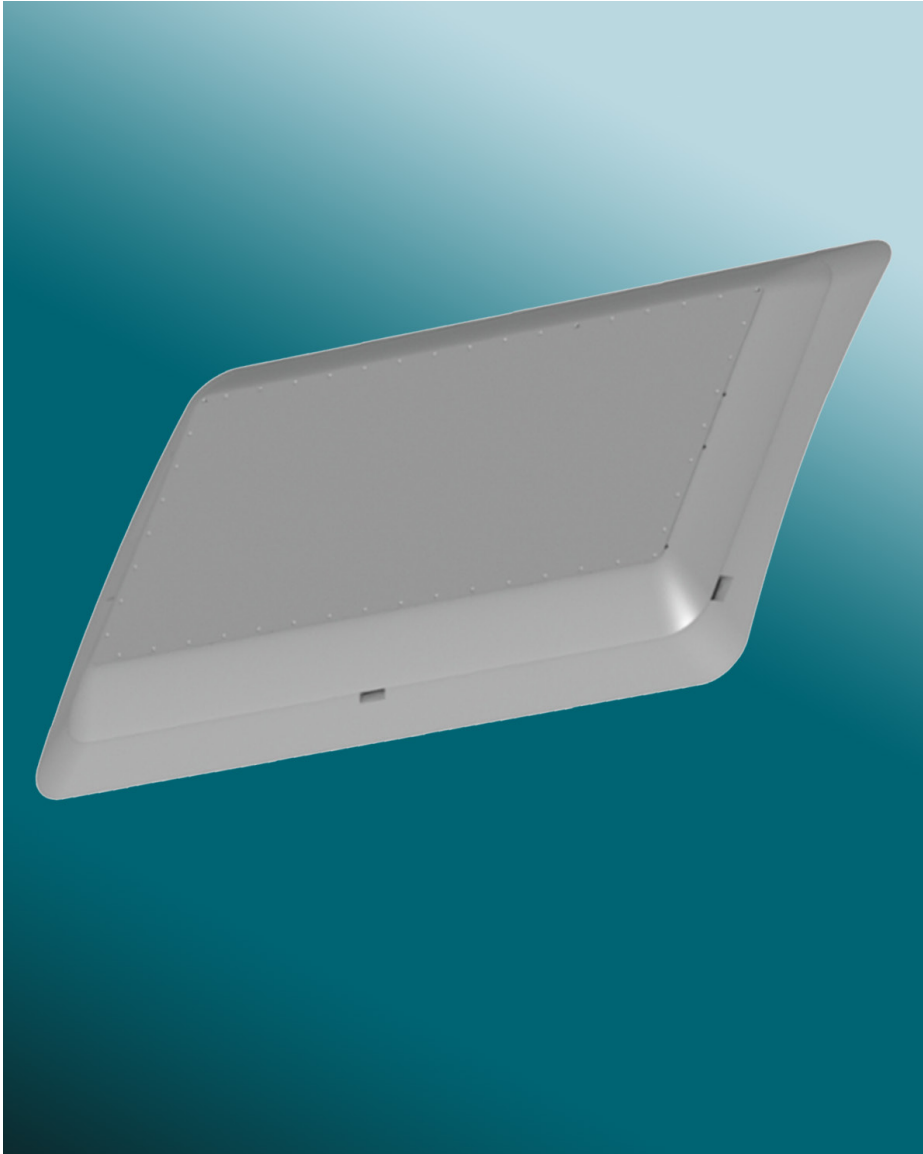


# Ka SATCOM PHASED ARRAY TERMINALS



GO BEYOND WITH BALL.®

Ball Aerospace delivers industry-leading, low-profile, affordable phased array SATCOM terminal solutions for air, land and sea markets. 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. Phased array SATCOM terminals form smart, agile, electronically steered beams for rapid satellite acquisition and highly reliable tracking performance with no moving parts.

## OVERVIEW

Ball's state-of-the-art phased array SATCOM terminals enable reliable connectivity delivering broadband high data rate communication and video streaming. Leveraging our technologies and expertise, we rapidly deliver integrated terminal solutions with well-defined interfaces to meet performance and environmental requirements. Planar phased array technology uniquely provides modular and scalable solutions to meet connectivity demands utilizing single array panels or multiple sub-array tiles joined to enhance performance.

