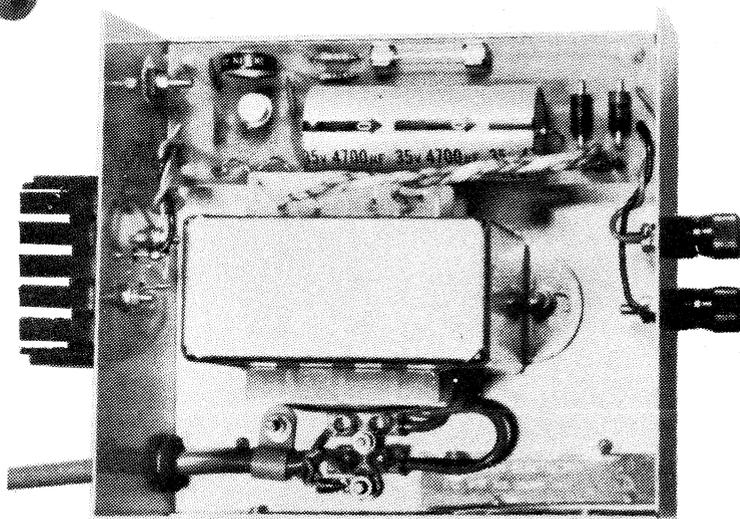
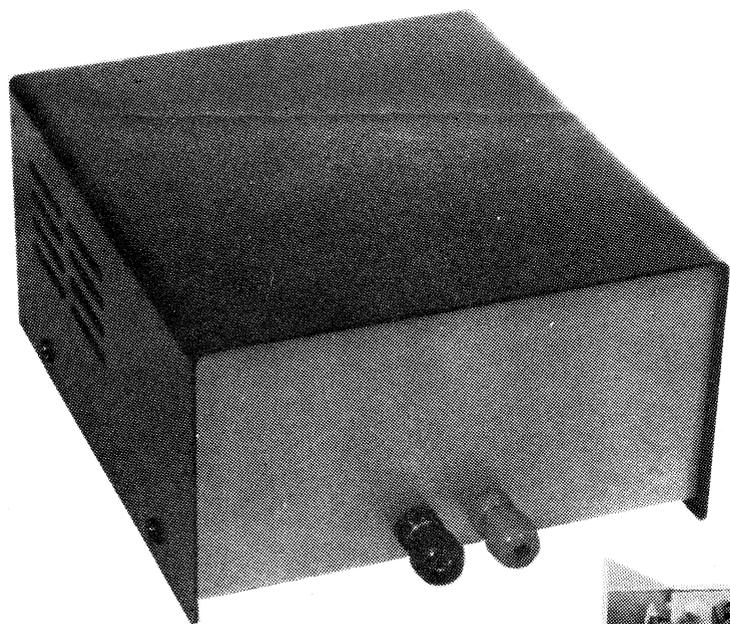


**DICK SMITH
UNIVERSAL
C B
POWER SUPPLY
KIT K-3448**



LOW VOLTAGE POWER SUPPLY KIT K-3448

DESIGN

The design of this supply is based on the well known, reliable UA723 IC regulator. The circuit is simple, yet capable of high performance. The circuit board is designed for ease of assembly, extra holes have been added to facilitate different component types or lead spacing.

The Kit supplied is complete with all components to enable you to construct a basic reliable supply.

Sufficient space is available on the front panel for such optional components as mains switch, pot. for voltage control and 2 panel meters such as a current meter 0-5A (Q-2030), voltmeter 0-20V (Q-2040).

CONSTRUCTION

Ref. to fig. 3 mechanical component layout diagram and note carefully the individual component placement. As this illustration is actual size, approximate position and sizes can be taken from it as a guide to your construction.

PC BOARD CONSTRUCTION

Assemble components on PC as shown in Layout fig. 2. Take particular care of diode and electro. cap. polarities. If T0-5 round 723 IC is supplied, take care in positioning the leads in the correct position, see Fig. 1. Link 1 can be installed if current limiting is not needed.

If current limiting is required, resistor R3 will have to be selected to give required current limiting value, see section on current limiting. This can be chosen after construction is completed.

