INSTRUCTION MANUAL

Flight Light, Inc. ZA737/757
PRECISION APPROACH PATH INDICATOR (STYLE A)

Revision:C
05/30/2013

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INSTRUCTION MANUAL INDEX

3.00 SITING AND AIMING

SECTION ONE INSTALLATION INSTRUCTIONS

1.00 Installation: The ZA737/757 PAPI system requires several steps to insure proper installation and maximum performance.

These steps should not be bypassed.

*** Determination of proper location of the light boxes.**
*** Installation of the footers and mounting pads.**
*** Interconnect wiring and home run wiring.**
*** Alignment of the light box assemblies.**
*** Electrical adjustments.**
*** Flight check.**

1.10 Determination of Proper Light Boxes

To obtain an optimized approach system, several factors must be considered. These are:

* What is the distance between the pilot's eyes and the wheel of the largest aircraft to use the runway?
* What is the desired threshold crossing height?
* What is the desired glide slope angle?
* Will the selection of the above parameters satisfy the required obstacle clearance angle?

1.20 Interconnect Wiring and Home Runs

1.21 The home run wiring size should be carefully selected to insure optimum performance of the system. Select the size as indicated by plans and specifications. If the power unit is located within 30' of the light box, #10 wire is adequate for the lamp circuit, and #14 wire is adequate for the tilt switch circuit.

1.22 To protect the wiring between the light box assembly and the point at which it goes underground, 1" watertight flex duct is a good selection. It can be terminated in a 1" conduct (pipe) sweep to interface to the trench.

1.23 Wiring Connections

Connect to terminals marked of the power adapter. Connect a ground rod ground to the power supply ground lug.

Connect all light box assembles to the Power Adapter. Please refer to the appropriate Installation wiring diagrams (attached).

Install and connect the twist lock photocell in its socket on top of the power supply. Orient the window of the photocell north and away from the runway to prevent aircraft landing lights from switching the photocell. Test the PEC by covering the cell. Lights should dim.

1.30 Adjustment of the Light Box Assemblies

The Aiming Device consists of precision machined aluminum block corresponding to the particular angles required by Glide Slope and number of boxes. There are 5 blocks for a four box system and 3 blocks for a two box system with standard Glide Slope of 3 degrees. Non-standard Glide Slopes will require special sets of aiming blocks. The Aiming Blocks are designed to be set on the edge of the light box with the provided spirit level on the top surface. Refer to Figs. 1 & 2

Figure 1 - Aiming device positioning.

1.31 L-881 (two box system)

The light box assembly nearest the runway should be adjusted to the glide slope angle + 1/4 degree (+15 minutes). The light box assembly farthest from the runway should be adjusted to the glide slope angle - 1/4 degree (-15 minutes). When the boxes are in place, make sure both are adjusted with the adjustment jacks so that the center of the lens of the boxes are at the same elevation. Remove the cover from the light box assembly. For horizontal alignment place the 6" spirit level across the light box, either on the lens housing or reflector housing. Adjust the forward nuts on the adjustment jacks to bring the spirit level to center.

HINT!

For each 1/4 turn executed on the nut on one side, turn the nut on the other side 1/4 turn in the opposite direction. This will keep the lens center at the same elevation at all times during adjustment. recheck both points. Position the proper aiming block on the edge of the light box for vertical alignment. Place the spirit level on the aiming block. Adjust the both rear adjustment jacks to bring the spirit level to center. Next, tighten the bolts holding the pivots. These are accessible underneath the unit at the forward corners.
Recheck the horizontal adjustment at points at each corner and adjust as required.
Tighten all nuts securely. Recheck the vertical adjustment, then tighten all nuts on the new pivot.
Last, place the level on top of the tilt switch. Adjust the tilt switch until the spirit level is centered.
Tighten the bolts to hold the tilt switch secure. Replace the cover on the light box assembly.

1.32 L-880 (four box system)

The light boxes:
Assembly nearest the runway should be adjusted to the glide slope angle + 1/2 degree. The next adjacent light box assembly should be adjusted to the glide slope angle + 1/6 degree. The next adjacent light box assembly should be adjusted to the glide slope angle - 1/6 degree. The next adjacent light box assembly should be adjusted to the glide slope angle - 1/2 degree. When the boxes are in place, make sure both boxes are adjusted with the adjustment jacks so that the center of the lens of all boxes are at the same elevation. Remove the cover from the light box assembly. For horizontal alignment place the 6" spirit level across the light box, either on the lens baffle or reflector baffle. Adjust the forward nuts on the adjustment jacks to bring the spirit level to center.

HINT!

For each 1/4 turn executed on the nut on one side, turn the nut on the other side 1/4 turn in the opposite direction. This will keep the lens center at the same elevation at all times during adjustment. Recheck both points. Position the proper aiming block on the edge of the light box for vertical alignment. Place the spirit level on the aiming block. Adjust the both rear adjustment jacks to bring the spirit level to center. Next, tighten the bolts holding the pivots. These are accessible underneath the unit at the forward corners. Tighten all nuts securely. Recheck the horizontal adjustment and adjust as required. Recheck the vertical adjustment, then tighten all nuts on the new pivot. Last, place the level on top of the tilt switch. Adjust the tilt switch until the spirit level is centered. Tighten the bolts to hold the tilt switch secure. Replace the cover on the light box assembly.

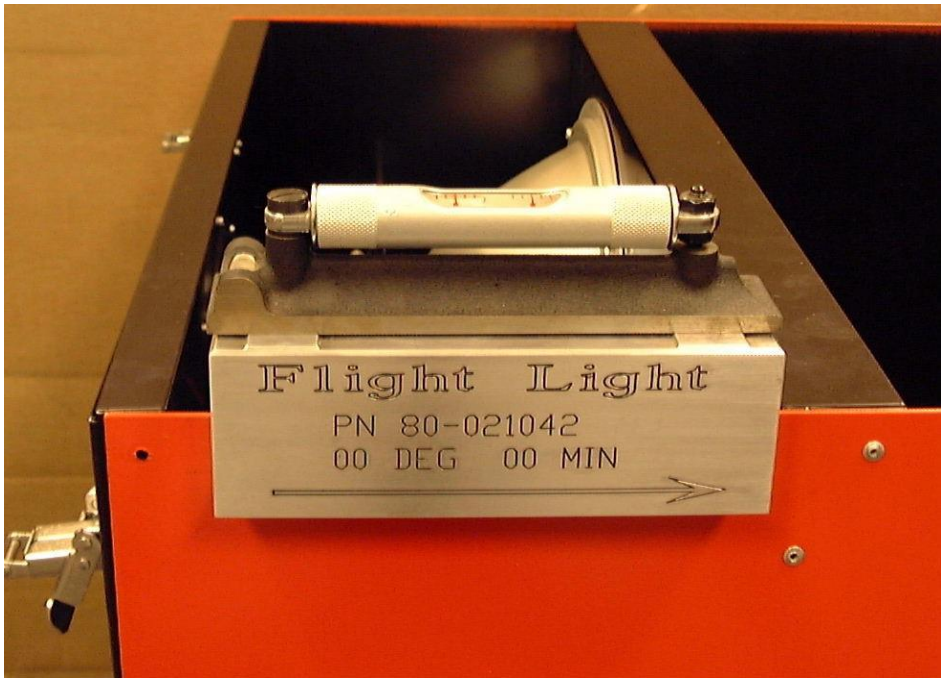


Figure 2 - Spirit level placed on aiming device.

1.40 Color Filter Installation and Electrical Adjustments

When installing the color filters, as viewed from the rear, select the indicated serial numbered filter set and install so that "TCR" is positioned top, center,(toward the center of the light box) and to the rear. This is marked on each color filter.

After each light box assembly has been properly aligned, and the tilt switches properly set, the system is ready to be turned on. Apply power to the system and energize the circuit breaker (CB1) in the Power Supply. The lamps in all light boxes should now be 'ON'.

CAUTION!

Do not look directly into the front of the light box because the light beam is very intense at that point.

Assuming it is daytime, the power supply should be adjusted to produce approximately 6.6 amps of current as read on the amp meter in the power adapter. If the amp meter reads less than 6.6 amps, turn the circuit breaker 'OFF'. Move the input to TB2-5 to the next lower numbered terminal, i.e. change from #5 to #4 would increase the amperage. At night the amperage should be 4.8 amperes.

Turn the circuit breaker 'ON'. check the amp meter for 6.6 amps. Continue this procedure until the current is as close to 6.6 amps as possible, but in no case, exceeding 6.6 amp.

Clean out the residue from the power supply and neatly dress the wiring.

Be sure that all light boxes and the power supply are connected to ground rod ground.

Close the door of the power supply and secure it's latch.

1.41 Lamp Installation-Install LA-6373 lamps into each light box assembly's lamp holder.

CAUTION!

Do not touch the quartz tube of the LA-6373 lamp as finger oils will significantly reduce lamp life. If touched, clean with rubbing alcohol.

1.42 Interlock Adjustment, set in over-current mode (optional feature only)
The current monitor is set at the factory to turn on when the current being sensed rises to a level greater than 6.3 amps after a time delay. This internal delay may require adjustment based upon airfield operational requirements, but set to minimum unless advised otherwise. Apply power to the runway lights at the required operational step. Fine-tune the trip point by turning the adjustment and watching the LED. The LED will light indicating over-current. When a over-current is sensed (**LED ON**), the output relay is energized. This is the normal state when the runway lights are energized.

1.50 Flight Check
Before placing in service, the system should be thoroughly flight checked. The flight check should include flying over any and all obstructions in the approach area to be sure that all light boxes show red whenever you are close to the obstructions. Several normal approaches should be made to insure good signal at all points in the approach path.

WARNING!

Turning the circuit breaker (CB1) to 'OFF' does NOT remove All voltages. TB1, SA1/2, and CB1are still 'HOT'!

SECTION TWO
SYSTEM DESCRIPTION

2.00 Principle Components
The model ZAZ737/757 PAPI 'A' Style system consists of the following principle components:
Light Box Assemblies (Qty 4 for L880; 2 for L881)
1 ea. - Power Adapter
1 lot - Mounting Hardware
1 ea. - Aiming Device with precision 6" Spirit Level. A protective case is included with each device.

2.10 Light Housing Assembly
The light box assembly is stable optical platform which supports the lamp, Reflector, lenses, color filter, and tilt switch. Light from the lamp is collected and focused into the plano-convex lens set. This combination produces the field of illumination into the approach area. Concurrent with the illumination, a red filter is so located that it is at the focal point of the plano-convex lens set as one would view the light box from the approach area. The transitions zone is factory adjusted so that it agrees with the calibrated scale on the alignment arrow assembly. When the light box assembly is being adjusted, the process elevates the front of the light box assembly so that the transition zone is set to the desired angle of inclination (alignment angle). It is extremely important that when the light box assembly is aligned in the field, all bolts and nuts are tightened properly, then alignment rechecked to insure accuracy. Lamp is Flight Light PN: LA-J1/39

2.20 Power Adapter

The power adapter assembly converts the 220 to 240 VAC (@ 50 or 60Hz) into 6.6 amperes to operate the lamps. This is accomplished by transformers T1 (and T2 in a 4 box system) which also provides a lower amperage taps so that the lamps can be dimmed for nighttime service. Following is a description of the purpose of the main components in the power supply:

SA1/2	Provides basic lightning surge protection of the 220-240 VAC input.
CB1	Circuit over current protection and ON/OFF switch.
T1(T2)	Power transformer(s): reduces the 220-240 VAC to acceptable required voltages while providing adjustments to lamp brightness.
PEC	Photo Electric Controller: detects night or day condition and provides signal (1=night, 0=day).
RTE-P21	Tilt failure detector and delay timer - adjustable - set to 30 seconds in factory.
M1	0 - 10 Meter: provides visual indication of lamp current and assists in prevention of over-driving the lamps. It's accuracy is 2%.
CR1 & CR2	Lamp intensity step-down relay: Energized during low light levels.
CR3 & CR4	Lamp/tilt circuit control element - normally energized. Tilt failures de-energize this unit with delay set by RTE-P21. This turns OFF all lamps.
Monitor	This is an optional unit used to provide interlock to runway lighting circuits.
K1	Control relay for optional interlock control.
PS1	Power supply for stable timer and monitor operation.

2.30 Day/Night Control

By utilizing a PEC and a DPST relay, the controller can automatically switch between two different brightness levels depending on ambient light levels. This in essence provides day/night brightness levels. During daylight the PEC's output will be de-energized. Relays CR1 and CR2 will be

2.30 Day/Night Control(cont)

de-energized. During night operation, the PEC's output is energized which in turn energizes the relays CR1 and CR2. Minimum rated current is supplied to the lamps from T1/T2. This reduced lamp current (4.8A)/intensity insures pilot safety and convenience. By design in the event of component failure, the system will default to the night brightness level for insured aircraft safety or shut down completely with tilt failures.

