

**INTRODUCTION**

This manual has been reproduced by James Lawrence, NA5RC, a 600L owner. Text no longer applicable such as 'insurance claim with the carrier' has been deleted. Some capitalization and grammar has been changed where appropriate. A rear layout has been added.

**Table of Contents**

INTRODUCTION.....	1
INSTALLATION INSTRUCTIONS.....	2
RF Input.....	2
Antenna.....	2
TR Switch.....	2
External Blocking Bias.....	2
Internal Keying Bias.....	3
Power Source.....	3
Adjust No-Signal Dissipation.....	3
OPERATION.....	3
Single Side Band (SSB).....	3
Amplitude Modulation (AM).....	3
Phase Modulation (PM or FM).....	3
RF Amp Meter Scale.....	3
Reflected Power Meter Scale.....	4
TVI.....	4
Plate Overload.....	4
Load Mismatch Breaker.....	4
SAFETY.....	4
APPENDIX.....	5
Rear Layout.....	5

## INSTALLATION INSTRUCTIONS

The 600L is shipped ready to connect and operate.

### RF Input

Use 52-Ohm coaxial cable with a minimum length of six (6) feet. This is necessary to allow full drive to be supplied by the exciter on 10 meters. The input shows the exciter a 52-Ohm essentially resistive load; therefore additional swamping is not required. The maximum input to be applied to the 600L should not exceed 30-Volts or 20-Watts RMS.

### Antenna

Use a 52 or 72 Ohm coax antenna system for design center results. The unit will deliver maximum undistorted output into unbalanced 25 to 100 Ohm loads. For best results the SWR should not exceed 2:1. The 600L will work with higher standing wave ratios, however it is to your advantage to provide the best possible match between your antenna and its feed line. This will radiate the maximum amount of signal. Antenna reactance cannot be tuned out at the transmitter even with a Pi network; it must be tuned out by adjusting the antenna length. Balanced open-wire and ribbon-feed lines should be connected through suitable antenna tuners or BalUn coils.

### TR Switch

A connector is provided on the 600L that is essentially in parallel with the antenna. The shortest practical coax cable should be used to connect the TR Switch. When a TR Switch is used, it is necessary to block bias the 600L to prevent tube noise on frequency.

### External Blocking Bias

All Multiphase Exciters provide 100-Volts of negative blocking bias during standby. It is recommended that the 600L be block biased during standby to prevent tube noise on frequency and/or to reduce plate dissipation.

The following is recommended for use with a TR Switch or Antenna Relay:

- Remove the protective cover over the bias interlock terminals on the 600L. Note: The 4-prong socket is a duplicate of the screwdriver terminals.
- Remove the jumper between #3 and #4.
- Connect ground terminal #5 on the exciter<sup>1</sup> to #4 on the 600L.
- Connect blocking terminal #7 on the exciter to #3 on the 600L.
- When the TR switch is used, the jumper between #6 and #7 on the Multiphase Exciter remains.
- When an antenna relay is used, the exciter bias interlock jumper #6 and #7 is replaced with a pair of contacts on the antenna relay arranged to close during transmit and open during standby.

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<sup>1</sup> “exciter” refers to a Central Electronics Multiphase Exciter.

### Internal Keying Bias

When using a non-CE exciter that does not furnish blocking bias, the 600L internal keying bias can be utilized. The jumper on bias terminals #1 and #2 should be replaced by a pair of contacts on the exciter that will close during transmit and open during standby.

### Power Source

The 600L is designed to use 115-Volt, 50-60 cycle AC mains. Power circuit wiring should have 14G minimum conductor size<sup>2</sup> to prevent loss of power and poor line regulation. Cheap light-gauge extensions must be avoided.

