Product Review & Short Takes Columns from *QST* Magazine

January, 2003

Product Reviews

ICOM IC-T90A Triband Handheld Transceiver
Peet Ultimeter 2100 Weather Station

Short Takes

TRX-Manager

ICOM IC-T90A Triband Handheld Transceiver

Reviewed by Brennan Price, N4QX
Assistant Technical Editor

ICOM's newest entry into the multiband handheld market, the IC-T90A, is the first ICOM handheld that sports a look similar to Yaesu's most recent handheld offerings (the VX-5R and VX-7R). The half-pound package measures 3.4×2.3×1.1 inches and fits comfortably in the palm of the hand. The radio offers 5 W on three bands (6 and 2 meters on VHF and 70 cm on UHF) and AM and FM reception from 495 kHz to nearly 1 GHz, cellular frequencies excluded. I put the T90A to the test during October's Simulated Emergency Test and a November trip from Hartford to Pittsburgh. I was impressed.

On the Air Quickly

When the SET rolled around, I decided to simulate my own emergency conditions when testing the T90A. I vowed not to look at the manual at all until the weekend was over, and I kept that vow. Nevertheless, I successfully participated in the SET on both the 2-meter and 70-cm bands.

After charging the battery with the BC-110AR wall charger (included), the bright orange PWR button was impossible to miss. I keyed the appropriate repeater frequency on the keypad, and the display indicated that the standard repeater shift had been automatically selected. After adjusting the volume with the up and down arrow front panel buttons, I keyed the microphone and checked into the net within 15 seconds of turning the radio on.

The SET net was running concurrently on a 440 MHz machine, so I keyed in the 70-cm frequency on the keypad. Again, instant success. Successful operation on two bands within minutes was very impressive. Simple repeater operation is intuitive.

My experience was somewhat fortuitous, and is not typical of the universe of repeater operation. Neither repeater I keyed during the SET required CTCSS access, and both had standard repeater offsets; these require menu adjustments, which will be dealt with later. Also, I was surprised that I didn't have to adjust the squelch level before using the T90A. When I took a look at the manual after SET weekend, I found out why.

Automatic Squelch—A Good Idea that (Mostly) Works

Out of the box, the T90A's squelch level is set to "AUTO." At this setting, the T90A automatically adjusts the squelch in accordance with the noise pulses it counts over time. More pulses lead to a tighter squelch setting, and vice versa. For most of my transmitting with this radio, this worked wonderfully. I didn't try to change the squelch until I changed to the broadcast band, particularly the domestic AM and shortwave segments, where a marginal but readable signal would often fail to break the automatic squelch.

Changing the level is easy. The user first pushes the SQL button, on the left side of the receiver underneath the PTT key. If the user does nothing else, this opens the squelch while the button is pressed. By turning the DIAL on the top panel while SQL is pressed, the user can adjust the squelch setting from "AUTO" to "OPEN" or a numerical value from 1 (loose) to 9 (tight).

The top panel DIAL, incidentally, can be used as a manual tuning knob. If a user prefers, the volume and tuning control may be shifted from the DIAL to the up and down arrow buttons by pressing and holding the 1/V↔D button. Which brings me to my next topic:

No Pesky "F" Key!

There is no function key on the T90A to press while enabling certain options. Instead, each of the 15 keys on the main keypad has a red label under the number or the main text. Pressing and holding one of these buttons will execute the command described by the label. For instance, pressing and holding 2/TONE will enable one of fifty possible CTCSS transmit tones. Pressing and holding the key again will enable receive CTCSS squelch, and further toggles will enable digital code squelch and the "pocket beep" function, which will sound an alarm when a transmission with the appropriate tone or code is received.

Switching between high and low power (3/H/L), scanning (MODE/SCAN), toggling between duplex and simplex operation (4/DUP) and enabling the display of memory names (6/M.N) are accomplished in a similar manner. CTCSS tones and other variables are chosen in set mode, accessed by pressing and holding the 8/SET key. The DIAL toggles through a list of at least 19 and up to 37 items when in this mode. The first one, appropriately, is the most commonly used, the CTCSS tone selector. Touching the 8/SET key will display the current tone, which can be changed by rotating the DIAL and pressing 8/SET one last time.

Compared to the obscure and hard-to-access menu systems of some of ICOM's competitors, setting options on the T90A was a breeze. The process is not so intuitive that the user doesn't have to read the manual, but it is intuitive enough that the user—or at least this user—only has to read the appropriate section of the manual once before knowing the routine by heart.

