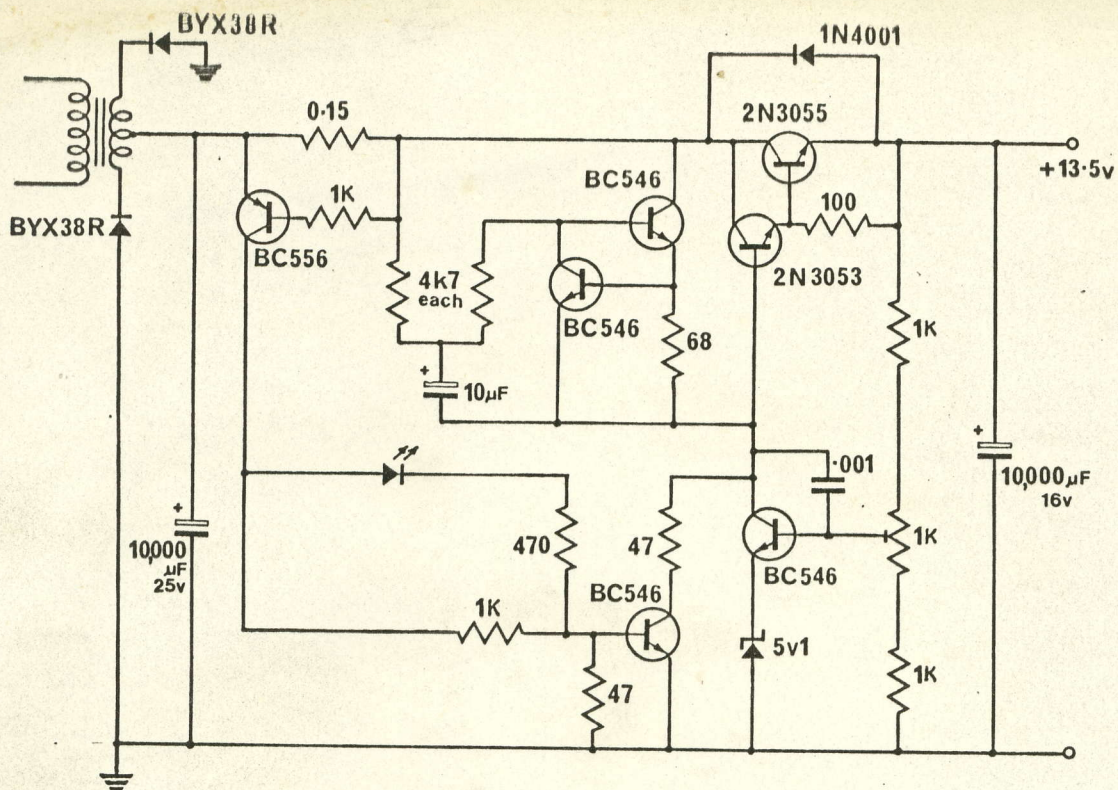


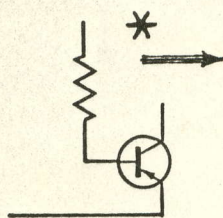
COMPONENT LIST FOR GALBRAITH PS1

- ✓ 2 BYX38 / 300R Diodes
- 1 DS130Y or 1N4001 Diode
- ✓ 1 2N3055 power Transistor
- ✓ 1 Mica Washer
- ✓ 2 Plastic Bushes
- 4 BC547 or BC548 Transistors
- 1 BC556 Transistor
- 1 BZX 79 5v1 Zener Diode
- ✓ 1 CQY 24A LED
- ✓ 1 LED Escutcheon
- ✓ 1 LED Collar
- ✓ 1 40389 or 2N3053 Transistor with Heatsink
- ✓ 1 1K preset pot
- 2 4K7 ohm 1/4 watt Resistor
- 1 1K2 " " "
- 3 1K " " "
- 1 470 " " "
- 1 100 " " "
- 1 68 " " "
- 2 47 " " "
- ✓ 1 10uF 16V Electrolytic Capacitor
- ✓ 1 10,000uF 16 V Electrolytic Capacitor
- ✓ 1 10,000uF 25V Electrolytic Capacitor
- ✓ 1 0.001uF Capacitor
- 1 Neon Indicator
- ✓ 1 Power Switch
- ✓ 2 Terminal Posts ( Red and Black)
- ✓ 1 Fuseholder
- ✓ 1 Fuse 500mA
- ✓ 1 Printed Circuit board
- ✓ 1 Tapon Plug
- ✓ 1 length of Power Flex
- ✓ 1 Cord Grip
- ✓ 1 Dollop of Heatsink Compound
- 1 100mm length of Blue Wire
- 1 200mm " Black "
- 1 350mm " Orange "
- 1 350 " Brown "

