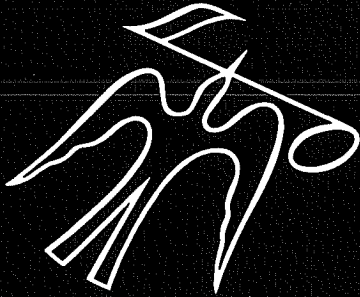


SERVICE MANUAL

PRICE \$1.00

125B

SERIAL NUMBERS
FROM 50001



The Fisher[®] 125B



WORLD LEADER IN HIGH QUALITY STEREO

TEST EQUIPMENT AND SERVICE TIPS

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

Line Voltage Autotransformer or Voltage Regulator	10.7 MHz Sweep Generator
DC Vacuum Tube Volt ohmmeter	Multiplex Generator (preferably with RF output)
Accurately Calibrated AC Vacuum Tube Voltmeter	455 kHz Sweep Generator
Oscilloscope ((Flat to 100 kHz Minimum)	Ferrite Test Loop Stick
Low-Distortion Audio (Sine Wave) Generator	2 – Full Range Speakers for Listening Tests
Intermodulation Distortion Analyzer	Stereo Source – Turntable, Tape Recorder, etc.
Harmonic Distortion Analyzer	Soldering Iron with Small Tip, Fully Insulated from AC Line
2 – Load resistors, 8-Ohms, 100 Watt (Minimum Rating)	Suction Desoldering Tool
AM/FM Signal Generator	

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 in-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-coupled 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 junction(s) 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 installing replacement 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, mica insulator, 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 insulator, cause a short, and destroy the transistor.

Silicone grease must be used between the transistor and the mica insulator, and between the mica 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, lugs 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 $\pm 10\%$. DC voltages are measured to ground with a VTVM, 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.

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REMOVING MOTORBOARD

To gain access to the chassis for servicing, remove the motorboard using the following procedure:

- (1) Unplug AC power cord.
- (2) Unscrew the two large shipping screws (near the left-rear and right-front corners of the turntable baseplate) fully out to lock the changer to the motorboard.
- (3) Remove the four screws in the motorboard (two on each side) holding the board to the wood side-panels. Lift the motorboard at the rear, and unplug audio cables and power plug from underside of changer.
- (4) Remove the motorboard from top of chassis.
- (5) To reinstall the motorboard, reverse procedure. Be sure to reconnect the audio cable with the red plug to the changer phono jack labeled Right.

REMOVING DRESS PANEL

- (1) Unplug AC power cord.
- (2) Gently pull the VOLUME, BASS, TREBLE, SELECTOR, and TUNING knobs from the control shafts. Remove the hex nuts from the shafts and remove panel by pulling forward over the shafts.
- (3) Reverse procedure for reassembly.

REPLACING STEREOBEACON AND METER LAMPS

NOTE: The compartmented lamp assembly (FR No. LM21608-2), mounted on the rear of the meter, contains the meter lamp and the STEREO BEACON lamp, and must be replaced as a complete unit.

- (1) Unplug AC power cord.
- (2) Remove motorboard. Refer to REMOVING MOTORBOARD procedure.
- (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 unsnap the lamp compartment from the top rear of the meter.
- (5) Center the replacement lamp assembly between the plastic flanges and press firmly into place.

REMOVING DIAL GLASS

- (1) Remove dress panel. Refer to REMOVING DRESS PANEL procedure.
- (2) Carefully remove the foam strips at the ends of the dial glass. Strips may be reused with the replacement glass.
- (3) Slide the retaining clips from the flanges by gently twisting a flat-blade screwdriver in each slot.

REPLACING DIAL LAMPS

NOTE: Dial lamps are replaceable only as molded assemblies (FR No. AS21410-3).

- (1) Unplug AC power cord.
- (2) Remove motorboard. Refer to REMOVING MOTORBOARD procedure.
- (3) Remove dress panel. Refer to REMOVING DRESS PANEL procedure.
- (4) Squeeze the sides of the assembly together at the back and press through the panel.

REPLACING METER

- (1) Remove motorboard. Refer to REMOVING MOTORBOARD procedure.
 - (2) Gently unsnap the lamp compartment from the top of the meter. It is unnecessary to remove the leads.
 - (3) Gently pry the meter off the panel, and scrape off the residual adhesive.
 - (4) Unsolder the two leads from the terminals on the rear of the meter and label each wire with its associated pin location for easy replacement later.
- WARNING:** Damage to the meter may result from excessive heating of the meter terminals. Use a pair of pliers (as a heat sink) to hold each terminal when soldering or unsoldering leads.
- (5) Peel the backing from one side of the replacement adhesive mounting pad (FR No. E51A219), and affix it to the replacement meter (FR No. MM21608-1). Peel the backing from the remaining side of the adhesive pad, align the meter over the cutout, and firmly press the meter to the back of the panel.
 - (6) Center the lamp compartment between the plastic flanges and press firmly into place.

DIAL STRINGING

- (1) Unplug AC power cord.
- (2) Remove motorboard. Refer to REMOVING MOTORBOARD procedure.
- (3) Remove dress panel. Refer to REMOVING DRESS PANEL procedure.
- (4) Remove dial pointer from old dial cord.
- (5) Prop unit on left side. Remove right wood side-panel by removing two slotted screws near feet on right side.
- (6) Rotate tuning capacitor fully CW. Loosen screws in the drum and remove old dial cord.
- (7) Tie cord to spring. Fasten spring to START screw.
- (8) Run cord through slot in rim and wrap 1/2 turn CW around drum. Guide cord around pulley "A", and wrap 2 turns (CCW viewed from back) around tuning shaft.
- (9) Guide cord across front, around pulley "B", back and around pulley "C". Keep cord taut.
- (10) Rotate gang CCW, allowing cord to wind on drum.
- (11) Run cord over top of drum, around other side, into the rim slot. Tie a half-knot around FINISH screw.
- (12) Pull cord taut and tighten screw.
- (13) Rotate gang fully CW and CCW to distribute tensioning along cord. Repeat (12) and (13) to tension spring.
- (14) Place pointer on rail and slip cord over and under tabs.
- (15) Rotate gang fully CCW. Slide pointer to (0) mark on logging scale while holding tuning shaft fully CCW. Cement pointer to cord. Check dial calibration.

