OBSOLETE TAD-494.6

**AC NO:** 150/5340-27

**DATE:** August 10, 1977

# ADVISORY CIRCULAR

## DEPARTMENT OF TRANSPORTATION
## FEDERAL AVIATION ADMINISTRATION

**SUBJECT:** AIR-TO-GROUND RADIO CONTROL OF AIRPORT LIGHTING SYSTEMS

1. PURPOSE. This advisory circular describes operating criteria for air-to-ground radio control of airport lighting systems. These criteria:

   a. Will satisfy the standards for compliance with Section 16(a) of the Airport and Airway Development Act of 1970, as amended, and the standards for air-to-ground radio control of airport lighting systems installed by the FAA under the Facilities and Equipment Program.

   b. Will be required for air-to-ground radio control of airport lighting systems at locations with instrument approach procedures.

   c. Are recommended for all installations of air-to-ground radio control of airport lighting systems for the purpose of standardization, except as deviations are permitted by internal FAA processes.

2. REFERENCES. Advisory Circular (AC) 00-2, Advisory Circular Checklist and Status of Federal Aviation Regulations, updated triannually, contains the listing of current issuances of advisory circulars and changes thereto. It explains the circular numbering system and gives instructions for ordering advisory circulars that are for sale as well as those distributed free of charge. AC 00-2 also gives instructions for ordering the Airman's Information Manual.

   a. The following free advisory circulars may be obtained from the Department of Transportation, Publications Section, TAD-443.1, Washington, D. C. 20590:

Initiated by: AAP-550

(1) AC 00-2, Advisory Circular Checklist and Status of Federal Aviation Regulations.

(2) Advisory Circular 150/5345-49, Specification for L-854, Radio Control Equipment.

b. The Airman's Information Manual, Part 1, Basic Flight Information and ATC Procedures, and Part 2, Airport Directory, may be obtained on an annual subscription basis from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

3. BACKGROUND. The use of radio to control airport lighting systems from aircraft has been practiced, to a limited degree, at smaller airports for several years. This control method has several advantages in that it permits the pilot to select the light intensity of his choice, eliminates the need for costly control cables, and conserves power by having the lighting system de-energized when not needed. The success of this method has resulted in the use of radio to control medium intensity approach lighting systems in association with instrument approach procedures. In order to preclude a proliferation of operating principles and in the interest of maintaining operational safety, it has become necessary to establish basic parameters to achieve national standardization.

4. ABBREVIATIONS.

a. VASI - Visual Approach Slope Indicator

b. REIL - Runway End Identifier Lights

c. MIRL - Medium Intensity Runway Lights

d. HIRL - High Intensity Runway Lights

e. LIRL - Low Intensity Runway Lights

5. APPLICATION. Radio control of airport lighting systems from aircraft should be used only at uncontrolled airports or at other airports during periods when the airport traffic control tower or flight service station is not in operation. Lighting systems which should not be radio controlled include obstruction lights, airport rotating beacons, high intensity approach lights, runway centerline lights, and touchdown zone lights.

TABLE 2. RUNWAYS WITHOUT APPROACH LIGHTS

| Lighting System | No. of Int. Steps | Status During Nonuse Period | Intensity Step Selected Per No. of Mike Clicks | | |
|---|---|---|---|---|---|
| | | | 3 Clicks | 5 Clicks | 7 Clicks |
| MIRL | 3 | Off or Low | Low | Med. | High |
| HIRL | 5 | Off or Low | Step 1 or 2 | Step 3 | Step 5 |
| LIRL | 1 | Off | On | On | On |
| VASI 2/ | 2 | Off | 1/ | 1/ | 1/ |
| REIL 2/ | 1 | Off | Off | Off | On |
| REIL 2/ | 2 | Off | Off | Low | High |
| REIL 2/ | 3 | Off | Low | Med. | High |
| Taxiway Edge Lights | 1 | Off | On | On | On |
| Taxiway Edge Lights | 2 | Off | Low | Low | High |
| Taxiway Edge Lights | 3 | Off | Low | Med. | High |

NOTES:

1/ Low intensity for night use. High intensity for day use as determined by photocell control.

