

Prometheus was the Greek god of forethought, and a lot of forethought went into the Dishtronix HF amplifier that bears his name. N8BJQ has our review.

CQ Reviews:

The Dishtronix DX-2400L1 “Prometheus” Solid-State 1.5-KW Amplifier

BY STEVE BOLIA,* N8BJQ

Over a year ago I was asked by CQ to review a new solid-state full-power amplifier. Not being the technical type, it became apparent that my main qualifications were the proximity of the manufacturer (Dishtronix) and downtown Thackery, Ohio (reviewer) and the fact that I am a reasonably active HF contester. If you are expecting a lot of technical stuff, there won't be much included. This is a how well does it operate from a contester's perspective review.

The DX-2400L1 Prometheus is a full-legal-power, auto-band-switching, solid-state amplifier with lots of extra features. The amount of technology in this amplifier is impressive, enough so that it is already covered under one U.S. patent, with more pending. The amp is designed to run 1500W PEP on SSB/CW/RTTY and 375 watts on AM with 50–60 watts drive on 10–160 meters. It is rated at 100% duty cycle into 1:1 SWR. I did not verify the AM performance but did give the CW/RTTY and SSB modes a pretty good workout.

About the Amplifier

The Prometheus puts out a full 1.5 KW on 10–160 meters including the WARC bands. The power transistors are rated at 2400 W PEP. A vacuum antenna relay is standard and a PIN diode switch is an option. All control functions are optically isolated from the radio, as are the ports that interface to the computer. The amp is very well protected via software for every conceivable failure,

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Front view of the Dishtronix DX-2400L1 “Prometheus” amplifier. Power supply is at the bottom.

including operator errors (I tested a few of these.). In all cases, the amp was smarter than I was. I can't say it will be impossible to fry the transistors, but you will have to try very hard to outsmart the software to do it.

The front panel has several bar-graph type displays for reading forward power, reflected power, and computed SWR. These are multi-function displays also used for changing both the user-configurable settings and the factory default settings (not recommended).

The manual band switch and the antenna selector are also on this panel.

The rear panel has connections for four antennas plus inputs for two radios and ports for CIV (computer) control for two radios plus band data, PTT, and ALC connections for both radios.

No expense was spared in the construction of the amplifier and the cases. This is definitely a commercial-quality unit. The power supply and the RF deck will fit in standard 19-inch racks with the rack-handle option. The all-aluminum

metalwork in the cases is excellent with every surface either yellow iridite, black anodized, or powder coated. All of the hardware is stainless steel. The circuit boards are all modular plug-in construction with Teflon® coax and gold connectors. The heat exchanger for the power transistors is a whopping 30 lbs. These are rather large cases at between 7" to 10.5"H x 17"W x 22"D.

As noted above, there are two complete transceiver and data inputs to the RF deck. With the optional SO2R (single operator, two radios) module it is possible to use two transceivers at the same time.

The amp firmware can be updated via a serial connection to a computer. This was done once during the review period and worked very well.

The unit I tested had two external fans and two internal fans (standard on all units) which were useful for cooling during the RTTY contest. These are a bit loud for a phone contest, but do the job for CW and RTTY. There are kits available that will make the fans quieter. The fans are temperature-controlled, continuously-variable-speed units that are hardly noticeable in a casual CW or sideband roundtable-type QSO.

Prometheus Arrives

The week after Hamvention® 2009 was chosen because I would be home and the CQ WPX CW Contest was the following weekend. The amp (and installation crew) arrived at my QTH a couple of days before the contest with two large Pelican cases and a couple of hefty cardboard boxes. A bit of warning: This amp is not for those with bad backs or flimsy operating desks. Total weight of the power supply and RF deck is around 250 lbs. A switching power supply is available and was tested in later trials. It is considerably lighter than the linear supply and performed as well.

After I cleared off a suitable space on my operating desk, we first started to assemble the power supply. Assembly is pretty straightforward with all connectors marked and keyed so nothing can be plugged in where it should not be. The transformer weighs approximately 70 lbs. For ease of installation, it does have a strap to lift it into the power-supply case. Once that was installed, the 40-lb filter choke was then installed. Once everything was plugged in, the power-supply case was closed up and we unpacked the RF deck. This is the light part at only 55 lbs. It fits securely on top of the power-supply case. No need to worry about either piece moving

around on your operating desk. Several power cords were connected between the power supply and the RF deck (again all labeled and keyed).

A couple of quick checks of the power supply were made and it was time to hook up the radio and antennas. We did some preliminary low-power checks to make sure everything was connected properly and the amp was configured for my radio (a user-configuration menu setting via the front panel). ALC was adjusted and a couple of quick on-the-air tests were made. No smoke was observed, so we shut it down for the evening.

Operation

For the WPX contest the only antennas that I had available were a three-tribander stack for 10–20. Needless to say, 10 meters at this point in the solar cycle is not much use and 15 has not been much better here in W8-land. This made my operating choice pretty easy. Twenty meters would be the band for the WPX CW contest.

