Miniport Receiver EB 200

Hard times for eavesdroppers

The optional DIGI-Scan allows Miniport Receiver EB 200 – the portable all-in solution for radiolocation [1] – to cover a wide RF spectrum from 10 kHz through 3 GHz. This gives the user a variety of applications, including the detection and localization of spy transmitters (FIG 1).


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FIG 1
Thanks to its low weight, powerful directional antennas and high sensitivity, Miniport Receiver EB 200 is perfectly suited for numerous applications, eg for detecting spy transmitters

Industrial espionage causes serious damage

Professional eavesdroppers use sophisticated electronic techniques to get hold of the information they want. The effort seems to pay off, seeing as how information and communication are factors of strategic importance nowadays. The high-tech industry is a particularly promising target. In Germany alone, the losses caused by industrial espionage are estimated at several billion marks per year.

Miniature transmitters have long been popular devices for finding out, acoustically, about what other people are doing. Today it is no problem, not even for amateurs, to come by the equipment required. Socalled spy shops offer their products openly on the Internet – miniature transmitters for eavesdropping on rooms and telephones, directional microphones and miniaturized cameras concealed in cigarette packs and pens.

Swatting small bugs fast: EB 200 with DIGI-Scan

With EB 200 on their tail, bugging devices have no chance of hiding. RF Spectrum DIGI-Scan, an option for EB 200, provides the user with an overview of the current frequency spectrum within seconds. It detects any interferer and also hopping frequencies in a shot and then pinpoints them with the aid of its handheld directional antenna.

An electronic “tracker dog” – easy to handle

The exact localization of miniature transmitters starts with determination of the frequency on which they are operating. This is done by calling up the DIGI-Scan option on EB 200 and allowing the receiver to scan the selected frequency range (FIG 2). Localization of miniature transmitters at close range is made possible by the differential mode of DIGI-Scan (FIG 3). After calling up this mode, the current spectrum is stored as a reference. New spectra are superimposed on the reference spectrum, and any newly appearing signals or variations in signal strength are clearly discernible as peaks. Once the frequency of the spy transmitter is determined in the DIGI-Scan mode, the remainder is simple and fast: set EB200 to the frequency (FIG 4), call up the TONE mode in the display menu and set the level of the determined frequency approximately to the center of the bar shown on the level display. For localizing emission sources with the handheld antenna, the user only has to observe the level display or the loudness of the tone. The maximum level or the loudest tone will guide him straight towards the transmitter.

EB 200 is the only portable minireceiver combining spectrum display and level/tone search in a single unit.

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REFERENCES

[1] Günther Klenner: Miniport Receiver EB 200 and Handheld Directional Antenna HE 200 – Radiolocation from 10 kHz to 3 GHz with portable equipment. News from Rohde & Schwarz (1997) No. 156, pp 4–6

Reader service card 164/08

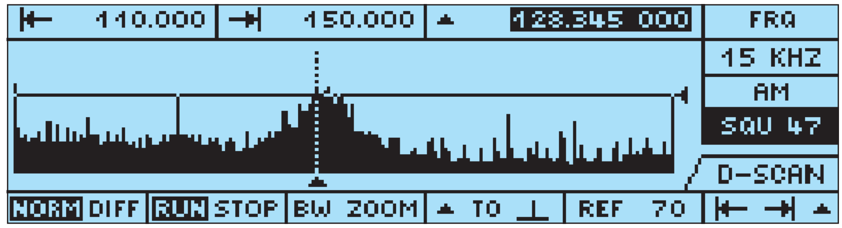

FIG 2 EB 200 in normal DIGI-Scan mode

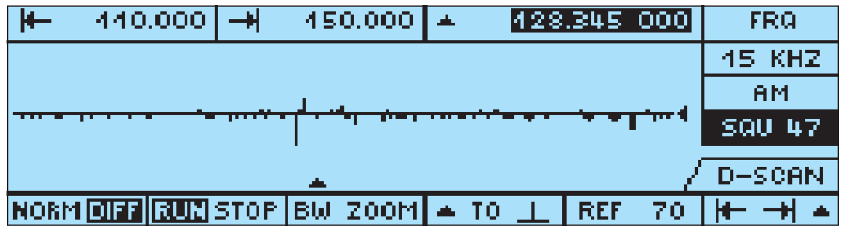

FIG 3 EB 200 in differential DIGI-Scan mode

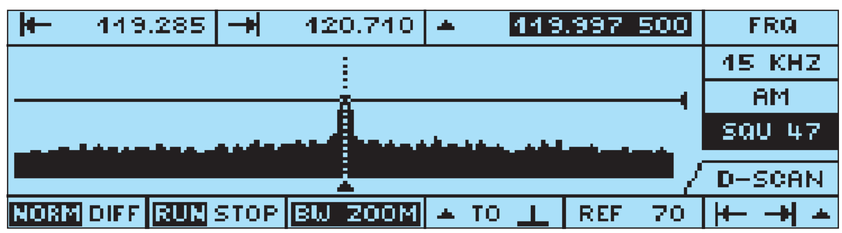

FIG 4 EB 200 in DIGI-Scan mode with high IF resolution for frequency tuning

Correction

In the test hint "Conversion of C/N or SNR to E_b/N_0 in DVB" in issue No. 163, "C" rather than "S" was incorrectly used in some equations. The correct equations are printed on the right. Please overlook our mistake.

$$S/N = E_b/N_0 + 10 \times \lg\frac{188}{204} + 10 \times \lg(m) + 10 \times \lg(P) - 10 \times \lg\left(1 - \frac{\alpha}{4}\right)\ \text{dB} \qquad \text{Equation 1}$$

$$E_b/N_0 = S/N - 10 \times \lg\frac{188}{204} - 10 \times \lg(m) - 10 \times \lg(P) + 10 \times \lg\left(1 - \frac{\alpha}{4}\right)\ \text{dB} \qquad \text{Equation 2}$$

For measurements in the **QAM demodulator,** √cos roll-off filtering has to be taken into account.

$$E_b/N_0 = S/N - 10 \times \lg\frac{188}{204} - 10 \times \lg(m) + 10 \times \lg\left(1 - \frac{\alpha}{4}\right)\ \text{dB}$$

For measurements in the **satellite demodulator** with QPSK, the equation for determining the BER as a function of E_b/N_0 after Viterbi FEC is as follows:

$$E_b/N_0 = S/N - 10 \times \lg\frac{188}{204} - 10 \times \lg(m) - 10 \times \lg(P) + 10 \times \lg\left(1 - \frac{\alpha}{4}\right)\ \text{dB}$$