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CHANGE

AC NO: 150/5345-3A CHG 2

DATE: 9/17/69



ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION

SUBJECT: CHG 2 TO ADVISORY CIRCULAR 150/5345-3A
SUBJECT: SPECIFICATION FOR L-821 AIRPORT LIGHTING PANEL
FOR REMOTE CONTROL OF AIRPORT LIGHTING

1. PURPOSE. This advisory circular change transmits page changes to the subject advisory circular. This change provides corrected drawings for the Size 4 panel layout dimensions and the Size 4 case dimensions.
2. EXPLANATION OF CHANGES. Corrected drawings for the Size 4 panel layout dimensions, Figure 1(c), Appendix 1, Page 1, and the Size 4 case dimensions, Figure 2(c), Appendix 1, Page 2, have been added.
3. PAGE CONTROL CHART.

Remove Pages	Dated	Insert Pages	Dated
Appendix 1		Appendix 1	
1	10/20/67	1	9/17/69
2	6/11/68	2	9/17/69

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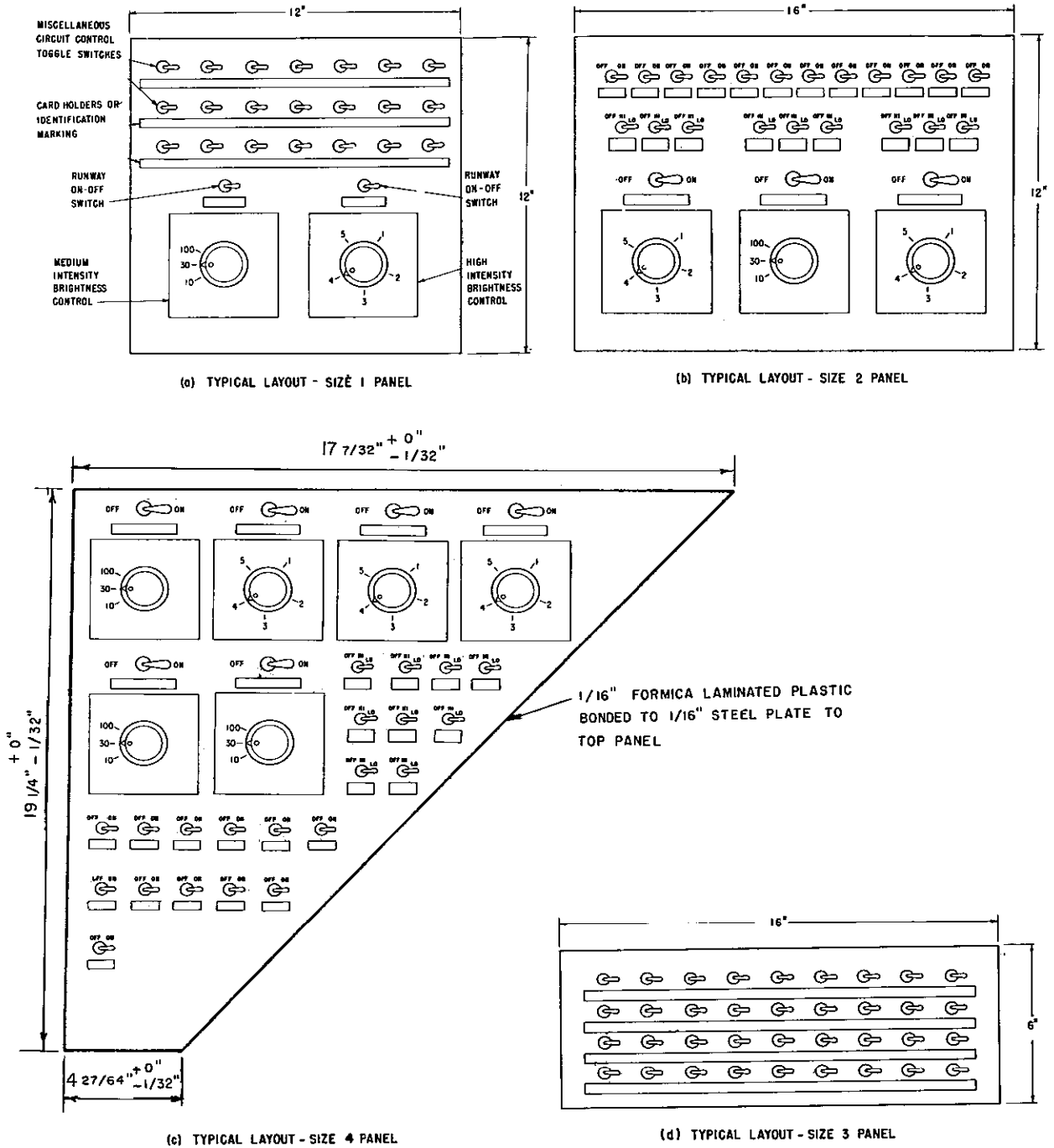


