SCOTTY and Airborne Surveillance

The Transmission of Data in Real-time

Transmitting real-time data to the ground is vital for the chain of command. It enables the decision-makers to virtually enter a patrol aircraft. Commanders can see what the crew sees, give orders, and discuss options... *as if they were onboard themselves.*

All of this is possible by the SCOTTY suite of systems.

The aircraft is outfitted with two types of SCOTTY data transmission systems: line-of-sight ("LOS") and beyond line-of-sight ("BLOS"). Both systems are used to transmit mission-critical information such as surveillance imagery and target data. The LOS system is limited to a range of approximately 100 kilometers (depending on the frequency) but can transmit higher quality live video imagery. The BLOS system uses a satellite link enabling it to have unlimited range - the live video is limited in quality but the system can transmit high quality (HD) still pictures and can provide duplex telephony.

Examples of live video transmissions - including geo-data blended into the video

A HD snapshot received via satellite

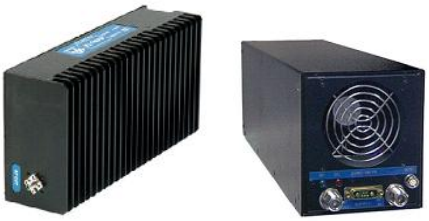
Surveillance imagery gathered by a patrol aircraft should not be stranded onboard the plane. This vital information must be shared, in real time, with commanders on the ground. The SCOTTY system makes this possible through LOS and BLOS transmissions.

SCOTTY Group Austria GmbH
a SCOTTY Group plc company
Teslastrasse 4, 8074 Grambach · Austria
T +43 316 409 426 · F +43 316 409 426-53
info@scottygroup.com

The SCOTTY Line-of-sight (LOS) System

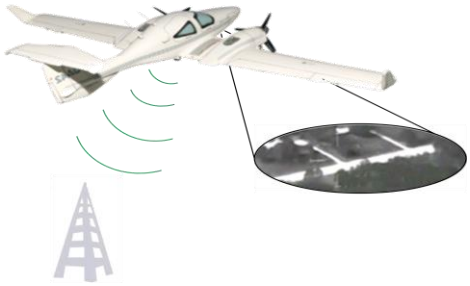
The SCOTTY LOS transmission system uses an antenna installed on the bottom of the aircraft. The system is connected to the observation turret and transmits TV and thermal video in MPEG4 format at up to 15 Mbits/sec. Any information included in the video, such as from the camera or from a mission computer overlay, is also included in the transmission. Pre-order options include transmission frequencies of 320 MHz to 5 GHz, AES 256 encryption, 384000 baud RS232 data channel for independent moving map (or other) data, and one-way audio. The entire system weighs ten kilos.

Antenna on bottom of aircraft



LOS components

The LOS system is designed to provide high quality live video and target information to commanders when the aircraft is close to home. This live imagery can be fed to the ground constantly enabling commanders to monitor both routine and emergency surveillance operations. The transmission however, is limited in range, will not work when obstructed by hills or buildings, and sensitive to weather conditions.



SCOTTY Group Austria GmbH
a SCOTTY Group plc company
Teslastrasse 4, 8074 Grambach · Austria
T +43 316 409 426 · F +43 316 409 426-53
info@scottygroup.com

The SCOTTY Beyond Line-of-Sight (BLOS) System

The SCOTTY BLOS system works by L-Band satellite communications which can transmit through rotor blades and work perfectly in all weather conditions and at unlimited range. This system enables commanders to virtually enter the aircraft even if it is thousands of kilometers away. The system requires a tracking antenna on the top of the aircraft, a satellite modem, and a satcom computer system. The system is connected to the observation turret and the cabin intercom. Unlike the LOS system, the satellite link is billed per transmission and should therefore be used only when necessary.

A *DA42 MPP with SCOTTY Satcom antenna (top)*

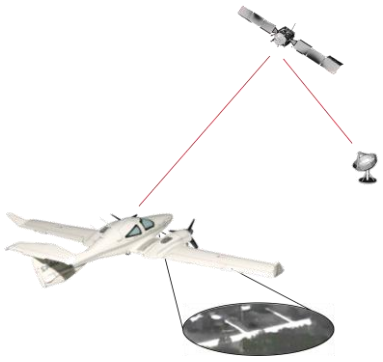
The BLOS component rack examples

The SCOTTY BLOS system offers a package of features:

- transmission of live compressed TV and thermal video from the observation turret,
- simultaneous transmission of target and tracking data,
- transmission of high resolution still pictures taken from the observation turret
- digital recording and forwarding of high resolution video files taken from the observation turret,
- duplex audio telephony with the cabin crew,
- Internet access,
- other PC applications such as live chat, fax, email.

The BLOS transmissions can be encrypted by various off-the-shelf or military-standard devices.

When the aircraft flies outside of the LOS range, commanders can keep in touch with it via periodic satellite telephony. When the mission requires support from the ground, the operator begins live video transmission. This live transmission enables the commanders to get an overview of the situation and instruct pilots where to fly, command operators where to point the camera, and request high resolution snapshots from the live feed. These snapshots are automatically transmitted to the ground for instant analysis.



SCOTTY Group Austria GmbH
a SCOTTY Group plc company
Teslastrasse 4, 8074 Grambach · Austria
T +43 316 409 426 · F +43 316 409 426-53
info@scottygroup.com

The SCOTTY Ground Command Stations

The SCOTTY ground station is specifically designed to enable decision-makers to virtually enter the deployed aircraft and command the mission. This is done though customization of the hardware to suit the needs of the customer.