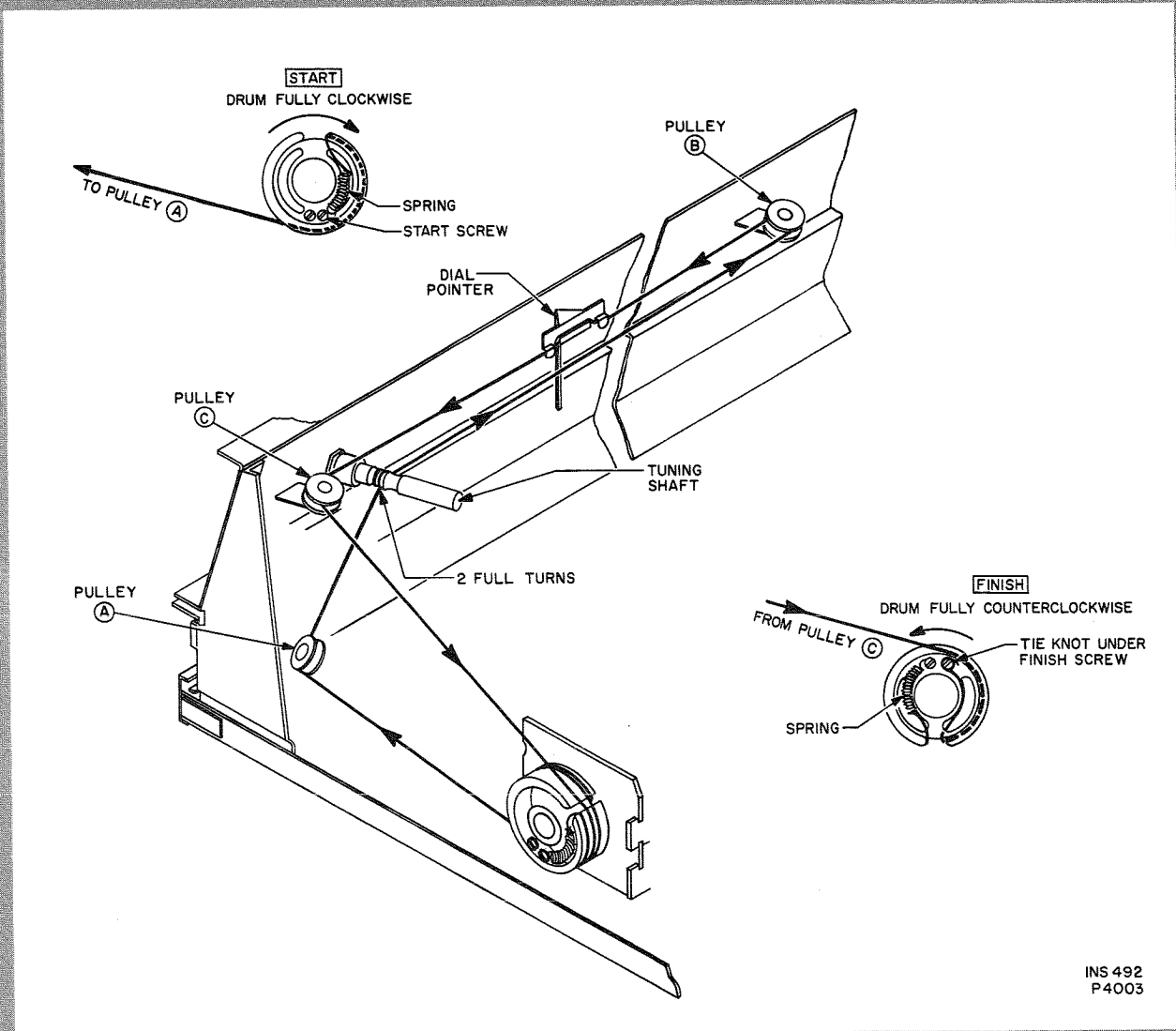
HARMONIC DISTORTION TEST

CAUTION:

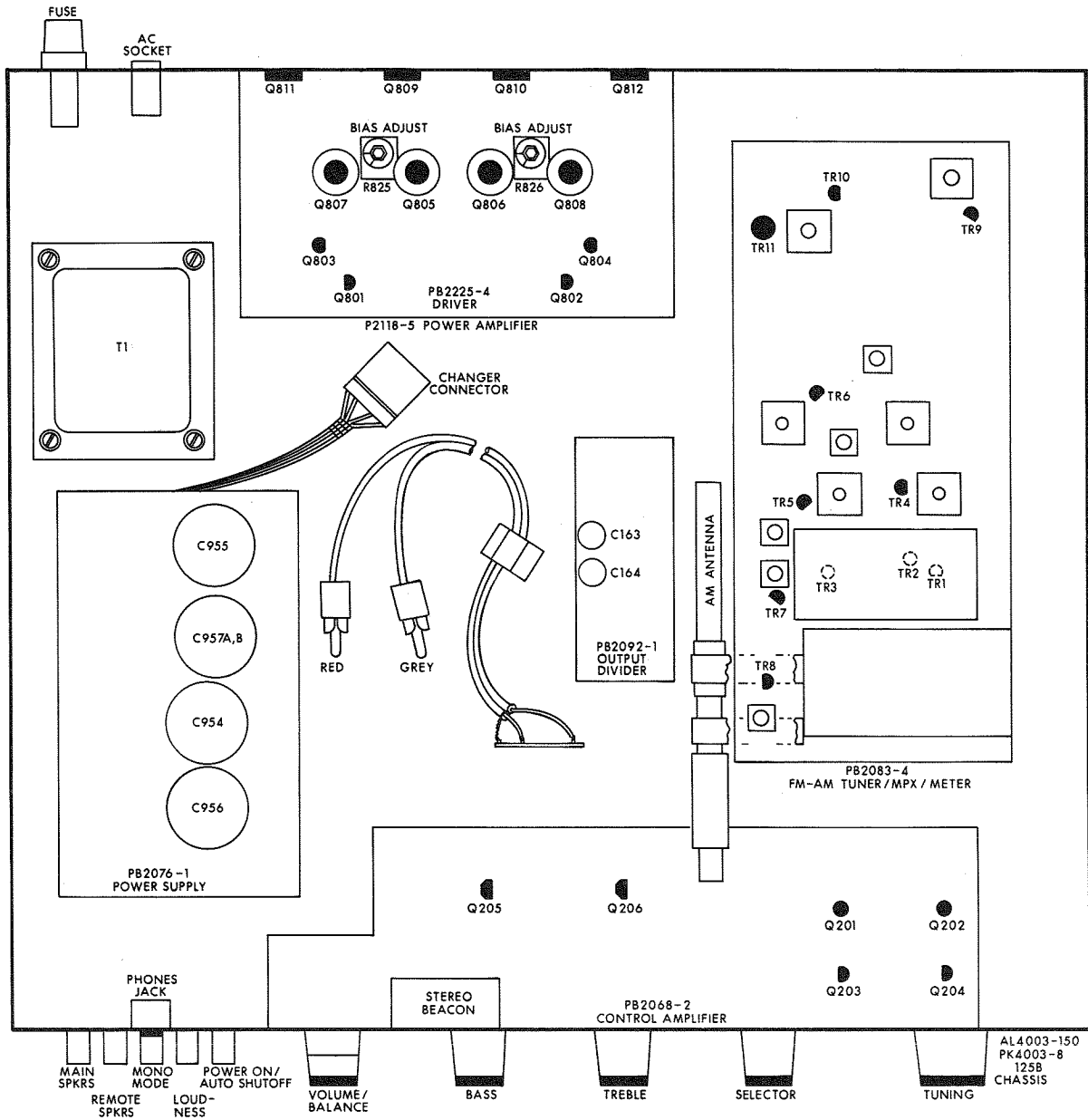
- (A) Measure the power of one channel at a time.
- (B) Limit measurements to 10 minutes.
- (C) Use a load resistor with a minimum rating of 50 watts.

Set BASS and TREBLE controls to NORMAL. Set SELECTOR switch to AUX. Depress MAIN SPKRS switch. Unplug AC power cord.

