Wideband Gapfiller Satellites
Ground System
Interoperability
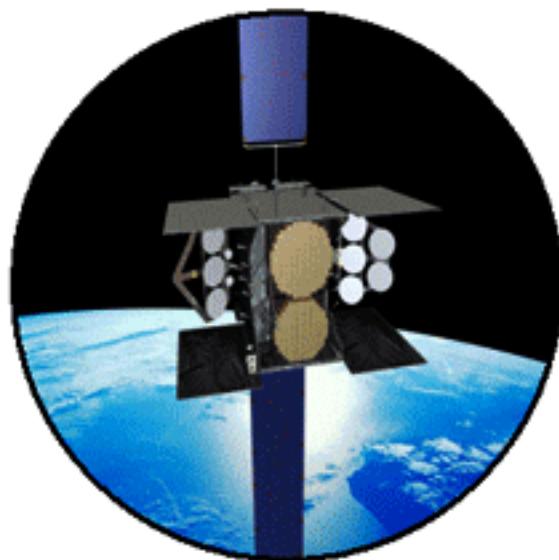
Lt Col Stephen Hargis

GSAW 2005

1 March 2005

WGS Capacity Comparison with DSCS III

U.S. AIR FORCE

1 Wideband Gapfiller Satellite

DSCS III Satellites

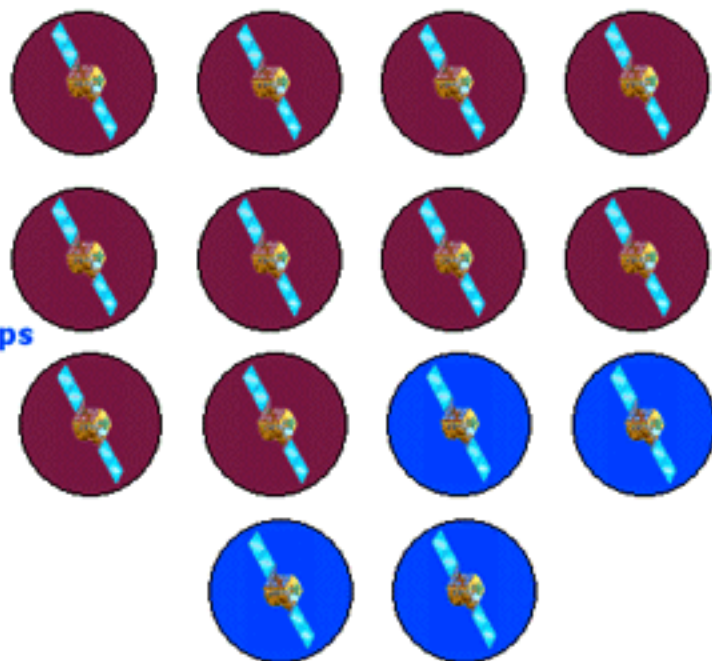WGS = 2.1 Gbps

