9446A Anniversary Series Power Amplifier

SERVICE INSTRUCTIONS

*** * * CAUTION * * ***

NO USER SERVICEABLE PARTS INSIDE. EXTREMELY HAZARDOUS VOLTAGES AND CURRENTS MAY BE ENCOUNTERED WITHIN THE CHASSIS. THE SERVICING INFORMATION CONTAINED WITHIN THIS DOCUMENT IS ONLY FOR USE BY ALTEC LANSING'S AUTHORIZED WARRANTY REPAIR STATIONS AND QUALIFIED SERVICE PERSONNEL. TO AVOID ELECTRIC SHOCK, DO NO PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN THE OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO. OTHERWISE, REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL.

9 SERVICE INFORMATION

WARNING: *No user servicable parts inside. Extremely hazardous voltages and currents may be encountered within the chassis. The servicing information contained within this document is only for use by ALTEC LANSING's authorized warranty repair stations and qualified service personnel. To avoid electric shock DO NOT perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Otherwise, refer all servicing to qualified service personnel.*

NOTICE: *Modifications to ALTEC LANSING products are not recommended. Such modifications shall be at the sole expense of the person(s) or company responsible, and any damage resulting therefrom shall not be covered under warranty or otherwise.*

9.1 Trimpot Adjustments

Figure 12 is a component layout of the main circuit board for one channel (both channels use the same board). The schematic of the amplifier is shown in Figure 13. Several trimpots are provided for adjustment. Resistor R26 adjusts the bias. Resistor R23 sets the negative current limit and resistor R24 sets the positive current limit. These two resistors also affect the symmetry of clipping. The LF Cancel trimpot, R39, minimizes distortion caused by ripple on the power supply lines.

9.2 Equipment Needed

To precisely adjust the trimpots, you must have the following equipment:

- 1 — Oscilloscope (Tektronix 2445 or equivalent)
- 1 — Distortion analyzer (Sound Technology 1700B or equivalent)
- 1 — 15 amp ac ammeter
- 1 — 2 Ω load rated at 1000 watts or one 4 Ω load rated at 750 watts
- 1 — 8 Ω load rated at 500 watts
- 1 — Small non-conducting flat-blade screwdriver or set of plastic TV alignment tools
- 1 — 12 in jumper cable with alligator clips on each end
- Miscellaneous handtools (to remove the top cover)

NOTE: *If you need to verify the amplifier's performance against the rated specifications, you must be able to maintain the ac line voltage constant at 120 V ac (or 240 V ac if wired according to Figure 2b). Therefore, we recommend a suitably rated variac (50 ampere rating at 120 V ac).*

9.3 Adjusting R39, the LF Cancel Trimpot

Shown in Figure 6 is a distortion waveform resulting from an improperly adjusted R39. Notice the near sawtooth appearance of the waveform. The trace in Figure 7 shows the resulting waveform after R39 is properly adjusted. Notice the reduction in ripple.

To adjust R39 for minimum ripple, follow the procedures below:

1. Turn power off and disconnect the unit from its power source. Make sure the unit is in the Dual mode with 8 Ω loads connected to each channel.

2. Remove the eleven screws securing the top cover. Refer to Figure 1 for the screw locations.

3. Connect the sinewave generator output of the analyzer to the input of Channel 1. Rotate the input level control of Channel 1 to its full clockwise position. Rotate the input level control of Channel 2 to its full counter-clockwise position.

4. Apply power to the amplifier and adjust the sinewave generator for a 60 Hz, 0 dBu (0.775 V rms) output level. For this adjustment, it is not necessary to maintain a constant 120 V ac line input voltage under load.

5. Find R39 on the component layout in Figure 12. With a non-conducting or plastic-shaft screwdriver, adjust R39 for least amount of ripple as shown in Figure 7.

6. Repeat steps 3 through 5 for Channel 2.

7. Turn off the generator's output signal. If you have concluded with the test and alignment procedures, disconnect the amplifier from its power source and re-install the top cover with the eleven screws previously removed.

