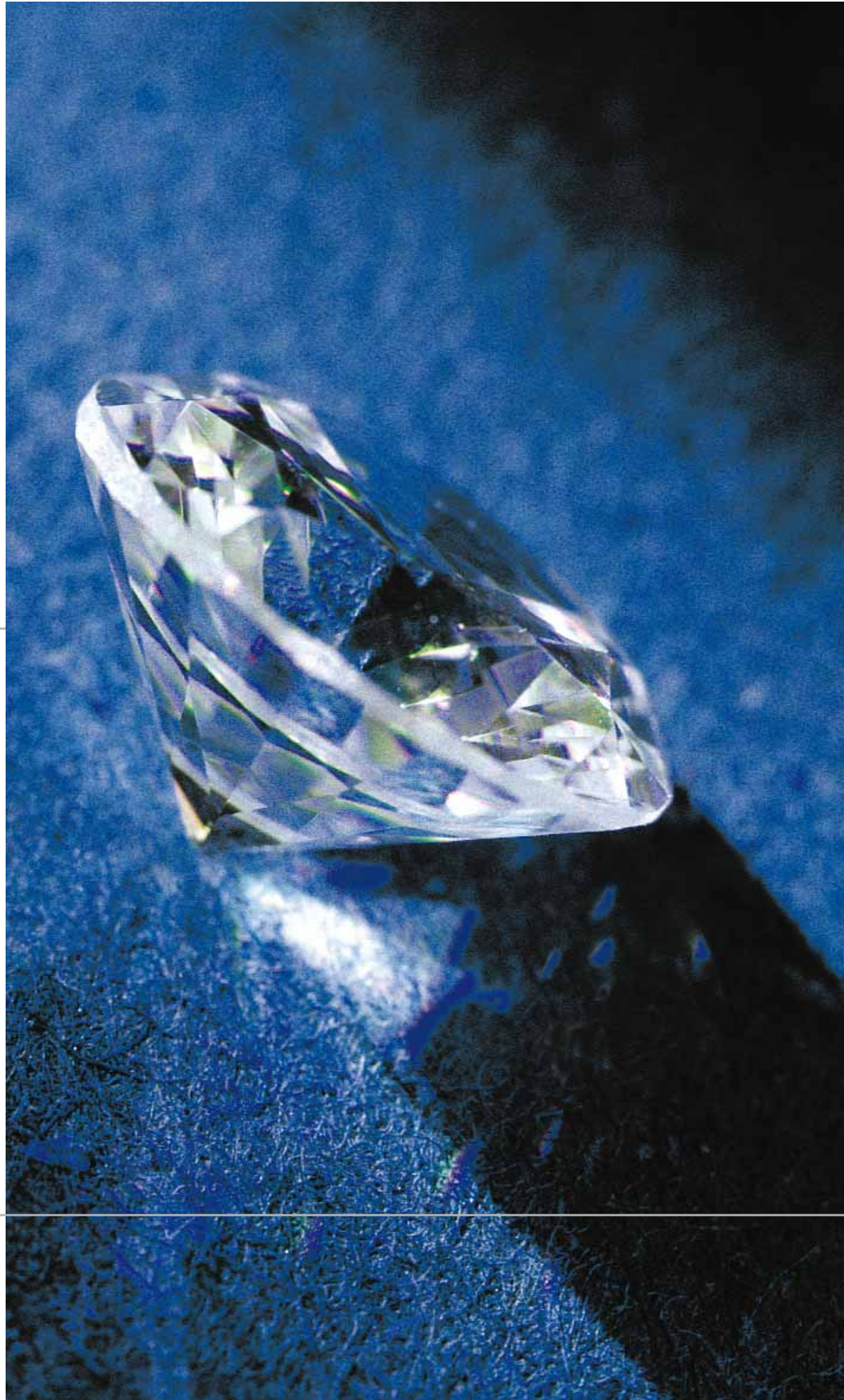


SURVEILLANCE
COMMUNICATION
SYSTEMS



SURVEILLANCE DATA – A PRECIOUS RESOURCE



● Surveillance data represents one of the most valuable resources in Air Traffic Control. Gathered by radar equipment, ADS-B or other means, it is the key to both air traffic safety and efficiency.

Making best possible use of the resource improves the quality of surveillance and has a direct and quantifiable effect on traffic capacity. This helps Air Traffic Service Providers compete in a world of ever growing ATC demands.

COMSOFT's Surveillance Communication Products enable the management of the resource: surveillance data. They make surveillance data available at the right place, at the right time, and in the required form and quality. They also support the trade of surveillance data in a controlled way, tailoring scope, performance, reliability and cost recovery to match the specific needs of each application.

With products such as the RMCDE (Radar Message Conversion and Distribution Equipment) COMSOFT supports the wide area exchange of radar data, the buildup of surveillance data networks as well as the adaptation and conversion of a large variety of surveillance data formats and protocols.

