RMCDS

Radar Message Conversion &

Distribution System for the Uk Radnet

In recent years the United Kingdom has been engaged in building one of the largest and most advanced air traffic control facilities in the world, the New En-Route Centre (NERC) at Swanwick. COMSOFT provided the entire radar communication for NERC and the related UK RADNET.

The RMCDS is a derivative of the European RMCDE and demonstrates COMSOFT's successful strategy of using an open architecture and a modular design for its systems. Just as for other countries, a straight-forward adaptation of the RMCDE was at the core of the development.

New protocols and formats were added, the graphical user interface was extended and the number of configurable interfaces increased.

The result is impressive and strongly contributes to the European harmonization effort in Air Traffic Control. Using the RADNET technology also for the UK, promotes the free exchange of radar data across Europe.

Highlights

NERC serves an extremely busy segment of the air space and was consequently specified with the most rigid operational require-ments. As an answer, COMSOFT provided the Radar Message Conversion and Distribution System (RMCDS) and received acceptance by August 1995, some weeks ahead of schedule.

COMSOFT also built up the UK RADNET, which currently connects NERC with the London Area Terminal Control Centre (LATCC), Manchester, Gatwick and the Scottish/Oceanic ATCC.

Technical Data

Interfaces	- Up to 104 physical interfaces per RMCDS
	  (13 boards, each with 8 interfaces)
	  Additional 140 interfaces via Expansion Cabinet

Formats	- ASTERIX, RDIF, CAA
Protocols	- HDLC LAPB, X.25, HDLC Frame, CAA - Protocol drivers certified according to ISO 8882
Time Services	- GPS, MSF/Rugby, High Precision Flywheel Service
Backbone	- Up to 128 network nodes - Up to 16 physical connections per node (64 logical) - up to 512 KBaud serial lines
RMA	- Computed Availability: 99,9999986% - Mean Time To Repair: 15 minutes
Performance	- Delay ‹ 50 msec per plot (end-to-end in network, no frame clustering) - Throughput › 10.000 plots/sec
System Software	- Realtime operating system for core unit - HMI based on POSIX-compliant LINUX - Fully graphical, OSF/Motif based GUI under POSIX- compliant LINUX

Technical Overview

The RMCDSs represent the network nodes of the RADNET. They are based on a fault-tolerant, multi-processor architecture with a configurable number of physical interfaces, each with selectable format and protocol. Radars can be connected via digital or analogue lines and are directly available to every user connected to a node of the RADNET.

The RADNET operates with the internationally standardized ASTERIX (All-purpose Structured EUROCONTROL Radar Exchange) format.

The UK-specific RDIF and CAA protocols are adapted at the entry and exit points of the network.

A filtering mechanism permits the RMCDS user to selectively and dynamically assign priorities to radar data. A sophisticated load control scheme avoids overload situations by discarding messages based on priority, geography, height and plot type of the target reports. Filtering is automatically performed at the earliest possible time in the radar data communication chain, thus relieving the network from any undue user load.

Uk Radnet Dual Feed Concept

An underlying foundation of the UK RADNET is the duplication of all system components. There are two totally separate networks, each connecting all participating ATCCs but located in different physically separated equipment rooms at the respective locations.

All radars as well as the end users are connected to both networks. This way, the controller is always capable of receiving data via two alternative and diversely routed paths, thus increasing the overall radar data availability yet by another dimension.

Uk Services Management Center (Smc)

In order to provide a central point of control the UK built a network management center at Spectrum House, Gatwick in 1997. COMSOFT supplied the CRMCS (Central UK RADNET Monitoring & Control System), which provides a comprehensive set of diagnostic and statistic tools for the network. This includes the possibility

to measure runtime delays between any two points in the network and to access diagnostic data at any remote network node. Planned are central logging for events and statistics, as well as the possibility for remote configuration of any RADNET node from a central point via CRMCS.