TWR Lighting®, Inc. HARK®

Enlightened Technology®

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IMPORTANT!!!!

PLEASE TAKE THE TIME TO FILL OUT THE FORM COMPLETELY. FILE IN A SAFE PLACE. IN THE EVENT YOU EXPERIENCE PROBLEMS WITH OR HAVE QUESTIONS CONCERNING YOUR CONTROLLER, THE FOLLOWING INFORMATION IS NECESSARY TO OBTAIN PROPER SERVICE AND PARTS.

MODEL # E-1DB

SERIAL # _____

PURCHASE DATE _____

PURCHASED FROM _____

TWR Lighting® Inc. HARK

Enlightened Technology®

DUAL MEDIUM INTENSITY STROBE
MODEL E-1DB

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TWR Lighting, Inc. HARK

Enlightened Technology®

DUAL MEDIUM INTENSITY STROBE
MODEL E-1DB

1.0 INTRODUCTION

The TWR Lighting, Inc. (TWR) Model E-1DB Type L-864/L-865 Controller has been designed and built to the Federal Aviation Advisory (FAA) Circular 150/5345-43E, with safety and reliability in mind. TWR is committed to providing our customers with some of the best products and services available. TWR welcomes you to our family of fine products, and we look forward to servicing your needs now and in the future.

1.1 APPLICATION

The E-1DB Controller is for use on lighting structures or towers (201' to 350' AGL) that are approved to be lighted with Dual White/Red Flashing Medium Intensity Strobes in accordance with the FAA's Advisory Circular 70/7460-1K.

1.2 SPECIFICATIONS OF EQUIPMENT

Dimensions:	
Controller (H X W X D) / Weight	30.50" X 20.0" X 8.0" / 95.0 lbs
Mounting Dim (H X W)	31.25" X 14.0"
Beacon Height / Weight	28.0" / 36 lbs
Cable Diameter / Weight per 100 ft.	.625" +/- 10% 24 lbs
Electrical Voltage:	120V AC +/- 10% 60 Hz (Standard) 240V AC +/- 10% 60 Hz (Available)
Intensity:	
White Daymode	20,000 +/- 25% Effective Candelas
Red Nightmode	2,000 +/- 25% Effective Candelas
White Nightmode (Back-up mode)	2,000 +/- 25% Effective Candelas
Beam Spread:	
Horizontal	360°
Vertical	3° Minimum
Flash Rate:	
White Daymode	40 fpm +/- 2 fpm
Red Nightmode	22 fpm +/- 2 fpm
White Nightmode (Back-up mode)	40 fpm +/- 2 fpm
Wattage:	
Daymode	95 Watts
Red Nightmode	310 Watts
White Nightmode	35 Watts
Temperature:	+55°C / -55°C
Beacon Wind Load:	2.1 ft^2

M.E-2015.E-1DB
12-97 – REV 3-5-15

2.0 INSTALLATION

WARNING DANGER!!!

THIS SYSTEM OPERATES AT HIGH VOLTAGE LEVELS THAT COULD BE LETHAL TO SERVICE PERSONNEL. ALL INSTALLATION AND MAINTENANCE WORK SHOULD BE DONE BY QUALIFIED SERVICE PERSONNEL ONLY. WHEN PERSONNEL IS INSTALLING SYSTEM OR PERFORMING MAINTENANCE ON THIS SYSTEM, MAKE SURE THE POWER IS TURNED OFF AT THE SERVICE BREAKER PANEL!!

READ AND UNDERSTAND THE THEORY OF OPERATION AND ITS SAFETY MESSAGES BEFORE ATTEMPTING INSTALLATION/MAINTENANCE OF THIS SYSTEM. DO NOT ATTEMPT TO DEFEAT THE INTERNAL SAFETY SWITCHES IN THE CONTROLLER AND BEACON!!

2.1 POWER SUPPLY CONTROL CABINET MOUNTING

The power supply control cabinet can be located at the base of the structure or in an equipment building. Mounting Dimensions can be found in Section 1.2, on page 1. Pay particular attention when choosing your controller mounting location to ensure proper door opening and room for service personnel. Refer to installation drawings INS-269, and HDO-269, for ease of install.

2.2 PHOTOCELL HOUSING

The standard photocell housing is supplied with a 20' pigtail of 16 AWG TYPE TFFN wire. On occasion in mounting of the photocell an additional amount of wire may be required. Refer to drawing 100239, for proper assistance on determining gauge of wire for your specific needs.

2.3 PHOTOCELL WIRING (Refer to Drawings HDO-269, and H40-269)

If the control cabinet is mounted inside an equipment building, the photocell should be mounted vertically on ½" conduit outside the building above the eaves facing north. Wiring from the photocell housing socket to the control cabinet should consist of one (1) each; red, black, and white wires. The white wire is connected to the socket terminal marked "N," the black wire is connected to the socket terminal marked "LI," and the red wire is connected to the socket terminal marked "LO." The photocell should be positioned so that it does not "see" ambient light, which would prevent it from switching to the nightmode. If the control cabinet is mounted outside an equipment building, the photocell should be mounted vertically on ½" conduit so the photocell is above the control cabinet. Care must be taken to assure that the photocell does not "see" any ambient light that would prevent it from switching into the nightmode. The photocell housing socket wiring is the same as above.

2.3.1 Connect the **BLACK** wire from the photocell to TB1-8.

2.3.2 Connect the **RED** wire from the photocell to TB1-9.

2.3.3 Connect the **WHITE** wire from the photocell to TB1-10.

2.3.4 Install the photocell into the receptacle and twist to the right while depressing to lock into place.

2.4 POWER WIRING (Refer to Drawing H40-269)

Power wiring to the control cabinet should be in accordance with local methods and the National Electric Code (NEC).

2.4.1 A 15 amp circuit breaker is recommended at service panel.

2.4.2 Connect the **"HOT"** side of the 120V AC line to TB1-11.

2.4.3 Connect the **"NEUTRAL"** side of the 120V AC line to TB1-12.

2.4.4 Connect the AC ground to the ground stud to the lower right of the terminal block TB1.

2.4.5 Controller panel should be connected to the tower and/or building grounding system with the exception of installations on AM/RF Applications where controller grounding to earth ground is prohibited. Ground the controller only to the tower itself using a suitable RF ground.

2.5 TOWER LIGHTING KIT

When installing this system, the customer will need to use strobe cable wiring method to wire the strobe beacon. Refer to Drawings 600-01, and 600 for cable installations.

WARNING DANGER!!!

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READ AND UNDERSTAND THE THEORY OF OPERATION AND ITS SAFETY MESSAGES BEFORE ATTEMPTING INSTALLATION/MAINTENANCE OF THIS SYSTEM. DO NOT ATTEMPT TO DEFEAT THE INTERNAL SAFETY SWITCHES IN THE CONTROLLER AND BEACON!!

2.5.1 Beacon Mounting and Wiring (Refer to Drawings HDO-269, and INS-269)

2.5.1.1 Bolt the beacon to the mounting plate using four (4) 5/8" X 1 1/4" galvanized bolts that are supplied. Installer should make sure to check for full thread engagement on Anco locknut. Allow 16" clearance in back of the hinge (25" from the center of the base) to tilt lens back without hitting an obstruction.

2.5.1.2 Level the beacon using the spirit level at the base of the lens. Shims may be used under beacon base or triple nutting each bolt with palnuts on all four (4) nuts.

2.5.1.3 Slip the electrical cable for the dual beacon through the watertight connector (cable gland bushing), and tighten the gland nut to make a watertight seal. Attach the wires to the terminal strip as follows:

Connect Cable Wire Color	To Match	Lamp platform Wire Color	Terminal Block Number
10 Gauge Black		20 Gauge Black	5
10 Gauge Red/Black		12 Gauge Red	3
10 Gauge Red		12 Gauge Red/Black	2
14 Gauge White		20 Gauge White	6
14 Gauge White/Green		20 Gauge White/Green	7
14 Gauge Green		20 Gauge Green	4
16 Gauge Blue		20 Gauge Blue	8
16 Gauge Brown		20 Gauge Brown	9
16 Gauge Bare Wire		Beacon Base	

2.5.2 Lighting Kit Wiring

Install wiring from the controller to the beacon utilizing strobe cable method. **(TWR LIGHTING CAN NOT WARRANTY SYSTEMS THAT EMPLOY SPLICING CABLE.)** Refer to drawings HDO-269, 600, and 600-01 for install of light kits. Following these minimum guidelines as well as any local or end user additional requirements, installing light kits will require lifting of the cable by the supplied cable grip or conduit to affix to the tower. Always work safely and adhere to all OSHA Safety Guidelines when lifting wiring or working on the structure or tower itself. It is the installer's responsibility to install the lighting kit in a safe manner. Installers can request from OSHA their requirements 29CFT 1926.21, and 29CFR 1926.105, to ensure compliance to regulations.

NOTE: ***On occasion, a set of custom lighting kit drawings may be specifically requested by a customer and installed in this manual. In cases such as this, the drawings will precede the manual if a conflict occurs.***

All the necessary information for wiring the dual beacon and sidelights is contained on the tower kit drawings 600, and 600-01. The connections for the dual beacon and sidelights in the controller are as follows:

2.5.2.1 Connect the 10 gauge ***Red/Black*** wire from beacon wiring to *TB1-1.*

2.5.2.2 Connect the 10 gauge ***Red*** wire from beacon wiring to *TB1-2.*

2.5.2.3 Connect the 10 gauge ***Black*** wire from beacon wiring to *TB1-3.*

2.5.2.4 Connect the 14 gauge ***White*** wire from beacon wiring to *TB1-4.*

2.5.2.5 Connect the 14 gauge ***White/Green*** wire from beacon wiring to *TB1-5.*

2.5.2.6 Connect the 14 gauge ***Green*** wire from beacon wiring to the ground screw left of *TB1.*

2.5.2.7 Connect the 16 gauge ***Brown*** wire from beacon wiring to *TB1-6.*

2.5.2.8 Connect the 16 gauge ***Blue*** wire from beacon wiring *TB1-7.*

2.5.2.9 Connect the ***Neutral*** wire from sidelight wiring to *TB1-12.*

2.5.2.10 Connect the ***Red*** wire from sidelight wiring to Fuse Block marked S1.

2.5.2.11 Connect the ground wire (if cable is used) from sidelight wiring to ground screw right of TB1.

2.6 ALARM WIRING

Individual alarm contacts (Form C) are provided for strobe failures, power failure, and photocell on. It is left up to the customer or installer on how they choose to utilize these contacts with their monitoring equipment. External monitoring equipment is available. Please inquire within the sales staff at the factory for models available and pricing. Alarm configurations are shown on drawings H40-269, and M01-269.

2.6.1 White Strobe Failure (SF)

Connect the customer's alarm common to plug J3 terminal #5. Connect the customer's alarm wire to plug J3 terminal #4, for normally open (or) terminal #6, for normally closed monitoring.

2.6.2 Red Strobe Failure (RF)

Connect the customer's alarm common to plug J3 terminal #11. Connect the customer's alarm wire to plug J3, terminal #10, for normally open (or) terminal #12, for normally closed monitoring.

2.6.3 Power Failure (PF)

Connect the customer's alarm common to plug J3 to terminal #14. Connect the customer's alarm wire to plug J3, terminal #15, for normally open (or) terminal #13, for normally closed monitoring.

2.6.4 Photocell (PC)

Connect the customer's alarm common to plug J3 terminal #8. Connect the customer's alarm wire to plug J3, terminal #7, for "off" operation (or) terminal #9, for "on" operation monitoring.

2.6.5 Sidelight Alarm (SA)

Connect the customer's alarm common to plug J3, terminal #2. Connect the customer's alarm wire to plug J3, terminal #1, for normally open (or) terminal #3, for normally closed monitoring.

2.7 ALARM TESTING

To test alarms, follow these procedures using an "ohm" meter between alarm common and alarm points.

2.7.1 White Strobe Failure (SF)

White strobe failure testing can be performed in the daymode operation. Check for status of strobe beacon. Turn "on" switch S1, on PCB #1, and status will change after a four (4) second delay. After test, turn switch S1 to the normal operating position.

2.7.2 Red Strobe Failure (RF)

Red strobe failure testing can be performed in the nightmode operation. Check for status of strobe beacon. Turn "off" switch SW2 on controller panel and status will change after an eight (8) second delay. This testing will cause the unit to go into the back-up white strobe operation. To clear this situation, turn “on” switch SW2, and reset the breaker.

2.7.3 Power Failure (PF)

While the controller is in normal operation, shut off power to the controller at the breaker panel. Alarm should be prompt. Reset the breaker to resume normal operation.

2.7.4 Photocell (PC)

Controller should be in the daymode of operation when performing this test. Check status of operation. Turn “on” switch SW1, (or) cover the photocell and operation status should change state. After test, turn switch SW1 to the normal operating position.

2.7.5 Sidelight Alarm (SA)

Controller should be in the nightmode of operation. Check status of operation. Pull fuse switch S1 open. Alarm shall occur within five (5) seconds. After test, re-engage fuse switch S1.

2.8 CONTROLLER CONFIGURATION (Refer to Drawing H01-269)

This unit is factory setup to be a master controller. If this unit is to be used in conjunction with additional unit, change dip switch settings as drawing indicates. The following connections will need to be interfaced between systems.

2.8.1 Connect at least an 18/20-gauge wire from PCB #1 connector P1-15 from unit setup to be the master unit to PCB #1 connector P1-15 of unit setup to be the slave unit.

2.8.2 Connect at least an 18/20-gauge wire from TB1-9 of master unit to slave unit TB1-9.

2.8.3 Connect at least an 18/20-gauge wire (ground) from one chassis to the other chassis.

2.8.4 Use a single breaker for supply power to all controllers.

2.8.5 Follow standard instructions provided in the manual supplied with the controller.

3.0 THEORY OF OPERATION

3.1 THE POWER SUPPLY

The AC line is sent to transformers T2 through fuse F2 MOVMOD1 and relay K1. In order for K1 to energize and complete the circuit to T1, the safety interlock switch CSS, BSS, must be closed. The BSS switch is located in the base of the beacon. In order for the system to operate, the beacon and the power supply must be closed and secured.

Transformer T1 secondary output is around 900V AC. These outputs are sent to the high voltage rectifier PCB (PCB #2) and converts the 900V AC of the transformer to around +550V DC and -550V DC in daymode and +700V DC and -550V DC in nightmode. This high voltage is then used to charge the energy storage capacitor C102 through current limiting resistor R31, T3 and steering diode D5 for nightmode operation. Resistor R31 and R31A are by-passed through K5 for daymode operation.

Energy storage capacitors bank C103-110 is used for the daymode operation and are connected to the high voltage through the normally closed contacts of relay K5. When the light level drops below 3 foot candles, the 6390-FAA2 photocell supplies 120V AC to relay K5, which removes C103-110 from the discharge path leaving capacitor C102 in the circuit for nightmode operation. The energy storage capacitor banks are connected to the flashtube through the interconnecting tower wiring.

3.2 THE FLASHTUBE

The flashtubes FT1 (daymode) and FT2 (nightmode) are quartz tubes containing two (2) electrodes each. The electrode at the positive (+) end is called the anode and is connected to the positive side of the storage capacitors through inductor L1, and L2. The electrode at the negative (-) end of the tube is called the Cathode and is connected to the negative side of the energy storage capacitors banks.

The flashtube contains a gas called Xenon. When the high voltage energy in the storage capacitors is connected to the flashtube, nothing will happen since Xenon in its natural state is not a conductor of electricity. However, when a very short duration high voltage pulse is impressed on the trigger element of the tube (via the power supply and trigger transformers T4 and T5), the Xenon gas is ionized and thereby becomes a good conductor of electricity. This allows the electrical energy in the storage capacitors to discharge rapidly through the flashtube, which converts this energy to light energy and heat energy. When the voltage stored in the capacitors discharges to a low level, the Xenon gas can no longer sustain conduction and since the short trigger pulse is gone by this time, it deonizes returning to its nonconducting state until another trigger pulse arrives to repeat the process. Meanwhile, the storage capacitor is being recharged by the transformer and the high voltage rectifiers.

3.3 TIMING CIRCUIT

The timing circuit is contained entirely on printed circuit board #1. The timing circuit has its own power supply. This circuit converts the AC voltage to approximately 12V DC, which is used to supply all of the components in this circuit. It uses this low voltage DC to generate pulses that control the flash rate of the flashtube. It actually generates two (2) groups of pulses. The first is a pulse approximately once every 1.2 seconds to operate the flashtube during daylight hours. The second is a burst at 100 Hz to elongate the apparent flash during the night time hours at reduced flash energy.

3.4 TRIGGER CIRCUIT

The trigger circuit is supplied by transformer T2 secondary windings. The 250V AC is converted to DC, which is stored in a storage capacitor much like the action of the high voltage circuit. The main difference is that the storage capacitor is much smaller. The trigger circuit receives the pulses generated by the timing circuit. It releases its stored energy with each pulse and delivers it to the flashtube's trigger element to initiate each flash.

3.5 ALARM CIRCUITS

3.5.1 White Strobe Failure (SF)

White Strobe Failure alarm circuit monitors each flash of the daymode flashtube within the beacon. If the flashtube fails to flash (for any reason), the alarm circuit operates relay K7 (on PCB #3) that the customer can connect to their alarm transmitting devices. The alarm point can be accessed on J3 of PCB #3.

3.5.2 Red Strobe Failure (RF)

Red Strobe Failure alarm circuit monitors each flash of the nightmode flashtube within the beacon. If the flashtube fails to flash (for any reason), the alarm circuit operates relay K8 (on PCB #3) that the customer can connect to their alarm transmitting devices. The alarm point can be accessed on J3 of PCB #3.

