LEMUR-20M
ESM SYSTEM

DESCRIPTION

The LEMUR-20M is a high performance modular ESM system designed to operate in high density electromagnetic environment, dedicated for various platforms. The modular design enables various configuration according to customer's requirements.
The system applies the latest innovations in digital signal processing and interception techniques with on-line and off-line capabilities.

SYSTEM DESIGN

LEMUR –20M system consists of separate parts:

Antenna System (TAW-20) includes:

- a set of spiral wideband antennas for 1 to 2 GHz and 2-18 GHz;
- omni-directional antenna;
- preamplifiers and filters.

TAW-20

Receiver Module (BOM-20) includes:

- a set of microwave receivers,
- instantaneous frequency measurement unit (IFM)
- BITE system.

BOM-20

Processing and Display Module (BPZ-20) includes:

- Digital Signal Processing system with a de-interleaving unit;
- Visualization module;
- System environment monitoring unit;
- LAN, navigation system and on board radars blanking interface;
- Operator console with LCD monitor, keyboard and trackball.

BPZ-20

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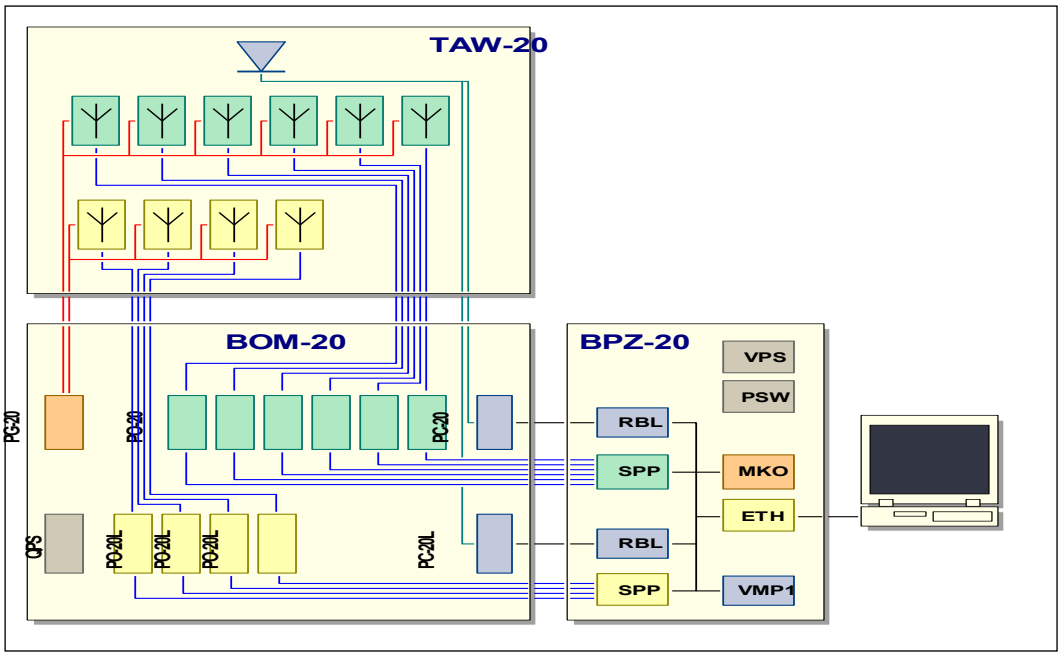

LEMUR–20M system

SYSTEM FEATURES

The LEMUR-20M system performs the following functions:

Signal reception and pulse parameter estimation

The signals received by the antenna/receiver system are processed by the programmable hardware, real-time Pulse Parameter processor to perform digital filtering and linearization as well as angle of arrival, time, amplitude and frequency parameters estimation, in order to complete a pulse parameter vector and to send it to the de-interleaving unit.

De-interleaving and estimation of emitters' parameter

The received pulse parameter vectors are sorted in a parameter space to build an Emitters Parameter Descriptor structure describing technical parameters of sources. Sophisticated algorithms have been implemented to assure high capacity real-time computing

Tracking

The following source parameters provided by the EPD are tracked by the Tracking Unit to determine the way they change in time:

- Frequency
- Pulse width (CW included)
- Amplitude
- Direction of arrival
- Time of arrival
- PRF value and modulation type
- Antenna rotation rate
- Scanning type
- Beamwidth

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Signal identification

Real-time identification of source parameters is performed using database containing information on technical and tactical data of the sources, their platform, hostility etc. To this end weight functions and expert criteria are employed

Environment analysis tools

Powerful tools to analyse the electromagnetic environment signals are available to the user: oscilloscope-like visualisation of the received samples and pulses, capability to turn on and off filters and attenuators; recording the signal in both time and frequency domain.
The tools are especially useful to analyse strange, unknown emissions and for system troubleshooting.

Recording and replaying

LEMUR-20M system is capable of recording the received signals on three levels of minuteness of detail:

- Sample level
- Pulse level
- Source level (tracks)

The processed information is stored in a computer memory or transmitted to the superior system via LAN to be used in off-line signal analysis, training simulation, software development and database management. New records can be entered into the database from several sources. Database management has been implemented using COTS Microsoft Windows based software.

