technology
showcase *new product performance analysis*

by Ken Reiss, <armadillo@aol.com>

Ten-Tec RX-340 Receiver

If you've been around Shortwave Listening for any length of time, you've seen several super receivers come and go. Ten-Tec has made their RX-340 available to the consumer market, and with the virtual disappearance of the Watkins Johnson HF-1000 receiver (although you can still get the 8610 for an additional $1000), Ten-Tec has the high-end of the consumer market all to themselves. Let's take a look at this high-end receiver and see what it offers that your Sony 7600 doesn't.

First of all, that's not even a fair comparison. Putting portables and desktop receivers in the same category just isn't fair to either receiver. Yes, they both receive shortwave signals, but that's about where the similarity ends. If you're asking yourself "what's this thing going to do that my $200 receiver won't?" then you probably shouldn't get one. This is a communications receiver built for the government's high demand applications. I'm quite sure it will meet the needs of most shortwave listeners quite admirably.

However, it may not be for everyone, even if price is no object. Many people who listen primarily for program content find they prefer the simplicity, and sometimes the sound of a receiver that's built for that purpose. The government application for these receivers involves mostly data and point-to-point or "utility" transmission. Most of the time the receiver is used in the SSB mode. If you also like to listen to these types of signals, you'll love this receiver.

The very military looking user's manual starts off: "Purpose and Function: The Ten-Tec RX-340 is an all-mode general-coverage receiver that delivers military-grade performance at off-the-shelf commercial pricing. Powerful digital signal processing (DSP) and over 60,000 lines of intensive code provide a level of performance and flexibility unattainable with conventional analog circuitry." I'd say that pretty well sums it up!

Features

Frequency coverage runs from 50 kHz to 30 MHz, so this is what most hobbyists will consider a shortwave only communications receiver. Tuning can be done at 1 Hz rates, although 10 step rates are available for faster and more practical operation if you're just tuning the dial. Remember, the military is the intended target for this receiver, so 1 Hz operation makes sense for fine-tuning delicate data channels and other modes that they use on a regular basis.

One hundred memories are available for storage of frequencies and other settings so that the receiver is ready to go as soon as the memory is selected. Also available are one hundred frequency lockouts so that undesired frequencies can be skipped
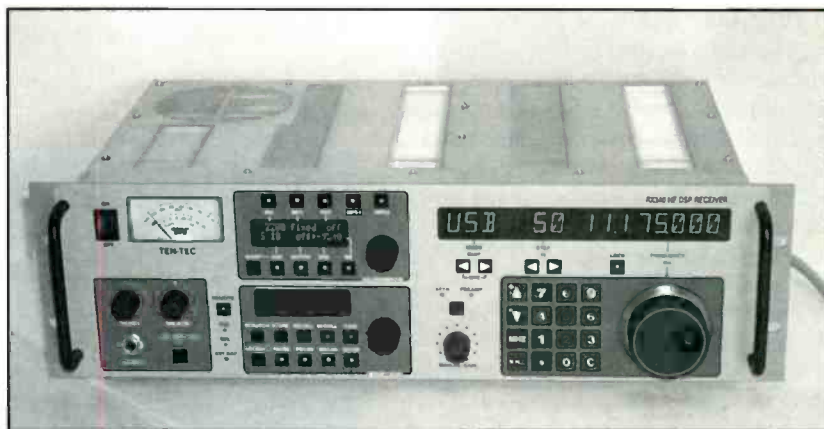
It's certainly an impressive receiver. You can almost picture about a dozen of them mounted in racks on some military base, but this state of the art receiver could be in your shack. You could mount a dozen of them too, but you'll need a very big checkbook!

during a "programmable scan" from one frequency to another. This is a very convenient feature if you use this type of scan in your listening.

In fact, the RX-340 is one of few receivers that perform as well as a scanner for shortwave operation. All sorts of controls are available to determine which memories are included in the scan, and how long each channel should be listened to for activity. Individual squelch setting for noise levels that vary across the band (and make scanning almost impossible on many receivers) makes for a very functional receiver.

Ten-Tec claims a "signal handling range" of 140 dB, which is an incredible range. We did not put the receiver through any kind of technical tests to verify this, but I did not experience anything that would give any reason to doubt this claim. Its dynamic range is quite excellent, and the entire time I was using the receiver it was interference free (except for interference on the bands themselves, of course). The RX-340 also includes a built-in automatic tracking pre-selector. This was available as an option on the Watkins Johnson HF-1000, and it really made a difference in the amount of local interference the receiver was subjected to handling.

To help deal with the interference on the shortwave bands — for example, two signals right next to each other, the RX-340 offers no less than 57 DSP bandwidth filters ranging from 100 Hz to 16 kHz. By switching to a slightly narrower filter and using the notch and pass band tuning controls (PBT), or moving off frequency just a bit, the interfering signal can often be eliminated completely.

