

FUN Radio Network Planning Software System Overview



This System Overview brochure provides a description of FUN's integration and deployment strengths, and highlights its major integral components. The brochure offers insight to both RF Engineers and IT Managers by describing the product's capabilities and advantages. Specific product information addressing different network technologies is available in other FUN brochures for GSM, UMTS, and Microwave planning.

Challenges

Selecting a radio-planning tool is a difficult task. Upon reading the market literature many of the suppliers look the same. Even after a product has been short-listed your team will not fully comprehend the tool, and its competitive advantages, until it is deployed. It is then that you discover its strengths and weaknesses. Integration of large, new software systems into mature, complicated corporate software "landscapes" is not a trivial task. With the more complex planning tool deployments requiring support to regional planning offices, and head-office wanting the most current and consolidated network view, high performance software that is robust and facilitates efficient daily workflow processes is essential. To achieve this, the tool not only requires an architecture that provides both rapid central and regional views, but also demands a high degree of flexibility to adapt to an operator's organisation, and IT infrastructure: (LAN/WAN, database structures etc).

What can COSIRO offer?

With FUN, COSIRO can support the vision of the most demanding IT-managers and at the same time satisfy the needs of the most rigorous power users. FUN integrates UMTS, GSM, GPRS, HSCSD, and Microwave networks in one planning tool. Large multi-technology networks or multiple network versions can be integrated into one project. COSIRO is also a different kind of supplier. One that listens and supports its customers, offering product architecture that is robust, componentized, and really open: enabling better integration and deployment and providing a superior foundation for change, customisation and growth. The architecture is independent of a specific operating system, leaving you – the customer – the choice of Solaris, LINUX and Windows as the primary deployment platform. In short, we provide -- **a Future Proof Solution.**

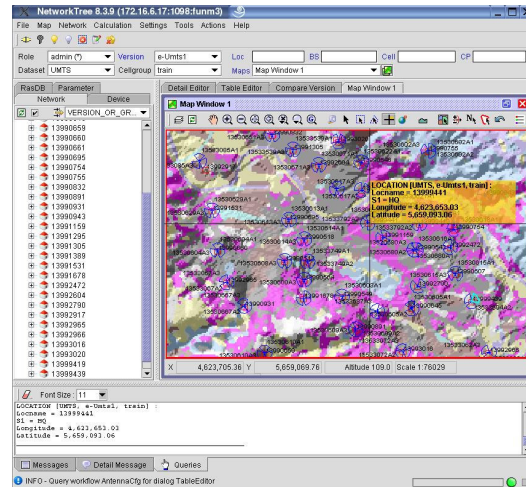


Figure 1 – FUN User Interface

Standards

FUN's open system architecture embraces the most prevalent and accepted standards for interfaces, operating systems, and database management. The breadth of interface options and architecture strengths enables customers to select and integrate the software best suited to their needs. When future IT system changes occur e.g., exchanging 3rd party components, substantial redesign and integration can be avoided because the architecture offers customers options and flexibility.

Other in-house applications, or separate proprietary algorithms, can be more easily integrated in FUN using:

- CORBA service
- JAVA interface
- C / C++ API
- POSIX/C
- X11
- Direct database access (ODBC, SQL)

The open system architecture enables COSIRO to continually meet customer's requirements with minimum effort and shorter lead times.

Open System Architecture

The architecture is designed to support a number of deployment options from integration with customer's large high-performance networks to smaller stand-alone work groups.

FUN Java provides cross-platform client functionality enabling customers to choose the most appropriate computers, and users

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to utilize full computational power of the X11 version.

FUN offers both client-server architecture and optional stand-alone connectivity enabling work to be done in the field and later reconnected for project updates.

- Data consistency
- Data security
- User management
- Dataset management
- Version management
- Overall better data management

In a large deployment example, FUN would support a nationwide central server configuration containing a master database. Each regional planning office would be equipped with a server replicating data regularly with the master server, and consolidating it with the master database at specified intervals.

This type of deployment option provides:

- Single point of contact for IT administration and reduced administration cost
- Quicker roll-out of upgrades (single point of installation)
- Better scaling of CPU power and disk space at one central point
- Optimum use of installed computing power
- Low-cost client machines can be used
- Considerable reduction of LAN traffic.

Equally important, this deployment option enables better workflow optimisation, supporting company business processes, and offering better adaptability to change.

Database

Unlike competing tools, FUN's Relational Database Management System (RDBMS) fully enables the user to leverage ORACLE's data administration and management capabilities. If ORACLE is not the RDBMS of choice, then COSIRO offers other RDBMS options on demand. This is only possible due to the concept of open interfaces and the high degree of standards conformity in the software.

FUN fully exploits the use of the database with a comprehensive data model for storage of all data types including:

- Network elements data
- Calculation results (raster data)
- Digital vector maps (requires ORACLE Spatial Option)
- Digital raster maps
- DTM and Clutter (raster) data
- Ancillary Data

By utilizing this approach it provides the following advantages:

Different user privileges can be assigned based on roles and responsibilities. The datasets are managed in a modular way for each technology such as GSM, UMTS, or microwave, allowing users to share common information such as location and site information.

