



# **Automated Flight Following Data/Transfer Specifications**

# Automated Flight Following

## (Data / Transfer Specifications)

**The following supplemental requirements are in addition to language contained in contract solicitations and are equally binding.**

### **1: General System Requirements**

#### 1.1: Security

Data must be secured between the tracking unit and the agency NOC. A minimum of 128 bit Secure Socket Layer will be used between the vendor NOC and the agency's AFF NOC.

#### 1.2: Quality

Only valid 3D position reports will be used for tracking. Reports with DOPs less than 1 or greater than 98 will be deemed invalid.

#### 1.3: Latency

Position reports from the tracking unit must be delivered to the agency NOC in less than 5 minutes of the position report time.

#### 1.4: Frequency

Tracking unit will report a minimum of one position every two minutes.

#### 1.5: System Health Validation

Two sources of validation data are required (referred to as the "heartbeat").

- 1) One computer generated position report every 5 minutes to verify the query is retrieving current data from the production data server. This report may be substituted by using the `rptTime` attribute in the root data element.
- 2) One end-to-end position report is required from a tracking unit using the same hardware and satellite segment as production tracking units every 5 to 10 minutes to verify that the system is working from end-to-end. New firmware may be tested using the end-to-end unit. 2D positions are acceptable for end-to-end "heartbeat" position reports.

## 1.6: Consistency

The number of lost/invalid position reports must not exceed .02% on a 7 day running average.

## 1.7: Scheduled and unscheduled changes and outages

Each Automated Flight Following agency NOC will be notified of system changes, scheduled maintenance and planned or unplanned service outages via email to the agency's automated flight following designated contact.

## **2: Data Types and Precision for Aircraft Tracking Units**

This specification section addresses minimum requirements of an individual position report.

The tracking unit must generate all data specified below and all data except ESN (Equipment Serial Number) must be calculated by GPS. Data units may be reformatted at the vendor NOC before delivery to agency NOC (e.g. Latitude / Longitude may be transmitted from tracking units in Degrees Minutes and Seconds to the vendor NOC, then reformatted to decimal degrees for delivery to agency NOC).

### 2.1: Equipment Serial Number

Will be embedded in the position report by the tracking device. No lookup or pivot tables shall be used for this value when generating XML tag.

### 2.2: Date/Time

Will be the UTC time of the GPS position report.

### 2.3: Latitude and Longitude

Will be sent from the device in decimal degrees.

***Position data coordinate system will be Geodetic Latitude / Longitude, WGS 1984 datum. GPS and position report must be capable of reporting its position to with +- 100 metres.***

### 2.4: Fix Type calculated by the GPS unit. Valid values are:

3D  
2D  
Invalid

2.5: Altitude

2.6: Speed

2.7: Heading

2.8: Position Quality

Metrics can be any of the following combination of precision:

Position Dilution of Precision (PDOP) Horizontal  
Dilution of Precision (HDOP)

2.9: Table of data types and precision

<b>Description</b>	<b>Data Type</b>
Equipment Serial Number	String
Date Time	DateTime
Latitude	Double
Longitude	Double
Speed	Integer
Heading	Integer
Altitude	Integer
Fix Type	String
PDOP	Integer
HDOP	Integer

Real values may be rounded to create an Integer Value Type.

**3: Data Storage, Delivery Method, Frequency**

This specification section addresses minimum requirements for the vendor's network operation center. (NOC)

3.1: Storage

Data will be stored at the vendor NOC for a minimum of 14 days.

3.2: Delivery Method

HTTPS will be used for data exchange

The request page will be username and password protected  
An xml post method will be used to request data.

### 3.3: Frequency

The agency AFF server will request data no more frequently than every 30 seconds.

### 3.4: Data Format

Data will be formatted into a well-formed XML document as defined in Exhibit 1.  
(Sample Query, Position Report, and Error XML document is in Exhibit 2.)

### 3.5: Bandwidth

The vendor NOC must be able to deliver all position data over a 60 second interval in less than 30 seconds from time of request. Agency data requests will not be synchronized.  
Vendor should be able to handle a minimum of 6 concurrent connections from each agency's Automated Flight Following NOC.

### 3.6: Vendor NOC

Must be operational 99.99% on a 7 day running average.

#### **Definitions**

**NOC** – Network Operations Center(s)

**DOP** - Dilution of Precision **SSL** – Secure Socket Layer\

**HTTPS** – Hypertext Transfer Protocol Secure

**2D** – Two-dimensional position report

**ESN** – Equipment Serial Number

**3D** – Three-dimensional position report

**WGS** - World Geodetic System

**IMEI** – International Mobil Equipment Identity

**UTC** – Universal Time Coordinate

**XML** – Extensible Mark-up Language (as defined by the W3 Consortium)

**AFF** – Automated Flight Following