Cut leads to length and solder components in position. 3 PC Board pins have been supplied and these are inserted and soldered into the wiring points for the secondary of the transformer, AC - OV - AC.

TR1 transistor should be soldered into the PC approx 1/2" above the board. Make sure it's straight up and down, the brass side of the transistor faces away from the PC Board.

ASSEMBLY (See drilling instructions)

Remove all burrs from holes drilled in the case. This is most important on the transistor mounts.

Assemble all components into the case using the screws, washers and nuts provided.

When fitting the terminal posts on the front panel, make sure you have assembled the pieces in the correct order so that the post is insulated from the case.

Take particular notice of the assembly order of the transistor mount TR1 and TR2. See Fig. 4. The silicon grease supplied is smeared lightly on both sides of

the mica washer. After the screws have been tightened securely, make checks with your multimeter to make sure that the transistor is not "shorted" to the chassis.

The mains cord can now be fitted. Bare back a suitable length of insulation and pass the flex through the rubber grommet and then terminate into the connector strip as shown. Active is red (or brown) to "A", neutral is black (or light blue) to "N", earth is green (or green with yellow trace) to the earth lug. Solder the lug to the earth wire. The lug can now be secured with the nuts, washers and screw provided.

Shorten the primary wires of the transformer (2 x multistrand cable) to a suitable length and terminate to the connector strip.

Fit the PC Board standoffs to case.

From the multistrand cable supplied, cut suitable lengths to connect the PC to the TR2 transistor or terminal posts on front panel. Solder these selected lengths to the points on the PC Board shown in the diagram fig. 2.

Locate the PC Board onto the standoffs.

TR1 is now located flat on the rear panel by bending the leads to suit. This should fit naturally in position without any stress. Mark through the hole in the transistor the actual position of the mounting hole in the back panel. Remove the PC Board and drill a 1/8" hole at this point. Remove all burrs from this hole.

Replace the PC Board back onto the standoffs. Smear silicon grease lightly on both sides of the TR1 mica washer. Locate and secure TR1 on the rear panel as shown in Fig. 4.

The wires already attached to the PC Board can now be soldered to TR2 and the terminal posts. It should be noted that these wires should be kept short as possible, yet have sufficient length to allow the PC Board to be removed to a position for service access.

Position the secondary wires of the transformer (single wires) to the AC - OV - AC points and cut to length. Bare back the insulation and scrape the enamel from the wires with a knife, razor blade, etc. Now solder these wires onto the appropriate PC board pins, AC outside wire, OV centre wire, and other AC outside wire.

CURRENT LIMITING

The circuit has been designed to allow you to use short circuit protection by substituting a resistor (R3) in place of link 1.

The value of this resistor can be found by using the formula:-

$$R = \frac{.65}{I} \text{ where } R = \text{value of } R3, .65 \text{ is the sense voltage required by the IC and } I \text{ is the current limit required.}$$

It should be noted that the actual sense voltage may vary from one IC to another and is ambient temperature dependent but for a starting point, this is an average value. If exact values of current limit are required, a trial and error approach would have to be taken using a multimeter.

For your convenience we have included in your kit free of charge, a length of 28 B & S resistance wire. It has a value of 1.84 ohms per foot.

This supply is capable of up to 4A surge current, so a value of R3 can be slightly above this level.

By folding the length of resistance wire in half and tightly twisting together, it will be found that approx. 1.7" soldered between the R3 lead mounting holes will current limit at just over 4 amps. If limiting values below this value is required, use the formula to approx. R3.

Commercially available values of resistors could be used instead of the resistance wire supplied. Here are some examples,

Use 3 to 5 watt ratings:-

.15 ohm = 4.33A	.18 ohm = 3.6A
.22 ohm = 2.9A	.27 ohm = 2.4A,
.33 ohm = 1.96A	.39 ohm = 1.66A,
.47 ohm = 1.33A, etc.	

FINAL CHECK

Before switching on the power supply, carry out a thorough check of all your construction and wiring. If all is correct, switch on and with a multimeter check the voltage at the output terminals. This should be somewhere between 9 and 15.5 volts depending on RV1. Set the voltage you require (13.8V nominal) by adjusting RV1. The supply is now operational.

