INTRODUCTION

COMPANY PROFILE

SERVICES

TURNKEY SOLUTION
Complex services over the whole lifecycle of ATC system delivery project.

SOLUTIONS

ALS
Comprehensive and Extremely Flexible ATM Solution.

RADAR VIEW
Precise information for ground handling staff.

RADAR DATA DISTRIBUTOR
System tool for secure surveillance data distribution.

MODULES

CSS SAFETY NETS
System module provides warning of safety hazards in air traffic.

ALS TRACKER
ALS system module for surveillance data processing and distribution.

CSS FDPS
System module for Flight data processing (FDP) and Aeronautical information system (AIS).

ALS CWS
ALS system Controller Working Position display module.

SIMULATOR

ATC SIMULATOR
Comprehensive simulator for ATCO training in region (ACC), approach (APP), airport (TWR).

TOOLS

VALIDATION TOOLS FOR ATC SYSTEMS
Validation tools for generating artificial air and ground targets.

COTOOL
Solution for creating surveillance data analysis tools.

PUBLIC RADAR
Surveillance information system.

IDS5
Unique and fully customizable solution for your operational needs.
"The aim of CS SOFT a.s. is to develop, market and maintain state of the art ATM systems combined with full service availability to every customer. Our knowledge and core competences are based upon more than two decades of professional aviation programming and implementation. Combined with products that were developed in cooperation with controllers, handling agencies, and emergency service units, we are now able to support your airport environmental needs as well."

Ivan Camrda, Vice-Chairman of the Board

COMPANY PROFILE

CS SOFT is a reliable supplier of ATM systems with more than 20 years of experience. In a matter of a few years, CS SOFT has evolved from a small Czech-based business pioneering in ATM software into a dynamic modern company with advanced software development methodology and project management. Our company has always strived to build a strong and stable team of highly skilled professionals and experts. Thanks to the cooperation with the top Czech technical universities (The Czech Technical University in Prague and the University of West Bohemia in Pilsen), we have established several research centers around the Czech Republic to help us constantly move forward. Throughout the years, we have also managed to attract a wide range of customers worldwide, the most significant of whom may be Air Navigation Services of the Czech Republic, Lithuanian Oro Navigacija, Slovenian Air Navigation Services and Civil Aviation Authority of the Philippines.

MAIN AREAS OF ACTIVITIES

Systems for Air Traffic Control
CS SOFT designs and develops systems for area control (ACC), approach services (APP), tower services (TWR) and flight information service (FIS). Processing of the flight plans data and surveillance data is essential for keeping view of the air traffic, flight trajectory computations, evaluation of conflicting trajectories, calculations and reporting procedures regulating operations with the coordinating partners.

Supporting systems for airports and ground services
CS SOFT also develops systems providing data exchange among particular segments of the airport and mutual communication between the air navigation services and the airport. The data are also used by various handling companies, or for airline dispatching operations and information passenger boards.

Industrial and IT monitoring
Besides major scope of activities, CS SOFT also develops industrial monitoring systems and their components for IT technologies and industry, particularly in power engineering and gas industry. The monitoring systems provide a unified and comprehensive display of operational and service centers.

CS SOFT PROVIDES

- Complete A/C Systems (ACC, APP, TWR)
- ATC system modules
- Systems for simulated training of A/C operators
- Consulting (Feasibility Studies, Safety Assessment)
- Project Management

CERTIFICATES

CS SOFT is certified by IQNet and CQS for processes of Software administration, Development, Design and Supply of Aeronautical Ground Facilities and A/M equipment maintenance.

CS SOFT is certified by Civil Aviation Authority of Czech Republic to design and develop Air Traffic management systems.

CS SOFT has achieved the level of Citec Silver Integrator for the year 2005.

### COMPANY MILESTONES

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>1988</td>
<td>Establishment of CS SOFT Company</td>
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<td>1990</td>
<td>Development of new FDPS</td>
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<tr>
<td>1992</td>
<td>CAA certificate allows development and design of ATM systems</td>
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<tr>
<td>1995</td>
<td>CS SOFT FDPS integration into Eurocat 2000 for ANS Czech Republic</td>
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<td>2006</td>
<td>CS SOFT expansion (takeover of the company RADAS s.r.o.)</td>
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<td>2009</td>
<td>Changeover of the company from Ltd. to Inc.</td>
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<td>2010</td>
<td>New development centers in Brno and Pilsen</td>
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<tr>
<td>2011</td>
<td>Foundation of the development center in Pardubice</td>
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<tr>
<td>2013</td>
<td>Initiation of cooperation with Systems Atlanta Inc.</td>
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### REFERENCES

