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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 #	<u>D1LVS DUAL WHITE (SLAVE)</u>
SERIAL #	_____
PURCHASE DATE	_____
PURCHASED FROM	_____

D1LVS DUAL WHITE (SLAVE) CONTROLLER

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TWR Lighting, Inc.

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HARK

D1LVS DUAL WHITE (SLAVE) CONTROLLER

APPENDIX

CHASSIS COMPONENT LAYOUT H40-346S
SCHEMATIC LAYOUT M01-346S
HOUSING DETAIL HDO-346
TOWER LIGHTING KIT – LK1D1LVS DUAL T1414 (REV B)
CONTROL PCB #1 H01-346
HIGH VOLTAGE RECTIFIED PCB #2 H02-226A
RELAY PCB #3..... H03-226 (REV B)
SIGNAL BACKUP PCB #4 H04-338TS
STDBEACOND LAYOUT..... 100837i

D1LVS DUAL WHITE (SLAVE) CONTROLLER

1.0 INTRODUCTION

The TWR Lighting®, Inc. (TWR®) Model D1LVS Dual White Type L-865 Slave Controller has been designed and built to the Federal Aviation Administration's (FAA) Advisory Circular 150/5345-43F 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 D1LVS Dual White L-865 Slave Controller is for use on lighting structures or towers that are approved to be lighted with Medium Intensity Strobes in accordance with the FAA's Advisory Circular 70/7460-1K. Structures from 201' to 350' may be lighted with Medium Intensity lights. **NOTE: Structures exceeding 500' will require to be painted in addition to this lighting for added visual hazard marking.**

1.2 SPECIFICATIONS OF EQUIPMENT

Dimensions:

Panel (LxW)/Weight	22.0" x 17.5625" X 10.75" / 59# lbs.
Mounting Dim (H x W)	21.25" x 10.0"
Beacon Height / Weight	28.0" / 36 lbs.
Cable Diameter / Weight per 100	.625" +/- 10% / 24 lbs.

Electrical Voltage

120V AC +/- 10% 60 Hz (Standard)
240V AC +/- 10% 60 Hz (Available)

Intensity:

Daymode	20,000 +/- 25%	Effective Candelas
Nightmode	2,000 +/- 25%	Effective Candelas

Beamspread:

Horizontal	360°
Vertical	3° minimum

Flash Rate:

Daymode	40 fpm +/- 2 fpm
Nightmode	40 fpm +/- 2 fpm

Wattage:

Daymode	95 Watts
Nightmode	35 Watts

Temperature:

+55°C / -55°C

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Beacon Wind Load:

2.1 ft²

D1LVS DUAL WHITE (SLAVE) CONTROLLER

2.0 INSTALLATION

2.1 PHOTOCELL WIRING

***Note:** When installing multiple controllers together, the photocell is only required on one (1) unit. It is to be installed on the master. Refer to Master Controller manual.*

2.2 POWER WIRING

(Refer to Drawing H40-346S)

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

CAUTION !!!

ALL CONTROLLERS MUST BE CONNECTED TO THE SAME PHASE OF POWER SUPPLY. FAILURE TO ADHERE TO THIS WILL RESULT IN FAILURE OF ALL THE CONTROLS.

- 2.2.1 A 20 amp circuit breaker is recommended at the service panel. This circuit breaker size is dependent on the number of controllers in the system. Adjust the size of the breaker accordingly.
- 2.2.2 Connect the “**HOT**” side of the 120V AC line to TB1-11.
- 2.2.3 Connect the “**NEUTRAL**” side of the 120V AC line to TB1-12.
- 2.2.4 Connect the AC ground to the ground stud to the lower right of the terminal block TB1.
- 2.2.5 Controller panel should be connected to 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.

2.3 TOWER LIGHTING KIT

When installing this system, the customer will need to use strobe cable wiring method to wire the strobe beacon. Refer to drawing T1414, for details.

2.3.1 Beacon Mounting

2.3.1.1 Level the beacon using the 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.

2.3.2 Lighting Kit Wiring

Install wiring between the controller and the beacon utilizing strobe cable method. (**TWR LIGHTING CANNOT WARRANTY SYSTEMS THAT EMPLOY SPLICING CABLE.**) Refer to drawings for install of lighting kits. Follow these minimum guidelines as well as any local or end user addition requirements. Installing lighting kits will require lifting of the cable by the supplied cable grip 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.*

2.4 ALARM WIRING

Individual alarm contacts (Form C) are provided for the main and secondary strobe failure, 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. Alarm configurations are shown on drawing H40-346S.

2.4.1 Alarm Testing

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

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2.4.2 Main Strobe Failure

Strobe failure testing can be performed in either day or nightmode strobe operation. To check alarm, unit must be in normal operation. Remove lower wire on TB1-2. The status of Relay K9 should change after a 15 second delay. An LED indicator on Relay K9 will be illuminated.

2.4.3 Secondary Strobe Failure

Strobe failure testing can be performed in either day or nightmode strobe operation. To check alarm, unit must be operating on the secondary flashtube. Remove lower wire on TB1-3. The status of Relay K10 should change after a 15 second delay. After testing is complete, re-install lower wires on TB1-2, and TB1-3. Reset by turning off circuit breakers at panel, and turning back on. Unit will resume normal operations.

2.4.4 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 breaker to resume normal operation.

2.5 MASTER AND SLAVE WIRING

(Refer to Drawings H40-346S)

- 2.5.1 Jumper all units on PCB #3, P2-6 SSR1 (item #17). If utilizing interconnect cable on install, utilize the red wire. Keep the existing red wire in the master unit P2-6 SSR1 (item #17). On the slave unit, remove the existing wire, and cap off*. It will not be used due to the master unit controlling all the units. Please keep these series connections through to the final slave unit.
- 2.5.2 Connect all units' ground together. If using the interconnect cable on install, utilize the bare wire. Please keep these series connections through to the final slave unit.
- 2.5.3 Connect the master unit PCB #1, P1-15, (item #20), to the first slave unit on PCB #4, J1-3 (item #32). If using the interconnect cable on install, utilize the black wire. Please keep these series connections through to the final slave unit.

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- 2.5.4 Connect the master unit PCB #1, J5-PIN2 (refer to drawing H01-346) to the first slave PCB #4, J1-1 (item #32). If using the interconnect cable on install, utilize the white wire. Then connect the first slave unit signal output port J5-1 (item #30), to the next slave signal input port J1-3 (item #32). Please keep these series connections through to the final slave unit.
- 2.5.5 Slave PCB's synchronous signal input port is on PCB #4, J1-3 (item #32), and output port is J5-1, on PCB #1.
- 2.5.6 Master unit PCB dip switch preset #1, and #3 on, and #2 off, for master operation. Slave unit PCBs dip switches preset #1, and #3 off, and #2 on, for slave operation (refer to drawing #H01-346).
- 2.5.7 All slave units SW3 (item #15, photocell bypass switch) should be kept in downward position at all times.

* **Capping off SSRI @ P2-6 on slave units may be done at the factory, dependent on system ordered.**

3.0 THEORY OF OPERATION

3.1 THE POWER SUPPLY

The AC line is sent to transformer T1 through fuse F1 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 1,000V AC. These outputs are sent to the high voltage rectifier PCB (PCB #2) and converts the 1,000V AC of the transformer to around +500V DC and -500V 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 steering diode D5 for nightmode operation. Resistor R31 is by-passed through relay K5 for daymode operation.

Energy storage capacitors bank C103-109 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, photocell 6390-FAA2 (Photocell will only be connected to the master controller, refer to Section 2.1) supplies 120V AC to relay K4, which removes C103-109 from the discharge path leaving capacitor C102 in the circuit for nightmode operation.

The energy storage capacitor bank is connected to the flashtube through the interconnecting tower wiring.

3.2 THE FLASHTUBE

The flashtubes FT1, and FT2, are a quartz tube 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. 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.

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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 deionizes returning to its non-conducting state until another trigger pulse arrives to repeat the process. Meanwhile, the storage capacitor is being recharged by the transformer and the high voltage rectifier.

3.3 TIMING CIRCUIT

The timing circuit is contained of both, the PCBs #1 (STH01-346), and #4 (STH04-338TS). PCB #1 has its own timing signal (LED #8 indicated) for back up, and 12V DC power supply to energize both PCBs. PCB #4 is a timing signal change-over circuit with two (2) signal inputs. The first signal (LED #1 indicated) is coming from the master unit or another slave unit. The second signal is coming from PCB #1, for backup. During the normal operation, PCB #1, LED #8, and PCB #4, LED#1, to be synchronous flashing. PCB #4 is keeping the synchronous timing signal flashing unless it is missing, then turns on the backup signal to be a lead timing signal, and turn the warning LED #2 on.

