

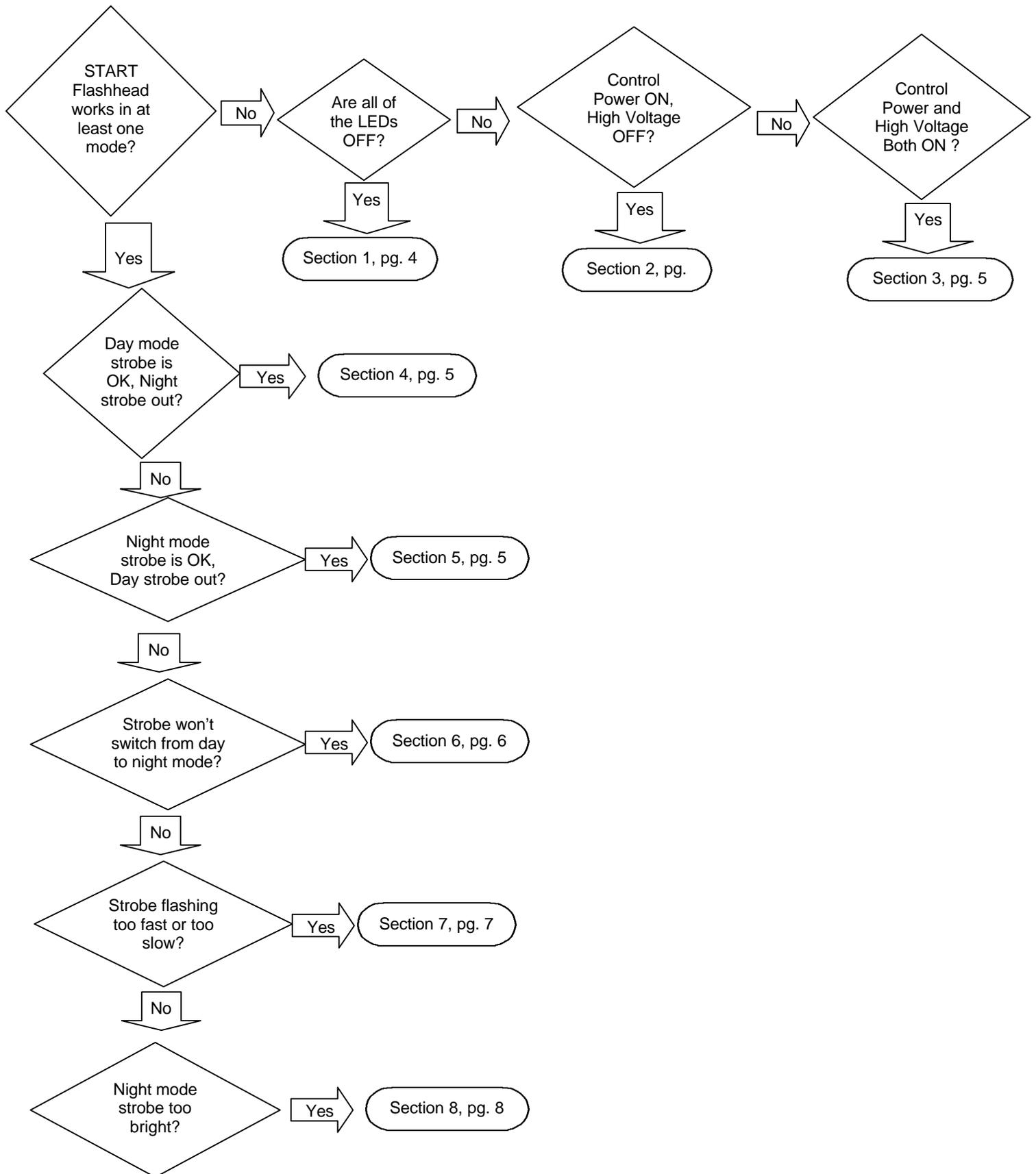
# Honeywell

## FlashGuard 2000B Medium Intensity Lighting System Troubleshooting Guide

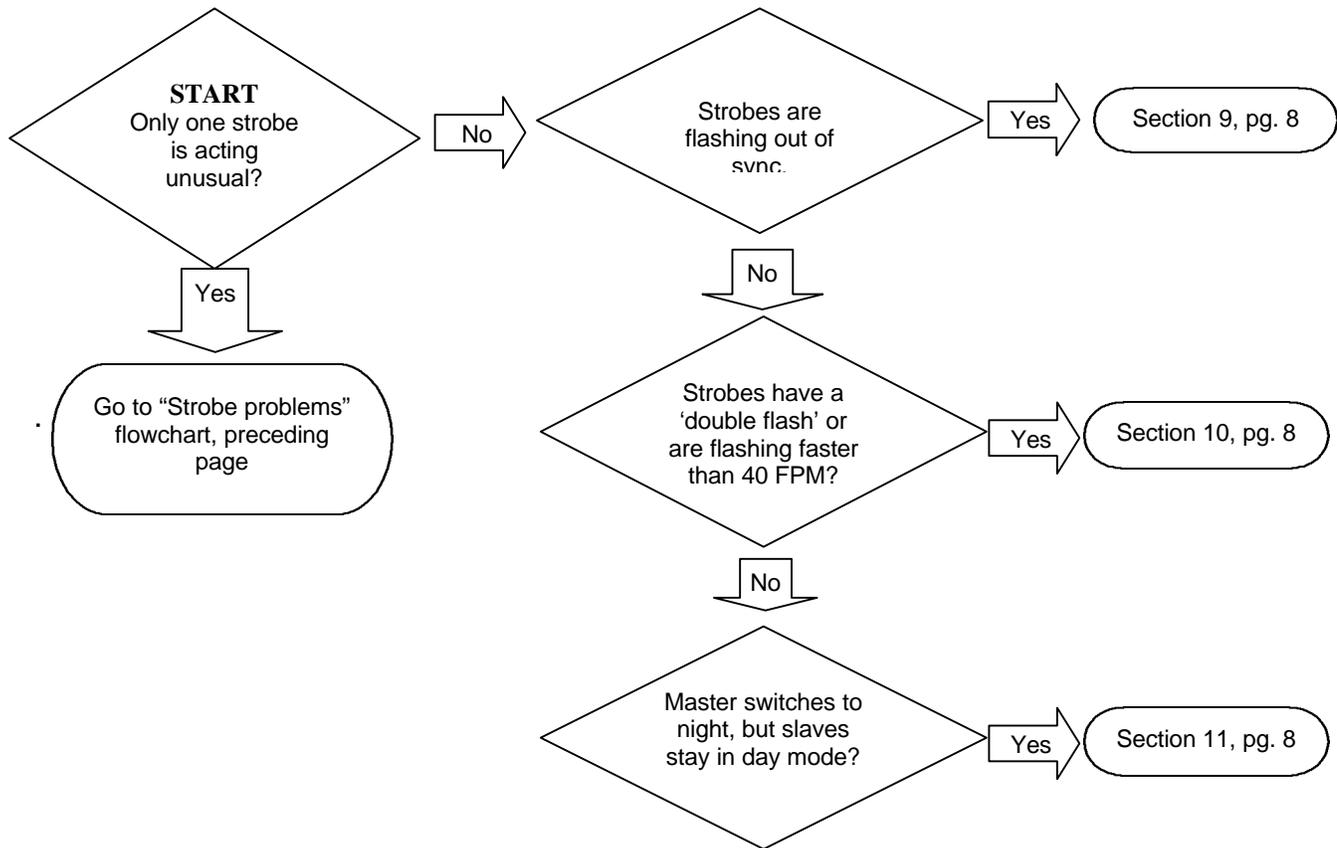
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# Flashhead (Strobe) Problems



## Multiple Strobe Problems



## FLASHHEAD (STROBE) PROBLEMS

### Section 1 Flashhead does not operate in any mode, no LED's on.

**Possible Cause:** Input power incorrect.

**Diagnostic Test:** Measure input power – it should be 120 VAC  $\pm 10\%$ .

**Corrective Action:** Supply correct input power.

**Possible Cause:** Power supply interlock switch not engaged.

**Diagnostic Test:** Press the power supply interlock switch and hold it down.

**Corrective Action:** Close the unit – the system should operate properly.

**Possible Cause:** Blown F1 (4 Amp) fuse, or transformer (630mA) fuse.

**Diagnostic Test:** Remove all three circuit boards and check for damage. Remove the photocell wiring from TB1-1 and TB1-2. Perform “Flashhead Isolation Test” (pg. 9) and check for improper resistances. Leave the flashhead cable disconnected, replace the fuse and apply power. Reconnect the strobe cable, the photocell wiring, and the circuit boards one by one to determine which one will blow the fuse.