3.5.3 Power Failure (PF)

The power failure alarm relay is energized during normal operation. Should the power be removed for any reason, then relay K1 would drop, creating an alarm for the customer alarm-transmitting device.

3.5.4 Photocell (PC)

The photocell alarm relay K4 is energized whenever the photocell or SW1 is on. This relay will allow the customer to monitor the modes of operation to determine if switch from day to nightmode has occurred.

3.5.4.1 To test daymode operation in night time, set SW1 switch in the middle position. Make sure to switch downward to "NORMAL" position after testing.

3.5.5 Sidelight Alarm (SA)

Module M1 monitors the current flowing to the sidelights. This module can monitor from (1-4) 116W lamps. Factory setting is generally for three (3) lamps. When the current falls to two (2) amps (1 lamp less than the factory setting), then the onboard relay will engage, creating an alarm which is then sent to PCB #3.

3.6 BLEEDER CIRCUIT

The bleeder circuit is the most important safety item in this system. It consists of resistor R32 connected to the high voltage storage capacitor through relay K2. When the AC line voltage is turned off, the relay will close allowing the resistors to discharge the high voltage stored in the capacitor banks below 50V in 30 seconds.

CAUTION

NEVER RELY ON THIS CIRCUIT TO RENDER THIS SYSTEM HARMLESS. ANY DEFECT IN THIS CIRCUIT COULD ALLOW A HAZARDOUS HIGH VOLTAGE CHARGE TO REMAIN ON THE STORAGE CAPACITORS. ALWAYS WAIT AT LEAST 30 SECONDS AFTER POWER HAS BEEN TURNED OFF BEFORE STARTING ANY WORK ON THIS SYSTEM. ALWAYS MEASURE THE VOLTAGE ON THE STORAGE CAPACITORS WITH A VOLTMETER BEFORE STARTING ANY OTHER WORK ON THIS SYSTEM. NEVER ATTEMPT TO DEFEAT THE SAFETY INTERLOCKS.

3.7 STROBE DIAGNOSTIC CIRCUITS

The diagnostic circuit is provided as a means of making system checks and maintenance more convenient. This circuit is entirely contained on the printed circuit boards PCB #1, and PCB #2. The circuits that are contained on PCB #1 and PCB #2 are as follows:

3.7.1 Control Power On

Line from the 120V AC input is sent through safety switches CSS, BSS, isolation transformer T2 and fuse F11 on PCB #1. Once this low voltage is at PCB #1, it is rectified, then sent to LED4 (D5). If for any reason power is interrupted, (beacon opened, controller door open, blown F1 fuse, failed relay, etc.) LED4 would be extinguished.

3.7.2 High Voltage

The Cathode side of the high voltage HV is routed through a current limiting resistor (R201). When the unit is in daymode, D14 will be at full brightness when the capacitors are at full charge, but dims with the discharging of the storage capacitors. A constant intensity indicates that high voltage is present but capacitors are not discharging (check other indicators for fault). When the red LED fails to glow, then the high voltage is no longer present.

3.7.3 Trigger Voltage

The trigger voltage from fuse F41 (PCB #4) is sent to current limiting resistor R1 and LED6 (D11). Under normal circumstances, the red LED should be at full intensity indicating voltage to be normal. An absence of this indication means that the voltage is no longer present.

3.7.4 Nightmode

Output voltage from the photocell (SSR) is connected to the coil of relay K4 on PCB #3. Whenever the photocell senses the darkness or switch SW1 is on, relay K4 will energize, thereby sending 120V to relay U2. Relay U2 will supply 12V DC to the timing circuit as well as LED7 (D7). LED7 will glow a constant red when in the nightmode.

3.7.5 Primary Timing

The primary timing pulses are received at LED8 (D12). LED8 will flash according to the pulses received from the timing circuit. If LED8 fails to flash, then the primary timing circuit has failed. Check LED9 (D28) for secondary timing operation. The strobe unit should produce 40 (+/- 2) pulses per minute in daymode or nightmode back-up operation. The strobe unit in nightmode operation should produce 22 (+/- 2) pulses per minute.

3.7.6 Timing Signal Verify

Timing pulses (either primary or secondary) are received at LED9 (D28). The LED will flash according to the pulses received from the timing circuit. In the unlikely event that this LED is out, then total timing failure has occurred.

3.7.7 Flash Verified

Current from the Cathode side of the flashtube (FTC) is sent through the current sensing transformer T4 on PCB 1. T4 will send a pulse to the gate of the SCR's Q13 and turns it on. Capacitor C15 via Q13 will send voltage to LED1 (D20). After each confirmed flash, LED1 will blink. Absence of a blinking LED signifies that strobe beacon has ceased to flash.

3.7.8 Strobe Fail Test

Switch S1, when turned on, cuts off the timing signal to the trigger circuit and extinguishes LED8 (D12). At this time a strobe alarm should be received at J3. The normal position of switch S1 is off (switch downward).

4.0 TROUBLESHOOTING

Much of the troubleshooting of this system will consist of correcting a "beacon out" situation. There may also be a failure mode where the flashtube is still flashing, but at the wrong rate or the wrong intensity.

You must study and understand the safety messages and the theory of operation before attempting any service on this system. Servicing this system must be done by qualified personnel only.

4.1 TOOL REQUIREMENTS

In order to be prepared to trouble shoot or repair this system, a minimum amount of tools and equipment will be required. A recommendation list includes:

1) 5/16 Flat Electrician's Screwdriver
1) #2 Phillips Screwdriver
1) Nut Driver or Socket Set
1) 5/32 Allen Wrench
1) Needle Nose Pliers
1) Precision Flat Screwdriver
1) Multi meter - Analog or Digital 600V AC / 600V DC Minimum

4.2 DIAGNOSTIC EVALUATION

The first step in trouble shooting of this system or performing annual maintenance will require the technician to open the controller door. With the power off to the controller, the technician should look over the controller circuit and repair or replace any apparent problems such as loose wire connections or corroded terminations. After the initial visual checks have been completed, restore power to the controller and pull out on the plunger of the cabinet safety switch (CSS) located at the lower right edge of the enclosure. Observe at this time the LEDs located on PCB #1 and PCB #2. Determine, by observation of these LED indicators, if the controller is performing to normal operation.

LEDs on PCB #1 are numbered from top to bottom, 1-9. LEDs on PCB #2 are numbered from top to bottom, D14 - D16. (See drawings H40-269, and H01-269)

4.3 TROUBLESHOOTING ASSISTANCE

4.3.1 Flash Verify LED - Out

4.3.1.1 Observe high voltage LED (D14) on the same beacon circuit to determine if it is available. If the LED is dim or out completely, then check the high voltage capacitor bank (C103 - C110 daymode, C102 nightmode) for a short. If no capacitor is found to be shorted, check the resonant cap (C101) for a short. If the resonant cap is okay, replace PCB #2. If the LED is at full illumination, go to the next step.

4.3.1.2 Check the status of trigger LED6. If LED is dim or off, check fuse F41. If blown, replace with exact type of fuse. If the fuse blows again, check transformer T2. Replace as necessary. If LED is okay, go to the next step.

4.3.1.3 If steps 4.3.1.1 and 4.3.1.2 check out okay, re-lamp the beacon.

4.3.2 Control Power on LED - Out

4.3.2.2 Check interlock circuit for an open circuit. If open, make the necessary repairs. If okay, check fuse F2 in the cabinet. Replace if bad.

4.3.3 Primary Timing LED – Out

4.3.3.1 Observe the status of the timing LED8. If the LED is dim or out completely, check LED9, and if dim or out, replace PCB #1. If one (1) or both are lit, you should have timing.

4.3.4 False or Nonexistent Beacon Alarm (SF)

4.3.4.1 If alarm trips when the system appears to be working normally or fails to show an alarm when there is an obvious failure, check PCB #1 P1-4 for 120V AC output. If voltage is okay, go to the next step.

4.3.4.2 Check relay K7 coil for an open condition. Normal resistance should be around 2K ohm. If coil is open, replace K7.

4.3.4.3 The time delay between an actual failure and the point where the relay trips is pre-set at the factory or about eight (8) seconds. This delay period can be tested by placing the control board (PCB #1) test switch to "ON." On the analog board, this position is *upward*. On the digital board, this position is towards the front of the cabinet. After testing, return the test switch to the normal position. On the analog board, this is *downward*, and on the digital board, this is towards the back of the cabinet.

4.3.5 False or Nonexistent Beacon Alarm (RF)

If alarm trips when the system appears to be working normally or fails to show an alarm when there is an obvious failure, check relay K8 coil for an open condition. Normal resistance should be around 2K ohm. If coil is open, replace K8.

4.3.6 No Red Strobe Operation

4.3.6.1 Check if switch SW2 is on. If switch is off, turn switch to the on position *(upward)*. If okay, go to the next step.

4.3.6.2 Turn switch SW1 to the on position (upward). On the breaker at the service panel to the lights, turn off then back on. If the beacon comes on then the unit fail-safes back to the white back-up mode of operation, then replace the red mode flashtube.

NOTE: ***Once the unit fail-safes, you will need to reset the breaker at the panel in order to release the latched relay in this circuit anytime a failure has been detected. This is an important fact to remember when troubleshooting this system.***

5.0 MAINTENANCE GUIDE

WARNING - HIGH - VOLTAGE

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Tools Required: #2 Phillips Screwdriver
3/16 Flat Blade Screwdriver

5.1 FLASHTUBE REPLACEMENT

The only required maintenance needed to be performed is the replacement of the flashtubes every four (4) years. By following these instructions, maximum safety and performance can be achieved.

5.1.1 Loosen the single quick open bolt located on upper hinge assembly.

5.1.2 Open the lens and tilt it back.

ALWAYS WAIT AT LEAST 30 SECONDS AFTER OPENING THE BEACON BEFORE STARTING ANY WORK ON THE BEACON.

5.1.3 Loosen the three (3) socket screws with a #2 Phillips screwdriver to remove lamp.

5.1.4 Install the new night mode flashtube making sure that the pins are aligned with the socket. Make sure tube is flush on the socket.

5.1.5 Tighten the socket screws snug, then 1/4 turn more.

5.1.6 Open the internal hatch plate latch and let it recline open.

5.1.7 Disconnect the cable running through the tube from the 10 position terminal block located at the base of the fixture.

5.1.8 Loosen the three (3) socket screws with a #2 Phillips screwdriver.

5.1.9 To remove the flashtube, slide the lamp down to the cable.

5.1.10 To install a flashtube, slide the lamp over the connector on to the cable with lamp in the base up position.

5.1.11 Insert the flashtube with the pins aligned with the socket.

5.1.12 Tighten the socket screws snug, then 1/4 turn more.

5.1.13 Reconnect cable connection. Make sure to follow the color codes on the cable to the terminal block.

5.1.14 Close the hatch and latch securely.

5.1.15 Close the upper hinge assembly and latch securely.

5.2 RED OBSTRUCTION LIGHTING

The only required maintenance needed to be performed is replacement of the lamps in the L-810 fixture. Lamps should be replaced after being operated for not more than 75% of the rated life or immediately upon failure as per FAA Advisory Circular 70/7460-1K. By following these instructions, maximum safety and performance can be achieved.

Tools Required: None

5.2.1 LAMP REPLACEMENT

5.2.1.1 Unclasp the two (2) latches and let the bail recline back.

5.2.1.2 Lift the lens up and over the lamp letting the lens hang from the safety cable.

5.2.1.3 Unscrew the lamp counter-clockwise and remove.

5.2.1.4 Install the new lamp by screwing the lamp clockwise.

5.2.1.5 Reinstall the lens making sure it is seated properly on the base.

5.2.1.6 Reclasp the two (2) latches.

5.3 POWER SUPPLY

The only required maintenance to be performed is periodic inspection/cleaning of the vent filter. Monthly inspections should be made at first to familiarize yourself with the power supply's particular maintenance requirements. Maintenance intervals can vary due to location, seasonal weather conditions, and general housekeeping of site.

The filter is located on the inside of the enclosure on the lower right hand side.

Tools Required: None

5.3.1 Turn off power at breaker panel.

5.3.2 Open the controller door.

5.3.3 Disconnect P1 connector from PCB #1.

5.3.4 Remove PCB #1 from track.

5.3.5 Slide filter up and remove from bracket.

5.3.6 Wash filter with water and squeeze until all excess water is removed. If no water is available, then knock out dust from filter before reinstalling.

5.3.7 Reinstall filter into bracket.

5.3.8 Reinstall PCB #1.

5.3.9 Reconnect P1 connector to PCB #1.

5.3.10 Close the controller door.

5.3.11 Turn on power at breaker panel.

5.4 PHOTOCELL

The photocell is a sealed unit. No maintenance is needed or required other than replacement as necessary.

6.0 MAJOR COMPONENTS LIST

SCHEMATIC TAG #	PART NUMBER	DESCRIPTION
BSS1	STJ02003	BEACON SAFETY SWITCH
C101	STB99005	4 uF 660V AC CAP
C102	STB99010	4 uF 2.5 KV CAP
C103 - C110	STB99006	40 uF 1KV CAP
CSS	STJ02001	CABINET SAFETY SWITCH
FAN	EP123815LBT	AXIAL FAN
F1	KTK1	1 amp FUSE
F2	FNQ10	10 amp FUSE
F11	FUSE.5	1/2 amp FUSE
F41	FUSE.125	1/8 amp FUSE
FT1	STFLSHTB6	DAYMODE FLASHTUBE
FT2	STFLSHTB7	NIGHTMODE FLASHTUBE
K1, K4, K5, K6, K8	KRPA11AG120V	DPDT OCTAL RELAY
K2, K3	STJ10006	HV BLEEDER RELAY
K7	KRPA5AG120V	SPDT OCTAL RELAY
K9	SPEC224	TIME DELAY RELAY
L1	INDCTR3001	INDUCTOR
L2	100453	INDUCTOR
M1	SCR430T	CURRENT SENSOR
MOVMOD1	DTK-120HW	SURGE SUPPRESSOR
MOV 1, 2	MOV524V15	METAL OXIDE VARISTOR
MOV3, MOV4	V1000LA80A	METAL OXIDE VARISTOR
MOV5, 6	V275LA20A	METAL OXIDE VARISTOR
P1, P2, P3	STT60021	15 POSITION PLUG
PCB1	STH01269	E-1DB CONTROL PCB
PCB2	STH02226A	HIGH VOLTAGE RECTIFIER PCB

6.0 MAJOR COMPONENTS LIST (continued)

SCHEMATIC TAG #	PART NUMBER	DESCRIPTION
PCB3	STH03269A	RELAY PCB w/ALARM LOCKOUT ELIMINATION MODIFICATION
PCB 4	STH04269	TRIGGER VOLTAGE RECTIFIER PCB
PHOTOCELL	6390-FAA2	120 - 240V AC PHOTOCELL
R31	STA22004	50 ohm 225W
R32	STA08020	25K ohm 20W
R33	ST08010	2.4 MEG 2W
S1	KTK5	5 amp FUSE
SW2	STJ01002	SPDT 15 amp SWITCH
SW1	STJ01004	SPDT 15 amp SWITCH
T1	STC30019	FERRORESONANT TRANSFORMER
T2	100272	ISOLATION TRANSFORMER
T3	100273	BURSTING CHOKE
T4, T5	STC05005	TRIGGER TRANSFORMER
TB1	TERMBLK-12	12 PART TERM BLK
TB2	TERMBLK 141-12	12 PART TERM BLK
TB3	TERMBLK 141-4	4 PART TERM BLK
TB4	CURBLK	3 PART TERM BLK
TLS1	STJ10008	THERMAL LIMITING SWITCH/210
TLS2	STJ10010	THERMAL LIMITING SWITCH/130
	100319	FLASHTUBE SOCKET
	STBEAGSKT	HINGE GASKET
	STBEAGSKT2	LENS GASKET
	STDBCLENS	CLEAR DUAL BEACON LENS
	STDBEACON	DB STROBE BEACON FIXTURE
	STROBCABLE-3	STROBE BEACON CABLE

6.0 MAJOR COMPONENTS LIST (continued)

SCHEMATIC TAG #	PART NUMBER	DESCRIPTION
	STCABLE0B	SIDELIGHT CABLE
	STFILTER	VENT FILTER
	STDBRLENS	RED DUAL BEACON LENS
	STCABLTIE	STROBE CABLE TIE
	STDHATPLT	STDBEACON HATCH LATCH ASSEMBLY
	DBTERMBLK8KIT	DUAL BEACON UPPER TERMINAL BLOCK KIT
	DBTERMBLK10KIT	DUAL BEACON LOWER TERMINAL BLOCK KIT
	CABLEGRIP1	SINGLE EYE LACE MESH .50 - .62
	CABLEGRIP3	SINGLE EYE LACE MESH .63 - .74
	116A21TS	116W, 120V SIDELIGHT BULB

7.0 SUGGESTED SPARE PARTS LIST

QTY#	PART NUMBER	DESCRIPTION
2	KTK1	1 amp FUSE
2	FNQ10	10 amp FUSE
2	KTK5	5 amp FUSE
2	FUSE.5	1/2 amp FUSE
2	FUSE.125	1/8 amp FUSE
1	STH01269	E-1DB PCB #1
1	6390-FAA2 (This replaces the P2455L Photocell)	120 - 240V AC PHOTOCELL
1	STJ10006	HV BLEEDER RELAY
1	STJ02003	BEACON SAFETY SWITCH
1	STJ02001	CABINET SAFETY SWITCH
1	STFLSHTB6	DAYMODE FLASH TUBE
1	STFLSHTB7	NIGHTMODE FLASH TUBE
3	KRPA11AG120	DPDT OCTAL RELAY
1	SCR430T	CURRENT SENSOR
1	DTK-120HW	SURGE SUPPRESSOR
1	KRPA5AG120	SPDT OCTAL RELAY

TWR Lighting®, Inc. HARK

Enlightened Technology®

DUAL MEDIUM INTENSITY STROBE
MODEL E-1DB

Warranty & Return Policy

TWR Lighting®, Inc. ("TWR®") warrants its products (other than "LED Product") against defects in design, material (excluding incandescent bulbs) and workmanship for a period ending on the earlier of two (2) years from the date of shipment or one (1) year from the date of installation.

