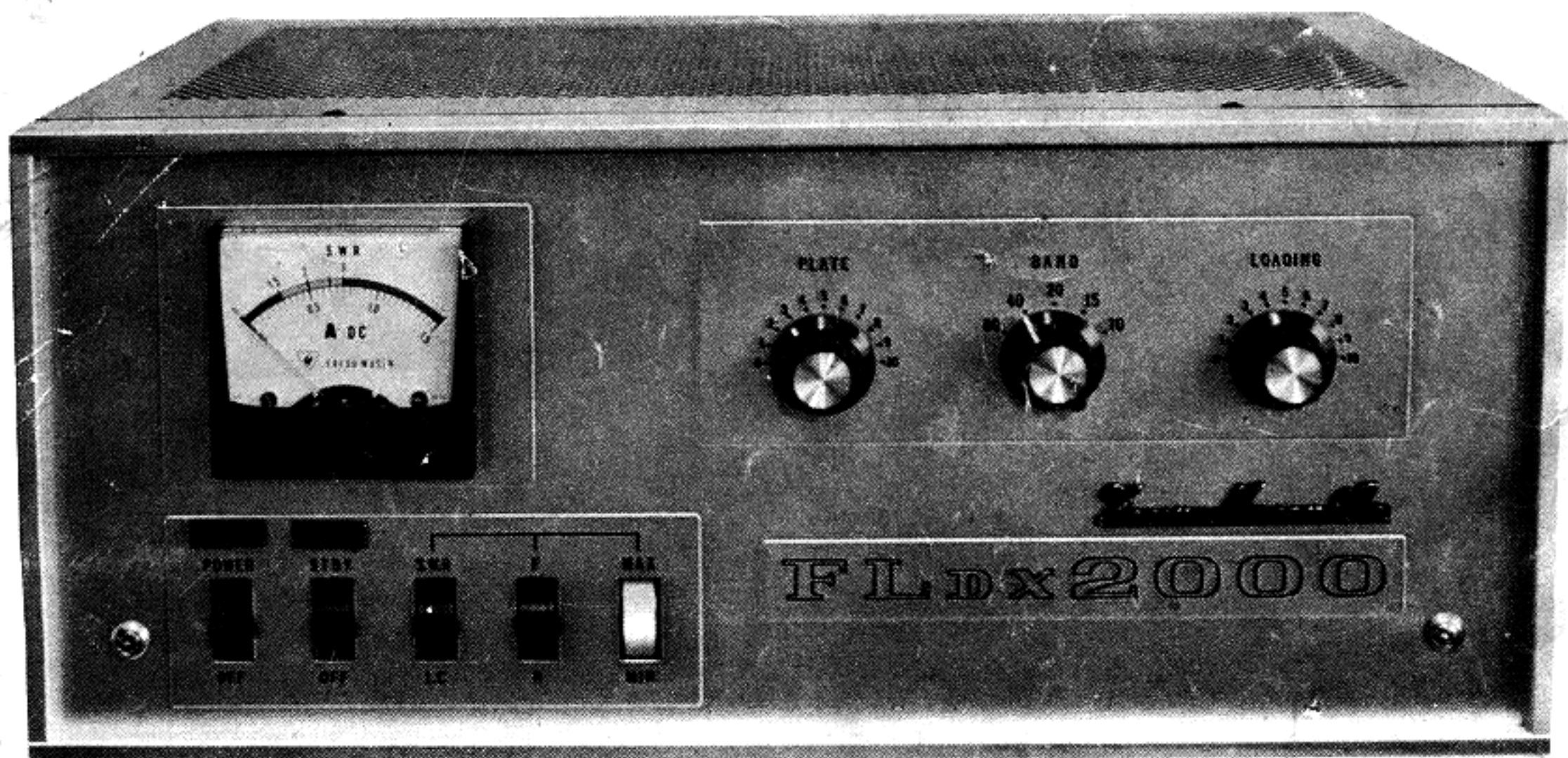


**INSTRUCTION
BOOK
for
FL-2000 LINEAR AMPLIFIER**



PARTS LIST

| PARTS NO. | PARTS |
|-----------|-------------------------------|
| C 1, 2 | Mica 70P 1.5KV |
| C 3 | " 5000P 2KV |
| C 4-9, 13 | Disc, 0.01, 500V |
| C 10, 12 | Mica, 0.005, 3KV |
| C 11 | " 500P, 3KV |
| C 14 | Paper, 0.05, 50V |
| C 15 | FM, 150P, 500V, $\pm 10\%$ |
| C 16 | " 10P " |
| C 17, 18 | Disc, 0.01, 1.5KV AC UL |
| C 19-26 | " 0.005, 1.5KV AC UL |
| C 27-29 | Electrolytic, 100U, 500V |
| C 30-31 | " 500U, 25V |
| C 32-33 | Disc, 0.01, 500V |
| R 1-4 | 56 ohms, 1 watt |
| R 5 | 10 K, 2 " |
| R 6 | 4.7K, 2 " |
| R 8-15 | 470K, $\frac{1}{2}$ " |
| R 16-18 | 270K, 2 " |
| R 19 | 3.3K, 2 " |
| R 20 | 100 ohms, 10 watt |
| R 21 | Meer shunt |
| VR 1 | Pot, 100K |
| VR 2-3 | " 500 ohms |
| VC 1 | Tuning Cap 270P |
| VC 2 | Loading Cap 430P x 2 |
| FAN 1 | Fun Motor, 2S-10-A |
| PL 1-2 | Lump, 12V |
| F-1 | Fuse 15A |
| T 1 | Transformer, SA3-10213 |
| T 2 | " SA3-10214 |
| D 1-2, 15 | Diode, 1S-1007 |
| D 3-10 | Silicon Diode, SA-2-C |
| D 11-14 | " " SD-1-Y |
| RL-1 | Relay, AR-42, 12V |
| M 1 | Meter, BW-22, S# OB1017YB67-5 |

INSTRUCTION BOOK

FOR

FL-2000 LINEAR AMPLIFIER

IMPORTANT

Do not operate this linear amplifier before getting complete understanding of this instruction book.

DANGER !

High voltage is used for plate supply. Check high voltage first with VTVM before opening shield cover on amplifier section.

