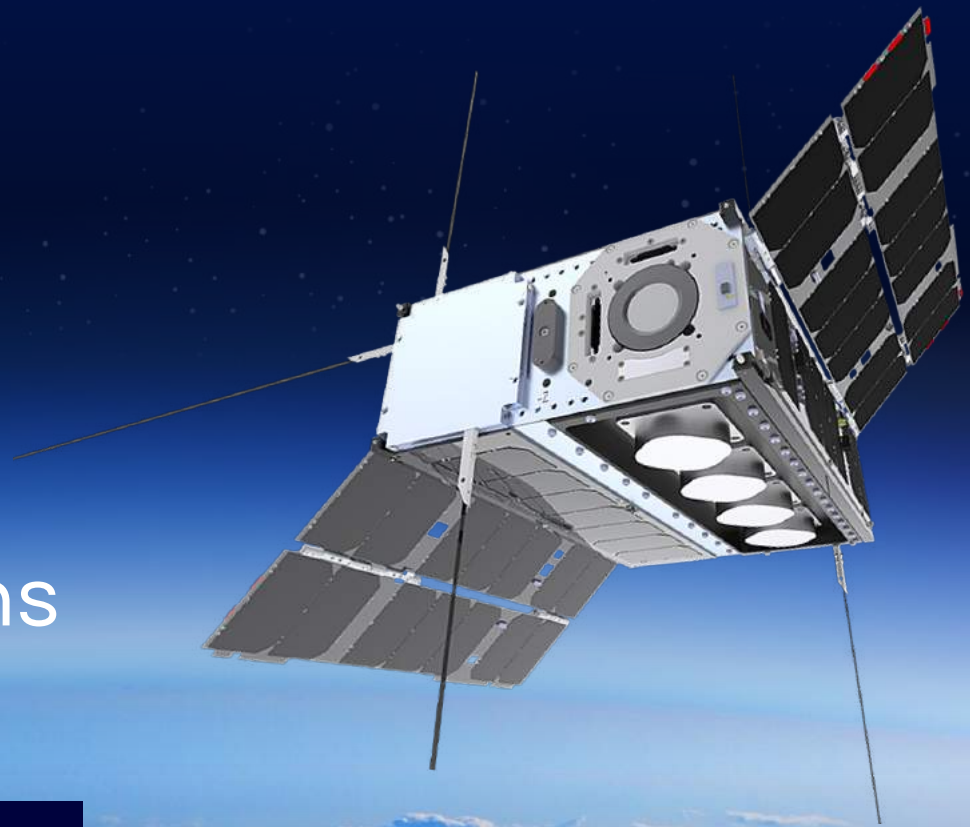




Space-Based Maritime Domain Intelligence Solutions



Unique “Always On” Monitoring of:



L-Band Sat Phones and Datalinks



S/X-Band Vessel Radars



Automatic Identification System (AIS)