FIGURE 1. PANEL LAYOUT

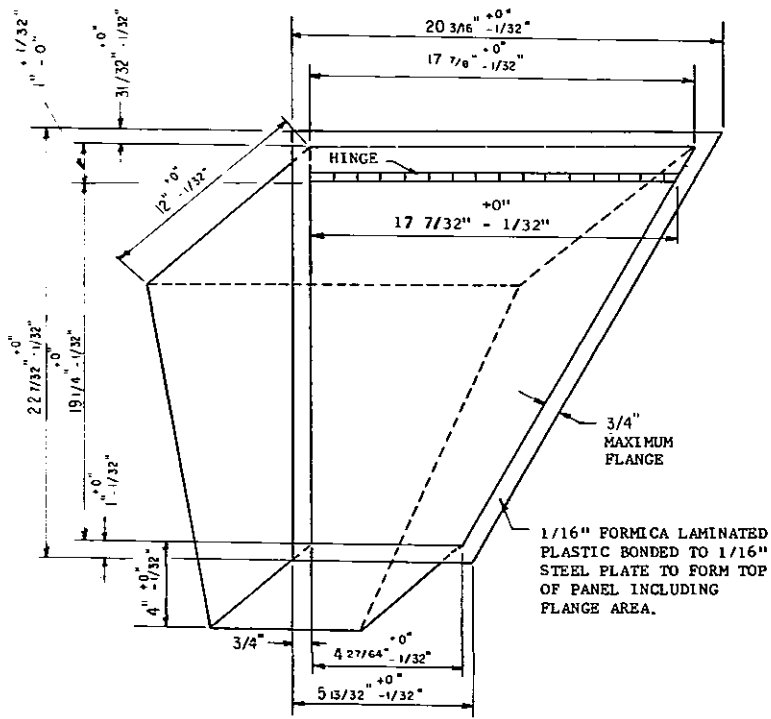
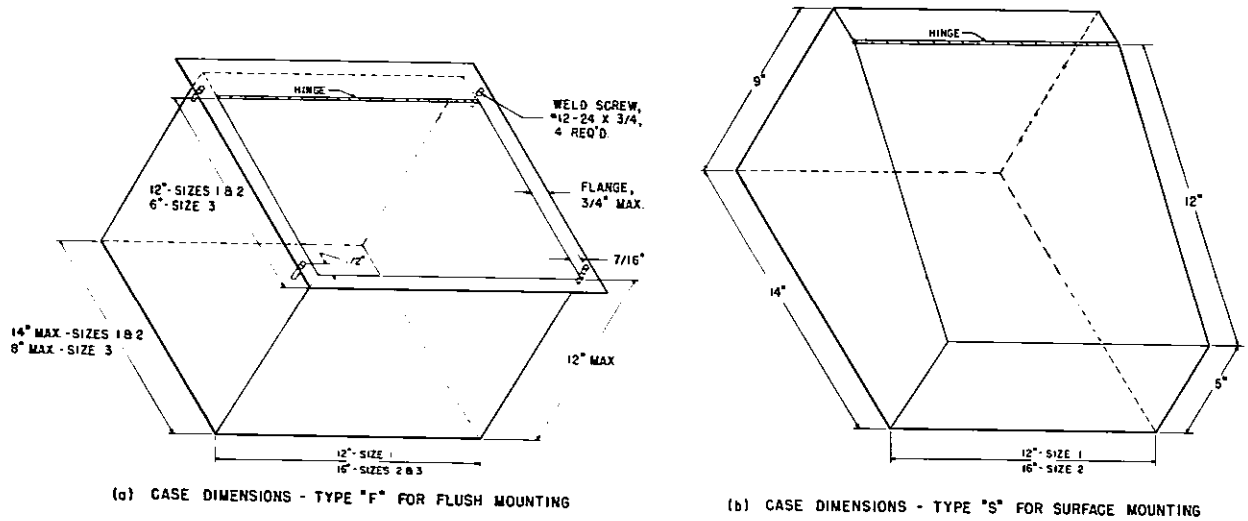


FIGURE 2. CASE DIMENSIONS

Federal Aviation Agency



AC NO: AC 150/5345-3A

AIRPORTS

EFFECTIVE :

