



## Geographic Information Software R&S MapView

### Digital map display for radiomonitoring systems

- ◆ Fast online display of results on digitized maps
- ◆ Offline display of results in combination with external databases
- ◆ Use in direction finding and radiolocation systems as well as in coverage measurement systems
- ◆ Graphical situation display
- ◆ Special functions for use in mobile systems
- ◆ Import of digital maps in various formats
- ◆ Generation and digitizing of new maps
- ◆ Editing and adaptation of digital maps



**ROHDE & SCHWARZ**

## General

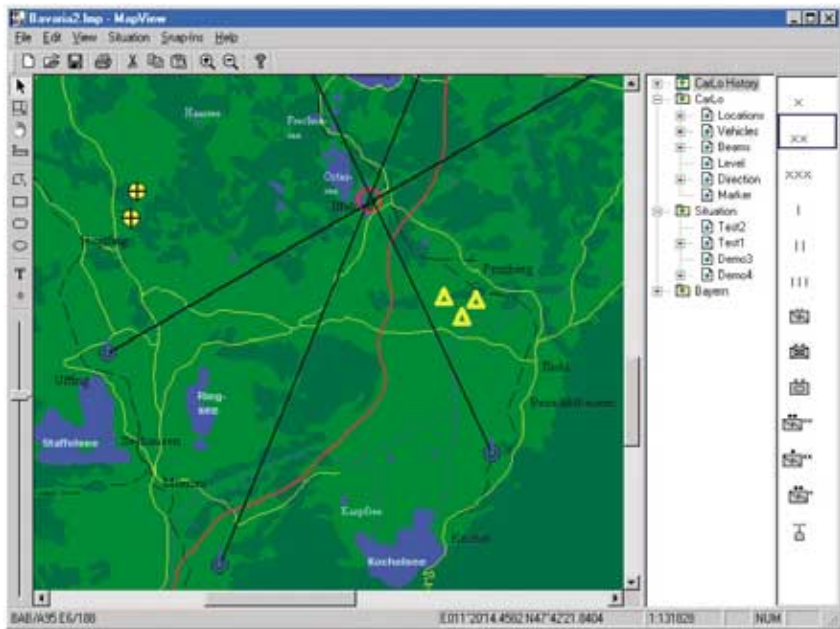
Facilities for displaying direction finding and radiolocation results on maps are essential for DF evaluations in civil and military radiomonitoring systems. In military applications, this display is used to support operational and tactical analysis (R&S RAMON systems). In the case of civil applications, the transmitter-site display supports the DF evaluation (R&S ARGUS-IT systems). Another application is displaying results obtained by coverage measurement systems (R&S ARGUS-FMTV or R&S ARGUS-IT systems).

The R&S MapView software is used to display geographic data on digital vector and raster maps. It was primarily designed for radiomonitoring and radiolocation applications and this is why the online result display is fast and has features optimized for this task.

The digital maps are easy to work with by virtue of the range of functions that are available, for example:

- ◆ Fast map zooming
- ◆ Measurement of distances and directions
- ◆ Direct selection of map objects as well as direction finding and radiolocation results
- ◆ Rapid finding of map objects by means of the tree next to the window

The current position of the cursor, and also of objects and location results can be displayed in a variety of formats, i.e. degrees longitude/latitude, UTM or UTM REF.



**Fig. 1: Map with location results (on the right are the symbols used for situation displays).**

## Mobile use

R&S MapView has functions that make it ideal for use in conjunction with mobile systems (e.g. in homing DF vehicles):

- ◆ Optimized for use with small TFT displays (e.g. in vehicles, see Fig. 2)
- ◆ Automatic map navigation on the basis of the current vehicle heading and position (rotatable vector maps)
- ◆ Length of DF beam proportional to the current RF receive level of the DF signal – evaluation of the DF results possible by monitoring level variations
- ◆ RF receive level display right next to the DF symbol on the map

- ◆ Routing function in conjunction with the map&guide option (route display)
- ◆ Scaling as a function of vehicle speed
- ◆ Indication of heading (in conjunction with an electronic compass or GPS)



**Fig. 2: Display in a homing DF system. On the left-hand side of the DF symbol is the receive level display. The system can be conveniently operated without using a keyboard; all menus that are not required during driving are deactivated.**

## Situation display

With the aid of graphical elements, R&S MapView makes it possible to display the results obtained from the analysis of the full range of information provided by a radiomonitoring system. The situation display is the basis for the assessment of the situation. It is generated by using several map layers and can be stored.

