

January 2012



OBSTAFLASH
XENON Medium
intensity obstruction
lighting system
Single color

*INSTALLATION AND OPERATION GUIDE FOR:
OBSTAFLASH XENON (FLASHEAD AND POWER
CABINET)*

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DESCRIPTION	COLOR	POWER SUPPLY	P/N
Medium Intensity type A and B	white and red	24V	13822
Medium Intensity type A and B	white and red	230 V – 50Hz	13812
Medium Intensity type A	white only	24V	13820
Medium Intensity type A	white only	230 V – 50Hz	13810
Medium Intensity type B	red	24V	13821
Medium Intensity type B	red	230 V – 50Hz	13811



Flashhead and stainless cabinet

BE CAREFUL

This system uses lethal voltages in both the Power supply and the flashhead. Do not attempt to service or adjust this equipment with line power applied.

Interlock switches are provided in both the flashhead and the power supply enclosures to interrupt the main power to the, power supply. These switches are activated when either the power supply door or the flashhead lens assembly is opened in the conventional manner. No interlock is provided when other means of access are used. Never tamper with (remove, short circuit) the interlocked in any way.

**LINE VOLTAGE IS STILL PRESENT WHEN INTERLOCKS ARE ACTIVATED.
DISCONNECT POWER BEFORE INSPECTING OR SERVICING.**

WARNING!

Flashlamps in this lighting system Produce brilliant flashes of light containing some ultraviolet radiation which can result in temporary or permanent eye damage. **DO NOT LOOK DIRECTLY AT THE FLASHHEAD WHILE IT IS IN OPERATION.**

WARRANTY

OBSTA warrants the equipment described in this instruction manual and sold to the purchaser to be free from defects in material and workmanship at the time of shipment. OBSTA's liability under this warranty being limited to repairing or replacing, at OBSTA's option, items which are returned to it prepaid within eighteen (18) months from shipment to the original Purchaser and found, to OBSTA's satisfaction, to have been defective. In no event shall OBSTA be liable for consequential damages. **NO PRODUCT IS WARRANTED AS BEING FIT FOR A PARTICULAR PURPOSE AND THERE IS NO WARRANTY OF MERCHANTABILITY.** This warranty applies only if: (I) the items are used solely under the operating conditions and in the manner recommended in OBSTA's instruction manual, specifications, or other literature; (II) the items have not been misused or abused in any manner or repairs attempted thereon; (III) written notice of the failure within the warranty period is forwarded to OBSTA and the directions received for properly identifying items returned under warranty are followed; and (IV) such return notice authorizes OBSTA to examine and disassemble returned products to the extent OBSTA deems necessary to ascertain the cause of failure. The warranties stated herein are exclusive. **THERE ARE NO OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED, BEYOND THOSE SET FORTH HEREIN,** and OBSTA does not assume, nor does OBSTA authorize anyone else to assume for it, any other obligation or liability in connection with the sale or use of said products. OBSTA's liability on any claim of any kind, including negligence, for loss or damages arising out of or connected with the manufacture, sale, delivery, repair or use of any equipment or services provided by OBSTA shall in no case exceed the price allocable to the item or service or part thereof which gives rise to the claim.

NOTICE

The integrity and reliability of OBSTA aviation obstruction lighting systems are dependent on the use of OBSTA parts and components. To ensure the optimum performance and reliability of your OBSTA system, it is strongly advised that only components and modules manufactured by OBSTA be used.

WARNING!

Modifications to the Power Supply are required for certain applications. Documentation to describe these changes may be found at the end of the manual.

SECTION 1.0 - GENERAL INFORMATION

1.1 Scope

This manual provides information about the installation, operation, and maintenance of the OBSTAFLASH Xe Medium Intensity Obstruction Lighting Systems manufactured by OBSTA. The lighting systems described in this manual are ICAO Medium intensity type A(13820) or B(13821), and FAA types L-865 or L-864, for use as medium intensity aviation obstruction warning systems.

1.2 General Description

The OBSTAFLASH Xe Lighting System is a capacitor discharge, xenon flash strobe light system manufactured to comply with ICAO annex 14 chapter 6 and Federal Aviation Administration Advisory Circular 150/5345-43. Each system consists of an omnidirectional flashhead, an associated power supply with integrated controls, an optional ambient light sensor (photocell P/N00754), and an interconnecting cable P/N13805 (up to 300 meters in length). System components are shown in Figures 1-1 and 1-2 page 5 and 6. Modifications may be made to suit different applications.

The obstafash beacon consists of a glass assembly attached to a hinged base. Included within the flashhead are the 2 flashtube assemblies P/N13840, an interlock switch P/N13842, 2 trigger transformers P/N13841 (1 per flash tube) and the terminal block where the interconnecting cable terminates.

The power supply contains power control circuits (relays P/N13865, PCB with fuses P/N13865, switches) for strobe, a high-voltage circuit (power transformer, rectifiers, energy storage capacitors, discharge circuits), flash interval and timing circuits, dual monitor circuits, intensity selection controls, and a trigger generator. Also attached to (or remotely located from) the power supply is the ambient light sensor (photocell) P/N00754 or GPS system P/N13746.

