ORBIT

Communications without Boundaries

Company presentation

March 2020

Who We Are



Orbit is based in Israel, with additional operations in the United States

We provide highly reliable and cost-effective communications solutions for the most extreme conditions.

Since the 1980's Orbit is a global leader in tracking antenna solutions and aeronautical audio management systems.

You'll find Orbit solutions on cruise ships and navy vessels, airliners and jet fighters, teleports and rooftops, offshore platforms and UAVs.

A reputation for innovation

Orbit systems keep people connected around the world

3,500+
airborne systems

4,000+
maritime systems

1,500+
ground systems

Our People

Over 200 professionals – multi-skilled, multi-talented and customer-focused

Our staff in Orbit US, Europe, and Asia and offer further skills and depth

Our team has a rich history of innovations, firsts, patents and awards

Orbit promotes social responsibility – mentoring students and giving a helping hand in local communities






Customer Experience

We focus on customer care/support from our first collaborative meetings to long-term maintenance

Our goal is to maximize availability and lifecycle through robust construction and high reliability

Supportability is key – fast restoration through modular and accessible designs, training and support

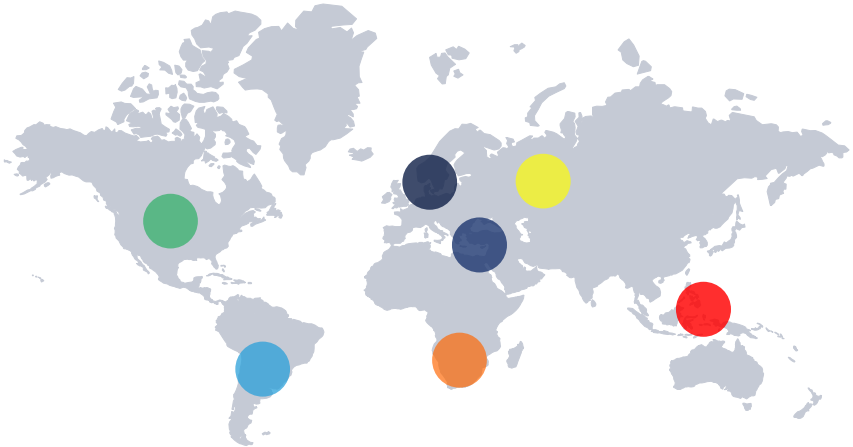
We're IP and network friendly – easy integration, intuitive interfaces and sharp tools

Logistics and maintenance support is available 24/7, through Orbit and partner facilities across the globe

We tailor our support to meet your needs, for more cost-effective spares and maintenance plans

Our Customers

Our diverse customer base helps us develop and improve, and to find better and faster ways to serve emerging markets



- Emerging New Space Entrants
- Satellite Operators
- ESA, NASA and National Space Agencies
- Earth Observation Companies
- US, NATO & International Armed Forces
- Aircraft Manufacturers

SES · BOEING · AIRBUS · McMURDO · esa · radiomar · LOCKHEED MARTIN · NORTHROP GRUMMAN · Rockwell Collins · SNC · Raytheon · NAVY · Gilat · inmarsat · IAI · ANTONOV · EMBRAER · RAFAEL · THALES · MARINE NATIONALE · MORABA · SPACEFLIGHT · DLR · eutelsat · BHARAT ELECTRONICS · UAC · GAZPROM · ST Engineering · HAL · Elbit Systems · TELESPAZIO · ISRO

What We Offer

Orbit specializes in 4 primary product areas

Ground Systems

- Top provider of compact high performance Ground Stations for ‘New Space’ cubesat/ smallsat and Earth Observation sectors

Maritime/O&G Systems

- Key role in the rapid development of Maritime Satcoms
- Leading provider tp large cruise ships
- Provider to US and over 20 other Navies

Airborne Systems

- Strongly established in Airborne Satcoms
- Preferred supplier to Boeing, Airbus, and Gulfstream
- Civil and DoD/MoD qualifications and certifications

Audio Management Systems

- innovative airborne audio management system.
- Powered by a patented Dual IP Ring
- Orion provides exceptional 3D Audio and Adaptive Noise

Airborne Satcom

Airborne series: qualified and operational on a broad range of platforms – helicopters, military aircraft, UAVs and commercial aircraft

Over 1500 terminals delivered worldwide for both commercial and government customers

Light and compact design, simplifying installation and maintenance

High speed and reliable links, and fast transitions between satellites

Industry-leading RF performance, global stabilization control and tracking capabilities

Extensive military and civilian qualification and compatibility, exceeding stringent environmental requirements

