

A wide-angle, high-altitude view of Earth from space, showing the curvature of the planet and the dark blue of the oceans. The atmosphere is a vibrant blue, and numerous city lights are visible as bright yellow and orange spots across the landmasses.

Zephyr

High Altitude Platform Station (HAPS)

DEFENCE AND SPACE

Name: Ms. DAVINA EGBUNA
TITLE: UAS SOLUTIONS ENGINEER

AIRBUS

Our Background-Innovative and customer focused

Military Aircraft



- A400M
- A330 Multi-Role Tanker Transport
- Special Mission Aircraft
- Combat Aircraft
- Full In-Service Support

Space Systems



- Telecommunication Satellites
- Earth Observation Satellites
- Navigation Satellites
- Orbital and Space Exploration Infrastructure
- Science Missions
- Launchers (Ariane Group)

C.I.S



- Intelligence
- Cyber Security
- Security Solutions
- Secure Communications
- Secure Land Communications
- Future Applications

Unmanned Aerial Systems



- **UAS and UAV**
- **Connectivity**
- **Intelligence**
- **Surveillance**
- **Reconnaissance**
- **Combat missions**

Airbus Zephyr

Since 2000 Airbus has been a Pioneer in the Defence and Space Industry

The next mission is to bring **TRUE CONNECTIVITY** to the globe

4 billion people remain unconnected

1.2 billion women do not use the internet

60% of the unconnected live in rural areas

39% of those that are connected have 3G or 4G



“Everyone has the right to education, information, freedom and economic participation-True connectivity enables this”

Zephyr- What is it ?

- HAPS –High Altitude Platform Station
- Running exclusively on solar power
- Batteries charged during daytime for operation at night
- Airborne for weeks/ months
- Operating in the stratosphere (above 65,000 feet)
- Above weather
- Above regular air traffic
- Solution types similar to PPDR & Backhaul connectivity
- Focus of an aircraft



“Connectivity enables transparency for better government, education and health”

Bill Gates

Zephyr-The Facts

- Wing span of **25meters**
- Weight of under **75kg**
- Current Endurance of **25 days**
- **11** flight campaigns
- **1600+** hours total programme flight time
- **4** times longer flight than any other UAV
- Only solar UAV to demonstrate day/night longevity
- **World Record Holder**

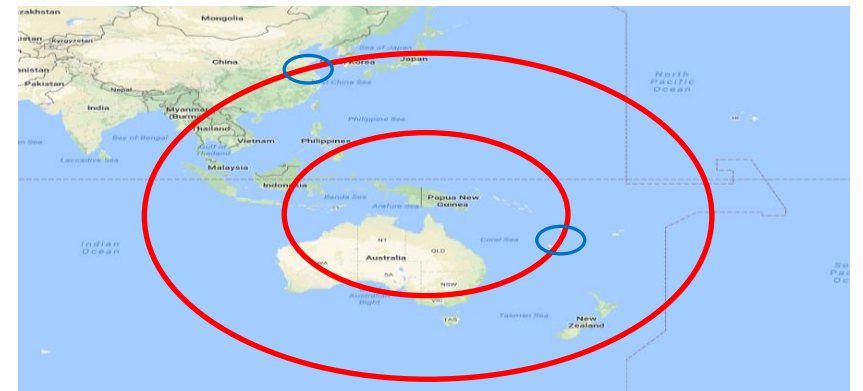


“Connectivity just can’t be for people in the richest countries. We believe that connecting everyone in the world is one of the great challenges of our generation”

Marc Zuckerberg

Zephyr-Operation

- Zephyr is designed to be operated more like a satellite, from a small number of strategic, routine launch and recovery sites selected for: Benign, year round weather conditions to allow regular, low risk launch and recovery (Such as Wyndham-Western Australia) avoiding congested air traffic routes
- Typically an aircraft will be already airborne and can be simply tasked to a new service
- Following tasking or launch, aircraft transits to the area of interest, flying in the stratosphere for over 2,000km per day
- At the end of the Zephyr can either fly to the next requirement/location or be returned and re-equipped with a different payload



