

Listening Luxury: The new Ten-Tec RX-340

When the military needed a reliable receiver, they sat down with leaders of the communications industry. Initially, Watkins Johnson produced the early versions of the WJ8711, but as sales began to diminish with time, WJ turned to the hobby sector, releasing the legendary HF1000 receiver.

Although this quality product caused quite a stir a few years ago, sales were disappointing; but then, this was a \$4000 radio! WJ gradually withdrew from the SWL/amateur sector, relegating the HF1000 to history.

But Ten-Tec is still very much alive, and they have been producing “black box” remote control receivers (model RX-331) for the government for nearly a decade. Now they have taken their successful mil-spec receiver and wrapped it in a very appealing, highly functional new package, quality built for 100% duty cycle with no down time.

While the rugged, mil-spec design and construction of the RX-340 minimizes circuit failure, a built-in test and evaluation (BITE) provides instant readout of just about any conceivable board-level failure.

Off the shelf, it has the most-commonly-used functions factory programmed, but the user can custom-select operating characteristics like AGC attack/hang/decay timing. A laboratory precision clock oscillator provides stability of +/- 1 PPM over a temperature excursion of 0-50 degrees Celsius (32-122 degrees Fahrenheit).

We were privileged to take a sneak peek at the new RX-340, and we were very impressed with what we saw – and heard.

❖ Let's Take a Look

MT contributor Tom Sundstrom provided readers with a technical overview of the RX-340 in our May issue (*What's New*, p.102), so we will concentrate on the operational aspects of the receiver in this column.

Since the receiver is intended for rack mount, it is not finished in a wrap-around cabinet; the heavy anodized shielding is the final finish behind the panel. Ten-Tec provides a set of rubber feet for those users who elect to set the receiver on an operating table.

A high quality, 4” speaker faces upward from the top shield grill and provides excellent sound.

Even at full, room-filling volume, there is no audio distortion. Alternatively, the user may wish to plug a larger, external speaker system into the 1/4-inch rear-panel phone jack, thus disabling the internal speaker.

❖ That Rear Panel

The RX-340 is intended for agility. The rear panel is loaded with BNC connectors for various RF tasks and offers an RS232C data port as well for computer interfacing and a separate port

of independent sideband (ISB) signals. A string of DIP switches may be reset for configuration selections.

Intended for rack mounting installations, not mobile/portable facility, the receiver has no provision for DC power; it is operable only from worldwide 90-240 VAC, 48-440 Hz (30 watts nom.) mains.

❖ That Impressive Front Panel

Simply watching the receiver come on is a treat in itself as the circuitry sequentially activates its readouts. Amber-lit function keys and brilliant blue fluorescent alphanumeric displays signal their status. The primary display shows mode, frequency (to one hertz accuracy – that's six decimal places!), and stepping increments, all in bright, half-inch characters. A two-inch tuning knob sports a textured rubber grip, while a finger-indent allows rapid slewing through the bands. The action is smooth.

Unlike the busy, multi-function pushbutton galaxies found on many shortwave receivers (and especially scanners), the RX-340 has dedicated, single-function buttons for the most part. And when alternate function keys are pressed, the associated display automatically changes to reflect their settings.

Stereo headphones may be plugged into the standard 1/4-inch jack, affording channelized (binaural) reception of separate ISB, LSB, and USB functions. All other modes are monaural.



The Ten-Tec RX340 is neat, clean, and straightforward to operate.

for custom audio requirements.

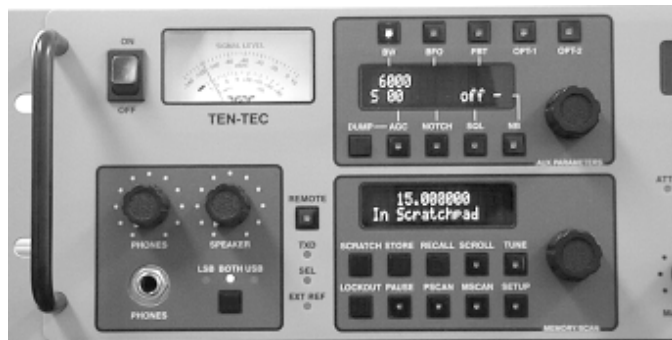
A wideband, first mixer IF 45.555 MHz output is provided to feed an optional spectrum display unit limited only by the front-end filter selected. Span varies from a few hundred kilohertz at MF to several megahertz at HF.

While Ten-Tec does not offer a spectrum display unit, an excellent choice would be the AVCOM SDM42A, ordered with the 45.555 MHz IF input frequency and the rack-mount option if needed.

A second mixer IF feed is also provided for post-DSP 455 kHz output with bandwidth determined by the filter selection. Separate 455 kHz signal monitor outputs may be taken with and without AGC delay.

For increased precision frequency measurements, an external reference oscillator of 1, 2, 5, or 10 MHz may be injected into the rear-panel BNC.

Line-level audio (600 ohms @ 0 dBm) is available from two circuits, permitting the separate detec-



A close-up of the S meter, audio gain controls, and fluorescent menu-selection displays.



The large fluorescent display and single-function keypads are a pleasure to execute.

A separate volume control, next to the speaker volume control, is used for the headphone jack.

The illuminated signal strength meter is a husky, analog (D'Arsonval) movement with separate – and accurate – scales for dBm (-140 to +10) and S units (0 to S9+80 dB).

❖ Control Functions

Of all the controls on the receiver, none is more impressive than the IF bandwidth (selectivity) adjustment. Since this alters the actual digital signal processing (DSP) channel width of the final IF stage, you can actually hear the bandwidth change proportionately as you firewall the desired signal from adjacent signal interference!

