

SECTION IV MAINTENANCE

4.1 GENERAL.

Adjustment of the r-f input circuits requires the following equipment:

a. R-f wattmeter and directional coupler, such as are included in the 312B-4 or 312B-5 Station Controls, or the 302C-3 Directional Wattmeter.

b. 50-ohm, 500-watt, nonreactive dummy load. (For short tests where key-down conditions do not exceed 30 seconds, the DL-1 Dummy Load can be used when applicable.)

The filament circuit in the 30L-1 is fused with a length of number 30 wire in the center-tap ground return of the filament winding on T1. The fuse is connected between the two outer lugs of a terminal strip located near R11 in the power supply compartment (refer to figure 6-1). Under some conditions, the amplifier may appear to function normally even though this fuse has blown; however, this causes hum to appear on the output signal. Check for shorts in the filament circuit.

4.2 REMOVAL OF CABINET AND COVERS.

a. Lift the cabinet lid, and remove the two Phillips-head screws located at the top-front edge of the cabinet. Remove the four feet and the Phillips-head screw located midway between the rear feet. Push the amplifier forward from the rear until the front panel projects from the cabinet about a half inch. Grasping the front panel at the edges, carefully slide the amplifier out of the cabinet, making sure the a-c power cord clears.

b. To remove the r-f compartment upper cover, loosen the ten screws about three turns, slide the cover toward the front panel, and lift off.

c. To remove the power supply compartment upper cover, remove screws located about the edges of the cover.

d. To remove the bottom cover, remove two round Phillips-head screws from each end of the cover and three flat-head screws near the middle of the cover, and lift off.

4.3 BLOWER LUBRICATION.

Every 1000 hours of operation (or 6 months, whichever comes first), lubricate the blower motor bearings with three or four drops of sewing machine oil. Do not overlubricate.

4.4 ALIGNMENT OF R-F INPUT CIRCUITS.

Remove the amplifier from its cabinet as outlined in paragraph 4.2. Do not remove any of the covers. To align for amateur band coverage, observe the following procedure:

a. Connect the directional wattmeter between the exciter output and the 30L-1 R-F INPUT jack. Connect the dummy load to the R-F OUTPUT jack on the 30L-1. Set up the equipment on 28.5 megacycles. Set the exciter EMISSION switch to LOCK KEY, and 30L-1 METER switch to TUNE.

b. With 30L-1 power off, tune and load the exciter to approximately 30 watts output as indicated on the wattmeter (forward power).

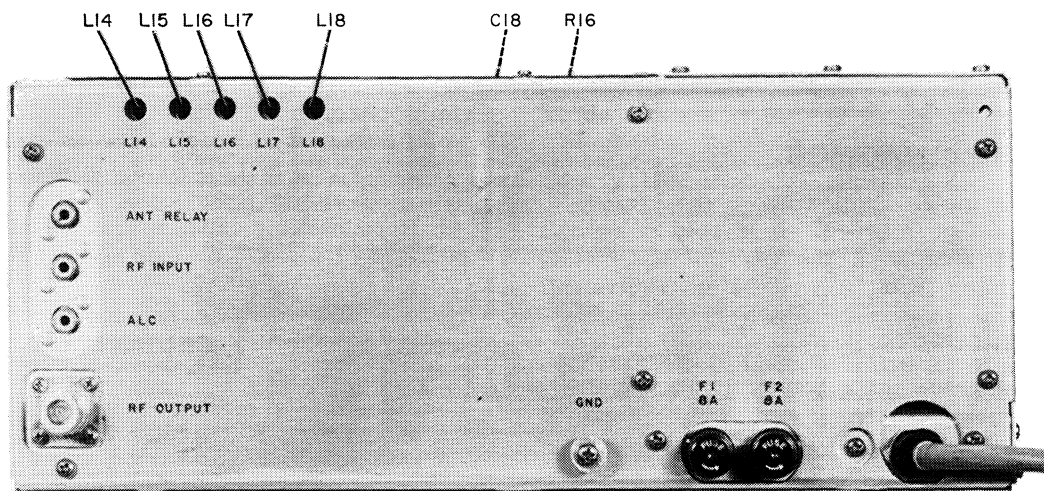


Figure 4-1. Location of Adjustments

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c. Press the 30L-1 power switch to ON. Tune and load the 30L-1 into the dummy load. The exciter is now loaded into the 30L-1 input circuits. Retune and reload the exciter, if necessary, to 30 watts forward power output.

