PHASOR
THE FUTURE OF MOBILE BROADBAND™

Passenger Rail Industry Use-Case

For business and leisure travellers alike, broadband access on board trains has become a critical part of their journey. For commuters, who want to check on their emails in advance of arriving at the office, to travellers that wish to use their mobile devices to keep in touch on social media or watch their favourite TV show, a reliable broadband connection is a basic requirement. Expectations of rail passengers have grown to the point where they expect to be able to access everything that they have at home or in the office on the move, from business presentations to video chatting.

The rail market, like the aeronautical and maritime markets, is experiencing increasing demand for broadband connectivity on board rolling stock. Access to broadband connectivity can also help rail companies to run a much more efficient service in terms of monitoring the equipment on board and providing updates on its status along the route.

Basic broadband connectivity solutions available today rely upon oversubscribed terrestrial wireless services, supplemented by underperforming satellite communications based on mechanically stabilized dish antennas. Heavy and complex, these large SATCOM antennas depend upon moving mechanical systems, which make them prone to failure, difficult to repair, limited in bandwidth, and costly to install. They also take time to re-acquire a satellite signal that has been lost due to passing through a tunnel, making it a frustrating experience for passengers on board.

Rail Operations
(Scheduling, Track Conditions, Security, and Logistics updates)

Crew Communications
(VOIP, Messaging, Alerts)

Passenger Services
(broadband, social media, online services, entertainment)

Telematics (IoT)
(Equipment performance, conditions, status)

Changing the Game with Phasor Technology

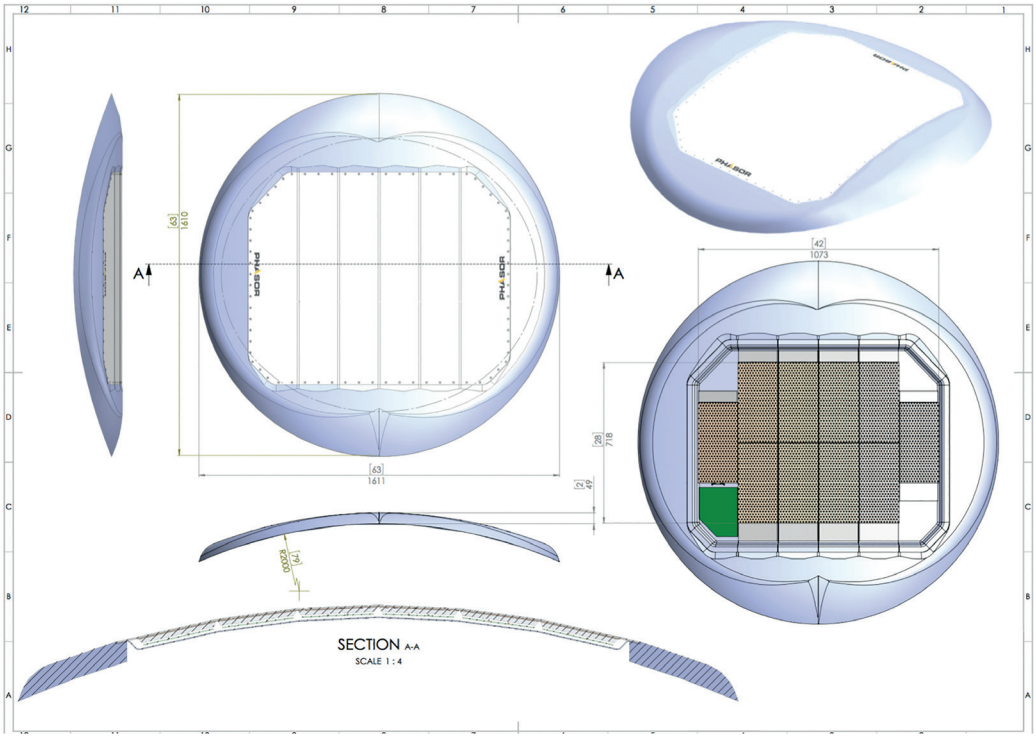
Phasor has developed the world's first enterprise-grade, solid-state, electronically steerable, flat panel antenna, designed for the passenger rail market. Lightweight, low-profile, conformal and highly scalable to meet a broad range of bandwidth requirements, the Phasor electronically-steerable antenna will usher in a new era of broadband connectivity, reliability and convenience.

The Technology

Based upon patented innovations in dynamic beam-forming and system architecture, Phasor pushes antenna innovation further than ever before by taking the entire RF-chain and shrinking it onto its own proprietary microchip. This is how it works:

- These microchips are connected to their own tiny omni-directional “Patch-antenna”; creating the radiating “Element”;
- Its electronically steered antennas are made up of an array of elements all interconnected across a “Core Module” - the basic system building block; all within a 2-inch thick solid-state package;
- Phasor’s technology dynamically controls the phase and amplitude of each Element to steer the beam; allowing it to track any satellite signal no matter where you or the satellite moves.

This revolutionary design means the antenna is extremely low-profile and highly reliable and can be scaled-up without loss of performance and integrated onto the train roof as a flat or conformable unit.



Using this software defined antenna architecture, Phasor technology can achieve:

- nearly instantaneous tracking speeds;
- multiple independent beams, enabling the tracking of two independent satellites, simultaneously;
- dynamic beam shaping, tapering or nulling, to avoid adjacent satellite interference;
- the option of a “distributed array” combining signals from antennas placed separately into one “logical antenna”

For the first time, Phasor’s technology can allow train operators and mobile broadband service providers to deliver a highly reliable, broadband solution to their passengers without the need for large, heavy and maintenance-intensive parabolic antennas.

Bringing high speed connectivity to the passenger rail world has never been easier.

Phasor is the future of Mobile Broadband.