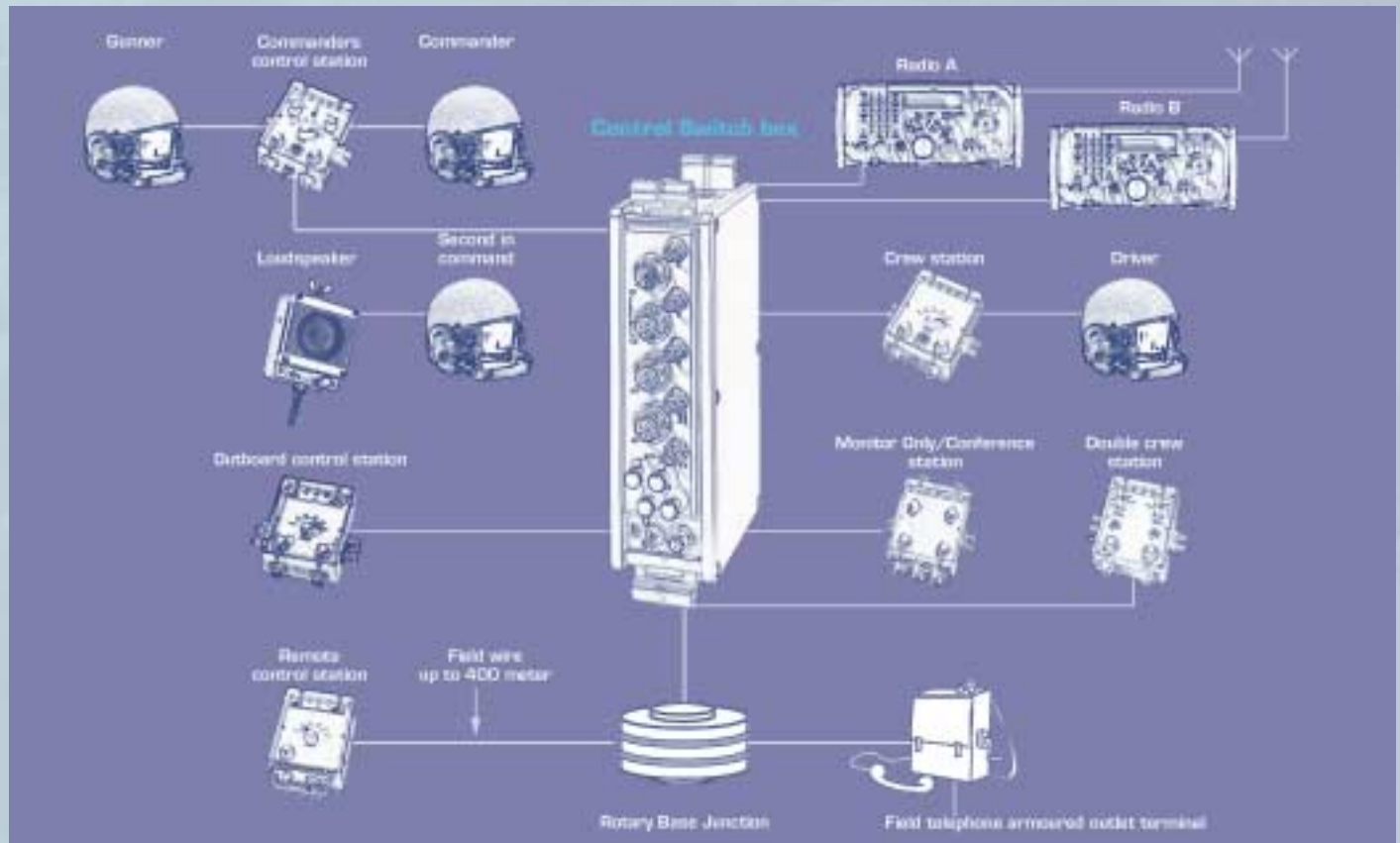# THALES COMMUNICATIONS

SOTAS
DIGITAL MILITARY VEHICLE INTERCOM SYSTEM

CRYSTAL-CLEAR COMMUNICATION

UNRIVALLED COST-EFFECTIVE
ONBOARD VEHICLE COMMUNICATIONS

THALES

SOTAS Digital Vehicle Intercom System

This configuration example shows a typical Infantry Fighting Vehicle.