TWR Lighting®, Inc. ("TWR®") warrants its "LED Product" against defects in design, material and workmanship for a period of five (5) years from the date of shipment. TWR®, at its sole option, will, itself, or through others, repair, replace or refund the purchase price paid for "LED Product" that TWR® verifies as being inoperable due to original design, material, or workmanship. All warranty replacement "LED Product" is warranted only for the remainder of the original warranty of the "LED Product" replaced. Replacement "LED Product" will be equivalent in function, but not necessarily identical, to the replaced "LED Product."

TWR Lighting®, Inc. ("TWR®") warrants its "LED Product" against light degradation for a period of five (5) years from the date of installation. TWR®, at its sole option, will, itself, or through others, repair, replace, or refund the purchase price paid for "LED Product" that TWR® verifies as failing to meet 75% of the minimum intensity requirements as defined in the FAA Advisory Circular 150/5345-43G dated 09/26/12. All warranty replacement "LED Product" is warranted only for the remainder of the original warranty of the "LED Product" replaced. Replacement "LED Product" will be equivalent in function, but not necessarily identical, to the replaced "LED Product."

Replacement parts (other than "LED Product") are warranted for 90 days from the date of shipment.

Conditions not covered by this Warranty, or which might **void** this Warranty are as follows:

- Improper Installation or Operation
- Misuse
- Abuse
- Unauthorized or Improper Repair or Alteration
- Accident or Negligence in Use, Storage, Transportation, or Handling
- Any Acts of God or Nature
- **Non-OEM Parts**
  The use of Non-OEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43.

TWR Lighting®, Inc. HARK

Enlightened Technology®

DUAL MEDIUM INTENSITY STROBE
MODEL E-1DB

Warranty & Return Policy
(continued)

Field Service – Repairs are warranted for 90 days from the date of service, except where TWR® has made recommendations that were not adhered to that may cause premature failure on previous repairs. Labor, Travel, and Tower Climb are not covered under warranty. Customer shall be obligated to pay for all incurred charges not related to warranty. All warranty repairs are performed by trained TWR® personnel, or dispatched through an extensive network of certified and insured Service Representatives.

Return Terms – You must first contact our Customer Service Department at **713-973-6905** to acquire a Return Merchandise Authorization (RMA) number in order to return the product(s). Please have the following information available when requesting an RMA number:

- The contact name and phone number of the tower owner
- The contact name and phone number of the contractor
- The site name and number
- The part number(s)
- The serial number(s) (if any)
- A description of the problem
- The billing information
- The Ship To address

This RMA number must be clearly visible on the outside of the box. If the RMA number is not clearly labeled on the outside of the box, your shipment will be refused. Please ensure the material you are returning is packaged carefully. **The warranty is null and void if the product(s) are damaged in the return shipment.**

All RMAs must be received by TWR LIGHTING®, INC., 4300 WINDFERN RD #100, HOUSTON TX 77041-8943, within 30 days of issuance.

Upon full compliance with the Return Terms, TWR® will replace, repair and return, or credit product(s) returned by the customer. It is TWR®'s sole discretion to determine the disposition of the returned item(s).

TWR Lighting®, Inc. HARK®

Enlightened Technology®

DUAL MEDIUM INTENSITY STROBE
MODEL E-1DB

Warranty & Return Policy
(continued)

Replacements – Replacement part(s) will be shipped and billed to the customer for product(s) considered as Warranty, pending return of defective product(s). When available, a certified reconditioned part is shipped as warranty replacement with a Return Merchandise Authorization (RMA) number attached. Upon receipt of returned product(s), inspection, testing, and evaluation will be performed to determine the cause of defect. The customer is then notified of the determination of the testing.

- Product(s) that is deemed defective and/or unrepairable and covered under warranty - a credit will be issued to the customer's account.
- Product(s) found to have no defect will be subject to a **$60.00 per hour testing charge (1 hour minimum), which will be invoiced to the customer.** At this time the customer may decide to have the tested part(s) returned and is responsible for the return charges.
- Product(s) under warranty, which the customer does not wish returned, the customer will be issued a credit against the replacement invoice.

Repair & Return – A Return Merchandise Authorization (RMA) will be issued for all part(s) returned to TWR® for repair. Upon receipt of returned product(s), inspection, testing, and evaluation will be performed to determine the cause of defect. The customer is then notified of the determination of the testing. If the returned part(s) is deemed unrepairable, or the returned part(s) is found to have no defect, the customer will be subject to a **$60.00 per hour testing charge (1 hour minimum), which will be invoiced to the customer.** Should the returned parts be determined to be repairable, a written estimated cost of repair will be sent to the customer for their written approval prior to any work being performed. In order to have the tested part(s) repaired and/or returned, the customer must issue a purchase order and is responsible for the return shipping charges.

Return to Stock – Any order that is returned to TWR® for part(s) ordered incorrectly by the customer, or unneeded upon receipt, the customer is required to pay a **20% restocking fee**. A credit will be issued once it is determined that the Return Terms are met.

Credits – Credits are issued once it is determined that all of the Warranty and Return Terms are met. All credits are processed on Fridays. In the event a Friday falls on a Holiday, the credit will be issued on the following Friday.

Freight – All warranty replacement part(s) will be shipped via ground delivery and paid for by TWR®. Delivery other than ground is the responsibility of the customer.

TWR Lighting®, Inc. HARK

Enlightened Technology®

DUAL MEDIUM INTENSITY STROBE
MODEL E-1DB

Warranty & Return Policy
(continued)

REMEDIES UNDER THIS WARRANTY ARE LIMITED TO PROVISIONS OF REPLACEMENT PARTS AND REPAIRS AS SPECIFICALLY PROVIDED. IN NO EVENT SHALL **TWR®** BE LIABLE FOR ANY OTHER LOSSES, DAMAGES, COSTS, OR EXPENSES INCURRED BY THE CUSTOMER, INCLUDING, BUT NOT LIMITED TO, LOSS FROM FAILURE OF THE PRODUCT(S) TO OPERATE FOR ANY TIME, AND ALL OTHER DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING ALL PERSONAL INJURY OR PROPERTY DAMAGE DUE TO ALLEGED NEGLIGENCE, OR ANY OTHER LEGAL THEORY WHATSOEVER. THIS WARRANTY IS MADE BY **TWR®** EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED. WITHOUT LIMITING THE GENERALITY OF THE FORGOING, **TWR®** MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS OF THE PRODUCT(S) FOR ANY PARTICULAR PURPOSE. **TWR®** EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES.

TWR Lighting® Inc. HARK®

Enlightened Technology®

DUAL MEDIUM INTENSITY STROBE
MODEL E-1DB

RETURN MERCHANDISE AUTHORIZATION (RMA) FORM

RMA#:_____ **DATE:**_____

CUSTOMER:_____

_____

CONTACT:_____ **PHONE NO.:**_____

ITEM DESCRIPTION (PART NO.):_____

_____

MODEL NO.:_____ **SERIAL NO.:**_____

ORIGINAL TWR INVOICE NO.:_____ **DATED:**_____

DESCRIPTION OF PROBLEM:_____

_____

_____

_____

SIGNED:_____ **DATE NEEDED:**_____

RETURN ADDRESS:_____

_____

PLEASE RETURN PRODUCT TO: 4300 WINDFERN RD #100 HOUSTON TX 77041-8943

TWR Lighting®, Inc. HARK®

Enlightened Technology®

DUAL MEDIUM INTENSITY STROBE
MODEL E-1DB

RETURN MERCHANDISE AUTHORIZATION (RMA) FORM

RMA#:_____ **DATE:**_____

CUSTOMER:_____

_____

CONTACT:_____ **PHONE NO.:**_____

ITEM DESCRIPTION (PART NO.):_____

_____

MODEL NO.:_____ **SERIAL NO.:**_____

ORIGINAL TWR INVOICE NO.:_____ **DATED:**_____

DESCRIPTION OF PROBLEM:_____

_____

_____

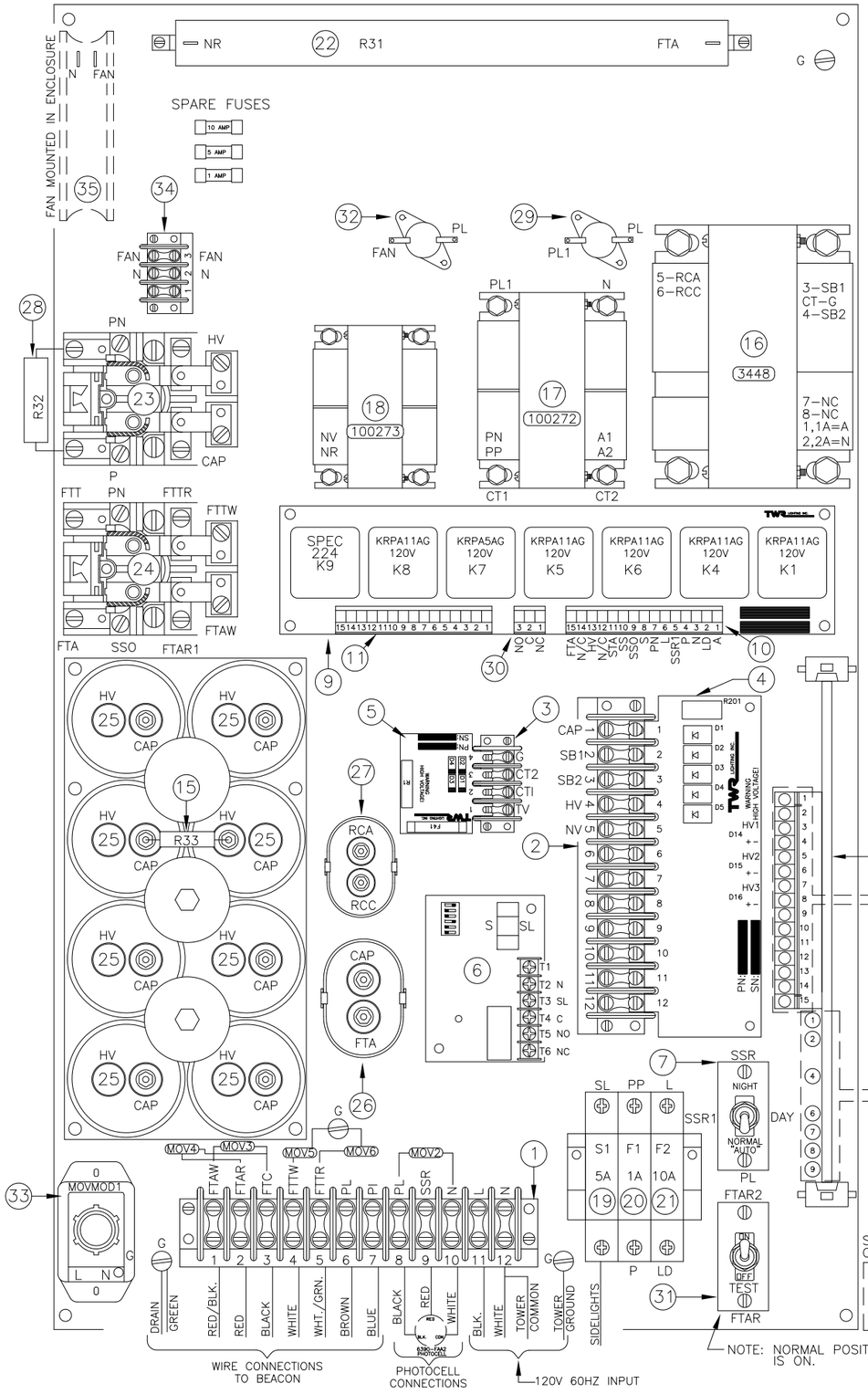
_____

SIGNED:_____ **DATE NEEDED:**_____

RETURN ADDRESS:_____

_____

PLEASE RETURN PRODUCT TO: 4300 WINDFERN RD #100 HOUSTON TX 77041-8943



CUSTOMER STROBE ALARM POINTS

*J3 CUSTOMER ALARMS

1	NO	SA	(SIDELIGHT ALARM)
2	COM		
3	NC		
4	OPEN	SF	(WHITE STROBE FAILURE)
5	COM		
6	CLOSED		
7	OFF	PC	(PHOTOCELL)
8	COM		
9	ON		
10	OPEN	RF	(RED STROBE FAILURE)
11	COM		
12	CLOSED		
13	CLOSED	PF	(POWER FAILURE)
14	COM		
15	OPEN		

*CONTACT POINTS SHOWN IN NORMAL OPERATION.

J2 ALARM INTERCONNECT

1	NC
2	C
3	NO

NC=NORMALLY OPEN C=COMMON NC=NORMALLY CLOSED

P1 CONNECTIONS

1 = FTT	6 = CAP	11 = TV
2 = FTAR2	7 = FTC	12 = G
3 = FTARI	8 = SSO	13 = A1
4 = STA	9 = SS	14 = A2
5 = P	10 = PN	15 = TS

LED DIAGNOSTICS

LED1: FLASH VERIFY
LED2: RED FLASH FAIL
LED4: CONTROL POWER ON
LED6: TRIGGER VOLTAGE
LED7: NIGHT MODE
LED8: OPERATION SIGNAL
LED9: TIMING SIGNAL VERIFY

ITEM NO.	SCH. TAG NO.	DESCRIPTION
1	TB1	12-POSITION TERMINAL BLOCK
2	TB2	12-POSITION TERMINAL BLOCK
3	TB3	4-POSITION TERMINAL BLOCK
4	PCB2	HV RECTIFIER PCB
5	PCB4	TRIGGER VOLTAGE RECTIFIER PCB
	R1	TRIGGER RESISTOR 1K 20W
	F41	.125A TRIGGER FUSE
6	M1	SCR430T MODULE
7	SW1	PHOTOCELL BYPASS SWITCH
8	CSS	ENCLOSURE SAFETY SWITCH (SWITCH IN OFF POSITION FOR NORMAL OPERATION)
9	PCB3	RELAY PCB STH03269A
	K1	POWER/POWER FAIL RELAY
	K4	PHOTOCELL RELAY
	K5	DAY/NIGHT INTENSITY RELAY
	K6	SIDE LIGHT ALARM RELAY
	K7	STROBE FAIL RELAY
	K8	RED STROBE FAIL ALARM RELAY
	K9	RED STROBE FAIL TRANSFER RELAY
10	J1	RELAY PCB CONNECTION
11	J3	CUSTOMER ALARM POINTS
12	P1	CONTROL PCB CONNECTION
13	LED	DIAGNOSTIC LEDS
14	PCB1	TIMING & CONTROL PCB
	F11	.5 AMP FUSE
15	R33	AUXILIARY BLEEDER RESISTOR
16	T1	FERRORESONANT TRANSFORMER
17	T2	ISOLATION TRANSFORMER
18	T3	BURSTING CHOKE
19	S1	5 AMP SIDELIGHT FUSE&FUSE HOLDER
20	F1	1 AMP ISOLATION TRANS. FUSE&FUSE HOLDER
21	F2	10 AMP INPUT FUSE & FUSE HOLDER
22	R31	RESISTOR 50 OHM 225W
23	K2	BLEEDER RELAY
24	K3	WHITE/RED BEACON RELAY
25	C103-C110	DAY CAPACITOR 40uf
26	C102	NIGHT CAPACITOR 4uf 2.5KVDC
27	C101	RESONANT CAPACITOR 4uf 660VAC
28	R32	BLEEDER RESISTOR 25K 20W
29	TLS1	THERMAL LIMITING SWITCH 1
30	J2	SIDELIGHT ALARM INTERCONNECT
31	SW2	RED STROBE FAIL TEST SWITCH
32	TLS2	THERMAL LIMITING SWITCH 2 (SWITCH IN ON POSITION FOR NORMAL OPERATION)
33	MOVMOD1	SURGE ARRESTOR
34	TB4	FAN CONNECTIONS
35	FAN	AXIAL FAN

NOTES:

1. USE BUSSMANN KTK FUSES. SIZE AS SHOWN ON FUSE BLOCKS.
2. WIRES ARE CONNECTED LETTER TO LETTER. (EXAMPLE: N TO N TO N)
3. THIS DRAWING IS PROVIDED AS A GENERAL REFERENCE. TWR LIGHTING, INC. DOCUMENTATION SUPERCEEDES THIS DRAWING AND SHOULD BE REVIEWED PRIOR TO INSTALLATION OF THIS SYSTEM.

*4. FILTER MAINTENANCE/CLEANING SHOULD BE PERFORMED MONTHLY (OR) AS REQUIRED FOR PROPER OPERATION.

