A Fresh Look at the TenTec RX-340

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The RX-340 is a commercially priced, all-mode DSP general-coverage HF tabletop receiver, built to deliver military-grade performance. Although reviewed by *MT* back in July 2000, this is my first look at one of TenTec's more sophisticated products.

❖ Ergonomics/Aesthetics

Some people don't like the "commercial" look, but I love it; in fact, the more a receiver looks like a piece of test-equipment, the more I am attracted to it. With that said, you'll know what I mean when I say the 340 is a beautiful radio.

With fifty separate controls, the front-panel is "busy," yet neat. Ten-Tec has segregated the controls into four logical groups: Audio, Auxiliary Parameter, Memory/Scan, and Tuning/Keypad.

The blue color of the displays and the S-meter really come together to give it a professional look. The frequency display is so visible that, with characters measuring one-quarter by one-half inch, you can read its 1 Hz resolution from across the room. Equipped with an analog S-meter, the signal strength scale is marked with two separate scales, S-units and dBm. As appealing as the blue light on the S-meter is, I found it didn't help much with reading the meter. If I were to purchase a 340, my only mod would be to change the meter illumination to white.

Turning to the rear-panel, the 340 provides a number of signal-access jacks, as well as dipswitches to configure remote-control parameters.

❖ Detection-Modes

The 340 has eight detection-modes: AM, SAM, FM, USB, LSB, ISB, CW, and CW1. Selection is made using a pair of arrow buttons immediately below its indicator.

For those not familiar with them, ISB is Independent Sideband, and CW1 is CW with no offset. In ISB, you can listen to just the upper, just the lower, or both sidebands simultaneously.

While receiving SAM, "Synchronous AM," the display uses decimal points to change "SAM" to "S.A.M." as an indication the detector has locked.

❖ Tuning/Keypad Group

The performance specifications cover 50 Hz to 30 MHz, but tuning is capable down to 0 Hz, with reduced performance, of course.

Tuning steps available are 100, 10, 9, 5, and 1 kHz; 100, 50, 10, and 1 Hz. Whenever the step size is increased, the next change in frequency rounds it to the nearest step.

The 340 is equipped with a tuning knob – not always provided on commercial radios – and, while more than utilitarian, the feel when tuning is less than that of radios half its cost. It does fit well in the hand, however, and has a finger-detent for rapid or continuous tuning. Tuning increments, while using the knob, are the same as the currently selected step size.

Up/Down buttons, on the keypad, allow the operator to change frequency as if tuning channels. The frequency change is the current step size; with the larger step sizes it's much easier to use the buttons than the knob.

Direct frequency entry is possible using the numeric keypad. Located to the left of the main tuning knob, the keys are about one-half inch square and have a nice positive feel when pressing them. However, after looking at my phone and TV remotes, I wonder if there is a reason for the top and third rows of the numeric keypad being reversed.

There is a frequency "Lock," to prevent accidental over-write, but that is all that is locked; all other front-panel controls are still usable.

❖ Memory/Scan Group

Memory operation is built on a bank of 100 memory channels, with each one holding frequency, detection-mode, and other operating parameters. Store, Recall, View, Clear, and Overwrite are all functions available for channel maintenance.

Whether using the 340 to scan memories, "MScan", or frequency ranges, "PScan," scanning behavior is customizable, allowing the user to set Dwell, Dead, and Gaze times. The amount of time the receiver stays on a frequency is determined by the Dwell setting, which can be set to 0.1 - 29 seconds, or infinite. The Dead Time setting is used to compensate for anticipated short duration losses of signal after detection. It requires a period of time from 0.1 to 29 seconds to pass, after loss of signal, before continuing scan operations; receiving a signal during that period resets the "Dead Time" timer. "Gaze" time is how long the receiver will sit on a frequency waiting for a signal before it aborts and continues to the next.

Scanning "Lockouts" are available for discrete frequencies, as well as memory-channels. When programming a discrete "Lockout" frequency, the receiver bandwidth is also stored. By storing the bandwidth, the 340 not only avoids the discrete frequency, but also the range of frequencies from 1/2 bandwidth below to 1/2 bandwidth above center.

Table 1.

S-Unit Correlation

S-Units	Volts	dBm
0	.099 uV	-127
9	50.0 uV	-73
9 +60 dB	50.0 mV	-13

❖ Auxiliary Parameters Group

The Aux. Parameters group contains the following features: IF Bandwidth, BFO-offset, IF Shift, AGC, Notch-filter, Squelch, Noise Blanker, OPT1, and OPT2.

As I stated earlier, the grouping of controls gives the 340 a neat look. However, this comes at the expense of not being able to quickly change multiple settings. Just like the Memory/Scan group, there is only one knob to change the setting for all of the parameters; pressing a button within the group selects the parameter to be changed. While changing a feature's setting first requires its selection, once it's set, the same button, depending on the feature, is used to enable or disable it.

There are up to 57 predefined bandwidths available, ranging from 100 Hz to 16 kHz, depending on the detection mode.

The BFO-offset can be changed, only in CW, to +/- 8000 Hz. In CW1 the offset is fixed at 0 Hz, and in ISB the offset is fixed at 1800 Hz.

Passband Tuning, "PBT", also known as IF Shift, can be used in USB, LSB, and CW detection-modes, with shifts of +/- 2000 Hz possible.

