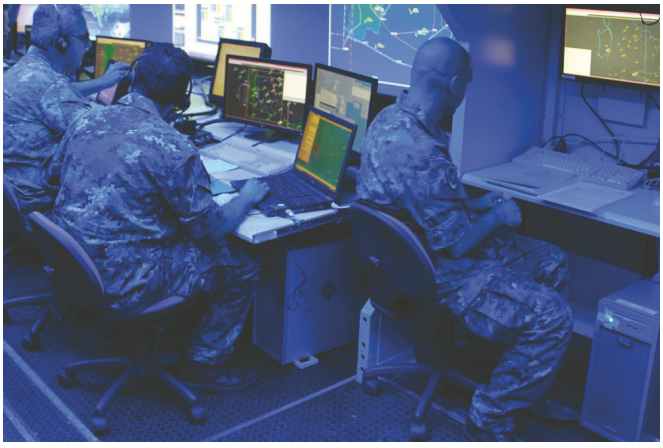
Advanced Military Communication Features

MULTIFONO®, the Voice Communication Systems by SITTI, includes important features to cope with the specific needs of advanced and secure communications, especially in military applications:

- High redundancy
- Multi purpose systems (mobile towers and field deployable systems)
- Radio Management (HF, VHF, UHF)
- Security features (RED/BLACK, ECCM, Secure File Transfer, Users Management)
- Nationwide Network Management
- Simulation and Training



Redundancy and Installation Diversity

MULTIFONO® is a very high performance Voice Communications System with no single-point-of-failure (SPOF): all elements in the system are duplicated in either 1+1 or N+M mode. The general redundancy approach has indeed been extended to the possibility of installing the duplicated hardware in physically separated buildings, thus guaranteeing continuity of operations even in case one of the buildings is not accessible for any reason. Some critical boards can be configured to implement N+M redundancy: whichever of the N system boards gets faulty, one of the M spare ones takes over.

Mobile Towers and Field Deployable Systems

SITTI has been providing mobile towers to the Air Force, to allow quick tactical deployment of air combat missions. Such towers host all required communication and coordination devices to provide effective Control and Command functions for AFIS (Aerodrome Flight Information Service). These features are also installed in field deployable systems that provide further extended Air Traffic Control (ATC) functions with a larger number of operators, to supervise a broader airspace.

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Radio Management

Radio types and features

SITTI MULTIFONO® Voice Communication Systems are capable of managing radios covering all frequency bands (HF, VHF, UHF). Appropriate configuration parameters allow proper setup and fine-tuning, through the MMS system management and configuration software. Access to radios is performed via dedicated keys that can be autonomously allocated onto the operators keyboards.

SITTI Controller Working Positions (CWP) allow prompt setup of radio parameters, such as frequency and transmission power. Analogue radios (both at local and remote sites) can be easily interfaced via so-called RIU (Remote Interface Units), also available from SITTI. All our systems include the following features:

- Best signal selection
- Automatic delay compensation
- Echo cancellation
- Climax
- Radio-Telephone coupling
- Audio compression

HF Radios

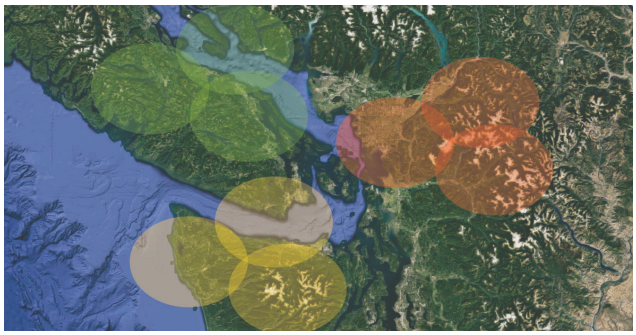
High Frequency radios are fully managed by SITTI MULTIFONO® VCS. When Automatic Link Establishment (ALE) is used to set-up connections between radio operators, ALE 2G and ALE 3G can be configured. This allows the calling operator to enter the ALE address of the called party, much like a phone call number.

Frequency selection is implemented by using the position keyboard, while the antenna direction is selected by setting the appropriate angular value. In addition, the operator can choose the type of modulation (USB, LSB, ISB).

Radio Coverage Areas

By properly configuring the MULTIFONO® M800IP® Voice Communication System, radio sites in the area under control at regional or national level can be subdivided into separate coverage areas, called zones. The audio from aircrafts is received by the different radio sites in the zone and sent to an evaluator board for choosing the best received signal.

Several zone coverage areas can be combined to create larger radio coverage areas, over a much bigger territory, where the same frequency can be reutilised in different zone areas. This allows operators to supervise very vast areas and to simultaneously send/receive audio to/from aircrafts tuned to the same frequency in different zone areas.



