# Product Review & Short Takes Columns from *QST* Magazine

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**Product Reviews**

Ten-Tec Argonaut V MF/HF Transceiver Model 516
RIGblaster Pro

**Short Takes**

SkySweeper

# Ten-Tec Argonaut V MF/HF Transceiver Model 516

*By Rick Lindquist, N1RL*
*ARRL Senior News Editor*


Face it. The *Argonaut* name still evokes powerful magic. It stirs fond memories of the original Argonaut Model 505—a 5-W analog transceiver that's now a classic (and collectible) piece of US-made gear that continues to be much-beloved within the low-power (QRP) community. To judge by comments posted on the Internet, diehard Ten-Tec fans—a number of whom rushed out to buy this latest "Argo" largely on the basis of its name alone—appear to be thrilled with this latest version.

It's been more than a decade since Ten-Tec's last Argonaut, the Argonaut II—a strictly 5 W unit, but with more features than the original. Ten-Tec, in the same breath, also offered the higher-powered, but largely otherwise-identical, Delta II; we reviewed both in the January 1992 issue of *QST*. Now we've jumped to the economically priced Argonaut V, also known as the Model 516.

This latter-day unit is not exactly a QRP transceiver, but, of course, you can adjust the power level down to the requisite 5 W. At full throttle, the Argo V boasts 20 W of output and many other features Ten-Tec has not included on some of its higher-priced rigs, such as a general-coverage HF receiver. To borrow a phrase, this is not your father's Argonaut, although there are some similarities to the Argonaut II.

We've prodded, probed, pushed and twisted this latest Argonaut version to put it through its proverbial paces. Here's what we found out about this fun little radio.

## The Box

Panel labels aside, the Argonaut V Model 516 looks just like Ten-Tec's Model 526 *6N2* multimode VHF transceiver (see "Product Review," *QST*, Oct 2001). The black box is smaller than the Argonaut II's—roughly 3.5×8.5×9.5 inches (HWD), counting the heat sink and the big front feet, but not the fold-down bail that lets you tip up the front of the radio for better viewing, depending on where you have it situated in terms of eye level. In other words, this is not the smallest radio on the market, but it's fairly compact.

From a stylistic standpoint, the Argo V has a solid, plain-vanilla, no-nonsense look about it. With its big American knobs, an analog S/power meter, an appropriately weighted tuning knob (with the now *de rigeur* dial-spinning dimple), it nicely complemented my early 1990s-vintage transceiver.

The LED display offers greenish-yellow, half-inch-tall digits that read out to the 10-Hz position, whether or not you need that level of precision. There's a sub-display with slightly smaller characters that reads out such things as RIT/XIT, passband tuning and memory settings. Three smaller knobs (two of them concentric controls), a dozen pushbuttons (most handling more than one function) and the microphone and headphone jacks round out the front panel.

## Software-Defined Radio Comes to QRP

Ten-Tec says the Argonaut V is "an IF-DSP software-defined radio for QRP." In this regard, the Argo V definitely parts company with is predecessors, not to mention a lot of other radios now on the market. What Ten-Tec has done is to define the heart of the Argonaut V's functionality in software—or, to be more accurate, firmware. What this means, aside from IF-level digital signal processing (DSP), is that owners can update their radios to the latest "model" simply by downloading a file from the Web, **www.rfsquared.com**, and loading it into the radio's flash read-only memory (ROM) via a built-in, nine-pin RS-232 connector on the rear apron. (The same serial connector lets users control the Argo V with a PC using third-party software.) By the way, the radio flashes the latest software version on the display when you turn it on. Ours had version 1.06.

"Should the 60-meter [5-MHz] band be allocated for Amateur Radio use, your transceiver will be ready the day the band opens," Ten-Tec says, pointing out the advantages of flash-ROM updating on its Web site, **www.tentec.com**.

Another really slick feature is that the Argo V lets you wire up directly to your PC soundcard to operate digital modes such as PSK31, so many of which have become available via software. You don't need any kind of interface to do this, but, unless you enjoy soldering to DIN connectors, you might want to pick up Ten-Tec's accessory cable (part number 46176) to simplify matters. Its $10 cost is cheap insurance against burned fingers and strained eyes.

### Bottom Line

Ten-Tec's "QRP" HF rig provides a great deal of bang for the buck, and the ability to update with firmware is very nice.

