



OPERATOR'S MANUAL



L75

LINEAR AMPLIFIER

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CHAPTER 1

INTRODUCTION

1-1. GENERAL DESCRIPTION

The R. L. Drake Model L75 Linear Amplifier is designed for 1200 Wats PEP SSB (continuous) and 1000 Watts CW (50% duty cycle) operation covering the ham bands 160 through 15 meters. Non-amateur frequencies from 1.8 to 4.0 MHz and 6.5 to 21.5 MHz may be covered with modification of the input circuit.

The L75 uses a 3-500Z zero-bias triode in a class B grounded-grid circuit configuration that uses RF negative feedback for lower odd-order distortion products. A transmitting AGC circuit controls the exciter gain to allow the highest average power without peak clipping. An internal changeover relay feeds the antenna through when the L75 is turned off. A pair of relay contacts bias the output tubes to cut-off, eliminating unwanted heat and thermal noise when receiving. The front panel meter indicates plate current, grid current, plate voltage, and an indication of relative output power. The self-contained solid state Power Supply requires no warm-up period and provides excellent dynamic and static voltage regulation.

1-2. MANUAL COVERAGE

This manual is presented in 5 chapters with supporting illustrations and is arranged for the convenience of the operator and service technician as follows:

Chapter 1	Introduction (self-explanatory).
Chapter 2	Installation. Describes the procedures to be followed prior to operation.
Chapter 3	Operation. Illustration and describes front panel controls and describes tune-up and operation in SSB, CW and TUNE modes.
Chapter 4	Theory of Operation. Describes all critical circuits and networks.
Chapter 5	Maintenance. Provides maintenance instructions, troubleshooting and parts ordering information.

SPECIFICATIONS

Frequency Coverage:	Ham bands 160 through 15 meters. Non-amateur frequencies between 1.8-4.0 and 6.5-21.5 MHz may be covered with some modification of the input circuit.*	Intermodulation Distortion Products:	In excess of -33 dB below PEP.
Plate Input:	1200 W PEP SSB; 1000 W CW, AM, RTTY and SSTV at 50% duty cycle.	Power Requirements:	240 Volts 50-60 Hertz 10 Amperes, or 120 Volts 50-60 Hertz 20 Amperes.
Drive Requirements:	Typically, 60 Watts PEP on SSB and 50 Watts on CW.	Tube Complement:	One 3-500Z or 8802/3-500Z zero-bias triode.
Input Impedance:	50 Ohms (Tuned Input).	Dimensions:	13-11/16 in. W x 6-3/4 in. H x 14-1/4 in. D (34.8 cm W x 17.1 cm H x 36.2 cm D.)
Output Impedance:	Adjustable pi-network matches 50 ohm line with SWR not to exceed 2:1.	Weight:	42.2 lbs. (19.2 kg)
		*Export model includes coverage of 10 meter Ham Band.	

CHAPTER 2 INSTALLATION

WARNING

The L75 has been designed incorporating several interlocks to prevent dangerous electrical shock. **"DO NOT DEFEAT THESE INTERLOCKS!"** Voltages within the L75 cabinet are quite lethal. When disassembling the L75, first unplug the unit from the AC socket and allow two minutes for the filter capacitors to discharge before removing the cabinet. When removing the cabinet, be sure it is removed completely in order to engage the interlock switch near the middle of the chassis. The L75 can be installed and serviced in complete safety if the instructions in this manual are followed explicitly.

2-1. UNPACKING

The L75 Linear Amplifier is shipped from the factory in 3 separate cartons; 1 contains the Amplifier and miscellaneous hardware, 1 contains the power transformer, and the third contains the tube. Carefully unpack all three cartons and examine their contents for evidence of shipping damage. If any damage is discovered, notify the transportation company that delivered the equipment. Be sure to keep the cartons and packing material as the transportation company that delivered the equipment will want to examine them. Keep the carton and packing even if no shipping damage occurs. Having the original cartons available simplifies repacking the equipment for storage or to return it to the factory for service. Inspect the packing material closely before storing it to be sure that none of the accessory hardware has been overlooked. The dismantled components and accessory hardware shipped with the L75 should be checked against the following list:

- a. one power transformer
- b. one plate cap (for tube)
- c. one 5-32x5/8 screw (for plate cap)
- d. one parasitic choke (note TOP label)
- e. one 6-32x1/4 screw (connects choke to cap)
- f. one internal tooth lock washer (connects choke to cap)
- g. 2 cables (1 VOX relay, 1 transmit AGC)

- h. 2 resistors, 0.82 ohm, 2 Watts (replacement spares for Power Supply R46).
- i. 2 rubber feet (for viewing option B)
- j. 2 studs (to attach rubber feet)
- k. 4-1/4-20 screws (secure transformer)
- l. 1 Instruction Manual (READ IT!)
- m. 1 Warranty Registration Card

NOTE

Fill out the enclosed Warranty Registration Card and return it to the factory immediately to insure registration and validation of the warranty.

2-2. TRANSFORMER INSTALLATION

WARNING

The tube and power transformer must be installed and the cabinet replaced **BEFORE ANY POWER CONNECTIONS** are made to the L75.

- a. Remove the 6 screws which secure the cabinet to the amplifier. Remove the cabinet.
- b. Take off the rear bottom cover (the one with the ventilating slots) by removing the 8 mounting screws.

- c. Lift the filament choke ends (to expose the transformer screw mounting hole) by removing the 2 screws from the terminal block (yellow leads — figure 2-2).
- d. Place the power transformer upside down (leads extending up) on the table in front of you. The two red wires and single green wire should point away from you. Support the transformer a small distance above the table top with two pencils or similar spacer as shown in figure 2-1.
- e. Turn the chassis upside down with the rear panel facing you and lower it in place over the power transformer, fishing the transformer leads through the access holes in the chassis. DO NOT put red wires through the front access hole. Form the red leads down the side of the transformer.
- f. Align the transformer mounting feet with the four mounting holes in the chassis and fasten the transformer in place with the four 1/4" screws provided.
- g. Slide the short tubing, securing the transformer leads, toward the transformer base and attach the transformer wires to the proper screw terminals as shown in figure 2-2. Double check that the proper wires go to the correct terminals. This *must* be carefully checked as mis-wiring may cause damage.
- h. Replace the filament choke leads removed in step C and secure with screws to the terminal strip opposite the yellow leads. At this time refer to paragraph 2-6 for primary jumper connections required for 110 or 220 volts operations. The amplifier is shipped with a 10 amp fuse for 220 volts operation. This must be replaced with a 20 amp fuse for 110 volt operation.
- i. Turn the amplifier right side up. Fish the two 'red' high voltage wires up between the transformer shield and the transformer and connect one lead to the screw terminal on the rectifier board and the other to the screw terminal on the filter board. (See figure 5-1).

