Ball Aerospace delivers industry-leading, low-profile, affordable phased array SATCOM terminal solutions for air, land and sea applications. Ball’s innovation, extensive product heritage and proven phased array capabilities enable reliable, high data rate connectivity in Ka frequency bands for government, military, intelligence, consumer and enterprise markets. Ball’s SATCOM experience covers L-, X-, Ku- and Ka-Band spectrums. Our 50 years of phased array design gives us in-depth knowledge of regulatory standards and an understanding of a diverse range of satellite systems.
Ball has a fully electronically steerable Ka-Band phased array antenna architecture that starts with a fundamental building block that we call a sub-array. It is designed to be tiled with other sub-arrays to form a SATCOM terminal. The number of sub-arrays required is a function of the end user’s use case and the satellites they are communicating with. The architecture allows independent scaling of transmit and receive antenna sizes and supports distributed antenna solutions. This approach allows the flexibility to optimize a terminal to the needs of the user without the cost of antenna re-design. These fully electronically steerable antennas eliminate moving parts, providing long-term reliability with lower maintenance costs. Their low profile enables the design of flat terminals to meet a range of military and commercial use cases.

This sub-array architecture brings cost effective flat panel antennas to the market. The sub-arrays utilize highly integrated semiconductor devices and standard circuit card materials, avoiding unproven materials. The resulting sub-arrays are designed for high-volume manufacturing and are produced like any other electronics communication equipment. By leveraging high volume contract manufacturing facilities and design for manufacturability expertise, cost is driven down as volumes increases. Having a standard building block drives economies of scale for all users, a first for the industry.

**KEY FEATURES**

- Low cost modular array building blocks enable scalable terminal solutions to meet any connectivity demands
- Operation resiliency on GEO, MEO and LEO satellite constellations
- Fast, agile, accurate steering improves satellite acquisition and tracking for highly mobile platforms
- Dual beam capable and fast update rates to support satellite switching and TDMA architectures
- Modem agnostic to work with most commercially available modems, supporting Open AMIP/BMIP and custom interfaces
- Low profile package provides minimal visual signature and low drag
- Aperture integrated radome for reduced cost, increased performance and lowest profile
- Software defined beamformer enables unique beam shaping capabilities
- Distributed amplifiers facilitate reliable connectivity with graceful degradation
- Capable of top mount or saddlebag installation for increased coverage and flexible platform integration
- Minimal inboard equipment including Antenna Control Unit (ACU) and Frequency Conversion Unit (FCU)
- Environmentally sealed and designed to maximize heat dissipation

**SYSTEM PERFORMANCE**

**RF**
- **Frequency**
  - Transmit 27.5 to 31 GHz
  - Receive 17.7 to 21.2 GHz
- **Polarization** RHCP/LHCP (Electronically Switchable)
- **Axial Ratio** < 2.0 dB (Electronically Controlled)
- **Coverage**
  - Azimuth 360°
  - Elevation 25° to 90° (Top Mount)

**TRACKING**
- **Beam Update Rate** 300 μs (any position, any polarization)
- **Pointing Accuracy** <0.2°