3.4 TRIGGER CIRCUIT

The trigger circuit is supplied by one (1) of transformer T1's secondary windings. The 300V 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 Strobe Failure (SF)

Strobe Failure alarm circuit monitors each flash of the two (2) flashtubes within each beacon. If the primary flashtube, FT1, fails to flash (for any reason), the alarm circuit operates relay K9 that the customer can connect to their alarm transmitting devices. The controller would also then power the secondary flashtube FT2. If this flashtube fails to flash (for any reason), the alarm circuit would operate relay K10, that the customer can connect to their alarm transmitting devices.

3.5.2 Power Failure (PF)

The power failure alarm relay is energized during normal operation. Should the power be removed for any reason, then relay K6 would drop, creating an alarm for the customer's alarm transmitting device.

3.5.3 Photocell (PC)

The photocell alarm relay is energized whenever the photocell or SW3 in the master unit is on. This relay will allow the customer to monitor the modes of operation to determine if switch from day to nightmode has occurred.

3.6 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, relays close, allowing the resistors to discharge the high voltage stored in the capacitor bank 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, PCB #2, and PCB #4. The circuits that are contained on PCB #1, PCB #2, and PCB #4 are as follows:

3.7.1 Control Power On

Line from the 120V AC input is sent through safety switches CSS and BSS isolation transformer T2, fuse F3, and relay K1, to PCB #1. Once this voltage is at PCB #1, it is sent to a step down transformer and is rectified, then sent to LED4 (D15). If for any reason power is interrupted, (beacon opened, controller door open, blown F3 fuse, failed relay, etc.) LED4 would be extinguished.

3.7.2 High Voltage

The high voltage HV is routed through current limiting resistor. When the unit is in daymode, PCB #2, 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 high voltage is no longer present.

3.7.3 Trigger Voltage

The trigger voltage from fuse F2 (CT1A) is sent to current limiting resistor R29, and LED6 (D20) on PCB #1. 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 RLY1. Whenever the photocell senses darkness or switch SW3 is on, relay RLY1 will energize thereby sending 12V to the timing circuit as well as to LED7, letting LED7 (D7) on PCB #1 glow a constant red.

3.7.5 Primary Timing

The primary timing pulses are received at LED8 (D3) on PCB #1. 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 for secondary timing operation. The strobe unit should produce 40 (+/-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, but should be 40 +/-2 FPM. 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 flashtubes (MFTC and SFTC) are sent through the current sensing transformers T1, T2, and T3, on PCB #1. T1, and T2, or T3, will send a pulse to the gate of the SCR's Q2, and Q3, and turns it on. Capacitor C11, via Q2, or C12 via Q3, will send voltage to LED5 (D8). After each confirmed flash on FT1, or FT2, LED 5 will blink. Absence of a blinking LED signifies that strobe beacon has ceased to flash.

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.

*****WARNING - HIGH - VOLTAGE*****

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. READ AND UNDERSTAND THE THEORY OF OPERATION AND ITS SAFETY MESSAGES BEFORE ATTEMPTING INSTALLATION OF THIS SYSTEM. DO NOT ATTEMPT TO DEFEAT THE INTERNAL SAFETY DEVICES.

4.1 TOOL REQUIREMENTS

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

- 1) 5/16 Electrician’s Screwdriver
- 1) Nut Drivers or Socket Set
- 1) Multi meter - Analog or Digital 600V AC/600V DC Minimum

4.2 DIAGNOSTIC EVALUATION

The first step in troubleshooting 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. LEDs on PCB #4 are numbered from top to bottom D1 – D2. The following chart will indicate normal LED operation.

INDICATOR	OPERATION	NORMAL STATUS
<u>PCB #1</u>		
LED 1	Flash Verify 2	N/A
LED 2	Strobe Fail Test	Normal OFF/Flashes in Test Mode
LED 3	Flash Verify 3	N/A
LED 4	Control Power ON	Steady ON
LED 5	Flash Verify 1	Blinks
LED 6	Trigger Voltage	Steady ON
LED 7	Nightmode	Steady ON During Nightmode Operation
LED 8	Primary Timing	Flashing
LED 9	Timing Verify	Flashing
<u>PCB #2</u>		
D14	High Voltage #1	Steady ON when Voltage Above 50V DC
D15	High Voltage #2	N/A
D16	High Voltage #3	N/A
<u>PCB #4</u>		
D1	Primary Timing	ON
D2	Backup Timing	Normally off / on when using backup timing

4.3 **TROUBLESHOOTING ASSISTANCE**

4.3.1 **Flash Verify LED - Out**

- 4.3.1.1 Observe high voltage LED on the same beacon circuit to determine if it is available. If the LED is dim or out completely, then check high voltage capacitor bank for a short. If no capacitor is found to be shorted, check the resonant cap 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 the trigger LED. If LED is dim or off, check fuse F2. If blown, replace with exact type of fuse. If the fuse blows again, replace PCB #1. 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, relamp the beacon.

4.3.2 Control Power On LED - Out

Check interlock circuit for an open circuit. If open, make the necessary repairs. If okay, check fuse F3. Replace if bad.

4.3.3 Primary Timing LED Out

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

4.3.4 False or Nonexistent Beacon Alarms

4.3.4.1 If alarms trip when the system appears to be working normally or fails to show an alarm when there is an obvious failure, replace PCB #1.

*****WARNING - HIGH - VOLTAGE*****

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. READ AND UNDERSTAND THE THEORY OF OPERATION AND ITS SAFETY MESSAGES BEFORE ATTEMPTING INSTALLATION OF THIS SYSTEM. DO NOT ATTEMPT TO DEFEAT THE INTERNAL SAFETY DEVICES.

5.0 MAINTENANCE GUIDE

5.1 FLASHTUBE REPLACEMENT

The only required maintenance needed to be performed is the replacement of the flashtubes every two (2) years. By following these instructions, maximum safety and performance can be achieved.

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

- 5.1.1 Loosen the three (3) socket screws with a screwdriver to remove lamp.
- 5.1.2 Install the new flashtube making sure that the pins are aligned with the socket. Make sure tube is flush on socket.
- 5.1.3 Tighten the socket screws snug, then 1/4 turn more.
- 5.1.4 Close the lens - make sure nothing hampers safety interlock action.

5.2 POWER SUPPLY

No scheduled maintenance is required. Perform on an as needed basis only.

5.3 PHOTOCELL

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

6.0 MAJOR COMPONENTS PARTS LIST

SCHEMATIC TAG #	DESCRIPTION	TWR PART #
BSS1	BEACON SAFETY SWITCH	STJ02003
C103 - C109	40uf 1KV CAP	STB99006
C101, C102	3uf 660V AC CAP	STB99008CSI
CSS	CABINET SAFETY SWITCH	STJ02001
F1	10 amp FUSE	KTK10
F2	1/8 amp FUSE	FLQ 1/8
F3	.5 amp FUSE	FUSE .5
FT2	SECONDARY FLASHTUBE	STFLSHTB6
K1, K4, K5	DPDT OCTAL RELAY	KRPA11AG120V
K6, K8	SPDT OCTAL RELAY	KRPA5AG120V
K2, K3	CONTACTOR RELAY	STJ10006
L1	INDUCTOR	INDCTR3001
L11	BURSTING CHOKE	100273
MOV1, MOV2	METAL OXIDE VARISTOR	MOV524V15
MOV3	METAL OXIDE VARISTOR	V1000LA80A
P1	15 POSITION PLUG	STT60021
PCB #1	D-1LVS DUAL WHITE CONTROL PCB	STH01346
PCB #2	HIGH VOLTAGE RECTIFIER PCB	STH02226A
PCB #3	RELAY PCB	STH03226
PCB #4	SIGNAL BACKUP PCB	STH04-338TS
R31	150 ohm 100W	STA08018
R32	35K 20W	STA08015
R33	2.4 MEG 2W	STA08010
J2	9 POSITION PLUG	STT60001
SW3	SPDT 15 amp SWITCH	STJ01004
T2	ISOLATION TRANSFORMER	STC05004
T1	FERRORESONANT	STC30018

SCHEMATIC TAG #	DESCRIPTION	TWR PART #
	TRANSFORMER	
K7, K10	5 SEC DELAY ON SPDT	SPEC 224
FT1	PRIMARY FLASHTUBE	STFLSHTB8
T4, T5	TRIGGER TRANSFORMER	STC05005
TB1	10 PART TERM BLK	TERMBLK – 10
TB2	12 PART TERM BLK	TERMBLK 141 – 12
TLS	THERMAL LIMITING SWITCH	STJ10008
K9	SPDT OCTAL RELAY W/LED	STJ10019

7.0 RECOMMENDED SPARE PARTS LIST

QTY	PART NUMBER	DESCRIPTION
1	STH01346	D-1LVS PRINTED CIRCUIT BOARD
1	STJ10006	DPDT CONTACTOR RELAY
1	STFLSHTB6	SECONDARY FLASHTUBE
2	KTK10	10 amp FUSE
2	FLQ18	1/8 amp FUSE
2	FUSE .5	1/2 amp FUSE
1	KRPA5AG120V	SPDT RELAY
2	KRPA11AG120V	DPDT RELAY
1	STFLSHTB8	PRIMARY FLASHTUBE
1	KRPA5AN120V	SPDT RELAY W/LED



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 70% 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:

- x Improper Installation or Operation
- x Misuse
- x Abuse
- x Unauthorized or Improper Repair or Alteration
- x Accident or Negligence in Use, Storage, Transportation, or Handling
- x Any Acts of God or Nature
- x **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.

