

# RF20 - EPM handheld transceiver

Type designation: **RF20**

PN (RN): **2300.100.10**

RF20 EPM handheld multiband transceiver with improved resistance to electronic warfare is designated for use at the lowest tactical command levels for all kinds of military units. Depending on the type of selected frequency band, the transceiver is able to communicate in HF band with frequency modulation, with VHF RF13 transceivers, RF2050, RF2350 mobile transceivers and with airborne transceivers in Aircraft band I.

## Operating features

### a) in all operation modes

- automatic self-test after power-up, with failure indication on the transceiver display (BITE);
- operational data programming from external units;
- emergency erasure of operation data on fixed frequency channels, including encryption unit codes and information for FH networks including TRANSEC and COMSEC;
- transmission of tone calling ( $1000 \pm 200$ ) Hz, in VHF III band ( $1750 \pm 25$ ) Hz;
- acoustic signaling switching on/off by transceiver operator;
- display and keypad backlight activation;
- adjustable display contrast;
- battery pack voltage signaling;
- transmission power signaling on the display, transmission signaling by LED on the top panel;
- "reception only" mode, with transmission disabled;
- whisper mode with increased microphone sensitivity and decreased audio volume;
- displaying of servicing information – firmware;
- position, velocity and time display on the LCD with GPR23 receiver connected;
- easy to control;
- transceiver remote control via PRC20 protocol;
- automatic transition from increased output to nominal output with dropped nominal supply voltage;
- possibility of using bag for modular carrying system.

### b) in fixed frequency mode

- max. 10 presets from the entire frequency range, fewer preset channels if occupied by FH networks;
- simplex or semi-duplex operation;
- 150 Hz sub-tone squelch or signal squelch (only signal in VHF II);
- voice operation via internal encryption unit compatible with RF13, RF2050, RF23 - in FM ranges;

- transmission and reception of short encrypted messages – FLASH, with the opposite transceiver identification;
- data transmission according to MIL-STD-188-220 (NET);
- channel parameter programming from keypad;
- preset channel scanning;
- operation frequency setting in 6.25 kHz, 8.33 kHz, 25 kHz or 1 MHz steps;
- transmission band for digital voice and data transmission 16 kbit/s according to STANAG 4204, edition 2.

### c) in FH operation

- max. 6 network presets;
- operation in frequency range 30.000 MHz to 87.975 MHz;
- secure operation TRANSEC and secret operation COMSEC;
- simplex or semi-duplex operation with frequency hopping;
- compatibility with RF2050 and RF23 transceivers and RX2050 receiver on simplex and semi-duplex channels;
- selectable frequency hopping operation mode – FH, DFF, FCS, MIX and IFF with quick transition to HLC, HLG or HLA;
- communication on the channel with a continuous carrier;
- iso-fixed frequency operation mode;
- establishing of connection with fixed frequency transceivers through HLC and HLG monitoring;
- 121.500 MHz (HLA) frequency monitoring and transition to HLA with transmission disabled;
- late net entry with synchronization request;
- master transceiver switching depending on the network condition;
- transmission of warning message to all network participants;
- all transceivers authentication request;
- MASTER transceiver selective communication with a selected slave transceiver;
- transmission and reception of short text message, maximum 156 characters;
- preparation, saving and reading of up to 10 short text messages;
- transmission over notification (BREAK IN) by all transceivers;
- INTERLEAVING switching off for close-to-the-limits communication;
- data transmission at adjustable rates – 7100 bit/s, 4800 bit/s and 2400 bit/s (P2P);
- data transmission according to MIL-STD-188-220 (NET);
- CW mode suitable for use with external frequency converters;
- G-track, sending position reports via radio channel (with GPR23 receiver connected);
- own position sending by SMS (with GPR23 receiver connected).

## Technical parameters

|                                       |                               |
|---------------------------------------|-------------------------------|
| <b>Frequency range</b>                | 25.000 MHz to<br>145.9875 MHz |
| <b>Nominal input/output impedance</b> | 50 Ω                          |
| <b>Frequency ranges</b>               |                               |
| <b>HF</b>                             | 25.000 MHz to 29.975<br>MHz   |
| <b>VHF I</b>                          | 30.000 MHz to<br>108.000 MHz  |

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| <b>VHF II</b>  | 117.975 MHz to<br>140.000 MHz                        |
| <b>VHF III</b>   | 140.025 MHz to<br>145.9875 MHz                       |
| <b>Modulation type</b>   |  |
| <b>HF</b>  | FM   |
| <b>VHF I</b>   | FM   |
| <b>VHF II</b>  | AM   |
| <b>VHF III</b>   | FM   |
| <b>Channel spacing</b>   |  |
| <b>HF band</b>   | 25 kHz   |
| <b>VHF I band</b>  | 25 kHz; 12.5 kHz;<br>6.25 kHz                        |
| <b>VHF II band</b>   | 25 kHz; 8.33 kHz                                     |
| <b>VHF III band</b>  | 25 kHz; 12.5 kHz                                     |
| <b>Number of operation channels at 25<br/>kHz channel spacing</b>      |  |
| <b>HF</b>  | 200  |
| <b>VHF I</b>   | 3121   |
| <b>VHF II</b>  | 882  |
| <b>VHF III</b>   | 239  |
| <b>Preset channels</b>   | 10   |
| <b>Number of channels monitored in<br/>all special operation modes</b> | 3 (two adjustable,<br>third fixed at 121.500<br>MHz) |
| <b>Max. number of programmable nets</b>                                | 6  |
| <b>Nominal supply voltage</b>  | 7.2 V  |
| <b>Limit supply voltage</b>  | 6.5 V to 9.5 V                                       |
| <b>Frequency band with special<br/>operation modes</b>                 | 30.000 MHz to 87.975<br>MHz                          |
| <b>Voice operation F3E</b>   | according to STANAG<br>4204                          |
| <b>Types of special operation modes</b>                                |  |
| <b>FH</b>  | frequency hopping                                    |
| <b>DFF</b>   | digital fixed frequency                              |
| <b>FCS</b>   | free channel search                                  |
| <b>MIX</b>   | mixed operation FH<br>and FCS                        |