FL-2000 Linear Amplifier is a desk top kilowatts SSB amplifier with builtin power supply. This amplifier is designed to match with our FL series SSB transmitters, however any SSB transmitters capable of power output of 30 to 100 watt can be used as an exciter without any modification.

SPECIFICATION

| | |
|---------------------|---|
| Circuit : | Grounded Grid, Class AB2. |
| Frequency range : | 80, 40, 20, 15, 10 meters amateur bands. |
| Power input : | 1,200 watts PEP maximum. |
| Plate voltage : | 1200 volts. DC. |
| Power requirement : | AC. 100/110/200/220 volts. 50/60 cps. |
| Driving power : | 30 to 100 watts PEP. |
| Impedance : | Input Approx. 50 ohms, output 50-100 ohms. |
| Tube and Diode : | 4-6KD6s, 8-8SLs, 4-5SD-1s, 3-1S-1007s. |
| Cooling : | Forced air cooling. |
| Size : | 6 5/16" high, 14 9/16" wide, 11 7/16" deep. |
| Weight : | 20 Kgs. Approx. |

CIRCUIT DESCRIPTION

(1) INPUT CIRCUIT :

Driving voltage from an exciter is applied to the cathodes of parallel connected 6KD6s through a low pass filter of which input impedance is approximately 50 ohms. The cut-off frequency of the filter is around 35 Mc. Input circuit is directly connected to the output circuit through a relay for receiving period or for barefoot operation.

(2) AMPLIFIER CIRCUIT :

Four 6KD6s are connected in parallel, and its screen grids are directly grounded to the chassis. The bias voltage (-11 volts approx.) is applied to the control grids to set idle current at 50 MA in total. In receiving, -18 volts is applied to the control grids to cut-off the tubes. Heater voltage is applied through choke coils to isolate the cathodes from the ground. Two 6KD6s are connected in series for 12 volts connection.

(3) OUTPUT CIRCUIT :

The plates of 6KD6s are connected all together through a plastic suppressor choke coil and coupled to PI network through a coupling condenser. Output impedance of the PI network is adjustable from 50 to 100 ohms to match average commercial feeder impedance. A SWR (standing wave ratio) meter is circuited between PI network and antenna relay.

(4) ALC CIRCUIT :

A part of the driving RF voltage is rectified for ALC (Automatic Level Control) voltage. A silicon rectifier 1S-1007 is so biased that ALC voltage is developed whenever input voltage becomes higher than this bias voltage. It is not necessary to adopt this ALC system to the exciter which has built-in ALC circuit.

(5) POWER SUPPLY :

Separate transformers are used for heater and plate supply. Both transformers have two primary windings for 100 volts and 200 volts operation. 8 silicon diodes 8SLs are connected in bridge circuit to deliver 1200 volts DC for the plate. Three 100uF 500V capacitors are used in series for filter. Secondary voltage of heater transformer is 13 volts and voltage drop in heater choke is approximately 1 volt. This heater voltage is also used for bias and relay with bridge connected four SD-1s. When a tap for 440 volts AC is used, the plate voltage become to 600 volts D.C. and then maximum plate input is 500 watts. PEP.

(6) METER CIRCUIT :

1 MA meter is used to measure plate current and standing wave ratio. Shunt resistors are used to measure plate current at 1.5A full scale. For standing wave ratio reading, a potentiometer is used to adjust the sensitivity of the meter, from the front panel.

OPERATION

It will be assumed all connections are in place as illustrated. Do not forget to connect dummy load to out put connector of the linear amplifier.

(1) Set power switch of the FL-2000 to OFF position. Set the BAND switch at desired band and TUNING AND LOADING as follows :

| BAND | TUNING | LOADING |
|------|--------|---------|
| 80 | 1 | 2 |
| 40 | 4 | 4 |
| 20 | 7 | 4 |
| 15 | 9 | 4 |
| 10 | 10 | 5 |

Adjust your exciter on desired frequency in CW mode. Dummy load will show power output. Put operation switch of exciter to STBY and carrier potentiometer to OFF position.

(2) Turn on power switch of FL-2000 and wait for few minutes till 6KD6s are fully heated. Set meter switch to IC position. Set STBY switch to STBY position. When the relay terminal is connected to the ground through the relay contacts of the exciter, the meter shows 0.05A idle current. Increase the carrier level of the exciter until IC of FL-2000 shows 0.3A. Tune PLATE tuning promptly to find IC dip point.

