

**BY ORDER OF THE COMMANDER
SPACE OPERATIONS COMMAND**

**SPACE OPERATIONS COMMAND
MISSION DIRECTIVE 601**

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Mission Directive

SATELLITE CONTROL NETWORK



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(Michele R. Kantak)

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This mission directive (MD) implements policy and guidance in Air Force Policy Directive (AFPD) 38-1, *Manpower and Organization*, and Air Force Instruction (AFI) 38-101, *Manpower and Organization*. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with (IAW) Air Force Manual (AFMAN) 33-322, *Management of Records Management and Information Governance Program*, and disposed of IAW the Air Force Records Information Management System Records Disposition Schedule. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using AF Form 847, Recommendation for Change of Publication; route AF Forms 847 from the field through the appropriate functional chain of command. This publication may not be supplemented or further implemented/extended. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication OPR for non-tiered compliance items. This MD defines the mission, organization, and responsibilities of the United States Space Force (USSF) Satellite Control Network (SCN) Squadrons. This MD does not apply to Air National Guard (ANG) or Air Force Reserve Command (AFRC) units and members.

1. Mission. Space Delta 6 Satellite Control Network (SCN) mission is to provide, through telemetry, tracking, and commanding (TT&C), assured access to space systems in varying threat level environments and to distribute space system information in support of operational Department of Defense (DoD) missions, National Security Space (NSS), Research, Development, Test & Evaluation (RDT&E) programs, and other designated users. SCN units are: 21st Space Operations Squadron (21 SOPS), 22d Space Operations Squadron (22 SOPS) and 23rd Space Operations Squadron (23 SOPS) and are organized under the Deployment Indicator (DEPID) Code 9 Unit Type Code (UTC) of "1SPFA – SPC AF Satellite Contrl Net". The SCN units operate, maintain, and manage:

1.1. SCN Weapon Systems and Equipment. The AN/FYQ-139, Electronic Schedule Dissemination (ESD); J-6548/AG, Operational Switch Replacement (OSR); A/E24U-24, Orbital Analysis System (OAS); AN/FSQ-151(V), AFSCN Link Protection System (ALPS); AN/FSQ-151, Automated Remote Tracking Station (ARTS)/Digital Archival Recorders (DARS); AN/FSQ-213, Digital Recording System (DRS); AN/FSQ213(V)1, Remote Tracking Station (RTS) Block Change (RBC) Fixed Site; AN/FSQ213(V)3, RBC Hybrid; and AN/FSQ213(V)2, RBC (Eastern Vehicle Checkout Facility [EVCF]) equipment provide resource scheduling, orbital analysis, satellite TT&C, SCN/base communications systems, recording, and other critical tasks for all tasked National Security Space and other assigned satellites. These programs are further explained in the following paragraphs.

1.2. SCN Equipment Description. The SCN consists of ESD, OSR, OAS, ARTS, and RBC (to include hybrid) major components and is supported by ALPS, as described below.

1.2.1. Electronic Schedule Dissemination (ESD). The ESD system accepts and processes requests for the use of SCN resources in support of space operations activities including space launches and satellite vehicle contacts. It receives requests from all organizations requiring the use of "common user" SCN resources (antennas, receivers, transmitters, recorders, communication links, etc.), identifies conflicts between requests, works with the requesters to resolve conflicts, and then publishes completed schedules allocating specific resources to specific activities at specific times. ESD provides a network status capability by allowing SCN users to report ancillary events and outages of common SCN resources and updates events and outages. The primary ESD resources are located at Schriever Space Force Base (SFB), CO, with alternate resources located at Vandenberg SFB, CA. The follow-on scheduling system, AFSCN Scheduling Tool (AST) is a form, fit function for ESD.