E-1DB CHASSIS LAYOUT

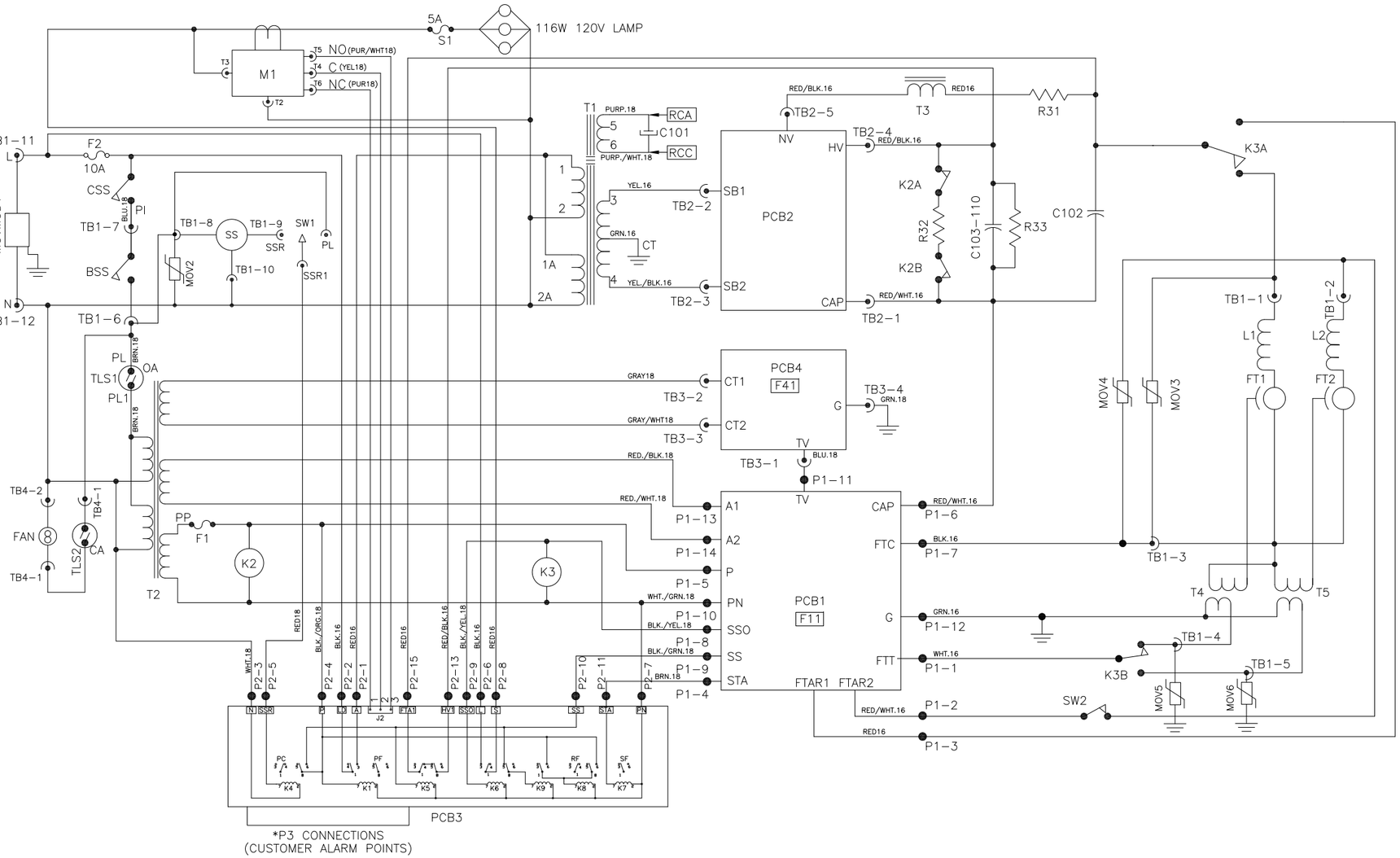
L-864/L-865 DUAL CONTROLLER 120VAC

PROD DEPT	
SERV DEPT	
ENGINEER	

TWR Lighting, Inc.
Enlightened Technology

DRAWN BY	E.A.SALAZAR	SHEET SIZE	B
SHEET QTY.	1 OF 1		
DATE	06/14/97	SCALE	N.T.S.
DWG. NO.	H40-269		

DATE:	LTR.	REVISION
05/29/08	K	CHG. PHOTOCELL



COMPONENT	SCHEMATIC TAG NO.	QTY.	DESCRIPTION
STE01005		1.00 EACH	PCB BOARD REV. H
STD01006		5.00 EACH	IN5398 RECTIFIER DIODE 800V 1.
STD01004		10.00 EACH	IN4004 RECTIFIER DIODE FAST RE
STD30003		2.00 EACH	SA556N TEXAS INSTRUMENTS DUA
STD30010		1.00 EACH	HEX INVERTER MC14049UBCPG ON
STD40006		1.00 EACH	MC14081BCL MOTOROLA
STD40008		1.00 EACH	CD4071BE QUAD 2IN OR GATE 14
STJ01001		1.00 EACH	SPDT TOGGLE SW PC MOUNT
STD30013		1.00 EACH	HEX BUFFER/DRIVER/RECEIVER LOG
STD30007		1.00 EACH	SA555P OR N TIMER 8PIN LV SERI
STD30002		1.00 EACH	LM158JG (TI) DUAL OP AMP
STD30004		1.00 EACH	MC78T12CT 35V 3A MOTOROLA OR
STD30014		1.00 EACH	PNP TRANSISTOR, 2N4403 HARRI
STD30009		1.00 EACH	MOSFET,125W, 800V 3 PIN T220
STD40005		1.00 EACH	SCR, MOTOROLA #2N6405G
STA40004		8.00 EACH	250K POT.VERT.10 TURN 67F5836
STB04005		1.00 EACH	47UF @63V RADIAL ALUMINUM E
STB10002		2.00 EACH	0.47 UF @ 50V +/- 10% RADIAL
STB10003		3.00 EACH	10UF @ 35V RAD. TANTALUM
STB02001		6.00 EACH	0.01 UF @ 50W VDC POLYESTER FI
MOV1V250		1.00 EACH	LITTLEFUSE V250LA4P VARISITOR
STC03001		1.00 EACH	XFMR, SIGNAL NO.LP 34-170
STA08011		1.00 EACH	10 OHM 2W RESISTOR OHMITE 42J1
STA08012		1.00 EACH	1K 8W NWK 13F150 1.K B8J1K0
STA02001		4.00 EACH	1K, 1/4W, RESISTOR 5% CARBON
STA02009		4.00 EACH	2.2K, 1/4W 5% RESISTOR CARBON
STA02005		4.00 EACH	10K, 1/4W RESISTOR 5% CARBON F
STA02014		2.00 EACH	270K OHM, 1/4W, 5%, 250V RESI
STD05001		6.00 EACH	T-1 3/4 RED LED 5mm
STD05002		1.00 EACH	T-1 3/4 GREEN LED 5mm
STB04006		3.00 EACH	100UF, 50V LECTRO LYTIC
STJ10007		1.00 EACH	JS1-12V-F, PCB RELAY,SPDT, 12V
STT60007		1.00 EACH	3 PIN TERMBLOCK NWK 90F9174
STA02011		1.00 EACH	510 OHM, 1/4W, +/- 5% CARBON F
STT60020		1.00 EACH	15 POSITION HEADER AMPHENOL PC
STB03003		1.00 EACH	1.0UF, 400V RADIAL METALIZED
STA02016		1.00 EACH	18K 1/4 WATT 5% RESISTOR CARBO
HEATSINK623"B		1.00 EACH	HEATSINK NWK 46F4094 SLIP ON T
18AWG BLK		0.08 FOOT	18AWG TEFLON TYPE EE BLACK
STC05007		1.00 EACH	CST306-3A CURRENT SENSE TRANSF
STD01007		1.00 EACH	1N4739A 9.1V 1W 28mA DIODE
STB01001		2.00 EACH	.01UF 1KV CERAMIC DISK VISH
STD30015		1.00 EACH	2N4401 NPN TRANSISTOR ON SEM
STA02017		1.00 EACH	15k OHM 1/4 WATT 5% RESISTOR C
STD01005		1.00 EACH	P6KE400A TVS DIODE
STJ01003		1.00 EACH	3 POSITION DIP SWITCH
STJ10015		1.00 EACH	RTB14615 P&B 115VAC SPDT PCB
STT10007		5.00 EACH	SPC PC SINGLE ROW BREAKAWAY H
STE01-054		1.00 EACH	120V RELAY CONVERSION PCB PLAN

DATE:	LTR.	REVISION
9/06/03	E EAS	MODIFIED SW1

E–1 DB WIRING DIAGRAM

PROD DEPT

SERV DEPT

ENGINEER

TWR Lighting, Inc.
Enlightened Technology

DRAWN BY E.A.SALAZAR

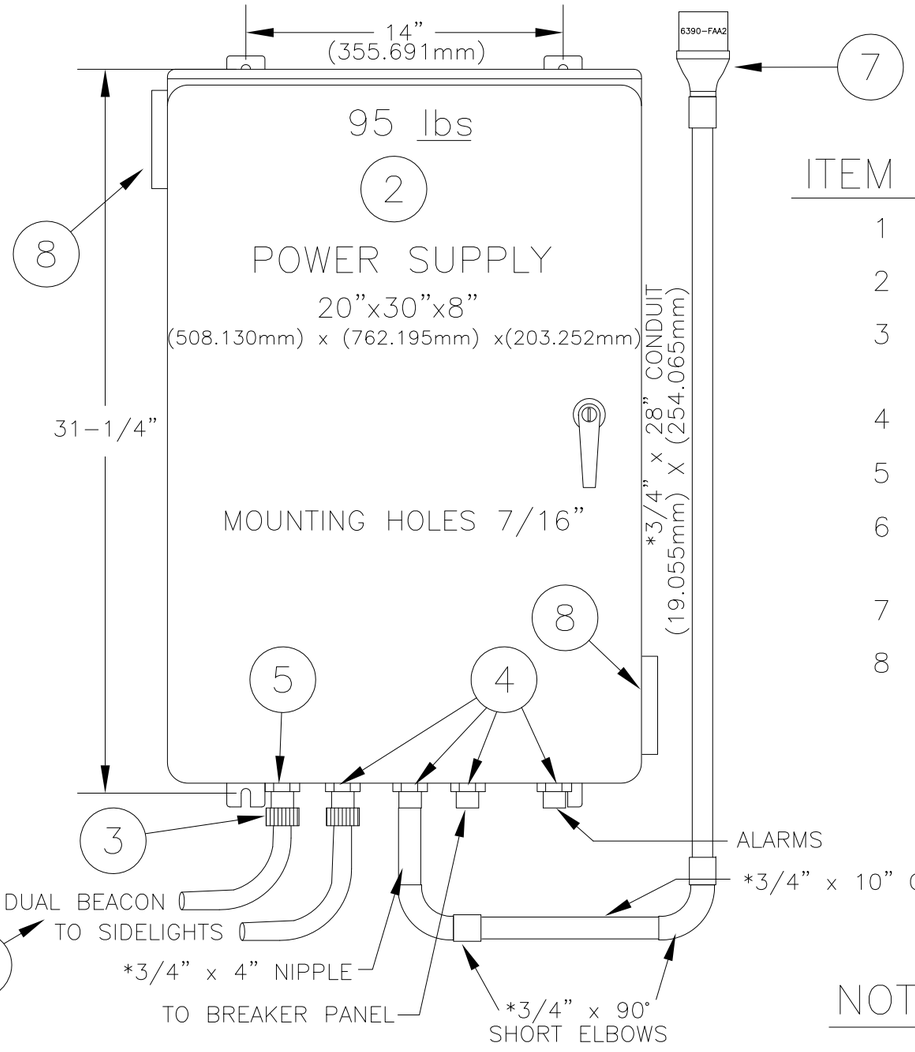
SHEET SIZE B

SHEET QTY. 1 OF 1

DATE 06/16/97

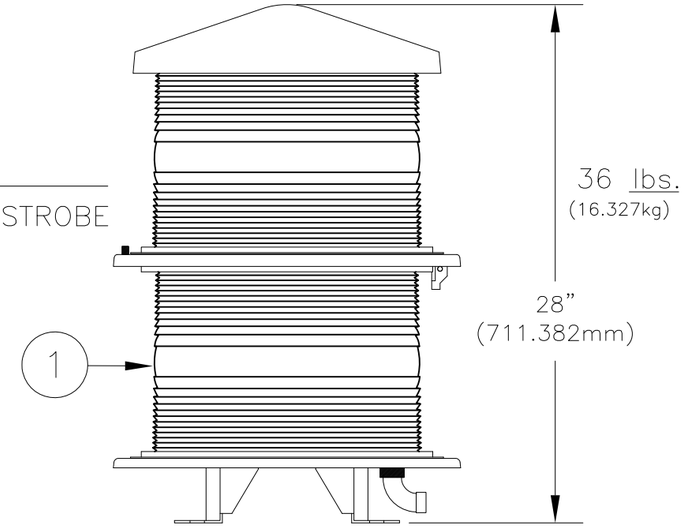
SCALE N.T.S.

DWG. NO. M01–269

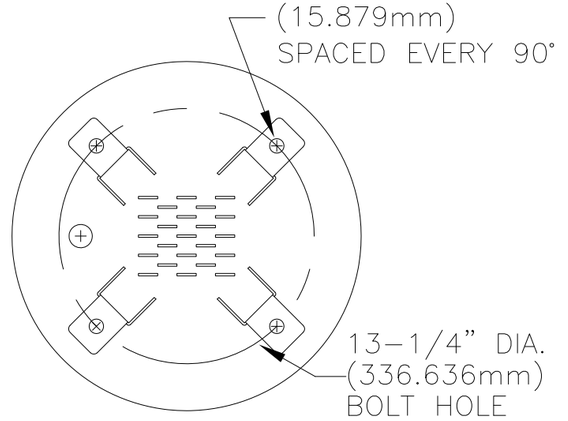


* = ITEMS NOT INCLUDED BUT ARE AVAILABLE UPON REQUEST.

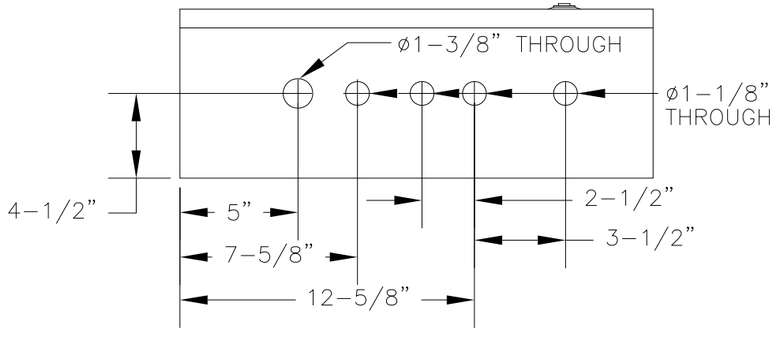
ITEM #	DESCRIPTION
1	BEACON L-864/L-865 DUAL RED/WHITE STROBE
2	POWER SUPPLY E-1DB
3	WATER TIGHT CABLE CONNECTOR WITH SEALING GLAND.
4	ENTRANCE HUB 3/4" (19.055mm)
5	ENTRANCE HUB 1" (25.407mm)
6	RIGID GALVANIZED CONDUIT OR STROBE CABLE.
7	#6390-FAA2 PHOTOCELL
8	VENT & FILTER COVER



SIDE VIEW



BASE



NOTES:

A. POWER SUPPLY IS NORMALLY MOUNTED AT GROUND LEVEL ON TOWER. IT CAN ALSO BE MOUNTED INDOORS. RECOMMENDED MOUNTING HEIGHT IS 48" (1219.512mm) TO BOTTOM OF THE ENCLOSURE FOR EASE OF MAINTENANCE.

