

INSTRUCTION BOOK
FOR
FL-1000 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-1000 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.

SPECIFICATIONS

Circuit	Grounded Grid, Class AB2.
Frequency range	80, 40, 20, 15, 10 meters amateur bands.
Power input	960 watts PEP maximum.
Plate voltage	850 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 - 6J86As, 8 - 8SLs, 4 - 9GU5, 2 - 1S-1007s.
Cooling	Forced air cooling.
Size	7-1/8" high, 15" wide, 11-3/4" deep.
Weight	20 Kgs. Approx.

CIRCUIT DESCRIPTION

(1) INPUT CIRCUIT:

Driving voltage from an exciter is applied to the cathodes of parallel connected 6JS6As through a low pass filter of which impedance is approximately 50 ohms. The cut-off frequency of the filter is around 39 Mc. Input circuit is directly connected to the output circuit through a relay for receiving period or for bare-foot operation.

(2) AMPLIFIER CIRCUIT:

Four 6JS6As are connected in parallel, and its screen grids are directly grounded to the chassis. The bias voltage (- 7 volts approx.) is applied to the control grids to set idle current at 100 mA in total. In receiving, -17 volts is applied to the control grids to cut-off the tubes. Heater voltage is applied through choke coil to isolate the cathodes from the ground. Two 6JS6As are connected in series for 12 volts connection.

(3) OUTPUT CIRCUIT:

The plates of 6JS6As are connected all together through a helastic 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. The RF output voltage is divided by resistors and rectified to measure relative output power.

(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. The bias voltage which determines ALC start point is adjusted by a potentiometer on rear apron of the chassis. 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 381S are connected in bridge circuit to deliver 850 volts DC. for the plate. Two 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 5G6s.

(6) METER CIRCUIT:

1 MA meter is used to measure grid current, plate current and relative power output. Shunt resistors are used to measure grid and plate current at 1.5 A full scale. For relative power output reading, a potentiometer is used to adjust the sensitivity of the meter.

OPERATION

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

(1) Set power switch of the PL-1000 to OFF position. Set the BAND switch at desired band and TUNING AND LOADING as follows:

BAND	TUNING	LOADING
30	2	5
40	4	2.5
20	6	4
15	8	5
10	9	6

Adjust your exciter on desired frequency in CW mode. Dummy load will show power output. Put operation switch to SSB.

(2) Put on power switch of PL-1000 and wait for few minutes till 630As are fully heated. Turn off carrier insertion potentiometer of the exciter. Set meter switch to IC position. Put the operation switch of the exciter to CW and increase carrier insertion till IC shows 0.4 A. Tune TUNING knob promptly to find IC dia point.

Do not exceed IC more than 0.4 A at any time during adjustment. Change meter switch from IC to PO 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. 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 800 watts DC.

For SSB operation, maximum IC measured with two tone test signal is approximately 0.7 A, that is to say power input is approximately 960 watts PEP.

For AM operation, continuous plate current should be held under 0.4A. Plate input is 350 watts at maximum for AM.

IG is around 100 MA at maximum driving power.

For bare-foot operation (exciter only), just turn off power switch of M-1000, then an antenna is automatically connected to the exciter without changing feeder etc..

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





