grid amplifier due to an impedance mismatch. A matching network or coupler should then be used between the exciter and amplifier to achieve a match.[3]

PERFORMANCE of the amplifier when constructed as illustrated will assure 60% efficiency at 28 megacycles, rising to 70% at 4 megacycles. This may sound high, but the driving power has not been subtracted from the efficiency figure. The amplifier shows a power gain in excess of 10 times. This means that 50 watts should be fed into the input jack if 500 watts output is desired. There is no way to cheat on these figures!

So far this testing has been done under CW conditions. Now the real test comes with an oscilloscope. Connect the scope to the amplifier test output jack, J_4. Note the two input and output jacks for easy access to a monitoring spot. Turn on the 500-watt output CW test and set the scope for a good sized CW display. The pattern should be a pure RF carrier. With a grease pencil or crayon, mark the height of this display on the scope screen.

Now switch to SSB and slowly advance the audio gain while speaking into the mike until peaks of the height marked for CW are reached. This indicates that the amplifier is delivering 500 watts peak output. Now adjust the scope for a slow sweep and look at the so called "Christmas tree pattern." Is there any flattening or distortion noticeable at this 500-watt level; or, can the audio level be increased?

If flattening is indicated, plug the scope into the input jack of the linear which will allow monitoring of the exciter. If the same flattening is present, it is coming from the driver. If a display with no flattening is seen, it must be in the linear stage. Try a slight increase in loading by decreasing the load capacitance (C_2). Did this cure the flattening? With 50 watts of linear drive, at least 500 watts output without distortion should be seen on the scope. It may be possible to further increase the drive without distortion. Remember that the scope is reading an instantaneous voltage. Also remember that the wattmeter will only read average power and so is of no value for this test.

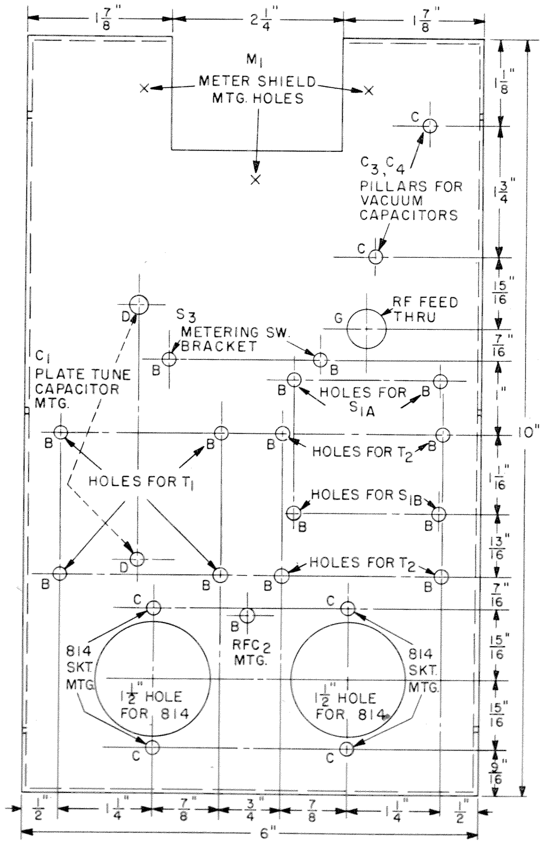
The 500-watt peak output can be directly compared with any other

(continued on page 7)

[3] A suitable pi-network impedance matching coupler is described on page 4 of the November-December, 1959 (Vol. 14, No. 6) issue of **G-E Ham News**.

TABLE II — DRILL SIZE LEGEND

"A" drill—No. 31 clears 4-40 screw.
"B" drill—No. 26 clears 6-32 screw.
"C" drill—No. 17 clears 8-32 screw.
"D" drill—No. 9 clears 10-32 screw.
"E" drill—9/32-inch diameter.
"F" drill—3/8-inch diameter.
"G" drill—1/2-inch diameter.
"H" socket punch—5/8-inch diameter for 7-pin miniature tube socket.
"J" socket punch—3/4-inch diameter for 9-pin miniature tube socket.
"K" socket punch—1 1/16-inch diameter for small octal tube socket.
"L" socket punch—1 1/4-inch diameter for large receiving tube socket.



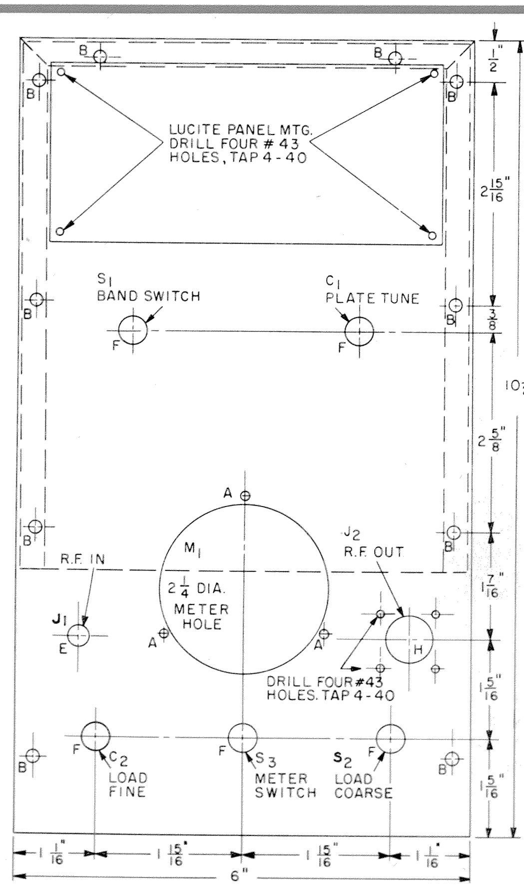


FIG. 2. CHASSIS LAYOUT DIAGRAM, showing the actual drilling for major parts on W8DLD's model amplifier with two GL-814 pentodes. See TABLE II for the sizes of holes keyed with letters. Locations of small holes marked C_1, C_3, C_4, RFC_2, S_1, T_1 and T_2 are for the components actually used, and should be moved to suit components having different mounting dimensions. The cutout for M_1 should clear the connecting terminals on the back of the meter.

FIG. 3. FRONT PANEL LAYOUT DIAGRAM for the amplifier. The front of the chassis also should be identically drilled, using the panel as a template. Locations for the shafts on C_1, C_2, S_1, S_2 and S_3 probably will be the same even if similar components are substituted for those specified in TABLE I. Meter mounting holes, marked "A," may differ and should be located from the meter actually used.