BOWENS

MONOLITE 400 B CX

Service Data

Covers Bowens 400CX Monolite) 117V 60Hz
Bcgen Photo 400B Monolite) AC only

Contains

Schematic
P.C.B. Layout
Parts List
Fault Charts
Circuit Description

BOWENS OF LONDON
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400E/CX

General Specifications

Modelling Lamp	:	E.S. Fitting 275 watt maximum
Voltage Supply	:	117 volts 60Hz A.C. only
Power Output	:	Maximum 250 watt/seconds
Flash Duration	:	Full Power 500th second 2/3 400th second 1/2 250th second 1/3 200th second 1/4 150th second
Weight	:	6 lbs/2.75 kg.
Fuse	:	Maximum 5 amps 1 1/4"
Flash Temperature	:	5600°K (equivalent to daylight)

MONOLITE 400B

CIRCUIT DESCRIPTION

The 400B consists of a voltage quadrupling capacitor/rectifier circuit which charges the main capacitors to approximately 650 volts on a 117volts 60Hz supply. The quadrupling components consist of C2/C3, Q3/4/5/6, and the main capacitors C4/5/6/7. The initial high current is limited by R2 which is a ceramic wirewound resistor situated on the resistor panel sub-assembly, and comes via the normally closed contacts of RY. This relay controls the glow-stopping by switching off the supply as the capacitor C8 discharges through RY and R5 when the unit fires. The glow-stopping period is about 0.4 seconds. The diode Q7 prevents RY from operating when C8 charges on switch-on.

The unit will normally fire and discharge to about 80volts on switch off. Resistors R3/R4 will discharge the main capacitors slowly in the event of the unit being unplugged from the supply without the operation of the unit s own on/off switch.

Resistors R6/7 and the preset R8 are a voltage divider for the ready neon N2, which has a delayed flash operation controlled by C9 and R9. R8 must be adjusted slowly until the neon lights when the voltage across the flashtube is standing at 450 volts. In normal operation the neon will then be indicating 80% of capacitor volts for a supply of 117 volts 60Hz.

R13/12/11/10 are ceramic, wirewound resistors on the resistor panel sub-assembly, and are progressively put in series with the flashtube by the rotary power switch S3A to reduce the output of the unit down to ¼ power in 5 steps.

The modelling lamp circuit consists of the triac Q1 controlled by diac Q2, capacitors C11 and 12, resistors R14/17/18/19 and pre-sets R15 and R16. R15 is used to adjust the dimming range which is switched by S3B. R16 is used to adjust the lowest dimming level. The switch S2 is for modelling lamp function, being continuously off when switched to short out C12, on when in the middle position, and intermittently on when switched to the normally open contacts of RY. As the unit fires these contacts close and short C12, thus switching Q1 off for the duration of the glow-stopping period. Choke L1 in series with the lamp is for radio interference suppression, in conjunction with capacitor C1.

Resistors R21/22/23/24/25 form a potential divider across the main capacitors to provide a sync. voltage of about 200 volts and at the same time providing isolation at a very low sync. energy. On the application of a short circuit across the sync. via P/B, J/S or S1B, the capacitor C10 discharges through the primary of the trigger coil T/C producing an E.H.T. pulse on the secondary for the triggering of the flashtube.

The thermal cut-out C/O and it's associated triac and resistor, Q7 and R26 respectively, are designed to cut the supply off to protect the unit in conditions of rapid firing. C/O operates at around 70°C and breaks to interupt the supply to the gate of the triac thus turning Q7, and hence the unit, off. When C/O breaks the neon N1 lights via R1 to indicate the overheat condition.

MONOLITE 400B

DISMANTLING INSTRUCTIONS

A. UNIT DISCHARGE

1. First remove the two screws holding the reflector/tube assembly to the front of the unit.
2. Discharge the unit by placing a 200ohm (approx.) wirewound resistor across the two lower spring contacts.

B. WRAP REMOVAL

1. Stand the unit on a bench with the tube contacts uppermost.
2. Unscrew both of the reflector clamp knobs and remove them from the unit.
3. Remove the two screws which hold the overlapping ends of the wrap together. These screws are situated on the right of the umbrella bracket.
4. Remove the two screws situated on the opposite side of the wrap and lift the wrap halfway up along the unit.
5. It can now be seen that the wrap is attached to the unit via a green earth wire. Unsolder this wire from the tag situated on the wrap fastener bracket.
6. The wrap can now be lifted clear of the unit.

