

RAPS-3 & MILRAPS

SURVEILLANCE DATA SERVICE, SUPPORT, TEST & EVALUATION SYSTEM

HIGHLIGHTS

- Versatile and flexible toolset for ATC environments and manufacturers
- EUROCONTROL qualified reference product for the ASTERIX standard
- Support of military ASTERIX defined by NATO
- User-definable or preset test and evaluation suites
- Remote control via command line and shell scripts for automated testing
- Multiple user environments
- Open, modular, XML-based architecture and configuration
- Easy data exchange with various 3rd party tools
- Experienced support team with wide service portfolio

COMSOFT





The RAPS product is a powerful and versatile toolset for testing, analysis, validation as well as generation of surveillance data. It is the world's first officially qualified ASTERIX reference tool utilised around the globe. The system enables recording, replay and multichannel communication of a wide range of formats and protocols.



It provides highly sophisticated and flexible functions for filtering, format-sensitive evaluation, visualisation, transformation of data and the generation of test data. A fully graphical user interface facilitates its use.

The RAPS system offers multifaceted cases of application: it is commonly used by manufactures as reference and test tool, by air navigation service providers in control centres or at radar sites for monitoring, trouble shooting or analysing any kind of surveillance information. RAPS has further become indispensable in critical situations such as integrating new systems into an existing environment or tracing and diagnosing problems occurring during acceptance tests.

Finally, RAPS is increasingly popular within the ATC community for error diagnostics on operationally running systems or test environments. With the addition of MILRAPS in 2011 the field of application for this well-accepted analysis tool has even widened addressing our military customer's needs. This unique derivate designed and developed for the requirements of the armed forces is available on two platforms – the Compact or the all new 3xD version with three unfolding LCD displays.

In order to cope with the increasing demands in the surveillance domain and to guarantee customer comfort and satisfaction, the implementation of new features and improvement of usability and performance of the application are among our highest priorities.

RAPS-3 in the standard configuration is used by many customers worldwide, however it can also be provided in a user-specific customised configuration.

Aside from delivering the tool, a highly experienced and motivated Surveillance Support Team is able to provide any kind of assistance in resolving on-site problems in the ATC environment, such as trouble shooting, acceptance and conformity testing. A large number of support services, training courses and customized workshops give the customer the opportunity to learn and benefit from COMSOFT's long experience in the ATC domain.