9.4 Adjusting R26, the BIAS Trimpot

Shown in Figure 8 is a distortion waveform resulting from an improperly adjusted R26. Notice the pronounced spikes at the crossover point in the waveform. The trace in Figure 9 shows the waveform with less pronounced spikes after R39 is properly adjusted.

To adjust R26 for the proper bias, follow the procedures below:

1. Turn power off and disconnect the unit from its power source. Make sure

the unit is in the Dual mode with 8 Ω loads connected to each channel.

2. Remove the eleven screws securing the top cover. Refer to Figure 1 for the screw locations.

3. Connect the sinewave generator output of the analyzer to the input of Channel 1. Rotate the input level control of Channel 1 to its full clockwise position. Rotate the input level control of Channel 2 to its full counter-clockwise position.

4. Apply power to the amplifier and adjust the sinewave generator for a 1 kHz, 0 dBu (0.775 V rms) output level. For this adjustment, it is not necessary to maintain a constant 120 V ac line input voltage under load.

5. Find R26 on the component layout in Figure 12. Rotate the shaft of R26 slowly clockwise until the spikes are minimized in the distortion waveform as shown in Figure 9.

6. Repeat steps 3 through 5 for Channel 2.

7. Check the ac idle current draw. With both channels at idle, the ac line current should be approximately 1 amp or less. If the idle current draw exceeds 1 amp, rotate R26 counter-clockwise slightly on both channels until the idle current is no more than 1 amp.

8. Turn off the generator's output signal. If you have concluded with the test and alignment procedures, disconnect the amplifier from its power source and re-install the top cover with the eleven screws previously removed.

9.5 Adjusting R23 and R24, the Negative and Positive Current Limit Trimpots

Shown in Figure 11 is an asymmetrically clipped waveform caused by an improperly adjusted positive current limit as determined by R24. Had R23 been improperly adjusted, the negative half of the waveform would be clipped as well, but its degree of clipping is a function of R23 only and is independent of R24.

In the following procedures, you will be adjusting the current limit thresholds by varying R23 and R24 in such a way so as to insure symmetrical clipping.

1. Turn power off and disconnect unit from power source. Make sure the unit is in the Dual mode with a 2 Ω load connected to the channel under test. If you do not have a 2 Ω load, you may use a 4 Ω load or even an 8 Ω load. The higher the load impedance, however, the less likely it is you will have symmetrical clipping on peaks into lower impedance loads.

2. Remove the eleven screws securing the top cover. Refer to Figure 1 for the screw locations.

3. Connect the sinewave generator output of the analyzer to the input of Channel 1. Rotate the input level control of Channel 1 to its full clockwise position. Rotate the input level control of Channel 2 to its full counter-clockwise position.

4. Find R23 and R24 on the component layout in Figure 12. Reach into the amplifier and rotate the shafts of R23 and R24 to their full clockwise positions.

5. Apply power to the amplifier and adjust the sinewave generator for a 1 kHz, —10 dBu (0.245 V rms) output level. For this adjustment, it is not necessary to maintain a constant 120 V ac line input under load.

6. Increase the level of the generator until the output of the amplifier reaches 42.43 V rms (which corresponds to 900 watts output into the 2 Ω load).

   The ac line current draw will be approximately 19 amps. Although the fuse installed is a 15 amp fuse, it should not blow during this test unless the amplifier is operated continuously for an extended period of time.

   If a 2 Ω load is unavailable, use either the 4 or 8 Ω load and increase the generator output level accordingly to the corresponding rated output power.

7. While monitoring the distortion waveform on the oscilloscope, rotate R23 counter-clockwise until the negative half of the waveform just begins to visibly clip (more pronounced spikes will appear on the distortion waveform). Then, rotate slightly clockwise just until the

visible clipping disappears and the spikes in the distortion waveform reduce to their pre-clip level.

8. Repeat Step 7 for the positive current limit pot R24. You may have to slightly re-adjust R23.

9. If R23 and R24 are properly adjusted, the channel should clip symmetrically (@ 1% THD) at approximately 1000 watts as shown in Figure 11.

