



Communications Intelligence and Electronic Warfare

Customer-specific solutions for signal interception, identification, location and analysis



ROHDE & SCHWARZ

Complex tasks

Military forces monitor radio traffic to gather intelligence on the size, location, movements and intentions of the other nations' forces. Law enforcement agencies search for radio activity coming from criminal operations such as smuggling and theft or from terrorist activities. They can only be successful if their technical equipment is up to the latest state of the art. Survival in the "digital battlefield" is only possible through the use of flexible

"COMINT goes digital" is the trend. All instruments and systems from Rohde & Schwarz are completely in line with this trend through the massive use of extremely fast data and signal processors for digital signal processing and the use of intelligent modular hardware and software.

We assist you in solving your complex tasks by providing all-inclusive solutions



technology. You simply have to be the fastest and "smartest" to intercept and evaluate the multitude of signals and information to be successful in the age of information warfare.

for searching, detecting, locating and analyzing all communication signals from HF to SHF as well as non-com signals. We cover any type of modulation and transmission method. Whether voice, fax or data, analog or digital signals or even LPI methods such as frequency hopping or spread spectrum technique – we can offer the optimum solution for you. Would you like to know more? Just turn over and convince yourself.



Communications intelligence (COMINT) involves the surveillance, identification and location of communications emitters for tactical and strategic applications. Detecting and analyzing signals allows intelligence to be extracted on the type, deployment and movement of targets. Detailed analysis identifies operational and signal parameters – which in turn allows conclusions to be drawn, for example, on the type of unit or weapon system with which the signal is associated. Detection of particular types of threatening signals and their identification are a part of electronic support measures (ESM).

Rohde & Schwarz has specialized in designing and manufacturing equipment and systems for COMINT applications and provides customized turnkey EW solutions.

Who we are and what we do

We are an independent manufacturer of electronic capital goods. Our name is synonymous with innovation, precision and quality. A leading position on the European market and world-wide presence are the foundations of our success.

Rohde & Schwarz is a company with an international presence in the fields of test and measurement, information technology and communications. For 70 years, the company group has been developing, producing and marketing a wide range of electronic products for the capital goods sector.

The company with its approx. 6000 employees worldwide has subsidiaries and representatives in over 70 countries around the world. Headquarters are in Munich.

Due to the comprehensive know-how and the innovative strength of its employees, Rohde & Schwarz counts among the technological leaders in all of its business fields.

Today the Rohde & Schwarz group of companies is active in the following fields:

- ◆ **Test and measurement**
- ◆ **Radiocommunications systems**
- ◆ **Mobile radio**
- ◆ **Broadcasting**
- ◆ **Radiomonitoring and radiolocation**
- ◆ **IT security**
- ◆ **Services**

Talk to us!

A discussion with our experts will smooth the way to a customized solution that is fully satisfying.

Phone +49 89 4129-0

E-mail: comint@rsd.rohde-schwarz.com

www.rohde-schwarz.com

Solutions ...



Antennas

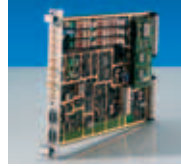
**Receiving signals from
100 Hz to 40 GHz**



The Rohde&Schwarz product line encompasses a wide range of highly sensitive active and passive antennas for mobile and stationary use, providing complete coverage of the 100 Hz to 40 GHz frequency range. Especially in radiomonitoring and radiolocation, our broadband antennas minimize the number of antennas needed. Rohde&Schwarz monitoring antennas can be easily arranged on a single mast using both directional and/or omnidirectional elements providing optimum reception for signals of any polarization. All antennas are fit for use under extreme weather conditions.

In addition to single antennas, we also offer complete antenna systems. These antenna systems can be controlled easily and efficiently via a graphical user interface and a commercial PC.

Receivers



**Searching/intercepting even the
weakest of signals**

Whatever kind of receiver you need, we can offer it:

- ◆ Stationary as well as mobile
- ◆ From HF, VHF/UHF and SHF through to 18 GHz
- ◆ Extremely sensitive in a congested signal environment
- ◆ Incorporating state-of-the-art DSP technology
- ◆ Featuring intelligent search routines
- ◆ With networking and remote control capability via software

Rohde&Schwarz receivers search at extremely high speeds of several GHz/s. This makes them ideal for intercepting LPI (low probability of intercept) signals such as frequency-agile emissions.