Zephyr-Connectivity

Zephyr uses satellite technology, but flies at 20km altitude

- Benign environment gives 30-50% plus weight savings compared to conventional aircraft-borne payload
- Offers low latency for communications
- Target the unconnected
- Stop gap for new market penetration
- Build resilience

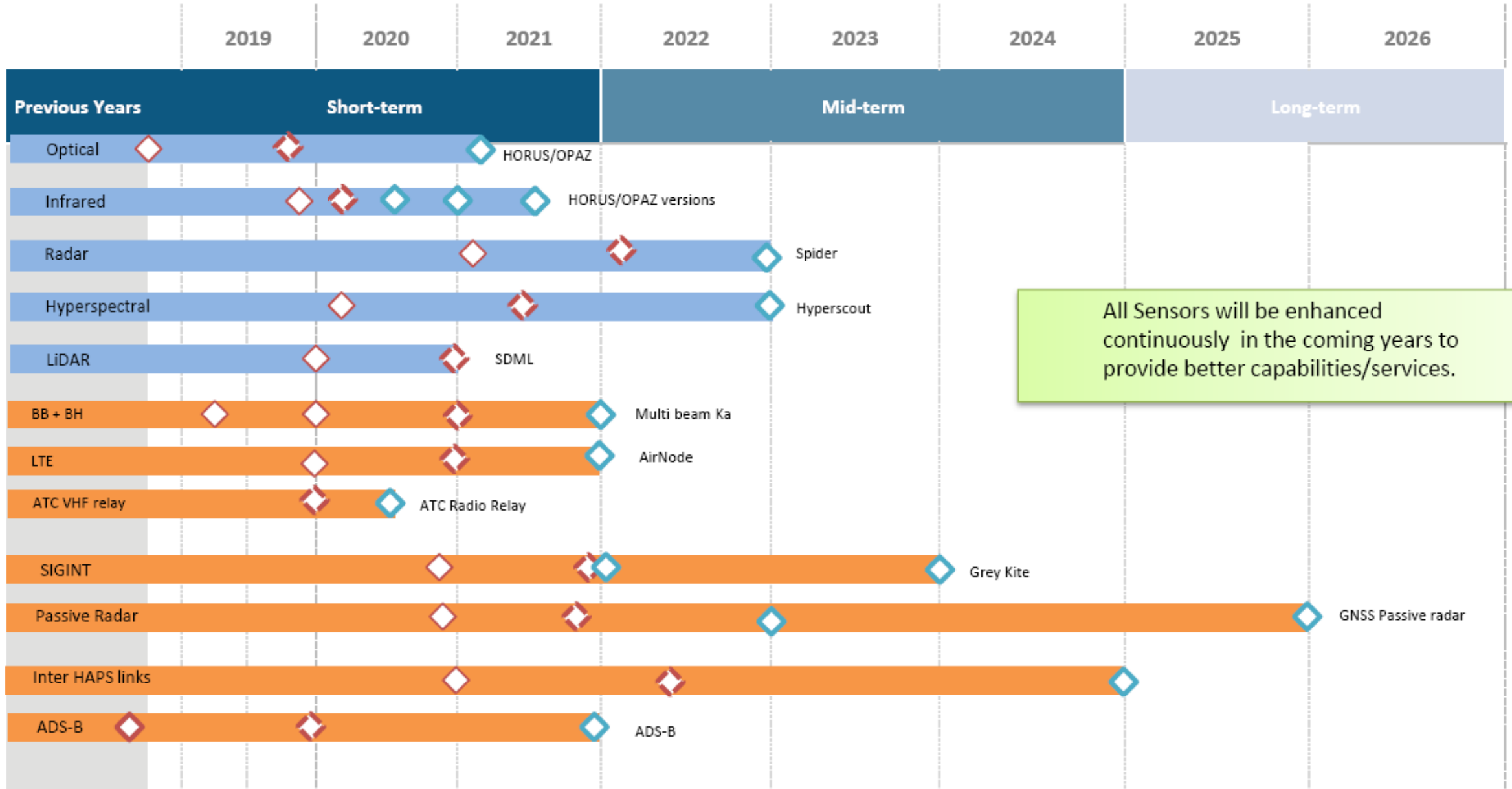
Zephyr can be tailored to support communications services for use in

