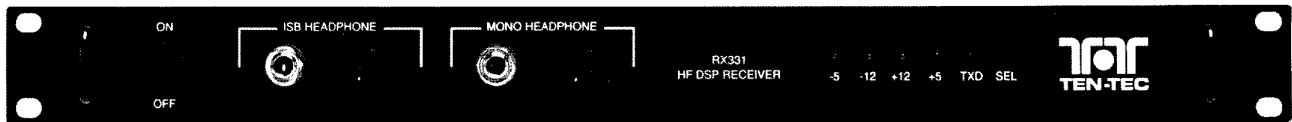


RX-331



HF DSP Receiver - Model RX-331

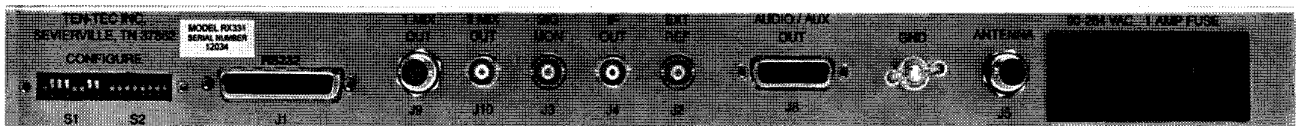
The TEN-TEC RX-331 is a multi-mode HF receiver operating from 5 kHz to 30 MHz, fully synthesized and utilizing state-of-the-art Digital Signal Processing. DSP technology brings the performance and repeatability of expensive military grade communications receivers into the more economic range of commercial receivers.

The design flexibility of DSP provides 57 standard selectivity choices from 100 Hz to 16 kHz. It is also practical to customize filter bandwidths, shape factors and time delays to match unique customer requirements.

The RX-331 is designed specifically for remote controlled applications. Multi-drop RS-232 interface permits simultaneous operation of multiple receivers on a single network at baud rates from 300 to 19,200. Receiver may be controlled by either internal or external frequency reference and an optional high stability internal reference is available.

This receiver is a compact, rack mount unit only 1 3/4" high - ideal when available rack space is at a premium. Power consumption is a nominal 30 watts which can provide a measured advantage when comparing recurring system costs. All connections are arranged on rear panel. Front panel provides ON/OFF switch, headphone jacks with independent volume controls, serial port status indicators and power supply indicators.

Built-in Test (BITE) allows quick field verification of major subsystems. Built-in software provides a "field test" mode to allow complete receiver operation from a simple terminal without need of customer's complete control system.



back view

TECHNICAL SPECIFICATIONS*

FREQUENCY COVERAGE: 50kHz - 30 MHz at typical sensitivity. Tunable down to 0 MHz with degraded performance.

MODE: USB, LSB, ISB, CW, AM, Synchronous AM, FM; all standard.

TUNING RESOLUTION: 1 Hz steps.

FREQUENCY STABILITY: +/- 1 PPM per degree C within operating range 0 - 50 degrees C using internal reference. Optional TCVCXO provides +/- 1 PPM over entire operating range.

ACCURACY: All internal oscillators are locked to either internal or external frequency standard. The internal reference is adjustable by a continuously variable trimmer to allow calibration to any desired accuracy.

EXTERNAL FREQUENCY REFERENCE: 1, 2, 5, or 10 MHz (+/- 1 PPM, 200 mv p-p into high impedance load). Receiver automatically switches to this reference upon application, at power up or after any serial link activity.

SPURIOUS RESPONSES: All spurious less than -119 dBm equivalent input - preamp on.

IMAGE REJECTION: 90 dB typical, 80 dB minimum

BFO: Tunable in CW mode only, +/- 8 kHz. Tuning in 10 Hz steps with a tuning accuracy of +/- 10 Hz of desired frequency setting. Fixed frequency in SSB/ISB (455 kHz), disabled in AM and FM.

SYNTHESIZER LOCK TIME: 10 msec typical

ANTENNA INPUT: 50 ohm, unbalanced, BNC connector. 2.5:1 VSWR max @ receiver's tuned frequency.

SELECTIVITY : 57 bandwidths selectable from .1 kHz - 16.0 kHz. Shape factor 1.5:1 or better. (6 to 60 dB) Bandwidth is fixed at 3.2 kHz in ISB mode, and at 6 kHz in SAM mode. Minimum bandwidth is 600 Hz in FM mode.

GROUP DELAY : no more than .1 ms variation over passband of 300 Hz to 3050 Hz.

ULTIMATE REJECTION: 70 dB minimum regardless of filter selected.

LO PHASE NOISE: -120 dBc/Hz @ 20 kHz offset typical, -110 dBc/Hz maximum.

IF REJECTION: 90 dB typical, 80 dB minimum.

MEMORIES: 100 memory store and recall.

OPERATING TEMPERATURE RANGE : 0 - 50 degrees C @ full specification. -10 to 60 degrees C with degraded performance.