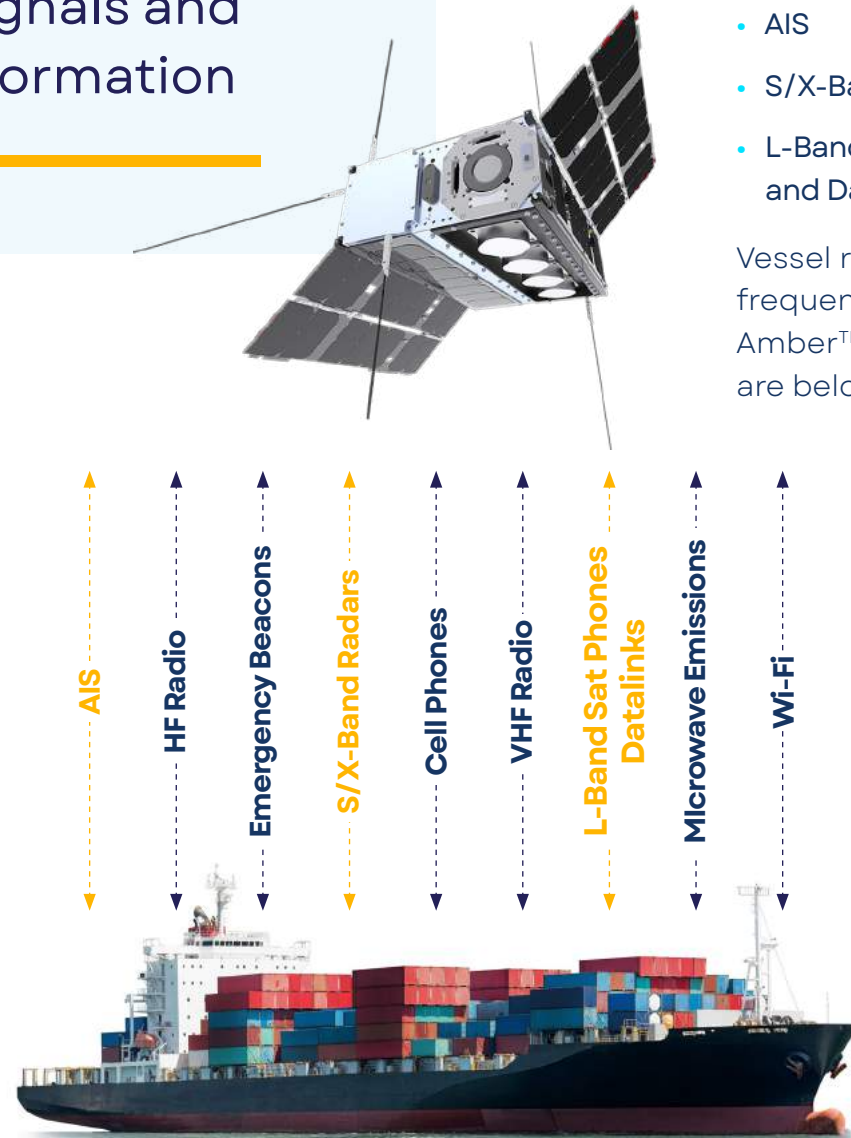
GNSS/GPS Spoofing



The Amber™ constellation of CubeSats detects radio-frequency (RF) signals and converts them to actionable information

The AMBER™ Constellation of CubeSats is a Space-Based Maritime Domain Awareness (MDA) Data-as-a-Service (DaaS).

AMBER™ will be able to locate and track vessels worldwide by picking up their RF emissions using the L-Band Sat Phone detection sensor package derived from Horizon Technologies' existing SIGINT systems combined with X and S-Band sensors and an Automatic Identification System (AIS) receiver to detect, geolocate, demodulate, and correlate these signals against the presence of AIS beacons.



Vessel RF emissions captured by AMBER™:

- AIS
- S/X-Band Radars
- L-Band Sat Phones and Datalinks

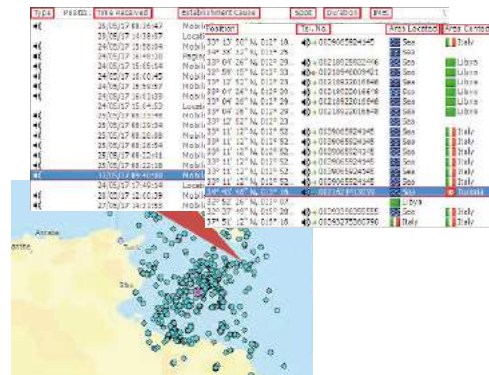
Vessel radio frequency emissions Amber™ captures are below in yellow

Detection and geolocation of Sat Phones, Vessel radars and AIS signals



Detection and Geolocation of S/X-Band Vessel Radars

- Detection and geolocation of commercial maritime radars
- The radar pulse data allows classification and identification of ships
- Electronic Support Measures (ESM)/Specific Emitter Identification (SEI) fingerprinting