- Direct Connectivity
- Fixed Broadband
- Cellular Backhauling

Zephyr can provide 100s of Mbps covering 400km diameter / 125,000 km² area per aircraft or up to 1Gbps over 70km diameter



EARTH OBSERVATION & COMMUNICATIONS PRODUCT ROADMAP

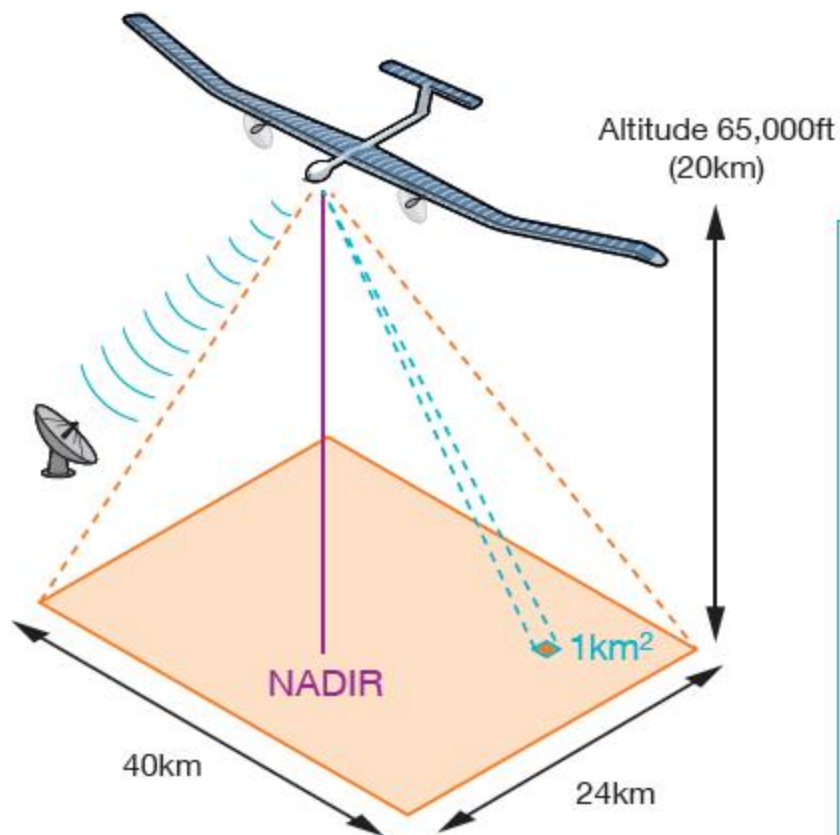


MILITARY COMMUNICATIONS PRODUCT ROADMAP



OPAZ

OPAZ is a new generation Earth observation system for images and video acquisition onboard Zephyr



Main Sensor

- 18cm GSD target in 2020, 26cm currently flying, at NADIR from 65,000ft (20km) distance
- High resolution RGB 1km² field of view video
- RGB 32 Megapixels ("8K")
- Frame rate 5fps 8K, or 20fps 4K.

Field of Regard (FOR)

+40°/-20° Pitch
+/- 45° Roll

Applications



Defence



Security



Maritime



Humanitarian

Surveillance

- Persistent and very high resolution imagery and videos
- Real-time video transmission