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.

Warranty & Return Policy
(continued)

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:

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

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.

- x Product(s) that is deemed defective and/or unrepairable and covered under warranty - a credit will be issued to the customer's account.
- x 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.
- x Product(s) under warranty, which the customer does not wish returned, the customer will be issued a credit against the replacement invoice.

Warranty & Return Policy
(continued)

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.

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.



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



RETURN MERCHANDISE AUTHORIZATION (RMA) FORM

RMA#: _____ **DATE:** _____

CUSTOMER: _____

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

ITEM DESCRIPTION (PART NO.): _____

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

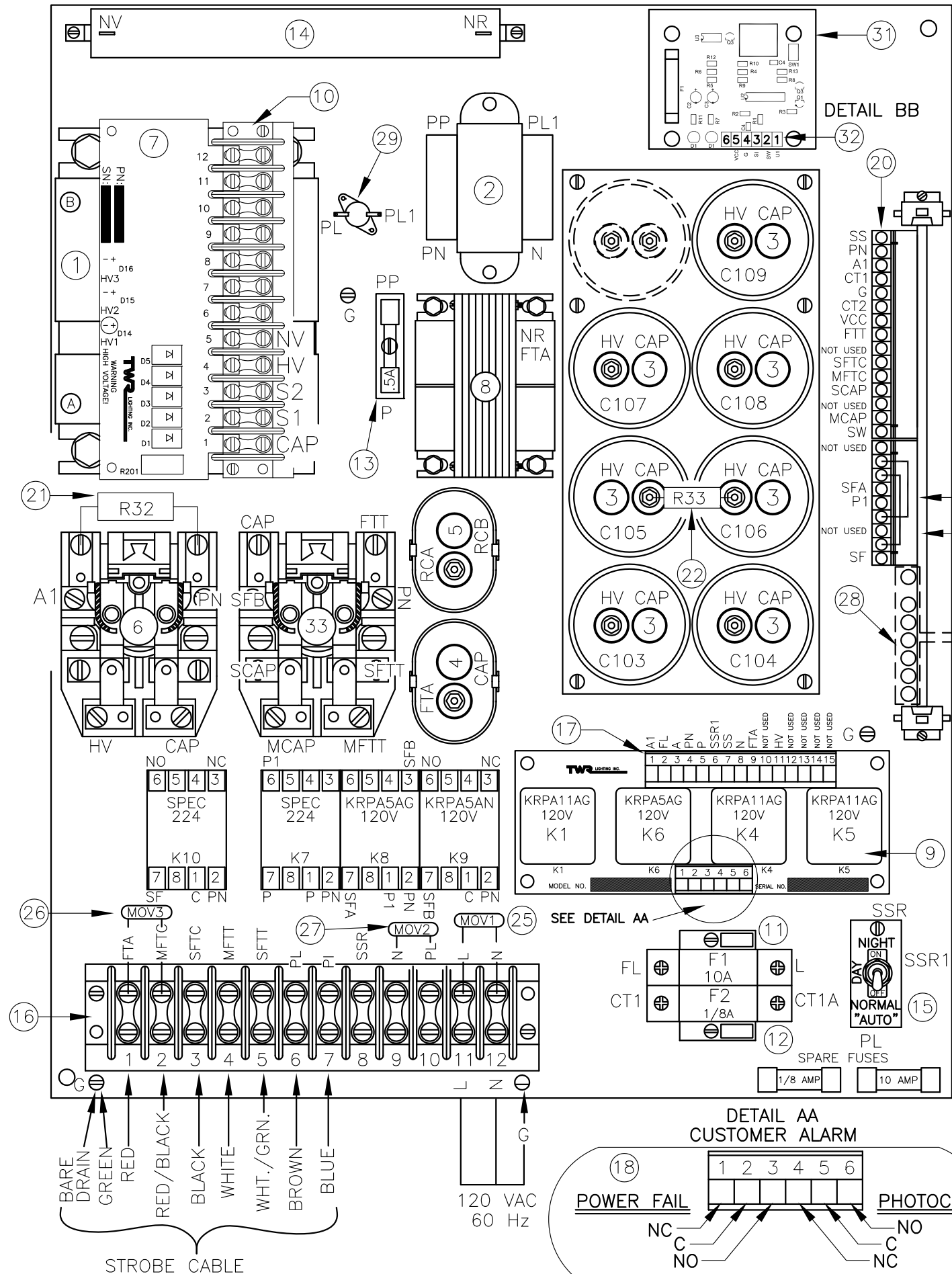
ORIGINAL TWR INVOICE NO.: _____ **DATED:** _____

DESCRIPTION OF PROBLEM: _____

SIGNED: _____ **DATE NEEDED:** _____

RETURN ADDRESS: _____

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



ITEM NO.	SCH. TAG NO.	DESCRIPTION
1	T1	FERRORESONANT TRANSFORMER T-3426
2	T2	ISOLATION TRANSFORMER
3	C103-C109	DAY CAPACITORS
4	C102	NIGHT CAPACITOR (STB99008CSI)
5	C101	RESONANT CAPACITOR (STB99008CSI)
6	K2	BLEEDER RELAY
7	PCB2	HV RECTIFIER PCB STH02-226A
8	L11	BURSTING CHOKE
9	PCB3	RELAY PCB STH03-226
10	TB2	12 PART TERMINAL BLOCK
11	F1	10 AMP FUSE
12	F2	1/8 AMP FUSE
13	F3	.5 AMP FUSE GLASS TYPE
14	R31	150 OHM 100W RESISTOR
15	SW3	PHOTOCELL BYPASS SWITCH
16	TB1	TERMINAL BLOCK 1
17	PCB3/P2	PLUG 2
18	PCB3/J3	CUSTOMER ALARM POINTS
19	PCB1	CONTROL PCB STH01-346
20	PCB1/P1	PLUG 1
21	R32	BLEEDER RESISTOR
22	R33	AUXILIARY BLEEDER RESISTOR
23	CSS	CABINET SAFETY SWITCH
24	PCB1/J2	CURRENT SENSING CONNECTIONS
25	MOV1	MOV-INPUT VOLTAGE
26	MOV3	MOV-HIGH VOLTAGE
27	MOV2	MOV-PHOTOCELL INPUT
28	LED	LED DIAGNOSTIC
29	TLS	THERMAL LIMITING SWITCH
30	PCB1/J5	TRIGGER SIGNAL OUTPUT CONNECTOR
31	PCB4	SIGNAL BACKUP PCB STH04-338TS
32	PCB4/J1	SIGNAL BACKUP PCB CONNECTOR
33	K3	MAIN/SECONDARY FLASHTUBE RELAY

NOTES:

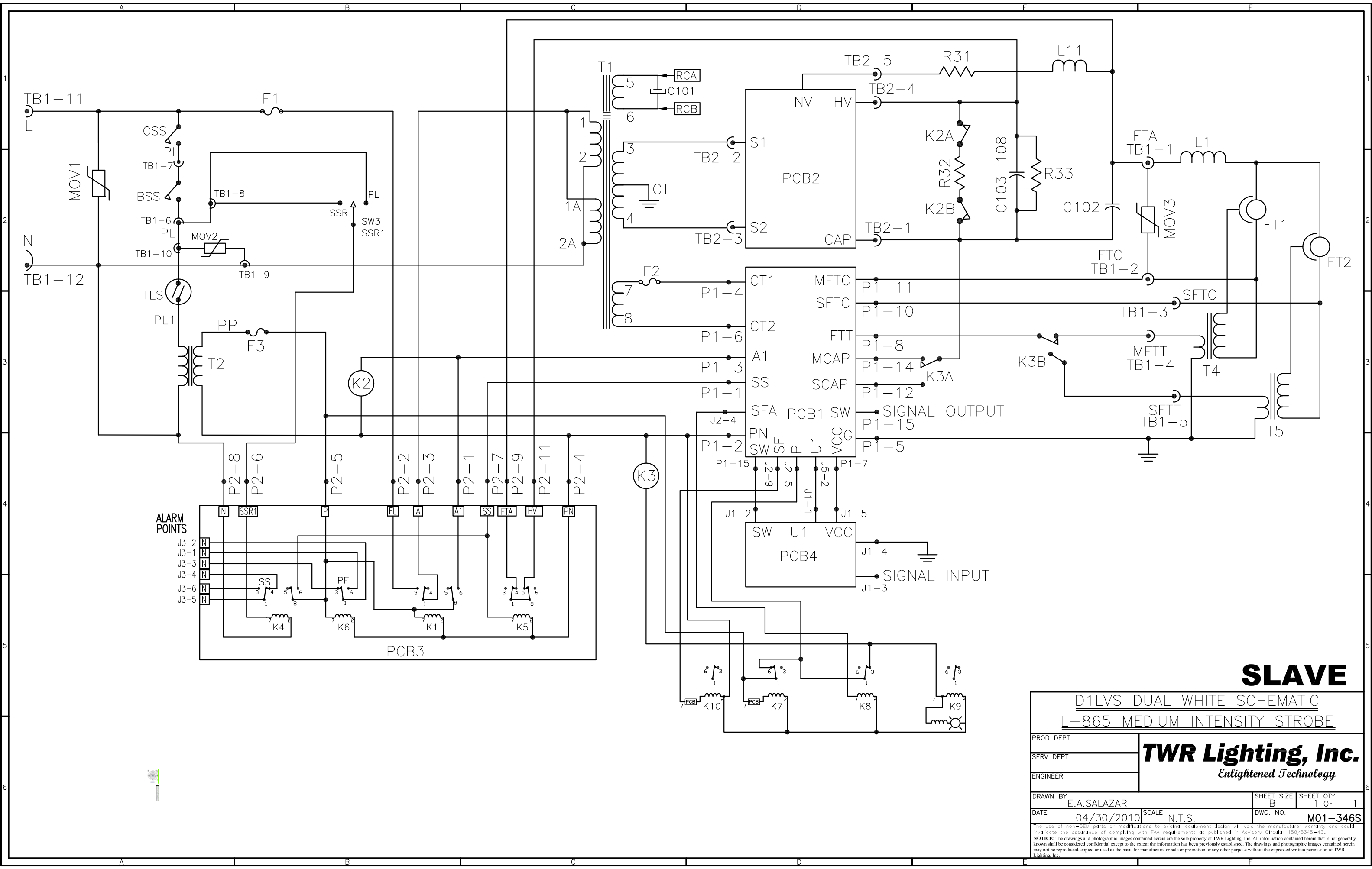
- USE BUSSMANN KTK FUSES. SIZE AS SHOWN ON FUSE BLOCKS.
- WIRES ARE CONNECTED LETTER TO LETTER. (EXAMPLE: N TO N TO N)
- THIS DRAWING IS PROVIDED AS A GENERAL REFERENCE. TWR LIGHTING, INC. DOCUMENTATION SUPERCEDES THIS DRAWING AND SHOULD BE REVIEWED PRIOR TO INSTALLATION OF THIS SYSTEM.

SLAVE

D1LVS DUAL WHITE CHASSIS LAYOUT
L-865 MEDIUM INTENSITY STROBE

PROD DEPT	TWR Lighting, Inc. Enlightened Technology	SHEET SIZE	SHEET QTY.
SERV DEPT		B	1 OF 1
ENGINEER			
DRAWN BY	E.A.SALAZAR	SCALE	N.T.S.
DATE	04/26/2010	DWG. NO.	H40-346S

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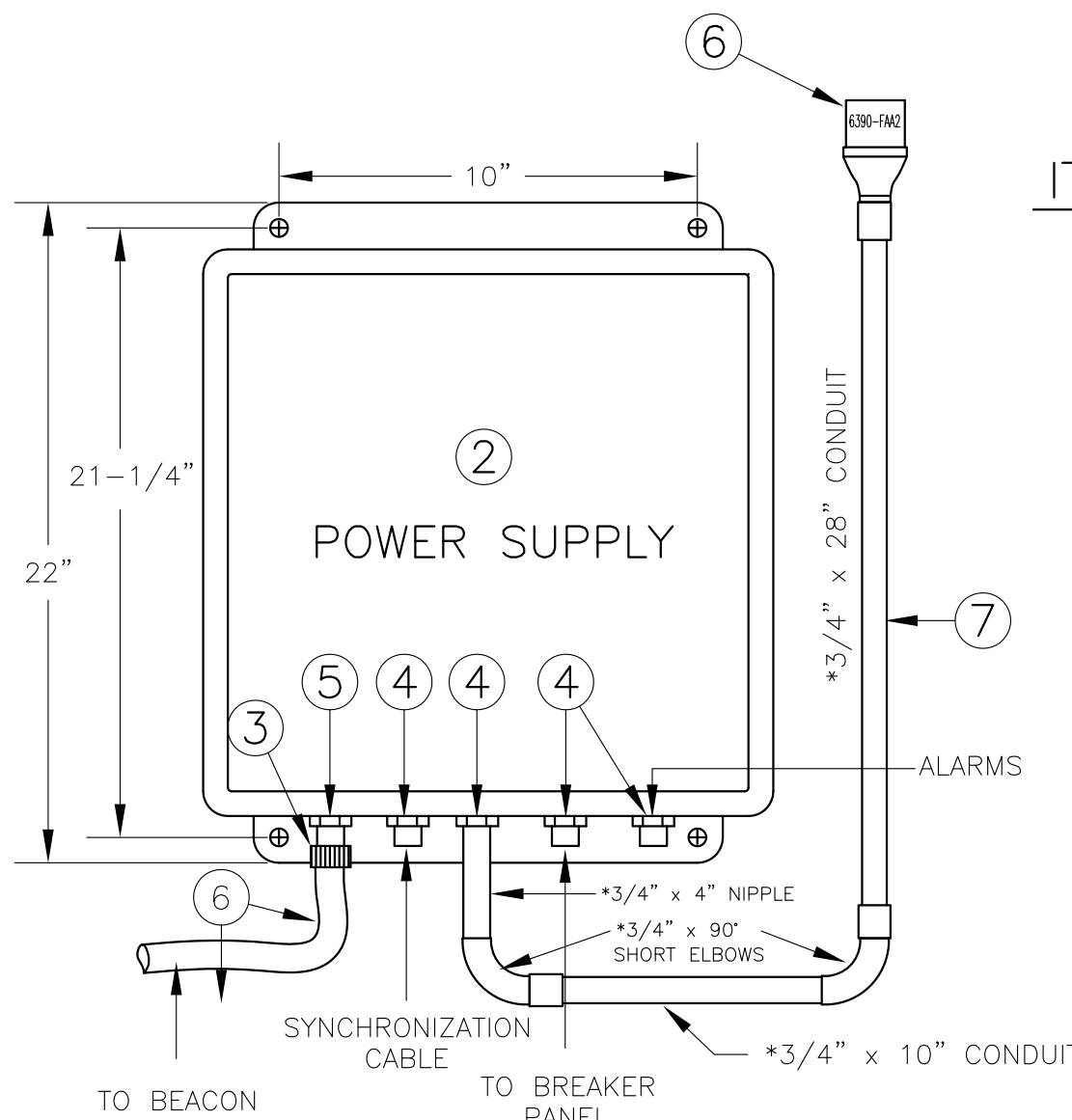