2.40 Power Regulation Circuit

The power regulation circuit consists of a 15 amp circuit breaker, and multi-tap transformers (T1 and T2). In operation CB1 acts as the ON/OFF switch while providing circuit over-current protection. SA1 and SA2 provides basic lightning surge protection to the entire unit. The multi-tap power transformer(s) allows adjustment of both the day and night brightness levels via the taps on the secondary side.

2.50 Tilt Detection Circuit

To insure aircraft safety by preventing out-of-alignment systems from operating, a tilt detection circuit has been incorporated into the controller. This circuit utilizes a time delay feature to screen out false signals due to vibrations. In normal operation with a closed tilt loop switch-loop,

NOTE: BOTH RTE-P21 LEDS WILL BE 'ON'.

Should the tilt circuit fail, the Mode LED (top) will extinguish after the delay period which was factory adjusted to 30 seconds. At no time should this or any other safety feature be bypassed or modified. To do so will risk aircraft safety.

2.60 Lens Heater Circuit, Class II only

In severe winter climates, the lens must be heated to insure dependable operation in all weather conditions. This is accomplished by a power resistor in series with each lamp filament. It dissipates approximately 20 watts into its heater mount; this insures complete lens heat absorption and dependable signal presentation to pilots.

2.70 Alignment & Aiming Device Calibration

This component has two parts. The structural component shown in Figure 2 has no calibration. It has been factory checked for accuracy and cannot be altered without damage to the frame. The adjustable precision spirit level is shown in Figure 3. The level was factory aligned and should not require adjustment, but if this were ever necessary, the check and alignment is quite simple:

A. Use any flat level surface - the more level and stable the better. Insure the surface is clean, and that the bottom of the level is also clean.

B. Place the level on the inspected area, marking its location. Now, reverse the level (turn it 180 degrees). The bubble **MUST** be in the same relative position on the scale.

C. With each movement of the level, give the bubble time to become stable.

D. Should the bubble **NOT** be in the same relative position, loosen the adjustment nuts and correct for **one-half** of the difference in the readings. Re-tighten the nuts. Repeat steps B, C, and D until there is no difference. This completes the Alignment and Aiming Device's calibration. It should be accomplished before each use, or at least semi-annually.

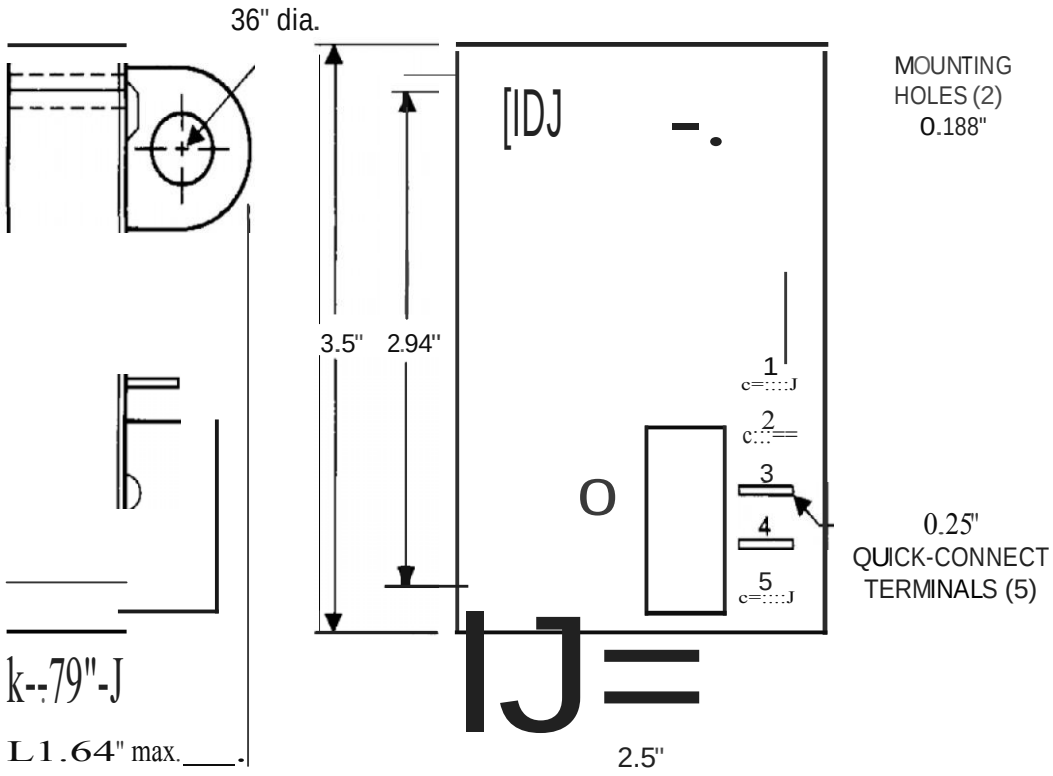
2.80 Runway Interlock (optional)

The Monitor senses the current flowing in the connected runway circuit. The logic of it operation is as follows:

Daylight:	**Runway Lights:**	**PAPI Lamps On?**
Yes	On	Yes
Yes	Off	Yes
No	**On**	**Yes**
No	**Off**	**No**

Since it controls the Power Adapter by interrupting the tilt switch circuit, the tilt switch timer's delay must be considered when testing or troubleshooting. Please refer to FLP28401D and FLP28401C, sheets 1 and 2 (attached).

MECHANICAL


36" dia.
MOUNTING
HOLES (2)
0.188"
3.5"
2.94"
1
2
3
4
5
0.25"
QUICK-CONNECT
TERMINALS (5)
.79"
1.64" max.
2.5"

SECTION THREE
SIGNAL PRESENTATION AND SITE CONSIDERATIONS

3.10 Signal Presentation

The precision approach path indicator (PAPI) is a system of either four or two identical light housing assemblies or "light units" placed on the left of the runway aimed outward into the approach zone on a line parallel to the runway. The front face of each unit is perpendicular to the runway centerline. The boxes are positioned and aimed to produce the signal presentation described below.

A. L-880 "Four Box System": When making an approach, the pilot will:

(1) When on or close to the established approach path, see the two units nearest the runway as red and the two units farthest from the runway as white; and

(2) When above the approach path, see the unit nearest the runway as red and the three units farthest from the runway as white; and when further above the approach path see all the units as white; and

(3) When below the approach path, see the three units nearest the runway as red and the unit farthest from the runway as white; and when further below the approach path see all units as red.

B. L-881 "Two Box System": when making an approach, the pilot will:

(1) When on or close to the established approach path, see the unit nearest the runway as red and the other unit as white; and

(2) When above the approach path, see both units as white; and

(3) When below the approach path, see both units as red.

PAPI SIGNAL PRESENTATION

3.20 General Site Considerations

When viewed from the approach end, the PAPI system shall be located on the left side of the runway. In the event of siting problems, such as conflicts with runways or taxiways, the PAPI may be located on the right side of the runway. The PAPI must be sited and aimed so that it defines an approach path with adequate clearance over obstacles and a minimum threshold crossing height ("TCH"). If the runway has an Instrument Landing System (ILS) Glide slope already established, the PAPI is installed as described in 1.3 below so that the visual Glideslope will coincide (as much as possible) with the electronic one produced by the ILS. If there is no ILS on the runway, the PAPI Glideslope is chosen as described in 1.4 below. Aiming of the light units is described at 1.50. Other siting tolerances and considerations which are common to all PAPI installations are described at 1.6.

3.30 PAPI site on a Runway With an ILS glide slope

When the PAPI site is on a runway with an established ILS glide slope, the PAPI visual approach path should coincide as much as possible with the one produced electronically by the ILS. To accomplish this, the PAPI is placed at the same distance from the threshold as the virtual source of the ILS glide slope within a tolerance of +/- 30 feet (+/- l0m). The PAPI is aimed at the same angle as the ILS glide slope. For these locations, the distance to the ILS glide slope source plus an additional 300 feet +50, -0 (90m + 15, -0).

3.40 PAPI site on a Runway Without an ILS glide slope

When an ILS glide slope is not present, the designer must determine a position and aiming for the PAPI which will produce the required threshold crossing height and clearance over obstacles in the approach area.

3.41 Threshold Crossing Height (TCH)

The TCH is the height of the lowest on-course signal at a point directly above the intersection of the runway centerline and the threshold. The minimum allowable TCH varies according to the height group of aircraft that uses the runway. The PAPI approach path must provide the proper TCH for the most demanding height group that uses the runway.

3.42 Glide Path Angle

The visual glide path angle is the center of the on-course zone, and is normally 3 degrees when measured from horizontal. For non-jet runways, this may be raised to 4 degrees if required to provide obstacle clearance. If used, the higher angle must be specified in a Notice to Airmen (NOTAM) and published in the Airport Facility Directory.

3.43 The PAPI Obstacle Clearance Surface

The PAPI obstacle clearance surface is established to provide the pilot with a minimum clearance over obstacles during approach. The PAPI must be positioned and aimed so that no obstacles penetrate this surface. The surface begins 300 feet (90m) in front of the PAPI system (closer to the threshold) and proceeds outward into the approach zone at an angle 1 degree less than the aiming angle of the third light unit from the runway (L-880, Four Box System), or the outside light unit (L-881, Two Box System). For a L-880 with a 3 degree glide path and 20 minute separation between light units, the third light unit from the runway would be aimed at 2 degree 50' elevation. The surface extends 10 degrees on either side of the runway centerline extended, and extends 4 statute miles from its point of origin. If a site survey determines that there is an obstacle which penetrates the obstacle clearance surface, and cannot be moved, then the glide path angle must be changed or the PAPI system moved further from the threshold. By moving or re-aiming the PAPI, the designer must reposition the PAPI obstacle clearance surface so it will not be penetrated by an obstacle.

3.50 Aiming

After the visual glide path angle has been selected, the PAPI units are aimed to define that path. The standard aiming angles for the L-880 (4-Box) and the L-881 (2-Box) systems are shown in Tables 2 and 3 of the FAA CIRCULAR AC 150/5345-28D dtd. 5/23/85, and are reflected in these instructions.

Table 2. Aiming of the L-880 (4-Box) PAPI
Relative to a pre-selected glide path, Chapter 2, par. 20, page 15.

Table 3. Aiming of the L-881 (2-Box) PAPI
Relative to a pre-selected glide path, Chapter 2, par. 20, page 15.

3.60 Other Site Dimension and Tolerances

3.61 Distances From Runway Edge

The inboard light unit shall be no closer than 50 feet, +10, -0 (15m, +3, -0) from the runway edge or to other runways or taxiways. This dimension may be reduced to 30 feet (10m) for small general aviation runways used by non-jet aircraft.

3.62 Separation Between Light Units-The PAPI Units shall have a lateral separation of between 20 and 30 feet (6 to 9m) for a 4-Box system because it increases the usable range of the 4-box system the distance between boxes shall not vary by more than 1 foot (0.3m).

3.63 Azimuth Aiming
Each light unit shall be aimed outward into the approach zone on a line parallel to the runway centerline within a tolerance of +/- 1/2 degree.

3.64 Mounting Height Tolerances
The beam centers of all light units shall be within +/- 1 inch of a horizontal plane. This horizontal plane shall be within +/- 1 foot (0. 3m) of the elevation of the runway centerline at the intercept point of the visual glide path with the runway (except for the condition at 1.67 below).

3.65 Tolerance Along Line Perpendicular to Runway
The front face of each light unit in a bar shall be located on a line perpendicular to the runway centerline within +/- 6 inches.

3.67 Other Site Consideration
(1) Where the terrain drops off rapidly near the approach threshold and severe turbulence is experienced, the PAPI should be located farther from the threshold to keep the aircraft at the maximum possible threshold crossing height.
(2) On short runways, the PAPI should be as near the threshold as possible to provide the maximum amount of runway for braking after landing.
(3) At locations where snow is likely to obscure the light beams, the light units may be installed so the top of the unit is a maximum of 6 feet (2m) above ground level. This may require locating the light units farther from the runway edge to ensure adequate clearance for the most critical aircraft. Since raising the light units also raises the threshold crossing height for the visual glide path, the lights may also have to be relocated closer to the threshold to remain within specified tolerances.

