

ASTI, ITALY — 2026

GHOST TRACKER 4.2

Impulse engineering for aerospace satellite automation.

01 — THE EXECUTIVE VISION

Three principles the whole system is built on

Hardwired 100%

Wi-Fi left behind entirely. A wired Gigabit network for absolute spectral immunity and link stability.

EMC / ESD barrier

Delta FIN35 galvanic shield and Ubiquiti ETH surge protectors for the highest lightning defense.

0.001 mm target

Millimetric precision from ISB Industries kinematics and active Delta PLC compensation.

02 — TECHNOLOGY PARTNER CONSORTIUM

A supply chain with no weak link

PARTNER	ORIGIN	STRATEGIC INTEGRATION & PAYLOAD
Delta Electronics	Taiwan / Global	PLC AX-308, B3A servo drives, EtherCAT synchronization.
DH Satellite	Wisconsin, USA	Spun parabolic reflector and DH HH Heavy-Duty mount.
Swedish Microwave (SMW)	Motala, Sweden	Professional metrological Ku / Ka LNBs, Ultra-Low Phase Noise.
ISB Industries	Italy	Micrometric X-Y-Z slides and guides — the 0.001 mm kinematics.
HPC Engranages	Lyon, France	Rotex elastic couplings and mechanical limit switches.
Messi & Paoloni	Ancona, Italy	INTSAT 170 Elite coaxial RF backbone (300 m / 14 runs).
AV-Comm Space & Defense	Sydney, Australia	Feedhorns, OMTs and LNBs for industrial C-band.
Viking Satcom	Albion, Michigan, USA	High-efficiency Ku / Ka feedhorns and Orthomode Transducers.
Apex Dynamics	Global / Italy	Ultra-rigid planetary reducers, zero torsional backlash.
Calypso Instruments	Zaragoza, Spain	Ultrasonic wind telemetry over Modbus RS-485 to the PLC for predictive stow.

03 — PRIMARY REFLECTOR

DH Satellite reflector (USA)

- ◆ **Spun reflector.** 4.25 m DH Satellite aluminium, high geometric precision for the extreme microwave bands.
- ◆ **DH Horizon-to-Horizon Heavy-Duty mount.** Load-bearing frame certified for critical wind loads.
- ◆ **Laser collimation.** Central hole prepared for 5 V millimetric optical pointing.

04 — KU / KA PAYLOAD

SMW Sweden

The SMW AB converters are the peak of professional RF metrology.

- ◆ **Ultra-Low Phase Noise.** Essential for decoding high-bitrate data.
- ◆ **Thermal stability.** Precision held in extreme climate.
- ◆ **Metrological grade.** Native support for the 14 Messi & Paoloni INTSAT 170 Elite runs.

05 — MULTI-BAND PAYLOAD

Feedhorns and OMTs

- ◆ **Viking Satcom (USA).** High-efficiency Ku / Ka feedhorns and Orthomode Transducers for millimetric polarity separation (H/V – R/L).
- ◆ **AV-Comm Space (AUS).** A world leader in industrial C-band: wave-transition feedhorns and circular polarizers (H/V + R/L), certified. LNBs with 5G rejection.

06 — THE RF UMBILICAL CORD

Zero-attenuation topology

- ◆ **300 metres total.** Messi & Paoloni INTSAT 170 Elite, certified > 105 dB shielding.
- ◆ **14 sectioned runs.** Surgical routes to serve the rack a few metres away.
- ◆ **90 mm backbone.** An ultra-short route to cancel losses and bottlenecks.

07 — MICROMETRIC TRACKING

0.001

MILLIMETRES / DEGREES

Phase 2 adds the Ergal 7075 monolith, with ISB Industries micrometric kinematics decoupled from HPC Engranages couplings. The X-Y-Z slides, and a SKEW stage for each feed, cancel the arm's deflections and keep the focal point incorruptible.

Fine micro-adjustments (tip-tilt) are made with manual knobs at the four corners of each feed base, pressing or releasing on Belleville springs.

08 — MASTER STAR CENTER

Enclosure and life support

- ◆ **EMC segregation.** Schneider Spacial CRN enclosure (IP66); bare galvanized sheet as the primary Faraday cage.
- ◆ **Life-support system.** APC 1000 VA UPS keeps the heart of the system alive through blackouts — left: PWM power and Delta drives; right: 24 V logic, EtherCAT and LAN.
- ◆ **The brain.** Delta AX-308 PLC, Reolink 4K surveillance, Calypso ULP anemometry.

09 — SIL3 HARDWARE SAFETY

Safe Torque Off

- ◆ **Hardware cut.** The Delta drives are de-energized instantly by the relay — safety in the silicon, not in software.
- ◆ **Rigger pushbutton.** Local Schneider XACA control on the roof, with an emergency mushroom.
- ◆ **Laser collimation.** A 5 V industrial module for fine optical centering.

10 — SITE ACCEPTANCE TEST

Engineering validation

A mandatory protocol for legal certification under D.M. 37/08 and the Machinery Directive.

- ◆ **Thermodynamic interlock.** Verify the Climate / Life-Support switchover under UPS.
- ◆ **ESD check.** Verify 0-ohm continuity of the ETH-SP-G2 surge-protector earth.
- ◆ **Vectorial validation.** Axis-rotation coherence in JOG, guided by the Delta PLC.
- ◆ **Laser test.** Geometric calibration from the DH central hole to the phase centre of the feed in use.

EXECUTIVE VALIDATION

"The innovative impulse turns the complexity of radio waves into a certifiable geometric perfection."

Technical Direction — Ghost Tracker 4.2