One of the far-too-many-features of the RX-340 is the availability of separate audio controls for headphones and speaker
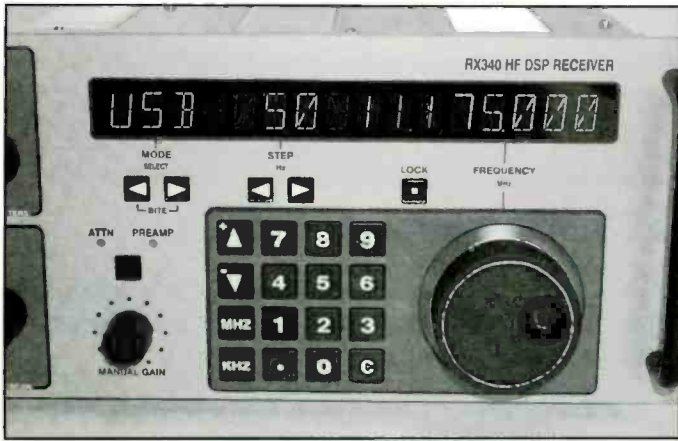
Bright and easy to read is the first impression of the lighted display sections on the RX-340. Information is easy to find, and even my fat fingers had no trouble with the keys!

The left side of the receiver features the memory and operating sections, as well as the signal strength meter. Note the dual volume controls for speaker and headphones.

levels. In addition, there is a USB/LSB BOTH switch for the AUDIO portion of the signal as one last line of defense against an interfering signal that makes it all the way through. I did find a few occasions where this control was very useful.

What Makes It Different?

For the technically minded, the way the RX-340 works is very similar to other DSP receivers. As the signal is received at the antenna, the front part of the receiver looks pretty much like any other high quality communications receiver. Signals are run through three IF stages where they are amplified and filtered to a form that is usable by the rest of the receiver. This "triple conversion front end" is completely analog.

After exiting from the third IF stage, the signals are then converted to digital, and that's where the magic happens. With digital processing of the IF signal, a lot more versatility can be introduced into the receiver than those receivers which apply DSP to the analog audio signal that's at the end of the receiver's processing stages. An excellent example of this can be seen in the notch filtering that's available on a receiver like the Ten-Tec RX-340 versus something like the notch on an ICOM PCR-1000 which features an excellent audio DSP option. The audio DSP unit (and this would include add on DSP units like the Timewave and others) sees the heterodyne or whistle on the audio and blocks those audio frequencies from the audio that is passed on to the speaker. If you've ever used one of these type filters, you'll know that they are amazing and can do wonderful things for the readability of weak and interference-ridden signals.

DSP in the IF, however, means we can recognize the heterodyne and remove it before the receiver ever gets a look at the audio signal. This results in a much cleaner signal, and in many instances one that is easier to listen to as well. This is just one very simple example of the type of power that full DSP receivers like the Ten Tec 340 and Watkins Johnson receivers utilize to get the absolute most out of every ounce of received signal.

The Bottom Line

Performance of the RX-340 is absolutely wonderful, and it proved to be a delightful receiver to use. For the utility listener, I would say that the RX-340 is probably the ultimate receiver, and I would add that the program listening I did with the 340 was also very good. It might be slight (only slight) overkill for a program only listener, however.
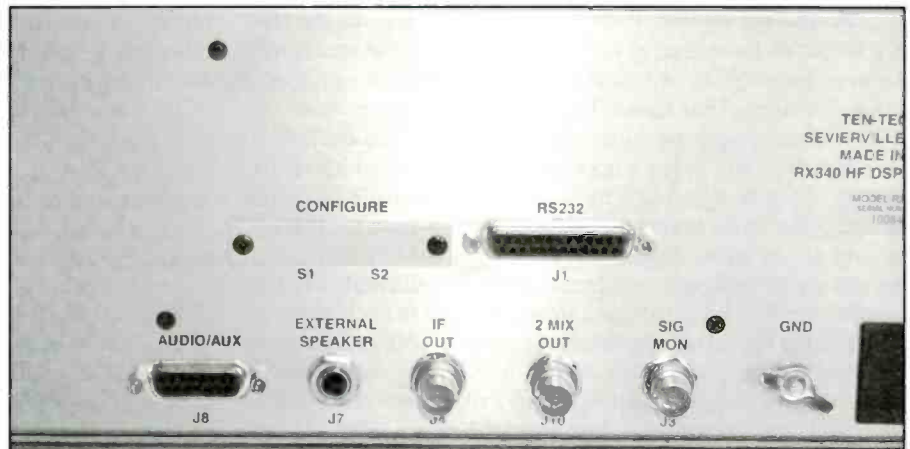
Watkins Johnson owners will appreciate the more traditional external speaker jack among the various connectors on the 340's rear panel.

The price range will, unfortunately, put this receiver out of range for most listeners. However if that doesn't scare you off, then you seriously should look at this receiver as the ultimate shortwave communications receiver on today's market. It's available from many of your favorite shortwave equipment dealers for about $3799. Check it out!

For more information, contact Ten-Tec at 800-833-7373 Monday to Friday 9 a.m. to 5:30 p.m. EST or visit their website at tentec.com. Be sure to tell them you read about it in *Popular Communications*. ∎