If you find the voltage measured is outside these units and RV1 will not control same, checks will have to be made to locate the problem.

The most common faults with home construction is incorrect wiring, bad soldered joints on PC Boards (or solder blobs across tracks or pads). Check transistor wiring and mounting.

OPTIONS

Panel meters can be fitted if required. Current meters in series with the positive lead and the load, voltmeters across the output terminals.

A mains switch can be fitted to the front panel.

A pot can be fitted to the front panel to give you control of the output voltage. This is substituted in place of the trim-pot, RV1.

PARTS LIST

PC BOARD COMPONENTS

IC	UA723, LM723
TR1	BD137, BD139, Transistor
D1-D2	IN5400, IN5404, IN5408, etc.
C1	4700uF 35V electrolytic
C2	.04uF ceramic or polyester
C3	100pF ceramic
C4	.1uf ceramic or polyester
R1	3.3 K 1/2W resistor
R2	1.8 K 1/2W resistor
R3	Resistance wire (see text)
VR1	2.2 K (2K) trimpot.
2	Fuse clips
1	3A fuse
1	PC Board

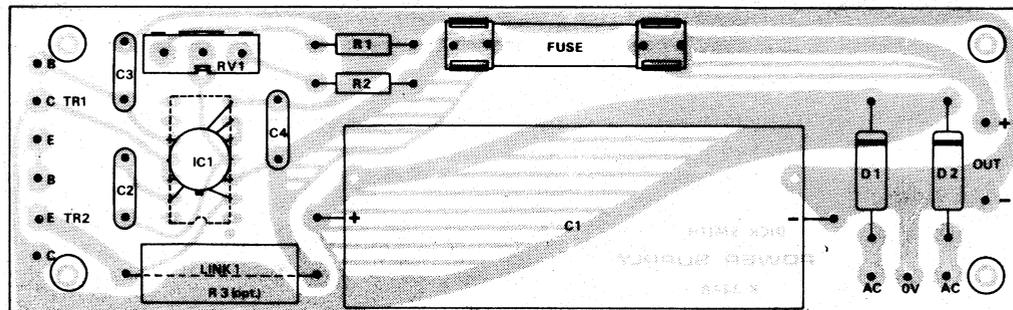
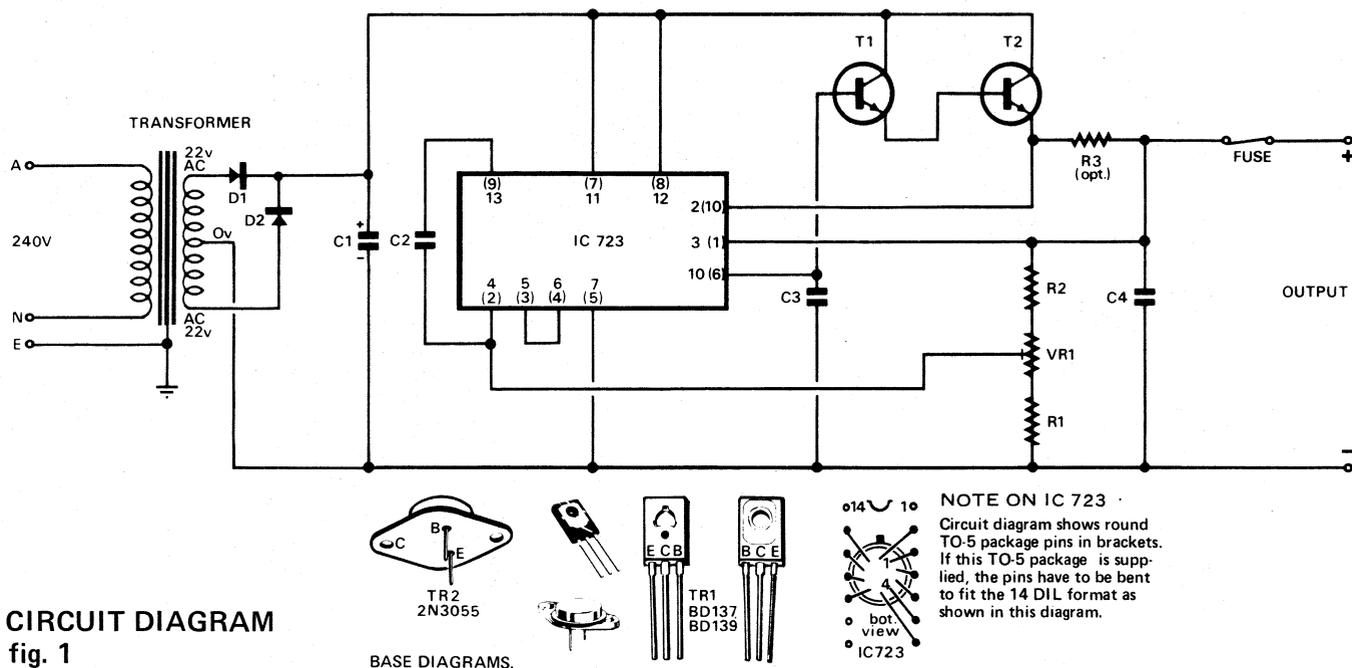
HARDWARE:

