

# AMERITRON AL-84 LINEAR AMPLIFIER

## INSTRUCTION MANUAL



The AMERITRON AL-84 is a grounded grid class AB<sub>2</sub> linear power amplifier that operates on 1.8 through 22 MHz. Four inexpensive 6MJ6 beam tetrodes are driven through an impedance compensating and power swamping network that eliminates instabilities common to parallel tube amplifiers while providing a low SWR to the exciter throughout the frequency range of the amplifier.

The pi-network output exceeds FCC harmonic specifications and provides full tuning coverage of all amateur, MARS and international frequencies below 22 MHz.

An illuminated meter reads plate current and voltage. Twelve volts is available to operate external lights or other low current (200 ma or less) loads.

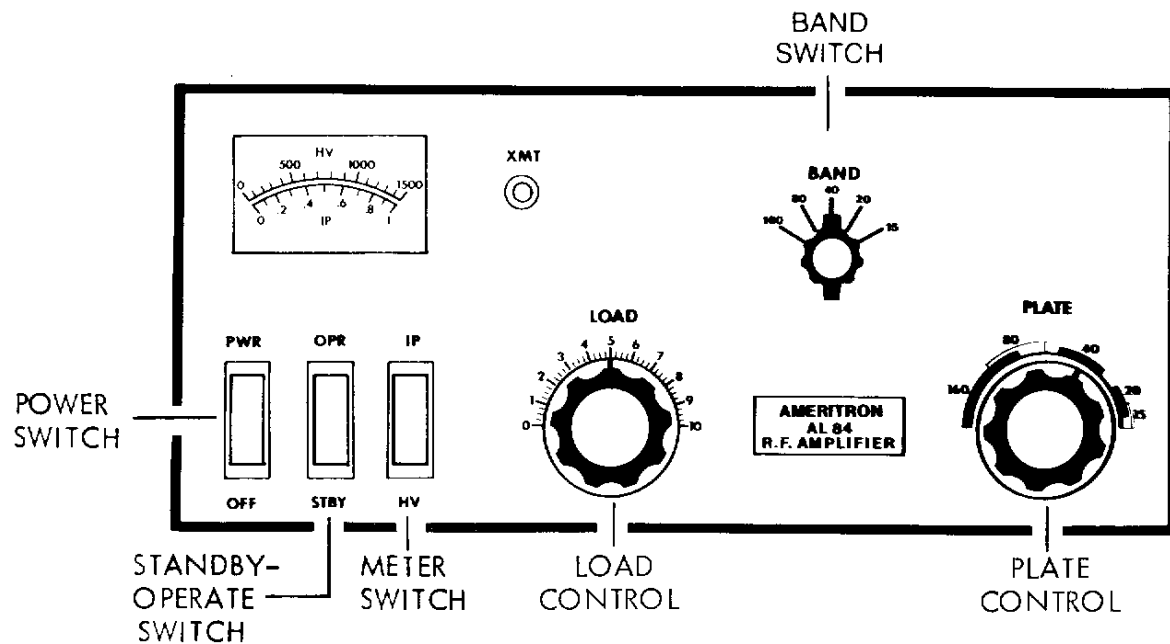
The AL-84 will deliver a minimum of 400 watts of RF output power with 100 watts of drive.

**AMERITRON**

DIVISION OF  
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### OPERATION

Plug the AL-84 into the proper outlet and turn the power switch by pushing in on the top of the PWR rocker bar.

The meter should light up and the fan should start and expel air out the sides of the cover. Push the meter switch to the HV position and read the top

meter scale. Approximately 1000 volts should be indicated. Put the meter switch to  $I_p$ .

Be sure the operate switch (OPR) is in the standby position (STBY) before continuing. When satisfied the transceiver is tuned properly, back its drive off to zero output and put it on standby.