Wide Aero VSAT Portfolio

Airborne Stabilized VSAT Systems 25cm to 90cm

AirTRx 25LP	MPT 30	MPT 46	MPT 60	MPT 90
				

0 cm — 25 cm — 31 cm — 46 cm — 60 cm — 90 cm

Competitive Advantages: Flexibility • SWaP • Multi-Band • Superior RF & Tracking • Reliability • Experience

Orbit Airborne Offering

- **Multiple Band support:** X/Ku/Ka
- (Commercial & Government)
  - **Parabolic**: Scalable antenna diameters
  - **Elliptical**: AirTRx-25LP Ku/Ka auto switch
- **ARINC 791** In-Flight-Connectivity (IFC) Building Blocks & Solutions
- **Tailored** Airborne Solutions
- **Comprehensive End-to-End Solutions:** AERO modems, Compatible ground modems, RF Tracking and Radomes

MPT 30 - Robust solution that stands apart from the competition

- **Differentiators and Key features**
  - Open Architecture – Modem/Network agnostic
  - Reliability and Robustness
  - Superb environmental and EMI/EMC compliance
  - Cost effective
  - RF Performance
  - Configurable – Multi-Platform

46-90cm

30cm

Low Profile

Biz Jets &
Mission

Mission

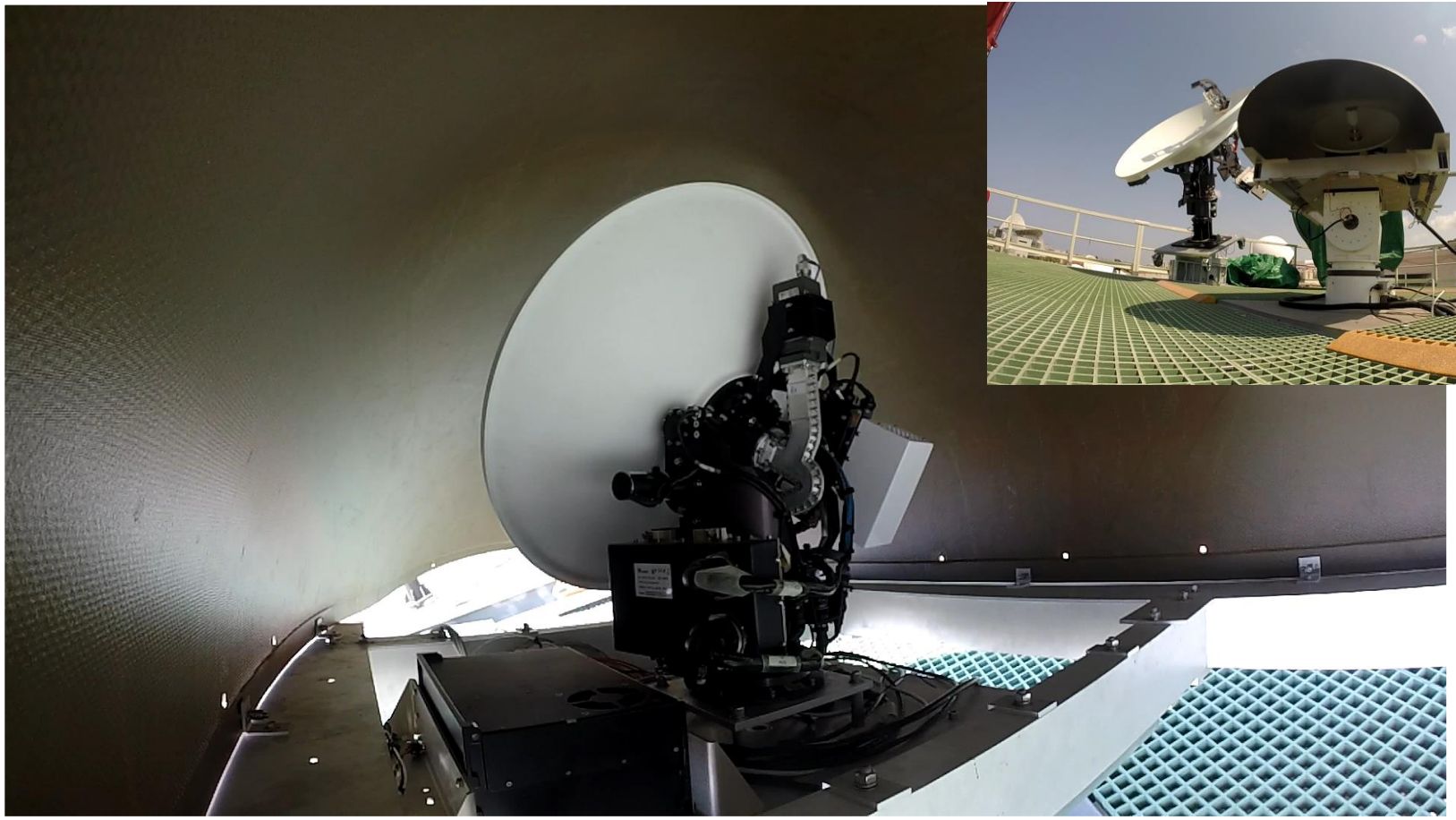
UAV's

Rotary wing

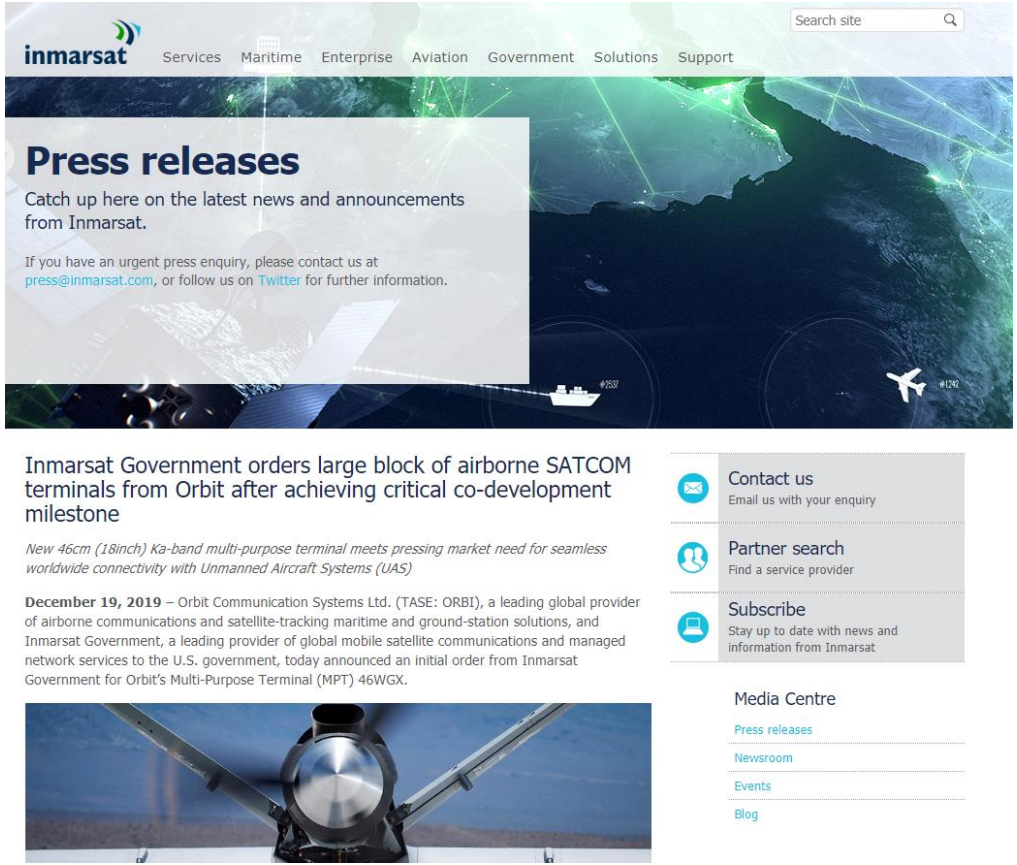
Capabilities and Specialties

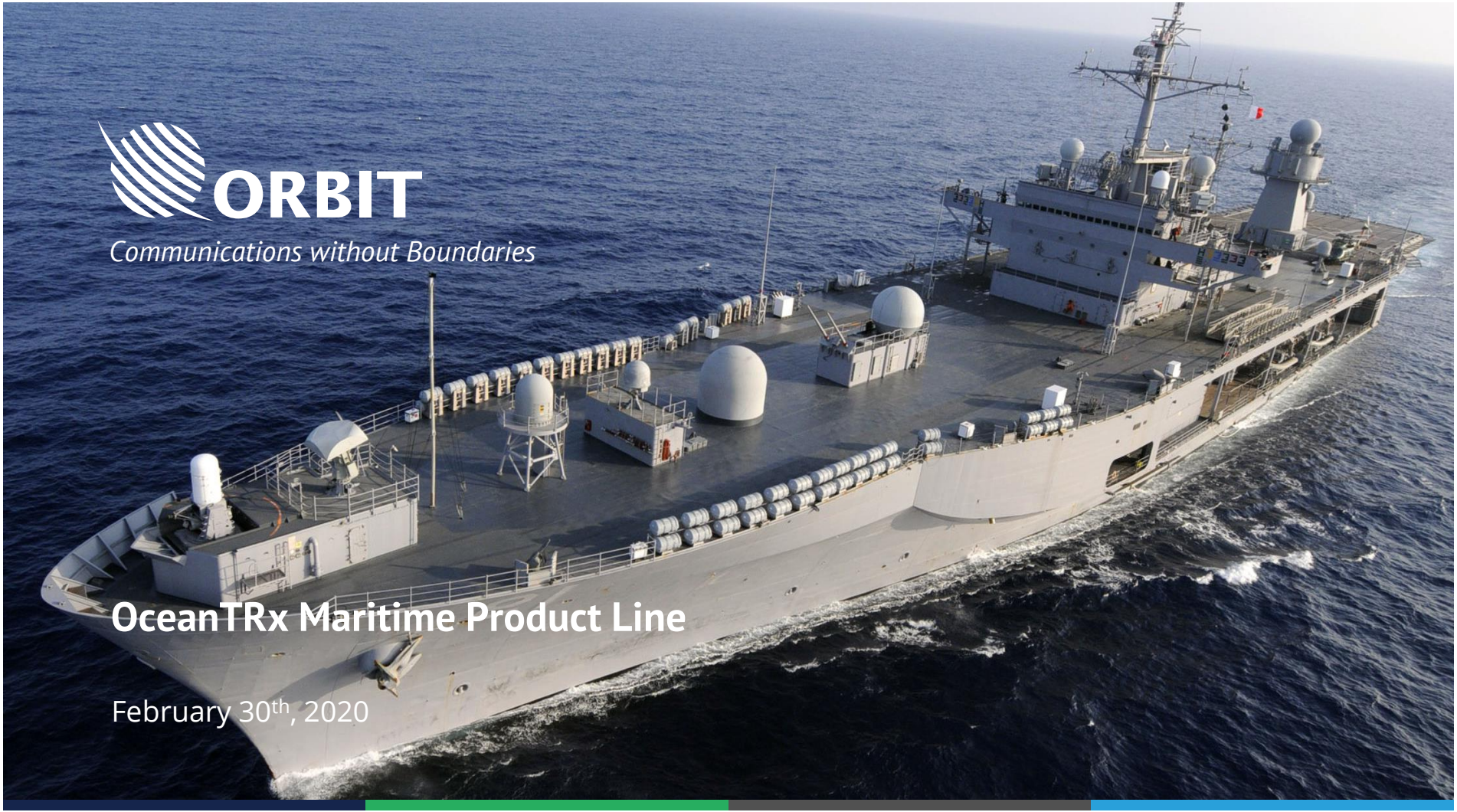
