



## R-8400

Next Generation  
Software-Defined  
LF/MF/HF Receiver



The Sunair R-8400 is a solution for communications applications requiring rugged, reliable, and flexible equipment. It has been designed to be paired with our T-8400 Transmitter to accommodate split-site operation or to be used for standalone, single-site receiver operation.

This next-generation receiver is equipped with a larger 7-inch TFT display, which is now touchscreen. It operates continuously (100% duty cycle) in AME, NB-FM, USB, LSB, ISB, CW, Data, or MELPe-based Digital Voice modes. The R-8400 uses software-defined digital signal processing (DSP) technology, which supports the latest developments in high-speed waveform processing. This technology enhances the functionality of the CPU as well as the Synthesizer, Digital Audio, and Digital IF stages.

The audio interface supports analog or VoIP connections, while the CPU allows for remote control and programming via Ethernet or serial port.

When operating in split-site mode in combination with the Sunair T-8400 transmitter, the R-8400 receiver offers an optional internal solution (hardware module and licenses) for data link operation (receive only) in compliance with MIL-STD-188-203-1A and STANAG 5511/5522 (TADIL-A/Link 11 and NILE/Link 22). In this setting, it also supports Automatic Link Establishment (ALE) as an external option in accordance with MIL-STD-188-141 A/B/C, FS1045A, and S4538 as well as STANAG 4444.

The radio's advanced built-in-test (BITE) capability provides feedback to the lowest replaceable unit (LRU) level by means of test result messages in English on the display as well as LED indications.

The R-8400 can operate from both ac and dc voltage sources with automatic changeover if one of them fails. Its internal power supply provides energy to the internal modules as well as to external accessories.

The R-8400's intuitive modular design allows for ease of maintenance, expansion, and upgrade throughout the equipment life cycle at minimal expense. Its construction minimizes undesirable RFI and EMC effects by using multiple layers of shielding as well as filtering and protection on the individual control lines.

Thousands of these radios are in daily service as integral components of critical strategic communications solutions worldwide.

- **Analog or VoIP audio interface**
- **VoIP ATM ED-137B**
- **Software-Defined SSB and ISB configurations**
- **DSP-based syllabic squelch and tone squelch**
- **Remote control via RS-232/422/485 and Ethernet**
- **Comprehensive BITE to LRU**
- **Internal 115/230 Vac power supply**
- **Data Link - MIL-STD-188-203-1A TADIL A and Link 11/22 (factory installed option when operating with a T-9000E)**
- **HF Data - MIL-STD-188-110 A/B/C and STANAG**
- **ALE - 2G MIL-STD-188-141 A/B/C and 3G STANAG 4538, when operating with an T-9000E (verify availability)**
- **Secure Digital Voice (MELPe S4591)**

# Product Specifications

## GENERAL

Frequency Range	10 kHz – 30 MHz
Frequency Stability	$\pm 1 \times 10^{-8}$ per day after a warm up period of 30 minutes
Programmable Channels	250, Simplex or Half-Duplex, non-volatile Flash memory
Modulation Modes	AME (R3E); NB-FM (F3E); USB/LSB (J3E, J2D); ISB (B7D, B8D, B9W); CW (A2A); FSK (F1B)
Data Bandwidth	Up to 24 kHz
Scan	Manual or automatic
Analog Audio Interface	Front panel MIC and PHONE jacks, 600-ohm line, and VoIP
BFO	$\pm 1.99$ kHz, 1 Hz resolution
Synthesizer Lock	10 ms maximum
Synthesizer Tuning Step	1 Hz
Remote Interface	Ethernet, RS-232, RS-422 (point-to-point and bus), RS-485, and optional internal FSK/PSK Tone modem (leased lines)
RF Antenna Impedance:	50 ohms, nominal, unbalanced to ground
RF Antenna Connector:	Coaxial, female UHF connector
Power Supply	Internal (ac voltage), external (dc voltage)
Input Voltage	<ul style="list-style-type: none"> <li>28 Vdc <math>\pm 15\%</math></li> <li>115/230 Vac <math>\pm 15\%</math>, 50 Hz/60 Hz <math>\pm 10\%</math></li> <li>Automatic ac/dc changeover</li> </ul>
Energy Consumption	< 100 VA
BITE:	Fault isolated to module level (LRU); descriptive readout on front panel and individual module indication
MTBF	11,100 hours
MTTR	15 Minutes (with spares at hand)
Dimensions	Height: 5.95 in (15.1 cm) Width: 17.83 in (45.3 cm) Length: 17.66 in (44.9 cm)
Weight	49 lbs (22.3 kg), unpacked
Construction	Internal modular plug-in assemblies, field serviceable
Origin	Designed and manufactured in the U.S.A.

