input matching. RFC_1 is the new B & W FC-30A bifilar filament choke which is more efficient than the earlier type FC-30. With the center tap of the filament transformer returned to ground through an extra pair of contacts on the VOX or antenna relay, the no-signal resting current will be approximately 60 ma. with 3000 volts on the plate. With the relay contacts open on standby, the 25K bias resistor drops the plate current to a negligible value.

A B & W type 850-A coil-switching unit is used in the pi-network output circuit. The type 852, incidentally, is not suitable for use with the 4-1000A, since it is designed for a much lower plate load impedance. Its use would not only require much higher input and output capacitances, but would also result in an abnormally high-Q circuit in this amplifier. Instead of an expensive vacuum variable for the tank capacitor, C_2 is a split-stator air unit with 0.175-inch plate spacing. To reduce the minimum circuit capacitance on the higher-frequency bands, one section of the dual capacitor is used for 10, 15, and 20 meters; the second section is switched in parallel with the first for the lower frequencies.

The variable output capacitor C_3 is a 1500-pf. unit with 0.03-inch plate spacing. This provides sufficient capacitance for the phone end of the 80-meter band. However, more capacitance will usually be required for the low-frequency end of this band, and this is provided by connecting a fixed 0.001-μf. mica capacitor in parallel with C_3 in the last position of S_{1C}.

Parasitic Suppression

Several different makes of chokes were tried at RFC_2 in conjunction with many different resistance-inductance combinations in the v.h.f. suppressor Z_1. However, it was found practically impossible to completely eliminate parasitic oscillation on all bands until the B & W type 800 choke was tried.

Metering

Grid current is monitored very simply. The control grid is grounded through four 4.7-ohm ½-watt composition resistors in parallel, bypassed by a 0.01-μf. disk ceramic capacitor. The RC combination serves to hold the control grid very close to ground potential. Grid current is monitored by measuring the voltage drop across the resistors with the 1-ma. grid meter, calibrated 0-300 ma. full scale, and a series resistor.

A simple way to determine the value of the series resistor R_1 is to place a regular milliammeter with a scale of 200 ma. or more from the VOX relay terminal to ground. Apply excitation, and substitute resistors at R_1 until both meters have the same deflection at 150 ma. As an example, the Weston Model 301, 1-ma. meter requires a 27-ohm series resistor.

Plate current is measured by a 0–1-amp. d.c. meter shunted across a 10-ohm resistor in the negative high-voltage lead. This resistor is incorporated in the power supply, not in the amplifier itself. The 50-watt rating gives an ample safety factor, since the power dissipation would not exceed a few watts should the ammeter open up. Notice that the negative terminal of the supply must not be grounded except through the 10-ohm resistor.

A plate voltmeter has a definite place in this amplifier, or in any other amplifier where the d.c. input runs 900 watts or more, since it is required by FCC regulations. Even if you run less than 900 watts, it is reassuring to know exactly what your input is at all times.

To continuously monitor the r.f. output level of the amplifier and to aid in efficient tuning, a simple r.f. voltmeter has been incorporated in the circuit. Absolute readings are not necessary, so provision has been made for varying the sensitivity by adjustment of R_3.

Component Modification

Some of the components require minor modification before mounting. The last rotor plate and the last stator plate of the rear section of the tank capacitor C_2 are removed. This is section C_{2A} in the diagram, which is used alone on the higher frequencies. The operation is simple and requires no special tools. The alteration reduces the minimum capacitance to permit a more favorable Q on 10 meters. To further reduce the minimum circuit capacitance, the stators of C_2 are moved farther away from the chassis by mounting the capacitor in an inverted position; that is,

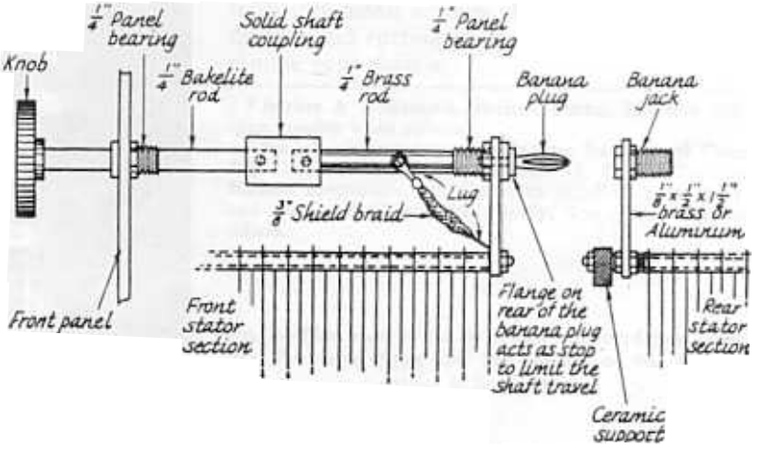

Fig. 3—Sketch showing details of the tuning-capacitor switch, S_2. The stator sections are connected in parallel when the panel control knob is pushed to engage the plug in the jack.