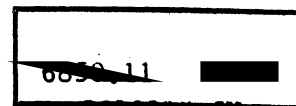


ORDER

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION



8/27/75

(Revised by
CHG 1 dated 8/13/76

SUBJ: MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM WITH
RUNWAY ALIGNMENT INDICATOR LIGHTS (MALSR)

1. **PURPOSE.** This order directs the use of the following standard drawings and specification FAA-C-2626 to establish MALSR systems using components furnished under Contract DOT-FA69WA-2046, DOT-FA72WA-2826 and DOT-FA74WA-3472, and it incorporates requirements-for remote radio control.

<u>Number</u>	<u>Date</u>	<u>Title</u>	
		<u>Medium-Intensity Approach Lighting System</u> <u>with Runway A l i g n m e n t</u>	
D-6060-0	6/19/75	0' -0" to 40' -0" Mounting Height Title	
D-6060-1	6/19/75	Typical Plot Layout, Runway No., Airport Name, City, State	
* D-6060-2A	7/30/75	System Layout and Wiring Diagram,	*
D-6060-3	6/19/75	5-Light Bar 0' -0" to 6' -0" Maxium Mounting Height, Electrical Details	
* D-6060-4A	7/30/75	Low-Impact Resistance Structure 6' -0" to 40' -0" Mounting Height, Electrical Details	I *
D-6060-5A	7/30/75	Runway Alignment Indicator Light Sequenced Flasher, 0' -0" to 40' -0" Mounting Height, Electrical Details	
D-6060-6A	7/30/75	5-Light Bar and Sequenced Flasher 6' -0" to 40' -0" Mounting Height, Foundations	
D-6060-7A	7/30/75	Power and Control Station Equipment Details	*
D-6060-8	6/19/75	Miscellaneous Details	
* D-6060-9A	7/30/75	Low-Impact Resistance Tower, Structural Erection and Details	*

Distribution: WAF/AS-3;
WFS/AT/LG/RD-2; RAF/AS/AT/
FS-3 (except AEU); NC-1

Initiated By: AAF-560

<u>Number</u>	<u>Date</u>	<u>Title</u>
		<u>Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights</u>
* D-6060-10A	7/30/75	Low-Impact Resistance Tower Light Bar and Mounting Head *
D-6060-11	6/19/75	Remote Radio Control Wiring Diagram, Ground-Ground and Air-Ground Combination System
D-6060-12	6/19/75	Remote Radio Control Wiring Diagram, Ground-Ground System
D-6060-13	6/19/75	Remote Radio Control Wiring Diagram, Air-Ground System

2. DISTRIBUTION, This order is distributed to branch level in Airway Facilities and Airports Services and to division level Flight Standards, Air -Traffic, Logistics, and Systems Research and Development Services in the Washington headquarters; branch level in Airway Facilities, Airports, Air Traffic, and Flight Standards divisions in the regions (except AEU); and to the Director, NAFEC and the Aeronautical Center,
3. BACKGROUND, Drawings D-6060-0 thru D-6060-13 are issued to provide the proper installation of MALSR equipment manufactured by Multi-Electric co., Inc., under Contracts No. DOT-FA69WA-2046, DOT-FA72WA-2826, and DOT-FA74WA-3472 for MALSR frangible system mounting height of zero to 40'. Tower structures of 6' to 40' will be procured by the regions, using FAA Specification FAA-E-2604. For tower structures 40' and above, new systems performance requirements are being developed. The drawings reflect the requirements for remote radio control for: ground-ground and air-ground combination system, ground-ground system and air-ground system. The air-ground radio control shown on drawings D-6060-11 and D-6060-13 has two-function capability,
4. APPLICATION. Drawings D-6060-0 is a typical title sheet for project drawings. Drawing D-6060-1 shows typical site layout plan and profile for a MALSR system. This drawing is to be used as a guide and check-list, for information that is required on the project site layout drawing. 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 Order 6850.2, Visual Guidance Lighting System. Drawings D-6060-2 thru 13 have been developed as standard construction and electrical installation drawings for MALSR lighting system with low-impact resistance supporting structure as specified in FAA-E-2604 and installed in accordance with Specification

FAA-C-2626. Foundation designs for the 5-lamp bars, sequenced flashers and power control station supports are based on a minimum safe soil-bearing pressure of 3,000 psf and lateral soil pressure of 200 psf per foot of depth below grade for applied loading conditions tabulated on drawing D-6060-6. 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'-0", the foundation designs as shown on the drawings shall be modified 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. The pvc duct installation detailed on drawing D-6060-8 shall be used only in those areas where it is necessary to protect the cable from possible animal or insect damage. These drawings shall be used for all future establishment, relocation, and current construction projects for the equipment identified in paragraph 1. Inquiries or comments regarding these drawings shall be directed to the Chief, Environmental Systems Division, AAF-500, Airway Facilities Service,

5. REMOTE HEAD FLASHER. The sequenced flashers supplied by Contract No. DOT-FA74WA-3472 have a remote flasher head separate from the power supply, and installation instructions are contained in the equipment instruction book. However, the sequenced flashers supplied by Contract No. DOT-FA72WA-2826 have the optical unit and power supply as one integral unit. In order to use the sequenced flashers supplied under Contract No. DOT-FA72WA-2826, remote flasher heads have been purchased and will be supplied at sites requiring remote flasher heads for mounting on the Specification FAA-E-2604 support structures. The material supplied and installation instructions for the remote flasher head applicable to the Contract No. DOT-FA72WA-2826 equipment are described in Specification FAA-E-2626, Division 11, Section 11-8.
6. REMOTE CONTROL. There are three remote radio control configurations for controlling a MALS system, depending on the type of air traffic control facilities, Ground-ground and air-ground combination system, ground-ground system, and air-ground system. The remote control equipment is supplied directly to the site by the Washington office with frequency pretuned by the manufacturer.
 - a. The combination radio control system allows remote control of the MALS from the Air Traffic Control Tower (ATCT) or Flight Service Station (FSS) over a frequency modulated (fm) radio link and 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 at a part-time ATCT and at a part-time FSS when there is no ATCT on the airport.