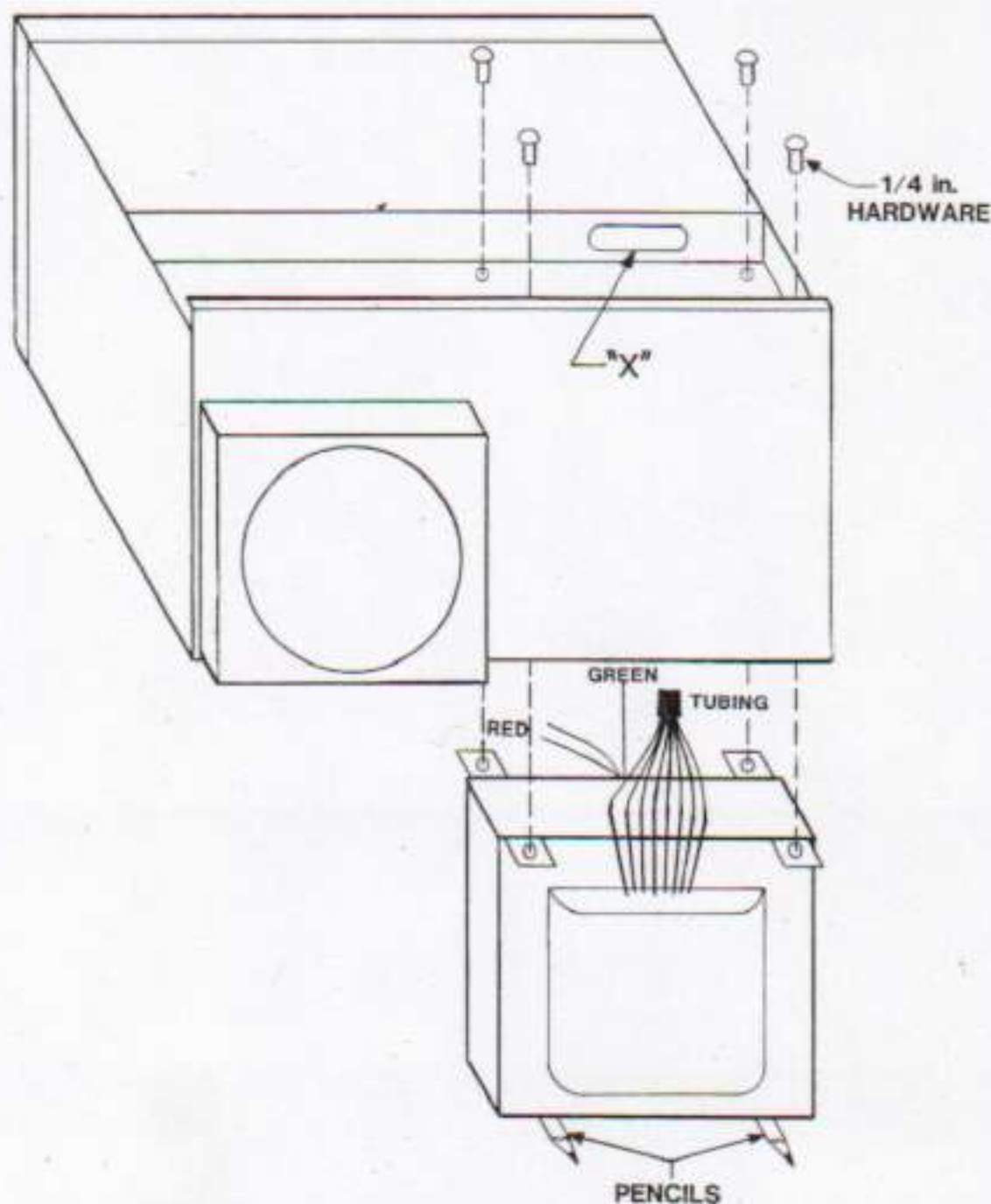


Figure 2-1 Transformer Installation

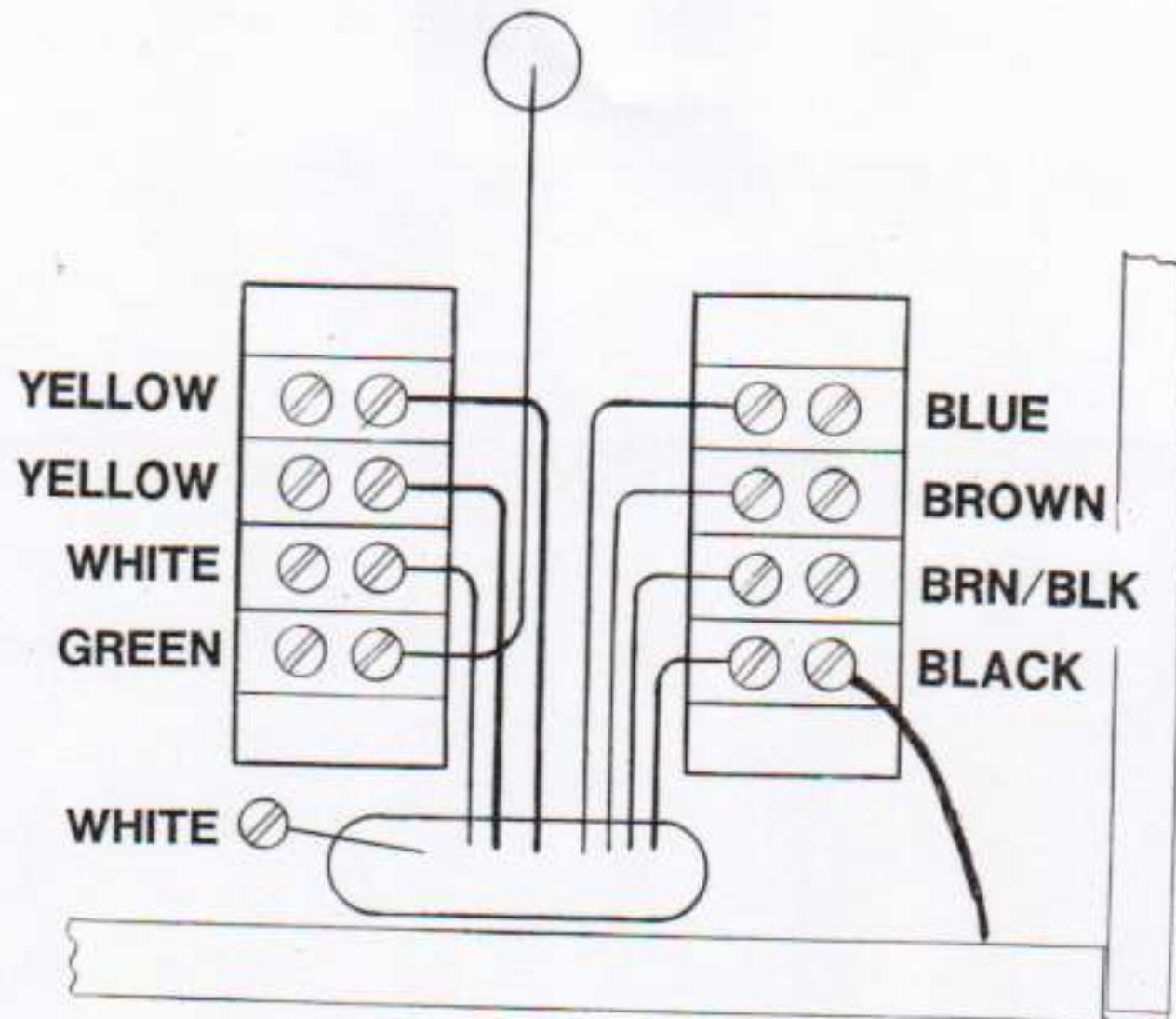


Figure 2-2 Transformer Lead Connections

2-3. TUBE INSTALLATION

- Refer to figure 5-1. Insert the tube into the socket on the amplifier chassis.
- Install the plate cap on the tube and secure it with the 6-32 screw provided.
- Attach the parasitic choke to the top of the plate cap with the screw and lockwasher provided. Make sure that the coil of the choke hangs DOWN. The word TOP stamped on the choke must be visible from the top of the amplifier.
- Attach the remaining lead on the parasitic choke to the top of the plate RF choke using the 1/4-20 aluminium screw which also secures the mounting bracket for the coupling capacitor. DO NOT overtighten this screw.
- Replace the cabinet and secure it with the 6 screws removed in section 2-2.

2-4. LOCATION

In general, the location of the L75 is not critical; however, the back of the Amplifier case must not be obstructed and should not be placed closer than 1 inch from a wall or the air outlet for the blower will be blocked and overheating of the tubes may occur.

2-5. POWER REQUIREMENTS

The L75 is equipped with an internal Power Supply which can be operated from either 120 VAC or 240 VAC 50-60 Hertz. Because of the large variety of plug and socket configurations for 240 volt service, and because the L75 can be operated from either 120 Volts or 240 Volts, a line plug is not furnished with the amplifier. The L75 is shipped from the factory with jumpers connected to operate on 240 VAC. It is recommended that the L75 be operated from its own separate 240 volt AC supply. If the amplifier must be operated from a 120 V lighting circuit, then the circuit should be rated and fused for 20 Amp service. No other devices should be operated from the same line.

2-6. JUMPER CONNECTIONS

Figure 2-3 shows the jumper connections required for 120 and 240 Volt operation. These jumpers are connected at the factory for 240 volt operation. Make sure the L75 is wired correctly for the power source to be used. Also be sure the correct fuse is installed at the rear of the amplifier. 10 Amp for 240 V operation and 20 Amp for 110 V operation.

PRIMARY TERMINAL BLOCK

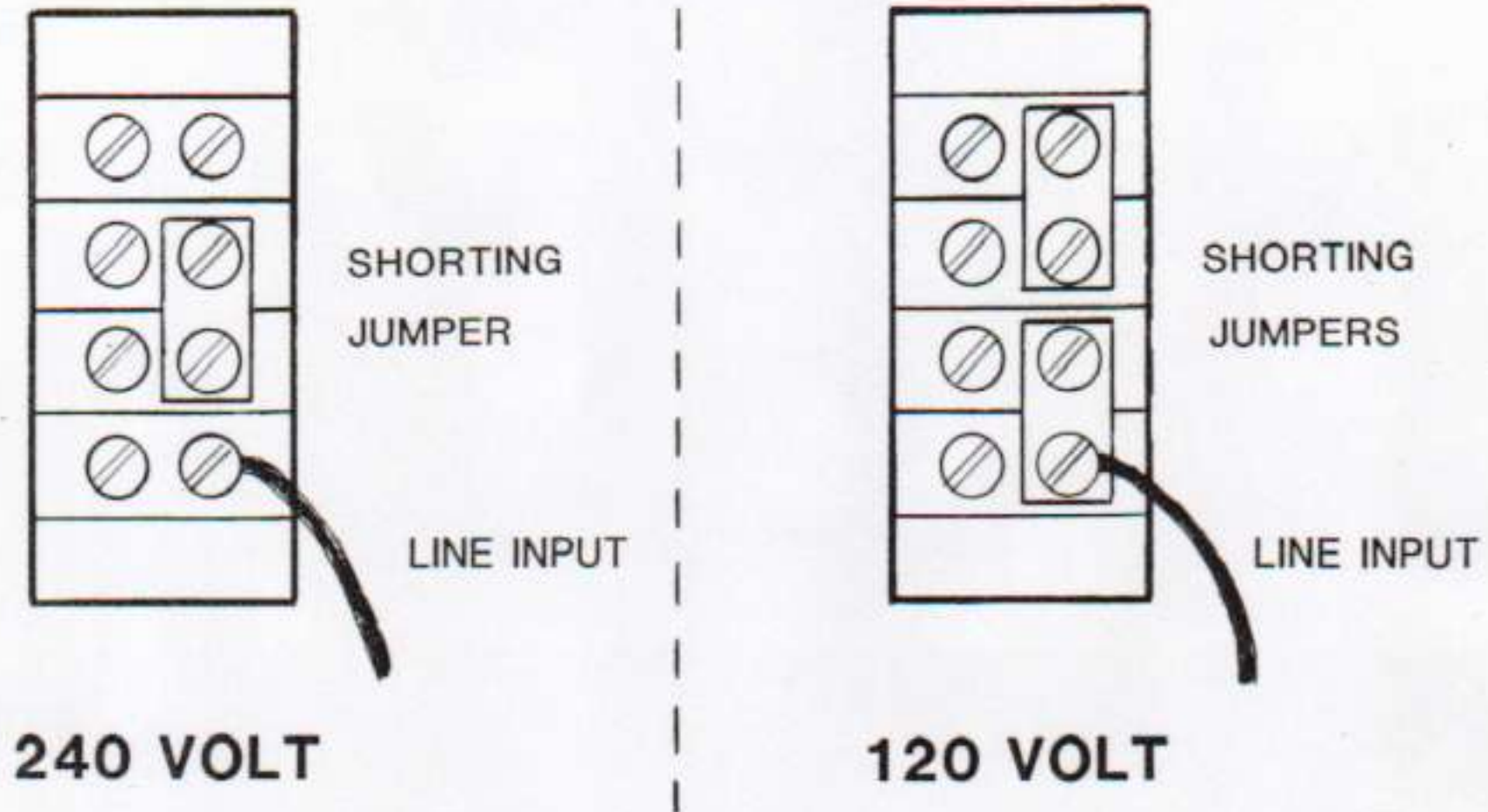


Figure 2-3 Transformer Primary Jumper Connections

2-7. ANTENNA REQUIREMENTS

The L75 has been designed for use with antennas resonant at the operating frequency and having approximate impedances within the limits of 25 to 100 Ohms. The nominal output impedance of the amplifier is 50 Ohms and the SWR of this load should never exceed 2:1. Although there are many types of antennas which will meet these requirements, the simplest is a one-half wave dipole center fed with 52 Ohm coax. For a detailed discussion on antennas, refer to an appropriate antenna book.

