

AC NO: 150/5345-12B

DATE: September 8, 1977



ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION

SUBJECT: SPECIFICATION FOR L-801 BEACONS

1. PURPOSE. This advisory circular contains the requirements for light beacons to be used for identifying lighted civil airports, seaplane bases and heliports during hours of darkness and in daytime low visibility conditions.
2. CANCELLATIONS. The following documents are cancelled:
 - a. AC 150/5345-12A, Specification for L-801 Beacon, dated May 12, 1967.
 - b. Specification CAA-291, Specification for Beacon, 36-Inch Rotating, Double Ended Type, dated July 31, 1944.
3. REFERENCE. Publications that may be used in connection with this advisory circular are listed in paragraph 2 of the specification.
4. HOW TO OBTAIN THIS CIRCULAR. Additional copies of this circular may be obtained, free of charge, from the Department of Transportation, Publications Section, TAD-443.1, Washington, D. C. 20590.

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SPECIFICATION FOR L-801 BEACONS

1. SCOPE AND CLASSIFICATION.

1.1 Scope. - This specification covers the requirements for airport, heliport, and seaplane base light beacons.

1.2 Classification. - The following types of light beacons are covered by this specification:

<u>Type</u>	<u>Description</u>
L-801A	Airport Light Beacon
L-801S	Seaplane Base Light Beacon
L-801H	Heliport Light Beacon

2. APPLICABLE DOCUMENTS.

2.1 FAA Advisory Circular. - The following FAA advisory circular, of the issue in effect on date of application for qualification, forms a part of this specification to the extent specified herein.

AC 150/5345-1	Approved Airport Lighting Equipment
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2.2 Military and Federal Publications. - The following Military and Federal publications, of the issue in effect on date of application for qualification, form a part of this specification to the extent specified herein.

2.2.1 Military Specifications.

MIL-C-7989	Covers, Light-Transmitting, for Aeronautical Lights, General Specification for
MIL-C-25050	Colors, Aeronautical Lights and Lighting Equipment, General Requirements for

2.2.2 Military Standard.

MIL-STD-810	Environmental Test Methods
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2.2.3 Federal Specification.

TT-E-489	Enamel, Alkyd, Gloss
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2.2.4 Federal Standard.

FED-STD-595	Colors
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2.3 Other Publications. - The following publication forms a part of this specification to the extent specified herein.

Guide for Calculating the Effective Intensity of Flashing Signal Lights (as contained in the publication Illuminating Engineering for November 1964, published by the Illuminating Engineering Society.)

(Copies of FAA advisory circulars may be obtained from the Department of Transportation, Publications Section, TAD-443.1, Washington, D.C. 20590.)

(Copies of Military documents may be obtained from the Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120, Attention: Code CDS.)

(Information on obtaining copies of Federal specifications and standards may be obtained from General Services Administration offices in Atlanta; Boston; Chicago; Denver; Fort Worth; Houston; Kansas City, Mo.; Los Angeles; New York; Philadelphia; San Francisco; Seattle, Wash.; and Washington, D.C.)

(Copies of Illuminating Engineering Society documents may be obtained from the Illuminating Engineering Society, 345 East 47 Street, New York, New York 10017.)

3. REQUIREMENTS.

3.1 General Functional Requirements. - The light beacons specified herein are intended for use in identifying lighted civil airports, seaplane bases, and heliports during hours of darkness and in daytime low visibility conditions.

3.2 Environmental Conditions. - The light beacons shall be designed to operate under the following environmental conditions:

3.2.1 Temperature. - Any ambient temperature from -45° C. to $+55^{\circ}$ C.

3.2.2 Wind. - Wind velocities to 100 miles per hour (161 Kilometers per hour).

3.2.3 Rain and Hail. - Exposure to rain and hail.

3.2.4 Ice. - The exposed rotating mechanism shall start with 1/2 inch (1.27 cm) of ice coating.

3.3 Photometric Requirements. - The beacons shall appear to an observer, at any point throughout 360 degrees in azimuth, as a light source emitting flashes of white and colored light at the specified rate, colors, and intensities.

