



# *Space Surveillance Network*

*Lt Col Glen Shepherd*  
*Air Force Space Command*  
*(AFSPC)*

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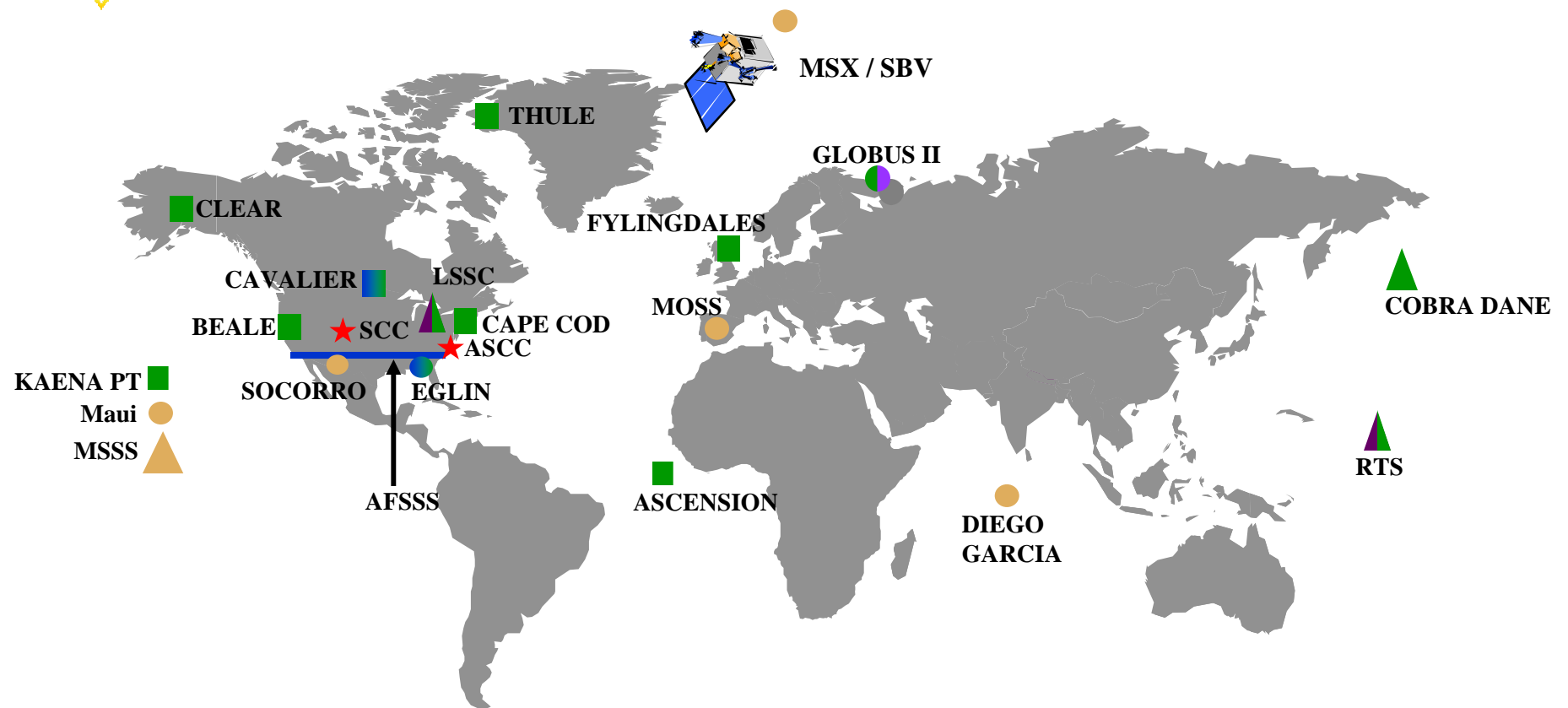


# *Overview*

- **Space Surveillance Network**
- **Future Upgrades**
- **Current Satellite Catalog**
- **Space Surveillance Support**