B. MOUNT BEACON HINGES SO LENS WILL OPEN UNOBSTRUCTED BY STRUCTURE.

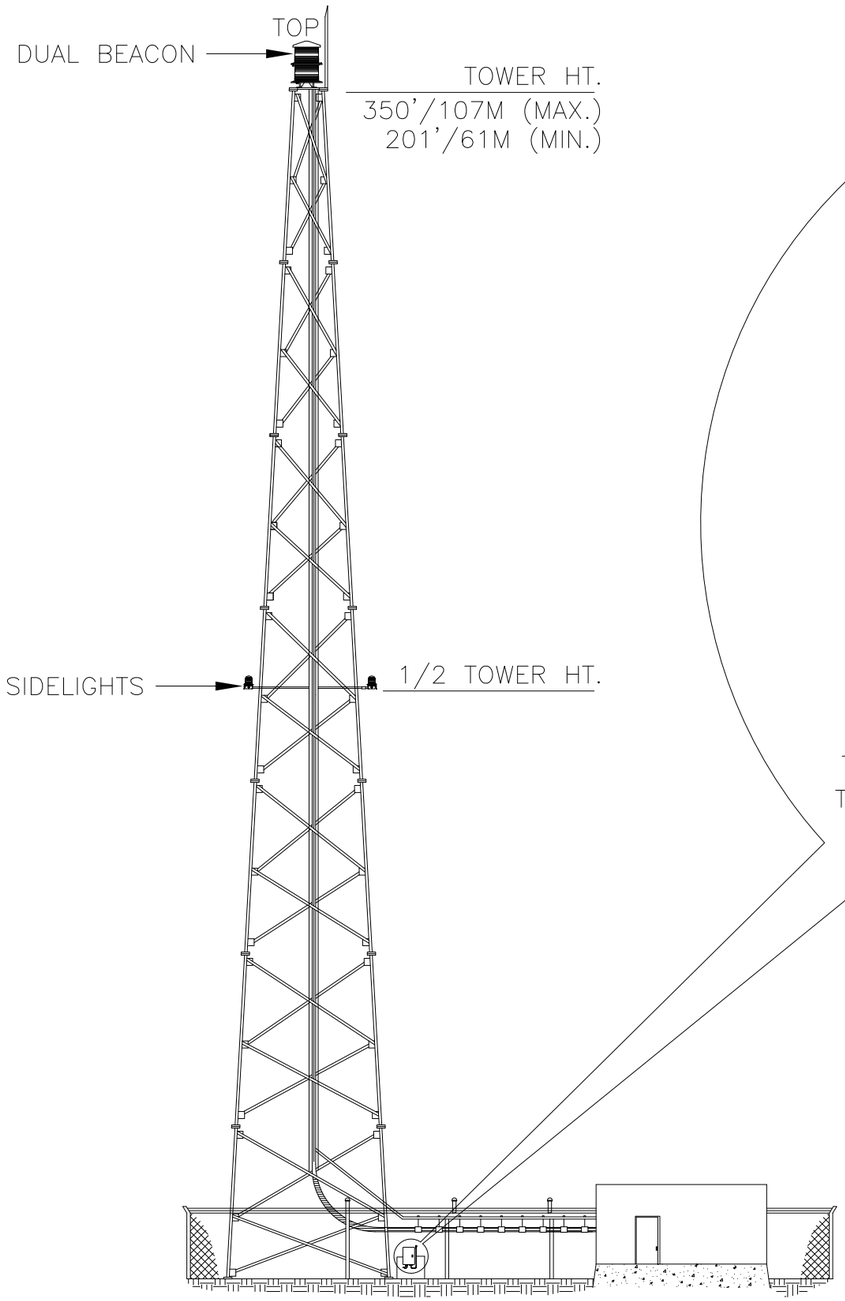
HOUSING DETAILS E-1DB
L-864/L-865 RED/WHITE STROBE

PROD DEPT	
SERV DEPT	
ENGINEER	

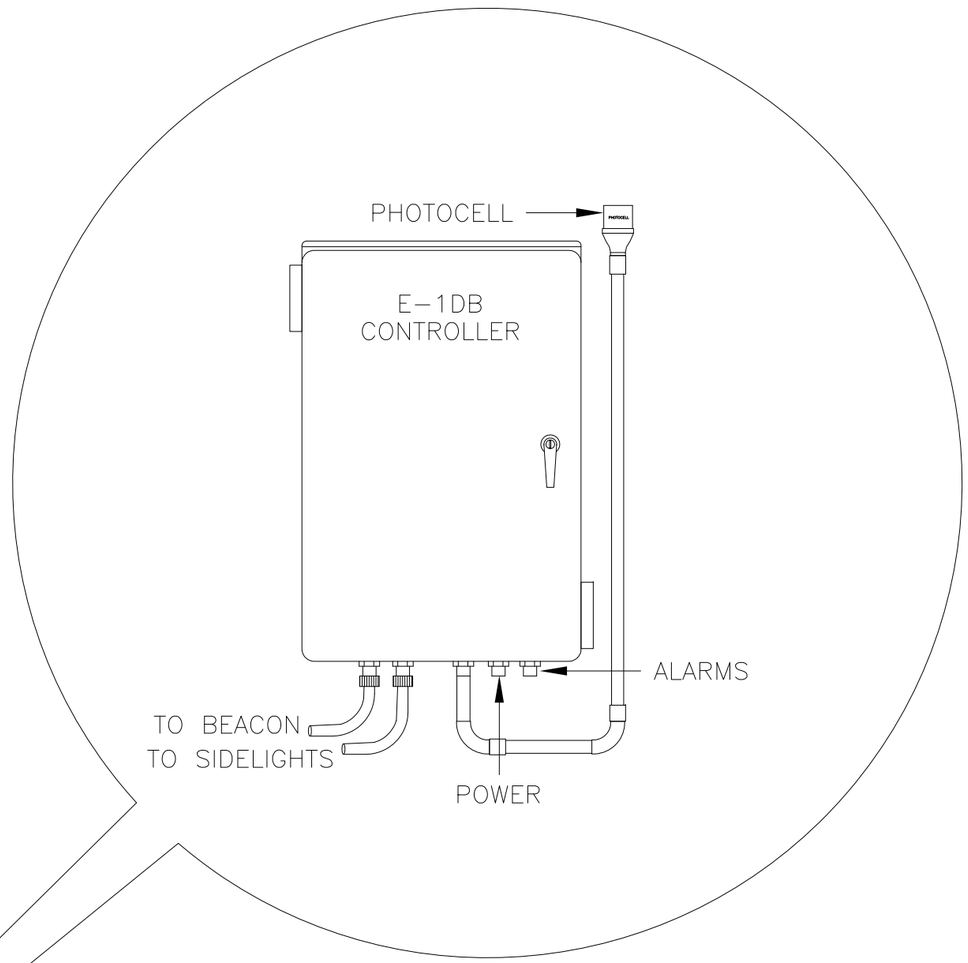
TWR Lighting, Inc.
Enlightened Technology

DRAWN BY G.D.SEBEK		SHEET SIZE B	SHEET QTY. 1 OF 1
DATE 06/17/97	SCALE N.T.S.	DWG. NO.	HD0-269

DATE:	LTR.	REVISION
05/29/08	D	CHG. PHOTOCELL



TYPICAL SITE LAYOUT



NOTES:

1. THIS CONTROLLER CAN BE MOUNTED INDOOR OR OUTDOOR.
2. IT IS HIGHLY RECOMMENDED TO MOUNT A LIGHTING ROD AT THE TOP LEVEL.
3. FOR MORE DETAILS REFER TO DRAWINGS HD0-269 (CONTROLLER INSTALLATION), 600 (LIGHT KIT CABLE RUN), 600-01(LIGHT KIT CONDUIT & CABLE RUN) AND 600-02 (LIGHT KIT ONLY CONDUIT RUN).

DATE:	LTR.	G.D.S.	REVISION
8/13/98	A		ADDED MATERIALS

E-1DB INSTALLATION GUIDELINE

PROD DEPT

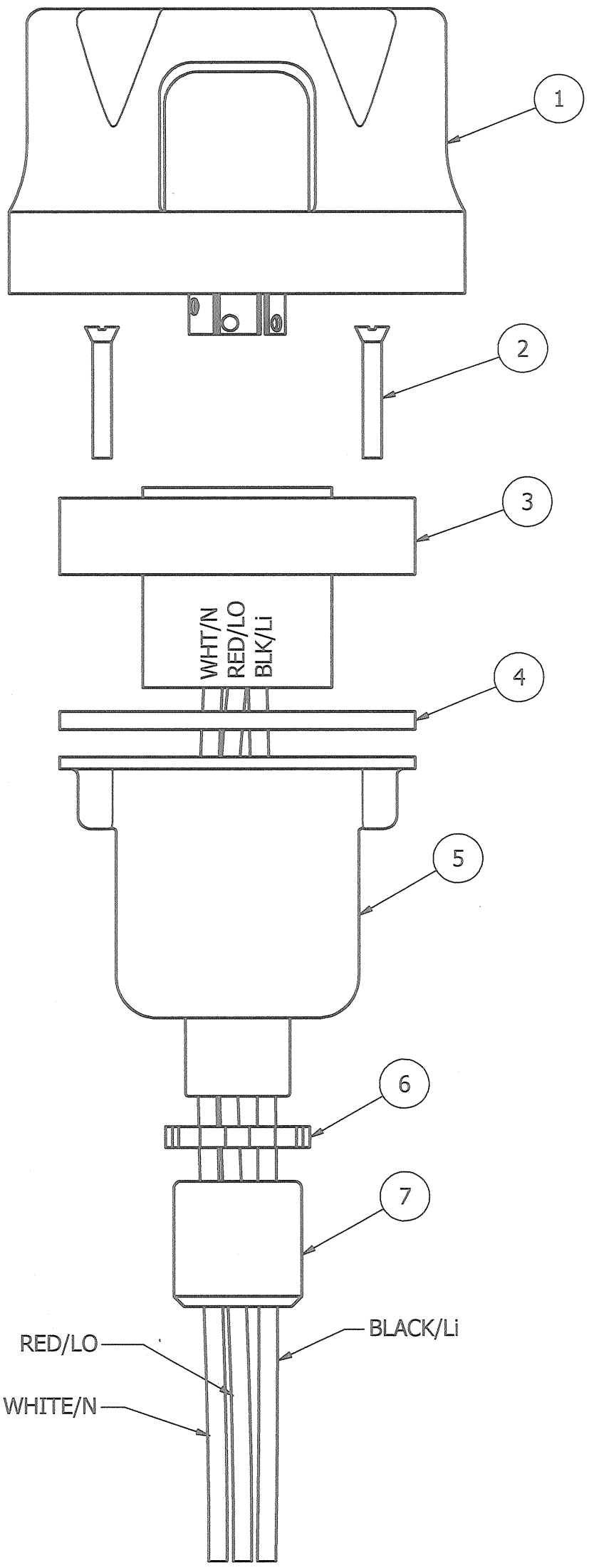
SERV DEPT

ENGINEER

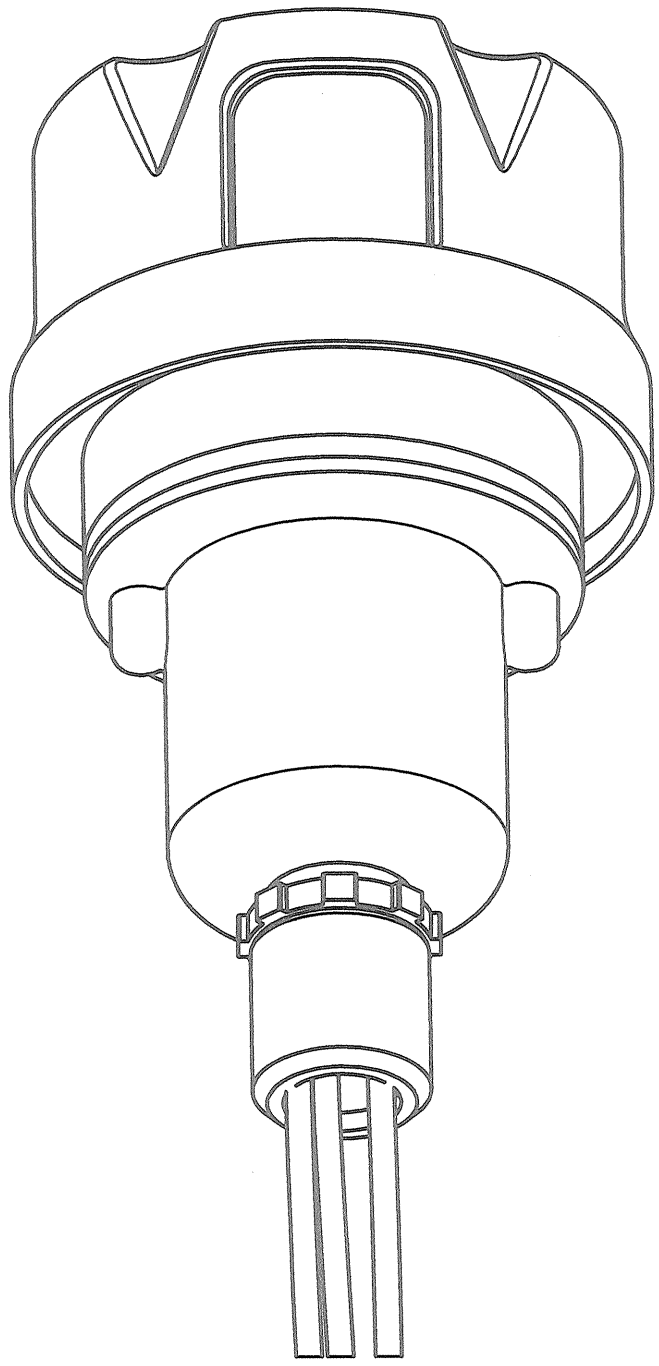
TWR Lighting, Inc.
Enlightened Technology

DRAWN BY	SHEET SIZE	SHEET QTY.
E.A.SALAZAR	B	1 OF 1
DATE 12/23/97	SCALE N.T.S.	DWG. NO. INS-269

PARTS LIST		
ITEM	QTY	PART NUMBER
1	1	PHOTOCELL
2	2	6-32 x 1" SCREW
3	1	RECEPTACLE SOCKET
4	1	RECEPTACLE GASKET
5	1	RECEPTACLE HOUSING
6	1	1/2" CONDUIT LOCKNUT
7	1	3/4" TO 1/2" REDUCER



EXPLODED VIEW



ASSEMBLY

NOTES:
1. ITEM #7 CAN BE USED TO REDUCE 3/4" CONDUIT TO 1/2" CONDUIT AT THE HOUSING OR AT THE CONTROLLER ITSELF.
2. IF ADDITIONAL WIRE IS REQUIRED OVER THE FACTORY 20', USE THE FOLLOWING CHART.
   21' TO 300'- 16 AWG TFFN
   301' TO 500' - 14 AWG TFFN

DATE	REV	AUTHOR	DESCRIPTION
02/03/2015	H	JZAMORANO	UPDATED NOTES

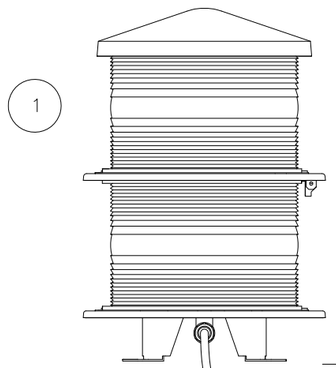
PHOTOCELL HOUSING DETAIL

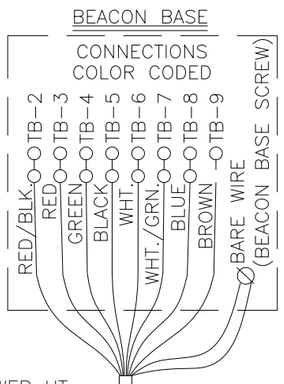
PROD DEPT
SERV DEPT
ENGINEER

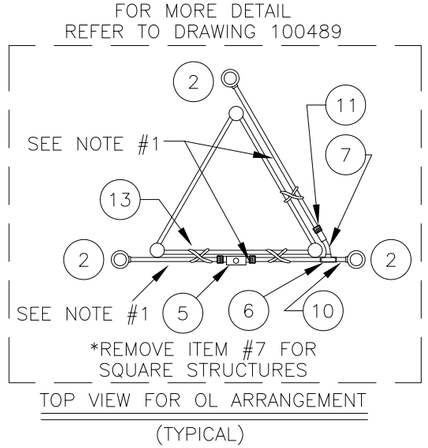
TWR Lighting, Inc. HARK
Enlightened Technology®

DRAWN BY: vhernandez		SHEET SIZE: B	SHEET QTY.: 1 OF 1
DATE: 10/18/1995	SCALE: 1/1	DWG. NO.: 100239i	

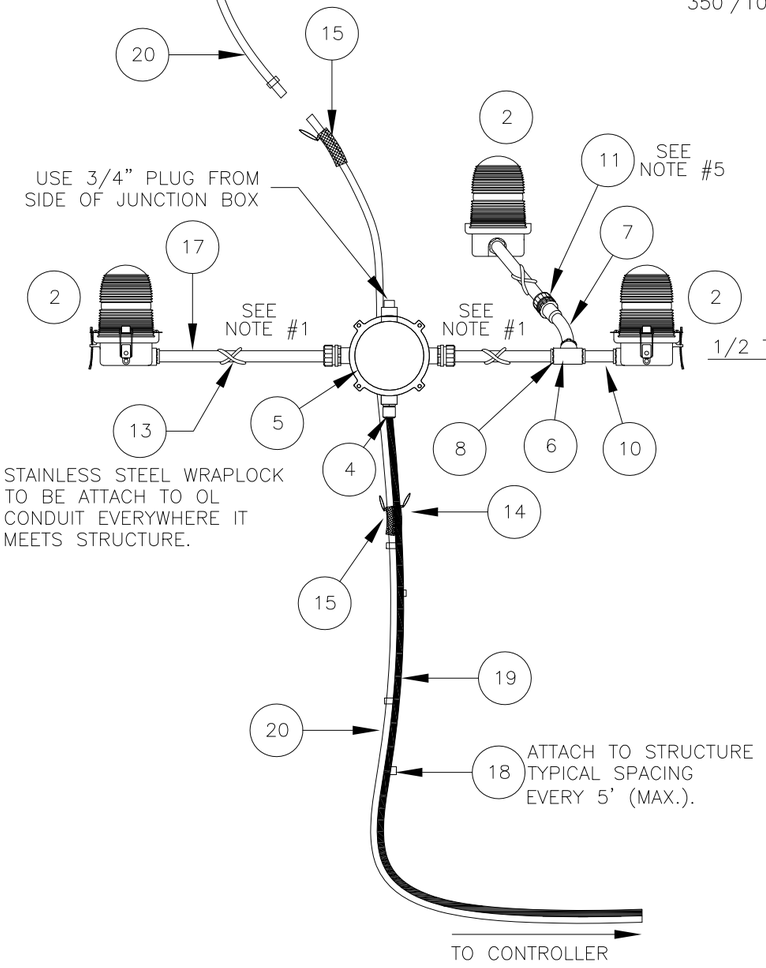
The use of non-OEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43.

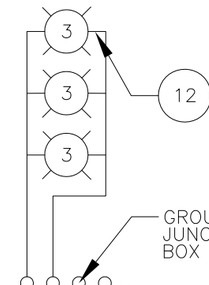




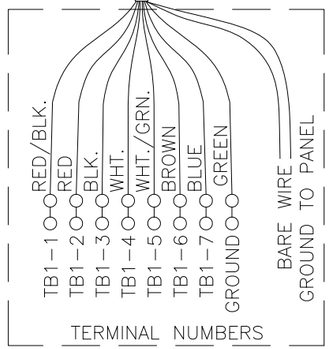


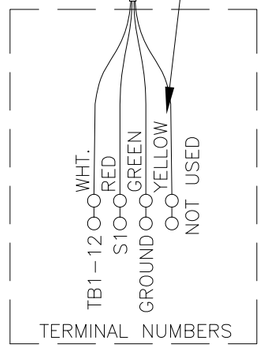
TOWER HT.
201'/61M (MIN.)
350'/107M (MAX.)