Bottom Line

The ICOM IC-T90A combines user friendliness with a convenient size and a nice feel. FM enthusiasts will be pleased with its performance on 6 meters, 2 meters and 70 cm.

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

Table 1
ICOM IC-T90, serial number 01090

Manufacturer's Claimed Specifications	Measured in the ARRL Lab
Frequency coverage: Receive, 0.5-999 MHz (cell blocked), transmit, 50-54, 144-148, 430-450 MHz.	Receive and transmit, as specified.
Modes: FM, AM (receive only), WFM (receive only, 40-230, 450-810 MHz).	As specified.
Power requirements: 5.5-11.0 V dc; receive, 0.22 A; transmit, 2.0 A (max, high power).	Receive, 0.25 A (max volume, no signal); transmit, 1.5 A, with BP-217 battery pack
Receiver	**Receiver Dynamic Testing**
FM Sensitivity: 12 dB SINAD, 1.6-5 MHz, 0.4 µV, 5-50 MHz, 0.18 µV, 50-54 MHz, 0.16 µV, 54-144 MHz, 0.18 µV, 144-148 MHz, 0.16 µV, 148-222 MHz, 0.4 µV, 222-225 MHz, 0.32 µV, 225-247 MHz, 0.4 µV, 247-430 MHz, 0.32 µV, 430-450 MHz, 0.16 µV, 450-833 MHz, 0.32 µV, 833-999 MHz, 1.0 µV; WFM, 40-108 MHz, 1 µV, 175-222 MHz, 1.8 µV.	For 12 dB SINAD, 6 m and 2 m, 0.15 µV; 70 cm, 0.16 µV; WFM, 100 MHz, 0.6 µV.
AM Sensitivity: 10 dB S/N, 0.5-5 MHz, 1.3 µV, 5-30 MHz, 0.56 µV, 118-136 MHz, 0.5 µV, 222-230 MHz, 0.79 µV, 320-330 MHz, 1.0 µV.	10 dB S+N/N, 1-kHz tone, 30% modulation, 120 MHz: 0.42 µV.
Two-tone, third-order IMD dynamic range: Not specified.	20 kHz offset: 6 m, 52 dB; 2 m, 58 dB; 70 cm, 57 dB; 10 MHz offset: 6 m, 68 dB; 2 m, 65 dB; 70 cm, 60 dB.
Adjacent-channel rejection: Not specified.	20 kHz offset: 6 m, 58 dB; 2 m, 66 dB; 70 cm, 58 dB.
Spurious response: VHF, 60 dB (except IF rejection on 50 MHz); UHF, 50 dB.	IF rejection, 6 m, 41 dB; 2 m, 91 dB; 70 cm, 102 dB; image rejection, 6 m, 104 dB; 2 m, 107 dB; 70 cm, 72 dB.
Squelch sensitivity: VHF and UHF, 0.18 µV; 23 cm, 0.25 µV.	At threshold, 6 m, 0.17 µV; 2 m, 0.18 µV; 70 cm, 0.16 µV.
Audio output: 200 mW typical at 10% THD into 8 Ω.	210 mW at 10% THD into 8 Ω.
Transmitter	**Transmitter Dynamic Testing**
Power Output: VHF and UHF, 5.0 W high; 0.5 W low.	with BP-217 battery pack, 6 m, 4.8 / 0.5 W; 2 m, 5.3 / 0.5 W; 70 cm, 4.4 / 0.5 W; with 11 V dc: 6 m, 5.3 / 0.5 W; 2 m, 6.0 / 0.5 W; 70 cm, 5.3 / 0.6 W.
Spurious signal and harmonic suppression: VHF and UHF, 60 dB.	6 m, 68 dB; 2 m, 72 dB; 70 cm, 70 dB. Meets FCC requirements.
Transmit-receive turnaround time (PTT release to 50% of full audio output): Not specified.	Squelch on, S9 signal, VHF, UHF, 385 ms.
Receive-transmit turnaround time ("tx delay"): Not specified.	6 m, 200 ms; 2 m, 260 ms; 70 cm, 325 ms.
Size (height, width, depth): 3.4×2.3×1.1; weight, 8.5 ounces.	

