

## Article for Mitel

### THE POWER OF NEVADA

***The Royal International Air Tattoo at RAF Fairford, near Swindon, is the largest military event of its type in the world. This year, communications specialist, Mitel, provided a unique, highly sophisticated converged communications infrastructure, based on its award-winning NeVaDa (Networked Voice and Data).***

The Royal International Air Tattoo had a requirement for relaying real time voice, data, virtual reality images and videoconferencing across various parts of RAF Fairford. The key driver was the Breitling Fighter Challenge - the world's first virtual reality competition to find the Champion Fighter Pilot of the World.

Top guns from around the world flew into Fairford to take part in simulated one-on-one aerial combat. To accommodate approximately 128 pilots over the three days of the show, 16 pilot stations (PCs) were connected to the NeVaDa backbone to allow for eight simultaneous head-to-head engagements. Large, real-time screens gave the public a spectacular view of the simulated aerial combat.

NeVaDa is the world's first solution to integrate real-time voice, video and data onto a common, enterprise-wide, 155 Mbps ATM LAN backbone. NeVaDa was voted Voice Integration Product of the Year at last year's Networks Show and Network Product of the Year at this year's Comdex. NeVaDa is installed at customer sites in the US and UK, including ICL at Reading and Manchester.

The idea was to use NeVaDa to connect the four major sites at the show - the Tattoo Headquarters, the Flight Simulation 'dog fight' Building and, on the other side of the runway, the RIAT office and the Flight Centre in Hangar 20, where pilots and crews arrive from around the world for customs clearance.

#### **A Major Expansion**

For normal day-to-day operations throughout the year, the RIAT office has a fibre-distributed Mitel SX-2000 LIGHT PBX (Private Branch Exchange) to provide its telephony, and a small, separate LAN. However, for the week of the Tattoo, a major expansion in services takes place.

#### **No Room For Tradition**

Mitel has supported the Tattoo for many years, and has traditionally installed up to seven PBX systems, interconnected by private wires to provide these expanded services. But there are drawbacks to this traditional approach. For the Tattoo, RIAT personnel always have to move to offices on the opposite side of the runway and, with conventional technology, have the inconvenience of using different telephone numbers. Conventionally linked PBX arrangements are also complex to install, manage and test. There is the

hassle of separate systems for voice and data, and no possibility of high bandwidth video transmission.

### **The NeVaDa Solution**

The converged solution developed by Mitel was based on a permanent four-core fibre optic cable - installed and used by the US Airforce. The cable ran for over 2km between the Flight Centre in Hanger 20 and the Control Tower on the opposite side of the runway. As only two of the cores in this cable were being used, the remaining two were used by NeVaDa to form the main converged communications link between the two sides.

If it had not been possible to converge voice and data over this single link, the solution would have involved modem technology. This would have been more complex and less efficient, and would not have had the capacity to handle the large amounts of data involved. As every modem would have needed a phone line, the infrastructure would become very complex.

### **At the Tattoo HQ**

From the Control Tower, where the USAF fibre terminated, Mitel ran a temporary fibre-optic cable to the Tattoo Headquarters where the modularity of the Mitel SX-2000 LIGHT PBX allowed the relocation of a peripheral cabinet (originally housed in the RIAT office). Because this peripheral cabinet formed part of the original PBX located at the RIAT offices on the other side of the runway, no telephone numbering changes were needed. The remote peripheral cabinet had enough capacity to provide all the telephony services for the Tattoo. The Tattoo HQ also contained a 'far end' NeVaDa link - a Madge MultiNet LET 20 chassis, LBT-155 converged voice and data module - along with an LEB-200 Fast Ethernet module.

### **At the Flight Simulation Building**

Mitel installed another temporary fibre from the Tattoo HQ to the Flight Simulation Building which housed the dog fight computers. 100Mb Fast Ethernet was run over this fibre to a collection of Madge Visage hubs which served 16 high-end PCs - eight groups of two - to which Mitel provided 10Mb switched Ethernet for high performance. Each PC had a virtual reality headset, valued a \$10,000.

### **At the RIAT Office**

On the other side of the runway, NeVaDa-specific components were added to the original Mitel SX-2000 LIGHT PBX in the RIAT office - making the whole infrastructure into a converged solution. Using NeVaDa's switched data hubs, Mitel also connected into RIAT's legacy data LAN to provide access to all RIAT's normal data services from the Tattoo HQ.

### **At Hangar 20**

Mitel installed a temporary fibre link between the RIAT office and Hanger 20 where it connected to the terminating point for the US Air Force fibre. A Madge Visage hub was installed in Hanger 20, using a spare pair in the Mitel fibre.

### **A Great Day Out**

By adopting an innovative approach to the network design, and adding NeVaDa technology to the existing infrastructure, Mitel was able to evolve an enhanced converged solution. All aspects of the NeVaDa infrastructure performed faultlessly over the two days of the show. Well over 100,000 people visited the Tattoo and a great time was had by all. And none more than Mitel's NeVaDa team and the winner of the Breitling Fighter Challenge - Flight Lieutenant Mark Discombe of RAF Coltishall.