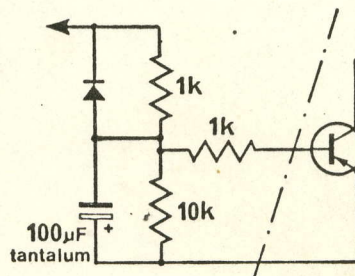




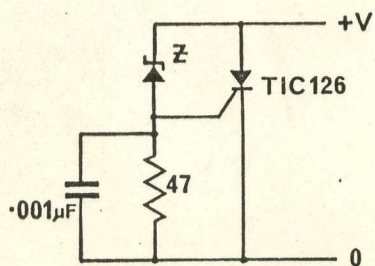
#### CURRENT LIMIT



fast action

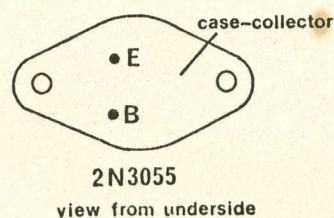
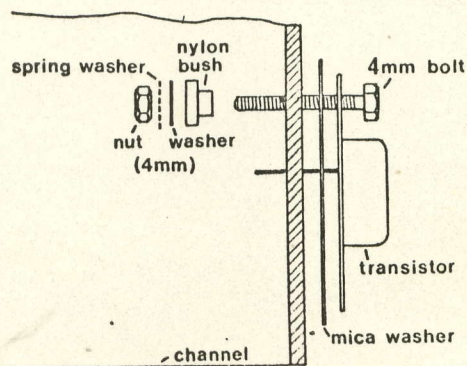
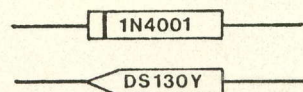
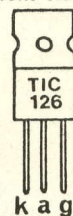


slow action



over voltage protection

front view



view from underside



1 600mm length of Red Wire

1 Brown Painted Top

1 Brown Painted Bottom

1 Plated Chassis

1 False Front Panel

1 Transformer

1 Black Heatsink

1 Black Mounting Channel

4 Rubber Feet

1 Large Solder Lug

4 Standard Solder Lugs

9 3mm x 6mm countersunk screws

4 3mm x 12mm Pan Head Screws

4 4mm x 6mm " " "

11 3mm spring washers

2 4mm Plain washers

11 3mm Nuts

4 4 x 3/8 PK Screws

8 4 x 1/4 PK Screws

2 4mm x 12mm Pan Head Screws

2 4mm Nuts



## CONSTRUCTION OF THE GALBRAITH PSl.

- 1) Carefully unpack your new kit and check against the component list for any missing parts.
- 2) Mount the transformer in the chassis using 8 short 3mm counter-sunk screws, spring washers and nuts. The transformer should be mounted with the mains or primary wires to the front and also at the bottom. The primary wires are coloured brown and should be nearest to the two terminal holes in the front panel.
- 3) The heatsink is in two parts. Both are blackend aluminium and in the finished article are bolted together. At this stage, do not assemble these, but fit the finned heatsink to the back of the chassis using 4 4mm screws. The heatsink should be already tapped for the 4mm screws and should be mounted with the small holes (for mounting the channel) to the top.
- 4) Mount the fuseholder in the top hole punched in the back of the chassis with the terminals to the top.
- 5) Mount the switch in the large hole on the right hand side of the front of the chassis and use this to secure the screen printed false front panel to the chassis. Do not tighten the nut on the switch until the neon, LED and terminals have been mounted.
- 6) Mount the neon on the left hand side of the front panel. The hole is very tight to stop the neon from being loose once fitted.
- 7) Neatly file a small notch in the sides of the holes to accommodate the locating tab on the terminals. Mount the terminals with the negative (Black) to the left hand side.
- 8) The LED clip takes the form of an escutcheon and a locking ring. Mount the escutcheon through from the front but do not fit the locking ring.
- 9) Tighten the nut on the switch mounting and one nut on each of the terminals.
- 10) A small solder lug is now fitted to the back of each terminal and held on by the second nut supplied.
- 11) In the completed supply, the electrolytic capacitors are on the front of the p.c.board. The components marked with dotted outlines on the p.c.board, are optional and are described later in the text. Assemble the p.c.board, starting with the resistors. It is often a good idea to orient the coding of the resistors in one direction. i.e. with the gold band on the right or in this case, to the back of the supply. This facilitates easy value reading during checking and fault finding.
- 12) Fit the preset pot and the zener diode, being careful to observe



