



Radar Operation Simulator & Editor

A FEW FACTS AND FIGURES

Aircraft types and performance

Exercise design allows up to 500 aircraft to be operated simultaneously.

ROSE includes 380 different aircraft types. Each of them follows individual performance data.

In more than 15 years of experience the aircraft performance has proven its approach - in training scenarios as well as in fast-time simulations.

The key to the realistic aircraft performance of **ROSE** is the unique and physically mature formula that calculates all movements. It takes three layers into account:

1. At first **ROSE** checks physically, what a specific aircraft type is able to do, e.g. the maximum climb rate at a certain level.
2. As the second step, it is considered how a real pilot would fly an aircraft - having passengers' comfort in mind as well as not wanting to waste any fuel.
3. And as the third factor, the ATC clearances and planning are regarded, so if e.g. an expeditious climb is necessary due to safety, the **ROSE** pilot will perform it in the frame of points 1 & 2.

Airspace database

There are a number of airspaces (real and fictional) already available for **ROSE**, which are used in various ATC units. These cover large parts of Europe. However, since **ROSE** has an open text-based import format, any airspace data can be implemented and used with minimal effort.

Administration information

ROSE is easy to install and administrate: You only need 5 minutes for the setup, including all airspace and exercise data.

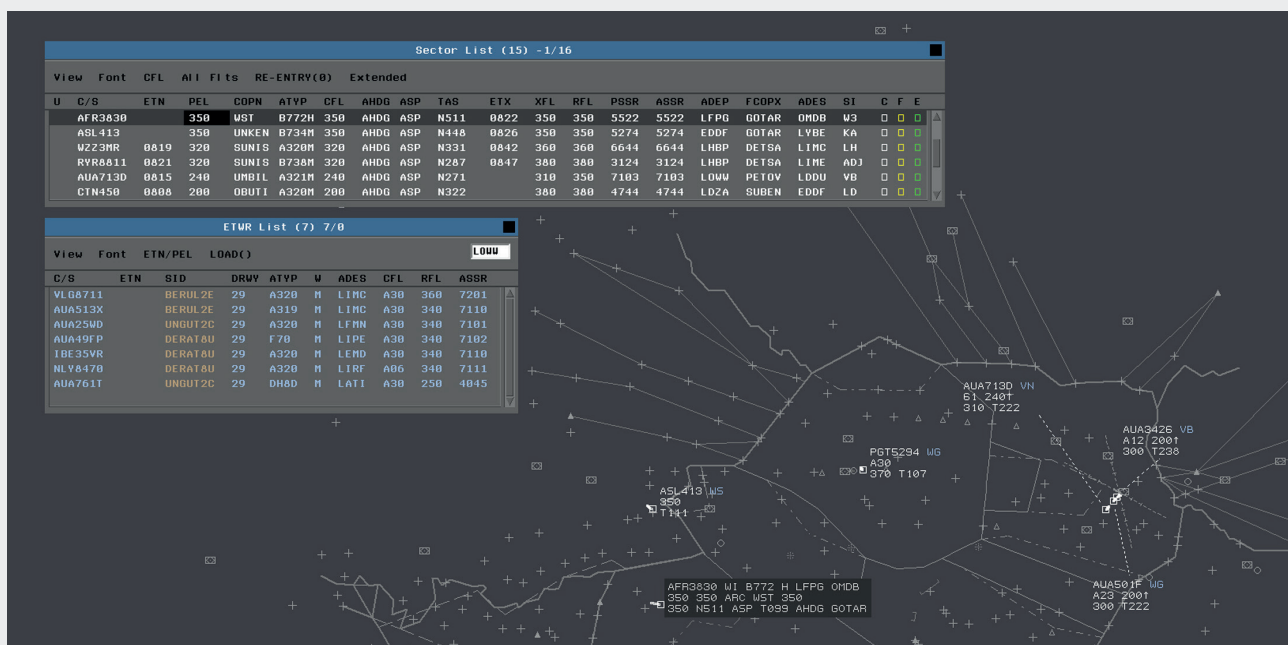
Operating system: **ROSE** runs on every Windows PC (Windows XP or newer) or notebook and does not need any further software to be installed. **ROSE** also works on LINUX operating system by means of emulation.