10. Repeat Steps 3 through 9 for Channel 2.

11. Turn off the generator's output signal. If you have concluded with the test and alignment procedures, disconnect the amplifier from its power source and re-install the top cover with the eleven screws previously removed.

9.6 Checking the Short Circuit Current

With one channel operating at full rated power into an 8 Ω load, carefully short the output terminals using the 12 inch jumper cable while monitoring the ac line current. The ac line current draw under a short circuit condition should be less than 3 amps (typically 1.5 to 2 amps). If it exceeds 3 amps, you need to re-adjust R23 and R24 by rotating them slightly counter-clockwise, both by approximately the same amount, until the ac line current is under 3 amps. Repeat this procedure for Channel 2.

9.7 Ordering Replacement Parts

To order replacement parts, look up the ordering number from the component parts listing and call (405) 324-5311, FAX (405) 324-8981, or write:

ALTEC LANSING
Replacement Parts Sales
P.O. Box 26105
Oklahoma City, OK 73126-0105
U.S.A.

9.8 Factory Service

If factory service is required, ship the unit in its original packing prepaid to:

ALTEC LANSING Customer Service/Repair
10500 W. Reno
Oklahoma City, OK 73128
U.S.A.

Enclose a note describing the problem in as much detail as possible. Include any additional helpful information such as test conditions, where used, how used, etc.

9.9 Technical Assistance

For applications assistance or other technical information, contact the Technical Services Manager. You can call (405) 324-5311, FAX (405) 324-8981, or write:

ALTEC LANSING
Technical Services Manager
P.O. Box 26105
Oklahoma City, OK 73126-0105
U.S.A.