## On the Airwaves with the Argo V

You can work CW, SSB, FM and AM with the Argonaut V. AM? We wondered about that too. I'm not sure how many

Brennan Price, N4QX ♦ Assistant Technical Editor ♦ n4qx@arrl.org

## Table 1
## Ten-Tec Argonaut V, serial number 08C10452

| Manufacturer's Claimed Specifications | Measured in the ARRL Lab |
|---|---|
| Frequency coverage: Receive, 0.5-30 MHz; transmit, 1.8-2, 3.5-4, 7-7.3, 10.1-10.15, 14-14.35, 18.068-18.168, 21-21.45, 24.89-24.99, 28-29.7 MHz. | Receive and transmit, as specified.[1] |
| Power requirement: Receive, 0.5 A; transmit, 7 A; 12-14 V dc. | Receive, 1.0 A; transmit, 7.5 A. Tested at 13.8 V. |
| Modes of operation: CW, SSB, AM, FM, AFSK. | As specified. |
| **Receiver** | **Receiver Dynamic Testing** |
| SSB/CW sensitivity, 2.4 kHz bandwidth, 10 dB SINAD: 0.5 μV. | Noise floor (MDS), 500 Hz bandwidth:<br>1.0 MHz –121 dBm<br>3.5 MHz –133 dBm<br>14 MHz –132 dBm |
| AM sensitivity: 6 kHz bandwidth, 10 dB SINAD: 1.2 μV | 10 dB (S+N)/N, 1-kHz tone, 30% modulation:<br>1.0 MHz 7.2 μV<br>3.8 MHz 1.2 μV |
| FM sensitivity: 15 kHz bandwidth, 12 dB SINAD: 1.2 μV | For 12 dB SINAD:<br>29 MHz 1.27 μV |
| Blocking dynamic range: Not specified. | Blocking dynamic range, 500 Hz filter:<br>*Spacing* *20 kHz* *5 kHz*<br>3.5 MHz 112 dB 67 dB<br>14 MHz 118 dB 67 dB |
| Two-tone, third-order IMD dynamic range: Not specified. | Two-tone, third-order IMD dynamic range, 500 Hz filter:<br>*Spacing* *20 kHz* *5 kHz*<br>3.5 MHz 85 dB 61 dB<br>14 MHz 85 dB 62 dB |
| Third-order intercept: +4 dBm. | 3.5 MHz –4.5 dBm –30 dBm<br>14 MHz –3.4 dBm –29 dBm |
| Second-order intercept: +66 dBm. | +47 dBm. |
| FM adjacent channel rejection: Not specified. | 20 kHz channel spacing: 29 MHz, 64 dB. |
| FM two-tone, third-order IMD dynamic range: Not specified. | 20 kHz channel spacing: 29 MHz, 64 dB.* |
| S-meter sensitivity: 50 μV at S9. | S9 signal at 14.2 MHz: 39 μV. |
| Squelch sensitivity: Not specified. | At threshold: SSB, 14 MHz, 0.11 μV; FM, 29 MHz, 0.99 μV. |
| Receiver audio output: 2.0 W into 4 Ω @ 5% THD. | 2.7 W at 5% THD into 4 Ω |
| IF/audio response: Not specified. | Range at –6 dB points, (bandwidth):<br>CW-N (500 Hz bandwidth): 394-1015 Hz (621 Hz);<br>USB: 158-2030 Hz (1872 Hz);<br>LSB: 166-2382 Hz (2216 Hz);<br>AM: 111-2642 Hz (2531 Hz). |
| Spurious and image rejection: 70 dB. | First IF rejection, 72 dB; image rejection, 84 dB. |
| **Transmitter** | **Transmitter Dynamic Testing** |
| Power output: 20 W (high), 1 W (low). | Typically 18 W high, <1 W low. |
| Spurious-signal and harmonic suppression: >43 dB | 44 dB. Meets FCC requirements for spectral purity. |
| SSB carrier suppression: >50 dB. | As specified. 62 dB. |
| Undesired sideband suppression: >60 dB. | As specified. 70 dB. |
| Third-order intermodulation distortion (IMD) products: Not specified. | See Figure 1. |
| CW keyer speed range: Not specified. | 5 to 44 WPM. |
| CW keying characteristics: Not specified. | See Figure 2. |
| Transmit-receive turn-around time (PTT release to 50% audio output): <20 ms. | S9 signal, 24 ms. |
| Receive-transmit turnaround time (tx delay): Not specified. | SSB, 25 ms; FM, 25 ms. Unit is suitable for use on AMTOR. |
| Composite transmitted noise: Not specified. | See Figure 3. |
| Size (height, width, depth): 2.8×8.5×9.7 inches; weight, 5 pounds. | |

Note: Unless otherwise noted, all dynamic range measurements are taken at the ARRL Lab standard spacing of 20 kHz.
*Measurement was noise-limited at the value indicated.
Third-order intercept points were determined using S5 reference.
[1]Transmit range extends a few kHz beyond the edges of each band (example 1795-2006 kHz for 160 m). Receive sensitivity reduced below 1.5 MHz.