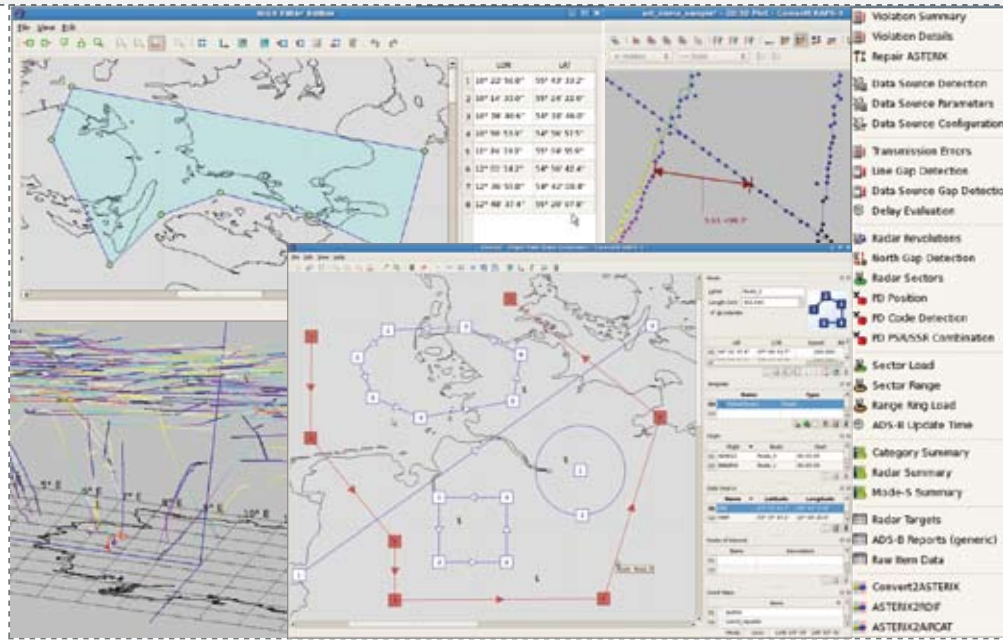
NEW FEATURES

- Latest EUROCONTROL ASTERIX Standard supported (www.eurocontrol.int/asterix) including Reserved Expansion Field Interpretation and Non-Standard Data Field Decoding
- Mode-S MB Data Decoding and Encoding
- Military RAPS version (MILRAPS) supporting NATO-defined ASTERIX (STANAG5535)
- Large number of new automated test and analysis suites
- Graphical Target Extractor
- Report Template Editor
- Weather Data Display
- 3xD hardware platform



2D3D PLOT

- Static presentation of air traffic situation (eg. Test flights, critical situations)
- Detailed target information for recorded or imported data
- Access to complete ASTERIX and raw byte information
- Colour modes based on time, height, speed and user-criteria
- Distance measurements
- Two and three-dimensional presentation
- Export of views to various formats



SURVEILLANCE DATA EDITOR

ASTERIX Format/Version Editor

- Modification of ASTERIX category definitions and easy creation of new user-specific categories or versions (e. g. military or site-specific)
- Environment for generation and testing of complete new ASTERIX application sets

ASTERIX Surveillance Data Editor

- ASTERIX-sensitive data composition and display
- Manual generation of artificial surveillance data messages from ASTERIX Data field down to byte level
- Encoding of ASTERIX based on chosen ASTERIX Version
- Simultaneous presentation of the edited data
- Automatic repair of corrupted data files
- Editing of recorded, artificially created or imported surveillance data
- Efficient generation of test data suites for acceptance testing

FLIGHT EXTRACTOR

- Extraction of targets from graphical display
- Target selection by brush, fence, polygon or tracking rules
- Extracted data can be used for further analysis, real-time replay, simulation

SIMULATOR

- Artificial data streams based on user-defined input
- Generation of fixed target, monitoring messages, status etc.
- load profiles for system testing
- systematically modified real data
- erroneous messages and test sequences
- Generated ASTERIX Data can be converted into other formats

FLIGHT PATH DATA GENERATOR

- Data stream simulations of radar sensors and trackers
- Generation of target reports, plots and service messages for standard or user-defined (military) ASTERIX categories (e. g. radar, ADS-B, Mode S, MLAT)

- Conversion of generated data into non-ASTERIX formats
- Manual modification of generated data by using ASTERIX editor
- Simulation of error characteristics created by surveillance sensors (range bias, range gain, range accuracy, azimuth bias, azimuth accuracy)
- Definition of flights
- Graphical user-friendly HMI for generation of flights in predefined geographical areas
- Circular flight patterns
- Sequence of waypoints
- Flexible scenario generation in XML (flight generation rules)
- Target template editor

DATA CONVERSION

- Tailored for the use in test and pre-operational ATC environments
- Translation of different user-defined ASTERIX versions
- Quick conversion of ASTERIX data streams into legacy formats and vice versa

MILRAPS

MILRAPS has been developed to explicitly cater for the needs and requirements of armed forces. Just like the existing platforms, MILRAPS is a mobile analysis and test equipment but with the focus on supporting specific classified ASTERIX versions or the emerging military ASTERIX standard as defined by NATO.

A specific user-development environment allows for definition, implementation and testing of classified or user-specific ASTERIX categories. The specialised tool is available on two hardware platforms: the Compact or the new ruggedized 3xD alternative.