1.2.2. Operational Switch Replacement (OSR). OSR is a Communications Segment (CS) upgrade. It provides support for satellite operations through a worldwide communications network. This network provides the interface between the Operational Control Nodes (OCNs) and the individual RTSs. The CS distributes information including commands, network status, telemetry, timing data, and Defense Red Switch Network (DRSN). The CS has a physical presence in all other segments and provides selectable connectivity among all SCN sites via the OCNs. Each site has CS hardware and software components that interface to external communications. The OSR consists of five functional elements: Distributed Communications Control (DCC), Wide Area Network Interface Unit (WANIU), Networking, Network Management, and Signal Distribution. The DCC provides control and monitor of the WANIUs. The WANIUs provide the communications interface between the Range Segment (RS) at the Remote Ground Facilities and the user

equipment. The Networking element provides a communications interface between DCCs and WANIUs and between sites via the Government-Furnished Equipment transport services. The Network Management element provides status monitoring of the WANIUs and Networking elements. The Signal Distribution element provides fan-out capability for the WANIU interface with the RS. AFSCN Edge Transport System (ANETS) and Wide Area Network Resource Management (WRM) are the planned replacements for WANIUs and the DCCs.

1.2.3. Orbital Analysis System (OAS). OAS provides 22 SOPS the ability to supply many orbit products to SCN customer agencies. It also coordinates ephemeris data, look angles, investigative Radio Frequency Interference (RFI), and predictive RFI products to all SCN users. The primary location is Schriever SFB, CO, with the alternate capability located at Vandenberg SFB, CA.

1.2.4. Automated Remote Tracking Station (ARTS). ARTS provides automated ground-based TT&C capabilities. ARTS only exists at some of the SCN RTSs. It receives directives through the local RTS Human Machine Interface (HMI) and/or distributive mission-unique Satellite Operations Centers (SOCs). ARTS supports two satellite communications capabilities, Space Ground Link Subsystem (SGLS) and non-SGLS (data relay function). The system operates in both the L- and S-bands of the Radio Frequency (RF) spectrum. The L-band is defined as the range of frequencies between approximately 1000 and 2000 MHz. The S-band spans 2000 to 4000 MHz. The SGLS L-band RF transmit frequency range is from 1755 to 1850 MHz. The ARTS receive capability is S-band with a frequency range from 2200 to 2300 MHz. To support ARTS, DARS is the capability to record and playback TT&C digital and analog data from SCN contacts.

1.2.5. Remote Tracking Station (RTS) Block Change (RBC). RBC (to include hybrid) provides automated ground-based TT&C capabilities. There is one RBC at each RTS. The RBC Hybrid upgrade is 50% complete and when complete will have at a minimum one RBC Hybrid at each RTS. RBC receives directives through the local RTS HMI and/or automated remote directives from the distributive mission-unique SOC. RBC supports two satellite communications capabilities, SGLS and non-SGLS (data relay function). The system operates in the same RF bands as ARTS (paragraph 1.2.4). As part of the RBC delivered capability, the DRS provides the ability to record and playback TT&C digital data from SCN contacts.

1.2.6. AFSCN Link Protection System (ALPS). ALPS provides worldwide, real time RFI detection and reporting for the SGLS band (2195 - 2305 MHz) downlink used by SCN. ALPS provides detection capability and consists of a remotely operated spectrum analyzer on all SCN antennas. An upgrade, called AFSCN RFI Monitoring System (ARMS), is planned to expand situation awareness of both downlink and uplink RFI.

1.3. SCN Units Organized/Designed Missions. The 21 SOPS, 21 SOPS Detachment (Det) 1, 21 SOPS Det 2, 21 SOPS Det 3, 21 SOPS Operating Location (OL-CK), 22 SOPS, 22 SOPS OL-AA, 23 SOPS, 23 SOPS Det 1, 23 SOPS OL-A, 23 SOPS OL-CA, 23 SOPS OL-CC are assigned to DEL 6. The below alignment reflects the administrative chain of command for the SCN within DEL 6 and provides a brief mission description of each unit.

