NAVSTAR GLOBAL POSITIONING SYSTEM

CGSIC
20 Sep 2004

Lt Rebecca Hamilton
Navigation Payload Engineer
2nd Space Operations Squadron
719.567.6399 (DSN 560)

Civil GPS Service Interface Committee

Constellation Summary and Performance

Constellation Summary
Since 1 Jan 04

- 29 operational on-orbit satellites
- 3 satellites launched
  - SVN47(PRN22): 20 Dec 03
  - SVN59(PRN19): 20 Mar 04
  - SVN60(PRN23): 4 Jun 04
- 1 satellite disposed
  - SVN13: 29 Apr 04

Constellation Summary
Since 1 Jan 04

- Component changes
  - SVN23 switched to Rubidium #2 (Last Clock)
  - SVN25 switched to Cesium #3
  - SVN25 reaction wheel #4 shutdown
  - SVN36 switched to Cesium #3
  - SVN38 switched to Cesium #3
- Constellation changes
  - SVN 31 (C5) Arrived on station 3 Aug 04
    - SVN 37 (C4) Back-up
  - SVN 32 Re-phased
    - Cross-Plane Coverage of SVN 25 (A2) and SVN 37 (C4)
    - Arrives on station Nov 04

Constellation Summary

Anomaly Summary

SVN31 (PRN31): 12 Sep, 4 Mar, 15 Feb – Baseband upset

SVN27 (PRN27): 29 Aug - Clock anomaly

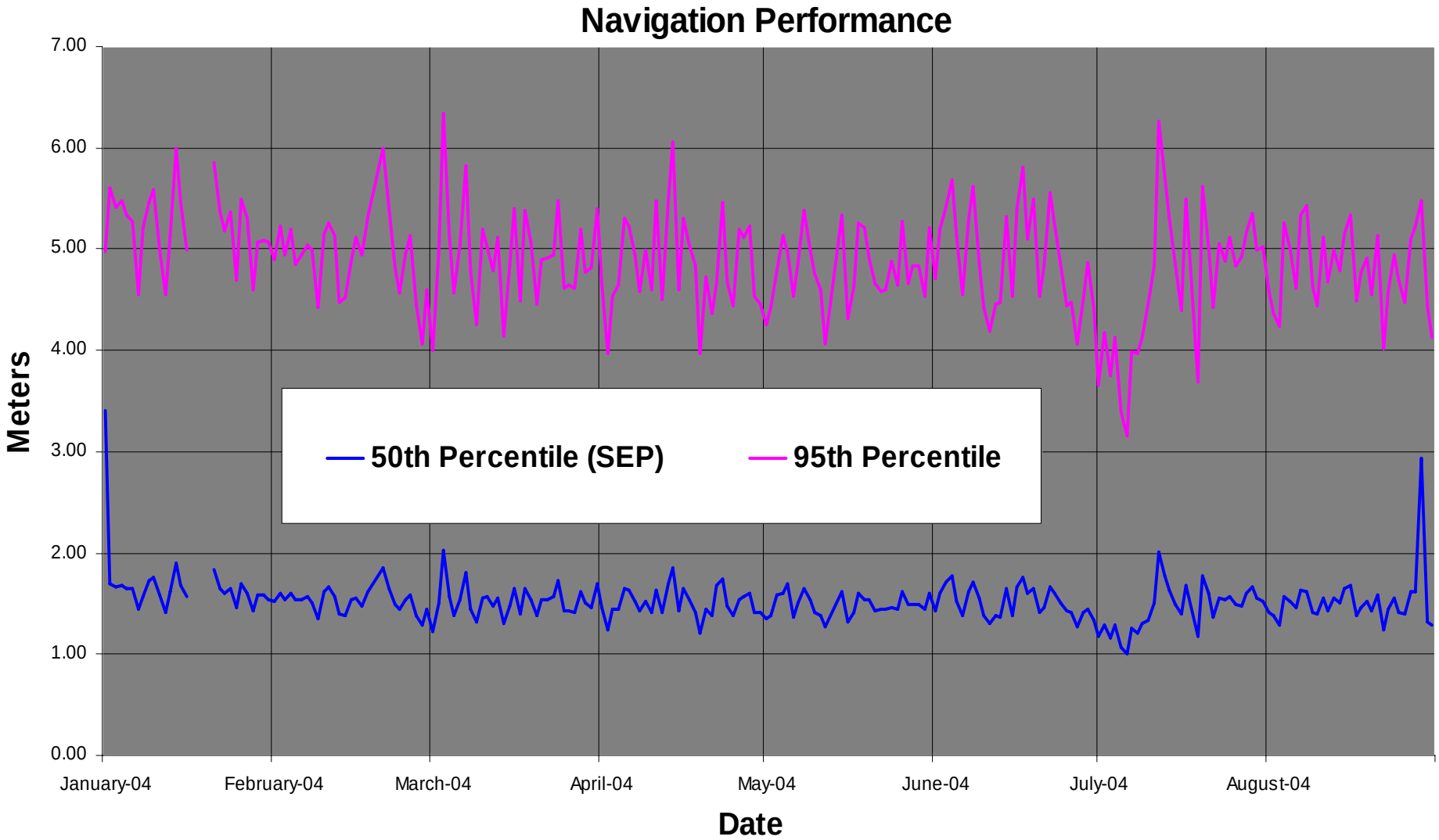
SVN38(PRN8): 5 May, 3 May, 22 Apr – FSDU output shifted