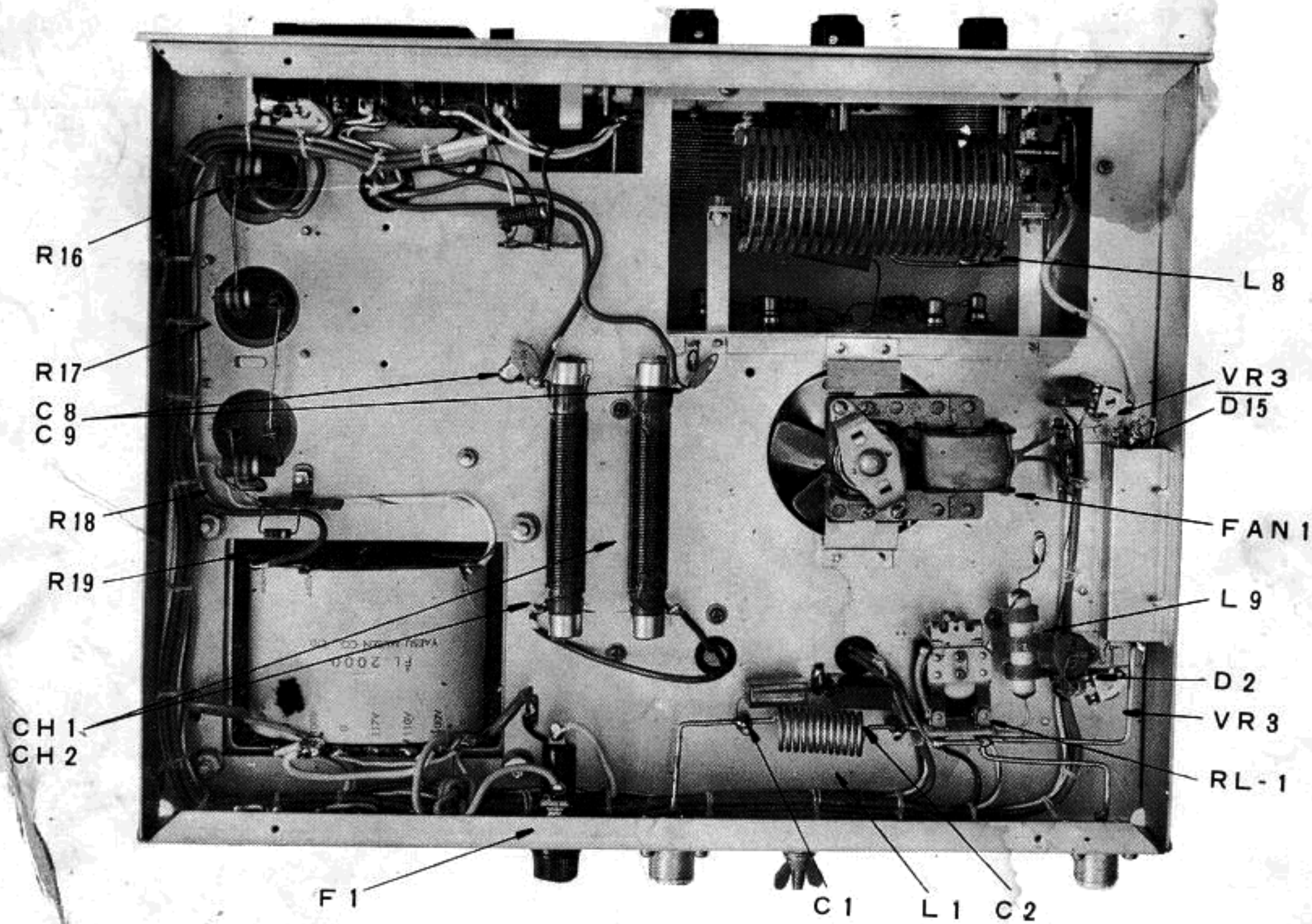
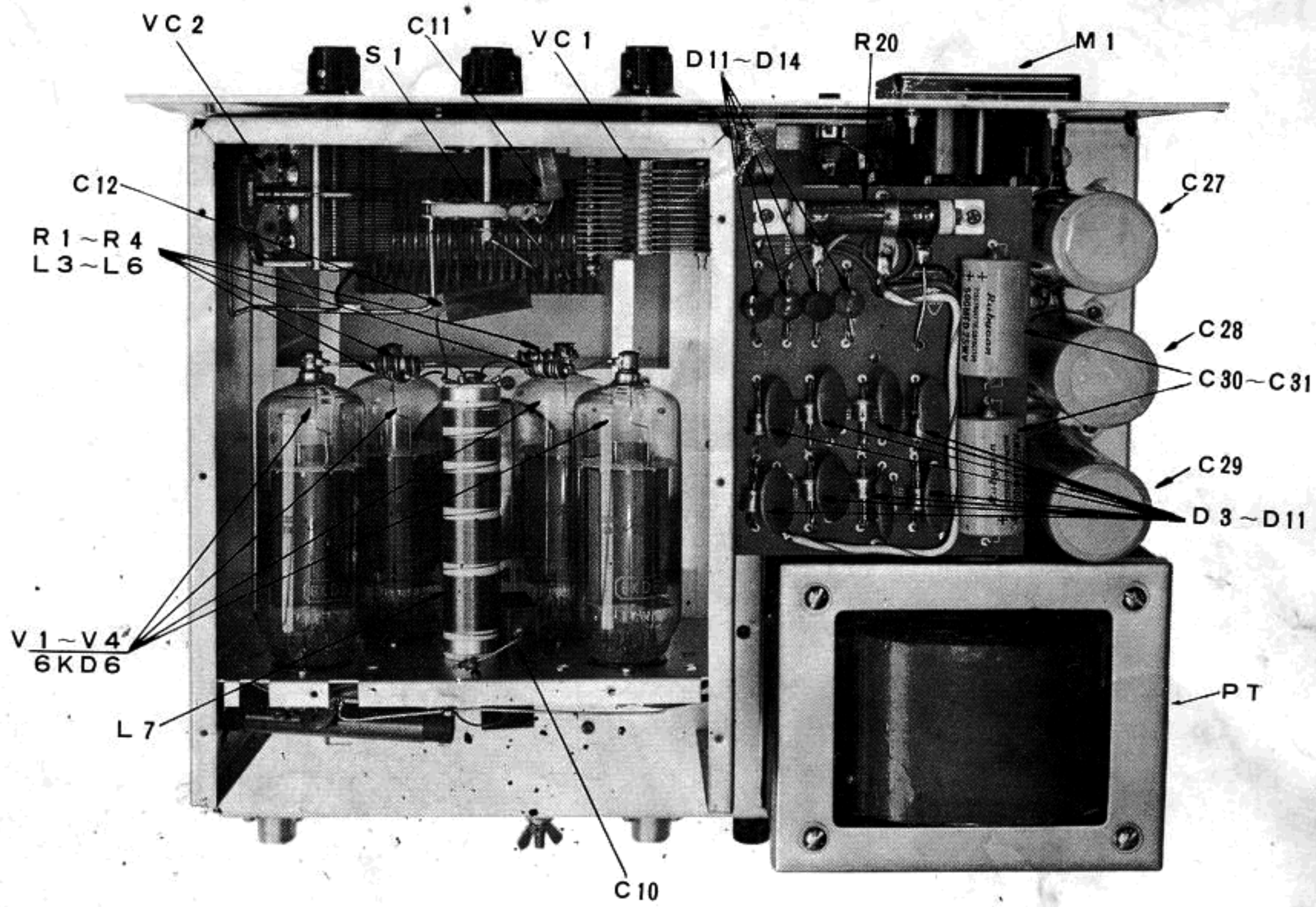
Do not exceed IC more than 0.3A at any time during adjustment. Change meter switch from IC to SWR and F position and adjust TUNING and LOADING for maximum meter reading. Adjust meter sensitivity in the case of over scale. During these adjustment, do not apply driving continuously. Turn F/R switch to R position which shows reflecting current which must be kept in minimum. Change dummy load to antenna and repeat this procedure to get perfect match.