SLAVE

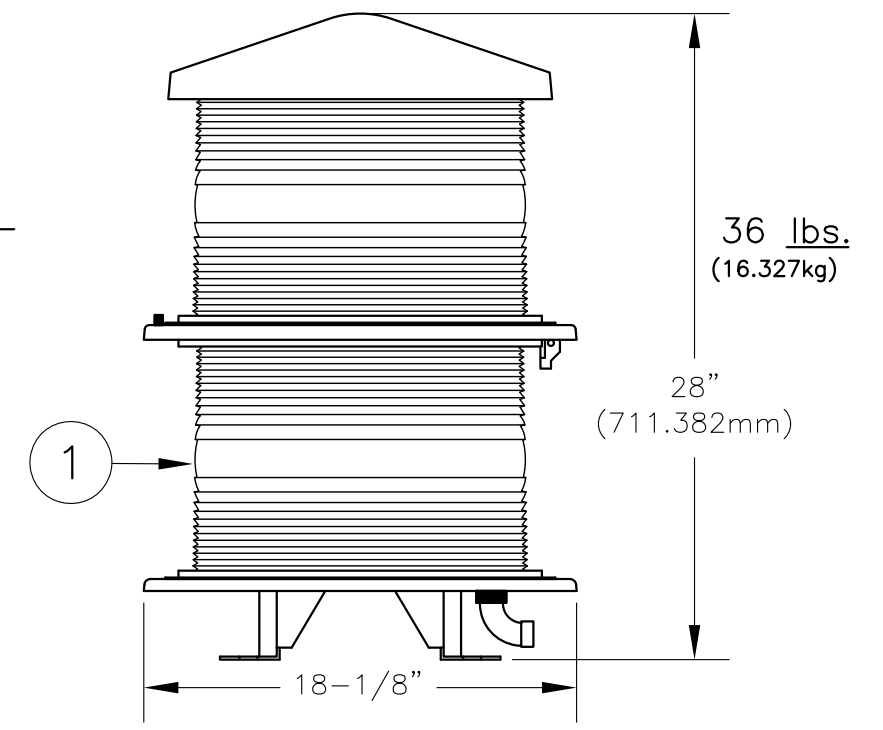
D1LVS DUAL WHITE SCHEMATIC L-865 MEDIUM INTENSITY STROBE

PROD DEPT	TWR Lighting, Inc. <i>Enlightened Technology</i>	SHEET SIZE	SHEET QTY.
SERV DEPT		B	1 OF 1
ENGINEER			
DRAWN BY	E.A.SALAZAR	SCALE	N.T.S.
DATE	04/30/2010	DWG. NO.	M01-346S

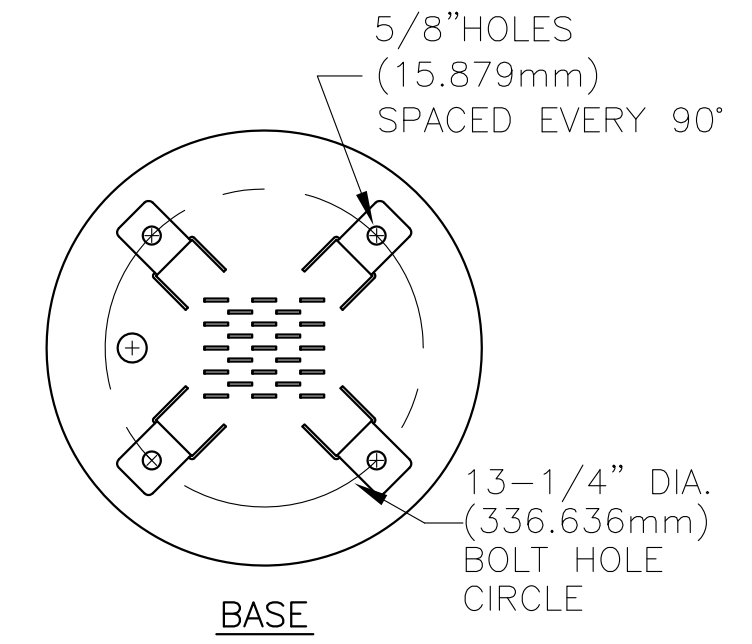
The use of non-TWR parts or modifications to original equipment design will void the manufacturer warranty and could invalidate the assurance of complying with FAA requirements as published in Advisory Circular 150/5345-43.
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ITEM #	DESCRIPTION
1	BEACON L-865 DUAL WHITE STROBE
2	POWER SUPPLY D1LVS DUAL WHITE
3	WATER TIGHT CABLE CONNECTOR WITH SEALING GLAND.
4	ENTRANCE HUB 3/4" (19.055mm)
5	ENTRANCE HUB 1" (25.4mm)
6	6390 FAA-2 PHOTOCCELL
7	SSMTKIT SHOWN (OPTIONAL)



SIDE VIEW

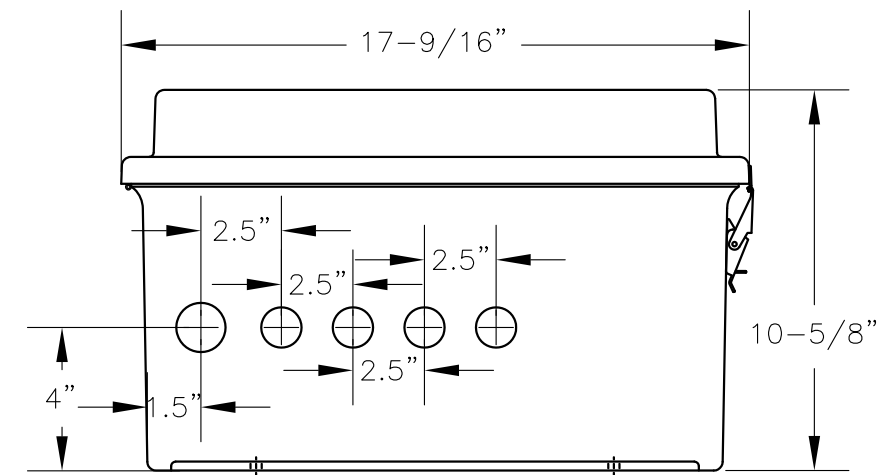


BASE

* = ITEMS NOT INCLUDED BUT ARE AVAILABLE UPON REQUEST.

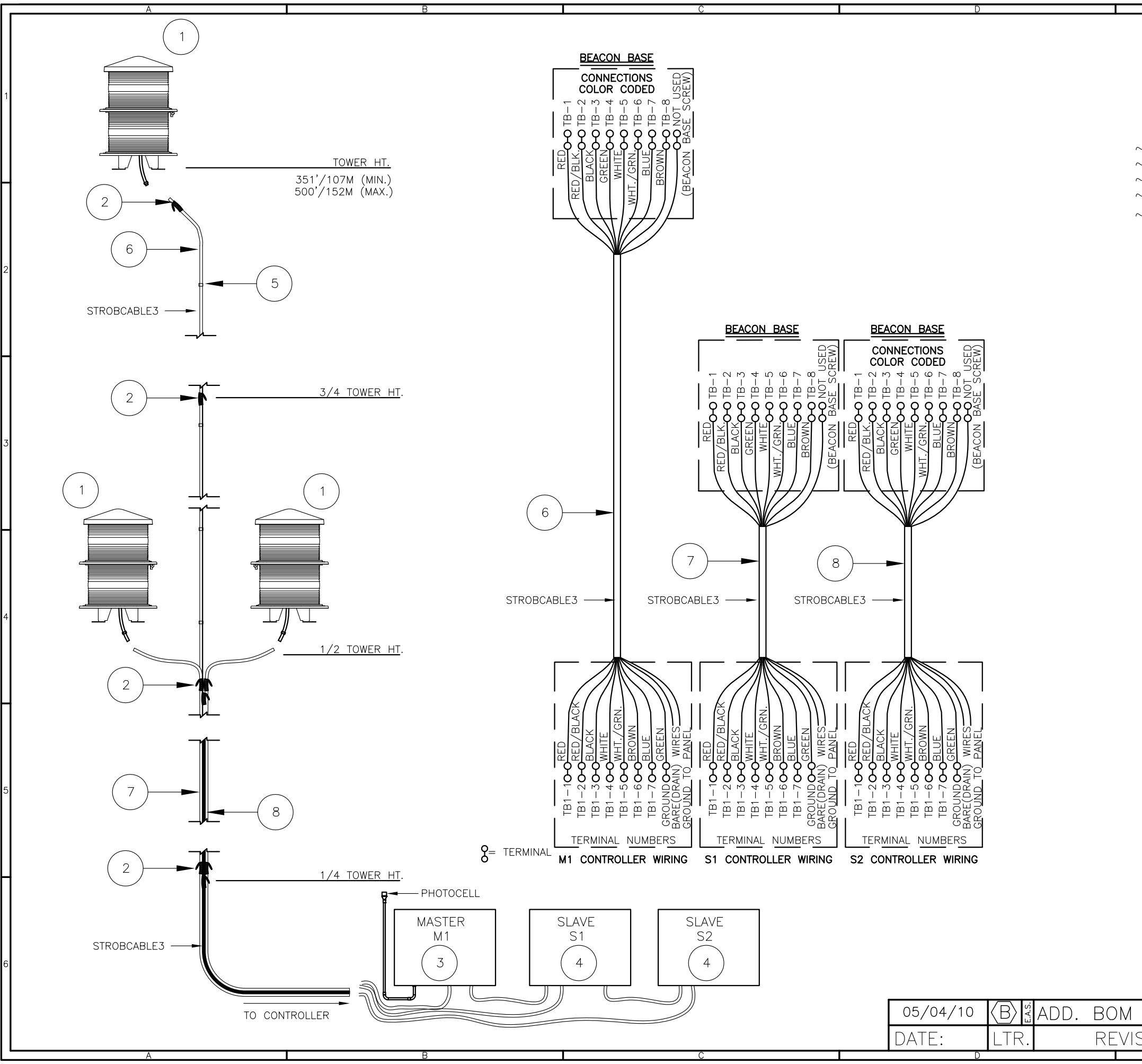
NOTES:

- 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.
- C POWER SUPPLY DETAIL FOR L865 MODEL NO. D1LVS DUAL WHITE LIGHTING CONTROLLER.



