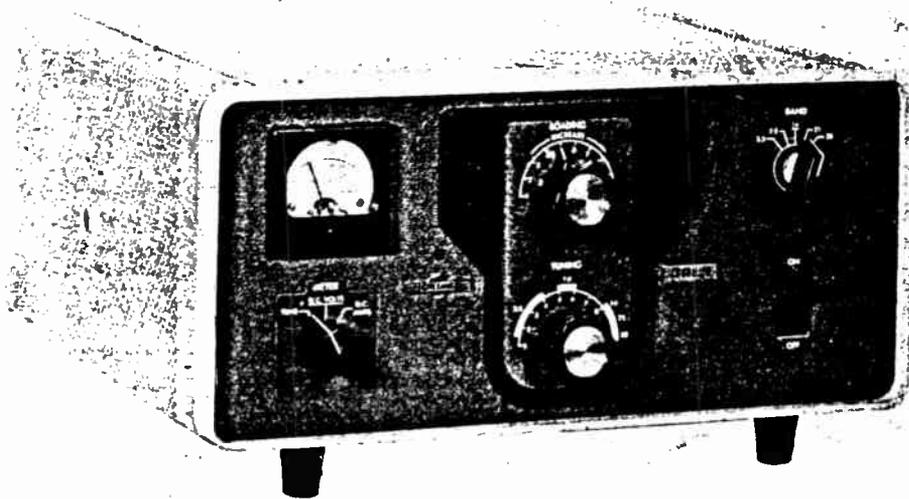


INSTRUCTION BOOK

RF LINEAR AMPLIFIER

30L-1



COLLINS RADIO COMPANY



TYPE 30L-1
LINEAR AMPLIFIER
SER. No. 11547
COLLINS RADIO CO.
CEDAR RAPIDS, IOWA, U. S. A.

30L-1

R-F LINEAR AMPLIFIER

INSTRUCTION BOOK

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1961

CEDAR RAPIDS, IOWA, U.S.A.

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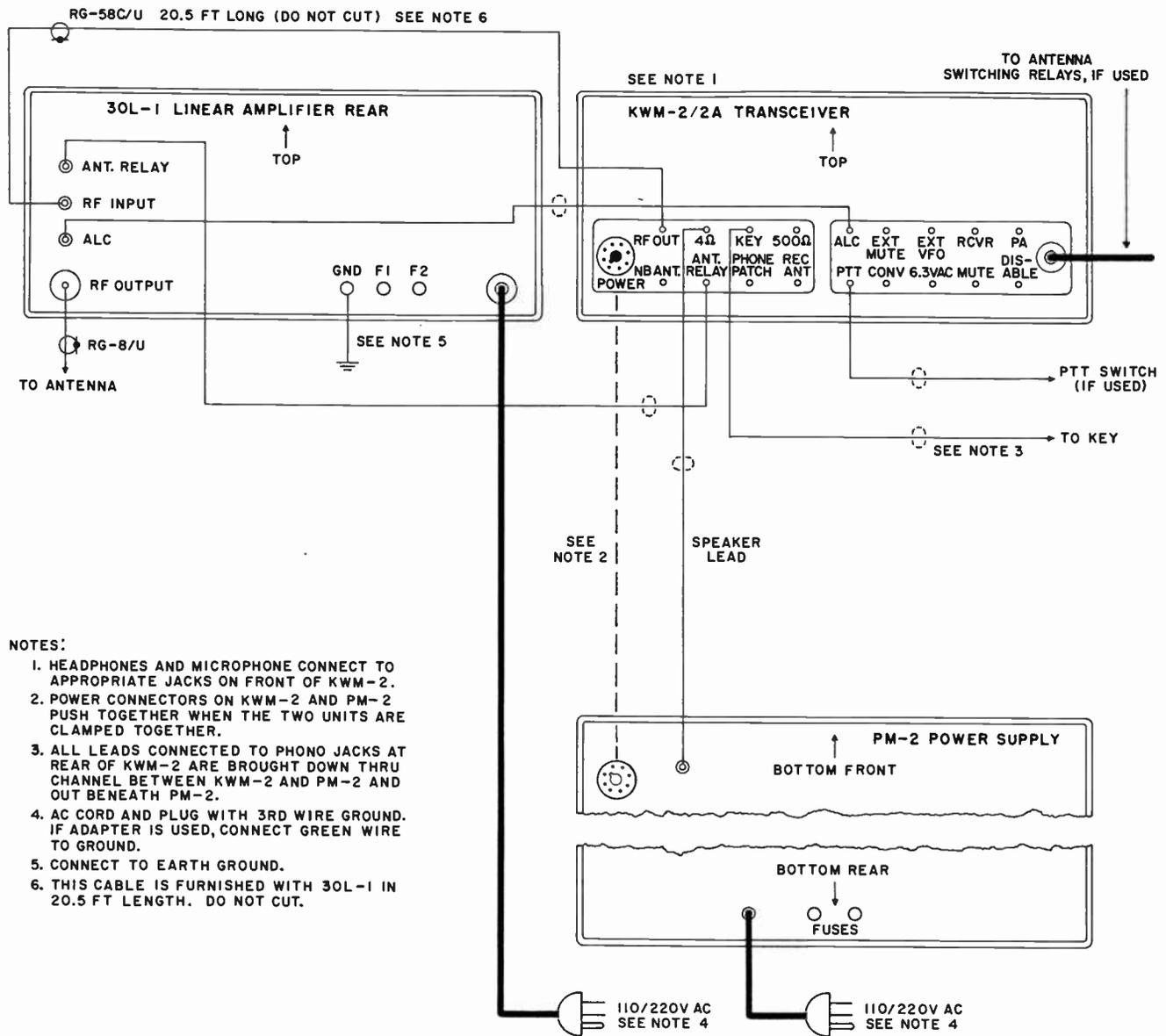
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SECTION I
Installation



NOTES:

1. HEADPHONES AND MICROPHONE CONNECT TO APPROPRIATE JACKS ON FRONT OF KWM-2.
2. POWER CONNECTORS ON KWM-2 AND PM-2 PUSH TOGETHER WHEN THE TWO UNITS ARE CLAMPED TOGETHER.
3. ALL LEADS CONNECTED TO PHONO JACKS AT REAR OF KWM-2 ARE BROUGHT DOWN THRU CHANNEL BETWEEN KWM-2 AND PM-2 AND OUT BENEATH PM-2.
4. AC CORD AND PLUG WITH 3RD WIRE GROUND. IF ADAPTER IS USED, CONNECT GREEN WIRE TO GROUND.
5. CONNECT TO EARTH GROUND.
6. THIS CABLE IS FURNISHED WITH 30L-1 IN 20.5 FT LENGTH. DO NOT CUT.

Figure 1-1. Interconnections with KWM-2/2A Traveling Station

SECTION VII ILLUSTRATIONS

- NOTES:
1. UNLESS OTHERWISE INDICATED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES IN UUF, ALL INDUCTANCE VALUES ARE IN UH.
 2. CR1 THRU CR16 ARE ALL 1N1492.

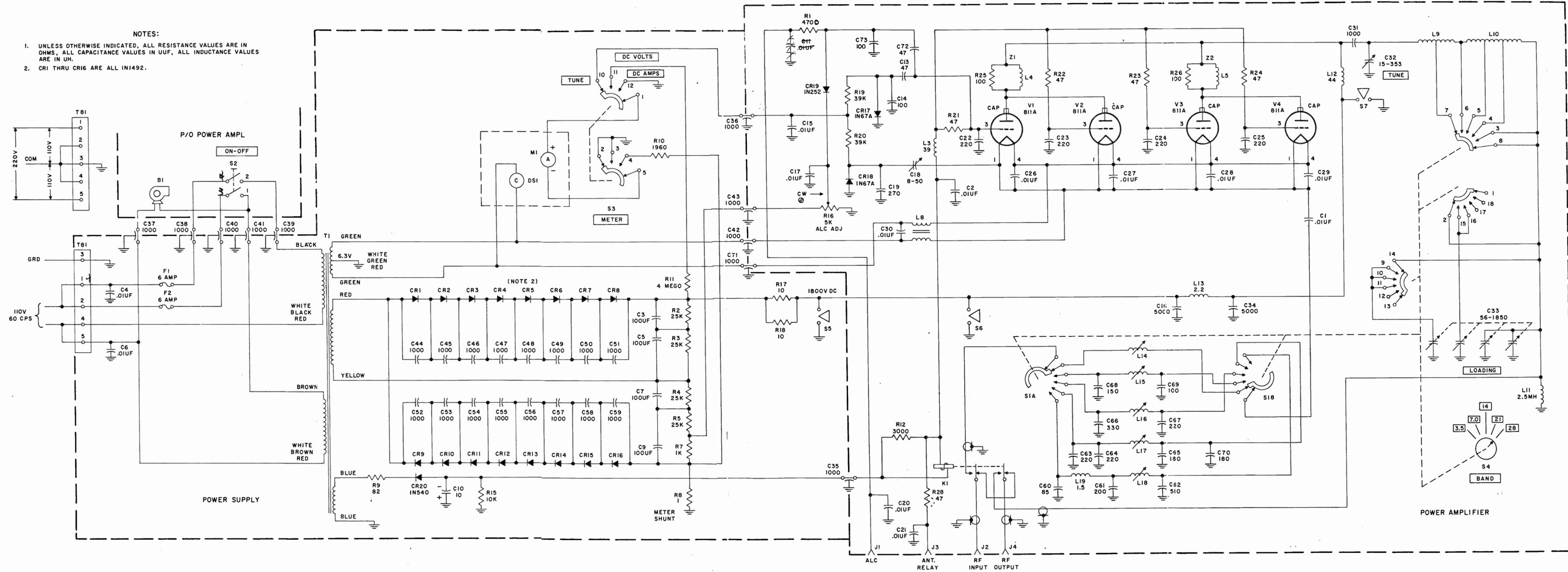


Figure 7-1. 30L-1 Schematic Diagram

SECTION I INSTALLATION

1.1 UNPACKING.

Carefully lift the amplifier out of the packing material. Examine for visible damage. If the amplifier has been damaged in shipment, save box and packing material and notify the transportation company. Fill out and mail the equipment registration card. Check tuning controls and switches for freedom of action. Check

the equipment included with the amplifier against table 1-1.