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- FDP System Upgrade – Processing of Specific Military Flights (OAT) – Prague 2013
- PublicRadar Benešov – Benešov Airport 2012
- FDP System Upgrade – Prague 2012
- FDP System Upgrade – Prague 2011
- FDP System Upgrade – OLDS Implementation, Prague 2010-2011
- LP Gateway Upgrade – Prague 2011
- SIM TWR Upgrade – Prague 2011
- HIFI SIMU Upgrade – Prague 2010-2011
- Tracker Upgrade – Brno, Ostrava 2010
- JRadar – Prague 2010
- LP Gateway – Prague 2010
- ANS SIM TWR – Prague 2010
- FDP System Upgrade – Prague 2009-2010
- TR7 Simulator – Prague 2009
- TR7 System for Regional Airports 2009
- Safety Nets – Prague 2009
- Dual Tracker for Multilateration – Regional Airports 2009
- JRadar 2 – Prague 2009
- Tracker - SW unification of radar data for Military of the Czech Republic – Prague 2006
- ANS Gateway – Prague 2005 - 2006
- GW Radar – Prague 2005 - 2006
- FDE - Flight Data Exchange – Prague 2005
- TWR Aero Vodochody upgrade and AVION-X 2005
- MiniFPL – Prague 2004 - 2005
- E2000 upgrade - the participation with Thales – Prague 2004
- FIDS - Flight Information Display System Airport – Ostrava 2004
- TIS -Information System enabling the management of all ATM systems in CR – Prague 2003 - 2006
- JRadar – Prague 2003 – 2005
- SIMU HIFI upgrade – Prague 2003
- PSS Passive Surveillance System - signal processing – Ostrava 2002
- RDAPS – Prague 2001
- ATC HIFI integrated simulator – Prague 2000 - 2002
- FDPS simulator – Prague 2000
- REPA - SNMP monitoring system – Prague 2000
- Safety - Assessment of EUROCAT 2000 – Prague 2000
- AVION-X simulator – Karlovy Vary, Brno and Ostrava 2000
- ALS System – Karlovy Vary 1999
- TCMS - Monitoring and Control System – Prague 1998
- TWR RDP System – Aero Vodochody and LET Kunovice 1998
- ALS System – Brno a Ostrava 1996
- FDP System upgrades – Prague 1993 - 2000
- Advanced FDPS for ATC Units – Prague 1992
- Basic Flight Data Processing System – Prague 1988
- ALS System – Skopje 2001
- Interface of Macedonian System to RDP Comsoft – 1999
- TCMS - Monitoring and Control system – 1999
- Flight Data Processing System for ATC Units – Bratislava 1993
- FDP for ATC Units System upgrades – Bratislava 1993 - 1998
- FIDS Upgrade – Ras Al Khaimah 2013
- FID-GW System Implementation – Ras Al Khaimah 2010-2011
- Skyring ATM system - FDPS and RDPS – Ras Al Khaimah 2008
- Tracker - part of Skyring ATC system – Ras Al Khaimah 2008
- ALS System – Šeremetěvo, Moscow 2001
- ALS System – Seremetevo, Moscow 1997
- FPL 2012 – Kaunas 2012
- ALS 2.1 System Safety Nets implementation – 2009
- ALS 2.1 System - completion – Kaunas 2008
- ALS 2.1 System - new CWs stations, Radar data recorders – Kaunas 2007
- Server FDP/ASAI a contingency ACC RDP/ CWs – Vilnius 2006
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- TWR RDP System – Kaunas 2003
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- DataLink Integration (ADS-C, CPDLC) – Manila 2010
- ALS 2.1 System – Manila 2010
- Safety Nets – Manila 2010
- KAMI SYSCO implementation – Ljubljana 2009
- KAMI upgrade – Ljubljana 2008 - 2009
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#### SLOVAKIA
- PublicRadar – Žilina Airport 2012
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- FDP for ATC Units System upgrades – Bratislava 1993 - 1998

#### MACEDONIA
- Interface of Macedonian System to RDP Comsoft – 1999
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#### PHILIPPINES
- ALS 2.1 Upgrade – Manila 2011
- DataLink Integration (ADS-C, CPDLC) – Manila 2010
- ALS 2.1 System – Manila 2010
- Safety Nets – Manila 2010

#### SLOVENIA
- KAMI SYSCO implementation – Ljubljana 2009
- KAMI upgrade – Ljubljana 2008 - 2009

#### LITHUANIA
- FPL 2012 – Kaunas 2012
- ALS 2.1 System Safety Nets implementation – 2009
- ALS 2.1 System - completion – Kaunas 2008
- ALS 2.1 System - new CWs stations, Radar data recorders – Kaunas 2007
- Server FDP/ASAI a contingency ACC RDP/ CWs – Vilnius 2006
- AVION-X Simulator – Kaunas 2003
- TWR RDP System – Kaunas 2003

#### BANGLADESH
- ALS 2.1 System, HW and SW update - subdelivery for T-CZ, a.s. – 2013
- ALS 2.1 System - subdelivery for T-CZ, a.s. – 2008
TURNKEY SOLUTION

Complex services over the whole lifecycle of ATC system delivery project

Worried about handling such a big project as ATC system procurement is? Worried about finding all required components and services? Don’t worry!

We supply our customers with a complete ATC system project, including software and hardware, integration and installation services, console furniture system, as well as feasibility studies and safety assessment. The customer care continues even after the project completion in terms of a service level agreement. Our maintenance process is designed to satisfy the customers’ need for a quick recovery and adequate solution. We always help our customers to keep their systems running in order to ensure reliable and safe operations.

Feasibility studies, integration and project management

Besides ATM systems, CS SOFT can offer additional services that could help a customer avoid some frequent mistakes in the project stage, elaborating OCD and ORD, how the work on a product is progressing etc.

Therefore, CS SOFT offers support in:
• Project management to the maximum extent - PMP, risk management and change management
• Elaboration of Operational Concept Document (OCD)
• Justifying real customer needs – Operation Requirement Document (ORD)
• Taking over problem-solving with the system manufacturer
• SDD requirements validation
• Requirement traceability
• Testing documentation and reviews
• Testing itself, handling the observations and testing results
• Data Sets and system tuning
• Progressing towards FSO
• The integration of new ATMS into the existing

Interested in just a part of our services?

No problem. Choose any of our complementary services to help you with ATM system procurement.

CONSOLES

As a complement to ATC systems, CS SOFT also supplies console technical furniture. A top-class solution used for special purpose workplaces such as ATCO workplace, flight data operator desks and supervisor workplace. Thanks to the console system flexibility and modularity, it can be tailored for ACC, APP and TWR environment.