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SURVEILLANCE DATA RESOURCE MANAGEMENT

It is difficult and costly to generate surveillance data. Therefore it is important to exploit this resource in the best possible way, overcoming obstacles of distance, compatibility and commercial interests. COMSOFT products make it all work.

MAKING THE LINK

Surveillance data sources and their users are typically spread over a country or a region. Connectivity is a major issue to make use of this resource.

COMSOFT surveillance communication systems flexibly span the gap. In both LAN and WAN environments, COMSOFT products ideally cater for the specific connectivity requirements of surveillance-related equipment. A variety of communication and networking features are available, all based on highly reliable realtime architectures and platforms.





MAKING INCOMPATIBLES MEET

Often a specific surveillance data resource cannot be used because the protocol, format or other characteristics do not match the requirements of a user. For example, the radar of a neighboring country that would be ideal for complementing domestic coverage could have an incompatible format. Or, in the course of a radar upgrade program, an ASTERIX radar may have been procured, which can no longer interface to older processing equipment that yet has a usable service lifetime.

In all such cases COMSOFT surveillance communication products help to bridge the gap. The COMSOFT conversion library for surveillance data is the world's largest. A wide range of modules allow a user to connect almost any type of radar to almost any type of Radar Data Processing (RDP) system. Based on a general framework, conversions can be tailored to new required formats, quickly and efficiently.

- ◆ ASTERIX
- ◆ CD2
- ◆ RDIF
- ◆ Eurocontrol
- ◆ CAA
- ◆ AIRCAT
- ◆ RDE
- ◆ RLD
- ◆ RRP
- ◆ RDE
- ◆ NAV 1
- ◆
- ◆
- ◆ HDLC LAPB
- ◆ X.25
- ◆ TCP/IP
- ◆ UDP
- ◆ SNMP
- ◆
- ◆

MAKING PARTNERS

Often a complex relationship exists between the provider of surveillance data and the users of this resource. For example, radar data is exchanged across organisational borders based on radar data sharing agreements. In such cases, it is not enough merely to ensure technical transmission of surveillance data: it is also necessary to ensure that the operational framework is economically viable for the suppliers and the users of this resource.

COMSOFT products are ideal for these situations. For the supplier of surveillance data, it is possible to flexibly tailor the data that he intends to export for each of his users. This relates to restrictions in geographical coverage, target types and other parameters. For the resource user a monitoring scheme enables him to ascertain a specified service level. A journaling mechanism supports both supplier and consumer with base data to handle any resource cost issues.



RMCDE

RADAR MESSAGE CONVERSION AND DISTRIBUTION EQUIPMENT



The RMCDE is a powerful and highly versatile surveillance communication engine ideally suited as a core building block for a flexible surveillance infrastructure and surveillance data resource management. The equipment is capable of making the link between a huge variety of surveillance data sources and sinks. The RMCDE is constantly adapted and extended to cater for all new formats, such as the new ASTERIX categories for Mode S radars or for ARTAS, the advanced European tracker and server.

Multiple RMCDEs can be linked together to form small or large surveillance data networks. Arbitrary sources, such as primary/secondary radars, track servers or ADS-B ground stations input their data at a convenient location into the network and a wide range of users, connected at another arbitrary location are able to use them. The RMCDE performs format and protocol adaptation, routing, filtering, load balancing and journalling for the different surveillance data streams.

An associated network management component, the CRMCS (COMSOFT Radar Data Network Monitoring and Control System) provides functions and features that are specifically geared for a surveillance data network. For example, it enables the user to tune the network by means of a dedicated flow control scheme identifying levels of priority for different types of surveillance data.

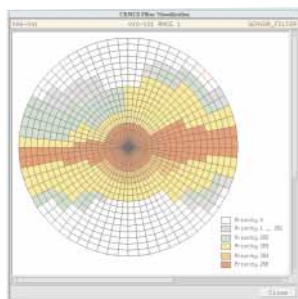
The RMCDE follows a highly reliable redundant hardware architecture and is largely scalable in terms of number and types of required interfaces, functionality, performance and redundancy. Delivered configurations range from a single in-out conversion unit to a fully equipped network node with more than 100 external interfaces.

Today RMCDE installations are operational in over thirty Air Traffic Control Centers and Airports. Practical experience over many years has proven the extreme reliability and flexible usability of this product.





ADR (All-purpose Data Stream Replicator) represents a down-scaled version of the RMCDE in terms of functionality, redundancy and performance. It provides cost-efficient conversion, distribution and filtering capabilities based on COTS industry PC hardware. ADR follows the same open design architecture as RMCDE and among its applications are surveillance data multiplexers, replicators and line/format converters in surveillance communication front ends. It is also often used for surveillance data fallback chains.