### TUNING

1. Turn the AL-84 bandswitch to the proper band, set the tuning control (PLATE) to the center of the space marked for the band selected and the LOAD control at zero.
2. Place the AL-84 operate switch to the operate (OPT) position and key the exciter WITHOUT APPLYING R.F. TO THE AL-84. The  $I_p$  should show a slight increase.
3. Apply drive until the plate current is between 150 and 200 ma and QUICKLY ADJUST THE PLATE CONTROL FOR MAXIMUM R.F. OUTPUT OR MIN-

IMUM PLATE CURRENT. You have sixty (60) seconds at worst case condition (fully non-resonant) to complete this step. Pause for thirty (30) seconds before continuing if you feel you have used up most of the time.

4. Increase the exciter level to full output (not to exceed 100 ~~volts~~ <sup>amps</sup>) and adjust the LOAD control for maximum output on a wattmeter, SWR bridge or other output indicating device. DO NOT EXCEED 800 MA OF  $I_p$ . BE SURE THE PLATE CONTROL REMAINS DIPPED. Remove drive. You are now tuned up.

### NOTES:

- A. Do not apply out-of-tune currents in excess of 200 ma for over one minute.
- B. Do not change bands or move more than approximately 1.5% of the operating frequency without rechecking tuning. (Example: 30 KHz on 160, 60 KHz on 80, 120 KHz on 40, etc.) or if the SWR

changes more than a few percent.

- C. Do not abuse the ratings of the AL-84. 400 watts CW output and 600 watts PEP on SSB or 800 ma plate current at a 50% duty cycle in normal SSB or CW operation is the maximum power recommended.

## VENTILATION

The back of the AL-84 must not be closer than 2" from any obstruction that may block the air intake to the fan. The ventilation holes near the tubes

will expel warm air. Do not block these ventilation holes or place any heat sensitive objects near them.

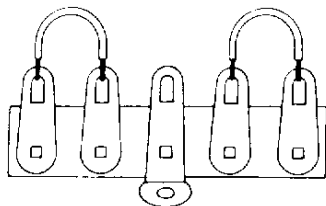
## POWER CONNECTIONS

The AL-84 is shipped with the transformer primary wired for 120 volt 50/60 Hz operation.

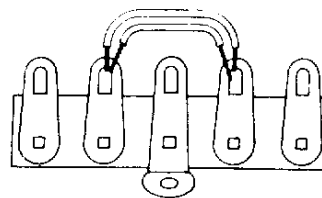
If 240 volts 50/60 Hz operation is desired the primary connections must be changed on the terminal strip that is located between the power transformer and the front panel. Unsolder the jumper wires

from the outside terminals and solder them to the two inside terminals as shown in the illustration. Do not solder any wire to the center terminal.