Release the two fasteners at the top-front of the amplifier cabinet and lift the lid. Loosen the ten screws in the r-f compartment cover, slide it forward, and lift off. Remove the packing material around the tubes. Replace the cover and tighten screws. Lower the lid and refasten.

TABLE 1-1. EQUIPMENT FURNISHED WITH 30L-1

QUANTITY	DESCRIPTION	FUNCTION	PART NUMBER
2	Shielded cables, 4 feet long, with phono plug on each end	Alc and antenna relay cables	426-2027-00
1	RG-58C/U cable, 20.5 feet long, with phono plug on each end	R-f input cable	426-5079-00
6	Fuses	Spares	264-4100-00
1	A-c power plug adapter	A-c power	368-0138-00
1	UG-21D/U coaxial plug	R-f output connector	357-9261-00
1	Number 6 Bristo wrench	Knob removal	024-9730-00
1	Number 8 Bristo wrench	Knob removal	024-0019-00

1.2 POWER TRANSFORMER CONNECTIONS.

The 30L-1 is shipped with the transformer primary connected for 115 volts a-c. If 230-volt a-c operation is planned, the primary connections must be changed on terminal board TB1. Refer to figure 7-1. This board is located at the bottom of the power supply compartment. The a-c power cord is connected to this board. To obtain access, refer to paragraph 4.2.

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 all compartment covers are in place.

1.3 CABLING.

1.3.1 TRAVELING STATION.

The 30L-1 is particularly applicable to traveling station use in conjunction with portable transceivers such as the KWM-2/2A. Refer to figure 1-1. **IN THIS SERVICE, MAKE SURE THE TRANSFORMER PRIMARY IS CONNECTED FOR PROPER LINE VOLTAGE.**

1.3.2 HOME STATION.

Connect to KWM-2/2A, KWM-1, or S-Line as shown in figures 1-2, 1-3, and 1-4.

1.3.3 KWM-1 SERIAL NUMBERS ABOVE 861.

If KWM-1 models above serial number 861 are used with the 30L-1, it will be necessary to bring out alc

SECTION I
Installation

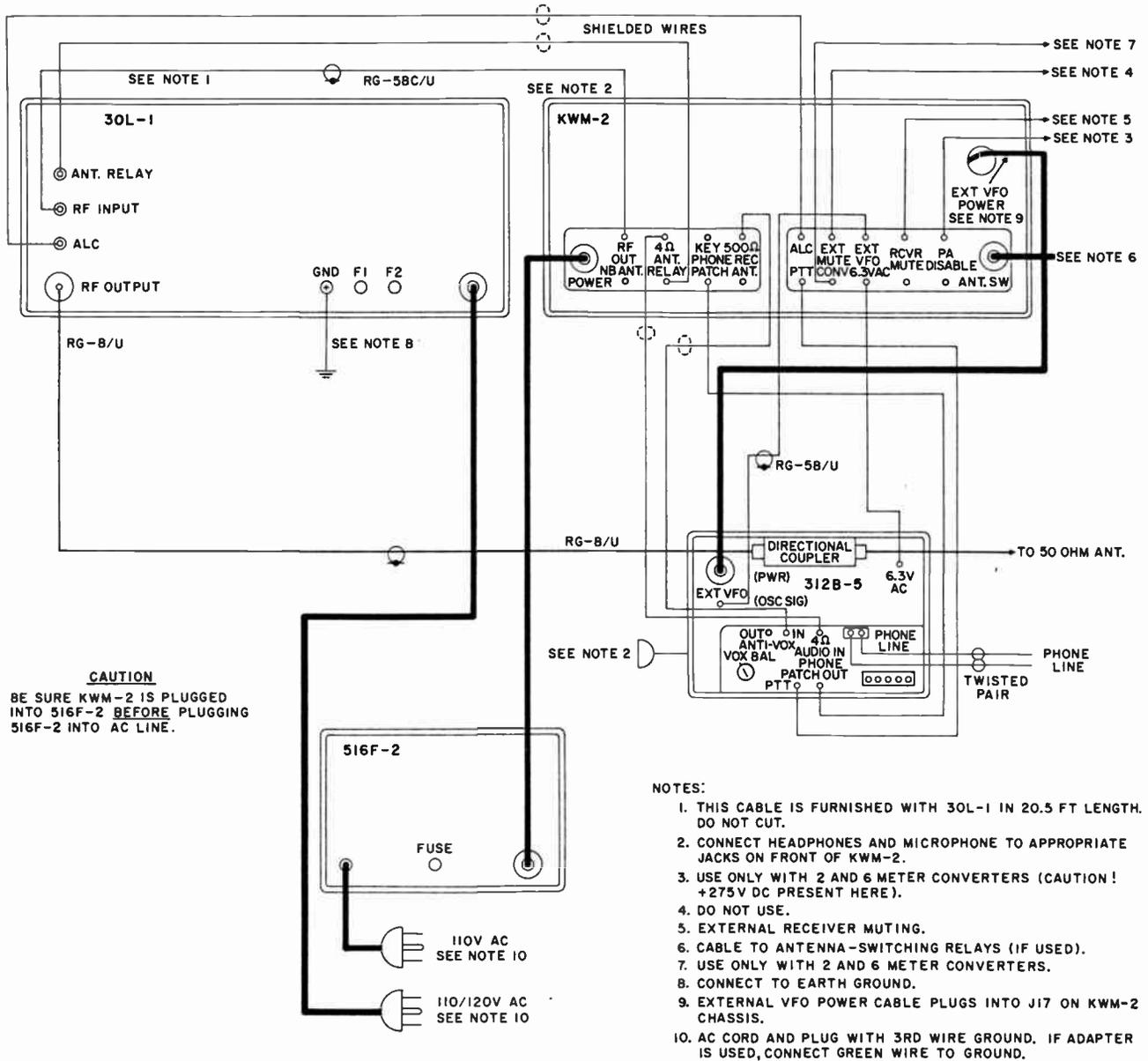
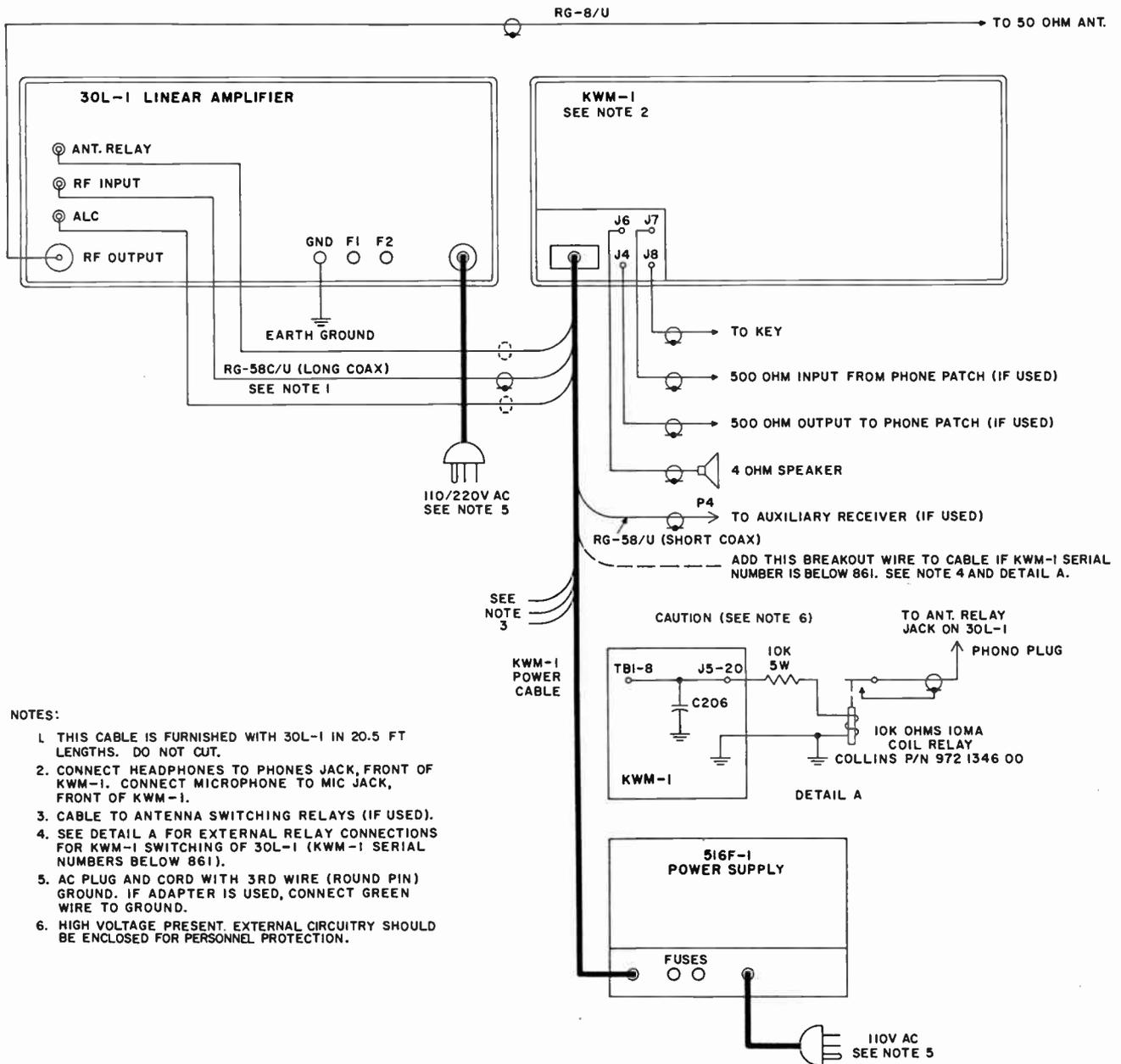


