

4)

With the RANGE switch on the 70V 5A position and an accurate external ammeter connected across the output terminals, adjust the CURRENT LIMIT control to give a reading of 5 amps on this meter. Set T103 until the front panel ammeter reads 5 amps (full scale).

ACCESS

Access to the circuitry may be gained by first removing the rear panel, and then withdrawing all the covers, bottom two sides and top, which are located in slots in the front panel chassis members.

Setting the Voltage Range and Current Limit

Set the "RANGE" switch to 35V, 10A. Set the CURRENT and FINE front panel controls to full scale.

Apply mains input to the unit and adjust T1 circuit board No. 1 to give 35.5 volts output.

With the CURRENT LIMIT control set fully anti clockwise and a short circuit applied to the output terminals, adjust T3 circuit board No. 1 to give zero output current. Remove the short circuit.

Connect a load to the output terminals and adjust it to give 11 Amps output current, with the CURRENT LIMIT control fully clockwise. Adjust T4 circuit board No. 1 until the output voltage of the unit just begins to fall at 11 Amps. Disconnect the load.

Set the range switch to 70V, 5A. Set the CORSE and FINE voltage control fully clockwise.

Adjust T1 circuit board No. 1 to give 70 volts output.

Circuit board No. 1 is located on the right hand side of the unit viewed from the front, and is the circuit board nearest to the front panel.

Setting the meter full scale deflections

With the RANGE switch on the 70V 5A position adjust the output voltage of the unit by means of the CORSE and FINE front panel controls to give 70 volts output as indicated on an accurate external meter. Set T101 until the front panel voltmeter reads 50 volts (full scale).

With the RANGE switch on the 35V 10A position adjust the output voltage of the unit to give 35 volts as indicated on an accurate external meter. Set T102 until the front panel voltmeter reads 25 volts (full scale).

With the RANGE switch on the 35V 10A position apply an accurate external ammeter across the output terminals. Adjust the CURRENT LIMIT control to give a reading of 10 amps on this external meter. Set T103 until the front panel ammeter reads 10 amps (full scale).

SECTION VI

TYPICAL PERFORMANCE AND APPLICATIONS.

1) SERIES OPERATION

Units may be connected in series to provide higher output voltages. It is recommended that a protective diode is fitted across the output terminal of each unit, cathode to positive terminal to prevent the supplies becoming reverse biased under overload conditions. The diode should have a current rating equal to the maximum output capability of the unit. It is recommended that not more than three units be series connected.

2) PARALLEL OPERATION

Units may be connected in parallel to increase the current capability. In order to parallel them the units should be adjusted for equal output voltage and their output terminals then connected in parallel. In such a system, as output load current is increased from zero, the unit having the highest voltage setting will conduct until it reaches its current limit point. The unit with the next highest voltage will then conduct until it reaches its current limit point and so on. The V/I characteristic of a system of three units connected in parallel is shown in figure 2.P14. This shows a series of descending steps in voltage as the load current increases. The magnitude of the step depends on how closely the voltages can be set together. The resolution of the fine potentiometer is approximately 10mV hence the steps in voltage could not be lower than 10mV. No more than three units should be operated in parallel.

3) EXTERNAL SENSING OPERATION

Units are supplied with links between the SENSE and OUTPUT terminals. If it is required to correct for the voltage drop along the leads carrying current to the load, it is possible to use a four terminal connection. It is not possible to correct for more than $\frac{1}{2}$ volt drop in each lead.

Addition of lead from the sensing terminals and output terminals increases the inductance in the feedback path, which could give rise to instability at high frequencies unless the following precautions are taken.

The leads from the + OUTPUT and + SENSE terminals should be twisted together. The leads from the "- OUTPUT" and "- SENSE" terminals should be twisted together.

Since inductance is introduced between the output terminals and the load, the transient performance of the supply at the load is adversely affected. This may

be restored by adding a capacitor of approximately 2000uF at 100 volts directly across the load.

It may also be necessary to decouple the output and sensing terminal pairs with low voltage electrolytic capacitors. For the + OUTPUT and + SENSE terminal pair the capacitor positive should be connected to the + OUTPUT terminal and for the - OUTPUT and - SENSE terminal pair, the capacitor positive should be connected to the - SENSE terminal.

NOTE: CARE MUST BE TAKEN NOT TO DRAW LOAD CURRENT FROM THE SENSE TERMINALS.

TYPICAL PERFORMANCE.

STABILITY.

Output voltage changes are due mainly to the following causes.

- a) Load change.
- b) Mains supply change.
- c) Component temperature change.

(a) Load Change.