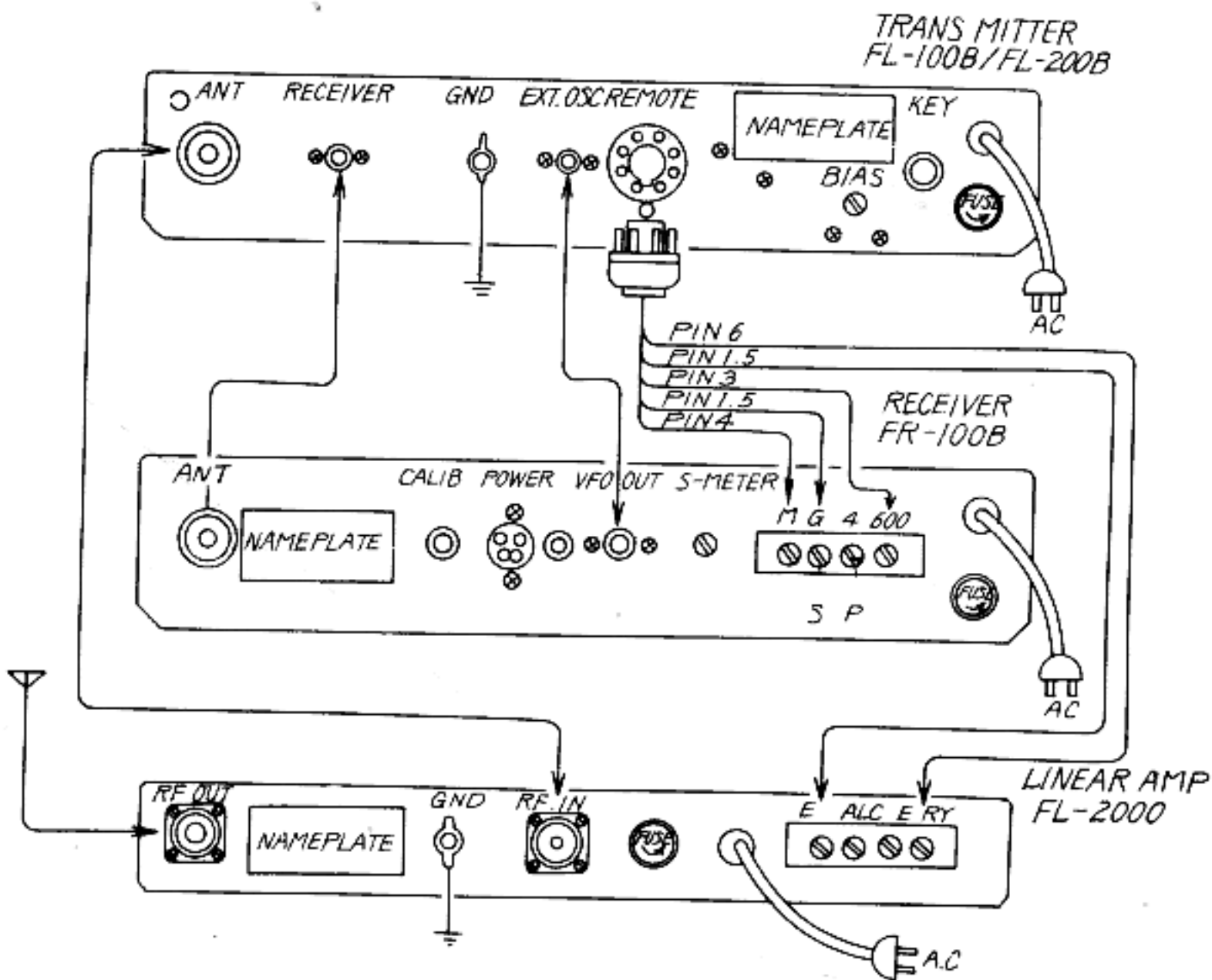
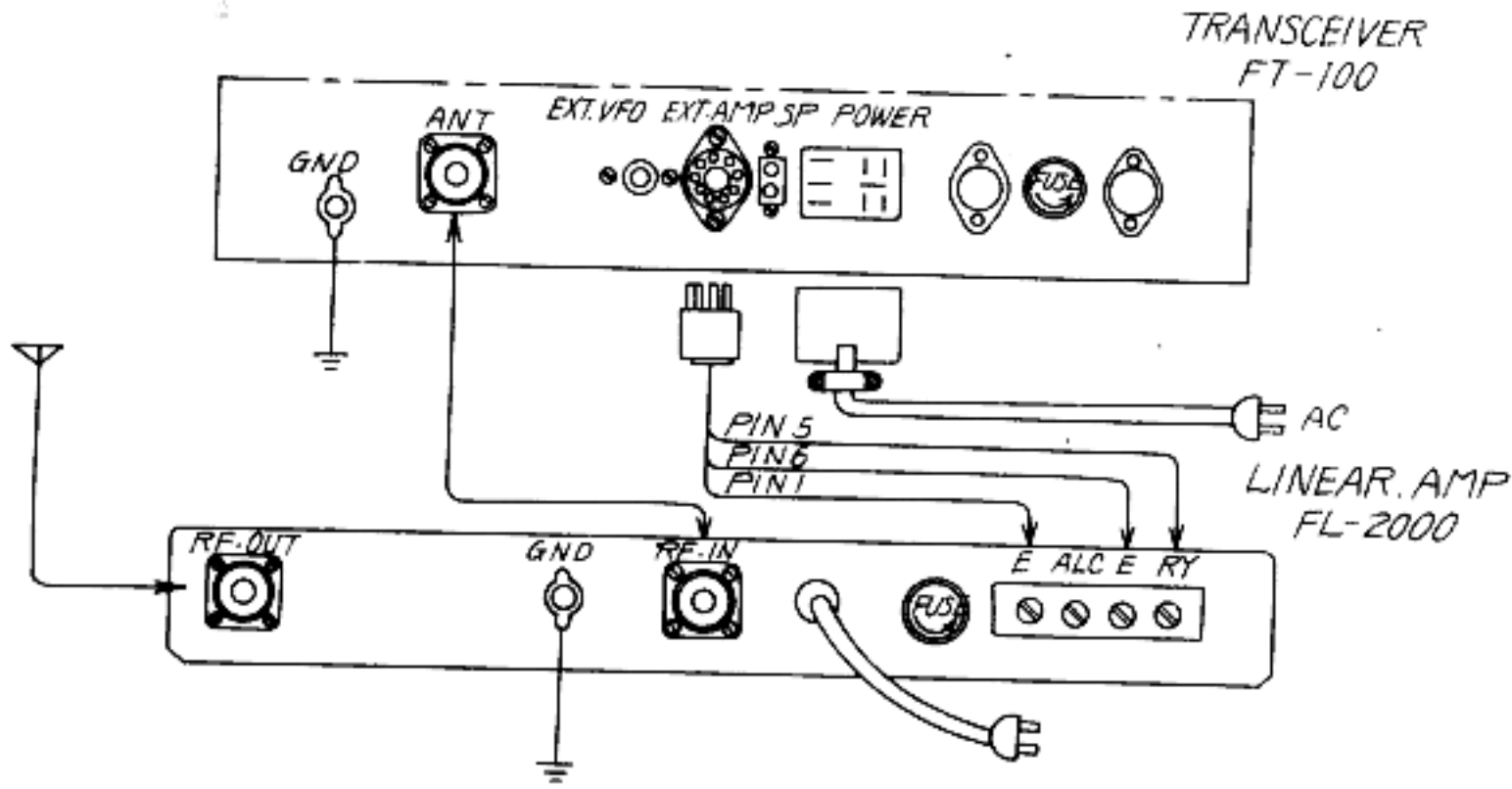
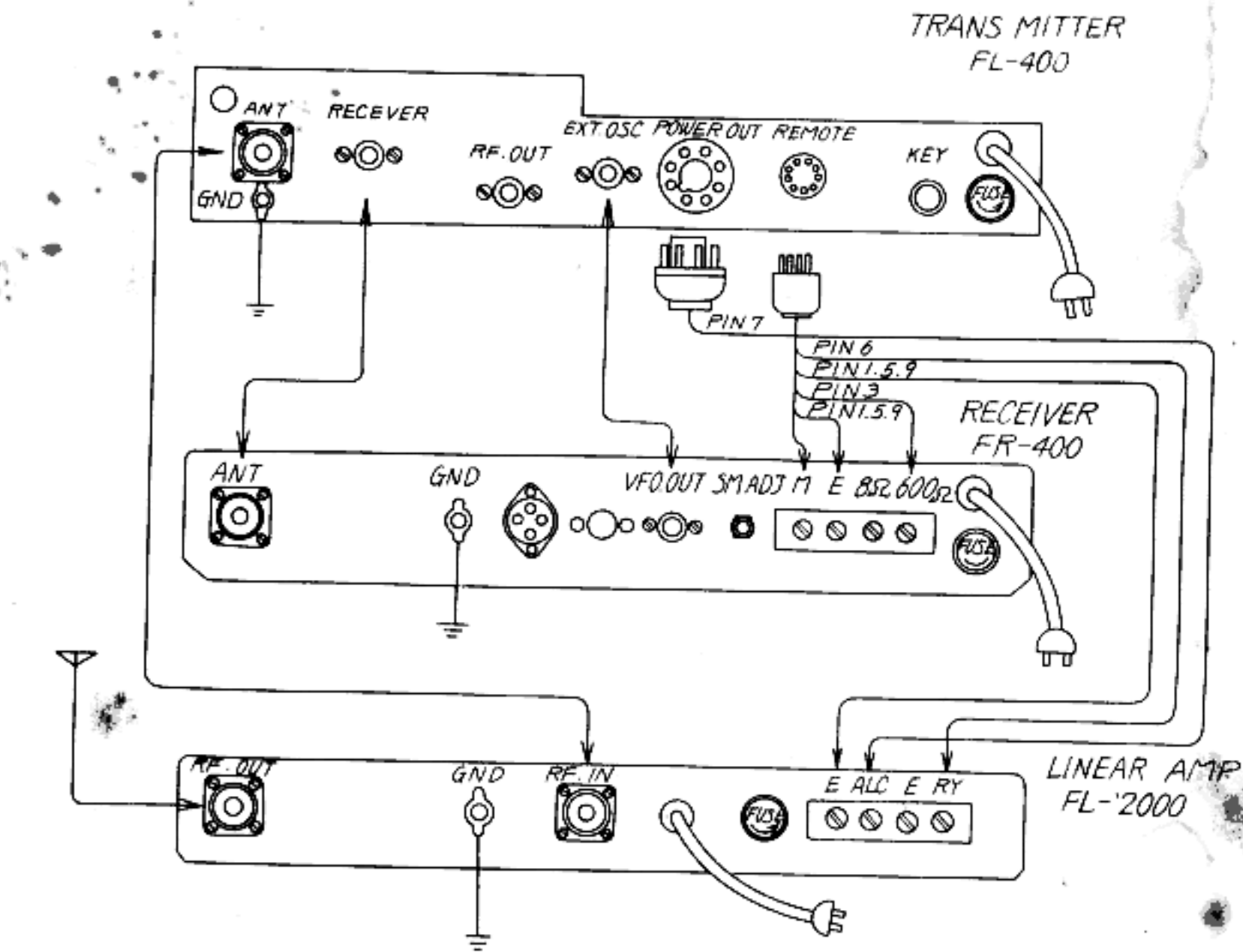
For CW operation, maximum IC is around 1A, and maximum input is approximately 1200 watts PEP. Do not exceed this value in any case.