Figure 1-2. Interconnections with KWM-2/2A Home Station

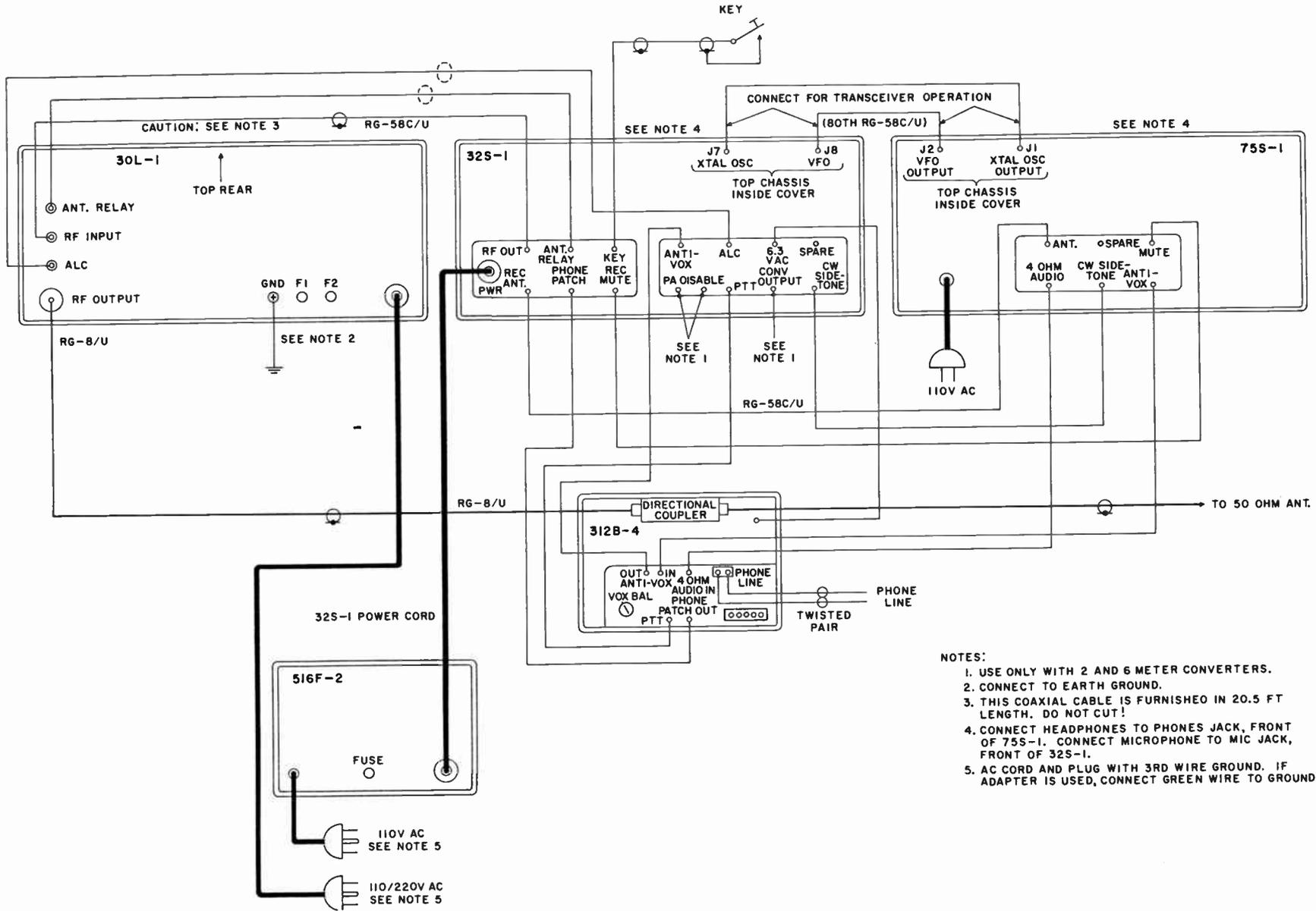


NOTES:

1. THIS CABLE IS FURNISHED WITH 30L-1 IN 20.5 FT LENGTHS. DO NOT CUT.
2. CONNECT HEADPHONES TO PHONES JACK, FRONT OF KWM-1. CONNECT MICROPHONE TO MIC JACK, FRONT OF KWM-1.
3. CABLE TO ANTENNA SWITCHING RELAYS (IF USED).
4. SEE DETAIL A FOR EXTERNAL RELAY CONNECTIONS FOR KWM-1 SWITCHING OF 30L-1 (KWM-1 SERIAL NUMBERS BELOW 861).
5. AC PLUG AND CORD WITH 3RD WIRE (ROUND PIN) GROUND. IF ADAPTER IS USED, CONNECT GREEN WIRE TO GROUND.
6. HIGH VOLTAGE PRESENT. EXTERNAL CIRCUITRY SHOULD BE ENCLOSED FOR PERSONNEL PROTECTION.

Figure 1-3. Interconnections with KWM-1

Figure 1-4. Interconnections with S-Line



and "ground-on-transmit" connections from the 516F-1 power cable plug, P-1, as shown in figure 1-3. Make the alc connection to terminal 19, and the "ground-on-transmit" connection to terminal 20. Use a shielded wire, and connect to 30L-1 ALC and ANT. RELAY jacks with phono plugs.

1.3.4 KWM-1 SERIAL NUMBERS BELOW 861.

If models below serial number 861 are used with the 30L-1, it is necessary to make connections inside the KWM-1 for alc and antenna relay control.

- a. Use an ohmmeter to locate the feedthrough capacitor, C169, which is connected to pin 19 of J5.
- b. Connect a wire from this feedthrough capacitor to pin 7 of tube socket XV10.
- c. Using an ohmmeter, locate the feedthrough capacitor, C206, which is connected to terminal 20 of J5 in KWM-1.
- d. Connect a wire from terminal 8 of TB1 in KWM-1 to C206.
- e. Make corresponding breakout connection to P1 terminal 19 with shielded wire, and connect to the 30L-1 ALC jack with a phono plug.
- f. Refer to figure 1-3, Detail A. External to the KWM-1, connect a 10,000-ohm, 5-watt resistor and a relay coil in series from J5 terminal 20 to a ground on the rear of the KWM-1 chassis. Use a relay, such as Collins part number 972-1346-00, with a 10,000-ohm, 10-ma coil, and a set of normally open contacts.
- g. Connect the normally open contacts through a piece of shielded wire and a phono plug to the 30L-1 ANT. RELAY jack.

WARNING

BE CAREFUL to protect the operator from the 260-volt B+ present on the relay coil and resistor connections. It is recommended that this circuitry be enclosed in a suitable shield box.

NOTE

The r-f cable supplied for connecting the 32S-1, KWM-2/2A, or KWM-1 to the 30L-1 is 20.5 feet long. DO NOT cut this cable. This length is optimum to maintain the low-distortion figure for which the equipment was designed.

1.4 INSTALLATION WITH OTHER MAKES OF EXCITERS.

Connect the r-f output of the exciter to the RF INPUT jack on the 30L-1. Existing antenna switching equipment between receiver and exciter may be left intact. To transmit, a ground must be supplied to the ANT. RELAY jack on the 30L-1. This removes blocking bias from the 811A tubes and energizes the internal antenna relay. Due to the variety of circuits involved, specific instructions for use of alc can not be given. A detailed study of paragraph 3.7 will be helpful if it is desired to utilize the alc provisions in the 30L-1.