10/20/67

SUBJECT : SPECIFICATION FOR L-821 AIRPORT LIGHTING
PANEL FOR REMOTE CONTROL OF AIRPORT LIGHTING

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1. PURPOSE. This advisory circular describes the specification requirements for an airport lighting control panel for the remote control of airport lighting circuits and is published by the Federal Aviation Administration for the guidance of the public.
 2. CANCELLATION. AC 150/5345-3, Specification for L-821 Airport Lighting Panel for Remote Control of Airport Lighting, dated November 4, 1963, is cancelled.
 3. REFERENCES. The following specifications, as referred to hereinafter, of the issues in effect on the date of application for qualification (paragraph 10) apply to this circular. This circular shall govern in case of conflict.
 - a. Copies of the following Federal specifications may be obtained from the appropriate Regional General Services Administration Office:
 - (1) TT-E-527b, Enamel, Alkyd, Lustreless.
 - (2) L-P-00508e (GSA-FSS), Interim Federal Specification Plastic Sheet, Laminated, Decorative and Nondecorative.
 - b. Copies of the following standard and advisory circulars and additional copies of this circular may be obtained from the Department of Transportation, Distribution Unit, TAD-434.3, Washington, D.C. 20590.
 - (1) FAA-STD-001, Color and Texture of Finishes for National Airspace System Equipment.
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- (2) AC 150/5345-10A, Specification for L-828 Constant Current Regulator with Stepless Brightness Control.
 - (3) AC 150/5345-11, Specification for L-812 Static Indoor Type Constant Current Regulator Assembly; 4KW and 7-1/2KW; With Brightness Control for Remote Operation.
 - (4) AC 150/5345-21, Specification for L-813 Static Indoor Type Constant Current Regulator Assembly; 4KW and 7-1/2KW; For Remote Operation of Taxiway Lights.
4. EXPLANATION OF REVISION. This revision adds a new flush type panel for use in the new pentagon console and updates the referenced publications.
 5. CONTROL PANEL ARRANGEMENT. The panel consists of a top plate and a case, toggle switches, terminal boards, and brightness control devices as required. Each control panel may have a different arrangement to meet the particular needs of the airport where it is to be used. Locate the toggle switches controlling the equipment associated with a particular runway above the runway's brightness control. Typical panel arrangements are illustrated in Figure 1.
 6. ORDERING INFORMATION.
 - a. To simplify the ordering of panels for the average airport, it is recommended that a standard panel be ordered. This panel provides twelve miscellaneous circuit controls, nine taxiway brightness controls, and up to six runway controls.
 - b. Wire the panel as shown in Figure 4 to provide one, two, three, or six runway control circuits so that when viewing the panel from above, the control circuits (reading from left to right) shall be arranged as shown in Figure 1a, 1b, or 1c. Specify each brightness control device as shown in Figure 3a or 3b to control either a medium intensity or a high intensity runway lighting system. Use switches rated for either 48 volts DC or 120 volts, 50/60 cycles supply. Thus, to order such a panel, specify an L-821 airport lighting panel.
 - c. Specify the following informaton on each order for a panel:
 - (1) Size (1, 2, 3, or 4).
 - (2) Type ("F" or "S").

- (3) Control voltage (48 volts DC or 120 volts, 40/60 cycles).
- (4) Number and type of toggle switches.
- (5) Number and type of runway brightness controls.
- (6) Arrangements of devices on panel.

7. SIZES AND TYPES. The panel shall be available in two types. Type "F" for mounting flush with the top of a console panel, and Type "S" for installation on a flat surface such as a desk top. The panel plate shall be available in four sizes as shown in Figure 1.

8. DETAIL REQUIREMENTS.

a. Panel Plate. Attach the panel plate to the case by means of a continuous hinge along its top edge. Case dimensions shall conform to those shown in Figure 2.

(1) Sizes 1, 2, and 3. The panel plate consists of sheet metal with a thickness of not less than 0.125 inches (nominal).

(2) Size 4. This panel plate consists of an 0.0625 inch sheet steel with an 0.0625 inch Formica laminate sheet bonded to the sheet steel.

(3) Plastic Laminate. Plastic laminate shall conform to the requirements of Federal Specification L-P-00508e (GSA-FSS). The finish shall be similar to "Formica, Umber 934 Sude" or an approved equal. Bonding of the plastic laminate to the sheet steel shall be as recommended by the manufacturer.

(4) Components. All switches, card holders, and other components shall be suitably positioned on the panel plate. Support the top edge of the panel plate for its entire width by a counter hinge. Bevel all surfaces. Provide a means for lifting up the panel plate on the Type "F" panels.

b. Case. Mount the top panel plate on a suitable steel case made of not less than 0.078 inch (nominal) sheet steel. A suitable lug shall be inside the case for attachment of a #6 AWG ground wire.

c. Latch. Mount a latch inside the case to support the panel plate when open. The latch shall be of such length and so constructed that the plate will be held near vertical in the open position, and no part of the plate or its attachments shall project behind the plane of the back of the case during opening and closing.

- d. Painting. The color and gloss of the case and panel plate, except as specified in paragraph 8a(2), shall conform to Federal Aviation Administration Standard FAA-STD-001. Apply a hard lustreless alkyd baked enamel finish having a smooth matte texture. The surface preparation, application of primer and enamel, including baking procedures, shall be such that the finish surface shall meet the water resistance test procedures specified in Federal Specification TT-E-527b.
- e. Wire and Wiring. All wire shall have stranded conductors and shall be plastic insulated. All leads shall be properly trained and cabled and long enough so that there will be adequate spare lead when the plate is raised to the extent permitted by the latch. All panels shall be wired at the factory with terminal connections in accordance with the applicable combination of components.
- (1) When the order specifies a 48-volt DC control voltage, the minimum wire size shall be #18 AWG.
 - (2) When the order specifies a 120-volt, 40/60 cycle control voltage, the minimum wire size shall be #16 AWG, except for high intensity potentiometer brightness control which shall be connected with at least #18 AWG wire.
- f. Toggle Switches. Use toggle switches to turn on and off regulators, beacons, obstruction lights, lighted wind cones, apron lights, etc. They may also be used to control taxiway light intensity or to simultaneously control several circuits.
- (1) Mount the toggle switches on the panel plate by means of a hexagon nut above and below the panel plate. Use an internal-tooth lockwasher and a locking ring to assure permanent mounting. Multiple-hole switch mounting is permitted for multiple-unit toggle assemblies.
 - (2) Provide screw or solder terminals on the switches for connecting leads. Seal the switches to prevent the entry of dust. They shall have silver-solid contacts and copper-moving contacts rated for at least 25,000 operations at rated current and voltage. Detent the switches to provide positive stiff-switch operation. Switches must have the approval of the Underwriters' Laboratories, Inc.