TR2	2N3055 transistor case C/W screws
1	Transformer 22V - 0V - 22V
1	Connector strip
1	Cable clamp
1	Grommet
1	Mains Cord and Plug
2	solder lugs
1	Heatsink
4	PC Board mounts
3	Lengths of hookup wire
2	terminal posts
1	TO-3 insulation kit (1 mica washer, 2 plastic bushes).

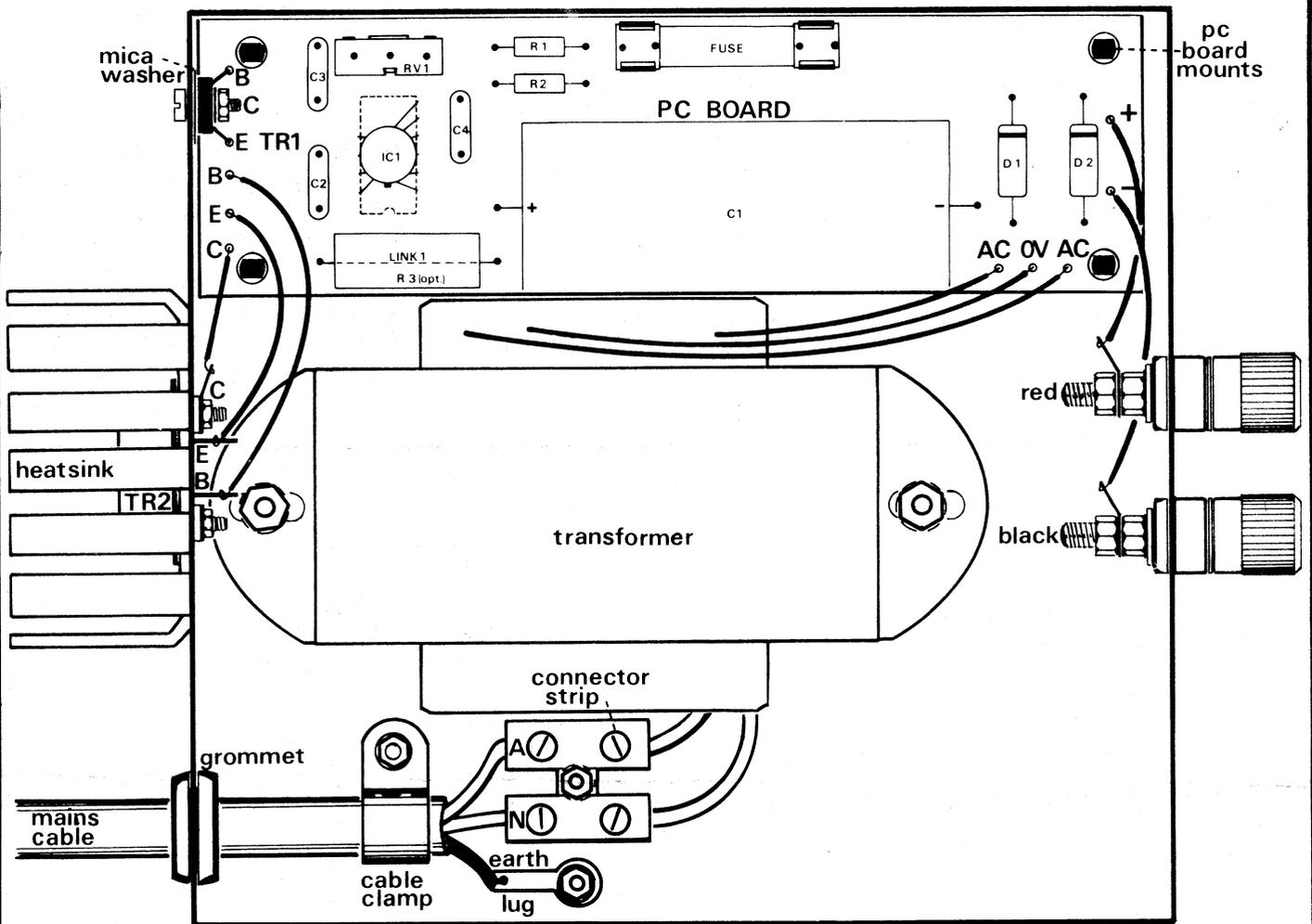
1	Pack of silicon grease
1	TO-126 mica washer.

