OMNI-VII

TEN-TEC

TEN-TEC OMNI-VII

The OMNI series of HF transceivers traces its roots back to the original OMNI A and D series rigs that were released by TEN-TEC in the late 1970's. Revered for their low-noise receiver performance and ease of operation, thousands of OMNI line transceivers continue to be in use worldwide today. We continue the tradition of the OMNI line in the 21st century with OMNI-VII.

What's new? The entire rig! OMNI-VII doesn't share a common heritage with either the current JUPITER or ORION II transceivers. We started from scratch. Our goal was to provide high-end receiver performance in an easy-to-use format with state-of-the-art Ethernet remote controllability in an affordable package.

• It's all about receiver performance! Nothing in its price class today rivals it. At 2 kHz tone spacing with I-F filters installed, the OMNI delivers an amazing 130 dB of blocking dynamic range and a third order intercept point of +8.5 dBm. No $3000-range competitors HF transceiver is even within striking distance of these numbers.

• OMNI-VII's most amazing new feature is the ability to completely remote control the transceiver from a high-speed Internet access point. Using our free One Plug GUI software package, simply connect the rig to your high-speed router at the remote location and then transceive in all modes from a high speed Internet access point.

• Remote control in the shack - in addition to remote control over the Internet, the One Plug GUI can be used to control the OMNI-VII from the Ethernet port on your PC, including RX and TX audio. Alternatively, numerous other programs already on the market can be used for local control of the rig using the serial interface. Simultaneous front panel control concurrent with Ethernet interface not supported.

• All the roofing filters you need – and then some. Stock I-F filtering at the 455 kHz I-F is provided at 20, 6, and 2.5 kHz. Optional Collins™ mechanical filters for 500 and 300 Hz bandwidths can also be installed. Bandwidth filtering is all DSP with 37 selectable filters from 200 to 9000 Hz included.

• HF + 6 meters. 100 watts output on 6 through 160 meters. General coverage receive on HF from 500 kHz – 30 MHz continuous plus 48-54 MHz on 6. SSB, CW, AM, FM, digital modes. Dual VFO's with SPLIT and REVERSE functions.

• High-stability +/- 0.5 PPM TCXO installed as standard equipment.

• Full-function color screen, a STN transmissive color LCD display with CFL backlighting, 320 x 240 pixels.

• Legendary QSK CW includes adjustable rise and decay times. User adjustable at the touch of a knob for "hard" or "soft" keying according to your taste. Built-in keyer can be used in Curtis A or B modes, adjustable 5-63 WPM.

• Independently adjustable RX EQ and TX EQ in 6 db/octave filters selectable in 1-dB steps from high pitched at minus 20 dB to essentially flat response at 0 dB to bassy at plus 20 dB.

• 17 selectable transmit bandwidths from 1000-4000 Hz. DSP-generated to give your SSB audio a well rounded sound tailored to your voice characteristics. A low frequency roll-off control and TX EQ provide further optimization.

• DSP noise reduction, automatic notch and manual notch reduces interference from undesired carriers and random noise. Manual notch range 20-4000 Hz center, 10-300 Hz width, >50 dB rejection.

• Heavy-duty broad range L-network auto tuner as used in the ORION II. Matches most antennas up to 10:1 SWR (<30 MHz only). 100 tune memories. Order your OMNI-VII with or without this option.

• Two SO-239 transceive antenna connectors, plus a third SO-239 connector for an auxiliary receive-only antenna. Antenna switching is front panel selectable. Both transceive outputs can be used on HF or 6 meters.

• Momentary band sweep gives you a snapshot of the entire band in seconds. Find the pileups or scout for a clear spot automatically without touching the tuning knob.

• Optional Model 302R remote encoder/ keypad works with the OMNI-VII. Plug it in and control selected features sitting back in your easy chair.

• Quad bandstacking registers and 100 memories.

• Updates by Flash-ROM. Serial port interface for local rig control via PC and for Flash-ROM updates available via the Internet. To obtain the very latest version of the OMNI-VII, visit our firmware download website at www.rfsquared.com and download the software. Connect the radio to a serial port on your PC and you are up to date in a flash. Easy!

REMOTE OPERATION: HOW DOES IT WORK?

The OMNI-VII is the first HF transceiver to feature a plug-and-play Ethernet interface for remote control. It's simple to hook up. Take the OMNI-VII to your remote location, and connect it to high-speed access via your router with an Ethernet cable. *No computer is required at the remote location.* Using our One Plug GUI software interface, you can then control all features and functions of the transceiver from a high speed Internet access point with your PC or laptop. Full transceive operation is supported. You don't need a separate VOIP client for audio – receive audio is streamed via your sound card and transmit audio is via a microphone attached to your computer. CW operation is just as easy. Type characters on the computer keyboard and they are sent as transmitted CW by the radio. An optional USB keying module for iambic paddle use is planned.