- (3) When the order specifies a 48-volt DC control voltage, use a switch rated to continuously carry a resistive load of 5 amperes and an inductive load of 3 amperes at 30 volts DC.
- (4) When the order specifies a 120-volt AC control voltage, use a switch rated to continuously carry a resistive or an inductive load of 10 amperes at 125 volts, 50/60 cycles.
- (5) Toggle switches may have either 2 or 3 positions. When 2-position switches are ordered, mount them so that they are off when thrown to the left and on when thrown to the right. Mount the 3-position switches so they are also off when thrown to the left. Mount all switches to operate to the left and right rather than up and down.
- (6) Usually, the following types of switches will be used to control the following equipment:
 - (a) Single Pole Single Throw (SPST) - Individual Specification L-812 and L-813 regulators, beacons, apron lights, wind cone lights, and obstruction lights.
 - (b) Double Pole Single Throw (DPST) - Individual Specification L-828 regulator.
 - (c) Single Pole, 3-Position - Individual Specification L-812 regulators used for taxiway circuits with brightness control.
 - (d) Multiple Pole, 2-Position - Master control of a complex of lighting systems (such as taxiways).
 - (e) Multiple Pole, 3-Position - Master control of a complex of taxiway systems with brightness control; master control of one runway where several regulators are used to control a complex of lighting systems, all of which are not on at one time.
- g. Medium Intensity Runway Lighting Control. Each medium intensity runway lighting control shall consist of a 3-position, rotary, detented, snap-action switch wired to a terminal board and marked as shown in Figure 3a. Use a switch rated for at least 10,000 operations, switching a 10-ampere inductive load at 30 volts DC or at 115 volts, 50/60 cycles. The control shall also include one SPST on-off toggle switch. Mount the rotary switch with a suitable pointer knob and dial marking. The dial marking shall consist of the numerals 10, 30, and 100 (corresponding to brightness percent) located opposite the switch positions and reading, in the above order, in a clockwise direction as illustrated in Figure 1b.

- h. High Intensity Runway Lighting Control. Each high intensity runway lighting control shall consist of a 1,000-ohm potentiometer, a 5-position detent, and knob. Wire the potentiometer to the terminal board as marked in Figure 3b. The control shall also include one double pole single throw (DPST) toggle switch. Normally a General Radio Company potentiometer part No. 975KS5G1 or an approved equal is used. Where panel space is quite limited, a Bournes Incorporated potentiometer part No. 3430S-411-102, 1,000 ohms, rated 2.8 watts at 40°C. or an approved equal may be used.
- (1) Dial marking shall consist of the numerals 1, 2, 3, 4, and 5 (corresponding to brightness positions) located opposite the detent positions and reading, in the above order, in a clockwise direction as illustrated in Figure 1.
 - (2) In some cases, more than one regulator shall be controlled by turning one brightness control knob. When this is desired, state in the order the number of regulators to be so controlled. In this event, modify the potentiometer control by ganging an additional potentiometer on the control shaft for each additional regulator. Figure 3c illustrates the wiring of a 2-gang potentiometer control. Apply the principles illustrated in Figure 3c when ganging as many as six potentiometers. A ganged regulator control will require that the single throw on-off switch have two poles for every regulator that is controlled.
 - (3) When multiple ganging of potentiometers is specified, space requirements will usually necessitate use of Type "F" panels. It may also be necessary to mount the cover plate so that its hinged edge is along the lower part of the case on sizes 1 and 2.
- i. Terminal Blocks. Use terminal blocks rated for at least 10 amperes and 600 volts. Terminal blocks shall be pressure type and capable of holding wires from #19 AWG to #10 AWG. Identify the individual terminals with permanent marks in accordance with the wiring diagram furnished with the unit.
- j. Marking. Mark the switch designations in characters not less than 3/16 inch or not over 5/16 inch high formed by engraving, etching, or stamping. Fill the characters with a permanent, durable white material. Place the markings either on the plate or on small separate plates securely fastened to the plate. Card holders may also be used for toggle switch designation.

- k. Code Requirements. The control panel shall comply with all applicable requirements of the National Electrical Code.
- l. Wiring Diagram. Supply three copies of a wiring diagram with each panel.
- m. Parts List and Installation Instructions. Furnish a component parts list and installation instructions with each control panel. Provide sufficient drawings or illustrations to indicate clearly the method of installation.
- n. Nameplate. Attach a nameplate to the panel and include the following information thereon:
 - (1) Airport lighting control panel.
 - (2) Identification: FAA L-821.
 - (3) Type _____ Size _____ Voltage _____.
 - (4) Manufacturer's part no. _____.
 - (5) Manufacturer's name or trademark.

