

Heathrow Terminal 5

T5 at London Heathrow – The largest in-building project ever delivered

COBHAM

Case Study

The most important thing will build is trust

Overview

Inside London Heathrow's brand new terminal, a complete telecommunications infrastructure had to be installed for cellular operators, airport operations and emergency services.

Challenge

BAA, the owners of Heathrow, decided they wanted a common shared cellular infrastructure to minimize the proliferation of cellular equipment across the new buildings. This would have to fulfil the requirements of all five UK Operators and be future-proof to allow for further expansions.



The Challenge

Terminal 5 - London Heathrow's brand new passenger terminal, dedicated to British Airways - took 18 years to design and 20,000 workers to build at a cost of £4.3bn. A complete telecommunications infrastructure had to be installed for cellular operators, airport operations and emergency services. It is known as one of the largest common shared infrastructure projects in Europe. Seamless coverage for all of these services had to be provided, which demanded special attention due to the combining of various frequency bands.

The equipment to be used in order to provide the necessary coverage had to fulfil specific requirements of the emergency services and T5 airport operations. The in-building and external coverage solution had to include robust, fail-safe redundancy and customised monitoring and alarm reporting.

BAA, the owners of Heathrow, decided to deploy a common shared cellular infrastructure to minimize the proliferation of cellular equipment across the new buildings. This would have to fulfil the requirements of all five UK Operators (Vodafone, O2, T-Mobile, Orange and 3). These operators would require mobile services for all cellular bands and technologies: GSM900, GSM1800 and WCDMA (3G). The equipment to be deployed was required to support not only existing technologies but also to support the emergence of new technologies and allow for future expansion to new areas of the Terminal. In addition, various mechanical requirements imposed by space limitations and maintainability considerations had to be met.

All of these services had to be introduced into the already congested environment of the airport whilst avoiding unwanted interference.

The Solution

The project received offers from some of the main providers of coverage solutions. Only one supplier had the capability of providing the complete range of equipment that was needed in order to fulfil all of the requirements and achieve the coverage for all of the required services. Cobham Wireless was chosen as the main supplier of safety critical, operational and cellular communications equipment.

The equipment supplied was custom designed to exceed the individual requirements of the various services. This was accomplished by using Cobham Wireless' unique range of products. The products were tailored to meet the needs of the project in terms of electrical performance or even packaging. In addition, specific configurations of amplifiers, filters and control and monitoring cards were developed to ensure complete compliance to the customers' requirements.

"It has been a great pleasure to work with both BAA and all five of the UK Cellular Operators to design, develop and see installed, probably the largest common shared infrastructure in Europe - if not the world.

It really shows what can be achieved with good teamwork from all parties involved and the support of major suppliers, especially Cobham Wireless."

Neil Mackinlay, Principal Design Engineer, STS-Wireless

Customised passive Points-Of-Interface and combiners were produced to combine the many operators and services on to the Distributed Antenna System at the required power levels, whilst meeting the demanding intermodulation specifications and enabling a wide frequency spectrum to co-exist without interference.

A total of 40 high-power and low-power fibre-fed cellular tri-band remotes were manufactured for the shared infrastructure project. These were fed from a customised fibre optical master site, combining all operators on their respective bands with gain control and monitoring capable of supporting up to 112 remote units.

For the PMR bands, amplifier and master site solutions employing redundant fibre-optic paths with automatic and manual switching were deployed from independent base sites. Control and system monitoring over RS232, Ethernet and GSM Modems was utilised and defined by the exact requirements for the individual services.

Cobham Wireless was chosen as the main provider as we have the complete range of equipment, the ability to customise it in order to meet specific requirements and the technical engineering capability to supply such a complex solution. As a result, Cobham Wireless provided total radio coverage throughout Terminal 5, making it the largest in-building project ever delivered.

The Benefit

Cobham Wireless was the only supplier that could deliver the complete system based on our own range of equipment, resulting in several key advantages:

- One common supervision system that manages all equipment.
- System design, commissioning and maintenance could be simplified as the modules and equipment came from one and the same supplier.

There was a sense of continuity as only two Cobham Wireless engineers needed to interface with the customer throughout the project as they both had complete knowledge of the system.