- **Airborne Radomes**
- System **qualification/certification based on DO-160 / MIL-STD**
- **Supplemental type certificate (STC)** escort/support service
- **Satcom regulations** certification support package
- Services – **Integration/Testing**

AirTRx antenna system under a RADOME - SIMULATOR



MPT 30 & MPT 46 - Inmarsat Certified




ORBIT
Communications without Boundaries
OceanTRx Maritime Product Line
February 30th, 2020

OceanTRx Target Markets

Different worlds, similar “pain points”

Mission Critical - Always Available

Band/Satellite Coverage

Harsh Environmental Conditions

Military Grade Standards

Weight/Size Constraints (ADE and BDE)

High Throughput

Huge Revenue Source – Always-on

NGSO Handover Challenges

“Het-net”: GSO + NGSO + Multiple Bands

Weight/Size and Distances Constraints

Short Service Windows

Ultra High Throughput

OceanTRx VSAT Platforms

- **OceanTRx 7 (2.2m)**
  - **Multiband:** C/Ka or Ku/Ka
  - **Single Bands (with manual switching):**
    - C-band, X-band, Ku-band, Ka-band (Military, Commercial & ITU), Ka-band O3b
- **OceanTRx 4 (1.15m)**
  - **Single Band (with manual switching):** X-band, Ku-band, Ka-band (Military, Commercial & ITU), Ka-band
  - **Multiband** Ku/Ka