DSCS III = 100 Mbps

DSCS III (SLEP) = 250Mbps
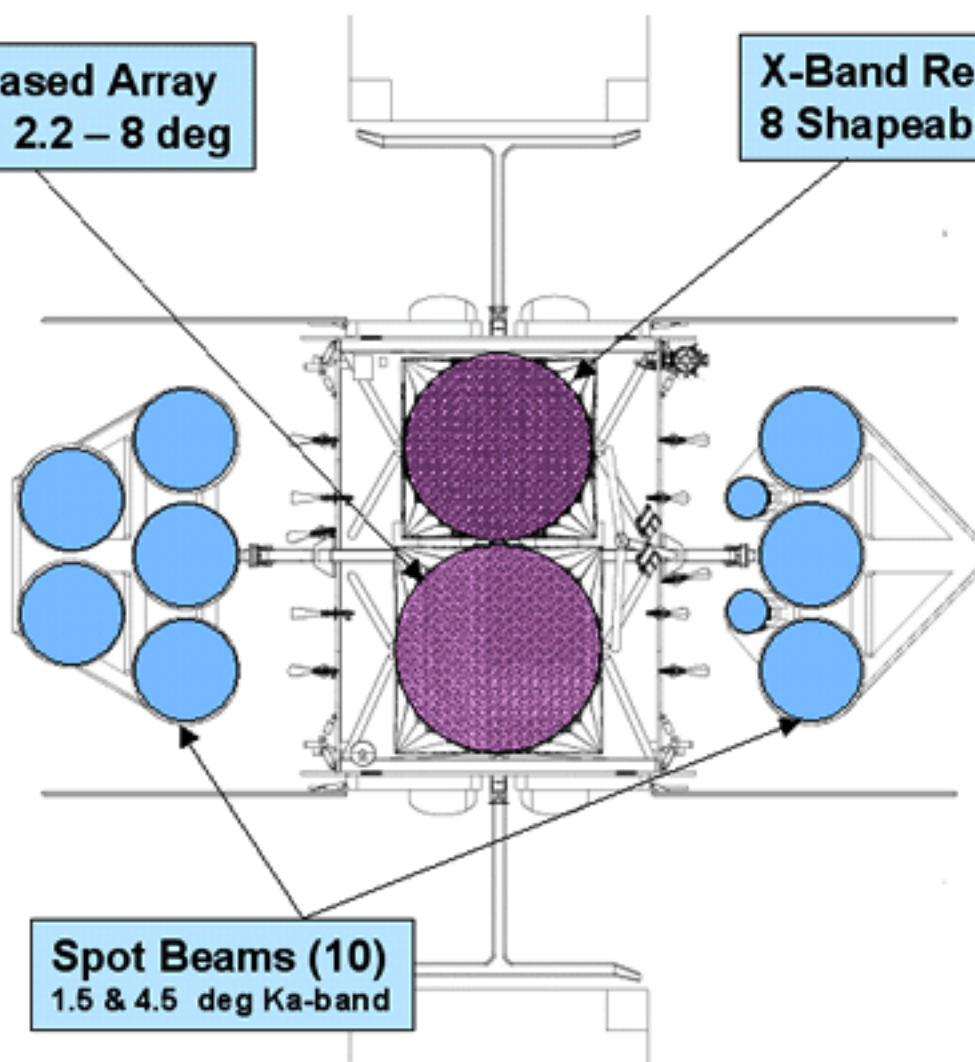
1 WGS = 2.1 Gbps > 10 DSCS III + 4 DSCS III (SLEP)

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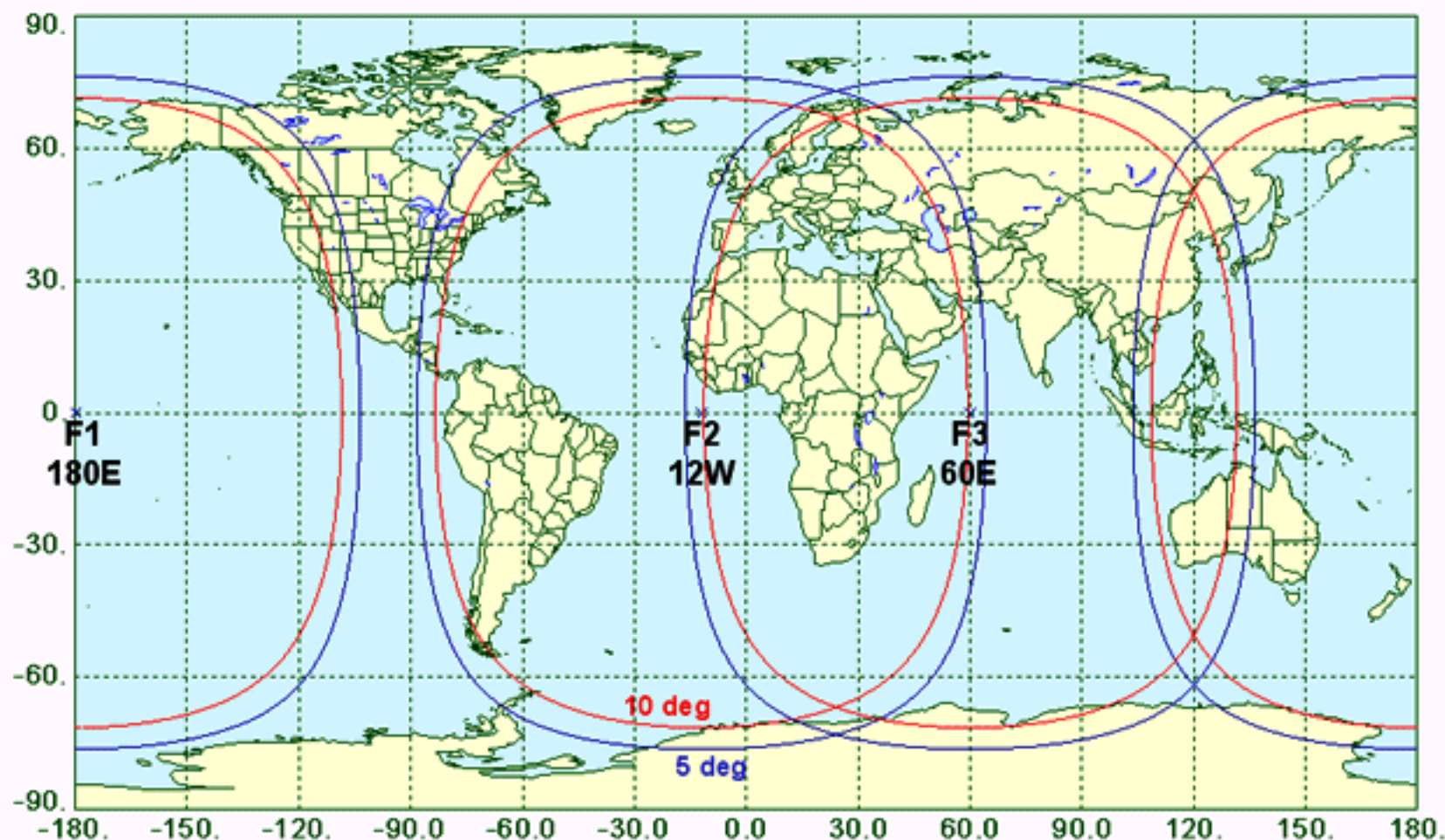**X-Band Transmit Phased Array**
8 Shapeable Beams 2.2 – 8 deg

