3 PHASE POWER AMPLIFIER

IL 11737

PACKAGED UNIT - 8×12×4 IN.

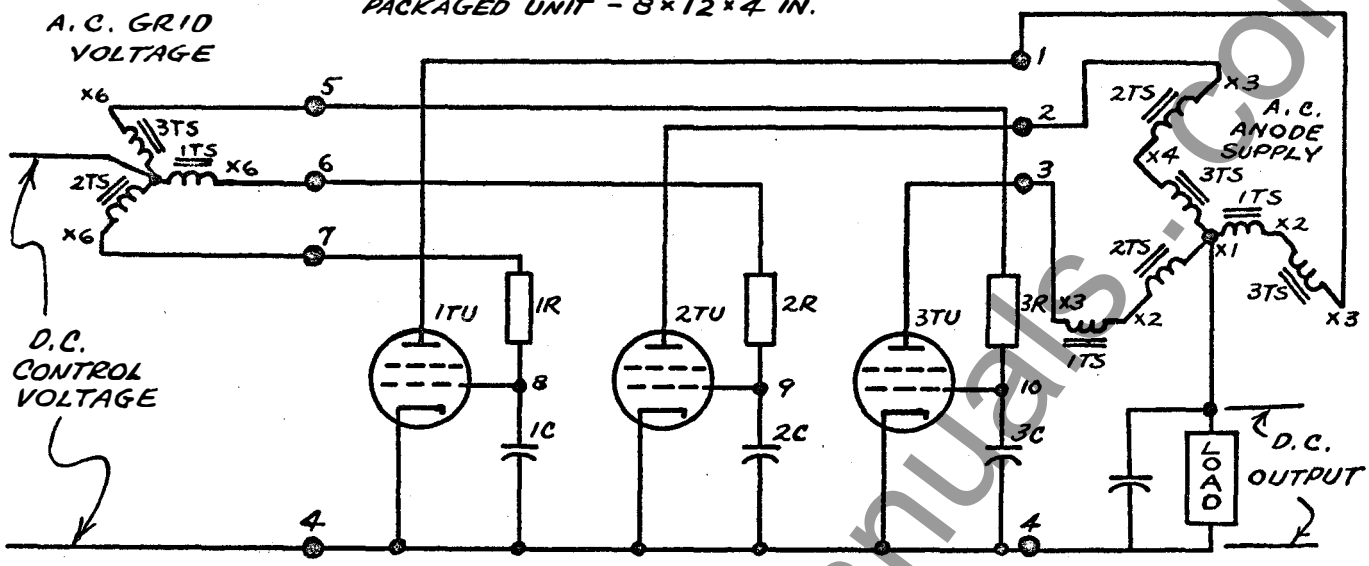
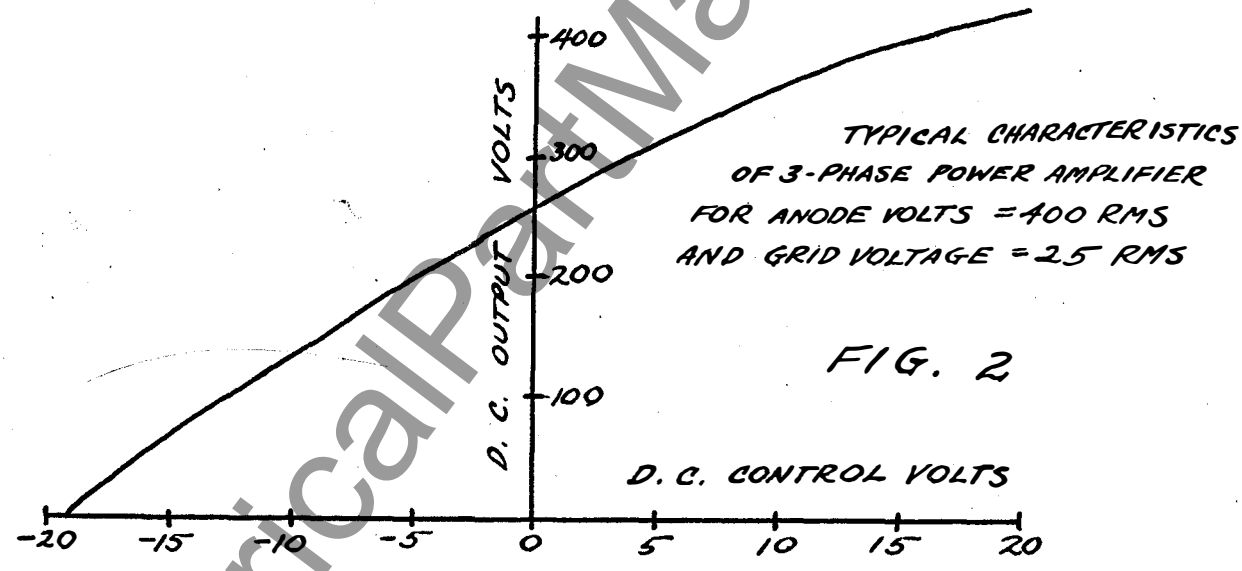