9. TESTING.

- a. Qualification Testing. Make the following examination and tests on a panel of any size or type, including at least one each of the switching components listed under paragraphs 8g and 8h. The panel shall withstand the tests successfully, and the component parts shall meet the detail requirements specified in paragraph 8 of this specification.
 - (1) Examination. This examination shall be in the form of a checkoff list to certify that the material used, dimensions, component parts, calibration, quantities, etc., are all in accordance with the detail requirements of this specification.
 - (2) Operation. Connect the panel to a pilot-light test board, and check each component and switch for proper operation.
 - (3) Dielectric. All terminals on the terminal block shall have a potential of at least 500 volts, r.m.s., 60 cycles, applied for a period of one minute between the terminal and the grounded case. There shall be no breakdown of the insulation.


(4) Other inspections and tests may be made as deemed necessary by the Federal Aviation Administration, Airports Service, Washington, D.C. 20590, to determine compliance with this specification.

b. Production Testing. Each panel shall be inspected and tested by the manufacturer as specified in paragraph 9a above.

10. QUALIFICATION.

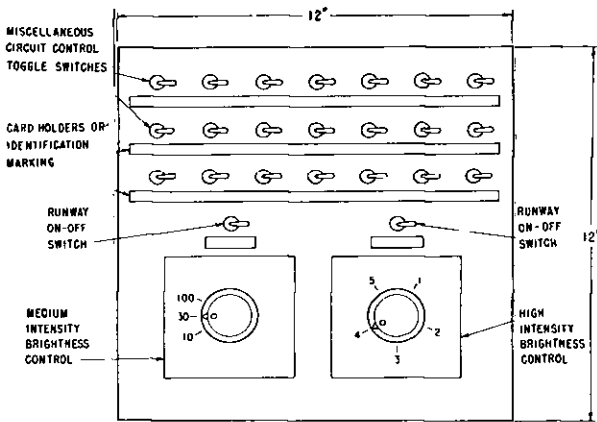
- a. The manufacturer shall furnish a sample panel with the component parts as specified in paragraphs 8g and 8h to a disinterested testing laboratory to be tested as described in paragraph 9 to obtain certification regarding the ability to manufacture panels meeting the requirements of this specification. The disinterested testing laboratory shall be a laboratory acceptable to the Federal Aviation Administration, Airports Service, Washington, D.C. 20590. The manufacturer shall furnish two copies of the testing laboratory's reports to the Airports Service for review and approval consideration. Upon approval of the test reports which show satisfactory certification of compliance, the Airports Service shall list the name of the qualified manufacturer and a description of their panel in Advisory Circular 150/5345-1A, Approved Airport Lighting Equipment. The cost of testing shall be borne by the manufacturer offering the material for qualification.
- b. If the manufacturer has satisfactory laboratory facilities, the required tests and examination may be performed at the factory, and such tests shall be witnessed by a representative of the Federal Aviation Administration, Airports Service, Washington, D.C. 20590. The manufacturer shall furnish written reports of the tests and inspections.
- c. Manufacturers must obtain approval of each size and type of panel to be furnished. However, manufacturers having obtained approval on any size or type panel, in accordance with paragraphs 10a or 10b above, may request approval on any other size or type with the submission of detail drawings for review and approval by the Federal Aviation Administration, Airports Service, Washington, D.C. 20590.
- d. The manufacturer shall furnish a certificate of compliance from the plastic laminate manufacturer that the laminate supplied conforms to the specified grade for review and approval by the Federal Aviation Administration, Airports Service, Washington, D.C. 20590.

- e. Parts list and installation instructions shall be submitted with the above test reports to the Federal Aviation Administration, Airports Service, Washington, D.C. 20590.

