

BRIEFING
MEETING WITH [REDACTED] ON 8 MARCH 2019

Context of the meeting

- You will meet with [REDACTED] of Airbus Defence and Space (DS). Thomas Skordas Director CNECT/C, [REDACTED], CNECT/C1 and [REDACTED] CNECT/C2 will be present at the meeting.

[REDACTED]

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Article 4(2),
first indent*

- [REDACTED], [REDACTED] of Airbus DS was one of the 12 representatives from industry in the High Level Steering Committee that advised the EC when setting up the European Quantum Technology FET Flagship during 2016/2017. The EC is currently setting up a Strategic Advisory Board of the QT Flagship. [REDACTED], [REDACTED] Airbus [REDACTED] will be member of this new Board.
- Airbus is a beneficiary of 14 on-going CNECT projects for a total amount of approximately 5 million Euros; half of those projects are with Airbus DS and deal with different surveillance systems; none of them is related to laser communication. (*see background information*).

*Personal
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Article
4(1)(b)*

Objectives of your intervention

- Obtain information whether Airbus is already working on quantum-cryptography technologies or has plans to do so in the future.

[REDACTED]

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Suggested line to take

- Promote the idea of an integrated Global Vision and Implementation Plan for a pan-European Quantum Communication Infrastructure (QCI), including terrestrial and space components and their interconnectivity.

- Explain that CNECT is starting to work with ESA on a space mission called SAGA for the integration of the satellite component into the QCI terrestrial component. This concept requires larger optic terminals which are not yet under development in Europe.
- The introduction of SAGA could serve to distribute cryptographic keys for highly secure applications but also towards a much broader range of applications beyond QKD thanks to the entanglement protocol such as time-base distribution (clock synchronisation) and future interconnections between quantum computers ("quantum internet").

[REDACTED]

Background notes

Airbus as beneficiary of EC projects

- Through different subsidiaries, Airbus is a beneficiary of 14 on-going projects for a total amount of approximately 5 million EUR. Airbus participates to projects aiming at improving the composition of horizontal tail plane using graphene-enhanced composites from the Graphene Flagship, optimisation of supply-chain process and 5G projects on the terrestrial and satellite parts.
- The company Airbus Defence & Space (Airbus DS) itself participates in 7 Horizon 2020 projects which deal with different surveillance systems (maritime, land-based, satellite-based), specific technologies (surveillance using infrared light) and applications in air traffic management. None of the projects has dealt with satellite based laser communication.

Airbus and Quantum technologies

The company Airbus is involved in two of the QT Flagship projects:

- QMiCS (basic science): Airbus acts as member of the project's industry advisory board (IAB). [REDACTED]
 - PASQuanS (quantum simulation): The project is targeting industrial applications, and Airbus is involved as an industrial end-user with a letter of support but without legal link to any beneficiary. [REDACTED]
- At the beginning of 2019 Airbus launched “Airbus Quantum Computing Challenge”. It takes the form of a global competition in quantum computing, challenging experts to address aerospace flight physics problems. Airbus provides the computing capabilities available in QC-ware to solve these complex problems. Airbus is an investor of QC-ware which develops hardware-agnostic enterprise software solutions running on quantum computers.

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CONNECT in the area of laser communication

- None of the H2020 projects in the CONNECT portfolio is in the area of intra-satellite laser communication or optical payloads and this field is not addressed by the cPPP on photonics. However, the components (e.g. transceivers/multiplexers/modulators etc.) developed in CONNECT.A4 projects may have applications in optical communication terminals or satellites.

- Unit CONNECT.E1 manages projects on integration of satellite communications with terrestrial systems, but nothing specific on laser communication.

The European Data Relay System (EDRS) system

The European Data Relay System (EDRS) system is a European constellation of state of the art GEO satellites that relay information and data between satellites, spacecraft, UAVs, and ground stations. The designers intend the system to provide almost full-time communication, even with satellites in low Earth orbit that often have reduced visibility from ground stations. It makes on-demand data available to, for example, rescue workers who want near-real-time satellite data of a crisis region.

The system has been developed as part of the ARTES 7 programme and is intended to be an independent, European satellite system that reduces time delays in the transmission of large quantities of data. The programme is similar to the American Tracking and Data Relay Satellite System that was set up to support the Space Shuttle—but EDRS is using a new generation Laser Communication Terminal (LCT) technology (see fig. 1). The laser terminal transmits 1.8 Gbit/s across 45,000 km, the distance of a LEO-GEO link. Such a terminal was successfully tested during in-orbit verification between the German radar satellite TerraSAR-X and the American NFIRE satellite. It is also embarked on the commercial telecommunication satellite Alphasat.