Up to 33 stations can be connected into one exercise via a local network.

Interfaces

ROSE is able to feed different applications. So far, we have established interfaces to the following systems:

- ▶ Microsoft Flight Simulator
- ▶ ELITE Flight Simulator
- ▶ SkySoft-ATM systems via AFTN, OLDI messaging
- ▶ AMOS tower simulator
- ▶ IRIS VoiceCom Module



INTRODUCING ROSE



To describe the radar simulator **ROSE** in a few words: Customizable, intuitive, high performance, scalable.

One of the main thoughts behind the development was to create a simulator that could be used flexibly: The quick change of a traffic situation, simple to use airspace modification and of course the independence of large and space consuming hardware were only a few action items.

ROSE offers the possibility to generate or import new traffic scenarios and airspace data within a short time.

Fields of use

The simulator is already used for example

- ▶ in complex networked simulations
- ▶ as a procedure planning tool
- ▶ as a basic radar skills trainer
- ▶ as a demonstration tool
- ▶ for classroom teaching
- ▶ as a training platform in CBT studios

User interface

The innovative **ROSE** user interface has been developed in close collaboration with active controllers - this is why it is an appreciated tool for trainers and operators. Debriefing, developing and testing have never been that simple.

Aircraft performance

The aircraft performance model within **ROSE** is highly realistic. A number of parameters are used to describe individual aircraft types, e.g. horizontal and vertical speed, engine performance (accelerate /decelerate), speed on final approach etc.

Label input options, 4D trajectory, 3D airspace modelling and a flexible role concept prove that **ROSE** simulation is state-of-the-art.

FIELDS OF USE

ROSE has proven its range of use in the following contexts:

Multi-sector rating training

„Are you looking for a smart solution with an outstanding cost-benefit ratio for your rating training?“

ROSE allows to connect up to 33 stations onto one exercise - with a flexible role model of pilot and radar positions. Communication functionality like the integrated text messaging system support the multi-sector training.

Classroom teaching

„Would you like to demonstrate ATC procedures and traffic situations in the classroom? Are you tired of using a million PowerPoint slides to illustrate aircraft movement?“

It has always been an important aim to create ROSE as a simulator that is flexible in use: quick changes of traffic situations, simple to use airspace modification, run exercises as soon as they have been designed, the independence of large and room consuming hardware...

All of these features make ROSE an essential tool for classroom teaching.

Briefing and debriefing

„Would you like to discuss the performance with your trainee after finishing 45 min of simulation? Wouldn't it be great to not just tell, but more show the trainee within the simulator at which point something went wrong?“

ROSE offers the unique possibility to rewind and fast forward within the whole process of a driven exercise - in a networked environment of course this runs independently on every single working position.

Combined tower and radar training

„Would you like to do a combined training for your tower and radar staff to practice certain scenarios with all involved units?“

The simulators AMOS (for tower) and ROSE (for radar) are highly interconnectable. They offer features that make writing a combined exercise an easy task. With the existing interfaces between the two simulators, it is possible to prepare and run joint exercises for radar and tower procedures with low effort, for example in project simulations.

Basic training

„Do you need a simple exercise to train headings or demonstrate flight climbing and descending behaviour?“

ROSE includes helpful functionality to set up basic exercises which can support your students to get into the learning matter hands-on.

Airspace design

„Do you plan to change certain routes in order to achieve an optimized traffic flow? Might it be necessary to revise the STARs/SIDs of an airport due to noise prevention?“

ROSE offers a wide range of airspace and procedure design as well as the opportunity to import your real life data. These options allow to simulate the impact of an adapted airspace or procedure.