Besides standard functions such as text entry and drawing various line figures, the users can select symbols with the mouse and position them on the map. They can generate the symbols themselves and save them to various libraries.

Fig. 1 shows the toolbar with a selection of tactical symbols.

## System applications

In radiomonitoring systems such as R&S ARGUS-IT or R&S RAMON, R&S MapView communicates with other software applications from Rohde & Schwarz via a TCP/IP interface. These applications can be the control software for the direction finders, the location software and database applications.

Interworking with these software modules, the current locations of the direction finders are automatically displayed on the map; they are continuously updated while the direction finders are moving. In this case, the current heading of the vehicle is also indicated on the map by the DF symbol. DF results are displayed on the map as DF beams, location results as circles.

The R&S ARGUS bearing measurement mode or the R&S RAMON's location software can be used to record the DF results for more detailed analysis at a later date.

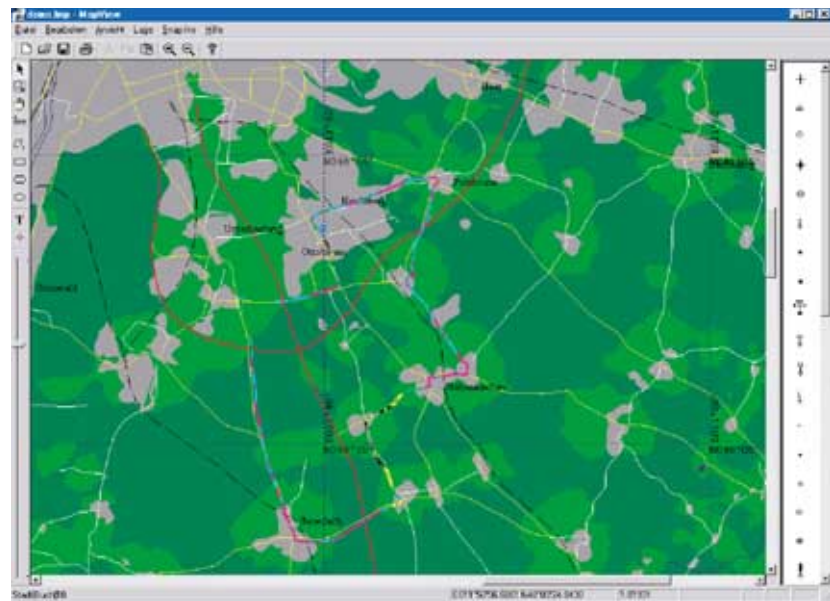
This also makes it possible to take running fixes and so locate radio signals with just *one* direction finder (direction finding from different locations).

It is, of course, also possible to use the offline result-display mode in conjunction with the system software packages mentioned above. DF and location results, backed up on a database, can be displayed on the map.

In conjunction with the R&S ARGUS software package, the transmitter sites and the coverage measurement results can also be displayed (see Fig. 3).

R&S MapView can also be linked to other customer-specific applications via an open TCP/IP interface.

- ◆ The R&S MapEdit option (see page 4) is for generating, converting and maintaining (and so subsequently modifying) user-specific maps
- ◆ As an option, maps from other manufacturers can be directly opened in R&S MapView and used without being converted:
  - Vector maps in map&guide format (road maps with routing information) with the map&guide server option
  - Raster maps of the German Bundeswehr Geographic Office (AMilGeo) with the CMRG (compressed milgeo raster graphics) server option
  - Raster maps in LS telcom format with the LS telcom server option
  - Vector maps in MapInfo format with the MapInfo server option



**Fig. 3: Display of coverage measurement results. The receive field strength recorded during the test trip is displayed in colour.**

## Maps

The usefulness of geographic display software depends on the quality of the available maps. R&S MapView uses a special data format to ensure optimal compliance with the requirements of radiomonitoring systems. There are various ways of obtaining maps:

## Option R&S MapEdit: generating maps

The option R&S MapEdit is for generating and editing user-specific digital maps. Many projection modes are supported for map generation. There are several ways of generating maps:

- ◆ Paper maps can be scanned with the R&S MEBASIC basic module, imported into R&S MapEdit in the form of a raster map and georeferenced.
- ◆ Using a digitizer with the R&S ME-DIGI option, paper maps can also be manually digitized and georeferenced. In this case, a vector map for R&S MapView is generated.
- ◆ Vector or raster maps from an existing GIS (geographic information system) can be imported using the R&S ME-VECT option. These maps should be in DXF format (with georeference) or in VPF (VMAP/DCW) format.

Maps used in R&S MapView via a map server cannot be edited with R&S MapEdit.