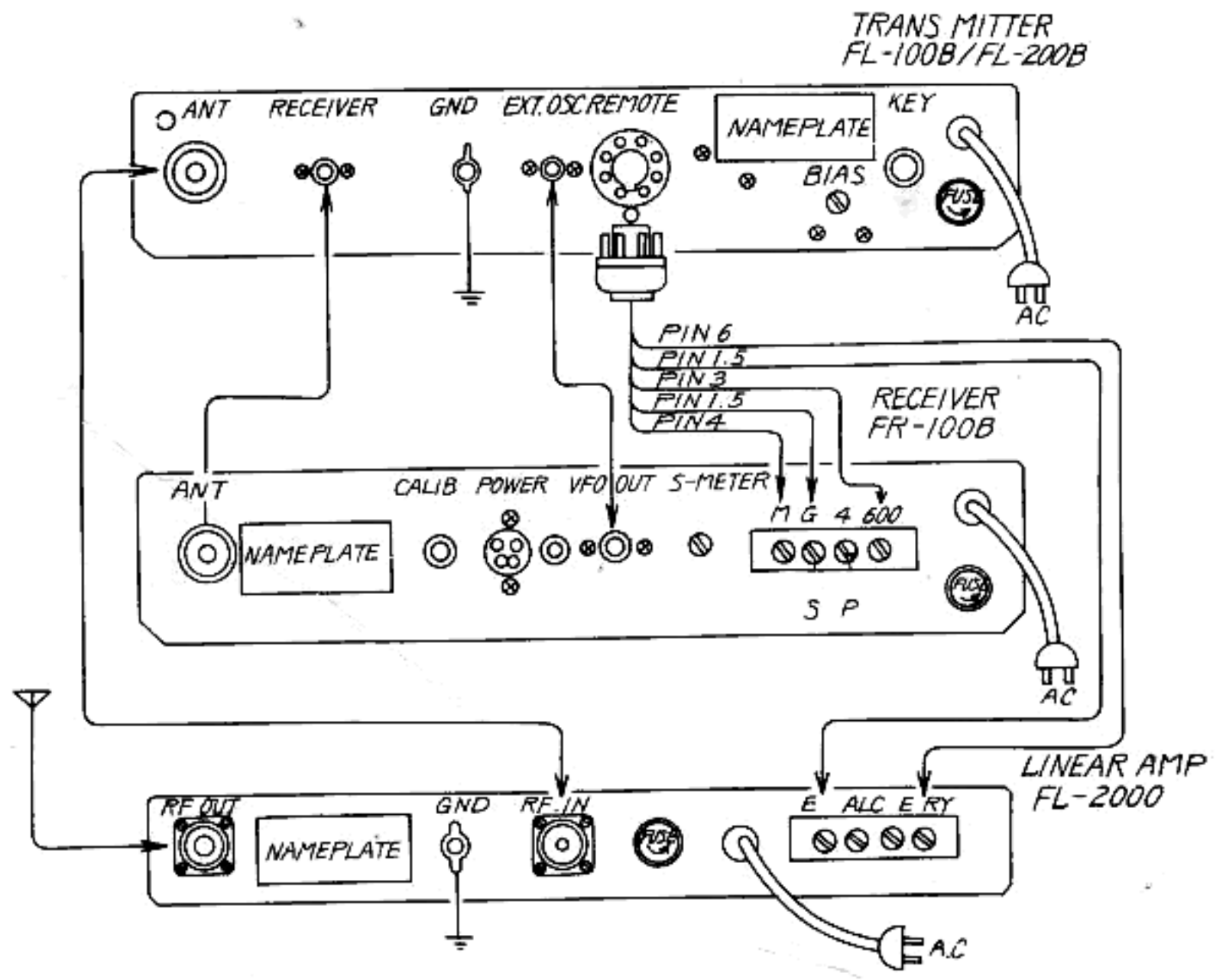
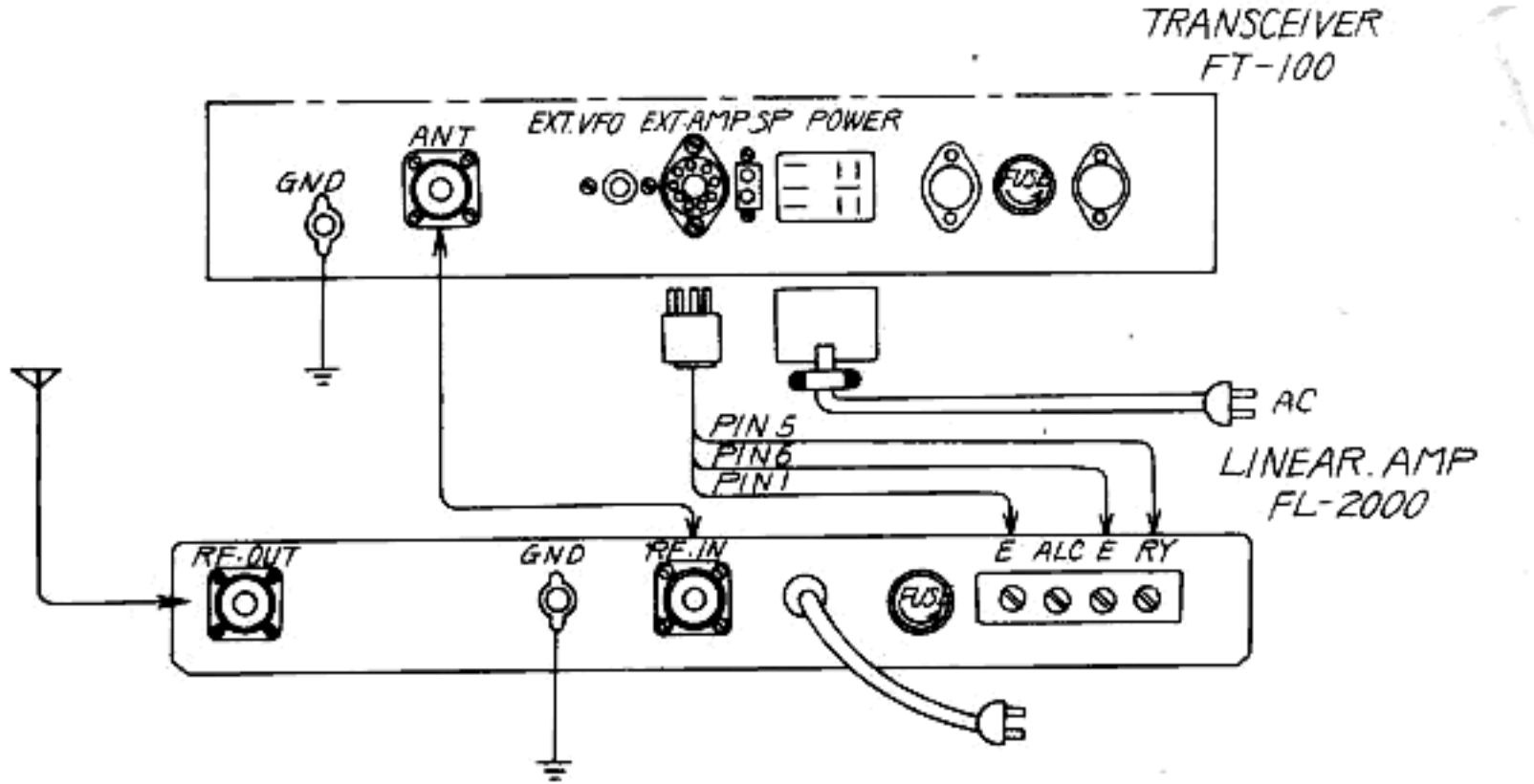
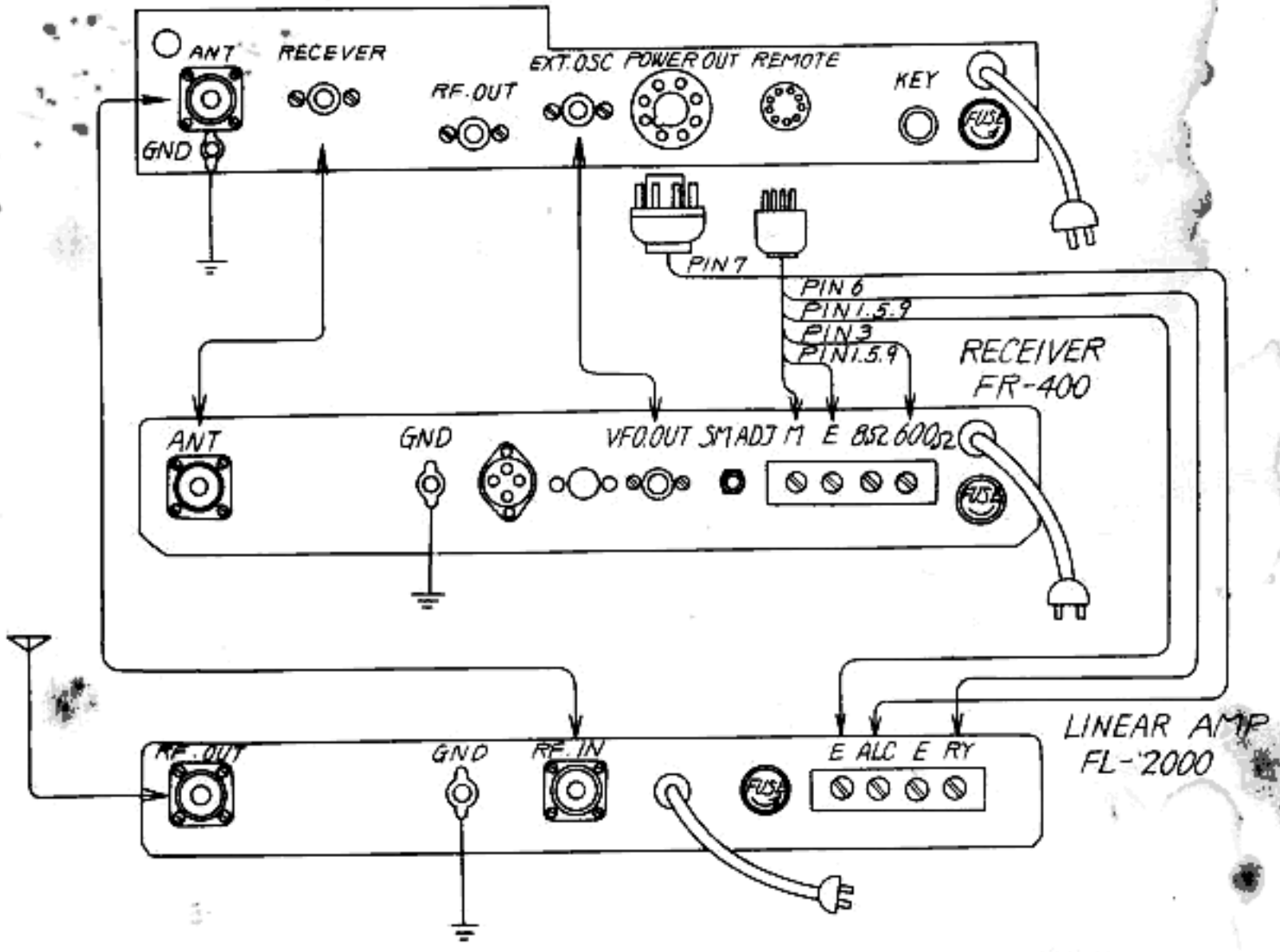
For SSB operation, maximum IC measured with two tone test signal is approximately 0.9A, that is to say power input is approximately 1200 watts PEP. Normally speaking into microphone plate current only shows 0.4-0.5A for maximum input because the meter can not respond to peak current. This equipment is not recommended to use for AM operation, because continuous plate current should be held under 0.2A, and plate input is only 200 watts at maximum for AM.