Taking the T90A on the Road

With a fuller understanding of the T90A's capabilities, I took it on the road with me to Pittsburgh. In the car, I replaced the multi-part antenna with an SMA connector that comes with the radio with a mag-mount antenna with a BNC connector. A BNC to SMA adapter put me in business.

The front-panel speaker provided pleasant audio throughout the trip, although I found I had to turn the volume above half-scale in order to reliably hear, but that may have been a function of the noise of the car and my halcyon days listening to loud music in broadcast radio stations. In order to avoid annoying my non-ham driver, I frequently used a headset and microphone, which fit via the standard mic/speaker jacks on the top panel. Of course, these jacks can connect the T90A to a TNC for digital use.

I enjoyed a few repeater contacts with hams across the Keystone State countryside, and the hams I worked were complimentary of how the radio sounded. The one moderately serious complaint that I had about the radio was the transmit-receive turnaround time. The T90A paused noticeably when I released the PTT key before the repeater signal broke the squelch. ARRL Lab tests seem to confirm a significant turnaround time (see Table 1). While not terribly annoying, such a long turnaround time might cut off transmissions from hams who key up immediately at the end of your transmission. When you're not talking to hams who are quick on the draw, the long turnaround time fades into the background.

Advertising for the T90A has indicated that handheld is "splash resistant" to "JIS 4 specifications." I took the radio to the November 10 National Football League contest between the Atlanta Falcons and the Pittsburgh Steelers at Heinz Field, which was dogged by in-

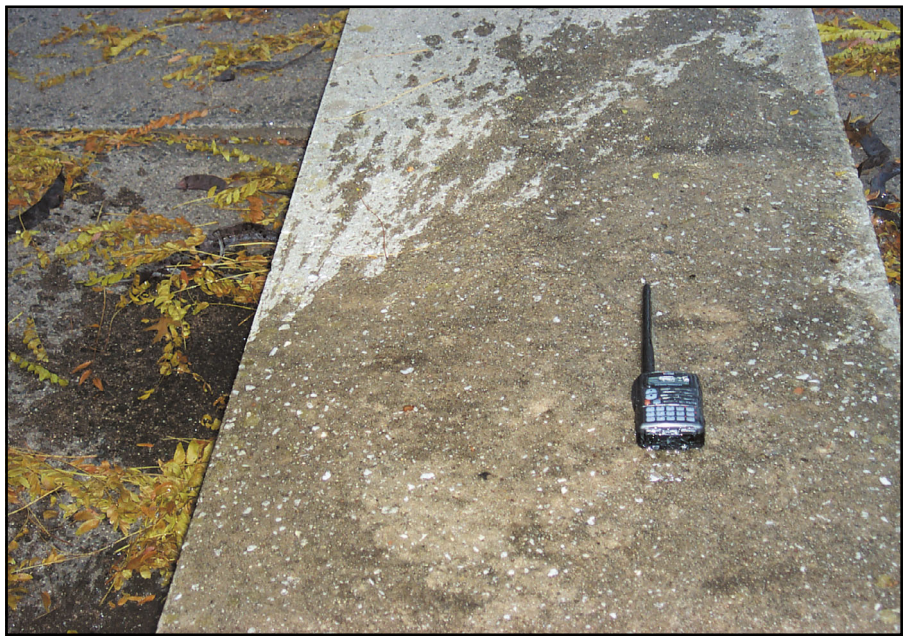


Figure 1—Putting the "splash resistant" claim to the test, we threw a bucket of water at the IC-T90A. Here is the aftermath of the dousing.

Figure 2—After the dousing, with drops of water still clinging to the case, the T90A passes the test.

termittent periods of substantial rain. The T90A held up nicely in the showers and worked well afterward. The buttons on the keypad feel like they are designed to withstand some moisture, but ICOM doesn't claim that you can drop the radio into a bucket of water.

So I dumped (or at least splashed) a bucket of water on the T90A instead, in order to really put the "splash resistant" claim to the test. After throwing some water on the rig outside of ARRL Headquarters (Figure 1), it still operated successfully (Figure 2). While the T90A does not feel like it has the extensive gasketing that makes the Yaesu VX-7R "submersible," ICOM's claim of splash resistance is quite meritorious (and impressive).