1.3.1. 21st Space Operations Squadron (21 SOPS), Vandenberg SFB, California. 21 SOPS operates and maintains four of seven SCN RTS locations providing USSPACECOM with critical satellite TT&C capability to more than 190 DoD, national, and civilian satellites performing intelligence, weather, navigation, early-warning and communications operations. The four SCN RTSs perform on-orbit satellite TT&C, mission data retrieval operations, pre-launch satellite test and checkout, as well as direct operations launch support. The squadron includes Vandenberg Tracking Station (VTS), call sign COOK, located northeast of Vandenberg SFB with one RBC, one RBC Hybrid and one hybrid ARTS (transportable antenna with ARTS core). It also includes three world-wide detachments: Det 1, located at Diego Garcia, British Indian Ocean Territory (REEF); Det 2, located on Andersen AFB, Guam (GUAM); and Det 3, located on Oahu, Hawaii (HULA). The squadron monitors, maintains, and updates status of SCN resources, providing cyber defense, configuration, and readiness condition of controlled resources. 21 SOPS maintains the Global Positioning System (GPS) ground antennas and monitor stations on Diego Garcia, British Indian Ocean Territory; Kaena Point, Hawaii; and Kwajalein Atoll, Republic of Marshall Islands (OL-CK) supporting on-orbit satellite commanding, mission uploads, payload, and bus maintenance activities. The unit is also responsible for operating and maintaining two Defense Information Systems Agency (DISA) satellite communication antennas. 21 SOPS plans and conducts specialized communications for a wide spectrum of DoD, allied, civil, and national space systems. Additionally, VTS provides pre-launch compatibility and direct launch operations support to the Western Range launch complex. VTS also hosts the 148 SOPS (California Air National Guard) and backup operations centers for SCN, GPS, and Military Satellite Communications (MILSATCOM).

1.3.1.1. 21st Space Operations Squadron Detachment 1 (21 SOPS Det 1), Diego Garcia British Indian Ocean Territory. Diego Garcia Station (DGS), call sign REEF, is located within the British Indian Ocean Territory on a small atoll in the Chagos Archipelago (7° south latitude). The only RTS south of the equator, DGS operates and maintains one RBC and one hybrid ARTS (transportable antenna with ARTS core) and one Hybrid RBC (in development) performing on-orbit satellite TT&C, mission data retrieval operations, and launch operations. DGS also maintains the GPS ground antenna and GPS monitor station supporting on-orbit satellite commanding, mission uploads, payload, and bus maintenance activities.

1.3.1.2. 21st Space Operations Squadron Detachment 2 (21 SOPS Det 2), Andersen AFB, Guam. Located 7 miles from the main base on Andersen AFB's North West Field (NWF), Guam Tracking Station (GTS), call sign GUAM, provides critical coverage in the Western Pacific. It operates and maintains one RBC, one RBC Hybrid and one ARTS performing on-orbit satellite tracking, telemetry, commanding, mission data retrieval operations, and launch operations.

1.3.1.3. 21st Space Operations Squadron Detachment 3 (21 SOPS Det 3), Kaena Point, Hawaii. Located on Oahu, Hawaii Tracking Station (HTS), call sign HULA, operates and maintains one RBC and one RBC Hybrid performing on-orbit satellite TT&C, mission data retrieval operations, and launch operations. Det 3 performs base operations for the 153-acre site to include civil engineering, communications, and safety. HTS also maintains the GPS monitor station, which collects positioning data.

1.3.1.4. **21st Space Operations Squadron Operating Location CK (21 SOPS OL-CK), Kwajalein Atoll, Republic of Marshall Islands.** OL-CK maintains the GPS ground antenna and GPS monitor station supporting on-orbit satellite commanding, mission uploads, payload, and bus maintenance activities.

