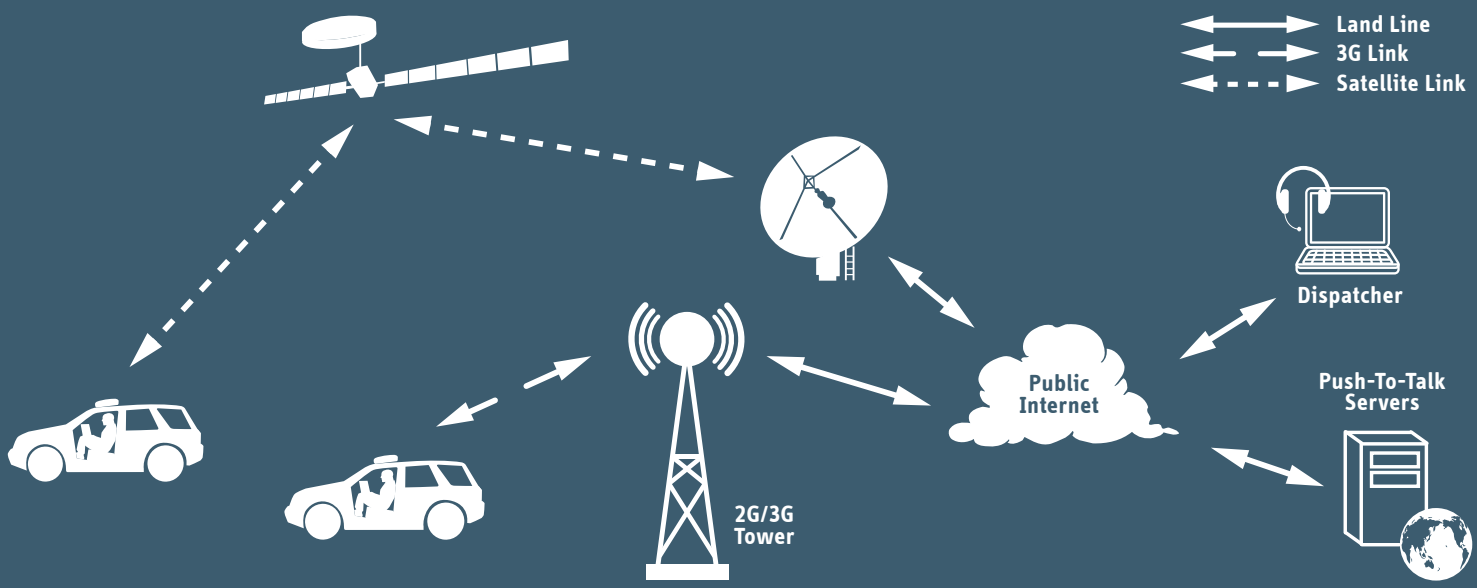
EXPLORER PUSH-TO-TALK OVERVIEW



The complete EXPLORER 325 Push-To-Talk solution (3G modem optional)

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PUSH-TO-TALK VOICE COMMUNICATION

COBHAM

We're now a Cobham company, so we're moving to the Cobham brand in the coming months. You'll see changes to our marketing collateral, but the same people will continue providing great products.

EXPLORER PUSH-TO-TALK

EXPLORER Push-To-Talk (PTT) is a rugged voice dispatch and communication system. It is a cost effective, IP based voice and data communication system designed to replace VHF/UHF based trunk radio systems widely used in the field service, search and rescue, utility, mining and Oil & Gas sectors. The system extends classical Push-To-Talk capabilities to hybrid data networks such as terrestrial 2G/3G/GPRS networks where available supplemented by the Inmarsat BGAN satellite network where no terrestrial network coverage is present. With no user intervention required the system automatically routes voice and data traffic via the least expensive network available.