3.70 Siting the Typical L-881 (2-Box) System

Abbreviations:
Dl = ideal (zero gradient) distance from the threshold
RWY = Runway longitudinal gradient
TCH = Threshold Crossing Height
T = Threshold
E = Elevation difference between threshold and
RRP = Runway reference point (where aiming angle or visual approach path intersects runway profile)
D= Adjusted Distance from Threshold
O= Aiming Angle

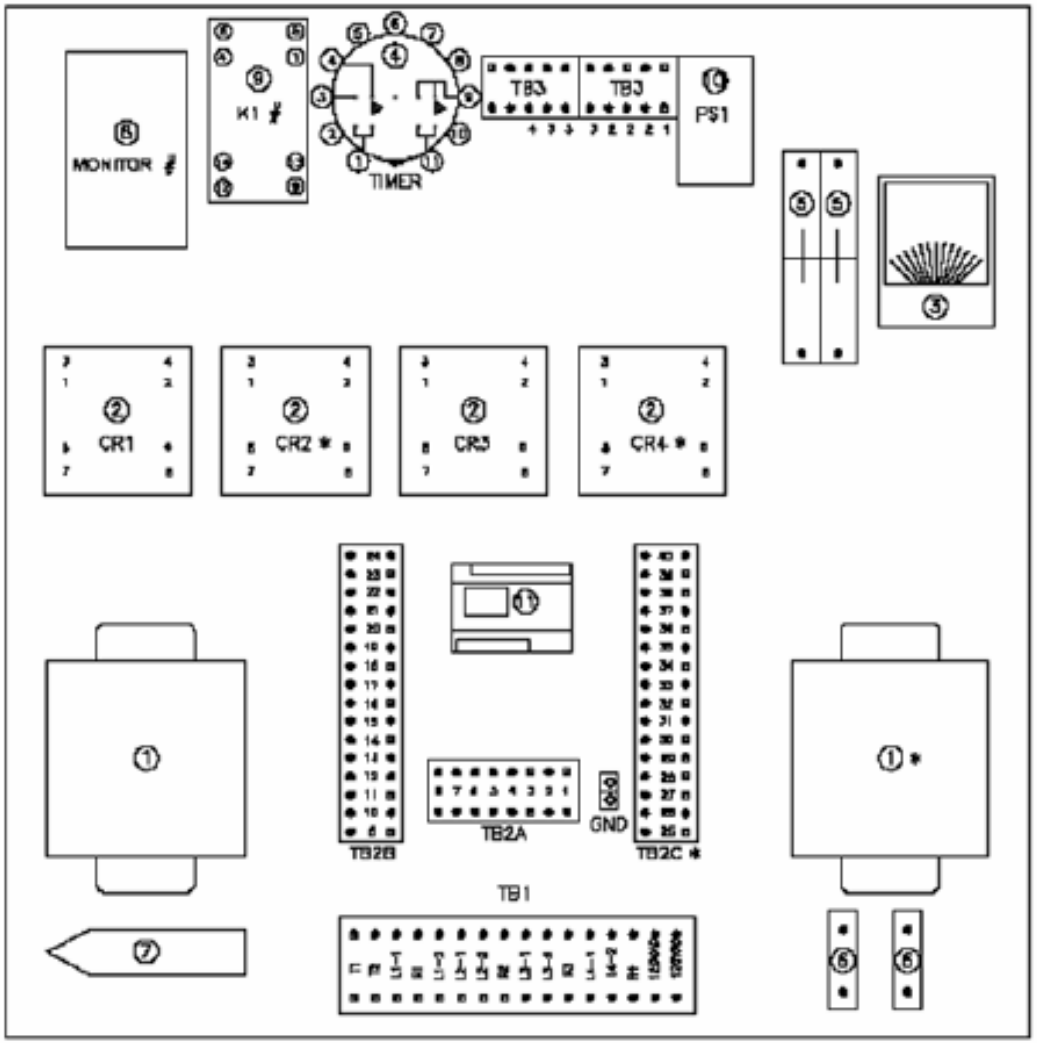
SECTION FOUR

TROUBLESHOOTING

4.00 Troubleshooting

Very few problems will occur with your system. However, in the case of problems, the following pointers will help you locate and correct the problems. It is assumed that all interconnect wiring is good and that tilt switches are aligned and have continuity. Also, verify 50 or 60Hz power source for operation.

Symptom	**Likely Problem**
CLASS I or CLASS II	
Lamp **'OUT'**	Check lamp (if either lamp burns out, it would not shut off the other lamp).
PEC operation reversed (dim in daylight)	Check wiring of PEC toTB3 (color coded red/blk/wht).
CLASS II ONLY!	
Lamp still not **'ON'**	Temporarily short TB1B, R1-1 and R1-2, then R2-1 and R2-2. As each is tested, if the failed lamp turns **'ON'**, the heater resistor may have failed. Check for .5 ohm resistance - replace if required.
CLASS I or CLASS II	
Lamps do not light (RTE-P21 mode light out)	Temporarily short Power Supply TB1 T-1 and TB1 T-2 and engage CB1. If system now functions, problem is either switches or tilt switch wiring. If problem is determined to be a particular tilt switch, readjust tilt switch by going through zero and then back. ***DO NOT LEAVE JUMPER IN PLACE!***
Light Box Alignment	Footers not stable. Mounting hardware is not tight. Check floor flanges, nuts on frangible couplings, bolts & nuts on light b



PART LISTS

Item	Noun	Pn	Quantity
1]	Transformer	77-837-10X	2 ea. *
2]	Relay	77-R186X-15	4 ea. *
3]	Meter	77-153-0606	1 ea.
4]	Timer	77-RTC-P21	1 ea.
5]	DCT Breaker	77-15584U	1 ea.
6]	Surge Arrester	77-V2510A40	2 ea.
7]	Tool	77-777-310	1 ea.
8]	MONITOR #	77-DC501BC	1 ea.
9]	RELAY #	77-RM2S-UL	1 ea.
10]	POWER SUPPLY	77-PSSRA24	1 ea.
11]	MICROCONTROLLER	77-MA610RCA	1 ea

Notes:

* = Not present in 2 box system

= Present w/Interlock Option

PN: 77-937-10X

X=0=ZA737, Class 1
X=7=ZA737, Class 2

CAD FILE: FLP28400J.DWG
PLOT PALETTE: FLPLOT.PCP

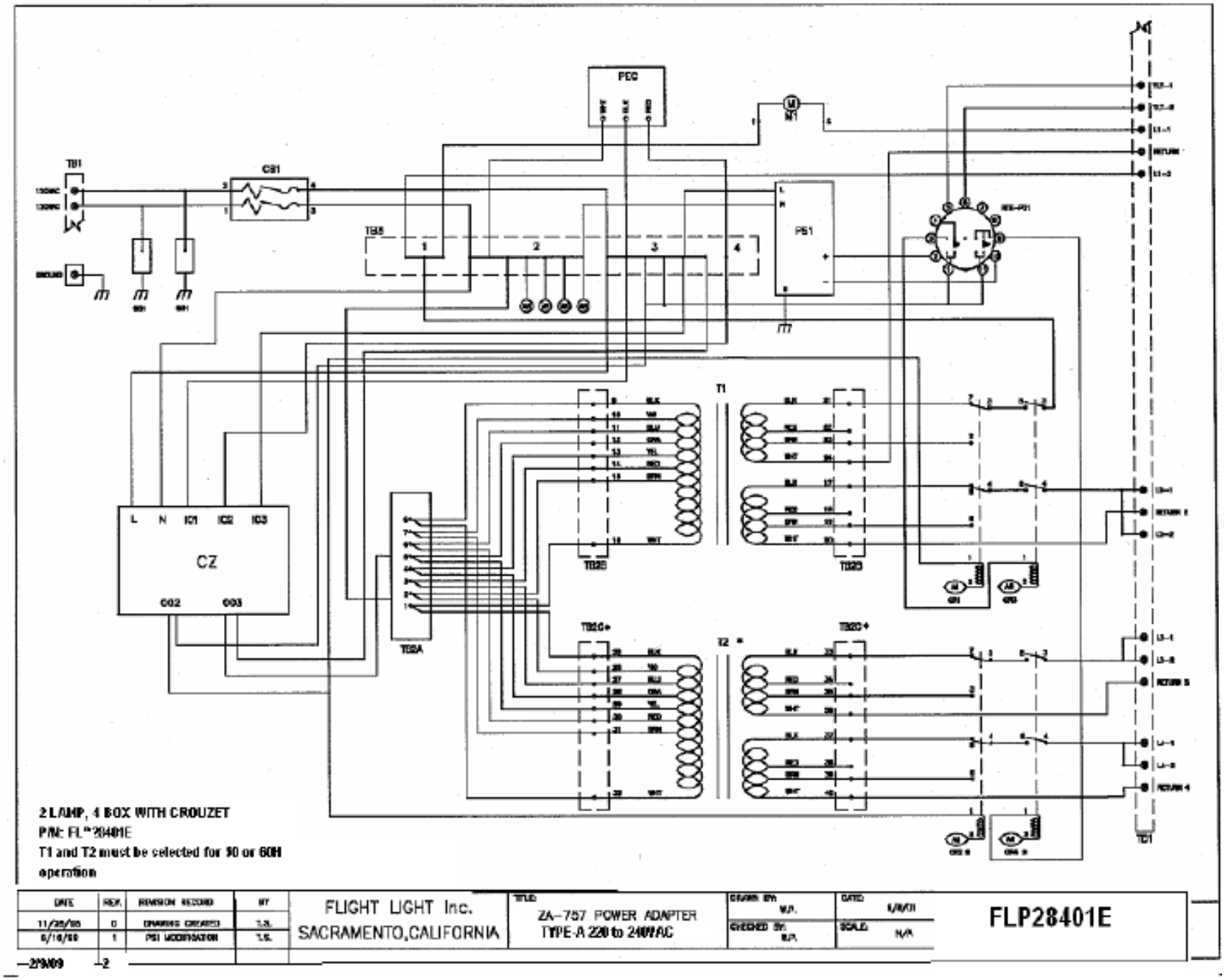
DATE	REV.	REVISION RECORD	BY
7/14/08	0	DRAWING CREATED	M.F.

FLIGHT LIGHT Inc.
SACRAMENTO, CALIFORNIA

TITLE: ZA-737 POWER ADAPTER LAYOUT TYPE-A, 240VAC

DRAWN BY: MIKE PAGE
CHECKED BY: M.F.
DATED: 7/14/08
SCALE: N.T.S.

DWG. NO. FLP28400J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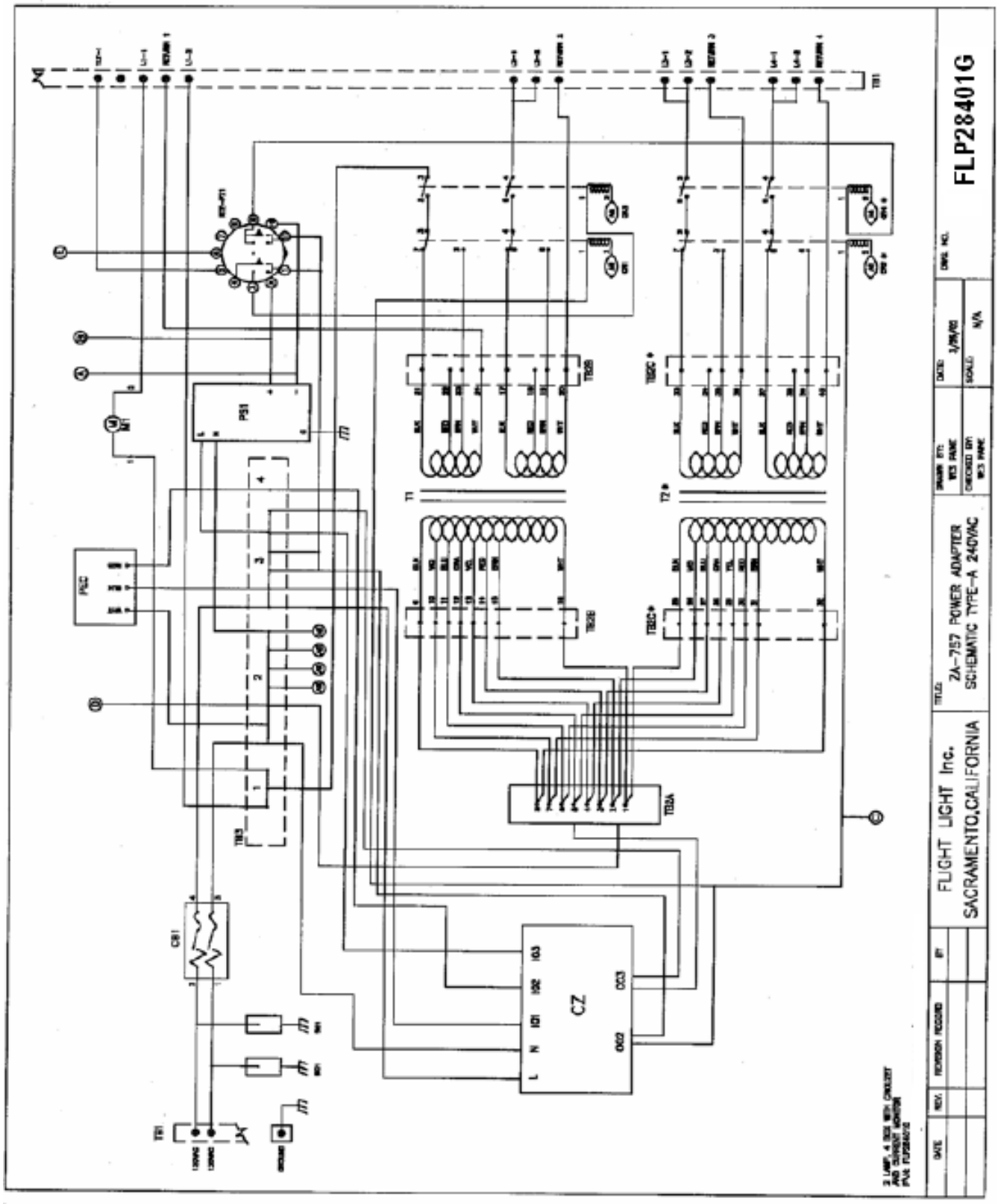
TB1
CB1
TB5
PS1
T1
T2
CZ
L
N
IO1
IO2
IO3
OO2
OO3
TB2A
TB2B
TB2C
TB2D
TD1
2 LAMP, 4 BOX WITH CROUZET
P/N: FLP28401E
T1 and T2 must be selected for 50 or 60H operation
FLIGHT LIGHT Inc.
SACRAMENTO,CALIFORNIA
ZA-757 POWER ADAPTER
TYPE A 220 to 240VAC
FLP28401E