For bare-foot operation (exciter only), just turn off oper switch of FL-2000, then an antenna is automatically connected to the exciter without changing feeder etc....

IMPORTANT : DO NOT OPERATE THIS LINEAR AMPLIFIER AT FULL DC INPUT CONTINUOUSLY MORE THAN THREE SECONDS.



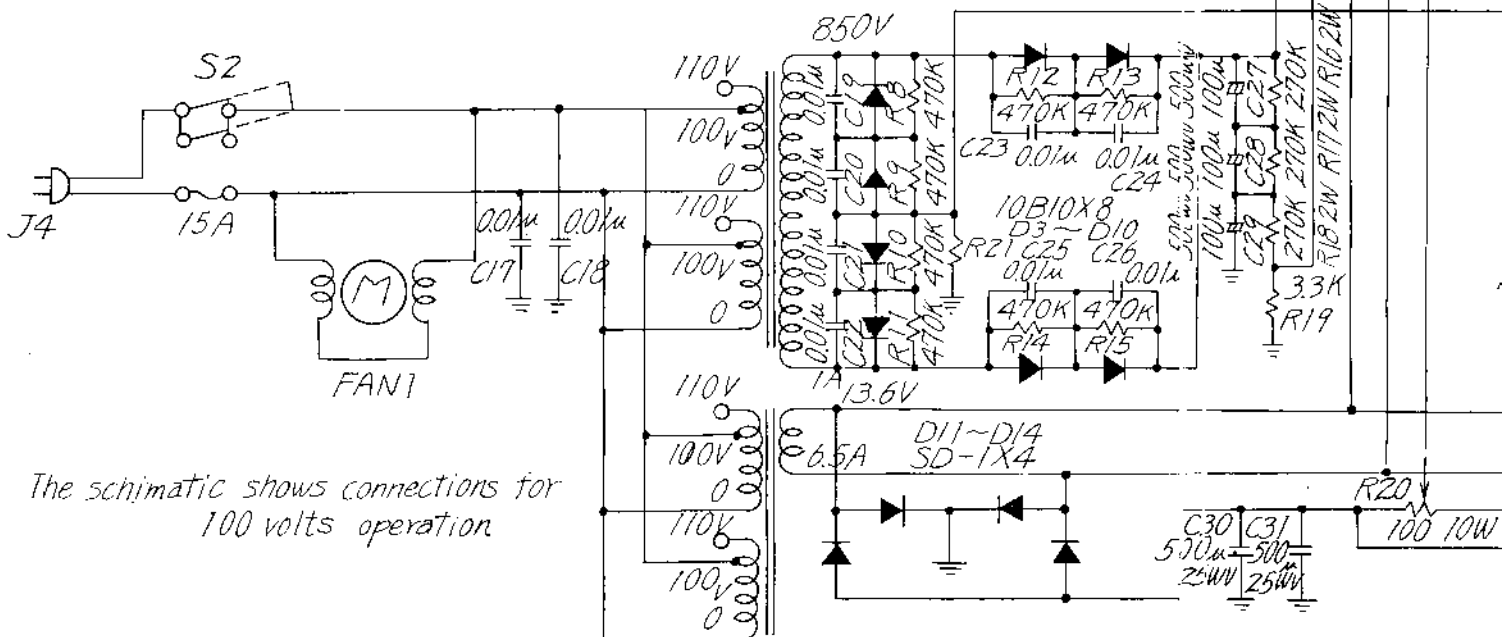
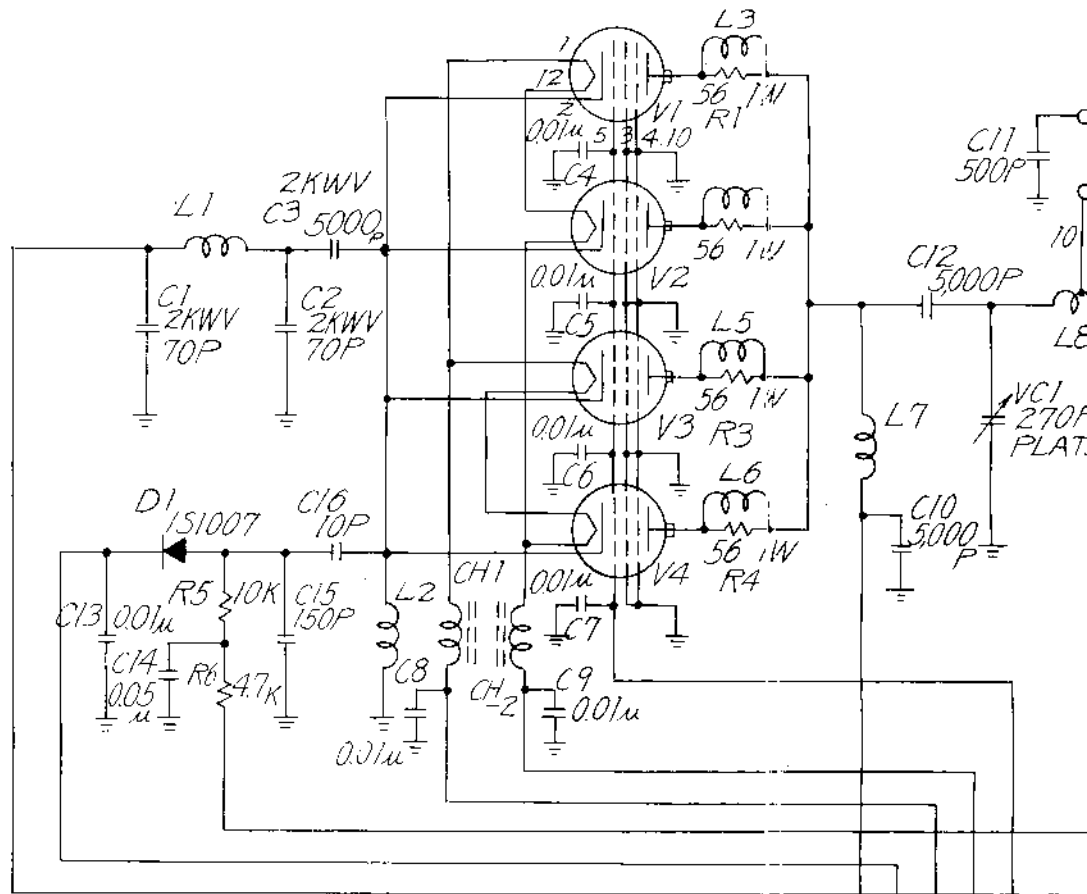
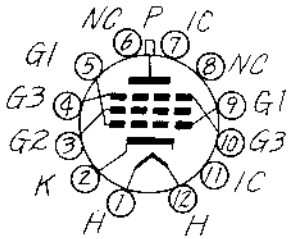




VI~V4 6KD6X4

6KD6

BASE CONNECTION



The schimatic shows connections for 100 volts operation

V1~V4 6KD6X4

