



18th Space Control Squadron



This Briefing is UNCLASSIFIED



Small Satellite Support

*Ms Cynthia Wilson,
2Lt Brian Caulfield
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- What We Do, What We Share
- CubeSat Coordination
 - Finding you
 - Identifying your satellite
 - www.Space-Track.org
- How YOU Can Help

18th Space Control Squadron Mission

TRACK

- Space Surveillance Network (300,000+ observations/day)
- Sensors deployed across the globe & in space
- Satellite Catalog maintenance



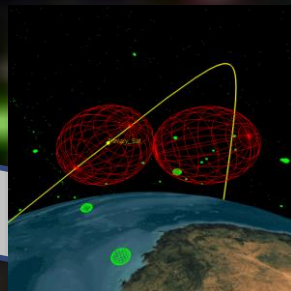
DETECT

- Launch Screening (Conjunction Assessment & Collision Avoidance)
- Early Orbit Determination



IDENTIFY

- On-orbit Conjunction Assessment & Collision Avoidance
- Deorbit & Reentry Assessment
- Spacecraft End of Life/Disposal
- Breakup Processing
- Advanced/Specialized Analysis
- Characterization Support



ENGAGEMENT & SUPPORT

- Human Spaceflight Safety: including the International Space Station & Tiangong (2)
- U.S. Interagency & Allies
- SSA Sharing Agreement Holders
- Small Satellite Owners
- *Space-Track.org* Users





Satellite Catalog on www.space-track.org

NORAD CAT ID	SATNAME	INTLDES	TYPE	COUNTRY	LAUNCH	SITE	DECAY	PERIOD	INCL	APOGEE	PERIGEE	RCS	TLE
1	SL-1 R/B	1957-001A	ROCKET BODY	CIS	1957-10-04	TTMTR	1957-12-01	96.19	65.10	938	214	LARGE	TLE OMM
2	SPUTNIK 1	1957-001B	PAYLOAD	CIS	1957-10-04	TTMTR	1958-01-03	96.10	65.00	945	227		TLE OMM
3	SPUTNIK 2	1957-002A	PAYLOAD	CIS	1957-11-03	TTMTR	1958-04-14	103.74	65.33	1659	211	SMALL	TLE OMM
4	EXPLORER 1	1958-001A	PAYLOAD	US	1958-02-01	AFETR	1970-03-31	88.48	33.15	215	183		TLE OMM
5	VANGUARD 1	1958-002B	PAYLOAD	US	1958-03-17	AFETR		132.74	34.25	3834	650	MEDIUM	TLE OMM
6	EXPLORER 3	1958-003A	PAYLOAD	US	1958-03-26	AFETR	1958-06-28	103.60	33.50	1739	117		TLE OMM
7	SL-1 R/B	1958-004A	ROCKET BODY	CIS	1958-05-15	TTMTR	1958-12-03	102.74	65.14	1571	206		TLE OMM
8	SPUTNIK 3	1958-004B	PAYLOAD	CIS	1958-05-15	TTMTR	1960-04-06	88.43	65.06	255	139	LARGE	TLE OMM
9	EXPLORER 4	1958-005A	PAYLOAD	US	1958-07-26	AFETR	1959-10-23	92.81	50.25	585	239		TLE OMM
10	SCORE	1958-006A	PAYLOAD	US	1958-12-18	AFETR	1959-01-21	98.21	32.29	1187	159		TLE OMM
11	VANGUARD 2	1959-001A	PAYLOAD	US	1959-02-17	AFETR		121.46	32.87	2939	553	MEDIUM	TLE OMM
12	VANGUARD R/B	1959-001B	ROCKET BODY	US	1959-02-17	AFETR		125.86	32.90	3326	556	MEDIUM	TLE OMM
13	DISCOVERER 1	1959-002A	PAYLOAD	US	1959-02-28	AFWTR	1959-03-03	92.70	90.00	697	114		TLE OMM
14	DISCOVERER 2	1959-003A	PAYLOAD	US	1959-04-13	AFWTR	1959-04-26	90.40	89.90	346	239		TLE OMM
15	EXPLORER 6	1959-004A	PAYLOAD	US	1959-08-07	AFETR	1961-06-30	762.25	46.95	42276	251		TLE OMM



Conjunction Assessment Services (No Cost)

- Conjunction Assessment
 - We screen all active payloads against everything out there (satellites, rocket bodies, debris – about 23,000 pieces)
 - If we can locate contact information for an operator, we provide conjunction assessment information
 - If your satellite's involved, we'll tell you!
- We create roughly 15,000 "Conjunction Data Messages" every day
- If it's really close, we'll call you – wherever you are (rare)