SECTION II
Operation

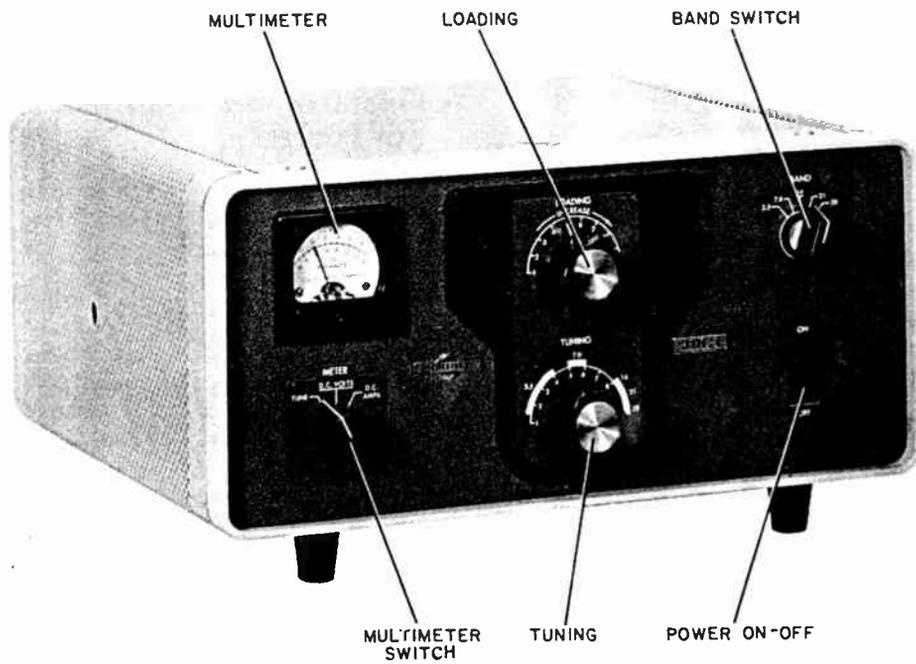


Figure 2-1. 30L-1 Operating Controls

SECTION II OPERATION



2.1 OPERATION IN AMATEUR BANDS.

Table 2-1 shows normal and full-scale meter readings. If the exciter is a KWM-2/2A or S-line, set exciter + BIAS ADJUST to produce an idling plate current of 50 ma. Tune and load according to exciter instruction book, *except load to only 200 ma plate current*

a. Connect the antenna for the band in use to the RF OUTPUT jack on the 30L-1. (When the ON-OFF switch is in the OFF position, the transfer relay in the 30L-1 connects the antenna to the exciter.)

b. Make sure the ON-OFF switch in the 30L-1 is in the OFF position as shown in figure 2-1.

c. Tune and load the exciter into the antenna. Set MIC GAIN to off position.

d. Set the 30L-1 METER switch to the TUNE position.

e. Set BAND switch to same band as that of the exciter. *loading control to / on Dial Tuning control*

f. Press the 30L-1 ON-OFF switch to the ON position.

g. Turn up MIC GAIN to provide excitation. *meter on Tune*

h. IMMEDIATELY adjust TUNING control for multi-meter dip.

i. Alternately adjust TUNING and LOADING controls for zero multimeter reading. The meter will indicate zero at the dip when the amplifier is properly tuned and loaded. Always make the TUNING adjustment for meter dip as the last adjustment.

j. Switch the exciter to the desired sideband or to CW. The station is now ready to operate.

k. If the antenna does not present a nearly 50-ohm resistive load, the exciter can be tuned and loaded into a 50-ohm dummy load, such as the DL-1. When switched to the input of the 30L-1, the exciter will then remain in tune.

DO NOT operate the 30L-1 into a load presenting a vswr greater than 2 to 1. The equipment may not function properly and damage may result. DO NOT operate the amplifier in continuous key-down condition for more than 30 seconds. The power supply may be damaged. DO NOT use the 30L-1 in FSK, AM, or FM service. DO NOT use slow-blow fuses, or fuses larger than the 6-ampere type supplied.

1. Once the equipment has been tuned up on a given frequency, the 30L-1 may be switched in or out of the circuit at will by operating the ON-OFF switch. Output power from the amplifier is available instantly with no warm-up period required.

2.2 OPERATION WITH OTHER MAKES OF EXCITERS.

Tune according to the procedure outlined in paragraph 2.1. If alc is not used, be careful not to overdrive either the exciter or the final amplifier. Normal plate current meter readings for the 30L-1 are from 300 to 350 ma on voice peaks. Actual plate current under these conditions will peak at approximately 600 to 700 ma. Be sure the exciter is capable of producing the required drive without excessive distortion. If not, the amplifier may be operated at reduced level.

2.3 OPERATION OUTSIDE AMATEUR BANDS.

Operation outside amateur band limits requires retuning of the 30L-1 input circuits. This is necessary to present the proper load impedance to the exciter. For procedure, refer to paragraph 4.4.

TABLE 2-1. MULTIMETER SCALE VALUES

METER SWITCH SETTING	FULL-SCALE INDICATION	NORMAL INDICATION
TUNE	Not applicable	Zero when 30L-1 is properly loaded
D. C. VOLTS	2000 volts	1800 volts (No modulation) 1600 volts (At rated load)
D. C. AMPS	1.0 amp (1000 ma)	600 ma (Key down CW) 300-350 ma (SSB voice peaks) 130 ma (Keyed, no excitation)

SECTION III
Principles of Operation

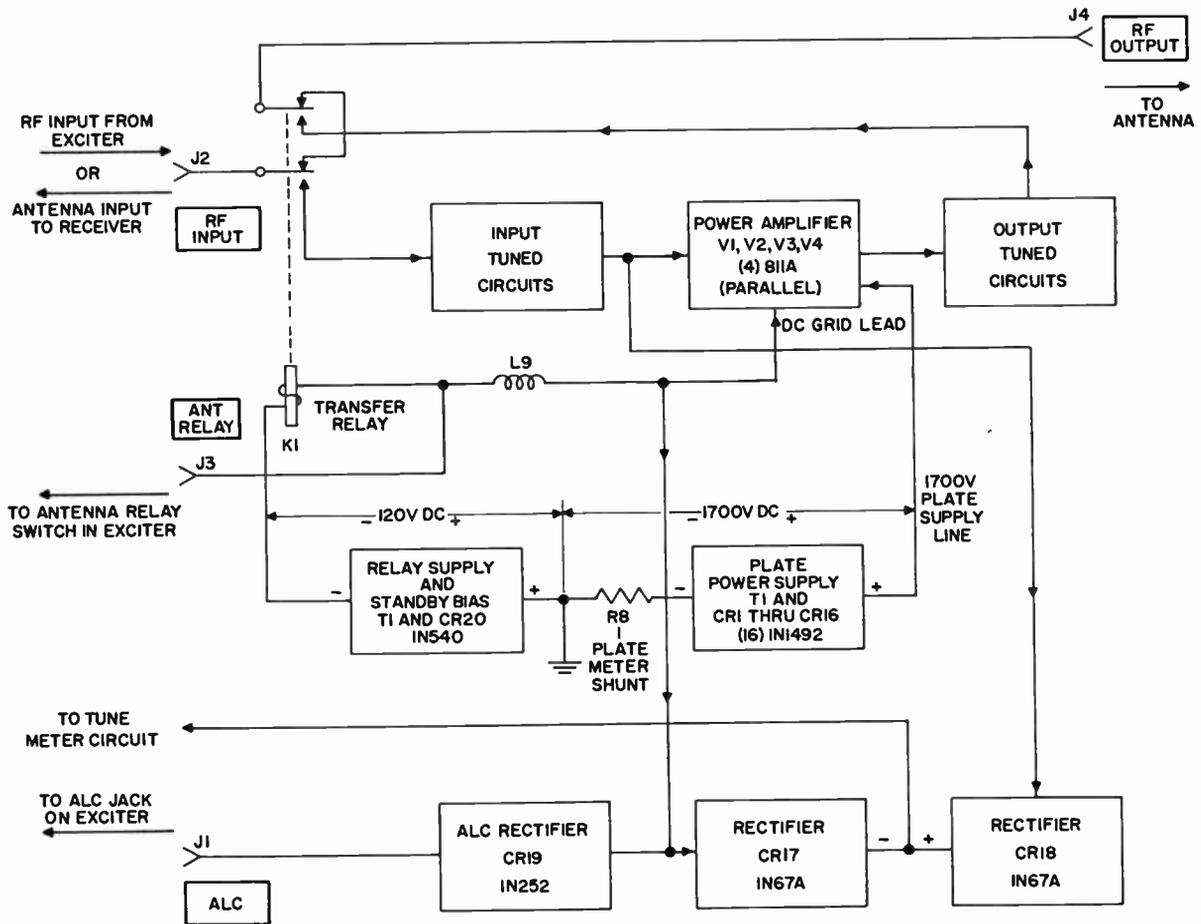


Figure 3-1. 30L-1 Block Diagram

SECTION III PRINCIPLES OF OPERATION

3.1 GENERAL.

The 30L-1 is a portable r-f linear power amplifier, including plate power and bias supplies. It is capable of 1000 watts PEP input power in SSB or 1000 watts d-c input in CW service with any exciter (such as the KWM-1, KWM-2/2A, or 32S-1) capable of 70 watts PEP output. It covers the amateur bands between 3.5 and 29.7 mc. In addition, the amplifier may be operated outside the amateur bands over certain ranges of frequency. These ranges are specified in table 4-1. The power amplifier stage uses four 811A triodes connected in parallel with cathode drive.

3.2 INPUT CIRCUITS.

Refer to figures 3-1 and 7-1. Broadband pi-network circuits couple the exciting signal into the cathode circuits of the power amplifier tubes. In conjunction with the interconnecting r-f feed cable supplied, this presents a nearly constant 50-ohm load to the exciter. This aids in maintaining the low level of distortion products under modulation. For this reason, it is important not to alter the length of interconnecting cable supplied with the amplifier.

3.3 OUTPUT CIRCUITS.

The plate circuit of the power amplifier is tuned by a pi network consisting of C32, L9, L10, and C33. Capacitor C32 resonates the tank circuit at the frequency in use. It is adjusted by the TUNING control on the front panel. The four-gang capacitor, C33, is adjusted by the LOADING control to match the pi-network circuit to the impedance presented by the antenna and feed system in use. Output from the plate tank circuit is connected through the contacts of antenna changeover relay, K1, to the antenna when the control circuits are energized.