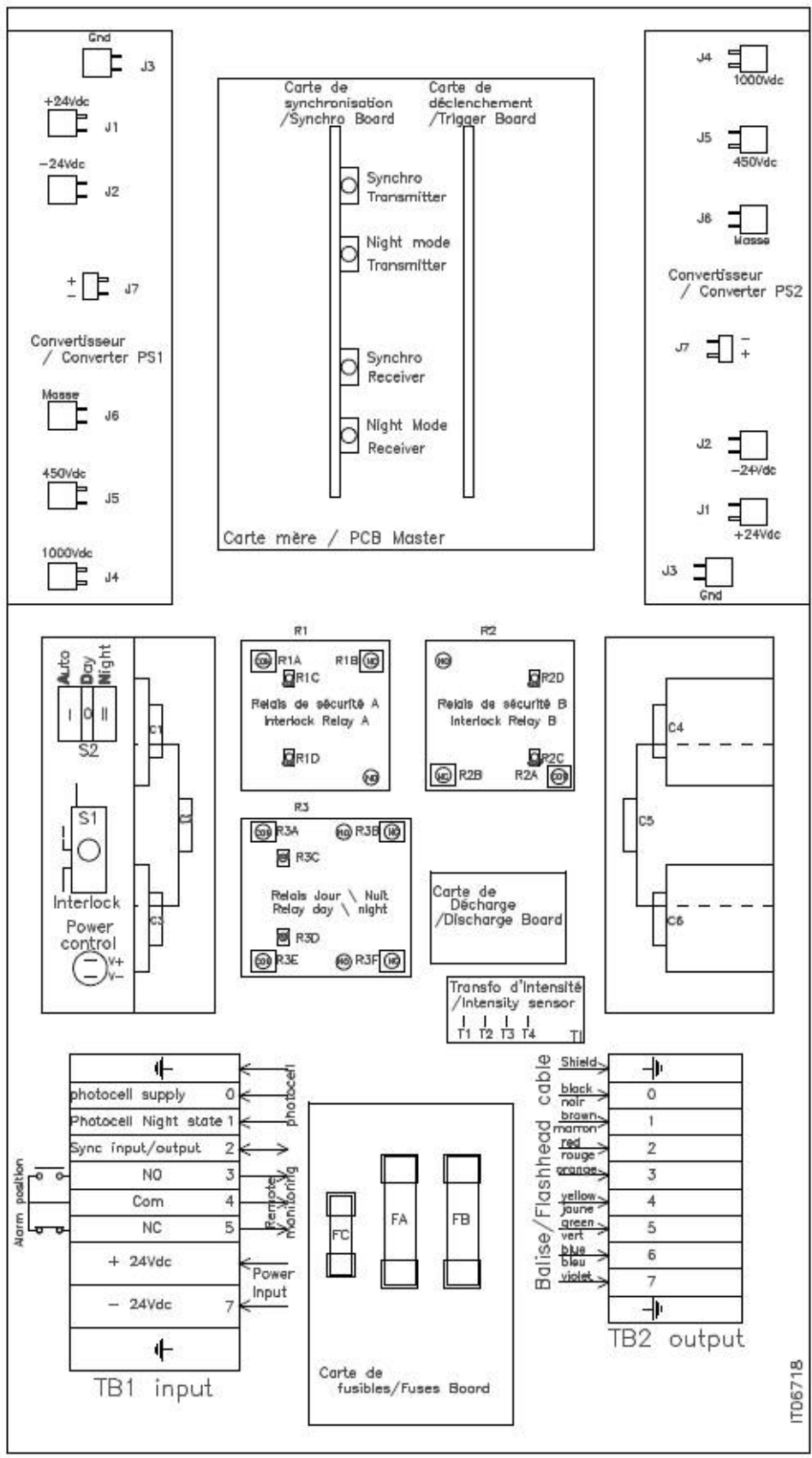


Figure 1-1. POWER SUPPLY COMPONENT LOCATIONS P/N13821 & P/N13820

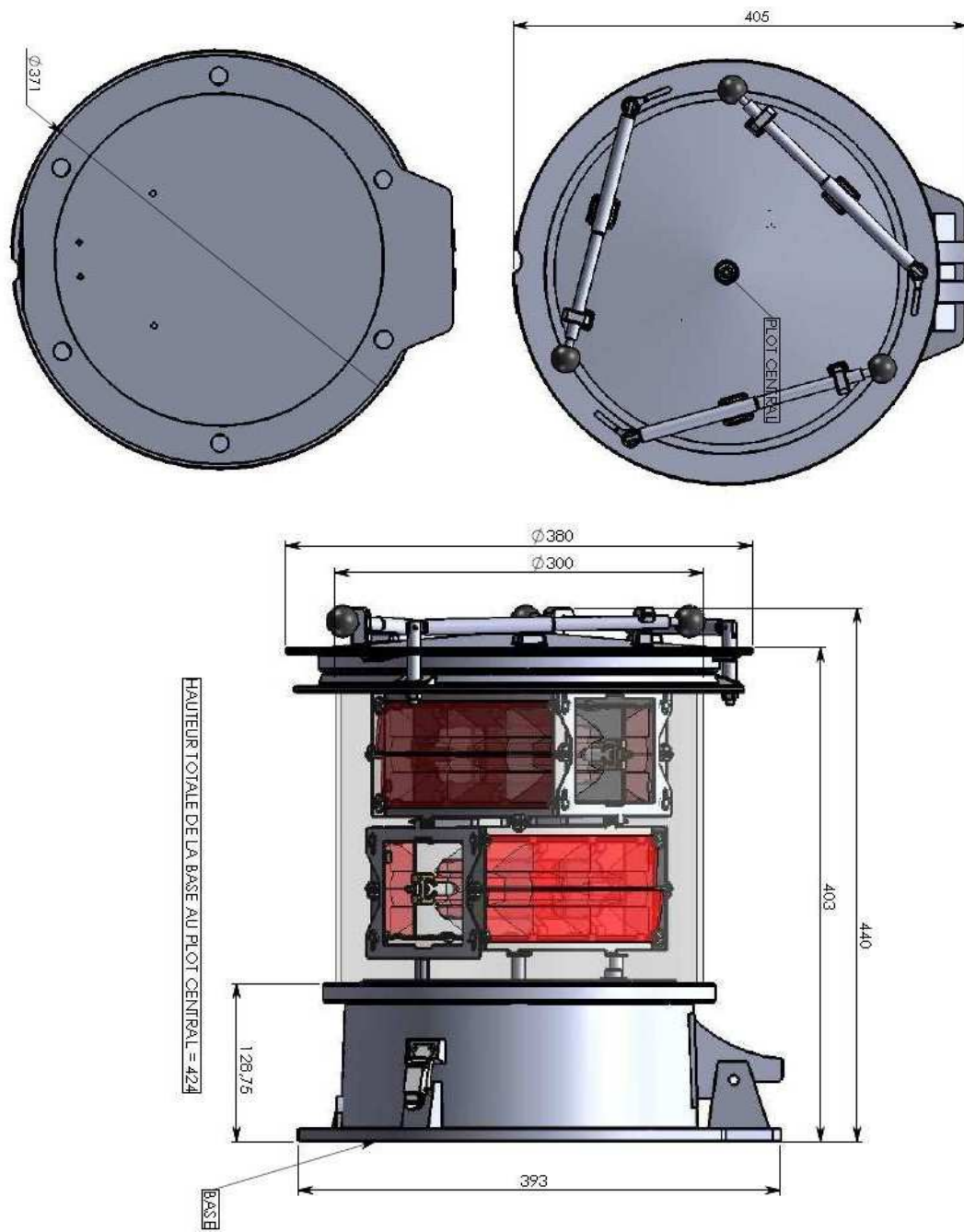


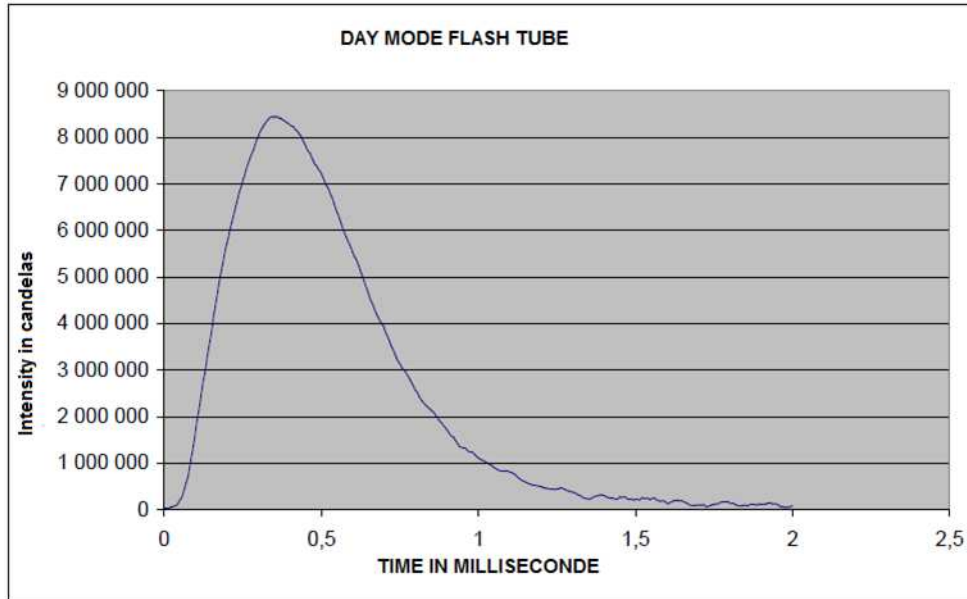
Figure 1-2. OBSTAFLASH COMPONENT LOCATIONS

1.3 SPECIFICATIONS

1.3.1 LIGHT OUTPUT

Intensity	day20 000 ±25% effective candelas
	night.....2 000 ±25% effective candelas
Beam Pattern.....	360° horizontally; 3° min. vertically; lower half-power point between -0.5° and -1.5°
Flash Rate:	20 up to 60 fpm

20 000 effective candelas are done in less than 1 ms and 8 millions peak candelas



1.3.2 ELECTRICAL INPUT

Power Supply.....	24VDC or 230VAC with converter
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1.3.3 MECHANICAL PROPERTIES

Flashhead

Weight.....	18 kg
Dimensions	w = 394 mm x h = 440 mm
Surface Area	0.1277 m ²
Wind Load	52 kg at 240 Km/h

Power Supply

Weight.....	24 kg
Dimensions	w = 411 mm x h = 590 mm x d = 253 mm

1.3.4 OPERATING ENVIRONMENT

Operating Temperature.....	-55°C to +55°C
Humidity	95% relative humidity

1.3.5 SYSTEM OPERATING STATUS INDICATORS

Neon Lamps	24VDC power indicator
L.E.D. Lamps:	
High voltage	
Sync/Monitor Board.....	Sync out (green); Fault relay (green); normal flash tube (green)
Trigger Control Bd	Sync line active (green), default (red)
Fault Indication.....	Relay closure, contact ratings of 3A at 120VAC

SECTION 2.0 - INSTALLATION

2.1 Unpacking

Carefully unpack each item and remove any internal packing material from the power supply and flashhead. Examine each item for obvious physical damage. Report any claims to the carrier immediately. Pertinent data such as installation drawings, schematics, interconnection drawings, and operation manuals are included in the power supply carton. The flashtubes are packaged inside the flashhead.

2.2 Mounting and Preparation

Detailed drawings for mounting the flashhead and power supply are shown in Figures 2-1 page 9.

2.2.1 OBSTAFLASH Flashhead

Normally the flashhead is mounted at the uppermost point on the structure. It must be mounted level to assure proper light output.

2.2.2 OBSTAFLASH Power Supply

The power supply is connected to its flashhead via the cable provided by OBSTA. The length of the OBSTAFLASH cable P/N13805 (up to 300 meters) determines how far from the flashhead the power supply can be mounted.

The vent hole on the bottom surface of the power supply is covered with a solid plug prior to shipping. Optional screened plugs are furnished separately.

The user should determine that the power line voltage selector, located on the transformer board inside the power supply enclosure is set to the main voltage being used.

2.2.3 Ambient Light Sensor (if used) P/N00754 and GPS synchronizer (if used) P/N13646

The ambient light sensor, when supplied with the system, should be mounted upright, away from artificial light (eg., floodlights), and in a location that will enable its sensor window to have an unobstructed view of the polar sky (eg., pointed north in the northern hemisphere).

The GPS synchronizer, when supplied is inside the power cabinet. The GPS antenna comes with a 5 meters cable and should be mounted upright in a location with an unobstructed view of the sky.