- (1) The ground-ground and air-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 Pm transmitter installed on the roof of the ATCT or FSS. Use another location if inter-mode interference is experienced.
 - (d) One fm receiver and decoder installed at the MALSR power and control panel.
 - (e) One antenna for fm receiver installed at the MALSR power and control panel.
 - (f) One interface unit installed between the fm receiver-decoder and the MALSR power and control panel.
 - (g) One modification to MALSR power and control panel wiring with removal of current sensors.
 - (h) One am receiver-controller installed at the MALSR power and control panel.
- (2) The installation of ground-ground and air-ground combination radio control system and MALSR power and control cabinet modification requires testing after completion or during the work. The testing to be conducted by the contractor is described in Specification FAA-C-2626, Division 11. The FAA shall test and tune up, as described in AF P 6910.3.

<u>Equipment Type</u>	<u>Document</u> <u>AF P 6910.3</u>
FA-8091	Change 78, Chapter 67 Par. 15.f,g,h,i and j.
FA-8767	Change 73, Chapter 63 Par. 15.f,g,h,i and j.
FA-9425	Change 73, Chapter 63 Par. 15.f,g,h,i and j.

- b. The ground-ground radio control system allows remote control of the MALSR from only the ATCT or FSS over an fm radio link. The ground-ground system is installed at a full-time ATCT and at a full-time FSS when there is no ATCT on the airport.
- (1) The ground-ground radio control system is composed of the equipment described in paragraph 6a. (1)(a),(b),(c),(d),(e), (f) and (g) above.

- (2) The installation of ground-ground radio control system and MALSR power and control cabinet modification requires testing after completion or during the work. The testing to be conducted by the contractor is described in Specification FAA-C-2626, Division 11. The FAA shall test and tune up as described in AF P 6910.3.

<u>Equipment Type</u>	<u>Document</u>
FA-8091	Change 76 Chapter 66 Par, 15.e,f and g.
FA-8767	Change 75 Chapter 64 Par. 15.e,f and g.
FA-9425	Change 75 Chapter 64 Par, 15.e, f and g.

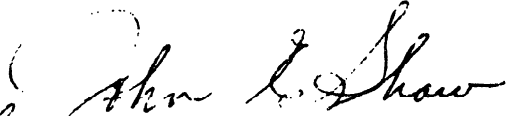
c. The air-ground radio control system allows remote control of MALSR through an am receiver-controller by the aircraft pilot. The air-ground system is installed at locations having no air traffic control operation. The air-ground radio control system has two control functions with expansion capability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

- (1) The air-ground radio control system is composed of the equipment described in paragraphs 6a. (l)(g) and (h).
- (2) The installation of air-ground radio control system and MALSR power and control cabinet modification requires testing after completion or during the work. The testing to be conducted by the contractor is described in Specification FAA-C-2626, Division 11. The FM shall test and tune up as described in AF P 6910.3.

<u>Equipment Type</u>	<u>Document</u>
FA-8091	Change 79 Chapter 68 Par. 15.c and d.
FA-8767	Change 74 Chapter 62 Par, 15.c and d.
FA-9425	Change 74 Chapter 62 Par. 15.c and d.

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&ground remote radio control application shall be from 162-174 MHz, fm with lo-watt output, short-range, low-use (less than 1 percent of the time). Technical standards for operations in the 162-174 MHz band are found in paragraph 5.4.7 of the Office of Telecommunication Policy, Manual of Regulations and Procedures for Radio Frequency Management, Authorized emissions are 16F2 and 16F3.
 - b. The region may obtain authorization to use the ATCT local control 'frequency for air-ground control of airport lights during hours when the ATCT is shut down. Similar authorization may be obtained for air-ground control on FSS frequencies at non-ATCT airports.
 - c. At non-ATCT/non-FSS airports, authorization may be obtained for air-ground control on frequencies in the band from 121.95 to 123.05 MHz.
 - d. Air-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 in the ATCT or FSS shall be coordinated with the Air Traffic divisions in the regions.
9. FLIGHT STANDARDS INTERFACE. The MALSr system shall be flight inspected to assure that the remote radio controls perform satisfactorily; this includes the ground-ground and/or air-ground 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. Regional site adaptation to accommodate terrain, utility connections, 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 **NAFEC**; each region (except **AEU**), Attention: Airway Facilities Division; and two copies of each drawing to the Aeronautical Center, Attention: Chief, FM Depot. Additional copies may be obtained from the Environmental Systems Division, Airway Facilities Service, Attention: **AAF-510**.


for **WARREN C. SHARP**
Director, Airway Facilities Service

