

MOBILE RDF STATION WITH HIGH PANORAMIC SCANNING RATE OF HF FREQUENCY BAND «BERKUT-P»

Mobile RDF station «Berkut-P» is designed for **high panoramic scanning rate and direction finding** of short-time signals of RES within frequency band from 1.5–30 MHz. Station provides scanning of set frequency band with a rate of $V_{sc}=50-400$ MHz/s, spatial search and position finding of radio emission source (RES) by surface and low-angle radiowaves with vertical polarization.

Mobile RDF station «Berkut-P» has prompt control of operation modes, providing high speed RES search, automatic bearing sampling and interaction with external radiomonitoring system via GSM-communication channel.

Equipment of RDF and panoramic scanning station is installed inside vehicular platform of jeep type (or any other on Customer's demand); DF antenna is installed inside special transport cargo box or is cut into the roof of the vehicle.

Presence in the composition of direction finder of GSM-communication equipment increases efficiency of RES search, especially in DF network consisting of similar stations.

Mobile direction finder «Berkut-P» on Reno «Duster»:

External view



view of equipment section

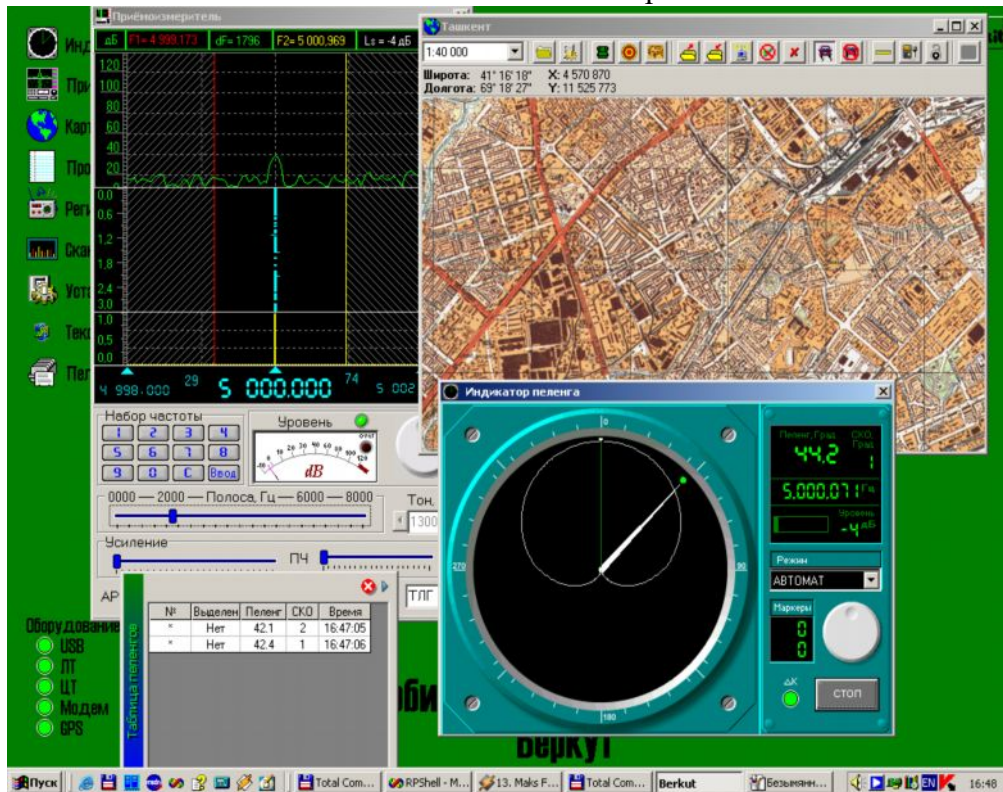


Direction finder based on three-channel receiving and measuring device provides stable signal direction finding implementing **Watson-Watt** method in the real open waves, and also delivers bearing samples for short-time RES with signal duration **5-200 ms** (including those from station interference).

Station «Berkut-P» provides high rate scanning of preset HF frequency band in panoramic mode implementing FFTs of 1024, 2048, 4096, 8192, providing resolution of spectral analysis of 1000 Hz, 500 Hz, 250 Hz, 125 Hz, 62.5 Hz. Panoramic scanning is provided by additional receiver of HF frequency band «**Filin-HF/P**», presented in the picture from the right.