GPS synchronizer interface

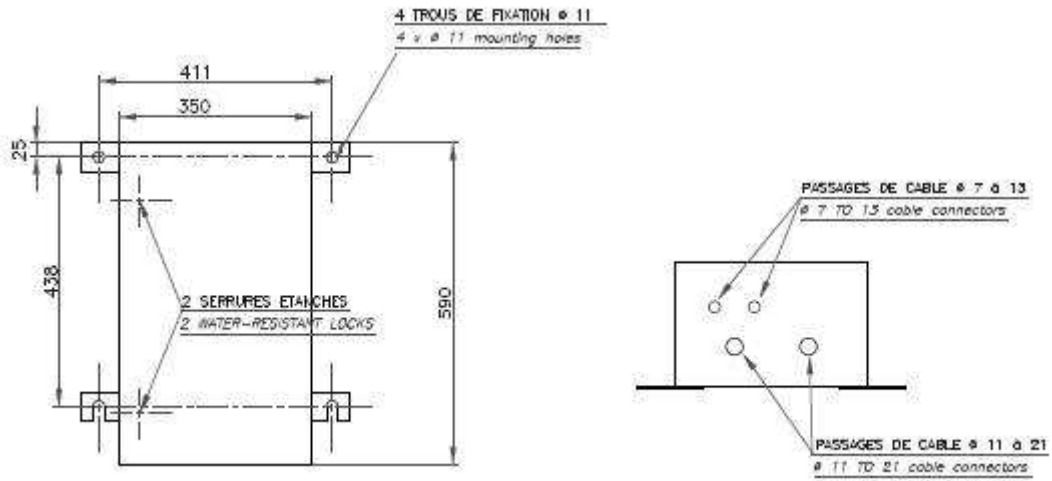


Figure 2-1a. POWER SUPPLY: OUTLINE AND MOUNTING DIMENSIONS

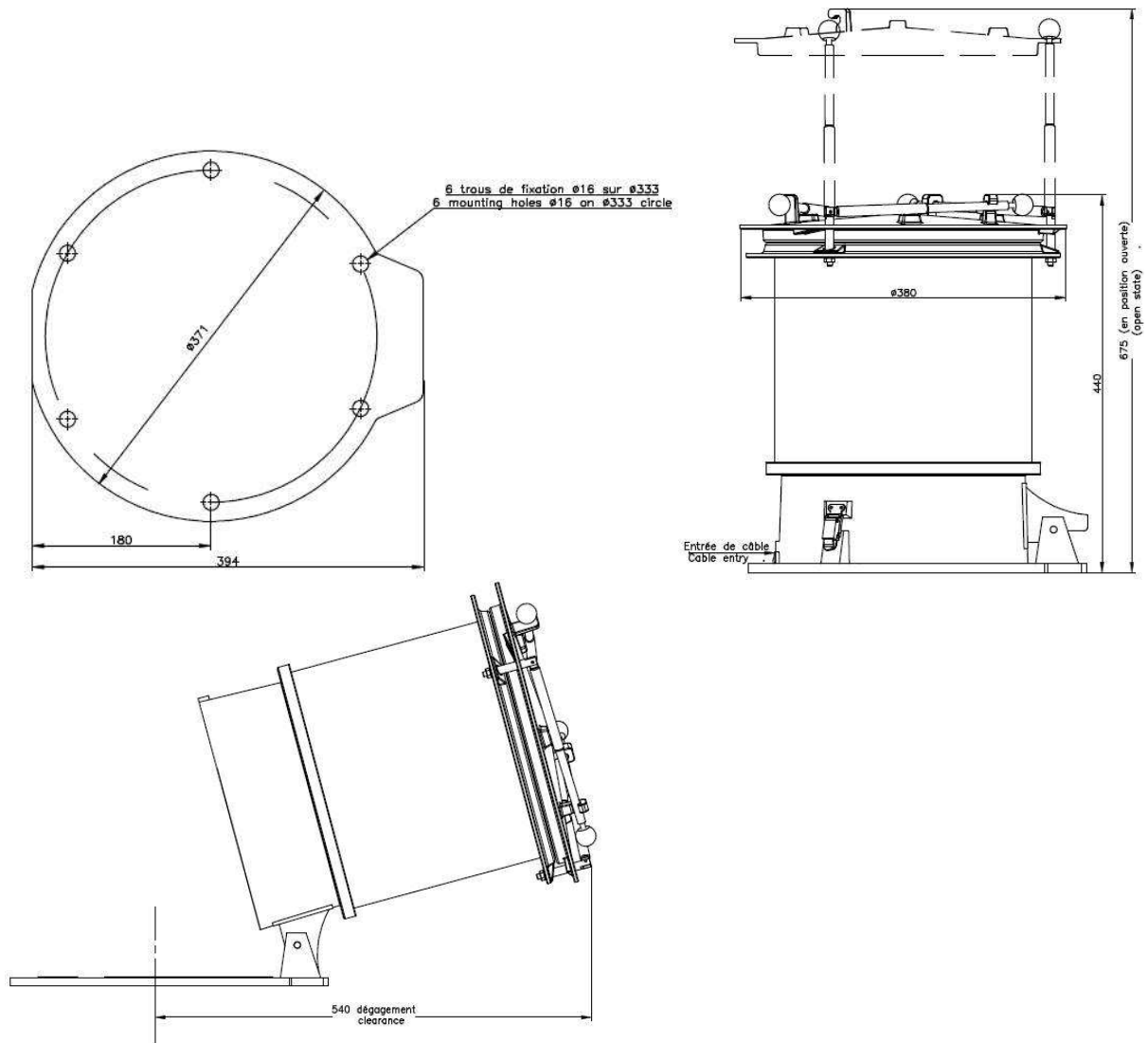


Figure 2-1b. FLASHHEAD: OUTLINE AND MOUNTING DIMENSIONS

2.3 Installation Wiring

The interconnection between the flashhead and the power supply using OBSTA supplied cable P/N13805. The wires in this cable are color coded and are connected to the numbered terminals of **TB1 in the flashhead** and the corresponding numbered terminals of **TB2 in the power supply** per *Figure 2-2*.

Make the interconnects between the external photocell and the power supply. The wires in this cable are connected to **TB1** per *Figure 4-1* as follows.

If two or more systems are installed on the same tower (or other obstruction) make the interconnection between the Master power supply and Slave power supply to synchronize the flashes. The wires are connected to **TB1 in the Power Supply (s)** per *Figure 2-3*.

Make the connections for Incoming Power to **TB1 in the Power Supply** per *Figure 2-2* as follows. The wires or cable needed are NOT supplied.

2.4 Final Check

Before applying power to the equipment, check all relays and printed circuit boards to ensure that they are properly seated in their sockets. Check to ensure that any user-installed wiring does not interfere with relay operation when covers are closed.