C. SUB ASSEMBLY REMOVAL

1. The resistor panel assembly can be removed by levering out the 10 way socket and removing the four screws situated at the four corners of the panel. On the first 200 units, the triac associated with the cut-out is adjacent to the panel and this must also be removed from the main chassis before the resistor panel can be separated from the unit. On later models, the triac is situated on the printed circuit board and thus does not have to be touched.
2. The printed circuit board is attached to the chassis by two screws situated on the metal heat-sink in the centre of the board. Remove these screws and lever out the two 10 way sockets. The board is now held on by five connectors. The thick yellow wire at the top of the board (trigger wire) has to be disconnected from the spring connector at the front by separating the spade terminals. The four connectors on the board can be pulled off after noting which wires connect which terminals.
3. The capacitors can be removed by unscrewing the bolts holding the two black brackets and unsoldering the connecting wires Care must be taken to ensure that the insulating strips around the brackets are put back upon re-assebmly.
4. The control panel is attached to the chassis by five screws, four being accessable on the outside of the panel and the fifth on the bracket holding the top jack socket. If the 10 way socket on the resistor panel is unplugged, the control panel can then be swung away to the left.

400CX MONOLITE

ELECTRICAL SETTING UP PARAMETERS.

1) Mains Input Volts at 60Hz	107	TYP 117	MAX 127	V.A.C.
2) Maximum H.T. Volts for each case for 50 or 60Hz mains	599	655	700	V.D.C.

3) Flash to indicator interval should be around 1 secs at 50Hz corresponding to less than 2 secs on 60Hz mains.

4) Static H.T. volts for ready Neon setting = 450 VDC to
give an 80% indication of capacitor volts.
Corresponding mains input at this point = 80 volts 50Hz
as measured on a moving Iron meter

5) Equivalent Lamp working voltages) Full power = 95 volts
for 117 VAC 50Hz mains input) Quarter power = 72 volts
as measured on a moving Iron meter)

NOTE: All A.C. measurements must be made with a moving Iron Meter not a moving coil meter

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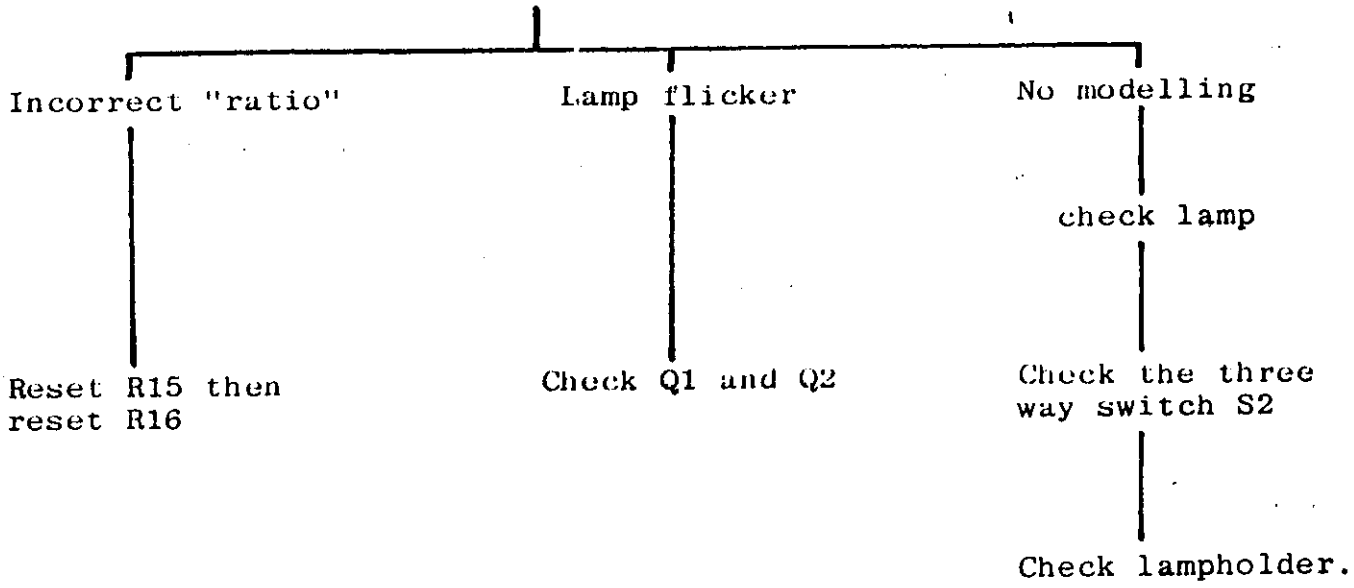
FAULTY MODELLING CONDITION