MILRAPS operates as universal converter between civil and military categories:

- Offline and real-time format translation from EUROCONTROL-defined ASTERIX Categories (1, 20, 21, 48, 62) into NATO Categories
- Conversion of military data into civil ASTERIX data to allow analysis of military targets with civil third party tools
- User-configurable Data Field Manipulation by injection and/or removing confidential information

MILITARY ASTERIX DATA GENERATION

- ASTERIX Editor for air surveillance and ground-based sensor data
- Target template-based generation of flights using NATO and classified categories

MILITARY DATA DISPLAY – SPECIAL FEATURES

- Multilevel, user-defined overlays and grids
- Customisable track/plot history
- 3D visualisation
- Multiple symbol sets (NTDS, MCE, MS-2525+subsets, MS-1477C, Icon-based, etc.)
- User-definable alerts
- Group selection support
- Configurable toolbars
- Numerous interactive queries and decision aids (bearing, position, distance, compass rose, etc.)
- Graphing and analysis utilities
- Extensive filtering capabilities
- WGS-84 Earth Model, various projections
- MAP Formats e.g. NITF, CIB, ADRG, CADRG, VPF, DAFIF, DTED



MILRAPS on 3xD platform



TECHNICAL DATA



RAPS-3 Classic with interfaces



RAPS-3 Compact with external interface module box

Platform – Classic (portable PC)

Intel® Core™2 Quad 2,83 GHz
Internal memory 4 GB
2 x 320 GB removable hard disks
10 serial interfaces and 6 Gigabit LAN interface on-board
15,4" TFT display
8,5 kg

Platform – Compact (ruggedised portable PC)

Certified rugged body

- Resistant to dust, drop, vibration and demolition
- Salt fog compliance (optional)
- Certified to UL1604 Class 1, Division 2, Group A/B/C/D (optional)

Shock-protected removable HDD
MIL-STD810G certified
MIL-STD461F certified (optional)
IP65 compliant
Intel® Core™2 Duo 64 Bit 1,5 GHz
Internal memory 4 GB
166 GB removable HDD
Up to 32 serial interfaces and 2 Gigabit LAN interfaces on-board
15" SXGA+ display
4,4 kg

Platform – 3xD (ruggedised portable COTS solution)

Intel® Core™2 Quad Q9450 (high performance graphic platform)
Up to 3TB removable storage capacity with on-board RAID
10 serial interfaces and 4 Gigabit LAN interfaces
Triple 17" SXGA LCD display (3840*1024 resolution)
29,5 kg

Operating System

Linux Red Hat

HMI

Fully graphical, user-configurable, plug-in feature for 3rd party products

ASTERIX

Supported categories: EUROCONTROL Standard, NATO STANAG5535
Multi-version support
Current & previous versions, dialects and customised
User-defined versions

Other Data Formats

AIRCAT, Alenia, CAA, CD2 (all major dialects including CD-1, CD2, CD-2, ARSR-3, ARSR-4, ASR-9, FPS-117, STARS, SCIP), NAVAIR, EURO, F200, FPL, GAF, HADR, RRP, LR, MADREC, MSSR, NAV1, NMEA-GPS, RDE, RDIF, RLD, SVE, SR, Transparent, UZJ

Protocols

HDLC LAP-B, HDLC Frame Level, Async, AIRCAT, CD2, LLC1, TCP/IP, UDP/IP, IPv6, further protocols and formats on request

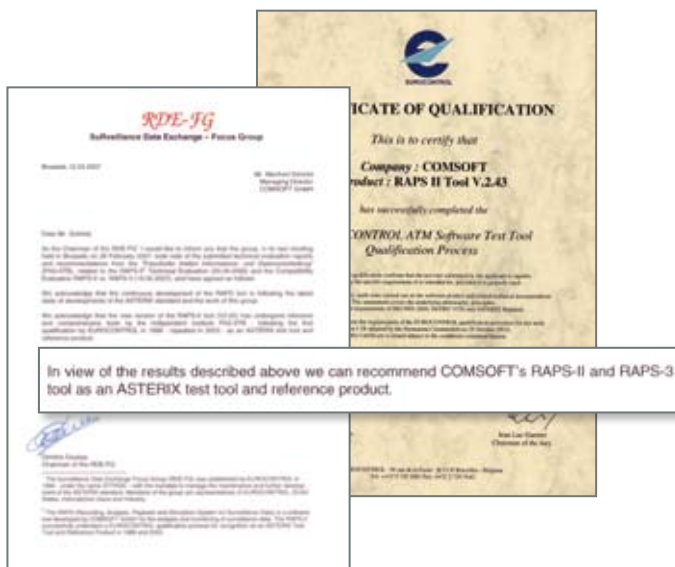
Time Synchronisation

GPS, DCF-77, NTP

ASTERIX CATEGORY SUPPORT

RAPS supports all currently existing standardised ASTERIX categories and also allows the operator to choose among different ASTERIX versions. Moreover, its progressive processor is capable of converting all earlier versions backwards. COMSOFT is closely monitoring the standardisation process and provides upgrades to forthcoming versions of the ASTERIX standard as soon as they are available.