Ball's light weight, durable and low profile phased array terminals provide numerous benefits. Conformal phased array terminals present low visual signatures. Their low profile significantly decreases drag on mobile platforms reducing operating costs compared to high profile, parabolic dish antenna systems. Unlike mechanically steered antenna systems that require downtime for routine maintenance of their moving parts, Ball's phased arrays electronically steer beams resulting in more reliable systems with no moving parts and higher availability. Smart, software configured phased array beams provide automated alignment and do not require costly installations and manual beam re-alignment like dish antennas. Light weight integrated array terminals are easy to transport, install and rapidly deploy. Fast and agile electronic beam steering enables SATCOM service for highly mobile platforms. Array terminals deliver rapid, accurate satellite acquisition, tracking and hand-offs providing the highest levels of uninterrupted service for LEO, MEO and GEO systems.

Ball has five decades of heritage successfully delivering reliable and proven SATCOM array solutions. We deliver today's affordable terminals utilizing cutting-edge highly integrated semiconductor devices, advanced high volume circuit card assembly processes and state-of-the-art automated manufacturing. Modular sub-array panels enable highly flexible solutions, allowing independent scaling of transmit and receive antenna sizing for desired data rate performance as well as easily supporting modem agnostic distributed antenna solutions. Ball's SATCOM experience covers L-, X-, Ku- and Ka-band spectrums, in-depth knowledge of regulatory standards and understanding of diverse range of satellite systems. Phased array terminals optimally enable a full range of global SATCOM services for government, military and special operations missions.

## ADVANTAGES

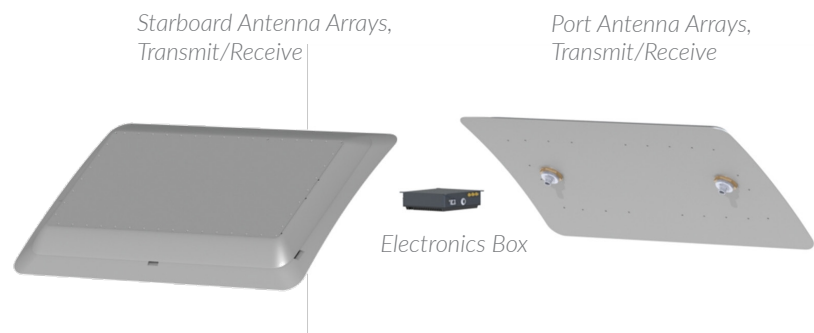
Terminals with electronically steered phased arrays have numerous advantages over mechanically steered antennas.

- Fast, agile, accurate steering improves satellite acquisition and tracking
- Much lower profile and weight in a conformal package
- No moving parts or motors provides higher reliability and lower maintenance costs
- Easier to install and configure with lower operational cost
- Modular array building blocks rapidly enable scalable terminal solutions to meet any connectivity demands
- Distributed amplifiers facilitate reliable connectivity vs mechanical dish single point amplifier failure

## SYSTEM PERFORMANCE

- **Frequency**  
Transmit 27.5 to 31 GHz  
Receive 18.3 to 21.2 GHz
- **Data Rate** >100 Mbps  
(Performance scalable)
- **EIRP** 45.7 dBW, 51.5 dBW & 57.3 dBW  
(at P1dB at boresight)  
One, two or four array building blocks  
Transmit performance scalable, not limited to example configurations
- **G/T (at boresight)** 7.3 dB/K, 10.1 dB/K & 12.9 dB/K  
One, two or four array building blocks  
Receive performance scalable, not limited to example configurations
- **Polarization** CP, Switchable Linear/Circular
- **Axial Ratio** <2 dB
- **Coverage** Configurable, below horizon with saddle bag installation
- **Antenna Size, Weight and Power** Variable based on configuration and Power
- **Supply Voltage** 18 to 31 VDC
- **Environment** MIL-STD-810, DO-160
- **Data/Control Interface** Ethernet, RS-232
- **Modem Interface** OpenAMIP
- **Modem Modulator** DVB-S2/ACM, INFINITI TDM (TX Downstream Carrier)
- **Modem Demodulator** ATDMA (RX Upstream Carrier)

## SYSTEM COMPONENTS



Saddlebag Configurations - Same platform interface as L-Band