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UNIT CHARGES BUT DOES NOT FIRE

Ready light is flashing at normal rate

Press the firing button. Can the trigger spark be heard?

YES

Check the tube

NO

Check sync. volt
Check trigger capacitor C10
Check continuity of trigger coil.
Check spade connection to uppermose spring tube connector.

MONOLITE 400B

Unit fails to show 'ready'

Check the mating of all 10-way plugs and sockets

Does modelling lamp work,

- NO
  - Check supply
  - Check fuse
  - Check switch
  - Check C/O (overheat will light if open circuit).
- YES

Do C4/5/6/7 charge at all?

- NO
  - Check Q7
  - Check R26
  - Check RY contacts
  - Check R2
  - Check C2/C3
- YES

Is voltage approx 660.

- NO

  Check supply voltage
  Check C4/5/6/7 for deforming
  Check Q3/4/5/6
  Check Q7
- YES

  Check setting of R8
  Check neon N2
  Check R6/7/8

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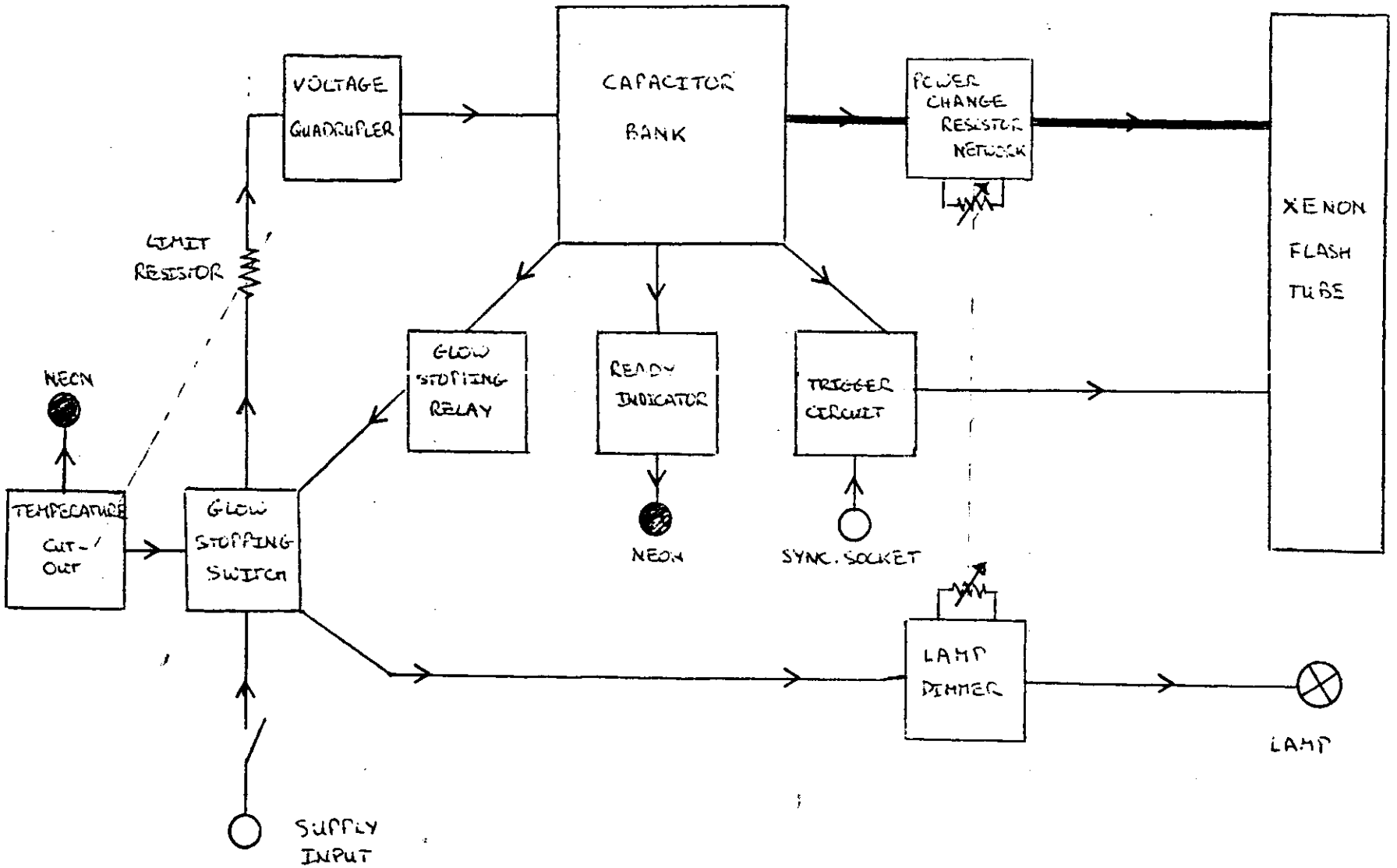
FUNCTION BLOCK DIAGRAM