2-8. LOW PASS FILTER

The amplifier has been designed in accordance with good engineering practices, and harmonic attenuation meets or exceeds current FCC specifications. However, to reduce the chance of television interference in severe RFI environments, it is recommended that a suitable low pass filter such as the R. L. Drake Model TV-3300-LP be used with the L75.

2-9. MATCHING NETWORK

Many practical antennas exhibit an SWR range over a complete amateur band that exceeds 2:1. For this reason we recommend using an antenna matching network such as the R. L. Drake MN2700 which will allow the L75 to work into a 50 Ohm load for maximum power transfer into the antenna.

CAUTION

Never attempt to operate the L75 without first connecting it to an antenna or 50 Ohm Dummy Load of sufficient power handling capacity or serious damage may result.

2-10. GROUND REQUIREMENTS

For best results, the amplifier should be attached to a good earth ground through as short and as large a ground strap as possible. A binding post is provided on the rear of the amplifier chassis for the ground

connection. It is always a good idea to connect the chassis of all associated equipment together and ground them at one point to avoid ground loops. We recommend that all of the equipment in your station be connected together and grounded at the L75 Amplifier chassis.

2-11. EXCITER REQUIREMENTS

To operate the amplifier at maximum output the exciter must provide approximately 60 watts PEP RF power for SSB operation and 50 watts RF power for CW operation. Locate the exciter as close to the amplifier as practical to shorten the coaxial cable and ground strap. Refer to figures 2-4 and 2-5 for recommended connection arrangements.

2-12. TRANSMITTING AGC

The transmitting AGC voltage, which controls the gain of the exciter, is presented at a connector labelled XMTR AGC on the rear of the L75. Any power level can be run up to 1200 watts PEP without peak clipping. A cable is furnished with the amplifier which provides a connection to the R. L. Drake

PS7 or AC-4 Power Supply. This connection is routed through the power supply to the transmitter.

2-13. VOX RELAY

An RCA phono jack on the rear of the L75 Amplifier is provided for connection to a pair of normally open relay contacts in the exciter which close on transmit, thus turning on the amplifier. The L75 is supplied with a cable to connect this jack to a similar jack on the Model PS7 Power Supply which terminates in the particular transmitter being used. On AC-4 Power Supplies and some older model PS7 supplies, a special two-pin connector is used.

The Drake TR7 Transceiver grounds one of the extra relay contacts made available to key a linear amplifier. For those with the older 2-pin connector on the PS7 Power Supplies, it is necessary to plug the two pin connector into the PS7 VOX RELAY socket observing the correct polarity. With the exciter in standby, set the L75 ON-OFF switch to ON and set the STBY switch in the "operate" (out) position. Plug in the VOX cable connector and observe the Plate Current Meter. If it reads up scale, reverse the VOX cable connector to the PS7. The amplifier plate current must be zero with the VOX cable plugged in and the exciter in Standby.

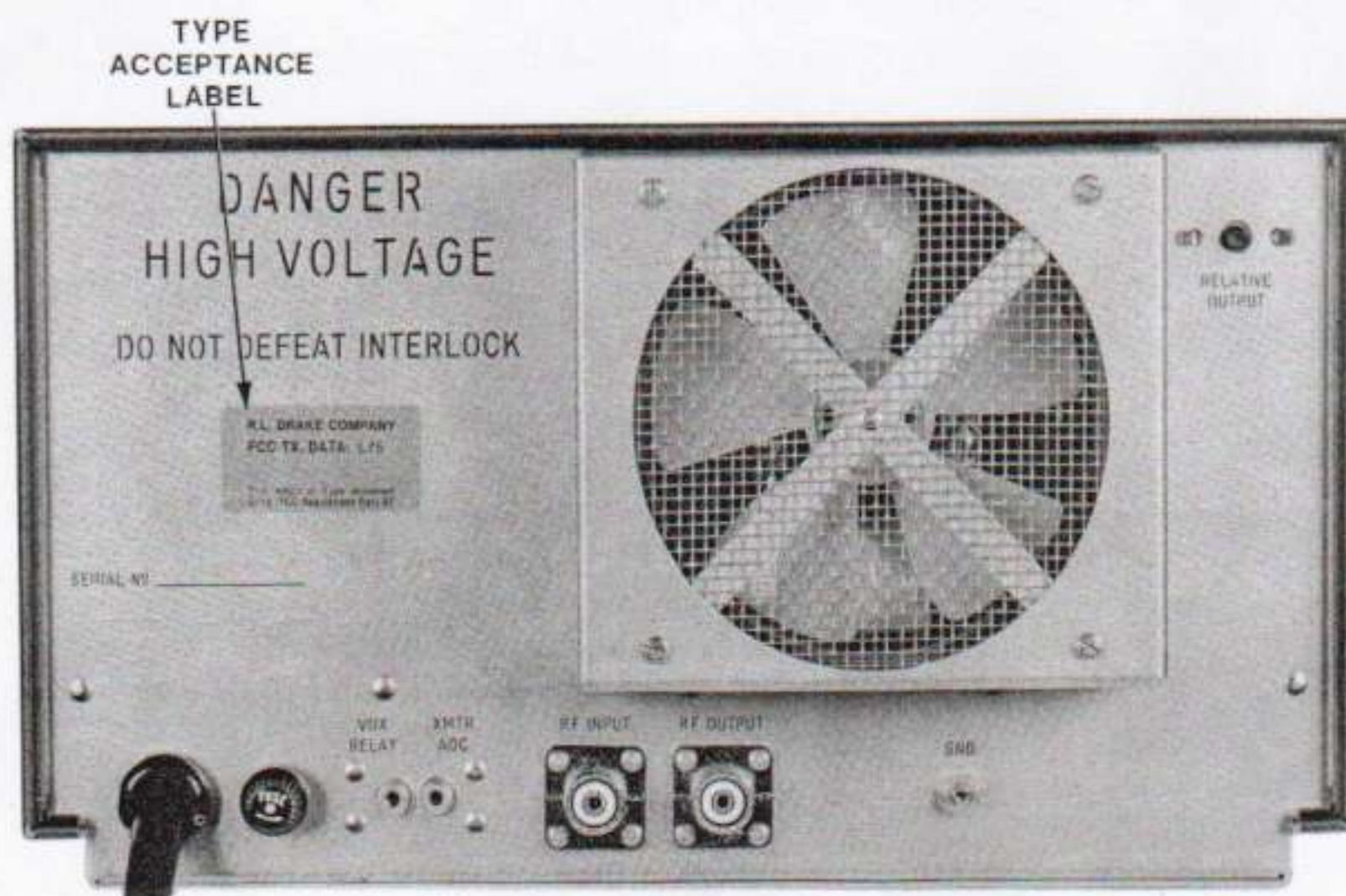
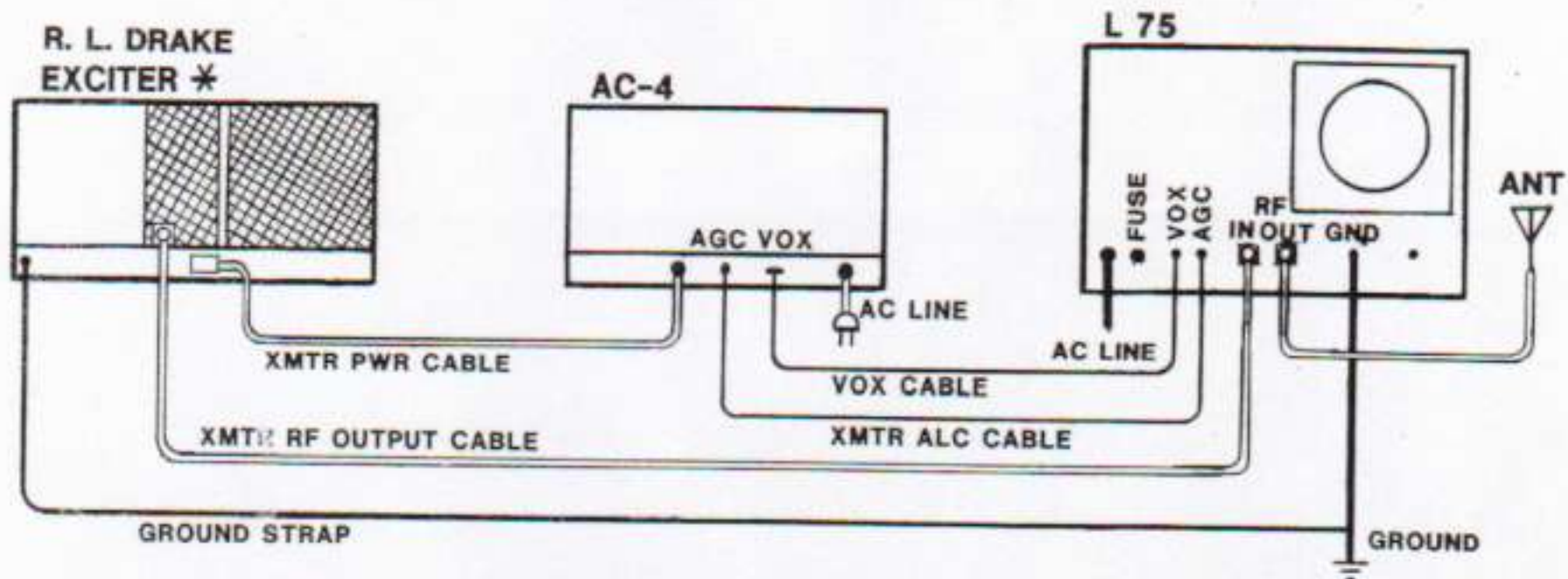


