

# ORDER

## DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION

6850.21

1/9/81

**SUBJ: OMNIDIRECTIONAL APPROACH LIGHTING SYSTEM (ODALS)**

1. 1.0111. This order directs the use of standard drawings, series **D-6067**, **D-6027**, and **D-6155** (appendix 1), and Specification **FAA-C-2642**, Construction of an Omnidirectional Approach Lighting System (**ODALS**), to establish the **ODALS** using components furnished under Contract **DOT-FA79WAI-132**.

2 DISTRIBUTION. This order is distributed to branch level in Airway Facilities Service and Office of Airport Planning and Programming, to division level in Air Traffic, Logistics, and Systems Research and Development Services and Office of Flight Operations in Washington headquarters; to branch level in the regional Airway Facilities, Airports, Air Traffic, and Flight Standards divisions (except **AEU**); and to Director level at the FAA Technical Center and Aeronautical Center.

3. BACKGROUND. Drawings **D-6067-0** through **D-6067-4** and **D-6027-1** through **D-6027-2** are issued to provide the proper installation of **ODALS** equipment manufactured by Soncraft, Inc., of Chicago, Illinois, under Contract **DOT-FA79WAI-132** for **ODALS** frangible system mounting height of 0 to 128 feet - 0 inches. Tower structures of 6 feet to 40 feet will be procured by the regions using Specification **FAA-E-2604**, Low Impact Resistance Structures for Medium Intensity Approach Lighting Systems. For tower structures 40 feet and above, utilize the drawings, series **D-6155-1** through **D-6155-22**.

4 APPLICATION. Drawing **D-6067-0** is a typical title sheet for project drawings. Drawing **D-6067-1** shows the typical site layout plan and profile for **ODALS**. This drawing is to be used as a guide and checklist for information that is required on the project site layout drawings. The access road and turnaround, which shall be constructed in accordance with access road drawings **D-5980-1** and **-2**, are optional and should be site-determined by regional requirements. Actual siting of the system shall be in accordance with the latest edition of Order **6850.2**, Visual Guidance Lighting Systems. Drawings **D-6067-1** through **-4** have been developed as standard construction and electrical installation drawings for the **ODALS** lighting system with low-impact resistance supporting structure as specified in Specification **FAA-E-2604** and installed in accordance with Specification **FAA-C-2642**, Construction of an Omnidirectional Approach Lighting System (**ODALS**). Foundation designs are based on a minimum safe soil-bearing pressure of **3,000psf** and lateral soil pressure of **200psf** per foot of depth below grade for applied loading conditions tabulated on drawing **D-6067-5**. Depth of foundation footings shall be as shown on drawings or one foot below local frost depth, whichever is greater. The local frost depth shall be noted on the project site plan. Where the actual site soil-bearing strength is less than **3,000 psf** and/or the local frost depth is greater than 5 feet - 0 inches, the foundation designs as shown on the drawings shall be modified

Distribution: **A-W(AF/PP)-3**; **A-W(AT/LG/RD/FO)-2**;

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**A-X(AF/AS/AT/FS)-3** (except **AEU**); **A-YZ-1**

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as required to suit existing soil conditions. Power source configurations are site-determined; therefore, the most economical service extension shall be set forth on the project site layout and an appropriate service extension detailed drawing developed. These drawings shall be used for all future establishment, relocation, and current construction projects for the equipment identified in paragraph 1 of this order. Inquiries or comments regarding these drawings shall be directed to the **Chief**, Environmental Systems Division, . **AAF-500**, Airway Facilities Service.

5. REMOTE HEADFLASHER. The sequenced flashers have a remote flasher head separate from the power supply; installation instructions are contained in the equipment instruction book.

6 REMOTE CONTROL. There are three remote radio control configurations for controlling **ODALS**, depending on the type of air traffic control facilities: ground-to-ground and air-to-ground combination system, ground-to-ground system, and air-to-ground system. The remote control equipment is procured by the region with frequency **pretuned** by the manufacturer.

a. The combination radio control system allows remote control of the **ODALS** from the airport traffic control tower (**ATCT**) or flight service station (**FSS**) over a frequency modulated (**fm**) radio link. When the **ATCT** or **FSS** is not operating, the control is switched to an amplitude modulated (**am**) receiver to be operated by the aircraft pilot. The combination system is installed either at a part-time **ATCT** or at a part-time **FSS** when there is no **ATCT** on the airport.

(1) The ground-to-ground and air-to-ground combination radio control system is **composed** of the following equipment:

(a) One **fm transmitter** installed at the **ATCT** or **FSS**.

(b) One manual control console with **96** function capability installed at the control point in **ATCT** or **FSS**.

(c) One antenna for the **fm** transmitter installed on the roof of the **ATCT** or **FSS**. Use another location **if** intermode interference is experienced.

(d) One **fm** receiver/decoder installed at the **ODALS** power control unit.

(e) One antenna for **fm** receiver installed at the **ODALS** control unit.

(f) One interface unit installed between the **fm** receiver/decoder and/or the air-to-ground receiver/controller and the **ODALS** control unit.

(g) One **am** receiver/controller installed at the **ODALS** control unit.