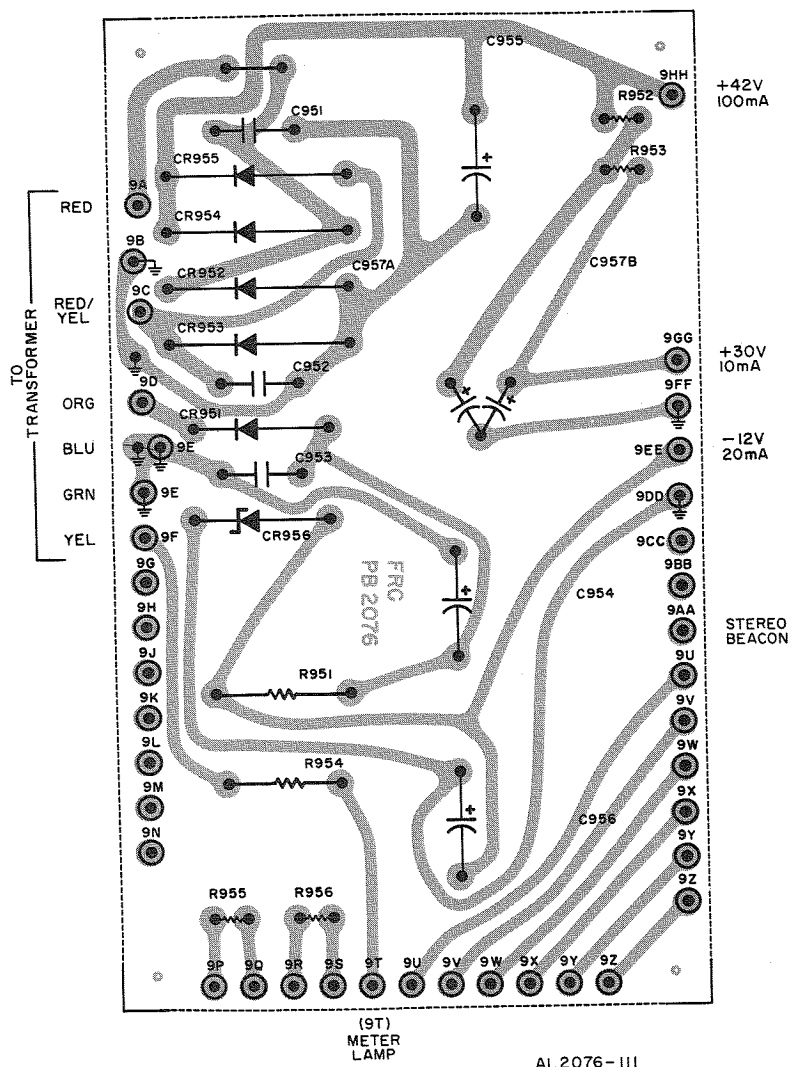
- (1) Connect a low-distortion sine-wave generator to the LEFT AUX IN jack. Set generator frequency to 1,000 Hz, and output level to minimum.
- (2) Connect an 8-ohm load resistor between the LEFT SPKRS MAIN and COMMON terminals. In parallel with the load resistor, connect the input leads of an HD analyzer and the input leads of an accurately calibrated AC VTVM.
- (3) Connect AC power cord and rotate VOLUME control to maximum.
- (4) Increase generator level for 14 watts output (10.6V RMS across 8-ohm load). HD meter should read 0.5% or less.
- (5) Repeat preceding steps for right channel.