The One Plug GUI and its user guide can be downloaded from the Internet at no charge. Even if you don't have an OMNI-VII, you can have a look by running the software. Want a custom interface to run your OMNI-VII remotely? One Plug is a great way to start – the Visual Basic source code for the One Plug GUI and a programmer's reference document are also available for free download.

OMNI-VII's NEW DISTRIBUTED ROOFING FILTER SYSTEM

The main difficulty with maintaining high performance with a general coverage HF receiver is they generally are an upconverting VHF first I-F design and utilize a 15 to 20 kHz wide filter to prevent unwanted signals from compromising overall performance. OMNI-VII features a new "distributed roofing filter" system. Instead of the challenging task of building a small bandwidth filter at the VHF level I-F, we elected to use narrow filter architecture at the 455 kHz I-F and tailor gain distribution to those filters, to minimize 3rd-order IMD and protect receiver noise figure. Mode-appropriate stock filters are provided at 20, 6, and 2.5 kHz bandwidths – the stock 2.5 kHz filter is a Collins™ mechanical filter. Optional Collins™ mechanical filters at 500 Hz and 300 Hz bandwidths are also available. Bandwidth filtering is all done with DSP with 37 available filters from 200 Hz to 9 kHz.

These distributed roofing filters protect blocking and third order IMD dynamic range and third order intercept point down to smaller bandwidths than would be possible by simply using a wide (15 to 20) kHz filter only. Our receiver performance numbers are significantly better than any other transceiver in its price class as a result.

OMNI-VII operations are displayed on an easy-to-read color LCD display with CFL backlighting. User functions are controlled by buttons surrounding the screen. An ALT function is provided for dual-function buttons along the bottom of the screen, eliminating the need for these to be sequestered inside the transceiver menu. Pushbutton encoders on the AF/RF and PBT/BW knobs allow easy switching between these functions.

The ergonomic design of the popular JUPITER transceiver has been adopted for the front panel knob and button layout on the connector side of the rig. Front panel KEY jack, 8 pin microphone connector, headphone jack and three large knobs for adjustment of transceiver controls.

The bandchange keypad also allows direct frequency entry and access to quad bandstacking registers. VFO swap, equal, split, and momentary reverse functions. Dedicated RIT/XIT control with pushbutton encoder 'clear' function. Menu access button doubles as a VFO LOCK with LED indicator for lock function.

OMNI-VII rear panel detail. Both Ethernet and serial interfaces are provided. Ethernet can be used for remote control. Serial can be used for local control and firmware updates. Additionally, if the rig is remoted via the Ethernet interface, commands can be streamed to the serial port to control RS-232 accessory equipment like automatic antenna switches, etc. PC sound card connection for digital modes like PSK31 is done by connecting appropriate cables to the ACC1 jack. No interface between rig and computer is necessary. Amp keying for QSK or non-QSK amps provided. Three SO-239 antenna connectors, two for transceive and a third for receive-only are on the opposite side of the heat sink.

MODEL 588 OMNI-VII TECHNICAL SPECIFICATIONS

GENERAL

Frequency Range RX: 100 kHz – 30 MHz and 48 – 54 MHz. Specifications apply within Amateur Radio bands only.

Frequency Range TX: 1.797-2.010, 3.495-4.005, 5.275-5.407, 6.995-7.305, 10.095-10.155, 13.995-14.352, 18.063-18.170, 20.995-21.452, 24.885-24.995, 27.995-29.702, 49.995-54.0 MHz.

Tuning Step Sizes: 1, 10, 100, 1k, 5k, 10k, and 100 kHz.

Frequency Stability: Maximum +/- 0.5 PPM over operating temperature. TCXO standard.

Rated RF Load: 50 ohms nominal.

Antenna Jacks: 2 x SO-239 transceive, 1 x SO-239 receive only.

Modes: USB, LSB, AM, FM, CWUSB, CWLSB, FSK.

I-Fs: 1st: 70 MHz, 2nd: 455 kHz, 3rd: 14 kHz.

NTIA Compliance: Meets requirements for frequency stability, not in compliance for transmit occupied bandwidth.

Display: STN transmissive color LCD display with CFL backlight, 320 x 240 pixels.

PC control ports: Serial, EIA-232 standard, DB-9F. Integrated 10 mb/s Ethernet, CAT5 or CAT6, RJ-45.

Supply Voltage: 13.8 Vdc nominal. Reverse-polarity and over-voltage protection standard.

Operating Temperature Range: 0-50 degrees Celsius.

Dimensions (HxWxD): 5.0" x 12.0" x 14.75". Depth measurement includes rear panel heat sink.

Weight: 15.4 lbs. (7 kg).