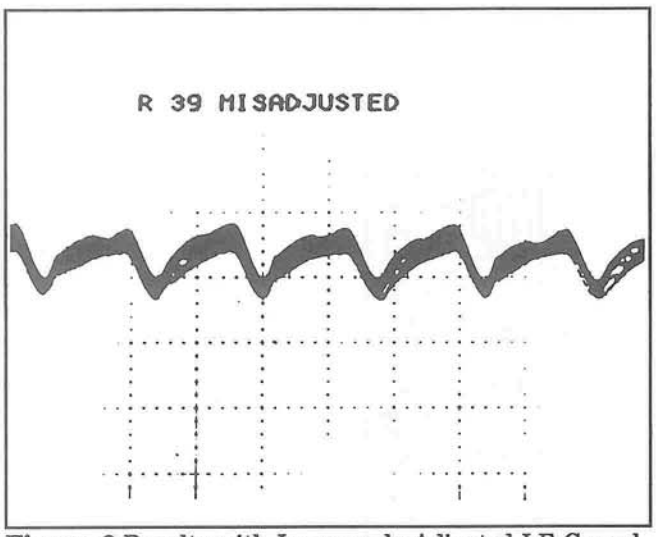

Figure 6 Results with Improperly Adjusted LF Cancel

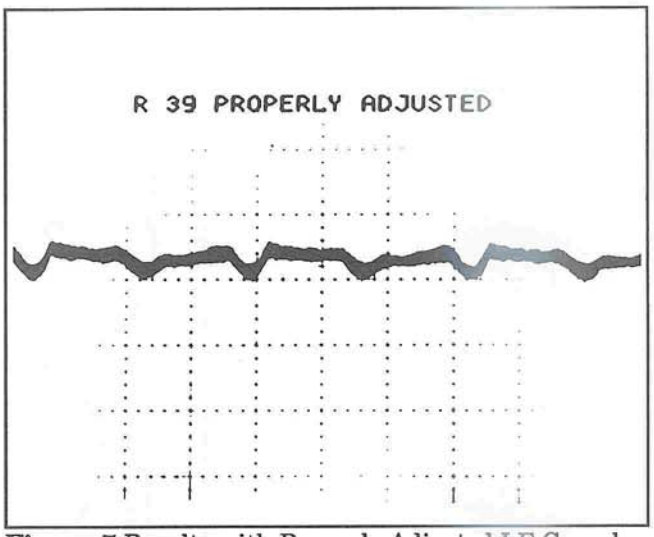

Figure 7 Results with Properly Adjusted LF Cancel

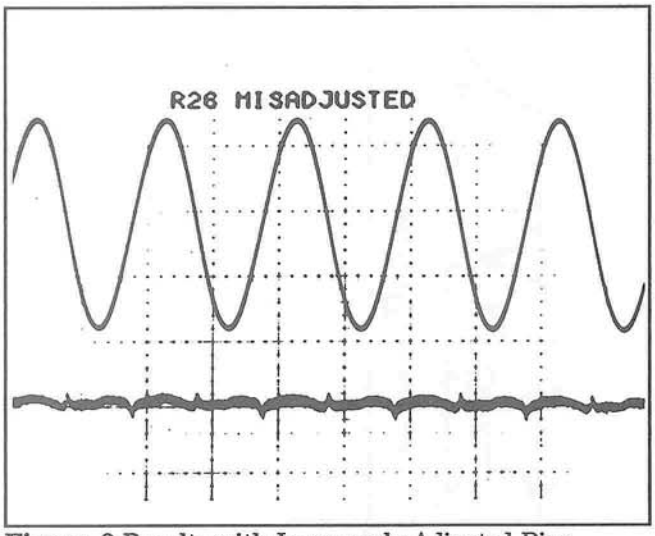