Additionally, the user can define new, work-case dependent ASTERIX categories as well as user application profiles (UAP) according to the specific requirements of an application. Surveillance data - recorded, artificial or imported - can be edited on byte level or on ASTERIX item level.



Recommendations & Certificates

ASTERIX EXPERIENCE

COMSOFT has continuously refined and upgraded the RAPS technology since the first implementation of ASTERIX in 1989. Ever since, the RAPS product benefits from COMSOFT's long-time and further growing expertise in the field of surveillance data testing and helps civil and military aviation authorities as well as manufactures to align and test their ASTERIX implementations.

Qualification certificates issued by various organisations endorse the trustworthiness of the product. EUROCONTROL and a recognised German research organisation evaluated the product and certified RAPS as recommended ASTERIX test tool and reference product.

ASTERIX (EUROCONTROL)

Implementation of previous versions available on user request

CAT 000 MAS-S/GD_0026_03
CAT 001 SUR.ET1.ST05.2000-STD-02a-01
CAT 002 SUR.ET1.ST05.2000-STD-02b-01
CAT 003 MAS-S/GD_0026_03
CAT 004 SUR.ET1.ST05.2000-STD-17-02
CAT 007 SUR.ET1.ST05.2000-STD-21-01
CAT 008 SUR.ET1.ST05.2000-STD-03-01
CAT 009 MAS-S/GD_0026_03
CAT 010 SUR.ET1.ST05.2000-STD-07-01
CAT 011 SUR.ET1.ST05.2000-STD-08-01
CAT 017 SUR.ET2.ST03.3111-SPC-02-0
CAT 018 SUR.ET2.ST03.3112-SPC-01-00
CAT 019 SUR.ET1.ST05.2000-STD-18-02
CAT 020 SUR.ET1.ST05.2000-STD-14-02
CAT 020 Appendix A "RE-Field"
CAT 021 SUR.ET1.ST05.2000-STD-12-01
CAT 022 SUR.ET1.ST05.2000-STD-13-01
CAT 023 SUR.ET1.ST05.2000-STD-16-01
CAT 030 DIS/SUR/ARTAS.ASTX.015
CAT 031 DIS/SUR/ARTAS.ASTX.015
CAT 032 DIS/SUR/ARTAS.ASTX.015
CAT 034 SUR.ET1.ST05.2000-STD-02b-01
CAT 048 SUR.ET1.ST05.2000-STD-04-01
CAT 061 SUR.ET1.ST05.2000-STD-11-01
CAT 062 SUR.ET1.ST05.2000-STD-09-01
CAT 063 SUR.ET1.ST05.2000-STD-10-01
CAT 065 SUR.ET1.ST05.2000-STD-15-01
CAT 128 Exchange of C3I messages
CAT 150 TE1.DED.MIDD.OIF.030
CAT 151 TE1.DED.MIDD.OIF.030
CAT 152 TE1.DED.MIDD.OIF.030
CAT 153 TE1.DED.MIDD.OIF.030
CAT 221 AWA-SSD-V1.5
CAT 244 DIS/SUR/SASS-C/DOC/00303.0.4
CAT 252 DIS/SUR/ARTAS.ASTX.015

ASTERIX (NATO)

supported military Categories:

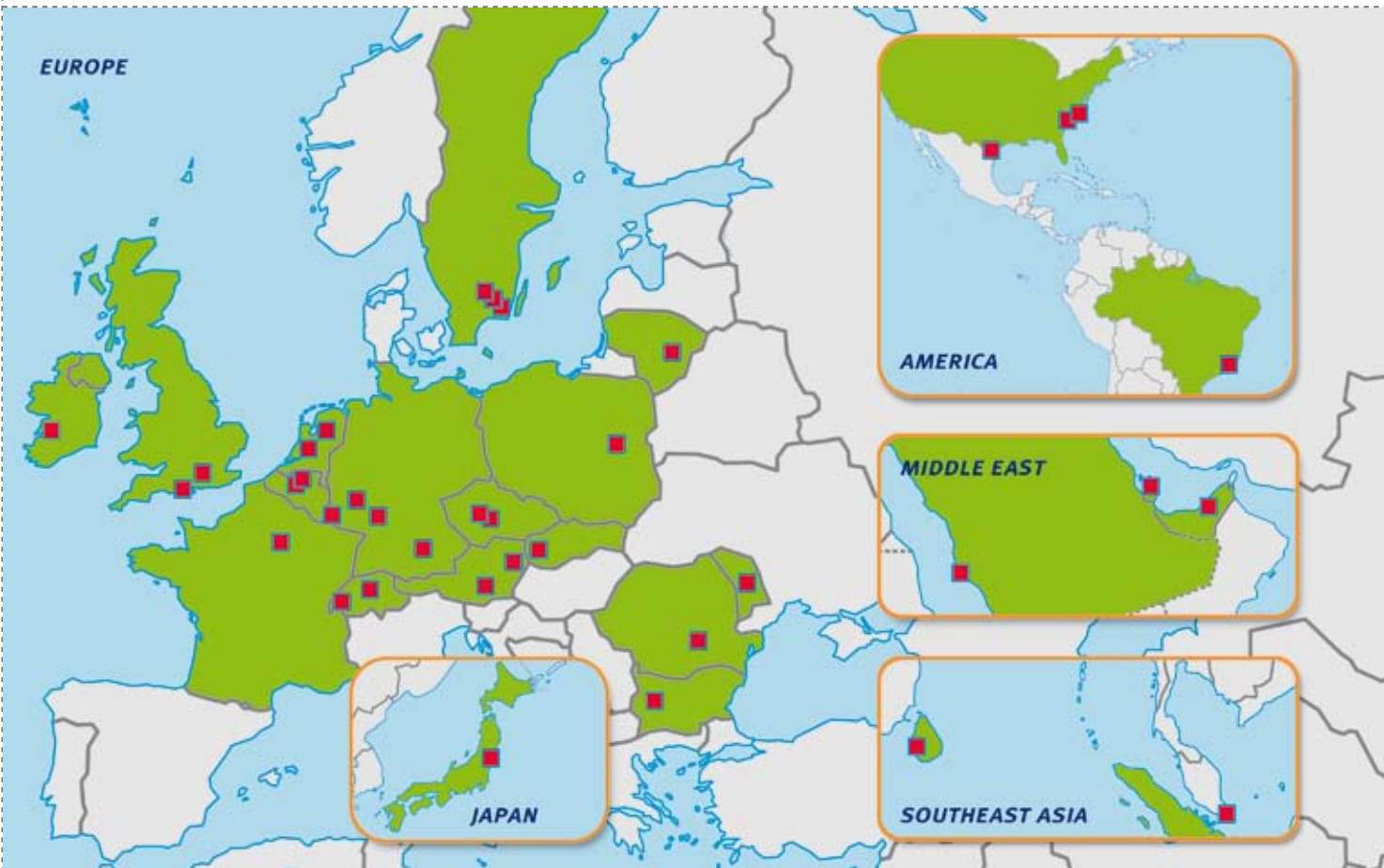
CAT 155 Layouts of Sensor Monitoring Data
ADatP-35 part II
CAT 156 Layout of Radar Controls
ADatP-35 part III
CAT 157 Layout of Services Data Exchange
ADatP-35 part IV
CAT 158 Layout of Strobe Reports
ADatP-35 part V
CAT 159 Layout of Target Reports
ADatP-35 part VI
CAT 160 Layout of Passive Sensors Controls
ADatP-35 part VII
CAT 161 Layout of Surveillance System Exchange Data
CAT 200 Layout of SDF Object
ADatP-35 part VIII



RAPS has been sold to numerous customers around the globe with diverse fields of application. ATC centres generally use RAPS as measurement and analysis system, manufacturers appreciate the system as independent reference system for acceptance testing of various

systems and applications. Military customers prefer generating and analysing data. More than 100 systems are currently in operational use in various test and evaluation scenarios supporting each individual user at mastering his own challenge.