# Space Surveillance Network (SSN) Map



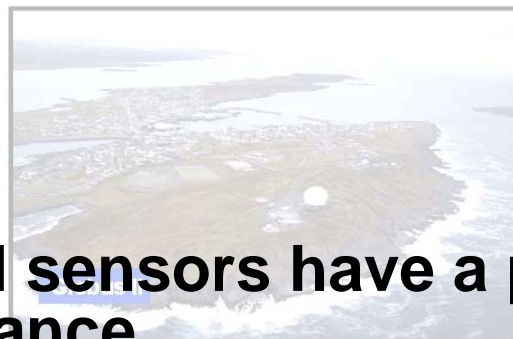
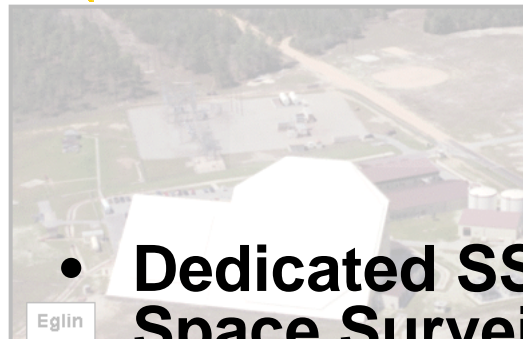
LSSC = Lincoln Space Surveillance Complex  
 Millstone, Haystack, HAX  
 MSSS = Maui Space Surveillance System  
 (former AMOS/MOTIF site)  
 AFSSS = Air Force Space Surveillance System  
 RTS = Reagan Test Site

Tracking Radar  
 Detection Radar  
 Imaging Radar  
 Optical Telescope  
 SSN C2

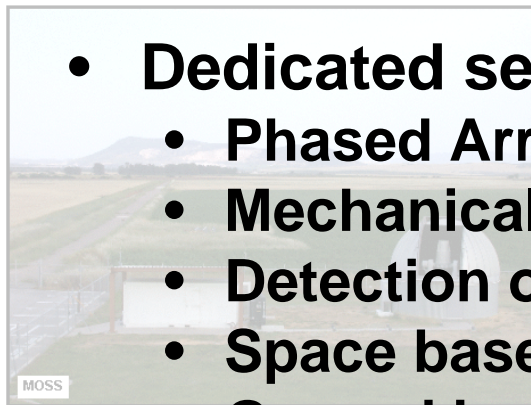
● Dedicated  
 ■ Collateral  
 ▲ Contributing  
 ★ SSN C2



## *Dedicated SSN Sensors*



- **Dedicated SSN sensors have a primary mission of Space Surveillance**



- **Dedicated sensors include:**
  - **Phased Array Radar (Eglin)**
  - **Mechanical tracker (Globus II – Vardo, Norway)**
  - **Detection only sensors (AFSSS)**
  - **Space based (MSX/SBV)**
  - **Ground based electro optical sensors (GEODSS and MOSS)**



