

**SPECIFICATIONS FOR ELECTRONIC NAVIGATION EQUIPMENT
DEPARTMENT OF AVIATION**

I. SCOPE OF WORK

This term contract work shall consist of providing and delivering Instrument Landing System (ILS) components (i.e., localizer, glide slope and marker beacon), Distance Measuring Equipment (DME), monitor receivers, spare parts kits (i.e., circuit card assemblies (CCA), modules and parts), miscellaneous spare parts, and provide technician training during the term of the contract on an as ordered "**requirement basis**" for the Department of Aviation (DOAV), an Agency of the Commonwealth of Virginia, or for other Public Bodies of the Commonwealth. Equipment will be installed by the Department of Aviation or by other qualified parties.

II. BID SUBMITTAL DATA

A. General:

1. All ILS components (localizer, glide slope and marker beacon) and distance measuring equipment (DME) shall be solid state and of proven design as demonstrated by installed and commissioned systems. The system shall be approved under Federal Aviation Regulation (FAR) Part 171 and under Annex 10 to the Convention on International Civil Aviation (ICAO).
2. The equipment provided shall be Federal Aviation Administration (FAA) "type accepted" for Airport Improvement Program (AIP) funding, for potential "take over" by the FAA, and inclusion in the National Airspace System (NAS) as prescribed in FAA Order 6700.20A, dated December 11, 1992, "Non-Federal Navigational Aids and Air Traffic Control Facilities," Chapter 4, "Assumption of Ownership of Non-Federal Facilities."

B. Specific:

1. Submit with bid, documentation from the FAA that the equipment meets the specifications contained herein. Systems offered must be compatible and capable of interfacing with other manufacturer's systems, i.e. any other ILS functions.
2. Submit a reference list of at least two (2) similar localizers, glide slopes, marker beacons and distance measuring equipment that has been installed, ground inspected, flight inspected and commissioned by the FAA prior to the award of this contract. Provide the name, phone number and address for contact person at each location. Bidders shall make available their most recent fiscal year financial statements along with auditor's opinions, i.e., Income Statement and Balance Sheet upon request.
3. Provide a list of Company personnel with qualifications who will provide technical support for the offered systems.
4. Submit a training package with bid. The training provided by the Contractor shall be in-depth to the extent that only "theory of operation" and "performance" examinations administered by the FAA in any given area office are necessary for FAA verification on any and all components offered. A statement from the FAA, showing approval of the

Bidder's training program shall be provided not later than (4) four weeks after receipt of bids.

III. EQUIPMENT

The following specifications are intended to define the level of quality and performance of the requested work and not to be restricted by manufacturer, brand, method of configuring a system, and method of accomplishing required functions, unless otherwise indicated. The word "**shall**" indicates a mandatory requirement. **Bidders shall annotate and return these specification pages to indicate compliance.** Bidder shall provide pertinent technical data documenting compliance/equivalence with dimensions, quality, features, functions and performance. All figures are approximate unless stated otherwise. The Commonwealth reserves the right to obtain technical data, to request clarifications and to set time limits for response, when deemed necessary. **Failure on the part of the Bidder to provide the aforementioned documentation will be cause to declare the bid non-responsive.** The offered equipment shall provide the following or approved equal dimensions, quality, features, functions and performance.

SPECIFICATIONS

OFFERED PRODUCT SPECIFICATIONS

STATE MFR. & MODEL NO. _____

A. Localizer

1) These systems shall be complete including: _____

a. Electronics subsystem – single equipment single frequency, single monitor suitable for category I operations. Subsystem shall provide transmitter, monitor, control, remote maintenance monitor and power supply functions. _____

b. Antenna subsystem - eight (8) element, single frequency, log-periodic dipole. Subsystem shall provide rf distribution, rf sampling, rf combining, monitor combining, suppressor net-works, cable fault/antenna mis-alignment, cancellation bridge, inline phasing, integral course, integral width detectors, and frequency difference detector. _____

c. Localizer antenna cable kit - for single frequency equipment, 250-feet between antenna and shelter. Kit shall include all power, telephone and rf transmission cables required to interface the localizer antenna array with the localizer equipment shelter. _____

d. Junction box assembly shall include ILS transient suppressor circuit card assembly. _____

e. Battery kit - for single AC power supply, shall include batteries and all equipment to provide power to the electronics subsystem in the event of commercial power failure, and shall be suitable for installation inside of equipment shelter.

f. Portable computer kit:

1. Option 1 - shall include computer and all interconnect cable used to view station status and alarm history, set up station parameters, and perform troubleshooting.

2. Option 2 - shall **not** include the above computer.

g. Software - shall include software and manuals used to view localizer station status and alarm history, set up station parameters, and perform troubleshooting.

h. VHF antenna and installation kit - shall include rf cable and connectors.

i. Installation drawings - shall include half-scale copies of the manufacturer's standard (non-site specific) installation drawings for the specified localizer.

j. Two each complete localizer instruction manuals, and system manuals.

k. Any and all other standard fixtures and components not stated above but necessary to complete in-place a working system as accepted by the Commonwealth.