The console system offers:
• Modular, flexible and durable solution for reasonable price
• Maximum operating comfort & timeless design
• Convenient workplace ergonomics
• High stability and load capacity
• Increased durability of a desk
• Flexibility – console can be customized to suit any floor plan and environment
• Mounting systems allows to use a variety of monitors and flat panels
• Easy handling and maintenance special access to equipment and wiring area
• Effective cabling and rack system for mounting multiple equipment modules
ALS Air Traffic Control System
Comprehensive and Extremely Flexible ATM Solution

Deployment Flexibility
The system can be implemented for use in:
- En-route control (ACC)
- Approach (APP)
- Tower control (TWR)
The system may be also used as a Backup system to your already existing solution.

Inter-operation Flexibility
ALS’s open architecture and modularity enables seamless integration to your existing environment according to your interoperability requirements.
This makes future upgrades and enhancements easy to apply.

Customization Flexibility
ALS features a unique concept of parameterization, which makes this solution easily adaptable to your specific operating needs.
Team of ATC experts is ready to tailor the system with full respect to your local situation and habits with all the possible comfort for your AICOs.

CERTIFICATES

CS SOFT is certified by IQNet and COS for processes of Software administration, Development, Design and Supplies of Aeronautical Ground Facilities and ATM equipment maintenance.

CS SOFT is certified by Civil Aviation Authority of Czech Republic to design and develop Air Traffic Management Systems.

CS SOFT has achieved the level of CITECT SILVER INTEGRATOR for the year 2005.
**ALS - Air Traffic Control System**

**Comprehensive ATM solution**

Ready to cover your operating needs for TWR, APP and/or ACC instantly and completely. It consists of the following essential modules:

- SDPS
- Tracker
- FDPS
- Coupler
- CWS
- Consoles
- Strip presentation
- FDO positions
- Supervisor position
- Data Set module
- REC-Playback
- Monitoring and Control
- Safety Nets

**USER FEATURES**

**All data (radar and non-radar) accessible from both Controllers’ positions**

Both ATCOs – EC and PLC can access the same functionalities. This results in better substitutability and operational safety.

**Degradation resistant CWS**

CWS takes over a number of server functionalities, which makes CWS more independent. This allows CWS to operate also in case of server overload.

**Complex position information**

ALS provides a well-organized and visually distinctive display of position information of all types (flight plan, ADS-C, radar tracking). This feature steps forward to fully stripless system.

**Seamless Controller-Pilot and Controller-Controller communication**

Datalink CPDLC is integrated into ALS system and can be controlled by ATCO from CWS HMI. SYS-CO is offered as a part of OLDI.

**Wide range of non-radar data presentation options**

Presentation of non radar data kinds (paper, strips, glass, electronic) can be adjusted and customized according to your local settings. All electronic strip data are editable and ready to be shared.

**Safety Nets, Monitoring Aids and MTCD**

These warning modules are offered as an integral part of ALS with expert setting and fine-tuning assistance.

**Easy adjustments due to high level of parameterization**

ALS can be easily tailored to ATCO specific needs, such as HMI colors and control, e-strip layout, strip posting rules, Safety Nets etc.

**Billing and Statistics module**

Adjustable in accordance with your local billing rules.

**Data Security**

In case of CWS failure, key data and functions are available at Supervisor’s position.

**Record and replay feature**

ALS allows recording and replay all operational data including audio communication. Record can be used for the evaluation of emergency situation.

**SAFETY FEATURES**

**Software development strictly follows ISO/IEC 12207 normative**

**Functional Hazard Assessment is used as the basis for System design**

**PSSA is a component part of ALS product**

**HW redundancy and seamless switching**

ALS has been developed with regards to performance redundancy and full hardware redundancy. ALS switching feature guarantees uninterrupted system operation.

**Advanced CWS sectorization**

ALS operates with the feature of quick and safe sector redistribution in case of CWS outage. The sectors of any CWS can be seamlessly transferred to any other CWS.
TECHNICAL FEATURES

Open architecture
ALS’s open architecture allows tailor-made solutions which may be gradually developed and changed according to your operating needs.

Distributed system
ALS deploys distributed computing between the core and applied modules which makes the whole system more degradation resistant. For example, CWS takes over a number of server functionalities and consequently reduces the load of its operations.

Reliability and Robustness
High availability and reliability of the system is supported by hardware redundancy and quick software switching.

Customizable AIS module
All necessary data for Flight information service (AIS, MET, warning frequencies, etc.) can be displayed on a separate screen or in a window on CWS display (depending on custom settings).

Surveillance data flexibility
Module Tracker processes Radar, Passive radar and ADS-C data. The most accurate data available are chosen for position computing. In case of an absence of surveillance data (in areas with no radar coverage), the CWS screen displays Flight Plan Tracks computed by FDPS.

Easy setting of interoperability
Interoperability is defined in custom “Data Set” meaning it can be quickly adapted to local coordination adjusting and transfer conditions.

Sophisticated two-way AFTN module
The AFTN Daemon does not only process incoming AFTN messages, but enables you to compile and distribute all kinds of AFTN messages as well.

Comprehensive monitoring and control
The Monitoring module is an integral part of the whole system. It continuously generates the overview of the status and possible errors of individual ALS components. Early warnings enable to eliminate significant malfunctions.

OLDI complying with Eurocontrol standard
The module is an integral part of ALS and is adjustable to your local needs. It can be also deactivated.

Progressive 4D Trajectory Prediction
ALS features cutting-edge functionalities. 4D Trajectory Prediction is driven by advanced route extraction operating within AoI (Area of Interest). The ETO and altitude computation are enhanced by radar updating and the results are based on complex computing using the instant aircraft propulsive performance as one of the parameters. This results in exact altitude attitude prediction.