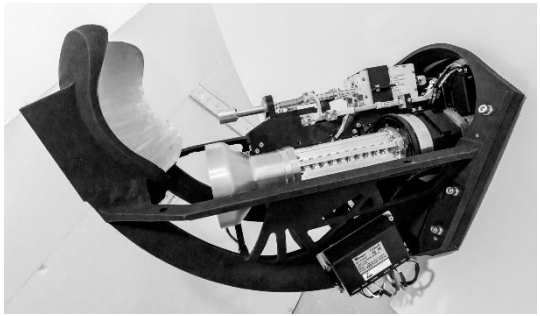
OceanTRx™ 4 Main Features

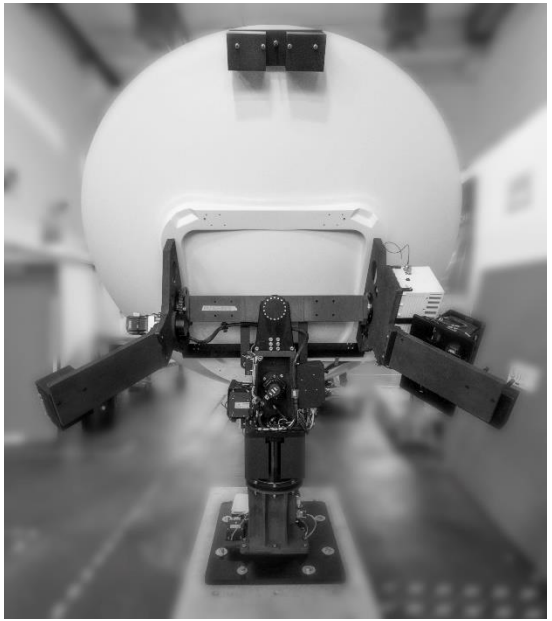
- Multiple bands Ku/Ka/X
- Built for fast manual band change in the field
- Wide range of BUC and LNB to choose from
- Dual and Triple system configuration including O3b constellation support
- Modem Agnostic

OceanTRx™ 7 Main Features

- A 2.2meter Antenna in Compact Radome (2.7m)
- Light weight (~650Kg)
- Multiple Bands – Single Platform
- Best fit for Military and Commercial applications
- Multiband (including switchable) - Global Coverage
- Shipped Fully assembled and pre - tested >> Fast Installation, Up to 6 hours
- GEO and NGSO satellites Tracking , vast experience with LEOs and MEOs

OceanTRx7 Multiband Terminals: C/Ka | Ku/Ka | X/Ka*





Single, Dual or Sim Bands?

Single Band

- Manual switch between bands
- Time consuming, approx. 1 hour downtime
- Supporting multiple bands with same platform