Figure 8 Results with Improperly Adjusted Bias

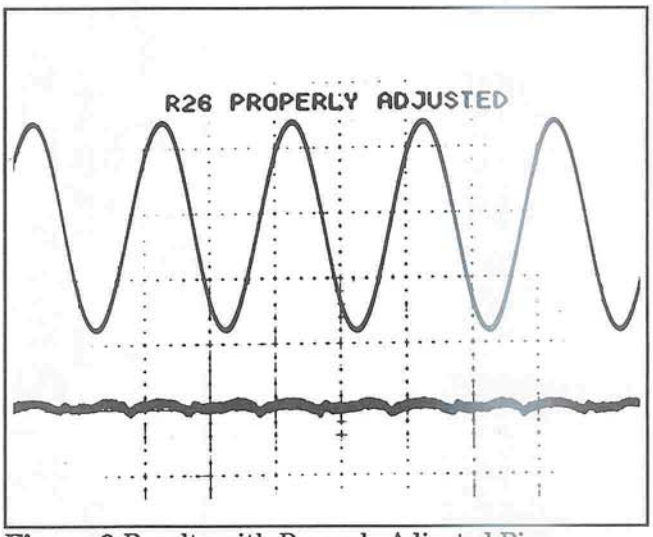

Figure 9 Results with Properly Adjusted Bias

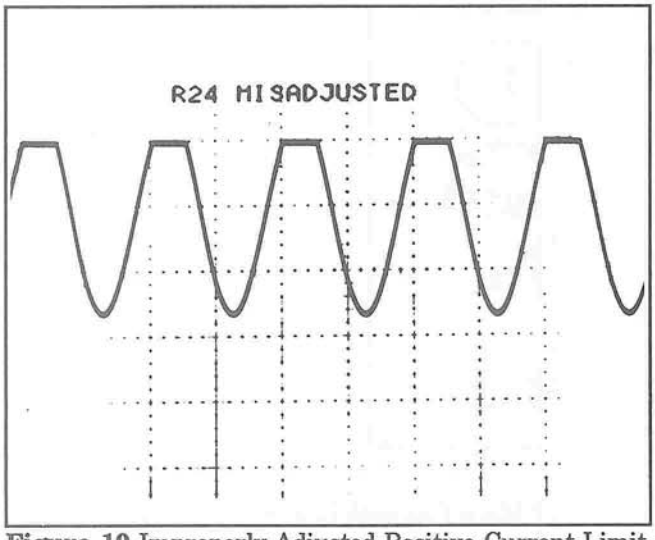

Figure 10 Improperly Adjusted Positive Current Limit

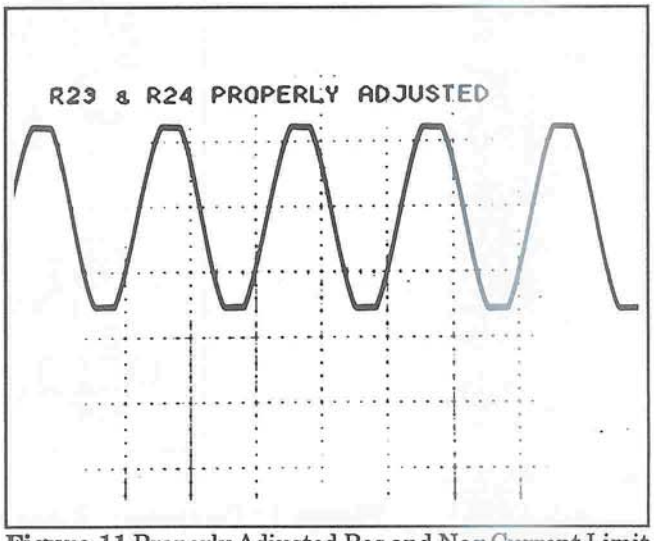