## *Collateral SSN Sensors*

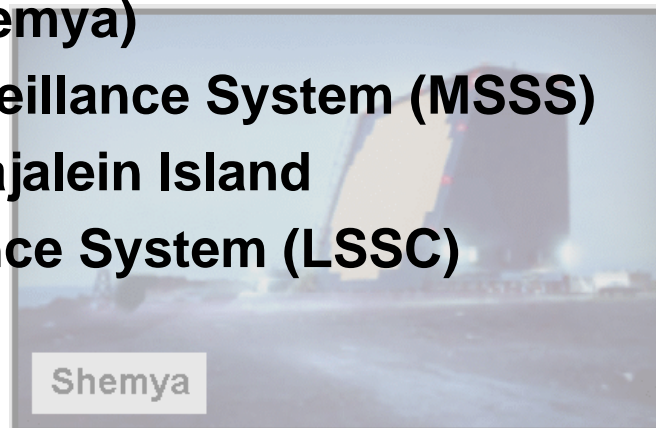
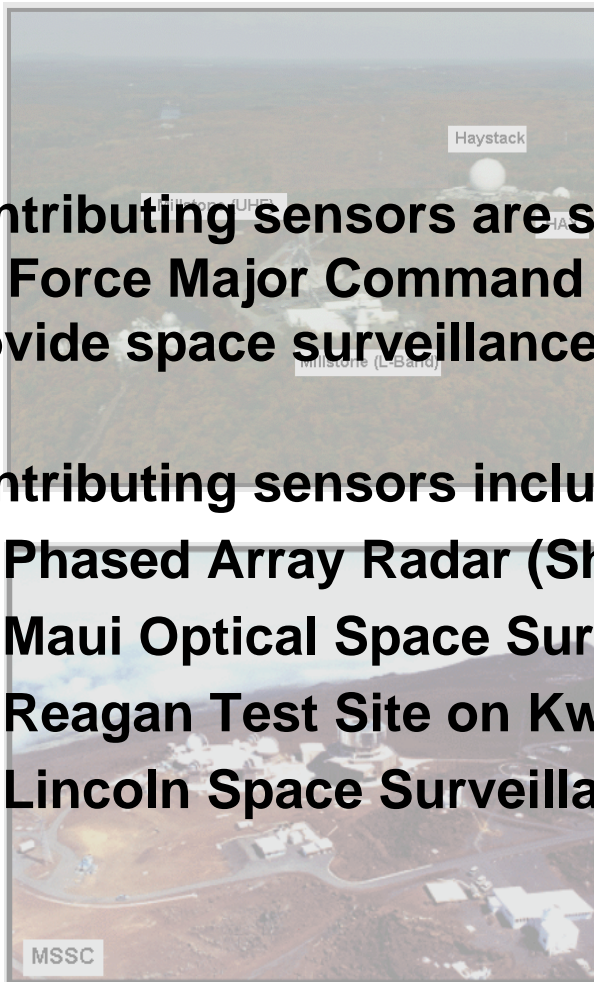
- Collateral sensors belong to AFSPC, but have a primary mission other than space surveillance
- Collateral sensors include:
  - Solid State Phased Array Radars (SSPARs)
    - 3 Ballistic Missile Early Warning System (BMEWS)
    - 2 PAVE Phased Array Warning System (PAVE PAWS)
  - Phased Array Radar at Cavalier AFS, ND
  - Mechanical trackers at Kaena Point, HI and Ascension Island
    - Support the Eastern and Western Launch Ranges.





## *Contributing SSN Sensors*

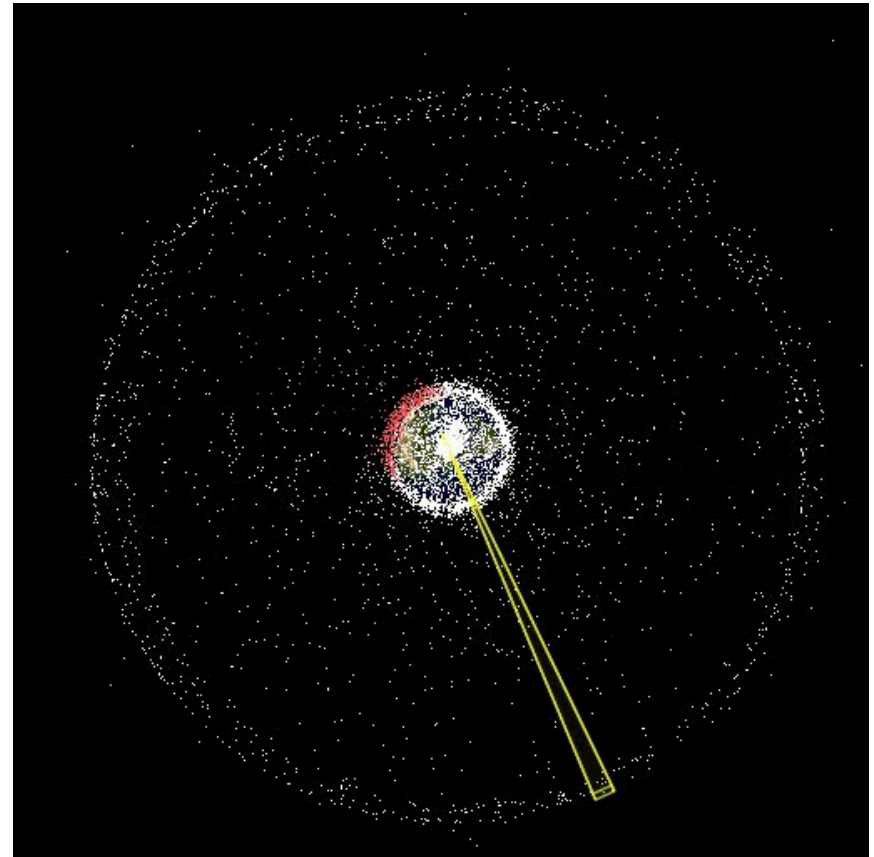
- **Contributing sensors are sensors that either report to another Air Force Major Command or are under contract to AFSPC to provide space surveillance information**
- **Contributing sensors include:**
  - **Phased Array Radar (Shemya)**
  - **Maui Optical Space Surveillance System (MSSS)**
  - **Reagan Test Site on Kwajalein Island**
  - **Lincoln Space Surveillance System (LSSC)**





