



## HF Transceiver RS 150 T

Ideal choice for use in mobile vehicles of all kinds

- Compatible with XK 2000, HF850 and R150 A
- High mechanical and weather resistance
- Simple and easy-to-operate via external control unit
- One hundred presets each containing a complete list of parameters and classes of emission
- Configurable from fill-gun or PC
- Transceiver, control unit and antenna tuner software upgradeable from PC
- Speech compressor, syllabic squelch
- Integrated ALIS or ALE system
- Optional HF modem with data transfer rate up to 5400 bps
- Single coaxial cable link between transceiver and antenna tuner
- Continuous monitoring of transceiver parameters and functions
- High reliability

# HF Transceiver RS 150T



## Brief description

RS 150T will satisfy your HF communication needs meeting the most demanding environmental conditions. Its small size, robust design and easy-to-use characteristics make it the ideal choice for use in vehicles of all kinds, including armoured vehicles with mortars. RS 150 T is based on XK2000 technology and makes use of its sophisticated DSP and ALE means.

The transceiver features excellent high-frequency characteristics and intelligent internal control (continuous monitoring of functions on module level), can be easily operated from a detached control unit with an easy-to-read backlit display

RS 150T in its basic configuration is capable of transmitting morse, speech and teletype data. All common classes of emission such as SSB (USB, LSB), ISB, AME, CW, FSK, AFSK, weather fax and FM are available. The transceiver covers 1.5 MHz to 30 MHz for TX, 10 kHz to 30 MHz for RX, with 401 freely programmable channels. The unit meets MIL-STD-810 for environment, MIL-STD-461 and EN50081/

50082 for EMC. State-of-the-art technologies have been used in RS 150T, such as digital signal processing in the intermediate-frequency section of the transceiver and the automatic connection unit.

The transceiver comes equipped with ALIS (adaptive automatic link setup) or ALE (automatic link establishment) system (MIL-STD-188-141A).

Typical applications are shortwave telephone and fax, transmission of picture and computer data with 5400 bits/s, data services such as DATA LINK Y, LINK E, LINK 11/LINK 22 and MAHRS expandability.

Communication processors to international standards, fast and reliable data transmission as well as message handling (eg with MERLIN) allow XK2000 to be integrated into modern multimedia systems, thus providing the basis for reliable, worldwide communication independent of existing infrastructures.

ALE Processor GS2200 automatically sets up the optimum radiocommunication

link using the adaptive Rohde & Schwarz ALIS 2000 procedure or FED-STD-1045/1046/1049 (MIL-STD-188-141A). As for ALIS, this procedure is 100% compatible with the HF850 family of radio equipment.

Data transmission: Up to 5400 bits/s are possible by means of the internal multimode HF Modem GM2100. Selectable waveforms are to Rohde & Schwarz standard, MIL-STD-188-110A and STANAG 4285/4481. This enables the transmission and reception of telefax messages, computer data, and colour video still pictures, for example. Connection between the data terminal (fax machine, video camera) and XK2000 is made by System Processor MERLIN from Rohde & Schwarz or an equivalent PC with the appropriate software.

## HF e-mail

Rohde & Schwarz multimedia product line PostMan now provides the user with seamless online communication, based on wireless TCP/IP protocol, with an open system approach, offering errorfree, fast and reliable LAN/WAN connections via HF.



RS 150T

HF Transceiver RS150T with shockmount for military vehicles. Frequency range 1.5 MHz to 30 MHz, RF output power up to 150 W, 401 programmable user channels; available operating modes: USB, LSB, ISB, AM and CW, optional modules for ALE, EPM as well as fast data.



AD150T

Antenna Tuning Unit, 250 programmable user channels, silent tuning in less than 30 ms, at a tuning power of 30 W, shockproof and immersible down to 4 m.



DO 150TG

Control Unit DO 150TG with graphics LCD and menu-guided user interface. Direct entry of frequencies and channel parameters via hardkeys and softkeys. Direct access to all main settings via menus also in the manual mode. Storage of up to 400 presets, built-in loudspeaker; if desired, settings are confirmed by voice prompt. Default settings (user profile) can be optionally stored. Connectors for fill-gun, handset/headset, PC interface for data transmission and software update.



DO 150T

Compact Control Unit DO 150T - selection of channel and operating modes by rotary switches, mode indication, alphanumeric display of channel number and frequency, storage of up to 100 presets, PC interface for data transmission and software update.

