Product Review & Short Takes Columns from *QST* Magazine

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Product Reviews

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Yaesu FT-2800M 2-Meter FM Transceiver

Reviewed by Joe Carcia, NJ1Q
W1AW Station Manager

Yaesu produces quite a number of mobile FM radios, from single band to quad band units, with all sorts of functions and features. Some amateurs may find that all those additional bells and whistles may be too much given their particular needs. These folks may find the FT-2800M to be a radio of choice.

"A hefty transceiver that appears to be more heat sink than radio!" That's the first impression I got when I pulled the radio out of the box. The '2800M is, as stated in the manual, a "rugged" single band FM mobile transceiver, weighing in at 4 pounds. That was a bit of a jump from my own radio, the Yaesu FT-90R.

Here is a no-nonsense transceiver. It pretty much covers all the basics one would desire in a 2-meter FM transceiver, and those found in many of today's radios. This includes such features as the CTCSS encoding/decoding and DCS tone systems, automatic repeater shift, DTMF operation, programmable memory scan and so on. For those who can't get enough memories, you'll find this radio has a total of 221. (This includes the programmable band scan limits and home channel.) Each memory can have a 6-character alphanumeric label.

First Impressions

The layout is clean, with just six buttons (five backlit), well labeled for viewing ease. Reading left to right you have the Internet Connection, PWR, MHz(SET), REV(DW), LOW(A/N) and D/MR(MW) buttons. The letters in parentheses indicate those functions displayed through a menu procedure, or an additional function when depressing one of the buttons mentioned.

The Internet Connection (WIRES) and PWR buttons are pretty self-explanatory. The MHz(SET) button is used to allow for 1 MHz tuning, activation of the memory tuning mode and activating the menu system. REV(DW) does the old switcheroo with the transmit and receive frequencies, as well as activating the dual watch feature. The LOW(A/N) button is used to switch between the four power levels: 65, 25, 10 and 5 W. It's also used to toggle the display between an alphanumeric tag and the

actual frequency. The D/MR(MW) button toggles between the VFO, memory and home channels. It's also used to activate the memory storage mode.

Three plastic knobs control the VOL, SQL and DIAL functions. The knobs all have a decent feel to them. I did find that using the dial took a bit getting used to. It's detented and is used to control the frequency, memory storage and menu settings, among other things. I found that if I went just a bit too fast, I flew right past a desired menu setting. It's not that the dial is loose; rather it turns very smoothly.

The LCD (measuring about 1 by 3 inches) has clear, easy to read alphanumeric characters against an orange background. The display's brightness level is controlled via a menu setting.

I found the decently sized display could be viewed at many angles. While I was sitting at my desk and looking down at the radio, the display was still quite clear and readable. I actually found myself moving my head about like a bird trying different viewing angles to see when the display would wash out. The display was clearly visible even from across the room. When operating in my truck, I was still able to see the display

clearly, even with some sun glare. By the way, if you like the ability to separate the display from the transceiver body, you won't find that here—it's all one unit.

A pigtail from the back of the radio terminates to a 2-pin standard locking power plug. Next to the power line is a $1/8$-inch jack for an external speaker or packet radio use. The antenna connector (a standard SO-239) is chassis-mounted and rounds out the back of the radio.

A word about the antenna connector—the cabinet heat sink extends past the connector, with a portion of the heat sink also curved above the connector. I found I could barely get three fingers in there to thread on the antenna connection. You may find it desirable to connect the antenna prior to installing the radio, especially if the area is cramped.

As mentioned above, this radio looks like one big heat sink, and with a maximum output of 65 W, that kind of sinking is necessary. Unlike many other radios, this unit does not come with a cooling fan. The plus side to this is that you needn't contend with a fan that turns on and off at will. However, the radio's cabinet is used to dissipate heat. This has to be a consideration when mounting the radio, either in a mobile or base station application, and the manual describes some basic installation tips.

Notable Features

One of the features I found most interesting was the 10 NOAA weather channels, with the weather alert option

Bottom Line

The FT-2800M offers an impressive receiver and 65 W of 2-meter transmit power in a hefty but simple package.