Geo Information

- Mapping
- Crowd Monitoring
- Vehicles and Ship Detection

Analytics

- OneAtlas cloud based infrastructure
- Integrated and processed

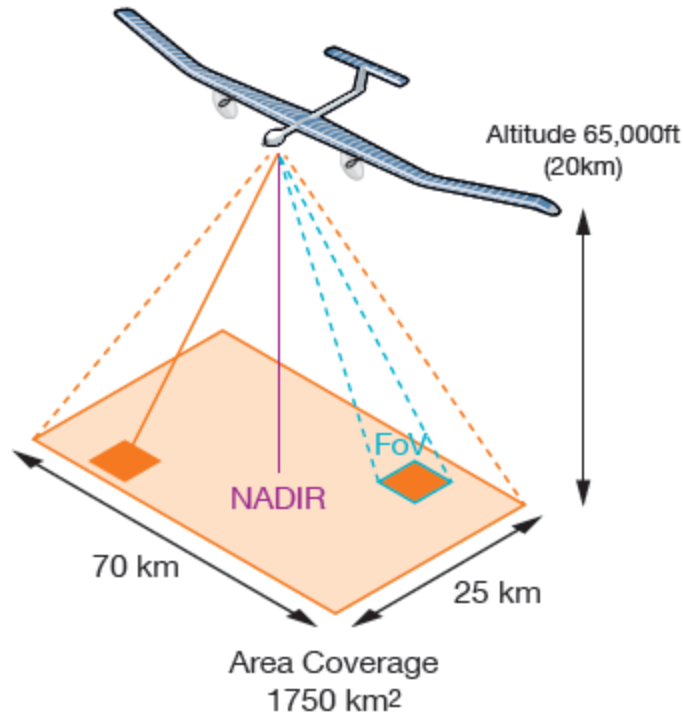


Mine Museum from 65,000 feet (20km) altitude

OPAZ Images – © Airbus DS 2018 – view from Airbus Zephyr

HORUS

An integrated payload infrastructure capable of supporting a wide range of payload types and missions.



EO/IR

The sensor provides high resolution day and night imagery and continuous video, in LOS mode, from a gyro stabilised camera. As well as Beyond Line of Sight (BLOS) communications, voice and data relay. It is manual steerable, agile, has on board storage, provides EO/IR video streams, snapshot or mosaicking

HORUS includes

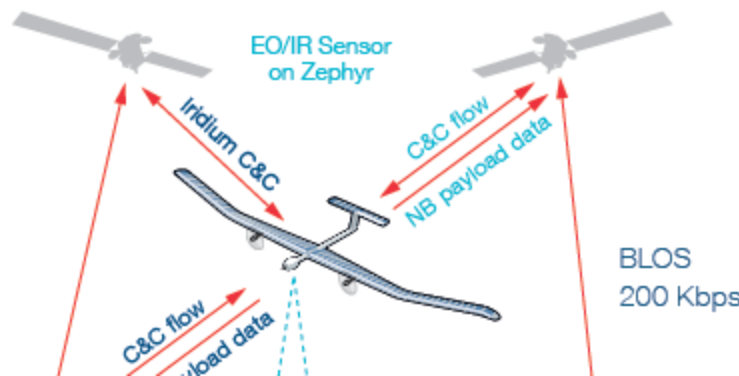
- Onboard communications and network infrastructure supporting common payload interfaces and IP
- Offboard payload communications (LOS and BLOS) supporting common payload interfaces and IP
- Firewalled interface to aircraft avionics
- Payload resources and services such as:
 - Cryptography
 - Data Processing
 - Data Storage
 - Accurate Nav/INS Service
- HORUS is independent from aircraft operations to allow rapid implementation and qualification

Field of Regard (FoR)

Pitch +45° Forward, -15° Aft ±60° Left and Right

Narrow Field of View (FoV)

≤ 2° (depending on configuration)



Example Use Cases

- Humanitarian Missions and Disaster Response
- Wildfire Detection and Monitoring
- Conflict Monitoring
- Land and Maritime Border Protection
- Sea Ice Surveillance and Monitoring
- Situational Awareness in the Migration of People
- Infrastructure Monitoring
- Food Security (Precision Agriculture)

Situational Awareness

- High performance multi-sensor camera providing high quality persistent surveillance and intelligence 24 hours a day, 365 days per year.
- Situational Awareness in the Migration of People
 - Food Security (Precision Agriculture)
 - Natural Disaster Response
 - Conflict Monitoring
 - Wildfire Detection and Monitoring

Markets



Defence



Commercial



Institutional

Beyond Line of Sight (BLOS) - Satellite Communications

- IP based packet switched services
- Operates down to 5 degrees elevation
- Contested data service of up to 200 Kbps

Zephyr In flight



Thank You

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