3.3.1 Flash Rate. - The frequency of total flashes shall be as follows:

L-801A	24 to 30 flashes per minute
L-801S	24 to 30 flashes per minute
L-801H	36 to 45 flashes per minute

3.3.2 Flash Duration. - The effective flash duration shall be 75 to 300 milliseconds. This may be accomplished for capacitor discharge type beacons by a series of rapid successive flashes which appear to an observer as one uninterrupted flash.

3.3.3 Color. - The light colors shall be as follows:

L-801A	Alternate white and green
L-801S	Alternate white and yellow
L-801H	Alternate white, green, and yellow

3.3.4 Light Intensity. - The light intensity, with the light beam center set at 5 degrees above the horizontal, shall be as follows:

<u>Beacon</u>	<u>Elevation Angle (Degrees)</u>	<u>Minimum Effective Intensity of White Flash (Candelas)</u>
L-801A	1 to 2	25,000
and	2 to 8	50,000
L-801S	8 to 10	25,000
L-801H	1 to 2	12,500
	2 to 8	25,000
	8 to 10	12,500

The effective intensity of the colored lights shall be not less than the values specified for white light multiplied by the following factors:

yellow - 0.40
green - 0.15

3.4 Design Requirements.

3.4.1 General. - The beacons may be designed as a rotating type using incandescent lamps or as a nonrotating type using omnidirectional capacitor discharge lamps. The total input power, size, and weight of the beacon shall be held to the minimum necessary to meet specification requirements.

3.4.2 Input Voltage. - The beacons shall be designed to operate from a 120 V AC, +10%, 60 Hz source.

3.4.3 Lamps. - The beacons shall use lamps rated to provide 2000 hours of operation and shall provide a source size of at least 8 inches for the L-801A and L-801S beacons and at least 7 inches for the L-801H beacon.

3.4.4 Light Transmitting Materials. - The light cover, lenses, and color screen shall be glass meeting the requirements of MIL-C-7989, Type C. Light colors shall be in accordance with MIL-C-25050, Type I.

3.4.5 Motor. - Motors used on rotating type beacons shall have adequate capacity to start and operate the beacon under the specified environmental conditions. Universal type motors are not acceptable. The motor and turntable drive shall not cause vibration of the lamp filaments.

3.4.6 Vertical Adjustment. - The light beam center shall be field adjustable using common hand-tools through vertical angles of 2 to 10 degrees above the horizontal. A scale marked in 1/2 degree increments shall be provided to indicate the vertical setting.

3.4.7 Interlock Switches. - Interlock switches shall be incorporated into capacitor discharge type beacons so that, upon opening the access door or cover, the incoming power is disconnected and capacitors are discharged to a maximum of 50 volts within 10 seconds.

3.4.8 Mounting. - The beacon shall be designed for mounting on a flat, horizontal surface and shall be provided with easily accessible leveling points to facilitate field adjustments.

3.4.9 Electronic Interference. - The beacon shall not generate any interference to electronic communication and navigation equipment normally used on an airport.

3.4.10 Painting. - All exterior surfaces, except the light emitting surface, shall be painted with a body coat and two finish coats of alkyd baking enamel in accordance with Federal Specification TT-E-489, Class B. The color shall be international orange, color number 12197 in accordance with Federal Standard No. 595. The final painted surfaces shall be free of blotches, scratches, and runs.

3.4.11 Nameplate. - A nameplate, with the following information, shall be attached to the light beacon:

Light Beacon.

Identification: FAA L-_____

Voltage _____ Watts _____

Manufacturer's Part No. _____

Manufacturer's Name or Trademark _____

3.5 Optional Items. - The following items may be made available to the purchaser as optional items when so specified.

3.5.1 Automatic Lampchanger. - The lampchanger shall automatically bring auxiliary lamp(s) into operation in the correct focal position when the service lamp(s) fail.

3.5.2 Lamp Monitor. - A circuit shall be provided, when the automatic lamp-changer is specified, to permit connection to an indicator lamp or buzzer at a remote point to indicate failure of the service lamp(s).