Direction finders

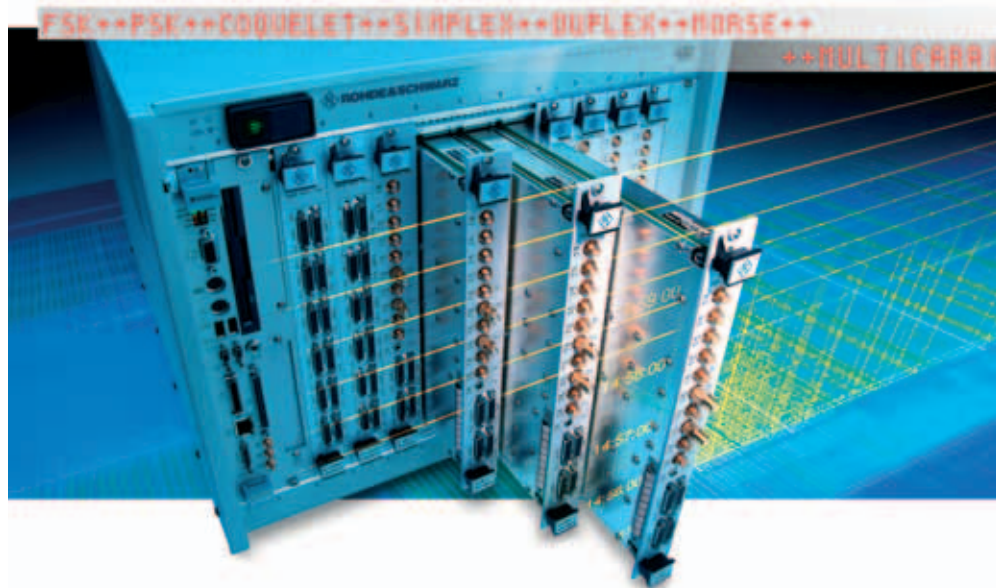


**Intercepting emissions
in a few microseconds**

Using state-of-the-art digital technology, direction finders from Rohde&Schwarz detect any signal from 300 kHz to more than 3 GHz with extremely high speed.



Even short emissions of GSM sources will be detected. Having different DF methods implemented, the direction finders can be optimally matched to any scenario.



Detection, interception and analysis of radio signals

We offer a complete program:

- ◆ For land-based, shipboard or airborne use
- ◆ Stationary, transportable and portable sets
- ◆ SSL (single station locator) DF systems for the HF range
- ◆ DF antennas for all types of application

The synchronous scanning option together with our high-end location system enables the location of fast frequency hopping transmitters.

