Civil GPS, Summary of Key Events

- GPS strongly benefited from the TRANSIT system operated by the Navy in the 1960's and 1970's.
- Navy vs. Air Force >> Joint Program Office >> Brad Parkinson
- 1978 - First Global Positioning System satellite launch
- 1993 - GPS Standard Positioning Service (SPS) available (L1)
- 1994 - FAA approves GPS for use in National Airspace System
- 1998-1999 - Two new GPS civil signals (L2 and L5) announced
- 2000 - Selective Availability set to zero

Designing a navigation constellation

- 24 hours a day
- global
- Real-time
- cheap
- light
- Passive
- Minimize atmosphere delays
- All weather

Physical constraints

- money
- # satellites
- inclination
- Orbital planes
- altitude
- Ground tracks
- Accuracy (Frequencies)
- Power
- Encryption
- Dual-use (Civilian & Military)
- Ground support needs

Physical constraints

- Ionospheric delay ~100 meters, so a dual-frequency system was planned from the beginning.
- TRANSIT - doppler; GPS - ranging.
- Encryption used to accommodate dual-use.
- Must be able to track the constellation.

Quality	GPS	GLONASS
Satellites (planned)	24	24
Satellites (2001)	29	9
Orbital planes	6	3
Spacing	uneven	even
Inclination (degrees)	55	64.8
Orbital Radius (km)	26,560	25,510
Orbital Period (hr:min)	11:58	11:16
Ground Track Repeat	sidereal day	8 sidereal days
Reference System	WGS84	SGS85
Frequencies	2	2
Passive	yes	yes

Jargon

Jargon

Jargon

http://www.navcen.uscg.gov/navinfo/Gps/ActiveNanu.aspx

GPS CONSTELLATION STATUS FOR 03 SEP 2008

PLANE	SLOT	SVN	PRN	BLOCK-TYPE	CLOCK	OUTAGE DATE		NANU-TYPE	N
A	1	39	09	II-A	CS				
A	2	52	31	IIR-M	RB				
A	3	38	08	II-A	CS				
A	4	27	27	II-A	CS				
A	5	25	25	II-A	RB	26 AUG 2008	UNUSUFN	2008092 - SVN2	
A	6	48	07	IIR-M	RB	05 SEP 2008	FCSTMX	2008094 - SVN4	
B	1	56	16	II-R	RB				
B	2	30	30	II-A	CS				
B	3	44	28	II-R	RB				
B	4	58	12	IIR-M	RB				
B	5	35	05	II-A	RB	05 AUG 2008	UNUSUFN	2008084 - SVN3	
C	1	36	06	II-A	RB				
C	2	33	03	II-A	CS				
C	3	59	19	II-R	RB				
C	4	53	17	IIR-M	RB				
C	6	57	29	IIR-M	RB				
D	1	61	02	II-R	RB				
D	2	46	11	II-R	RB	02 SEP 2008	FCSTSUMM	2008096 - SVN4	
D	3	45	21	II-R	RB				
D	4	34	04	II-A	RB				
D	5	24	24	II-A	CS				
E	1	51	20	II-R	RB				
E	2	47	22	II-R	RB				
E	3	40	10	II-A	RB				
E	4	54	18	II-R	RB				
E	5	23	32	II-A	RB				
F	1	41	14	II-R	RB				
F	2	55	15	IIR-M	RB				
F	3	43	13	II-R	RB				
F	4	60	23	II-R	RB				
F	5	26	26	II-A	RB				
F	6	32	01	II-A	CS				

GENERAL INFORMATION NANUsN

More jargon