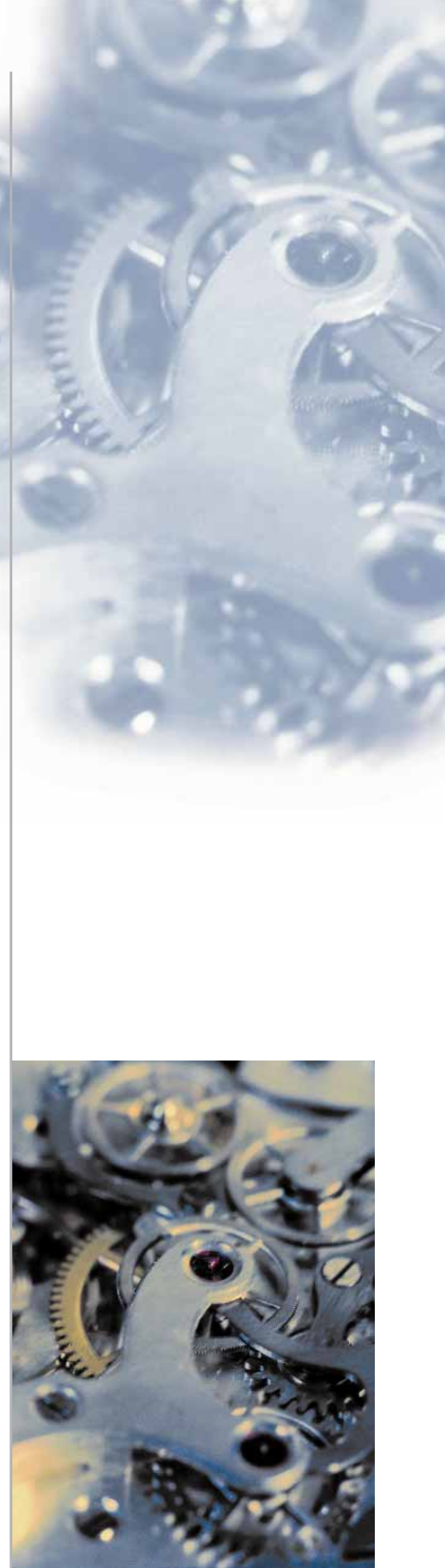


CRMCS (COMSOFT Radar Network Monitoring and Control System) is a system and network management component tailored to the needs of surveillance data communication. With a rich set of features for remote system diagnosis and maintenance, it permits the supervision of surveillance data networks such as the RADNET from one or more central sites.



RAPS (Radar Recording Analysis, Playback and Simulation System) is a powerful technical monitoring and support system for surveillance data. It comprises features for analysis, visualization and test data generation of surveillance data. RAPS-II has many times proven an indispensable tool for integration testing, acceptance testing and day-to-day monitoring of surveillance equipment.

IQM (Integrated Quality Management for Radar Sensors) is a maintenance tool for the continuous supervision of radar sensor data quality. It permits the user to anticipate a degradation of quality parameters. During regular operation IQM passively listens to the radar data. In the event that predefined threshold values are violated the system triggers alerts and thus acts as an early warning system.



ASTERIX

THE NEW SURVEILLANCE DATA STANDARD

ASTERIX (All-Purpose Structured Eurocontrol Information Exchange), the emerging world-wide standard for surveillance data is the centerpiece of the COMSOFT surveillance communication products. The RMCDE and all related systems are in their core native ASTERIX engines i.e. they use this universal format as internal processing language to and from which they translate all surveillance data.

ASTERIX today, with its more than 20 different categories of dedicated surveillance data types, from target plots to weather tracks, is an ideal vehicle for the representation of positional data. Powerful in its presentation capabilities and up-to-date with all new developments in surveillance technology, the format

is recognized by all large ATC service providers and industry.

In 1989, COMSOFT was the first company world-wide to implement the ASTERIX standard. This was done on behalf of EUROCONTROL and as part of the European RADNET (Radar Data Network) program. Since then the company has gathered incomparable expertise in the practical use of the format, and today is market leader with its ASTERIX systems and tools.

COMSOFT has in its product portfolio the RAPS (Recording, Analysis, Playback and Simulation System) surveillance support tool, the world's first EUROCONTROL-qualified ASTERIX Reference Product and Test Tool.

COMSOFT System	RMCDE	ADR	RRR	RAPS	AMOR	IQM	RDD	RMD	RFX
Functionality									
ASTERIX Communication									
ASTERIX Conversion									
ASTERIX Recording / Replay									
ASTERIX Certification									
ASTERIX Analysis									
ASTERIX Display									
ASTERIX Tracking									
ASTERIX Simulation									
ASTERIX Editor									
ASTERIX Report Generation									
ASTERIX Quality Monitoring									

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