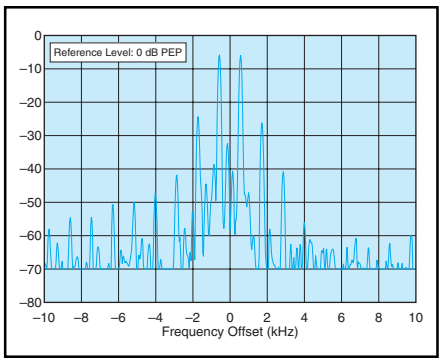



**Figure 1—Worst-case spectral display of the Argonaut V transmitter during two-tone intermodulation distortion (IMD) testing. The worst-case third-order product is approximately 25 dB below PEP output, and the worst-case fifth-order product is approximately 41 dB down. The transmitter was being operated at 20 W output at 1.850 MHz.**

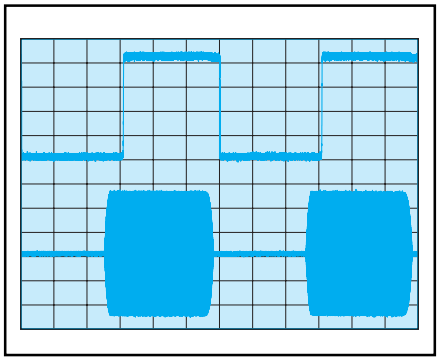


**Figure 2—CW keying waveform for the Argonaut V showing the first two dits in full-break-in (QSK) mode. The equivalent keying speed is 40 WPM, rather than the ARRL Lab standard 60 WPM. The upper trace is the actual key closure; the lower trace is the RF envelope. Horizontal divisions are 10 ms. The transceiver was being operated at 20 W output at 14.2 MHz.**

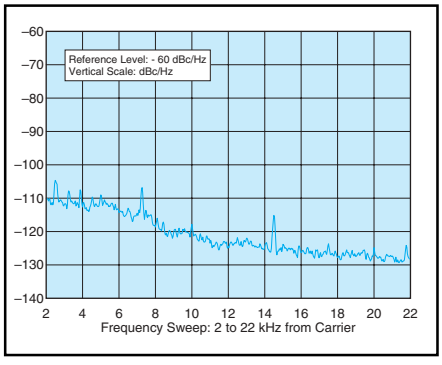



**Figure 3—Worst-case spectral display of the Argonaut V transmitter during composite-noise testing at 14.020 MHz. Power output is 20 W. The carrier, off the left edge of the plot, is not shown.**


**Figure 4—Rear panel of the Argonaut V. Note the sizeable cooling fans (right). Firmware updates are received through the SERIAL port (lower left). The Argonaut V and the computer may be connected with a standard 9-pin serial cable.**

low-power AMers are out there, but I have a suspicion you could count them on one hand. On the other hand, I recall that my first forays into AM phone on 40 meters at 10-20 W output in the late 1950s and early 1960s yielded many successful and enjoyable contacts.

In that same vein, the 20 W available on SSB and CW is plenty of power to literally work the world. In comparison with strictly 5-W QRP operation, you'll be about one S unit louder at full output. A simple twist of the knob cuts you back to whatever power level you want, up to 20 W, of course.

The Argo V scores at least a 9 on the 10-point "can-I-figure-this-thing-out-without-looking-at-the-manual?" scale. Ten-Tec is correct when it says that the Argo V offers "solid HF radio performance in a user-friendly format."

Once you've got your Argonaut V all hooked up, the first thing you have to do is turn it on. There's no power button, however. You power up the Argonaut V by turning the AF knob, which incorporates the power switch. It's a bit retro, but, hey, it works! (No, you don't then have to wait for the tubes to warm up.)

Operation is very straightforward, and it should not take long for anyone already familiar with a typical HF transceiver how to figure out how to make almost everything work. You control a good deal of the radio's operation via the MULTI (multifunction) knob. Each button (sometimes you need to press the FUNC button first) gets you into a sub-menu (there's no *big*, main menu). For example, enabling passband tuning (PBT) is as simple as pressing the PBT button. The PBT setting will appear in the box at the right of the display. The PBT works very well and has a range of ±2.99 kHz. Less intuitive, but certainly mighty convenient, is the process of clearing the PBT setting (and your RIT/XIT settings) by holding the appropriate button down for one second or longer.

For CW work, the internal keyer is excellent and Ten-Tec's legendary QSK flawless (provided you remember to remove any hang time settings via the VOX menu—see below). The keyer starts out at 5 WPM and is supposed to top out at 50 WPM, although we measured 44 WPM in the Lab. The front panel reads out the speed in words per minute. The KEYR menu also includes the rarely adjusted dot-dash ratio (weighting), as well as CW pitch (400-999 Hz) and sidetone level. You don't have to step through these functions each time you need to set the speed, however. Once the keyer is enabled, just press the KEYR button; it's the first thing on the menu. Hit FUNC or another button to escape.

