



TELERAD EXPERTISE

A dedicated entity for benefiting from TELERAD's know-how in the areas of studies, design, industrialization and fabrication of radio systems.

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Several partners



TELERAD innovates for its clients and partners

The permanent increase in air traffic leads to a growing demand in the area of radio communications, while the VHF band is particularly saturated in Europe. To respond to this, the international aviation community is working on future communications infrastructures. With the objective of maintaining vocal communications and some of the data transmission services in this spectral band, while proposing to respond to the growing challenges by new services at higher frequencies.

Thus, future infrastructures will be composed of ground-to-air links in the L band and new satellite links, indispensable for covering transoceanic zones.

TELERAD is preparing for this migration by incorporating into its new developments, solutions which will allow current systems to transition to future communications resources (cf. our letter of December 2016 [LINK](#)).

In the framework of change and modernization, we are pleased to welcome Magali Vaissiere - Director of telecommunications and integrated applications at the European Space Agency - to speak about a subject for the future, that of satellite communications.

Growth and increase of air traffic, new standards, technological leaps... TELERAD innovates for its clients and partners.

Patrice Mariotte

President of TELERAD

Three questions for...

Magali Vaissiere

Director of telecommunications and integrated applications
European Space Agency



Could you present ESA's Department of telecommunications and integrated applications?

ESA's programme of telecommunications research (ARTES - Advanced Research in Telecommunications Systems) supports the innovation and development of technologies, products and systems in partnership with industry. ARTES aims to assist European Industry to maintain its position as one of the leaders on the very competitive worldwide market for telecommunications and satellite applications, by means of:

- R&D activities for developing, world ranked, innovative and competitive products, systems and services;
- partnerships with equipment suppliers, manufacturers and satellite operators for developing new systems and supplying services and while doing this, contributing to European economic growth;
- the development of satellite services for improving our daily lives, from health to civil protection, and including transports, energy and environmental services.

Could you present the Iris telecommunications programme?

Iris is a system of communication by satellite for Air Traffic Management (ATM) and is part of the ARTES programme of the European Space Agency. It has been developed in close collaboration with the SESAR programme (Single European Sky Air Traffic Management Research) launched in 2004 by the European Commission, Eurocontrol and European aeronautical industries. Iris is part of the SESAR blueprint for the modernization of European Air Traffic.

By 2021, the "Iris IOC" (Initial Operational Capability) project will offer air-to-ground communications for the future control of flights in 4D, locating the aircraft in its four dimensions: latitude, longitude, altitude and time. It will provide accurate monitoring of flights and more effective traffic control. High data rate digital transmissions via satellite for guiding aircraft could become the norm. Thus, voice communications will then only be for special operations.

As of 2028, the "Iris FOC" (Full Operational Capability) programme will provide trajectory management entirely in 4D over the whole European airspace and data transmission will become the principal means of communication between crews and controllers.

What will be the contribution of Iris to the future communications infrastructures of ATM?

Once the Iris programme is deployed, aircraft equipped with satellite terminals could communicate via global satellite systems. The Iris system will be transparent for the pilot and the controller; the crews will send and receive messages to and from secure and efficient, flight management systems.

Being present in more than sixty countries, TELERAD is specialized in the study, the development and the manufacture of radio systems used for the control of aerial and maritime navigation. A unique company in this area, it is a key player in the French and European defense, industrial and technological base.

Its flying!

For over a century, the DASSAULT Aviation dual aeronautics group has been the designer of over a hundred prototypes and more than 10,000 aircraft sold in 90 countries. It offers both civil and military airplanes. Together with the commercialization of these aircraft, flight tests are performed with the objectives of development, overall testing and qualification/certification. Essentially involving the FALCON and RAFALE families, these flight tests are performed on the testing bases at Mérignac and Istres. Their effectiveness necessitates specific air traffic control resources allowing not only the safety of the



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tests to be ensured but also guaranteeing perfect availability. Dassault Aviation has chosen TELERAD to refurbish and modernize the ground-to-air radio component of its testing resources on these two test bases. The solution implemented meets the very high level of the demands in terms of reliability, while offering exceptional comfort of use by means of the perfect mastery of the "Voice on IP" technology.