CHASSIS LAYOUT



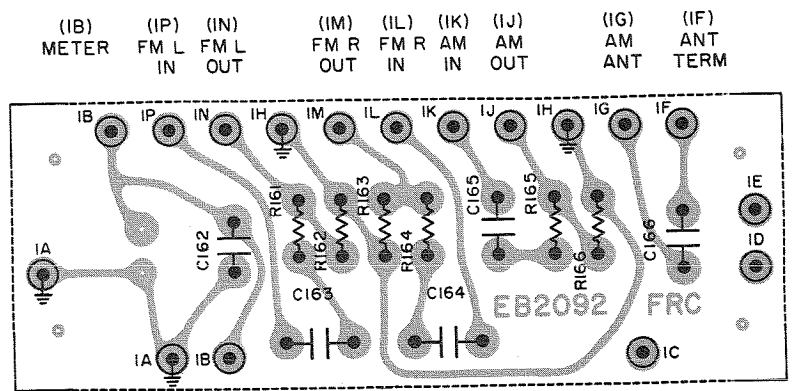
POWER SUPPLY 2076-1



AL2076-III

SCHEMATIC SHOWN ON MAIN CHASSIS DIAGRAM

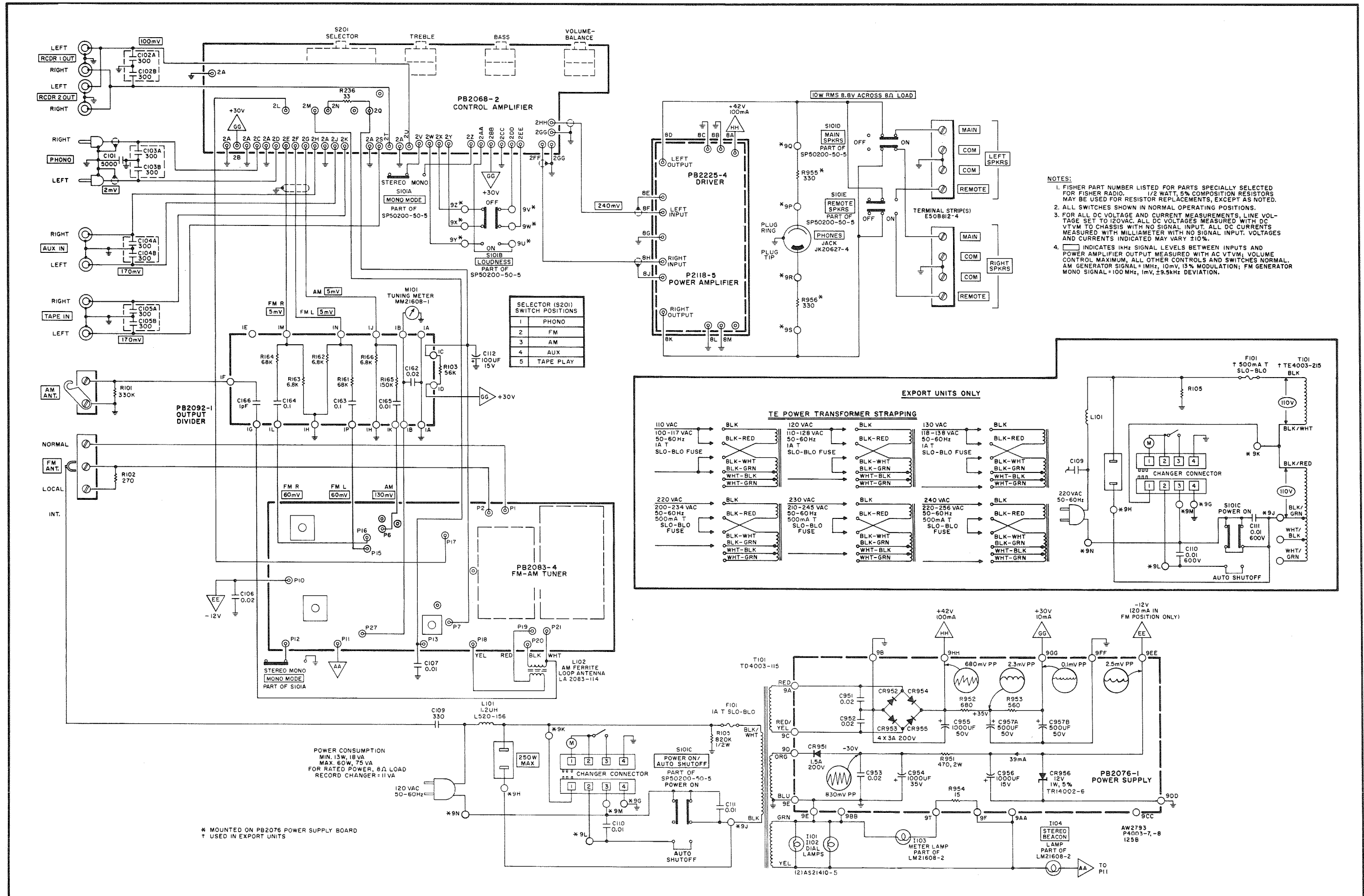
OUTPUT DIVIDER 2092-1

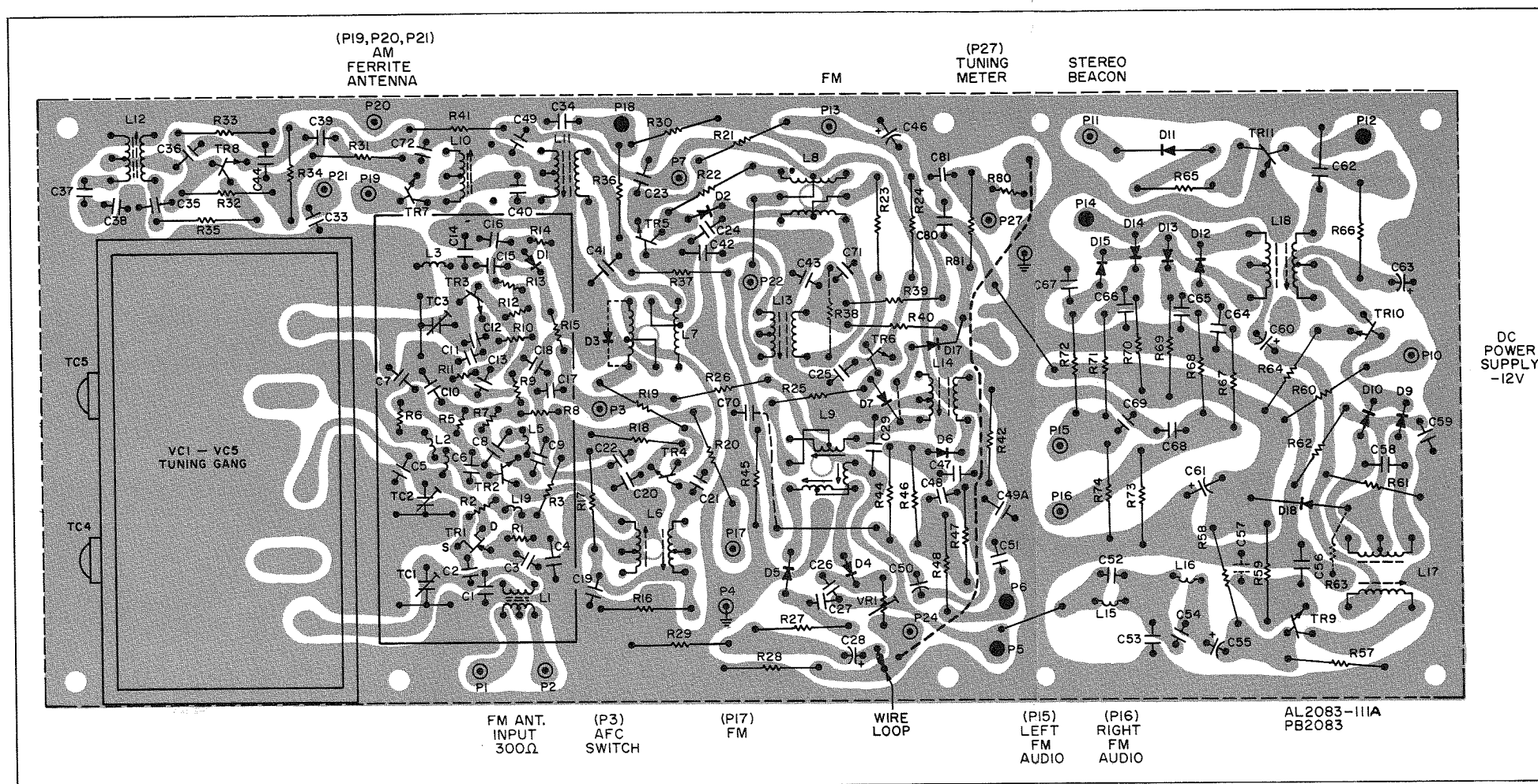


(IB) METER DRIVE

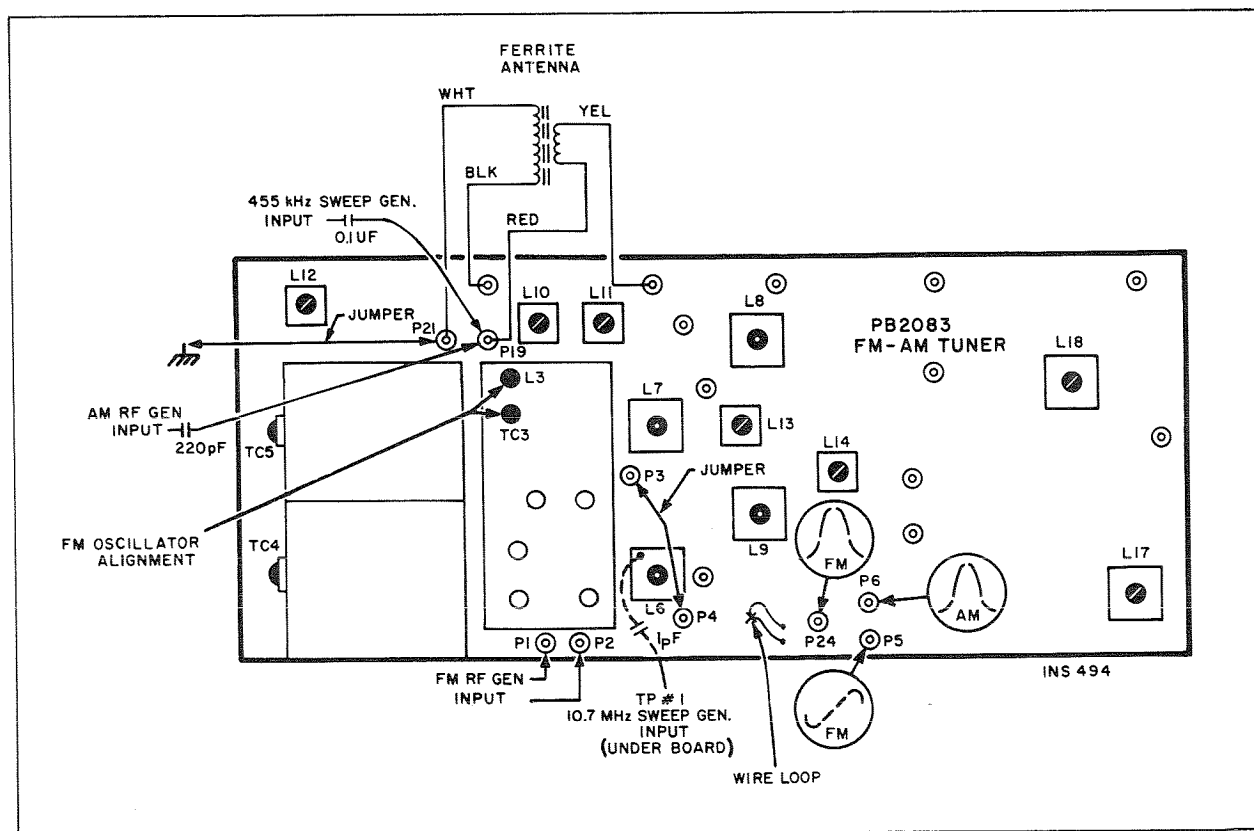
AL2092-III

SCHEMATIC SHOWN ON MAIN CHASSIS DIAGRAM





- (6) Set generator frequency and dial pointer accurately to 90MHz. Modulate generator with 400Hz, ± 75 kHz deviation. Bend oscillator coil L3 for maximum amplitude at P5.
- (7) Set generator frequency and dial pointer accurately to 106MHz. Adjust oscillator trimmer TC3 for maximum amplitude at P5.
- (8) Repeat steps (6) and (7) for maximum sensitivity and accurate dial calibration.
- (9) Reconnect DC VTVM to P5. Set generator level to 1 mV. Tune receiver to generator frequency (106MHz) for 0 VDC at P5.
- (10) Connect AC VTVM and scope to RIGHT RCDR OUT jack. Connect MPX generator composite output to FM generator EXTERNAL MODULATION input. Modulate left and right channels with 400Hz, (± 75 kHz deviation) and 19kHz pilot (± 7.5 kHz deviation).
- (11) Adjust top cores of L17 and L18 for maximum audio. Note audio level.
- (12) Modulate left channel only. AC VTVM should read at least 20 dB below level noted in step (11).
- (13) Reconnect AC VTVM and scope to LEFT RCDR OUT jack. Note audio level.