- (1) Steady load - for a change in steady load from zero to full load, the specification on page holds.
- (11) Transient response - Typical response to a pulsed load is shown in figure 3. P.14.
- (111) Output impedance - for alternating load superimposed on a steady load, the output impedance of the supply increases with frequency due to fall off in gain of the control amplifier, until eventually it is determined by the output capacitor and lead inductance. A typical output impedance/frequency curve is shown in figure 4. P.15.

(b) Mains Supply Change.

Surges on the mains in the form of short rise time pulses may be fed on to the output terminals by stray capacitances. When monitoring the output waveform, both oscilloscope leads should be connected to the same output terminal before making a measurement to ensure that pulses which may not appear across the output terminals are not present.

Where mains borne pulses exist it may be necessary to fit some form of mains input filter to the mains lead.

(c) Component Temperature Change.

Output variation is caused by component value change due to temperature change. The temperature

change can be:

- (1) As a result of ambient temperature change or
 - (11) As a result of internal temperature change caused by change in load or mains input to the unit.
- (1) Ambient change - the typical temperature coefficient of output voltage, at constant load and constant mains input is 0.02% per degree centigrade.
- (11) Internal change - a typical plot of output variation against time for changes in mains input and load is shown in figure 5. P.15.

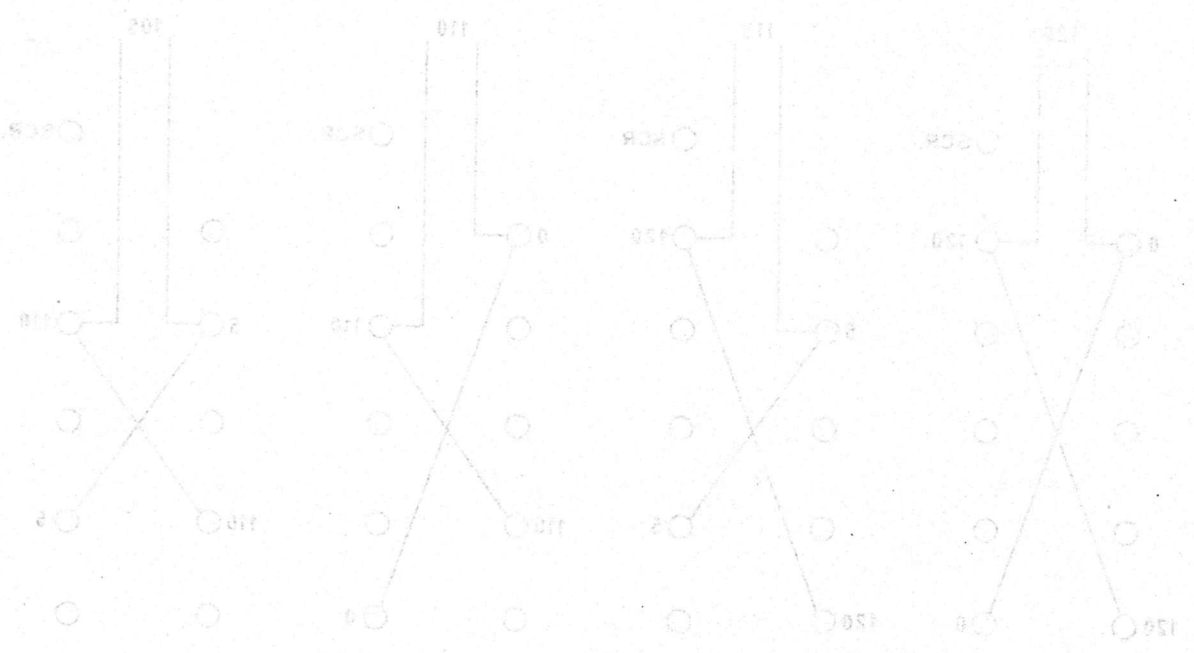


FIGURE 1 - TRANSFORMER PRIMARY CONNECTIONS

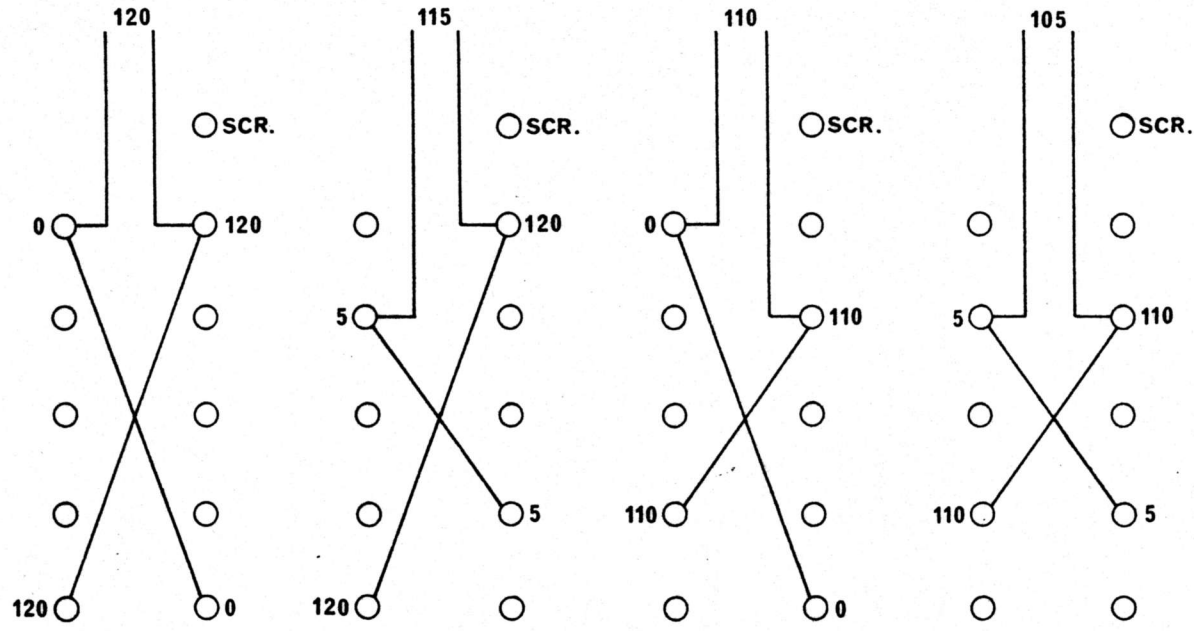
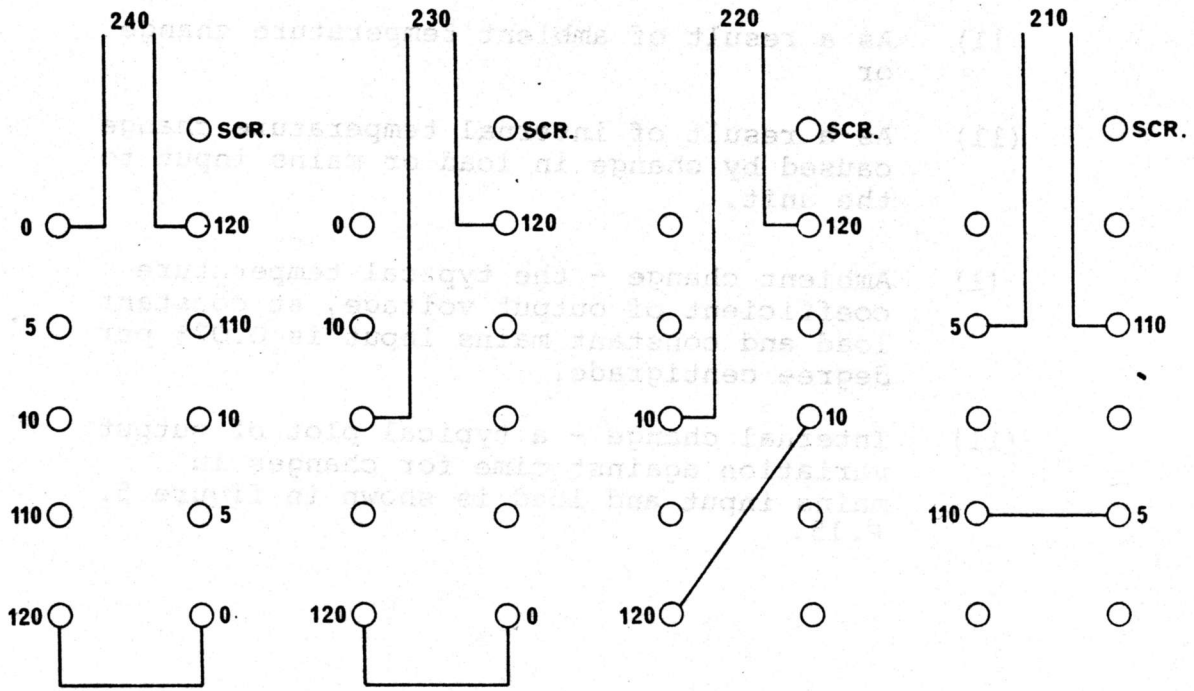


FIGURE 1 - TRANSFORMER PRIMARY CONNECTIONS.