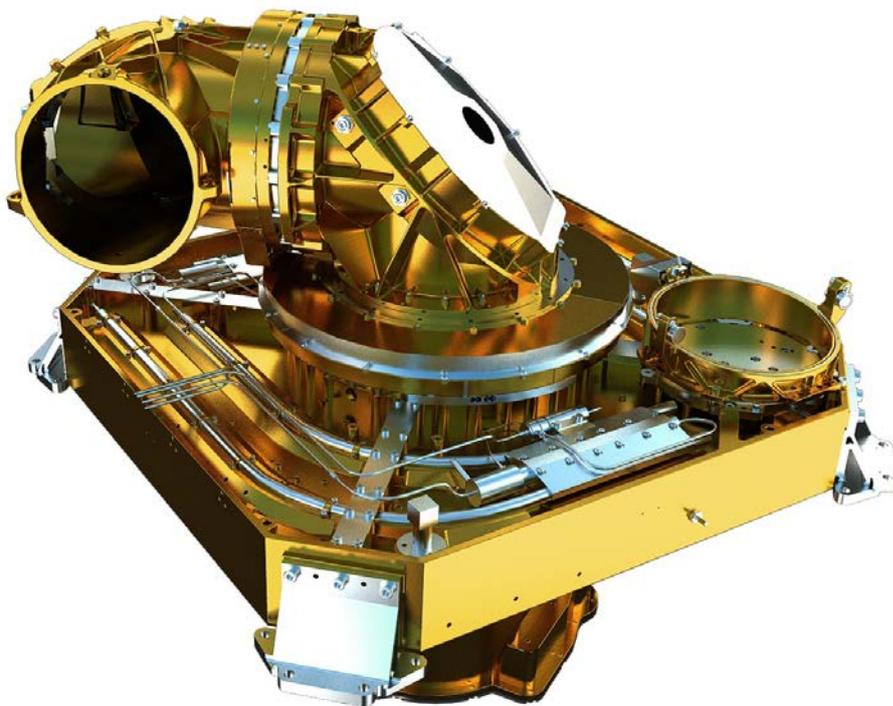


Figure 1: Laser Terminal of ERDS (picture Tesat-Spacecom)

The **SpaceDataHighway** service utilizes the Airbus owned and operated EDRS laser communication infrastructure to provide this high bandwidth capability. The services offered by the SpaceDataHighway enables users to transfer data (imagery, video, voice..) from their LEO Satellites and Airborne platforms by means of laser communications via the EDRS-A and EDRS-C geostationary satellites to receiving ground stations located in Europe (source: www.airbus.com)

The SpaceDataHighway is a public-private partnership between the European Space Agency (ESA) and Airbus, with the laser terminals developed by Tesat-Spacecom and the DLR German Space Administration. EDRS-A, the first SpaceDataHighway relay satellite launched in January 2016, offers coverage from the American East Coast to India. A second satellite will be launched in mid-2019. It will double the system's capacity and extend the coverage and redundancy of the system.

In February 2019 Airbus and Japanese telecommunications satellite operator SKY Perfect JSAT have signed a cooperation agreement for the design preparation of the EDRS-D node. This third communication node of the SpaceDataHighway system is to be positioned over the Asia-Pacific region before 2025. EDRS-D will lead to a significant increase in the system's communication capacity and considerably expand its coverage (source: Airbus press release, www.airbus.com)

CONTACTS:

[REDACTED], C2, tel: [REDACTED]

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Airbus DS participation in H2020 projects

1. **SEERS** project: Snapshot spectral imager for cost effective IR Surveillance

CONNECT.A4

SEERS proposes a breakthrough approach to multispectral imaging in a broad band of the infrared domain (0.7-14 μm wavelength). Video surveillance for safety and security is targeted for demonstration.

2. **AEROBI**: Aerial Robotic System for In-Depth Bridge Inspection by Contact

CONNECT.A2

The latest developments in low flying unmanned robots with arms and the associated fields of intelligent control, computer vision and sensors open the floor for robotic solutions, exploitable in the near term, in the field of inspection of difficult-to access areas of the civil infrastructure in general and bridges in particular.

3. **5GENESIS**: 5th Generation End-to-end Network, Experimentation, System Integration, and Showcasing

CONNECT.E1

In the global race towards 5G, the establishment and implementation of the 5G-PPP programme in the EU has significantly strengthened the position of Europe, promoting both technological excellence and industrial leadership. Now, the crucial next step in the “Genesis of 5G”, in Europe but also worldwide, is to integrate all these highly diverse results and technologies. ...

4. **SALSA SATELLITE-BASED ADS-B FOR LOWER SEPARATION-MINIMA APPLICATION (SALSA)**

SALSA is an exploratory research project relating to multi-source ADS-B system. A multi-source ADS-B system that combines the benefit of all possible type of relays (space, maritime, air or ground based) of ADS-B messages could provide a global surveillance system to overcome the prevailing continuous surveillance constraints in the non-radar airspace.

5. **PJ08 AAM**: Advanced Airspace Management; SESAR JU project

According to EUROCONTROL’s 2013 Challenges of Growth Report, Air traffic in the ECAC region is forecast to increase by 50% between 2012-2035 (most-likely scenario). Network Operations will have to become more flexible and adaptable, PJ08 Advanced

Airspace Management (AAM) brings key European aviation industry partners combining the right expertise and investment to address this challenge.

6. **IN-PREP** An Integrated next generation Preparedness programme for improving effective inter-organisational response capacity in complex environments of disasters and causes of crises; REA B.04 project

European countries confront the rising specter of transboundary crises, which cross national borders as well as policy boundaries with speed and ease, threatening the continuing functioning of critical infrastructures and the well-being of many citizens. Transboundary crises pose a specific set of complex challenges for which Europe is ... still ill prepared.

7. **MARISA** Maritime Integrated Surveillance Awareness; REA B.04

Combating irregular migration, human smuggling, terrorism at sea, piracy, as well as arms and drug trafficking has become a high priority on Europe's security agenda. Securing the sea requires a day-to-day collaboration activities among European actors of maritime surveillance, Member States' administrations and European agencies principally, and a significant number of initiatives are being taken at EU level to address this challenge.