We'd complained that the Argonaut II gave you no option *but* QSK. The Argonaut V lets you use semi-break-in mode (VOX) by setting the VOX hang time (delay). The problem is that the hang time setting is common to SSB and CW (although the manual seems to suggest that they are mode-dependent). This means that if you set the hang time for one mode, it will apply to the other—whether you have VOX turned on or not. You can't change the CW "sideband."

SSB operation is as simple as plugging in the provided hand-held microphone, stepping through the bands (it only goes one direction: up) and modes to an appropriate frequency and sideband and setting the concentric MIC and PWR controls. As noted, the Argo V includes VOX, but it does not have any kind of audio processor or signal monitor. It worked very nicely with my Heil Pro-Set Plus headset, too. Audio reports were uniformly excellent with either the supplied mike or with the Heil.

The noise blanker level is adjustable (very helpful, because too high a level can lead to received-signal distortion and pop-

ping), but it's only accessible as a secondary function (FUNC+A-B/NB button).

Another minor gripe: The MULTI knob, which is so important to many menu and function settings and adjustments, turns continuously, *not* in discrete steps. As a result, it slips easily from one setting (eg, a memory channel) to the next, unless you're very careful manipulating it. Some may actually prefer this approach; it's a matter of individual preference.

Just like many "big rigs," the Argo V includes a band-stacking feature that's really handy for those who like to keep two frequencies and/or modes in a given band at their fingertips. Pressing FUNC + BAND switches to the second frequency in a given band. The bandwidth setting sticks with the band and mode setting.

The S/power meter also can display a sort of relative SWR reading as well as the power amplifier current. You can also change the meter's range—especially handy for checking your output in the 0-5 W range—but you can only do this while in transmit, and the meter range goes back to the default range when you return to receive.

The Argo V actually sounds decent on AM—listening and transmitting. I listened to several AM broadcast stations, and it's got good sensitivity on the *standard broadcast* band. Inconvenient is that in order to initially get to a "general-coverage" frequency, you have to start at one of the default ham-band settings and dial up the frequency you want. Once you get a few frequencies pinned down in memory, however, you can go to those, then flip back to VFO mode. Speaking of memories, there are 100 of them.

In the "but-wait-there's-more" department, the Argo V offers scanning features. You can scan memories or a range of frequencies and even skip a stored frequency. Given the MF/HF range of the Model 516, this is not something you'd be likely to use much outside of 10-meter FM (in fact, that might be something you'd not be likely to use either, but you have it if you want it).

The fan kit is a desirable option for high-duty-cycle modes such as PSK-31 and AM, where power already is limited to 5 W output. The optional fans can be noisy. We tried out two Argonaut Vs, and the cooling fans (there are two of them that slide onto the heat sink) were whiny on both units. They emit a sort of throbbing whine, and the noise was slightly different for each of the two cooling fans. It was worse on one of the radios than on the other (the fans on one unit sounded slightly slower).

We've heard noisier cooling fans, and these won't drive you out of the room or anything like that. They're pretty tiny, however, and look as though they *should* be really quiet.

## A Standing Ovation for DSP

The 35 IF-DSP receive filter settings are what really make the Argonaut V sing. Press the BW button, and you can set from 200 to 1000 Hz bandwidth in 50-Hz steps, and from 1000 to 3000 Hz in 100-Hz steps. (For AM, filters range from 400 Hz to 6 kHz; the filter setting is fixed in FM mode.)

On SSB, you can get down to around 850 Hz and still decipher audio, which gives you an idea of how the filters are shaped. For my purposes, I sometimes wanted a narrower filter than 200 Hz for CW (this is also great for PSK31); perhaps this is something that can be added in a future flash-ROM update.

While the software-defined DSP filters in the third IF work pretty well, the difference between them and traditional crystal filters and the DSP in the Argo V was obvious. A strong nearby signal will "pump" the radio's AGC. This is characterized by downward fluctuations in receiver gain that match the interfering signal's peaks. You won't necessarily *hear* the other signal if you have the bandwidth set to narrow, but you can see the effect on the S meter. Incidentally there is no AGC adjustment; it's set automatically according to mode.

It was in situations like the above that the attenuator came in handy. Oddly, there's no front-panel indication that the 20-dB attenuator is engaged. Ten-Tec advises the user to check the S meter to tell, which is less than convenient. There's no RF gain control on the Argonaut V, and, given that most operators leave that control wide open, most will not miss it.

The Argonaut V's DSP does not include any kind of notching or noise-reduction features.

## Making Sense of the Numbers

The Lab numbers in Table 1 spell out how well the Argonaut V performs in technical terms. From a receiver standpoint, the dynamic range numbers are the most important, in my opinion. This goes back to the "if-you-can't-hear-'em-you-can't-work-'em" school of thought. The higher the two-tone, third-order intermodulation distortion (IMD) numbers, the better the receiver will be able to pull out a weak signal in the presence of stronger signals.