## RECEIVER

Selectivity	<ul style="list-style-type: none"> <li>SSB / ISB: 300 – 3300 Hz @ 6 dB</li> <li>CW: 500 Hz @ 3 dB, centered at 1 kHz</li> <li>AM: <math>\pm 3000</math> Hz @ 6 dB</li> </ul>
Sensitivity	<ul style="list-style-type: none"> <li>SSB / ISB: 0.5 <math>\mu</math>V for 10 dB (S+N)/N</li> <li>CW: 0.3 <math>\mu</math>V for 10 dB (S+N)/N</li> <li>AM: 3.0 <math>\mu</math>V for 10 dB (S+N)/N</li> </ul>
Audio Output	<ul style="list-style-type: none"> <li>5 W into internal speaker, &lt;1 % THD</li> <li>600 <math>\Omega</math>, balanced @ -20 dBm to +10 dBm</li> <li>Headset: low impedance</li> </ul>
Audio Response	$\pm 2$ dB from 300 Hz to 3300 Hz
Image & IF Rejection	90 dB minimum
Spurious Rejection	80 dB minimum
IMD (IP3)	> 20 dBm
Intermodulation Suppression	Not less than 32 dB
AGC Attack Time	10 ms nominal
AGC Release Time	<ul style="list-style-type: none"> <li>Fast: 23 ms nominal</li> <li>Medium: 200 <math>\pm</math> 100 ms nominal</li> <li>Slow: 3 <math>\pm</math> 1 second nominal</li> </ul>
AGC Range	100 dB
AGC Control	No more than 6 dB change for signal inputs from -100 to 0 dBm; 4 dB for signal inputs from -90 to 0 dBm
Squelch	Syllabic, carrier, tone, and noise
Antenna Input Protection	100 V Peak to Peak (53 dBm), self-resetting
Internally Generated Spurious	99.5 % of available frequencies from 100 kHz – 30 MHz At or Below 0.5 $\mu$ V equivalent input at antenna terminal

## INTERNAL OPTIONS

ALE	<ul style="list-style-type: none"> <li>MIL-STD-188-141 A and FS1045A</li> <li>MIL-STD-188-141 B and STANAG 453</li> </ul>
Data Link	TADIL-A, Link 11/22
Bandwidth Filters	Custom bandwidth filters and center frequencies available
HF Modem Modes	FSK, MSK, PSK, and QAM
VoIP	SIP, RTP, and VoIP ATM (ED-137B)

## PERIPHERAL EQUIPMENT OPTIONS

Mounting	<ul style="list-style-type: none"> <li>Shroud and rack slides for EIA standard 19 inch rack</li> <li>Desktop</li> <li>Shock mount kit</li> </ul>
Spares Kits	Running spares, field modules
Remote Control	RCU-8310, Pathfinder II Software
Linear Power Amplifiers	LPA-9500 (500 W), LPA-9600 (1 kW), LPA-5000 (5 kW), LPA-10000 (10 kW)
Antenna Couplers	CU-9125 (150 W), CU-9150 (1 kW)
Pre-Postselector	F-9810B
AC Power Control	Remote On/Off
Messaging	STANAG 5066 controller

## CERTIFICATIONS

FCC Part 90, RT	FCC Identifier XVKRT-9000
European CE Standard (Optional)	<ul style="list-style-type: none"> <li>EN 300 373-2 v1.2.1</li> <li>EN 301 843-5 v1.1.1</li> <li>EN 60950</li> <li>Notified Body 1177</li> </ul>

## ENVIRONMENTAL

Temperature	<ul style="list-style-type: none"> <li>Operating: -30 °C to +55 °C (-22 °F to 131 °F)</li> <li>Optional: +60 °C (140 °F)</li> <li>Storage: -40 °C to +85 °C (-40 °F to 185 °F)</li> </ul>
Humidity	95 % at 55 °C (122 °F), non-condensing; splash-resistant front panel
Shock	MIL-STD 810F, Method 516.5, Procedure 1
Vibration	MIL-STD 810F, Method 514.5 & MIL-STD-167-1
Altitude	<ul style="list-style-type: none"> <li>Operating: up to 10,000 feet</li> <li>Storage: up to 40,000 feet</li> </ul>



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Specifications subject to change without notice or obligation. Rev. 4 (Set 2023)

US export control laws may apply to some options