## *Space Based Space Surveillance (SBSS)*

- **Gap-filler between MSX/SBV & SBSS Objective System**
- **Metric (position) data and Space Object Identification (SOI) data**
- **Addresses challenges caused by weather, daytime and moonlight restrictions and limited capacity of existing optical and radar-based SSN**
- **SBSS Block 10 Launch 1stQtr FY08**





## *Current Satellite Catalog*



- There just over 9,000 man made cataloged space objects orbiting the Earth
- Consists of active and dead payloads, spent rocket bodies, and debris





## *Congressional Tasking*

- **The FY04 Defense Authorization bill included language to allow the DoD to provide satellite tracking support to entities outside United States Government (foreign governments, companies, etc)**
  - **The SECDEF may carry out a pilot program to determine the feasibility and desirability of providing to non-United States Government entities space surveillance data support described in subsection**
  - **The pilot program three-year period planned to end May 07**
    - **Requested two-year extension until May 09 in order to further study expanded support**



## *Program Details*

- **Provides timely, accurate, state-of-the-art space surveillance services**
  - **Registered users can download unclassified Two-Line Element Sets, decay messages, and associated reports from Space-Track.org website**
- **Space-Track website achieved full functionality of NASA Orbital Information Group (OIG) website (May 05)**
  - **Since January 2005 accounts increased from 815 under NASA OIG to almost 21,000**
- **Users must agree to following terms before downloading data**
  - **Users will not redistribute any data/analysis without DoD approval**
    - **Process in place to approve request for redistribution of TLEs and analysis**
  - **Users will use data at own risk and will not hold the government/Federally Funded Research and Development Center (FFRDC) liable for damages/losses resulting from decisions made based on data received**