2) These systems shall **not** include:

a. *Portable Instrument Landing System (ILS) Receiver's (PIR); oscilloscopes; digital voltmeters or other test equipment not necessary to be permanently dedicated to a particular system.*

b. *Shelter subsystem.*

c. *Far-field monitor kit.*

d. Environmental sensors kit.

e. Remote maintenance monitoring (rmm) sensors kit.

f. Remote control status unit (rcsu).

g. Remote status unit (rsu).

h. "Off-the-air" monitor receiver.

i. Spares kits.

B. Glide Slope

1) Option 1 - this system shall be complete including:

a. Electronics subsystem – single equipment, single frequency, single monitor suitable for category I operations. Subsystem shall provide transmitter, monitor, control, remote maintenance monitor, and power supply functions.

b. Antenna subsystem - null reference, single frequency. Subsystem shall provide antenna elements, antenna mounting kit, antenna civil kit, antenna installation kit, distribution unit/combining unit, and antenna tower.

2) Option 2 - This system shall be complete including:

a. Electronic subsystem – single equipment, single frequency, single monitor suitable for category I operations. Subsystem shall provide transmitter, monitor, control, remote maintenance monitor, and power supply functions.

b. Antenna subsystem – sideband reference, single frequency. Sub-system shall provide antenna elements, antenna mounting kit, antenna civil kit, antenna installation kit, distribution unit/combining unit, and antenna tower.

3) Option 3 - This system shall be complete including:

a. Electronics subsystem – single equipment, dual frequency, single monitor suitable for category I operations. Subsystem shall provide transmitter, monitor, control, remote maintenance monitor, and power supply functions.

b. Antenna subsystem - capture effect, dual frequency. Subsystem shall provide antenna elements, antenna mounting kit, antenna civil kit, antenna installation kit, distribution unit/combining unit, and antenna tower.

4) Each of the above options shall also include the following:

a. Shelter civil kit.

b. Battery kit, for single AC power supply, shall include batteries and all equipment to provide power to the electronics subsystem in the event of commercial power failure, and shall be suitable for installation inside of equipment shelter.

c. Portable computer kit:

1. Option 1: - shall include computer and all interconnect cable used to view station status and alarm history, set up station parameters, and perform trouble shooting, or

2. Option 2: - Shall **not** include the above computer

d. Software shall include software and manuals used to view glide slope station status and alarm history, set up station parameters, and perform trouble shooting.

e. VHF antenna and installation kit shall include rf cable and connectors.

f. Installation drawings shall include half-scale copies of manufacturer's standard (non-site specific) installation drawings for the specified glide slope.

g. Two each complete glide slope instruction manuals and system manuals.

h. Any and all other standard fixtures and components not stated above but necessary to complete in-place a working system as accepted by the Commonwealth.

5) These systems shall **not** include:

a. *Portable Instrument Landing System (ILS) Receiver's (PIR); oscilloscope; digital voltmeters or other test equipment not necessary to be permanently dedicated to a particular system.*

b. *Shelter subsystem.*

c. *Nearfield monitor kit.*

d. *Environmental sensors kit.*

e. *Remote maintenance monitoring (RMM) sensors kit.*

f. *Remote control status unit (rcsu).*

g. *Remote status unit (rsu).*

h. *"Off-the-air" monitor receiver.*

i. *Spares kits.*

C. Marker Beacon

1) Option 1 - this system shall be complete including:

Electronics subsystem – single equipment, suitable for category I operations and suitable for outside pole mounting. Subsystem shall provide transmitter, monitor, control, remote maintenance monitor, power supply and transient suppressor functions.

2) Option 2 - this system shall be complete including:

Electronics subsystem – single equipment, suitable for category I operations and suitable for

inside wall mounting. Subsystem shall provide transmitter, monitor, control, remote maintenance monitor, power supply, and transient suppressor functions.

3) Each of the above options shall include the following:

a. Antenna Subsystem - dual yagi type suitable for outer marker installation, and monitor antenna.

b. Outdoor enclosure:

- 1. Option 1 – Outdoor enclosure with fan, or
- 2. Option 2 – Outdoor enclosure without fan, or
- 3. Option 3 – No outdoor enclosure

c. Battery Kit – shall include single AC power supply, batteries, and all equipment to provide power to the electronics subsystem in the event of commercial power failure:

- 1. Option 1 – shall be suitable for installation inside of equipment shelter, or
- 2. Option 2 – shall be suitable for installation outside.

d. Portable computer kit:

- 1. Option 1 - shall include computer and all interconnect cable used to view station status and alarm history, set up station parameters, and perform troubleshooting, or
- 2. Option 2 – shall **not** include the above computer

e. Software - shall include software and manuals used to view marker beacon station status and alarm history, set up station parameters, and perform troubleshooting.