Figure 11 Properly Adjusted Pos and Neg Current Limit

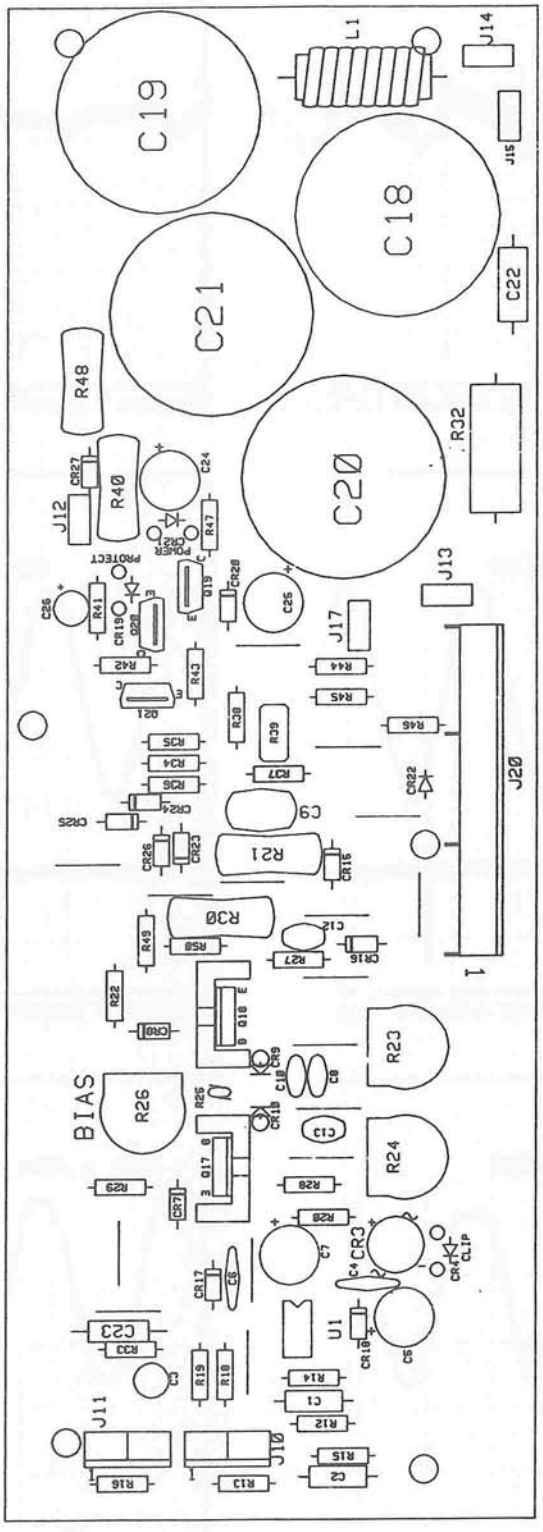

Figure 12 Component Silkscreen Layout of Main Channel Board

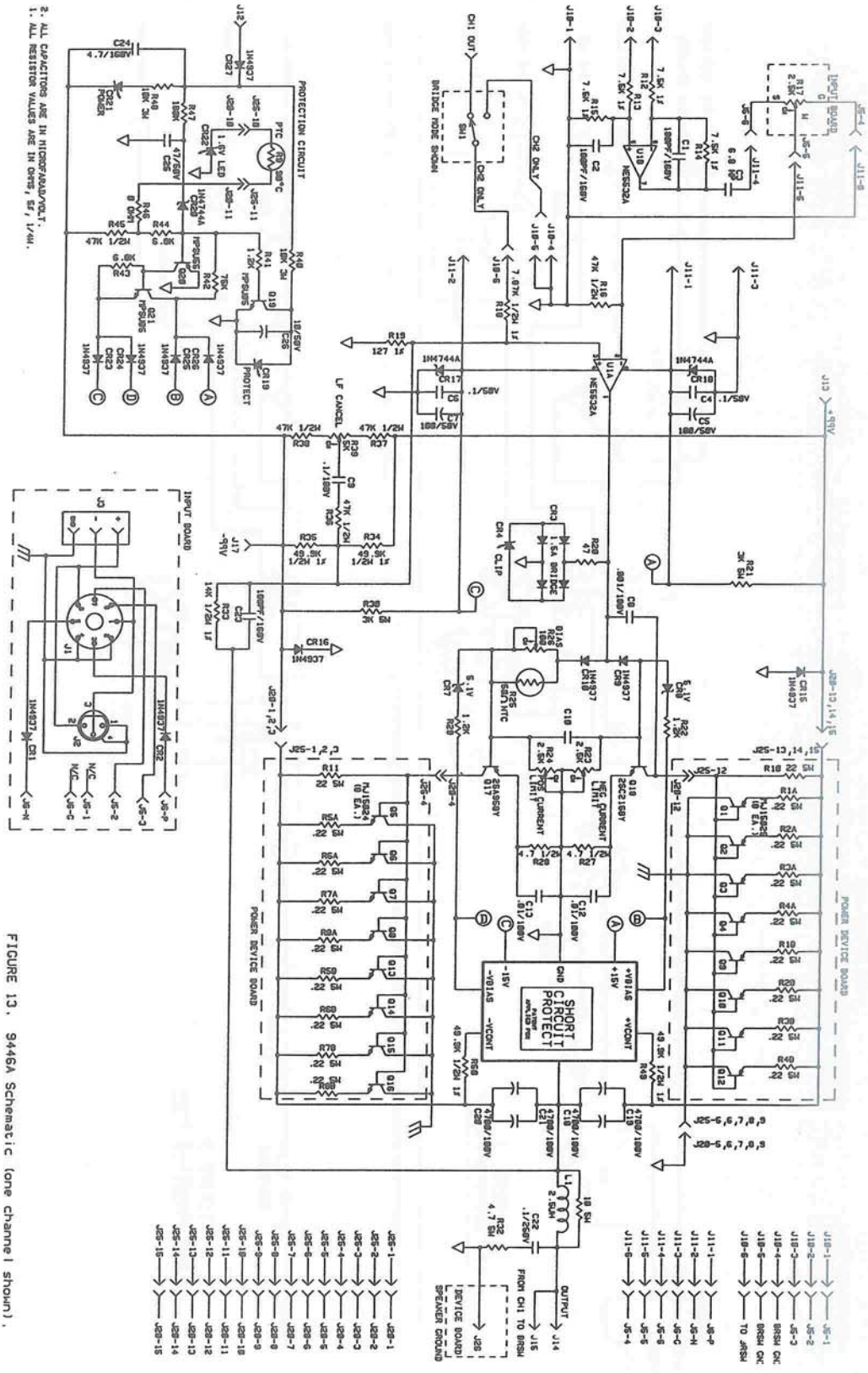

FIGURE 13. 9446A Schematic (one channel shown).