Figure 2-4 Rear Chassis Connections



* LIST OF EXCITERS: T-4 T-4B T-4C
T-4X T-4XB T-4XC TR-3 TR-4 TR-4C

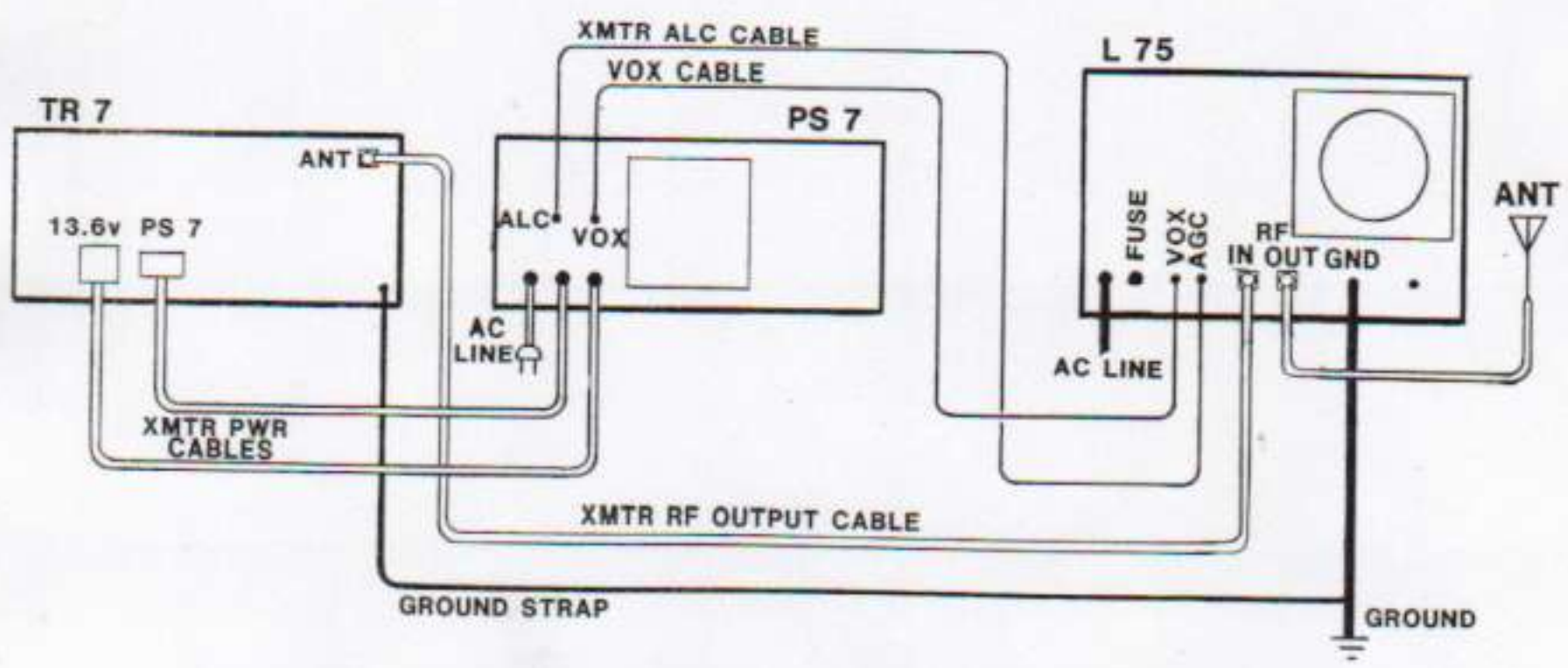
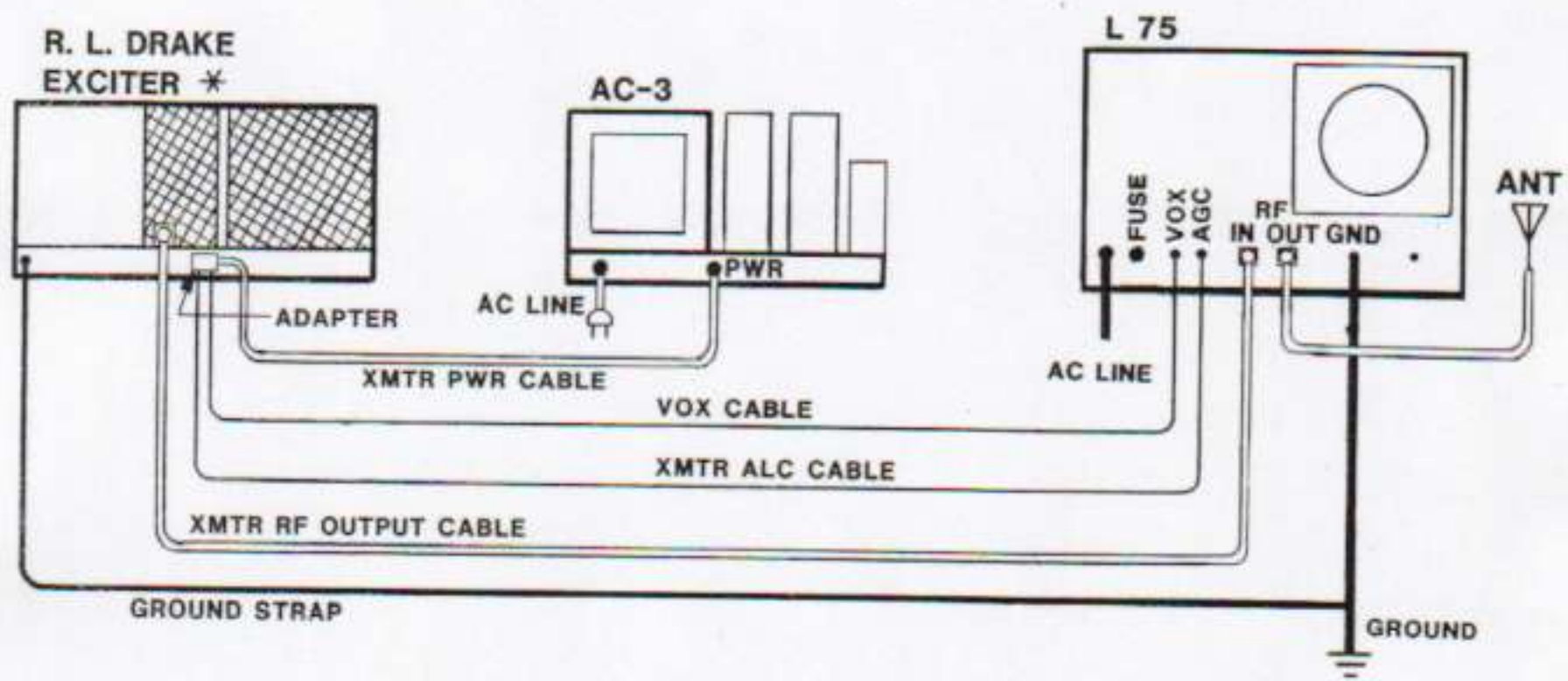
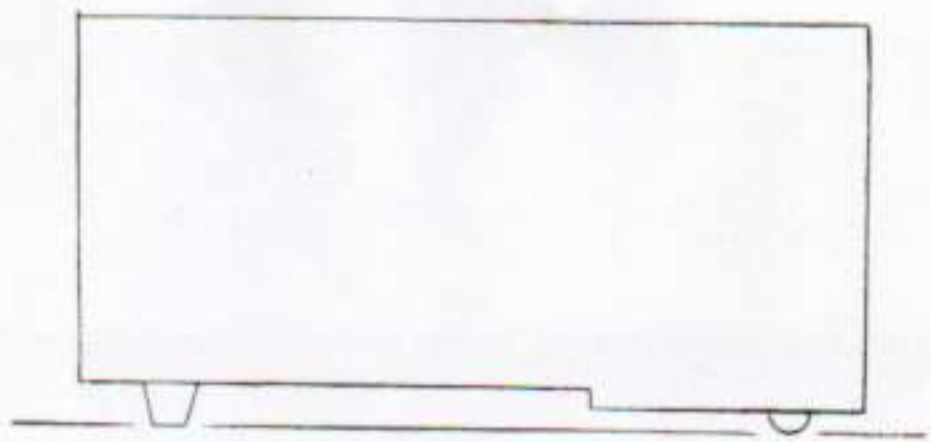
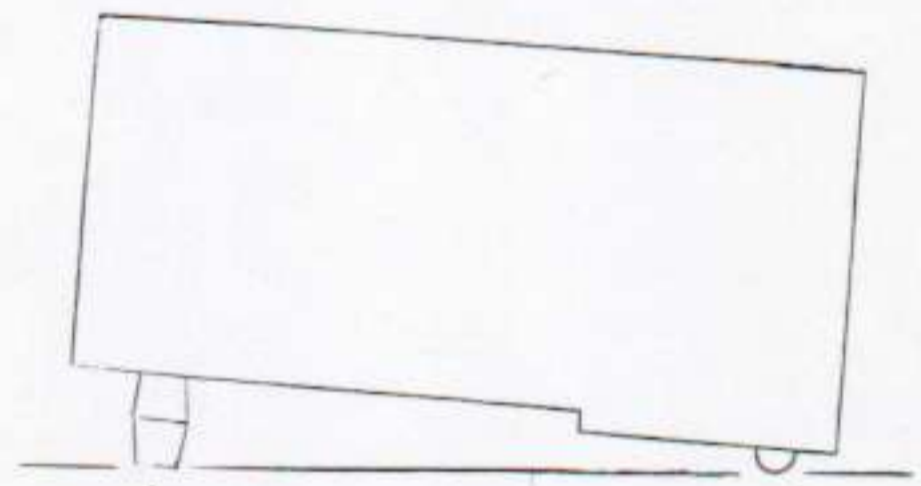