X-Band Receive Phased Array
8 Shapeable Beams 2.2 – 8 deg

Spot Beams (10)
1.5 & 4.5 deg Ka-band

WGS Planned Deployment

WGS Control Segment

U.S. AIR FORCE

Schriever AFB

Cp Roberts

Vandenberg AFB

Ft Meade

Ft Detrick

Landstuhl

Ft Buckner
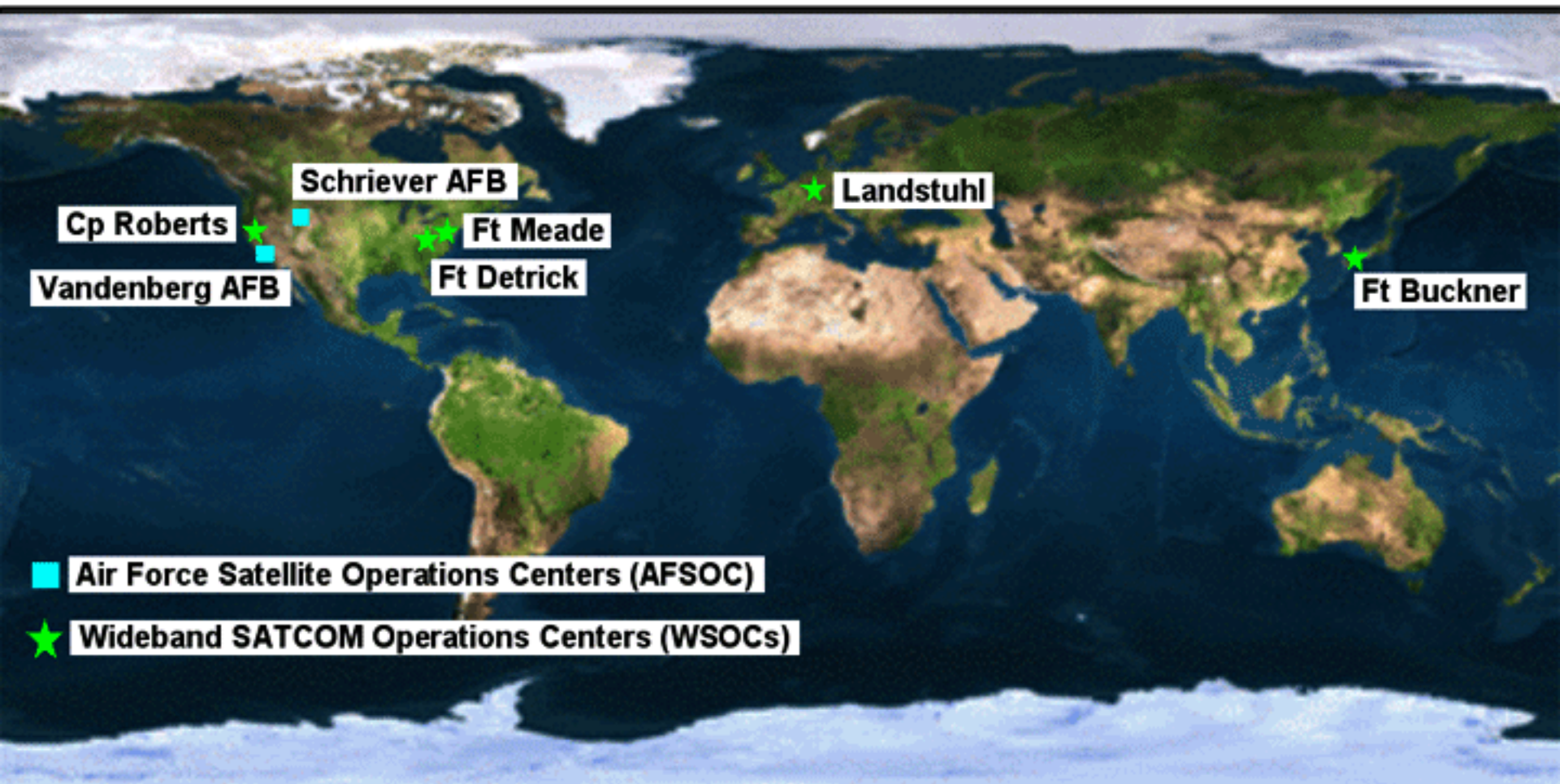
Air Force Satellite Operations Centers (AFSOC)