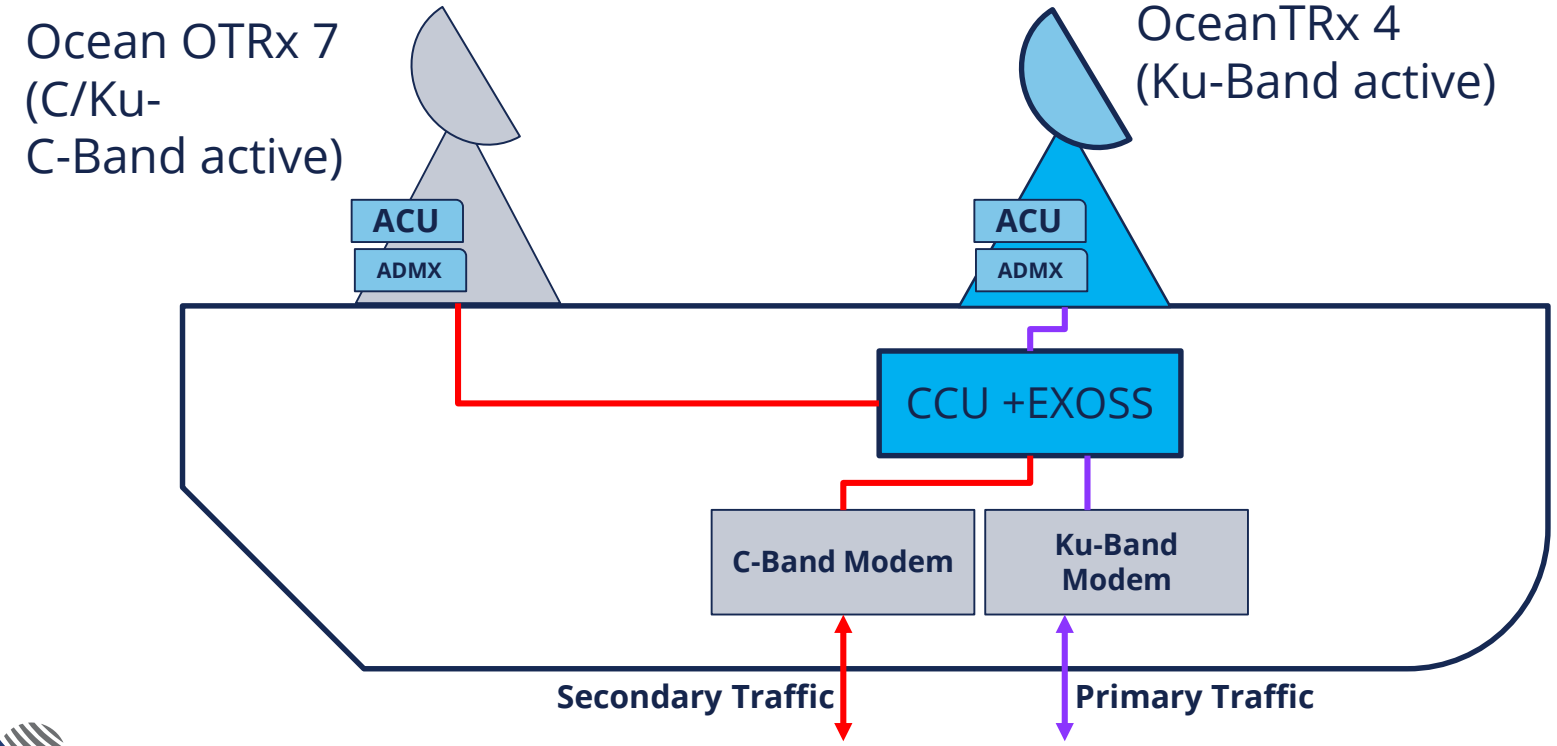
Dual Band

- Automatic or preemptive switching according to preference, coverage, environment
- Negligible downtime (a few seconds)
- Limited to two frequency bands

Sim-Band

- At least 2 simultaneously operational bands
- Can be used as single band with zero switching downtime

Independent Operation



Earth Observation Ground Stations

Gaia Earth Observation ground station: fresh approaches to ground stations. Lighter, smaller footprint, and simpler to install, operate and maintain

Highly accurate compact ground terminals for uninterrupted links to LEO, MEO and GEO constellations

Diverse range of applications and customers – Space Agencies, Earth Observation companies, and search and rescue operators

Ease of installation – lightweight, pre-configured and pre-tested