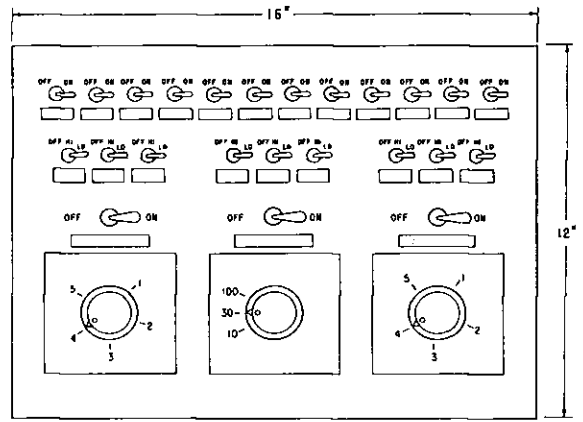


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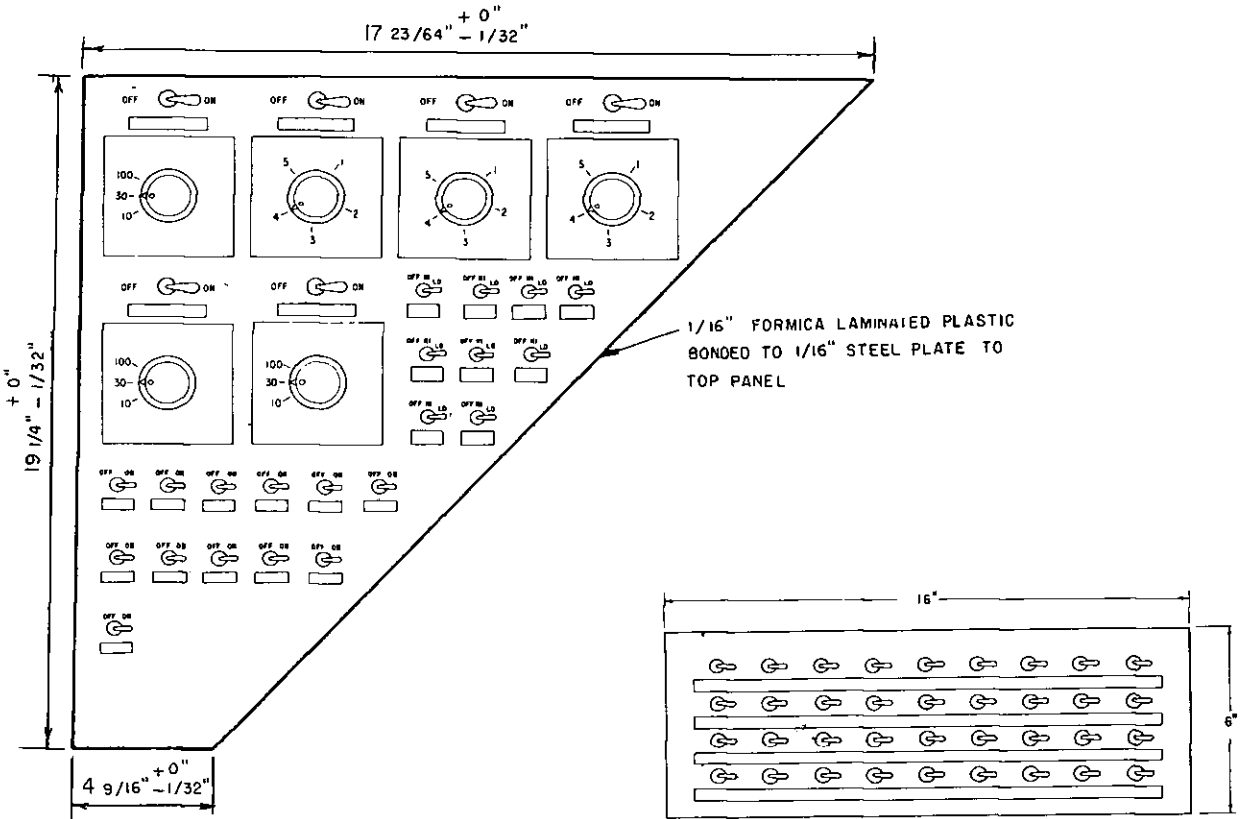
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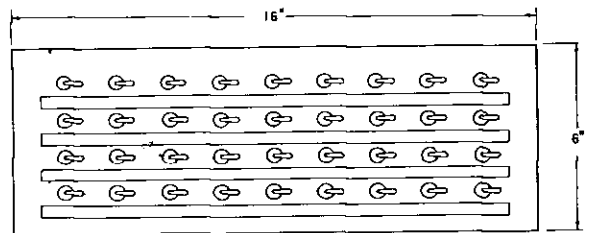
(a) TYPICAL LAYOUT - SIZE 1 PANEL