2/ The control of VASI and/or REIL independent of other lighting systems, as described in paragraph 7b, should also be in accordance with Table 2.

systems are left either OFF or LOW when the approach lights are OFF. When the approach lights are activated by the radio control, the runway lighting systems will also be activated to their predetermined intensity setting. Further intensity step changes may be made to the approach lighting system, but the runway lighting systems will remain on their predetermined intensity step. When the approach lights go OFF at the end of the automatic timing cycle, the runway lighting systems will also go OFF or to LOW, depending on the operating mode used.

b. Runways Without Approach Lighting Systems. On these runways there is no restriction on intensity step changing of runway edge lights as is the case when an approach lighting system is involved. Other lighting systems, including VASI, REIL, and taxiway lights, should be controlled with the runway edge lights during nighttime use to preclude having these systems energized on an unlighted runway. During daytime when runway edge lights are not needed, or during nighttime if the runway edge lights are left on, VASIs and REILs may be radio controlled independently of the runway edge lights.

c. Intensity Step Relationships. Tables 1 and 2 reflect the intensity step relationship of various lighting systems when radio controlled together with other lighting systems.

8. FREQUENCY SELECTION. The air-to-ground radio equipment is available in the frequency range of 118-136 MHz. At unattended airports the unicom frequency will normally be used and at other locations the airport traffic control tower local control frequency may be used. In all instances the frequency selected will be coordinated with the regional FAA Frequency Management Officer, Airway Facilities Division, prior to ordering the radio control equipment. See Appendix 1 for addresses of FAA regional offices.

9. FLIGHT INSPECTION. Air-to-ground radio systems installed for operation of lighting systems in conjunction with instrument approach procedures will be flight inspected by the FAA prior to commissioning. Flight inspection of other radio controlled lighting systems should be accomplished when deemed necessary to assure proper system performance.

10. DATA REPORTING. At least 90 days prior to implementing new or retrofitting existing radio control systems, information (consisting of airport name, city or state, sponsor, facilities controlled, runway(s), frequency and hours available) concerning the use of the system must be reported to the FAA for publication in appropriate documents. Information should be reported to the

nearest FAA Flight Service Station or directly to the FAA National Flight Data Center, AAT-430, Washington, D. C. 20591. This information will be published in the Airman's Information Manual, Part 2, Airport Directory. Availability of radio controlled lighting systems will also be depicted on Sectional Aeronautical Charts by the symbol (L) . In addition, if the radio control systems are to be installed at locations with instrument approach procedures, the same information must be forwarded to the regional FAA Flight Standards Division. The regional office will provide the sponsor with an effective date for implementing the radio control system to be effective concurrent with the effective date of the Instrument Approach Procedure Charts containing the control information.

11. UPGRADING EXISTING SYSTEMS. To achieve national standardization and to provide operational safeguards, the FAA is encouraging that all existing nonstandard radio control systems be replaced or modified to conform to the standards specified in this advisory circular. Such upgrading will be required whenever an airport lighting system is to be installed under the FAA's Facilities and Equipment Program or funded under the Airport Development Aid Program. The use of modulated voice to activate radio controls is not acceptable and will not be utilized in conjunction with instrument approach procedures nor advertised for use in the Airman's Information Manual or on Aeronautical Sectional Charts.

12. USE OF EXISTING SYSTEMS WITH INSTRUMENT APPROACH PROCEDURES. The FAA has incorporated standard and nonstandard radio control systems in a number of instrument approach procedures. Effective January 1, 1978, only standard radio control systems will be accepted for use with instrument approach procedures. Where nonstandard radio controls are installed for use with approach lighting systems, visibility credit will not be given for landing minimums. When nonstandard controls are used for runway edge lights, night landing minimums, and night alternate minimums will not be authorized. At airports with instrument approach procedures and with nonstandard radio controls, airport operators will be given until July 1, 1978, to upgrade the radio controls to a standard keying system before adjustment to landing minimums is accomplished.

