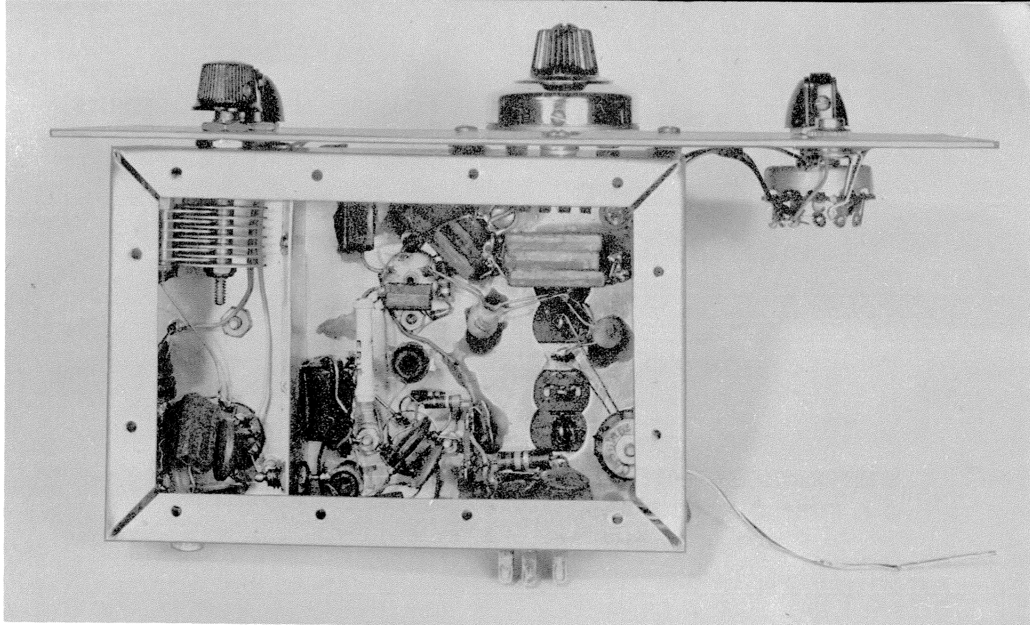
capacitors from RF energy can be minimized by using the lowest possible voltages on the oscillator but despite this precaution some heating and drift are inevitable. Various types and makes of mica and silver mica capacitors were tried and despite popular belief, some silver mica capacitors were no better than conventional micas in this application. A slight improvement was noted by paralleling several capacitors to provide the required 0.006 mfd. of capacitance. This VFO parallels three .002-mfd. capacitors for each of the voltage dividing capacitors.

The drift problem was licked in conventional fashion by the use of temperature - compensating capacitors in the oscillator grid-coupling and tuned circuit. These reduce the drift to less than 30 cycles at the fundamental frequency.

If you don't want to bother with temperature compensation you can still rate your VFO as manufacturers do by saying, "drift is negligible after ten minutes warmup." However, the true test for short-term VFO stability is the amount of drift measured from the moment plate power is applied, after two minutes of heater warmup. After all, the fellow at the other end doesn't wait ten minutes for your VFO to warm up before he starts to copy you!

Aside from the afore-mentioned drift considerations, the Inductuner VFO eliminates "pussyfooting" on the operating table. Even on 28 megacycles the VFO can be rapped sharply with no detectible change in beat-note — provided the oscillator components have anchored down. The Inductuner completely eliminates frequency variations usually found in the average home-built VFO where a push on the front panel shifts frequency.



BOTTOM VIEW of the exciter, showing placement of smaller parts around the major components, locations of which are shown in Fig. 4 below. Note the two groups of three 0.002-mfd. mica capacitors in parallel for C_3 and C_4. The toroidal coil, L_2, shown at the lower right corner, fastened to the chassis with insulating spacer washers and a brass machine screw. Bottom plate covers chassis for shielding.

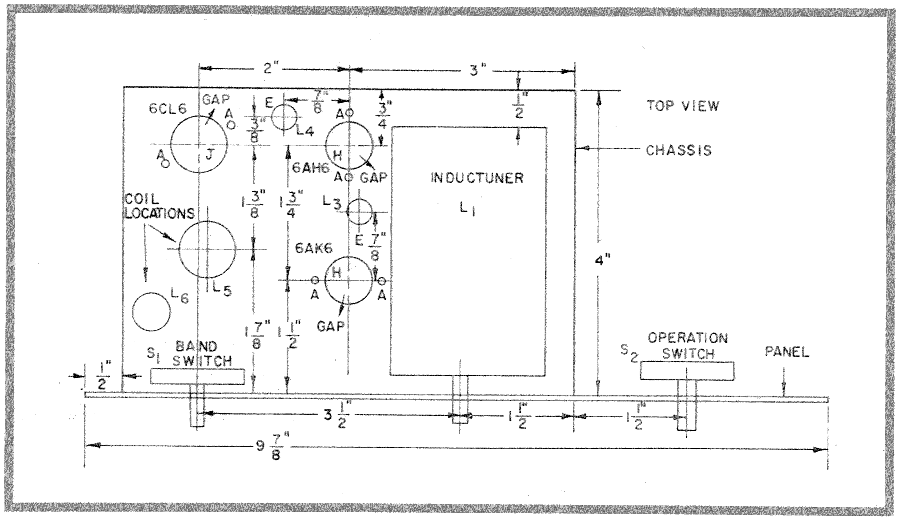


FIG. 4. CHASSIS LAYOUT DIAGRAM for the inductive-tuned VFO exciter. Locations for coils L_5 and L_6 are also shown. Holes marked "A" are No. 31 drill for No. 4 machine screws; those marked "E" are 9/32 of an inch in diameter for the mounting studs on L_3 and L_4.

TRANSMITTER PROTECTIVE CIRCUITRY (continued from page 3)

THE COMPLETE POWER SUPPLY for the transmitter at W7KCS is shown in the schematic diagram of Fig. 4. Note that all of the foregoing features have been included in this circuit. Power is fed into the power supply through a 3-prong AC line plug whch provides for automatic grounding of the transmitter cabinet and chassis. A time-delay switch is included in the high voltage supply primary circuit to provide 60 seconds delay after the GL-3B28 filaments are energized, before the high voltage transformer can be energized.

Good construction practice should be followed in this unit, including adequate insulation in high voltage circuits, fastening small parts securely to prevent movement, etc. The photographs of W7KCS's transmitter and power supplies on these pages show many of these construction details. Readers are also referred to the "Power Supply Construction" chapter of the ARRL *Radio Amateur's Handbook* for further suggestions.

Although W7KCS's protective circuits have been utilized in his AM transmitter, they are also excellent for the bias, screen grid and plate voltage power supplies for linear amplifiers. They can be easily added as subassemblies to existing power supplies.

It's smart to protect the lives of your transmitting tubes — not to mention your own life — by including these simple, but effective circuits in your transmitter.

CONTROL CIRCUIT VOLTAGE is measured by Norm Morgan checking the protective circuits in his transmitter. Note that all parts are firmly fastened to chassis.