## Specifications

### Frequency

Transmission	1.5 MHz to 30 MHz
Reception	10 kHz to 30 MHz
Frequency setting	decadic in 1-Hz steps
Frequency error	$<1 \times 10^{-9}/^{\circ}\text{C}$ $<1 \times 10^{-9}/\text{day}$ $<1 \times 10^{-7}/\text{year}$

### Aging

Channel memory	401
User-programmable channels	100
Half-duplex channels thereof	401 to 2240
Fixed-programmed channels (ITU)	120
Additional channels for ALE	150 W PEP into 50 $\Omega$
Transmit power	3 power levels – A1A (CW) – J3E (USB, LSB) – H3E (AME/USB) – J7B (A7J), J3E for data transmission) – B8E (ISB) – F1B (FSK, AFSK, baud rate 50 to 600 Bd, shift 42.5 kHz to 425 kHz) – F3E (FM) – F1C (FAX)

### Classes of emission

### Switchover times

Tx/Rx, Rx/Tx	<10 ms
Frequency change	<30 ms

### Transmission

Output power into 50 $\Omega$ /VSWR <1.5	150 W +0.5/–1 dB PEP 100 W +0.5/–1 dB CW (power reduction according to VSWR, no switchoff for VSWR $\infty$ )
--	---

### Power levels

Spurious suppression	>70 dB, typ. 80 dB (into 50 $\Omega$ )
Harmonics suppression	>45 dB, typ. >60 dB (into 50 $\Omega$ )
Intermodulation products	>32 dB, typ. >36 dB (referred to PEP)
S/N ratio	>150 dB (referred to 1 Hz test bandwidth, $\Delta f >1$ MHz)

### Weighted S/N ratio (H3E)

Carrier suppression	>60 dB, typ. >70 dB (referred to PEP)
Suppression of unwanted sideband	>60 dB (referred to PEP)
Voice compression	built-in

### Reception

Input impedance	50 $\Omega$ , VSWR <3
Noise figure	
without preamplifier	17 dB
with preamplifier	9 dB
Input sensitivity (typ.) (for S/N = 10 dB, f = 0.2 MHz to 30 MHz)	
without preamplifier	
A1A (CW)	0.4 $\mu\text{V}$ EMF, BW = 300 Hz
J3E (SSB), J7B	1.0 $\mu\text{V}$ EMF, BW = 2.7 kHz
H3E (AME), 1 kHz, m = 60%	2.7 $\mu\text{V}$ EMF, BW = 6 kHz
with preamplifier	
A1A (CW)	0.15 $\mu\text{V}$ EMF, BW = 300 Hz
J3E (SSB), J7B	0.4 $\mu\text{V}$ EMF, BW = 2.7 kHz
H3E (AME), 1 kHz, m = 60%	1.0 $\mu\text{V}$ EMF, BW = 6 kHz
Receiving bandwidths	3 dB 60 dB
	$\pm 75$ Hz $\pm 150$ Hz
	$\pm 150$ Hz $\pm 225$ Hz
	$\pm 300$ Hz $\pm 430$ Hz
	$\pm 500$ Hz $\pm 770$ Hz
	$\pm 750$ Hz $\pm 990$ Hz
	$\pm 1050$ Hz $\pm 1600$ Hz
	$\pm 1200$ Hz $\pm 1760$ Hz
	$\pm 1350$ Hz $\pm 1900$ Hz
	$\pm 1550$ Hz $\pm 2100$ Hz
	$\pm 3000$ Hz $\pm 4200$ Hz
	$\pm 4000$ Hz $\pm 5200$ Hz
	<3 dB (1 mV to 1 V EMF)

### AGC

Response to a 60 dB step variation	
Attack time	<10 ms
Decay time	25/150/500 ms/1 s/3 s
AF distortion	
Line output 0 dBm	<1%
Loudspeaker	<10% at rated power
Weighted S/N ratio (H3E)	>46 dB SINAD for 1 mV EMF, weighted with filter to CCIT (0.41/P53)

Nonlinearities (1.5 MHz to 30 MHz)

### Blocking

### Desensitization

### Intercept point IP<sub>3</sub>

### Crossmodulation

### Inherent spurious signal

Immunity to interference ( $\Delta f >30$ kHz)	
Image-frequency rejection	>80 dB, typ. >90 dB
IF rejection	>80 dB, typ. >90 dB
Oscillator reradiation	<10 $\mu\text{V}$ (at antenna input)
Protection of receiver input	<100 V EMF (f <30 MHz)

### General data

### Operating temperature range

Storage temperature range	–25 $^{\circ}\text{C}$ to +55 $^{\circ}\text{C}$
Supply voltage	–40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$
Maximum altitude	+21 V to +31 V DC
Humidity	3000 m above sea level, $T_{\text{amb}} = 35$ $^{\circ}\text{C}$ to MIL-STD-810E, Meth. 507.3, 26 $^{\circ}\text{C}/41$ $^{\circ}\text{C}$ , 95% RH, 5 days

### Mechanical test

(with shockmount OS150T1)

### Vibration

Shock	6 g / 5 Hz to 500 Hz
EMC	3000 g / 0.2 to 0.5 ms
MTBF	MIL-STD-461
Dimensions (W x H x D)	>9600 h
Weight	435 mm x 130 mm x 291 mm

### Remote Control Unit D0150T

Channel memory	10
Selection	rotary switch (rotation >360 $^{\circ}$ )
Indication	2 characters on LCD
Transmit indication	LED, green
Fault indication	LED, red + error message on LCD (13 characters max.)