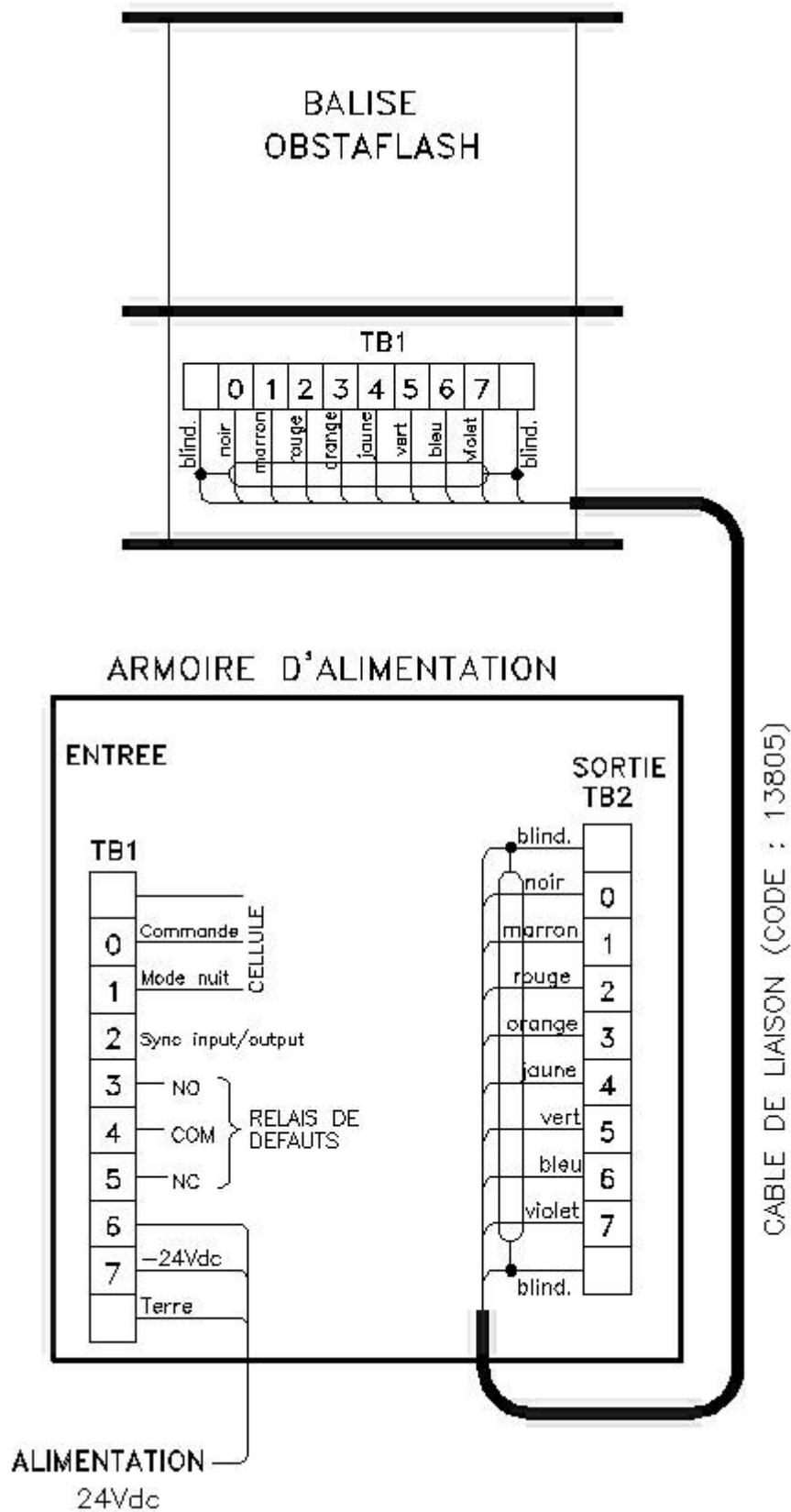


Figure 2-2. INSTALLATION WIRING FOR STAND-ALONE UNIT

SECTION 3.0 - OPERATION

After the system has been wired according to the instructions in section 2, it is ready for normal operation. The flashhead assembly should be closed and secured. When the door of the power supply is closed so that the interlock switch is engaged and power is applied, the system will begin to operate. When the door of the power supply is open, the interlock switch disconnects the power and discharges all the capacitors. If there is sufficient light and the ambient light sensor is mounted correctly, the system will automatically switch to the correct mode after a short delay. The delay protects against unwarranted switching due to momentary changes in the light reaching the sensor.

If the system is not operating correctly, review the installation instructions in Section 2 or consult the troubleshooting information in Section 5.

SECTION 4.0 - PRINCIPLES OF OPERATION

4.1 Overall Description

The DC main power input to the power supply is converted through the 2 converters PS1 & PS2 P/N13860 (see figure 1-1) to approximately 1000 VDC to the 2 flashtubes P/N13840 in the flashhead and to charge their storage capacitors P/N13861 and P/N13862. The ambient light sensor P/N00754 (or GPS synchronizer P/N13746) sends correct control signals to the power supply to automatically change the intensity of the flashhead.

The main power to the power supply is applied to the control and logic circuitry, thereby activating relays which determine the intensity of the flashhead. Logic circuits in the power supply generate a timing signal which controls the rate of flash.

Test switch S2 is located on the switch board and allows the system to operate in remote, day or night mode. The switch S2 should be left in the **remote** position (in normal operation when connected to a photocell, a gps, or in synchronization mode) or **day or night** position for testing continuous operation (see figure 1-1).

4.2 Description of the Printed Circuit Board

4.2.1. Trigger Control Printed Circuit Board P/N13866 (Figure 4-1 page 14)

The function of the Trigger Control PCB P/N13866 is to provide a synchronized trigger pulse to the primary of a trigger transformer P/N13841 located in the flashhead. A single pulse in day or night mode is required. This card is modular and it is plugged on the master card P/N13867.

A sync pulse (450Vdc approx) is generated by this card on the primary of the trigger transformer P/N13841. It initializes the flash tube P/N13840 inside the obstafash beacon: The voltage is stepped up to 15 KV, flashing the flashtube.

