



The Communication/Navigation Outage Forecasting System(C/NOFS)

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Space Vehicles Directorate

Air Force Research Laboratory

FACT SHEET

The Space Vehicles Directorate is developing the Communication/ Navigation Outage Forecasting System (C/NOFS) to demonstrate a technique for locating and forecasting scintillations in the low latitude ionospheric. Scintillations are caused by naturally occurring irregularities and lead to fluctuations in communication signals. Scintillations are responsible for decreased satellite-to-ground message throughput and delayed signal acquisition. C/NOFS will alert users of impending UHF and L-band satellite communication outages.

The goal of C/NOFS is to detect regions of active scintillation, to forecast regions of scintillation three to six hours before its onset, and to improve estimates of scintillation probability. During the C/NOFS mission, the estimates will extend to 24 hours from the time of the data collection. With the knowledge gained from the mission, the estimates may be extended to 48 to 120 hours.

C/NOFS includes three core elements:

1. A satellite with several ionosphere instruments
2. A set of complementary ground instruments
3. Models and user products to provide tailored outage forecast maps

C/NOFS is a joint project of the DoD Space Test Program (Space & Missile Command Detachment 12) and the Air Force Research Laboratory (AFRL). Project participants include the National Aeronautics and Space Administration (NASA) Hq., the Naval Research Laboratory (NRL), Goddard Space Flight Center of NASA, University of Texas, Naval Research Laboratory, the Aerospace Corporation, the National Polar Orbiting Environmental Satellite System (NPOESS) Joint Program Office, and Jackson & Tull.

The C/NOFS satellite will be launched into a low inclination (13°) elliptical (375 x 710 km altitude) orbit. The six on board instrument packages are:

- Planner Langmuir Probe
- Vector Electric Field instrument
- Neutral Wind Monitor
- Ion Velocity Monitor
- GPS Receiver for Remote Ionospheric Sensing.
- Radio Beacon



The DoD Space Test Program provides the spacecraft, launch vehicle, launch and first year of on-orbit operations. The spacecraft is built by General Dynamics, and the launch vehicle is built by Orbital Sciences. AFRL is responsible for the six-instrument payload, payload integration and test, model development, data center operations, and product generation and distribution. During the first year of flight, C/NOFS will demonstrate its capability for forecasting scintillation events. During the follow-on years, C/NOFS will provide scintillation forecasts to users.

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