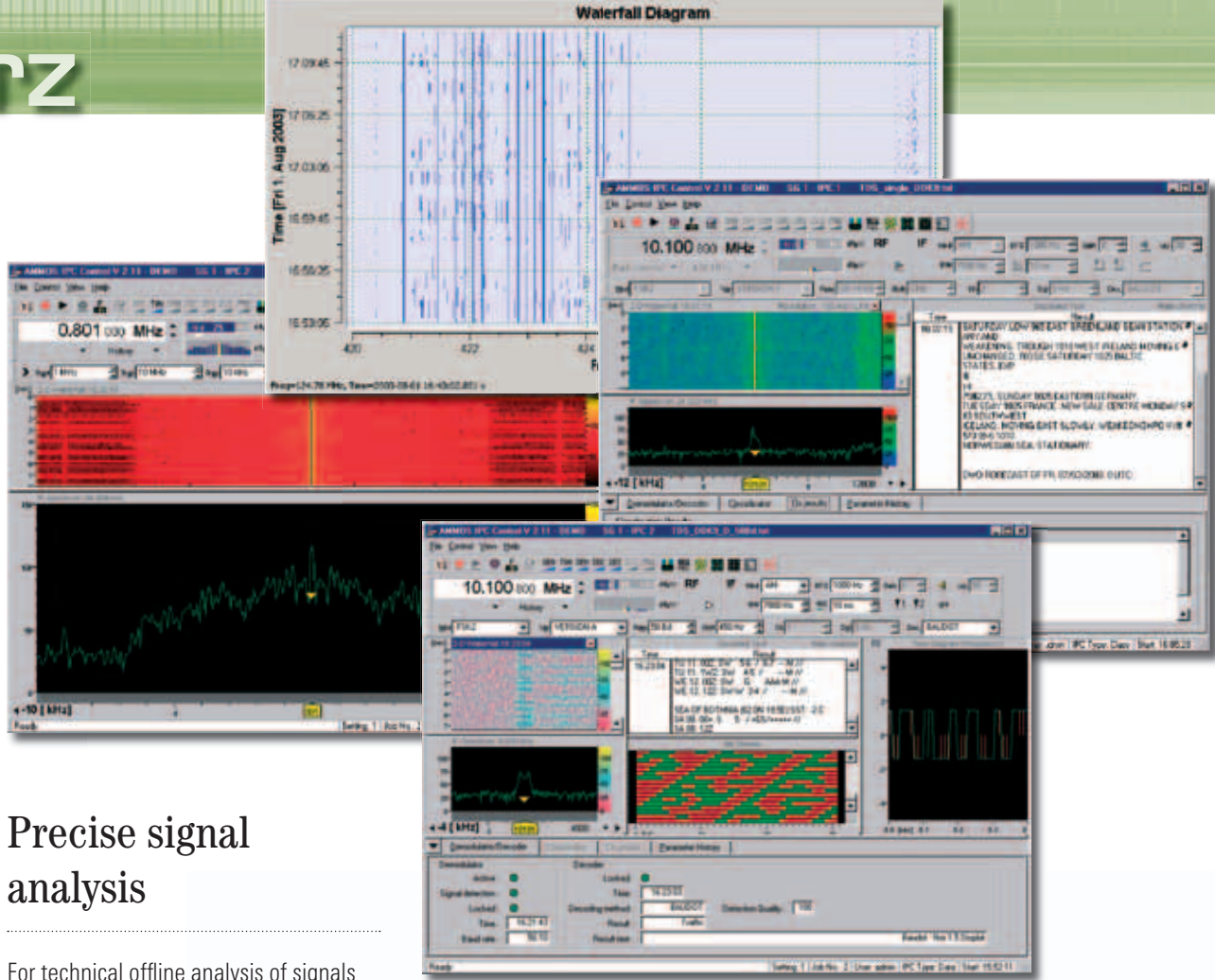
Rohde & Schwarz offers COMINT systems for automatic and manual interception, monitoring and analysis of radiocommunications in the frequency range from 300 Hz to 3.6 GHz for tactical and strategic applications.

The VXI-based sensor equipment (modern VXI receivers and signal processing boards installed in VXI mainframes) provides high modularity and configurability.

Signal processing functionality includes the following:

- ◆ Automatic detection of conventional and short-time signals (bursts, hoppers)
- ◆ Classification of unknown signals in the HF and VHF/UHF range
- ◆ Statistical evaluation of signal activities
- ◆ Digital narrowband and wideband IF recording and replay
- ◆ Technical analysis of (short-time) signals

Digital direction finders can be integrated in the system functionality for use in exclusive (one operator) or concurrent (many operators) mode.



Precise signal analysis

For technical offline analysis of signals based on wideband receivers and wideband signal processing components, loss-free reception, detection and analysis of emissions are provided: *(see figure on right)*