If the typical selection of three AGC settings leaves you frustrated, you'll be pleased to know that, on top of the standard slow, medium, and fast, the 340 provides the user with a programmable AGC. The programmable AGC allows setting the attack-time from 0.01 to 1.0 mS/dB; the hang-time from 0.0 to 99.0 seconds; the decay-time from 0.01 to 99.9 dB/Sec.

The 340's notch filter leaves a little to be desired, but only compared to today's technology. The Notch is only available in CW, CW1, USB, and LSB, and can only be used with bandwidths of 4 kHz and less. Even though the Notch does an excellent job, it just can't

compete with the automatic, multi-mode, multi-bandwidth, multi-signal Notches being employed on many of today's amateur transceivers.

Unlike some of the other features, the Squelch is available to all detection-modes and all bandwidths. The Squelch threshold is displayed in terms of dBm; for those not familiar with dBm, refer to Table 1 for a correlation of S-Units, volts, and dBm. Don't worry about the conversions, though; remember, the S-Meter is marked in dBm and S-Units, so you can use the S-Meter to determine the dBm level for the Squelch.

The Noise Blanker is also available for all detection-modes and bandwidths; the different blanking levels are off, or, 1 to 9.

Ten-Tec made provision for two options, OPT1 and OPT2, but at this time I know of no available options.

❖ Audio Group

The Audio group contains three controls: phones volume, speaker volume, and sideband-audio selection.

It's handy having the separate Phones and Speaker level controls. I connected the phones audio to my laptop, for data-modes, and liked being able to control the speaker level independent of the output to the sound card. Likewise, using headphones, you can switch back and forth without having to change levels based on what you're listening with.

❖ Miscellaneous Items

Input signal modification can be accomplished using either the 340's preamp or attenuator. The preamp is spec'd at 10 dB of gain, and the attenuator at 15 dB.

About that S-meter: Seeing it marked in S-Units and dBm, I just had to do a level accuracy test, see Table 2. I was impressed to find that most levels were within a few dB of the source. An aspect of the S-Meter that I really like is that it doesn't matter what AGC speed is used or whether the RF Preamp or Attenuator is active, the S-meter always indicates the actual input signal level. This may disappoint some at first, but I found it grew on me, knowing what the signal level really is, not what I've changed it to using front-panel controls.

Table 2.

S-Meter Accuracy

Signal Level (dBm)	S-Meter (dBm)
-130	-127
-120	-117
-110	-107
-100	-97
-90	-91
-80	-81
-70	-72
-60	-62
-50	-53
-40	-43
-30	-34
-20	-24
-10	-14
0	-5

A rack-mount front-panel indicates the 340 is meant for more than the casual listener. Remote-control capabilities are standard, being enabled, or disabled, via a button on the front-panel. Multiple 340s can be set up in a multi-drop configuration to facilitate complex computer-controlled surveillance systems.

The receiver's IF gain can be varied by a Manual Gain control, with a maximum reduction of 120 dB. The IF gain reduction level is displayed in dB, next to the AGC speed, in the Auxiliary Parameters group.

❖ How does it play?

Now that we've gotten all the formalities out of the way, let's get down to brass tacks: how does this commercial receiver perform?

First, I must say, the internal speaker provided audio that was much better than expected. I think it's good enough to qualify as "good" – not Hi-Fi, but definitely better than expected. For my real world testing, though, I opted for an external speaker, as well as my 500-ft Loop Sky-Wire.

I'm always curious how these types of radios perform under 500 kHz. While most "ham" radios drastically reduce sensitivity in that frequency range, most commercial units incorporate only minor reductions, as they are designed more to maintain the same performance over the radio's entire frequency range. True to form, the 340 performed wonderfully in radio's "basement." The sharp, narrow bandwidths really help out when digging through the late-night clusters of beacons. If you come upon a beacon and can't find a combination of mode, bandwidth/PBT, and notch that digs it out of the interference, then it's probably going to take a whole lot more receiver to do it, if at all.

Now for the AM broadcast band. Performance was very nice, to say the least. I really enjoyed having the wider bandwidth capabilities for strong stations with no adjacent channel interference. It was while listening to some of those stations, I noticed there were very short duration "pops" in the audio, but only on voice peaks. After checking multiple local stations, and hearing the same thing, I started experimenting with front-panel settings. It wasn't long before I found that the AGC was set to Fast, and when I switched it to Slow, the popping went away.

After experiencing the previous two bands, there was not much of a surprise when it came to shortwave. The same great performance was enjoyed throughout this part of the spectrum as well. I love these DSP radios, with their multitude of bandwidths; you can almost always find one that will do the trick. And, there are so many choices, you're usually able to reduce bandwidth just enough to eliminate the interference, yet maintain enough bandwidth for good readability.

❖ Final Thoughts

I'd be lying if I said I wouldn't like having a 340 at my station, but I'd also be lying if I said that there are no radios out there now that perform as good as, if not better, for less money. Those radios, however, are intended for the amateur radio market and probably wouldn't be suited in the commercial or military applications that the 340 was designed for. With the 340 and its technology now about 6 years old, I wonder if TenTec will release a "modern" version of the 340, perhaps the 340B; I don't think I'm the only one who would be eager to get one on the bench, to see if a new "standard of comparison" had been created.

The RX-340 is sold directly from the factory to customers in the U.S.A., Canada, and any country without a Ten-Tec dealer; MSRP is now $4,250. For more information, visit the TenTec website at **http://www.TenTec.com** or write Ten-Tec at 1185 Dolly Parton Parkway, Sevierville, TN 37862; 865-453-7172.