(2) The installation of a ground-to-ground and air-to-ground combination radio control system requires testing after completion or during the work. The testing to be conducted by the contractor is described in Specification **FAA-C-2642**, Division **11**, Construction of an Omnidirectional Approach Lighting System (**ODALS**). The FAA shall test and tune-up, as described in **AF P 6910.3**, change **90**, chapter **67**,

paragraph 15.f., g., h., i., and j., remote control for FA-8767 MALSR at locations without an ATCT or FSS. These procedures were written for lighting systems procured under another contract but are applicable to this equipment.

b. The ground-to-ground radio control system allows remote control of the ODALS from only the ATCT or FSS over an fm radio link. The ground-to-ground system is installed either at a full-time ATCT or at a full-time FSS when there is no ATCT on the airport,

(1) The ground-to-ground radio control system is composed of the equipment described in paragraphs 6.a.(1)(a), (b), (c), (d), (e), and (f), above.

(2) The installation of a ground-to-ground radio control system requires testing after completion or during the work. The testing to be conducted by the contractor is described in Specification FAA-C-2642, Division 11, Construction of an Omnidirectional Approach Lighting System (ODALS). The FAA shall test and tune-up as described in AF P 6910.3, change 76, chapter 66, paragraphs 15.e., f., and g., remote control for FA-8091 MALSR at locations having (1) full-time ATCT, with or without an FSS, or (2) full-time FSS only. These procedures were written for lighting systems procured under another contract but are applicable to the equipment.

c. The air-to-ground radio control system allows remote control of ODALS through an am receiver/controller by the aircraft pilot. The air-to-ground system is installed at locations having no air traffic control operation. The air-to-ground radio control system has two control functions with expansion capability to a three-function system.

(1) The air-to-ground radio control system is composed of the equipment described in paragraphs 6.a.(1)(f), and (g).

(2) The installation of an air-to-ground radio control system requires testing after completion or during the work. The testing to be conducted by the contractor is described in Specification FAA-C-2624, Division 11. The FAA shall test and tune-up as described in AF P 6910.3, change 83, chapter 62, paragraphs 15c. and d, remote control for FA-8767 MALSR at locations without an ATCT or FSS. These procedures were written for lighting systems procured under another contract but are applicable to this equipment.

7. FREQUENCY ASSIGNMENT. Each application for a frequency authorization shall be coordinated by FAA regional and Washington office frequency managers on a case-by-case basis prior to making an operational assignment.

a. The frequency assignments for the transmitters/receivers used in the ground-to-ground remote radio control application shall be from 162-174 MHz, Em with 10-watt output, short-range, low-use (less than one percent of the time). Technical standards for operations in the 162-174 MHz band are found in paragraphs 5.4.7 of the Office of Telecommunication Policy, Manual of Regulations and Procedures for Radio Frequency Management. Authorized emissions are 16F2 and 16F3.

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b The region may obtain authorization to use the **ATCT** local control frequency for air-to-ground control of airport lights during hours when the **ATCT** is shutdown. Similar authorization may be obtained for air-to-ground control on **FSS** frequencies at **non-ATCT** airports.

c. At **non-ATCT/non-FSS** airports, authorization may be obtained for **air-to-ground** control on frequencies in the band from **121.95** to **123.05 MHz**.

d Air-to-ground control is not recommended on ground control frequencies. However, **ATCT** to airport lighting control point assignments may be obtained on these frequencies.

8. AIR TRAFFIC INTERFACE. The installation of the remote radio control console shall be coordinated with the Air Traffic divisions in the regions.

9 FLIGHT STANDARDS INTERFACE. The **ODALS** shall be flight inspected to assure that the remote radio control perform satisfactorily; this includes the remote radio control system.

10. DEVIATION FROM STANDARD. No deviation from the standard is authorized without the prior approval of the Director, Airway Facilities Service. Parking lots, access roads, and similar details are authorized without further clearance. Dimensional errors, discrepancies, or suggestions for modification or addition of details should be brought to the attention of Chief, Environmental Systems Division, **AAF-500**.

11. CORRECTIONS TO STANDARD. Corrections to the standard may be made by the Director, Airway Facilities Service, without further regional or inter-service coordination. These may include corrections of dimensional errors, misspellings, and modification, addition, or deletion of details.

12. DISTRIBUTION OF DRAWINGS. A reproducible copy of each drawing is being forwarded to the **FAA** Technical Center; each region (except **AEU**) Attention: Airway Facilities Division; and two copies of each drawing to the Aeronautical Center, Attention: Chief, FAA Depot. Additional copies may be obtained from the Airway Facilities Service, Attention: **AAF-10**.



7 **GERALD L. THOMPSON**  
Director, Airway Facilities Service

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Appendix 1

APPENDIX 1. OMNIDIRECTIONAL APPROACH LIGHTING SYSTEM (ODALS)

<u>Number</u>	<u>Date</u>	<u>Title</u>
D-6067-0		Title/Index.
D-6067-1		Plan and Profile.
D-6067-2		Plans and Access Road Details.
D-6067-3		Equipment Installation Details.
D-6067-4		Electrical Details and Wiring Diagrams,
D-6067-5		Foundation Plans and Miscellaneous Details for Low Impact Resistant Towers 6'-0" to 40'-0".
D-6027-1	11/3/76	Remote Radio Control, Interface Unit, Electrical Wiring Diagram.
D-6027-2	11/3/76	Remote Radio Control, Interface Unit, Assembly Unit.
D-6155-1 thru -22	5/3/79	Approach Lighting System with Sequenced Flashers -2 (ALSF-2) 6' to 128', and Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) 40' to 128'.