FLP28401G
ZA-757 POWER ADAPTER
SCHEMATIC TYPE-A 240VAC
FLIGHT LIGHT Inc.
SACRAMENTO,CALIFORNIA
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T2
TB1
TB2
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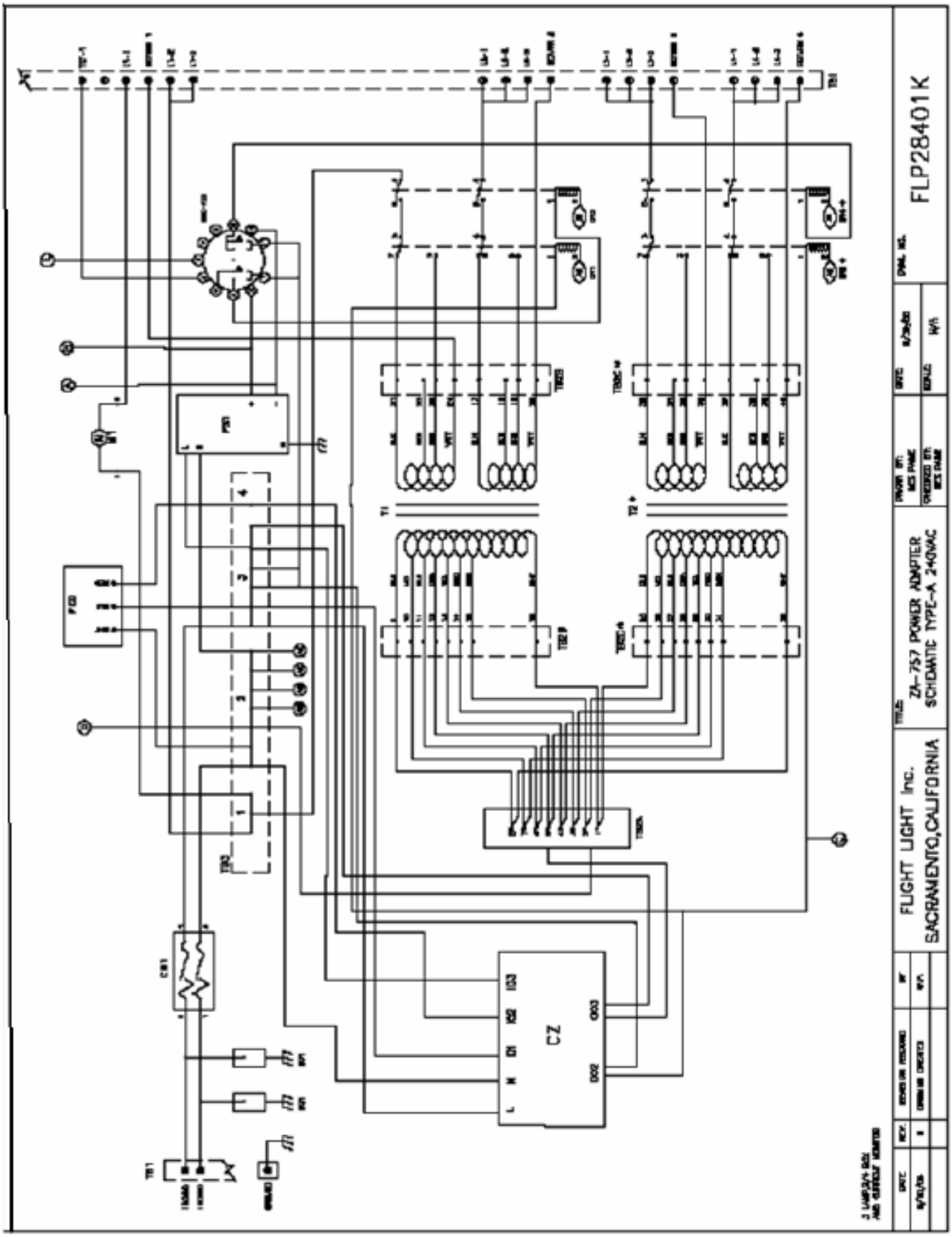
TB2B
TB2C
TB3
CB1
PLC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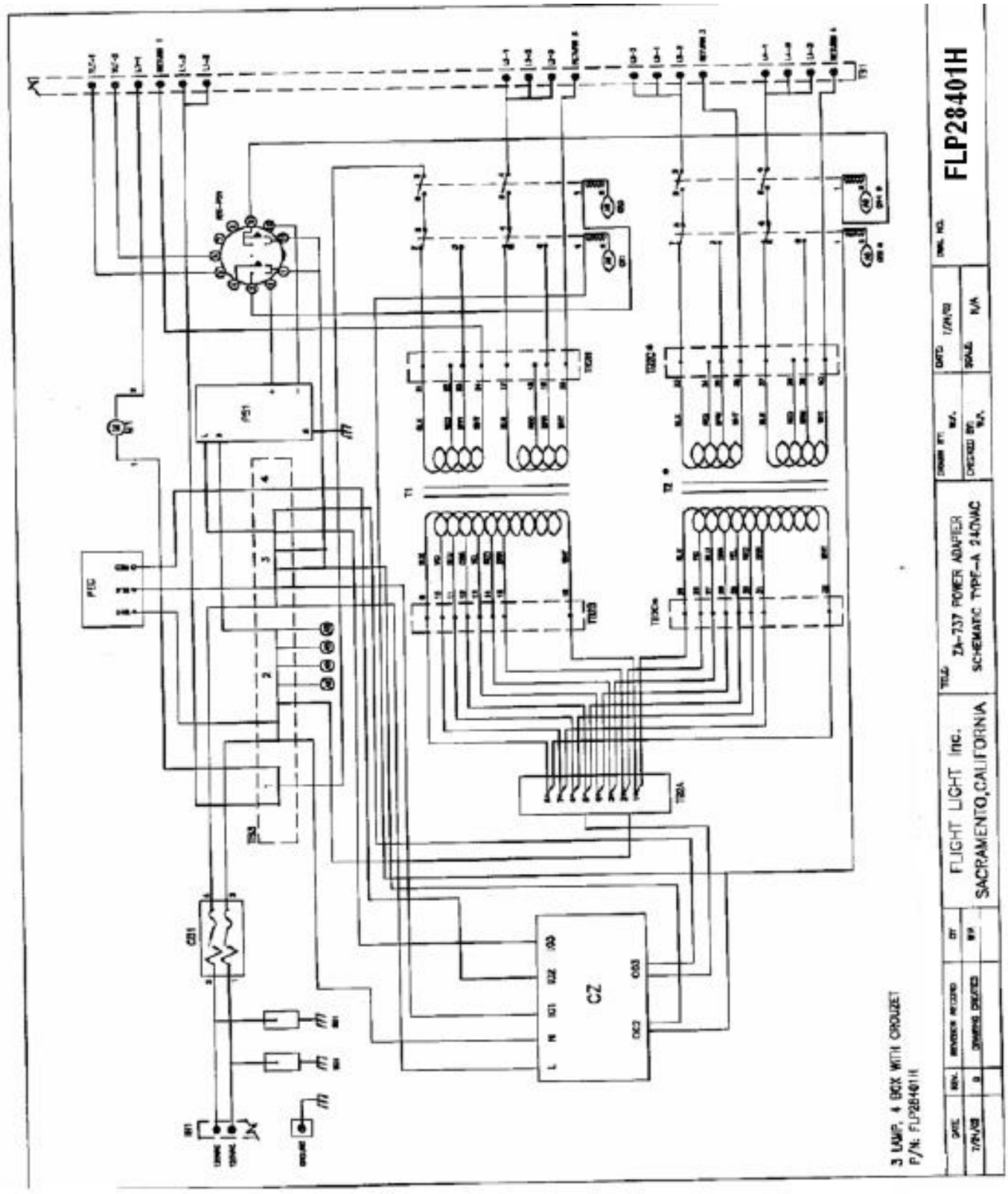
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FLIGHT LIGHT Inc.
SACRAMENTO,CALIFORNIA
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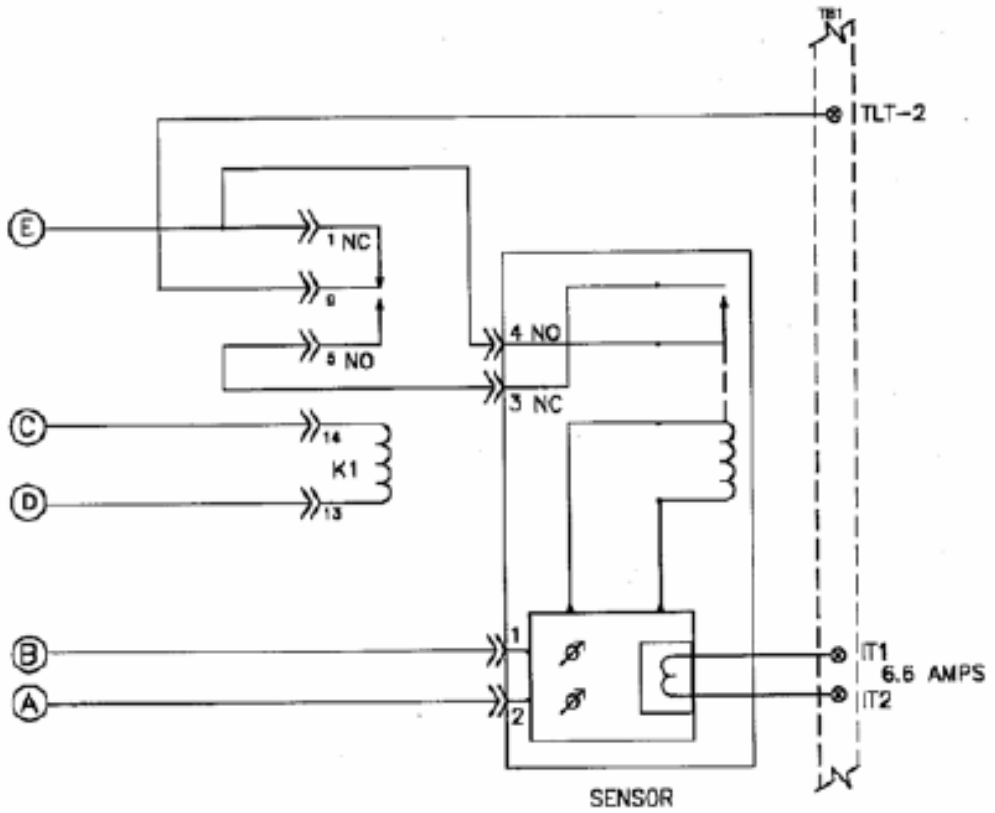
C2



CURRENT SENSOR
P\N: FLP28401G-2

DATE	REV.	REVISION RECORD	BY
3/25/02	0	DRAWING CREATED	W.P.