FIG. 1



TYPICAL CHARACTERISTICS OF 3-PHASE POWER AMPLIFIER FOR ANODE VOLTS = 400 RMS AND GRID VOLTAGE = 25 RMS

FIG. 2

Description: The three phase power amplifier is a half wave thyratron rectifier packaged unit complete with filament transformer. The AC anode supply and AC grid voltages are connected externally.

This unit is used for supplying the DC control voltage to generator, motor or reactor control fields. It is generally used in electronically regulated control systems and is controlled by the output of a DC voltage amplifier. The maximum DC voltage gain of the three phase power amplifier is approximately 12 to 15.

Operation: The AC grid voltage of each thyratron lags its corresponding AC anode voltage by approximately 90 degrees. The AC grid voltage is controlled to intercept the critical grid voltage of the thyratrons by the DC control voltage. This gives control of the thyratrons over the complete half cycle which the thyratron anode is positive with respect to cathode.

For inductive loads, smooth control is obtained over all of the output range except in the low voltage output region (approximately 80 volts output to cutoff). This is corrected for applications requiring smooth control over the low voltage region by connecting a rectifier across the output load so that the rectifier conducts when the load voltage reverses due to inductive reaction when the DC current goes to zero between conducting half cycles. This rectifier is shown as IRX in Fig. 1.

Voltage Sequence: It is necessary to have the proper phase voltage sequence so the AC grid voltage of each thyratron will lag its corresponding anode voltage. In Figure 1, the phase rotation is counter clockwise.

Check for proper phase voltage sequence as follows:

1. Vary D.C. control voltage plus and minus over complete range of control and observe for smooth control of D.C. output voltage. If output voltage control is not smooth and jumps from one value to another in one or two steps, phase sequence is incorrect.

2. Reverse any two of the three phase leads on the primary side of the anode transformers. This reverses the phase voltage sequence. Again vary D.C. control voltage and observe output for smooth control. (If the DC output should jump from zero to some small value when controlling the thyratrons from zero output, this is a normal condition as explained in the "operation" when a rectifier IRX is not across the load.)

Trouble Shooting

The following sequence is recommended for trouble shooting:

A. Measure all transformer voltages (filament, anode, and grid supply) for approximately $\pm$ 5% of values shown on schematic diagram.

