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.

Oparating 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 ± 200) Hz, in VHF III band (1750 ± 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;

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• 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

Frequency range	25.000 MHz to 145.9875 MHz
Nominal input/output impedance	50 Ω
Frequency ranges	
HF	25.000 MHz to 29.975 MHz
VHF I	30.000 MHz to 108.000 MHz

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

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

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

Accesories

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

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