Main features

- Unrivalled cost-effectiveness

- Compatible with all relevant in-service combat net radios

- High reliability (MTBF >70.000 hrs)

- No single point of failure (star network)

- Minimal installation costs (e.g. single coaxial cable interconnection)

- High intelligibility

- ANR support

- Voice-operated switch (VOX) facility for optimal hands-free operation

- Crystal-clear communication

- Visual monitoring of radio traffic and system function at each crew station

- Advanced built-in-test equipment (BITE) with PC-based diagnostic facility

- Active upgrade program

- Compatible with relevant military standards and AN/VIC-3 requirements

- Part of an extensive product family (SOTAS$_{M2}$ and SmartNet, respectively Multimedia and Multimedia LAN-based intercom)

A comprehensive range of system units

SOTAS is a 'Star' network, with all elements of an installation connecting to a Central Switch Box. All traffic uses dedicated point-to-point links, allowing precise monitoring as part of the advanced Built-In-Test function. Units are easily added to or removed from the system without disturbing the existing intercom.

Low Life Cycle Costs

The Life Cycle Cost (LCC) for SOTAS is extremely low for a digital military intercom system, using traditional maintenance approaches.

Since SOTAS is extremely reliable and the cable harness has a low attrition rate, we can propose a radically different approach to system maintenance, which greatly reduces the Life Cycle Cost.

Ease of operation, OK-Control

Featuring One-Knob-Control operation, the SOTAS system allows the crew members to concentrate on their actual jobs. Furthermore, every crew station has a visual radio-activity indicator.

This ease of operation provides SOTAS with a tremendous advantage over other military intercom systems.

The SOTAS user interface is identical to the interface of the basic version called MiniSOTAS so a customer can have both SOTAS and MiniSOTAS in use without having to train the users on different systems.

Reliable

The low number of components, the single coaxial cable and the high level of integration all contribute to the impressive reliability of the SOTAS system (MTBF > 70.000 hrs)

Low installation costs

A single coaxial cable is used to connect a crew station to the SOTAS system. This is very cost-effective in terms of installation and maintenance. Extensive field experience with SOTAS has shown that the attrition rate of these cables is extremely low, up to 5 times better than multi-core highway cables.

Network topology

SOTAS continues the field-proven star topology maximising the network throughput whilst by using a single coax cable minimising the effects of failures, thus contributing to a high MTBF.

Unrivalled Cost Effectiveness

SOTAS is the inexpensive solution for vehicles with the regular number of users & radios, requiring the full functionality of a modern intercom system.

System Highway

A single coaxial highway cable carries power, digital voice, control and signaling data between the system components.
This creates a huge benefit over multi-core cables, in particular if a Rotary Base Junction (RBJ) needs to be crossed.
A coaxial cable only requires two pins to cross an RBJ where a multi-core may require up to 10 crossing pins.
This simple cabling concept not only simplifies installation, but fault diagnosis as well, improving reliability and availability and yielding low life-cycle-costs.

Advanced BITE functions

Advance BITE provides on-line fault detection and warning. Computer aided diagnostics provide field maintenance personnel with detailed system information.
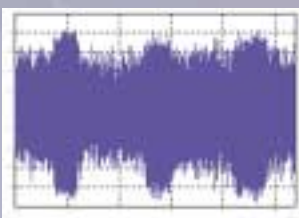
Crystal-Clear Communications
ANR support

SOTAS can support Active Noise Reduction (ANR) headsets on all crew stations to facilitate these functions in noisy environments thus improving hearing protection and enhancing intelligibility.
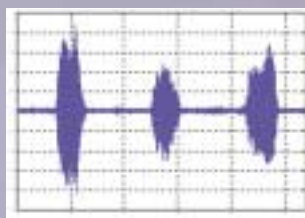
Dynamic Noise Reduction

Where Active Noise Reduction (ANR) headsets are protecting the ears from the deafening noise in armoured vehicles, this very same deafening noise enters the speech signal via an open microphone when you talk. This means, irrespective of the use of ANR headsets, that the noise in the vehicle enters and disturbs the speech signal. The vehicle noise, together with the speech signal, is transported to the other crew members and transmitted over the radios, causing overall poor intelligibility.
To guarantee the highest intelligibility SOTAS offers Dynamic Noise Reduction (DNR). DNR eliminates 'unwanted' non-speech-originated noise from the microphone signal to produce clean-speech audio. This enhances SOTAS' intelligibility to state-of-the art performance. The DNR can be used in combination with ANR headsets and standard headsets.