3.4 POWER SUPPLY CIRCUITS.

Two d-c power supplies and one a-c filament supply are included in the 30L-1. The amplifier may be connected to a 115-volt single-phase or to a 230-volt, three-wire, single-phase source. Where practical, the 230-volt, three-wire connection is recommended. Power transformer T1 has two primary windings. These windings are connected in parallel for 115-volt operation, and in series for 230-volt operation. The 6.3-volt secondary winding provides filament power for the 811A tubes through r-f choke L8. It also powers the pilot lamp in the meter. Another secondary winding applies voltage through surge resistor R9 to semiconductor rectifier CR20. This is a half-wave circuit connected to furnish blocking bias to the amplifier tubes under receive conditions. It also furnishes power for changeover relay K1. Voltage from the third

secondary winding is applied to two semiconductor rectifier strings connected in a full-wave voltage doubler configuration. These strings consist of CR1-CR8, C44-C51 in one string, and CR9-CR16, C52-C59 in the other. The parallel capacitors equalize the reverse voltages impressed across the diode junctions and protect against damage by transients. The output of this supply provides approximately 1600 volts d-c under load for the amplifier tube plates.

3.5 SAFETY INTERLOCK CIRCUITS.

The r-f and power supply compartment covers operate safety interlock switches for operator protection. Switch S5 is located in the power supply compartment. Switches S6 and S7 are located in the r-f compartment. Cover removal closes these switches and shorts the high voltage to ground. This arrangement protects the operator from accidentally coming in contact with high-voltage d-c which is present in either compartment.

WARNING

DO NOT BLOCK INTERLOCK SWITCHES. Contact with voltages in this equipment can be fatal. Be sure to disconnect the a-c power plug before removing any of the covers.

3.6 POWER CONTROL CIRCUITS.

Refer to figure 3-2. The front-panel ON-OFF switch breaks one side of the a-c line in the OFF position. When operated to the ON position, a-c power is applied to the power transformer primaries and the tube-cooling fan B1. Overload protection is provided by six-ampere fuses F1 and F2. These are used for both 115-volt a-c and 230-volt a-c operation.

3.7 ALC CIRCUITS.

Automatic load control (alc) is a compressor circuit operating at radio frequencies. In the 30L-1, the grid-to-plate capacities of the amplifier tubes in conjunction with capacitors C22, C23, C24, and C25 form capacitive voltage dividers. Under modulation, an r-f voltage is developed across these dividers and L3. It is coupled to the alc rectifier CR19 through capacitors C12 and C13. Here it is rectified and filtered to produce a negative d-c control voltage which is proportional to the modulation level. The load resistor for CR19 must be provided by the exciter alc circuits. This voltage is applied to the control grid of a low-level r-f amplifier tube or tubes in the exciter. The time constants of these circuits have a fast

SECTION III
Principles of Operation

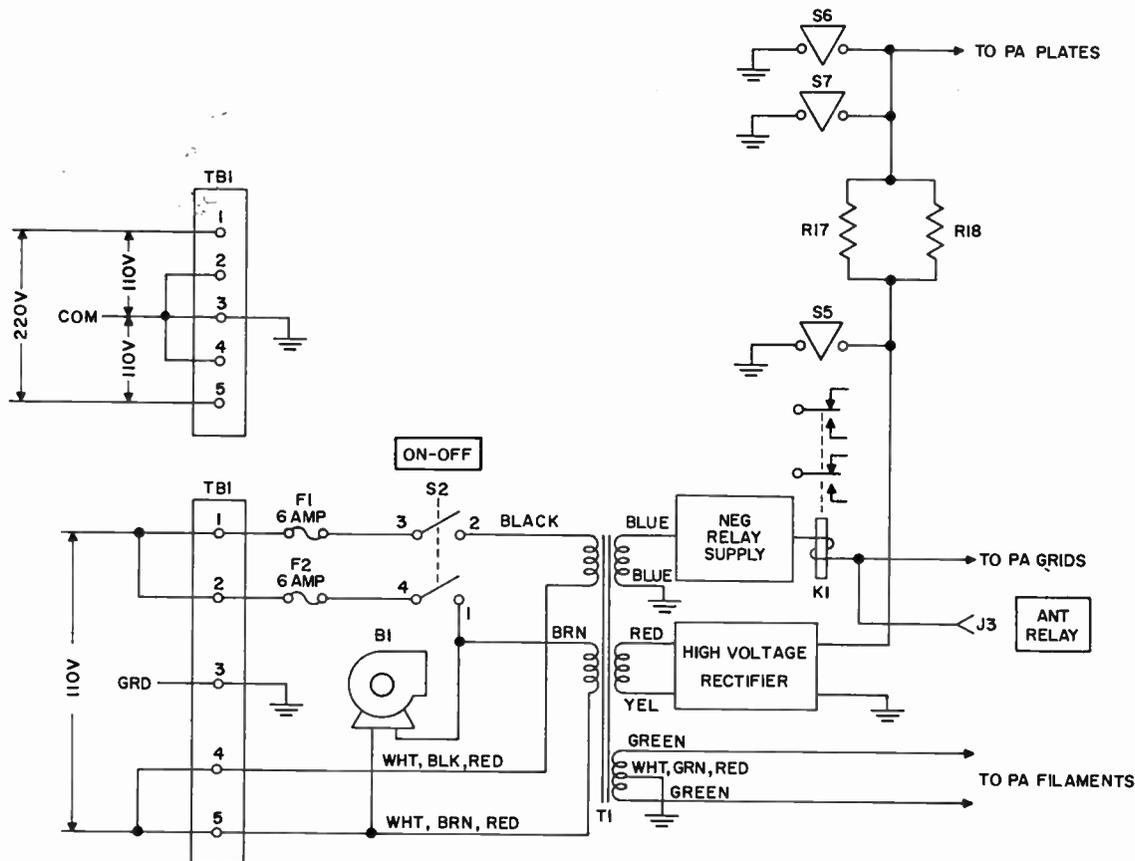


Figure 3-2. Control and Interlock Circuits

attack, slow-release characteristic. The alc threshold is controlled by the amount of reverse bias on CR19. This voltage is developed across R7 in the plate supply bleeder network, and varied by potentiometer R16. It is adjusted at the factory for optimum operation in conjunction with the internal alc circuits of excitors such as the KWM-1, KWM-2/2A, or 32S-1. Normally it will not need readjustment.

This system allows a high average level of modulation and optimum power output from the amplifier, within the rated limits of distortion.

3.8 METERING CIRCUITS.

One section of the METER switch, S3, selects the output voltage from a tuning and loading bridge circuit.

This circuit consists of the power amplifier tubes, CR17, CR18, and the associated load resistors and filter networks. The bridge is balanced when the plate circuit TUNING and LOADING controls are adjusted to present the proper load impedance to the power amplifier plates. The meter then will read zero.

The second section of the meter switch connects the meter to the plate supply through a four-megohm multiplier resistor to indicate the d-c voltage output. It is read on the D.C. KILOVOLT scale.

The third section of the meter switch connects the meter, through R10, across shunt, R8. This indicates power amplifier plate current. It is read on the D.C. AMPS scale.

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 Control Station, 312B-5 PTO Console, or the 302C-3.
- b. 50-ohm, 500-watt, nonreactive dummy load.

NOTE

For short-duration tests (key-down conditions not to exceed 30 seconds), it is permissible to use the DL-1 Dummy Load where applicable to the following procedures.

4.2 REMOVAL OF CABINET AND COVERS.

a. Lift the cabinet lid, and remove the two Phillips-head screws located between the lid fasteners. 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 the 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).

c. Press the 30L-1 power switch to ON. Tune and load the 30L-1 into the dummy load. The exciter is

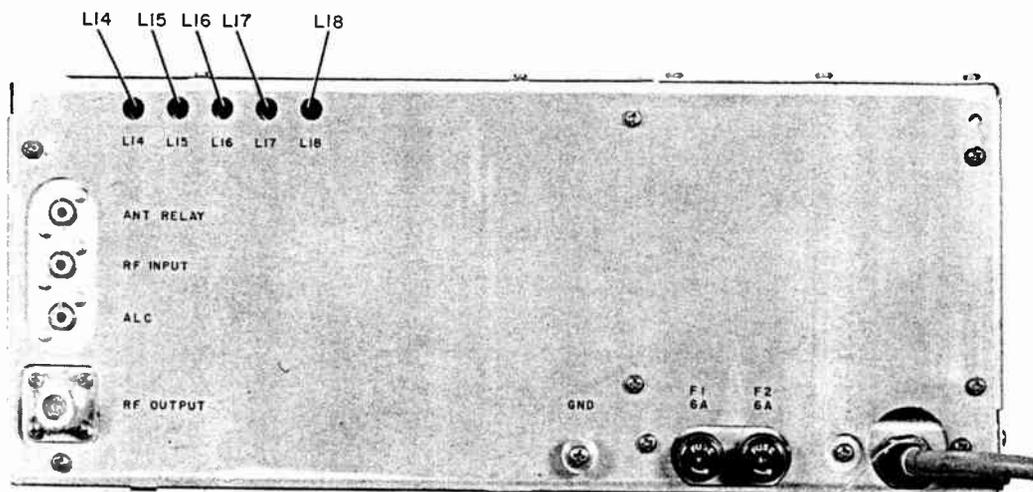


Figure 4-1. Location of Input Circuit Adjustments

Section IV
Maintenance

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.