**Corrective Action:** Replace the defective component.

### Section 2 Flashhead does not operate in any mode, control power indicator on, high-voltage neon lamp off.

**Possible Cause:** Flashhead interlock switch not engaged.

**Diagnostic Test:** Remove the flashhead wires TB2-5 and TB2-6 (gray and white), and measure resistance between them – it should be less than  $5\Omega$ .

**Corrective Action:** Re-seat the flashhead cover, making sure the interlock switch engages when the cover is closed. If the system still does not have continuity between TB2-5 and TB2-6, replace the flashhead interlock switch and/or inspect the strobe cable for damage.

**Possible Cause:** Relay **K1** not energizing.

**Diagnostic Test:** When the interlock switches are engaged, the K1 relay should energize. If not, measure for 120 VAC across the relay coil. Alternatively, remove the connectors and check resistance across the K1 coil – it should be  $300\Omega$ .

**Corrective Action:** Replace the K1 relay.

**Possible Cause:** Faulty high-voltage board.

**Diagnostic Test:** Visually check the traces on the high-voltage board. Check for any shorted diodes. Use diode check function on multimeter if available.

**Corrective Action:** Replace the high-voltage board.

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**Section 3** Flashhead will not operate in any mode. Control power indicator on, high-voltage board LED indicator on.

**Possible Cause:** Trigger control board defective, or incorrect DIP switch setting.

**Diagnostic Test:** Perform “Flashhead Isolation Test” (pg. 9) and “Power Supply Isolation Test” (pg.10) Also compare trigger board DIP switch settings with default settings in manual.

**Corrective Action:** Set DIP switches according to specifications. If no trigger output is observed when performing the flashhead isolation test, replace the trigger control board.

**Possible Cause:** Insufficient trigger voltage to the flashhead.

**Diagnostic Test:** If tower height is greater than 340 feet, remove the connector at terminal E13 on the motherboard, and connect it to E14. This will boost the voltage to the flashhead by approximately 10%.

**Corrective Action:** Leave the connector at E14.

**Possible Cause:** Flashtube and/or trigger transformer faulty.

**Diagnostic Test:** Perform the Power Supply isolation test to check for trigger pulses.

**Corrective Action:** If trigger pulses are present and high voltage neon lamp is lit then replace flashtube and/or trigger transformer.

**Section 4** Flashhead operates properly in day mode, but no strobe in night mode and trips the strobe alarm.

**Possible Cause:** Trigger control board faulty.

**Diagnostic Test:** Perform “Power Supply Isolation Test” (pg. 11) to check for trigger pulses.

**Corrective Action:** Replace the trigger control board.

**Possible Cause:** Diode board **DB1** faulty.

**Diagnostic Test:** Remove the two mounting screws on the control panel. Disconnect DB1, and measure resistance both ways across each diode. Make sure no diodes have shorts. If shorted, DB1 is faulty. **Note:** The diode board DB1 is located under the control panel where the test switches are.

**Corrective Action:** Replace DB1.

**Section 5** Flashhead operates properly in night mode. No flash in day mode, strobe alarm is on.

**Possible Cause:** Trigger control board faulty.

**Diagnostic Test:** Perform “Power Supply Isolation Test” (pg. 10) to check for trigger pulses.

**Corrective Action:** Replace the trigger control board if test fails.

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**Possible Cause:** Day capacitor/s or 20 $\Omega$  resistors faulty, or connection loose/open.

**Diagnostic Test:** With all conductors attached, check resistance across the terminals of any C2 capacitor. Resistance should be @ 40 $\Omega$ .

**Corrective Actions:**

1. If resistance is near 0 $\Omega$ , one or more C2 capacitors is shorted. Remove conductors to each capacitor, and individually check / replace each capacitor.
2. If resistance is too high, one or more C2 capacitors may a loose connection, or one or more of resistors R2, R3, and R4 may be defective or have a loose connection. Tighten connections to all C2 capacitors and resistors R2, R3, and R4. If resistance is still too high, individually disconnect / check / replace the resistors.

**Note:** The resistors R2, R3, and R4 are located under the control panel (where the test switches are) below the diode board DB1. R2 is at the bottom, R3 in the middle, and R4 is topmost of the three.

**Possible Cause:** Diode board **DB1** faulty.

**Diagnostic Test:** Remove the two mounting screws on the control panel. Disconnect DB1, and measure resistance across each diode. Replace DB1 if any diodes have shorted. **Note:** The diode board DB1 is located under the control panel where the test switches are.