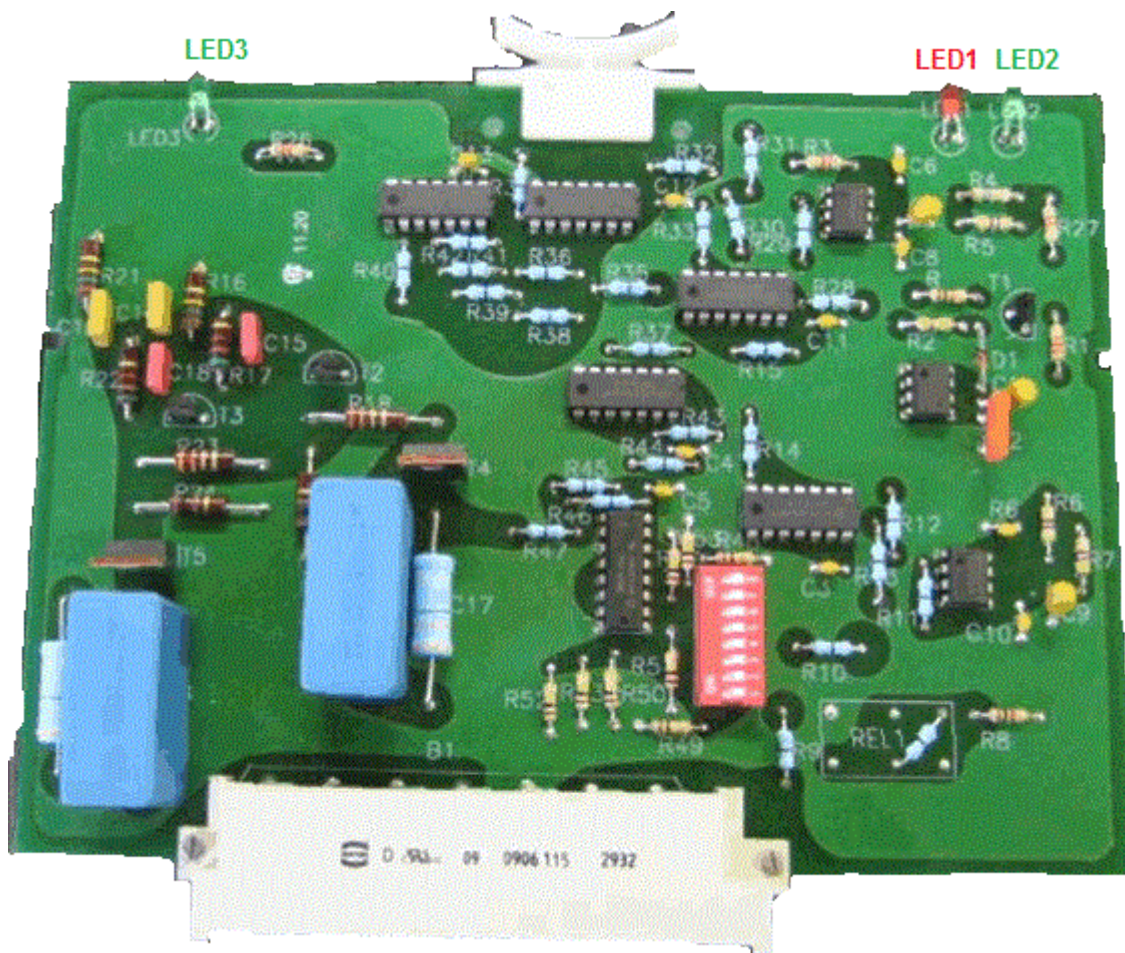


FIGURE 4-1. TRIGGER CONTROL PRINTED CIRCUIT BOARD

In the default configuration, it is not necessary to configure the switches SW1 because the system is working with 1 single flash during night time. All switches are open.

The red LED (LED1), located in the upper level of the card, blinks if the system does not receive correctly the synchronization signal (from the master light if the light is configured as slave or from the GPS synchronizer if used). In case no signal is received, the flash rate is at 15 flashes per minute (alarm mode).

The green LED (LED2), also located in the upper level of the card, blinks if the system receives correctly the synchronization signal (from the master light if the light is to be slave or from the GPS synchronizer if used).

The green LED (LED3), also located in the upper level of the card, blinks if the system receives correctly the trigger signal, this signal can come from the synchronization card or from the alarm mode if there is an alarm.

4.2.1 Sync/Monitor Printed Circuit Board P/N13864 (Figure 4-2, page 16)

The function of the sync/monitor printed circuit board is:

- to generate a sync pulse for the trigger control board;
- to select master or slave operation;
- to detect faulty operation of the complete obstaflash system.

This card is modular and it is plugged on the master card P/N13867.

The generation of the impulse in master configuration is done by the “8 switch” (with 8 positions). This switch allows setting the required number of flashes in day mode and night mode.

- To get 20 flashes per minute, the position of 2 and 5 must be “ON”.
- To get 40 flashes per minute, the position of 3 and 6 must be “ON”.
- To get 60 flashes per minute, the position of 1 and 4 must be “ON”.
- To get a configuration in slave mode (sync pulse is then coming from master light or GPS interface), all position must be “OFF”.

The blinking green LED (LED1) indicates that synchronization impulse are created by the sync card and sent to the trigger card. If this LED is not blinking, this means that the sync card is not sending the impulse signal to the trigger card.

A fault monitor relay assures that the flashtube is firing synchronously with the sync pulse. This relay remains energized as long as the flashtube fires in response to a sync pulse. A green LED (LED4) is energized, (normal operation).

The blinking green LED (LED2) indicates that the upper flashtube is firing synchronously with the sync pulse. A second LED (LED3) indicates that the lower flashtube is firing synchronously with the sync pulse.

Single-pole double-throw contacts are available for monitoring: The continuity between TB1-3 and 4 (NO and COM) is recognized as a condition of normal operation. TB1-5 and 4 (NF and Com) is then open. The continuity between TB1-5 and 4 is recognized as a default, TB1-3 and 4 is then open.

Option with synchronization with fiber optic: In this case the synchronisation signals are sent through 2 optical wires from the master unit to the slaves units

This system in option is implemented on the synchronisation card with 2 optical transmitters (between LED2 and LED3) and 2 optical receivers (close to LED4 and LED1), see figure 4.2 below). For cabling, see figure 1.1.

