTPUT BALIAS ADJUST) for DC VTVM reading of 15 mV.
2. Connect ground lead of DC VTVM to pin 80 of right-channel predriver/driver board. Connect probe of DC VTVM to pin 92 on predriver/driver board. (4A) 250-724, 240, Adjust pot. R816 for DC VTVM reading of 15 mV.

POWER AMPLIFIER IDLING CURRENT ADJUSTMENT

NOTE: Allow set to warm up at least 10 minutes before making measurements or adjustments. Power amplifier center voltage test should be performed starting before this procedure.

1. Connect ground lead of DC VTVM to pin 80 of left-channel of predriver/driver board. Connect probe of DC VTVM to pin 82 on predriver/driver board. (2A) 250-724, 240; Adjust pot. R815 (OUTPUT BALIAS ADJUST) for DC VTVM reading of 15 mV.
2. Connect ground lead of DC VTVM to pin 80 of right-channel predriver/driver board. Connect probe of DC VTVM to pin 92 on predriver/driver board. (4A) 250-724, 240, Adjust pot. R816 for DC VTVM reading of 15 mV.

INTERMODULATION DISTORTION TEST

NOTE: Bypass C20 and C21 with direct connections for IM test on 24H corelase. Bypass C17 and C18 on 265.

Set BALANCE, BASS, and TREBLE controls to their center positions. Set SELECTOR switch to AUX. Depress MAIN SPKRS pushbutton switch; release all other pushbutton switches to test position.

1. Connect an 8 ohm, 100-watt resistor across the LEF NT SPEAKERS MAIN terminals. In parallel with the load resistor, connect the input leads of an HD analyzer and the input leads of an accurately calibrated AC VTVM.
2. Connect IM-analyzer generator output to the left channel AUX IN jack.

NOTE: Allow set to warm up at least 10 minutes before making measurements.

IM F & DETECTOR ALIGNMENT

Set SELECTOR switch to FM, and AFC switch to OFF. Turn VOLUME control to minimum. Depress MUTING OF PUSH button.

1. Disconnect detector lead from Test Point 301 (pin 3N on AM/FM IC, MF board) and connect vertical AC input of scope to FM Test Point 301. Connect ground lead of scope to pin 20.
2. Connect an 8 ohm resistor across scope input and set scope vertical sensitivity to 100mV/10mV.
3. Connect 10.7 MHz sweeper generator to Test Point 501 (pin 6 on FM RF board). Connect ground lead of generator to pin 58. Adjust generator level and sweep to observe IF response curve.
4. Adjust top and bottom cores of C305, C204, and C302 (pin 40/AM/FM IC, MF board) for symmetry and maximum gain.
5. Adjust top and bottom cores of LS60 (pin FM RF board) for maximum gain and symmetry. Repeat alignment until maximum gain and symmetry are obtained (see Figure 4).
6. Increase generator level to full output (approximately 100,000 uV). If necessary, slightly readjust top cores of 3005 to center 10.7 MHz marker (see Figure 5).
7. Reconnect the jumper lead to FM Test Point 301 (pin 3N on AM/FM IC, MF board). Disconnect the 8 ohm resistor across scope input connected previously.
8. Reduce generator sweep to zero (sweep off). Adjust FM METER ADJ. pot. R328 on AM/FM IC, MF board for front panel tuning meter reading of 4.3.
9. Connect a 100 kOhm resistor in series with the vertical input of the scope and connect to FM Test Point 405 (pin 40 on AM/FM IC, MF board). Use same AC scope sensitivity setting (100uV/mV).
10. Adjust generator level and sweep to observe detector "S" curve. Adjust bottom core of C306 first, then top core for maximum gain and symmetry (see Figure 6).
11. Connect DC VTVM to Test Point 405 (pin 4A on AM/FM IC, MF board). Use most sensitive meter setting.
12. Readjust top core of C306 for zero (0) reading (within ±50 mV) on DC VTVM.

FM FRONT END ALIGNMENT

NOTE: FM IF alignment should be performed before starting this procedure.

Set SELECTOR switch to FM, and AFC switch to OFF. Turn VOLUME control to minimum. Depress MUTING OFF, and MONO MODE pushbutton switches. Depress MANUAL pushbutton on TUNE-O-MATIC dial assembly.

1. Set TUNING dial to point to zero (0) calibration mark on the logging scale. If the dial pointer is not centered on the 0 at the extreme end of the knob rotation, repulsion the pointer assembly on the dial cord and cement the pointer in place to prevent slippage. Allow cement to thoroughly dry.

NOTE: Repositioning the dial pointer may require realignment of AM RF board for correct AM station calibration.

2. Connect an accurately calibrated DC VTVM to Test Point 98 (on TUNE-O-MATIC circuit board). DO NOT USE DC VTVM.
3. Rotate TUNING knob to central dial pointer on 88 kHz calibration mark on dial glass.
4. Using a small screwdriver, adjust R28, FM ALIGNMENT POT, for DC VTVM reading of exactly 4.3 volts Disconnect DC VTVM.
5. Connect an FM generator to the FM Antenna terminals. Use a 120ohm comparator connection with each generator setting for maximum gain and symmetry (see generator test outlet) (see Figure 7).
6. Connect a scope and an AC VTVM to either LEFT or RIGHT ICROR OUT jack.
7. Set FM generator frequency to receive frequency, 90 kHz, modulated with 400 Hz, 75 kHz deviation. Set generator output level to low as possible.
8. Align (oscillator coil) L604 first, then (mixer coil) LS603, and (RF coil) L502 for maximum reading on AC VTVM and tuning meter, and maximum waveform amplitude and symmetry.
9. Set generator frequency and TUNING dial to point to 108 MHz. Align (oscillator trimmer) C651 first, then (mixer trimmer) C512, and (RF trimmer) C652 for maximum reading on AC VTVM and tuning meter, and maximum waveform amplitude and symmetry.
10. Repeat alignment several times until accurate dial calibration and maximum gain are obtained. Keep generator output level as low as possible during all adjustments.
NOTE: If the FM IF and DETECTOR ALIGNMENT procedure (including calibration of tuning meter) has been completed, omit the following procedure. Use the following procedure to calibrate the tuning meter without IF alignment; i.e., after meter replacement.

