

Next Generation Space Defense

MilsatMagazine

December 2021

*United Launch Alliance Atlas V
launch of USSF's STP-6 mission*



YEAR IN REVIEW: WAVESTREAM

Wavestream has shipped more than 40,000 systems to airborne, ground/mobile and gateway customers in support of commercial and military applications around the globe. Our company has earned a reputation across the SATCOM industry for innovative design, high quality, reliability, and performance of our Solid-State Power Amplifiers (SSPAs), Block Upconverters (BUCs), Block Downconverters (BDCs), and Transceivers.

2021 IN RETROSPECT

As challenging as 2020 was for Wavestream, and indeed the entire satellite communications community, 2021 was a year of explosive growth for Wavestream. We saw a huge surge in orders from a surprisingly strong resurgence in business operations, investments in large projects, and an insatiable demand for more bandwidth in mobile and remote environments.

Wavestream received several major contract awards in 2021. Most notably, we received purchase orders totaling more than \$50 million for support of gateways for large **Low Earth Orbit (LEO)** constellation. These 160W Ka-Band SSPAs are designed specifically for networks using wide bandwidth uplinks and high-order modulation schemes. The customer asked us to accelerate our production and we are producing these units at about twice the initial anticipated production rate.

Additionally, Wavestream announced \$10 million in awards from a Tier-1 U.S. terminal provider for a highly integrated RF frequency conversion and power amplification subsystem. We refer to these deeply embedded products as **MicroStream**. More than 1,200 MicroStream units were ordered in 2021 by multiple Wavestream customers.

Wavestream also saw our **In-Flight Connectivity (IFC)** business rebound in 2021. While still not back to the levels we saw in 2019, our orders for airborne equipment easily tripled the orders received in 2020 during the height of the pandemic and the near complete shutdown of airborne travel around the globe. As part of these IFC awards, Wavestream announced that we had received **DO-160G Certification** for the **AeroStream 50Ku High Power Transceiver**.

INNOVATION+ R&D

In 2021, Wavestream continued a trend of significant investment in new products and technologies that we started in 2020. At the height of the pandemic, Wavestream looked at the changing marketplace and our product line and saw a misalignment with the new post-COVID world. We poured ourselves into a new modular product architecture that will allow us to mix and match components for faster product development and better supply chain resilience. This trend will continue through 2022 and beyond, and indeed will be the core of our RF architecture for a decade or longer.

In 2021, Wavestream announced several new products — two **PowerStream** units, one MicroStream unit and one AeroStream unit. Two new PowerStream 160Ka units are now available, one for **MILSATCOM** applications (30.0 – 31.0 GHz) and one for commercial wideband applications (27.5 – 30.0 GHz).



Wavestream's PowerStream 160Ka

The military version is part of **DataPath's Gen-3 DKET** terminal that recently received ARSTRAT certification for operations on the **Wideband Global Satcom (WGS)** constellation. Our unit was selected to replace a competitor's unit due to better overall performance.

Our MicroStream 20Ka Wideband unit already has more than 1,000 orders and is indicative of how Wavestream can work with terminal providers to build complex RF subsystems to fit inside and around a tightly integrated terminal. For tactical terminal providers, we are seeing an increase in interest for deeply integrated RF subsystems, with less interest in typical box BUCs (which we refer to as our **Matchbox** product line).

As mentioned earlier, our **AeroStream 50Ku High-Power Transceiver (HPT)**, which has received DO-160G certification, was announced earlier in 2021. This unit is our next-generation, aviation-grade transceiver designed to be used in commercial and private jet applications for customers with high bandwidth requirements.



Wavestream's AeroStream Transceiver

YEAR IN REVIEW: WAVESTREAM

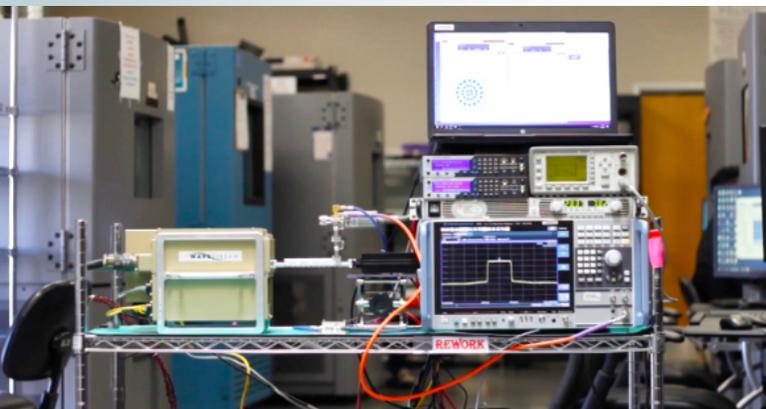
DIGITAL INTERFACE STANDARD (DIS)

Also in 2021, Wavestream spearheaded an effort to create an open standard for a digital interface between the satellite modem and the block upconverter. This interface has traditionally been an analog one, with the Modem modulating a signal onto an RF carrier centered originally at 70 MHz, or more recently at L-Band, usually centered around 1500 MHz.

This L-Band interface worked quite well for 20 years since it was introduced around 2000, but with the advent of *High-Throughput Satellites (HTS)* with 2.5GHz wide transponders, it has become difficult to use L-band as the intermediate frequency between modem and BUC. The carriers are just too wide to be centered at 1500 MHz.

Some operators handle this by changing the IF frequency to something higher than L-band, usually in the S-band (around 3 GHz). However, there are now so many fragmented IF bands that it's nearly impossible to build a standard block upconverter to work with all of them. One of our products can operate in 8 discrete IF frequencies, which is fantastic technologically, but imprudent from a business perspective.

With the support of several other companies including our parent company *Gilat Satellite Networks*, Wavestream created the *Digital Interface Standard (DIS) Working Group* and jointly built an open standard for a digital interface. This digital interface is explained further on our website and in this video found [at this direct link](#). Wavestream has built a demonstration of this digital interface and will be demonstrating it to customers throughout 2022.



Wavestream's DIS demo.

LOOKING AHEAD TO 2022

Next year will be a big year for Wavestream. We will be doubling our production capacity as we expand beyond our current building into a second facility next door. We are also working diligently to modernize our internal processes and workflows to better streamline our customer care.

We will have several new products to announce for gateway, airborne and defense markets and we will be spending a lot of energy on *Electronic Warfare (EW)* and *Protected SATCOM* applications, as well as space-based RF technologies.



Wavestream manufacturing

We expect to see continued pressure in the global supply chain which is driving our efforts to streamline and add resiliency to our product portfolio to try to reduce lead times of critical components for our products. We also expect to witness further adoption of *non-GEO* satellite communications technologies as well as the adoption of a digital IF interface between modems and BUCs.

From all of us at Wavestream, we wish you the very best for a prosperous and safe new year and look forward to working with you for years to come.



The Wavestream team.

www.wavestream.com



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