TABLE I — PARTS LIST

C_1.....10-53-mmf variable, 0.125-inch air gap (Johnson 50E45, Cat. No. 154-12).

C_2.....10-325-mmf variable, 0.025-inch air gap (Hammarlund MC-325-M, or equivalent).

C_3.....50-mmf, 7,500-volt fixed vacuum capacitor (G. E. 1L38, or equivalent).

C_4.....100-mmf, 7,500-volt fixed vacuum capacitor (G. E. 1L33, or equivalent).

J_1, J_2.....midget one-pin phono type connectors.

J_3, J_4.....chassis type coaxial jack. (SO-239).

L_1.....0.65 uh., 5 turns, $\frac{3}{16}$-inch diameter copper tubing, 1¼ inches inside diameter, 1¾ inches long (28-Mc. coil).

L_2.....2 uh., 5 turns, ⅛-inch diameter copper tubing or wire, 2¼ inches inside diameter, ¾ of an inch long, tapped at 2 turns from L_1 end (14 & 21-Mc. coil).

L_3.....9 uh., 14 turns, No. 12 tinned copper wire, 2½ inches in diameter, 2⅜ inches long, tapped at 5 turns from L_2 end (7 & 3.5 megacycles) (B & W No. 3905-1 coil stock, or equivalent).

M_1....0—1-milliampere DC meter, 2½-inch square flange (G. E. DW-91).

R_1.....300 ohms, 1 watt total, precision type.

R_2.....3620 ohms, 1 watt, precision type.

R_3, R_4.....0.25 ohms, 1 watt, precision type.

R_5, R_6.....1.5 ohms, 1 watt, precision type.

R_7, R_8.....0.64 ohms, 1 watt, precision type.

RFC_1..100-uh. solenoid type single layer r.f. choke; 140 turns of No. 26 enameled wire closewound 2½ inches long on ¾-inch diameter ceramic pillar 3 inches long.

RFC_2..2.5-mh, 250-milliampere pi-wound r.f. choke (National R-300, or equivalent).

RFC_3..Dual 15-ampere filament r.f. choke (B & W FC-30).

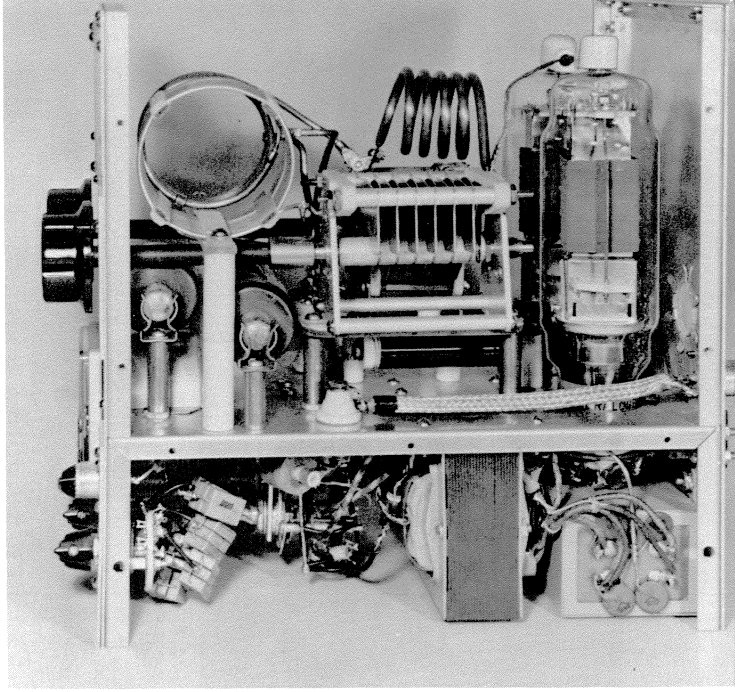
S_1.....5-position, 2 pole, heavy-duty rotary tap switch (Shallcross type 12609[2] or Radio Switch Corp. No. 86 Standard).

S_2.....10-position, 1 pole, progressive shorting rotary tap switch (Centralab No. 2042).