SVN36(PRN6): 17 Mar - Clock anomaly

SVN13 (disposed 29 Apr): 22 Feb – A-side DCEA deactivated

SVN23 (decommissioned 13 Feb): 1 Jan - Clock failed

2 SOPS WILL CONTINUE TO ENSURE GPS PERFORMANCE SUPPORTS ALL USER REQUIREMENTS

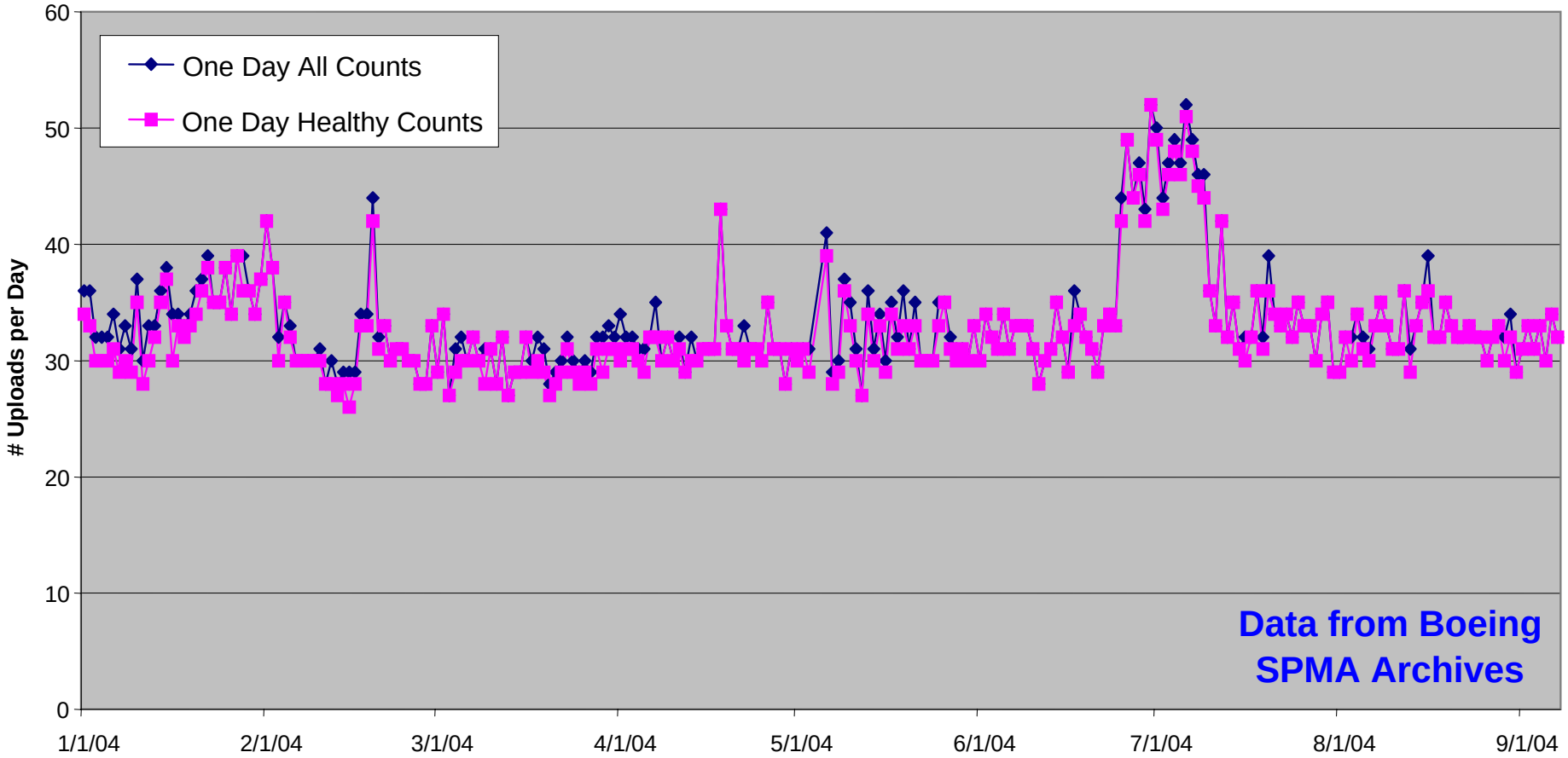


SEP Requirement = 16m

CONSTELLATION EXCEEDS ALL PERFORMANCE REQUIREMENTS

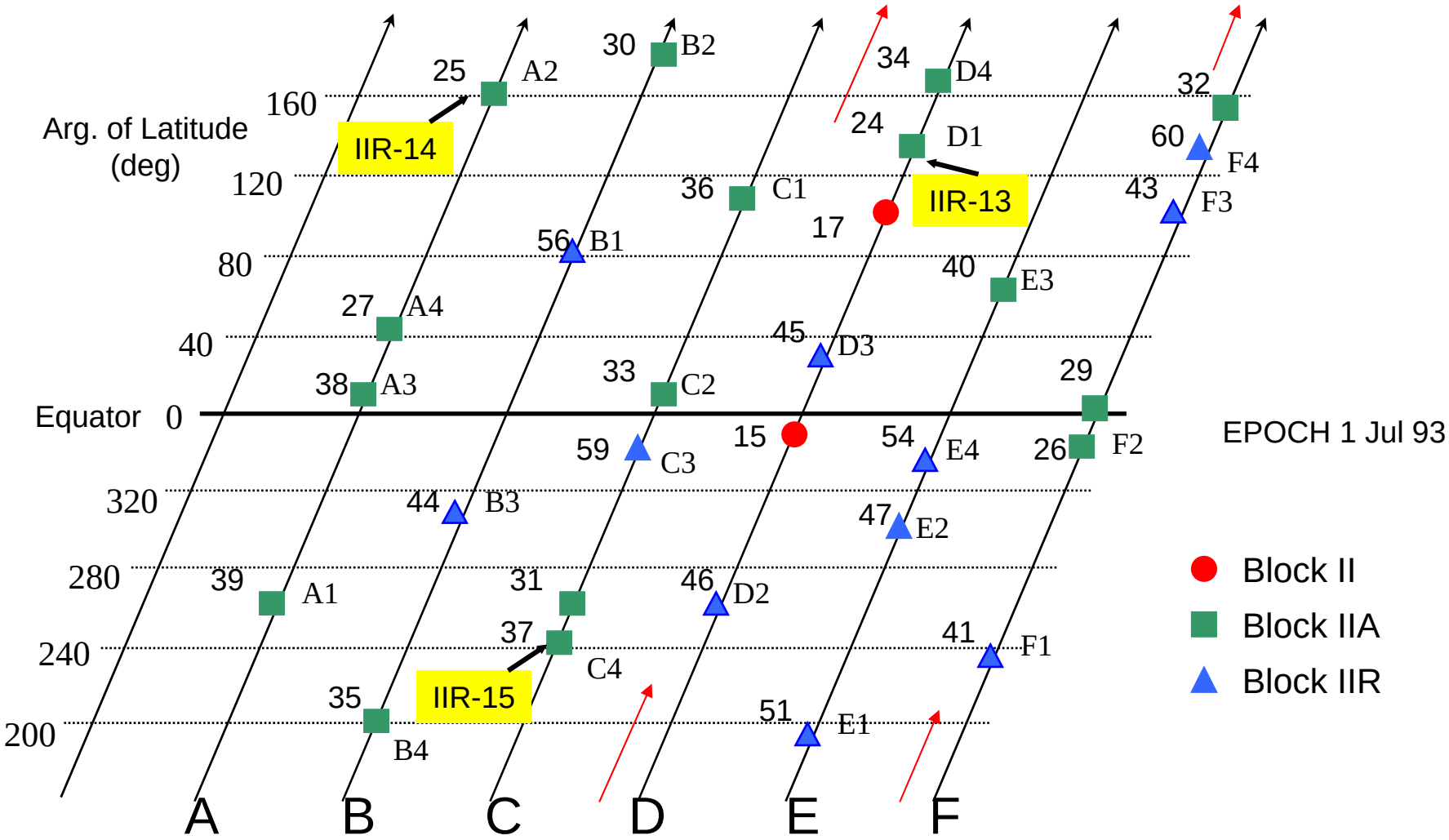
Navigation Uploads per Day

GPS daily Uploads Count - Calendar Year 2004



GPS OPERATORS ARE BUSY PROVIDING A SOLID, HEALTHY NAV SIGNAL TO USERS WORLDWIDE

GPS Locations 1 August 2004



GPS Space and Control Clock and Reaction Wheel Performance Status

(as of 1 Aug 2004)

	SVN (PRN) / launch date			
Clock*	1	2	3	4
Wheel	1	2	3	4

*** II/IIA** = Rb, Rb, Cs, Cs
IIR = Rb, Rb, Rb