After the game, I tuned in the postgame broadcast on the Steelers' AM and FM flagship stations. The FM reception was very clear. Reception of AM broadcast signals was good when I held the radio in my hand, presumably because my arm added to the ground plane of the included antenna. However, when I set the radio down, AM reception significantly degraded, even with the included 50 MHz and below band adapter attached. This is not uncommon in similar handhelds, and is understandable, given the small size of the antenna with respect to the wavelength of domestic AM broadcasts.

Odds and Ends

In addition to the domestic AM and FM broadcast bands and the three ham bands, pressing the BAND key repeatedly will toggle the user through all major band segments from 495 kHz to 999.990 MHz. The user can program his or her favorite amateur frequencies as well as broadcast, public safety and aircraft frequencies into 500 memory channels and five calling channels. An alphanumeric label of up to six characters can be assigned to each memory and displayed if the user desires. The user may assign memories to 18 programmable banks, which may be individually scanned. A variety of VFO and memory scanning options exist.

An alkaline battery case (the BP-216) is available to power the T90A with two AA batteries. We did not review operation with the optional battery case, but it is safe to assume that at 3 volts of battery potential, the output on high power would be less than 5 W (although the full half watt should be available on the low power setting.)

From either of the two VFOs, a touch of the CALL/TV/LOCK key enables the five calling channels, which can be individually selected by the DIAL. Pressing CALL/TV/LOCK again enables North American television channels 2-69, again tunable with the DIAL. Pressing the key a third time allows tuning of 10 NOAA frequencies. A weather alert function allows for continuous monitoring of the NOAA channels and enables an alarm when a watch or warning is issued.

Sight-impaired hams will find the Morse code synthesizer useful. When enabled, the current frequency, television channel or weather channel will be sounded in Morse code when the BAND key is pressed and held. The speed is adjustable from 10 to 25 words per minute.

Conclusion

The IC-T90A doesn't offer quite as many features as other recent entries into the high-end handheld transceiver market. But the features it does incorporate are very nicely done, and the basic operation of the radio exudes a friendliness to the user that other major manufacturers should strive to emulate. The IC-T90A does everything that an FM handheld operator would need to do on the three most popular VHF and UHF bands, and the ease of operation makes the radio particularly ideal as a first handheld for a new amateur.

Manufacturer: ICOM America, 2380 116th Ave NE, Bellevue, WA 98004; tel 425-454-8155; fax 425-454-1509; **www.icomamerica.com**. Price: $249.95.

Peet Ultimeter 2100 Weather Station

Reviewed by Stan Horzepa, WA1LOU
QST *Contributing Editor*

When I was a kid, I bought a book about weather from the Scholastic Book Club. The book described how to build a home weather station. I studied the book and became a weather maven. My goal was to build my own weather station, but for some reason, I lost interest in the project and put it on the back burner with my many other lost interests.

Instead of building my own weather station, I started saving money to buy a simple weather station advertised in the Edmund Scientific catalog. I saved for a while, but for some reason, I lost interest and spent my savings on something else.

As an adult, I bought a house on top of a mountain for ham radio propagation reasons. In addition to interesting radio propagation, I quickly became familiar with such interesting weather conditions as snow when there was none anywhere else in the area, rain clouds so low that they surrounded my home in a thick fog, very high winds and lots of precipitation. I looked it up and discovered that an environmental study claimed that my neighborhood had the highest average rainfall in the state of Connecticut!

My home begged for a weather station, especially in light of my heavy involvement in APRS (Automatic Position Reporting System), which includes an interstate network of weather stations. When the opportunity arose, I jumped at the chance to review a weather station for *QST*.

I "shopped" for weather stations at the last Dayton Hamvention and determined that among the stations shown at the Hamvention, the offerings from the Peet Bros Company were the most APRS-friendly. In fact, Peet had a handout at the Hamvention that described how to interface and program their weather station to a Kantronics KPC-3 Plus TNC, which I just happen to have in my collection of TNCs.

The station I put together for this review started with the Peet Bros Ultimeter 2100 Weather Station, which monitors indoor and outdoor temperature, barometric pressure, wind speed and direction. I upgraded its anemometer/wind vane to one that is heated to avoid lockups caused by frozen winter precipitation. I added the Ultimeter Pro Rain Gauge with heater (to affirm that I lived in the most precipitation-prone area in the state) and the Ultimeter Outdoor Humidity and Temperature Sensor to complete the station. (The Outdoor Humidity and Temperature Sensor made the outdoor temperature sensor included with the Ultimeter 2100 Weather Station redundant.)