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. Described below is an alternate method which provides better access to the tube sockets.

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

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.

SECTION V SPECIFICATIONS

- Size 6-9/16 in. high, 14-3/4 in. wide, 13-3/4 in. deep (overall).
- Weight 38 pounds.
- Frequency range 3.5-29.7 mc, covering all amateur bands. By retuning input coils as necessary, the following general-coverage bands may be covered:

<u>FREQUENCY BAND</u>	<u>TOTAL COVERAGE</u>
3.5 mc	3.4-5.0 mc
7.0 mc	6.5-9.5 mc
14 mc	9.5-16.0 mc
21 mc	16.0-22.0 mc
28 mc	22.0-30.0 mc

- Mode SSB or CW
- Type of Service SSB - continuous voice modulation.
CW - 50-percent duty cycle (continuous key-down conditions not to exceed 30 seconds duration).
- Plate power input CW - 1000 watts.
SSB - Nominal PEP input of 1000 watts with speech. Third order distortion products at this level are at least 30 db down from signal.
- Drive power requirements 70 watts.
- Primary power requirements 230 volts a-c $\pm 10\%$, 3-wire, single phase, at 5 amperes, or 115 volts a-c $\pm 10\%$ at 10 amperes, 50-400 cps. Operation from a line frequency other than 50-60 cps requires an auxiliary 60-cps supply for fan motor.
- Input impedance 52 ohms.
- Output impedance 52 ohms unbalanced with vswr not to exceed 2 to 1.
- Noise level 40 db down from output signal with 1-kw single-tone input.
- Harmonic output All harmonics at least 50 db down from output signal.
- Vacuum tubes Type 811A triodes (4).
- Available accessories Model 351E-4 mounting plate (Collins part number 522-1482-003). This plate can be used when installing the 30L-1 in an airplane, boat, or similar location requiring a rigid mount. A luggage-type carrying case is also available.

SECTION VI
PARTS LIST

ITEM	DESCRIPTION	COLLINS PART NUMBER
	LINEAR AMPLIFIER	522-2375-00
B1	FAN: 115 v ac, 60 cps, single phase	547-3702-00
C1	CAPACITOR, FIXED, CERAMIC: 10,000 uuf +100% -20%, 500 v dc	913-3013-00
C2	CAPACITOR, FIXED, CERAMIC: same as C1	913-3013-00
C3	CAPACITOR, FIXED, ELECTROLYTIC: 100 uf -10% +100%, 450 v dc	183-1567-00
C4	CAPACITOR, FIXED, CERAMIC: 10,000 uuf ±20%, 1000 v dc	913-3922-00
C5	CAPACITOR, FIXED, ELECTROLYTIC: same as C3	183-1567-00
C6	CAPACITOR, FIXED, CERAMIC: same as C4	913-3922-00
C7	CAPACITOR, FIXED, ELECTROLYTIC: same as C3	183-1567-00
C8	NOT USED	
C9	CAPACITOR, FIXED, ELECTROLYTIC: same as C3	183-1567-00
C10	CAPACITOR, FIXED, ELECTROLYTIC: 10 uf -10%, +100%, 150 v dc	183-1568-00
C11	CAPACITOR, FIXED, CERAMIC: same as C1	913-3013-00
C12	NOT USED	912-2864-00
C13	CAPACITOR, FIXED, MICA: 47 uuf ±5%, 500 v dc	912-2792-00
C14	CAPACITOR, FIXED, MICA: 100 uuf ±5%, 500 v dc	912-2816-00
C15	CAPACITOR, FIXED, CERAMIC: same as C1	913-3013-00
C16	CAPACITOR, FIXED, CERAMIC: 0.005 uf ±20%, 3000 v dc	913-4329-00
C17	CAPACITOR, FIXED, CERAMIC: same as C1	913-3013-00
C18	CAPACITOR, VARIABLE, CERAMIC: 8.0 uuf min 75.0 uuf max, 350 v dc	917-1075-00
C19	CAPACITOR, FIXED, MICA: 270 uuf ±5%, 500 v dc	912-2846-00
C20	CAPACITOR, FIXED, CERAMIC: same as C1	913-3013-00
C21	CAPACITOR, FIXED, CERAMIC: same as C1	913-3013-00
C22	CAPACITOR, FIXED, MICA: 220 uuf ±5%, 500 v dc	912-2840-00
C23	CAPACITOR, FIXED, MICA: same as C22	912-2840-00
C24	CAPACITOR, FIXED, MICA: same as C22	912-2840-00
C25	CAPACITOR, FIXED, MICA: same as C22	912-2840-00
C26 thru C30	CAPACITOR, FIXED, CERAMIC: same as C1	913-3013-00
C31	CAPACITOR, FIXED, CERAMIC: 1000 uuf ±20%, 5000 v dc	913-0101-00
C32	CAPACITOR, VARIABLE AIR: 15 uuf min 353.0 uuf max	920-0066-00
C33	CAPACITOR, VARIABLE AIR: 14 uuf min 432 uuf max	921-0018-00
C34	CAPACITOR, FIXED, CERAMIC: same as C16	913-4329-00
C35	CAPACITOR, FIXED, CERAMIC: feedthrough type, 1000 uuf +80% -20%, 500 v dc	913-1292-00
C36 thru C43	CAPACITOR, FIXED, CERAMIC: same as C35	913-1292-00
C44	CAPACITOR, FIXED, CERAMIC: 1000 uuf +100% -20%, 500 v dc	913-3009-00
C45 thru C59	CAPACITOR, FIXED, CERAMIC: same as C44	913-3009-00
C60	CAPACITOR, FIXED, MICA: 82 uuf ±5%, 500 v dc	912-2810-00
C61	CAPACITOR, FIXED, MICA: 200 uuf ±5%, 500 v dc	912-2837-00
C62	CAPACITOR, FIXED, MICA: 510 uuf ±5%, 300 v dc	912-2867-00
C63	CAPACITOR, FIXED, MICA: same as C22	912-2840-00
C64	CAPACITOR, FIXED, MICA: same as C22	912-2840-00
C65	CAPACITOR, FIXED, MICA: 180 uuf ±5%, 500 v dc	912-2834-00
C66	CAPACITOR, FIXED, MICA: 330 uuf ±5%, 500 v dc	912-2852-00
C67	CAPACITOR, FIXED, MICA: same as C22	912-2840-00
C68	CAPACITOR, FIXED, MICA: 150 uuf ±5%, 500 v dc	912-2828-00
C69	CAPACITOR, FIXED, MICA: same as C14	912-2816-00
C70	CAPACITOR, FIXED, MICA: same as C65	912-2834-00
C71	CAPACITOR, FIXED, CERAMIC: same as C35	913-1292-00
C72	Same as C13	912-2792-00
C73	Same as C14	912-2816-00
CR1	DIODE: silicon; type 1N1492	353-1661-00
CR2	DIODE: same as CR1	353-1661-00
thru CR16		
CR17	DIODE: germanium; type 1N67A	353-0147-00
CR18	DIODE: same as CR17	353-0147-00
CR19	DIODE: silicon; type 1N252	353-2940-00
CR20	DIODE: silicon; type 1N540	353-1546-00
F1	FUSE, CARTRIDGE: 6 amp, 250 v dc; ferrule type terminal	264-4100-00
F2	FUSE, CARTRIDGE: same as F1	264-4100-00

