

# RF2350 - EPM mobile transceiver

Type designation: **RF2350**

PN (RN): **2310.100.40**

RF2350 mobile multiband transceiver with increased resistance against radio-electronic warfare is intended for installation in all tracked and wheeled vehicles and base stations. It is fully compatible with RF20, RF23 and RF2050 in simplex and semi-duplex frequency hopping channel. Depending on the selected frequency band, the transceiver communicates with older RF13 radio system transceivers and with other transceivers complying with STANAG 4204. The transceiver secures data communication in fixed frequency channels according to MIL-STD-188-220 standard (NET modem). Two types of modem can be used for data transmission in frequency hopping channels - P2P and NET. RF2350 transceiver includes a navigation receiver displaying navigation data on a display and transmitting the GPS data via frequency hopping radio channel using G-track service. The transceiver features one U-229/ U audio frequency connector (complying with MIL-DTL-55116 standard) to connect standard headsets. Various acoustic devices such as SONETRONICS, CJ COMPONENT PRODUCTS, POWER TIME etc. can be connected to the connector.

The transceiver is manufactured in two versions: 2310.100.40 without the co-site filter and 2310.100.41 with the co-site filter.

The co-site filter allows simultaneous operation of multiple RF2350 transceivers or of one RF2350 transceiver with RF2050 transceiver in one vehicle in 30 MHz to 90 MHz operating band. There must be at least 1.5 m between the recommended types of vehicle antennas and spacing between receiving and transmitting frequencies of at least 10 %. The co-site filter must be used with all transceivers to guarantee compatible operation.

## 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 - PK20 or PK23;
- simplex or semi-duplex operation;
- emergency erasure of operation data on fixed frequency channels, including encryption unit codes and information for FH networks including TRANSEC and COMSEC keys;
- acoustic signaling switching on/off by transceiver operator;
- transmission of tone calling ( $1000 \pm 200$ ) Hz, in VHF III band ( $1750 \pm 25$ ) Hz;
- display and keypad backlight;
- adjustable display contrast;
- synchronous data transmission;

- transmission power signaling on the display, transmission signaling by LED on the top panel;
- operation channel signal reception signaling by a LED on the transceiver panel;
- transmitter overheat signaling LED on the transceiver panel with automatic switching to lower power output;
- signaling of active mode with co-site filter (version 2310.100.41);
- optional external cooling box for improved cooling efficiency;
- "reception only" mode, with transmission disabled;
- whisper mode with increased microphone sensitivity and decreased audio volume;
- loud received signal monitoring with volume regulation and LED signaling;
- transceiver remote control via RC20 remote control unit and PRC20 protocol;
- connector configuration for connecting one or two antennas;
- displaying of servicing information – firmware;
- position, velocity and time display on the LCD with external GPS antenna connected;
- easy to control.

#### **b) in fixed frequency mode**

- max. 10 presets from the entire frequency range 25 MHz to 145.9875 MHz, fewer preset channels if occupied by FH networks;
- 150 Hz sub-tone squelch or signal squelch (only signal in VHF II);
- voice operation via internal encryption unit compatible with RF13, RF1301, RF20 and RF2050;
- transmission and reception of short encrypted messages – FLASH, with the opposite transceiver identification;
- channel parameter programming from keypad;
- preset channel scanning;
- data transmission according to MIL-STD-188-220 compatible with modem MD13.1;
- 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;
- selectable frequency hopping operation mode – FH, DFF, FCS and MIX with quick transition to HLC, HLG or HLA;
- communication on the channel with a continuous carrier;
- iso-fixed frequency operation mode without HLC, HLG and HLA monitoring;
- 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;
- own position sending by SMS.