Wideband SATCOM Operations Centers (WSOCs)

WGS Control Segment products will be integrated into existing facilities

Key WGS Stakeholders
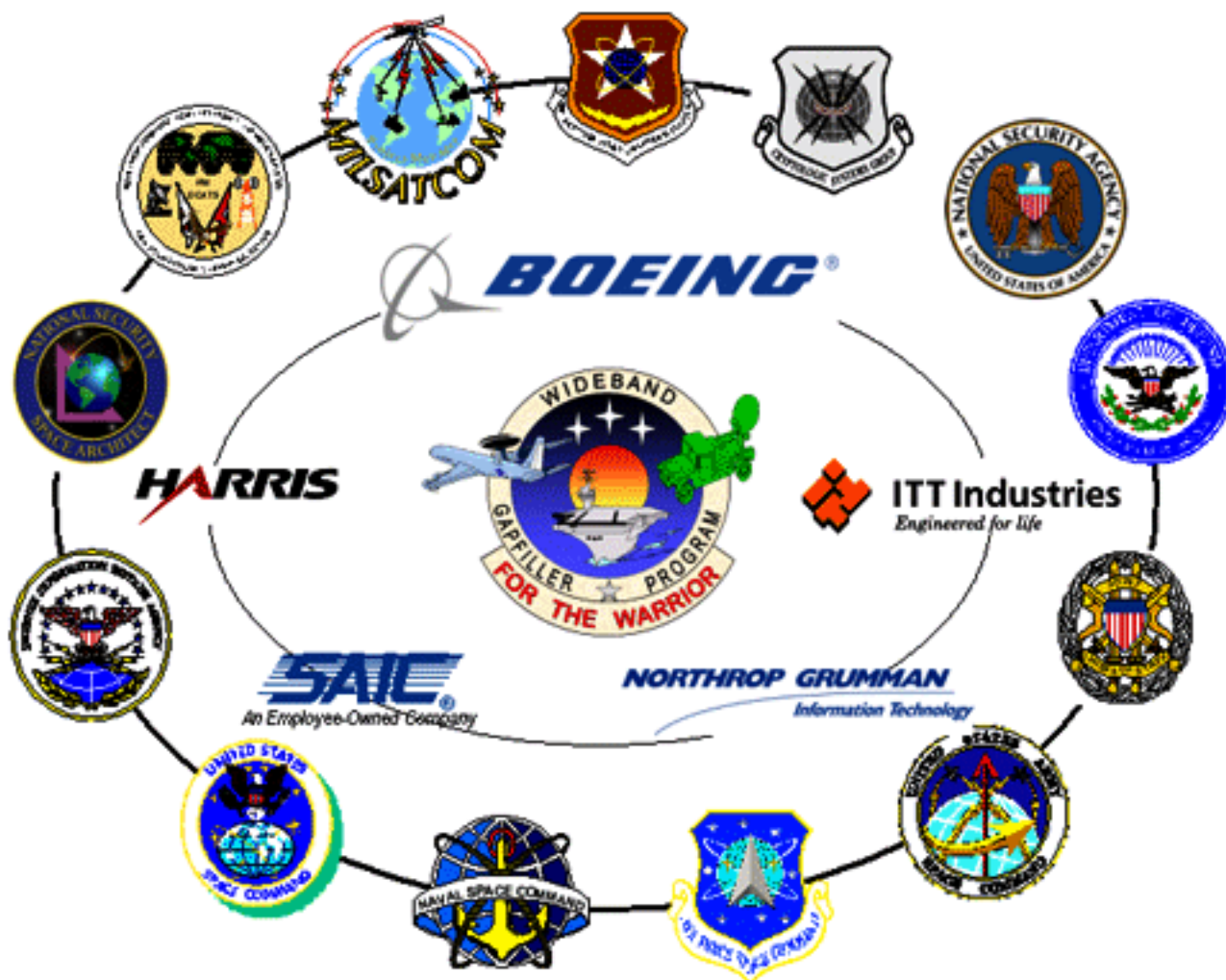
- AFSPC
- ARSTRAT
- BSS
- DISA
- ESC
- Harris
- ITT
- JCS
- NAVSPACE
- Northrop Grumman
- NSA
- NSSA
- PM DCATS
- PM WIN-T
- SAIC
- SPAWAR
- USSPACE

