



# Providing satellite solutions for the Airwave Network.



**From remote backhaul to 'Rad in a Bag' rapid deploy systems, VSAT satellite solutions have an important role to play in delivering flexibility and resilience to Great Britain's emergency services network. Airwave choose Datasat Communications to deliver effective satellite services for a network that must be continuously available.**



Airwave is the world's largest TETRA Network providing mission critical communications services within and between Great Britain's emergency services. Today, the Airwave Network covers 99% of the country's landmass.

To achieve this level of coverage, the Airwave Network was extended into areas where there was limited terrestrial infrastructure. Whereas adding terrestrial systems would be complex, costly and take a considerable amount of time and resource, satellite communications

offered a mature, secure and cost-effective technology that could be quickly and easily installed.

After an initial pilot in 2003, Airwave selected Datasat Communications to design, install and manage a VSAT network to cover the most remote locations in Great Britain including the Highlands and Islands of Scotland, Wales, Cumbria and North Yorkshire. The system involved connecting a VSAT modem and antenna to a TETRA base station at the distant end. This backhauled network traffic to Datasat's UK Teleport and onto the Airwave Network to deliver continuous, high performance communications.

There were two key challenges in designing the VSAT network. First, as the VSAT links were often located in challenging rural environments, they had to provide unattended operation with limited maintenance requirements regardless of the weather conditions. Datasat Communications developed a heating system for Airwave that automatically operated when temperatures dropped to ensure that snow or ice would not cause the unit to fail.

More importantly, the Airwave TETRA Network and the satellite connections operate at different voltages. Datasat Communications had to ensure that

TETRA traffic would travel seamlessly over the VSAT connections. The company designed and developed a power converter – the RF/PSU – specifically for the Airwave Network.

## Since 2005, Airwave has rolled out its VSAT network to over 100 locations throughout Great Britain.

“Given the importance of the Network, we felt that, rather than select an off-the-shelf power converter, it was better to design one that met the exacting requirements of the Airwave Network. We worked closely with Airwave to deliver a system that would deliver the resilient operation that the Network requires,” says Bernie Branfield, General Manager at Datasat Communications.

Since 2005, Airwave has rolled out its VSAT network to over 100 locations throughout Great Britain. It delivers highly secure, always on bandwidth to ensure that the emergency services have continual voice and data services in every location and under every circumstance.

### SUPPORTING FIRELINK

When Airwave looked to provide the Fire & Rescue Services with a very resilient Network, Datasat Communications was an ideal supplier to deliver the satellite backhaul elements. In Great Britain, the Fire & Rescue Services are responsible for

coordinating the efforts of all emergency services when there is a crisis or disaster.

The Fire & Rescue Service wanted to ensure every element of the Network had a mirror should the active system fail. In terms of communications, Datasat Communications helped provide VSAT redundant paths for existing terrestrial and VSAT connections. A key concern was that there would be no performance degradation should the Network need to switch between connections.

“The Network we designed included a UK satellite earth station and two separate satellite networks. In an emergency situation, a call cannot be dropped as the Network switches between connection. We developed a switching solution that would deliver the precise levels of performance and continuity that Airwave required,” comments Branfield.

He says: “Datasat Communications provides bespoke communications solutions to our customer's requirements. With Airwave, we have taken the approach that if we don't believe that the products or solutions available provide the right levels of service or quality, we work with Airwave to develop systems that do.”

### ENHANCED MOBILITY

Another example of this is the development of mobile terminals for rapid deployment. The Airwave Network needs to continue operations in the unlikely event that a base station or cellular connection fails or, more likely, when a disaster temporarily removes terrestrial connectivity. Datasat first became

## Key achievements

- **Secure, resilient and high performance VSAT backhaul sites in the remotest locations throughout Great Britain**
- **Unique knowledge and experience of TETRA and satellite systems allows for flexible solution provision to Airwave requirements**
- **RF/PSU power converters exclusively designed for operation on the Airwave Network**
- **Completely integrated vehicle mounted rapid deploy units reduce connection times from 2 hours to 15 minutes**
- **‘Rad in a Bag’ self-assembly mobile units can be transported anywhere and assembled in 15 minutes**

involved in the development of mobile solutions for Airwave after the initial roll-out phase of the VSAT backhaul network.

“Airwave approached us with the idea of creating mobile units that could be quickly deployed for Network continuity. We re-engineered some of the VSAT technology that had been used for permanent installations to create complete vehicle mounted solutions with base station, VSAT modem, RF/PSU and antenna. This was the first rapid deploy system that we developed for Airwave,” says Branfield.

## OPERATIONAL IN 15 MINUTES

The success of the first mobile terminals led to the creation of completely integrated mobile solutions that were trailer mounted and could be towed quickly to the site of the emergency. Axell Wireless took the Datasat designs and created a fleet of Landrover-based Service

Restoration and Emergency Response Vehicles. “By including an auto-point antenna as well as pre-setting the satellite connection, we were able to help Airwave to reduce the time to establish secure connections with a mobile unit in the field from two hours to 15 minutes. With a little training, you didn’t need to be a satellite engineer to use the system. It was simply the push of a button,” states Branfield.

This system was used during incidents such as the Tewksbury floods where flood water had taken down all the power and terrestrial connections. Airwave was able to station a mobile unit on a motorway flyover and quickly establish the communications necessary to aid the relief efforts.

However, vehicle and trailer mounted systems still provided issues in terms of true mobility. In built-up urban

areas, it would still often be difficult to place the mobile unit exactly where it was needed. For instance if the ideal spot for connection was on the roof of a tower block, the mobile system could not be transported up the stairs. The answer was ‘Rad in a Bag’.

## ‘RAD IN A BAG’

Branfield comments: “Rad in a Bag is a tool-free, self-assembly unit that is transported in an IATA-compliant transit case. It is light enough for one person to take up flights of stairs and easily assembled to be operational in 15 minutes. We designed the system with Airwave, providing our expert advice and engineering skills to deliver a solution that required only a minimum of training to operate. Since 2007, we have designed and delivered several layers of mobile recovery solutions for incidents, emergency and site failures.”

# About Datasat Communications

Datasat Communications has been successfully delivering remote communications solutions for governments, commercial organisations and emergency services for 25 years. Specialists in satellite communications, the company brings experience in TETRA, terrestrial and wireless technologies to deliver fully integrated satellite hybrid networks around the globe.

The company tailors every network to the specific requirements of the organisation – from small bespoke networks to large global platform-based systems. With a reputation for quality and customer service, the company provides high performance, reliable and secure network infrastructure for Internet, broadband and business services to remote locations across the globe.

Datasat Communications delivers a range of satellite backhaul services to the world's largest TETRA network, Airwave as well as other major national PSS networks such as TETRA Ireland.