While you rotate the control from as wide as 16 kHz wide to as narrow as 100 Hz (in 57 discrete steps!), a digital readout accurately announces the bandwidth in hertz. With a filter shape factor of 1.5:1 or better (70 dB ultimate attenuation), the audible effect is astounding. You can tailor the adjustment to suit your listening preference as you slew the control, balancing adjacent-signal-interference reduction with audio intelligibility.

And even if you have a residual heterodyne tone remaining, simply invoke the razor-sharp notch filter and slice it out without degrading the remaining audio passband (SSB and CW modes only).

But variable IF bandwidth isn't the only way to reduce interference. In addition to normal full-carrier AM detection, the RX-340 also has selectable-sideband synchronous detection. This allows the user to choose which sideband of an AM signal to eliminate for the reduction of adjacent-signal interference or, if he prefers, full-

envelope synchronous detection.

We found the synchronous mode to be very effective, locking on weak signals in spite of high interference levels, although the bandwidth is irrevocably set at 6 kHz in this mode. The receiver can be tuned only a few hundred hertz from center carrier without losing lock in the synchronous AM mode, and it will lose lock on signals near the noise floor.

Momentary dropouts in synchronous lock may be heard when new selections are made for attenuation or preamplification, or when resetting the manual (RF) gain control.

But let's not forget yet another, highly-effective noise reduction technique: passband tuning (PBT). The RX-340 allows the user to move the apparent center of the received signal away from adjacent-frequency interference in five hertz steps to as far as 2 kHz from its original position, effectively placing the interference outside the filter's selectivity skirt for brick-wall rejection.

The PBT works in the USB, LSB, ISB, and CW modes only, not AM or FM. In AM, the Synchronous detection does the job, and in FM, the capture effect restricts adjacent channel, and even weaker co-channel, interference.

To remove background noise while monitoring for activity, an all-mode squelch, continuously adjustable over a 150 dB range, is included.

In spite of the superlative dynamic range (3rd order intercept point 30 dB typ.), a 15 dB attenuator function is supplied, and in spite of the excellent sensitivity (-112 dBm SSB), a 10 dB preamplifier is selectable as well. Spurious IF rejection is a superb 90 dB.

❖ Scanning

The RX-340 includes 100 scannable memories; the scan functions are in a display block all by themselves (see photo). There's a scratchpad memory as well for holding current information. Search between two preset limits is provided as well. Although the scan rate is not as lightning fast as modern VHF/UHF scanners, it is several channels per second, probably too fast to get any

Update on the Grundig Millennium 800

In our May issue we reviewed the long-awaited Grundig Millennium 800 receiver. We noted both good and not-so-good observations on our pre-production sample. Since Grundig spokesmen assured us that our concerns were being addressed, we promised an update to our readers.

By now hundreds of the 800s are in daily use by U.S. and Canadian listeners. Although two randomly-picked samples of the current production run did still displayed some self-generated spurious signals, under actual reception conditions, signals strengths seem to overcome the spurs.

Larry Van Horn, our in-house reviewer, agrees, observing that the prevalence of internal interference heard on the pre-production prototype was not observed when tuning throughout the shortwave ranges with the antenna connected. He did note, however, that tuning synthesizer noise is still quite prevalent, with the annoying crackling noise especially prominent on the AM and FM broadcast bands, less so on shortwave. The noise is only present as the tuning knob is being rotated.

Although the three samples we tested over a two-month period seemed to exhibit different sensitivities on AM and FM, most listeners are quite satisfied with its performance. The Millennium 800 has good sound and is easy to operate—and easy to see with its giant display and pushbuttons. And by actual count at Grove Enterprises, fewer than 10% of the radios sold have been returned—a low return rate for a brand new product.

audible indication of activity.

Memory contents include frequency, mode, bandwidth, and BFO setting. Channels can be temporarily locked out of the scan sequence, and pause may be selected as well.

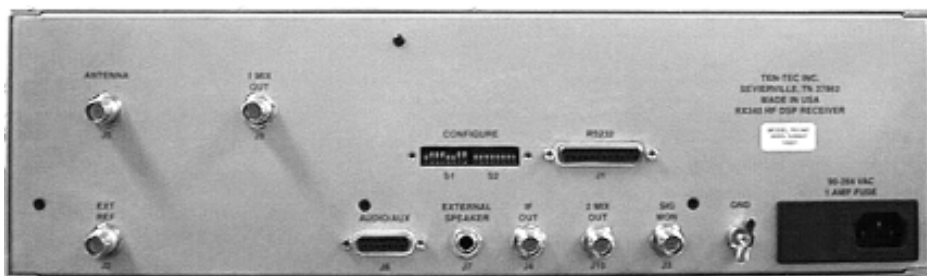
❖ So Who Needs it?

Jaded listeners might think that the new Ten-Tec RX-340 is just too much receiver; after all, aren't receivers in the \$1000 class eminently listenable? Sure, or reputable companies wouldn't be selling them. But there's another perspective besides audible quality.

Those whose success depends upon ultimate reliability (military departments, government agencies, laboratories, surveillance organizations, shortwave broadcasters, etc.) require the confidence offered by the RX-340. They need the assurance that they have not only the best reception possible, but long-term dependability as well.

And then, of course, there's you and me – wouldn't you just love to tell someone you were using a Ten-Tec RX-340 as your primary monitoring instrument?

Ten-Tec RX-340 receiver, \$3949 plus \$15.95 shipping and insurance from Grove Enterprises (PO Box 98, Brasstown, NC 28902; 800-438-8155 sales or 828-837-9200 tech.)



The rear panel affords flexible I/O options.