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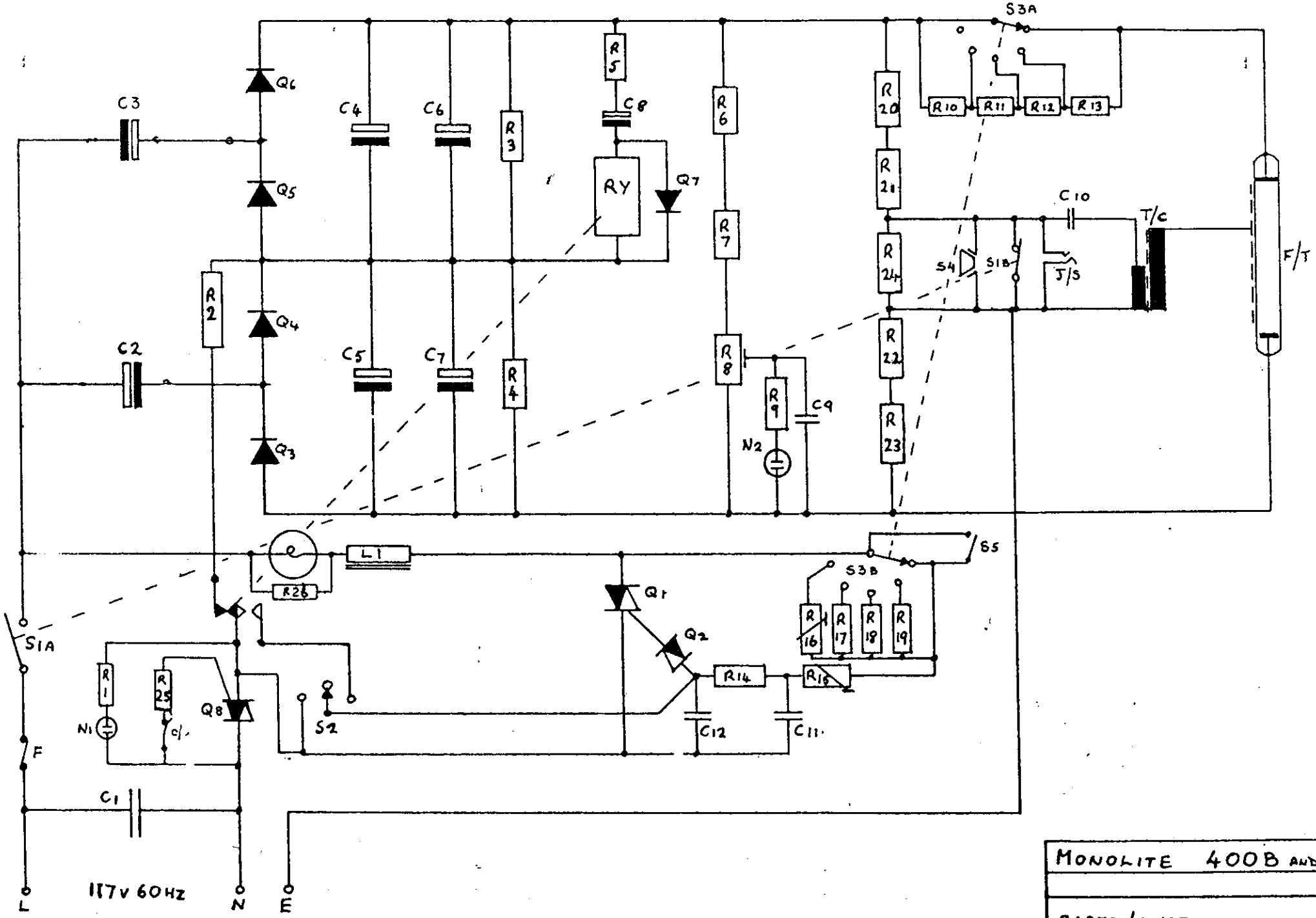
CAPACITOR ELECTROLYTE LEAKAGE