NOTE WHEN USING CABLES
OTHER THAN TWR LABELED
CABLE COLORS MAY VERY.





= TERMINAL

BILL OF MATERIALS

	ITEM NO.	QTY.	TWR PART NO.	DESCRIPTION
	1	1	STDBEACON	DUAL BEACON
	2	3	OL1	3/4" OBSTRUCTION LIGHT
*	3	3	116A21TS	116 WATT 120 VOLT LAMP
	4	1	CGB295SA	3/4" CORD CONNECTOR 0.50 – 0.625
	5	1	JB5	3/4" JUNCTION BOX
	6	1	T27CG	3/4" CONDULET W/COVER AND GASKET
	7	1	EL3430	3/4" 30° ELBOW
	8	3	A314	3/4" CONDUIT LOCKNUTS
*	9	1	PIPDOP	4 oz. PIPE DOPE
	10	1	N34T3	3/4" x 3" NIPPLE
	11	3	HC-402	3/4" NO THREAD CONNECTOR
	12	3	SLPIGTAIL25	25' SIDELIGHT PIGTAIL
	13	1	SS5012	STAINLESS STEEL WRAPLOCK 50'
	14	1	CABLEGRIP1	SINGLE EYE LACE MESH 0.5 – 0.62
	15	2	CABLEGRIP3	SINGLE EYE LACE MESH 0.63 – 0.74
*	16	1	STH40269	SINGLE DUAL BEACON CONTROLLER
	17	30'	CONDUIT34	3/4" CONDUIT

ITEM NUMBERS #18–#20 ARE NOT INCLUDED IN THE KIT BUT ARE AVAILABLE UPON REQUEST, AND REQUIRED FOR INSTALLATION.

≈	18	–	STCABLTIE	STROBE CABLE TIES (TWR. HEIGHT ÷ 5 x 1.5)
≈	19	–	STCABLEOB	OBSTRUCTION LIGHT CABLE(1/2 TWR. HT.+30')
≈	20	–	STROBCABLE-3	STROBE CABLE (TWR. HT. + 30')

* = ITEMS NOT SHOWN
≈ = ITEMS QUANTITY CALCULATED ACCORDING TO STRUCTURE HEIGHT.

NOTES:

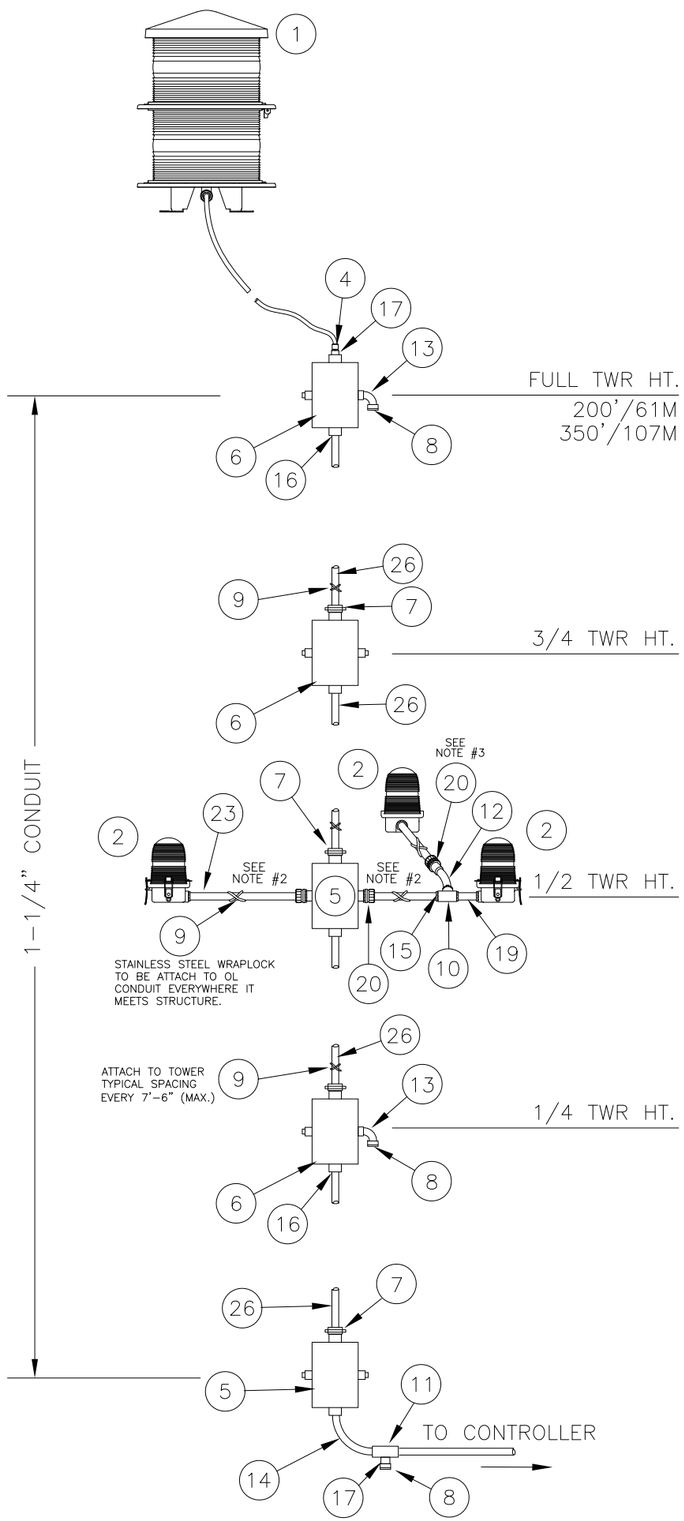
1) ITEM #17 CUT TO LENGTH FOR PROPER EXTENTION OF OL1 (6"–12") FROM STRUCTURE. ATTACH ITEM #11 TO UNTHREADED CONDUIT TO COMPLETE ASSEMBLY.
2) MOUNT BEACON HINGE SO LENS WILL OPEN UNOBSTRUCTED BY STRUCTURE.
3) ON AM TOWER APPLICATIONS, KEEP GROUND LUG FROM BEING CONNECTED TO EARTH GROUND. GROUND TO THE TOWER ONLY.
4) THIS DRAWING IS PROVIDED AS A GENERAL REFERENCE. TWR LIGHTING, INC. DOCUMENTATION SUPERSEDES THIS DRAWING & SHOULD BE REVIEWED PRIOR TO INSTALLATION OF THIS SYSTEM.
5) USE COUPLING THAT IS PROVIDED WITH ITEM #17.

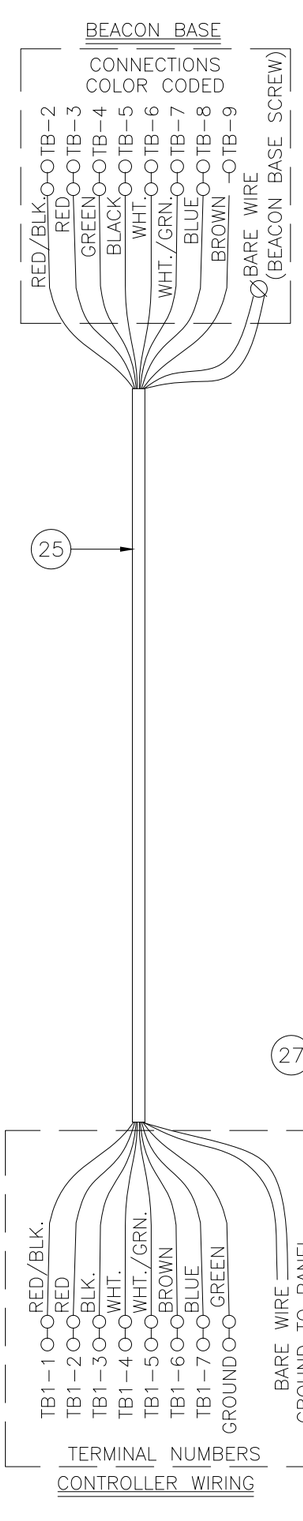
DATE:	LTR.	REVISION
08/01/03	E	E.A.S. CHG. WIRE CONN.

LK1E1DB TOWER LIGHTING KIT CABLE RUN
(TOWERS 201'/61M TO 350'/107M/10' FACE WIDTH MAX)

TWR Lighting, Inc.

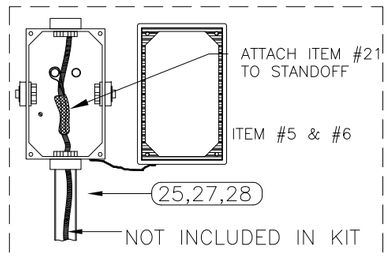
APP'D	ENGINEER	CHK'D BY
DRAWN BY: E.A.SALAZAR	SHEET SIZE: B	SHEET QTY.: 1 OF 1
DATE: 11/20/97	SCALE: N.T.S.	DRAWING NO.: 600



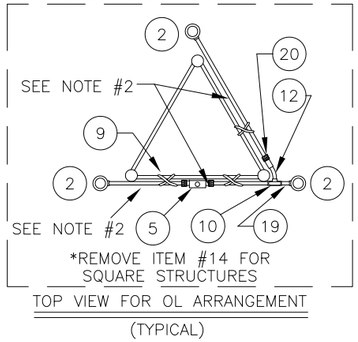


NOTES:

1) MOUNT BEACON HINGE SO LENS WILL OPEN UNOBSTRUCTED BY STRUCTURE.
2) ITEM #23 CUT TO LENGTH FOR PROPER EXTENTION OF OL1 (6"–12") FROM STRUCTURE. ATTACH ITEM #20 TO UNTHREADED CONDUIT TO COMPLETE ASSEMBLY.
3) USE COUPLING THAT IS PROVIDED WITH ITEM #23.
4) ON AM TOWER APPLICATIONS, KEEP GROUND LUG FROM BEING CONNECTED TO EARTH GROUND. GROUND TO THE TOWER ONLY.
5) USE RIGID GALVANIZED STEEL CONDUIT.
6) BREATHERS ALLOW FOR CIRCULATION OF AIR TO PREVENT CONDENSATION.
7) POWER SUPPLY IS NORMALLY MOUNTED AT EYE LEVEL ON TOWER. IT CAN ALSO BE MOUNTED INDOORS. RECOMMENDED MOUNTING HEIGHT IS 42" TO BOTTOM OF ENCLOSURE FOR EASE OF MAINTENANCE.
8) THIS DRAWING IS PROVIDED AS A GENERAL REFERENCE. TWR LIGHTING, INC. DOCUMENTATION SUPERCEEDS THIS DRAWING & SHOULD BE REVIEWED PRIOR TO INSTALLATION OF THIS SYSTEM.



JUNCTION BOX DETAIL



TOP VIEW FOR OL ARRANGEMENT
(TYPICAL)

BILL OF MATERIALS

	ITEM NO.	QTY.	TWR PART NO.	DESCRIPTION
	1	1	STDBEACON	DUAL STROBE BEACON
	2	3	OL1	3/4" OBSTRUCTION LIGHT
	3	3	116A21TS	116 WATT 120 VOLT LAMP
	4	1	CGB296SA	3/4" CORD CON. (KILLARK ZS210)
	5	2	JB8114C	1-1/4" JUNCTION BOX
	6	3	JB8SR114C	1-1/4" STRAIN RELIEF JUNCTION BOX
	7	4	UNY405	1-1/4" UNION
	8	3	5012902	3/4" BREATHER
	9	1	SS10012	WRAPLOCK
	10	1	T27CG	3/4" CONDULET W/COVER AND GASKET
	11	2	T47CG	1-1/4" CONDULET W/COVER AND GASKET
	12	1	EL3430	3/4" 30° ELBOW
	13	2	EL3490	3/4" 90° SHORT ELBOW
	14	2	EL11490	1-1/4" 90° SWEEP ELBOW
	15	3	A314	3/4" CONDUIT LOCKNUTS
	16	10	A316	1-1/4" CONDUIT LOCKNUTS
	17	3	RE42	1-1/4" TO 3/4" REDUCER
*	18	1	PIPDOP	4 oz. PIPE DOPE
	19	1	N34T3	3/4" x 3" NIPPLE
	20	3	HC402	3/4" NO THREAD CONNECTOR
*	21	4	CABLEGRIP3	SINGLE EYE LACE MESH 0.63-0.74
	22	3	SLPIGTAIL25	25' SIDELIGHT PIGTAIL
	23	30'	CONDUIT34	3/4" CONDUIT (FOR OLS)
*	24	1	STH40269	SINGLE DUAL BEACON CONTROLLER

ITEM NUMBERS #25–#28 ARE NOT INCLUDED IN THE KIT BUT ARE AVAILABLE REQUEST, AND REQUIRED FOR INSTALLATION.

~	25	–	STROBCABLE-3	STROBE CABLE (TWR. HT. + 30')
~	26	–	CONDUIT114	1-1/4" CONDUIT(TWR. HT. + 30'/9M)
~	27	–	12THHNWHT	#12 THHN WHT. WIRE(1/2 TWR HT+40'/12M)
~	28	–	12THHNRED	#12 THHN RED. WIRE(1/2 TWR HT+40'/12M)

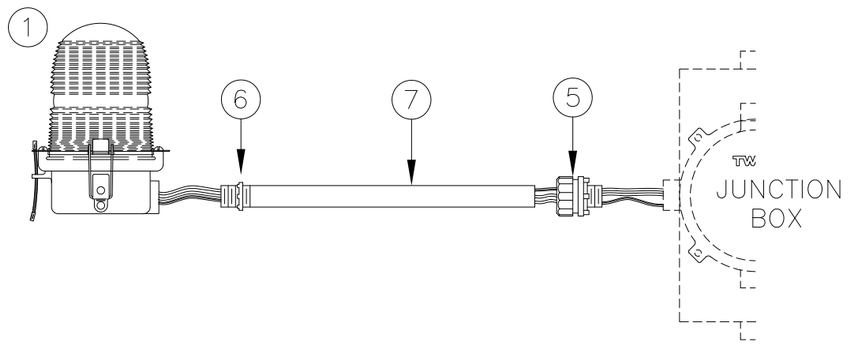
* = ITEMS NOT SHOWN
~ = ITEMS QUANTITY CALCULATED ACCORDING TO STRUCTURE HEIGHT.

LKT1154 E1DB TOWER LIGHTING KIT
(CONDUIT RUN FOR 200'/61M TO 350'/107M TOWERS)

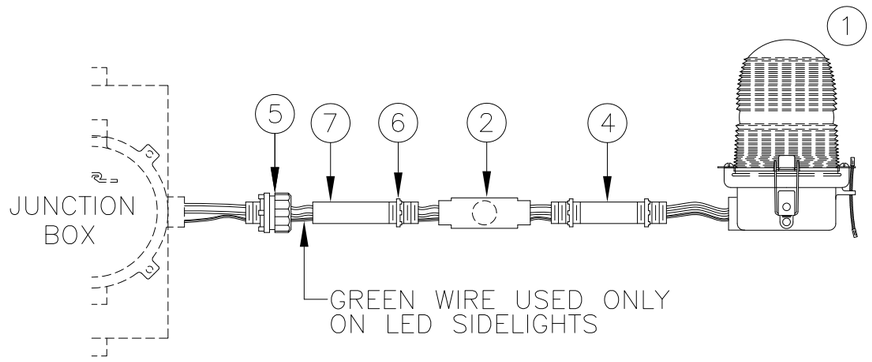
PROD DEPT
SERV DEPT
ENGINEER

TWR Lighting, Inc.
Enlightened Technology

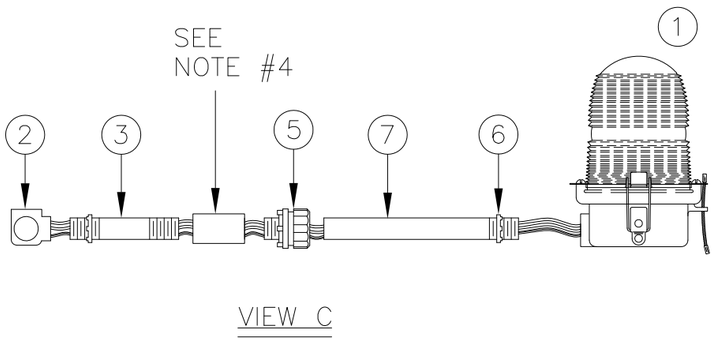
DRAWN BY E.A.SALAZAR | SHEET SIZE B | SHEET QTY. 1 OF 1
DATE 09/25/03 | SCALE N.T.S. | DWG. NO. T1154



VIEW A



VIEW B

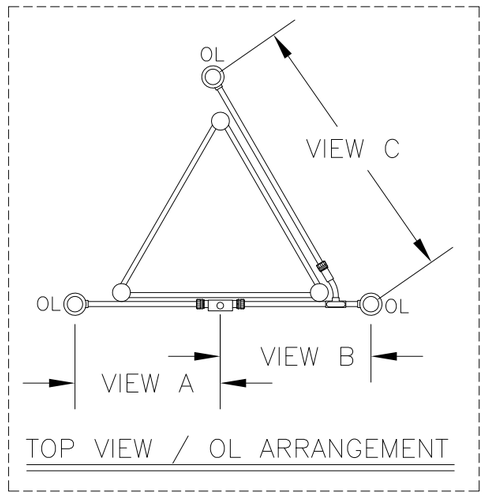


VIEW C

BILL OF MATERIALS

ITEM NO.	QTY.	TWR PART NO.	DESCRIPTION
1	3	OL1/LED	3/4" OBSTRUCTION LIGHT
2	1	T27CG	3/4" CONDULET W/COVER AND GASKET
3	1	EL3430	3/4" 30° ELBOW
4	1	N34T3	3/4" x 3" NIPPLE
5	3	HC402	3/4" NO THREAD CONNECTOR
6	5	A314	3/4" CONDUIT LOCKNUTS
7	30'	CONDUIT34	3/4" CONDUIT