Figure 2-5 Connecting the L75 to the R. L. Drake Line of Compatible Exciters



OPTION A



OPTION B

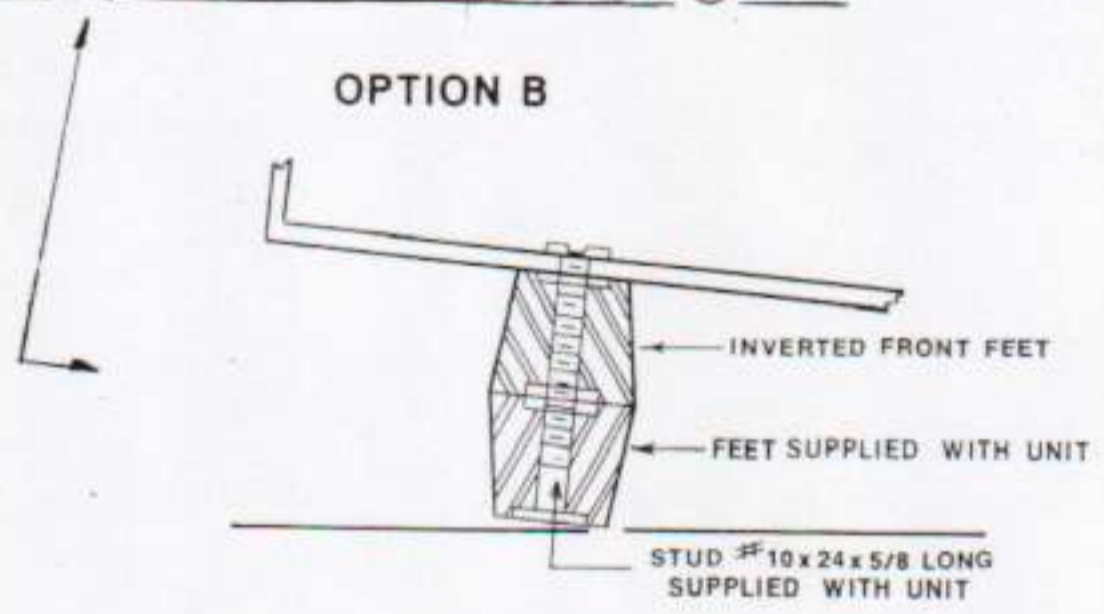


Figure 2-6 Viewing Angle Options

CHAPTER 3 OPERATION

CAUTION

DO NOT turn on the L75 Amplifier with the cabinet removed because the high voltage interlock shorts out the B+ and will damage Power Supply components. DO NOT plug into the AC Supply with the cabinet removed. DO NOT operate the Linear Amplifier until it has been connected to a 50 ohm antenna or a 50 ohm dummy load. Be sure that the correct jumper connections described in Chapter 2 have been made for the line voltage to be used.

3-1. GENERAL

Figure 3-1 identifies and describes all front panel controls and indicators referred to in these tuning and operating procedures. Perform the appropriate tuning procedures described below prior to operation.

The exciter may be tuned up on CW into the antenna connected to the amplifier by depressing the STBY switch. The exciter should be checked to be sure that it is tuned up when driving the L75 since the antenna connected to the amplifier may not be exactly 50 ohms.

3-2. TUNING PROCEDURE

After the exciter has been tuned up, turn the exciter to standby and release the STBY switch on the L75.

The Drake TR7 and some other exciters utilize transmitting AGC, sometimes called ALC, during all modes of operation. During tune up, transmitting AGC will have to be defeated either by unplugging the transmitting AGC connector, or by tuning the AGC control fully counterclockwise. All Drake Transmitters and Transceivers except the TR7 and 2-NT (which has no transmitting AGC) switch off AGC in TUNE, CW and AM modes, therefore it is not necessary to defeat AGC externally on these transmitters.

3-3. CW TUNING AND OPERATION

Preset the front panel controls on the L75 as follows:

- a. Band switch to desired band.
- b. Meter switch to Ip.
- c. STBY switch to "operate" (out).
- d. LOAD fully counterclockwise to zero.
- e. PLATE control in the arc provided for the desired band.
- f. Turn AGC control fully counterclockwise.
- g. ON-OFF switch to ON.
- h. For 160 and 80 meter operation, preset the LOAD RANGE control to 0-10.

By using the "REL OUTPUT" position on the L75, or if a relative power output meter (wattmeter, SWR meter, etc.) is available, the L75 may be tuned as follows: Turn the exciter on and increase exciter output while not exceeding .300 Amperes plate current in the L75. Tune the PLATE control for a dip in plate current. Alternately adjust LOAD and PLATE controls for maximum output power while increasing drive from the exciter until maximum output occurs at .375 plate amperes. If the LOAD control "runs out of range" on 80 meters or 160 meters, the LOAD RANGE switch may be used by switching to 10-20 or 20-30 range.

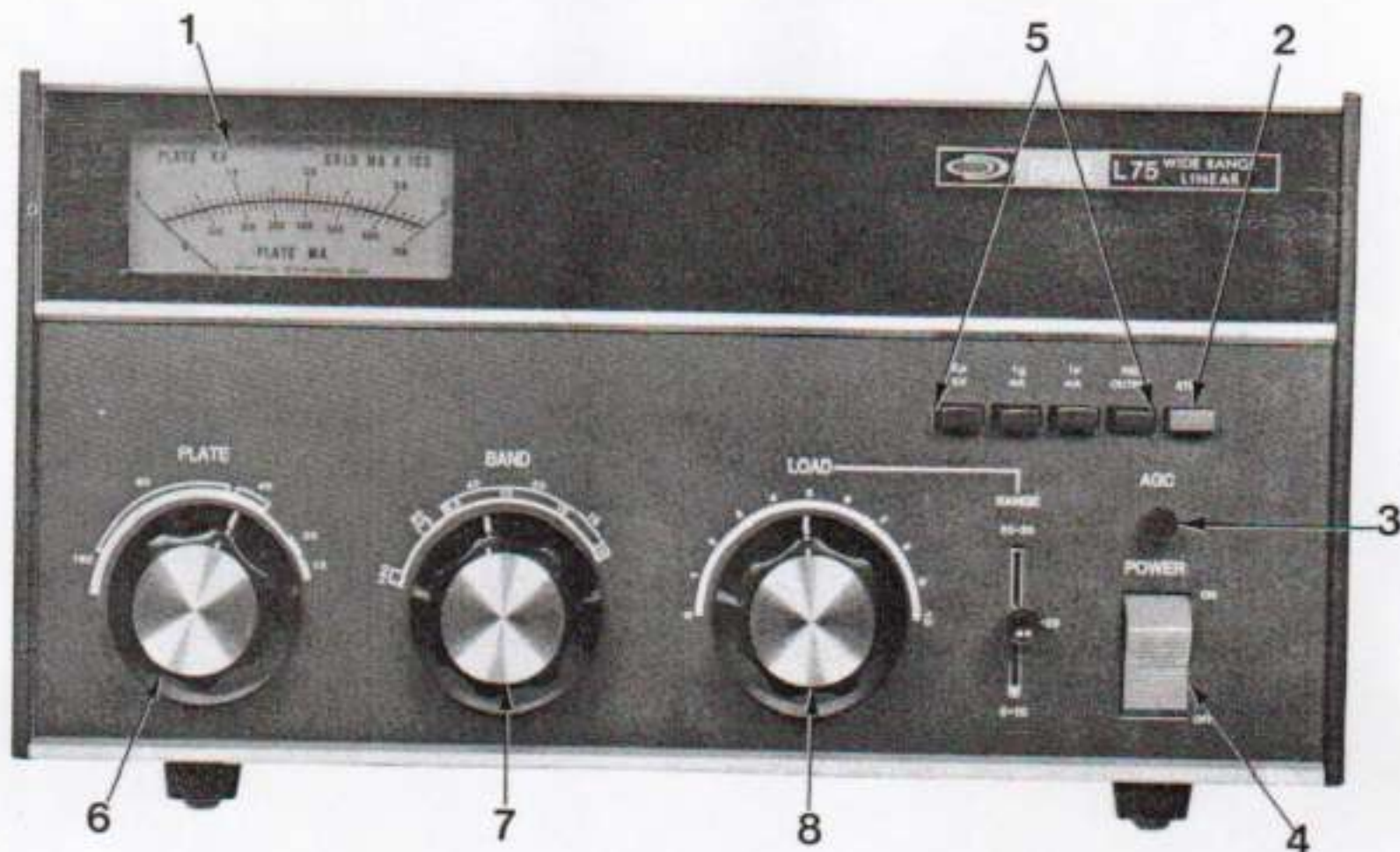


Figure 3-1 Front Panel Controls

1. Multimeter: Indicates plate voltage, grid current, plate current and relative output power as selected by meter switches (5).
2. STBY Switch: When depressed, allows standby operation with the exciter connected straight through to the antenna.
3. AGC Control: Adjusts the transmitting AGC threshold.
4. ON/OFF Switch: Turns the main power on and off.
5. Meter Switches: Selects indication for Multimeter (1).
6. PLATE Control: Resonates the plate tank circuit.
7. BAND Switch: Selects input and plate tank components to resonate the amplifier on the selected band.
8. LOAD Control: Adjusts the output impedance of the amplifier to match the antenna load impedance.

Because of variations in AC line voltage, the plate voltage under load should be checked to assure that 1000 W input power is not exceeded. A graph (figure 3-2) is supplied which correlates plate voltage and plate current for 1000 watts DC plate input power and should be used to insure the amplifier is operating within the legal input power.

On exciters such as the TR7 in which the CW output power may be controlled by the AGC input, the exciter drive control may be set as prescribed in the instructions for the exciter and the drive will be controlled by the AGC control on the L75.

The L75 was not designed to withstand the continuous duty cycle associated with RTTY and SSTV operation at full power. If extensive RTTY or SSTV operation is planned, input power should be reduced to 500 W (220 ma plate, 65 ma grid). If this power level is exceeded the transformer may overheat and be damaged. On some bands, the LOAD control may not have sufficient adjustment capability at the 600 W level even with the LOAD RANGE control set at minimum, dip the plate current with the TUNE control and adjust the drive level for 220 ma plate current.

For CW operation, depress the key and adjust the drive level until the product of plate voltage and plate current is at or under maximum legal input power.

3-4. SSB TUNING AND OPERATION

To tune the L75 at the 1200 watt level for SSB use, use the method described under "CW TUNING AND OPERATION" except tune for plate current of approximately .450 amperes instead of .375 amperes. To assure legal amateur operation, tuning must be done into a suitable 1000 watt 50 ohm dummy antenna such as the Drake DL1000. If the actual transmitting antenna does not have a perfect 50 ohm impedance, further tuning will then be neces-

sary using one of the following two methods.

The simpler method involves the use of a 1000 watt antenna tuner such as the Drake MN2700. Depress the STANDBY button on the L75 and adjust the tuner for 1:1 SWR using the exciter. If the L75 has been properly tuned for 1200 watts input into the 50 ohm dummy load, no retuning of the L75 will then be needed when switching to the amplifier. The MN2700 has built-in provision for switching between dummy load and any of four antennas.

If no antenna tuner is available, then load the L75 into the 50 ohm dummy load as described before. Without changing any control setting, reduce drive level until the L75 input power is 1000 watts (about .375 amperes plate current). Switch the exciter to standby. Then, *leaving the exciter drive at the same level*, reconnect the transmitting antenna to the L75, switch the exciter back to transmit, and adjust the TUNE and LOAD controls on the L75 until the plate current dips to .375 amperes. The amplifier will now be properly adjusted for 1200 watt operation.