Radio Audio Multicast

By means of the Multicast function, it is possible to automatically tune a set of radios with predefined frequencies. As soon as at least one of them is operative, the received audio is mixed and sent to all listening operators, while the pressure of the PTT button makes all radios in the multicast set transmit on their own configured frequency.

Guard Frequencies

The MULTIFONO® VCS can be configured to properly manage guard frequencies, whose received audio is (optionally) mixed and sent to specific operators and/or loudspeakers. Guard frequencies can of course also be used for transmitting. If the operator was using other frequencies, these latter are not disengaged, but temporarily "suspended" to give priority to the guard ones, that are normally used for emergency reasons.

Frequency Monitoring

Frequency Monitoring is a software application that is aimed at providing additional instantaneous information about the operative condition of all radio interfaces used by the MULTIFONO® VCS and their mutual interconnections. This allows easier fault detection and faster maintenance, especially over large areas.

Security

RED/BLACK Communications (Crypto)

Encryption is a fundamental part of today's communications, especially when it comes to military operations, where the availability of cyphering schemes and protected communications are vital for the effectiveness of critical missions. SITTI can claim a very long experience in providing Military Air Forces all over the world with secure Voice Communication Systems, where clear (Black) and encrypted (Red) voice streams are separated and controlled to avoid any kind of eavesdropping.

When encryption is activated by the operator, the audio from the Controller Working Position is physically disconnected and logically deactivated from the Black side of the system and only remains interfaced to the Red side. The audio from the operator is therefore only managed by the Red side of the VCS, where cyphering takes place before being sent to the transmitting radio. The opposite process is performed for incoming audio from aircrafts.

ECCM (HQ1, HQ2, Saturn)

Electronic counter-countermeasures (ECCM) is a part of electronic warfare to reduce or eliminate the effect of electronic countermeasures (ECM) aboard vehicles, ships, aircrafts, weapons and missiles. Through SITTI Controller Working Positions, the operators can activate the operating ECCM mode (Have Quick I, Have Quick II, Saturn) and configure their work parameters, such as the network identifier.

Secure File Transfer

The MULTIFONO® VCS configuration and supervision software uses the client-server paradigm. When files have to be exchanged between machines, it shall be guaranteed that they are not intelligible by possible eavesdropping by utilizing secure protocols like SFTP. This is a standard configurable option of MULTIFONO® systems.

Users Authentication (Active Directory and LDAP)

Especially in the military field, it is crucial to clearly identify the user who is willing to access the system. Secure protocols and centralized users management (through the LDAP protocol and the Active Directory user authentication function) grant access to authorized persons only, by also tracking all their successful and unsuccessful accesses and actions.

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Nationwide Network Management

Central Briefing Office (CBO)

CBO800 is the solution proposed by SITTI for the provision of centralized regional and national services, normally provided by ARO (ATS Reporting Offices). These are usually located close to airports to provide informative service to pilots, airport operators and handlers. Such distributed organization results being expensive and often difficult to manage.

Centralisation of ARO services to a (possibly redundant) Central Briefing Office (CBO) meets the requirement of having immediate and reliable access to information and communications among operators. This ends up in the provision of additional new services normally not available at local ARO offices or too expensive to be implemented:

- Concentration of facilities and allocated staff
- Reduction of the number of ATS Reporting Offices (ARO)
- Significant saving of associated costs
- Full integration with MULTIFONO® VCS and its voice processing features

Disaster Recovery / Parallel Processing

Especially in military applications, it is vital to have contingency recovery centers that can take over all functions in case of serious damages or unavailability of a communication site. This can be done in either mode:

- Disaster Recovery - National/regional network resources are not preassigned to a given site. In case of emergency, the system gives the possibility to different sites to access all resources normally assigned to the out-of-service one, thus recovering abnormal situations.

- Parallel Processing - Communication resources are not preassigned to a given site: two or more communication centers are allowed to access each and every resource in the network: the involved systems automatically coordinate activities to provide proper non-exclusive usage of their features.

The MULTIFONO® VCS structure allows both.

Centralised Management

When two or more MULTIFONO® VCS systems are deployed in the field, they have their own Management System for local configuration, supervision and alarm reporting. Besides local management, such systems can be interfaced to a higher level centralized management center, from which it is possible to execute a (configurable) subset of operations, without losing local operation possibilities. This allows remote alarm collection, remote maintenance and remote configuration.

Simulation and Training

The MULTIFONO® VCS platform is also used for simulation and training purposes. Trainees have the same touch-and-feel approach as with the real deployed system, to be able to recreate a close-to-real situation that will make them acquainted in a very short time, also thanks to the user-friendliness of the Man-Machine Interface provided by the Controller Working Position touch screens.