SCOTTY offers a number of customized ground stations for the reception of both the Line-of-Sight (LOS) and Beyond Line-of-Sight (BLOS) satellite transmissions. These can either be integrated into an existing situation room or can be installed separately. SCOTTY also offers mobile ground stations for vehicles and ships. Typically, a combined LOS and BLOS multi-reception/multi-capability system is offered. This fly-away system can receive and display multiple LOS and BLOS signals as well as tracking and targeting data.

Multi-capability Ground Station

In order to improve reception, the LOS receiving station comprises of a multi-sector antenna which combines signals ("diversity reception") and should be installed at a high place (e.g. on the roof). Depending on the configuration ordered, the system then displays the live video and data at 38400 Baud for tracking or targeting data from various aircraft simultaneously.

Dual-diversity LOS antennas installed on roof

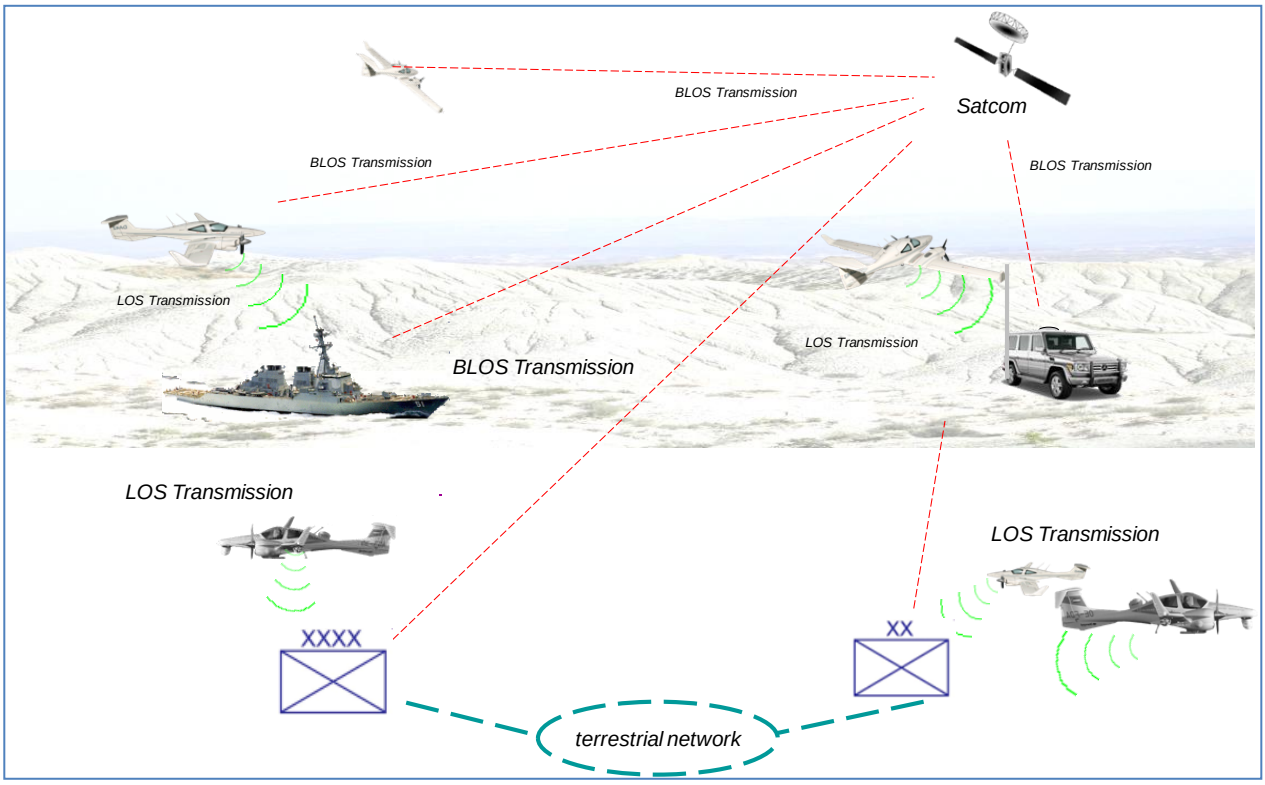
The BLOS connections over satellite can be either obtained through a standard terrestrial network such as Internet or through a satellite antenna installed outside. Vehicular and maritime systems are also available.

SCOTTY Group Austria GmbH
a SCOTTY Group plc company
Teslastrasse 4, 8074 Grambach · Austria
T +43 316 409 426 · F +43 316 409 426-53
info@scottygroup.com

Satellite antenna on roof

The satellite connection is completely duplex enabling the commanders to interact with the airborne personnel (and any other personnel in the field), transmit and receive information, and issue last-minute orders. Typically, when the LOS connection has been lost, the commanders periodically connect to the aircraft until a full video connection is needed. All of the live video, high resolution stills, and other information are displayed and recorded at the ground station. Imagery and data can be saved, forwarded, and shared with others on the ground. With the use of an optional multi-point switch, several aircraft can be connected via satellite with the ground.

Furthermore, all LOS receive stations can forward the imagery via satellite to any other site or mobile station. For example, a vehicle which receives LOS video from an overhead aircraft can forward it to the command center and to commandos preparing to deploy from a ship.



Theatre overview with both Line-of-sight and Beyond Line-of-Sight (satellite) connectivity

Airborne surveillance with SCOTTY: enabling the commanders to stay in command through the use of powerful and flexible technology.

SCOTTY Group Austria GmbH
a SCOTTY Group plc company
Teslastrasse 4, 8074 Grambach · Austria
T +43 316 409 426 · F +43 316 409 426-53
info@scottygroup.com