L-Band/Sat Phone SIGINT

- Detection and geolocation of ISatPhone, Iridium and Thuraya Sat Phones and associated datalinks.
- Complement to government Sat Phone user databases
- Random Access Channel (RACH) data captured including IMSI & IMEI's
- Sat Phone conversation content with third-party software



Automatic Identification Systems (AIS)

- Detection and geolocation of AIS
- AIS reports are captured at the same time as the radar pulse data which allows for correlation

Correlated Sat Phones and datalinks, Vessel Radars and AIS

By correlating AIS, S/X Band Radars and L-Band Sat Phones, and datalinks, AMBER™ is able to provide enhanced Maritime Domain Awareness assisting Governmental Defence, Security and Law Enforcement Agencies with:

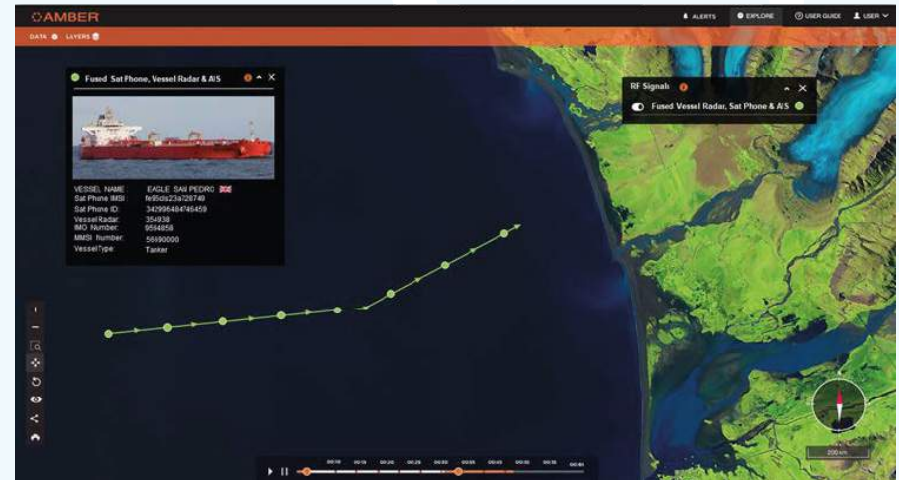
- Maritime Security
- Customs & Border Protection
- Homeland Security
- Battlespace Awareness

And combatting:

- Illegal Fishing
- Smuggling & Trafficking
- Piracy
- Terrorism & Insurgency



Ship-To-Ship Transfers



Correlated Vessel Radars, Sat Phones And Ais



Dark Vessels - Illegal Fishing



Amber™ Constellation and Data Flow

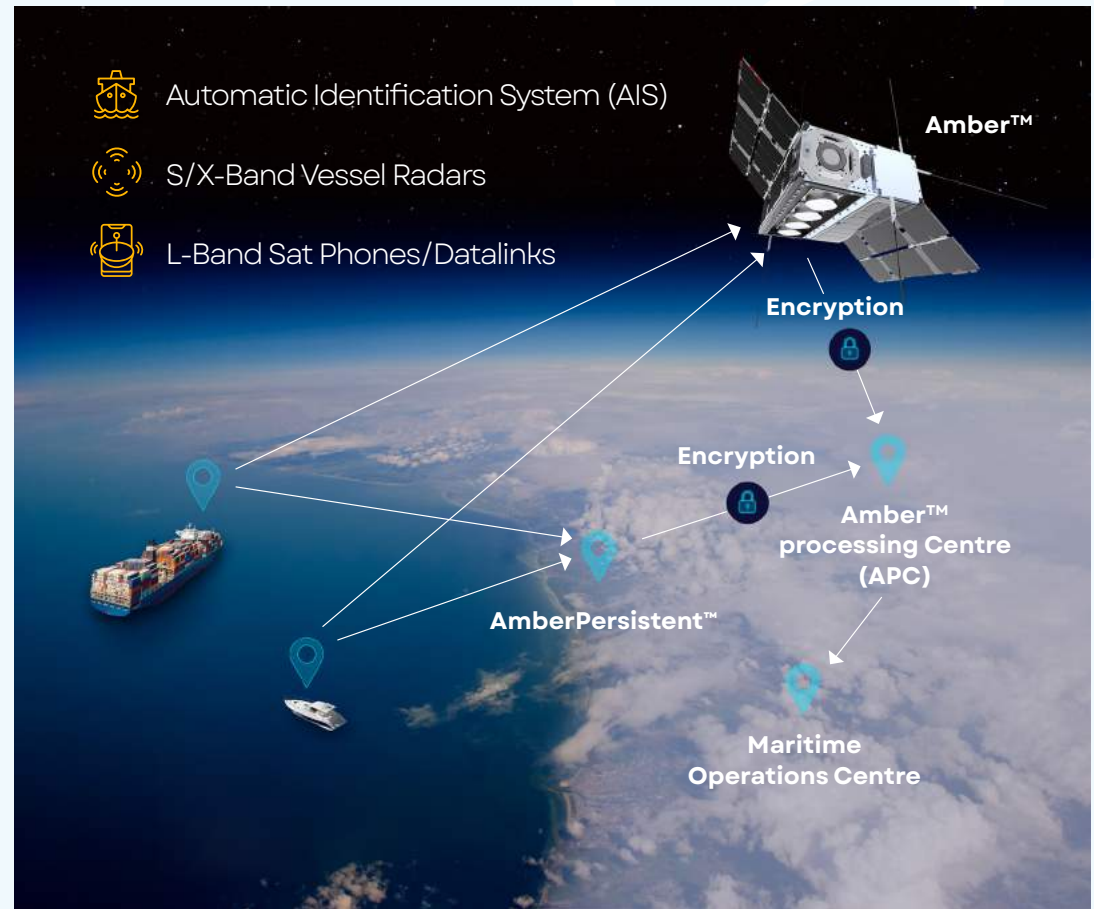
Full AMBER™ Constellation consists of twenty four CubeSats in six orbital planes.

Amber™ CubeSats are “always on” and even one satellite is always picking up 2+% of the Earth’s surface on a continuous basis.



Revisit times and latency:

- AMBER 1 provides a minimum 4 to 7 revisits to every location on the planet 24 hours
- Adding AMBER 2 and 3 provides revisit times of up to 11/2 to 2 hours
- The Full AMBER™ Constellation (twenty four satellites) provides revisit times and latencies in Near Real-Time (NRT)



Amber™ Data Flow

GPS & GNSS Spoofing / AmberPersistent™

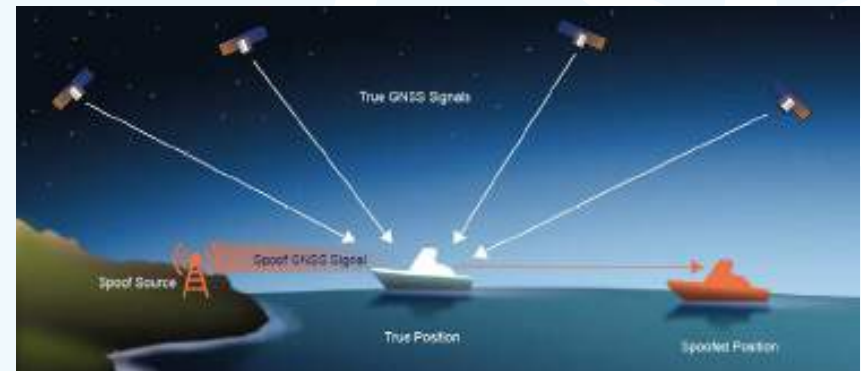
To combat Global Positioning System (GPS) & Global Navigation Satellite System (GNSS) Spoofing, AMBER™ detects spurious signals and geolocates them.