## Digitizing or scanning?

R&S MapEdit distinguishes between digitized vector maps and scanned raster maps. The use of vector maps comes into its own if information has to be displayed to scale (i.e. reduction of information density at higher zoom levels, maximum information density for displaying smaller map sections).

The advantage of using raster maps is the user-friendliness of map generation and the low cost of maps.

The vector maps used by R&S MapView have several layers. Fig. 4 shows the basic structure of the maps.

The layers may contain text, points, lines/surfaces, scanned maps or symbols. The layer technique means that the information the user wants can be displayed with a high degree of flexibility because layers can be displayed or hidden depending on the magnification of the map section being zoomed.

The information density can, therefore, be adapted to the current scale.

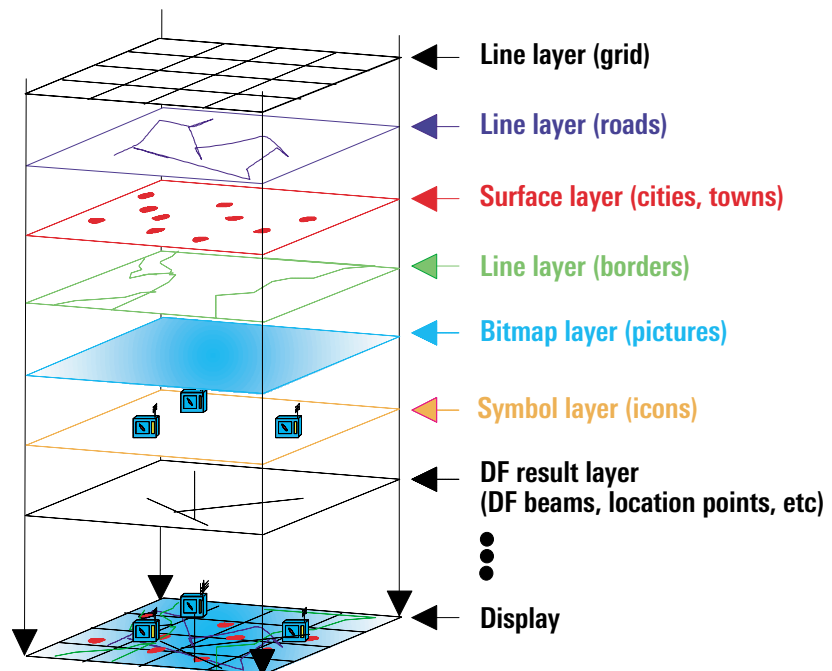


Fig. 4: Layered map structure



## Differences between vector maps and raster maps

The following comparison shows the differences between vector and raster maps.

### Vector maps

+	-
<ul style="list-style-type: none"><li>◆ Improved handling due to fast loading</li><li>◆ Information density adapted to scale (layers can be displayed or hidden)</li><li>◆ Identification of objects in the graphics (by positioning the mouse pointer on the objects)</li></ul>	<ul style="list-style-type: none"><li>◆ Complex map generation</li></ul>

### Raster maps

+	-
<ul style="list-style-type: none"><li>◆ Simple map generation</li><li>◆ Fast display in original scale</li></ul>	<ul style="list-style-type: none"><li>◆ High memory capacity required</li><li>◆ No true zoom function with flexible information density</li><li>◆ No identification of objects in graphics</li></ul>

## Required operating system

R&S MapView and R&S MapEdit were designed for use on PCs with 32-bit operating systems (Windows 2000, Windows NT 4.0, Windows XP).

## Information

Additional information on the system family R&S RAMON can be obtained by e-mail to

**comint@rsd.rohde-schwarz.com**

or from your local Rohde & Schwarz representative.

Additional information on the system family R&S ARGUS can be obtained on the Internet at

**www.argus.rohde-schwarz.com**

or by e-mail to

**argus@rohde-schwarz.com**

or from your local Rohde & Schwarz representative.