**Corrective Action:** Replace DB1.

## Section 6 System will not switch between day and night modes correctly.

**Possible Cause:** Mode switches in wrong position.

**Diagnostic Test:** Put both mode switches in "Remote" position. Illuminate the photocell for a minute or so to approximate daytime conditions. The system should go into day mode. Cover the photocell with a thick, dark, opaque material, to approximate nighttime conditions. Wait for a minute or so. The system should go into night mode. If the system does not respond correctly to the photocell, try changing modes by using the mode switches on the control panel.

**Corrective Action:** If the system responds to the switches, but not to the photocell, replace the photocell.

**Possible Cause:** K2 mode relay malfunctioning.

**Diagnostic Test:** Set the day mode switch to "Remote," night mode to "Test." The K2 relay should energize. If not, measure for 120 VAC across the relay coil. Alternatively, remove the connectors and check resistance across the K2 coil – it should be @ 300 $\Omega$ .

**Corrective Action:** Replace the K2 relay.

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### Section 7 Flashhead flashing slow (15 – 20 flashes per minute), strobe alarm on.

**Possible Cause:** Mis-configured or defective sync monitor board.

**Diagnostic Test:** Ensure the DIP switches on the sync monitor board are set correctly per the manual. Visually verify that the red LED on the sync monitor board is pulsing at 40 fpm.

**Corrective Action:** If the DIP switch settings are correct, and the red LED is not pulsing at 40 fpm, replace the sync monitor board.

**Possible Cause:** Current sense transformer wires are crossed, or current sense transformer is defective.

**Diagnostic Test:** The brown wire should connect to the capacitor side of the current sense transformer, the purple wire towards TB2.

**Corrective Action:** If the transformer wires are correct, replace the current sense transformer.

### Section 8 Night mode very bright, no alarms.

**Possible Cause:** K2 relay open.

**Diagnostic Test:** Put the system in night mode. Check for 120 VAC across the coil of the K2 relay. Alternatively, remove the connectors and check resistance across the K2 coil – it should be @ 300Ω.

**Corrective Action:** Replace the K2 relay.

## MULTIPLE STROBE PROBLEMS

### Section 9 Flashheads are operating, but out of sync.

**Possible Cause:** Sync monitor boards in the power supplies not configured correctly.

**Diagnostic Test/ Corrective Action:** Configure sync board as referenced in manual.

**Possible Cause:** Interconnecting wire between master and slave power supplies missing.

**Diagnostic Test:** Inspect wiring between power supplies. TB1 position 3 should be daisy-chained between each power supply, per the installation wiring diagram.

**Corrective Action:** Install interconnecting wiring.

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**Section 10** All lights are in sync, but there is a double-flash, or flashing faster than 40 flashes per minute (fpm).

**Possible Cause:** More than one sync monitor board is set as master.

**Diagnostic Test:** Inspect the DIP switches on each sync monitor board. In the master power supply, DIP switch S1-4 should be set to "OFF," which is the master position. In all the other power supplies, this switch 4 should be set to "ON," which is the slave position

**Corrective Action:** Reconfigure sync monitor boards. Refer to the manual for correct positions.

**Section 11** Master unit switches to night mode at night, but slave units remain in day mode.

**Possible Cause:** Interconnecting wire between master and slave power supplies missing.

**Diagnostic Test:** Inspect wiring between power supplies. TB1 position 1 should be daisy-chained between each power supply, per the installation wiring diagram for multiple units. **Note: Do not interconnect TB1-2 between power supplies.**

**Corrective Action:** Install interconnecting wiring.

# Flashhead Isolation Test

Disconnect the seven conductor cable from power supply at terminal block TB2. Using an Ohmmeter, check the resistance between the conductors of the disconnected flashhead cable, and compare to the expected values:

### **FG 2000B White Strobe** (cable disconnected from power supply)

- #1 Red: Open to all conductors
- #2 Brown: Open to all conductors
- #3 Black: < 5Ω to blue, open to all others
- #4 Blue: < 5Ω to black, open to all others
- #5 White: < 5Ω to gray, open to all others
- #6 Gray: < 5Ω to white, open to all others
- #7 Ground: Open to all conductors

### **Flashhead Test Results**

1. Correct readings do not ensure that the flashhead and cable are good, but this is a quick check for obvious problems.
2. If the readings above are correct, proceed to the Power Supply Isolation Test.
3. If #5 (gray) to #6 (white) is greater than 5Ω, or is 'open', suspect that the flashhead interlock switch is not depressed.
4. For other inconsistencies with the above chart, the probable causes are miswiring, or conductors shorted and/or opened. If possible, disconnect the flashhead cable at both ends and perform a 'Megger' test with a Megohm Meter.