- (14) Modulate right channel only. AC VTVM should read at least 20 dB below level noted in step (13).
- (15) Disconnect MPX generator. Set generator output to 20 mV, and modulate with 400Hz, ± 75 kHz deviation.
- (16) Detune generator frequency for +0.5 VDC at P5. Disconnect jumper between P3 and P4 to turn AFC on. DC VTVM should read between +0.5 and 0 VDC.
- (17) Reconnect jumper between P3 and P4. Detune generator frequency for -0.5 VDC at P5. Remove jumper. Meter should read between -0.5 and 0 VDC. Disconnect test equipment.



Turn TUNING knob fully CCW. If pointer is not centered on (0), reposition and cement pointer. Except as noted, maintain generator level as low as possible during alignment.

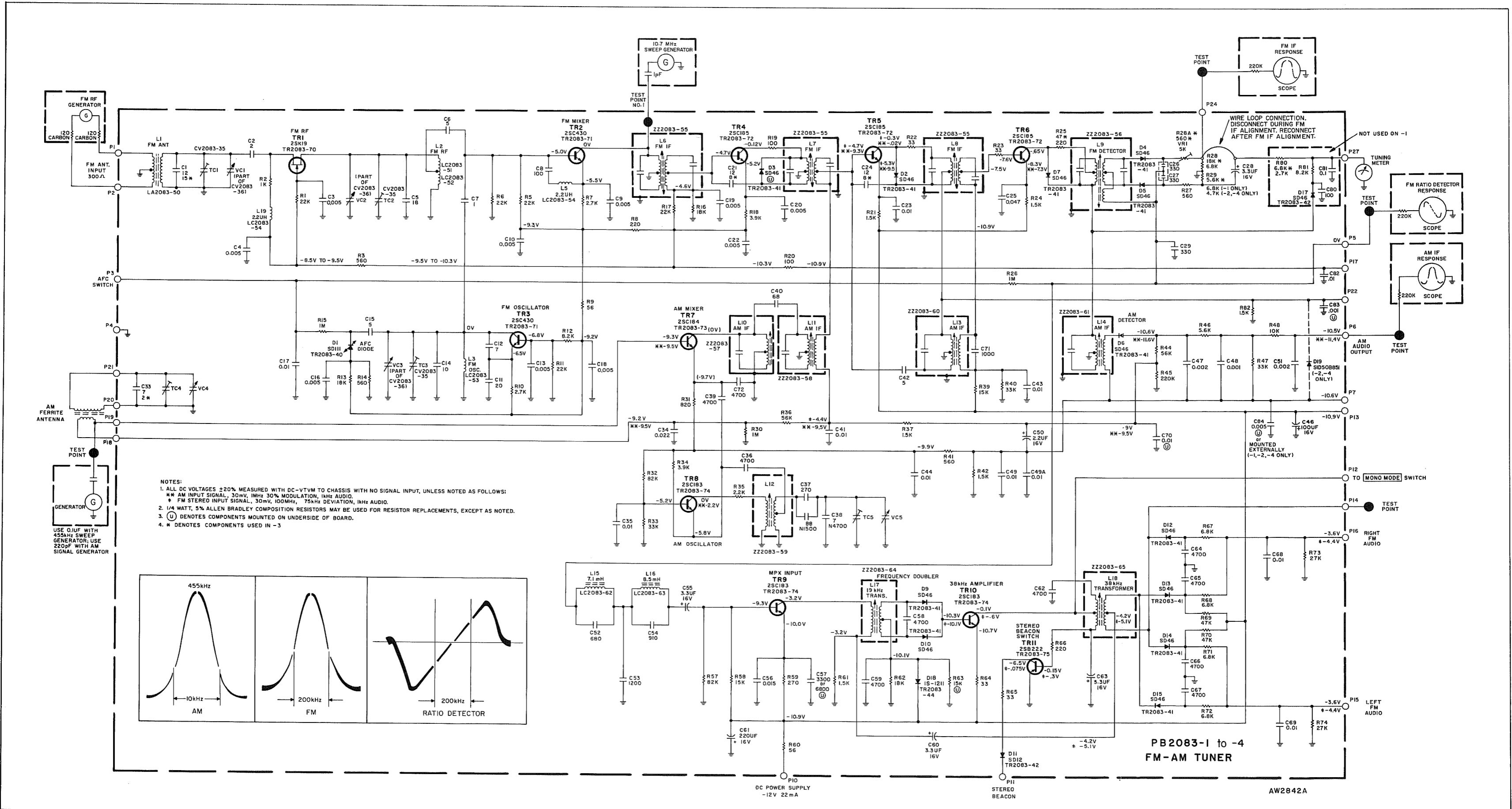
FM ALIGNMENT

- (1) Set SELECTOR switch to FM. Turn VOLUME control to minimum. Connect jumper between P3 and P4 to defeat AFC.
- (2) Connect 10.7MHz sweep generator through 1pF to Test Point 1. Connect scope through 220k to P24. Cut wire loop at P24.
- (3) Adjust top and bottom cores of L8, L7, and L6, and bottom core of L9 for maximum gain and symmetry.
- (4) Reconnect wire loop at P24. Reconnect scope to P5. Adjust top and bottom cores of L9 for maximum linear amplitude.
- (5) Connect DC VTVM to P5. Readjust top core of L9 for 0 VDC. Disconnect sweep generator and DC VTVM. Connect FM RF generator through 120-ohm carbon resistors to P1 and P2.