The EXPLORER PTT solution is the result of 1½ years of field evaluation. The customer, a South American electricity distribution company covering 66.000 miles of distribution lines and a concessional area of 120.000 square kilometers were facing a communication challenge. They were using a traditional VHF trunk radio system provided by an infrastructure of 180 VHF towers with combined satellite and land line backhaul to the dispatch center. The mobile work force consisted of 500+ field engineers maintaining the power grid and serving subscribers on a daily basis. Faced with high infrastructure maintenance costs, poor VHF voice quality and limited coverage the company was looking for an alternative. They were looking for a cost efficient, simple and user friendly communication solution with a PTT/VHF user experience and with improved voice quality, support of data connectivity as well as expanded coverage.

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THE PUSH-TO-TALK SOLUTION

The EXPLORER PTT solution solved the majority of the built-in challenges of the previous VHF system.

- The use of BGAN and already existing 2G/3G/GPRS networks extended the coverage area.
- Improved voice quality with IP based digital voice quality compared to the analogue VHF voice quality.
- No expensive infrastructure (no VHF towers, no fixed VSAT) and thereby lower maintenance costs.
- High quality voice but also an on-the-move internet connection.

Simplicity permeates the EXPLORER PTT solution. The look and feel is exactly like the VHF system replaced - only a few buttons (on/off and call) and easy push to transmit communication.