(b) TYPICAL LAYOUT - SIZE 2 PANEL

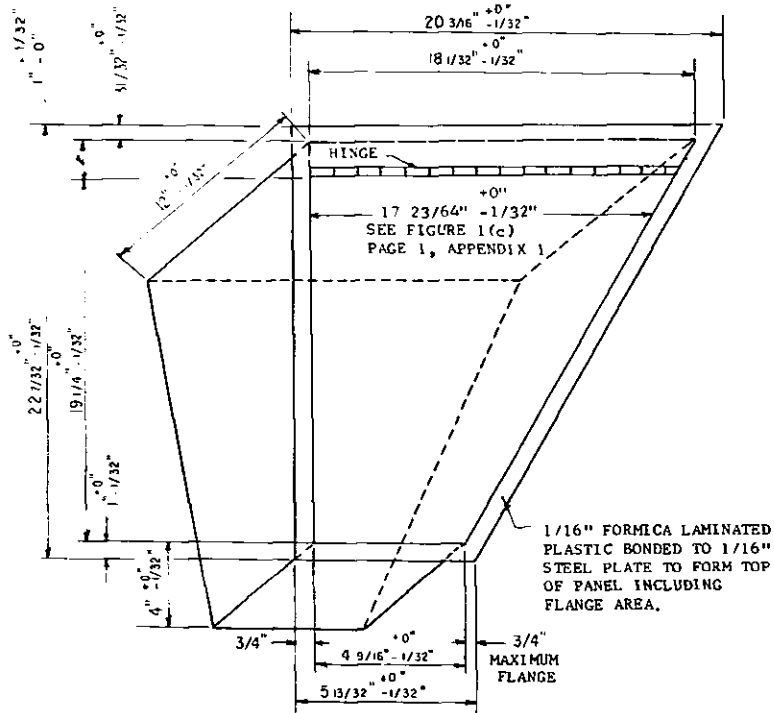
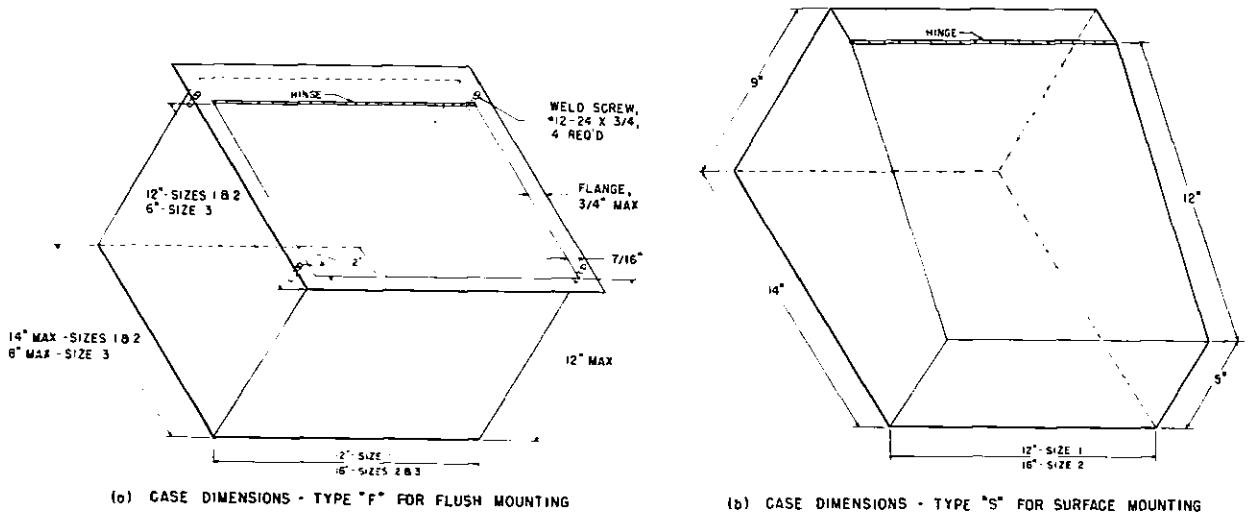