Testing

Before installing the station, I tested all the components as recommended by the owner's manual. Before testing the components, I had to assemble one of them—the anemometer/wind vane unit. The assembly was simple and testing commenced thereafter.

Testing involved connecting all the components and using the weather station keypad and display to see if the connected components worked properly. Everything seemed to work out of the box as advertised.

Installation

I chose a sunny summer day to install the weather station.

The anemometer/wind vane installation requires a nonferrous mast. Too much iron could interfere with the magnets in the unit, but the mast must be metallic in order to provide proper grounding. (By the way, the system includes built-in static electricity discharge protection for all outdoor sensors.) I used a 5-foot aluminum mast mounted with two hose clamps to the drain/waste vent near the peak of my house's roof.

I used a level to make sure the mast was vertical and a GPS receiver to determine which way was north. I marked the north direction on the mast, slipped the anemometer and wind vane onto the top of the mast and rotated it so that the north calibration mark on the wind vane matched the mark I made on the mast. Finally, I clamped the unit and tie-wrapped its cable to the mast.

The rain gauge installation required that it be in the open, away from overhanging trees, well clear of the house or other structures that might block blowing rain, and easily accessible for periodic inspection and cleaning. That was a tough list of requirements to meet at my location because I am treed-in. Ground mounting was out of the question.

The solution was to install the rain gauge on a 10-foot PVC pipe and attach the pipe with U-bolts to the second-floor deck. After some judicious tree limb trimming, it was clear of trees and above the edge of the roof, but it was still accessible for inspection and cleaning by simply loosening the U-bolts and lowering the PVC pipe.

I installed the rain gauge on the top of the PVC pipe, leveled the pipe for near-perfect vertical alignment, tie-wrapped its two cables and tightened the

Bottom Line

Amateurs looking for a weather station to complement their APRS activities will find the Peet Ultimeter 2100 attractive—and not just because of its packet-generating capabilities.

U-bolts (see Figure 3). Interestingly, as I finish this review, most of the leaves have fallen from the trees around here, but when I inspected the rain gauge, it was free of any debris.

Installing the outdoor humidity and temperature sensor was comparatively simple. Its installation had to be in the shade, where it can never receive direct sunlight, protected from wind and rain, so air can circulate freely around it, away from incidental heat sources, such as roof circulation vents, and not directly above radiated or reflected heat sources, such as cement patios or large picture windows. The back outside wall of my house met all those requirements, and all it took was two screws to mount the unit to the house (see Figure 4).

I had to drill a hole through the back wall of the house in order to get all four cables into the house (the anemometer/wind vane and outdoor humidity and temperature unit required one cable each, while the rain gauge had two cables, one for the gauge and one for its heater).

Once I threaded all the cables inside the house, I connected them to the weather station's junction box. Another cable connected the weather station's keypad and display to the junction box.

I powered up the keypad/display and went through the set-up procedures. I had to set the date, time, formats for date and time and the units of measurement for wind speed, temperature, barometric pressure and rainfall. I also had to obtain the local barometric pressure and adjust the weather station's barometric pressure reading to match. The weather station was up and running, and I let it run a few days before interfacing it to my APRS station.

My Kantronics KPC-3 Plus TNC has two serial ports. One is for connection to a computer; the other is for connection to a GPS receiver. Since the TNC is not going anywhere fast, I do not have a GPS connected to it, so that frees up that serial port for connection to the weather station using the weather station's serial cable.

Byron Smith, WA6YLB, has a Web page that includes information for connecting the KPC-3 TNC to a weather station (**www.theworks.com/~wa6ylb/kpcdigi.txt**). This information was invaluable for programming the TNC to operate with the weather station. I used a variation of WA6YLB's setup for my station.

The primary differences, aside from call sign and location information, were that WA6YLB's setup was intended for a remotely controlled TNC whereas mine is in my ham shack, and WA6YLB's weather station connection was to the first serial port whereas I used the second serial port for the weather station connection. If you are interested in how I programmed my TNC for that setup, I dumped all my TNC settings to a text file you can view at my weather station's Web page, **www.tapr.org/~wa1lou/wx.html**.

After I successfully interfaced the weather station to my APRS station, I built a quick and dirty Web page so that I could view the weather at my house from anywhere in the world. The APRSWXNET/Citizen Weather Observer's Program (**www.wxqa.com**) enlisted my station to be part of its network. The National Oceanic and Atmospheric Administration (NOAA) collects data from the network for research use by Forecast Systems Laboratory in Boulder, Colorado.