**IMPORTANT:** the fuse must be changed to a 4 amp rating for 240 volt operation.



CONNECTIONS FOR  
120 VOLT OPERATION



CONNECTIONS FOR  
240 VOLT OPERATION

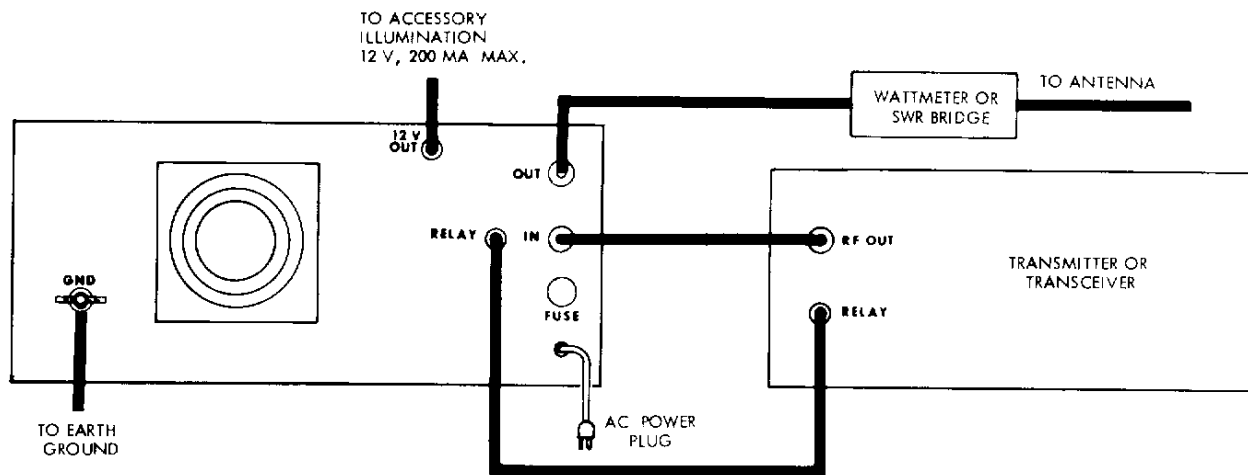
## INSTALLATION

The AL-84 requires a contact closure or keying circuit capable of sinking 100 ma of positive voltage (12V open circuit) to ground. This is well within the range of nearly all amateur transceivers on the market today. Read the manual supplied with the transceiver to find the proper radio to relay jack connections.

The co-ax cable from the transceiver to the AL-84 should be as short as possible and of good quality. RG-58 is adequate for both input and output cables.

Connect the RF output of the transceiver to the IN connector on the rear of the AL-84. Connect the existing station antenna system to the OUT connector on the AL-84. The station antenna system must be equipped with a watt meter or SWR bridge for proper tuning of the AL-84. A phono jack on the rear of the AL-84 is provided for connection to a pair of normally open relay contacts in the transceiver which close on transmit.

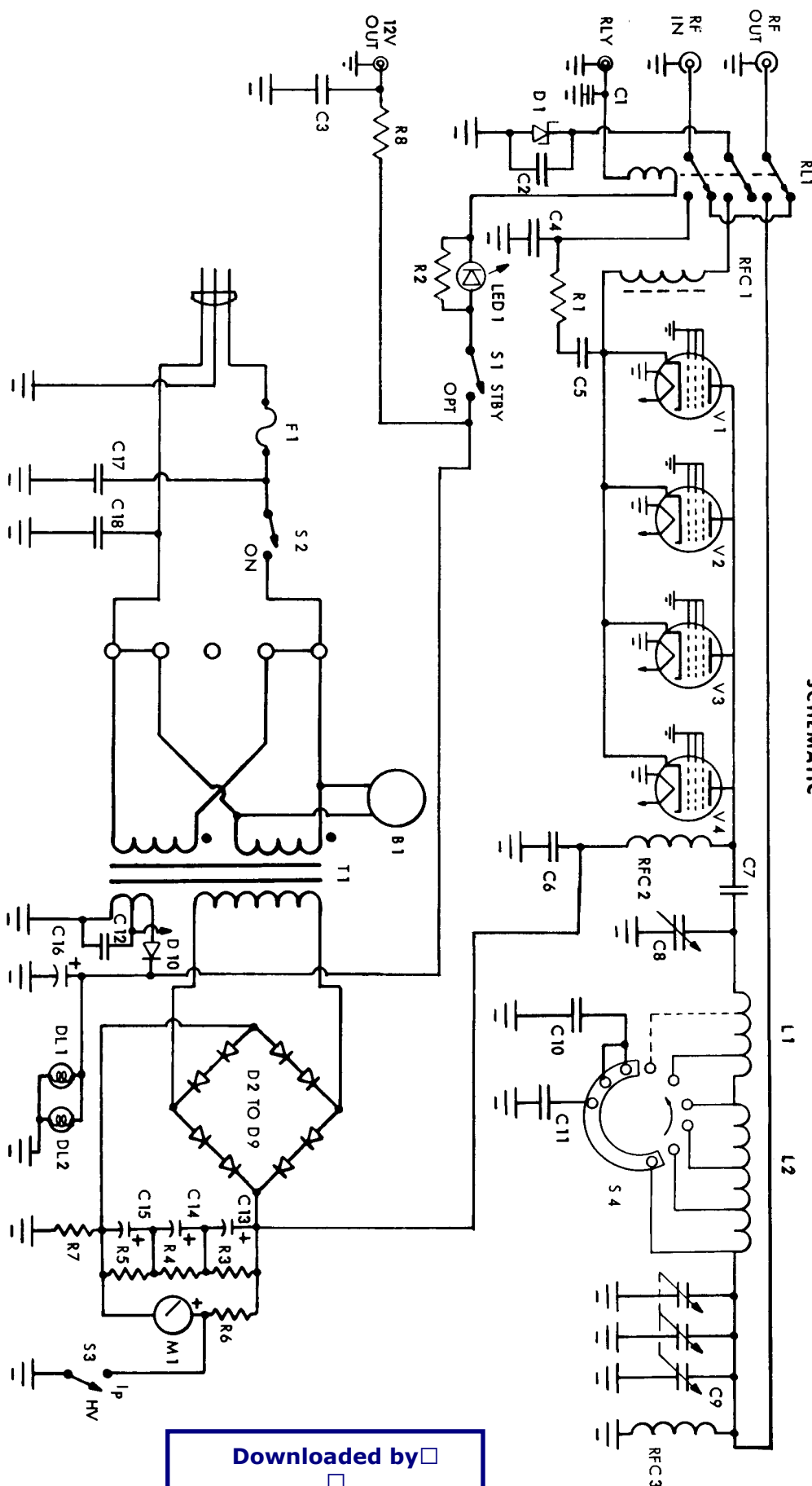
Connect as short a ground lead as possible from a good earth ground to the AL-84 rear panel GND terminal.