HOUSING DETAILS D1LVS DUAL WHITE			
L-865 WHITE STROBE			
PROD DEPT		TWR Lighting, Inc. <i>Enlightened Technology</i>	
SERV DEPT			
ENGINEER			
DRAWN BY	E.A.SALAZAR	SHEET SIZE	SHEET QTY.
DATE	05/04/2010	B	1 OF 1
		SCALE	DWG. NO.
		N.T.S.	HDO-346
<small> The use of non-TWR 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. NOTICE: The drawings and photographic images contained herein are the sole property of TWR Lighting, Inc. All information contained herein that is not generally known shall be considered confidential except to the extent the information has been previously established. The drawings and photographic images contained herein may not be reproduced, copied or used as the basis for manufacture or sale or promotion or any other purpose without the expressed written permission of TWR Lighting, Inc. </small>			

5/28/10 (A) **ADDED DIMS**



BILL OF MATERIALS

ITEM NO.	QTY.	TWR PART NO.	DESCRIPTION
1	3	STDBEACOND	DUAL STROBE BEACON
2	8	CABLEGRIP3	SINGLE EYE LACE MESH 0.63 - 0.74
3	1	STH40346	DUAL STROBE MASTER CONTROLLER
4	2	STH40346S	DUAL STROBE SLAVE CONTROLLER
5	-	STCABLIE	STROBE CABLE TIES (TWR. HEIGHT +5 x 2)
6	-	STROBCABLE-3	STROBE CABLE (TWR. HT. + 30')
7	-	STROBCABLE-3	STROBE CABLE (1/2 TWR. HT. + 30')
8	-	STROBCABLE-3	STROBE CABLE (1/2 TWR. HT. + 30')

~ = ITEMS QUANTITY CALCULATED ACCORDING TO STRUCTURE HEIGHT.

- NOTES:**
- 1) MOUNT BEACON HINGE SO LENS WILL OPEN UNOBSTRUCTED BY STRUCTURE.
 - 2) ON AM TOWER APPLICATIONS, KEEP GROUND LUG FROM BEING CONNECTED TO EARTH GROUND. GROUND TO THE TOWER ONLY.
 - 3) THIS DRAWING IS PROVIDED AS A GENERAL REFERENCE. TWR LIGHTING, INC. DOCUMENTATION SUPERSEDES THIS DRAWING & SHOULD BE REVIEWED PRIOR TO INSTALLATION OF THIS SYSTEM.

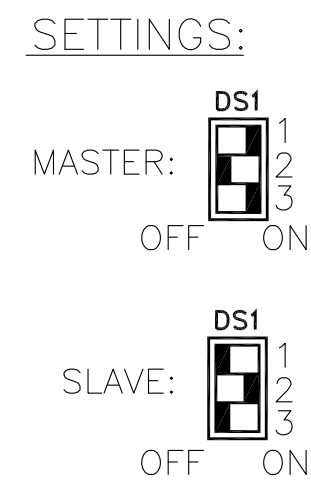
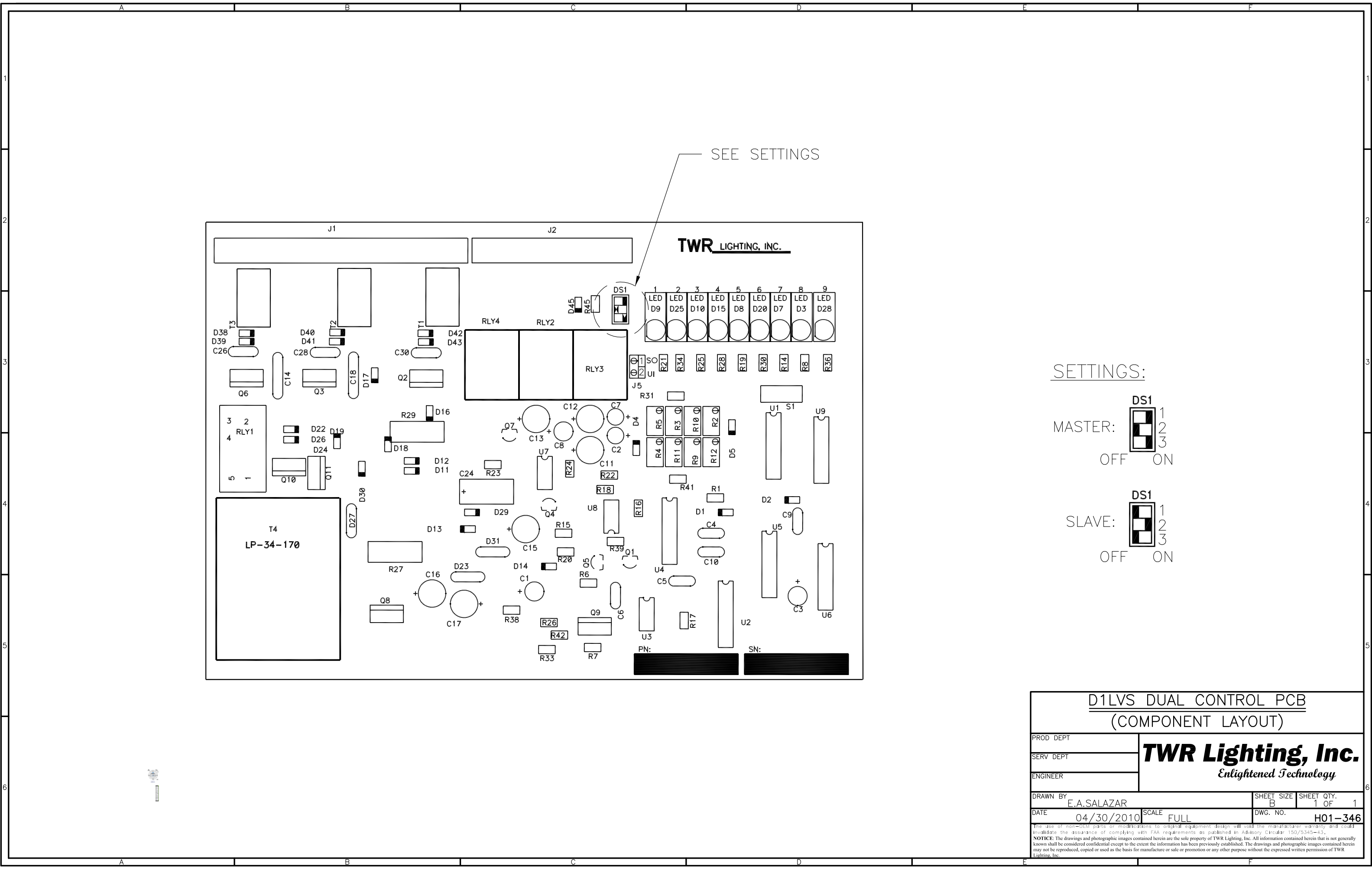
SYSTEM IS 120VAC 60Hz

