

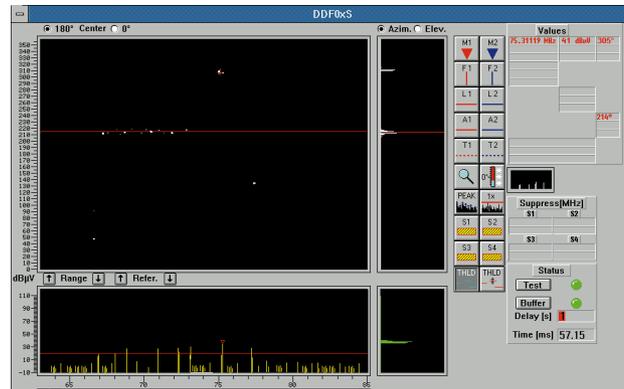
# RAMON basic software for Digital Direction Finders DDF0xM and DDF0xS

**Radiomonitoring System RAMON®** detects and monitors emissions in the frequency range 10 kHz to 18 GHz [1]. Using tried and tested standard components from Rohde & Schwarz, it is possible to compile even the most complex of radiomonitoring systems to customer requirements.

The purpose of detection and surveillance is to provide supervising stations with information enabling them to assess the actual scenario and prepare reports on it. The data obtained provide the answers to a whole series of questions regarding the who, when, where, what and why of a particular radio emission. Direction finding and the location of emitters play a major part in answering these questions. In conventional radiomonitoring systems a DF order is given to the DF base station and in the case of a successful bearing the result is signalled back. This procedure is time-consuming and requires several bearing stations, some of which may be manned. Modern radio transmitters emitting bursts or hopping between frequencies are difficult or not at all possible to detect with conventional methods.

For reliable detection of the signals generated by modern methods of data transmission **Digital Monitoring Direction Finder DDF0xM** [2] or **Digital Scanning Direction Finder DDF0xS** [3] can be used and controlled by Radiomonitoring System RAMON. Rohde & Schwarz has developed two new basic programs – Overview and Fixed Frequency – for the purpose. Scanning and direction finding are performed in the same direction finder, so the operator automatically receives the bearing for every activity revealed by the spectrum. Thus signal detection and direction finding go hand in hand. This applies to both traditional and frequency-agile signals.

FIG 1  
Overview display of  
Scanning Direction  
Finder DDF0xS



The main **features of the radiomonitoring and radiolocation system** include:

- RAMON user interface,
- frequency ranges HF/VHF/UHF,
- radiolocation using several direction finders,
- storage of selected DF and location results in RAMON database,
- optional display of DF and location results on digital map (MapView [4]),
- control of monitoring receivers from direction finder or vice versa.

Direction Finders DDF are able to process complex search orders for detecting radio signals. A **search order** may comprise

- up to nine frequency ranges,
- up to 50 suppress ranges.

The order is prepared with the aid of an editor and can be stored, reloaded and modified.

In the **Overview** mode the direction finder continually scans the frequency ranges of the search order and an overview of the scanned spectrum is displayed with direction information. Due to its high scan speed DDF0xS is particularly suitable for this mode. The overview display comprises four windows and a tool bar (FIG 1). The bearings of the detected signals are shown in the top left window, their levels in the window below. The frequency scale at the bottom edge is for both windows. The windows on the right show the frequency of occurrence of individual bearings or levels in the form of a histogram. A waterfall diagram showing activities at individual frequencies over time can optionally be displayed. In the example a frequency-agile signal with 214° bearing is

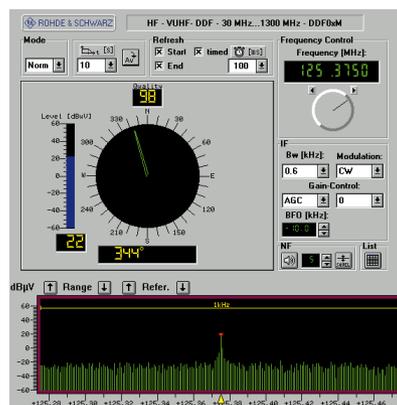


FIG 2 Azimuth display of Monitoring Direction Finder DDF0xM in Fixed Frequency mode

active. The display shows several bearings at different frequencies from the same direction and a cluster in the histogram. The operator may read the bearing angle with the aid of an azimuth line.

For direction finding at a particular frequency, the frequency is selected in the level window with the red triangular marker. A mouse click switches from Overview to **Fixed Frequency** mode. The selected frequency appears as the center frequency in the spectrum. FIG 2

shows the detection of a transmitter on 125.375 MHz at 344°. The display shows the spectrum around the center frequency and allows the direction finder to be tuned.

Using the Overview and Fixed Frequency device control windows, Direction Finders DDF0xM and DDF0xS are fully integrated into Radiomonitoring System RAMON, adding another two powerful modules to its capability.

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#### REFERENCES

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