Ease of Integration – extensive experience with diverse tracking schemes and handover, and IP/Network friendly

Lower Cost of Ownership – whether a big operator or a budget-constrained EO

Gaia family

				
	Gaia-100	**Gaia-200**	**Gaia-300**	**Gaia-400**
Reflector Size	**2.4m** **3.7m** **4.5m**	**3.7m** **4.5m** **5.0m** **5.5m**	**6.3m** **7.3m**	**9.0m** **10.0m** **11.0m**
Radome	✓	✘	✘	✘
Bands	L S X S & X	L S X S & X L & S L & X	L S X S & X L & S L & X	L S X S & X L & S L & X

Installation

Telemetry & Tracking

AL/Tri-Band series: Market-leading high-speed tracking and telemetry systems for land and sea

Extensive base of Government and Civilian customers

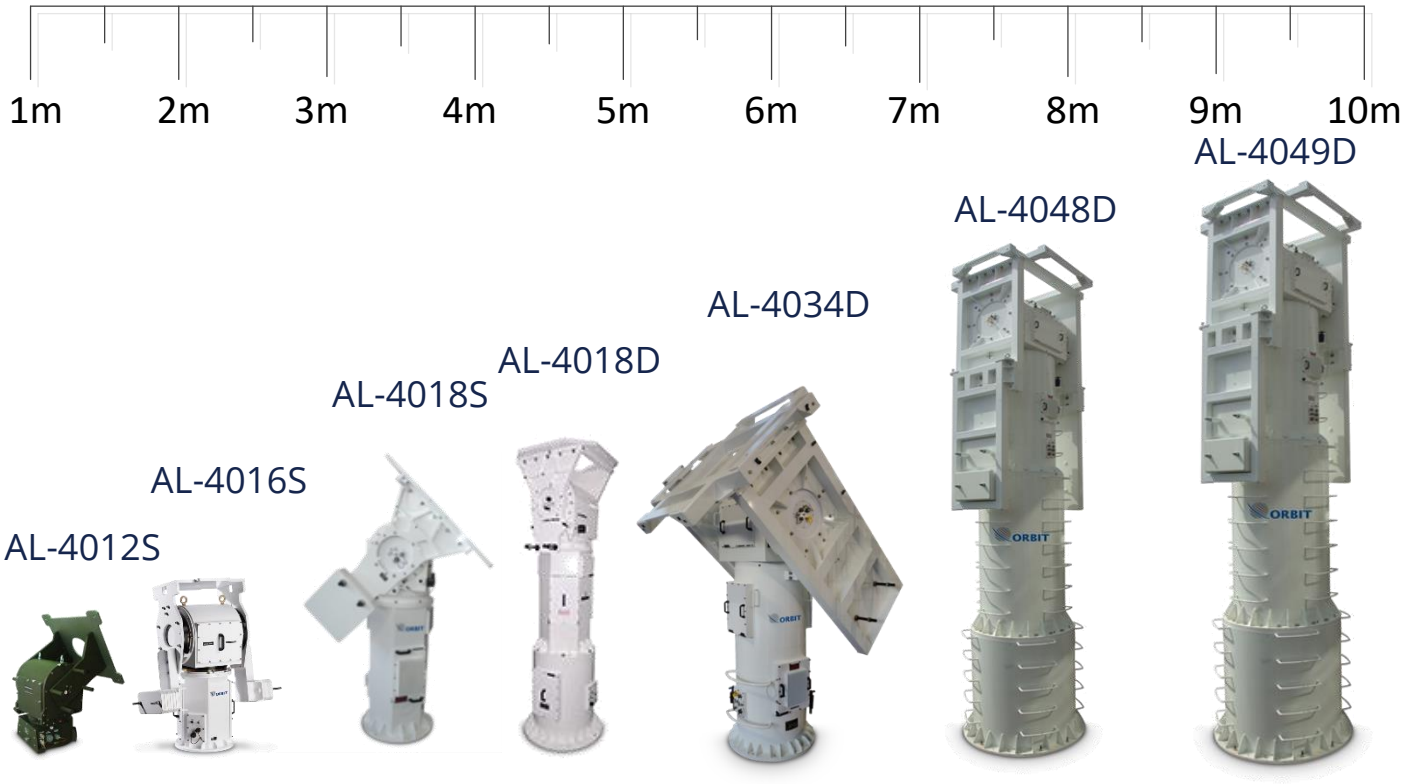
Modular design for easy transport and set-up

