



STPSat-6

Advanced Spacecraft for the USSF, NNSA, and NASA

STPSat-6 advances national security and science missions by delivering operational Nuclear Detonation (NUDET) detection capabilities, high-bandwidth laser communications services, and new technology demonstrations in space domain awareness, weather, and NUDET detection.

STPSat-6's nine payloads include the NNSA's Space and Atmospheric Burst Reporting System (SABRS), NASA's Laser Communications Relay Demonstration (LCRD), and seven Space Experiments Review Board (SERB) payloads that demonstrate cutting edge space technologies. STPSat-6 will be operated from the NASA White Sands Complex.

SPACECRAFT

Northrop Grumman is responsible for the design and manufacture of the STPSat-6 spacecraft, integration of the nine payloads, and on-orbit checkout for handover to long-term operations.

The spacecraft leverages decades of Northrop Grumman on-orbit heritage, combining avionics from its LEOSTar-3 platform with electrical and power components from its GEOSTar-3 line to support the diverse capabilities of the STPSat-6 mission.

The bus and payload components are packaged in a mission unique structure featuring three primary modules, a single wing solar array, and a deployable boom for an element of the SENSER payload.

FACTS AT A GLANCE

- Provides a bi-directional Ka-band mission data link (1.33 Gbps DL, 151 Mbps UL)
- Includes on-board digital routing interface between RF and Optical Communication systems
- Disseminates mission data via three major ground processing architectures

MISSION PARTNERS

- Space and Missile Systems Center (SMC)
- United States Space Force (USSF)
- DoD Space Test Program
- NNSA - National Nuclear Security Administration
- NASA - National Aeronautics and Space Administration
- USSF Space Launch Delta 45

STPSat-6 Payloads

PAYLOADS

SPACE AND ATMOSPHERIC BURST REPORTING SYSTEM-3 (SABRS-3) – NNSA

SABRS detects, locates, and reports nuclear detonations (NUDETs) in the earth's atmosphere and in near space in near-real time. The payload augments U.S. operational NUDET detection capabilities, serving as an operational element of the U.S. NUDET Detection System (USNDS).

LASER COMMUNICATIONS RELAY DEMONSTRATION (LCRD) – NASA

LCRD provides high data rate optical communication services to meet the growing need for higher data rates in space science and exploration. LCRD operationally demonstrates bi-directional uplink and downlink optical communications. The LCRD optical links interface with the spacecraft Ka band links to enable on-board hand-off between RF and Optical for both uplink and downlink.

SPACE EXPERIMENTS REVIEW BOARD (SERB) PAYLOADS

Compact Environmental Anomaly Sensor Experiment III (CEASE) III – Air Force Research Lab

Falcon Solid-State Energetic Electron Detector (FalconSEED) – US Air Force Academy

Rad-Hard Electronics Memory Experiment (RHEME) – Air Force Research Lab

Space & Endo-Atmospheric NUDET Surveillance Experiment and Risk-Reduction (SENSOR) - NNSA

Strontium Iodide Radiation Instrumentation (SIRI) II – Naval Research Lab

Ultraviolet Spectro-Coronagraph Pathfinder (UVSC Pathfinder) – Naval Research Lab

PERFORMANCE DATA

SPACECRAFT

HEIGHT	16 ft. 2.3 in.
LAUNCH MASS	2,572 kg (5,670 lb.)
SOLAR ARRAY	3,000 W (EOL) End of Life
BATTERY	290 Ah (BOL) Beginning of Life
ORBIT	GEO - 112W
STABILIZATION	3-axis, nadir pointing
POINTING	500 μ rad accuracy, 250 μ rad knowledge
RF COMM	S-Band TCR, Dual-pol Ka High-Data-Rate
PROPULSION	12 x 5 lb. (22N) REAs
DESIGN LIFE	8-10 years

LAUNCH VEHICLE

LAUNCH PROVIDER	ULA
LAUNCH VEHICLE	Atlas V 551
LAUNCH SITE	SLC-41, CCAFS, FL
DATE	22 Nov 2021