Diagonal Line = Unhealthy

Clock		**Wheel**
meets spec		functional
watch list		watch list
dead		dead
unused		
in use	●	

PLANE

SLOT	A	B	C	D	E	F
1	39A (09) 06/93	56R (16) 1/03	36A (06) 03/94	24A (24) 07/91	51R (20) 05/00	41R (14) 11/00
2	25A (25) 02/92	30A (30) 9/96	33A (03) 03/96	46R (11) 10/99	47R (22) 12/03	26A (26) 07/92
3	38A (08) 11/97	44R (28) 07/00	59R (19) 03/04	45R (21) 03/03	40A (10) 07/96	43R (13) 07/97
4	27A (27) 09/92	35A (05) 08/93	37A (07) 05/93	34A (04) 10/93	54R (18) 01/01	60R (23) 06/04
5			31A (31) 03/93	15 (15) 10/90		29A (29) 12/92
6				17 (17) 12/89		32A (01) 11/92

Constellation Performance

All Errors Based on Dual Frequency, Signal in Space Only. Information Presented Reflects Data Collected During the Period from January 1, 2004 to August 31, 2004. Thresholds Provided Reflect Average Location Requirements from SPS Signal Specification Dated October, 2001.

PDOP Availability:

- Requirement - PDOP of 6 or Less, 98% of the Time or Better
- Actual - 99.98495%

Horizontal Service Availability

- Requirement - 95% Threshold of 36 meters, 99% of the Time or Better
- Actual – 2.75 meters

Vertical Service Availability

- Requirement - 95% Threshold of 77 meters, 99% of the Time or Better
- Actual – 3.98 meters

User Range Error

- Requirement - 6 meters or Less, Constellation Average
- Actual - 1.12 meters (excluding SVN23 anomaly, 1 Jan 04)

NAVSTAR GLOBAL POSITIONING SYSTEM

CGSIC
20 Sep 2004

Lt Rebecca Hamilton
Navigation Payload Engineer
2nd Space Operations Squadron
719.567.6399 (DSN 560)