Reliable, robust systems for extreme environmental conditions

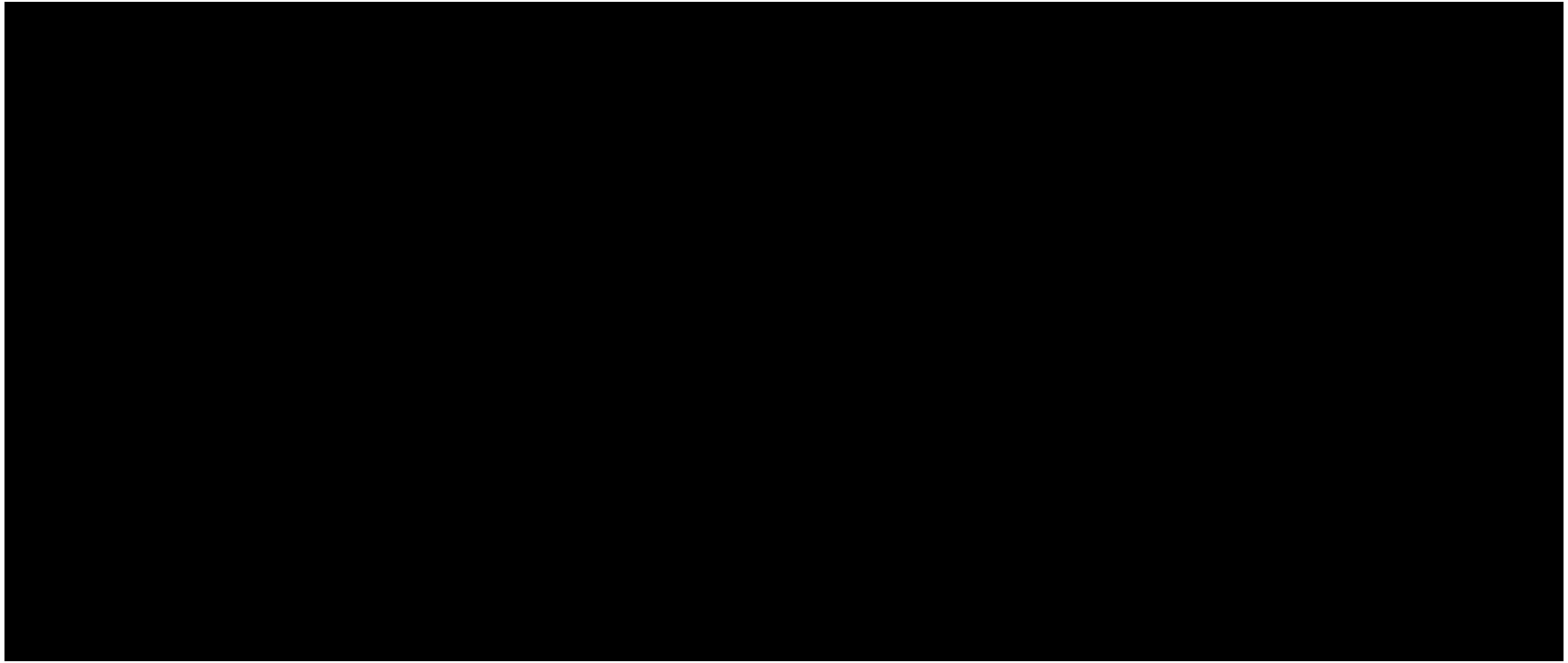
Fast target acquisition for unsurpassed tracking accuracy and quality