MOUNTING ACCESSORIES:-

TR1	nut, washer, screw
TR2	2 nuts, 4 washers, 2 screws
Transformer	2 nuts, 4 washers, 2 screws
Connector Strip	Nut, washer, screw
Earth Lug	2 nuts, 3 washers, screw
Cable clamp	Nut, washer, screw



MECHANICAL COMPONENT LAYOUT fig. 3



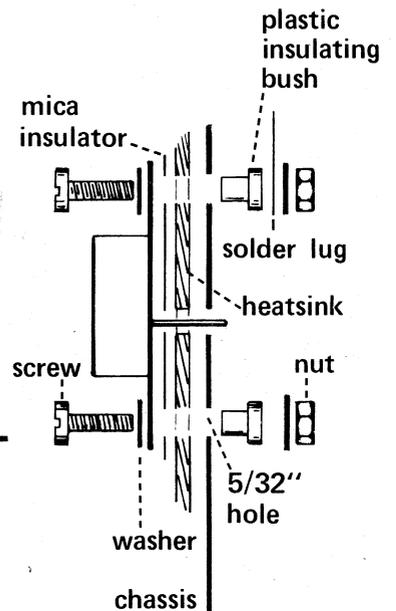
CASE DRILLING INSTRUCTIONS

Holes have to be drilled for all components external to the PC Board before assembly can commence.

POSITION AND MARK REFERENCE FOR

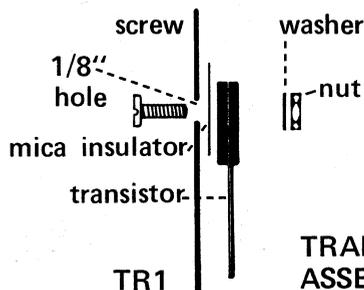
- Mains Cable Grommet
- Mains Cable Clamp
- Mains Connector Strip
- Mains Earth Lug
- TR2 Heatsink (in centre of rear panel)
- Transformer
- Output Terminal Posts (on front panel .4" [10 mm] above bottom edge of case)
- PC Board Mounts (Use actual PC Board to mark hole positions)
- TR1 Transistor (Don't drill hole at this stage - see text)

- DRILL:
- 3/8"
 - 5/32"
 - 1/8"
 - 5/32"
 - 4 x 5/32"
 - 2 x 5/32"
 - 2 x 5/16"
 - 4 x 3/16"
 - 1/8"



NOTE

It is important that all burrs are removed from transistor mounting positions. The mounting surface has to be perfectly flat. Don't forget to lightly smear each side of the mica insulating washer with silicon grease.



TRANSISTOR MOUNTING ASSEMBLY fig. 4

TR2