## *Current Services*

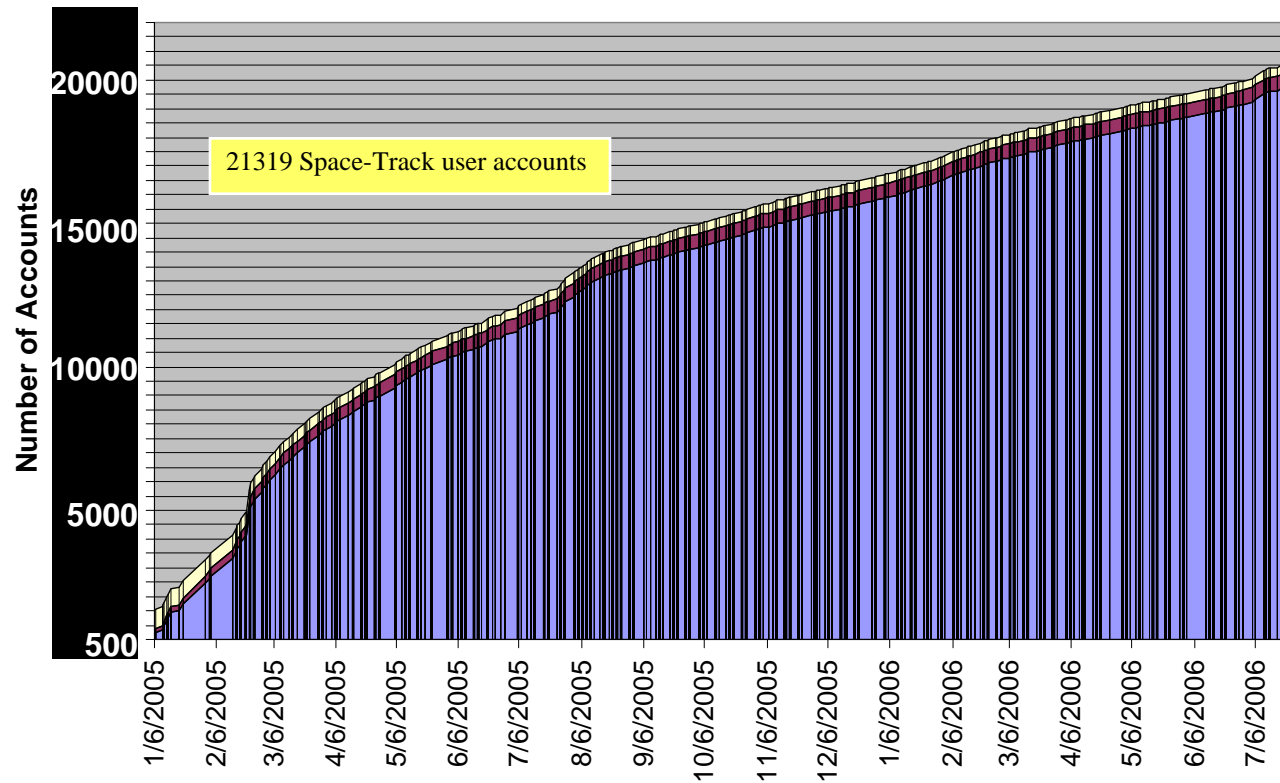
### **Current Website Products Include**

- **Catalog query common name**
- **Catalog query for catalog number**
- **Query for international designator**
- **Downloadable files**
- **60 day decay forecast report**
- **Satellite Catalog Action Report**
- **Catalog change history query**
- **Catalog query for decay date**
- **Decay prediction report**
- **Decay prediction text query**
- **Geosynchronous catalog query**
- **Satellite situation report**
- **Special interest group report**
- **Web site update Status**
- **Satellite situation report (Zipped)**