Figure 3—The Ultimeter Pro Rain Gauge must be in the open, away from overhanging trees and clear of the house or other structures that might block blowing rain.

Figure 4—The Ultimeter Outdoor Humidity and Temperature Sensor must be installed in the shade, where it can never receive direct sunlight. It must also be protected from wind and rain, and in a place that allows air to circulate freely around it.

The weather station sends current weather data to its serial port in three ways. In the "data logging mode," the weather station puts out a steady stream of records, about one per second. Each record includes all current weather readings including time and date. In the "packet mode," the weather station puts out one record every five minutes. Each record includes all current values, plus the highest wind speed over the past five minutes with the associated wind direction, three-hour barometric pressure change, station calibration numbers, and current time and date. In the "complete record mode," the weather station puts out a steady stream of records, about 20 per minute. Each record includes all current values, three-hour barometric pressure change, today's high and low values, yesterday's high and low values, and long term high and low values, station calibration numbers, and current time and date. To minimize transmissions, most APRS weather stations using Peet equipment use the packet mode, as do I.

Operation

The keypad/display of the Ultimeter 2100 is easy to use. The unit is small, but its display is big relative to the size of the unit. The unit measures 7.75× 2.75×1.25 inches; the LCD is 3.25×1.5 inches. The unit may be wall- or desk-mounted and has available a brilliant blue display backlighting to provide visibility in darkness or low-light conditions (see Figure 5).

To view data on the LCD, you press one or two keys. The LCD continues to display and update whatever data you selected to view last. You can choose to view wind speed, outdoor temperature, indoor temperature, rainfall, barometric pressure, outdoor humidity, indoor humidity (if you have an optional indoor humidity sensor, which I did not review), dew point, time and date. A compass displays the wind direction and shows up in each and every display.

Up and down arrow buttons indicate the daily, previous day's, and all-time high and low readings of whatever weather reading you are viewing. For example, with the outdoor temperature displayed, pressing the up arrow once displays the highest temperature reading since midnight and the time and date that high occurred. Pressing the up arrow twice displays the highest temperature reading during the previous day and the time and date that high occurred. Finally, pressing

Figure 5—The brilliant blue backlighting of the Ultimeter 2100 keypad/display provides excellent visibility in the dark

the up arrow three times displays the highest temperature reading ever recorded by the unit and the time and date the high occurred (97ºF on August 14, 2002 at 13:54 EDT). You can reset the unit to erase any of the stored records.

I like to leave the display set to the wind speed/direction display, because it is the most likely to change. But during a storm, I switch to the rainfall display to watch the inches of rain climb upward. During a particularly nasty storm earlier this fall, the storm alarm sounded, so I switched to the barometric pressure display and watched the mercury drop like a rock. (By default, the storm alarm occurs when the pressure has fallen more than 0.18 inch over the last 3 hours.) The system also has a rain rate alarm, which serves as an adjustable flash flood alert.

Conclusion

The Ultimeter 2100 weather station system has performed flawlessly through the summer and autumn. There have been no problems with any of the system components. As this issue was going to press, an ice storm hit my house, knocking down numerous limbs. The Ultimeter 2100 performed admirably, and the heating functions of the anemometer/weather vane and rain gauge worked until power was lost. Even then, the station continued to provide some weather data for a while, thanks to its internal 9-V battery. After a prolonged outage, I reprogrammed the weather station. It is now running fine.

The components of the Ultimeter 2100 weather station are sturdy and well constructed and should be able to sustain outdoor operation for many years to come.

The accuracy of the readings obtained from the weather station seems to correspond with weather reality. They closely match the readings of an indoor/outdoor thermometer and barometer installed in my home. They also closely match the readings from the National Weather Service and The Weather Channel.

The Internet allows me to view readings from 19 other weather stations in my area (select the "Wx Stations" link from my weather station Web page, **www.tapr.org/~wa1lou/wx.html**). The readings from the surrounding weather stations correspond favorably with the readings from my weather station. Interestingly, when it rains, my weather station is always near the top and usually at the top of the list with regard to the total rainfall amount.

During the installation and initial operation of the weather station, I had questions and called the Peet Bros technical support line for assistance. Each time I called, they quickly provided me with an accurate answer.

