RAPS-II

Recording, Analysis, Playback & Simulation System for Surveillance Data

RAPS-II is a powerful and versatile toolset for the testing, analysis and validation of surveillance data. It is the world's first officially qualified Reference Product for the emerging ASTERIX standard.

RAPS-II allows the multi-channel recording and playback of a wide range of radar formats and protocols. It provides highly sophisticated and flexible functions for filtering, format-sensitive analysis, visualization and test data generation. Ease-of-use is enhanced by means of a fully graphical user interface.

RAPS-II caters for a wide range of application areas including monitoring, quality analysis and trouble shooting in control centers or at radar sites. RAPS-II has also proven many times that it is an indispensable tool for integration testing and acceptance testing of surveillance products.

Recently RAPS-II successfully underwent a EUROCONTROL qualification process for recognition as an ASTERIX Test Tool and Reference Product.

Highlights

- Powerful ATC test equipment on portable PC

- World-wide only officially qualified ASTERIX Reference System and Test Tool

- Wide range of supported radar data formats and protocols

- Powerful data analysis, validation and visualization functions

- Online and offline filtering based on user-define rules

- ASTERIX editor and test data simulator

- Modular design and high adaptability of hardware and software

RECORDING & REPLAY

- Independent recording and playback of multiple radar data streams
- Rich set of communication adapters for serial lines and LANs
- Online monitoring of radar lines (modem signals, throughput, data integrity, ...)
- Playback in real-time mode or at user-defined speed
- Database with large repository of default protocol parameter configurations
- Large number of changeable protocol parameters for non-standard communication partners and special test cases
- Protocol-specific diagnostics functions
- Flexible user-definable start and stop conditions
- Long-term recording on removable media
- Optional UTC precision time-stamping (DCF 77 or GPS)

DATA ANALYSIS

- Format-specific analysis and generation of easy-to-read textual listings from raw radar data
- Various user-definable layout options
- Format and protocol validation
- Reporting of encoding rule and format violations
- Warnings for non-compliance to standard
- Generation of statistical reports
- Radar data browser with search facilities

DATA FORWARDER

- Online protocol conversion from input to output lines (e.g. serial HDLC/LAPB to LAN TCP/IP)
- Optional online filtering and user-defined data transformation
- Online merging and splitting of multiple radar data lines

FILTERING & DATA TRANSFORMATION FEATURES

- Off-line and online mode
- Flexible user-defined rules for data filtering and transformation
- Complex conditions on logical format level
- Geographical, height, type and other value-dependent filtering

RADAR DATA DISPLAY

- Graphical visualization of recorded or online data (radar data display)
- Dual channel display with overlay mode
- Online correlation of multiple radar data sources
- Zooming, centering, label adjustment, ...
- Live analysis of selected input data
- Extended trail history for selected targets

RADAR DATA EDITOR

- Format-sensitive data composition and display
- Manual generation of artificial radar data messages down to lowest format levels
- Editing of previous recordings or artificially created data
- Syntactical and semantical checks
- Efficient generation of test data suites for acceptance testing

RADAR DATA SIMULATOR

- Artificial data streams based on user-defined input
- Generation of fixed targets, monitoring messages, status, etc.
- Generation of load profiles for system testing
- Generation of systematically modified real data
- Generation of erroneous messages and test sequences
- Data stream simulations of radar sensors and trackers
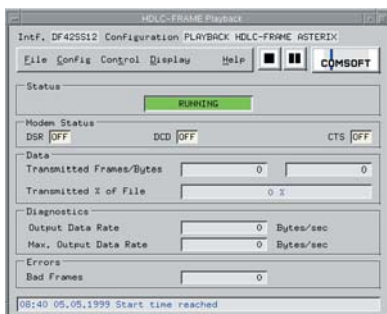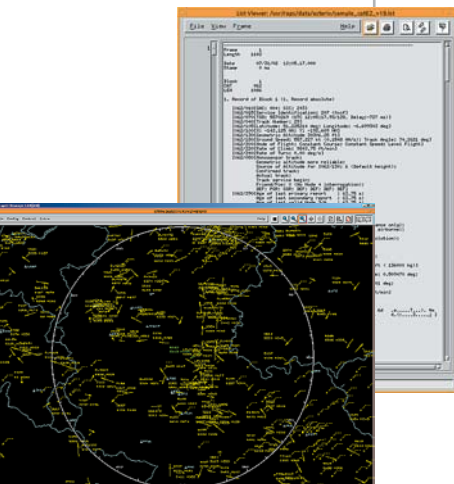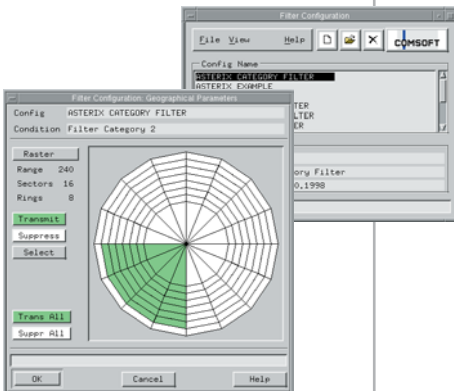
Asterix Test Tool & Reference Product

The ASTERIX radar data format (All-Purpose Structured Eurocontrol Radar Information Exchange), in the past years continuously refined and extended, is currently on the verge of being adopted as a world-wide surveillance data standard. In 1989, COMSOFT, on behalf of EUROCONTROL was the first company to implement ASTERIX. Today COMSOFT is again breaking new ground with the world-wide first qualified ASTERIX reference and test tool.