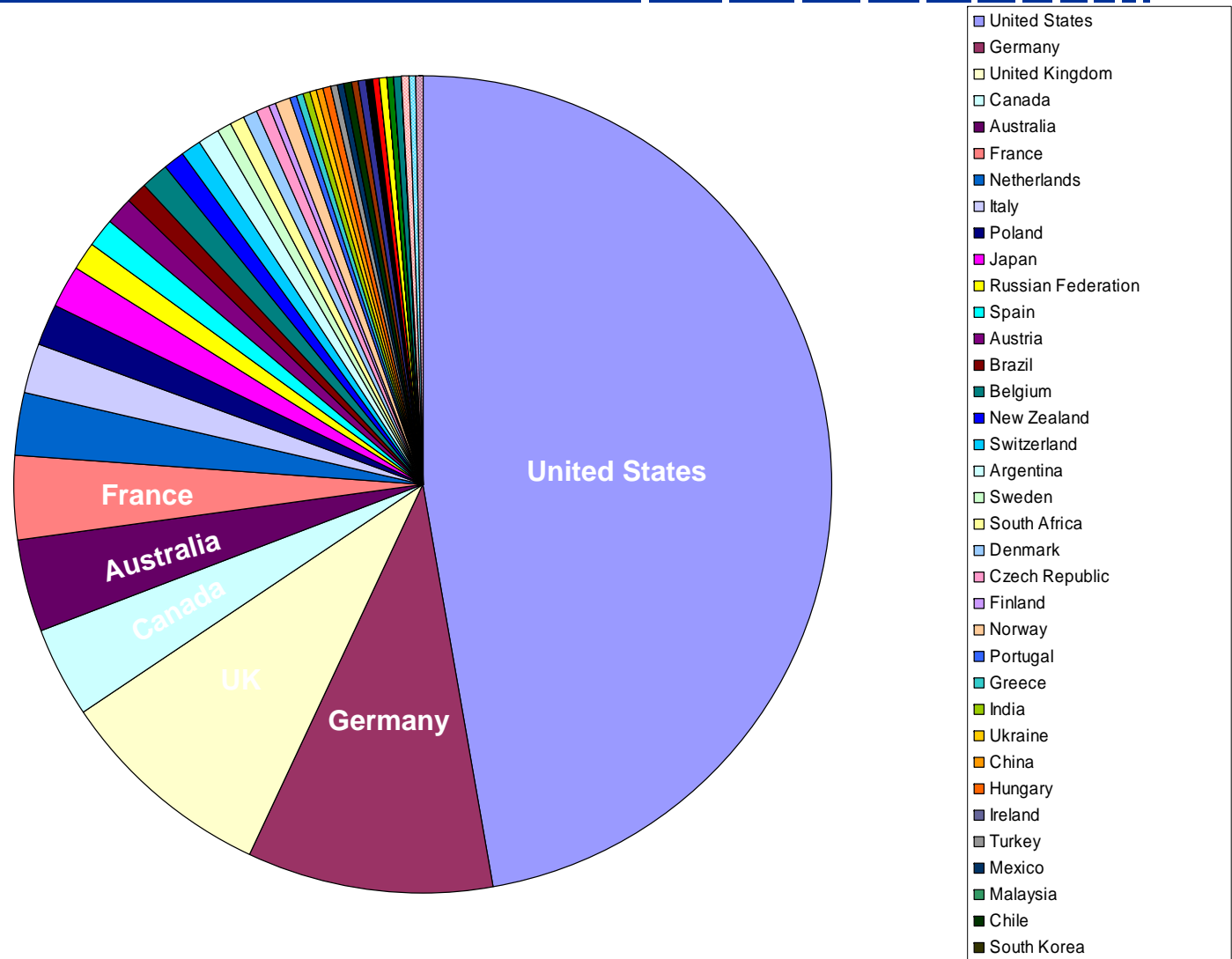
# *CFE Space-Track Website User Accounts*

Space-Track User Accounts





# Space-Track User Accounts – by Nations







## *Potential Expanded Services*

- **Expanded Services**
  - **Launch Support**
  - **Conjunction Assessment (CA)**
  - **End-of-Life/Reentry Support**
  - **Anomaly Resolution Support**
  - **Performing Emergency Service**
- **Requests for these type of services are currently processed via USSTRATCOM Form 1**
- **Expanded Services will increase overall Space Situational Awareness**

Will accomplish over time, within available resources



## *Summary*

- **Space Surveillance Network**
- **Future Upgrades**
- **Current Satellite Catalog**
- **Space Surveillance Support**



***QUESTIONS?***



*Back Up Slides*



## *The Form 1 Process*

- **There are two services that can be requested using the USSTRATCOM Form 1:**
  - **Request for Orbital Data/Advanced Type Services (Launch, Early Orbit Determination, Anomaly Resolution, Maneuver, etc)**
    - **The USSTRATCOM NASA Liaison at NASA/GSFC helps CFE customer get the correct format for CMOC processes**
    - **Either CMOC/J3S or 1 SPCS will send the approval message and/or any products or services to the CFE customer depending on job request**
  - **Request for Redistribution of TLEs/Analysis**
    - **CMOC/J3S or USSTRATCOM Liaison forward request for redistribution to HQ AFSPC/A3CD for processing**
    - **HQ AFSPC/A3CD processes requests and forwards to CMOC/J3S who sends the approved form 1 to the CFE requester**

**Request for these services are processed on a Case-by-Case basis on non interference basis with SCC**