The main charging capacitors C4-C7 and the doubler capacitors C2-C3 contain a small quantity of viscous fluid, the electrolyte which under fault conditions can form an abnormal quantity of gas. The gas creates a pressure which can force electrolyte out of the capacitor-can and spray the fluid over the insides of the unit. The electrolyte causes corrosion when in contact with metal and must be cleaned off with warm soapy water.

The connectors and the P.C.B. must be replaced if affected.

Normal operation of the Monolite can occur even after the capacitors have leaked electrolyte.



MONOLITE 400B AND C

24277/10677

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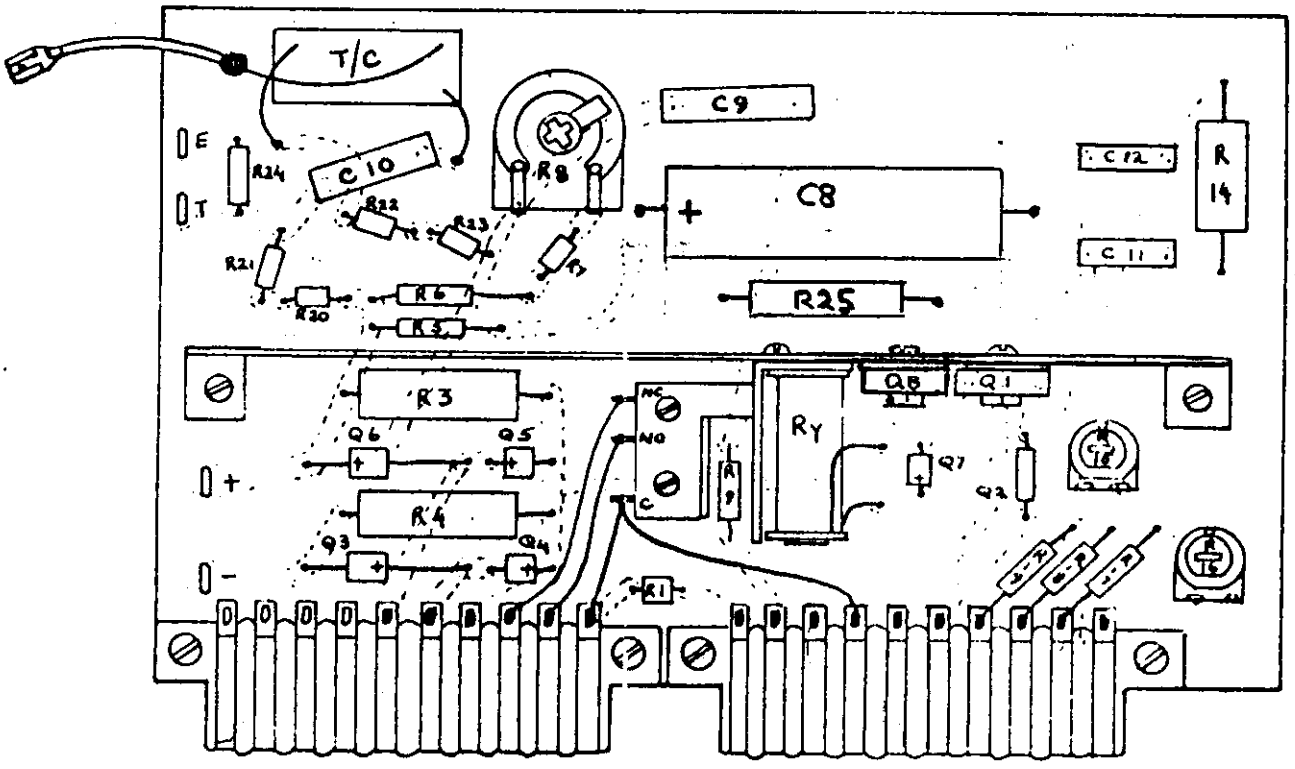
400B/CX PARTS LIST

