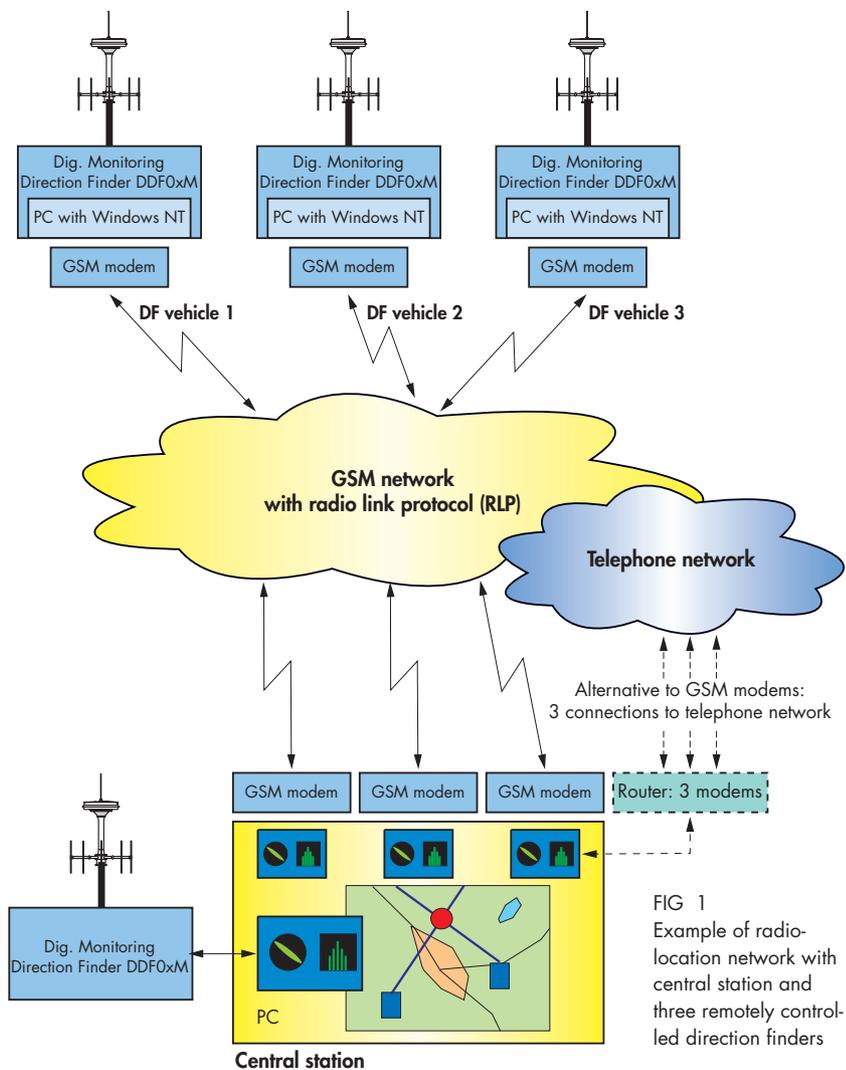


# MONLOC software GSM data link networks direction finders

MONLOC software combines digital monitoring direction finders of the type DDF0xM into extensive radiolocation systems that can be used for regional through nationwide spectrum monitoring, for security purposes as well as in military missions. A large variety of interfaces is available for this kind of application. A new possibility is the use of GSM links for data exchange. And in this way mobile direction finders can also be integrated into versatile DF networks



MONLOC displays the user interfaces of the remote, digital monitoring direction finders as well as digital maps on a PC in the central station for remote control. This PC must be equipped with data links to the direction finders, a variety of interfaces being available for the purpose (see box). Data links working through GSM modems is a new possibility. The links to the individual direction finders may also be different. Some of the direction finders may be stationary with conventional data lines and some of them mobile (eg in vehicles or transit cases) with GSM links. This allows versatile DF networks to be configured (FIG 1).

The central station is connected to the direction finders either through GSM modems or by routers and the regular telephone network. The relatively low transmission rate of 9600 bit/s is efficiently used so that even the IF spectrum or – using special data compression – audio information can be transmitted.

## Convenient central control

PC operation in the central station is both simple and straightforward. From a list the operator chooses the DF stations best situated for determining the particular signals. The data links to the selected direction finders are established automatically. Three direction finders should be activated, if possible, for really reliable location results.