* = ITEMS NOT SHOWN



TOP VIEW / OL ARRANGEMENT

NOTES:

1. THIS DRAWING IS A TYPICAL INSTALLATION DETAIL FOR 3 OL-1 PER LEVEL SYSTEM.
2. IN VIEW C ITEM NUMBER 3 MAY BE OMITTED WHEN ARRANGING FOUR LEG TOWERS.
3. ITEMS #7 CUT TO LENGTH FOR PROPER EXTENSION OF OL1 FROM STRUCTURE (6"-12"). ATTACH ITEM #5 TO UNTHREADED CONDUIT TO COMPLETE ASSEMBLY.
4. USE COUPLING THAT IS PROVIDED BY ITEM #7.
5. GREEN WIRE USED ONLY ON LED SIDELIGHTS

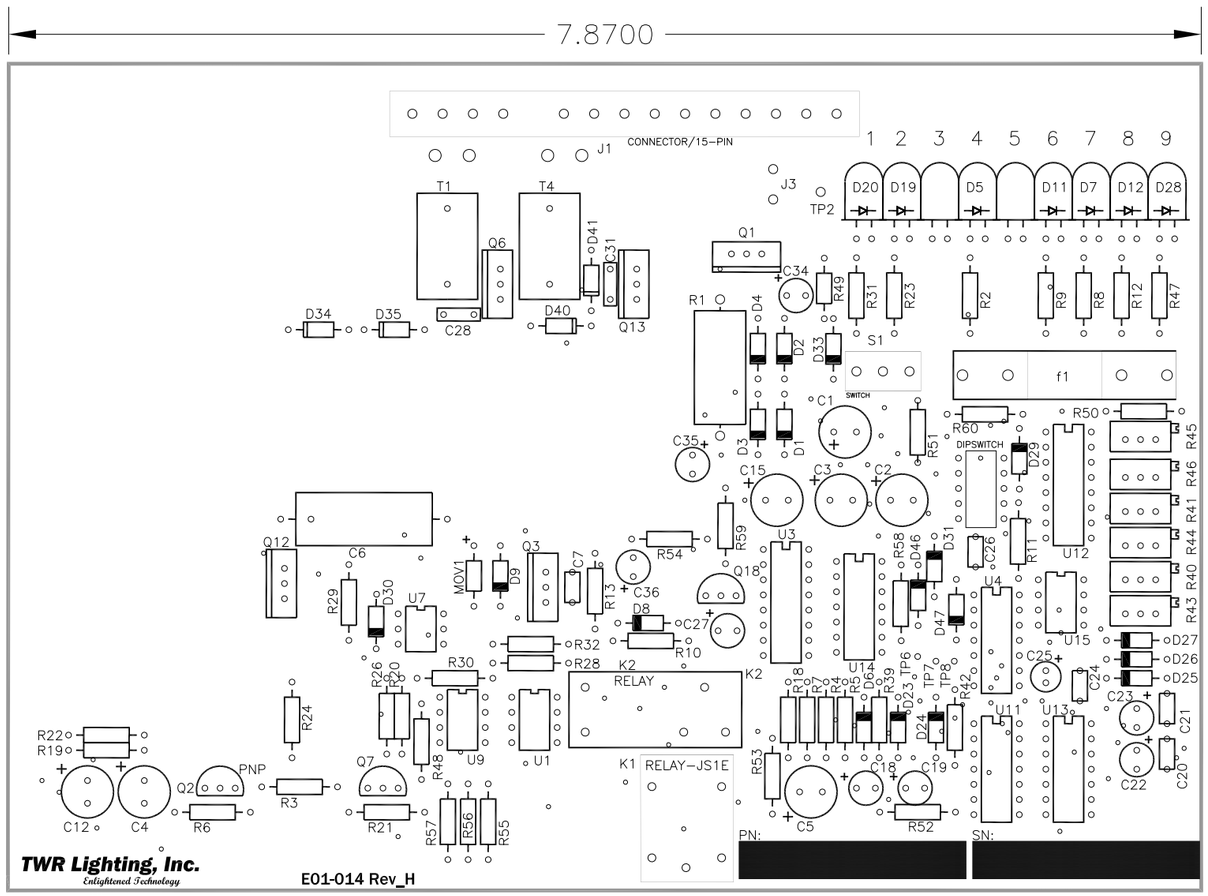
SLASSM

SIDELIGHT MOUNT ASSEMBLY
(10' FACE WIDTH MAX W/30' CONDUIT LISTED)

PROD DEPT			
SERV DEPT			
ENGINEER			
DRAWN BY F.DELACRUZ		SHEET SIZE B	SHEET QTY. 1 OF 1
DATE 05/23/00	SCALE N.T.S.	DWG. NO.	100489

TWR Lighting, Inc.
Enlightened Technology

DATE:	LTR.	REVISION
04/05/07	A (V.L.B.)	UPDATED TO LED



FACTORY SETUP:

MASTER & STAND ALONE

	OFF	ON
1		ON
2	OFF	
3		ON
4	OFF	
5		ON

DIPSW

OPTIONAL SETUP:

SLAVE

	OFF	ON
1	OFF	
2		ON
3	OFF	
4	OFF	
5	OFF	

DIPSW

DATE:	LTR.	REVISION
04/12/07	E (E.A.S.)	UPDATED PCB

E-1DB CONTROL PCB

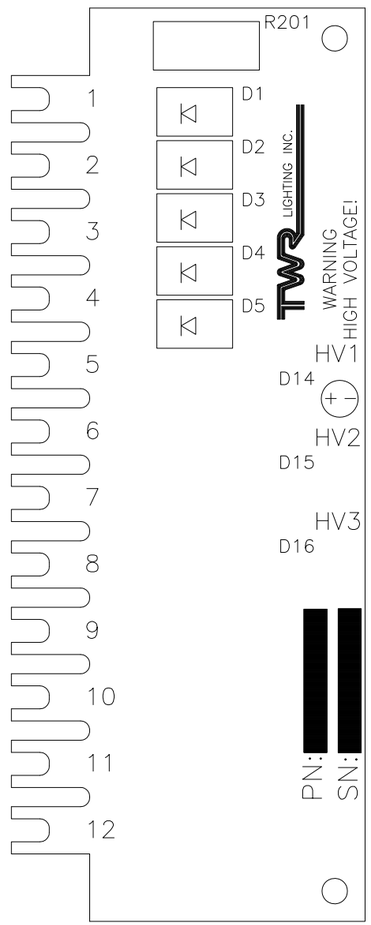
APP'D

CHK'D BY

ENGINEER

TWR Lighting, Inc.
Enlightened Technology

DRAWN BY: E.A.SALAZAR		SHEET SIZE: B	SHEET QTY.: 1 OF 1
DATE: 12/01/97	SCALE: N.T.S.	DWG. NO.: H01-269	

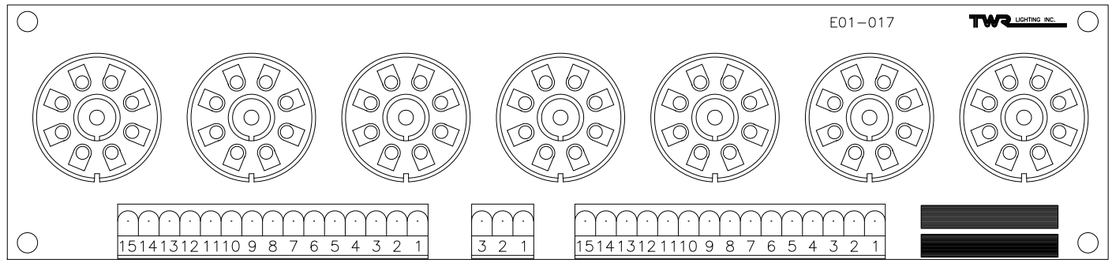


DATE:	LTR.	REVISION
05/13/03	A E.A.S.	UPDATED DWG

HIGH VOLTAGE RECTIFIER PCB

APP'D	**TWR Lighting, Inc.** *Enlightened Technology*
CHK'D BY	
ENGINEER	
DRAWN BY E.A.SALAZAR	SHEET SIZE B / SHEET QTY. 1 OF 1
DATE 11/07/98	SCALE FULL / DWG. NO. H02-226A

The use of non-OEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43.



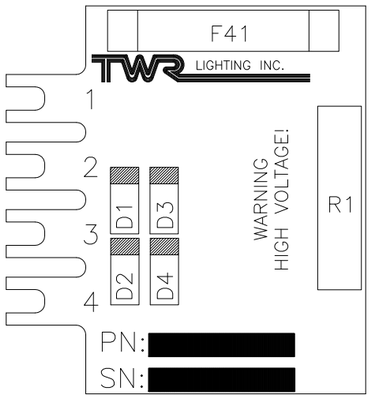
DATE:	LTR.	REVISION
3/31/2009	A R.N.M	UPDATE NAME

E1DB AND E1DB2 RELAY PCB3 PART #STH03269A

ALARM LOCKOUT ELIMINATION MODIFICATION

PROD DEPT	**TWR Lighting, Inc.** *Enlightened Technology*
SERV DEPT	
ENGINEER	

DRAWN BY: E.A.SALAZAR		SHEET SIZE: B	SHEET QTY.: 1 OF 1
DATE: 07/13/06	SCALE: N.T.S.	DWG. NO.: H03-269A	



E-1DB/E-2/3DB TRIGGER VOLTAGE
RECTIFIER PCB (PCB4)

PROD DEPT	**TWR Lighting, Inc.** *Enlightened Technology*
SERV DEPT	
ENGINEER	
DRAWN BY: E.A.SALAZAR	SHEET SIZE: B / SHEET QTY.: 1 OF 1
DATE: 06/13/97	SCALE: N.T.S. / DWG. NO.: H04-269

The use of non-OEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43.

TWR Lighting, Inc.

FAA Approved L-810
Single Obstruction Light Side Hub
OL1

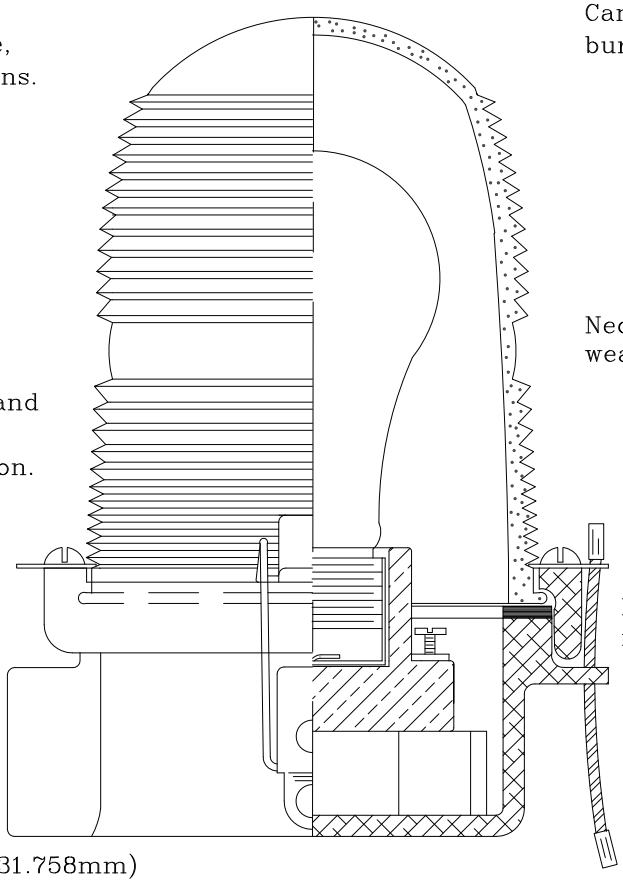
FM10018_RD.DWG

For use as an obstruction light on towers, building, bridges, cooling towers. Meets or exceeds all FAA specs as found in AC 150/5345-43 Type L-810.

Our most popular light. The side hub allows for a straight run of conduit from the junction box for hook up.

High temperature, ultra pure FAA approved Aviation red, blue, yellow, or clear glass fresnel lens.

Can be used steady burning or flashing.



Neoprene gasket for weatherproofing.

Copper free aluminum casting and all stainless steel latches and hardware for corrosion protection.

High quality porcelain receptacle.

Stainless steel safety cable.

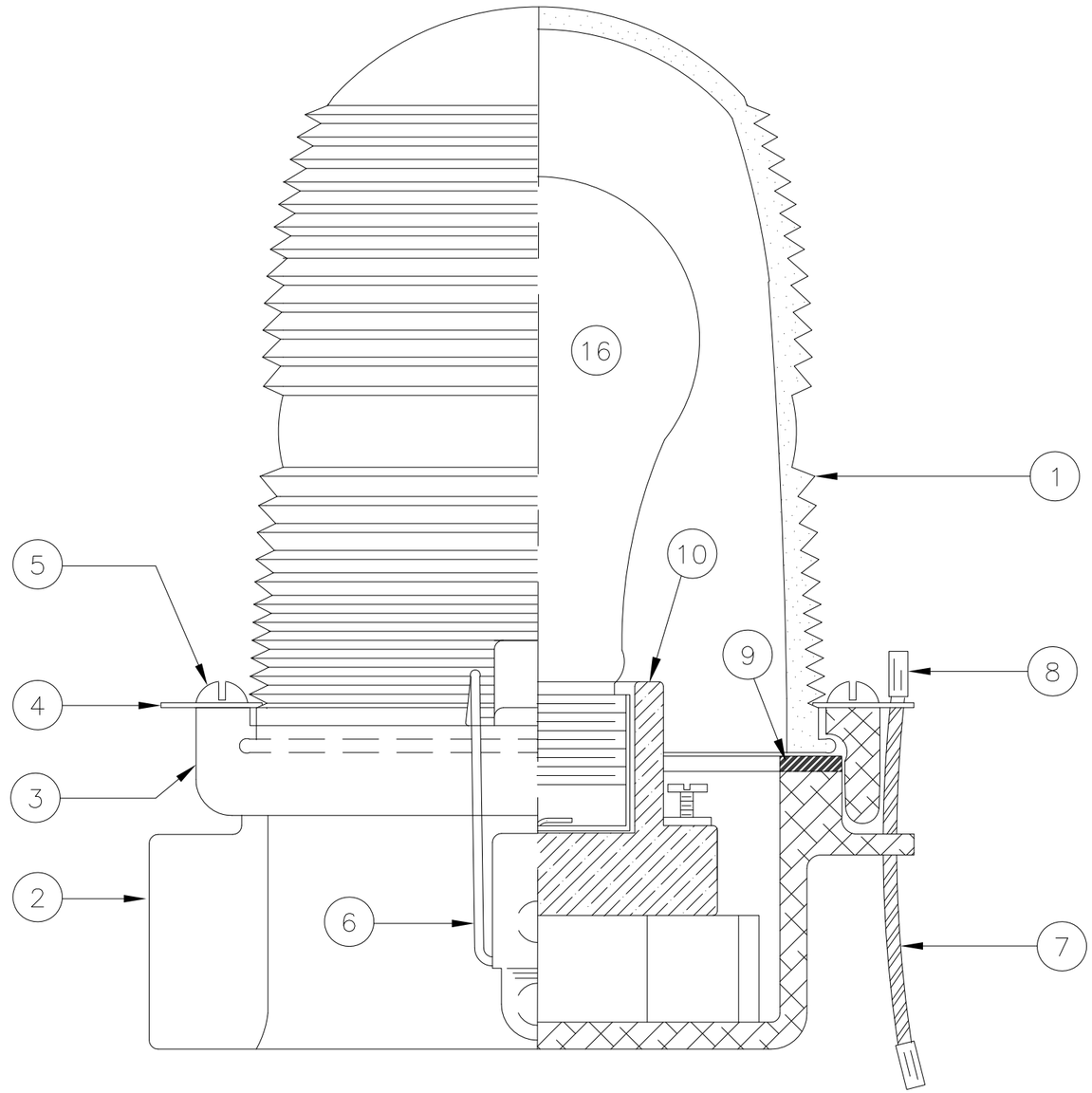
Specify conduit size
3/4", 1", 1-1/4" NPT
(19.055mm), (25.407mm), (31.758mm)

No special tools required for maintenance.

General Specifications

Height 7.5 inches (19.055 cm)
Weight 3 lbs (13605.442g)
Power 120, 230, or 240 volts AC
Uses 116W, 120V or 240V bulbs
Bulbs sold separately

TWR Lighting, Inc.
4300 Windfern Rd. #100
Houston, Tx., 77041-8943
Phone: (713)973-6905
Fax: (713)973-9352
WEB SITE: http://www.twrlighting.com



ITEM NO	QTY.	TWR PART NUMBER	DESCRIPTION
1	1	AP35222	RED SIDELIGHT GLASS
2	1	105C	SINGLE SIDELIGHT BODY
3	1	106C	LENS HOLDER RING
4	2	12V245	OL LENS CLIP
5	2	832X14PH	8-32 X 1/4" PH S.S. SLOT
6	2	HC255SS	SIDELIGHT LATCHES
7	1	7X7SS	1/16 7 X 7 S.S. WIRE
8	2	A1A	STAKON CRIMP
9	1	OLG	OL GASKET
10	1	19062	SIDELIGHT RECEPTACLE
* 11	4	18PRSS	1/8 POP RIVETS
* 12	1	A314	3/4" CONDUIT LOCKNUT
* 13	2	104G	WHITE TEFLON WASHER
* 14	2	832X34PH	8-32 X 3/4" S.S. RH SLOT
* 15	1	100327	OL-1 SERIAL NUMBER LABEL
~ 16	1	116A21TS	116W-120V LAMP (TYP.)