SWAL's Way

Modern ATM (Air Traffic Management) systems and equipment include software which must comply with safety processes meeting the demands of air safety.

It is in this framework that the Service Technique de l'Aviation Civile (STAC) [Civil Aviation Technical Department] has a special mission relative to approvals, checks of conformity and certifications of the performances of systems or equipment contributing to safety and to security. In France, this operates mainly on behalf of the Direction Générale de l'Aviation Civile (DGAC) [General Directorate for Civil Aviation] and the Minister of Defense, but can also intervene on behalf of all the directorates of the Ministry of Ecological Transition and Solidarity, the Ministry of Transport and other ministries.

In terms of inspection and auditing, the STAC has confirmed that the TELERAD equipment of the 9000 2G series- because of its intrinsic level of assurance of software security (AL5) supplemented by experience in service - is apt to achieve the level SWAL2 expected by the DGAC for operational use. This SWAL2 level of software security is the highest in the area of V/UHF ATM aeronautical telecommunications.

UHF radios at their peak in Portugal

The Portuguese air force has expressed confidence in TELERAD for the modernization of its station of Serra da Estrela situated at the highest point of continental Portugal. To get



around the difficulties of access to the site during winter, their choice was based on high performance and reliable equipment which does not require preventive maintenance and which responds to the needs of implementing voice on IP. The 9010-2G UHF series from TELERAD has been the solution retained. Despite great constraints, the equipment was deployed this autumn within the deadline.

FOCUS

Convergence with the tactical operations service

Whether in the framework of external operations theatres (OPEX), for the needs of event-based deployments or exercises in Metropolitan France, tactical aeronautical radiocommunications between ground operations and aircraft are crucial for the implementation of aerial protection.

To meet the operational needs, the technical heart of the ground tactical aeronautics radio component is composed of the transmitters/receivers in the VHF and UHF ranges. Identical in terms of performances with equipment employed in control towers to provide links with aircraft, over and above this, they require qualities usually belonging to deployable equipment.

A tactical transmitter/receiver must be powerful, compact, solid and extremely reliable. It must be able to be implemented extremely rapidly and under all difficult operational conditions encountered. It is therefore monolithic equipment, without fragile elements (metal structure, absence of fans and openings to dust, etc.). For many decades, TELERAD has developed and mastered the manufacture of tactical transmitters/receivers. Several generations of this equipment are currently employed by different French and foreign armed forces.

However, responding to existing operational needs is not enough. Modern tactical communications aids (Ethernet, satellite links, etc.) call for a convergence to which the tactical aeronautical V/UHF radio component must also conform.

Conscious of these developments, TELERAD offers an innovative solution derived from its SDR (Software Defined Radio) of the 9000-2G series: the new TRX9000-2G tactical aeronautical radio equipment. This is defined in the VHF, UHF frequency ranges and also double band V/UHF, a configuration optimizing the flexibility of use sought in operations. The TRX9000-2G extends the use of "classic" radiocommunications, of course being perfectly compatible with existing analog systems. Its innovative design offers many advantages:

- Perfect interoperability in VoIP with all aeronautical radiocommunications equipment, due to its compliance with the ED137 standard.
- Possibility of coupling to digital media in IP. This provides high quality operation.
- Locally operable on its integrated interface, but also remotely via operator stations which can be situated either in the operating theatre or thousands of kilometers away, via a satellite link for example.
- Occupying a very reduced band pass, reducing the need for satellite resources.
- Derived from the 9000-2G series already deployed in thousands of examples, its reliability in service is verified and extremely high.

This new TELERAD equipment thus perfectly responds to the convergence of digital tactical aids by permitting operation of this aeronautical radio media at any point on the globe.



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