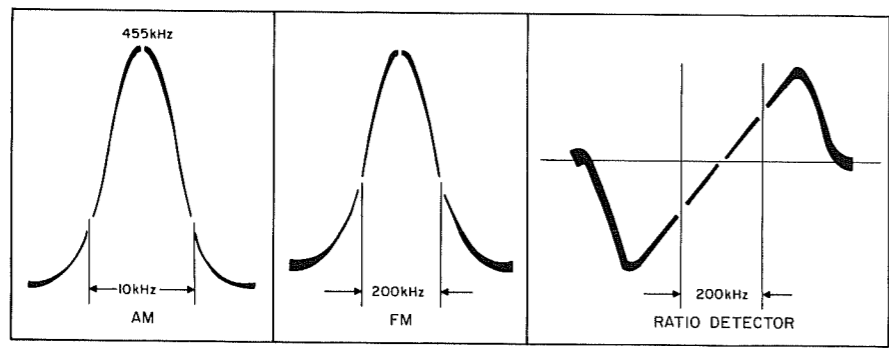
AM ALIGNMENT

- (1) Set SELECTOR switch to AM. Turn VOLUME control to minimum.
- (2) Connect 455kHz sweep generator through 0.1uF to P19. Connect scope through 220k to P6.
- (3) Adjust cores of L14, L13, L11 and L10 for maximum gain and symmetry.
- (4) Disconnect sweep generator. Connect AM signal generator through 220pF to P19. Connect scope and AC VTVM to RIGHT RCDR OUT jack.
- (5) Set generator frequency and dial pointer accurately to 600kHz. Modulate generator with 400Hz, 30% modulation. Connect a short jumper between P21 and chassis. Adjust oscillator coil L12 for maximum amplitude.
- (6) Set generator frequency and dial pointer accurately to 1400kHz. Adjust oscillator trimmer TC5 for maximum amplitude.