Datalink for uncovered areas
ALS is able to use Datalink functionalities (such as CPDLC and ADS-C) for oceanic sectors or areas without radar and radio coverage.
Let your ATM system grow together with your staff’s skills

Open ALS architecture allows to start out with a basic version and to add enhanced and special features as your staff grow.

Step-by-step functionality enhancement
As CS SOFT software is developed with a close co-operation with active ATCOs, we have gained a great experience with step-by-step system implementation. This approach allows us to start out with a basic version of ALS structure, and its subsequent enlargement takes place according to your changing operating needs and your staff’s experience growth.

Step-by-step implementation results in:
- Lower starting costs
- Faster staff’s training
- Always the latest software upgrades
- Easier transition period

CS SOFT complex services cover the whole project life cycle

We supply our customers with the full service of delivery, installing and guarantee maintenance. We offer as well the system integration of third party’s system parts, including the maintenance. Last but not least, we assist our customers with the professional experience and support in gaining all necessary legal safety certificates.

- Project management
- Feasibility studies
- Safety assessment
- Integration and migration
- Maintenance
- HW delivery (including consoles)

MAIN ALS REFERENCES

- **Philippines**
  - Civil Aviation Authority
  - Installation 2010
  - ACC

- **Lithuania**
  - Oro Navigacija
  - Installation 2007
  - APP, TWR, ACC

- **Russia**
  - RosAeronavigatsia
  - Installation 1997
  - APP, TWR

- **Czech Republic**
  - Air Navigation Services CR
  - Installation 1996
  - APP, TWR, ACC

- **Bangladesh**
  - Chittagong Airport
  - Installation 2008
  - APP, TWR

CS SOFT is central Europe based company established in 1988. Despite our growth, we keep many of the assets of a small organisation: flexibility, competitiveness and low overhead costs. This allows us to offer our products and services at reasonable prices.

„You are safe with us” means safety of our systems as well as safety of our business relationship. Our systems have always been developed in a close cooperation with regular ATCOs. We feel honoured to call our solutions „ATCO-friendly”.

COSTS SAVING FEATURES

- **Commercial off-the-shelf hardware**
  - ALS uses standard Hewlett Packard hardware components which are easily available at favorable prices worldwide.

- **Remote access maintenance**
  - Remote access allows service and upgrade installation to be done without the need of on-site supervision and additional service costs.

DELIVERY OPTIONS

Apart from standard sale, CS SOFT offers to arrange hire purchase with flexible deferred payment plan in cooperation with commercial banks.

- Time period varies from few months to several years. This solution can solve the budget constraints when purchasing new system.

COMPLEX SYSTEM INTEGRATION AND POST-IMPLEMENTATION GUIDANCE

The installation and the system integration with existing environment (VCCS, AFTN switch etc.) is an integral part of our services. We also offer post-implementation on-site guidance during fine-tuning of all systems and processes.

ATC SIMULATOR AS AN OPTION

Simulator is another CS SOFT product with the SDPS, FDPS and HMI functionalities, which are the same as ALS. A part of ATC Simu is Exercise preparation tool as well.
If you know that

Every Minute Counts

RADARVIEW
Precise information for ground handling staff

Aircraft handling is a matter of time and precision… Every minute costs money!
Are your current information about the aircraft you are in charge of precise enough?

Movement data are no longer precise and complete enough!

Each part of ground handling staff needs precise and up-to-date information about their aircraft position and status. „Movement“ based data are not precise any longer to stand the 21st century challenges.

Make use of RadarView
The best information precision, sophisticated prediction and data visualisation.
- Improve your management and coordination
- Reduce inefficient and error-prone voice communication
- Enhance your staff efficiency
- Save your operating costs
- Start Real Time Control of Human Resources
**RADAR VIEW DISPLAY EXAMPLE**

**LANDING**
- The current A/C location before landing and take-off
- Precise and updated time until landing
- The current apron before landing

**REPLAY**
- Radar situation replay
- Display of the airport and aprons
- Display of the A/C even when the responder is off

**DIVERSION**
- Division of the flight from its destination

**THE APRON DETAILS**
- Display of the airport a flight is diverted to
- Individual configuration and setting
- Ground times of airline’s aircraft
- De-icing aprons and the A/C order for de-icing
- TOBT times
- Responder-equipped devices (push back, follow me, etc.)

**MAIN FEATURES**

- **Precise aircraft position information**
  RadarView synthetizes data of all sources available and displays the most relevant aircraft position information. The user can display more simultaneous views of different areas and different zoom.

- **Widely customizable user interface**
  The radar data display may be adjusted according to your preference, needs and local standards. The system also allows displaying any other custom-defined data, as well as maps and plans (incl. 3D view) in the background.

- **Flexibility ad easy connection to your dispatching information systems**
  RadarView may be easily implemented into your current environment. RadarView provides position data for use by other systems and it also can display data of these systems.

- **Operational situation record, archive and replay**
  This feature provides source data for tracking events and future evaluation. This may be used for analysis, training, billing, or solving possible disagreement etc.

**SYSTEM AND TECHNICAL FEATURES**

- **Data export and statistics**
  The system offers a wide range of output data formats that can be easily used for statistical analysis and economic processing.

- **Advanced data security**
  The distributed data are encrypted and secured with advanced user authentication (hardware key).

- **Friendly Multi-license policy**
  Due to smart client-server performance distribution, RadarView is prepared to be used by any number of end user terminals with minimal hardware and software requirements.

- **Easy installation and maintenance**
  The system does not require powerful hardware or specific operating system. It is easy to install and maintain.

- **Operational situation record, archive and replay**
  This feature provides source data for tracking events and future evaluation. This may be used for analysis, training, billing, or solving possible disagreement etc.