1.3.2. **22d Space Operations Squadron (22 SOPS) and 22 SOPS Operating Location AA (22 SOPS OL-AA), Schriever SFB, Colorado.** 22 SOPS executes command and control of the SCN by developing, executing and enforcing the Space Access Tasking Order (SpATO) and providing space safety analysis to conduct satellite operations. 22 SOPS coordinates the launch and on-orbit operations of more than 190 DoD, national intelligence, civil, and allied nation's satellites in support of global war fighters, intelligence community users, the President and the Secretary of Defense. 22 SOPS operates the Network Operations Center, which develops, publishes and enforces the SpATO, and directs and monitors all aspects of enterprise operations for SCN users through a combination of military commanders, civilian professionals, and contract support. The squadron's orbit analysts coordinate ephemeris data, launch and early orbit analysis determination, and tracking station look angles to support space operations for some 29 different SOCs. The orbital analysis section also provides satellite visibilities critical for SpATO development along with custom orbital data products to include generation of limited predictive and investigative RFI products. 22 SOPS also performs radio frequency downlink monitoring, attribution, and analysis of interference impacting SCN downlinks using ALPS and executes mitigation actions to protect users and the SpATO. In addition, 22 SOPS develops the Inter-Range Operations Number (IRON) database by incorporating user requirements, generating satellite ground station configurations and publishes formal database releases for testing and installation.

1.3.3. **23rd Space Operations Squadron (23 SOPS), New Boston Space Force Station (SFS), New Hampshire.** 23 SOPS operates and maintains three of seven SCN RTS locations providing USSPACECOM with critical satellite TT&C capability to more than 190 DoD, national, civilian and allied satellites performing intelligence, weather, navigation, early-warning and communications operations. The three SCN RTSs perform on-orbit satellite TT&C, mission data retrieval operations, pre-launch satellite test and checkout, and operations launch support. The squadron includes the New Hampshire Station (NHS) on New Boston SFS, call sign BOSS, with one RBC, one RBC Hybrid (in development) and one ARTS. It also includes two world-wide RTSs: 23 SOPS Det 1 (POGO), located at Thule AB, Greenland and OL-A, located at Ministry of Defense (MoD) Oakhanger, England (LION). 23 SOPS also operates a pre-launch support capability, the 23 SOPS OL-CC (BEACH), located at Cape Canaveral AFS, FL. It operates and maintains a Defense Satellite Communications System (DSCS) Heavy Earth Terminal, hosts and supports a Defense Meteorological Satellite Program Enhancement (DMSP-E) terminal for the National Oceanographic Atmospheric Administration (NOAA) as well as a Small Earth Terminal. 23 SOPS maintains the GPS ground antennas and monitor stations at Cape Canaveral (OL-CC) and Ascension Auxiliary Air Field on Ascension Island (OL-CA) in the South Atlantic supporting on-orbit satellite commanding, mission uploads, payload, and bus maintenance activities. The squadron operates and maintains a 2,826-acre installation and infrastructure for the largest geographically separated unit in DEL 6. The

squadron performs all base operations for the installation including security, civil engineering, communications, services, natural resources and safety.

1.3.3.1. 23rd Space Operations Squadron Detachment 1 (23 SOPS Det 1), Thule AB, Greenland. Thule Tracking Station (TTS), call sign POGO, is the most northern RTS, enabling support to polar orbiting satellites. TTS operates and maintains one RBC and one RBC Hybrid performing on-orbit satellite TT&C, mission data and retrieval operations. The Det hosts and supports a DMSP-E terminal for NOAA.

1.3.3.2. 23rd Space Operations Squadron Operating Location A (23 SOPS OL-A), MoD Oakhanger, England. Telemetry and Command Station (TCS), call sign LION, provides critical coverage for Europe and Mid-Eastern operations. TCS is located on a United Kingdom MoD site. 23 SOPS OL-A operates and maintains one RBC, one ARTS and one RBC Hybrid (in development) performing on-orbit satellite TT&C, mission data retrieval operations, and launch operations. 23 SOPS OL-A also maintains the GPS monitor station, which collects positioning data.

1.3.3.3. 23rd Space Operations Squadron Operating Location CA (23 SOPS OL-CA), Ascension Auxiliary Air Field on Ascension Island. OL-CA maintains the GPS ground antenna and GPS monitor station supporting on-orbit satellite commanding, mission uploads, payload, and bus maintenance activities.