WGS Control Segment

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Bus control via Air Force Satellite Control Network
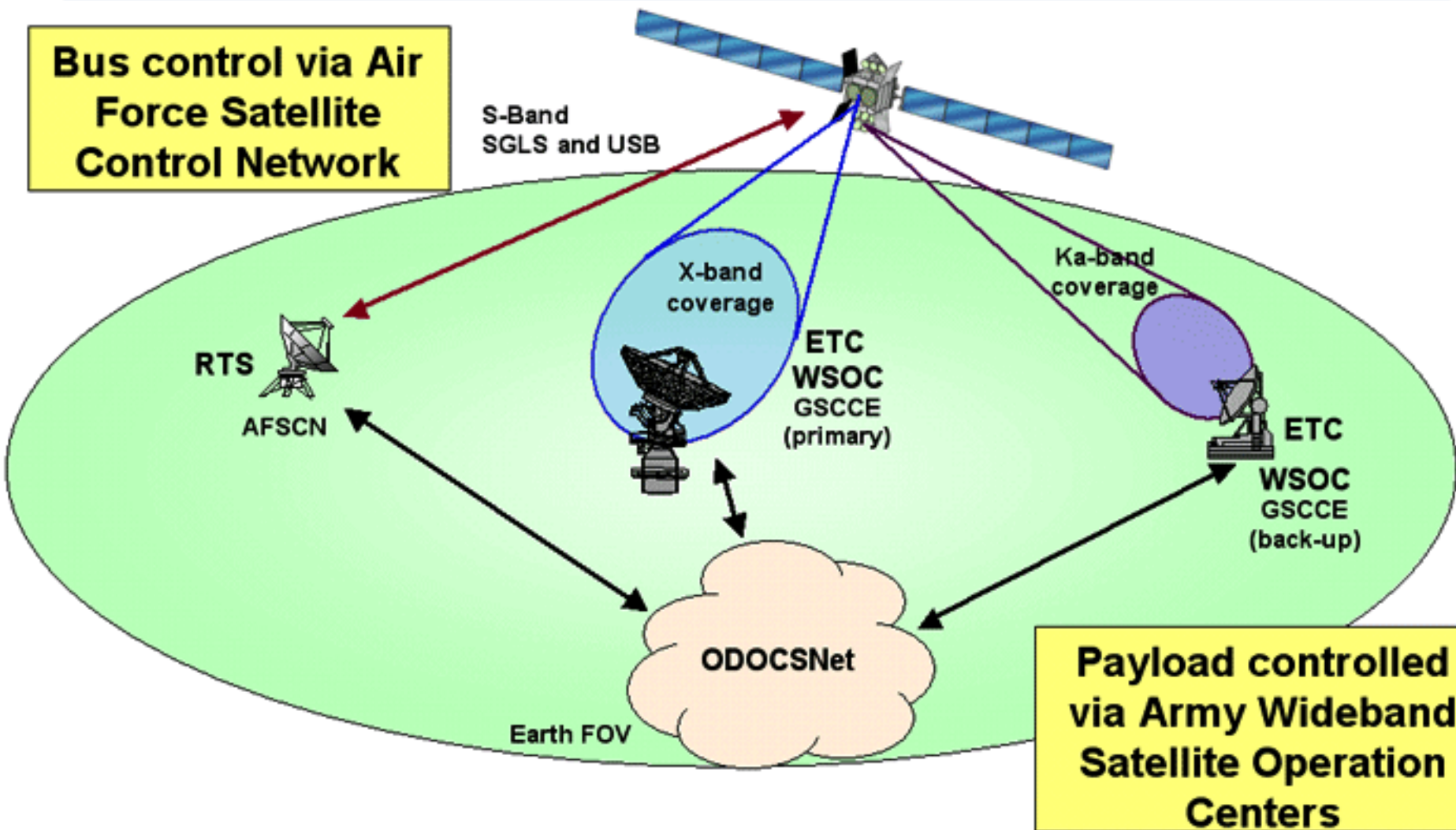
S-Band SGLS and USB