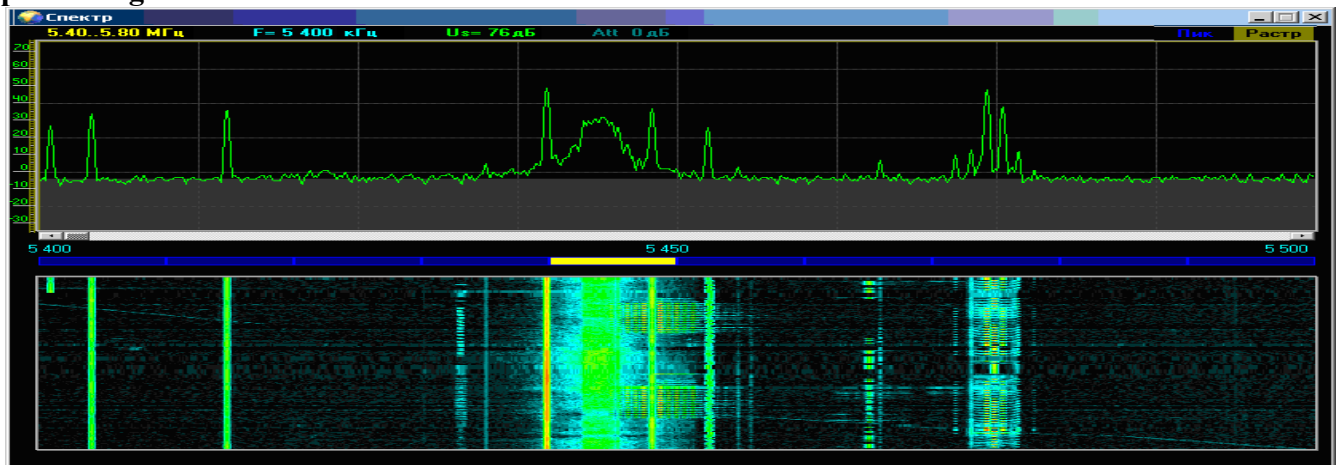
View of station desktop



Spatial FFT-processing while direction finding of signals provides spatial resolution of several RES, those signals are simultaneously operating in the receiving frequency bandwidth with overlapping spectra.

In the mode of bearing accumulation with polarization signal processing direction finder allows **stable direction finding of signals by spatial radiowave.**

Panorama amplitude-frequency and frequency –time –amplitude (waterfall) after FFT processing conducted in receiver «Filin-HF/P»



COMPOSITION

- direction finding antenna feeder system on the base of magnetic HF-loop antenna;
- receiving and measuring device on the base of three-channel DSP-radioreceiver with narrowband tunable preselector with one reserve receiving channel;
- **high rate receiver of HF frequency band «Filin-HF/P»;**
- operator's control board on the base of industrial computer;
- navigation equipment (GPS receiver, electronic compass);
- 3G GSM/GPRS modem;
- power supply unit with autocharging system of accumulators;
- two accumulator sets (main and reserve);

- complete set of cables and accessories (including field heterodyne for radio deviation correction measurement after installation of equipment inside a vehicle);
- complete set of operation and maintenance documentation.

MAIN FUNCTIONS

- High rate panoramic scanning of preset frequency bands;
- Automatic detection by means of spectral and statistical processing for detection of newly appeared signal against the background of existing HF band load with the following frequency tuning of direction finder and audio receiving channel;
- Direction finding of RES at preset frequency;
- Scanning through the list of frequency channels in order to detect already known sources;
- Indication of panoramic amplitude spectrum and group signal;
- Indication of amplitude spectrum of the signal being direction found;
- Recording of bearing information and voice signals to computer HDD;
- Display of RES position and DF station position on the map;
- Informational interaction via communication channel with external radiomonitoring system or similar DF stations;
- Achieving and automatic processing of measurement results;
- Automatic check of operability, equipment fault control and charge control of accumulators, and autocharge in motion.

TECHNICAL PARAMETERS

Operating frequency band	1.5– 30.0 MHz
Polarization	vertical
Panoramic scanning of frequency band with ΔF_{sc}	800 kHz
Scanning rate of frequency band	50 ... 400 MHz/s
FFT resolution	62.5/125/250/500/1000 Hz
Dynamic range by 3 ^d order intermodulation	> 90 dB
DF method	Watson-Watt
DF modes:	«instantaneous» DF, histogram accumulation, frequency RES selection, polarization selection
Instrumental DF error with RDC (MAE):	2°
Sensitivity by EM-field (threshold RMS = 3°)	5...25 μV/m
Minimal duration of signal	5 ms
Dynamic range of signals (with AGC)	not less than 120 dB
DF quality and signal level assessment	RMS / dBμV
Bandwidth of DSP-radio direction finder	0.03 ...16 kHz
Frequency resolution of bearing samples	100 Hz
Relative error of frequency measurement	< 2.0·10⁻⁷
Remote control	3 G GSM/GPRS
Consumed power from vehicle on-board system	not more than 140 W
Time of operation from autonomous power supply unit	6 hours
Operating frequency band of:	
equipment	+ 5° C...+ 50° C
antenna	– 40° C...+ 60° C

“Scientific-Engineering Center of Radio-Electronic Systems of Applied Radio Electronics of Academy of Sciences” Ltd.

Address: sq. Zakhystnykiv Ukrainy 7/8, Kharkiv, Ukraine, 61001

tel/fax:+38 (057) 732-25-53, fax +38 (057) 732-68-63

E-mail: ntcrts@kharkiv.com , www.ntcrts.com