

WAVESTREAM

By Joe Shilgalis, Vice President of Sales



With nearly 40,000 systems shipped to commercial, government and defense customers over the past 15 years, Wavestream has earned a reputation across the satcom industry for the innovative design, high quality, reliability and performance of its Solid State Power Amplifiers (SSPAs), Block Upconverters (BUCs), Block Down Converters and Transceivers.

In 2018, Wavestream experienced rapid growth and product expansion, fueled by new technologies that address the demands of the in-flight connectivity and gateway markets. In parallel, the company continued to upgrade and enhance its industry-leading Ka-band SSPA amplifiers for mission-critical satellite communication systems for military applications.

Supporting New IFC Trends

In-Flight Connectivity (IFC) is a burgeoning market with an almost insatiable demand for bandwidth, driven mainly by the explosive growth of WiFi service in commercial and business aviation.

A key trend is the transition from Ku- to Ka-band, which is becoming more prevalent as more Ka-band space capacity becomes available for IFC applications. In addition, the launch of LEO/MEO constellations is seen as a new opportunity to meet the increased demand for higher speed services across commercial, business and military aviation applications. Wavestream remains the leading SSPA supplier in the dynamic IFC market, offering a portfolio of BUC amplifiers for Ku and Ka bands.

These field-proven products have been integrated and operating within IFC systems since 2010, and are currently flying on B737, B757, B767, A320, and A321 commercial aircraft, as well as **Embraer, Bombardier** and **Gulfstream** business jets. Attesting to the robustness and stringent quality testing of our products, Wavestream BUC amplifiers are line-fit certified for **Boeing, Airbus** and other leading aircraft manufacturers.



Wavestream is recognized as the largest IFC merchant supplier of SSPA equipment across the world.

Leveraging its reliable product design and rigorous environmental testing standards, Wavestream's IFC products are designed to meet both OAE and IAE installations and are adapted for use in military applications.

Bringing SSPA Technology to the Gateway Market

Wavestream entered the gateway market in 2018, and is currently manufacturing mass-producible SSPAs at power levels that could previously be achieved only by traveling wave tube amplifiers. As power levels continue to increase and satellite altitudes decrease, Wavestream is well-equipped to capitalize upon this opportunity.

Wavestream SSPA amplifiers and **Spatial Power Combining** technology provide major technical and operational advantages for satellite operators with global LEO/MEO constellations. SSPAs are also more reliable than tube amplifiers — a critical requirement for LEO/MEO networks with hundreds of gateways in remote locations that cannot be easily serviced.

Traditional GEO networks, in contrast, commonly require 1-3 gateways. Moreover, the fact that SSPAs can be mass produced enables faster buildout of global LEO/MEO networks that typically require up to 500-1000 gateway amplifiers.

Wavestream's new **160W Peak Envelope Power SSPA**, designed for Ka-band gateway applications, enables operators to monitor real time power and make near-instantaneous power adjustments to ensure high bandwidth connectivity. This new SSPA is already in production and being installed in a next generation LEO network planned to comprise 400+ ground station antennas worldwide.

As an early technology leader in the LEO/MEO gateway segment, Wavestream looks forward to expanding its footprint as LEO/MEO networks become more prevalent.

The company's R&D team is exploring advanced linearization techniques that could be applicable to the wide bandwidth and complex waveforms used in gateway applications, enabling operators to further enhance efficiency and lower costs.

Defense

Wavestream is proud of its rich heritage in supplying high performance, highly reliable SSPA products that meet the challenging requirements of the defense sector. The company's successful track record reflects a highly scalable

and flexible manufacturing capability, enabling Wavestream to produce over 1700 Ka-band products per year for military applications alone.

In 2018, the company continued to deploy SSPAs for portable manpacks and flyaways, Comms on the Move (COTM) vehicles and Satellite Transportable Terminals (STT) across Ku-, Ka- and X-band frequencies.

These SSPAs use patented next generation **Spatial advantEdge™** technology to achieve higher output power, greater reliability and increased efficiency within more compact packages than traditional amplifier solutions.

Wavestream solutions are designed, tested and manufactured to operate in extremely harsh and rugged environmental conditions with varying temperatures, dust/sand and humidity environments. Throughout its history Wavestream has built upon robust design and attention to detail to achieve or exceed MTBF requirements, making its products the industry standard in reliability.

Based on its industry-leading experience with implementing next generation GaN technology, Wavestream performed a major upgrade this year of its widely deployed Ku- and Ka-band BUC amplifiers for the defense segment.

This upgrade to GaN technology means less power draw and less need for heat sinking, reducing the product footprint and enhancing performance in high temperatures. The new 60W BUC, for example, delivers 40 percent more linear power while drawing 10% less DC power than the previous generation design.

Similarly, Wavestream also recently released an upgrade of its 50W Ka-band BUC amplifier, thousands of which have been deployed in **Comms-On-The-Pause (COTP)** applications for the U.S. Army. Both product upgrades to GaN technology ensure the continuous supply and support of proven technology for defense customers with long term sustainability missions.



These and other innovations are designed to meet the future needs of warfighters — such as new form factors, increased portability, less power draw with higher power output and multi-band (Ka-, Ku-, X-band) support — in a wide range of high-bandwidth applications and mission requirements.

Looking Forward to 2019 and Beyond

During the upcoming year, Wavestream will continue to develop and innovate cutting-edge technology for commercial and government customers.

As new LEO/MEO networks become more prevalent in IFC applications, Wavestream's field-proven SSPA technology will be instrumental for enabling seamless switching between legacy GEO and new LEO/MEO networks. Wavestream foresees significant growth opportunities in the IFC segment as new markets, such as China, embrace IFC services.

The defense sector will continue to be a major focus for 2019. In addition to sales of our industry-leading Ka band offerings, the company plans to continue to invest substantial R&D resources in creating new products for military and homeland security applications.

Wavestream looks forward to sharing its successful experience and proven cutting-edge technologies for the IFC and gateway markets with government and defense customers looking for next generation solutions.

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