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Table 1
Yaesu FT-2800M, serial number 2M010815

Manufacturer's Claimed Specifications	Measured in the ARRL Lab
Frequency coverage: Receive, 137-174 MHz; transmit, 144-148 MHz.	Receive and transmit, as specified.
Power requirement: Receive, 0.7 A; transmit, 10 A (high power).	Receive, 0.46 A; transmit, 10.6 A. Tested at 13.8 V.
Modes of operation: FM.	As specified.

Receiver	Receiver Dynamic Testing
FM sensitivity, 12 dB SINAD: <0.2 µV.	For 12 dB SINAD, 0.22 µV.
FM adjacent channel rejection: Not specified.	20 kHz channel spacing: 70 dB.
FM two-tone, third-order IMD dynamic range: Not specified.	20 kHz channel spacing: 70 dB;* 10 MHz channel spacing: 95 dB.
FM two-tone, second-order IMD dynamic range: Not specified.	90 dB.
S-meter sensitivity: Not specified.	Max indication: 8.6 µV.
Squelch sensitivity: Not specified.	At threshold: 0.15 µV.
Receiver audio output: 3.0 W at 10% THD into 4 Ω.	3.2 W at 10% THD into 4 Ω.
IF and image rejection: 70 dB.	First IF rejection, 99 dB; image rejection, 92 dB.

Transmitter	Transmitter Dynamic Testing
Power output (H/M/L2/L1): 65 / 25 / 10 / 5 W.	VHF, 65 / 27 / 12 / 5.9 W.
Spurious-signal and harmonic suppression: ≥60 dB	72 dB. Meets FCC requirements for spectral purity.
Transmit-receive turn-around time (PTT release to 50% audio output): Not specified.	S9 signal, 144 ms.
Receive-transmit turn-around time (tx delay): Not specified.	26 ms.

Size (height, width, depth): 2.0×6.3×7.3 inches; weight, 4.0 pounds.

*Unless otherwise noted, all dynamic range measurements are taken at the ARRL Lab standard spacing of 20 kHz.

(selectable via a menu setting). With one touch of a button (P4) on the microphone, the radio instantly changes over to the 10 available weather channels. The dial or microphone's UP/DOWN buttons are used to switch between them. Obviously, this all depends on whether the microphone buttons are being used with their default functions. If not, then this feature may not be readily available.

The severe weather alert is a feature that SKYWARN folk (or weather monitors such as myself) would find useful. In the event of an extreme weather situation, NOAA will send out a weather alert accompanied by a 1050 Hz tone, and then the following weather report. You can set the FT-2800M to monitor (or scan) the 10 weather channels for this alert tone. If the tone is received, the '2800M will emit a pair of warbling tones. To listen to the weather alert, you merely depress the PTT button on the microphone to silence the tones.

The Smart Search function allows you to load active frequencies automatically. The radio will search (without stopping) a designated bandwidth for any activity and store those active frequencies in a special memory band that consists of 31 memories. While this may be a good feature to have when traveling without a Repeater Directory, you have to be careful when you go to operate on any of these stored memories, as you might not actually be operating on the repeater's exact frequency.

For example, on a relatively quiet night I had the radio perform a single scan above and below the frequency of a repeater about 12 miles from my home. On one sweep, I found four repeaters, but 12 channels were used. The radio noted activity 5 kHz above *and* below the main repeater frequency, and recorded all this activity in memory. Perhaps the squelch was not tight enough. If you use this function and find repeaters, listening to the signal quality beforehand and adhering to the channel spacing prevalent in your area would be appropriate first steps. If you find the audio appears distorted, it may very well be because you're not on the exact repeater frequency.

The memories also appear to be temporary. I found that when I shut down the radio after the scan, the memories were cleared. I found no mention of this in the manual.

Now, suppose you have a repeater system with an odd shift (not ±600 kHz). The '2800M can accommodate for odd shifts without requiring reprogramming of the offset. The user can set up memory channels with the independent transmit and receive frequencies.

The tuning rate is selectable from 5, 10, 12.5, 15, 20, 25, 50 and 100 kHz. The default is 5 kHz. You can change this step via the menu system. The '2800M has direct keypad frequency entry via the included microphone. The tuning rate affects all frequency navigation, however, even direct keypad entry. So if you find that you can't seem to get the radio to accept a particular frequency either through the DIAL or keypad, check the tuning rate.

A Mic of Many Functions

The 16-key DTMF microphone (a stock MH-48) performed as expected.

