T-50 AMPLIFIER OUTPUT BALANCING PROCEDURE

The procedure below must be followed whenever output transistors are replaced. The purpose is to adjust slider resistor R 16 so that the collector current for transistor TR 8 is between 25 and 30 milliamps and to adjust slider resistor R 32 so that there is zero DC voltage on the output. Proceed as follows:

1. Have amplifier unplugged and with no input signal. No load is necessary on the output.
2. Disconnect wire from the collector (center pin) of transistor TR 8 (closest to output terminals).
3. Connect a meter, set for 100 milliamps scale, in series with the collector -- positive lead to collector pin and negative lead to collector wire.
4. Plug in the amplifier and adjust R 16 (close to output terminals) so that the meter reads between 25 and 30 milliamps.
5. Unplug the amplifier and remove the meter leads. Temporarily re-attach the collector wire with a clip lead.
6. Set the meter for low DC volts scale and connect to the output terminals -- positive lead on 16 ohm tap and negative lead on common.
7. Plug in the amplifier and adjust R 32 so that the meter reads zero volts. This voltage may change polarity and go off scale in a negative direction. Raising the current by changing R 16 will also lower the DC on the output and may swing it negative. Conversely, lowering the current will swing the DC in a positive direction. Since a change in one circuit causes a slight change in the other circuit, it may be necessary to repeat the above procedure several times to achieve a proper setting. This is why the collector wire is temporarily re-attached with a clip lead. When you are satisfied that both readings are proper, resolder the collector wire.

Note: The above process is greatly simplified when two meters are available. Both can remain attached -- one for current and one for DC volts -- while the adjustments are made.

If the amplifier is equipped with bias potentiometers, as shown in Figure B, they must be replaced with 5 ohm 10 watt slider resistors. The potentiometers do not maintain good contact thereby causing intermittent or continuous hum, distortion, loss of volume and a "pop" when switching antiphonal stops. Replace the potentiometers as follows:

1. Remove wires from the Bias Potentiometers (R 16 and R 32).
2. If the amplifier has 2 ohm resistors in series with the potentiometers (on a two place terminal strip connecting wire from pot to .47 ohm resistor), this resistor must either be removed, and the wire moved over, or short the resistor with a wire.
3. Drill a 3/16" hole in each side of the chassis for the 2" 8-32 mounting bolts and mount the sliders as shown in the Figure A.
4. With the sliders in place, wire them the same as the potentiometers were wired, making sure to jump one end of the resistor to the sliding arm.
5. Balance output as described above.

Additional Notes:

Two precautions should be observed before replacing the output transistors. The transistor socket connectors should be pinched close together to assure good contact since some transistors have smaller diameter pins. A silicon grease should be applied to both sides of the mica wafer to assure good heat transfer to the heat sink.

When the slider resistors are properly adjusted, the physical position of both slider rings should be similar. If they are drastically otherwise, it indicates the possibility of unmatched output transistors or an open thermistor.

Defective bias potentiometers (R 16 and R 32) on early transistor amplifiers can cause defective output transistors and/or defective thermistors. Therefore, when replacing bias potentiometers with sliders it is wise to check for other related malfunctions.

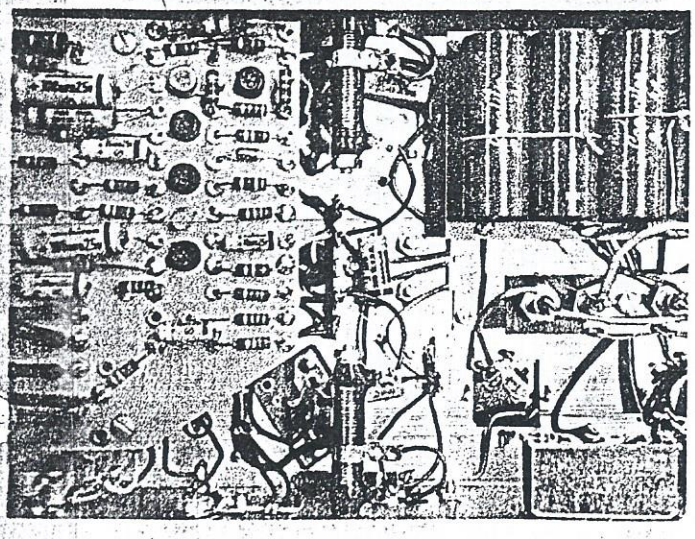

FIGURE A

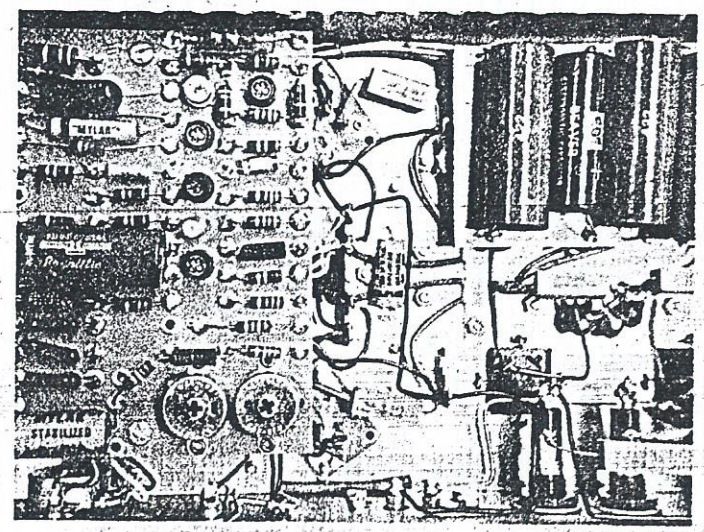

FIGURE B