We measured, worst case, 85 dB at the ARRL standard spacing of 20-kHz. This is in the ballpark for a transceiver in this price class and, perhaps coincidentally, the same as we'd measured a decade earlier for the Argonaut II. Closer in, we found two-tone, third-order IMD dynamic range dropped to 67 dB at 5-kHz spacing.

SSB/CW sensitivity, measured in terms of noise floor, indicated a rather "hot" front end. The AM and FM numbers were decent, too. The third-order intercept was in the negative numbers using the two-tone, third-order IMD dynamic range numbers at the 20 and 5-kHz spacings.

Another anomaly was the S meter calibration. Ten-Tec says the S meter is calibrated to 50 μV at S9; we measured 39 μV for S9 on one of our units.

## Me an' my Argo Go Contesting

I've run lots *less* power in various contests, so the 20 W the Argonaut V provides was almost like operating with an amp, comparatively speaking. That power level held up surprisingly well, even on a band full of competitors during the CW World Wide 160-Meter Contest and the ARRL International DX CW Contest. Even with a ton of signals in close proximity—many of them quite loud—the Argonaut was able to pick out the ones I wanted to hear; more often than not, the 20 W made it possible to work them.

During the ARRL event, I was able to work nearly everything I heard using wire antennas. That included contacts with Europe and South America on 80 meters during the late afternoon and early evening hours.

## Odds and Ends

The *Operator's Manual* is superb. Ten-Tec includes a *Quick Reference* card you can keep handy in case you forget something important—like how to turn on the radio. The manual includes a complete set of schematics as large—and readable—foldouts. The last chapter is an excellent glossary and index that even explains the technical terms (*buffered-T voltage* is one that comes to mind) and includes page references where appropriate. The guts of the manual are the 22 pages devoted to describing how to make the radio do what you need it to. Then, there are nine pages that go with the schematics and describe the theory of operation for each of the five subassemblies. For example, if you want to know how the Argonaut V's two codecs work together in the signal path, *it's in there*, as the spaghetti sauce ads say.

Ten-Tec has thoughtfully included a little plastic envelope that contains a stereo plug for the miniature (3.5-mm) key jack (Ten-Tec advises users to "resist the temptation" to use a quarter-inch-to-

3.5-mm adapter, which, owing to its length and size, could damage the jack); a spare four-pin microphone plug; a spare power connector; a spare 7.5-A fuse, a mobile microphone holder (plus hardware) and a small hex wrench to remove or tighten the knobs. A minor gripe is that Ten-Tec used the 3.5-mm jack for the key in the first place, especially when most transceivers use the ¼-inch jack. Then again, most QRP transceivers are really tiny and use the smaller jack.

By the way, Carl Moreschi, N4PY, offers a PC control program (a version of his Pegasus/Jupiter control software) for the Argonaut V. It's on his Web site, **www.ralabs.com/n4py**.

### Who Wants One of These?

There's a sort of "spiritual connection" between some amateurs and Ten-Tec gear than can defy objectivity at times. For example, one fellow posted his opinion that the Argo V was "more radio" than the original ICOM IC-706. At the very least, that's a very highly debatable issue given the capabilities of the latter radio.

Anyway, a lot of folks will buy the Argonaut V simply because it's from Ten-Tec; the Argonaut moniker alone will sweeten or perhaps clinch the deal for others. The 20 W suggests QRP with an edge, but it's a great power level for those who enjoy the slow lane, and it's demonstrably plenty of power to work DX, even in a contest environment. It's also sufficient to also enjoy casual contacts, and, as a bonus, you don't have to worry as much about RFI issues. We didn't try taking the Argonaut V on the road, however. There just did not seem to be any particular advantage. It might be a great rig to take to the field, although it does draw 7.5 A in transmit at full output (about 1.0 A on receive with the volume control wide open).

Current Argonaut V owners seem to have registered few complaints. Some have noted the lack of an RF-gain control. Owners have also offered helpful suggestions, such as one to use the memory feature to store frequencies in each band to permit moving more easily from band to band.

Overall, we found the Argonaut V to be a capable little transceiver that's easy to use and incorporates a lot of handy features in a compact, well-constructed package.

*Manufacturer:* Ten-Tec, 1185 Dolly Parton Pkwy, Sevierville, TN 37862; 800-833-7373; **sales@tentec.com**; **www.tentec.com**. Argonaut model 516 transceiver, $795; with optional temperature-compensated crystal oscillator (TCXO), $849; model 308 fan kit, $15; model 309 mobile bracket, $19.95; model 937 matching power supply, $89; model 705 desk microphone, $99.95.

