

THE VALUE OF PERFORMANCE.

**NORTHROP GRUMMAN**

## *Advanced Technology Microwave Sounder*

*The newest and most sophisticated,  
cost-effective cross-track Passive MW  
sensor instrument*

**A**t 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 — delivered on time and on budget.

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

Today, with ATMS, our Advanced Technology Microwave Sounder currently on-orbit on the Suomi National Polar-orbiting Partnership (SNPP) satellite, we've done it again. ATMS on SNPP has been exceeding on-orbit performance and ATMS for JPSS-1 has been on schedule and under cost.

### **ATMS: Nothing Comes Close**

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 developed for the National Polar-orbiting Operational Environmental Satellite System, or NPOESS, and represents the next generation in microwave instruments.

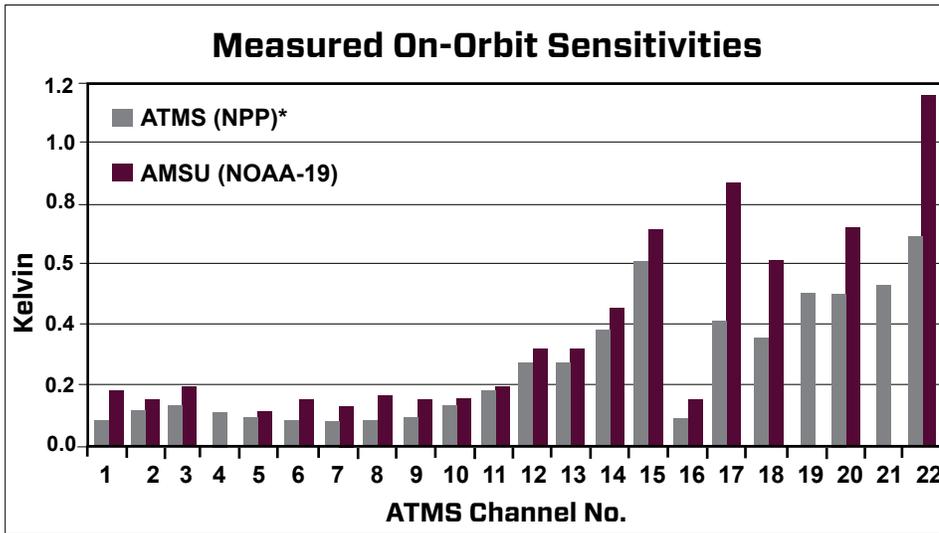
Our ATMS technology provides a 22-channel microwave radiometer that scientists will use to create global temperature and moisture profiles. Meteorologists can then enter this data into weather forecasting models.

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

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

The result

Improved temperature and humidity-sounding performance over past generations of microwave sounders that is versatile enough for both defense and commercial applications.



\* Shown above is NEAT for ATMS Ch's 1-22 with Ch 1-16 using equivalent 3.3° cells to allow comparisons with the AMSU 3.3° cells.

## The People Behind the Technology

No matter how sophisticated the technology, a system is only as good as the people who stand behind it. So it just makes sense that our Northrop Grumman family 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, Calif.-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, please contact:**

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Key design upgrades implemented on the Joint Polar Satellite System ATMS to provide further improvements on 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 motor bearing retainers.

- Eight hardware redundancy configurations
- Four modes, including off/survival, safe hold, diagnostic and operational
- Software upload capability
- Built-in diagnostics capability
- An Operational Mode that operates continuously without additional commands

ATMS features include:

- Energy-efficient, lightweight and compact package
- Reactionless scan drive mechanism
- Sophisticated 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

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

### And it doesn't stop there.

Northrop Grumman's ongoing internal research and development activities to study ATMS capability enhancements for future programs include such features as:

- 229 GHz channels
- 118 GHz channels
- Upper air channels
- Four-point calibration
- Electronics upgrade with digital filtering

ATMS is the low-risk, low-cost, high-performance leader in weather and environmental systems monitoring.

[www.northropgrumman.com](http://www.northropgrumman.com)

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eProc# 13-0914  
DS-484-AMG-0413  
2013 BWI Graphics TW