the correct orientation of the diode. The band on the diode is to the front of the board.

13) The transistors can now be soldered in place. Note, there are four small NPN transistors (BC 547) and one similar PNP transistor (BC 556). All the NPN transistors are oriented the same way, with the flat side to the rear of the p.c.board, The PNP transistor is oriented in the opposite direction, with the flat side to the front. If a 40389 transistor with integral heatsink is supplied, it may be necessary to drill out the two holes for the heatsink lugs. Where the 2N3053 is supplied, mount it hard down on the board and then press the aluminium heatsink on to it.

14) Fit the 1n4001 diode to the circuit board observing polarity.

15) Fit the 10uF and the .001uF capacitors paying attention to the polarity of the electrolytic capacitor.

16) Mount the two 10,000 uF capacitors on the front of the circuit board taking care to observe the polarity and voltage ratings.

The larger 25 volt capacitor is on the left hand side.

17) The heatsink U channel has two large holes and two small holes on each side, and is mounted with the small holes to the top. The transistor (2N3055) is mounted on the right hand side and the two power diodes are mounted on the left hand side. Establish which end of the channel is the top and mount the diodes on the inside left of the channel. A Solder lug is mounted under the bottom diode on the inside of the channel. The nuts and lockwashers should be on the outside of the channel and should be tightened. The transistor is mounted on the outside right of the channel, and the insulating hardware must be used. Both sides of the mica washer should be coated in the white heatsink compound as supplied, and any surplus compound may be smeared on the back of the channel. A Solder lug is fitted under the nut on the bottom screw of the transistor.

18) One end of a 45mm length of orange wire is soldered through the hole marked "C" at the back of the board. This is to go to the collector of the 2N3055. (solder lug). Two 65mm length of blue and brown wire are soldered through the holes marked "B" and "E" , corresponding to the base and emitter of the 2N3055. Similarly, the connection to the rectifiers is by a 40mm length of black wire from the rear of the circuit board.

19) Strip the outer plastic sheathing off the three core flex for about 60mm. Shorten the neutral wire (black or blue) to 20mm and solder through the appropriate hole on the rear right of the circuit board. Strip and tin the ends of the other two wires.

20) Solder one of the neon wires through the appropriate hole at the front right of the circuit board and likewise with one of the brown transformer primary wires.