# RIGblaster Pro


*By Steve Ford, WB8IMY*
QST *Editor*

Is there such a thing as an "ultimate" transceiver/computer interface? Perhaps not, but West Mountain Radio has introduced a strong candidate for the title in the new RIGblaster Pro. The RIGblaster Pro certainly has every bell and whistle I could imagine, plus some I didn't even think of. Of course, with such versatility comes increasing complexity. The "Pro" part of the model name should be taken at face value. This unit is designed for amateurs who have (or want) complete computer/radio integration and don't mind taking the time to become familiar with a full-featured interface. If all you care about is a simple box to link your sound card to your radio so that you can operate PSK31 or other soundcard modes, the RIGblaster Pro is gross overkill. But if you want to make your computer and radio true partners in a high-performance multimode station, the Pro is a godsend.

### Microphones, Headphones and LEDs

The RIGblaster Pro is housed in a flat metal box about 8 inches long, but only an inch thick. The front panel features an 8-pin microphone jack, a 1/8-inch auxiliary mic jack and two headphone jacks—1/8 and 1/4 inch. The purpose of the auxiliary mic jack is to allow you to plug in a headset microphone without having to unplug your main mic. When the headset plug is inserted, audio from the main mic is interrupted automatically.

The output level control is conveniently located on the front of the box for easy access. Tweaking this little knob to adjust transceiver drive is easier than grabbing your PC mouse and calling up your software audio mixer screen.

The LEDs are informative and serve as valuable troubleshooting tools when necessary. Just by glancing at the LEDs, you'll know that sound is reaching the Pro from your computer, that the FSK keying signal is active for RTTY and so on.

Then there is the PROCESS toggle switch and LED. Contrary to what you might think, the RIGblaster Pro does *not* have an internal speech processor. However, you can do a very nifty thing with the Pro's PROCESS function, as we'll see later.

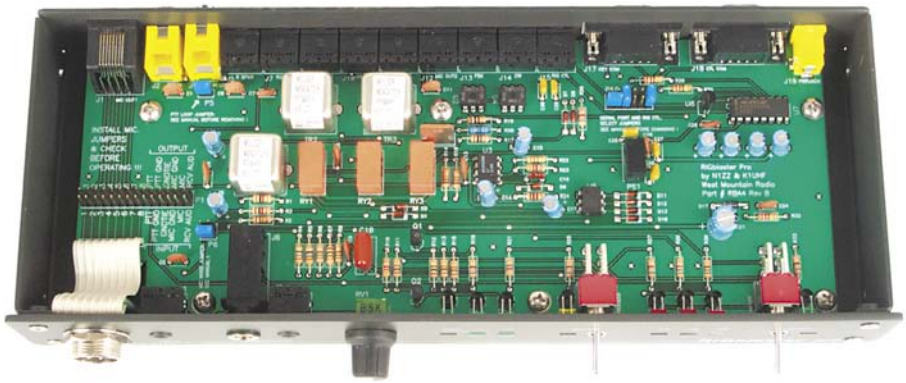
### Built-in Rig Control

Using computers to control amateur transceivers has become quite popular. Most modern transceivers have computer-control ports and, with the right software, your computer can become a versatile tool for either local or remote manipulation of your radio. The catch is that you usually need a hardware interface to do the signal translation between the computer's RS232 serial port and the transceiver's TTL port. This means an additional purchase and another device dangling from your PC.

Not so with the RIGblaster Pro. The Pro features a *built-in* RS232-to-TTL interface that will work with ICOM, Yaesu, Kenwood and Ten-Tec transceivers that support computer control. The Pro also offers serial port pass-through for radios that support direct RS232 control (newer Yaesu and Kenwood transceivers).

### Dual Serial Jacks

When you look at the rear panel of the RIGblaster Pro, your eyes are drawn immediately to the dual DB9 serial jacks. Considering the fact that most sound card interfaces sport only a single serial jack, this may seem puzzling. The answer to the mystery is that the RIGblaster Pro is designed to handle *two* serial lines from your computer *simultaneously*. A typical use for this feature might be with the popular *WriteLog* contesting software. In a RTTY competition, for instance, you can have *WriteLog* doing radio control on COM 1 and FSK keying on COM 2. With



**An interior view of the RIGblaster Pro. Note the shielded transformers.**


**The rear panel of the RIGblaster Pro is festooned with input and output jacks.**

the dual serial inputs, the RIGblaster Pro brings everything together in one box and allows you to sort the functions accordingly.

The RIGblaster Pro also gets quite a bit of mileage out of a single serial port in some situations. If you happen to be running *HamScope* or *MixW* software, you can control your transceiver push-to-talk function for PSK31 and other modes, *and* CW keying, on the same serial port.

