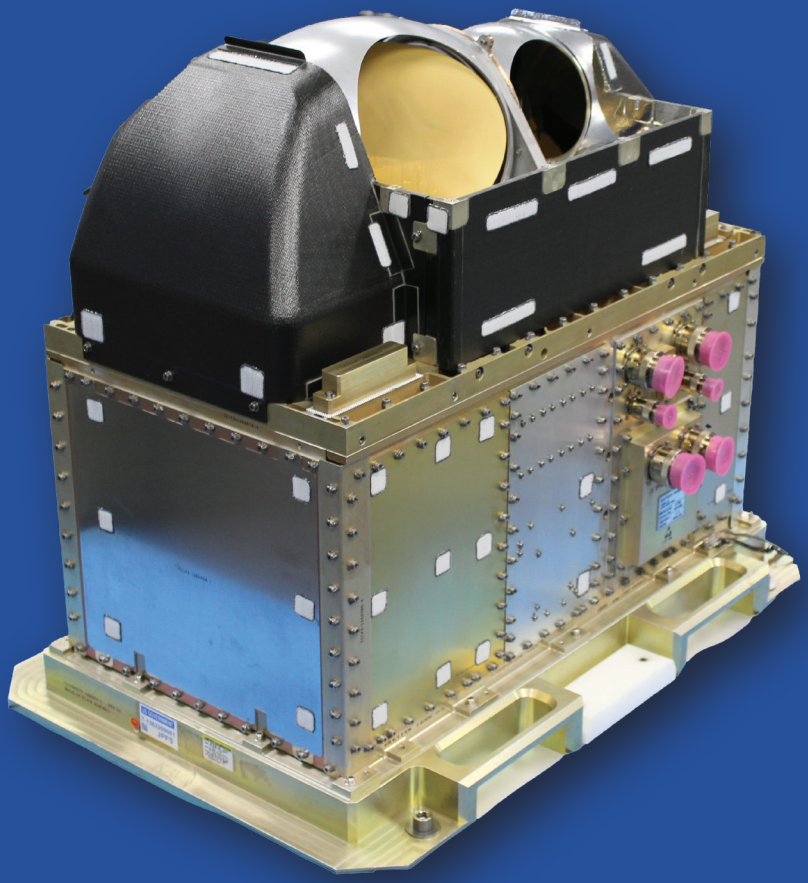


ADVANCED TECHNOLOGY MICROWAVE SOUNDER (ATMS)

Dependable and proven, cost-effective cross-track Passive Microwave (MW) instrument

At Northrop Grumman, when it comes to designing space-based weather technologies, our goal has always been the same: to provide the most accurate, sophisticated, and reliable systems available.

That's why, for over 50 years , we've proudly added our name to more than 100 military- and civilian-use space-based systems.

Our Advanced Technology Microwave Sounder (ATMS) is currently performing successfully on the Suomi National Polar-orbiting Partnership (SNPP) and the Joint Polar Satellite System-1 (JPSS-1) spacecraft, known officially as NOAA-20. The SNPP ATMS, launched in October 2011, has exceeded its 7-year design life, and NOAA-20 ATMS, launched in November 2017, is going strong. Both on-orbit ATMS units exceed performance requirements.

On average, the JPSS-2 through JPSS-4 ATMS instruments have greater than 50% margin against critical specified parameters, and demonstrate improved performance with each successive build.

STATE OF THE ART TECHNOLOGY

Combining the functionality of Advanced Microwave Sounding Unit-A (AMSU-A) and Advanced Microwave Sounding Unit-B/ Microwave Humidity Sounder (AMSU-B/ MHS) instruments, ATMS was built to support the National Oceanic and Atmospheric Administration's (NOAA) newest series of weather satellites, and represents the state-of-the-art for microwave instruments.

Our ATMS technology provides a 22-channel microwave radiometer that scientists use to create global temperature and moisture profiles. Meteorologists then utilize this data in weather forecasting models.