For SSB operation the transmitting AGC threshold must be set before using the amplifier. With a 50 ohm dummy load connected the transmitting AGC threshold is adjusted by applying a strong single audio tone into the microphone input of the exciter either by an oscillator or by whistling a single tone into the microphone with the exciter adjusted for maximum output. With this single tone applied, tune the AGC control clockwise until the plate current is .450 amperes. If you desire to run less than 1200 W PEP, turn the AGC control clockwise until the single tone plate current decreases to the level corresponding to the power level desired (See fig. 3-2). The AGC threshold needs to be set once on each band. When making large changes in frequency within a band, the amplifier should be checked for plate tank resonance while still maintaining .450 amperes plate current. Under normal voice operating conditions the L75 Plate Meter will average between .200 to .375 amperes. Plate current of .375 amperes average is the maximum legal input allowed and this level should be reached only occasionally and never

exceeded. If the exciter has no provisions for transmitting AGC, the output from the amplifier should be monitored with an oscilloscope to check for peak clipping.

Tube life is largely a function of filament longevity, therefore avoid turning the "Power" switch on and off unnecessarily as the filament inrush current can eventually cause filament failure.

3-5. OPERATION ON ACCESSORY FREQUENCIES

Bandswitch Position	Frequency in MHz
160	1.8-2.0
80	3.2-4.5
40	6.5-10
20	10-16
15	16-21.5

The input coils may be retuned for frequencies moderately removed from the amateur bands. For frequencies far removed, it may be necessary to change the values of the capacitors in the input circuit.

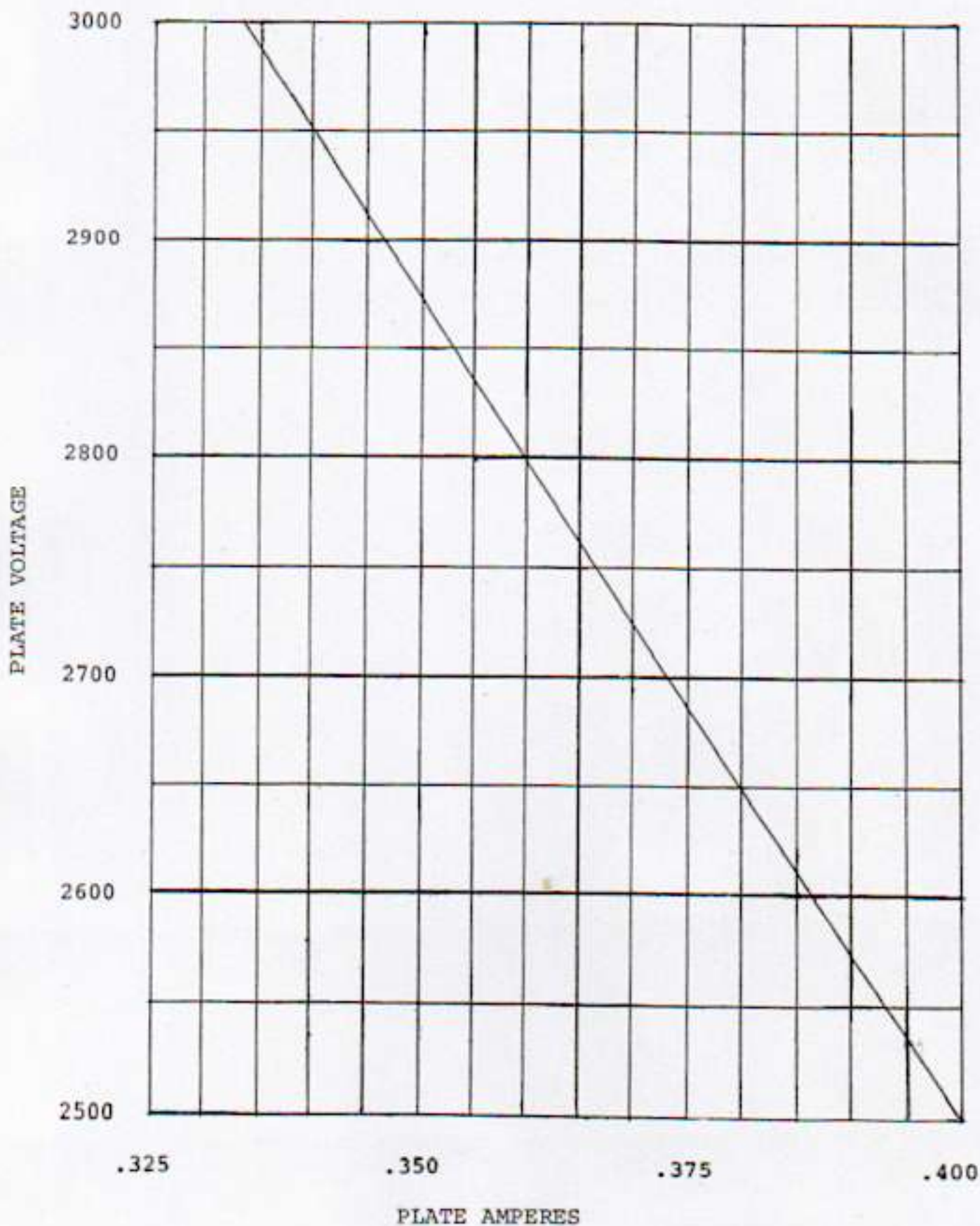


Figure 3-2 Plate Voltage Vs. Plate Current for 1000 Watts DC Input Power

CHAPTER 4

THEORY OF OPERATION

4-1. INPUT

Refer to the schematic diagram figure 5-4. The 50 ohm input is matched to the final amplifier cathode by a pi-network on each band which is selected by the input switch S1. The input switch is ganged to the plate circuit bandswitch S2. Negative feedback in the L75 Amplifier is obtained by slightly raising the grid above ground with capacitors C22, C24 and C26.

4-2. TRANSMITTING AGC

When the negative-going peak RF voltage from the capacitor divider C20 and C21 exceeds the positive bias set by R6, the transmitting AGC threshold control CR1, CR2 and CR3 conducts and a negative voltage proportional to the RF signal applied to the

input appears at the transmitting AGC output connector.

4-3. STANDBY CUTOFF BIAS

A positive voltage from the resistor divider R48, R51 and R52 in the Power Supply is applied to the cathode during standby which cuts off the plate current.

4-4. OUTPUT

The plate circuit is matched to the 50 ohm output by the adjustable pi-network consisting of L9, L10, L11, C32 and C38.

NOTES:

5-1. SERVICE DATA

Your L75 will be checked and aligned at the factory for a nominal fee if it has not been tampered with. Transportation charges are extra. Any necessary repairs will be made on a time and material basis. Please write or call the factory for authorization before returning your unit for alignment or service. Address your request for authorization to:

R. L. DRAKE COMPANY
540 Richard Street
Miamisburg, OH 45342
ATTN: Customer Service Department
Telephone: (Area Code 513) 866-3211

CAUTION

DO NOT ship the L75 with the tube or transformer installed. If the tube and/or transformer are in question remove them and repack them separately in their original shipping containers or obtain new containers from R. L. Drake Company at the address listed above. The R. L. Drake Company will not assume responsibility if the transportation company refuses to pay a damage claim due to improper packing or lack of insurance.

5-2. PARTS ORDERING

Replacements for any of the components used in the Amplifier may be ordered, at a nominal cost, from the factory at the address above. Parts orders should specify that the parts are for the L75, the serial number of the unit, schematic reference designation of the part, and value, tolerance and voltage rating, where applicable.

WARNING

DO NOT operate the L75 with the covers removed. DO NOT defeat the interlock. LETHAL VOLTAGE is present at various points inside the amplifier when the interlock is defeated.

Before disassembling or making any adjustments, unplug the amplifier from the AC power source and wait 2 minutes for the power supply filter capacitors to discharge before removing the cabinet. Disconnect all other connections to the amplifier. Remove the cabinet completely so that the interlock switch near the middle of the chassis engages properly. It is further suggested that the tube plate or the B+ terminal on the power supply filter board (see fig. 5-1) be shorted to ground with a heavy screwdriver (with an insulated handle) before work is begun. Touch the screwdriver blade to the side of the chassis *first* and then, with the blade still in contact with the chassis, move the blade tip into contact with the high voltage (B+) terminal.

5-3. AMPLIFIER DISASSEMBLY

The cabinet is secured by 6 screws, 3 on each side of the unit. Remove the screws and slide the cabinet off the back of the amplifier.

There are two easily removable plates on the bottom of the amplifier chassis. The rear plate (with vent slots) covers the power transformer primary jumper wires, tube socket and relay and can be removed by removing the 8 mounting screws.

The small plate underneath the bandswitch conceals the input matching network. Unscrew the two mounting screws to remove this plate.

The power supply filter and rectifier boards may be removed by unsoldering the various wires to the power supply filter and rectifier boards. Note the proper connection for each wire so that they may be reconnected to the same terminals. The power supply module may now be lifted out by removing the two mounting screws on the side of the chassis.

5-4. CLEANING

Since the amplifier compartment is forced-air cooled, it will collect particles of dust which must be

removed periodically. When the fan blade accumulates a large amount of dust, the amplifier should be cleaned. The best way to clean the amplifier is to remove the cabinet and blow the dust out with compressed air. If compressed air is not available, a small paint brush with soft bristles may be used to brush the interior clean.

5-5. TUBE REPLACEMENT

If it is necessary to replace the tube in the L75, use the same brand and type as the tube removed or it may be necessary to retune the input coils as described in paragraph 5-10.

5-6. TEST EQUIPMENT

The following list of test equipment represents the minimum required to test and align the L75.

- a. Ohmmeter
- b. 50 Ohm SWR Bridge or Directional Wattmeter, such as the R. L. Drake Model WH7.
- c. Standard Milliammeter (500 mA).
- d. Transmitter with variable output to 60 W CW.
- e. 50 ohm Dummy Load, such as R. L. Drake Model DL1000.
- f. 1-1/2 Volt Battery.
- g. 10 Ohm Potentiometer
- h. Small Screwdriver.

