INSTRUCTIONS FOR POWER AMPLIFIER MODEL 4EF5B2

The General Electric 250 watt Power Amplifier Model 4EF5B2 has been designed for use in stations operating in the 144 to 174 MC band. An external exciter is required for driving the amplifier. A power supply is provided for external mounting. The amplifier employs a 4CX250-B tube as the final amplifier stage, with forced air cooling provided by a blower mounted on the power supply. Standard 19-inch relay rack mounting is employed for the amplifier and its power supply. Tuning controls are located on the front panel of the amplifier.

This power amplifier is exciter keyed. Only when RF is present at the grid of the PA tube will the power amplifier be keyed on to the full 250 watts.

RF AND POWER CONNECTIONS

All power connections (except the high voltage) are made through a six-conductor cable connected between the power supply and a plug (P481) on the front panel of the amplifier.

High voltage for the amplifier plate is supplied to a feed-through coupling (PO-2) at the rear of the plate compartment.

RF drive is connected between the exciter and a plug (P482) on the front of the unit by an RG-58/U coaxial cable.

PREVENTIVE MAINTENANCE

To obtain rated equipment performance, a program of regular preventive maintenance should be followed. Frequent checks of the operating frequency should be made as required by the FCC. Check the PA PLATE current, GRID current and PA PLATE voltage. Check for loose nuts, screws and damaged components. Inspect all power and RF cables and connectors for damage.

4CX250 POWER AMPLIFIER TUBE REPLACEMENT

A. To remove the power amplifier tube from its mounting, proceed as follows:

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1. Remove the high voltage lead from PO-2 located on the rear of the plate compartment.

2. Loosen the winged screws holding the rear cover plate assembly.

3. Slide off the rear cover plate assembly.

4. Insert the prongs of the tube extractor supplied with the equipment between the cooling fins of the tube.

5. Gently pull the tube straight out from the socket.

B. To insert the tube in its mounting, proceed as follows:

1. Insert the prongs of the tube extractor between the cooling fins of the tube.

2. Push the tube all the way into the socket.

3. Replace the rear cover plate assembly and tighten the winged screws.

4. Connect the high voltage lead to PO-2 on the rear of the PA.

BLOWER MAINTENANCE

The blower motor bearings are to be lubricated every 2000 hours of operation. Use Gulfcrest A (WCR) electric motor and generator low viscosity oil. Do not allow oil to get on the impeller blades. If the blades become coated with oil, they should be removed, washed in a grease solvent and hot water, thoroughly dried and replaced.

CIRCUIT DESCRIPTION

Excitation is fed to the power amplifier through P482 to the coupling loop L482 and coupled to Coil L484 which, with C481, forms the grid tank circuit of the amplifier. By adjusting the PA GRID control (C481), the grid tank is tuned to the operating frequency. L481 isolates RF from the power cable.

Heater voltage for V481 may be varied inside the control box on the power supply chassis. C482, C483 and C484 are RF by-pass capacitors. R481 is used as a screen decoupling resistor. Built into the tube socket is a ring type capacitor which serves as the screen by-pass.

C496 and C497 are neutralizing capacitors in series with the neutralizing adjustment. C485 provides RF by-passing for the B-PLUS and L485 is the RF choke in the plate supply. The plate tank is composed of C488 and the transmission line section formed by the inner and outer cages of the plate cavity. The plate tank is tuned to resonance by adjusting the PA PLATE control C488.

Adjusting the PA COUPLING control varies the coupling between the plate tank and the output of the amplifier by controlling the amount of magnetic flux linking the plate line and the filter line. L483 couples the energy from the PA FILTER cavity to the output connector J481. The signal at J481 is connected to the station antenna through the variable attenuator.

RF PROBE CIRCUIT

The RF probe circuit consists of L489, L488, R482, R483, CR481, CR482 and C489. L489 is the RF pick-up loop which feeds part of the RF energy present in the output circuit to the input of the RF probe detector. This RF energy is then rectified and a positive DC output is applied to an external RF Level Indicator. The RF Level Indicator is actuated when the power output exceeds 125 watts.

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LYNCHBURG, VIRGINIA

Printed in U.S.A.