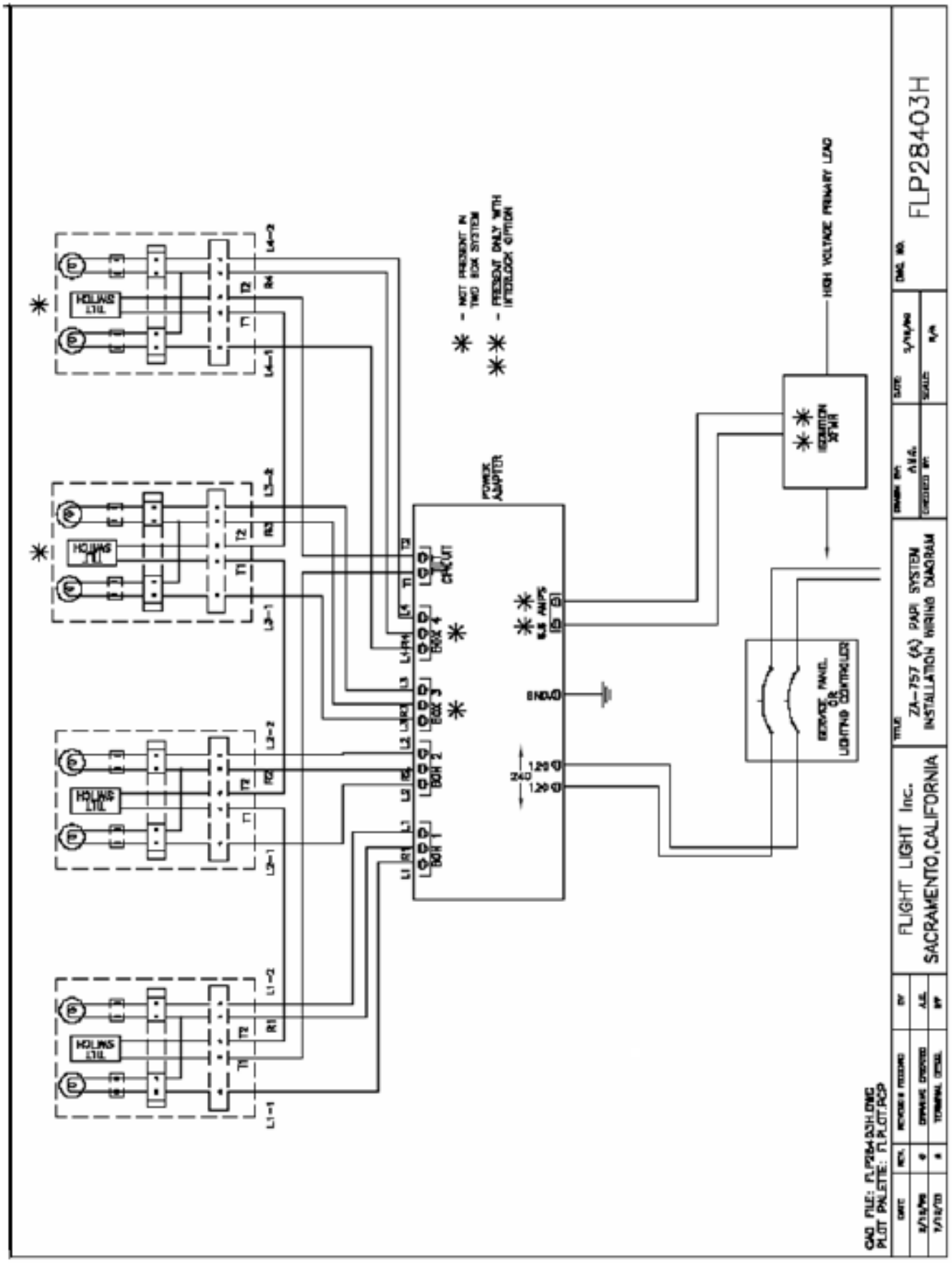
FLIGHT LIGHT Inc.
SACRAMENTO,CALIFORNIA

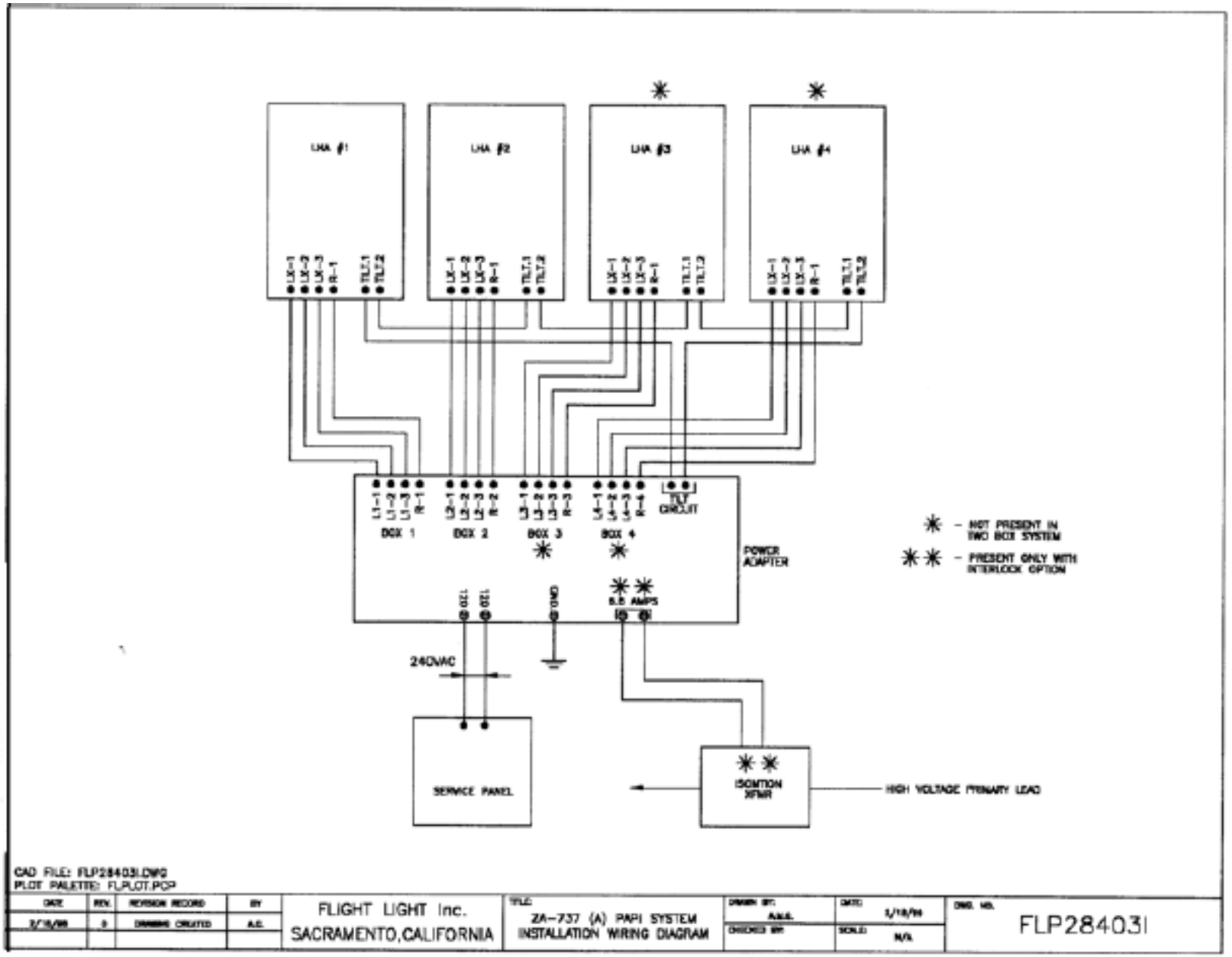
TITLE: ZA-737,757 POWER ADAPTER SCHEMATIC TYPE-A INTERLOCK

DRAWN BY: WES PAINE
CHECKED BY: WES PAINE

DATE: 3/25/02
SCALE: N/A

DWG. NO. FLP28401G-2
(SHEET 3)


FLP28403H
FLIGHT LIGHT Inc.
SACRAMENTO,CALIFORNIA
ZA-757 (A) PAPI SYSTEM
INSTALLATION WIRING DIAGRAM
HIGH VOLTAGE PRIMARY LEAD
POWER ADAPTER
* - NOT PRESENT IN TWO BOX SYSTEM
** - PRESENT ONLY WITH INTERLOCK OPTION



CAD FILE: FLP28403I.DWG
PLOT PALETTE: FLPLOT.PCP

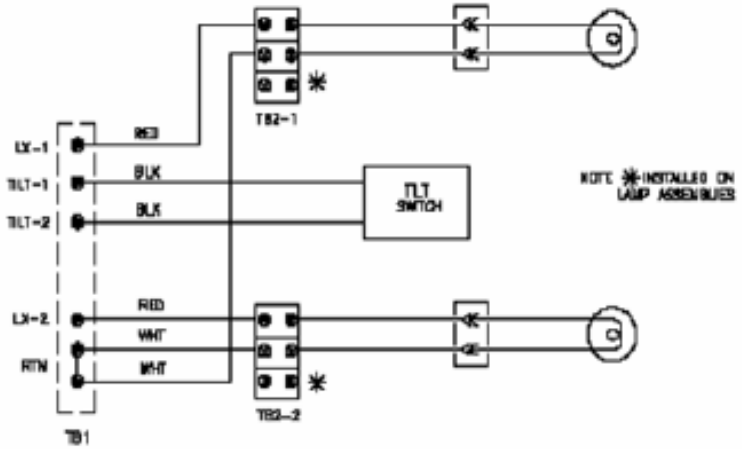
DATE	REV.	REVISION RECORD	BY
2/15/99	0	DRAWING CREATED	A.G.

FLIGHT LIGHT Inc.
SACRAMENTO, CALIFORNIA

TITLE:
ZA-737 (A) PAPI SYSTEM
INSTALLATION WIRING DIAGRAM

DRAWN BY: A.G.G.
CHECKED BY:
DATE: 1/18/99
SCALE: N/A

DWG. NO. FLP28403I



DATE	REV.	REVISION RECORD	BY
10/4/08	0	DRAWING CREATED	M.P.

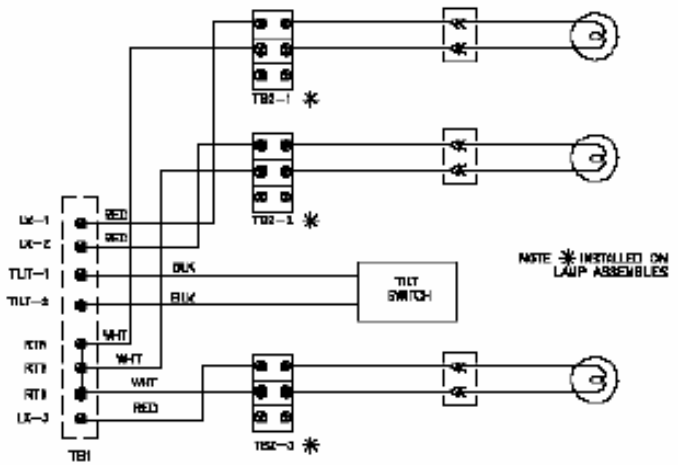
FLIGHT LIGHT Inc.
SACRAMENTO, CALIFORNIA

TITLE
ZA 757 LHA WIRING
DIAGRAM STYLE A CLASS 1

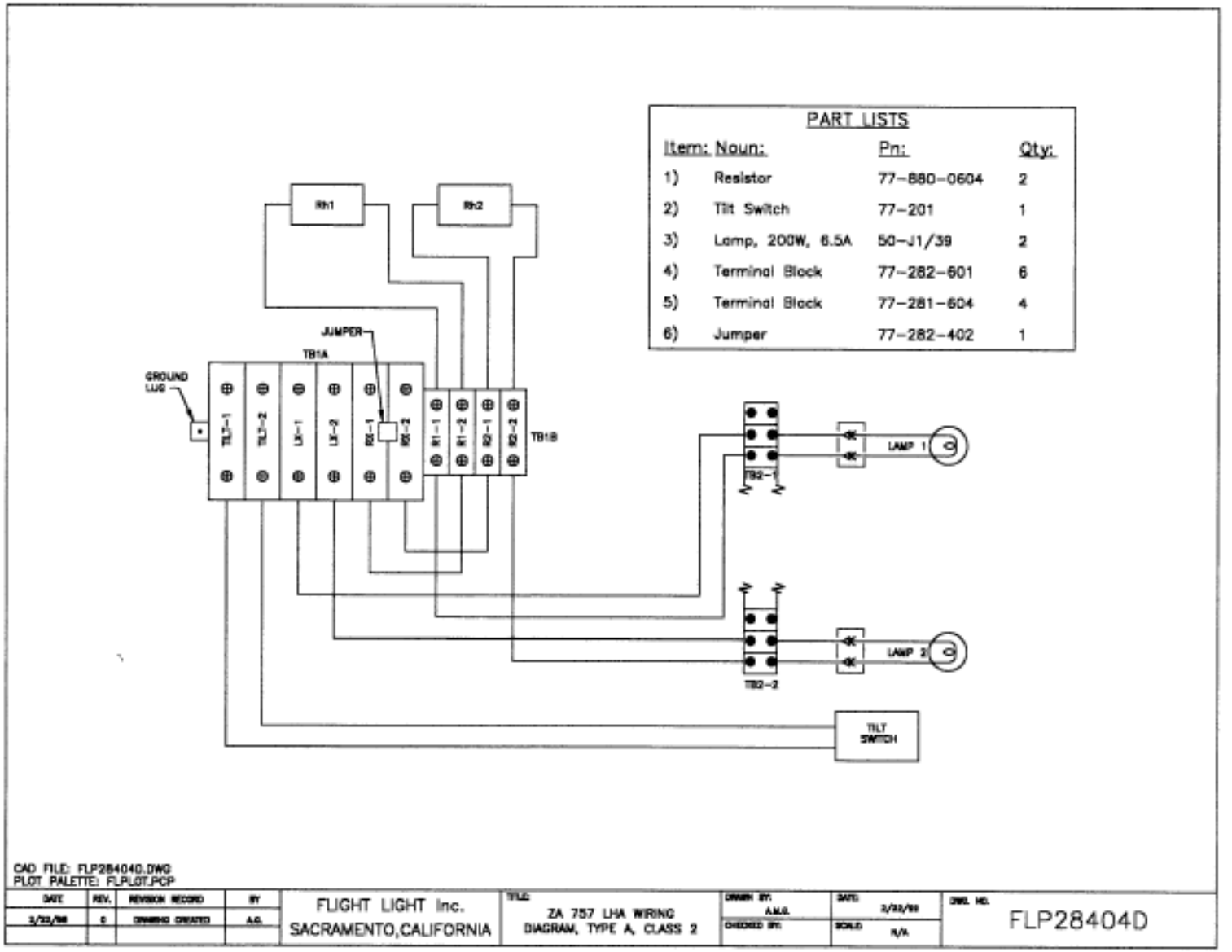
DRAWN BY: M.P.