This particular microphone can be programmed. As such, the non-numeric keys on it are not labeled with a function; they are labeled P1, P2, P3 and P4. Their default functions are Squelch Off, Smart Search, Tone Search and Weather Channel Search Recall, respectively. If you'd prefer these buttons to be used for other things, they can be reprogrammed via the menu system (each button has its own menu setting). The microphone also has the standard backlit (keypad) function, UP and DOWN keys and LOCK switch. (The LOCK switch controls the function keys, not the keypad or PTT switch.) The A, B, C and D keys mimic the functions of the four front panel buttons.

An Impressive Receiver

I used this radio both in my truck and at home. In both instances, I found the receive audio levels to be quite sufficient. Although the speaker is mounted underneath the radio, I heard it without difficulty. If this radio is to be used in a base setting, Yaesu supplies two small plastic feet that can be installed beneath it.

Now, I have to confess I reviewed this radio during a cold New England winter, so I didn't have too many opportunities to have the truck's windows cranked all the way down while operating the radio mobile. In light of this, given road and wind noise (from a slightly cracked-open window) plus a blowing heater fan, receive audio was still clear, even with the volume turned most of the way up.

Something that did impress me was the '2800M's apparent immunity to strong nearby signals. I had this radio installed in place of my FT-90R, using the same antenna and power connectors. I found that sitting in the parking lot of W1AW, I did not hear the station's 150-W signal blast through on a repeater frequency not that far from W1AW's 2-meter bulletin transmission (147.555 MHz). I occasionally experience intermod from W1AW with the FT-90R on that same repeater frequency. Obviously, this is not a comparison between the two, but rather anecdotal evidence of the '2800M's healthy third order IMD dynamic range measurement (see Table 1).

I had the opportunity to chat through some local repeaters, as well as with a few hams on simplex. All the signal reports indicated the transmit audio sounded clean. On one occasion there was a report of white noise on my signal. I merely
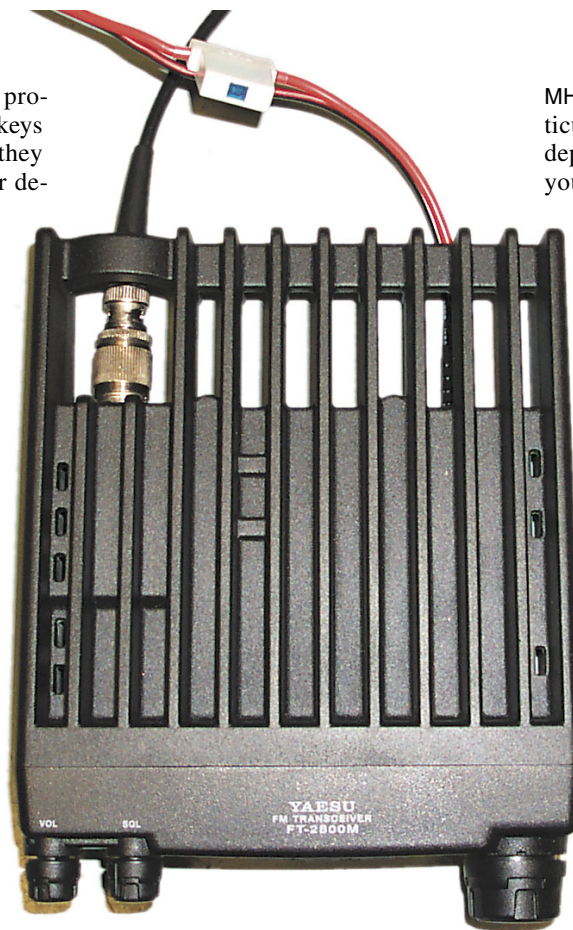

Figure 1—A top view of the Yaesu FT-2800M on the test bench of the ARRL Lab. Note the sizeable heat sink and the location of the antenna connector. Users with cramped quarters may wish to consider connecting the antenna before installing the radio.

bumped up the power to 10 W, however, and that seemed to clear it right up.

The '2800M is capable of 1200 baud packet (9600 baud is not available in this radio). I quickly wired up a connection between the radio's microphone jack and my MFJ-1278B multimode controller. The audio to the TNC is handled via the radio's external speaker jack. I had to adjust the volume properly to avoid swamping the TNC. Once I jumped these hurdles, I found packet operation to be easy. I was able to connect to the local nodes and a few of the local BBSs.