Space Situational Awareness Sharing

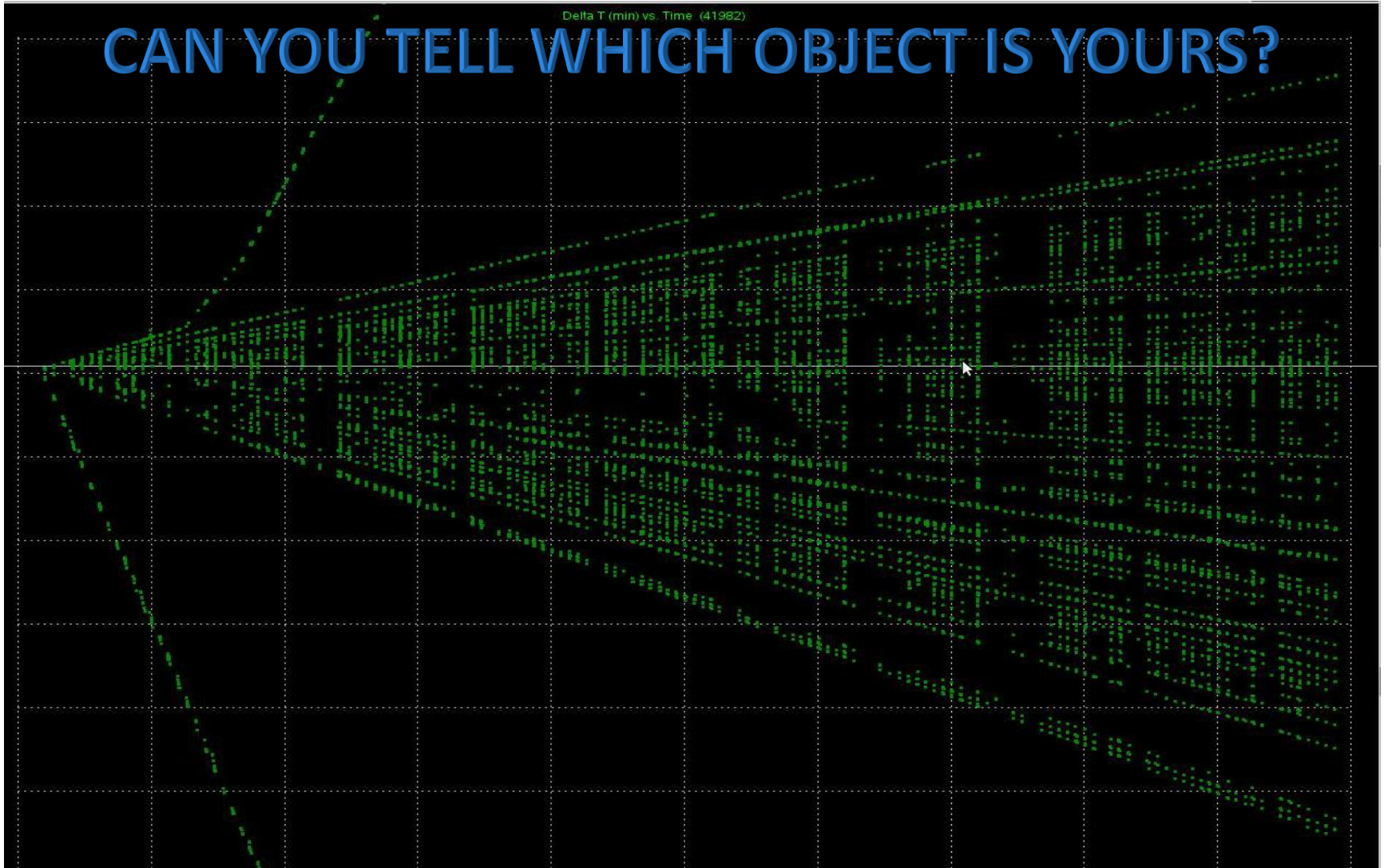
- Basic services are available to any person or organization with an account on www.space-track.org
- What we can do:
 - Provide high accuracy data and support at no cost
 - Facilitate communication and cooperation
- What we can't do:
 - Recommend courses of action
 - Tell an operator what to do
- Having “public” contact info in Space-Track allows easy coordination with other satellites owner/operators



Why Might You Need The 18th?

CAN YOU TELL WHICH OBJECT IS YOURS?

Delta T (min) vs. Time (41982)





Forging Our Relationship

- Register on www.Space-Track.org and then contact us at jspoc.ssasharing@us.af.mil.
 - Let us know about your launch: launch provider, tentative date, primary payload, any predicted orbit information.
 - Tell us about your satellite: size, possible shape changes, expected lifetime, etc.
 - Provide contact information for your operators
- We'll work with you to identify your satellite after launch.
- Once on orbit, we'll track your satellite (if we can) and provide orbital info (TLEs) daily
- Also, we'll alert you if any other object gets close to your satellite (Conjunction Assessment)
- You have 24/7 access to the Satellite Catalog TLEs and historic/predicted re-entry information for all artificial objects in orbit.



Pre-Launch Coordination

- We'll set up an email with all the small satellite owners
- Owner/Operator tracking
 - Better signal equals more likely match
- TLEs published in the public catalog when sufficient quality
- Tell us BEFORE LAUNCH how you want your satellite name to appear in the catalog
 - CAPS ONLY
 - Max of 25 characters
 - Can do – and ()
 - No other special characters
 - Once it's in the catalog, changing it is difficult



How Can You Help?

- Mission Design Considerations
 - Consider human life: below the ISS is safer
 - Higher inclination orbits are better tracked
 - Is it big enough to be seen for tracking? (>1U is optimal)
 - » Check with us if you're not sure
 - Recommend using a unique name (check Space-Track)
 - Pre-Launch
 - Register on www.Space-Track.org
 - Contact us (jspoc.ssasharing@us.af.mil)
 - Tell us about your mission and the satellite
 - Send an R-15 form (pre-launch info) if possible
 - On-Orbit
 - If you've got propulsion, let us know before maneuvering
 - Let us know when your satellite has reached end of mission
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If you're launching in the next year or two, please talk to us!

Pavilion Level – T1

jspoc.ssasharing@us.af.mil

And don't forget www.Space-Track.org