



SURVEILLANCE DATA MONITORING

PRODUCTS & SOLUTIONS

HIGHLIGHTS

- High level of customisation: from off-the-shelf products to tailored solutions
- Processing and depiction of all kinds of surveillance data and related information in native form and real time
- Multichannel system for direct visual comparison of input data and data processing output
- Evaluation of input data quality
- Accepting raw sensor and processed data
- Collection and processing of statistical information

COMSOFT

SYSTEM MONITORING PRODUCTS



The constantly increasing number of flights has required air traffic service providers to undertake a number of projects to enhance the efficiency of airspace usage. In many cases the achievement of this goal was accompanied by an increase in traffic density.

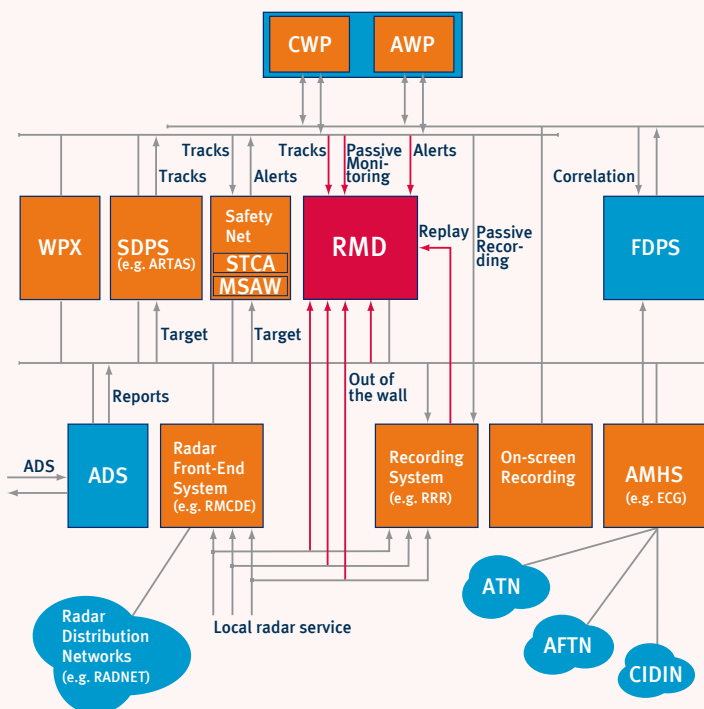
In order to maintain and even improve the safety of air traffic entire surveillance infrastructures were modernised and state-of-the-art Surveillance Data Processing Systems (SDPS) implemented. On the one hand air traffic controllers are now provided with more accurate information based on a higher level of data and system integration, but on the other hand the overall infrastructure complexity has increased and thus the need for efficient monitoring and supervising systems has emerged.

Recognising this need, COMSOFT developed a range of monitoring tools and systems, dedicated to assist technical engineers and maintenance staff with their daily tasks. With our products playing a mediating role between SDPS and operators, they allow its users to produce service

quality at a higher level. A comprehensive set of powerful functions, integrated in a flexible user interface embody the basic configuration of each solution. However, the systems' individual tailorability according to any specific customer needs is one of their most valued attribute.

Technical Monitoring, Incident Analysis and Statistics are typical applications of our products. Therefore, our platforms can be seamlessly integrated into any existing surveillance data processing environment where they acquire the essential information from the given external and internal interfaces. Using sophisticated algorithms, the collected data is processed, analysed and visualised in real-time, either automatically or interactively.

REASONS FOR MONITORING



Manufacturer-integrated monitoring and control functions of surveillance data processing systems cover a number of anticipated standard malfunctions, which can be identified with 100% accuracy. However, service quality will most likely deteriorate due to unexpected situations or combinations of events which were not anticipated initially.

Therefore, scanning of information at different stages of the data processing chain is considered to be the most effective method to identify and eliminate inherent problems. These stages generally start with the reception of the data and end with its presentation. Both, independence of the system under control, and the quality of our internal test and validation methodology guarantee the detection of erroneous procedures and problems.