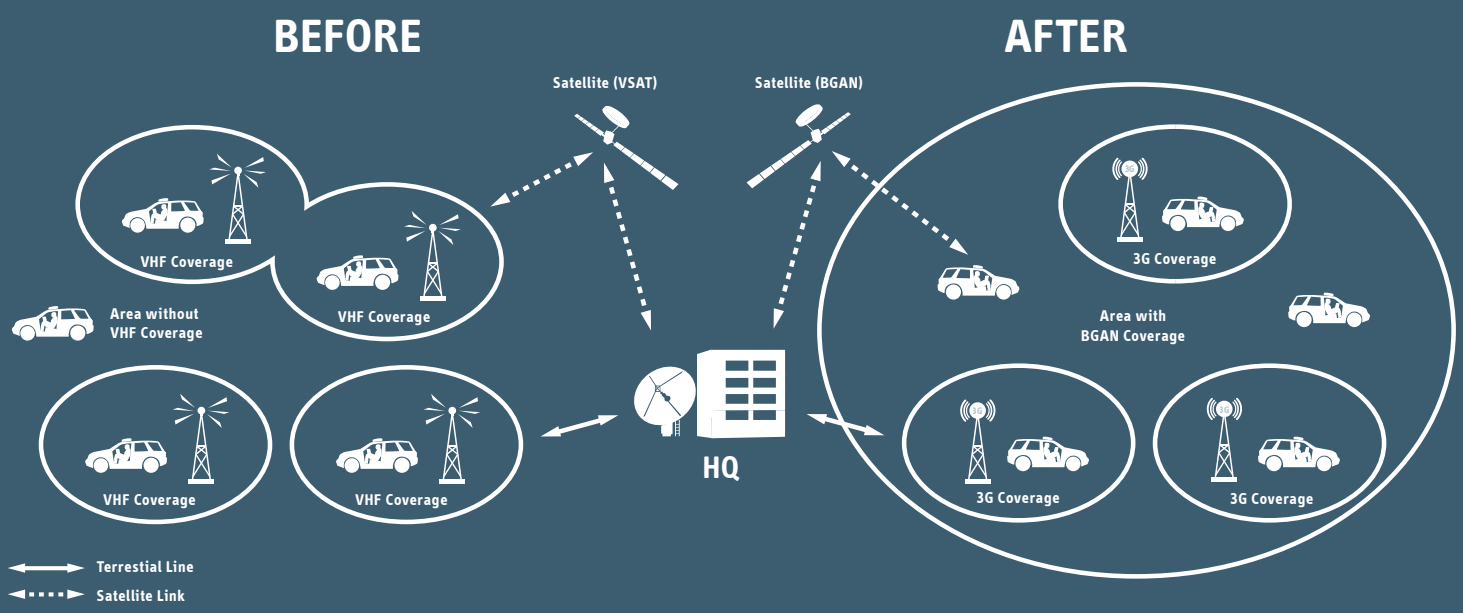

Illustration 1: The communication challenge - before and after

A car installation includes a vehicular EXPLORER BGAN terminal with a roof mounted antenna and a base station with a hand microphone (fist-mike) in the cabin. The all important built-in least cost routing functionality enables automatic switching between the available networks. The system is designed to use existing cellular networks as default. Two independent cellular networks can be supported simultaneously. If one of the cellular networks is congested or unavailable the system will automatically switch to the other 2G/3G/GPRS network. If the vehicle is situated in areas with limited or no cellular coverage the system will switch to the Inmarsat BGAN satellite network.

When the system is connected to the cellular networks the cost of communication is typically based on a flat rate data package. A state of the art voice transfer protocol ensures that the bandwidth usage is minimized to an absolute minimum in order for optimal use on background satellite connections.

In summary EXPLORER Push-To-Talk turns traditional satellite communication, cellular networks and the internet into a closed managed Wide Area Network with beyond line-of-sight communication.

SYSTEM COMPONENTS

- **The Mobile Unit**
- **EXPLORER Push-To-Talk servers**
- **Dispatch client software**

Mobile Unit

The mobile part of the PTT system consists of:

- Push-To-Talk user terminal (PTT box)
- Hand microphone/speaker (fist-mike)
- Vehicular BGAN terminal with a seperate antenna & transceiver
- One or two 2G/3G/GPRS USB modems

The fist-mike is connected to the PTT box and gives the user a "VHF-radio-like" experience. The PTT box has several ways of communicating with the PTT servers, either through the BGAN network or one of the 2G/3G/GPRS modems.

The user interface of the PTT box is extremely simple to use with only a dial-button, a few LEDs and a combined volume control/on-off button. Once the user presses the dial-button a VoIP connection is established between the PTT box and the dispatcher. When the dispatcher answers the call, a simplex communication channel is available. In the same way the dispatcher may call the mobile unit; to answer the call the mobile user simply presses the dial button.

In order to secure communication, the PTT box must always be connected to an EXPLORER BGAN terminal but can also use up to two 2G/3G/GPRS cellular USB modems to ensure better coverage, reachability and cost efficiency. Routing over the multiple network interfaces can be setup for least cost routing. The PTT box can also route data e.g. from a PC connected via a standard Ethernet interface.

A vital part of the system is the BGAN terminal from Thrane & Thrane. All EXPLORER BGAN terminals can be used depending on the environment in which the PTT box is deployed. If the PTT box is mounted in a vehicle the EXPLORER 727 or EXPLORER 325 would be the right choices. For stationary use the PTT box can operate with an EXPLORER 700 (or 300/500) and for maritime use the SAILOR FBB series. The BGAN terminal ensures reliable communication in rural areas where no 2G/3G/GPRS network has been built or if existing 2G/3G/GPRS networks is congested or lost due to natural disaster, extreme weather etc.

EXPLORER Push-To-Talk server infrastructure

The heart of the system is the PTT servers. A server setup initially consists of two standard 19" rack servers that can be placed anywhere connected to the public internet:

1. The PTT server is handling all switching between the mobile units and the dispatchers.
2. The transcoding server handles the voice transcoding and compression

The PTT server can handle any number of users, while the transcoding server can accommodate 20 concurrent calls, more transcoding servers can be added when the need arises. All information is stored in the PTT server including:

- GPS position of each PTT user.
- Statistics on availability of each PTT user on each network.
- Recordings of call logs and voice communication.

Dispatch client software

The Dispatch client software is a combined PABX switchboard and VOIP softphone. The software runs on a standard PC and the dispatcher uses a headset to communicate with the PTT box users in the field. Through the dispatch client software, the dispatcher can

- answer calls from mobile users
- initiate calls to mobile users
- create conference calls between mobile users
- lookup the GPS position of each mobile user on map (google maps or similar).