

Compact panoramic SDR receiver of HF frequency band “Philin-HF/P”

Compact panoramic receiver “Philin-HF/P” is purposed for operating RES frequency search within frequency band from 1 to 30 MHz in the composition of mobile DF stations “Berkut”.

Receiver has computer control via interface LAN 1 Gbps and provides amplitude signal spectrum observation on the monitor of DF station in panoramic mode (bandwidth 800 kHz).

Information from receiver output is presented in the form of digital quadrature samples transmitted via LAN-port into computer for spectral-statistical processing in order to detect newly appeared signals in the open waves against the background of existing load.

SDR-receiver is deigned on direct conversion circuit of signal frequency by 16-bit ADP and BBC converting into the complex form (I/Q-samples) with the following signal processing in PGA and DSP-processor.

Power supply of receiver can be provided both from DC power supply unit +7.5 V and from industrial network 220 V, 50 Hz using regular power supply unit.

SDR-receiver “Philin-HF/P” is purposed for:

- 1) Automatic receiving and FFT-detection of radio signals while scanning within frequency band from 1 MHz to 30 MHz;
- 2) Generating FFT-spectrum (amplitude spectrum) of received signals.
- 3) Automatic control of frequency adjustment of direction finder of station “Berkut” while detecting new signals;
- 4) Operation under stationary, mobile and filed conditions.

COMPOSITION

- Panoramic receiver of HF frequency band “Philin-HF/P”;
- special software for external PC of mobile DF station “Berkut”;
- complete set of connecting cables;
- power supply unit form AC network 220 V, 50 Hz;
- operational documentation.

Compact receiver
of interception and
surveillance



Main technical parameters of HF band receiver “Philin-HF/P”

Name	Parameter
Operating frequency band	1 MHz – 30 MHz
Antenna input (connector SMA)	$Z_{in}=50$ Ohm
VSWR of antenna input	not more than 2.5
Tuning resolution of receiver	1 Hz
Tuning time of frequency synthesizer	not more than 0.5 ms
Relative tuning frequency instability within operating frequency band	not more than $\pm 2.5 \cdot 10^{-6}$
Sensitivity of signal detection with frequency resolution FFT 62.5 kHz	not more 0.2 μV
Scanning rate (with $F_{coverage}= 800$ kHz): with frequency resolution FFT 125 Hz with frequency resolution FFT 250 Hz with frequency resolution FFT 500 Hz with frequency resolution FFT 1000 Hz	not less than 100 MHz/s not less than 200 MHz/s not less than 400 MHz/s not less than 500 MHz/s
Real time bandwidth	800 kHz
Noise factor	not more than 10 dB
Dynamic range by third order intermodulation distortions	not less than 90 dB
Attenuation adjustment of HF attenuators	coarse 0, 30 dB, fine 0...31 dB, step 1 dB
Consumed power from net 220 V/50 Hz from DC source 7.5 V	not more than 10 W not more than 7 W
Weight of receiver	not more than 1.1 kg
Overall dimensions of receiver	not more than 86×50×215 mm
Operating frequency band	-10°C ...+50°C

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