	Austrocontrol, AAF – Austria		Moldatsa – Moldova
	Belgocontrol – Belgium		RNLAF – The Netherlands
	Eurocontrol – Belgium		PANSA – Poland
	DECEA – Brasil		QCAA – Qatar
	DG CAA – Bulgaria		Romatsa – Romania
	ANS, ERA – Czech Republic		GACA – Saudi Arabia
	Eurocontrol, Thales – France		CAAS – Singapore
	NATS – Great Britain		LPS SR – Slovak Republic
	DFS, GAF, EADS – Germany		CAA – Sri Lanka
	STPI, ATPK – Indonesia		LFV, FMV, Saab – Sweden
	IAA – Ireland		Skyguide, Armasuisse – Switzerland
	NEC – Japan		GCAA, ADAC – Abu Dhabi, UAE
	Oro Navigacija – Lithuania		General Dynamics, Raytheon Solipsys – USA
	AAL – Luxembourg		



SURVEILLANCE SUPPORT SERVICES

Service /	Content / General Overview
Operational Assistance	
Engineering Support	<p>On site assistance from support engineer with fully equipped RAPS-3 tool for any scenario.</p>
	<p>Various services related to the operation of a RAPS-3 system in any given application context.</p>
Pre Sales Support	<ul style="list-style-type: none">▪ Assistance for future RAPS customers in selecting the proper hardware and software modules for their particular environment or field of application▪ Assistance during the implementation of new use-cases▪ Product or feature presentations can be arranged at COMSOFT or at customer's site
After Sales Support	<ul style="list-style-type: none">▪ On demand support for troubleshooting, system handling procedures and application context▪ Extended service hotline & express e-mail support▪ Software upgrades
General RAPS Services	
Documentation	<p>Documentation tailored to the individual range of deliverables:</p> <ul style="list-style-type: none">▪ Hardware platform (Classic/Compact), components (physical interfaces), accessories (cabling adapters)▪ Software packages/features▪ Formats▪ Protocols
Warranty	<ul style="list-style-type: none">▪ General warranty of 12 months for all software and hardware components
Other	
Training	<ul style="list-style-type: none">▪ Individually tailored training courses according to respective experience level▪ The standard training course introduces the system and its functionality and is complemented by practical exercises and workshops
Equipment Rental	<ul style="list-style-type: none">▪ RAPS-3 hardware and components can be rented
Service Database	<ul style="list-style-type: none">▪ Comfortable online access to considerable support and service database containing and administrating user questions, trouble reports and corresponding solutions and improvement proposals▪ confidential content management▪ Notification option for changes and considerable trouble reports

Details / Additional Information	Target Group
Scenarios may be: <ul style="list-style-type: none"> ▪ troubleshooting ▪ simulations ▪ configurations ▪ generation of templates, filters, categories 	any surveillance data processing customer
Application may be: <ul style="list-style-type: none"> ▪ analysis/processing of surveillance data ▪ conformity testing of ASTERIX implementations ▪ search and handle surveillance data distribution and processing problems ▪ surveillance data quality analysis- generation of test environments, automated test scenarios and data samples ▪ generation of evaluation reports with recommendations for problem solutions 	RAPS customer
Also refer to Engineering Support	RAPS customer
	any surveillance data processing customer
	RAPS customer
Documentation consists of: <ul style="list-style-type: none"> ▪ Quick-Start Guide ▪ Operator’s Manual ▪ Administrator’s Manual ▪ Trainings Documentation ▪ Product Presentation ▪ Product Catalog ▪ Product Flyer 	RAPS customer
<ul style="list-style-type: none"> ▪ Warranty extendable by support contract 	RAPS customer
Training levels: <ul style="list-style-type: none"> ▪ Beginner training for new customers ▪ Refresh training for RAPS user ▪ Workshops for experienced power user 	RAPS customer
<ul style="list-style-type: none"> ▪ In case of a resulting purchase the rental fee will be subtracted from order amount 	non-RAPS customer
<ul style="list-style-type: none"> ▪ Future implementation 	RAPS customer



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