

Phasor

By David Helfgott, President and Chief Executive Officer



Phasor has experienced yet another fast-paced and exciting year. Momentum has been building, and continues to build, for the electronically steered antenna (ESA) developer.

As the company looks forward to the release of its first commercial products in the first half of 2019, the company can look back on a year that has seen the company continue the transition from a technology development firm to a products company. Here's a snapshot of some of the highlights of 2018 and a glimpse into what can be expected from Phasor during 2019.

Phasor: The Business

In March, Phasor opened their **Technology Development Center in London**, which is a world class research and development facility. This center hosts the design, development and testing of Phasor's current and next-generation connectivity technologies tailored to commercial SATCOM mobility markets, including high-speed broadband for maritime, aviation, and land-based vehicles. The opening of the center marked an important milestone in the evolution of Phasor as a company and allowed for the expansion of facilities and staff.

In addition to the opening of the Technology Center, Phasor appointed senior executives that are leading critical areas of Phasor's global operations, from engineering to business development and supply chain management. Phasor boasts a growing team of technology and engineering professionals.

Phasor also secured various major commercial product contracts over the past year, valued today at more than \$300 million. These agreements underscore the company's maturation, demonstrate successful early commercial engagement and underscore the latent demand for innovative access technology in commercial mobile broadband markets and the analogous unmet need in government Communications-On-The-Move (COTM) markets, for enterprise-grade connectivity on land, sea and in the air.

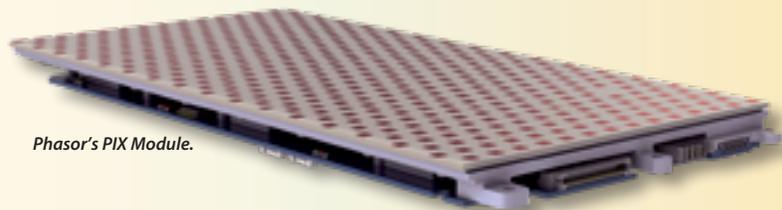
Phasor: The Technology

Technologically, Phasor has enjoyed a vibrant 2018. With the commercial product launch slated for the near future, the development of the ESA systems for land-mobile, maritime and aeronautical applications is moving into a new phase. There have been some notable milestones and partnerships in 2018.

March brought the signing of a partnership agreement between Phasor and Spanish satellite operator **Hispasat** in order to address rising connectivity demand for professional and passenger land vehicles in its geographical markets, such as Intercity buses. Phasor is collaborating with Hispasat on the development of a Ku-band ESA that will be tailored to the unique requirements of land-mobility applications, using the same core technology found in Phasor's commercial maritime and aeronautical ESA solutions. Drivers and passengers in buses, trucks and emergency or municipal vehicles, will be able to enjoy a high-quality connected travel experience for applications like operational telematics, and passenger Internet access, mobile telephone services, and even entertainment services on board. The ESA system is expected to be available within two years.

Related to the LEO market, in March, Phasor announced a strategic agreement with **LeoSat** who will launch a laser-linked constellation comprised of as many as 108 LEO communications satellites to provide gigabit-per-second connectivity speed to the enterprise market.

The agreement in place is set to serve a broad range of mission-critical enterprise network markets with an ultra-high throughput, low latency network infrastructure solution. As part of the alliance, Phasor will accelerate development of a Ka-band variant of its Ku-band ESA nearing commercial launch. This powerful Ka-band, NGSO – ready version of its ESA will be scalable to virtually any use-case requirement. Phasor's LEO-capable antenna technology will enable corporations, governments and other



Phasor's PIX Module.

mission-critical, high bandwidth users to access a network offering speeds about 1.5 times faster than terrestrial fiber in combination with high-throughput, ultra-security and very low latency. The engagement of Phasor is significant as it is an important step in the delivery of LeoSat's services and underlines the importance of the correct kind of access technology.

In June, Phasor entered into a commercial partnership with **Astronics AeroSat**. The companies are working together to produce scalable, dual-beam ESA-based aeronautical terminals, which will enhance the passenger and crew experience aboard connected business and commercial airlines. Astronics AeroSat will integrate Phasor's phased-array technology into an agile aviation antenna solution that will operate seamlessly with Geostationary (GEO) and Non-Geosynchronous satellites, such as the Low Earth Orbit (LEO) wideband constellations that are currently in development. The new antenna will feature dual-beam technology with a "make-before-break" capability.

The two companies will pursue and achieve certification and commercialization of the new dual-beam terminal across multiple commercial airframes and satellite communications networks, coupling Phasor's innovation with best-in-class avionics and terminal integration expertise.

In September, **Kepler's** first wideband LEO satellite, **KIPP**, was successfully auto-acquired, auto-tracked and communicated with, via Phasor's ESA. This was a highly anticipated milestone as this was the first time that a commercial, flat-panel, electronically steerable antenna had achieved such a feat. Phasor's antenna successfully acquired, tracked and received transmissions from KIPP as the satellite passed over Phasor's test range facility in the UK. For the test, Phasor's antenna was able to track KIPP for its entire pass down to 20 degree elevation angle, demonstrating the viability of the 70 degrees scan angle available from the Phasor electronically-steerable antenna.

That achievement now opens the door to a wide range of novel applications that can benefit from phased array antenna technology, which the duo intend to address. The combined capabilities of Kepler's ultra-low-cost satellites and Phasor's high-performance technology will allow the potential of high-speed LEO Ku-band mobile connectivity to be unleashed. Customers will be able to benefit from the ability to dynamically and seamlessly switch between satellite networks in order to optimize traffic management.

This marks another exciting beginning on Phasor's journey into the commercial market and to the prospect of bringing real capabilities to markets such as maritime, transportation, natural resources, IoT and other on-the-move applications.

More to Come

2018 was a busy year for the firm and the Phasor team is looking forward to launching the company's initial products into the market during 2019. Currently being worked by Phasor is the company's land mobile and maritime system, with field tests underway for the first release of products. Longer-term, Phasor's Product Roadmap includes a three-release strategy over several years, covering a range of form-factors, use-cases and frequency bands.

The year ahead promises to be an exciting and significant one as Phasor introduces its highly-anticipated technology to the market. The company is dedicated to making its breakthrough ESA available to the wide spectrum of mobile applications, enabling a level of connectivity that is transformative, delivering seamless, high performance connectivity — the future of mobile broadband.

www.phasorsolutions.com

David Helfgott has the responsibility for the company's strategic direction, to drive the development of the firm's Electronically Steerable Antenna (ESA) products and technology and to implement its operational programs. As a 20 year industry veteran, he has extensive experience in satellite broadband, mobile telecommunications as well as commercial and government SATCOM networking services. Mr. Helfgott has held leadership positions at Inmarsat, Cobham, DataPath and SES. He holds a BA Degree from the University of Virginia and an MBA from the Darden School.

Phasor's electronically steerable antennas (ESAs) are based on patented innovations in dynamic beamforming technologies and system architecture. Phasor's mission is to enable high-speed broadband communications while in-flight, at sea or traveling over land.



Phasor's Aero Antenna.