|  |                       |
|--|-----------------------|
| <b>IFF</b>   | iso-fixed frequency   |
| <b>CW</b>  | continuous wave       |
| <b>Time to first synchronization</b>   | max. 5 s              |
| <b>Synchronization hold with transceiver off and battery pack connected</b>        | min. 48 hours         |
| <b>transceiver synchronization hold with battery pack disconnected</b>             | min. 50 s             |
| <b>Transceiver current consumption</b>   |                       |
| <b>transmission (nominal power)</b>  | 1.6 A                 |
| <b>transmission (reduced power)</b>  | 0.65 A                |
| <b>transmission (increased power)</b>  | 3.2 A                 |
| <b>reception</b>   | 0.2 A                 |
| <b>stand-by</b>  | 0.18 A                |
| <b>Operation time (transmission [2 W]<br/>: reception : stand-by = 1 : 1 : 10)</b> |                       |
| <b>with LP1302 battery pack</b>  | min. 15 hours         |
| <b>with LP20 battery pack</b>  | min. 28 hours         |
| <b>TRANSMITTER PARAMETERS</b>  |                       |
| <b>Transmitter nominal output for FM</b>   | 2 W                   |
| <b>Transmitter nominal output for AM</b>   | 1 W                   |
| <b>Transmitter reduced output for FM</b>   | 0.2 W                 |
| <b>Transmitter reduced output for AM</b>   | 0.1 W                 |
| <b>Transmitter extended output for FM</b>  | 5 W                   |
| <b>Harmonics suppression</b>   | min. 40 dB            |
| <b>Spurious suppression at &gt; 25 kHz mistuning</b>                               | min. 60 dB            |
| <b>RECEIVER PARAMETERS</b>   |                       |
| <b>Sensitivity</b>   | 0.5 µV at 12 dB SINAD |
| <b>Non-linear distortion factor</b>  | 10 %                  |
| <b>Loudspeaker output power</b>  | 200 mW/8 Ω            |
| <b>Audio bandwidth</b>   |                       |
| <b>narrow band</b>   | 300 Hz to 3 000 Hz    |
| <b>wide band</b>   | 20 Hz to 11 000 Hz    |
| <b>Mechanical properties and resistance</b>  |                       |

|   |                              |
|---|------------------------------|
| <b>Immersion</b>  | 1 m depth                    |
| <b>Operating temperature range</b>  | -40 °C to +70 °C             |
| <b>Dimensions</b>   |                              |
| <b>transceiver with battery pack</b>  | W 97 mm x H 217 mm x D 44 mm |
| <b>LP1302 battery pack</b>  | W 79 mm x H 61 mm x D 44 mm  |
| <b>LP20 battery pack</b>  | W 76 mm x H 95 mm x D 45 mm  |
| <b>Weight</b>   |                              |
| <b>transceiver</b>  | max. 0.85 kg                 |
| <b>LP1302 battery pack</b>  | max. 0.3 kg                  |
| <b>LP20 battery pack</b>  | max. 0.45 kg                 |
| <b>Average ranges in a medium undulated and wooden terrain at nominal power</b> |                              |
| <b>with AS1301 short tape antenna</b>   | 0.8 km                       |
| <b>with AL1301 long tape antenna</b>  | 5 km                         |

## Set

| Type designation | PN (RN)     | Name                                      |
|------------------|-------------|---|
| RF20             | 2300.000.10 | EPM handheld transceiver set              |
| RF20             | 2300.000.62 | Set with modular carrying system elements |

## Accessories

| Type designation | PN (RN)     | Name                        |
|------------------|-------------|-----------------------------|
| LP1302           | 7029.100.02 | Battery pack                |
| AS1301           | 2038.100.01 | Short tape antenna<br>0.5 m |
| AL1301           | 2037.100.01 | Long tape antenna<br>1.1 m  |
|                  | 6000010032  | Transceiver bag             |

|        |                             |                                       |
|--------|-----------------------------|---------------------------------------|
|        | 6000010033                  | Set bag                               |
|        | 7020.116.01                 | Battery pack bag                      |
| LP20   | 7029.100.11,<br>7029.100.13 | Battery pack                          |
| PP20   | 7029.100.50                 | Battery holder                        |
| NU1302 | 7027.000.02                 | Universal charger<br>set              |
| NM1302 | 7028.000.02                 | Mobile charger set                    |
| PC20   | 7046.000.12                 | Small mains<br>charger set            |
| PD13   | 2036.100.10                 | Long-wire antenna                     |
| RF13.8 | 2036.100.11                 | Hang-up antenna                       |
| AL13   | 2039.100.01                 | Long tape antenna<br>1.5 m            |
| RM1301 | 2009.100.01                 | Handheld<br>microphone/<br>speaker    |
| RM20   | 2313.100.01                 | Handset with<br>control               |
| PK20   | 2320.000.02                 | Fill gun set                          |
| GPR23  | 2332.100.01                 | GPS receiver for<br>RF20 radio system |
|        | 1050.312.23                 | GPS receiver cable                    |
|        | 1050.285.01                 | Data cable (USB)                      |
|        | 1050.285.02                 | Data cable<br>(RS232C)                |
|        | 2025.500.51                 | CD for modem<br>configuration         |
|        |                             | RF headsets                           |