The Automatic Power-Off and Time-Out Timer functions performed as expected. The Power-Off is adjustable from 1 to 12 hours, but this feature is turned off in the radio's factory default setting. The Time-Out Timer is adjustable from 1 to 60 minutes, in 1-minute increments, and can also be disabled. The factory default is 6 minutes.

Menus Can Be Fun!

To activate the menu system (there are 33 menus), you hold down the MHz(SET) key for one second. You select the menu number using the dial. When you need to change a menu setting, you depress the

MHz(SET) button again to select a particular setting. I found that you have to depress this button quickly; otherwise, you may take yourself right out of the menu system. This is not uncommon —just something the user needs to be aware of before menus are changed and programming steps are performed.

Programming memories was not difficult. In the VFO mode, you select the desired frequency, CTCSS tones, power level, shift, etc. You press and hold the D/MR(MW) key for a second until a memory number (channel) appears. If the number is blinking, then it's empty. Use the dial to select the desired channel. Next, press the D/MR(MW) button again to write the memory contents.

As mentioned above, determining the amount of time needed to depress a button can be a bit of a challenge. I found that on a few occasions I'd miss writing the contents simply because I didn't hold the button down for the correct amount of time. But once you get used to programming, it's a breeze.

Your Buddy—The Manual!

The 57-page manual is laid out in an easy to read format. You start off with a table of contents, followed by a list of the rig's popular features. Pictorials of the display, front and back panels and microphone follow a few pages later. The manual familiarizes the user with all the basic functions before hitting the advanced ones. The later pages are devoted to menu functions and programming.

There is the installation section toward the front of the manual. There are also a few pages that are devoted to safety issues. Reviewing these pages to refresh one's memory never hurts.

A Nice Package

I was quite pleased with the performance and look of this radio. For the user looking for a simple 2 meter FM transceiver with just enough bells and whistles, this rig fits the bill. I also like that Yaesu did not crowd the front panel with all sorts of control buttons and that the display does not get too busy. While this approach requires a number of functions to be set using a variety of menu settings, it's a good trade-off.

Manufacturer: Vertex Standard USA, 10900 Walker St, Cypress, CA 90630; tel 714-827-7600; **www.vxstdusa.com**. Price: $159.95.

NCS-3240 Multi-Switcher

Reviewed by Steve Ford, WB8IMY
QST *Editor*

If chaos is the disease plaguing your station, the NCS-3240 Multi-Switcher by New Communications Solutions may be the cure. Chaos in this instance is best defined as having too many radios, too many things to plug into them, or both.

As the name implies, the Multi-Switcher is a multiple switch. The NCS-3240 puts you in complete control of which audio sources are connected to which radios. By "audio sources," I mean microphones, computer sound-card interfaces, multimode controllers—you name it. The NCS-3240 also allows you to switch a CW key (or keyer) between several radios.

If you own more than one transceiver, or more than one audio source, the benefits of the NCS-3240 are obvious. First there is the convenience of not having to fish through tangled cables and connectors when you want to jump from one radio or operating mode to another. Let's say you want to run a little CW with your QRP transceiver. Punch the appropriate RADIO SELECT button and your key is now "attached" to that rig. When it's time for a change, select your "high power" transceiver by pressing a different RADIO SELECT button and toggling MIC 1 to select your desk microphone for an SSB session. No, wait. Change your mind and press MIC 2 for your boom mic.

Contesters can put the NCS-3240 to good use, particularly for SO2R operating. For the uninitiated, SO2R means "single operator, two radios." SO2R is an intense juggling act that demands the ability to switch instantly between one radio and another as you search for contacts on different bands. With the NCS-3240, an SO2R operator can hop from one active rig to another in a fraction of a second. Not only is the microphone (and its push-to-talk keying line) selected automatically, the corresponding receive audio is automatically routed to speakers or headphones as well. You can even configure the '3240 to provide audio from one radio in the right channel and another radio in the left channel (that could lead to madness with headphones!).

NCS-3240 Features

The NCS-3240 is housed in a compact (8.5×6.2×3.3 inch) metal enclosure with attractive "rack handles" on either side of the front panel. The front panel sports a prominent POWER switch and two switch banks containing four momentary

Figure 2—The rear panel of the NCS-3240.

buttons for audio and radio selections. These buttons feature LEDs that glow bright red to indicate the device you've chosen. There are two 8-pin microphone jacks along with a 1/4-inch headphone jack. A row of four small potentiometers allows you to control transmit audio levels to each radio.