# Power Supply Isolation Test

Leave the seven conductor strobe cable disconnected from the power supply at terminal block TB2. Install a jumper wire between terminals 5 and 6 to simulate the interlock switch being depressed. Install a neon lamp (Radio Shack catalog # 272-1102, Honeywell Part # 77-2342) across the trigger output. For the FG2000B, install the neon lamp in terminals 3 and 4 on TB2. Apply power to the system and insure the following:

### Voltage Measurements

Using a voltmeter, measure the voltages of the conductors to ground terminal 7. Check the measurements in both day and night modes, and compare to the expected values:

#### FG 2000B Measurements

#1, Red: +500 VDC to ground  
#2, Brown: -500 VDC to ground

#5, Gray: 120 VAC to ground  
#6, White: 120 VAC to ground

If either the red or the brown conductor do not have +500 VDC or -500 VDC respectively, there is most likely a problem in the T1 transformer, the high voltage board, or a capacitor has failed. Check the input and output voltage of the transformer. Check the high voltage board for bad diodes. Check each capacitor for the proper value. If your meter will not measure capacitance (Farads) then check the capacitors for opens or shorts.

### Observe Neon Lamp

The neon lamp should be flashing at 40 flashes per minute. With the power supply in day mode, you should see one quick flash. When the system is put into night mode, you should see short 'bursts' of flashes.

If the neon tube will never flash, you most likely have a problem with the trigger board. Check the dip switch settings with those in the manual, and replace the board if necessary.

If the neon tube flashes slowly, you most likely have a problem with the sync board. Check the dip switch settings with those in the manual, and replace the board if necessary.

If the neon lamp is flashing correctly, and the voltages are correct, the power supply is probably working, and the problem is likely in the flashhead or the strobe cable.

**Remove neon lamp & jumper from TB2 before reconnecting the flashhead.**

### Status Indicators

#### Control Power ON

- Located on the control panel (top center), this indicator is illuminated whenever input power is present and the power supply interlock switch is engaged.

#### High Voltage Neon Lamp

- Located on the high voltage circuit (top) board, this lamp indicates that the high voltage circuits are active.
- Extreme caution should be used if the neon lamp is on.

#### Flashhead Alarm Status LED

- Located on the sync/monitor (middle) board, this LED will be green when the flashhead is operating correctly.
- If the LED is off, the system is in alarm mode.

#### Sync Out LED

- Located on the sync/monitor (middle) board, this LED blinks red to indicate that a sync signal has been generated.
- In a multiple flashhead system, only the sync/monitor board that is set as the master will blink this LED.

#### Sync In LED

- Located on the trigger/control (bottom) board, this LED blinks green to indicate that a sync signal has been received from the sync/monitor board.

### Tools Required

- Flat head screwdriver
- 5/16" nutdriver to open flashhead
- Clean gloves to use when changing flashtubes
- Digital multimeter w/ Ohm reading and 500 VDC capacity
- NE2 neon light, Radio Shack catalog number 272-1102, Honeywell part # 77-2342
- Short piece of wire for jumper (Approx. #12 wire gauge)

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# Recommended Spare Parts

### Flashhead Spares (Upstairs)

<u>Part Number</u>	<u>Description</u>
12S00602	Flashtube Assembly: FT1
77-4040K	Trigger Transformer: T1
77-2644	Switch, Interlock, S1

### Power Supply Spares (Downstairs)

<u>Part Number</u>	<u>Description</u>
77-3911	Night Capacitor: C3
CA706A441EK	Day Capacitors: C2 (A-F)
77-1167	6 Amp Fuse: F1
DP-1019 (Qty 2)	630mA fuse: TB-F1
277-3939	PC Board, Diode
277-3937	PC Board, High Voltage
277-4163	PC Board, Sync/Monitor
277-5014-003	PC Board, Trigger/Control
277-5016	PC Board, Mother
77-2013	Relay: K1, K2
77-5002	Transformer, T1 (120/240V 60Hz)
77-3259	Photocell
77-2342 **	Neon Lamp (** Used for testing purposes only)

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