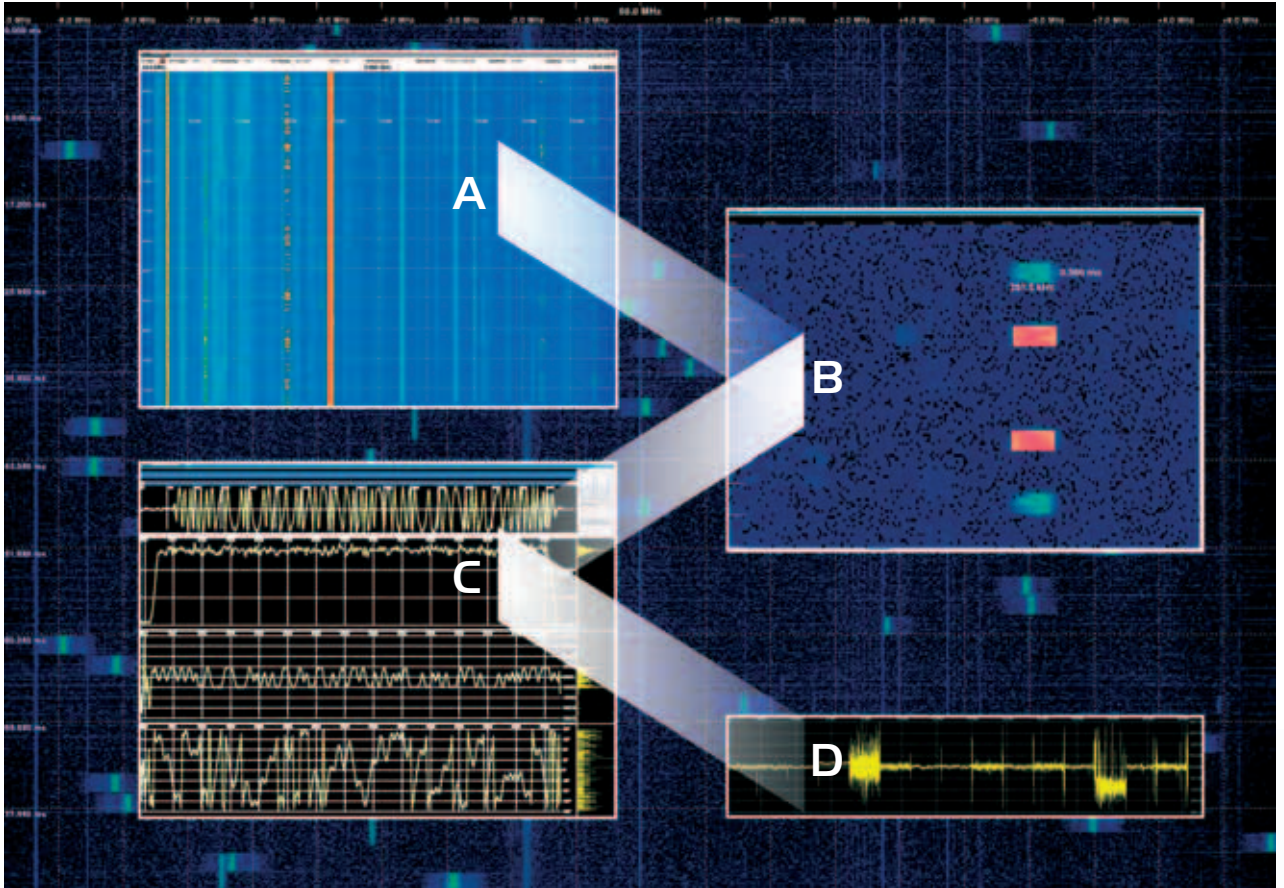
- ◆ Wideband signal acquisition **(A)** for an overview of the signal scenario in the whole frequency range
- ◆ Wideband signal analysis **(B)** for measurement of signals and emission autodetection
- ◆ Narrowband signal analysis **(C)** for high-resolution narrowband analysis to measure technical parameters of emissions
- ◆ Recombination of selected emissions and output as digital or analog narrowband IF **(D)**

Complex automatic systems

Rohde & Schwarz invites you to rely on decades of experience in the design of complex COMINT systems:

- ◆ Single- and multi-user systems
- ◆ Fixed, deployable and mobile stations
- ◆ Remote-controlled and networked systems
- ◆ Configuration to customer's requirements at short notice through modular hardware and software concepts
- ◆ Storage and evaluation of results in databases
- ◆ Control of system operation and data exchange using order and report mechanism
- ◆ Training and logistics from a single source

Smart systems ...



... for COMINT and EW from Rohde & Schwarz

The military situation has changed completely in the past years. A strict hierarchical structure will no longer fulfill the requirements for a modern EW system and its operation. Scalable systems are needed to provide a military commander with means of monitoring the activity on a battlefield and determining the effect of tactics and operations on enemy forces. EW systems are required by all forces in order to ensure continuous operation of their own C³I facilities.

Rohde & Schwarz offers a wide range of systems for tactical use. Small, highly mobile systems provide ESM facilities for force protection and compile an initial electronic situation picture over a large geographic area by rapidly changing sites.

Deployable, shelterized interception and location systems allow the surveillance of remote target areas without having to set up an infrastructure or deploy highly qualified personnel. Other systems enable the interception and location of LPI signals such as chirps, bursts or frequency hoppers.



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