d. Watch the wattmeter in the exciter r-f output line, and with a nonmetallic tuning tool, tune L14 for minimum reflected power. Readjust the exciter as necessary to maintain 30 watts forward. Continue adjustment of L14 for minimum vswr (not to exceed 2.0 to 1, or 11 percent reflected power).

e. Repeat the above procedures at 21.3, 14.3, 7.2, and 3.9 mc, adjusting L15, L16, L17, and L18 respectively. These adjustments are accessible through the holes in the rear cover of the r-f compartment. Do not remove the cover. Refer to figure 4-1.

For general coverage, use the same procedure as above, except set exciter to a frequency which is in the middle of the desired band. Useful bandwidth at the new alignment frequencies is approximately the same as that for the amateur bands. Do not attempt alignment to place the new operating bands outside the ranges listed in table 4-1 for the BAND switch positions indicated. Also do not attempt amateur-band operation on a BAND switch position for which the tuned circuits have been realigned for out-of-band operation.

TABLE 4-1
FREQUENCY COVERAGE ALLOWABLE
BY REALIGNMENT

BAND SWITCH SETTINGS	LOWER LIMIT (mc)	UPPER LIMIT (mc)
3.5	3.4	5.0
7.0	6.5	9.5
14	9.5	16.0
21	16.0	22.0
28	22.0	30.0

4.5 METER LAMP REPLACEMENT.

To replace the meter lamp, remove the bracket to which the socket is fastened. It is held by a small machine screw located at the rear of the meter. Replace the lamp with a type 51 or equivalent.

4.6 TUBE REPLACEMENT.

The tubes may be replaced without removing the amplifier cabinet by removing the r-f compartment top cover and installing new tubes from the top. The following is an alternate method which provides better access to the tube sockets.

Remove the cabinet, r-f compartment top cover, and bottom cover as outlined in paragraph 4.2. Disconnect

plate connectors and remove old tubes. Install the upper pair of replacements from the top of the amplifier. Install the lower pair from the bottom. The locating pin on the base of each of the tubes should point away from the power supply compartment. Attach plate leads, making sure they clear other components. Replace covers and cabinet.

WARNING

DO NOT BLOCK INTERLOCK SWITCHES. Dangerous voltages are present in this equipment. The high voltage is interlocked with the amplifier covers. Make no attempt to put the amplifier into service until the procedure outlined above has been completed.

4.7 TUNE METER ADJUSTMENT.

- a. Make normal connections between exciter and 30L-1.
- b. Connect 50-ohm dummy load to 30L-1 output jack.
- c. Connect vertical input of a wide-band oscilloscope across dummy load.
- d. Connect a two-tone audio oscillator of about 15 mv rms output to exciter input.
- e. Using normal procedure, tune and load exciter and amplifier into dummy load at 3.9 mc. Leave 30L-1 METER switch in TUNE position, and remove excitation.
- f. Using USB or LSB emission, and monitoring output waveform on oscilloscope, increase drive until output ceases to increase or peaks begin to flatten.
- g. Make fine adjustments to drive level and 30L-1 tuning and loading for maximum output without peak flattening. Output voltage across dummy load should be not less than 450 volts peak to peak or 160 volts rms, and CW (single tone) plate current should not exceed 700 ma.
- h. Switch exciter to TUNE (approximately 20 watts drive) and adjust C18 with insulated tuning tool to produce reading of zero on 30L-1 multimeter.

4.8 ALC THRESHOLD ADJUSTMENT.

- a. Perform steps a, b, d, and e of paragraph 4.7. Omit step c.
- b. Disconnect alc cable between exciter and 30L-1.
- c. Using USB or LSB emission, increase drive until indicated alc is about 4 db (S-4) on exciter meter.
- d. Reconnect alc cable, and adjust R16 with insulated tuning tool for a 3-db (one S-unit) increase in alc.

CAUTION

Adjustments to tune meter and alc circuits should not be made unless the need has been clearly determined. If trouble is experienced, check PA tubes and exciter first. Improper adjustments can result in damage to amplifier and a distorted output signal. Do not attempt to make adjustments without proper test equipment.