Asterix Certification

The RAPS-II analysis functions allow an independent party to certify an ASTERIX implementation against the official standard. For this purpose the RAPS-II generates, e.g. reports identifying format and protocol violations, as well as corresponding statistics over a data stream.

RAPS-II's powerful set of tools for ASTERIX analysis, processing, visualization and data simulation, are each especially aligned to the new format.

The tools provide a comprehensive workbench for all tasks related to the practical use of ASTERIX during testing, acceptance or maintenance of any state-of-the-art surveillance product.

Support for all Existing Asterix Categories

RAPS-II fully supports all currently standardized ASTERIX radar data categories. Further, for all categories on the way to standardization, RAPS-II provides support based on the latest official working drafts. COMSOFT is closely monitoring the standardization process, and provides upgrades to newer versions of the ASTERIX standard as soon as they are available. Supported ASTERIX categories include: 0, 1, 2, 3, 4, 8, 9, 10, 11, 16, 17, 18, 21, 30, 31, 32, 34, 48, 62, 63, 65, 252, 253 and various dialects.

Support for new Categories & Uaps

RAPS-II allows a sufficiently authorized user to define new ASTERIX categories as well as User Application Profiles (UAPs) according to the specific requirements of an application. The definition is provided as an ASCII descriptor file and is automatically transformed for runtime execution. This provides the user with full flexibility for ASTERIX adaptations and test beds.

Long Years of Asterix Experience

COMSOFT has continuously refined and upgraded RAPS-II since the first ASTERIX implementation in 1989, when the early ancestor of this product, was developed. Being as close to the official standard as possible, it has during the past 10 years helped aviation authorities and industry partners to align and test their ASTERIX implementations. With its recognition as official ASTERIX Reference Product, RAPS-II will in the future further contribute to a smooth interoperability between surveillance systems.

Eurocontrol Qualification:

Raps-ii is Official Asterix Reference Product & Test Tool

COMSOFT's RAPS-II is the first product on the market that underwent a EUROCONTROL qualification process to assess its eligibility as ASTERIX Test Tool and Reference Product. The qualification took place initially in 1998 and was renewed in 2003 for all new ASTERIX formats.

The qualification process involved extensive testing of the equipment by independent accredited test laboratories, quality auditing and submission of comprehensive qualification evidence to a jury. The jury was composed of EUROCONTROL officials, member state representatives and representatives of the ASTERIX standardization committee as well as industry delegates.

The official jury passed RAPS-II, attesting that the product satisfies the EUROCONTROL technical and non-technical requirements for an ASTERIX Test Tool and Reference Product.

As part of this, RAPS-II demonstrated its eligibility to be used for evaluation and certification of arbitrary ASTERIX implementations against the standard.

TECHNICAL DATA

Platform	Portable Intel PC (Standard or Premium Version) - Pentium IV CPU, 3 GHz - 512 MByte main memory - 120 GByte integrated hard disk - 2 Gbyte removable hard disk - Standard keyboard and mouse or trackball - USB support for external devices - CD/DVD burner
Display	- 1024 x 768 TFT color display; 14,1" - External VGA
System Software	- UNIX SVR 4.2, X Windows and OSF/Motif - LINUX (Red Hat)
Communication Interfaces	- 2 to 10 serial interfaces, V.24 or V.11 - 100 MBit/s FDDI or CDDI interface - 10 Mbit/s Ethernet interface with 10base5, 10base2 or 10baseT - 100 Mbit/s Fast Ethernet - 1000 Mbit/s Gigabit Ethernet
Time System	- Network Time Protocol (NTP) - GPS - DCF77

Recording Format	- RFF format
	- General recording format for COMSOFT
	  products, facilitating fast exchange for
	  further processing of data

FORMATS & PROTOCOLS

Data Format	Protocol
ASTERIX	X.25, HDLC LAPB, HDLC Frame Level, LLC1, TP4, TCP/IP, UDP/IP
AIRCAT	Byte Sync, Async
CAA	Sync (12-bit Field)
CD2 (all major dialects, including CD-1, CD2, CD-2, ARSR-3, ARSR-4, ASR-9, STARS, SCIP)	Sync (12-bit Field)
NAVAIR	Sync (12-bit Field)
EURO	Byte Sync
F200	Sync (10 bit Field)
FPL	Async
GAF	Async
LR	Sync (12-bit Field)
MSSR	LLC1, TCP/IP, TPU, UDP/IP
NAV1	HDLC LAPB, HDLC Frame Level
RDE	Byte Sync
RDIF	X.25, HDLC LAPB, HDLC Frame Level
RLD,SVE	Byte Sync
RRP	Byte Sync
SR	Sync (12-bit Field)
Transparent	Format/protocol-independent mode
UZJ	HDLC Frame Level

Other user-specific protocols and formats on demand

COMSOFT i-IV