## From standalone to system

Digital Direction Finders DDF0xM from Rohde & Schwarz are able to take bearings of conventional signals as well as short-duration signals and broadband emissions in the frequency range

from 300 kHz to 3 GHz [\*]. With the aid of MONLOC (derived from "location system for monitoring direction finders") software, such monitoring direction finders can be combined into a radiolocation system and remotely controlled from a central station.

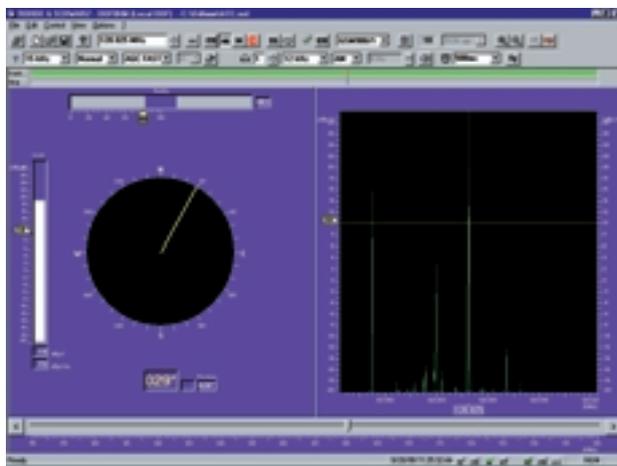


FIG 2  
User interface of  
DDF0xM direction  
finder

activating the individual user interfaces, the audio information of the direction finders can be compared to ensure that all stations take bearings of the same emitter with the same setting parameters.

### Master with two operating modes

In searching for new or unknown signals, one of the direction finders is always the master. Two operating modes are available: automatic search in a frequency band or frequency list for signals exceeding a preset level (search mode), or manual selection of

a signal from a broadband spectrum display (scan mode). Direction finders can also be set manually to a fixed frequency.

In **search mode** the master direction finder searches for emissions in user-definable frequency bands or lists. As soon as it detects a signal above a defined threshold, the software automatically sets all other direction finders to this same frequency.

**Scan mode** is recommended for direction finders connected via a fast data line (eg ISDN with 64 kbit/s). The direction finder displays the spectrum of a defined frequency band. After manual

selection of a frequency from this spectrum, all activated direction finders take bearings of the same signal.

### Comfortable results display and management

MONLOC is provided with the MapView software module from Rohde & Schwarz, which displays digital maps and marks transmitter locations by coloured circles (FIG 3). The DF results are also stored in a logbook on hard disk, so unattended operation with later evaluation of results is another possibility.

Frequency and position of a transmitter can be saved together with special features (eg licensed or non-licensed) in a signal library under a specific name. When an emitter is detected that is already contained in the signal library, the software automatically labels its position in the map with the associated name. A postevaluation option allows stored results to be recalled and displayed as the "track" of a mobile source of signals for instance.

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Reader service card 165/09

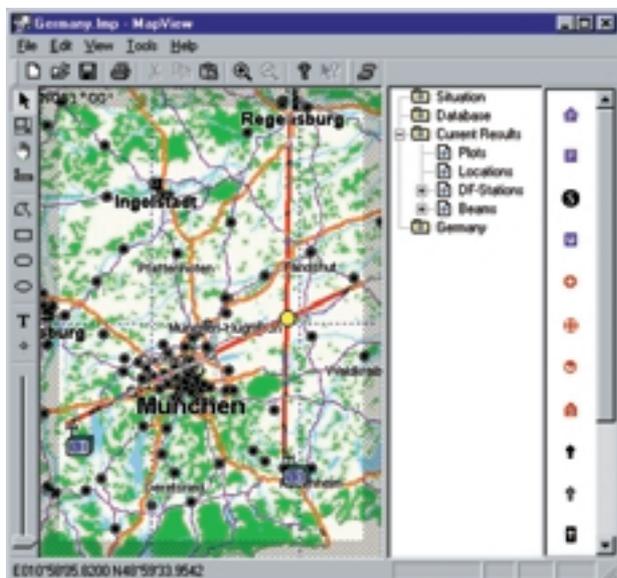


FIG 3  
Digital map with DF  
sites, DF beams and  
location result

### Possible data links PC – direction finder

Protocol: TCP/IP via

- RS-232-C
- LAN
- ISDN
- PSTN
- microwave
- GSM

### REFERENCES

- [\*] Demmel, Franz; Unsel, Ulrich; Dr Schmen- gler, Eckhard: Digital Monitoring Direction Finders DDF0xM – State-of-the art direction finding from HF to UHF. News from Rohde & Schwarz (1996) No. 150, pp 22–25