

SUBJECT: Loss of Navigation FMS Message  
Aircraft: Eclipse 500  
Effectivity: 000001 thru 000262, 000266 + 000267.  
Applicability: IFMS 2.03, 2.04, and 2.06 Equipped Aircraft

## 1. SUMMARY

This SIL introduces information regarding the LOSS OF NAVIGATION message on the FMS progress page and the NAV FAIL message on the PFDs accompanied by an Almanac or Pseudorange Step GPS message.

## 2. BACKGROUND

Operators have reported a LOSS OF NAVIGATION message on the FMS progress page and a NAV FAIL message on the PFDs. The messages may clear after a short period or they may be present for several hours across multiple power cycles.

The messages are typically accompanied by one of two GPS messages displayed in the message field on the GPS status page. The messages are "Almanac" and "Pseudorange Step".

To summarize: The LOSS OF NAVIGATION message on the FMS progress page and the NAV FAIL message on the PFDs can be considered nuisance messages ONLY when they are accompanied by the GPS messages "Almanac" or "Pseudorange Step".

The GPS message "Almanac" as seen in figure 1, means the copy of the GPS almanac data currently stored in the receiver is out of date and an up to date copy is being downloaded and stored.

The GPS message "Pseudorange Step" as seen in figure 2, is related to the receiver's autonomous integrity monitoring (RAIM) function. GPS receivers with RAIM continuously estimate the range value it expects to calculate from each satellite's signal in the next transmission. If the size of the difference between the estimate and what it calculates from the received signal is too large too many times over a period of time, it sets the Pseudorange Step message and removes that satellite from the position solution.

A true LOSS OF NAVIGATION / NAV FAIL will result in a downgrade of the approach or loss of total FMS navigation. If an aircraft is flying an LPV approach and the system determines the Vertical Figure of Merit (VFOM) or Horizontal Figure of Merit (HFOM) is not sufficient to fly the LPV it will downgrade the approach to an LNAV/VNAV or if necessary an LNAV only.

In addition, the following should be noted:

- If the system is unable to calculate an accurate navigation solution in the vertical and/or horizontal planes a NAV FAIL message will be displayed on the PFDs and the Approach Level of Service will drop if engaged. I.E. "LNAV ONLY"
- IFMS versions 2.07, 2.5, and 2.7 do not display The LOSS OF NAVIGATION and NAV FAIL FMS messages when the GPS messages "Almanac" or "Pseudorange Step" are present.

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NAV MODE	TERMINAL	NAV MODE	ENROUTE
HORIZ ALERT LIMIT	1.000 NM	HORIZ ALERT LIMIT	2.000 NM
VERT ALERT LIMIT	----	VERT ALERT LIMIT	----
POSITION LAT	N 42°06.67'	POSITION LAT	N 34°02.98'
POSITION LONG	W 87°54.18'	POSITION LONG	W 110°14.43'
GPS ALTITUDE	520 FT	GPS ALTITUDE	31,858 FT
MESSAGE	ALMANAC	MESSAGE	PSEUDORANGE STEP
UTC	05/01/2014 13:26:58 z	UTC	05/01/2014 22:07:42 z
PRAIM DEST	-----	PRAIM DEST	-----
PRAIM ETA	-----	PRAIM ETA	-----
PRAIM AVAIL	-----	PRAIM AVAIL	-----

  

LEFT	GPS RECEIVER	IN USE RIGHT	IN USE LEFT	GPS RECEIVER	RIGHT
3D-WAAS	STATUS	3D-WAAS	3D-WAAS	STATUS	3D-WAAS
0.046 NM	HPL	0.046 NM	0.010 NM	HPL	0.010 NM
470 FT	VPL	470 FT	111 FT	VPL	120 FT
176 FT	VFOM	176 FT	41 FT	VFOM	45 FT

Figure 1

Figure 2

### 3. ECLIPSE ACTIONS

Eclipse is issuing this SIL to clarify the reasons for the messages and the actions operators should take when the messages are present.

### 4. SUGGESTED OPERATOR ACTION

The GPS status page can be accessed on the MFD System Synoptic pages by selecting the Setup tab, then the sensors Line Select Key (LSK), then the GPS LSK.

When a LOSS OF NAVIGATION message is present on the FMS progress page together with a NAV FAIL message on the PFD they should be considered nuisance messages ONLY when they are accompanied by the GPS messages “Almanac” or “Pseudorange Step”. The Flight Manual procedures for all CAS messages should always be observed.

### 5. EXPORT CONTROL

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