*=PART NOT SHOWN
~=PART SOLD SEPARATELY

NOTE:
1. FAA APPROVED LIGHT USES THE 116A21TS LAMP. OTHER LAMPS ARE AVAILABLE TO MEET YOUR APPLICATION.

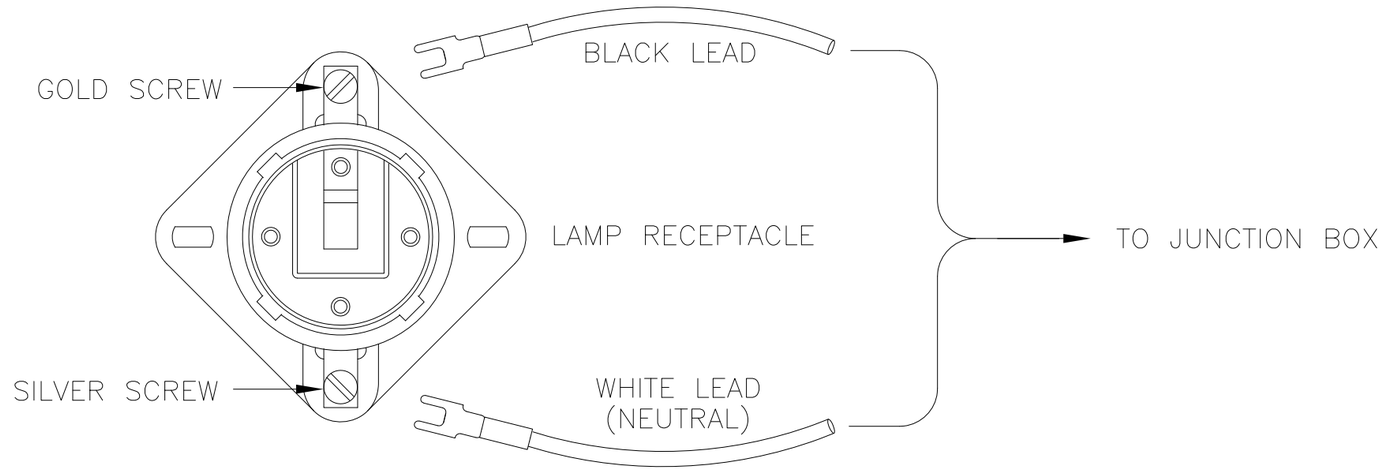
OL1

3/4" OL-1 SIDE HUB
ASSEMBLY DETAIL (PART #OL1)

PROD DEPT		**TWR Lighting, Inc.** *Enlightened Technology*	
SERV DEPT			
ENGINEER			
DRAWN BY E.A.SALAZAR		SHEET SIZE B	SHEET QTY. 1 OF 1
DATE 1/7/92	SCALE FULL	DWG. NO.	279-OL

DATE:	LTR.	REVISION
05/13/02	B	UPDATED B.O.M.

The use of non-OEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43.

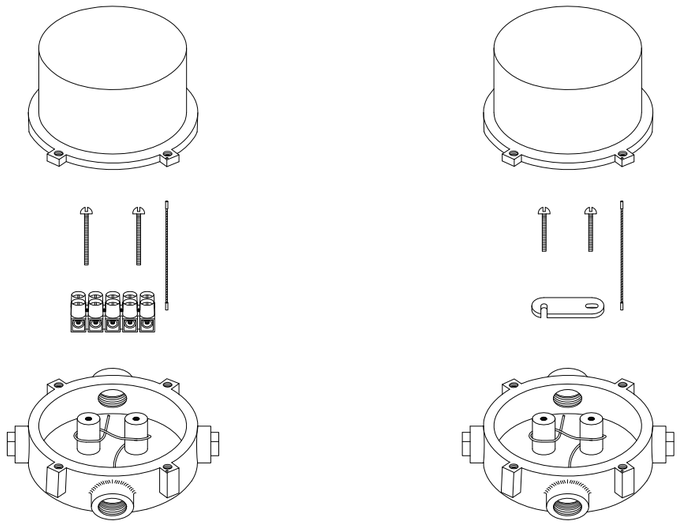


SIDELIGHT RECEPTACLE WIRING

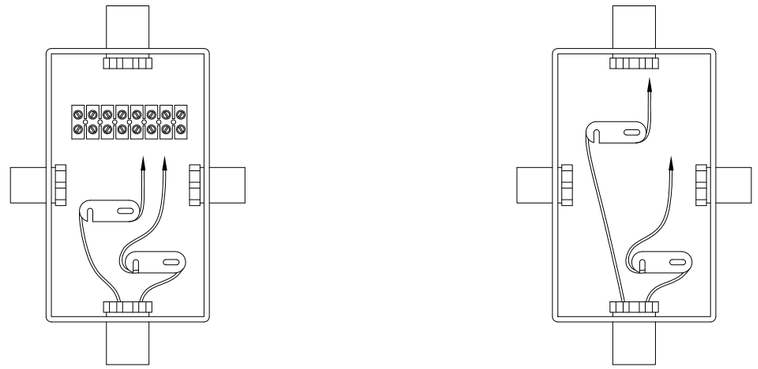
PROD DEPT	**TWR Lighting, Inc.** *Enlightened Technology*
SERV DEPT	
ENGINEER	
DRAWN BY: G.D. SEBEK	SHEET SIZE: B / SHEET QTY.: 1 OF 1
DATE: 06/08/91	SCALE: N.T.S. / DWG. NO.: 274-S

DATE:	LTR.	REVISION
7/2/98	A (G.D.S.)	CHANGED LABEL

The use of non-OEM parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43.



JB–5 AND JB–0
3/4" JUNCTION BOX



JB–8 AND JB–8SR
1" JUNCTION BOX

USING THIS JUNCTION BOX METHOD SPACING IS 100 FEET MAXIMUM.

AWG WIRE SIZE	MAX. NUMBER WIRES IN 3/4" CONDUIT	MAX. NUMBER WIRES IN 1" CONDUIT	WIRE AREA SQ. INCHES	WEIGHT PER 100 FEET
12 THHN	16	26	0.0117	2.50
10 THHN	10	17	0.0184	4.10
8 THHN	6	9	0.0373	6.70
6 THHN	4	7	0.0519	10.30
4 THHN	2	4	0.0845	16.20

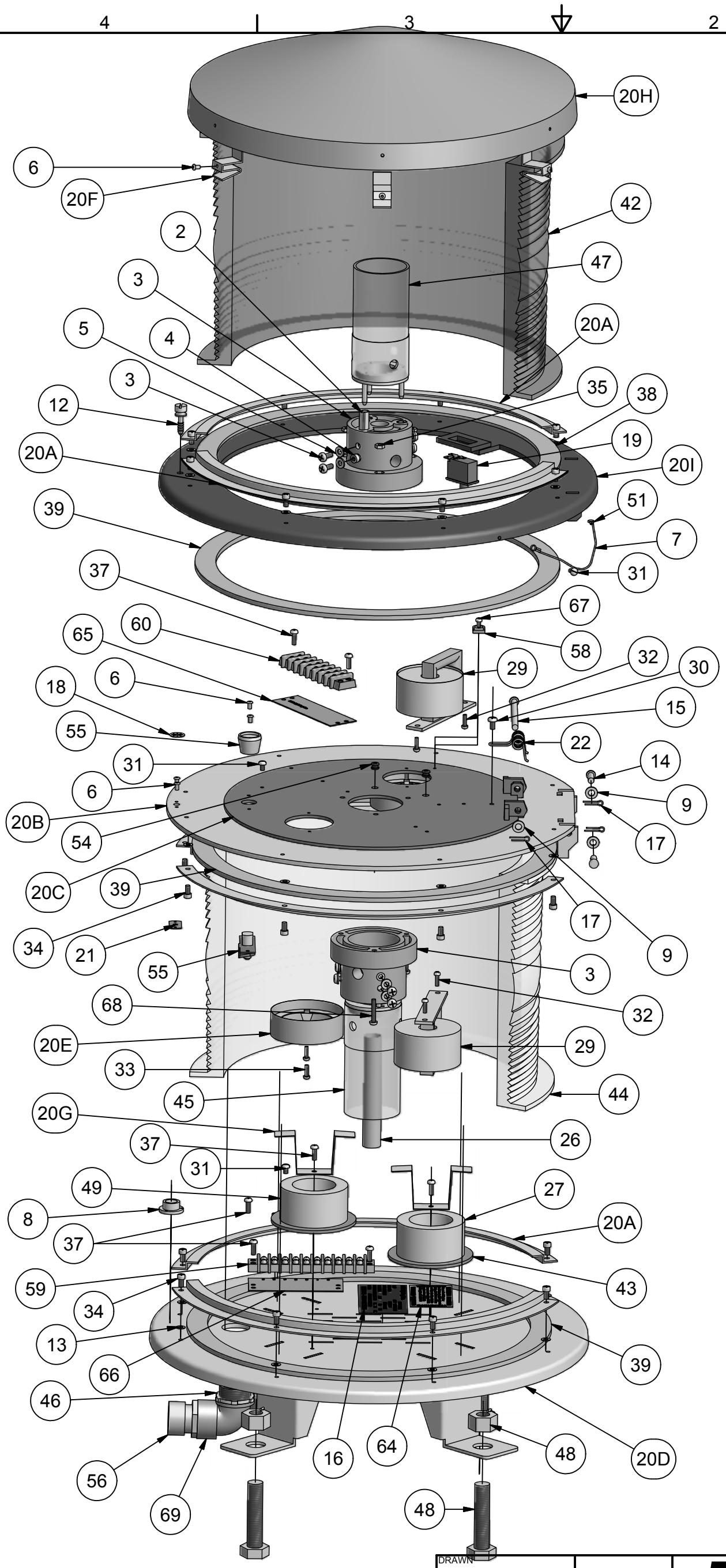
NOTES:

1) DRAWING ILLUSTRATES METHOD OF STRAIN RELIEVING WIRE. USE THIS METHOD ON ALL JUNCTION BOXES.
2) THE NATIONAL ELECTRICAL CODE–ARTICLE 300–19–B3 REQUIRES CONDUCTORS IN A VERTICAL CONDUIT BE SUPPORTED TO RELIEVE STRAIN ON TERMINAL BLOCK CONNECTIONS.
3) SKETCH ILLUSTRATES METHOD OF STRAIN RELIEVING A SINGLE CONDUCTOR. SEVERAL CONDUCTORS MAY BE GROUPED TOGETHER.
4) CONDUCTORS MAY BE MIXED BUT SHOULD NOT TAKE UP MORE THAN 40% OF CONDUIT'S INSIDE AREA.

DATE:	LTR.	REVISION
9/29/00	A	UPDATED NOTES

JUNCTION AND STRAIN RELIEF BOXES

PROD DEPT	**TWR Lighting, Inc.** *Enlightened Technology*
SERV DEPT	
ENGINEER	
DRAWN BY: G.D. SEBEK	SHEET SIZE: B / SHEET QTY.: 1 OF 1
DATE: 07/26/93	SCALE: N.T.S. / DWG. NO.: 100089



Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	100319	DUAL BEACON FLASHTUBE SOCKET
2	6	BU27200	FLASHTUBE SOCKET INSERT
3	12	1032X12PHH	10-32 X 1/2 PHILLIPS BINDER SCREW
4	6	115510SS0	5/16 X 1/4 ROUND SS SPACER
5	6	1032FW	#10 SS FLAT WASHER
6	10	18PRSS-2	1/8 X .40 SS POP RIVET
7	2	7X7SS	1/16 HOL 7 X 7 SS WIRE
8	1	2-10000	CIRCULAR SPIRIT LEVEL
9	3	14FWDB	1/4 FLAT WASHER CH16L
10	2	* 18AWG BLU	#18AWG TEFLON BLUE WIRE
11	2	* 18AWG BRN	#18AWG TEFLON BROWN WIRE
12	1	121340712	DB QUICK OPEN CAPTIVE SCREW
13	24	8NFW	#8 NYLON FLAT WASHER
14	2	14X34CLVP	1/4 X 3/4 SHORT SS CLEVIS PIN
15	1	14X358CLVP	1/4 X 3-5/8 LONG SS CLEVIS PIN
16	1	STCONLAB2	Product Label
17	3	12SSCP	1/2" SS COTTER PIN
18	1	1261	SS RETAINER FOR QUICK OPEN
19	1	STJ02003	CHERRY SWITCH
20	1	*STDBFRAMKIT	DUAL BEACON FRAME KIT
20A	6	100337	DUAL BEACON LENS RETAINER RING
20B	1	100343	DUAL BEACON LOWER HINGE ASSEMBLY
20C	1	100345	DUAL BEACON HATCH PLATE
20D	1	100360	DUAL BEACON BASE ASSEMBLY
20E	2	100367	DUAL BEACON VENT CAP
20F	6	100368	DUAL BEACON CAP BRACKET
20G	2	100396	INDUCTOR BRACKET
20H	1	100344	CAP DUAL BEACON
20I	1	100342	DUAL BEACON UPPER HINGE ASSEMBLY
21	1	121102013	DB QUICK OPEN SCREW FLAT RECEPTACLE
22	1	070-4500	DB HATCH SPRING SS DWG100558
23	2	* 16AWGBLK	#16AWG TEFLON BLACK WIRE
24	1	* 16AWG RED/WHT	#16AWG TEFLON RED/WHITE WIRE
26	1	INSUTUBE	DUAL BEACON CERAMIC INSULATOR
27	1	INDCTRC3001	INDUCTOR .47MH TRANSFORMER
28	1	* 16AWG RED/BLK	#16AWG TEFLON RED/BLACK WIRE
29	2	STC05005	TRIGGER TRANSFORMER
30	1	1032X38PHH	10-32 X 3/8 PILLIPS PAN HEAD SCREW
31	4	832X14PHH	8-32 X 1/4 PH SS SLOT SCREW
32	4	632X38PHH	6-32 X 3/8 PHILLIPS PAN HEAD SCREW
33	4	632X12PHH	6-32 X 1/2 PHILLIPS PAN HEAD SS SCREW
34	24	1032X38PHW	10-32 X 3/8 SS PHILIP HD CAPTIVE SCREW
35	3	832NUT	8-32 NUT
36	2	* 18RAD18277	T&B CONNECTOR
37	7	832X12PHH	8-32 X 1/2 PHILLIPS PAN HEAD
38	1	STBEAGSKT	GASKET NEOPRENE 13 1/4 X 15
39	3	STBEAGSK2	GASKET NEOPRENE 3/16 X 15 1/4
40	18	* TYZ23M	HI TEMP TY WRAPS
41	8	* 14RB10R	T&B CONNECTOR
42	1	STDBRLENS	RED DB LENS
43	2	100394-02	INDUCTOR BOTOM PAD GASKET
44	1	STDBCLENS	CLEAR DB LENS
45	1	STFLSHTB6	DAY MODE TUBE G01-109
46	1	A315	1" CONDUIT LOCKNUT GALVANIZED
47	1	STFLSHTB7	NIGHT MODE TUBE G01-112
48	4	58X112	A325 5/8 X 1-1/2 BOLT W/ANCO L/NUT
49	1	100453	INDUCTOR 135uh
50	2	* HEATSHRINK2	1/2" GLUE BASE HEAT SHRINK
51	4	CSL062X100	1/16 COPPER SLEEVE
52	2	* 14RB8FL	STAKON
53	.25	* HEATSHRINK	1/4" RED HEAT SHRINK
54	2	A10290	5/32" ID RUBBER GROMMET
55	1	57-10-401-10	SOUTHCO SPRING LATCH W/BLACK KNOB
56	1	CC-MPT-1-G	1" CORD CONNECTOR .700 TO .984
57	1	* STDBEAPIGTAIL2	DUAL BEACON PIGTAIL
58	1	TYANCHOR	TY WRAP ANCHOR 23N3669
59	1	621 RZ 10	10 PART TERMIBNAL BLOCK
60	1	621 RZ 8	8 PART TERMINAL BLOCK
61	24	* 18RA6FL	STAKON
62	13	* 14RB-6FL	14-16 AWG #6 LOCKING FORK
63	3	* KV10-8F-D	10-12 AWG #8 LOCKING FORK
64	1	NONOEMLBL	NON-OEM PARTS WARNING LABEL
65	1	MS621XP08	MS8-141 CINCH TERMINAL MARKER
66	1	MS621XP10	MS10-141 CINCH TERMINAL MARKER
67	1	632X14PHH	6-32 X 1/4 PHILLIPS PAN HEAD SCREW
68	3	832X1PHH	8-32 X 1 PHILLIPS PAN HEAD SS SCREW
69	1	EL190S	1" 90 DEGREE SHORT ELBOW GALV

* = ITEMS NOT SHOWN

DRAWN	Gavin Sebek	3/3/2004
PROD DEPT		
SERV DEPT		
ENGINEER		
APPROVED		

TWR Lighting, Inc.

Enlightened Technology

TITLE

L865/864 DUAL BEACON ASSEMBLY (STDBEACON)

SIZE	DWG NO	REV
B	100414	C

SCALE

SHEET 1 OF 1