(c) TYPICAL LAYOUT - SIZE 4 PANEL



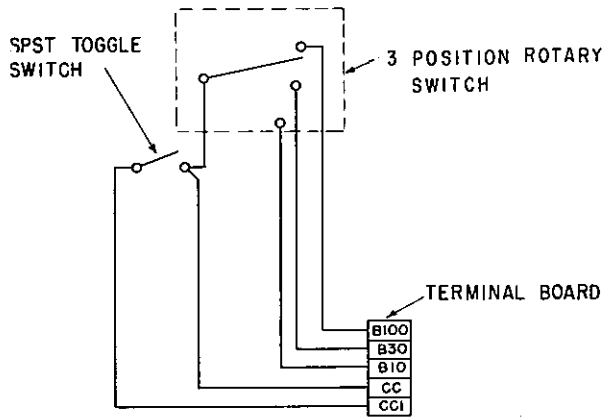
(d) TYPICAL LAYOUT - SIZE 3 PANEL

FIGURE 1. PANEL LAYOUT

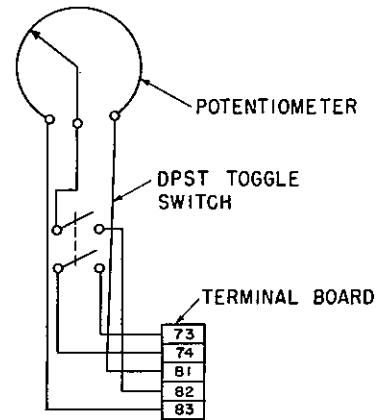


(c) CASE DIMENSIONS - TYPE "F" SIZE 4 FOR FLUSH MOUNTING

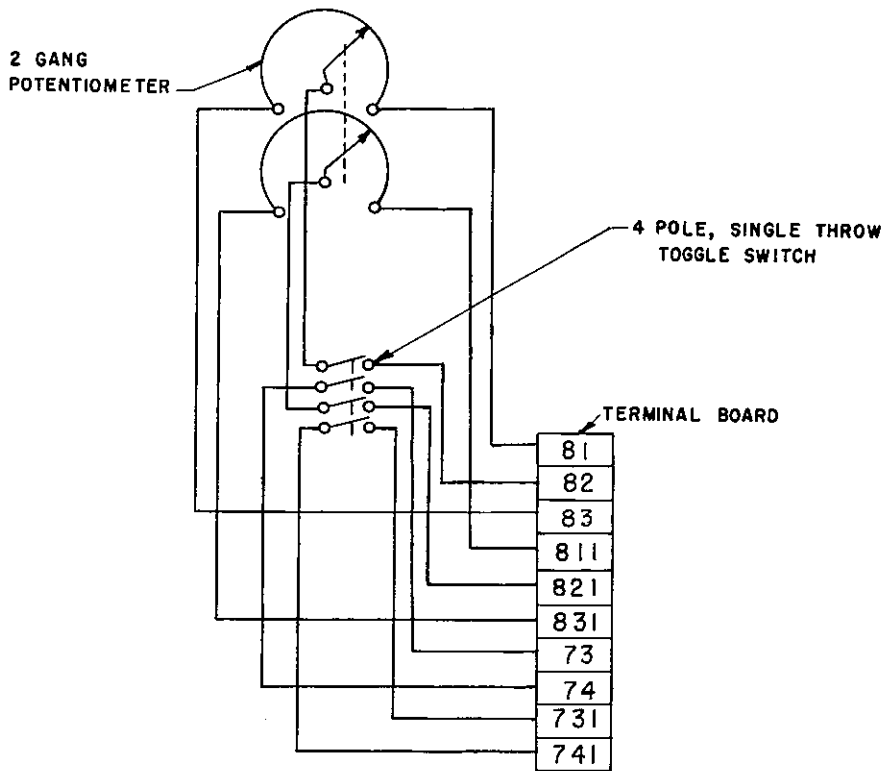
FIGURE 2. CASE DIMENSIONS



(a) WIRING DIAGRAM - MEDIUM INTENSITY RUNWAY LIGHTING CONTROL



(b) WIRING DIAGRAM - HIGH INTENSITY RUNWAY LIGHTING CONTROL



(c) WIRING DIAGRAM - HIGH INTENSITY RUNWAY EDGE LIGHTING AND TOUCHDOWN ZONE LIGHTING CONTROL FOR TWO REGULATORS

FIGURE 3. WIRING DIAGRAM

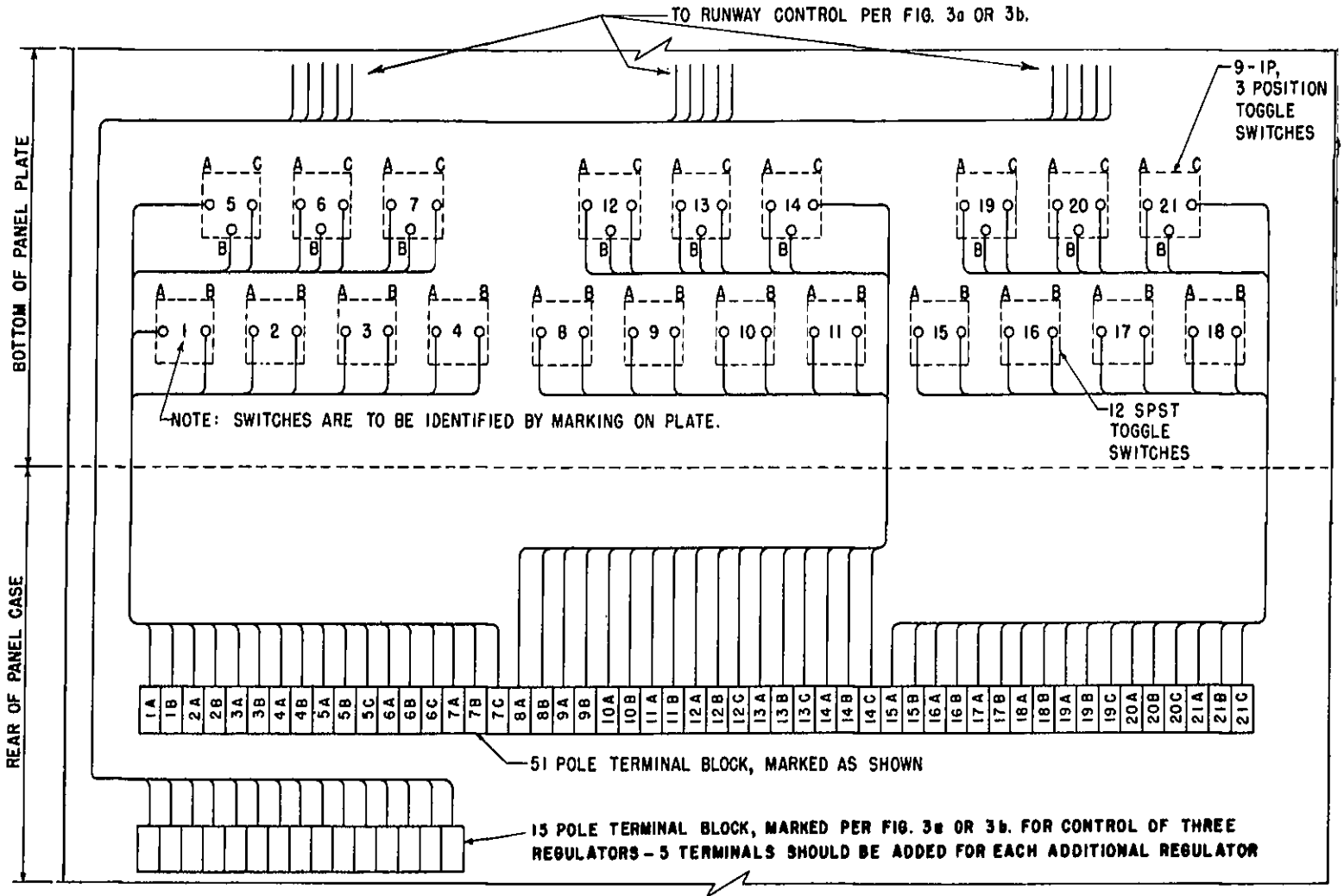


FIGURE 4. PANEL WIRING DIAGRAM