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# ADDRESSES OF REGIONAL OFFICES

AAL - ALASKAN REGION
Alaskan Regional Office
632 Sixth Avenue
Anchorage, Alaska 99501
Tel.: 907-265-4271

ACE - CENTRAL REGION
Central Regional Office
601 East 12th Street
Kansas City, Missouri 64106
Tel.: 816-374-3408

AEA - EASTERN REGION
Eastern Regional Office
JFK International Airport
Federal Building
Jamaica, New York 11430
Tel.: 212-995-3390

AGL - GREAT LAKES REGION
Great Lakes Regional Office
2300 East Devon Avenue
Des Plaines, Illinois 60018
Tel.: 312-694-4500, ext. 456

ANE - NEW ENGLAND REGION
New England Regional Office
12 New England Executive Park
Burlington, Massachusetts 01803
Tel.: 617-273-7285

ANW - NORTHWEST REGION
Northwest Regional Office
FAA Building, Boeing Field
Seattle, Washington 98108
Tel.: 206-767-2610

APC - PACIFIC REGION
Pacific Regional Office
1833 Kalakaua Avenue
Honolulu, Hawaii 96815
Mail Address:
P. O. Box 4009
Honolulu, Hawaii 96812
Tel.: 808-955-0491

ARM - ROCKY MOUNTAIN REGION
Rocky Mountain Regional Office
10455 East 25th Avenue
Aurora, Colorado 80010
Tel.: 303-837-3937

ASO - SOUTHERN REGION
Southern Regional Office
3400 Whipple Street
East Point, Georgia 30344
Mail Address:
P. O. Box 20636
Atlanta, Georgia 30320
Tel.: 404-526-7646

ASW - SOUTHWEST REGION
Southwest Regional Office
4400 Blue Mound Raod
Fort Worth, Texas 76101
Mail Address:
P. O. Box 1689
Fort Worth, Texas 76101
Tel.: 817-624-4911, ext. 306

AWE - WESTERN REGION
Western Regional Office
15000 Aviation Boulevard
Hawthorne, California 90260
Mail Address:
P. O. Box 92007
Worldway Postal Center
Los Angeles, California 90009
Tel.: 213-536-6186

6. SYSTEM OPERATION. Air-to-ground radio control of airport lighting systems is accomplished by keying the microphone of an aircraft communication transmitter a prescribed number of times in accordance with the following standard:

| Key Microphone | Function 1/ |
|---|---|
| 7 times in 5 seconds | High Intensity |
| 5 times in 5 seconds | Medium Intensity |
| 3 times in 5 seconds | Low Intensity |

1/ The function shown is for a three intensity step lighting system. Refer to Tables 1 and 2 for functions of other lighting systems.

The lighting system can be turned on by keying the microphone either 3, 5, or 7 times and will go off automatically 15 minutes later. The system may be recycled at any time for another 15-minute period at any intensity step desired by keying the microphone the appropriate number of times. The lighting systems, except for REILs, may not be turned off by radio control. Detailed characteristics of the radio control equipment are described in Advisory Circular 150/5345-49, Specification for L-854, Radio Control Equipment.

7. OPERATING CRITERIA. All lighting systems which are to be radio controlled at an airport, whether on a single runway or multiple runways, will operate on the same radio frequency in accordance with the following criteria:

a. Runways With Approach Lighting Systems. On such runways the approach lighting system takes a precedence for air-to-ground radio control and may be controlled independently of the runway lighting systems (runway edge lights, taxiway lights, etc.). The runway lighting systems are not radio controlled unless the approach lighting system is radio controlled. If the approach lighting system is radio controlled and the runway lighting systems are not radio controlled, the runway lighting systems are left ON at an intensity step determined by the expected visibility conditions. Where the runway lighting systems are to be radio controlled in conjunction with the approach lighting system, the runway lighting

TABLE 1. RUNWAYS WITH APPROACH LIGHTS

| Lighting System | No. of Int. Steps | Status During Nonuse Period | Intensity Step Selected Per No. of Mike Clicks | | |
|---|---|---|---|---|---|
| | | | 3 Clicks | 5 Clicks | 7 Clicks |
| Approach Lights (Med. Int.) | 2 | Off | Low | Low | High |
| Approach Lights (Med. Int.) | 3 | Off | Low | Med. | High |
| MIRL | 3 | Off or Low | 1/ | 1/ | 1/ |
| HIRL | 5 | Off or Low | 1/ | 1/ | 1/ |
| VASI | 2 | Off | 2/ | 2/ | 2/ |
| Taxiway Edge Lights | 1 | Off | Low | Low | Low |
| Taxiway Edge Lights | 2 | Off | Low | Low | High |
| Taxiway Edge Lights | 3 | Off | Low | Med. | High |

NOTES:

1/ Predetermined intensity step.

2/ Low intensity for night use. High intensity for day use as determined by photocell control.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Washington, D.C. 20591

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