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).

SECTION V1

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 ½ 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

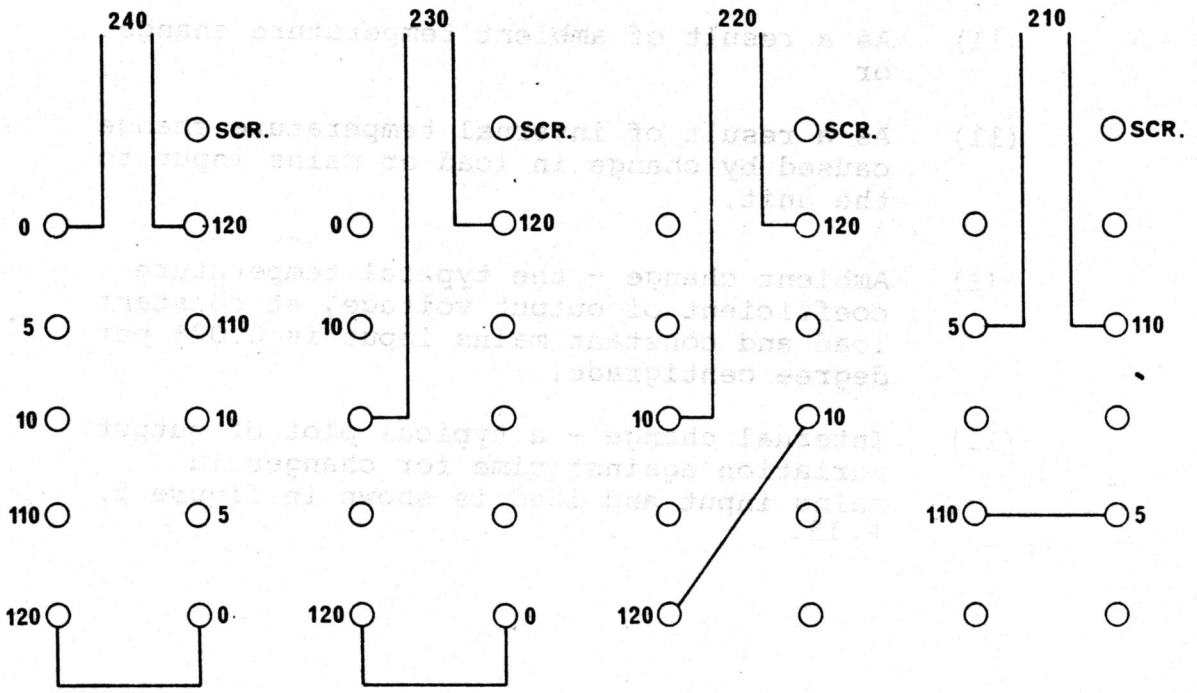
change can be:

(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.



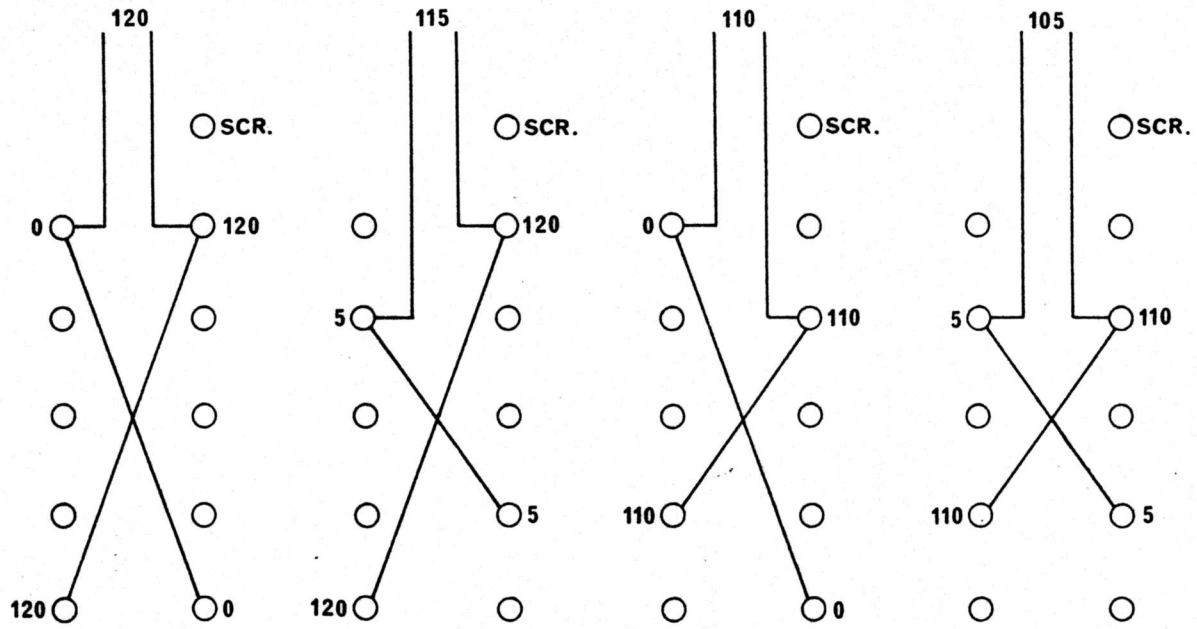


FIGURE 1 – TRANSFORMER PRIMARY CONNECTIONS.