18 SPACE DEFENSE SQUADRON

MISSION

LINEAGE
18 Surveillance Squadron constituted and activated, 1 Nov 1966
Organized, 1 Jan 1967
Inactivated, 1 Oct 1975
Activated, 1 Feb 1990
Redesignated 18 Space Surveillance Squadron, 15 May 1992
Redesignated 18 Space Control Squadron, 1 Mar 2003
Inactivated, 1 Jul 2004
Activated 22 Jul 2016
Changed status from a unit of United States Air Force to a unit of United States Space Force, 21 Oct 2020
Redesignated 18 Space Defense Squadron, 13 Apr 2022

STATIONS
Edwards AFB, CA, 1 Jan 1967–1 Oct 1975
Peterson AFB, CO, 1 Feb 1990
Edwards AFB, CA, 1 Nov 1994- Jul 2004
Vandenberg AFB (later, SFB), CA, 22 Jul 2016

ASSIGNMENTS
Air Defense Command, 1 Nov 1966

73 Aerospace Surveillance Wing, 1 Jan 1967
Fourteenth Aerospace Force, 30 Apr 1971–1 Oct 1975
1 Space Wing, 1 Feb 1990
73 Space Surveillance (later, 73rd Space) Group, 1 Jul 1991
21 Operations Group, 26 Apr 1995-1 Jul 2004
21 Operations Group (later, Space Delta 2), 22 Jul 2016

COMMANDERS
Maj T. Simpson

HONORS
Service Streamers

Campaign Streamers

Armed Forces Expeditionary Streamers

Decorations
Air Force Outstanding Unit Award
8 Jul 1970-7 Jul 1971
[1 Feb 1990-31 Aug 1991
18 Oct 1995-30 Sep 1997
1 Oct 1997-30 Sep 1999
1 Jan-31 Dec 1998
1 Jan-31 Dec 1999
1 Jan 2000-31 Aug 2001

EMBLEM

18 Surveillance Squadron emblem

Per fess Azure and Celeste, the base gridlined in perspective Sable a bald eagle volant Proper grasping a flight symbol in its talons Gray below in chief a mullet of four Or; all within a diminished bordure of the like. (Approved, 18 Jul 1995; replaced emblem approved, 29 Aug 1968)

18 Space Defense Squadron emblem approved, 2 Mar 2022

MOTTO
SEMPER VIGILANS IN SINE ALTO—Ever Vigilant in the High Frontier

OPERATIONS
The mission of the 18 Surveillance Squadron was to ensure space surveillance collection, requirements of detection, tracking and identification of all space objects are met by the four Ground-based Electro-Optical Deep Space Surveillance units, the Maui Optical Tracking and Identification Facility, a space surveillance C-band tracking radar unit and a Baker-Nunn satellite tracking unit.

VANDENBERG AIR FORCE BASE, Calif. (AFNS) -- While the everyday activities of life continue down below, what is taking place overhead doesn't usually warrant a thought. The 18 Space Control Squadron located at Vandenberg Air Force Base, California, is a geographically separated unit of the 21st Space Wing, Peterson AFB, Colorado. The squadron provides situational awareness on thousands of items filling the skies while life moves along for those on Earth's surface. "We have crews of eight people," said 1st Lt. Jonathan Diaz, an 18 SPCS mission commander. "We have Orbital Safety Analysts who are direct liaisons to National Aeronautics and Space Administration whose main concern is the (International Space Station) and astronauts. We have people supporting conjunction assessment who notify the satellite owner if anything approaches their (satellite), or is going to fly close by, so they can move it if they want. Others keep the Satellite Catalog up to date. Space operators monitor space to gain situational awareness on more than 1,300 satellites, the International Space Station and other items often known as debris.

Objects entering or exiting space are observed and data is collected for analysis from a worldwide network of sensors. The station is closely tracked to monitor approaching obstacles that could pose a problem. Potential collisions between satellites are scrutinized. The Airmen of the 18 SPCS carefully catalog all this orbital data to provide situational awareness in the space domain. The catalog is a record of everything within Earth's orbit at any given time. The vital characteristics of the object, as well as its orbit also are tracked. "We catalog what the object is and where it is going," Diaz said. "We monitor launches and assign a number so we can track them." If an object moves, or in some way changes its course, the crews of the 18 SPCS notify several different organizations, especially if the object is owned by another country. They notify every area of responsibility within the Defense Department, Peterson AFB, Defense Special Missile & Astronautics Center, Wright Patterson AFB, Ohio, Federal Emergency Management Agency, and the entire Space Surveillance Network, Diaz said. Allied countries are notified as well. "We notify everyone around the globe," he said. "We post new two-line element sets and the reentry information to Spacetrack.org. Anyone in the world can create an account if they wish."

A two-line element is a data format encoding a list of orbital elements of an Earth-orbiting object for a given point in time. Monitoring what is in space is critical, but monitoring what is leaving space is equally important. The squadron monitors and provides analysis on items re-entering Earth's atmosphere. Diaz said they determine where an object is falling and then depending upon that information, alert the proper agencies. "The on-duty mission commander will post periodic blogs on required runs for reentries once they're under 24 hours out, Diaz said. "Most people that read these blogs are from the Missile Warning Center, Missile Defense Agency, (U.S. Strategic Command), and other agencies."

The blogs are posted at intervals of one day, 12 hour, six hour, two hour, and final run. Entries are posted to the Strategic Knowledge Integration Web, part of the Defense Information Systems Agency website. A typical day for them is hard to describe, because there are so many variables in play guiding the crew's focus, Diaz explained. One typical event, however, is a space launch. Launches made from the U.S. are easier for crews to plan ahead of time because they have all the information for cataloging the event. It can be complicated if the launch is made by a foreign country because all of the information is not provided. "We have a couple of conjunctions on a typical day," said Diaz. "So we make sure there aren't any collisions. Maybe we have a launch to process and catalog, maybe a re-entry. The one thing we do constantly is make sure the (satellite) catalog is up to date."

"The ops tempo we experience fluctuates drastically and is most closely correlated with the space launch calendar," said Capt. Christopher Fabian, an 18 SPCS mission commander. "Tracking and cataloging new space objects then ensuring timely, accurate information to relevant agencies is a time intensive and involved process." Obtaining robust initial information is essential for maintaining an accurate satellite catalog, Fabian said. Once an object is cataloged, on-orbit conjunction analysis can be performed. Conjunction analysis involves screening for dangerous approaches between space objects, then providing actionable data to owner and/or operators they can use to perform collision avoidance actions.

Generating and disseminating all the data can be extremely time-consuming if more than a typical number of conjunctions are detected. Fabian said the crews also ensure safe passage of the International Space Station, performing conjunction screenings between the station and other objects passing through its orbit. "Similar to the on-orbit conjunction analysis, this can

create a heavy workload," he said. "Aside from general event processing and daily procedures, a major part of the job is up-channeling space situational awareness information to Air Force leadership." For the person sitting in rush hour traffic on a busy highway, what is going on overhead might not come to mind. But rest assured, the operators at the 18 SPCS are keeping watch on objects along the highways of space. 2017

DET 1, 18 SPSS/DET CHIEF, Socorro
DET 2, 18 SPSS/DET CHIEF, Diego Garcia
DET 3, 18 SPSS/CC, Kihei, HI

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Sources

Air Force Historical Research Agency. U.S. Air Force. Maxwell AFB, AL.
The Institute of Heraldry. U.S. Army. Fort Belvoir, VA.
Air Force News. Air Force Public Affairs Agency.