Construction: Aluminum chassis, steel cabinet, glass-epoxy printed-circuit boards, molded front panel.

RECEIVER

SSB Sensitivity: <0.18 uV typical for 10 dB SINAD at 2.4 kHz BW, pre-amp on. <0.5 uV typical for 10 dB SINAD at 2.4 kHz BW, pre-amp off.

AM Sensitivity: <2.5 uV for 10 dB SINAD at 6 kHz BW, 30% modulation, 1 kHz, pre-amp off.

FM Sensitivity: <2.5 uV for 12 dB SINAD at 20 kHz BW, 3 kHz deviation, 1 kHz, pre-amp off.

Selectivity, IF1: at 70 MHz, 20 kHz

Selectivity, IF2: at 455 kHz, 20, 6, 2.5 kHz standard, 500 Hz, 300 Hz, optional.

Selectivity, DSP IF: 37 built-in DSP filters from 200-9000 Hz BW.

IP3 (Third Order Intercept Point): +13 dBm at 20 kHz spacing, +8.5 dBm at 2 kHz spacing, optional 500 Hz I-F filter installed, 500 Hz DSP BW.

IMD3 Dynamic Range: 90 dB @ 20 kHz spacing, 2.5 kHz I-F filter. 78 dB @ 2 kHz spacing, optional 500 Hz I-F filter installed, 500 Hz DSP BW.

Blocking Dynamic Range: 135 dB at 20 kHz spacing, 2.5 kHz I-F filter. 130 dB at 2 kHz spacing with optional 500 Hz filter installed, 500 Hz DSP BW.

LO Phase Noise: -125 dBc/Hz @ 10 kHz, -121 dBc/Hz @ 2 kHz

Image Rejection: > 70 dB.

IF Rejection: > 70 dB.

Other Spurious Response Rejection: > 90 dB, F>1 MHz.

RIT/XIT Range: +/- 8.2 kHz

S-meter Reference: S9 = 50 uV RMS

TX > RX Recovery Time: < 20 ms.

RX Audio Equalizer: Bass/treble boost/cut up to 6 dB/octave.

RX Audio Output: 2W into 4 ohms, <3% THD

RX Headphone Output: Designed for 16-32 ohms impedance headphones. Usable at 8 ohms.

AUX Audio Output: 500 mv

RX Manual Notch Filter: IF DSP, > 50 dB depth, adjustable width.

Auto Notch: IF DSP, multi-tone, adjustable.

RX Noise Reduction: IF DSP, adjustable.

Noise Blanker: IF DSP, adjustable

RX Current Drain: 2A @ 13.8 Vdc, no signal, AF gain at 100%

TRANSMITTER

Power Output: Adjustable, 100 watts maximum.

CW & SSB Duty Cycle: continuous service @ 100 watts

AM, FM, AFSK, PSK Duty Cycle: continuous with cooling fan accessory

Microphone Input Impedance: >10 k-ohms at 1 kHz.

Microphone Sensitivity: 1 mV RMS for full power output, internal gain adjustment, dc power for electret elements.

AUX Level Input: 200 mv RMS nominal for 100 W, set to 50% independent of mic gain.

Speech Processor: RF compression, 0-9 adjustment.

TX Bandwidth: 1000-4000 Hz in 200 Hz steps plus 2500 Hz – 17 total steps.

TX Frequency Response: 70-4000 Hz maximum @ 6 dB points, adjustable.

TX Speech Monitor: Modulated IF after filtering, processing.

SSB Carrier Suppression: > 50 dB.

Unwanted Sideband Suppression: > 60 dB at 1 kHz.

Harmonic & Spurious Outputs: Meets FCC specifications.

T/R Switching: PTT or VOX on SSB, AM, FM, FSK. Adjustable QSK on CW.

CW Keyer: Speed range, 5-63 WPM, adjustable weighting, selectable Curtis A/B

CW Rise & Fall Times: Adjustable 3-10 ms.

CW Offset: Programmable 100-1270 Hz in 10 Hz steps. Sidetone pitch automatically matches selected CW offset.

FM Deviation: +/- 5 kHz peak nominal.

Current Drain: 25 A max. @ 100 W output.

Optional Antenna Tuner: Internal, L-network, 8 to 600 ohms matching range, 1.8-30 MHz.

All specifications and features are subject to change without prior notice.

1185 Dolly Parton Pkwy., Sevierville, TN 37862 **Sales: 800-833-7373** **www.tentec.com**
We accept Visa, MC, American Express and Discover. Office (865) 453-7172. FAX (865) 428-4483.
Sales: Mon-Fri 8:00-5:30 Eastern, sales@tentec.com. Service: Mon-Fri 8:00-5:00 Eastern, service@tentec.com (865) 428-0364.

TEN-TEC