## Technical parameters

<b>Frequency range</b>	25.0000 MHz to 145.9875 MHz
<b>Nominal input/output impedance</b>	50 Ω
<b>Frequency ranges</b>	
<b>HF</b>	25.000 MHz to 29.975 MHz
<b>VHF I</b>	30.000 MHz to 108.000 MHz
<b>VHF II</b>	117.975 MHz to 140.000 MHz
<b>VHF III</b>	140.0250 MHz to 145.9875 MHz
<b>Type of modulation</b>	
<b>HF</b>	F3E (FM)
<b>VHF I</b>	F3E (FM)
<b>VHF II</b>	A3E (AM)
<b>VHF III</b>	F3E (FM)
<b>Channel spacing</b>	
<b>HF</b>	25 kHz
<b>VHF I</b>	25 kHz; 12.5 kHz; 6.25 kHz
<b>VHF II</b>	25 kHz; 8.33 kHz
<b>VHF III</b>	25 kHz; 12.5 kHz
<b>Number of operation channels with 25 kHz spacing</b>	
<b>HF</b>	200
<b>VHF I</b>	3121
<b>VHF II</b>	882
<b>VHF III</b>	239
<b>Number of preset channels</b>	10
<b>Number of frequency hopping channels</b>	max. 6

### RECEIVER PARAMETERS

<b>Sensitivity</b>	
<b>(25-29.975) MHz</b>	0.6 $\mu$ V
<b>(30-90) MHz with co-site filter/ without co-site filter</b>	0.7 $\mu$ V/0.5 $\mu$ V
<b>(90.00625-108) MHz</b>	0.5 $\mu$ V
<b>(117.975-140) MHz</b>	0.5 $\mu$ V
<b>(140.025-145.9875) MHz</b>	0.5 $\mu$ V
<b>Dynamic two-signal selectivity for adjacent channel</b>	min. 57 dB
<b>Suppression of intermediate frequencies</b>	min. 80 dB
<b>Suppression of mirror frequencies</b>	min. 60 dB
<b>Suppression of spurious receptions for detuning &gt; 10 % from operating frequency</b>	min. 70 dB
<b>TRANSMITTER PARAMETERS</b>	
<b>Nominal output power</b>	FM 50 W
<b>Nominal output power</b>	AM 15 W
<b>Reduced output power</b>	FM 5 W
<b>Reduced output power</b>	AM 2 W
<b>Harmonic suppression</b>	min. 60 dB
<b>Spurious suppression at <math>\Delta f &gt; 25</math> kHz</b>	min. 70 dB
<b>Time of continuous operation at +50 °C at duty cycle reception : transmission = 1 : 1</b>	without limit
<b>Average ranges in medium undulated terrain at nominal power FF mode (with antenna 2.6 m)</b>	25 km
<b>POWER SUPPLY (according to MIL- STD-1275B)</b>	
<b>Nominal supply voltage</b>	12 VDC or 24 VDC
<b>Limit supply voltage</b>	10 VDC to 33 VDC
<b>Current consumption</b>	
● <b>Transmission - nominal output power</b>	
<b>at 12 V</b>	max. 25 A
<b>at 24 V</b>	max. 12 A
● <b>Reception</b>	
	max. 1.25 A (12 V)