- CWP: Air Traffic Controller Working Position
- AWP: Assistant Controller Working Position
- WPX: Weather Processing Executive
- STCA: Short Term Conflict Alert
- MSAW: Minimum Safe Altitude Warning
- FDPS: Flight Data Processing System
- ADS: Automatic Dependent Surveillance Interface
- AMHS: Aeronautical Message Handling System

Example of Integration into Generic Surveillance Infrastructure

RADAR MONITORING DISPLAY (RMD)

One of the most successful and flexible products from our surveillance monitoring product family is the Radar Monitoring Display (RMD). Besides outstanding

DEPICTION FUNCTIONS

- Dynamic off-centring
- Seamless zooming
- Support of vector maps
- Interactive centre of display determination (useful in close-zoom situations)
- Placable label (sticking to tracked flights, updating automatically)
- 3-dimensional presentation of the air situation
- Colors and symbols

connectivity it has the capability to process any kind of surveillance data such as radar plots, generated tracks, ADS-B information and multilateration reports.

Integrated into the familiar look and feel of an ATC working position and equipped with all features of a modern display system, RMD offers access to a series of remarkable functions, including selective multichannel processing and immediate replay. Apart from the dynamic aspect of data presentation and assessment, additional tools support online and offline analysis of data - regardless of any ongoing data acquisition processes.

Based on a common COTS platform, but using a distributed and highly scalable architecture, the interfaces of RMD collect and assess information from the existing SDPS independently. This versatile display solution supports the tracing of depicted target information down to the binary level and all along the chain of processing. Features like this effectively spare the use of general purpose analysers for situation assessment in the SDPS. RMD instantaneously presents the demanded information, without time-consuming set-up times.

COMPREHENSIVE SET OF TOOLS

In addition to the elementary functions data processing and visualisation of surveillance data, RMD incorporates a set of tools which have proven to be most efficient for both operational and engineering staff.

Hence, acquired data can either be archived or exported for further analysis to external systems like SASS-C or RAPS-3. A feature to ensure data coherence analyses the processed information regarding technical accuracy and load figures. Both values can be monitored online and at certain user-defined intervals.

Another agent ensures the adherence to current safety standards. On top of that, RMD offers supplementary value added tools to extract and accurately present an exact air situation in two or three dimensions. And finally, an option to add notes, in concert with the above mentioned features allows RMD to be used efficiently in the field of incident assessments.

Software agents for:

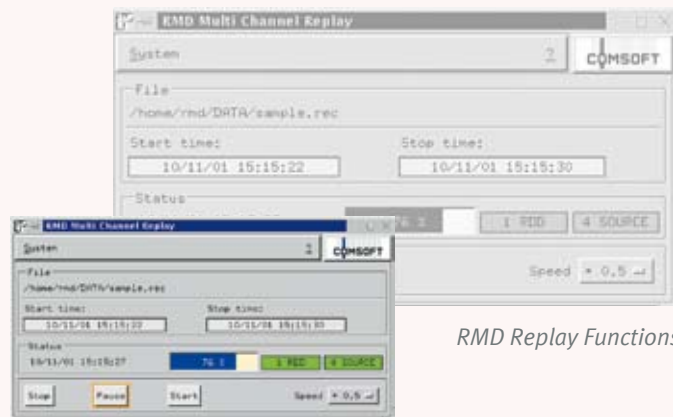
- Monitoring of data quality
- Signaling problem detection
- Composition of data logs for analysis
- Indication of violation of given surveillance performance standards



INSTANT RECORDING & REPLAY



RMD comes with a sophisticated integrated recording and replay functionality, capable of storing the entire volume of received data for up to 24 consecutive days. Within this period, recorded data can be further archived or replayed within a few seconds. This instant response can be guaranteed due to local data storage methods. Any data acquired by the recording module of an RMD can be either accessed by offline tools or migrated to appropriate external systems for further analysis.



RMD Replay Functions

RELATED PRODUCTS

RRR (Radar Recording and Replay System) and R2D2 (Recording & Replay of Digital Data) are products from our surveillance data recording product line. While RRR was designed for archiving, retrieval and replay of large amounts of any kind of sensor or track data, R2D2 is its web-based counterpart that permits integrated recording of surveillance data and audio information.



R2D2®

Both systems provide their users with powerful and highly sophisticated recording and replay functions. If clustered with RMD the process of recording can be monitored concurrently. If applied as back-end to our recording platforms, RMD can be a fast and user-friendly data replay device, which is easily set up in order to prepare recording sessions in real environments.

SCALABILITY

Most modern, sophisticated ATC infrastructures incorporate a multitude of logical data channels to convey surveillance-related data between different stages of processing. In such environments RMD can be easily integrated with a few software and hardware adaptors.

For this purpose, RMD can be equipped with a number of 'communication units' located at distinct places in the environment. By connecting these units, all services can be made available to any connected RMD console in the network, regardless of its purpose.