B. Check to see that load is connected to output. Also check to see that AC voltages are not open circuited.

C. Measure DC control voltage and check for approximate controlling magnitude with characteristic curve of Fig. 2.

D. Substitute new thyratron tubes to eliminate possibility of defective tubes.

E. Check for open or shorted grid capacitors 1C, 2C, and 3C.

F. Check for other open or shorted connections and defective components.

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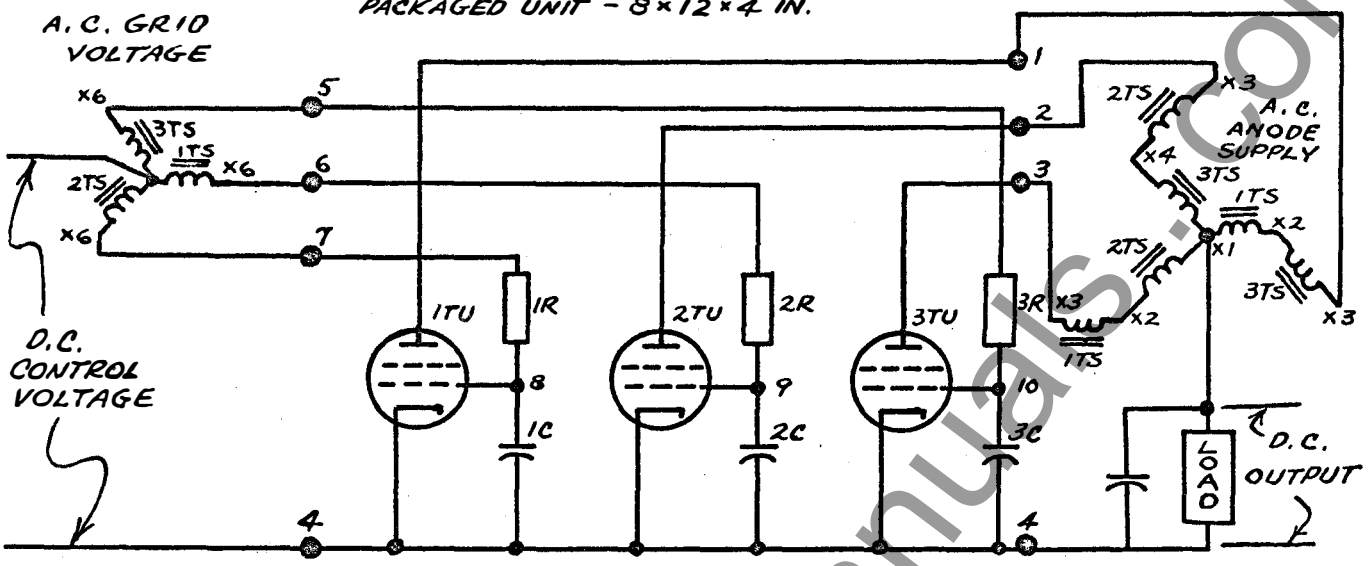
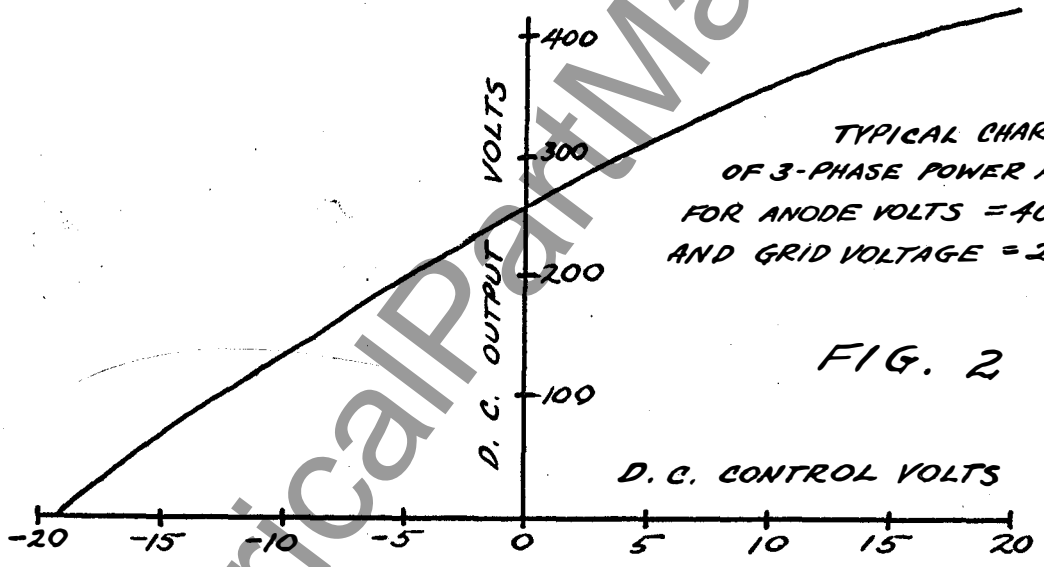