CBT exercises

„Do you plan to develop learning units for self-study that shall be available on your company's LMS?“

ROSE offers export functionalities for airspace data as well as for exercise content. Using these files, traffic situations can be imported into a format conform to web standards very easily and even be enriched with a didactic level.

As driver for radar systems

„Would you like to simulate an airspace or procedure change within your ATC unit by using your real radar system? Or train your staff in the use of a new update of your present radar system?“

In collaboration with SkySoft-ATM we have developed the ATC trainer SKYSIM, which is a combination of real-life radar display and supporting applications and our simulator ROSE.

ROSE acts as traffic generator & preparation module for the Skyguide radar system. The user interface displayed in a SKYSIM simulation is the same that is used for traffic control within Swiss airspace. ROSE is able to send OLDI, FPL, CPL and several Asterix messages according to the EUROCONTROL standard. In the same way ROSE is ready to feed other radar systems and thus provide an environment to

- ▶ prepare simulations to be conducted with the real HMI of an ATC service provider
- ▶ test software releases of a radar system with the simplicity of simulator exercise preparation.

Since ROSE provides the technology to send and receive data in a professional format used within operational radar systems, the software can easily be adopted to any operational system in order to generate realistic track data for any simulation within your real live environment.

PARTS OF THE SYSTEM

The "SE" in ROSE:

Radar Operation Simulator AND Editor

An innovative concept within **ROSE** is the idea to have all editors and the simulator itself within one single application. This provides the opportunity to evaluate and see any change in the data preparation at the very moment the change was made. There is no need to compile and transfer any editor data before using it within the simulator.

Experienced simulator administrators know about the resource saving benefit of this unique option.

Just to name a few **ROSE** editors (and more):

► **Airspace**

The Airspace Editor is used to create new navigational aids, runways, airways, lines, etc. with a single mouse click. All airspace elements can be used right after creation: You can build a new runway on your airport and directly advise any flight to select it for departure or landing. To position fixes, airway etc. precisely, the Airspace Editor uses LAT/LONG data (WGS84).

► **Exercise**

To prepare different exercises, the Exercise Editor offers to save and reuse single flight plans. These flight plans may include a route, specific clearances as well as prepared reactions, that are triggered by certain events. You can choose any aircraft type available in **ROSE** for each flight plan of course. Furthermore, it is possible to select different statuses for each flight (long range, short range, medium range), which influence the climb performance.

► **Text Information Exchange**

With the TIP (Text Information Processor) you can let all participants know the dramaturgy of an exercise by preparing „stage directions“ for any position (pilot, radar, other). The prepared information will be displayed on the respective screen depending on a given time or any specific situation or event. The same TIP window can be used by all participants of a networked exercise to interchange information via the included messaging system during the exercise.

Flight Data processing systems

Within **ROSE** different FDP-systems have already been emulated, providing the real touch and feel analogue to the system used in a specific ATM environment. **ROSE** keeps adapting to new systems and their HMI.

Radar Display

The **ROSE** main radar screen is flexible in many ways. Starting from different appearances of all types of airspace elements to a growing number of interactive label types, units adapt the **ROSE** configuration to be close to their live radar systems.

Debriefulator

The highly innovative and straight away useable tool for briefings, debriefings, presentations, backups and furthermore provides a modern and sustainable way to fulfil tasks in training, cooperation or public presentations. The Debriefulator offers the option to export the progress of any exercise (e.g. an exam) in order to save it for later review or to fulfil the legal obligation to archive test results.

OLDI / ASTERIX messaging

ROSE is able to send and read a number of EUROCONTROL standardized messages, such as ASTERIX62, ACT, CPL. This way **ROSE** can act as a traffic generator for an operational radar system. This has been successfully used in simulations with the Skyguide radar HMI (SkyVisual) and for system evaluation.





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