# Title

**FAS Datablock Interface**

# Background

On some installations, the FMS supports LP/LPV approach capability when used in conjunction with a TSO-C146() Delta-4 SBAS receiver (ARINC 743B GLSSU). On such installations:

* The Delta-4 SBAS receiver provides the lateral and vertical deviations (ILS look-alike) and guidance during the final approach segment;
* The FMS performs the following functions:
* hosts the Final Approach Segment (FAS) data in its navigation database
* allows the crew to select the desired approach and Level of Service (LPV or LP, LNAV/VNAV, LNAV)
* When a FAS data block is present in the database for the selected approach and level of Service, extraction of the FAS from the navigation database and transmission to the Delta-4 SBAS receiver (via a Final Approach Segment (FAS) Data Message (FASDM))

# Describe What Is Needed

Describe the above-mentioned capabilities supporting LP/LPV approaches. The protocol to exchange the FAS between the GLSSU and FMS equipment is based on ARINC 755 and defined in ARINC 743B Appendix D. ARINC 702-5 needs to be updated to point to those standardized interfaces.

# Recommended Changes

## Section 4.3.13 Approach Navigation Data Base Exchange

Original Text:

One possible implementation of this function provides for the FMC to transmit to the GNSS landing function the final approach path data packet as extracted from the FMC navigation data base when the approach has been selected and the GNSS landing function has been armed for the approach. The final approach data packet would include a 32 bit Cyclic Redundancy Check (CRC) value to ensure the integrity of the packet that was preserved from the time of the original packet generation. Specific recommendations will be provided in a future revision to this document.

Proposed Text:

*Modify section title to become*: **Final Approach Segment Exchange**

On some installations, the FMS supports LP/LPV approach capability when used in conjunction with a TSO-C146() Delta-4 SBAS receiver (ARINC 743B GLSSU). The Delta-4 SBAS receiver provides the lateral and vertical deviations (ILS look-alike) and guidance during the final approach segment.

On those installations, upon crew selection of the desired LP/LPV approach, the FMS should extract the Final Approach Segment (FAS) Datablock from its Navigation Data Base and transmit it to the GLSSU. The protocol to exchange the FAS Datablock is described in ARINC 743B Appendix D. The Final Approach Segment (FAS) Datablock includes a 32-bit Cyclic Redundancy Check (CRC) value ensuring the integrity of the data from the time of the original packet generation.

## Section 5.1.6 GNSS Input Ports

Original Text:

Two ARINC 429 input ports should receive data from an ARINC 743A GNSS Sensor. These may be ARINC 429 high-speed or low-speed inputs. The ARINC 743A GNSS Sensor is capable of providing ARINC 429 data in high-speed or low-speed format.

Proposed Text:

Two ARINC 429 input ports should receive data from an ARINC 743 GNSS sensor. These may be ARINC 429 high-speed or low-speed inputs. The ARINC 743 GNSS Sensor is capable of providing ARINC 429 data in high-speed or low-speed format.

**COMMENTARY**

For systems supporting LP/LPV approaches using an external Delta-4 GLSSU, the ARINC 429 input ports should receive data from ARINC 743B (or later revision) GNSS Landing System Sensor Unit.

## Section 5.2.2 General Output Port

Original Text:

Two ARINC 429 outputs provide data to flight instruments, to radio receivers or frequency management unit for tuning, to the Thrust Control Computer System, Flight Control Computer System, and other users. They may also provide initialization data to the IRS.

**COMMENTARY**

The amount of data to be carried may require the use of ARINC 429 high-speed buses.

Proposed Text:

Two ARINC 429 outputs provide data to flight instruments, to radio receivers or frequency management unit for tuning, to the Thrust Control Computer System, Flight Control Computer System, and other users. They may also provide initialization data to the IRS. Optionally, they may include the FAS datablock to a TSO-C146() Delta-4 SBAS receiver (ARINC 743B GLSSU).

**COMMENTARY**

The amount of data to be carried may require the use of ARINC 429 high-speed buses.

## Section 9.2 Navigation Data Base

Original Text:

The navigation data base contains all current information required for operation in a specified geographic area. The data base should be consistent with the requirements of **RTCA DO-201A:** *Standards for Aeronautical Data*. It includes the following data:

* VOR, ILS, DME, VORTAC, and TACAN navigation aids
* NDBs
* Waypoints
* Airports and runways
* Standard Instrument Departures (SIDs)
* Standard Terminal Arrival Routes (STARs)
* Enroute airways
* Charted holding patterns
* Approaches (GNSS, ILS, VOR, NDB, LOC, LDA, etc., types)
* Approach and departure transitions
* Company route structure
* Terminal gates
* Alternates
* Minimum Safe Altitude (MSA)
* Minimum Enroute IFR Altitude (MEA)
* Minimum Obstruction Clearance Altitude (MOCA)
* Grid Minimum Off-Route Altitudes (MORAs)
* FIR/Upper Flight Information Region (UIR) Boundaries
* Special Use Airspace
* Effectivity dates
* Airline customized data
* RNP

Proposed Text:

*Add Final Approach Segment Data Block in the possible Navigation Data Base contents.*

The navigation data base contains all current information required for operation in a specified geographic area. The data base should be consistent with the requirements of **RTCA DO-201A:** *Standards for Aeronautical Data*. It includes the following data:

* VOR, ILS, DME, VORTAC, and TACAN navigation aids
* NDBs
* Waypoints
* Airports and runways
* Standard Instrument Departures (SIDs)
* Standard Terminal Arrival Routes (STARs)
* Enroute airways
* Charted holding patterns
* Approaches (GNSS, ILS, VOR, NDB, LOC, LDA, etc., types)
* Approach and departure transitions
* Final Approach Segment (FAS) Data Block (for LP/LPV approaches)
* Company route structure
* Terminal gates
* Alternates
* Minimum Safe Altitude (MSA)
* Minimum Enroute IFR Altitude (MEA)
* Minimum Obstruction Clearance Altitude (MOCA)
* Grid Minimum Off-Route Altitudes (MORAs)
* FIR/Upper Flight Information Region (UIR) Boundaries
* Special Use Airspace
* Effectivity dates
* Airline customized data
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## Attachment 4 Data input/output FMC output

*Add labels related to FAS transmission*

Proposed Text

***To follow***

# Information Sources

ARINC 743B, Appendix D