The rear panel of the NCS-3240 offers four 8-pin DIN jacks, one for each radio. At these jacks you'll find the connections for transmit audio, push-to-talk keying, left and right receive audio input and 12 V dc (for accessories). Above each DIN jack there are phono jacks for left and right receive audio and the CW keying output.

There are also two auxiliary inputs on the rear panel in the form of more 8-pin DIN jacks. You can use these for connecting a sound card interface, microphone, packet TNC, etc. The AUX 1 and AUX 2 buttons on the front panel select these inputs for the radio of your choice.

Finally, there are separate rear-panel inputs for a foot switch and a CW keyer. Two phono jacks provide connec-

tions to external speakers.

Pop the cover and you find that the NCS-3240 is more than a simple switcher. The audio inputs pass through two adjustable gain stages before being applied to the connected radios. This is significant when you consider that different radios have differing audio input characteristics. The microphone input level and impedance that's appropriate for a vintage transceiver, for example, might be inappropriate for a modern rig, and vice versa. The gain stages also use transformer coupling for optimum isolation. This is particularly important when one of your audio sources is a sound-card interface or multimode controller.

Setup

For this review I used the NCS-3240 with an ICOM IC-706 MkII transceiver, an ancient Shure microphone, an ICOM SM-6 microphone and a sound-card interface.

I had no difficulty finding a place for the '3240 on my operating desk. It is large enough to be ergonomically efficient, yet small enough to stay out of the way. A power supply isn't provided, but NCS does include a coaxial power plug, which I used to connect to my station supply (the Multi-Switcher draws about 200 mA).

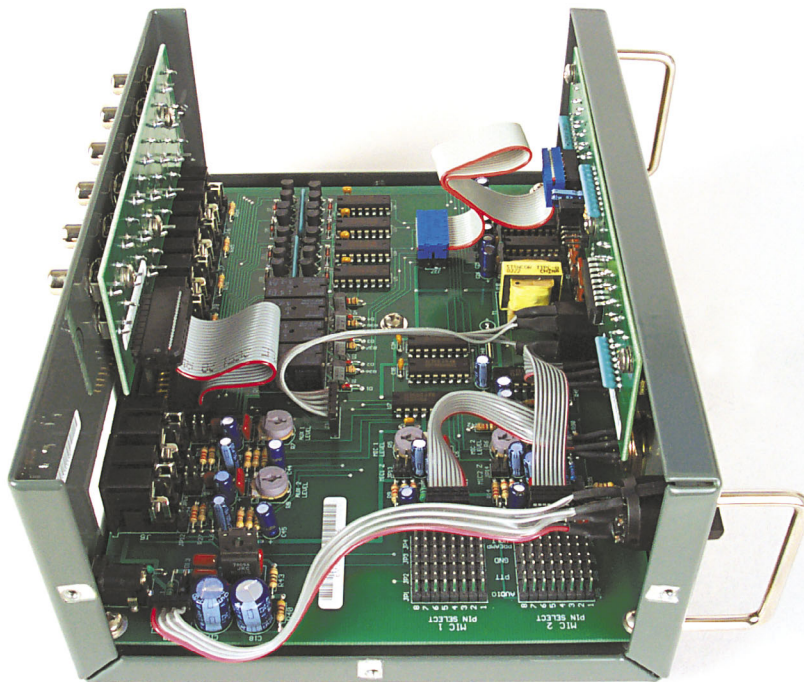Before you begin attaching cables, the first step is to decide which microphone

Figure 3—A look inside the NCS-3240 with the top cover removed. The front panel is at right.

and auxiliary inputs you are going to use and configure their jumpers accordingly. This involves going inside the unit and arranging the jumpers with help from the well-illustrated manual. I chose MIC 1 for my SM-6 desk microphone and MIC 2 for the Shure. It took a few minutes to configure the jumpers so that the audio and PTT for each microphone would be connected properly within the Multi-Switcher. If you own a microphone with an internal preamp, there is a jumper setting to pass power to the correct microphone pin. There are also jumpers to select "high," 200 or 600-Ω impedance. Lastly, there is an internal trimpot in the same area to adjust the audio input level, if necessary. These

trimpots are conveniently accessible from the bottom of the case.