Powerful version management functionality permits each user to create and work with different network versions, which can be compared, analysed, and committed to the project. For comparison, versions can be displayed and analysed in several geographical windows simultaneously. Version management functionality is a potent tool for enabling analysis between planned and operating networks.

Using robust database architecture, integration with in-house or 3rd party systems becomes easier, the performance quicker, and data extensibility throughout the enterprise is more easily managed and maintained.

Distributed Computing

FUN supports distributed computing for better performance. It is fully automated and can be set to run as a background task leaving the user free to continue with other work.

Hardware & Software Platforms

FUN is available on multiple platforms to provide flexibility and protect the customer's investment. The FUN client application is now available in a JAVA-based version for increased flexibility.

	Server	Client
SUN/SPARC Solaris	X	X
HP/UX (RISC)	X	X
Linux/Intel	X	X
Windows	(X)	X

(X) Denote minor modifications required

GIS

FUN provides flexibility and performance by using a commercially available rich Geographic Information System (GIS)

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underpinning. The GIS provides high performance, multi-resolution display functions, and a wide range of vector and raster features, and through one of COSIRO's close partners, can be customized to suit related enterprise geographic data extensibility requirements.

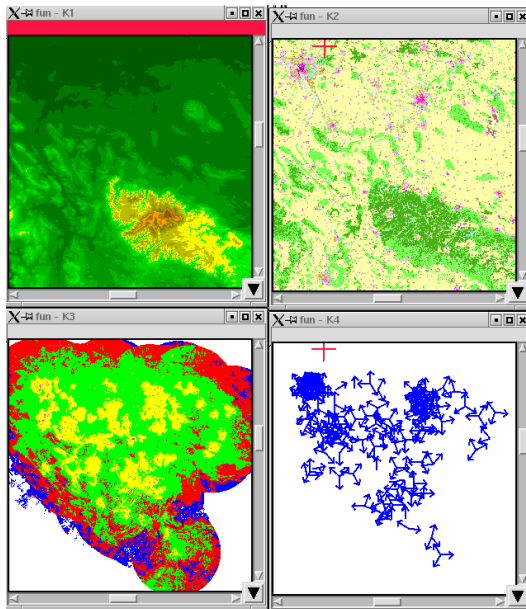


Figure 2 - Coupled geographic windows

Users are able to create numerous geographic windows simultaneously either as independent windows, or as parent - child windows, with any window supporting multiple layers. This includes re-use of same layer type for comparison of different network versions or simulation for result comparison. A coupled cursor function makes orientation easy. The parent child feature is a key advantage over other systems with comparison of different network configurations possible at a glance.

FUN provides the following functionality:

- Unlimited clutter classes
- Display of terrain and relief terrain profile analysis
- Display of vector and raster maps in up to 12 geographic windows
- Inter-visibility analysis
- Generation of coverage raster and vector coverage maps
- Blending of background/foreground layers

- Use of clutter and rain model data, including data edit functions
- WYSIWIG and scaled plotting, high resolution plotting
- Legend display for geographic layers, including user definable comments

The following GIS formats are supported:

- ESRI Shape file format (2D)
- ESRI Grid file format (ASCII)
- ArcInfo SHAPE file format
- TIFF
- PlaNet raster files
- PlaNet vector map files

FUN also fully supports importation of PlaNet network data.

Propagation models

Specific propagation models for each wireless technology are described in the separate GSM, UMTS, and microwave FUN brochures.

Product range

FUN radio network planning software offers solutions for:

- Cellular networks (2G, 2.5G, 3G)
- Microwave networks
- Micro cell design

Special Modules

A number of highly specialized functions are supported by specific, optional modules, such as the following:

- LAC-Planning
- RAC-Planning
- Emergency Area Planning
- Automatic Handover-Planning on the basis of Cell Assignment Probability data
- Multi-Frequency-Band Calculation for site assessment
- Parallel Multi-Host Calculation
- Coverage Database Functionality
- Raster repository for raster, satellite/aerial image and scanned map management, accessible by other application, e.g. ERDAS, GIS-Tools etc.

Please see the technology specific FUN brochure for a more complete list.

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Hardware Requirements

Client: (Minimum 512 MB RAM)

- All recent SUN/Sparc Solaris Workstations
- PC/LINUX/Intel, minimum 800MHz CPU
- Multiple platforms are supported through the use of JAVA-based Clients. COSIRO also supports CITRIX deployments

Server: (Minimum 1 GB RAM)

- Single user installation can use one Solaris or LINUX Workstation as client and server
- For Multiple user installations we recommend the use of SUN / Solaris-Workstations or Servers with 2-8 processors, minimum 400 MHz CPU.
- Alternatively, we support LINUX and HP/UX servers.

Support

COSIRO offers full support packages including e-mail, hotline, on-site support, as well as web-based support with full transparency to customers through Internet access. Detailed reports and powerful filter options are available showing status information, work progress and responsibilities.

Contact

COSIRO GmbH
Otto-Hahn-Strasse 20
D- 85609 Dornach, Munich, Germany

Tel. +49 89 90 10 88 10
Fax +49 89 90 10 88 77
E-Mail email@COSIRO.de
Web www.COSIRO.com