## **AUDIO FREQUENCY OUTPUTS/ INPUTS PARAMETERS**

### **Effectively transmitted frequency band**

**narrow band** 300 Hz to 3000 Hz

**wide band** 20 Hz to 11000 Hz

### **Audio frequency levels of AF connector outputs**

#### **AF1 connector**

**narrow band** adjustable level/1  
k $\Omega$

**wide band** constant level 1000  
mV/600  $\Omega$

#### **AF2 connector**

**narrow band** adjustable level min.  
200 mW/8  $\Omega$

**narrow band** constant level min.  
775 mV/600  $\Omega$

**wide band** constant level 1000  
mV/600  $\Omega$

#### **REMOTE connector**

**narrow band** constant level min.  
775 mV/600  $\Omega$

### **Audio frequency levels of AF connector inputs**

#### **AF1 connector**

**narrow band** 3 mV/ $\Delta f$  = 4 kHz

**wide band** 400 mV/ $\Delta f$  = 4 kHz

#### **AF2 connector**

**narrow band (NARROW/LINE)** 100 mV/ $\Delta f$  = 4 kHz

**wide band** 400 mV/ $\Delta f$  = 4 kHz

#### **REMOTE connector**

**narrow band (LINE)** 100 mV/ $\Delta f$  = 4 kHz

**Built-in speaker sound pressure** min. 85 dB at  
maximum volume

**Non-linear distortion factor** max. 10 %

## **GPS RECEIVER PARAMETERS**

**Received frequency** L1 (1575.42 MHz)

**Coding** C/A code

<b>Number of channels</b>	50
<b>Horizontal accuracy</b>	2.5 m CEP
<b>Velocity precision</b>	± 0.1 m/s
<b>Time to accuracy acquisition – cold start</b>	40 s
<b>GPS antenna connector type</b>	SMA
<b>GPS ANTENNA PARAMETERS</b>	
<b>Supply voltage for the preamplifier</b>	3.3 V/25 mA
<b>SPECIAL OPERATION MODES PARAMETERS</b>	
<b>Operating frequency range in FH modes</b>	30.000 MHz to 87.975 MHz
<b>Number of monitored frequencies in FH modes</b>	3 (two programmable, third 121.5 MHz)
<b>Frequency hopping 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 and FCS
<b>IFF</b>	iso-fixed frequency
<b>CW</b>	continuous wave
<b>Time to initial synchronization</b>	max. 5 s
<b>Time of autonomous synchronization holding</b>	48 h
<b>Synchronization hold when disconnected from power supply</b>	50 s
<b>Minimum number of operation frequencies for FH operation</b>	1
<b>Hopping rate</b>	100 hops/s
<b>MECHANICAL PROPERTIES AND RESISTANCE</b>	
<b>Dimensions [w x h x d]</b>	
• <b>without cooling block</b>	202 mm x 210 mm x 186 mm
• <b>with cooling block</b>	202 mm x 231 mm x 186 mm
<b>Weight</b>	8.5 kg

<b>Operating temperatures</b>	-40 °C to +70 °C
<b>Mechanical and climatic resistance</b>	according to MIL-STD-810E
<b>EMC</b>	according to MIL-STD-461E
<b>Power requirements</b>	according to MIL-STD-1275B

## Documentation

<b>RF2350 operating instructions</b>	2310.010.42
<b>RF2350 short operating instructions</b>	2310.011.42

## Set

<b>Type designation</b>	<b>PN (RN)</b>	<b>Name</b>
RF2350	2310.000.42	EPM mobile transceiver set

## Accessories

<b>Type designation</b>	<b>PN (RN)</b>	<b>Name</b>
	7007.100.14	Mobile set frame
RF13.3	2022.100.52	Handset
	2026.700.01	Handset holder
	1050.126.02	Power supply cable 3 m
	1050.993.01	Grounding
	2025.500.51	CD for modem configuration
	2036.100.23, 2036.100.24	2.6 m VHF vehicle antenna
	2036.100.45	Vehicle antenna 2.6 m with GPS antenna
	2036.100.84	Vehicle antenna VHF/UHF 1.3 m

	2036.100.85	Vehicle antenna VHF 1.6 m
	2036.100.86	Vehicle antenna VHF/ UHF 2.7 m
	2036.100.40	1.88 m VHF vehicle antenna
	2036.100.38	Groundplane antenna
	2036.100.68	Discon antenna
GPA24	2042.100.50	Satellite navigation antenna
	2036.100.39	Antenna mast
	2036.100.70	Telescopic winch driven mast 10 m
PK20	2320.000.02	Fill gun set
PK23	2320.000.42	Fill gun set
RC20	2312.000.01	Remote control unit set
	2328.100.01	Handset
	2328.100.11, 2328.100.12	Headset
RM23	2313.100.40	Handset with control
RM20	2313.100.01	Handset with control
RM1301	2009.100.01	Handheld microphone/speaker
	2310.270.01	Cooling block
	2011.904.01	Antenna cable (3 m)
	2011.904.02	Antenna cable (10 m)
	1050.430.30	Antenna cable 3 m
	1050.430.10	Antenna cable 10 m
	1050.454.02	Antenna cable
	1050.405.02	RF cable
	1050.299.01	PC interconnection cable (USB)
	1050.350.01	Data cable (RS232C)
	1050.993.22	Grounding
	5605002002	High frequency protection 1 GHz 200 V 400 W



5605002003

High frequency  
protection 6 GHz 180  
V 400 W

RF headsets