## !! Warning !!

MAKE NO ATTEMPT TO PUT THE AMPLIFIER IN SERVICE OUTSIDE OF THE CABINET  
CONTACT WITH VOLTAGES IN THIS AMPLIFIER CAN BE FATAL!

SCHMATIC



PARTS LIST

- |              |  |        |                                      |         |                                     |
|--------------|--|--------|--------------------------------------|---------|-------------------------------------|
| B 1          | Fan Papst 8800N or equivalent (AR-583) | D 1    | 7.5V 10W zener diode (AR-597)        | R 3,4,5 | 100K 2W metal film (AR-181)         |
| C 1-3, 12    | .01 mfd 50V disc (AR-416)              | D 2-9  | Diode 3A 1KV (AR-145)                | R 6     | 1.5 meg. 2W 5% (AR-187)             |
| C 4          | 68 pf 1KV SM (AR-583)                  | D 10   | Diode 1A 100V (AR-266)               | R 7     | .4 ohm 2W 1% (AR-127)               |
| C 5          | .01 uf 1KV disc (AR-395)               | DL 1,2 | 12V wire lead bulb (AR-164)          | R 8     | 10 ohm 1/2W film (AR-595)           |
| C 6,7        | .001 uf 7.5 KV disc (AR-224)           | F 1    | 8A fuse 120V (4A 240V) (AR-432)      | RFC 1   | Cathode choke (AR-156)              |
| C 8          | Plate capacitor 73-1-30-49 (AR-571)    | L 1    | HF tank coil (FP-146)                | RFC 2   | Plate choke (FP-144)                |
| C 9          | Loading capacitor 110053 (AR-113)      | L 2    | LF tank coil (AR-598)                | RFC 3   | Safety choke 2.5 mh 175 ma (AR-162) |
| C 10         | 1000 pf 5M DM19 (AR-176)               | M 1    | LED (AR-522)                         | RL 1    | 3 pole relay (AR-139)               |
| C 11         | 220 pf 5M DM19 (AR-175)                | R 1    | Panel meter (AR-596) 1 mA            | S 1,2,3 | SPST Rocker switch (AR-147)         |
| C 13, 14, 15 | 190 mfd 450V screw terminal (AR-587)   | R 2    | 22 ohm 50 watt noninductive (AR-581) | S 4     | Bandswitch (AR-568)                 |
| C 16         | 1000 mfd 25V pc mount (AR-149)         |        | 33 ohm 1/2 watt (AR-408)             | T 1     | Power transformer (AR-529)          |
| C 17, 18     | .01 mfd 1.4 KV disc (AR-122)           |        |                                      | V 1-4   | 6MJ6 tube (AR-120)                  |

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