- (7) Repeat steps (5) and (6) for accurate dial calibration and maximum gain.
- (8) Disconnect jumper connection between P21 and chassis. Reconnect AM signal generator to AM ANTENNA terminal. Tune receiver to generator frequency at 600kHz. Modulate generator with 400Hz, 30% modulation.
- (9) Melt the wax holding the coil to the ferrite antenna. Shift the coil for maximum audio indication. To secure coil in position, remelt wax.
- (10) Tune receiver to generator frequency at 1400kHz. Adjust antenna trimmer TC4 for maximum audio.

FM/AM TUNER 2083-4

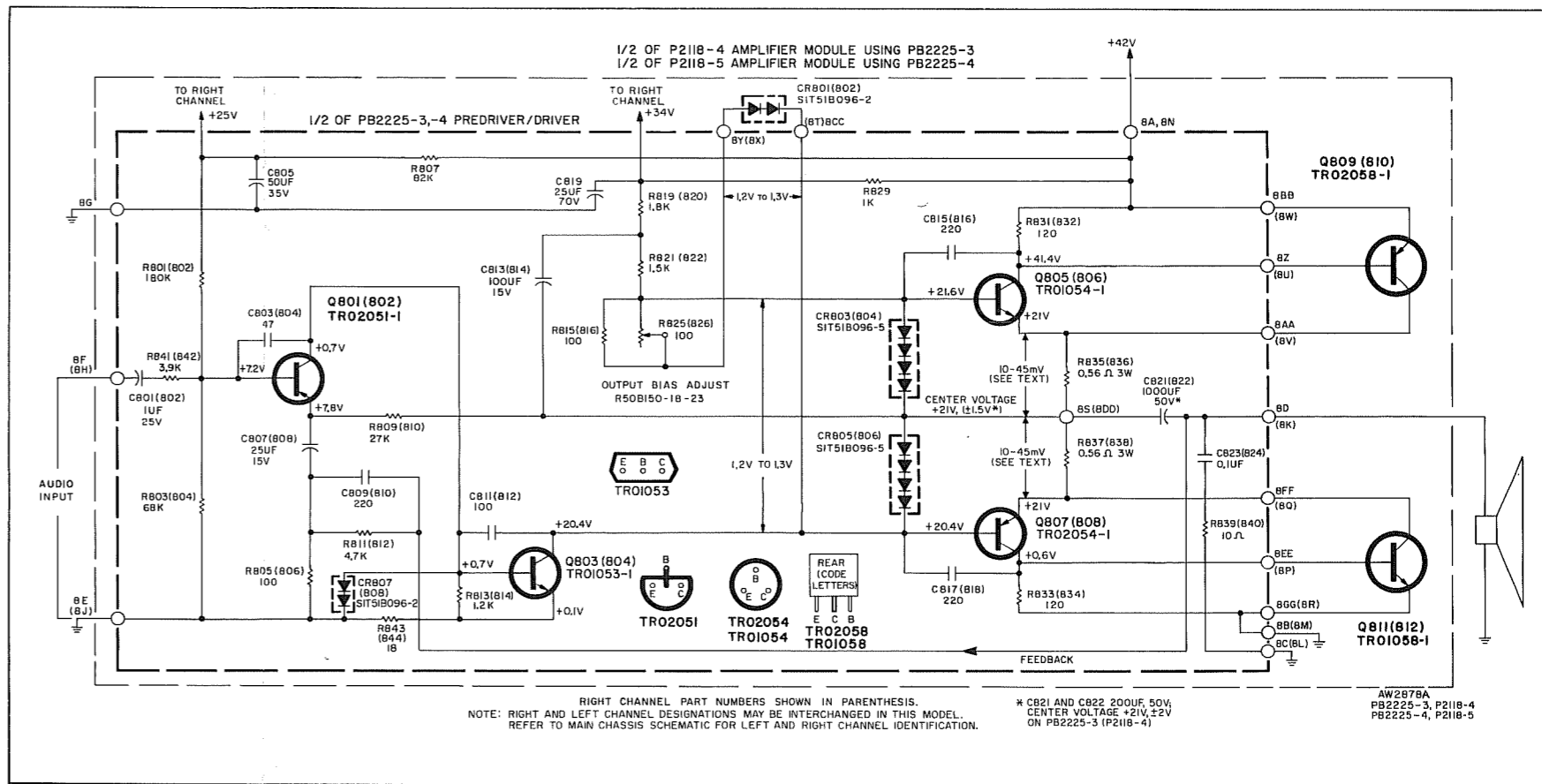
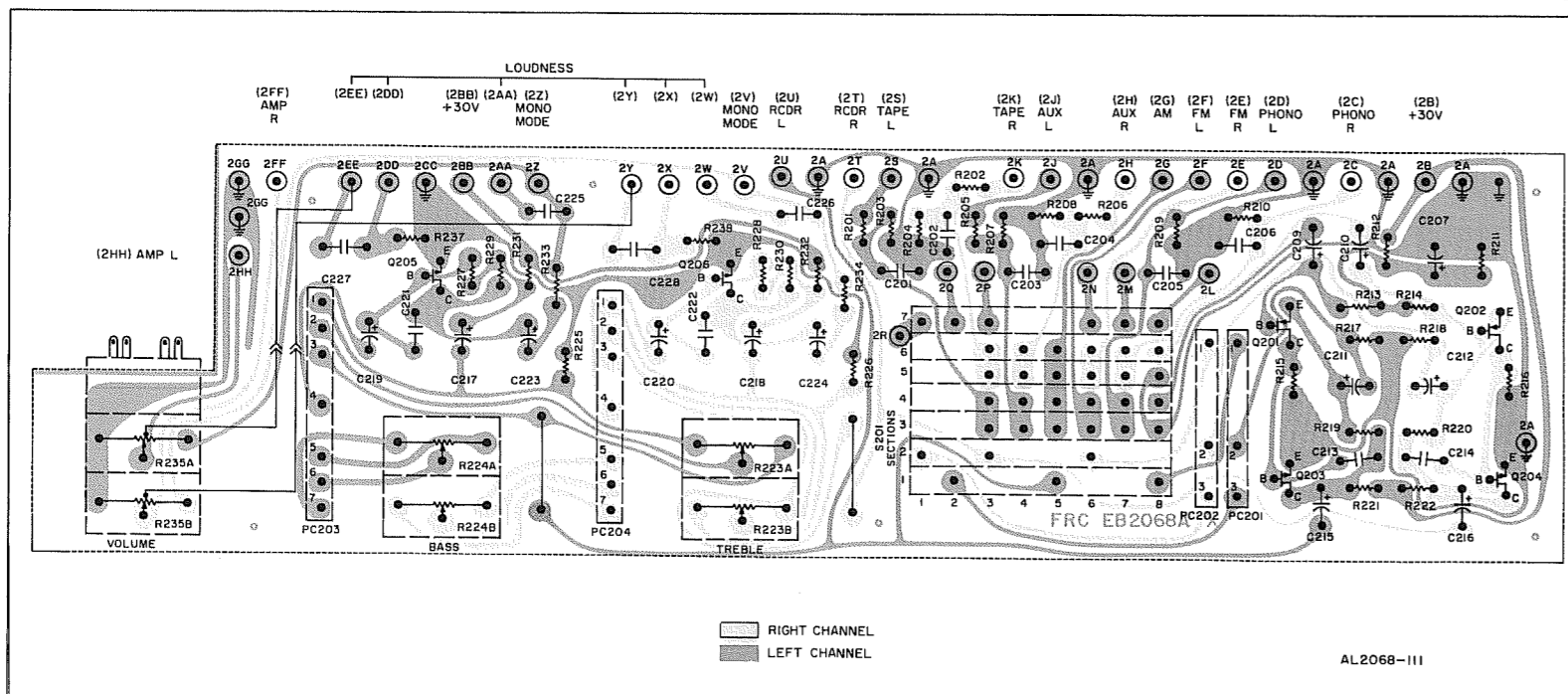
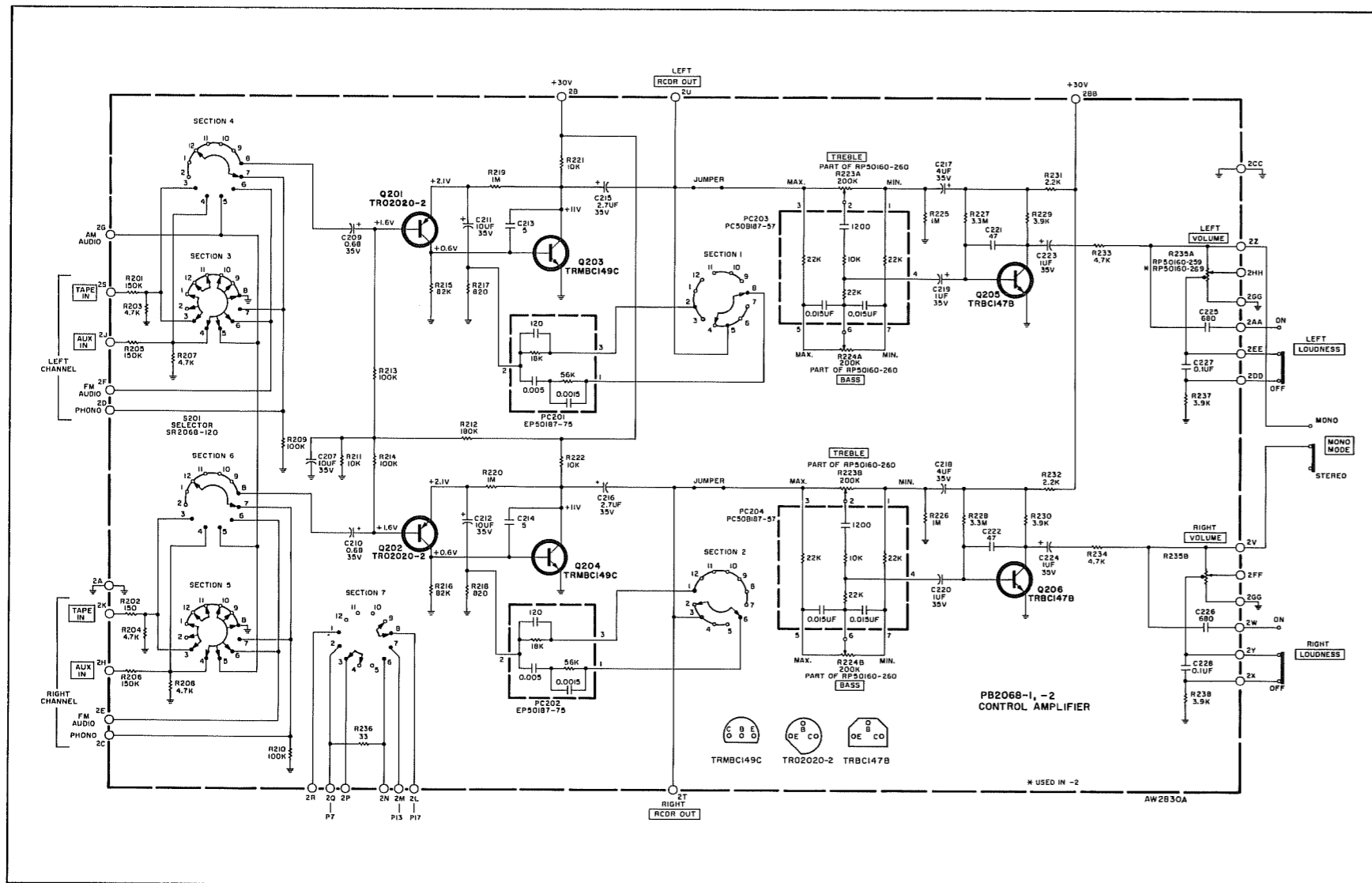