Set SELECTOR switch to FM. TURN VOLUME control to minimum.

1. Connect an AM generator to the AM ANTenna terminals. Use a 120-ohm composition resistor in series with each lead from the generator (see Figure 7).
2. Set generator frequency to same frequency as receiver. Set generator RF output level to full output (approximately 10000 µV) with audio modulation.
3. Adjust generator frequency for peak tuning meter reading.
4. Adjust FM METER ADJ. pot. R2B8 (on AM/FM IF, MPX board) for tuning meter reading of 4.5.

MULTIPLEX ALIGNMENT

Two methods of aligning the multiplexer decoder are given. The preferred procedure uses a multiplexer generator with RF and IF outputs and with 1 kHz modulation, such as the FISHER 300 Multiplexer Generator. This is the better method of alignment because the front-end IF and IF stages are also checked through the use of this procedure. An alternate procedure for use with multiplexers not generating an RF output is also given.

PREFERRED ALIGNMENT PROCEDURE

NOTE: Check the alignment of the IF amplifier before aligning the multiplexer decoder. Poor IF alignment can make proper MPX adjustment impossible.

Set SELECTOR switch to FM. TURN VOLUME control to minimum. Depress Muting OFF pushbutton switch. Depress MUTE pushbutton on TUNE-O-MATIC dial assembly. (1) Connect RF output of multiplexer generator to the FM ANTenna terminals. Use a 120-ohm composition resistor in series with each lead that will come from the RF output (see Figure 7). Set MPX generator for external modulation with 19 kHz pilot carrier (approximately 110 µV deviation). Tune receiver to RF frequency of MPX generator.
2. Connect DC VTM to Test Point 402 (pin 4 on AM/FM IF, MPX board) for maximum reading on DC VTM (2.5 to 4 VDC).
3. Connect output of audio generator to earphone for 1 kHz to the external modulation input of MPX generator and to the external sync input of an oscilloscope. Adjust audio generator level for 1.2 volts peak-to-peak composite MPX input (110 µV pilot, 90% audio). See Figure 8. Module right channel only. Proceed with steps 10 through 15 of PREFERRED ALIGNMENT PROCEDURE.
4. Disconnect the jumper lead going to pin 4A (on AM/FM IF, MPX board) removed previously.

AM IF ALIGNMENT

Set SELECTOR switch to AM, and VOLUME control to minimum.

1. Connect 455 kHz sweep generator to pin 7A (on AM RF board). Use a 6.1 fu capacitor in series with the generator lead. Connect generator ground to pin 7C.

NOTE: AM IF alignment should be performed before starting this procedure.

SERVICES PROCEDURES

CORRECT FOR RIGHT CHANNEL MODULATION

WAVEFORM WILL BE INVERTED FOR LEFT CHANNEL MODULATION

INCORRECT

WAVE BASELINE

Figure 9. Waveform At Test Point 402.

Figure 10. Composite Input To Multiplex Decoder.

Figure 11. AM RF Alignment

NOTE: AM IF alignment should be performed before starting this procedure.

Set SELECTOR switch to AM, and VOLUME control to minimum.

1. Connect 455 kHz sweep generator to pin 7A (on AM RF board). Use a 6.1 fu capacitor in series with the generator lead. Connect generator ground to pin 7C.

NOTE: Repeating the dial pointer may require realignment of FM IF RF board for correct FM station calibration.

2. Open the AM ANTenna GRND link at the antenna terminals. Connect an AM generator to the AM ANTenna and GRND terminals.

3. Connect a scope and an AC VTM to either the LEFT or RIGHT RCDR OUT jack.

4. Set AM generator frequency and TUNING dial pointer to 600 kHz. Use 200 modulation with 400 Hz.

5. Adjust generator output to as low as possible.

6. Adjust generator output with 8 to 9 several times until accurate dial calibration and maximum gain are obtained. Keep the generator output as low as possible during all adjustments.

7. Repeat AM generator frequency and TUNING dial pointer to 1400 kHz. Adjust oscillator trimmer C703 (on AM RF board) for maximum reading on AC VTM and maximum waveform amplitude and symmetry.

8. Adjust oscillator several times until accurate dial calibration and maximum match are obtained. Keep the generator output as low as possible during all adjustments.

9. Repeat AM generator frequency and TUNING dial pointer to 600 kHz. Adjust the position of the small coil on the ferrite loop antenna for maximum reading on AC VTM and maximum waveform amplitude and symmetry.

10. Repeat several times until accurate dial calibration and maximum match are obtained. Keep the generator output as low as possible during all adjustments.

11. Test for peak alignment by setting AM generator and TUNING dial pointer to 600 kHz. Adjust generator RF output level for tuning meter reading of 3. Generator RF output level should read between 500 µV and 1600 µV.

12. Set generator and TUNING dial pointer to 1400 kHz. Adjust generator RF output level for tuning meter reading of 3. Generator RF output level should read between 150-500 µV.