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Japan Radio's NRD-545



The front panel says it all — NRD-545 DSP Receiver. The controls are very conveniently laid out and easy to operate, even with my big fingers. It is truly a joy to listen with this excellent piece of equipment.

are documented in the manual (Way to go JRC!). Software from third party companies is beginning to become available as the NRD-545 becomes more popular with listeners. (Check out Smart NRD from Fineware at www.fineware-sw1.com).

JRC has released a sample application that will access front panel controls and upload/download memories, but the program is not terribly flexible. It will only work on COM 1 for instance, and the display size on screen is fixed with no scroll bars, etc. If you're trying to use it on a machine with less than 800 x 600 resolution on the screen, half of the controls, including the keypad are inaccessible. No doubt a more complete application will be forthcoming either from JRC or an independent developer. If you think about it for a second, what you most want for computer assisted shortwave receivers is memory management! Punching in 1000 memories and keeping track of them is a big job.

There are 1000 memory channels available, which should keep even the most dedicated memory fanatics happy. Each memory stores all of the operating parameters about the receiver including frequency, of course, mode, IF filter bandwidth, AGC, attenuator settings, and tuning step. Twenty of the memory channels can also store an ON and OFF time for unattended recording.

545 Operation

The operation of the receiver is accomplished with JRC's usual excellent flare for ergonomics. The controls are well placed, and often-used functions are easily accessible. The large tuning dial in the center of the faceplate is very comfortable, and offers a torque control for adjustment of the tension required to tune. The 545's LED display and large

A new shortwave receiver always generates a lot of excitement amongst enthusiasts, and one from Japan Radio is almost certain to generate a furor. The NRD-545 was certainly no exception, and once listeners began to realize that the 545 was also a DSP receiver, excitement grew.

DSP or Digital Signal Processing refers to what essentially are computer-based "digital" techniques for processing and enhancing the received signal, as opposed to the standard "analog" systems that are used in a more traditional receiver (including the earlier NRD-535). DSP systems are well known for audio processing and assisting in removal of unwanted heterodynes (whistle or tone-type noises).

Many aftermarket DSP units are available to take the audio from any receiver and process it using DSP technology. However these units don't get the signal to even process until *after* going through all the radio's audio stages, complete with noise and other artifacts of superheterodyne reception. Many of the receivers on the market that include DSP as an optional accessory work this way, also.

The NRD-545 takes the signal digital after the IF stages, similar in operation to the Watkins Johnson HF-1000. By putting DSP processing earlier in the system, we can get much more control of the

incoming signal, and feed the audio stages with a much cleaner, filtered signal. This can lead to greatly improved reception of weak signals or stations with interference from nearby stations. The NRD-545 also uses digital IF filtering techniques to generate a nearly endless selection of bandwidths to help in this process. Any bandwidth desired can be set for default in the easily-accessed Narrow, Intermediate, and Wide positions, but it's just as easy to override those settings with the bandwidth control which is continuously variable.

In addition, there is a range of controls designed to extract the signal from other noises around. The digital notch filter, for instance, can not only eliminate a steady noise or heterodyne that might be on the frequency you're trying to listen to, but in automatic mode, it will follow a wandering interference for quite some distance. This is truly amazing to see in operation. There is also a noise blanker with narrow and wide modes of operation, and an overall noise reduction system, all of which are accomplished digitally.

On the surface, the NRD-545 is like many other high-end HF receivers. The standard receiver covers 100 kHz to 30 MHz continuously. There is an optional converter to extend this range, which we'll discuss momentarily. A full computer interface is available, and the commands

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Lots of connections are available on the back panel. Note the N type connector at the upper right for the wide-band converter option. HF antennas are connected at the lower right either with a PL-259 coaxial connector, or wires. I also thought it was interesting that JRC uses a DB-25 connector for the serial port instead of the more common DB-9. You'll need a null modem adapter or cable to connect to the computer correctly.

LED generated S-Meter offer a myriad of information at a glance, and numerous LEDs in other locations on the front panel indicate which receiver functions are activated at any time. It's truly a joy to operate this receiver.

There were early reports of digital artifacts and other problems associated with the DSP circuitry. I did not experience them, and believe that JRC has gotten it right on the production version of this receiver. As a side note, there are a number of parameters about the DSP and receiver operation that are user adjustable through a setup menu. Many users on the Internet have reported that by working with these settings they were able to peak the performance of the receiver, or to remove unwanted effects of the DSP. I didn't find this necessary, but I am convinced that if you don't like how this receiver operates, you probably haven't gotten some setting right yet.

The NRD-545 also has available as an option, a VHF/UHF frequency converter. In theory, this would be the best of both worlds — a high-quality shortwave receiver and all that processing power applied to VHF/UHF frequencies. Combine that with lots of memories and other features, and the NRD-545 sounds very promising as the ultimate wide-band receiver. Alas, while the 545 makes a fantastic HF receiver, the wide band option doesn't quite deliver on this promise.

Two Minor Shortcomings

There are really two shortcomings, although one of those may be fairly minor. The wide band converter does not offer SSB modes on VHF/UHF. Granted, not many communications take place in these modes, but there are some. This might not

prove a problem depending on your listening habits.

The other shortcoming might prove a bit more severe. The wide band module is subject to overload. I do not have test equipment available to make hard measurements, but there were problems with overloading from nearby strong signals in many places. I have some fairly strong transmitters close to my location, so you might not find the problem as severe. Once I reduced the amount of signal being received (by using a smaller, less efficient antenna), the converter became useful for local signals, and I found it quite convenient. However, if scanning is your primary focus, there are other wide band receivers in this price range that will perform better on VHF/UHF. But if HF is your primary focus, you may

want to consider this option, or you may want to consider a 545 for HF and a dedicated scanner for your VHF/UHF needs. That might, in the end, be the ultimate combination.

The Bottom Line

So how does the 545 stack up? Extremely well as an HF receiver. The NRD-545 is definitely high on my wish list. It's a very capable and comfortable receiver to operate with many excellent features for noise and interference reduction. While I did not focus on broadcast listening, the stations that I did tune in were very comfortable to listen to. If you're looking for a top-of-the-line HF receiver, you owe it to yourself to check this one out!

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