- NOTES:
1. ALL DC VOLTAGES $\pm 20\%$ MEASURED WITH DC-VTVM TO CHASSIS WITH NO SIGNAL INPUT, UNLESS NOTED AS FOLLOWS:
 * AM INPUT SIGNAL, 30mV, 1MHz 30% MODULATION, 1kHz AUDIO.
 * FM STEREO INPUT SIGNAL, 30mV, 100MHz, 75kHz DEVIATION, 1kHz AUDIO.
 2. 1/4 WATT, 5% ALLEN BRADLEY COMPOSITION RESISTORS MAY BE USED FOR RESISTOR REPLACEMENTS, EXCEPT AS NOTED.
 3. (U) DENOTES COMPONENTS MOUNTED ON UNDERSIDE OF BOARD.
 4. * DENOTES COMPONENTS USED IN -3



PB2083-1 to -4
FM-AM TUNER

AW2842A

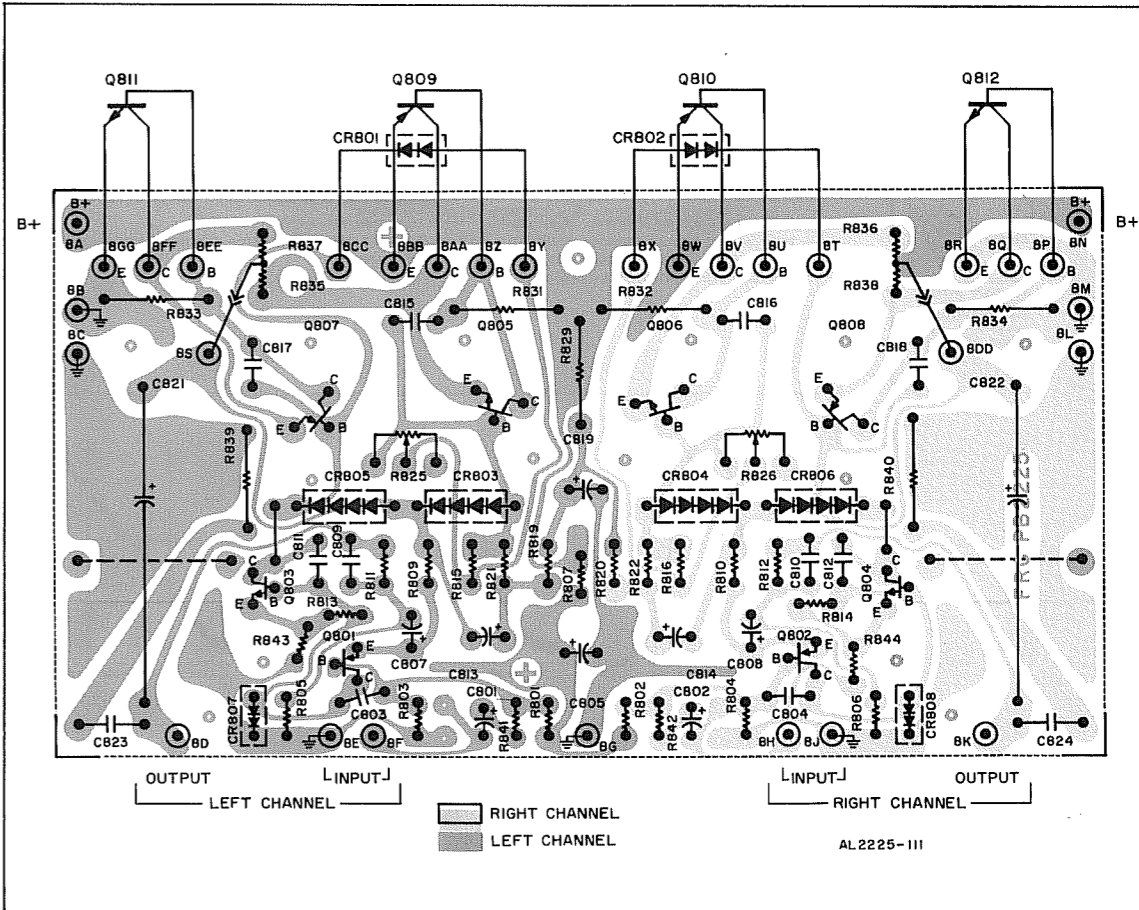


CENTER VOLTAGE TEST

- Turn VOLUME control to minimum. Depress MAIN SPKRS switch.
- Connect an 8-ohm load resistor across the LEFT SPKRS MAIN and COMMON terminals, and a second 8-ohm load resistor across the RIGHT SPKRS MAIN and COMMON terminals.
 - Temporarily connect two 10K ± 1% resistors in series between pins 9HH and 9B (on Power Supply board). Connect the common lead of a DC VTVM to the junction of the resistors.
 - Connect the probe of the DC VTVM to pin 8S (on Power Amplifier Module). Meter should read 0 VDC (± 1.5 volts).
 - Reconnect the probe of the meter to pin 8DD. Meter should read 0 VDC (± 1.5 volts).
 - Disconnect the two 10K resistors.

IDLING CURRENT ADJUSTMENT

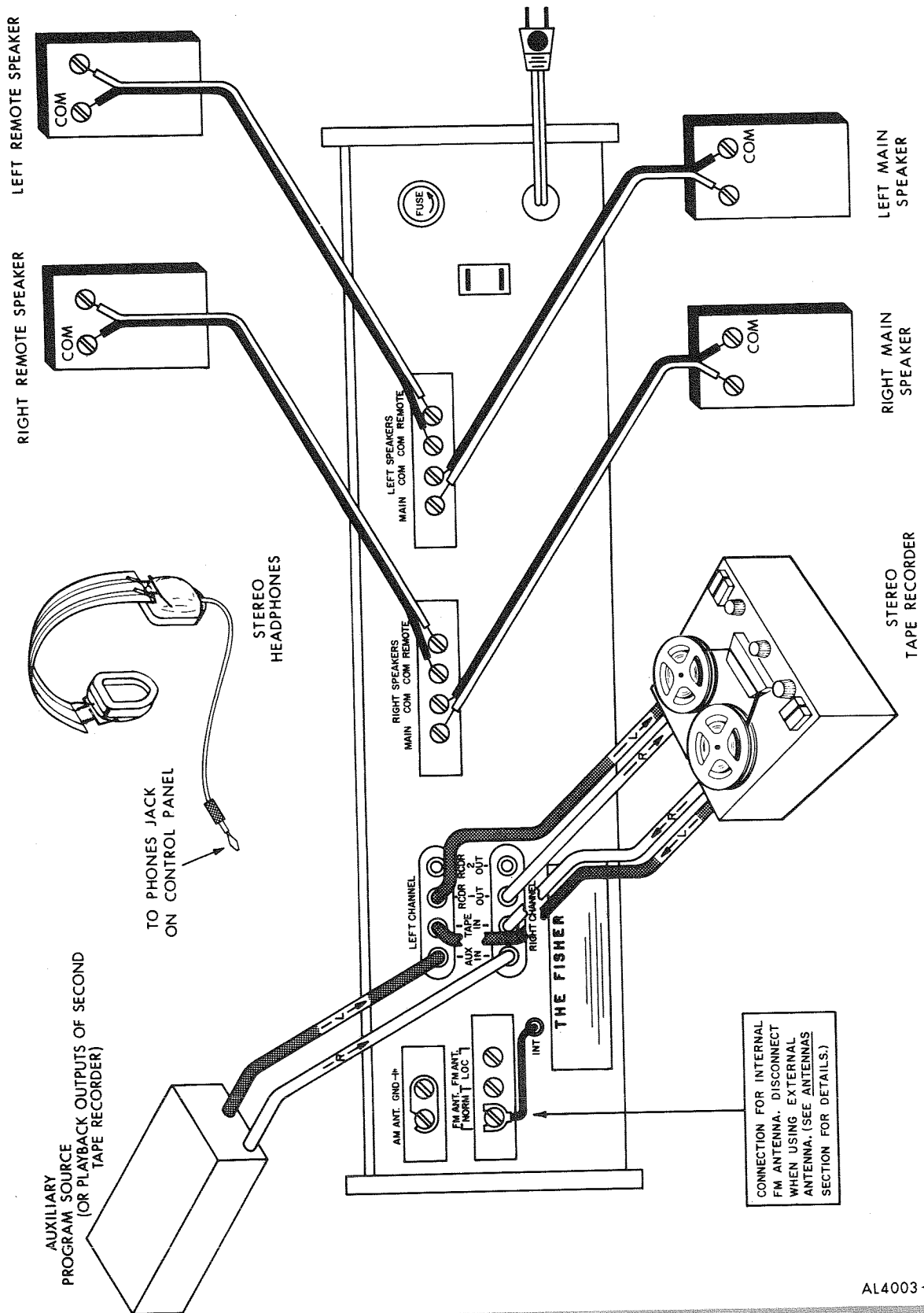
- Turn unit on, and warm up thoroughly (approximately 10 minutes). Turn VOLUME control to minimum.
- Connect the common lead of a DC VTVM to pin 8S (on Power Amplifier Module). Connect the probe of the meter to pin 8AA. **BE CAREFUL TO AVOID SHORTING ADJACENT PINS.** Meter should read between 10mV and 45mV.
 - If necessary, reset BIAS ADJUST pot. R825 (on Power Amplifier Module). Optimum amplifier performance will be achieved with 15mV setting.
 - Reconnect the common lead of the meter to pin 8DD. Reconnect meter probe to pin 8V. **BE CAREFUL TO AVOID SHORTING ADJACENT PINS.** Meter should read between 10mV and 45mV.
 - If necessary, reset BIAS ADJUST pot. R826.



SERVICE NOTES

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COMPONENT CONNECTIONS



AL4003-138