- **System features modular client-server architecture with secure communication (authentication – RSA, encrypted radar data flow – AES)**

- **Client-side access through JAVA application or web browser**

- **Radar data support in Asterix format**

- **Eurocat 200/2000 map format support (easily possible to extend the support for other formats)**
RADARDATA DISTRIBUTOR

System tool for secure surveillance data distribution

Do you need to share sensitive surveillance data of your ATC system with your partners or clients? RadarData Distributor can help you to carry out this duty by providing a comprehensive distribution process (data sorting and filtration) and multistage data security.

MAIN FEATURES

Full control over the distributed data
The provider of the information gets a safe tool, which enables them to provide the recipient only with the information they necessarily need in the right format and time. This way, they are able to reduce the risk to a minimum of provided data abuse or damage (in connection with a suitable application - RadarView - restricts the end user’s access to the source data).

Archiving and processed data availability
The system offers access to archive of processed data for later use. It enables the provider/end-user to replay the stored information and to analyse it for internal use, for dealing with external users or for providing evidence to the authorities (e.g. the Civil Aviation Authority). Data may be stored from the input ports, the filter outputs, and the output ports.

Low costs of additional functionality development and adjustment
The modular architecture, which the system is built on, allows local adjustments in separate functional units without interfering into the other system parts. Thanks to this, further development of system SW features is safer and less complicated, thus cheaper. Moreover, the distributed modular architecture can increase the performance by simply allocating the system modules to additional servers.

Lowering operating cost
The unified system of information distribution to internal and external users reduces the costs of administration, operation, maintenance, and development. Connecting more RadarData Distributor systems in a network can create complex distribution schemes while retaining low fixed and operating costs. The system does not require any high performance HW.

TECHNICAL DETAILS

- Secured information distribution from the provider to the recipient (SafeComm – HW or SW encoding RSA/AES, IP filtration)
- Content-based selection of the provided information for individual recipients by means of a system of filters allows controlled access to the sensitive data. It is ensured that the recipients can only see the data they are supposed to see
- Output data transformation into a suitable format (transformation filters)
- A wide choice of pre-prepared application data formats with a possibility of completion (currently ASTERIX CAT 001, 008, 011, 020, 021, 048, 062, easy extension of any other data format)
- Integration and separation of data channels. Additional information may be attached, e.g. ETA update, apron number, etc.
- Distribution of unknown data formats is possible (without the filtration functionality)
- Data storage for later use (replay, analysis, statistics, as a delayed source, export, etc.)
- A wide choice of transport data protocols (UDP UC/BC/MC, TCP, TCP SafeComm) ensures the independence on the type of the data line
- Administration and management of output data channels and their recipients
- Dual solution (hot backup) for non-stop system operation
- Detailed view of distribution channels and system status provided by SNMP interface
- Modular solution enables performance distribution among a number of servers and easy system enhancement (transport protocols, application data formats, filters and transition filters)
CSS SAFETY NETS

System module provides warning of safety hazards in air traffic

CS SOFT ground based Safety Nets provides air traffic controllers with a prior warning about a possible disruption in air traffic safety.

Sophisticated algorithms of evaluation protect ATCOs against false warnings and do not increase their workload.

The system, due to its standardized interface, can be seamlessly integrated in any ATC system.

MAIN FEATURES

Flexible parametrisation of airspace
CSS Safety Nets may be parameterization for different parts of airspace. Thus it will ensure the optimal operation of Safety Nets even in complex environment with different characteristics and operation modes.

Seamless integration through standardized interfaces
Standardized interface of input and output information facilitates quick and smooth integration in any air traffic control system. In case of special integration requirements, CSS Safety Nets system features a concept of modular interfaces which allow connecting more systems according to the proprietary client’s needs.

Off-line support of Try & Decide parameterization
The system operators can immediately verify its behaviour within different parameterizations. This way simplifies and accelerates otherwise complicated system of parametrization and reduces level of uncertainty during changes in the system settings.

Eurocontrol specification compliance
The processes of parameterization for Safety Nets regions and the system configuration fully comply with Eurocontrol recommendations.

TECHNICAL DETAILS

• Comprehensive Ground Based Safety Nets solution covering STCA, MSAW (incl. APM/AFDA) and APW according to the issued Eurocontrol recommendations.
• Proved in operation Ground Based Safety Nets features CLAM, WTSA, RAMLD/RAMHD implementation developed by CS SOFT a.s.
• The system is able to recognize hazard situations based not only on surveillance information, but for even better results it can use flight plan information, meteorological data or input data from the air traffic controller (if available).
• Standardized interface for input and output information (ASTERIX CAT 062/065, 011, 004, METAR/SPECI).
• Support of independent parameterizations for parts of airspace with different operation modes.
• Graphic user interface for system configuration and parameterization.
• Automatic activation/deactivation of the sectors with the user adjustable planner.
• System functions control through the communication interface.
• Storing of the issued and internal warnings for the purpose of subsequent analysis and system parameterization.
• Concept of modular interface for easy integration into non-standard ATM environments.
• Remote supervision based on SNMP protocol.
ALS TRACKER

ALS system module for surveillance data processing and distribution

Multitracker system handles all kinds of surveillance data sources (even modern such as multilateration and ADS-B/C). Deploys advanced tracking procedures and creates consolidated, real-time air situation picture. Due to its efficiency, interoperability, and minimal HW requirements, it can be applied in systems requiring maximum performance and quick response.

MAIN FEATURES

Decentralization in surveillance data processing

Thanks to its reliability and operational simplicity, ALS Tracker has been successfully deployed in remote sites within the costs of the centralized processing solution. The surveillance information is processed in the place of its use, which significantly reduces the risk of its unavailability in comparison with the traditional central processing.