Proven L/S/C Tri-band solution delivering excellent value/performance ratios

ORBIT Positioners



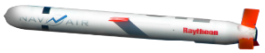
ORBIT Precise Antenna Systems



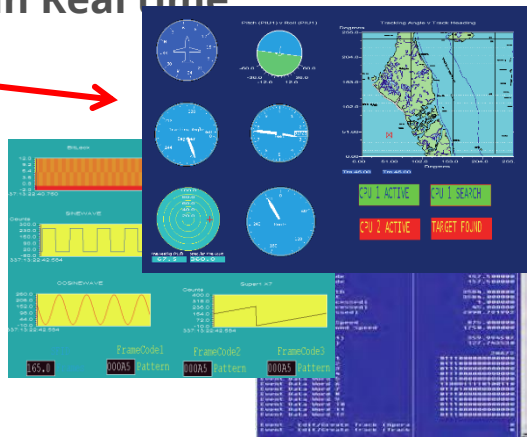
ORBIT Precise Antenna Systems

Full turn key projects Large scale installation

Full turn key projects Large scale installation



Telemetry - the bundle of technologies allowing remote measurement and reporting of information in Real time



Airborne Audio Mgt

Orion series:
Evolution and advancement based on experience with over 3,500 fielded systems

Optimized for fighters, helicopters, mission aircraft and commercial aircraft

Pioneer in 3D Audio and channel spatial separation

Ease of installation, integration and support

Robust and reliable, with patented dual IP ring redundancy architecture and backup modes

Extensively operational with Israeli, US and other Air Forces, and on airframes as diverse as the Gulfstream V and the MC-21 Airliner

AMS Product Offering






UAV	Trainer & Fighter	Helicopter	Transport	Mission	Airliner

Orion UAV

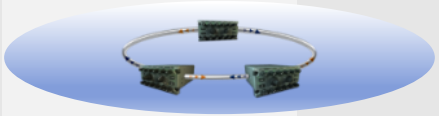


Ground Station

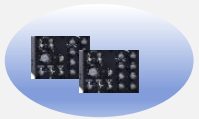
Orion Trainer

Orion Combat

Orion Helicopter



Orion Combat



ADAMS

ADAMS IP (AMSIP)

Orion Airliner

3D Audio - Main drivers/justification

- Survivability – ground missile threats
- Radio separation – communication intelligibility

Adaptive Noise Reduction

- Active Noise reduction headphones
- Electrical Noise Reduction
- Microphone Noise Reduction: Reduces the noise that enters the microphone, so that voice without noise is transmitted over the radio for increased intelligibility

Israel Air Force

- The leading Audio system provider to IAF
- F-4
- F-15
- F-16
- Helicopters
- Transport & Mission A/C

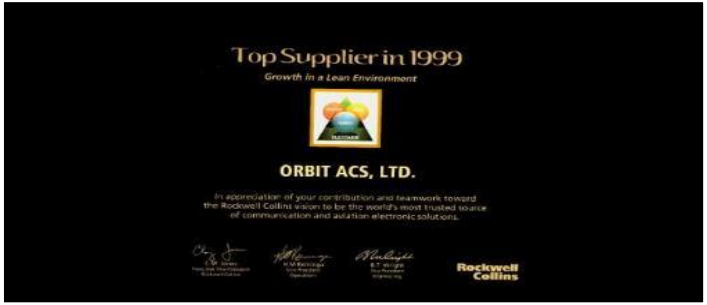
Airbus

AIRBUS DEFENCE & SPACE

- CN-235, supplied over 50 systems
- CN-295, order for 65 systems
- AMS with TSO Civil Certification & Tempest

Rockwell Collins – KC-135 Tanker

- RCI selected Orbit as the Government's ICS supplier for the program
- Orbit provides ~550 ICS systems to RCI



Embraer and Brazilian Programs

- Brazilian A4 & A1M
- E-99 ISR program

ANTONOV

ANTONOV

- Systems FAA TSO certified
- An-148
- An-158
- An-178

Communication Solutions Packages

AMS

SATCOM

BLOS

LOS

Thank You