3.6 Instruction Book. - An instruction booklet shall be provided with each beacon and shall contain the following information:

- a. Information as to safety requirements while maintaining the equipment.
- b. Description of circuit operation.
- c. Circuit schematics and wiring diagrams.
- d. Photographs or mechanical drawings of each unit of equipment showing all component parts. All parts shall be keyed to correspond to the designation given in the parts list.
- e. Complete parts list with each circuit component keyed to the designation assigned on schematics or wiring diagrams. Complete information shall be given for each part to permit ordering for replacement purposes.
- f. Recommended preventive maintenance.

- g. Troubleshooting information.
- h. Physical characteristics (weight, size, mounting dimensions).
- i. Installation instructions.
- j. Operating instructions.

4. QUALITY ASSURANCE PROVISIONS.

4.1 Qualification Procedure. - Requests for approval of light beacons as meeting the requirements of this specification shall be submitted to the Federal Aviation Administration, Office of Airports Programs, Attention: AAP-550, Washington, D. C. 20591, at least two weeks prior to the start of qualification tests. The request shall include sufficient data such as dimensional drawings, design calculations, installation and maintenance instructions, etc., for a preliminary review of the design. All qualification tests shall be conducted in facilities acceptable to the FAA either at the manufacturer's plant or at an independent testing laboratory. All tests may be witnessed by a representative of the FAA, and one certified copy of each test report must be submitted to the FAA to prove compliance with the specification. Light beacons approved as meeting this specification will be listed in AC 150/5345-1, Approved Airport Lighting Equipment, and once listed may not be changed in design, method of manufacture, quality and/or quantity of materials, substitution of components, catalog and/or style number, etc., without prior concurrence of the FAA.

4.2 Qualification Tests.

4.2.1 Visual Examination. - All components shall be visually inspected for quality of workmanship, fabrication, finish, and adequacy for the intended purpose.

4.2.2 High Temperature Test. - The equipment shall be placed in a test chamber at ambient temperature, then connected and operated to determine that no malfunction or damage was caused by faulty installation or handling. The temperature of the test chamber shall then be raised to 55° C., with the equipment nonoperating, and maintained for a period of 12 hours. The equipment shall then be operated and continue operating with the test chamber maintained at a temperature of 55° C. for a period of 36 hours. Failure of the equipment to operate properly or deterioration of any component is cause for rejection.

4.2.3 Low Temperature Test. - The equipment shall be placed in a test chamber at ambient temperature, then connected and operated to determine that no malfunction or damage was caused by faulty installation or handling. The temperature of the test chamber shall be lowered to the minimum temperature at which the equipment is designed to operate with the equipment nonoperating, and maintained for a period of 12 hours. The equipment shall then be operated and continue operating with the test chamber maintained at the minimum temperature for a period of 1 hour. Failure of the equipment to operate properly or deterioration of any component is cause for rejection.

4.2.4 Rain Test. - The rain test shall be in accordance with Method 506, Procedure I, of MIL-STD-810. The equipment shall be operated during the test and failure to operate properly or evidence of water accumulation within the equipment is cause for rejection.

4.2.5 Photometric Test. - Tests shall be conducted to prove conformance with all photometric requirements. Effective intensity shall be calculated as specified in Illuminating Engineering, Volume LIX, November 1964, Guide for Calculating the Effective Intensity of Flashing Signal Lights.

4.2.6 Humidity Test. - The test shall be in accordance with Method 507, Procedure I, of MIL-STD-810 except the maximum temperature shall be 55° C., and a total of three complete cycles (72 hours) shall be required.

4.2.7 Wind. - The wind test may be made in a wind tunnel, or by applying a simulated wind load at 90° to the vertical axis of the beacon. The beacon shall not suffer distortion or other damage that will impair normal operation. The load shall be held for 20 minutes.

4.2.8 Ice. - The ice test shall be conducted by actually building up 1/2 inch of ice on the nonoperating beacon in a cold chamber maintained at the minimum temperature at which the beacon is designed to operate. The temperature shall be maintained at the design minimum for no less than 4 hours after the required ice load has been built up, then normal power shall be applied to the beacon. The beacon shall operate normally within 30 seconds after applying power. This test may be combined with the low temperature test.

5. PREPARATION FOR DELIVERY.

5.1 General. - Packing and packaging shall be in accordance with standard commercial practices for equipment of this type.

6. NOTES.

6.1 Options. - Users of this specification should specify the options desired as contained in 3.5.