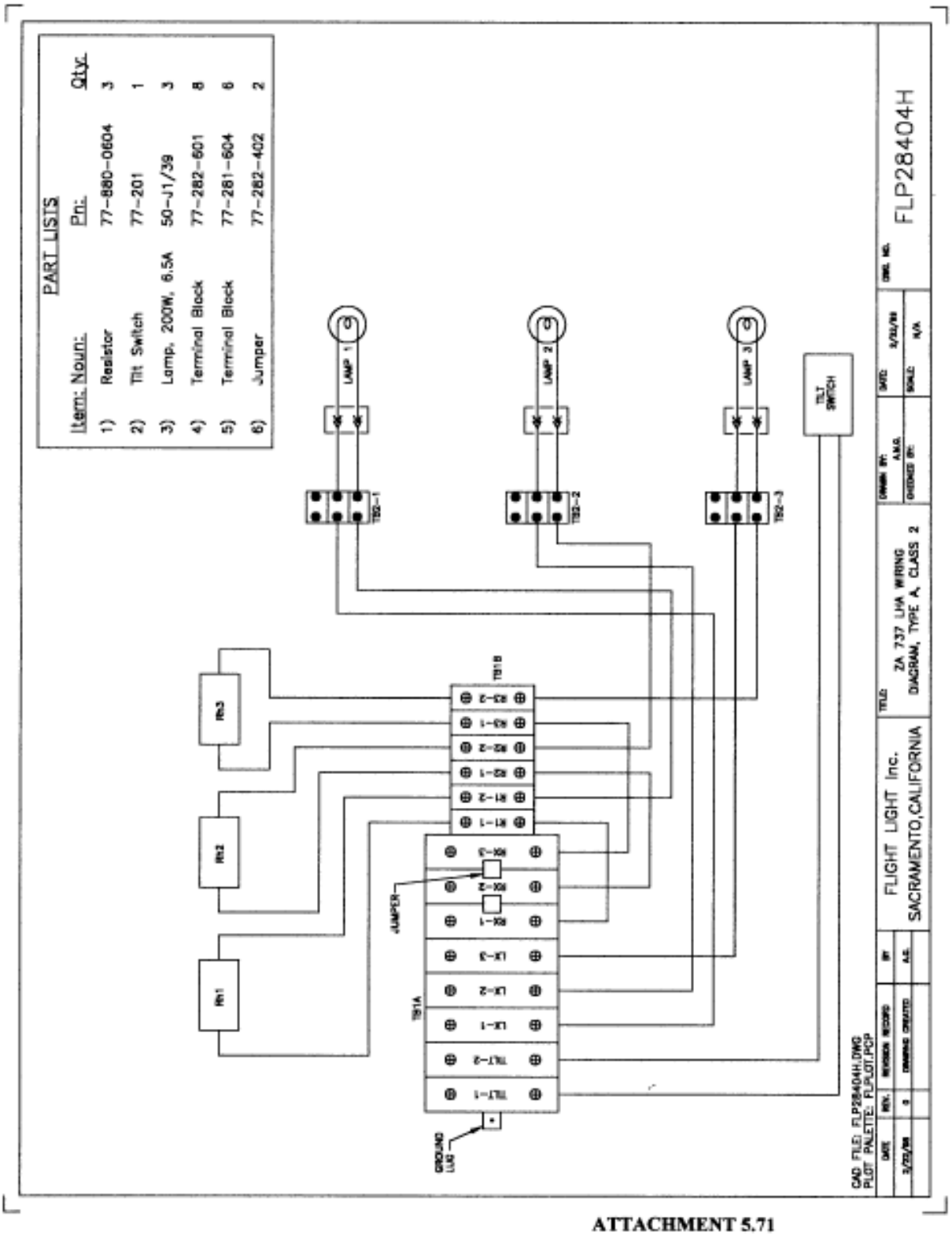
DATE: 10/4/08
N/A

FLP1006A



DATE	REV.	REVISION RECORD	BY	FLIGHT LIGHT Inc. SACRAMENTO, CALIFORNIA	TITLE: ZA 737 LHA WIRING DIAGRAM STYLE A CLASS 1	DRAWN BY: M.P.	DATE: 10/4/08	DWG. NO. FLP1006B
10/4/08	0	DRAWING RECORD	M.P.			CHECKED BY:	SCALE: N/A	


PART LISTS
Item: Noun: Pn: Qty:
1) Resistor 77-880-0604 2
2) Tilt Switch 77-201 1
3) Lamp, 200W, 6.5A 50-J1/39 2
4) Terminal Block 77-282-601 6
5) Terminal Block 77-281-604 4
6) Jumper 77-282-402 1
Rh1
Rh2
JUMPER
TB1A
GROUND LUG
TB1B
LAMP 1
LAMP 2
TB2-1
TB2-2
TILT SWITCH
CAD FILE: FLP28404D.DWG
PLOT PALETTE: FLPLOT.PCP
DATE REV. REVISION RECORD BY
2/22/99 0 DRAWING CREATED A.G.
FLIGHT LIGHT Inc.
SACRAMENTO,CALIFORNIA
TITLE:
ZA 757 LHA WIRING
DIAGRAM, TYPE A, CLASS 2
DRAWN BY: A.M.G.
CHECKED BY:
DATE: 2/22/99
SCALE: N/A
DWG. NO.
FLP28404D