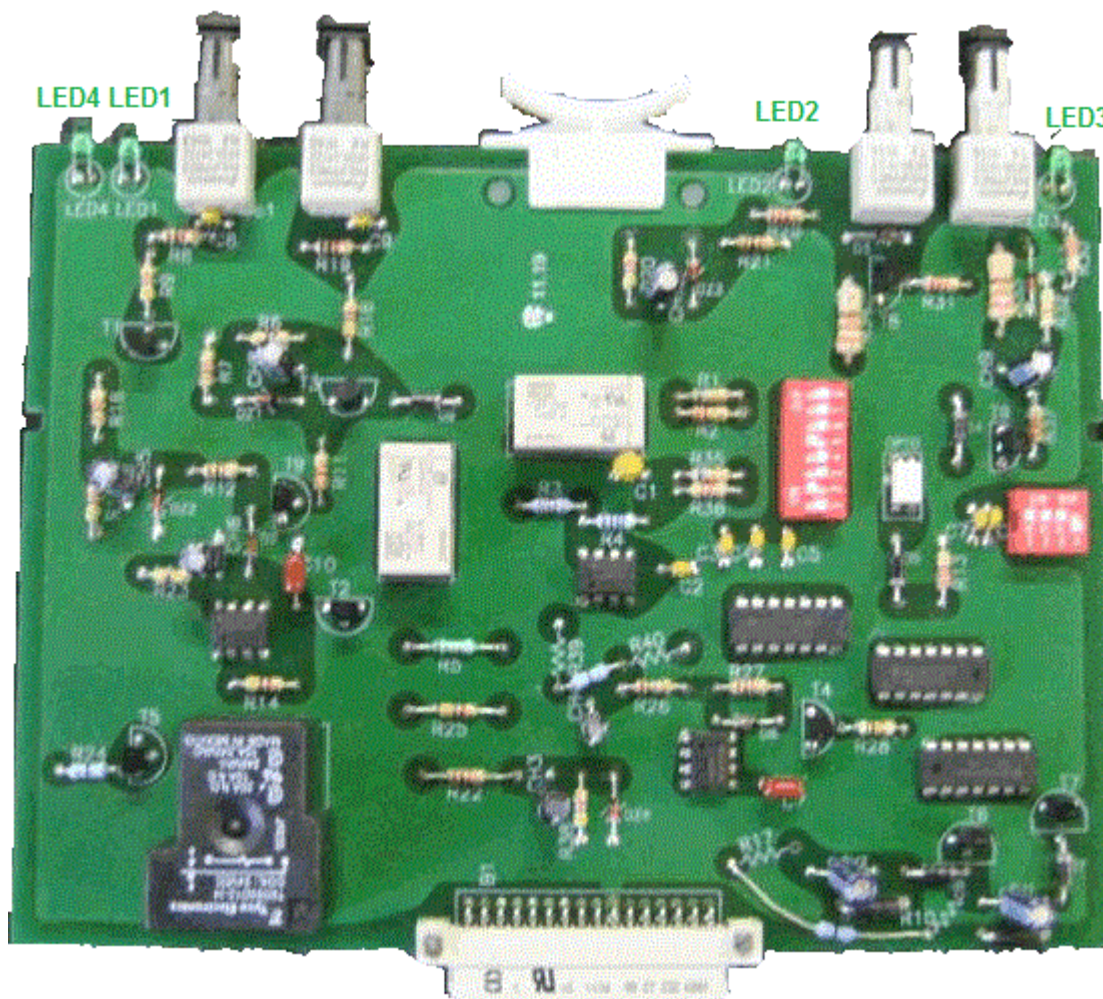


FIGURE 4-2. SYNCHRONISATION PRINTED CIRCUIT BOARD WITH OPTICAL TRANSMETER AND RECEIVER

SECTION 5.0 - TROUBLESHOOTING

WARNING!

1. Always turn off power when changing any component or printed circuit board.
2. High voltage is present in both the power supply and the flashhead. Do not cheat the interlocks.
3. Do not put hands or tools in either the power supply or the flashhead until the RED LED lamp on the converter PS1 and PS2 board is extinguished.
4. Do not look directly into the flashhead at close range when it is flashing.
5. Replace components in the order stated, keeping track of those replaced.
6. The procedures in Figure 5-1a, and b presume that all fuses, interlocks, and controls are functioning properly.
7. The components and assemblies in this system were designed by OBSTA to handle the high voltages which are present. We do not recommend substituting components or assemblies which might be available through other vendors.