Figure 13 Schematic of 9446A (DWG No. 11D697), One Channel, Sheet 1 of 2

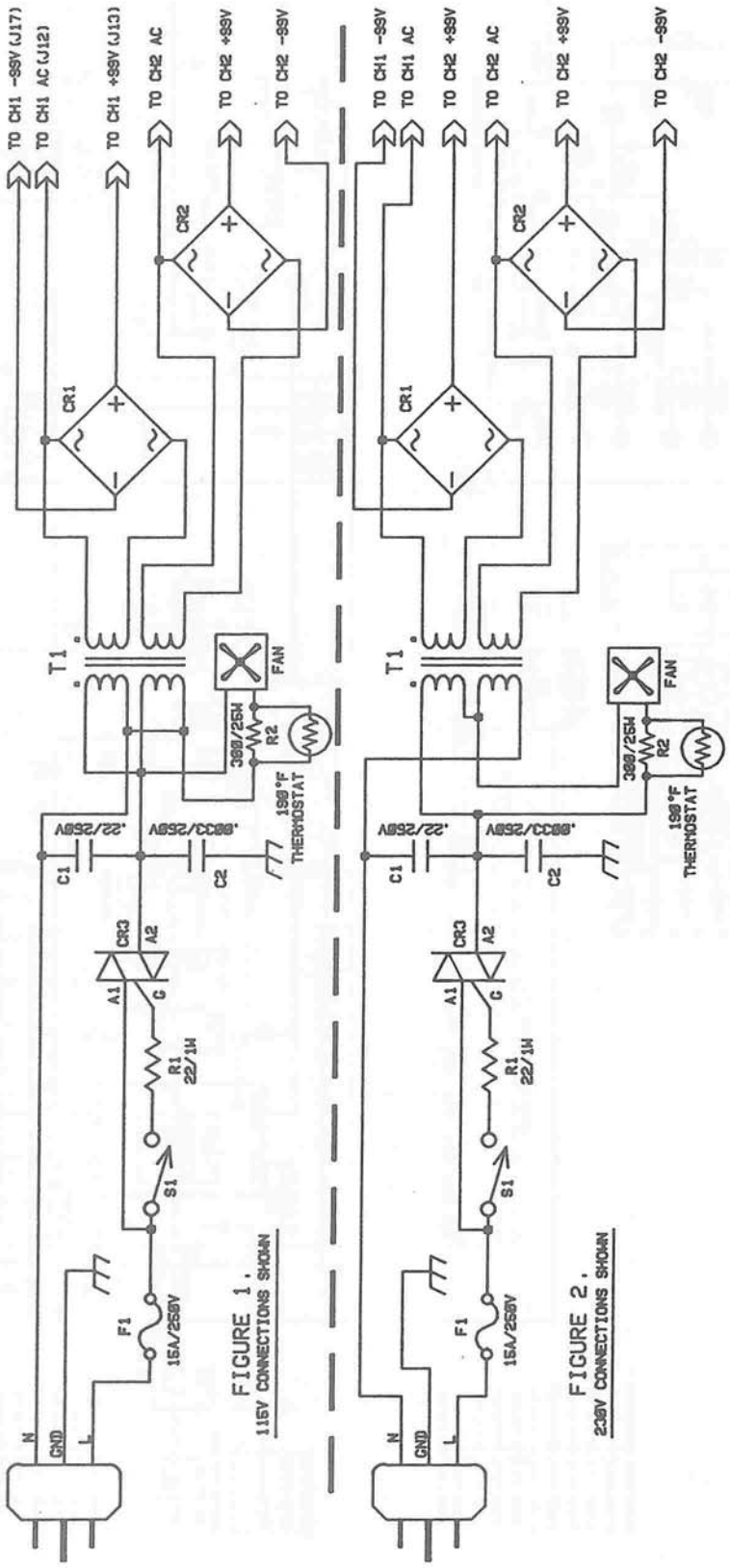

Figure 13 Continued, Schematic of Power Supply, Sheet 2 of 2