Cooperation with external SDP and FDP systems

ALS Tracker is ready to cooperate in an environment with several SDP systems. It allows to synchronize the track numbers with another SDP system and to ensure seamless transition to the backup source of surveillance information without an impact on the related systems (e.g. SafetyNets, FDPS, etc.).

The correlation of the surveillance information with the flight plans based on FDP data processing enables the system to produce a fully-enriched system track. These features, together with its operational simplicity, make ALS Tracker an ideal backup SDP system in ACC centers, regional airports and contingency (backup) systems.

Complete range of data sources and input/output formats

The ability to process a wide range of standard, obsolete and uncommon sensors and data formats allow using the current network of surveillance sensors.

Non-stop operation availability

Thanks to its dual mode operation (hot-standby) and the ability to configure the runtime system (without the need of restart or process limitation), ALS Tracker is capable of non-stop operation in permanently changeable ATM environment. The remote monitoring support on SNMP basis can strengthen the feature further.

Civil or military deployment capability

The system is fully qualified not only for civil use, but also for military deployment. It may process information uncommon to civil aviation or information with special features (long or irregular period of updating, etc.).

Low investment and operating costs

Thanks to its standard operating platform (x86/Linux using ordinary COTS HW) and low HW requirements, ALS Tracker represents a convenient, good value solution on the primary investment, as well as the operating costs and the staff training.

TECHNICAL DETAILS

- A wide range of data source – PSR, SSR, Mode S, ADS-B/C, multilateration.
- Standard, as well as uncommon data formats (ASTERIX, UFE, multilateration, Aircat, Selenia, Targa, and specific military formats).
- Processing of up to 30 sensors (600 plots in a sensor) and 3500 system tracks simultaneously.
- Track numbers synchronization with other tracking systems – seamless transition to backup system.
- Track correlation with flight plans using external FDP system data.
- Transformation of input/output data (data format conversion, coordinates conversion, updating period, etc.).
- Provides a stand-alone (single) or dual (hot-standby) operating mode.
- System parameters, input and output channels can be changed without the necessity of system restart.
- Short-term record and data replay feature.
- Estimation and correction of BIAS sensors.
- Remote monitoring on SNMP basis.
- Operating platform Intel/Linux.
CSS FDPS
System module for Flight Data Processing (FDP) and Aeronautical Information System (AIS)

System provides all of the functionality expected from a modern FDP system in one package. It also provides HMI applications needed for communication with the users, such as flight data operator, watch supervisor ACC (Area Control center), APP (Approach Control Unit), TWR (Aerodrome Control Tower), RGA (regional airports) and FIC (Flight Information Center) controllers.
**TECHNICAL FEATURES**

**Quick reference:**
- AFTN (aeronautical fixed telecommunication network), OLDI (on-line data interchange)/FDE (flight data exchange) (both X.25 and TCP), ETFMS (enhanced tactical flow management system) and AMA (arrival management message) connectivity.
- Processing of messages in both ICAO and ADEXP syntax.
- Processing of TACT (tactical)/CASA (computer assisted slot allocation) messages.
- SSR codes management.
- Mode S ELS (elementary surveillance) and EHS (enhanced surveillance) management.
- RDP (Radar Data Processing) integration - correlation output to RDP and flight data updating from radar track.
- Statistical functions.
- Output for billing system.
- Built on COTS (common-of-the-shelf) technologies, no specific proprietary HW or SW is needed.

**Industry standards compliant**
The product complies with standards commonly used in the ATM (Air Traffic Management) industry, fully supporting most ICAO and Eurocontrol standards applicable to FDP systems.

**Easy management provided via RCMS and SNMP**
Both a graphical, full-featured and easy-to-use RCMS console and a SNMP interface for control and monitoring are standard components of the product. They allow FDPS as well as client terminals management. FDPS may be managed using either the RCMS (remote control and monitoring systems) supplied, or it can be integrated into an existing monitoring system.

**Support for various user outputs**
The system supports various types of user output, such as paper strips and electronic strips, including interfaces to third-party systems.

**Easy integration with third-party products**
FDPS incorporates customizable interfaces to third party products, such as RDP, radar displays, electronic strips, co-operating systems, etc. In the most elementary case, FDP HMI applications can be displayed on screens of existing systems using the X-Window protocol.
ALS CWS

ALS system Controller Working Position display module

ALS CWS provides controllers with clearly structured display of the air traffic situation integrating the surveillance data and the flight data.

The position data are received from the tracker and displayed in the main and the secondary radar window, together with other aircraft information on a background of color maps of AoI.

The flight plans are received from FDPS and displayed as fully customizable electronic strips. ALS CWS automatically matches the flight plans to the tracks.

MAIN FEATURES

- A simple, well-arranged and easy-to-integrate module, which displays all necessary air traffic information for ATCo's.
- Wide configurability allows easy HMI adjustments according to the client’s needs.
- User configuration of HMI features, e.g. colors, display layout, electronic strip classification.
- Creating and displaying of so-called private maps directly from the workstation.
- Accessible Mapper – a SW tool for map creating and maintenance.
- Built on the latest technologies of picture processing (OpenGL) – smooth, no need for special HW, standard PC is sufficient.
- Basic tools for archive data evaluation.