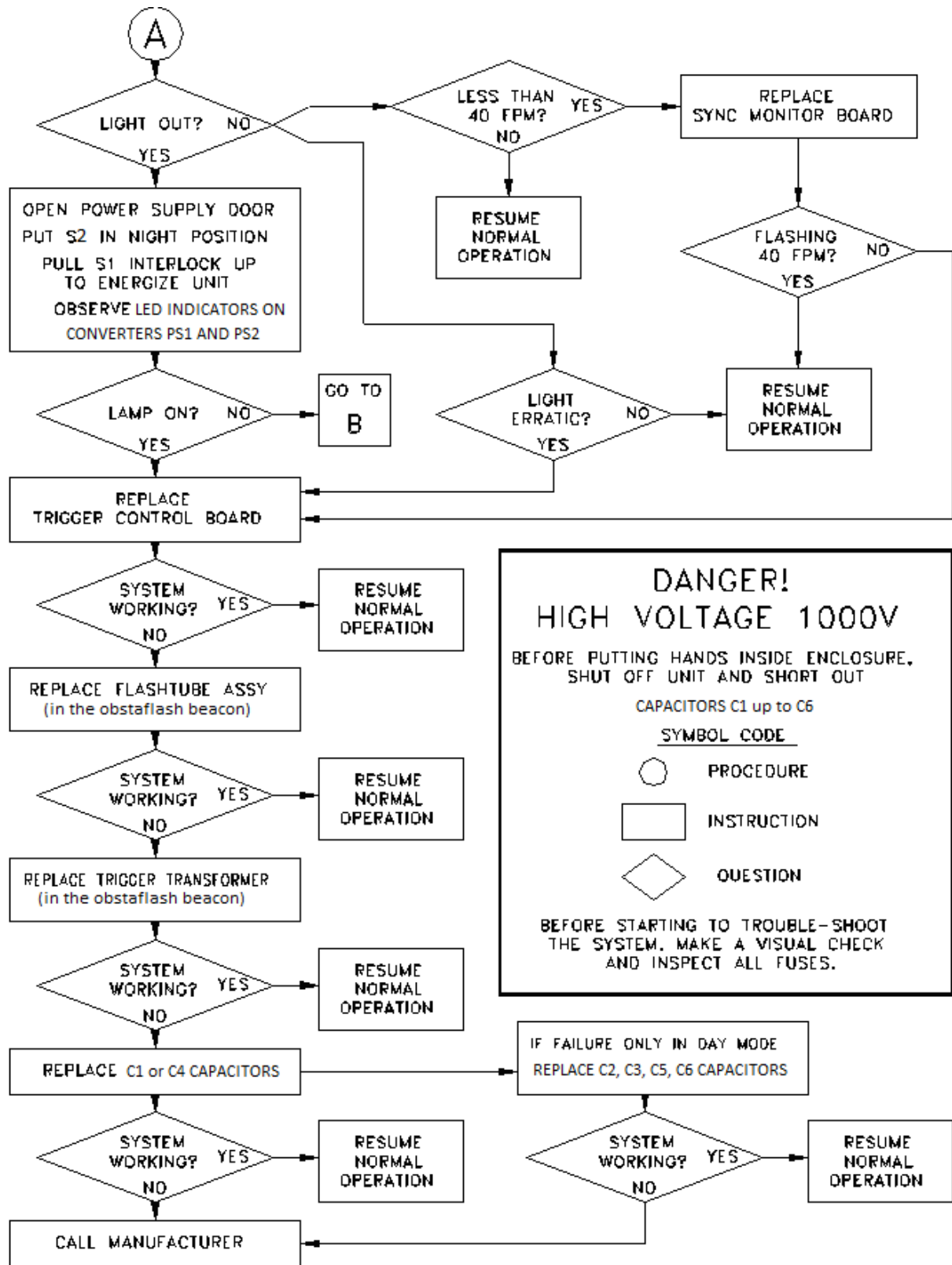


Figure 5-1a. TROUBLE SHOOTING PROCEDURE

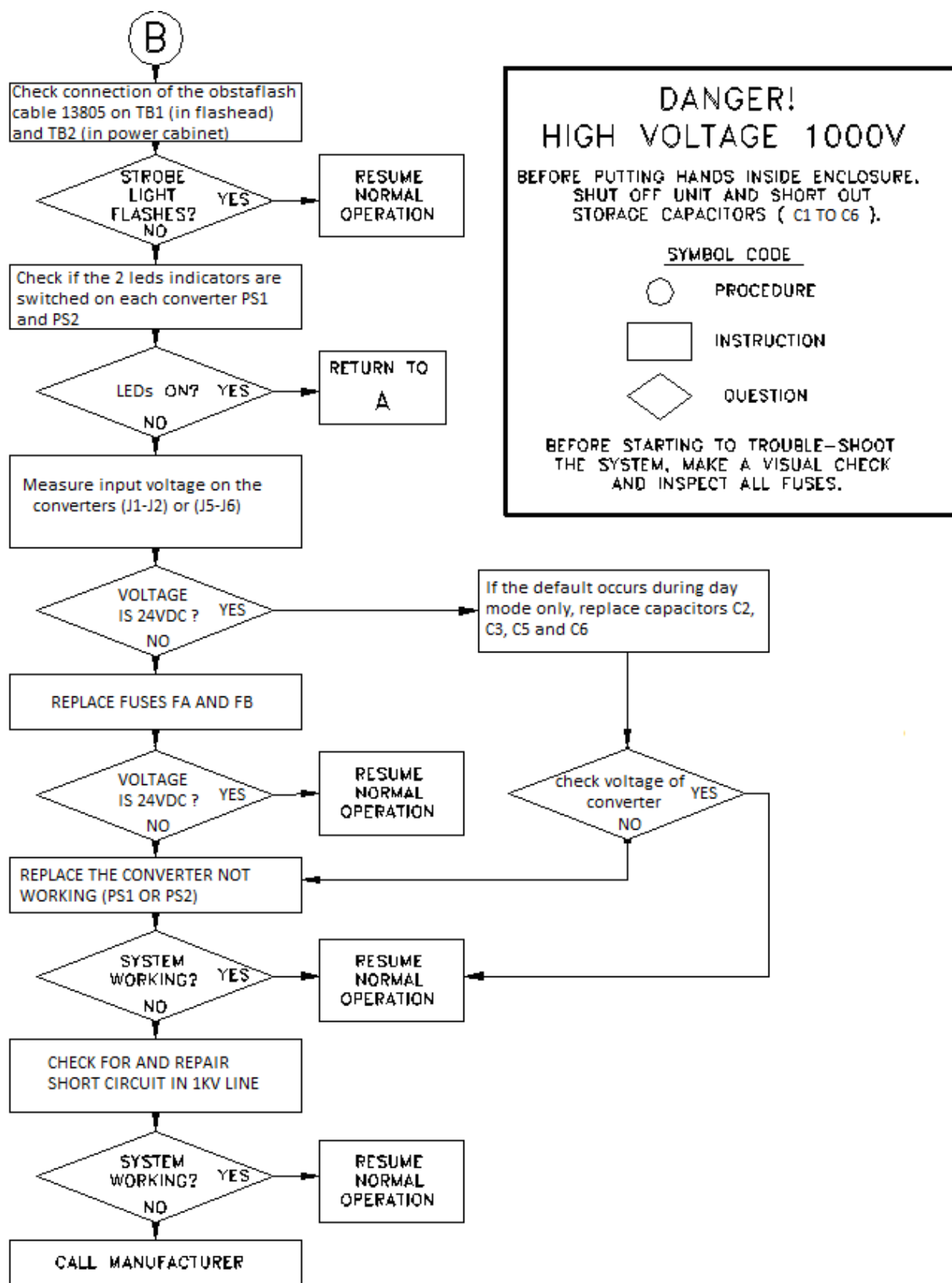


Figure 5-1b. TROUBLE SHOOTING PROCEDURE

SECTION 6.0 - MAINTENANCE

6.1 Obstaflash beacon

No special or preventive maintenance is required for the flashhead, but only that which can be performed on an as-needed basis. Should it become necessary to replace the flashtubes, the following instructions must be adhered to:

WARNING!

Ensure that the power is **OFF** and the capacitor bank has been discharged before opening the flashhead.

1. Lift the 3 lever arms securing the cover, slide down the security axes to secure the position of the 3 arms.
2. Lift the cover up to its upper position at the extremity of the arms and turn it to the left to block its position.
3. The cables of the two flashtubes drawer is attached at both ends. Disconnect the cables at both ends of the drawer to be replaced.
4. Gently pull out the flash tube drawer on its negative side.
5. Gently remove each new flashtube drawer from its container.
6. Insert the new flashtube drawer up to normal position.
7. Connect the wire at both ends of the drawer.
8. Turn the cover on the right and push it down carefully up to its lower position.
9. Remove the 3 security axes and the 3 arms to their initial position.

BE CAREFUL: DO NOT TOUCH THE FLASH TUBE WITH YOUR FINGER. FLASHTUBE ARE POLARISED AND THE “+” AND “-“, IT MUST BE RESPECTED.

6.2 Obstaflash power supply

No special maintenance is to be done on the power cabinet except when it is necessary

6.3 Photocell

No special maintenance is to be done.

SECTION 7.0 - SPARE PARTS

OBSTAFLASH BEACON

part no.

Flashtube drawer	13840
O-ring	13847
Security axes.....	13848
Switch interlock.....	13842
Transformer, Trigger.....	13841

POWER SUPPLY

part no.

24VDC converter	13860
Capacitor, C1 25 μ F.....	13861
Capacitor, C2 100 μ F.....	13862
Interlock relay A&B.....	13863
Synchro board.....	13864
Fuse board	13865
Trigger board	13866
PCB Master card	13867
Relay K1 24V	13868
Relay K2 24V	13869
Obstaflash interconnecting cable	13805
GPS synchronizer	13746
Photocell 24VDC.....	00754
AC to 24VDC power supply (for 230V only).....	13579