ATTACHMENT 5.71

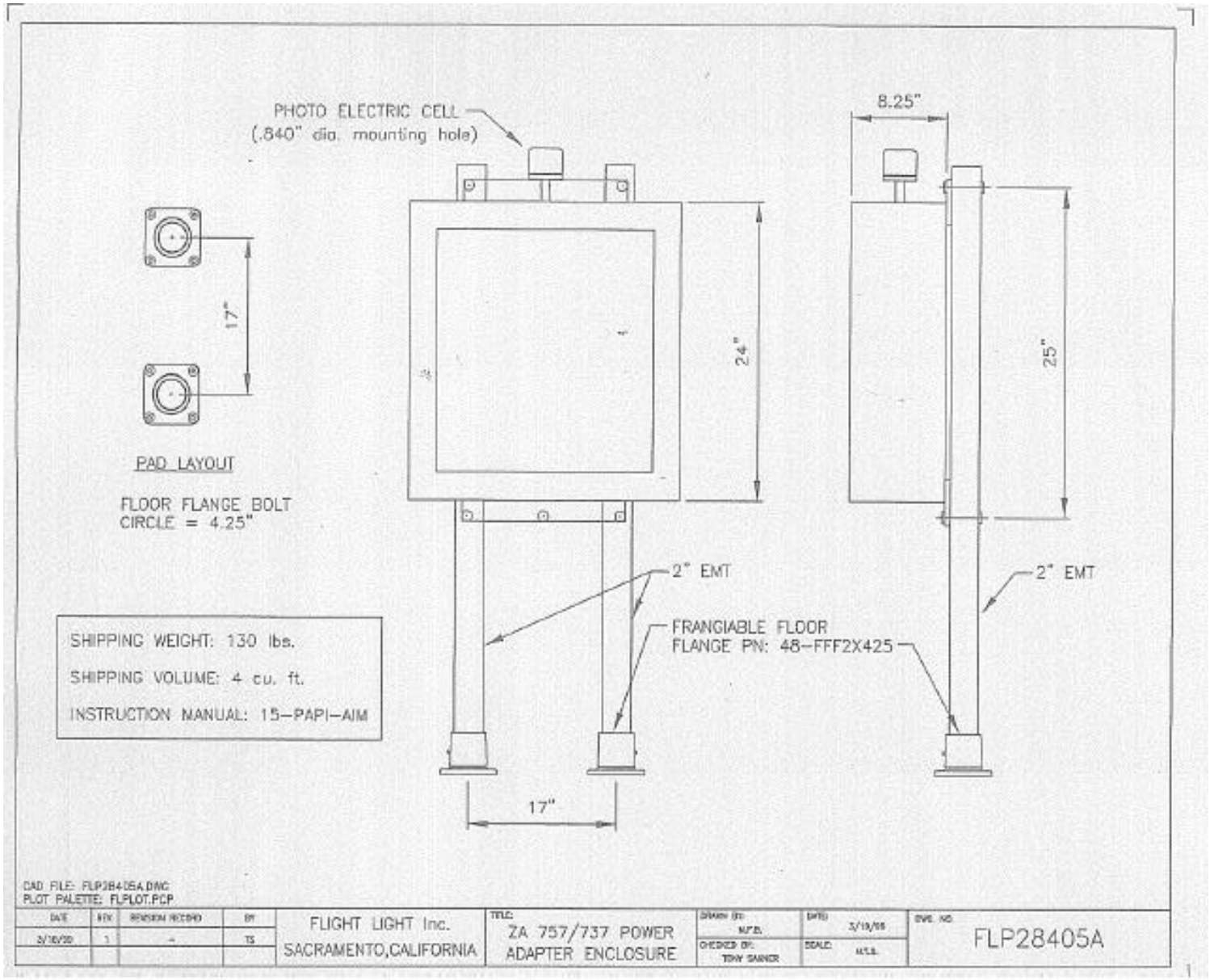
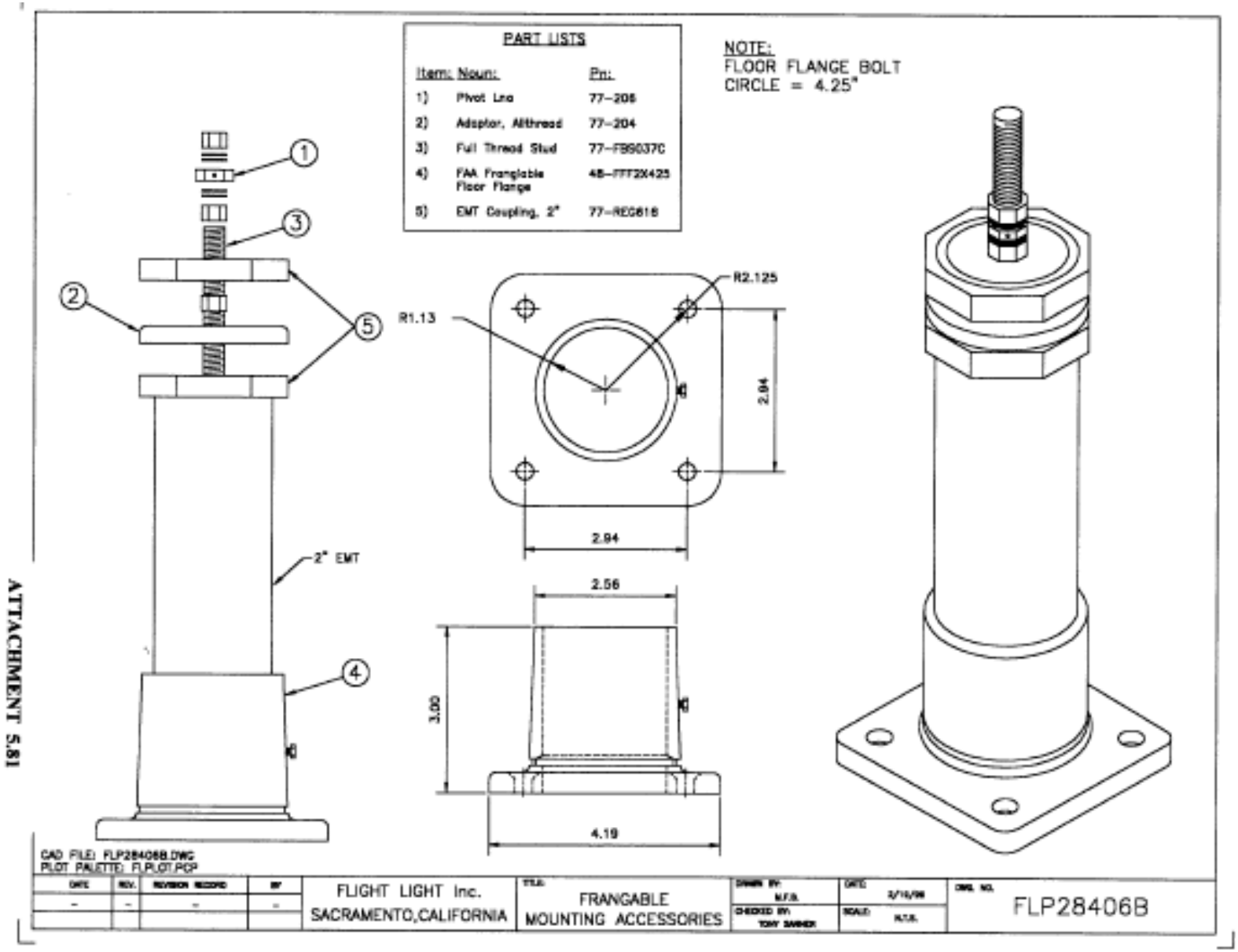
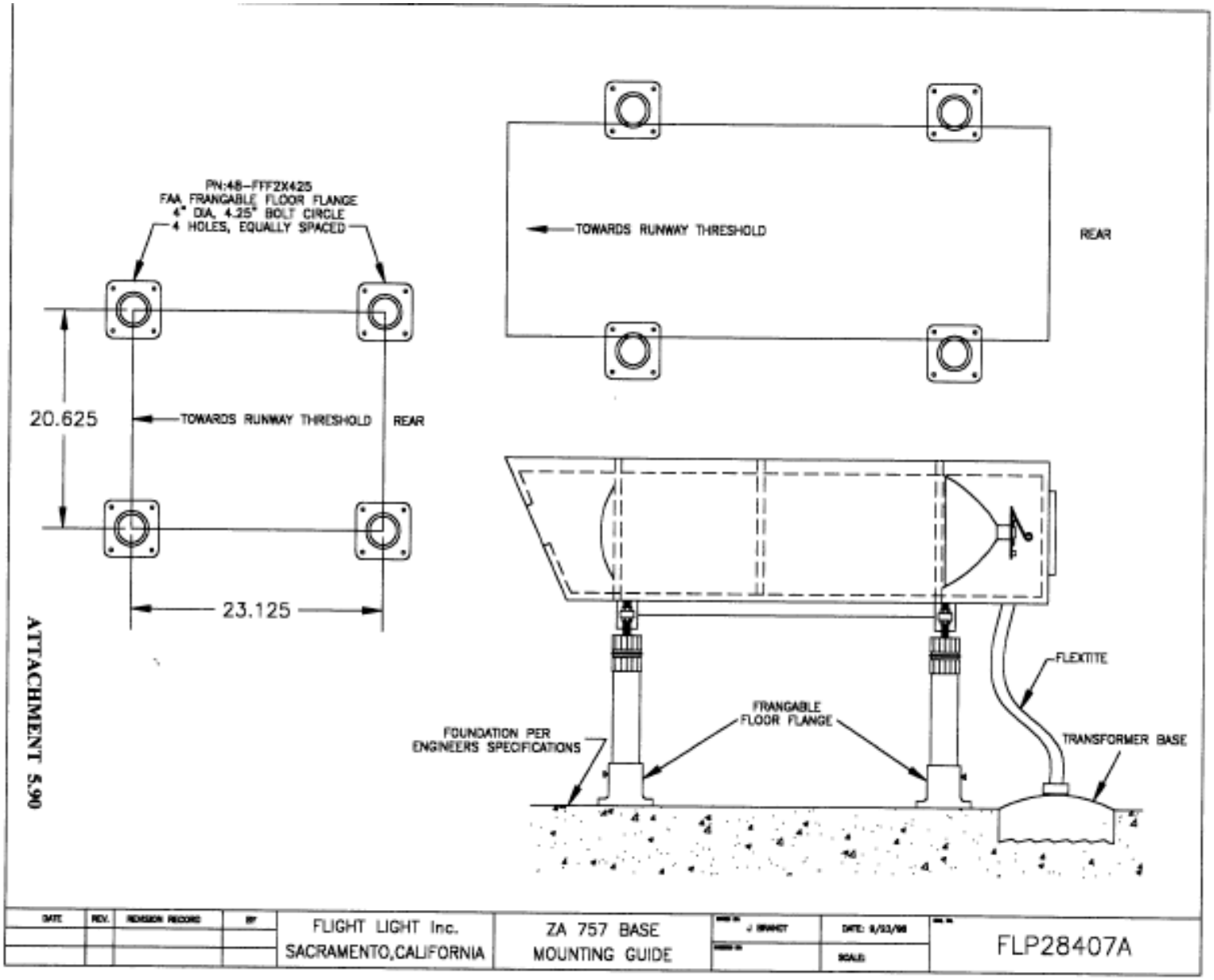
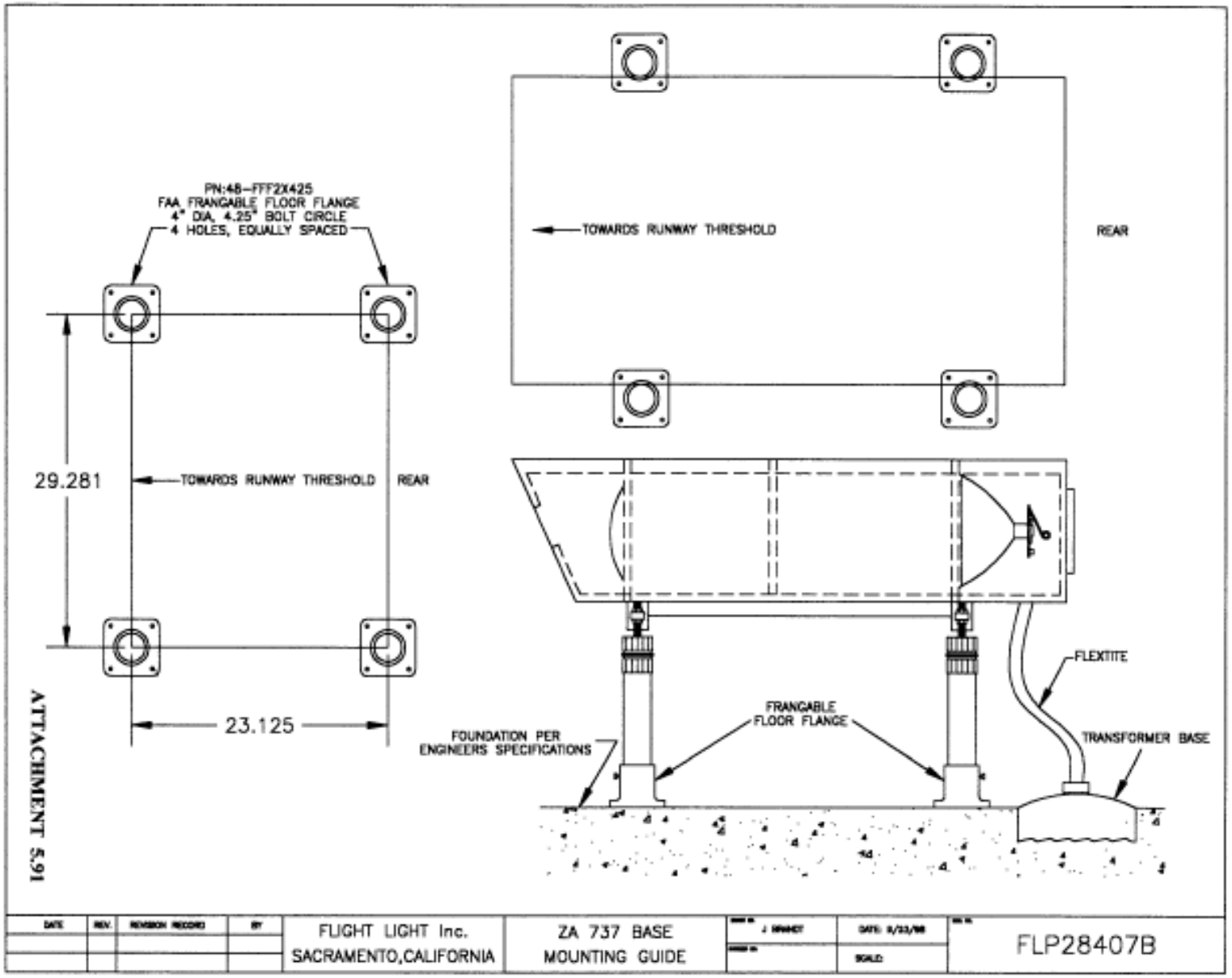


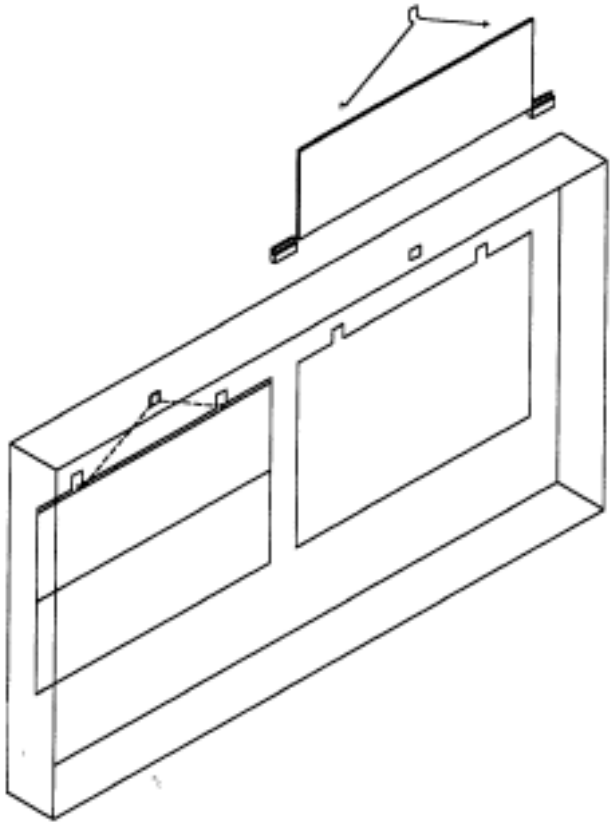
PHOTO ELECTRIC CELL
(.840" dia. mounting hole)
8.25"
17"
24"
25"
PAD LAYOUT
FLOOR FLANGE BOLT
CIRCLE = 4.25"
2" EMT
2" EMT
FRANGIABLE FLOOR
FLANGE PN: 48-FFF2X425
SHIPPING WEIGHT: 130 lbs.
SHIPPING VOLUME: 4 cu. ft.
INSTRUCTION MANUAL: 15-PAPI-AIM
17"
CAD FILE: FLP28405A.DWG
PLOT PALETTE: FLPLOT.PCP
DATE
REV
REVISION RECORD
BY
3/19/99
1
-
TS
FLIGHT LIGHT Inc.
SACRAMENTO,CALIFORNIA
TITLE:
ZA 757/737 POWER
ADAPTER ENCLOSURE
DRAWN BY:
M.F.B.
DATE:
3/19/99
CHECKED BY:
TONY BARKER
SCALE:
N.T.S.
DWG. NO.
FLP28405A

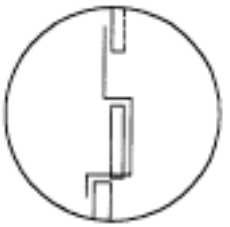
ATTACHMENT 5.81

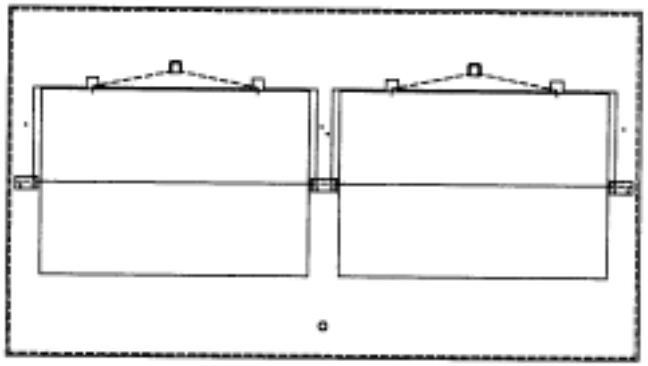


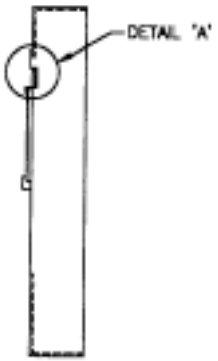

PN:48-FFF2X425
FAA FRANGABLE FLOOR FLANGE
4" DIA. 4.25" BOLT CIRCLE
4 HOLES, EQUALLY SPACED
20.625
TOWARDS RUNWAY THRESHOLD
REAR
23.125
TOWARDS RUNWAY THRESHOLD
REAR
FLEXITITE
FRANGABLE
FLOOR FLANGE
FOUNDATION PER
ENGINEERS SPECIFICATIONS
TRANSFORMER BASE
ATTACHMENT 5.90
DATE
REV.
REVISION RECORD
BY
FLIGHT LIGHT Inc.
SACRAMENTO,CALIFORNIA
ZA 757 BASE
MOUNTING GUIDE
J. BRANDT
DATE: 8/22/98
SCALE:
FLP28407A