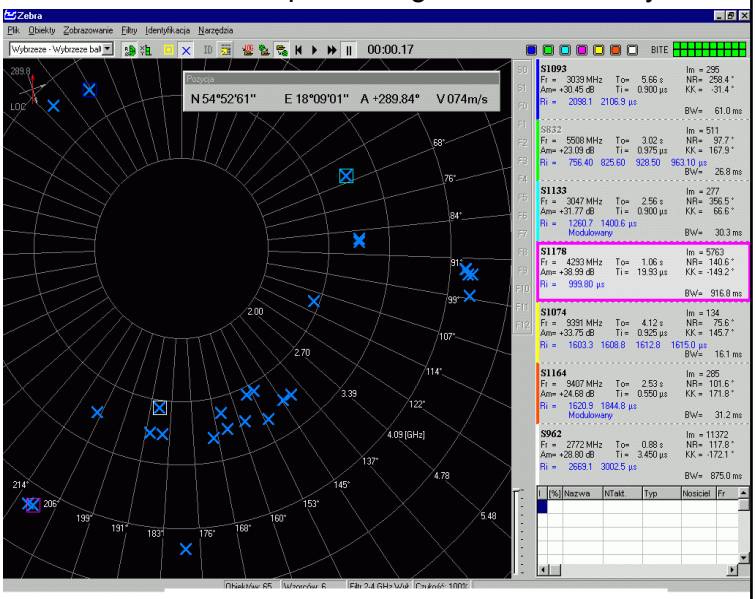
Human-Machine Interface

LEMUR-20M system Human-Machine Interface includes several synthetic pictures in Windows environment to represent radar situation, visualization on the map, tracking, identification, system control and BITE results.

The following information are displayed:

- view of the threat and target in electromagnetic environment;
- result of the identification;
- database editor;
- samples and pulses oscilloscope;
- results of system tests, failed units location down to the LRU;
- technical and tactical data.

LEMUR-20M system display covers complete file management, display settings, system control and environment monitoring. A proprietary and STANAG 4420 track symbols is included.



Visualization in the polar coordinates

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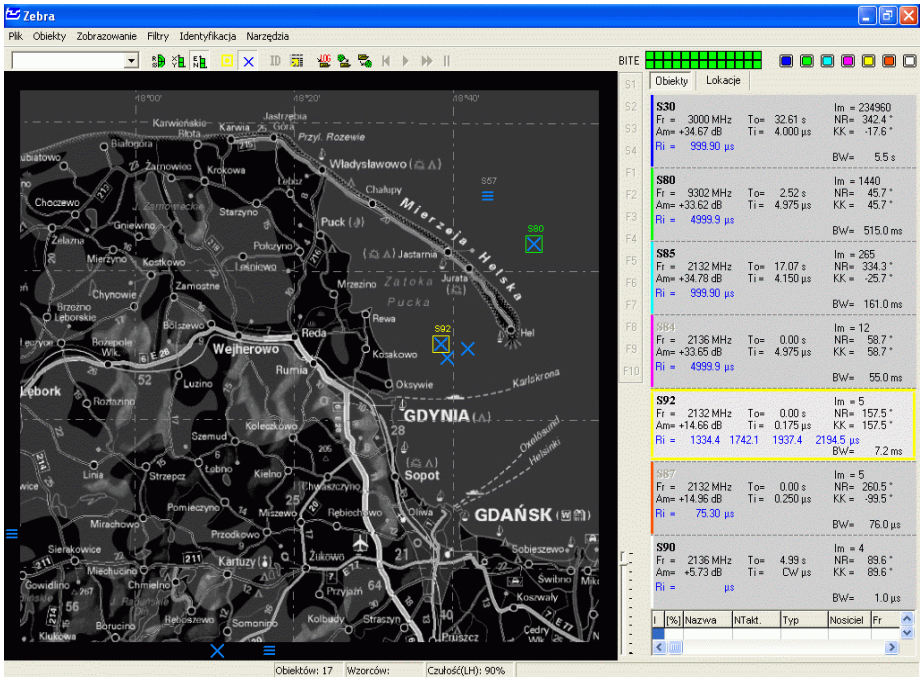

Visualization on the map

SPECIFICATION (technical and tactical data)

Parameter	Value
Frequency coverage	1 to 18 GHz
Spatial coverage	azimuth 360°; elevation ±45°
Probability of Intercept (POI)	near 100%
Dynamic range	50 dB
Frequency measurement accuracy	4 MHz rms
Direction finding accuracy	7° rms
Time parameters measurement accuracy	25 ns
Signal density	better than 10^6 pulses per second
Response time	less than 2000 ms
Navigation, supervisory and combat/ECM system interface	RS232, NMEA protocol, Ethernet TCP / IP
Recording real time signal/data and replaying the same for post-mission analysis	Samples, Pulses, Sources level
Alerts	Audio/ visual warning for each threat emission
Immunity from own/spurious friendly transmission and lightning	4 to 8 inputs
Mechanical, EMC and Climatic environment	MIL Std.
Power supply	27 V DC
Dimensions and mass	
BOM-20	19”x7U/ 20 kg
BPZ-20	19”x4U/ 10 kg
TAW-20	500x440 mm/ 15kg

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