Certified Quality System

**ISO 9001**

DQS REG. NO 1954

Certified Environmental System

**ISO 14001**

REG. NO 1954

## Ordering information R&S MapView

### Basic module

Basic module of Geographic Information Software R&S MapView <i>Contains a licence for R&amp;S MapView, display of raster or vector maps, situation display editor, system interface, special features for mobile DF systems and optimized display for DF and location results (maps not included)</i>	R&S MapView	R&S RAMON Systems: 4046.1205.02 R&S ARGUS Systems: 4049.9871.02
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### Options

R&S MapView Map & Guide Server with road map of Central Europe <i>Displays map&amp;guide road maps with routing support; contains the Central Europe City map (Germany, Austria, Switzerland, Liechtenstein, Alsace, Northern Italy)</i>	R&S MV-MCEU	R&S RAMON Systems: 4046.1457.02 R&S ARGUS Systems: 4046.1463.02
R&S MapView Map & Guide Server with road map of Benelux countries <i>Displays map&amp;guide road maps with routing support; contains the BeNeLux City map (Belgium, Netherlands, Luxembourg)</i>	R&S MV-MBNL	R&S RAMON Systems: 4046.1457.03 R&S ARGUS Systems: 4046.1463.03
R&S MapView Map & Guide Server with road map of Germany <i>Displays map&amp;guide road maps with routing support; contains the Germany City map</i>	R&S MV-MGER	R&S RAMON Systems: 4046.1457.04 R&S ARGUS Systems: 4046.1463.04
R&S MapView Map & Guide Server with road map of France <i>Displays map&amp;guide road maps with routing support; contains the France City map</i>	R&S MV-MFRA	R&S RAMON Systems: 4046.1457.05 R&S ARGUS Systems: 4046.1463.05
R&S MapView Map & Guide Server with road map of Great Britain <i>Displays map&amp;guide road maps with routing support; contains the Great Britain City map</i>	R&S MV-MGBR	R&S RAMON Systems: 4046.1457.06 R&S ARGUS Systems: 4046.1463.06
R&S MapView Map & Guide Server with road map of Iberian peninsula <i>Displays map&amp;guide road maps with routing support; contains the Iberia City map</i>	R&S MV-MIBE	R&S RAMON Systems: 4046.1457.07 R&S ARGUS Systems: 4046.1463.07

R&S MapView Map & Guide Server with road map of Italy <i>Displays map&amp;guide road maps with routing support; contains the Italy City map</i>	R&S MV-MITA	R&S RAMON Systems: 4046.1457.08 R&S ARGUS Systems: 4046.1463.08
R&S MapView Map & Guide Server with road map of Scandinavia <i>Displays map&amp;guide road maps with routing support; contains the Scandinavia City map</i>	R&S MV-MSCA	R&S RAMON Systems: 4046.1457.09 R&S ARGUS Systems: 4046.1463.09
R&S MapView CMRG Server <i>Displays raster maps of the German Bundeswehr Geographic Office (AMilGeo)</i>	R&S MV-CMRG	R&S RAMON Systems: 4046.1470.02 R&S ARGUS Systems: 4046.1486.02
R&S MapView LS telcom Server <i>Displays raster maps in LS telcom format</i>	R&S MV-LSTE	R&S ARGUS Systems: 4046.1492.02
R&S MapView MapInfo Server <i>Displays vector maps in MapInfo format</i>	R&S MV-MINF	R&S RAMON Systems: 4046.1434.02 R&S ARGUS Systems: 4049.1440.02
Digital Map Editor R&S MapEdit All Options <i>Contains a licence for R&amp;S MapEdit, the import of raster maps, the import of vector maps in DXF and VPF format, the generation of vector maps by digitizing paper maps (requires the Digitizer Summagrid V), editing the vector maps, inserting other map elements and the Rohde &amp; Schwarz support for generating the first map</i>	R&S MapEdit	R&S RAMON Systems: 4046.1170.02 R&S ARGUS Systems: 4049.0145.00

### Alternative: R&S MapEdit

Basic module of Digital Map Editor R&S MapEdit <i>Contains a licence for R&amp;S MapEdit, the import of raster maps and the insertion of additional map elements</i>	R&S MEBASIC	R&S RAMON Systems: 4046.1270.02 R&S ARGUS Systems: 4046.1328.02
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### Options for R&S MEBASIC

R&S MapEdit Import of vector maps <i>Import of vector maps in DXF and VPF (VMAP/DCW) format, editing of imported maps</i>	R&S ME-VECT	R&S RAMON Systems: 4046.1286.02 R&S ARGUS Systems: 4046.1334.02
R&S MapEdit map digitizing <i>Generation of vector maps by digitizing paper maps (requires the Digitizer Summagrid V), editing of generated maps</i>	R&S ME-DIGI	R&S RAMON Systems: 4046.1292.02 R&S ARGUS Systems: 4046.1340.02



**ROHDE & SCHWARZ**

ROHDE & SCHWARZ GmbH & Co. KG · Mühldorfstraße 15 · 81671 München · Germany

P.O.B. 80 14 69 · 81614 München · Germany · Telephone +49 89 4129-0 · Fax +49 89 4129-13247 · www.rohde-schwarz.com