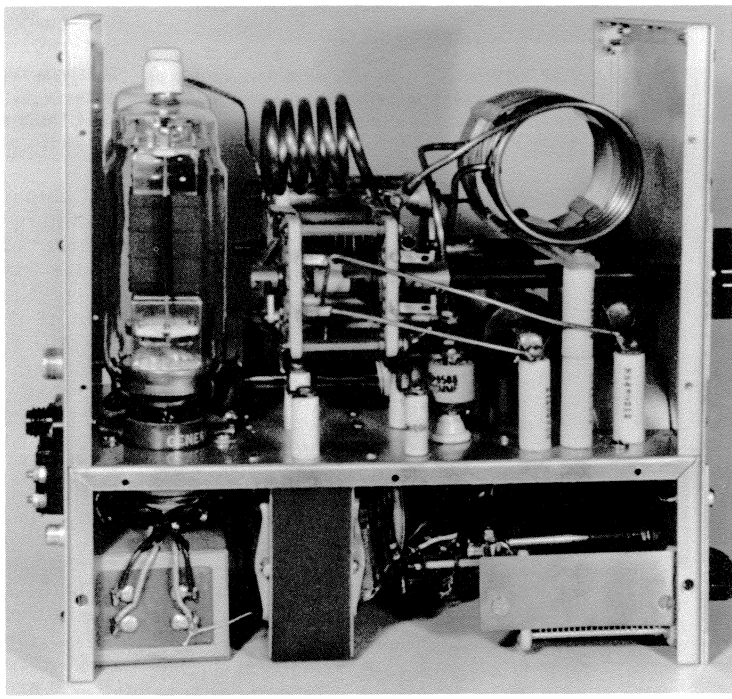
S_3.....8-position, 2 pole rotary tap switch (Centralab No. 1413, 11 positions).

T_1 T_2.....10-volt, 4-ampere filament transformer, 115-volt primary (Stancor P-5016, or P-6458; Thordarson T-21F18).

[2]Shallcross Manufacturing Co., Selma, North Carolina. See manufacturers' representatives listing in Electronics Buyers Guide for nearest distributor.



LEFT SIDE VIEW, showing how C_3, C_4, RFC_2 and S_1 are mounted on ceramic pillars. Coils L_2 and L_3 are cemented to plastic strips supported on ceramic pillars.



RIGHT SIDE VIEW, showing metal pillars for grounded ends of C_3 and C_4. Insulated shafts are used for C_1 and S_1 extensions to the panel knobs. GL-814 tube sockets are sub-mounted ½ inch on pillar insulators.

The same reasoning was applied to the loading capacitance (C_2). A 10 to 325-mmf variable is used for the higher frequencies, and additional capacitance, up to 2,100 mmf, is cut in by S_2 in steps of 300 mmf. RFC_2 is a safety choke.

THE METERING CIRCUIT provides for measuring control and screen grid, and cathode currents in each GL-814 individually. This permits selecting a matched pair of GL-814's (if you happen to have spares around), and is also handy for insuring that each tube is sharing the load.

It also allows you to catch a tube starting to go bad before it has a chance to wreck its mate. Many poor signals are caused by weak tubes, causing the other tubes in parallel to be overloaded or to work under improper loading conditions.

Control grid (No. 1 grid) current is normally considered of great importance. This amplifier also has number two grids metered independently. A "look-see" in this circuit is not only interesting but educational. This eliminates guessing as to the division of the drive between the control grid and screen grid.

The cathode circuits are metered in the filament center tap. Remember to subtract control grid and screen grid currents from this reading to determine true plate current. Normal cathode current may be read, but it may be abnormal grid current due to drive and loading that is responsible for this reading.

W8DLD also has built an r.f. wattmeter right into this amplifier. The circuit is described in the May-June, 1961 issue. (See LOW-COST RF WATTMETER, page 1.) Forward power up to 500 watts full scale is read in position 1 of S_3; and, reflected power up to 50 watts full scale is read in position 2. Thus, readings of nearly 500 watts forward and less than 50 watts reflected power indicate less than 10 per cent reflected power, and a VSWR of less than 2 to 1. The reflected power position can be precisely calibrated with a 50-ohm dummy load.

CONSTRUCTION OF THIS MODEL was accomplished in a 6 x 10 x 3½-inch deep chassis box (*Bud* CU-3010A Minibox, or equivalent). The parts layout shown in the accompanying pictures and chassis layout drawing, Fig. 2, provides very short r.f. circuit leads and good isolation of the input circuit. Nearly all of the 600 cubic inches of volume in the enclosure are occupied, as readers will note.

The complete enclosure should be constructed first. The 6 x 10-inch end

(continued on page 4)