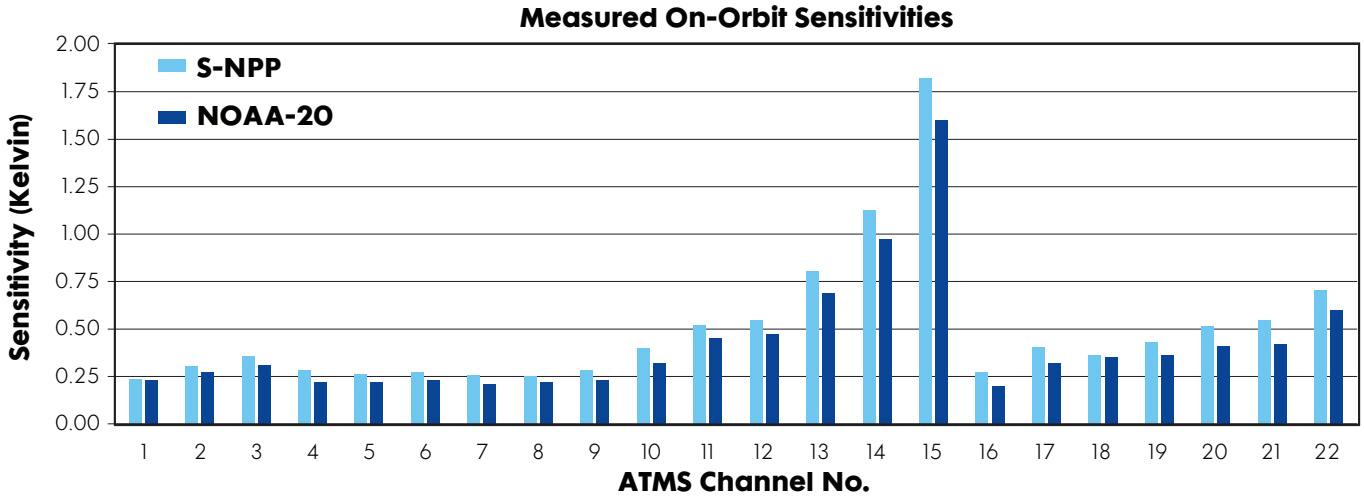
BENEFITS AT A GLANCE:

ATMS performance provides improved benefits relative to the previous AMSU/ MHS Suite:

- Three additional sounding channels
- Improved sensitivity and calibration accuracy
- Improved spatial resolution, sampling interval, and swath width
- Improved temperature control stability
- Longer mission life
- Reduced mass and power

NORTHROP GRUMMAN

ADVANCED TECHNOLOGY MICROWAVE SOUNDER (ATMS)



THE RESULT

ATMS is now recognized as the single most important space-based instrument for operational weather forecasting.

Key design upgrades implemented on the NOAA-20 ATMS to improve performance and reliability include Monolithic Microwave Integrated Circuit (MMIC) based Phase-locked Oscillators, Dielectric Resonator based 82 GHz and 91 GHz local oscillators, improved Receiver Front-End (RFE), and more reliable motor bearing retainers.

ATMS FEATURES INCLUDE:

- Lightweight and compact package
- External calibration system with four selectable cold calibration reference positions
- Highly sensitive 22-channel microwave receivers (23.8 GHz –183.3 GHz) featuring improved sampling and coverage
- Total power radiometer
- Continuous cross-track scanning, with torque and momentum compensation
- Eight hardware redundancy configurations
- Software upload capability
- Built-in diagnostics capability
- An Operational Mode that operates continuously without additional commands

Together, these features provide the most accurate global atmospheric temperature and humidity profiles available.

FUTURE ENHANCEMENTS

Northrop Grumman's ongoing internal research and development activities are investigating capability enhancements for future programs, including such features as:

- Additional radiometric bands while reducing mass and volume
- On-orbit dynamic reconfigurability of spectral channelization
- RFI mitigation
- Electronics upgrade with digital filtering

ATMS is the high-performance leader in weather and environmental systems monitoring.

THE PEOPLE BEHIND THE TECHNOLOGY

No matter how sophisticated the technology, a system is only as good as the people who stand behind it. Northrop Grumman talent includes the best in the field, from PhDs to master-certified technicians to all the highly trained and dedicated minds in between.

Operating out of Northrop Grumman's Azusa, California-based Passive Microwave Center of Excellence — a fully equipped, state-of-the art manufacturing and testing facility — our team's combined skills and expertise range from:

- Advanced microwave technologies
- End-to-end microwave instrument design capabilities
- Heritage subsystem designs, components, test methods and test equipment
- Instrument systems engineering and design, manufacturing, integration and testing
- Program management
- Spacecraft I&T, launch and post-launch support...And much more.

FOR MORE INFORMATION

Space Systems
Diane Pennington
(626) 812-1406
diane.pennington@ngc.com

northropgrumman.com

DS-81e
Northrop Grumman Public Release Approval #22-2005

NORTHROP GRUMMAN