'Noisy" microphone signal   *'Clean" output signal*

Operational Features

SOTAS is a digital intercom system, developed for use in all sorts of military platforms (land, sea & air) but mainly for military vehicles, to provide *crystal-clear communication* between crew members inside a vehicle and externally over combat net radios and field wires.

Central Switch box (CS-box)

The CS-box is the heart of the system and holds up to ten interchangeable interface cards. There are six basic types of interface cards that provide the connections of one or more of the following units:

- Commander Control station
- Crew station
- Outboard Control station
- Remote Control station
- Monitor Only / Conference station
- Field Telephone / External Line
- Combat Net Radios
- Vehicle Alarms and Sensors

The CS-box is supplied with interface cards according to customer specification. The configuration may be readily changed during field maintenance once the equipment has entered Service.

The CS-box provides power to all SOTAS stations and is protected against spikes, surges and reversed polarity.
Radio Interfaces are compatible with modern hopping radios as well as with existing fixed-frequency radio products.

The CS-box can be installed in any spare space in the vehicle, as no crew member needs to be close to the CS-box.

Full-duplex inter-vehicle conference facilities

SOTAS systems can be "daisy-chained" using the external line interfaces creating full-duplex inter-vehicle conference facilities. This is useful in field headquarters applications or under NBC conditions when vehicles are closed down and in situations of radio silence.

SOTAS System Elements

On-board Alarms and Sensors

The Alarm Interface in the CS-box allows onboard alarms to be heard over the intercom. The interface accepts existing audible alarms or will generate tones in response to trigger inputs. Digital voice alerting devices may also be used with the interface, to provide spoken warnings in response to sensor inputs.

Crew Audio Gear

SOTAS is compatible with a wide range of handsets, headsets and helmets including the latest ANR products. Both moving coil and electret microphones are supported.

Commander Control Station (CC-Station)

The CC-Station is basically identical to the Crew-Station and has additional facilities which allow a vehicle commander to control the communication status of the system, impose radio silence, block external access to onboard radios, choose radios and manage the external lines.
The CC-Station may be replaced by a Crew-Station in simple installations where additional facilities are not required.

Crew Station (C-Station)

Each C-Station provides up to two crew members with full intercom facilities and access to any radio. The C-Station has two individual output volume controls, an on/off switch for the VOX circuit and a network switch. LEDs display system-monitoring information including BITE results and the traffic status on each radio network.

Double crew station (M2C)

For crew members sitting close to each other and with the need for independent network control, two Crew-stations are provided together in one unit. Each M2C-station allows two crew members to appreciate the full functionality of a crew station.

Outboard Control Station (OC-Station)

Based on the Crew-Station, the OC-Station allows external users to use the onboard radios, intercom or external lines.

Remote Control Station (RC-Station)

The RC-Station connects to the Central Switch-box via a field wire (D10/WD1/TT or equivalent) and extends access to onboard facilities to a maximum distance of 400m from the vehicle. The RC-station can be equipped with a quick-fit mounting. Electrical connections are automatically made.

The mount provides the system with additional field wire terminals which can be used to connect a field telephone or another intercom system.

The Outboard Control-Station and RC-Station may be restricted to intercom-only operation by the vehicle commander from his CC-Station. A sliding cover on both stations conceals the LED indicators in a tactical environment.

Monitor Only/Conference-STATION (MOC-Station)

The Monitor Only/Conference station allows crew members to monitor intercom traffic and getting advantage of Active Noise Reduction (ANR) protection.
It is particularly suitable for soldiers travelling in the back of Armoured Personnel Carriers (APCs) or Infantry Fighting Vehicles (IFVs). Up to four soldiers can connect a headset to a station, and each one has an individual volume control. The system allows them to receive briefings as the vehicle is moving, enabling them to be deployed with a full understanding of the tactical situation and of their own individual orders.
Several MOC-stations can be daisy chained.

Loudspeaker Station (LS-Station)

The LS-Station can be connected directly to one of the crew stations, from which it also takes DC Power. It gives access to the intercom system by means of a talk-back facility.