X-band coverage

Ka-band coverage

RTS
AFSCN

ETC
WSOC
GSCCE
(primary)

ETC
WSOC
GSCCE
(back-up)

ODOCSNet

Earth FOV

Payload controlled via Army Wideband Satellite Operation Centers

Ground Control

U.S. AIR FORCE

A Co	B Co	C Co	D Co	E Co
FT DETRICK, MD	FT MEADE, MD	LANDSTUHL, GE	CP ROBERTS, CA	FT BUCKNER, JA

Ground Segment Block Diagram

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WSOC

ODOCS Workstation

Other ODOCS HCIs

HCI

Other Servers

CNPS/ DIMS | IMPCS | OSCS Server

Patch Facility

ODOCSnet LAN

GSCCE

Server A
(Intel based -Windows 2000)

GEC | Control & Status

Director | S/W Switch

Payload Apps | Launcher

STP

SC 1 | Scheduler

BPS

SSS

VKMS Switch

Maintenance Terminal
(Intel based Windows NT)

HCI | Firewall

Monitor, Keyboard, & Mouse

RAID

LAN

RS-449 CCS-C I/F

ODOCSNet WAN

Remote

CCS-C AFSCN

Mixed Programs, Contractors in a Legacy Environment

- **WGS Ground Segment (GSCCE) must integrate into an existing, operational workstation (ODOCS)**
- **Workstations subject to upgrade**
- **GSCCE must co-exist with other applications**

- **Solution:**
  - **Common Object Request Broker Architecture (CORBA) based environment**
  - **Provides "middle-man" with a standard interface for each component**

- **Three Main Services**
  - **GUI Navigation**
    - **Context sensitive/work flow navigation**
    - **Data population (form "pre-loading")**
    - **Provides standard and consistent user interfaces**
  - **Messaging & Notification**
    - **Provides standard and consistent means for distributing control messages among applications**
    - **Based on CORBA Event Services**
  - **Data Management**
    - **Provides standard and consistent stored data interfaces**
    - **Interfaces based on SQL/Call Level Interface**