FIG. 1



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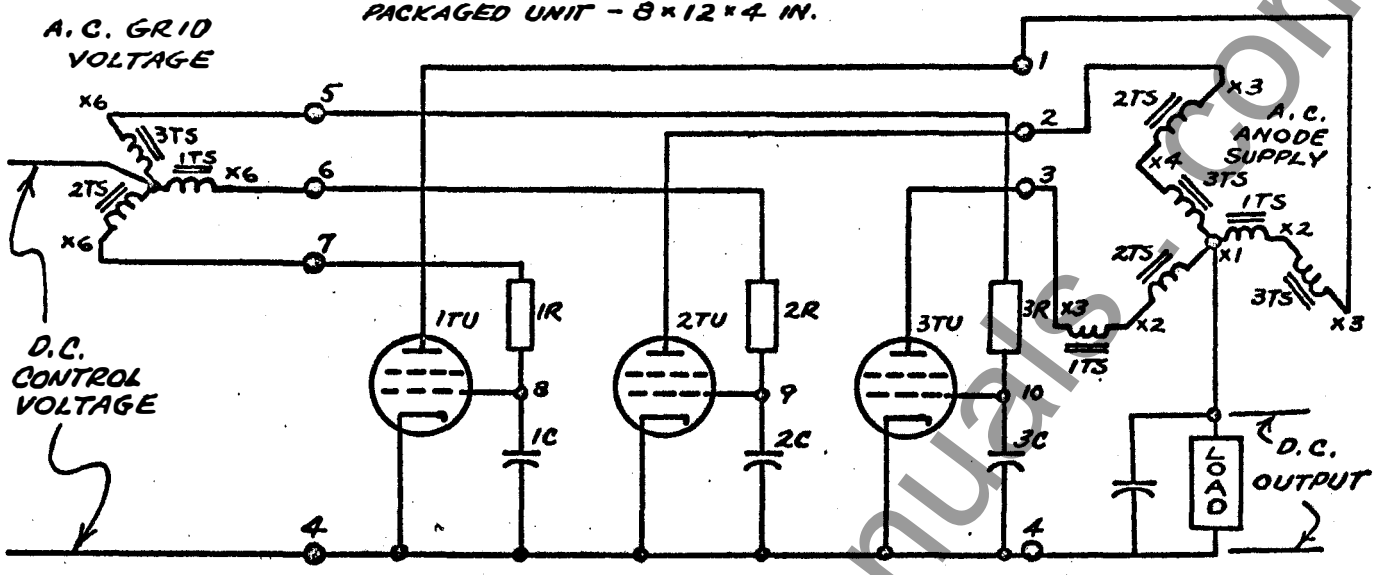

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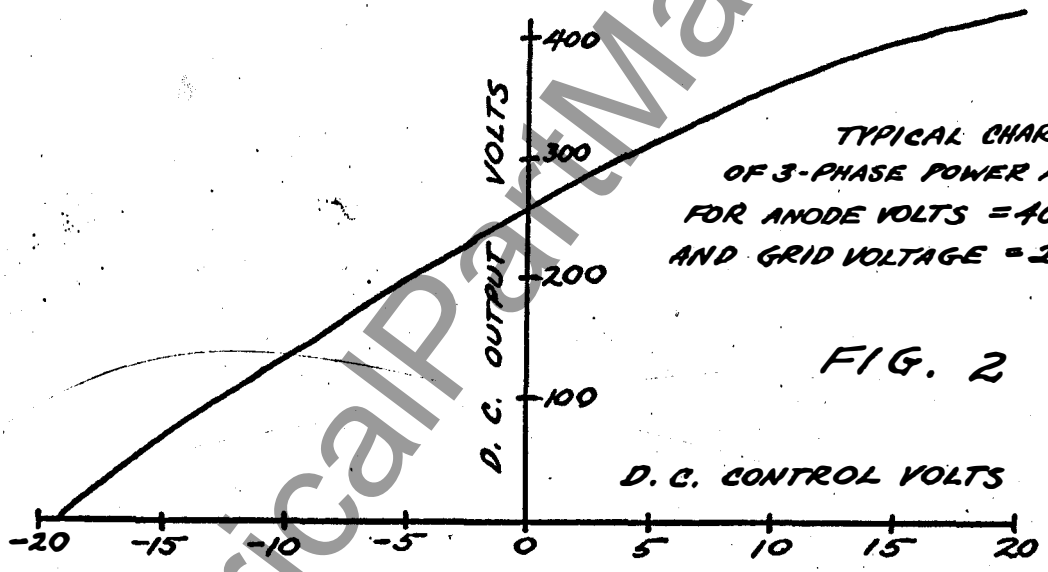

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