TECHNICAL DETAILS

- Electronic strips display (paper as an alternative).
- ASTERIX input format.
- Display of multi-radar surveillance data of the aircraft position (tracks and plots).
- Provides hand-off and automatic coordination within the system or with cooperating ATC workstations.
- Flight plan data display.
- Choice of displayed maps, scales, and other parameters.
- Display of the surveillance situation in the main or secondary radar window, with the feature of selected area detailed view.
- Display of the analogue primary radar data and meteorological data.
- Analogue information of the primary radar is displayed after scan converter processing.
- User-friendly interface (HMI) complying with ICAO standards.
- Data congestion resistant.
- Communication with FDP (Flight Data Processing) – flight plan data display and editing.
- Communication with AIS (Aeronautical Information System) – meteorological information, designated area activation, etc.
- Automatic or manual coupling of surveillance information with flight plan data.
- Display of Safety Nets subsystem warnings.
- Replay feature for archived subsystem data together with basic evaluation tools.
- Display of the radio-goniometer output directly in the view display (VDF).
- Running on Linux OS.
**ATC SIMULATOR**

Comprehensive simulator for ATCO training in region (ACC), approach (APP), airport (TWR)

CS SOFT simulators follow the concept of Hi-Fi (high fidelity). They accurately copy ATCO’s workplace (user interface, environment, communication with pseudopilots). An actual traffic and aircrafts flow are simulated with a great precision, as well as with the feasibility of dynamic correction of traffic density, meteorological data, pseudopilots intervening, etc. The system offers record and replay tools.

**TECHNICAL FEATURES**

You get a comprehensive simulator consisting of:
- Air Traffic Generator
- SDP
- FDP
- CWS – EC, PLC
- Instructor Coach
- Pseudopilot
- Exercise controller – environment simulation
- Exercise preparation
- Simulator administration
- VCS

Variable use
- Possible to use for ACC, APP, or TWR
- Additional to ALS ATC system
- Universal display – for aviation schools and training centres, where a specific FDP features of particular system are not necessary - general ATCO training

Complete training
The simulator can be used for all kinds of training:
- Ab initio (from the beginning)
- Follow-up training
- Advanced radar
- Retaining programs
- Examination practice

Lifelike character
The flight trajectory is designed based on the flight plan, aircraft technical parameters and selected meteorological data. Precise work with the module of traffic generator.

Exercise preparation, real traffic data is used.

**Record and replay**
The simulator also features recording of the exercise, the evaluation and replay. It is equipped with a controlling workplace with straightforward operation features (pause, revert to a preceding situation in the simulation, faster or slower practice).

**Training variability**
The simulator can perform exercise with different number of generated aircrafts and different level of difficulty; starting from the easiest, over to more complicated, up to critical situation management. It is able to repeat the practiced situation or play it in slow-motion.

**USER FEATURES**

**Highly modifiable CWS**
Thanks to wide configurability, the HMI can be easily customized and adapted faithfully to a lifelike ATC environment. Electronic strips display.

**User-friendly controlling of pseudopilots**
The interface is designed to minimize the number of steps necessary to control the flights, and to enable the operator to control as many flights as possible. The data and orders given by the operator are monitored for syntax correctness, so the operator receives no possible error reports.

**Wide range of practice settings**
The number and parameters of aircraft, their flight plans, actual flight routes, take-off and landing behaviour, the weather etc.

**General information system**
Provides information of both static character (AIP, maps, ICAO doc., RTF bank, locations, etc.) and dynamic character (weather NOTAMs, meteorological news, restricted airspace, etc.).

Solution fitting your needs
Thanks to our simulator you are able to provide a high quality ATCO training covering all your needs:
- Practical presentation of ATC concepts application.
- Introducing students to 4D surveillance situation.
- Teach the technology of ATCO thinking.
- Work under time pressure
- Priorities and expectations of the flight development.
- Peculiarities during the flight
- New procedures, their feasibility, tuning.
VALIDATION TOOLS FOR ATC SYSTEMS

Validation of ATC system functionalities on validation platforms requires often an artificial target(s) to be generated with complete control over its behavior, or even an artificial target(s) to be injected to the real surveillance data. For such purposes CS SOFT developed two validation tools intended for air and ground surveillance. These tools could be used either by ANS provider or system developers.

BENEFITS

- No need to wait for particular situation in live traffic. User can simulate any situation and target configuration.
- Quicker validation of ATC system on development platform without blocking simulator positions.
- Effective testing of functions and configuration of Safety Nets.
- Replace validation of ATC system with live traffic or recorded situations.

S-PILOT TOOL

S-Pilot tool is intended for simulation of SSR or Mode-S targets in Asterix Category 001/002 or 034/048. The tool enables an easy preparation of several target scenarios, by means of configuration file. When running, the tool offers an easy control interface, by which operator has control over the target’s behavior including setup of non-standard technical attributes of target detection. Generation and control over Mode-S DAPs (Downloaded Aircraft Parameters in BDS registers) is available.

G-PILOT TOOL

Tool is intended for simulation of targets for A-SMGCS type of systems. It generates Asterix Category 010 data. Offline database allows for preparation of airfield significant points. These points serve for definition of named taxi routes. Offline scenarios allow for preparation of situations:
- Arrival. Target appears airborne at FAF, lands, taxies to selected stand.
- Departures. Target is generated on stand, taxies to defined runway and takes off.
- Taxi only between points on ground. Scenarios allow inserting delay, waiting for manual resume, scenario restart, speed change and others. Online interface provides control over all, even over the technical characteristics of the generated Asterix data flow.
COTOOL
Development environment for creating tools for analysis of surveillance data

A remarkable IDE (Integrated Development Environment) with a toolset for radar data analysis. It allows extracting and analyzing radar data for information, by other means inaccessible, of operating and technical types, which are available for process tuning and optimization.

For example:
- Statistical information (operating taxiway and airport facilities load, apron utilization, aircraft behaviour, overloading, breach of rules).
- Technical information (radar data quality tracking, comparing with other surveillance sources).
- Information useful for air traffic methodologists (how to optimize airspace load, route planning).