AmberPersistent™ provides 24/7/365 coastal maritime domain awareness data to be combined with Amber™ space-based data:

- AIS
- S/X-Band Radars
- L-Band Sat Phones and Datalinks



Height vs detection radius



GNSS & GPS Spoofing

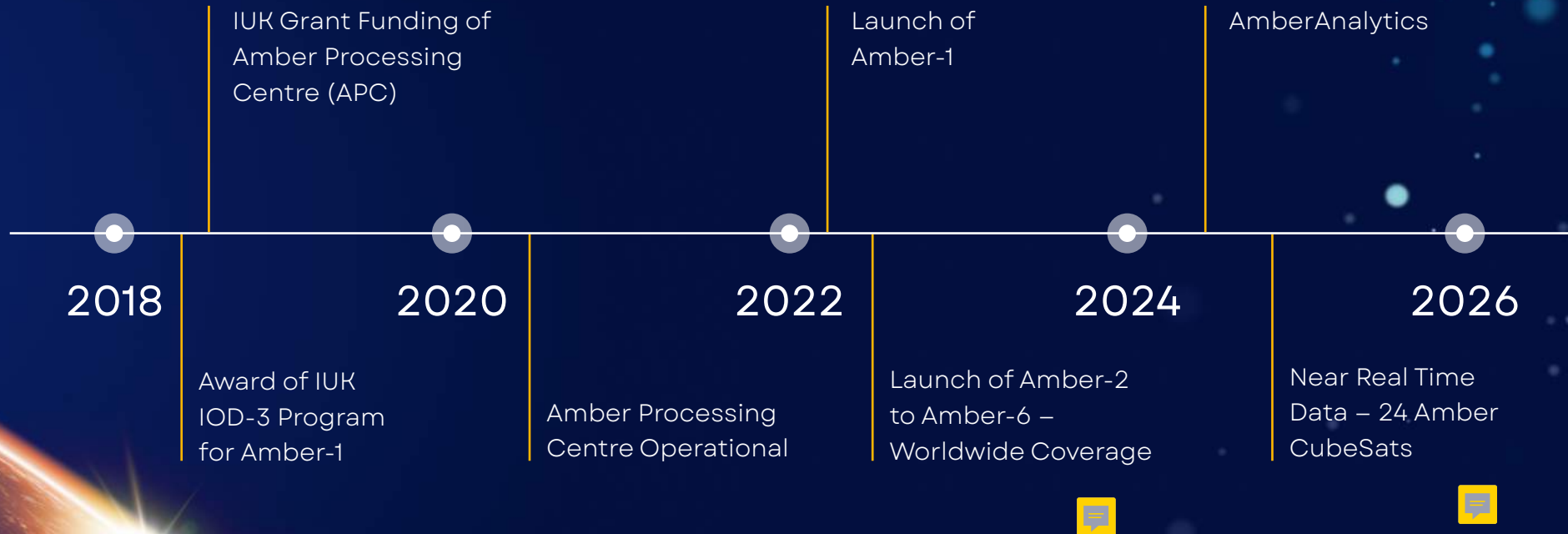



Amber™ Spoofing Detection And Geolocation



AmberPersistent™ 24/7/365

Amber™ timeline





Amber™ Space-Based Maritime Domain Intelligence Solutions You Can Trust

Horizon Technologies is the world leader in airborne satellite phone monitoring systems for Intelligence, Surveillance, and Reconnaissance (ISR) applications, equipping governments worldwide by enhancing their Signals Intelligence (SIGINT) capabilities. They are the Original Equipment Manufacturer (OEM) for the FlyingFish™ system which is in operation on numerous ISR aircraft worldwide, including NATO and FRONTEX. In 2021, Horizon Technologies, as part of a Public/Private partnership with the UK Government, will be launching the first of their AMBER™ commercial SIGINT CubeSats to provide customers with an enhanced Maritime Intelligence Data Service.

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