## Installation and Operation

The RIGblaster Pro comes with a detailed manual. You need to read the instructions carefully, then determine which modes you wish to operate and how you wish to do so. The answers will be different for everyone, so I can only offer my own station as an example. I wanted to be able to use the Pro's capability in several applications:

- Rig control for use with *WriteLog* and *TRX Manager*
- CW keying
- FSK RTTY
- PSK31, MFSK16 and slow-scan TV
- *Echolink*
- *WSJT* (for 6-meter meteor-scatter fun)
- SSB and FM with either my standard microphone or a headset mic.

The first step is to open the Pro and install the jumpers for the microphone, COM port and rig-control blocks. The manual shows several microphone jumper configurations, depending on the radio you own. The jumpers have to be set correctly so that the microphone pin assignments on your radio ultimately correspond with the pins on the Pro's front-panel microphone jack. It is important to note that the Pro connects to your rig's mic jack through an RJ45 telephone-style jack on the Pro's rear panel. My ICOM IC-706 also uses an RJ45 jack, so making the connection was relatively easy. Other radios may require adaptors.

Like most computers, my mongrel machine has two COM (serial) ports. The Pro package includes one DB9 serial cable, which I ran from COM2 to the Pro for rig control with *WriteLog* and *TRX Manager*. With another cable I dedicated COM1 to PTT (push to talk) control for my *MixW* software for CW, PSK31and MFSK16, as well as my *EchoLink* and *WSJT* applications. I also set up *MMTTY* and *WriteLog* to use COM1 for FSK RTTY keying.

The Pro includes independent, fully isolated CW, FSK and PTT keying outputs. This means that once you've installed the RIGblaster Pro, you won't need to swap cables to transition from mode to mode. You can jump from CW to FSK RTTY, to PSK31, for example, by just loading the proper software. The Pro does the rest.

I plugged my computer speakers into the Pro and connected the audio lines to and from the PC. (The thoughtful folks at West Mountain Radio not only include a generous number of audio cables, they add a set of color-coded adhesive labels maintain order in the cable chaos.) My microphone connected to the front-panel eight-pin jack and the wall-wart power supply (included with the Pro) plugged into the rear panel. Total setup and installation time: about 30 minutes.

The RIGblaster Pro worked perfectly from the moment I applied power. It was a pleasure to hop from one program and mode to another without pulling cables and throwing switches. And speaking of programs, the Pro package includes a CD with an astonishing number of freeware and shareware programs. Most of the applications are for *Windows*, but there are *Mac* and *Linux* applications on the CD as well.

But what about that PROCESS switch? Well, if you have audio processing software on your computer—such as the software found on the RIGblaster Pro CD—you can toggle the PROCESS switch and route your microphone audio through your sound card *before* it is applied to your radio. This allows you to use the software to process your audio characteristics in any way you desire. I also used the Process function with my headset microphone in contest operating to send the mic audio through the computer for virtually seamless live/recorded voice keying. I was even able to use the Process function to route the headset through my computer for nonham uses such as voice chats with *Windows Messenger*.

## Conclusion

Is the RIGblaster Pro for everyone? No. As I stated at the beginning of this review, you don't need a RIGblaster Pro for basic computer PTT keying. But if you consider your computer an essential part of your Amateur Radio experience regardless of mode, the RIGblaster does a superb job of integrating all of your activities in a way that adds substantial enjoyment and convenience. Some may find the Pro's price tag a little intimidating, but I found the per-dollar value to be quite good, especially considering the quality of design and construction. The RIGblaster Pro is definitely the Rolls Royce of interfaces.

*Manufacturer:* West Mountain Radio, 18 Sheehan Ave, Norwalk, CT 06854; tel 203-853-8080; **www.westmountainradio.com**. $299.

# SkySweeper

*SkySweeper* is a multifaceted software package that turns your sound-card-equipped *Windows* PC into a powerful signal analysis and decoding system. It will decode and display a broad range of signals, both commercial and amateur. *SkySweeper* will also *transmit* several modes including RTTY, Hellschrieber, PSK31, SSTV, CW and MFSK16.

Both in their print advertising and on their Web site, SkySweep Technologies promotes *SkySweeper* as software designed for professionals. This is an accurate statement. *SkySweeper*, while useful for Amateur Radio, is intended for people who know their way around DSP, signal analysis and sound cards.

## Flexibility

*SkySweeper's* strength is its extraordinary flexibility. Not only can you decode more than a dozen modes (including ACARS and satellite WEFAX), you can change the decoding parameters to adapt *SkySweeper* to the signal environment. In addition, audio levels can be adjusted on the fly without having to bring up mixer panels and the like. You simply click and drag on the slider near the display window. You can even select which displays you prefer to see, move them independently on the screen and then adjust them to any size.