*Applicable from 500 kHz - 30 MHz unless otherwise stated

SENSITIVITY

(PREAMP OFF)

(PREAMP ON)

Mode	BW	SINAD	Typical dBm/uV	Max dBm/uV	Typical dBm/uV	Max dBm/uV
AM (50% mod @ 400 Hz)	6.0 kHz	10 dB	-103/1.6	-101/2.0	-112/.56	-108/.9
FM (6 kHz dev @ 1 kHz mod)	16.0 kHz	16 dB	-102/1.8	-100/2.2	-108/.9	-104/1.4
USB/LSB/ISB	3.2 kHz	10 dB	-112/.6	110/.7	-119/.25	-115/.4
CW	3 kHz	16 dB	116/.35	-114/.45	-124/.14	-120/.22

SENSITIVITY: LOW FREQUENCY RANGE (PREAMP OFF)

Mode	Frequency	Typical dBm
CW @ 300 Hz BW	>500 kHz	-116 dBm/.35uV
SINAD - 16 dB	100 kHz	-115 dBm/.4uV
	50 kHz	-114 dBm/.45uV
	20 kHz	-107 dBm/1 uV
	15 kHz	-104 dBm/1.4uV
	10 kHz	-94 dBm/4.5 uV
	5 kHz	-82 dBm/18uV

DYNAMIC RANGE

Mode	Noise Figure (dB)		3rd Order Intercept(dBm)	
	Typ	Max	Typ	Min
10 dB PREAMP ON	10	14	20	15
PREAMP OFF	17	19	30	25
15 dB ATTEN	32	34	45	40

AGC Range - 90 dB minimum Threshold - 3.0 uV typical

MODE	ATTACK (dB/ms)	HANG (sec)	DECAY (dB/sec.)
FAST	0.8	0	1200
MEDIUM	0.8	0	100
SLOW	0.8	0	25
PROGRAMMABLE	0.01-1.0	0.01-99.9	0.01-99.9

2nd ORDER INTERCEPT: 75 dBm typical, 60 minimum.

WIDEBAND OUTPUT, 1st MIXER: 45.455 MHz center frequency, output level 16 dB below receiver input. Bandwidth equivalent to preselector, no AGC. (1 kHz tuning step, inverted)

IF OUTPUT, POST DSP: 455 kHz center frequency, -10 dBm nominal @ 50 ohms through BNC connector (AGC active). Bandwidth determined by filter selection.

SIGNAL MONITOR OUTPUT, DELAYED AGC: 455 kHz, 16 kHz bandwidth (-6 dB point), -10 dBm nominal (+/-3 dBm) @ 50 ohms through BNC connector. GC delayed 40 dB. (1 kHz tuning step, inverted)

SIGNAL MONITOR OUTPUT, 2nd MIXER, NO AGC:

455 kHz, 16 kHz bandwidth, output level equal to receiver input @ 50 ohms through BNC connector. (1 kHz tuning step, inverted)

AGC: Fast, Medium, Slow, Programmable. Manual gain setting is provided in all four modes through RS-232 Interface, adjustable over 120 dB range. DUMP feature provided in all modes.

AUDIO LINE OUTPUT: 0 dBm (+/- 3 dBm) Two 600 ohm outputs (one for each sideband in ISB mode) to DA-15 connector, ungrounded center tap. In all other modes, signal is mono. Terminals may be grounded or shorted together without damage. Two additional mono outputs are provided, one AC coupled, one DC coupled.

ISB HEADPHONE OUTPUT: Front panel mounted 1/4" stereo phone jack. Other modes mono. 10 mw maximum into 600 ohms. Front panel volume control.

MONO HEADPHONE OUTPUT: Front panel mounted 1/4" phone jack. LSB, USB or both available, switchable by software control only. Front panel volume control.

DIGITAL DATA OUTPUT: Provides post DSP IF and audio information in both serial and parallel data streams.

MTBF: Not specified

CONTROL INTERFACE: All receiver functions are controllable except headphone volumes. Multi-drop RS232 network @ DB25. Baud rate programmable from 300 to 19200. 7 or 8 data bits - even, odd or no parity. Interface can be configured for multiple or single receiver applications.

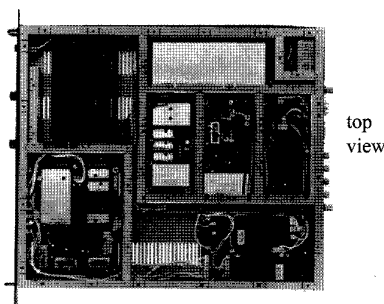
POWER REQUIREMENTS: 90-264 VAC, 48 - 440 Hz @ 30 watts nominal. Removable six foot line cord included. Front Panel ON/OFF switch provided. 5 X 20 mm 1 amp fuse.

DIMENSIONS: 1 3/4"H x 19"W (1U) (44.45 X 482.6mm). Chassis depth 20" (excluding front panel knobs, handles and rear panel connectors). Sized to mount in standard 19" racks. Accepts Jonathan slide type 375QD.

WEIGHT: 11.24 lbs. (5.10 kg)

ADDITIONAL FEATURES:

- Squelch: all mode
- Passband Tuning: +/- 2 kHz in USB, LSB and CW
- Mute: for use in transmit/receive applications, mutes audio and post DSP IF output.



top
view



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