ITEM	DESCRIPTION	COLLINS PART NUMBER
J1	JACK, PHONO-TYPE: accommodates 1/8 in. plug; ceramic insulation	360-0088-00
J2	JACK, PHONO-TYPE: same as J1	360-0088-00
J3	JACK, PHONO-TYPE: same as J1	360-0088-00
J4	CONNECTOR, RF TYPE N: UG-58A/U	357-9003-00
K1	RELAY: dpdt; 2 amps, coil resistance, 10,000 ohms	970-2140-00
L1	NOT USED	
L2	NOT USED	
L3	COIL, RADIO FREQUENCY: single layer wound, solenoid, #21 or #22 AWG copper wire 39.0 uh, 0.80 ohms dc	240-0189-00
L4	Part of Z1	547-3654-002
L5	Part of Z2	547-3654-002
L6	NOT USED	
L7	NOT USED	
L8	COIL, RADIO FREQUENCY: single layer wound, no. 14 AWG, formvar insulation; 7.5 uh	240-1244-00
L9	COIL, RADIO FREQUENCY: single layer wound; 6.5 turns no. 8 AWG	547-3718-002
L10	COIL, RADIO FREQUENCY: single layer wound; 17 turns no. 14 AWG	547-3708-003
L11	COIL, RADIO FREQUENCY: 4 sections; 2.5 mh, 35 to 50 ohms, 0.125 amp	240-0059-00
L12	COIL, RADIO FREQUENCY: single layer wound, 44 uh at 2.5 mc inductance, 3.54 ohm dc resistance, 1.6 amps current capacity	240-0807-00
L13	COIL, RADIO FREQUENCY: single layer wound, 2.2 uh, 1980 ma current; 0.20 ohms	240-0174-00
L14	COIL, RADIO FREQUENCY: single layer wound, 2 turns	547-3659-003
L15	COIL, RADIO FREQUENCY: single layer wound, 7 turns no. 22 AWG	547-3660-003
L16	COIL, RADIO FREQUENCY: single layer wound, 8 turns no. 22 AWG	547-3661-003
L17	COIL, RADIO FREQUENCY: single layer wound, 14 turns no. 22 AWG	547-3662-003
L18	COIL, RADIO FREQUENCY: single layer wound, 8 turns no. 22 AWG	547-3663-003
L19	COIL, RADIO FREQUENCY: 15. uh	240-0173-00
M1	METER, ELECTRICAL: 200-0-500 ua meter range, 190 ohms, ±2%, 2-1/2 in. sq	458-0592-00
O1	KNOB-METER	544-0779-004
O2	KNOB-BAND	544-0779-004
O3	KNOB, TUNING	547-3656-002
O4	KNOB, LOADING	547-3656-002
R1	RESISTOR, FIXED, COMPOSITION: 4700 ohms ±10%, 1/2 w	745-1338-00
R2	RESISTOR, FIXED, WIRE WOUND: 25,000 ohms ±5%, 26 w	746-9155-00
R3	RESISTOR, FIXED, WIRE WOUND: same as R2	746-9155-00
R4	RESISTOR, FIXED, WIRE WOUND: same as R2	746-9155-00
R5	RESISTOR, FIXED, WIRE WOUND: same as R2	746-9155-00
R6	NOT USED	
R7	RESISTOR, FIXED, COMPOSITION: 1000 ohms ±10%, 2 w	745-5652-00
R8	RESISTOR, FIXED, WIRE WOUND: 1.0 ohms ±1%, 5 w	747-9716-00
R9	RESISTOR, FIXED, COMPOSITION: 82 ohms ±10%, 1 w	745-3307-00
R10	RESISTOR, FIXED, FILM: 1,960 ohms ±10%, 1/4 w	705-7100-00
R11	RESISTOR, FIXED, FILM: 4,000,000 ohms ±1%, 2 w	705-4260-00
R12	RESISTOR, FIXED, WIRE WOUND: 3,000 ohms, ±10%, 7 w	710-9011-00
R13	NOT USED	
R14	NOT USED	
R15	RESISTOR, FIXED, COMPOSITION: 10,000 ohms ±10%, 2 w	745-5694-00
R16	RESISTOR, VARIABLE: composition; 5,000 ohms ±20%, 0.3 w	376-0205-00
R17	RESISTOR, FIXED, COMPOSITION: 10 ohms ±10%, 2 w	745-5568-00
R18	RESISTOR, FIXED, COMPOSITION: same as R17	745-5568-00
R19	RESISTOR, FIXED, COMPOSITION: 39,000 ohms ±10%, 1/2 w	745-1419-00
R20	RESISTOR, FIXED, COMPOSITION: same as R19	745-1419-00
R21	RESISTOR, FIXED, COMPOSITION: 47 ohms ±10%, 1 w	745-3296-00
R22	RESISTOR, FIXED, COMPOSITION: same as R21	745-3296-00

SECTION VI
Parts List

30L-1 R-F Linear Amplifier

ITEM	DESCRIPTION	COLLINS PART NUMBER
R23	RESISTOR, FIXED, COMPOSITION: same as R21	745-3296-00
R24	RESISTOR, FIXED, COMPOSITION: same as R21	745-3296-00
R25	Part of Z1	745-5610-00
R26	Part of Z2	745-5610-00
R27	NOT USED	
R28	RESISTOR, FIXED, COMPOSITION: 47 ohms, ±10%, 1/2 w	745-1296-00
S1	SWITCH, ROTARY: 2 circuit (2 pole), 18 position, 1 section	259-1385-00
S2	SWITCH, ROCKER: dpst; 20 amps, 125 v ac, 10 amps, 250 v ac	266-6020-00
S3	SWITCH, ROTARY: 2 circuit (2 pole), 3 position, 1 section	259-1368-00
S4	SWITCH, ROTARY: 3 circuit (3 pole), 5 position, 1 section	259-1386-00
S5	INTERLOCK ASSEMBLY: copper, silver plated; 11/16 in. by 3/4 in. by 1.312 in.	547-3632-002

ITEM	DESCRIPTION	COLLINS PART NUMBER
S6	Same as S5	547-3632-002
S7	Same as S5	547-3632-002
T1	POWER TRANSFORMER:	662-0010-00
V1	ELECTRON TUBE: triode; type 811A	256-0053-00
V2 thru V4	ELECTRON TUBE: same as V1	256-0053-00
XF1	FUSE HOLDER: 15 amps-250 v	265-1019-00
XF2	FUSE HOLDER: same as XF1	265-1019-00
XV1	SOCKET, ELECTRON TUBE: 5 amps 2000 v rms	220-1451-00
XV2 thru XV4	SOCKET, ELECTRON TUBE: same as XV1	220-1451-00
Z1	SUPPRESSOR, PARASITIC: 4 turns no. 16 AWG wire, 100 ohms, 2 w resistor	547-3654-002
Z2	SUPPRESSOR, PARASITIC: same as Z1	547-3654-002