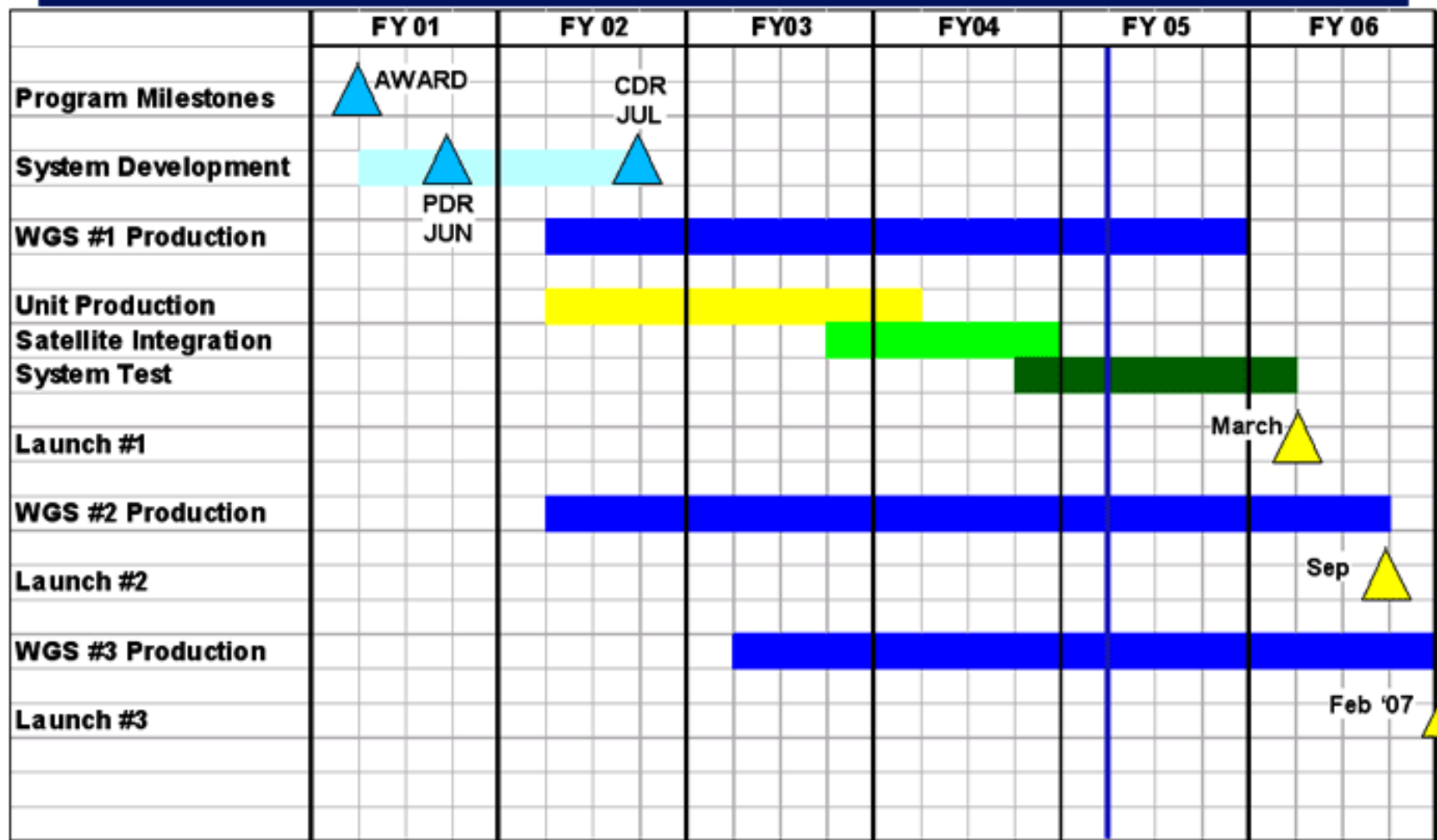# Commercial DoD Partnership

- **Meet Government Requirements with combination of custom, legacy and COTS products**

- **Diverse Partners**
  - **Boeing Satellite Systems – Custom and Legacy**
  - **Raytheon – Eclipse (COTS Telemetry & Control)**
  - **ITT – Integration and Custom Development**
  - **FDS – Orbit Determination (COTS)**

Program Schedule

U.S. AIR FORCE

	FY 01	FY 02	FY03	FY04	FY 05	FY 06
Program Milestones	▲ AWARD	CDR JUL				
System Development	▲ PDR JUN	▲				
WGS #1 Production						
Unit Production						
Satellite Integration						
System Test						
Launch #1					March ▲	
WGS #2 Production						
Launch #2						Sep ▲
WGS #3 Production						
Launch #3						Feb '07 ▲

Integrity - Service - Excellence

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