I connected my sound-card interface to AUX 1 on the rear panel. There are only a couple of impedance jumpers to set for the auxiliary inputs and level pots are available for each of these inputs as well.

I had to cobble together the appropriate cable to snake between my radio and the rear-panel RADIO 1 jack. That meant I had to create a cable with a DIN plug on one end for the NCS-3240 and an RJ45 plug on the other end for the IC-706 microphone input.

The last step was to set the microphone levels to the radio by using the controls on the front of the NCS-3240. A

flick of the switch selected MIC 1 and another flick selected RADIO 1. Two more button jabs selected MIC 2 or AUX 1. A couple of test transmissions and control tweaks later, I was finished.

Impressions

Once you go through the exercise of adapting cables and setting up the '3240, you have the pleasure of sitting back and enjoying the results. I hooked up with a German amateur on 17 meters and it was interesting to hear his reports as I switched easily between the SM-6 and Shure microphones. He reported that my signal on either mike was clean and distortion-free. I jumped to 6 meters and toggled AUX 1 to run FSK441 with my computer. Once again, the NCS-3240 made it possible to switch from one audio source to another as fast as I could press a button.

The NCS-3240 is an asset to "busy" stations—contest and otherwise—that have a need to switch quickly between several radios or audio sources at a moment's notice. My wish list for a future version might include a front-panel RJ45 jack (MIC 3?) for those increasingly popular hand-held microphones. Also, it would be helpful if the NCS-3240 package included six 8-pin DIN plugs. If you don't have DIN plugs hiding in your junk box, you are faced with a journey to RadioShack (as I was) before you can set up the '3240. There is also the option to buy pre- or custom-made cables directly from New Communications Solutions.

Manufacturer: New Communications Solutions, 5363 Valley Mist Trace, Suite 101, Norcross, GA 30092; tel 888-883-5788; **www.ncsradio.com**. $279.95. NCS-1512 wall power supply, $12.95.

MFJ-461 Pocket CW Reader

Reviewed by Brennan Price, N4QX
Assistant Technical Editor

As someone who, even after years of practice, sometimes struggles to copy high speed Morse code, programs and devices that will decode and display Morse interest me. While a number of

software packages for digital modes include this capability, I have yet to dedicate a computer for this purpose at my small, space-constrained station. MFJ's Model 461 Pocket CW Reader caught my attention. Very compact and functional even without a connection to the radio, the '461 seemed ideal for operation at home and on the road.

The "Pocket" designation in the '461's official name is fitting. The box measures 3¾×2¼×1 inch, slightly larger than an Altoids tin. About one-third of the volume of the box is occupied by the 9-V battery that powers the device.

Operation is theoretically very simple, and when the '461 is adjusted properly, it is. Pressing a red POWER switch on the

side panel turns the unit on, and the 32-character liquid crystal display comes to life. When the user places the box with the side-panel microphone facing a speaker that sends CW, the device determines the CW speed and displays the characters as they are sent. The firmware understands a comprehensive International Morse character set, including not only the 43 characters tested during Element 1

Figure 4 (left)—Is the sender talking about activities at W5YM, the station at the University of Arkansas? No! The sender didn't leave enough space between the M and the E in *home brew*. This illustrates the limitations of the MFJ-461—or nearly any other firmware or software Morse reader—when copying imperfect code. Still, it does a pretty credible job at 30 WPM. Notice that the K in "BK" is scrolled to the next line.
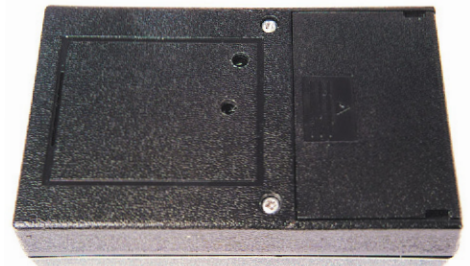

Figure 5—The rear panel of the MFJ-461. The 9-V battery compartment is at right. Within the rectangle at left, there are two screwdriver controls for audio frequency (top) and input level (center). The audio frequency setting is critical for proper operation.