R1 100Kohms 0.5 watt	6322C	
R2 12.5 ohms E.R.G. Wirewound	6352C	
R3 100K ohms 2 watt	6273C	
R4 100K ohms 2 watt	6273C	
R5 470 ohms 0.5 watt	6315C	
R6 4.7 meg ohms 0.5 watt	6307C	
R7 3.9 meg ohms 0.5 watt	6303C	
R8 4.7 meg horiz pre-set	6463C	
R9 6.8K ohms 0.5 watt	6238C	
R10-13 ED16155	6335C	
R14 15K ohms 2 watt res	6250C	
R15 47K horiz min pre-set	6445C	
R16 47K horiz min pre-set	6445C	
R17 18K ohms 0.5 watt	6327C	
R18 15K ohms 0.5 watt	6249C	
R19 6.8K ohms 0.5 watt	6238C	
R20 1 meg 0.5 watt	6297C	
R21 1 meg 0.5 watt	6297C	
R22 1 meg 0.5 watt	6297C	
R23 1 meg 0.5 watt	6297C	
R24 2.2 meg 0.5 watt	6301C	
R25 100 ohms 0.5 watt	6208C	
R26 100K ohms 0.5 watt	6322C	
C1 0.22 MFD 250V A.C. 330 022	6018C	
C2 150 MFD 200V D.C. Q7 52/85/6	6091C	
C3 150 MFD 200V D.C. Q7 52/85/6	6091C	
C4 1000 MFD PF QV 63/10/6	6078C	
C5 1000 MFD PFQV 63/10/6	6078C	
C6 1000 MFD PFQV 63/10/6	6078C	
C7 1000 MFD PFQV 63/10/6	6078C	
C8 15 MFD 450V Electrolytic	6055C	
C9 0.22 MFD 250V	6020C	
C10 0.1 MFD 400V PMT2R	6015C	
C11 0.1 MFD 250V C280	6011C	
C12 0.1 MFD 250V C280	6011C	
Q1 TXAL 2210B triac	6164C	BTB10-400
Q2 DIAC	6535C	30VOLT
Q3 10D6/IN4006	6111C	
Q4 10D6/IN4006	6111C	
Q5 10D6/IN4006	6111C	
Q6 10D6/IN4006	6111C	
Q7 10D6/IN4006	6111C	
Q8 TXAL 2210B TRIAC	6164C	BTB10-400
L1 Denco Coil	6848C	
L2 Jacob Trigger Coil	6840C	
RY1 MS1 48V Kev	6500C	
10 way plug	6564C	
10 way socket	6565C	



N.B. LATEST P.C.B. SHOWN.	MONOLITE 400B/CX
EARLIER TYPE HAD NO Q8 AND R25	PRINTED CIRCUIT BOARD.
	COMPONENT LAYOUT.