### Operational information

Operation temperature range	–25 $^{\circ}\text{C}$ to +55 $^{\circ}\text{C}$
Storage temperature range	–40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$

### Mechanical test

Vibration	6 g / 5 Hz to 500 Hz
Shock	3000 g / 0.2 ms to 0.5 ms
EMC	MIL-STD-461
Dimensions (W x H x D)	175 mm x 67 mm x 52 mm
Weight	0.5 kg

### Antenna Tuning Unit AD150T

Frequency range	1.5 MHz to 30 MHz
Input power	150 W PEP, 100 W CW + 0.5 dB
Input impedance	50 $\Omega$
VSWR	<1.5 (typ. 1.3)
Matchable antennas (1.5 MHz to 30 MHz)	5 to 7 m whip antenna 7 to 12 m rod antenna $\geq 3$ m whip antenna (1.5 MHz to 2 MHz) duty cycle 1:1 long-wire and broadband antennas

### Tuning time

Initial tuning	typ. 1 s, max. 6 s
Repeated tuning	typ. <0.2 s
Silent tuning	<30 ms
Number of memory channels	approx. 250
RF tuning power	30 W $\pm 1$ dB (VSWR <3)

### Connectors

RF input	N connector
Antenna	ceramic insulator
Antenna for f <1.5 MHz	N connector (optional)
Control data	via inner conductor, 9600 Bd
Power supply	via inner conductor of RS150T (21 V to 31 V, approx. 1 A)

### Permissible distances

Antenna feedpoint – ATU	<0.3 m
ATU – transceiver	<50 m (coaxial cable)

## Filling Device PK150T

Memory	
SRAM	256 byte (battery buffered, min. 1 year)
EEPROM	8192 byte
SRAM erase	pushbutton
Battery condition indicator	LED, yellow
Filling	via RS-232-C (I <sup>2</sup> C format)
Temperature ranges	
Operation	-25 °C to +55 °C
Storage	-40 °C to +85 °C
Dimensions (diameter x length)	39.5 mm x 132 mm
Weight	0.2 kg
Interface	D0150T (connector type Amphenol 162GB-36T12-10-PN for direct connecting to D0150T)

## Handset with Control MB150T

Channel control	pushbutton up/down
Channel indication	00 to 99 on LCD
Squelch control	pushbutton SQ
ALE control	pushbutton CALL & SCAN
LCD Light	pushbutton LITE (duration 10 s ±3 s)
Power supply	typ. +12 V DC
Speaker	
Impedance	25 Ω ±20%
Sensitivity at 80 mW	>72 dB
Volume change (push button)	6 dB ±2 dB
Output power	0.5 W max.
Microphone output voltage (1 kHz, acoustic pressure 80 dB at mic., distance from tone source 20 mm)	>100 mV
Operating temperature range	-25 °C to +55 °C
Storage temperature range	-40 °C to +85 °C
Dimensions (W x H x D)	58 mm x 210 mm x 91 mm
Cable length (quiescent state)	645 mm
Weight	0.45 kg

## Ordering information

### HF Transceiver

HF Modem	RS150T	6091.9004.02
Remote Control Unit	RM150T	6091.9104.02
Antenna Tuning Unit	DO150T	6091.9204.02
Filling Device	AD150T	6091.9304.02
Handset with Control	PK150T	6091.9404.02
Handset without Control	MO150T	6091.9504.02
Coaxial Cable	MB150T	6091.9604.02
Cable for Interconnection	KA150T	6091.9704.02
Shockmount for Transceiver	KS150T1	6091.9804.02
Shockmount for ATU	OS150T1	6091.9904.02
	OA150T1	6092.0000.02

Certified Quality System

ISO 9001

DQS REG. NO 1954-04

Fax Reply (HF Transceiver RS150T)

- Please send me an offer
- I would like a demo
- Please call me
- I would like to receive your free-of-charge CD-ROM catalogs

Others: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Name: \_\_\_\_\_

Company/Department: \_\_\_\_\_

Position: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Country: \_\_\_\_\_

Telephone: \_\_\_\_\_

Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_



**ROHDE & SCHWARZ**

ROHDE & SCHWARZ GmbH & Co. KG · Mühlendorfstraße 15 · D-81671 München

P.O.B. 801469 · D-81614 München · Telephone +4989 4129-0 · Fax +4989 4129-3663 · Internet: <http://www.rsd.rsd.de>