Figure 6—The side panel controls and jacks of the MFJ-461.

examinations in the United States, but also 14 relatively obscure characters, including the apostrophe ($\overline{\text{WG}}$), underline ($\overline{\text{IQ}}$) and dollar sign ($\overline{\text{SX}}$). All of the characters are listed on the '461's instruction sheet.

Sounds simple, right? Well, it is simple if two big conditions are met. First, the code must be very close to perfectly formed. As with many Morse-reading software programs, deviations from perfection can cause indecipherable results on the screen. The instruction sheet rightly points this out: "There is a lot of sloppy code on the air.... Do not expect this Reader to do the incredible when it comes to copying Morse code." Even very good code can have minor flaws. See Figure 4, which shows the MFJ-461 while deciphering a QSO heard at the W1HQ club station in the ARRL Headquarters. The sender was asking about the receiver's *home brew* activities. The M and the E were run too closely together, and the '461 heard a G, resulting in the somewhat humorous display.

The second critical condition is that the '461 must be set for the audio frequency at which the Morse is being sounded. The box will detect audio anywhere from 500 to 1000 Hz, but only at one frequency. One of two back-panel screwdriver controls (see Figure 5) adjusts the frequency to anywhere within that range; the factory setting is approximately 700 Hz. If the frequency does not match, either no code or nonsensical code is displayed. Even after the LOCK indicator on the side panel flashes in rhythm with the code, a slight disparity in frequency caused a display full of Es and Ts, as the '461 would only determine dots and dashes.

If your radio has the capability, it is often easier to adjust the RIT control or VFO frequency in order to match the radio to the '461, instead of the other way around. For MCW transmissions, however, this is not an option. This screwdriver control is somewhat awkward for two reasons: it requires a screwdriver, and the control is rotated clockwise to *decrease* frequency. If I have a complaint with this product, it's that these two controls (the other governs audio input level) are not governed by very small knobs. Then again, external knobs are as easy to misadjust as they are to adjust, and these are critical controls. Reasonable users may differ on whether they like MFJ's approach.

The side panel controls are shown in Figure 6. The black REPEAT button, when pressed momentarily, will redisplay the last 140 characters received. This can be helpful, for instance, to double check a contest exchange or an item of traffic received. Pressing and holding the REPEAT button toggles between one of four display modes. In Figure 4, the default mode is shown. Incoming text is displayed along the bottom line, and when the line is full, the line is scrolled to the top line. The speed is shown at right. In other modes, the user can elect to dispense with the speed display or scroll incoming text from right to left. The AUDIO IN 3.5-mm jack disables the microphone to its left and allows input from another audio source. The SERIAL OUT 3.5-mm jack allows output to a terminal program, in case a more substantial display is needed. To the left of the microphone, the LOCK indicator blinks in harmony with the sounded elements when the Morse is at (or near) the selected audio frequency.

Users should be aware that Farnsworth spaced Morse will display as individual letters at the character rate, not whole words at the overall rate. When listening to a W1AW slow code practice session, for instance, QST, when sent at a 15 WPM character rate and a 5 WPM overall rate, will be deciphered as 15 WPM and displayed as "Q S T" by the '461.

There is no substitute for hours of sending and receiving when building Morse speed and proficiency. To the extent that I am a proficient CW operator, I owe a debt of gratitude to the many operators of the Georgia State CW Net, who put up with months of my slow, sloppy sending and receiving. For someone trying to learn Morse, the '461 is no substitute for practice, and MFJ has other products available that would better fit the bill, such as their MFJ-418 Morse Code Tutor.

During a fast-paced traffic net or contest, however, or when trying to copy a CW bulletin, even the best-trained operator can miss a character, and in such situations, it is critical to avoid doing so. Amateurs in these situations can find electronic backup helpful, and the MFJ-461 is worthy of consideration, particularly if portability is critical.

Manufacturer: MFJ Enterprises, PO Box 494, Mississippi State, MS 39762, tel 800-647-1800; fax 662-323-6551; **www.mfjenterprises.com**. Price: $79.95. MFJ-5161 serial cable with DB-9 connector: $14.95; MFJ-5162 audio input cable: $5.95; MFJ-26B carrying case with belt clip: $6.95.
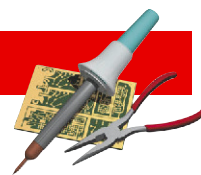
WinCAP Wizard 3

HF propagation analysis and prediction isn't an exact science, but it has achieved an impressive degree of accuracy. As a result of years of research, we now have software that can provide reliable predictions over various HF paths. The software analyzes the "circuit" using data points such as the frequency, smoothed sunspot number, time of day, time of year, local noise levels, communications modes, antenna gains and more. At the end of the process, you have a prediction of your ability to communicate.