I was able to run the amp at between 1400–1500 watts out for the entire 32 hours I was on the air. I was able to make 1300+ Qs and over 2-million points, which is the best I have ever done in a single-band effort. While I did not use many of the features of the Prometheus, the fact that I could run full power for the entire time without overheating was very impressive. My current amp will do 800–900 watts for a few hours before I have to cool it down.

This was the first contest experience for the Prometheus and its first test with an ICOM radio (756 Pro III). Again, no smoke and no failures. I experienced a few soft faults which were later traced to the keying rise time in the Pro III. When I reduced the rise time setting, the soft faults disappeared.

After the contest I hooked the ICOM CIV cable to the amplifier and enabled CIV control in the menu. Band switching was very fast and there were no communication issues between the radio and the amplifier.

My next foray with the Prometheus was in the CQ WW RTTY Contest in September. RTTY is pretty challenging for most amplifiers. By now my antennas had been repaired and moved and I was able to operate on 10–80 meters. The Pro III controlled the amp via the CIV port so I could change bands and the amp would follow. This worked great except that the N1MM contest logging program, the Pro III, and the amp were not happy together, so I disabled CIV to N1MM. This worked okay except that I kept for-

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Rear view of the DX-2400. Note the inputs and RF and computer control from two transceivers, and outputs for four antennas. A four-position antenna switch is built in.

getting to change the band on the computer and had to go back and make corrections to the log. About halfway through the contest, I disconnected the CIV from the amp and reconnected N1MM. It was easier to remember to change bands on the amp than on the computer. The amp did great running full power for the entire time I was on the air. I had a couple of decent runs of 75–80 Qs with no overheating. The end result was 1100 Qs and over 1-million points.

The next contest up (and my next time home) was the California QSO party. I decided to give it a serious effort (amazing what one will do for a bottle of wine). At the end of the contest, I ended up with 700 Qs which were pretty evenly split between SSB and CW. Again the amp was run at full legal power. I had a couple of good runs on SSB on 15 and 20 and had several reports of “you are loud” on phone. Auto band switching using the built-in frequency counter was tried in this contest and performed flawlessly.

Mike, N8WFF, from Dishtronix stopped in one evening to see if he

could figure out how to make the amp, the radio, and the computer all happy with auto band switching with my ICOM. Band data from the radio was already being used for antenna switching. The short version of a long story: I lent him an ICOM 746 and a band decoder and in a couple of days a box was delivered with a “gizmo” that plugged between the DB25 output of my band decoder and the control cable to the antenna switch box. This converted the switching voltage from the band decoder to the correct band data format for the amp. When plugged into the band data port on the back of the amp, auto band switching was enabled and the amp switched when I changed bands from either the radio or the logging program. A prettier version of this “gizmo” will be available for ICOM users. It should be noted that the problem I experienced was unique to the amp CIV conflicting with computer and is not an issue for other radios. Dishtronix is revising its firmware to allow the Icom CIV interface to work with the contest logging software.

I made over 3000 contest Qs plus worked a bunch of DX while using the Prometheus. I was not able to make it “cry uncle.” It did very well with RTTY, CW, and SSB operating on 10–160, plus a bit of WARC band operation. The final transistors are not as forgiving as tubes, so the built-in protection features have to be really quick. I did not try operating into no antenna, but was on the wrong antenna a couple of times before we had the auto band switching working, and the amp immediately went off line. Once the problem is corrected, hitting the bypass button on the front panel puts you back on line in a couple of seconds.

Features Not Tested

An interesting feature not tested yet is the ability to run SO2R with only one amplifier. Two radios can be hooked up to the amplifier and, with proper control, can be run as a full SO2R station. Each radio can be switched using CAT or CIV control or via a built-in frequency counter which samples the RF and picks the right band. There is also a built-in four-position antenna switch with built-in memory for the last antenna used on each band. Plus there is a remote-control feature that allows control of the amp at distances up to 1500 feet.

Conclusion

This is a very rugged amplifier that does what it claims to—that is, be able to run full legal power in SSB and CW/RTTY modes and not fail. I spent plenty of time watching the wattmeter, especially during the RTTY contest, and never saw the power dip. It performed well into SWRs up to 2:1 at full power on 10–160 meters. I also made a few Qs on 12 and 17 with no decrease in output. It is very nice to be able to QSY to a new band and be ready to go as soon as you get there. I’m told this amp also interfaces very well with Yaesu, Kenwood, and Elecraft radios. This was its first contest with an ICOM.

If you are looking for a full-legal-limit amplifier for contesting or DXing, you might check this out. I’m saving my pennies. For the contester, the SO2R option could allow one amp to serve both radios with full output and auto band switching.

List price for the Prometheus is \$10,500 with the linear power supply, \$10,250 with the optional switching supply. Contact Dishtronix at 937-292-7981 or <info@dishtronix.com>, or visit the company’s website at <http://www.dishtronix.com/prometheus.html>.