f. VHF antenna and installation kit:

- 1. Option 1 – shall include VHF antenna and installation kit, or
- 2. Option 2 – shall **not** include the above antenna.

g. Installation drawings - shall include half-scale copies of the manufacturer's standard (non-site specific) installation drawings for the specified marker beacon.

h. Two each complete marker beacon instruction manuals and system manuals. _____

i. Any and all other standard fixtures and components not stated above but necessary to complete in-place a working system as accepted by the Commonwealth. _____

4) These systems shall **not** include: _____

a. *Shelter subsystem.* _____

b. *Environmental sensors kit.* _____

c. *Remote control status unit (rcsu).* _____

d. *Remote status unit (rsu).* _____

e. *Spares kits.* _____

D. Glide Slope Conversion Kit

1) Single equipment sideband reference - kit shall include any and all equipment necessary to complete conversion. _____

2) Single equipment capture effect - kit shall include any and all equipment necessary to complete conversion. _____

E. Distance-Measuring-Equipment (DME)

1) These systems shall be complete including: _____

a. Electronics subsystem – single equipment, low power. Subsystem shall provide identification, transponder, monitor, control and display, and power supply functions. _____

b. Antenna – shall be omnidirectional _____

c. DME installation kit - shall include all material necessary to install the DME collocated near field to an ILS localizer. _____

d. Transient suppressor(s). _____

e. Battery kit - for single AC power supply, shall _____

include batteries and all equipment to provide power to the electronics subsystem in the event of commercial power failure and shall be suitable for installation outside of equipment shelter.

f. Portable computer kit:

1. Option 1 - shall include computer and all interconnect cable used to view station status and alarm history, set up station parameters, and perform trouble-shooting, or

2. Option 2 – shall **not** include the above computer

g. Software - shall include software and manuals used to view DME station status and alarm history, set up station parameters, and perform troubleshooting. Software shall be Microsoft Windows 7 Compatible.

h. Installation drawings - shall include half-scale copies of the manufacturer's standard (non-site specific) installation drawings for the specified DME.

i. Two complete sets on installation, operation, and maintenance manuals for the DME and system.

j. Through-the-air monitor receiver for DME, shall include the appropriate antenna, and shall be capable of receiving the DME signal at least two (2) nautical miles (line-of-sight) from the DME.

k. Any and all other fixtures and components not stated above but necessary to complete in-place a working system as accepted by the Commonwealth.

2) These systems shall **not** include:

a. Shelter subsystem.

b. Environmental sensors kit.

c. Remote control status unit (rcsu).

d. Remote status unit (rsu).

e. "Off-the-air" monitor receiver.

f. Spares kits.

F. "Off-the-air" monitor receiver

1) Monitor receiver, VHF, for localizer, shall include the appropriate VHF antenna and shall be capable of receiving the localizer signal at least two (2) nautical miles (line-of-sight) from the localizer.

2) Monitor receiver, UHF, for glide slope, shall include the appropriate UHF antenna and shall be capable of receiving the glide slope signal at least two (2) nautical miles (line-of-sight) from the glide slope.

3) Monitor receiver, for DME, shall include the appropriate antenna and shall be capable of receiving the DME signal at least two (2) nautical miles (line-of-sight) from the DME.

G. Spare Part Kits:

1) Localizer, single equipment, single frequency, single monitor, unique.

2) Glide slope, single equipment, single frequency, single monitor, unique.

3) Glide slope, single equipment, dual frequency, single monitor, unique.

4) Localizer/glide slope, single equipment, single frequency, single monitor, common.

5) Marker beacon, single equipment.

6) DME, single equipment, low power, spare modules kit.

7) DME, single equipment, lower power, site spares kit.

H. Spare/Replacement Parts

- 1) Spare parts kit for DME shall be for the specified DME equipment and shall provide detailed description and quantity of each spare part provided. _____

- 2) Any and all other fixtures and components not stated above but necessary to complete in-place a working system as accepted by the Commonwealth and the FAA. _____

- 3) All manufacturer replacement parts must be available to the Commonwealth for a period of 10 years minimum, following the date of placement in service of the systems described above. _____

IV. DELIVERY AND INSTALLATION BY OTHERS

Equipment shall be delivered directly by the Contractor to a third party selected by the Department of Aviation. Equipment shall be delivered by the Supplier Contractor no later than one-hundred eighty (180) calendar days following receipt of an order by the Department of Aviation.

V. VERIFICATION TRAINING

Theory of Operation and/or equipment specific training shall be provided on the Contractor's ILS and DME. FAA-approved factory training, at the Contractor's location, shall be provided to Department of Aviation technicians within ninety (90) calendar days of the Department's written request. Separate training courses on the ILS and DME must be provided. Training cost shall include cost of instruction, required supplies and books only. Department of Aviation or the respective ordering Public Body will be responsible for the cost of transportation, lodging and meals for DOAV or respective Public Body personnel.