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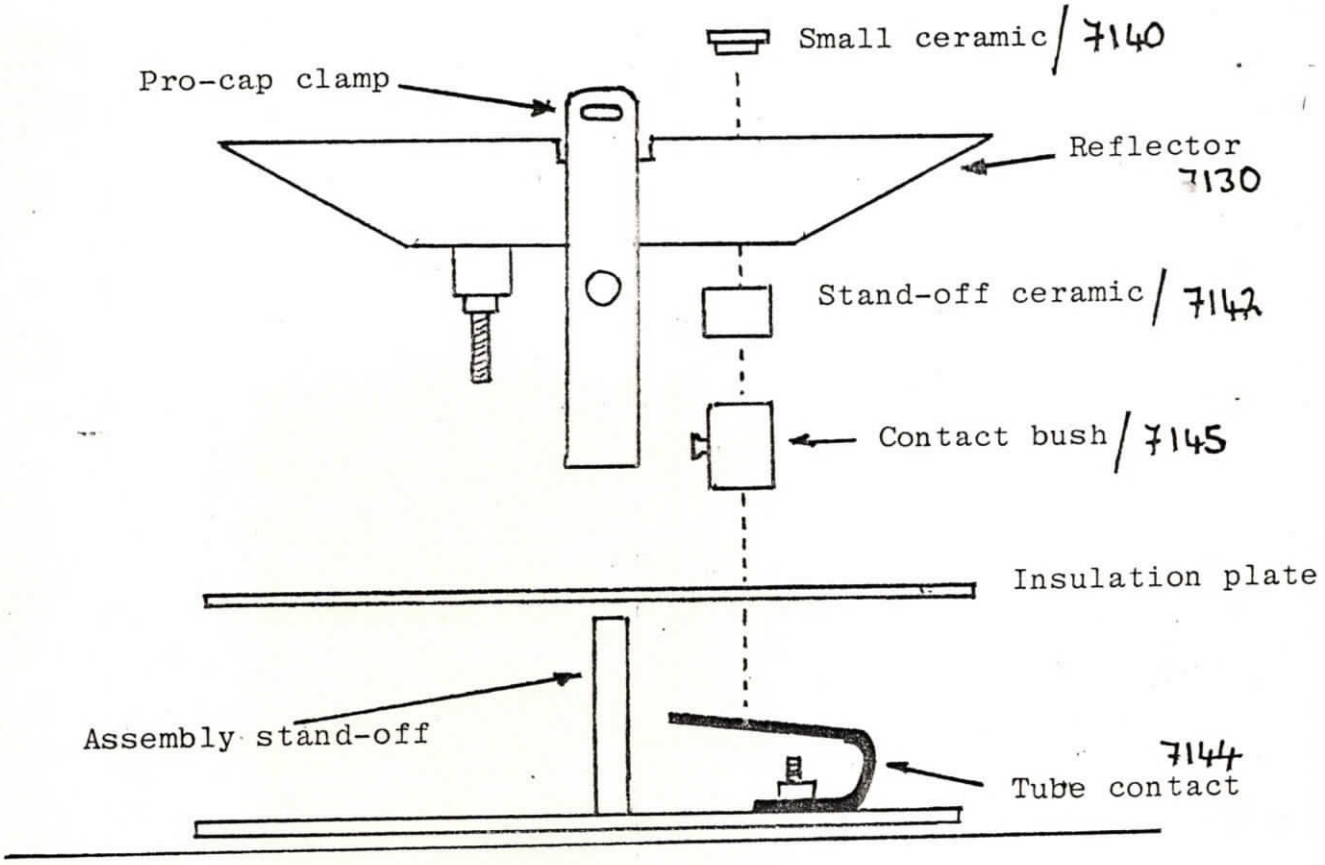
MONOLITE TUBE SECTION



A complete tube assembly is available comprising of flash tube, reflector, ceramic stand-offs and bushes. Part numbers are as follows:-

With U/V coated flashtube	1102
With clear flashtube	1101

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400B/CX Monolite

Modifications

1. Because of problems with R71 contacts burning out, circuit boards made after June 1977 had an additional triac and resistor (Q8 and R25) added to the over heat circuit. The same scematic can be used for repairing the earlier P.C.B. except C/O is in place of Q8 and R25 not present.

2. R26 added across lamp holder.

3. (Feb 81) ED16006 dropper resistor R10-13 changed to ED16155. Due to the increased length of the replacement it must be fitted using U-shape mounting plate and flat head screw.

4. December 80 - Lampholder changed

5. January 81 - Black rear disc fitted

6. March 81 - Omron G2L relay fitted
   Part No. 6512C