- 21) Two 230 mm wires, orange and brown, are soldered between the LED and the front left of the board. The cathode of the LED is connected to "k" and the anode, being the longer lead on the LED, is connected to "a". *orange*
- 22) The red wire from the secondary of the transformer is soldered through the hole at the front left hand side of the circuit board marked xformer ( R ).
- 23) Solder two 120mm wires from the output of the circuit board, preferably with a red wire to '+' and a black wire to '-'.
- 24) Pass the mains lead through the hole in the back of the chassis but do not yet fit the clamp.
- 25) Using four P.K. screws, fit the board into the chassis. The circuit board is mounted from the bottom with the capacitors to the front.
- 26) Fit the channel to the heatsink using the four 3mm screws through the heatsink into the tapped holes in the channel. The transistor should be on the right hand side with it's leads pointing into the channel.
- 27) Solder the wire from the hole marked rectifier on the rear left of the board, to the solderlug under the bottom rectifier. The three wires to the transistor go straight up to the respective terminals. The centre wire goes to the solder lug under the bottom mounting nut on the transistor, and the other two wires connect on to the base and emitter of the transistor without crossing.
- 28) Connect the two yellow sleeved wires from the transformer to the top terminals of the two rectifier diodes.
- 29) Solder the output wires from the circuit board on to the output terminals of the supply. ( + to red, - to black.)
- 30) Pass the LED through the locking clip and then push into the escutcheon mounted through the front panel. Push the LED right into the escutcheon and then fit the locking ring.
- 31) Solder the remaining brown transformer wire and neon wire to one side of the switch and solder a red wire from the other side of the switch to the terminal on the side of the fuse holder.
- 32) Using a short 3mm screw and nut mount a solder lug on the right hand side of the chassis using the countersunk hole provided. To this lug solder the earth wire of the mains flex. ( Green-Yellow / Green ) Do not shorten this wire before connecting.
- 33) Connect the remaining phase wire from the mains flex to the end terminal of the fuse holder. ( Red / Brown.)
- 34) Check that the screws through the heatsink are well tightened and that there are no shorts or dry joints on the circuit board.



- 35) Check that the mains wiring is correct.
- 36) Fit the three pin mains plug, fit the fuse and cord clamp.
- 37) Switch on and check the output voltage. With the preset pot at mid way, the output voltage should be about 11 or 12 volts. The output voltage should be able to be varied by adjusting the preset to the required output voltage.
- 38) If the regulator is working, apply a short between the collector and emitter of the BC556 transistor and check to see if the LED glows. (Collector and emitter are the two outside terminals of the BC556.) If the LED does not glow this would indicate that the LED is connected in reverse.
- 39) Check that the short circuit current is 4 to 6 amps. (LED should glow under short circuit conditions.)
- 40) Using long P.K. screws supplied fit four feet to the base and secure base and top covers with four short P.K. screws each. The covers should be mounted with the greatest overlap at the front.

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#### CIRCUIT MODIFICATIONS.

Circuit modifications are dotted in on the circuit board encoding, with a slow current limit action on the left hand side, and the over voltage trip on the right.

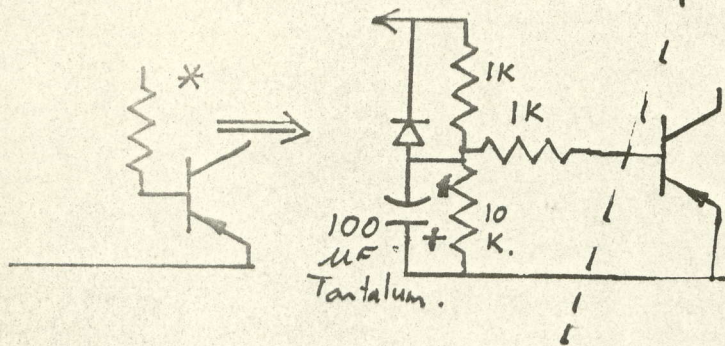
Should the printed circuit resistor become ineffective a 0.15 ohm resistor should be added as shown.

If the slow current limiter is added. the 1k resistor marked with a '\*' should be deleted.

The zener diode marked 'Z' on the circuit board sets the over voltage trip point and an appropriate value should be selected, i.e. 16 volts. If this modification is done it would be a good idea to fit a 10 amp fuse in series with the red secondary wire on the transformer.

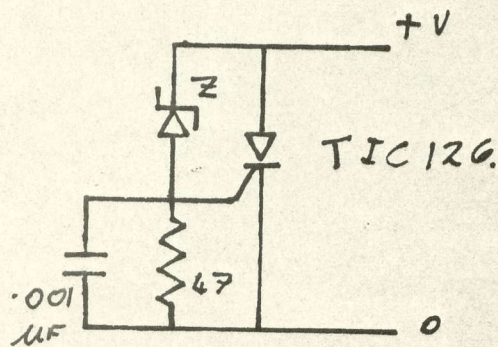
Current metering is best achieved in series with the red secondary wire from the transformer.





Current Limit  
Fast action

Slow Action



Over voltage Protection.