In the DSP mode, you can create filters to suit your particular needs—low-pass, high-pass, band-pass or bandstop. While listening to a group of CW signals, I was able to create a DSP filter so sharp that only one signal was audible. The only annoyance is that you have to make your adjustments and then click the APPLY button before you hear the results. You can't hear the effect of the filter while you are creating it, so you may find yourself going through several tweak-and-test steps before you get it right.

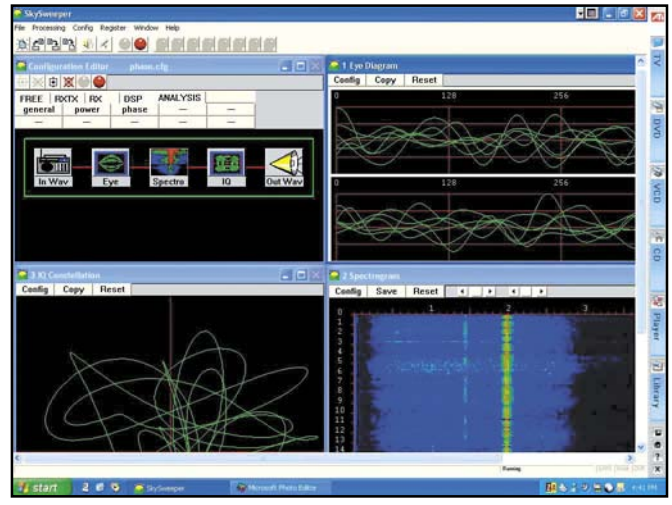
With *SkySweeper* you can create an array of decoders, encoders, filters and so on by adding "blocks" to the system block diagram shown in the Configuration Editor. You can then save the entire configuration for later use. For example, in the CW decoder mode I can insert a filter block, create a 50-Hz DSP band-pass filter, and then save the entire decoding configuration as "CW Narrow" and make a button label so I can recall it later.

There are detailed sub-menus that allow you to observe the performance of your sound card. You can make adjustments such as sampling rate and clock frequency. *SkySweeper* can also function as a sophisticated audio signal generator for testing purposes. The software even allows you to create a "*SkySweep* server" for remote control via the Internet (this function was not tested for this review).

## *SkySweeper* Operation

I spent several days using *SkySweeper* to gain a sense of its capabilities as an Amateur Radio digital signal encoder/decoder. In the CW mode, *SkySweeper* did a passable decoding job, but it performed best with strong signals and steady fists. *SkySweeper* seemed to have difficulty locking onto weaker CW signals that I could readily decode by ear.

*SkySweeper* successfully received and transmitted PSK31 signals, but hams who've grown to love user-friendly PSK31 software such as *DigiPan* will be disappointed. Unlike amateur PSK31 programs that allow users to tune by clicking on



signal signatures in scrolling "waterfall" displays, *SkySweeper* restricts point-and-click signal selection to its "FFT" window. The FFT window is often a jumble of signal peaks, making selection difficult. There is a "waterfall" (spectrogram) window, but you cannot click in this window to select a signal. I wish *SkySweeper* would use the spectrogram for PSK31 tuning, or at least give users the choice to do so.

RTTY was much easier because the classic dual-peaks for mark and space signals are easy to spot in the FFT window. I was able to create a RTTY configuration with a 350-Hz band-pass filter and the performance was impressive.

MFSK16 was problematic because *SkySweeper* does not provide a useful tuning indicator for this mode. Instead, you have to click on the lower-frequency signal peak in the FFT window and hope for the best. It took several tries to lock and decode an ongoing MFSK16 conversation.

*SkySweeper's* lack of tuning aids was most painfully apparent in the SSTV mode. There was nothing in the various display windows to indicate when I had an SSTV signal properly tuned. It was strictly hit or miss. An indicator for lining up the SSTV sync pulse would have been helpful. On the other hand, the slant correction is one of the best I've ever seen—very easy to use.

## Is *SkySweeper* for You?

My suggestion is to download the *SkySweeper* demo and try before you buy. Make sure you download and read the manual (in PDF format) shown on the same page. Some amateurs will find this software too complex for casual use. On the other hand, more technically minded amateurs will enjoy the versatility and sheer wealth of information *SkySweeper* provides. In either case, you'll need at least a 400-MHz Pentium system with about 128-Mbytes of RAM. *SkySweeper* requires a reasonable amount of computer power to work its magic.

*Manufacturer: SkySweep Technologies, Espoo, Finland. Distributed in the US by Computer Aided Technologies, PO Box 18285, 1112 Francais Dr, Shreveport, LA 71118; tel 888-722-6228. Registration $99. A demo version can be downloaded from the SkySweep Technologies Web site at* **www.skysweep.com/** *or from Computer Aided Technologies at* **www.scancat.com/dowload.html**.

Steve Ford, WB8IMY ♦ *QST* Editor ♦ sford@arrl.org