LK1D1LVSDUAL WHITE STROBE
TRANSFER FOR EACH BEACON

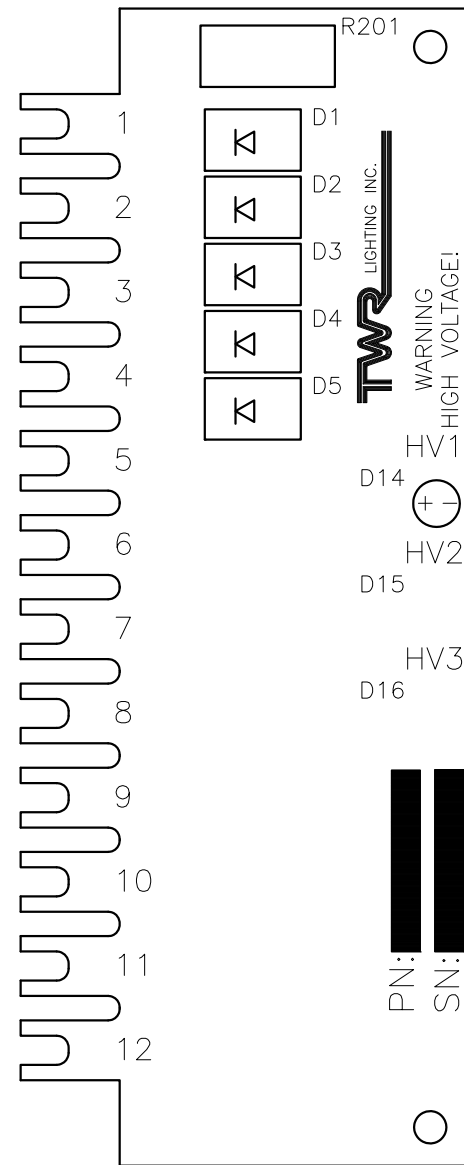
PROD DEPT	TWR Lighting, Inc. <i>Enlightened Technology</i>	SHEET SIZE	SHEET QTY.
SERV DEPT		B	1 OF 1
ENGINEER			
DRAWN BY	E.A.SALAZAR	SCALE	N.T.S.
DATE	12/08/2009	DWG. NO.	T1414

The use of non-TWR 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.
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05/04/10	(B)	ADD. BOM
DATE:	LTR.	REVISION



D1LVS DUAL CONTROL PCB (COMPONENT LAYOUT)			
PROD DEPT	TWR Lighting, Inc. <i>Enlightened Technology</i>		
SERV DEPT			
ENGINEER			
DRAWN BY E.A.SALAZAR	SHEET SIZE B	SHEET QTY. 1 OF 1	
DATE 04/30/2010	SCALE FULL	DWG. NO. H01-346	
<small>The use of non-TWR 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. NOTICE: The drawings and photographic images contained herein are the sole property of TWR Lighting, Inc. All information contained herein that is not generally known shall be considered confidential except to the extent the information has been previously established. The drawings and photographic images contained herein may not be reproduced, copied or used as the basis for manufacture or sale or promotion or any other purpose without the expressed written permission of TWR Lighting, Inc.</small>			

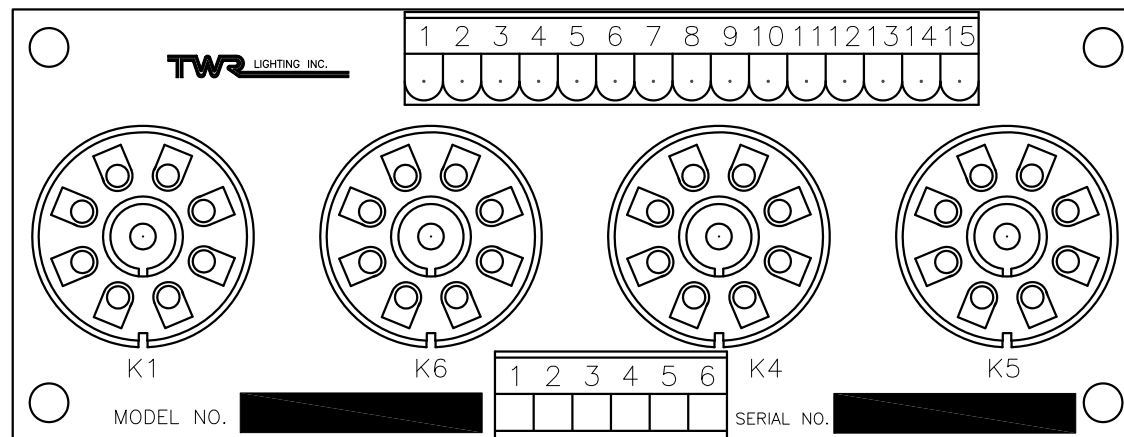


HIGH VOLTAGE RECTIFIER PCB

PROD DEPT	TWR Lighting, Inc. <i>Enlightened Technology®</i>		
SERV DEPT			
ENGINEER			
DRAWN BY E.A.SALAZAR	SHEET SIZE B	SHEET QTY. 1 OF 1	
DATE 11/07/98	SCALE FULL	DWG. NO. H02-226A	

05/13/03	(A)	UPDATED DWG
DATE:	LTR.	REVISION

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.
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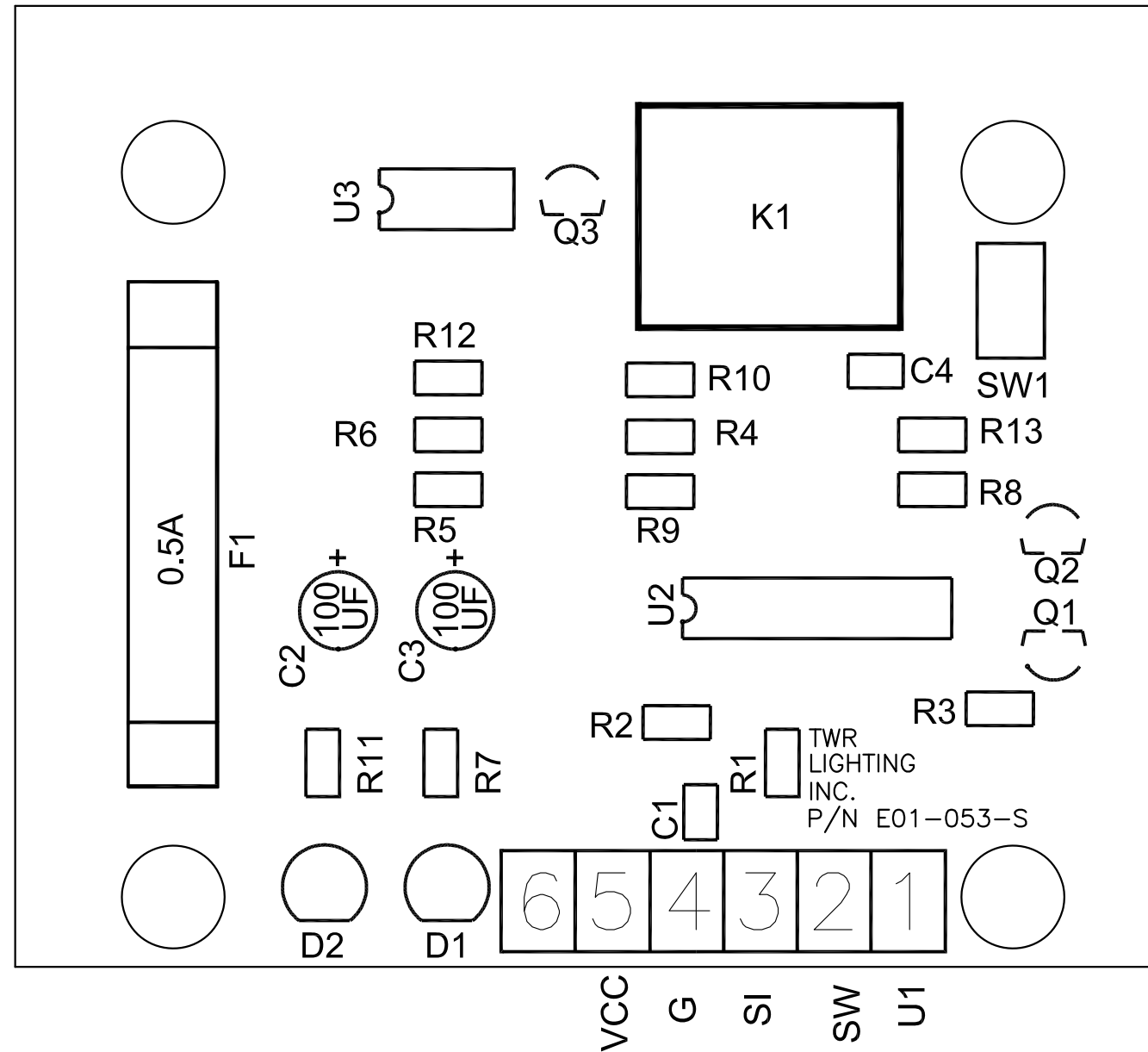


<u>D-1LV RELAY PCB</u>			
PROD DEPT	TWR Lighting, Inc. <i>Enlightened Technology®</i>		
SERV DEPT			
ENGINEER			
DRAWN BY	E.A.SALAZAR	SHEET SIZE	SHEET QTY.
DATE	07/24/97	B	1 OF 1
SCALE	N.T.S.	DWG. NO.	H03-226

05/13/03	(B)	UPDATED PCB
DATE:	LTR.	REVISION

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.