Furthermore, each RMD console shares a common environment set-up database, allowing them to access identical data streams. User preferences can be set and adjustments can be made on each RMD console individually.

CUSTOMISATION & REFERENCES

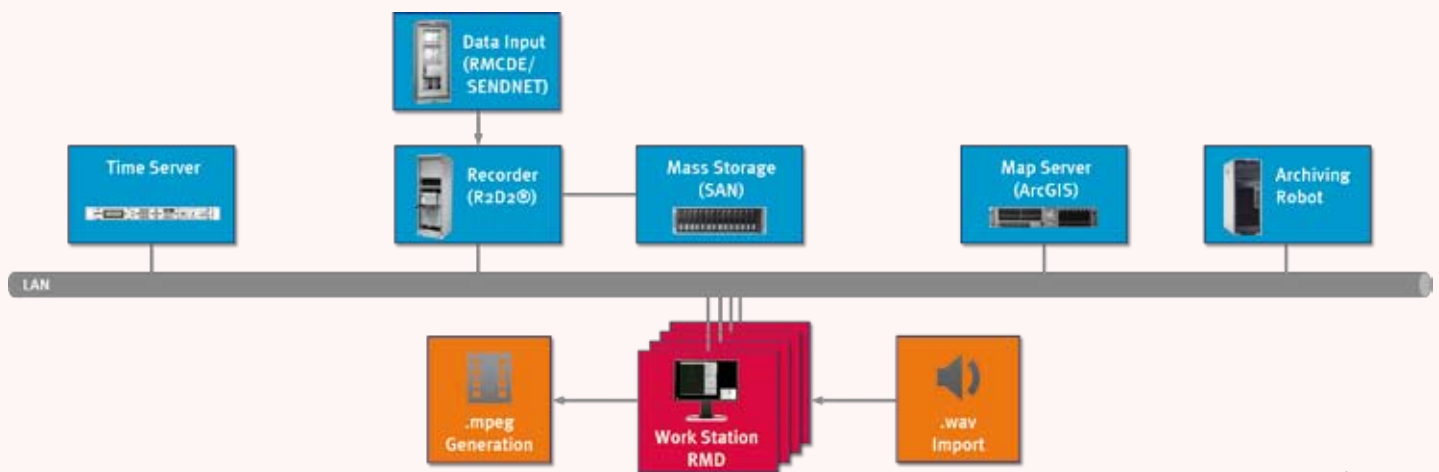
COMSOFT has built up a reputation with tailoring sophisticated solutions for its sophisticated customers. Particularly military administrations with their unique requirements, e.g. with respect to identification and documentation of movements in restricted air spaces, appreciate the flexibility of our systems.

Our capability to tailor unique solutions, including the inherent profiling and customisation of the standard modules, is a valued asset of our experienced engineering staff. This optional support service is rendered expeditiously and makes best use of the systems' off-the-shelf building blocks.

RADAR ANALYSIS & DEBRIEFING SYSTEM (RADS)

FMV of Sweden received a powerful solution for the recording and analysis of surveillance data primarily originating from the Swedish SENDNET. The HMI to this sophisticated infrastructure, split onto several systems at four locations, was realised by COMSOFT's RMD. Just like any other country, Sweden had its own requirements regarding customisation and extension of existing standard modules. An ad-on for the manual or automatic creation of tracks was implemented. Furthermore,

FMV's solution supports the integration of audio files, enabling the creation of movie sequences incorporating an arbitrary number of radar sources and corresponding audio information. Available background maps are either on vector or alternatively on raster basis including a scalable transparency factor. The system also includes an extended forward and backward replay mode for recorded data.



RADS Architecture

CENTRAL DATABASE FOR MILITARY FLIGHT OPERATIONS

German: Zentrale Datenbank für den militärischen Flugbetrieb (ZDmF)

The German Air Force introduced a central database for the collection and analysis of flight operations covering their air space under control. While this database permanently produces a picture of the current air situation its underlying surveillance data is recorded and can be retrieved for subsequent analysis. Therefore, RMD was selected as display and monitoring component for any processed radar data. A versatile set of tools supports the thorough and fine-grained analysis of

incidents in daily flight operations. Particular emphasis was put on the system's capability to represent radar data in a statistical manner in dedicated time frames. Moreover, the selectability of an arbitrary number of sensors enabling multichannel display were of major importance in this project. With a customer setting great value on individually tailorable filter options for radar data visualisation, RMD turned out to be the perfect solution for their needs.



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