MAIN FEATURES

Efficient analysis tools development
Thanks to a number of pre-prepared functional modules, every effort at the tool development is devoted to input analysis itself. For the activities such as input data reception, decoding, filtration, information storage, time extrapolation, etc.; the pre-prepared modules can be used immediately.

Open development architecture
The IDE contains API and development templates for creating new functional modules or revising existing ones. The developer uses a ready-made template and can concentrate mainly on functional features of the module. Newly developed modules can be re-used in analysis tools development, if necessary.

Architecture of data flow processing
The architecture built on data flow processing is intelligible and transparent for developers. By convenient linking of simple functional modules, it allows to implement even a complex analysis application in a simple and transparent way.

Graphical presentation tool
Graphical presentation interface, a part of Cotool environment, can project analyzed data or analysis results in a user-friendly interface.

CS SOFT support
- Development teams training.
- Provides users with support and counseling for module development and its linking into application.
- Producing functional modules according to the client’s requirements.
- Producing analysis tools according to the client’s requirements.
- Analysis processing according to the client’s requirements.

TECHNICAL DETAILS

- Modular system based on stream processing of data flow.
- A large number of pre-prepared functional modules for straightforward use for input/output, coding/decoding of data protocols, transformation, time extrapolation, data storage, replay, DB access, graphic display.
- Easy to create other functional modules.
- Compatible with the data distributor RadarData Distributor.

Pre-prepared analysis tools (functional examples of use)
- CaCTool – compares the identification received from the aircraft with the surveillance information source.
- PoCTool – compares the position information received from the aircraft with the reference surveillance source.
- DaCTool – verification of credibility and operational suitability of DAP information from Mode-S transponders.
- Analysis progress display on a brief GUI.
- Storage of analysis results in a database.

- Web access for the presentation of database stored results.

Display tool
- Receives data from up to 8 independent data access inputs – possible to increase.
- Radar information display in 3D view.
- Meteorological information display (ASTERIX CAT 008).
- Radar map display.
- Analysis tools – display of surveillance report details, measuring, user map drawing, etc.
PUBLIC RADAR

One of the major operational advantages of the Public Radar system is its modularity. Every functional module can be included/excluded according to the user’s needs. Every module can be used separately or can be integrated into your already existing system. Main components of the system:

- **PROPHET**
  - Ground based safety nets provides ATCO with a prior warning about a possible disruption in air traffic safety (STCA, MSAW, APW, CLAM, WTSA, RAMLD/ RAMHD functions).

- **Tracker**
  - Multitracker system handles all kinds of surveillance data sources. Tracker deploys advanced tracking procedures and creates consolidated, real time aircratuation picture with minimal HW requirements.

- **ORF/Mobile Tracer**
  - ADS-B based ground and air surveillance with optional multilateration module (under development).

- **ORF/Tracer**
  - Dedicated HW unit ORF Tracer is not only a positional data source. It also allow aircraft/engrines state monitoring, bi-directional data communication, data recording and much more.

- **Radar View**
  - Highly customizable controller’s working position. Precise aircraft position display with all the important target information included.

- **FDPS Light**
  - This FDP system exhibits all the basic flight data processing functions such as FPL reception and distribution; FPL validation, route generation and validation and visual presentation. Paper or electronic strips are available.

- **Event Generator**
  - ATCO is automatically warned about a certain condition currently occurring in the air or on the ground. Events based on position, status change or time.

- **Record and Replay**
  - Compound voice and surveillance recording and replay help to fulfill CAA requirements and serve as a great help for a potential incident investigation.

- **Mobile Tracer**
  - Smartphone positional data source transmits a GPS based position form the board to the ground system (up to 1 sec. intervals).

- **Data Distributor**
  - Ensures safe and reliable data distribution inside the system as well as to the external entities (ANSP, Airport, Airline, Handling, etc.)
IDS 5

Time matters, so have information now at your fingertips. A unique and fully customizable solution for your operational needs built by experts.

Systems Atlanta’s Information Display System (IDS) is a time and life-saving technology that enables key people to have a direct and instant access to real-time information they need in order to make critical decisions and ensure that their operations run smoothly and efficiently.

MAIN FEATURES

Users are allowed to manipulate a heavy stream of aviation data (weather, flight plans, NOTAMS, traffic information, surface surveillance, etc.) by redirecting specific elements of the stream to a particular person or office that needs it and has it available immediately.

IDS5 also takes under consideration the fact that no two facilities are alike. For that reason, we built our product with your functional and technical concerns in mind and so that every end user is allowed to create and shape every aspect of the application to fit his/her specific environment.

Users can choose how they want the data to be displayed (e.g. animated graphics, text, images); what hardware platform they are currently using (e.g. tablet, desktop, smart phone) and even the source of the data (local or enterprise, collected from local sensors or external services).

APPLICABILITY

Government
Civil Aviation Authority Management tool for processes and documentation control

Emergency/ Research & Rescue
Operation command and coordination unit

Airline
Operations, Air Navigation Services Provider and Aviation Information Service distribution

Military
Integrated command and informational platform

BENEFITS

- Reducing user workloads
- Increasing situational awareness
- Boosting operational efficiency
- Ensuring safety on the ground and in the air
- Expert guidance
- Adaptability

- Support Center Services
  - systems testing
  - engineering
  - technical expertise
  - project/program management

IDSS and RadarView

IDS5 works well together with the newest CS SOFT’s offered product called RadarView. The RadarView is an extremely useful application used by e.g. ground handling staff, ramp control, dispatch office for information precision, sophisticated prediction and data visualization. The application is capable of merging all available data sources into a precise display of real-time aircraft and vehicle movement. Users have the ability to visualize, record and replay the most precise and up-to-date information about status or position of aircrafts and vehicles.