5-7. AMPLIFIER TROUBLESHOOTING

Careful consideration has been given to the design of the L75 to keep maintenance problems to a minimum. However, it is quite possible that some problem will arise which cannot be solved by tube substitution. If this occurs, we suggest that you return your unit to your dealer, or write directly to the R. L. Drake Company, Customer Service Department, describing your problem in detail. Include full information concerning external connections, control settings, associated equipment and antenna. Be sure to include the serial number of the amplifier.

The L75 Plate Voltage is typically about 2900 volts No Load and 2600 volts at .450 amps. Resting current is typically .120 amps. All voltages and currents bear a tolerance for tube and line voltage variations.

5-8. TUBE CHECK

A common failure in the final amplifier tube is a filament-to-grid short which is usually intermittent. This failure may be detected by the incidence of negative grid current (and usually some plate current) during standby. Check each suspect tube as follows:

- a. Observe WARNING in paragraph 5-2 and remove the tube.
- b. Attach an ohmmeter between the grid and filament of the tube to be tested. A good tube will indicate infinite resistance. A bad tube will indicate a short circuit. An intermittent tube will indicate a momentary short when tapped lightly.

5-9. ALIGNMENT PROCEDURES

Refer to figure 5-1 and 5-2 as required to locate the components requiring adjustment.

5-10. INPUT COIL ADJUSTMENT

The input coils may have to be retuned if the final amplifier tube is replaced with a type different from the tube removed. Also, they may have to be retuned if it is desired to operate the amplifier outside the amateur bands. To retune the input coils proceed as follows:

- a. Turn the L75 upside down and remove the small cover plate just behind the bandswitch that covers the input coils.
- b. Turn the amplifier back upright with the front projecting three inches off the edge of the table top so that you can access the input coil tuning slugs from underneath with a small screwdriver.
- c. Connect the RF input jack of the L75 through an SWR bridge or directional wattmeter to the exciter, and connect the VOX relay cable as shown in figure 2-5. Connect the RF output to a 50 Ohm Dummy Load.
- d. Plug the L75 into the AC power source and tune it up as described in section 3-3.
- e. Adjust the input coil for the band in use (see figure 5-1) for lowest input SWR as indicated by the SWR bridge.
- f. Repeat steps d and e for each band to be retuned.

NOTE

As shipped from the factory, the input coils are adjusted for the center of each band and are broad enough to cover the entire band.

- g. Turn off the amplifier, disconnect it from the power source, remove the SWR bridge and replace the cover on the amplifier before resuming operation.

5-11. METER ADJUSTMENT

To adjust the meter on the front panel of the L75 proceed as follows:

- a. Remove all connections to the amplifier.
- b. Observe the WARNING in Section 5-2.
- c. Take the cabinet off the L75 by removing the six screws that secure the cabinet on the bottom of the amplifier.
- d. The meter has a conventional zero-adjust screw on the lower face of the meter and may be set to zero with that screw. To access this screw, remove the meter by unscrewing the two mounting screws on each side of the meter.
- e. If resistor R54 is replaced, the grid current adjustment pot R53 will have to be calibrated as follows:
 1. Set the meter switch to GRID CURRENT.
 2. Make the connections shown in 5-3 and 5-1.
 3. Adjust the 10 ohm pot until the milliammeter indicates 300 mA.
 4. Adjust R53 until the Grid Current meter indicates .300 amperes.
 5. Disconnect the test network.
- f. If resistor R50 is replaced, the plate current adjustment pot R49 will have to be calibrated as follows:
 1. Set the meter switch to PLATE CURRENT.
 2. Make connections shown in 5-3 and 5-1.
 3. Adjust the 10 ohm pot until the milliammeter indicates 500 mA.

4. Adjust R49 until the plate current meter indicates .500 amperes.
5. Disconnect the test network.

5-12. KNOB POINTER ALIGNMENT

When replacing the knobs on the L75 amplifier, correct alignment of the PLATE control is important. All of the other controls have flats on the control shafts and the setscrews in the knobs should press against the flats. The PLATE control shaft should be rotated so that the plates of the variable capacitor are fully meshed, and the pointer should be resting in a nine-o'clock position at the end of the tuning arc.

5-13. POWER SUPPLY TROUBLESHOOTING

If the power supply fails to function, first check the fuse, and replace if necessary. If the fuse continues to blow, check for short circuits in the high voltage line. Especially be certain that the high voltage interlock in the amplifier is not shorting the high voltage as it is supposed to do when the top cover is taken off the amplifier. If the fuse has been blown because of a short in the high voltage line, a continuity check should be given to each silicon diode bank in the power supply to determine if either or both banks have failed. In the event of a short circuit, resistor R46 in the power supply will be destroyed. This resistor protects the diodes in the power supply and it should be replaced with an IRC 0.82 Ohm 2 Watt type BWH resistor ONLY. In the event of a difficulty we recommend that you return your unit to the dealer, or write directly to our Customer Service Department describing your problem in detail. Include full information concerning the circumstances during the failure, any measurements that were made and be sure to include the serial number.