### Adjust No-Signal Dissipation

1. Connect the power cord to a nominal 115V, 50-60 Hz outlet
2. Turn **Filament Switch** on and allow several minutes for the mercury in the 816 rectifiers to vaporize
3. **Meter Switch** to Watts Position
4. Turn **Plate Switch** on
5. Adjust **Screen Voltage Control** on rear to 70-Watts input with no signal applied
6. If blocking bias is used, the exciter will have to be on **Manual** or in a **Transmit** condition to read **Watts Input**

## OPERATION

### Single Side Band (SSB)

Apply some carrier and tune exciter for maximum output. Remove carrier and modulate. The meter should average between 300 and 400 Watts input. At this input the voice peaks will reach the maximum undistorted design center of 600-Watts. Higher power input cause distortion in the unwanted sideband and should be avoided.

### Amplitude Modulation (AM)

An input of 200-Watts is recommended for AM operation on a monologue basis. If voice break-in and standby blocking bias is used, the input can be increased to 300-Watts. The proper ratio of modulation to carrier energy can be determined by watching the wattmeter. The wattmeter will start to deflect with speech as 100% modulation is exceeded.

### Phase Modulation (PM or FM)

An input of 200-Watts is recommended for monologue transmissions. If voice break-in and standby blocking bias is used, the input can be increased to 500-Watts.

### RF Amp Meter Scale

The RF output signal is passed through a 1-Ohm carbon resistor. The voltage drop across this resistor is rectified and the DC is supplied to the meter calibrated in RF Amperes. The meter is "fast acting" since it is not dependent upon a slow heating thermocouple.

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<sup>2</sup> 20-Amp circuit with 12G wire is highly recommended.

### Reflected Power Meter Scale

The 1-Ohm power-sampling resistor is part of a bridge circuit arranged to indicate load impedance departures from a pure resistance of 52-Ohms. A germanium diode functions as the null detector in the SWR Bridge and its output is indicated on the meter. The Reflected Power Scale is in calibration at a carrier input of 500-Watts. At the beginning of the yellow scale, the SWR is approximately 3:1. The antenna should be pruned if the indication is in the red portion of the scale. The use of an antenna scope or an impedance bridge with an electrical half wave repeater transmission line is recommended for pruning operation.

### TVI

Television interference may be encountered in some areas. First, determine if interference is caused by fundamental overload of the TV receiver by installing a high-pass filter at the TV receiver. If the interference persists, it may be caused by weak harmonics radiated by the antenna. Since the 600L RF unit is thoroughly shielded, the installation of a 52 or 72 Ohm low-pass filter close to the output connector should reduce the harmonic radiation. The attenuation required will vary with the order of harmonic and distance from the TV transmitter.

### Plate Overload

In the event of a plate voltage short, the Plate Overload Breaker will trip out. It will continue to trip when reset if the short persists. It is essentially in series with the Plate Supply Switch.

### Load Mismatch Breaker

The SWR Bridge in the output circuit of the 600L is used to control the internal blocking bias to prevent damage to the 813 in the event the unit is operated without a load.

At the front of the RF unit is a narrow shelf containing a 12AT7, a NE2 neon lamp, screwdriver slotted control, and a telephone type relay. The control adjusts the sensitivity of the mismatch trip circuit. If bursts of voice energy cause the breaker circuit to trip while an antenna is connected, the sensitivity can be decreased by turning the control slowly counterclockwise. The factory adjustment is made with no antenna for trip out at approximately 500-Watts input.

If the 12AT7 tube is not functioning, the relay will not operate when the Plate Switch is turned on. If the relay does not operate, the VR75 will not glow and blocking bias will be applied to the 813. With blocking bias applied, the exciter will just begin to drive the 813.

### SAFETY

#### **CAUTION: DEADLY HIGH VOLTAGE**

Due to the large energy storage capacity of the special 45- $\mu$ F filter capacitor, several minutes should be allowed before it is discharged with a large, well insulated, screwdriver.

**CAUTION!** To prevent damage to the RF choke DO NOT DISCHARGE B+ at the 813 plate cap. Suggest shorting the RF choke mounting bracket or feed through insulators to the chassis.

The Screen regulation circuit consists of an 812A series regulator, 6AQ5 control tube, and two 0A2 reference tubes.

APPENDIX

Rear Layout