1.3.3.4. 23rd Space Operations Squadron Operating Location CC (23 SOPS OL-CC), Cape Canaveral AFS, Florida. Eastern Vehicle Checkout Facility (EVCF), call sign BEACH, provides capability for Launch Base Compatibility Tests (LBCT) at satellite processing facilities (via RF tie lines) or on launch vehicle pads (via 2-meter antenna). EVCF operates and maintains one RBC core, one ARTS core and one 2-meter antenna to provide pre-launch support. The 2-meter antenna and the RF tie lines connect to either the RBC core or the ARTS core depending upon user request. 23 SOPS OL-CC also maintains the GPS ground antenna and GPS monitor station supporting on-orbit satellite commanding, mission uploads, payload, and bus maintenance activities.

1.4. SCN Applicable Threat Environments. The 21 SOPS, 21 SOPS Det 1, 21 SOPS Det 2, 21 SOPS Det 3, 22 SOPS, 23 SOPS, 23 SOPS Det 1, and 23 SOPS OL-A has been organized/designed to operate in Threat Level 1, Threat Level 2 and Threat Level 3.

1.5. SCN Future Requirements. The expected growth of satellite vehicle numbers is driving the need to significantly increase the number of simultaneously, available transmit/receive capability (e.g. phased array) versus the single aperture to single SV contacts currently available. The ESD system is being replaced by AST; however, as additional SV and ground capabilities come on-line, an Enterprise Resource Manager (ERM) is required to orchestrate across different ground transmit/receive networks and handle the increased transmit/receive load/complexity through machine to machine interfaces. Components of the SCN CS are old and will require updates (e.g. WANIFs) to ensure continued availability and improved monitoring. Spectrum congestion/ deconfliction requires the ability to monitor both the uplink and downlink frequencies; therefore, the current ALPS is being replaced by ARMS.

1.6. Air Reserve Component (ARC) Units. There are no ARC units that support this mission.

2. Command. Combatant Command authority is vested in Commander, United States Space Command (CDRUSSPACECOM), through its C2 facilities. CDRUSSPACECOM delegated tactical control of assigned space forces to Combined Joint Task Force Space Operations (CJTF-SO) Commander. The CJTF-SO coordinates, plans, integrates, synchronizes, tasks, executes and assesses space operations. Commander, Space Operations Command (SpOC/CC) generates, presents and sustains SCN units. Under the SpOC/CC, the Delta 6 commander exercises Administrative Control (ADCON) over three squadrons, four detachments and five operating locations and commands and controls the SCN. Unit commanders are authorized to communicate, coordinate, and work with other units or agencies on matters relating to mission accomplishment or regarding administrative or logistical support under applicable agreements and memorandums of understanding.

3. Unit Responsibilities:

- 3.1. Accomplishes all assigned mission(s) including providing forces to USSPACECOM for Space Control, Force Application, Force Enhancement, and Space Support.
- 3.2. Maintains the ability to command and control assigned units against all relevant threats and hazards to assure mission success.
- 3.3. Organizes, trains, and equips assigned personnel to accomplish the mission.
- 3.4. Provides administrative and logistical support to assigned personnel.
- 3.5. Establishes training, standardization, and evaluation programs as directed by higher HQ and Delta policy and guidance.
- 3.6. Evaluates on-site contractor performance in accordance with the statement of work and guidance from the contracting officer.
- 3.7. Ensures adequate support is provided per host-tenant/host-government agreements and memorandums of understanding and agreements.
- 3.8. Ensures adequate security is provided to protect any restricted access facilities and resources.
- 3.9. Provides operation and maintenance of all assigned equipment/facilities including antennas, core electronics, radomes, communications, power plant, air conditioning systems, fire protection, electric power distribution, and water systems.
- 3.10. Prepares financial plans, budgets, and budget revisions for operation and maintenance.
- 3.11. Provides data collection, processing, and reporting of operational testing and capability assessment.

3.12. Implements procedures for accommodating new mission requirements or system enhancements.

3.13. Comply with requirements identified in all DAFIs, SPFIs and SpOCIs which include: AFI 1-2 *Commander's Responsibilities*, AFSPCI 10-1204, *Satellite Operations* and AFSPCI 10-605, *Operational Acceptance Process*.