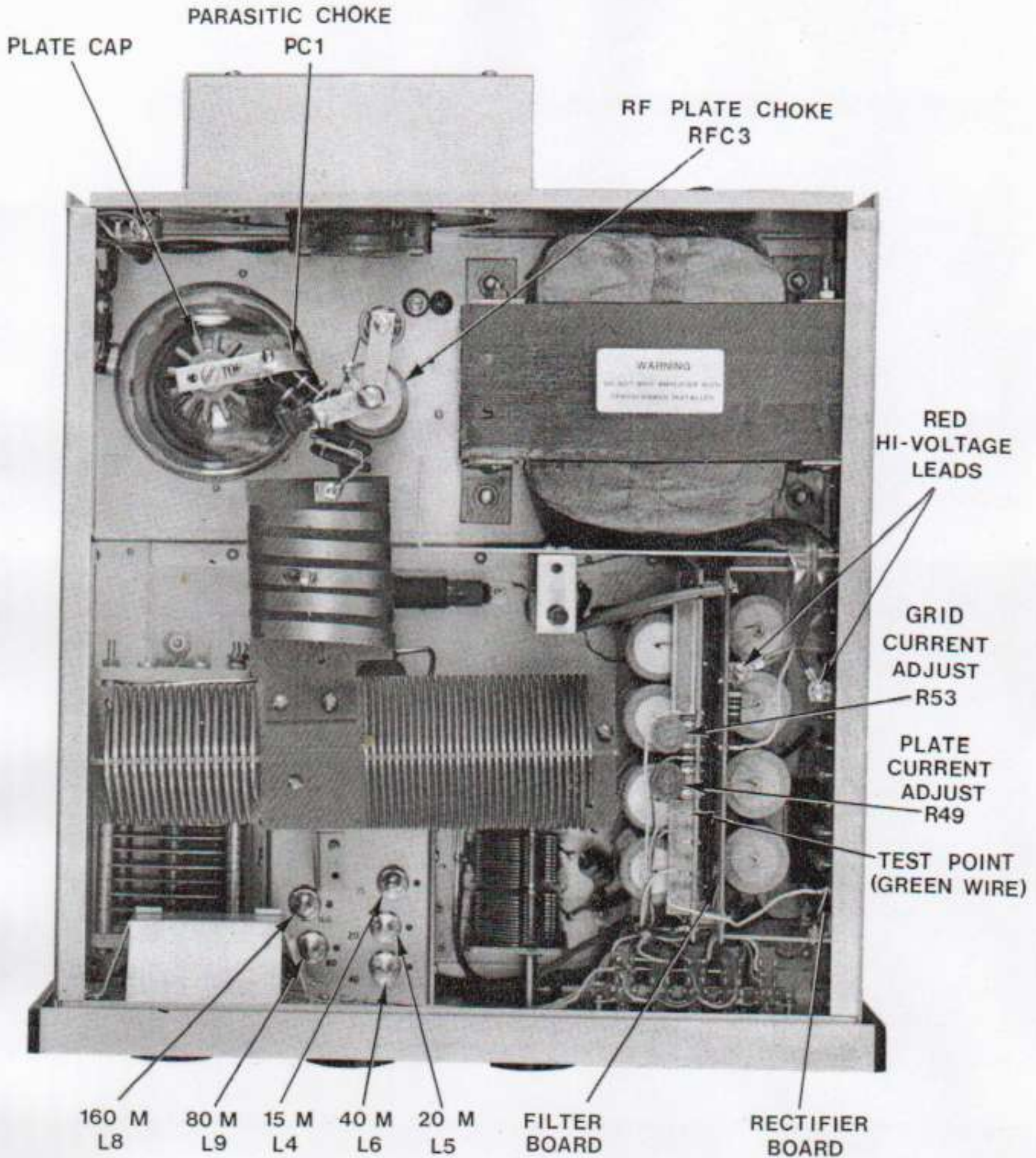


Figure 5-1 Component Locations, Top View

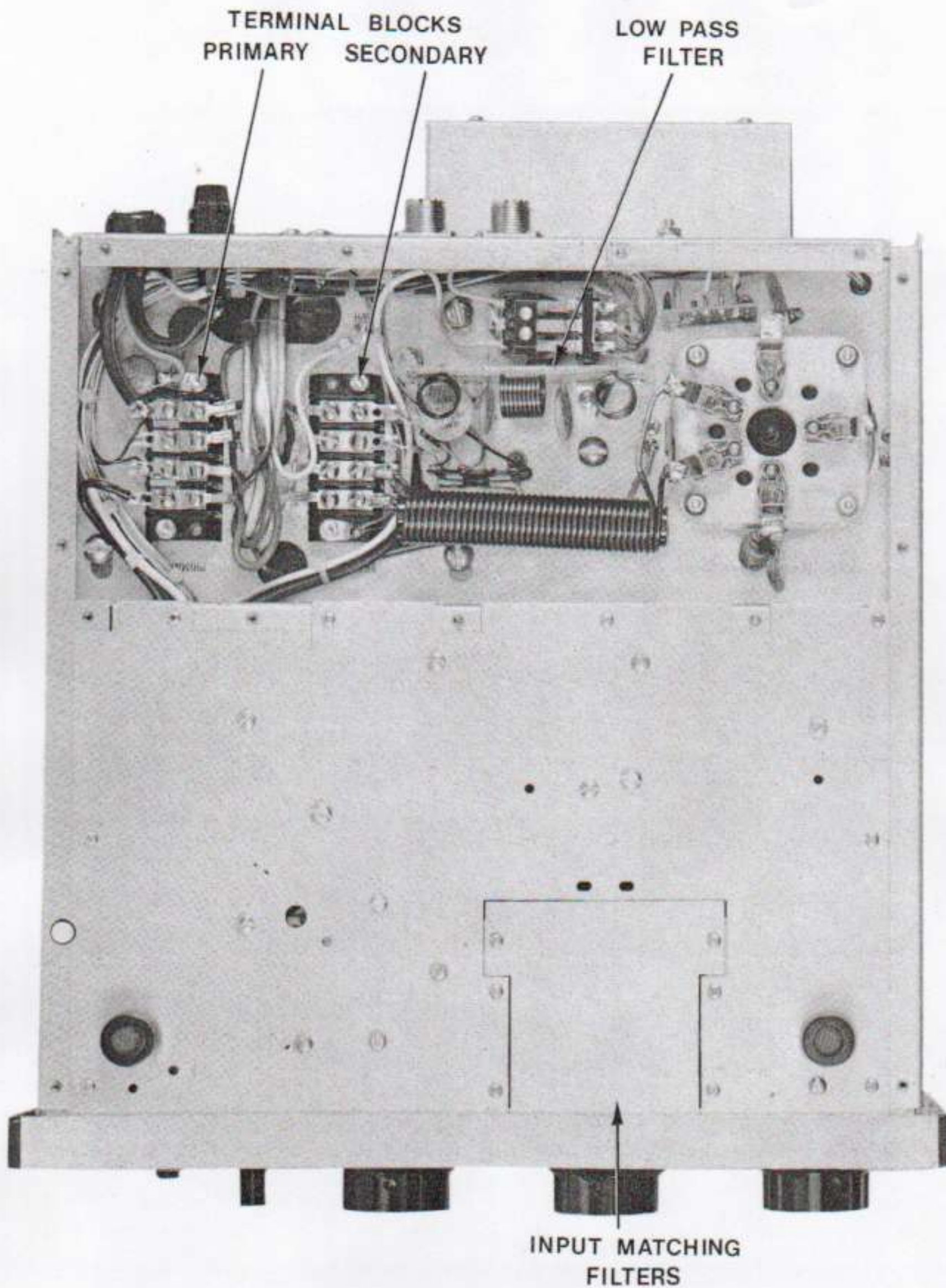
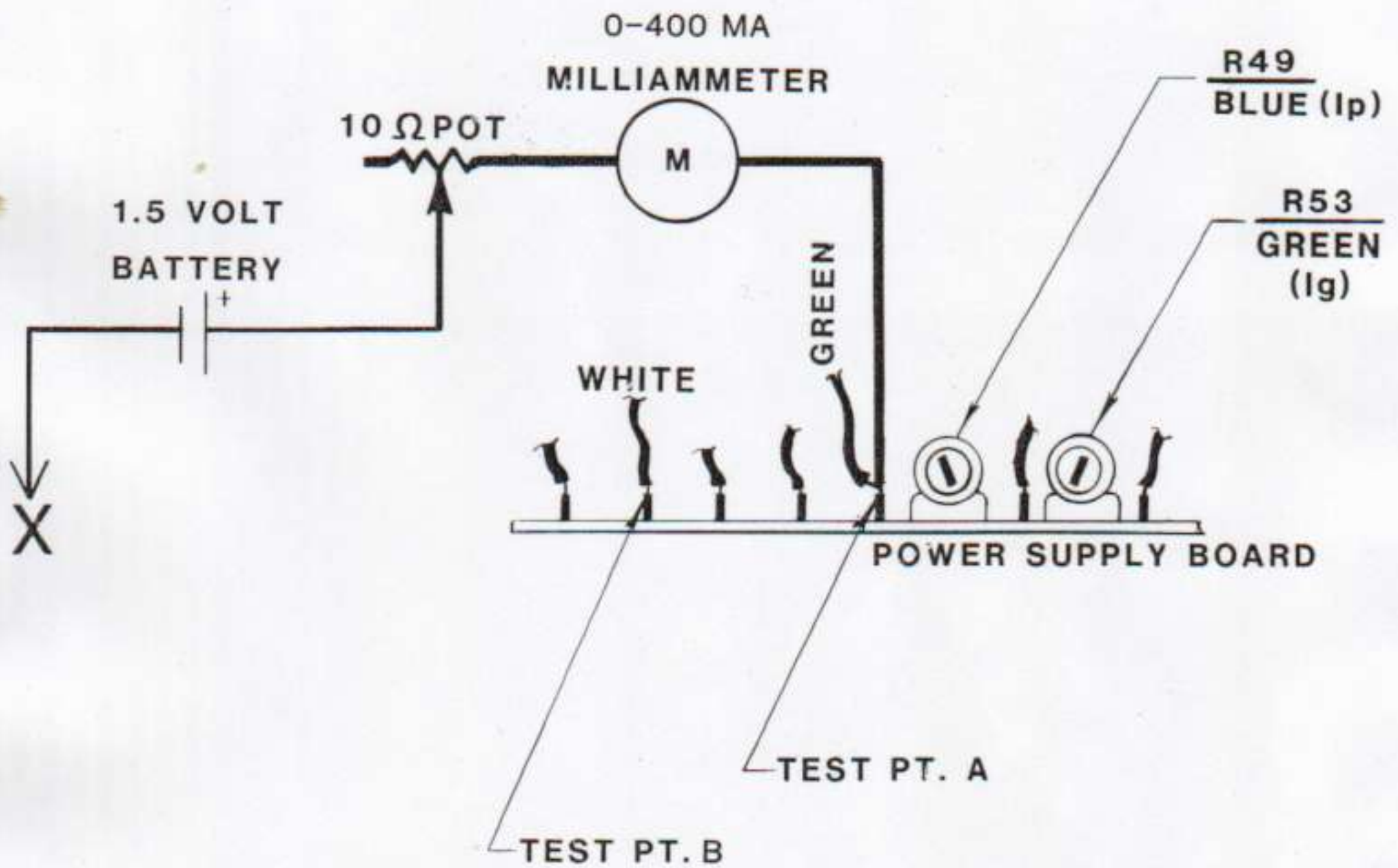
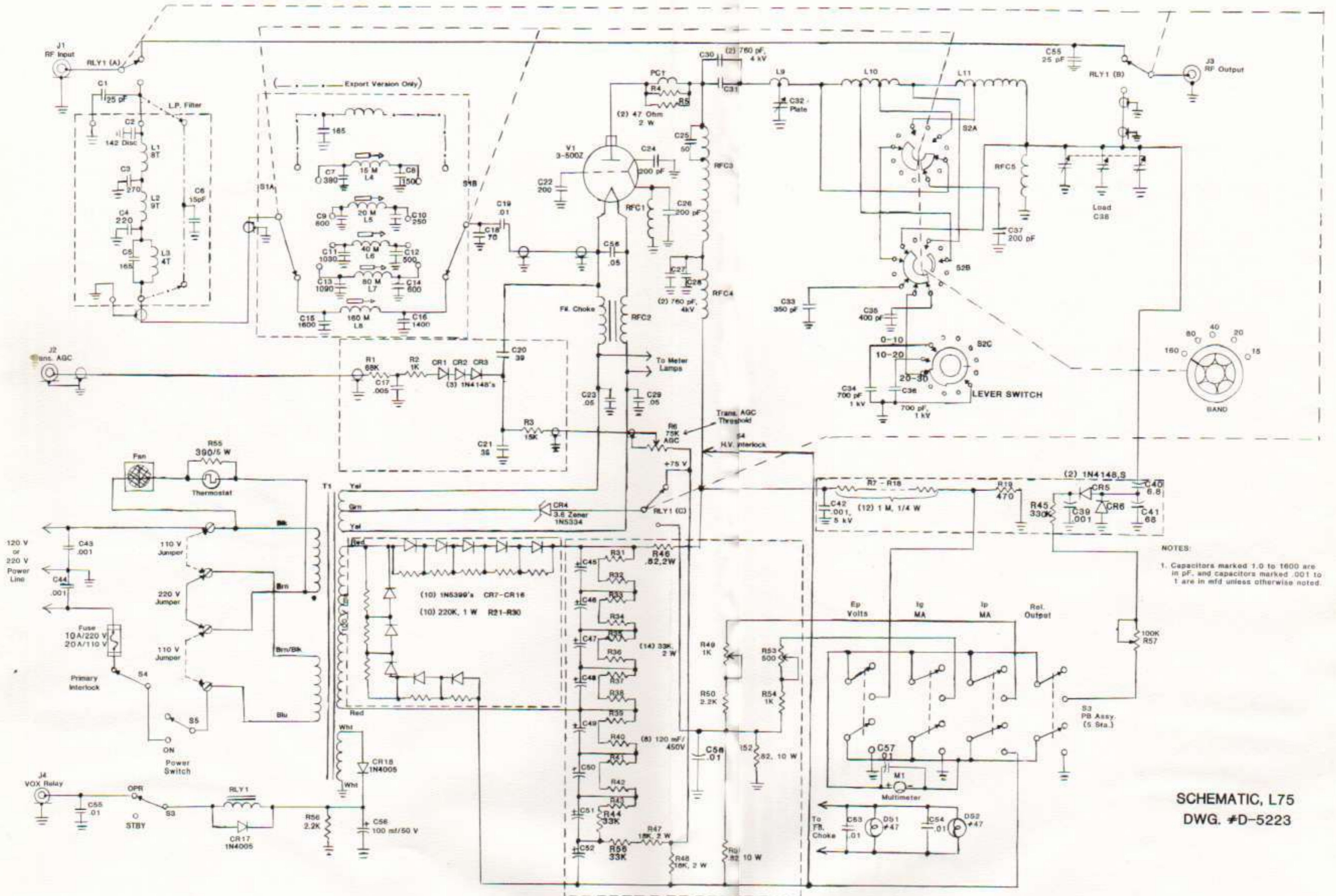


Figure 5-2 Component Locations, Bottom View



- 1) FOR GRID CURRENT ADJUST. CONNECT X TO L75 CHASSIS.
- 2) FOR PLATE CURRENT ADJUST. CONNECT X TO POINT B.

Figure 5-3 Connections for Grid and Plate Current Meter Calibration



NOTES:
 1. Capacitors marked 1.0 to 1600 are in pF, and capacitors marked .001 to 1 are in mfd unless otherwise noted.

SCHEMATIC, L75
 DWG. #D-5223