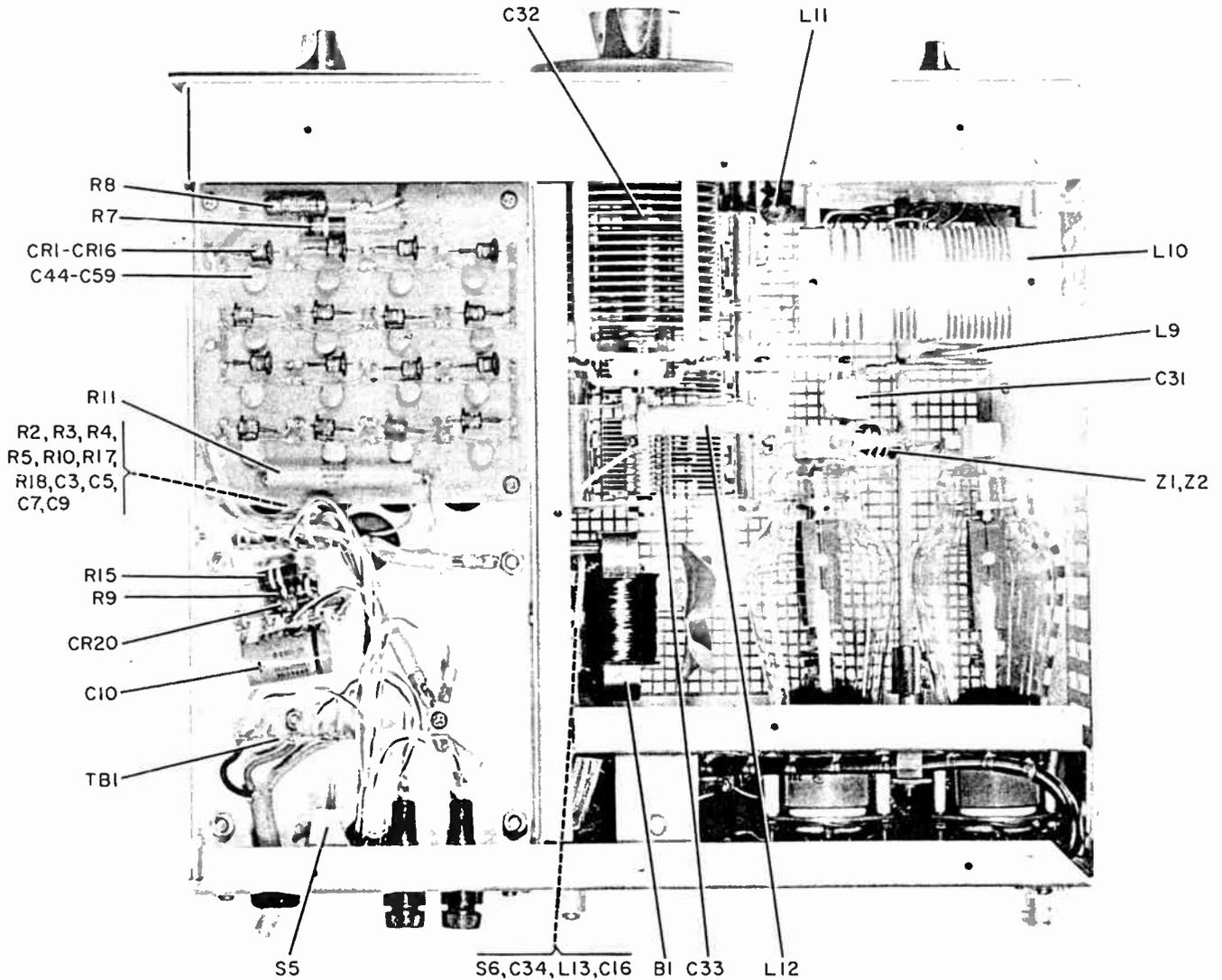


Figure 6-1. R-F and Power Supply Compartments, Parts Location

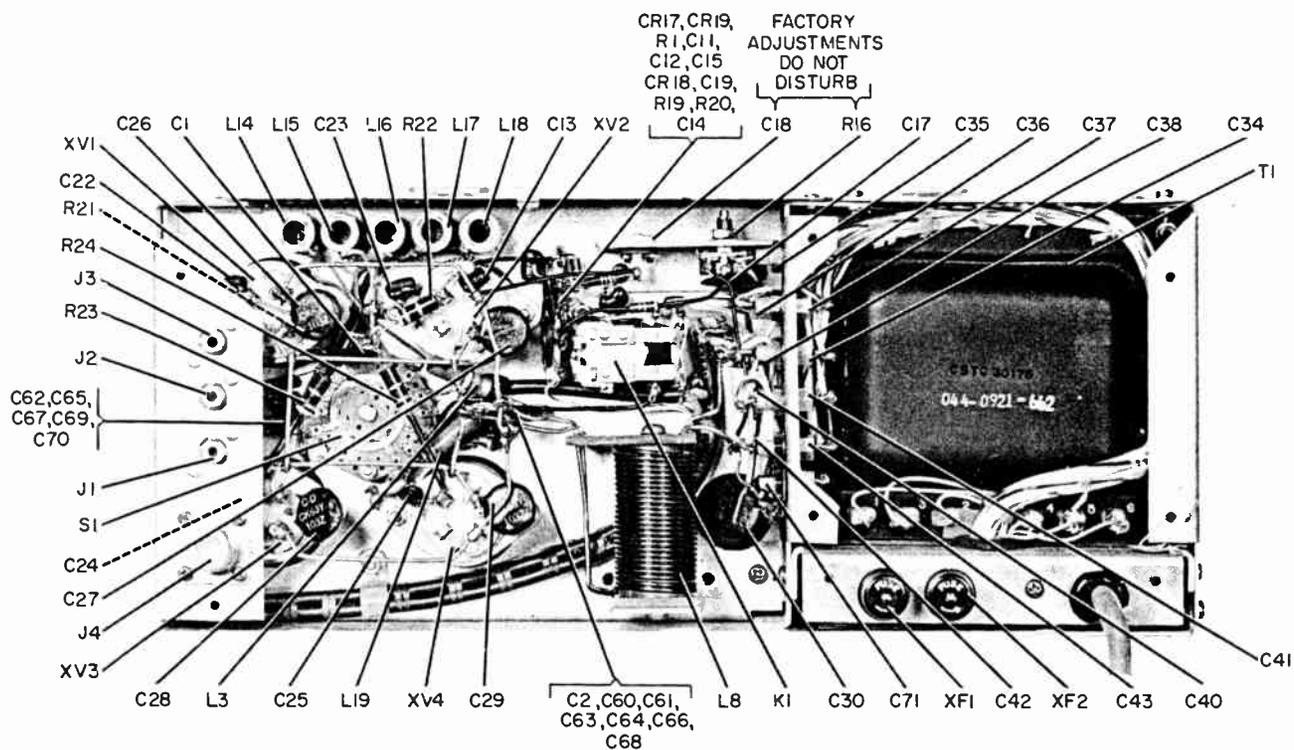


Figure 6-2. Input Circuitry, Parts Location

Replace C10 - 2-5-82

ADDENDUM FOR 30L-1 R-F LINEAR AMPLIFIER

(Collins Part Number 523-0122-00)

- ✓ Refer to Paragraphs 1.1 and 4.2. Disregard references to cabinet lid fasteners.
- ✓ Refer to Paragraph 2.1, step e. Set LOADING control to 1 on the dial, and TUNING control to white area for the band in use.
- ✓ Refer to Paragraph 2.1, step g. When using Collins exciters, set EMISSION switch to TUNE position for this procedure. The tuning meter circuit provides the proper indications at low power input for subsequent high-power operation of the 30L-1.
- ✓ Refer to Parts List and Figure 7-1. Change R1 to 4700 ohms. Delete C11.

6-28-61

ADDENDUM FOR 30L-1 R-F LINEAR AMPLIFIER

(Collins Part Number 523-0122-00)

✓ Refer to Paragraphs 1.1 and 4.2. Disregard references to cabinet lid fasteners.

✓ Refer to Paragraph 2.1, step e. Set **LOADING** control to 1 on the dial, and **TUNING** control to white area for the band in use.

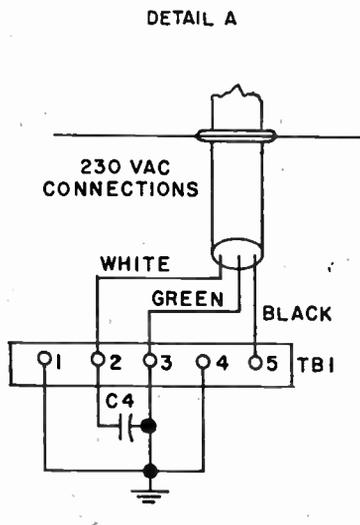
✓ Refer to Paragraph 2.1, step g. When using Collins exciters, set **EMISSION** switch to **TUNE** position for this procedure. The tuning meter circuit provides the proper indications at low power input for subsequent high-power operation of the 30L-1.

✓ Refer to Paragraph 3.7. Where reference is made to C12 and C13, substitute C72.

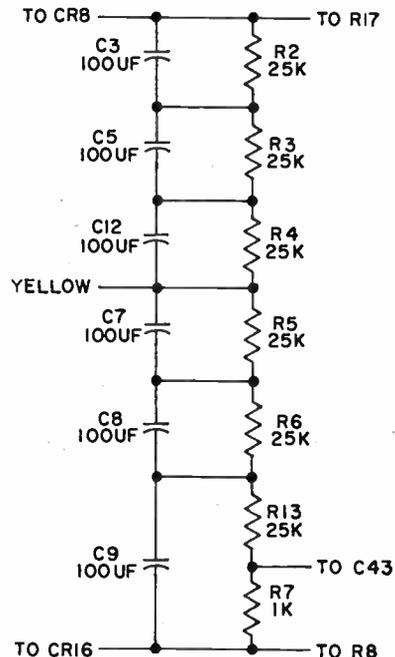
Refer to Figure 7-1. Change schematic to show F1 connected to terminal 4 of S2 and F2 connected to terminal 3 of S2. This is the reverse of the way these connections are presently drawn. To connect the primary for 230-vac operation, ignore the connections to TB1 which are shown in Figure 7-1. Remove the jumpers from terminals 1 to 2 and 4 to 5, and wire as indicated in detail A below. Note that C4 is moved from terminal 1 to terminal 2.

Refer to Parts List and Figure 7-1. Add C8 and C12 (same as C3), and R6 and R13 (same as R2). Change schematic as indicated in detail B below. Resistor R4 is now R5, and R5 is now R6.

✓ Refer to Parts List and Figure 7-1. Change R1 to 4700 ohms. Delete C11.



DETAIL B



SECTION VII ILLUSTRATIONS

- NOTES:
- UNLESS OTHERWISE INDICATED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES IN UUF, ALL INDUCTANCE VALUES ARE IN UH.
 - CR1 THRU CR16 ARE ALL 1N1492.

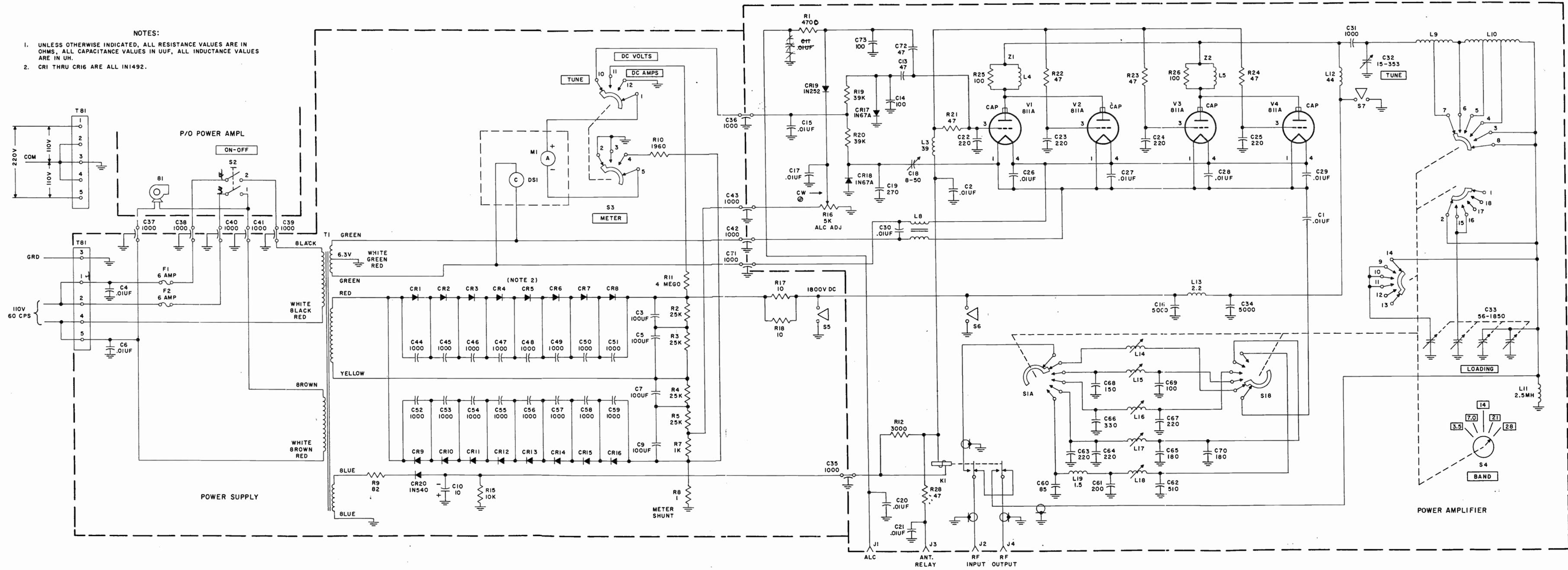


Figure 7-1. 30L-1 Schematic Diagram