There are two software "engines" that are the gold standard for HF analysis: *IonCAP* and *VOACAP*. *WinCAP Wizard 3* for *Windows* uses the *VOACAP* (Voice of America Coverage Analysis Program) engine to produce its predictions. *WinCAP* functions as a user interface to the *VOACAP* engine to render straightforward predictions that are easily understood. The *VOACAP* prediction engine calculates the expected performance on the "undisturbed" days of the month, when solar activity is typical. Obviously, it can't predict the effects of a sudden solar outburst, but I found *WinCAP* to be dependable and accurate.

Installation and Operation

The *WinCAP Wizard* CD launched immediately when I inserted it into the drive. The installation proceeded quickly and smoothly during my tests with both *Windows 98* and *Windows XP*.

WinCAP includes a detailed help file and I strongly recommend reading it before you attempt to navigate the program. I performed my usual "acid test" of trying to use the software without reading the documentation and failed. I couldn't figure out how to obtain a path prediction until I finally gave up and consulted the help file. You'll find it under MENU, then OPTIONS.

Once I put all the puzzle pieces together, though, *WinCAP* performed as advertised. You can choose from the database of sample antenna configurations, or make your own. Using *WinCAP* you can create three types of predictions: point-to-point, NCDXF/IARU International Beacon Network, and the user batch. You can also create up to 18 different circuits between any points on the globe. The location database is massive; chances are good that it includes a city near you. The prediction displays are informative and clean from a graphic standpoint. The real-time map of the world with its daylight/darkness display is particularly well-done.

As you'd expect from something based on *VOACAP*, the predictions were accurate most of the time. For example, one evening in February I worked D44AC in Cape Verde over a difficult path on 20 meters with considerable fading. After finally making the contact, I consulted *WinCAP Wizard*. Sure enough, *WinCAP* had offered a reliability prediction of only about 30% for that circuit.

Conclusion

While the software is "friendly" to some extent, you need to have a firm technical grasp to get the most out of *WinCAP Wizard 3*. Amateurs who are knowledgeable about HF propa-
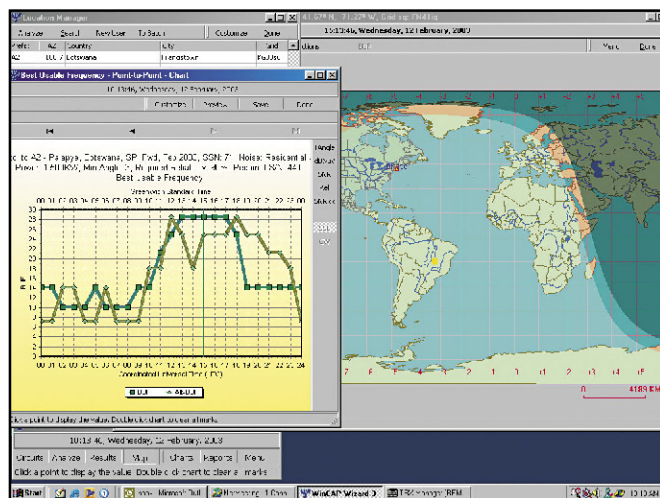
An MUF plot and real-time map display.

The massive *WinCAP Wizard 3* location database. No matter where you live, or where you wish to communicate, chances are good that you'll find a nearby city here.

gation will find *WinCAP* to be an outstanding tool, as will those who need highly accurate predictions for specific purposes (DXpeditioners and contesters come to mind). Casual users may find the *WinCAP Wizard 3* learning curve a bit steep—perhaps too steep to justify the cost. But, as I've recommended with other software packages, the best thing to do is download the 30-day free trial version from the Tabor Software Web site and give it a spin.

Manufacturer: Kangaroo Tabor Software, 1203 County Road 5, Farwell, TX 79325-9430; fax: 806-225-4006; **www.taborsoft.com/**. *$65. Minimum system requirements: Pentium 400 or faster PC running* Windows 98/NT/XP.

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