PN:48-FFF2X425
FAA FRANGABLE FLOOR FLANGE
4" DIA, 4.25" BOLT CIRCLE
4 HOLES, EQUALLY SPACED
29.281
TOWARDS RUNWAY THRESHOLD
REAR
23.125
TOWARDS RUNWAY THRESHOLD
REAR
FLEXTITE
FRANGABLE
FLOOR FLANGE
FOUNDATION PER
ENGINEERS SPECIFICATIONS
TRANSFORMER BASE
ATTACHMENT 5.91
DATE
REV.
REVISION RECORD
BY
FLIGHT LIGHT Inc.
SACRAMENTO,CALIFORNIA
ZA 737 BASE
MOUNTING GUIDE
J. BRANDT
DATE: 8/23/98
SCALE:
FLP28407B









ATTACHMENT 5.92

FILE: FLP28408.DWG
PLOT PALETTE: FLPLOT.PCP

DATE	REV.	REVISION RECORD	BY
–	1	–	–

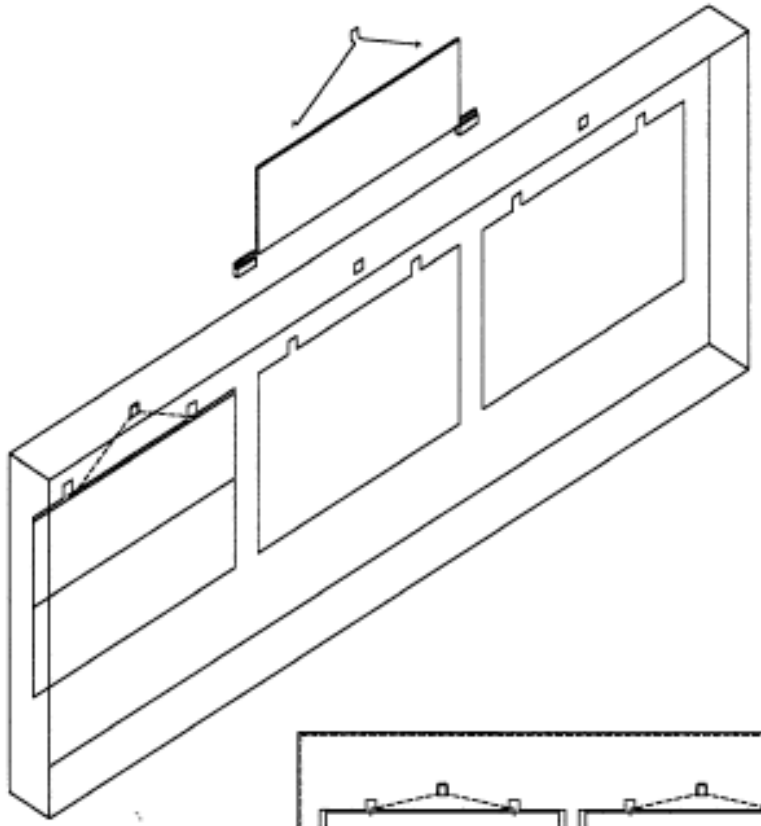
FLIGHT LIGHT Inc.
SACRAMENTO,CALIFORNIA

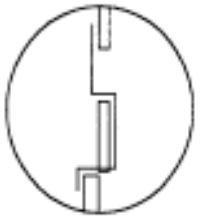
TITLE:
ZA 757
FILTER INSTALLATION

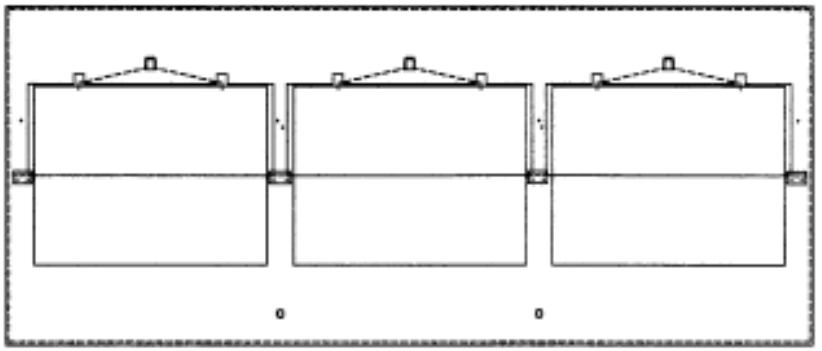
DRAWN BY: M.F.S. DATE: 2/16/99
CHECKED BY: TONY SANNER SCALE: N.T.S.

DWG. NO. FLP28408

ATTACHMENT 5.93







CAD FILE: FLP28408A.DWG
PLOT PALETTE: FLPLOT.PCP

DATE	REV.	REVISION RECORD	BY
-	-	-	-

FLIGHT LIGHT Inc.
SACRAMENTO,CALIFORNIA

TITLE: ZA 737 FILTER INSTALLATION

DRAWN BY: M.F.S.
CHECKED BY: TONY SANNER
DATE: 2/16/99
SCALE: N.T.S.

DWG. NO. FLP28408A

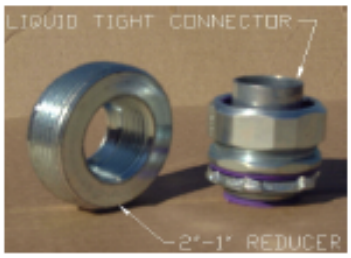
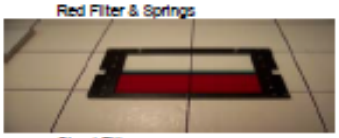
Hardware Packing List

Part Number: CL-PAPIHPL

Customer:_____

Sales Order #:_____

Date:_____

Part Picture	Parts Required	Quantity per LHA/PA		# of LHAorPA	Total Quantity To Pack
	Floor Flanges (P/N 48-FFF2X426)				
	LHA (Install Bolts)	4	x		
	PA (Install Bolts)	2	x		
	1/4-20x1 bolt				
				Total>>>	
	(FOR LHA'S ONLY)				
 Mounting Assembly	Mounting Assembly - consisting of:	4	x		
	3/8-16X9 Allthread (P/N 77-FTS8037C				
	Pivot Mount (P/N 77-208)				
	Adapter (P/N 77-204)				
	EMT Coupling 2" (P/N 77-REG818)				
	(FOR LHA'S ONLY)				
 Liquid Tight Connector & Reducer	1"Liquid Tight Connectors P/N 77-REG5803-S	2	x		
	2"-1" REDUCERS P/N 77-REG8413	1	x		
	Aiming Device Set / Level (see BOM)	1	x		
	Liquid Tight Conduit (P/N 77-2W281)	5'	x		
 Red Filter & Springs	Red Filters (P/N 80-018035) or CHAPI Filters (P/N 80-032081)	1 per lamp	x		
	Filter Springs (P/N 80-021263)	1 per lamp	x		
 Chapi Filter	 Packing of Red Filters & Springs				
	Wire Harness (Style B only) 15-SBCONN-2L or 3L		x		
	Interlock Plug (P/N TRC-90P-A6)		x		
	Installation Manual - Style A				
	Installation Manual - Style B				

Packed By:_____

Double Checked By:_____

Note: quantities modified for 3 lamp

Flight Light PN	Description
15-ZA7X7LHA-X	PAPI Light Housing Assy. A, I/II, Tilt Switch
Components:	
15-FFF2X425	FAA Frangible Floor Fiange
LA-6373	200W 6.6A Quartz G6.35
15-201TSA	TILT SWITCH ASSEMBLY
77-204	Adapter, all-thread
77-206	Pivot, LHA
77-207	Filter holder
77-249-117	End stop
77-282-402	Jumper, adjacent
77-282-601	Terminal block, gray. 315"
15-MIL-III	Programmed Crouzet
77-HC83314	Catch, stainless steel Strike,
77-HS83314SS	stainless steel Connector, 1"
77-REG5803-S	LT metallic, ins. EMT coupling.
77-REG616	2"
77-REG8413	Reducer, 2" to 1"
80-015053	ZA757/4 lampholder assembly
80-016045	ZA757/4 lens assembly
80-032081	CHAPI filter frame assembly(red/wht/grn)
80-019035	ZA757/4 filter glass, red
80-021077	Hatch cover
80-021253	ZA757/4 filter spring
80-021254	ZA757/4 reflector assembly
Lens heater Class II	
77-215	Lens heater mount
77-281-604	Terminal block, blue, 236"
77-821-402	Jumper
77-RH25.47	Resistor. 25W. 47 ohm
15-7X7LHA-X	PAPI Light Housing Assy. B, I/II, Tilt Switch
15-FFF2X425	FAA Frangible Floor Flange
77-FA9812103	Printed circuit assembly, primary (2 lamp)
77-FA9812104	Printed circuit assembly, secondary (2 lamp)
77-FA9812101	Printed circuit assembly, primary (3 lamp)
77-FA9812102	Printed circuit assembly, secondary (3 lamp)
77-HC83314	Catch, stainless steel
77-HS83314SS	Strike, stainless steel
77-REG5803-S	Connector, 1" LT metallics, ins.
77-REG616	EMT coupling. 2"
77-REG8413	Reducer, 2" to 1"
80-015053	ZA757/4 lampholder assembly
80-016045	ZA757-4 lens assembly

80-019035	ZA757/4 filter glass, red
80-021077	Hatch cover
80-021253	ZA757/4 filter spring
80-021254	ZA757/4 reflector assembly
Lens heater Class II	
77-215	Lens heater mount
77-281-604	Terminal block, blue. 236"
77-821-402	Jumper
77-RH25.47	Resistor, 25W. .47 ohm
15-ZA7X7XBPA	ZA7X7 2 and 4 box Power Adapter
Components	
15-FFF2X425	FAA Frangible Floor Flange
77-282-601	Terminal block, gray, .315"
77-15348U	Circuit breaker, 2 poke, 15 Amps, 240 VAC
77-153-0609	Meter, true RMS, 0-10 Amps, 2%
77-213	Enclosure, NEMA 2R, 8"x24"x24"
77-214	Panel, 24"x24"
77-28981	Labbel, Voltage Warning
77-249-116	End stop
77-249-117	End stop
77-280-313	End plate
77-280-402	Jumper, adjacent
77-280-503	Terminal block w/arrester (Modified)
77-AC120L	Surge arrester, lightening, 20K amps
77-280-641	Terminal block gray. . 197"
77-281-317	End plate
77-281-604	Terminal block gray. .315"
77-282-317	End plate
77-282-402	Jumper, adjacent
77-282-409	Jumper, alternate
77-W199AX-15	Relay, contactor, 20 amps DPDT, 240 VAC
77-777-310	Tool, for WAGO terminal blocks
77-91115A565	Standoff, SS, 1 1/2" X 1/4" 4-40 hex
77-H050-TB	Hub, raintight
77-RTE-P21	Timer, D-O-B, adjustable, 24VAC/DC
77-SR3P-05	Socket, 11 pin
77-TB-201-99	Photo control base
77-TL201-71	Photocontrol 208-277 VAC
Class 1 Only	
77-937-100	Transformer, 240/30.3 VAC 60 Hz (ZA757)
77-937-106	Transformer, 240/30.3 VAC 60 Hz (ZA737)
Class 2 Only	

77-937-105	Transformer, 240/34 VAC, 60 Hz (ZA757)
77-937-107	Transformer, 240/34 VAC, 60 Hz (ZA737)
77-937-101	Transformer, 220 VAC 50 Hz
15-021041	AIM DEVICE L880 4 BOX

15-021042	AIM DEVICE L881 2 BOX
77-210	Aiming Device frame
77-98-6	Level, spirit, precision, 6"
77-5211BK	Case, 51" X 11"X 5"
77-021041	Aiming Device 4 Box, 5 Pieces
77-021042	Aiming Device 2 Box, 3 Pieces
77-98-6	Level, spirit, precision, 6"