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SIGNAL BACKUP PCB #4

PROD DEPT
SERV DEPT
ENGINEER

TWR Lighting, Inc.
Enlightened Technology

DRAWN BY
R.MORENO

SHEET SIZE
B

SHEET QTY.
1 OF 1

DATE
1/21/2009

SCALE
N.T.S.

DWG. NO.
H04-338TS

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.
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4

3

2

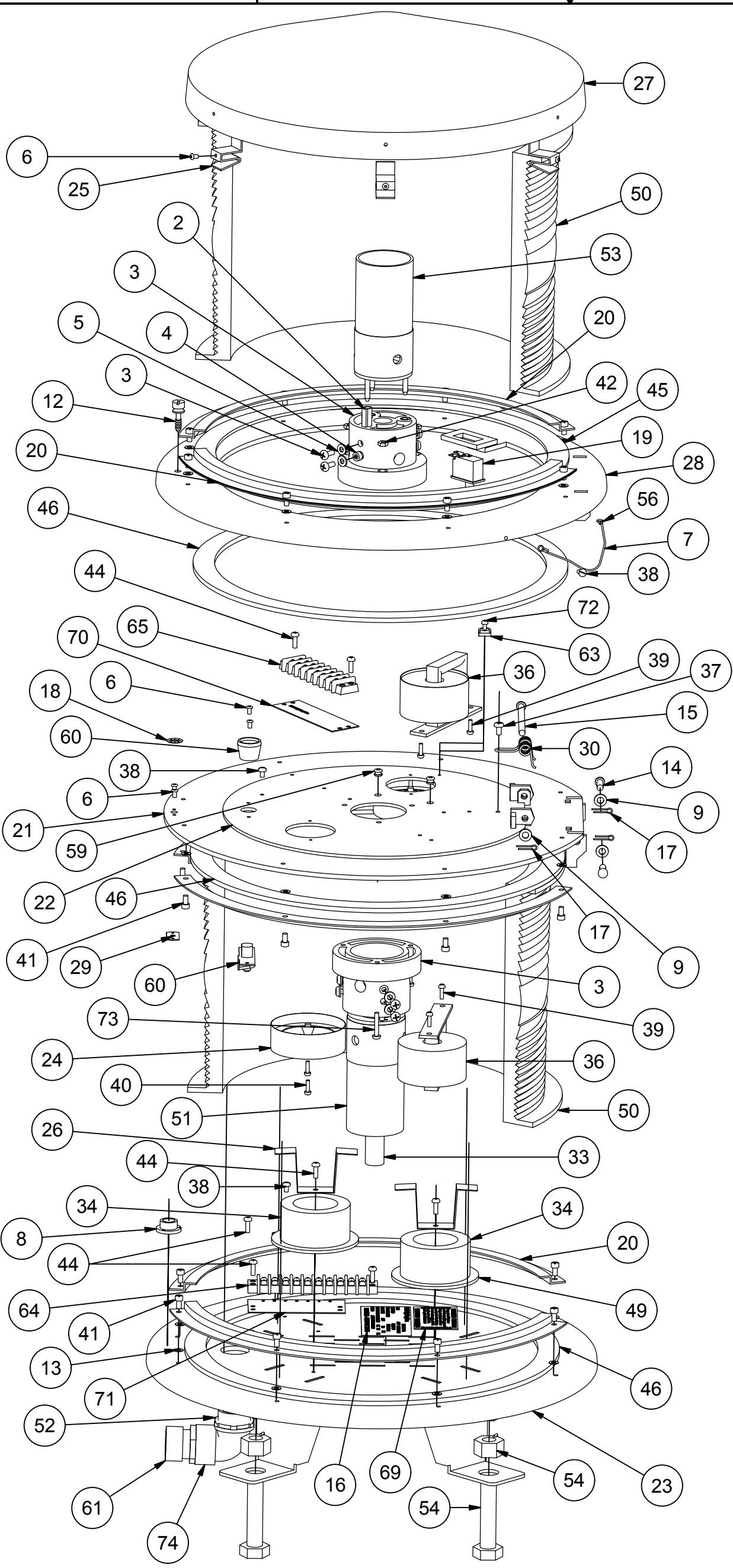
1

B

B

A

A



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	6	100337	DUAL BEACON LENS RETAINER RING
21	1	100343	DUAL BEACON LOWER HINGE ASSEMBLY
22	1	100345	DUAL BEACON HATCH PLATE
23	1	100360	DUAL BEACON BASE ASSEMBLY
24	2	100367	DUAL BEACON VENT CAP
25	6	100368	DUAL BEACON CAP BRACKET
26	1	100396	INDUCTOR BRACKET
27	1	100344	CAP DUAL BEACON
28	1	100342	DUAL BEACON UPPER HINGE ASSEMBLY
29	1	121102013	DB QUICK OPEN SCREW FLAT RECEPTACLE
30	1	070-4500	DB HATCH SPRING SS DWG100558
31	2	* 16AWGBLK	#16AWG TEFLON BLACK WIRE
32	1	* 16AWG RED/WHT	#16AWG TEFLON RED/WHITE WIRE
33	1	INSUTUBE	DUAL BEACON CERAMIC INSULATOR
34	1	INDCTRC3001	INDUCTOR .47MH TRANSFORMER
35	1	* 16AWG RED/BLK	#16AWG TEFLON RED/BLACK WIRE
36	2	STC05005	TRIGGER TRANSFORMER
37	1	1032X38PHH	10-32 X 3/8 PHILLIPS PAN HEAD SCREW
38	4	832X14PHH	8-32 X 1/4 PH SS SLOT SCREW
39	4	632X38PHH	6-32 X 3/8 PHILLIPS PAN HEAD SCREW
40	4	632X12PHH	6-32 X 1/2 PHILLIPS PAN HEAD SS SCREW
41	24	1032X38PHW	10-32 X 3/8 SS PHILIP HD CAPTIVE SCREW
42	3	832NUT	8-32 NUT
43	2	* 18RAD18277	T&B CONNECTOR
44	7	832X12PHH	8-32 X 1/2 PHILLIPS PAN HEAD
45	1	STBEAGSKT	GASKET NEOPRENE 13 1/4 X 15
46	3	STBEAGSK2	GASKET NEOPRENE 3/16 X 15 1/4
47	18	* TYZ23M	HI TEMP TY WRAPS
48	8	* 14RB10R	T&B CONNECTOR
49	2	100394-02	INDUCTOR BOTOM PAD GASKET
50	2	STDBCLENS	CLEAR DB LENS
51	1	STFLSHTB6	DAY MODE TUBE G01-109
52	1	A315	1" CONDUIT LOCKNUT GALVANIZED
53	1	STFLSHTB8	NIGHT MODE TUBE G01-112
54	4	58X112	A325 5/8 X 1-1/2 BOLT W/ANCO L/NUT
55	2	* HEATSHRINK2	1/2" GLUE BASE HEAT SHRINK
56	4	CSL062X100	1/16 COPPER SLEEVE
57	2	* 14RB8FL	STAKON
58	.25	* HEATSHRINK	1/4" RED HEAT SHRINK
59	2	A10290	5/32" ID RUBBER GROMMET
60	1	57-10-401-10	SOUTHCO SPRING LATCH W/BLACK KNOB
61	1	CC-MPT-1-G	1" CORD CONNECTOR .700 TO .984
62	1	* STDBEAPIGTAIL2	DUAL BEACON PIGTAIL
63	1	TYANCHOR	TY WRAP ANCHOR 23N3669
64	1	621 RZ 10	10 PART TERMIBNAL BLOCK
65	1	621 RZ 8	8 PART TERMINAL BLOCK
66	24	* 18RA6FL	STAKON
67	13	* 14RB-6FL	14-16 AWG #6 LOCKING FORK
68	3	* KV10-8F-D	10-12 AWG #8 LOCKING FORK
69	1	NONOEMLBL	NON-OEM PARTS WARNING LABEL
70	1	MS621XP08	MS8-141 CINCH TERMINAL MARKER
71	1	MS621XP10	MS10-141 CINCH TERMINAL MARKER
72	1	632X14PHH	6-32 X 1/4 PHILLIPS PAN HEAD SCREW
73	3	832X1PHH	8-32 X 1 PHILLIPS PAN HEAD SS SCREW
74	1	EL190S	1" 90 DEGREE SHORT ELBOW GALV

* = ITEMS NOT SHOWN

DRAWN	Edward Salazar	4/26/2010
PROD DEPT		
SERV DEPT		
ENGINEER		
APPROVED		

TWR Lighting, Inc.
Enlightened Technology

TITLE		
L865 DUAL BEACON ASSEMBLY (STDBEACOND)		
SIZE	DWG NO	REV
B	100837i	
SCALE	SHEET 1 OF 1	

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