DOUGLAS A. SCHIESS
Brigadier General, USAF
Deputy Commanding General, Operations

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFPD 38-1, *Manpower and Organization*, 2 July 2019

AFI 1-2, *Commander's Responsibilities*, 8 May 2014

AFI 38-101, *Manpower and Organization*, 29 August 2019

AFI 33-322, *Management of Records and Information Governance Program*, 28 July 2021

AFSPCI 10-605, *Operational Acceptance Process*, 20 June 2016

AFSPCI 10-1204, *Satellite Operations*, 15 May 2014

Prescribed Forms

None

Adopted Forms

AF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

AF—Air Force

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFPD—Air Force Policy Directive

AFRC—Air Force Reserve Command

AFSCN—Air Force Satellite Control Network

AFSPCMD—Air Force Space Command Mission Directive

ALPS—AFSCN Link Protection System

ANG—Air National Guard

ARMS—AFSCN RFI Monitoring System

ARTS—Automated Remote Tracking Station

AST—AFSCN Scheduling Tool

BEACH—Eastern Vehicle Checkout Facility Call Sign

BOSS—New Hampshire Station Call Sign

C2—Command and Control

CDRUSSPACECOM—Commander, United States Space Command

CJTF-SO—Combined Joint Task Force Space Operations

CS—Communications Segment
DARS—Digital Archival Recording System
DCC—Distributed Communications Control
DCG-O—Deputy Commanding General – Operations
DEL—Delta
DEPID—Deployment Indicator
Det—Detachment
DGS—Diego Garcia Station (Call Sign REEF)
DISA—Defense Information Systems Agency
DMSP-E—Defense Meteorological Satellite Program Enhanced
DoD—Department of Defense
DRS—Digital Recording System
DRSN—Defense Red Switch Network
DSCS—Defense Satellite Communication System
ESD—Electronic Schedule Dissemination
EVCF—Eastern Vehicle Checkout Facility (Call Sign BEACH)
GPS—Global Positioning System
GTS—Guam Tracking Station (Call Sign GUAM)
GUAM—Guam Tracking Station Call Sign
HMI—Human Machine Interface
HQ—Higher Headquarters
HTS—Hawaii Tracking Station (Call Sign HULA)
HULA—Hawaii Tracking Station Call Sign
IAW—In Accordance With
IRON—Inter-Range Operations Number
LBCT—Launch Base Compatibility Test
LION—Telemetry and Command Station Call Sign
MD—Mission Directive
MILSATCOM—Military Satellite Communications
MoD—Ministry of Defense
NHS—New Hampshire Station (Call Sign BOSS)
NOAA—National Oceanic and Atmospheric Administration

NSS—National Security Space
OAS—Orbital Analysis System
OCN—Operational Control Node
OL—Operating Location
OPR—Office of Primary Responsibility
OSR—Operational Switch Replacement
POGO—Thule Tracking Station Call Sign
RBC—RTS Block Change
RDT&E—Research, Development, Test & Evaluation
REEF—Diego Garcia Station Call Sign
RF—Radio Frequency
RFI—Radio Frequency Interference
RS—Range Segment
RTS—Remote Tracking Station
SCN—Satellite Control Network
SGLS—Space Ground Link Subsystem
SpATO—Space Access Tasking Order
SFB—Space Force Base
SFS—Space Force Stations
SPFMD—Space Force Mission Directive
SPFI—Space Force Instruction
SpOC—Space Operations Command
SpOCI—Space Operations Command Instructions
SOC—Satellite Operations Center
SOPS—Space Operations Squadron
TCS—Telemetry and Command Station (Call Sign LION)
TT&C—Telemetry, Tracking, and Commanding
TTS—Thule Tracking Station (Call Sign POGO)
UTC—Unit Type Code
VTS—Vandenberg Tracking Station (Call Sign COOK)
WANIU—Wide Area Network Interface Unit