Overall, I have a very favorable impression of the Ultimeter 2100 and recommend it to anyone considering the purchase of a weather station for their Amateur Radio station. An added benefit using the weather station is that it is an education; it definitely expanded my knowledge of the weather.

Manufacturer: Peet Bros Co, 31 E 17th St, St Cloud, FL 34769; tel 800-872-7738; fax 407-892-8552; **peetbros@peetbros.com**; **www.peetbros.com**. Manufacturer's suggested retail price: Ultimeter 2100 Weather Station, $399; upgraded Heated Anemometer/Wind Vane, $29; Ultimeter Pro Rain Gauge with Heater, $190; Ultimeter Outdoor Humidity and Temperature Sensor, $110; serial cable, $20. QST

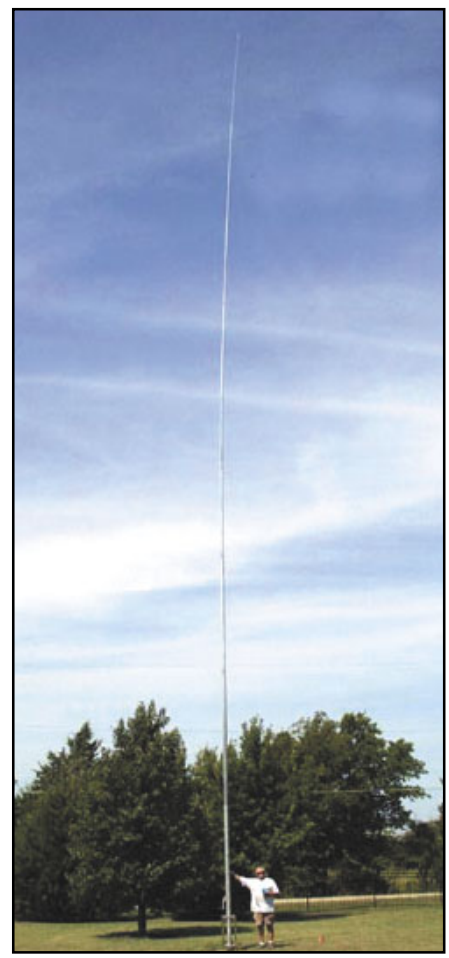
NEW PRODUCTS

80/75-METER VERTICAL FROM ARRAY SOLUTIONS

◊ Array Solutions of Sunnyvale, Texas, has recently added a full-size, ¼-wavelength, 80/75-meter vertical antenna to its wide selection of antenna systems and related products. The AS80-FS consists of a freestanding 70-foot aluminum radiating element that's attached to a steel foldover base.

The bottom portion of the antenna made of 4-inch-diameter aluminum tubing. A drilled radial plate, for connecting up to 120 radials, is included. The base assembly can be mounted in as little as one cubic yard of concrete while maintaining a wind survival rating of 110 MPH. According to the manufacturer, the 200-pound antenna can handle up to 15 kW of RF. 160-meter operation is possible with a tuner.

Price: $1340; the optional winch sells for $250. For more information, contact Jay Terleski, WXØB, at Array Solutions, 350 Gloria Rd, Sunnyvale, TX 75182; tel 972-203-2008, fax 972-203-8811; **wx0b@arraysolutions.com**, **www.arraysolutions.com**. QST



TRX-Manager

Laurent Labourie, F6DEX, developed *TRX-Manager* primarily as a means to control transceivers via computers running Microsoft *Windows*. Most modern transceivers offer computer control and there are many programs available to do the job, but what makes *TRX-Manager* different is its versatility. The program does so much, it is impossible to describe everything in a "Short Takes" review. Instead, I'll concentrate on several highlights.

Rig Control

TRX-Manager communicates with your transceiver through the computer COM (serial) port. You can control up to two radios and two antenna rotators, but not simultaneously. A drop-down menu allows you to select your rig model from a long list including ICOM, Kenwood, Yaesu, TenTec, Alinco, Elecraft and more. All you need is an interface between the computer and the rig itself. For this review, I used the LCU-3 W1GEE serial interface to my ICOM IC-706 MkII transceiver (the interface is available for a very reasonable price from Personal Database Applications, the US and Canadian distributor of *TRX-Manager*).

Logging

TRX-Manager incorporates a comprehensive station log, complete with award tracking. You can print and sort records at will, print QSL labels and perform call sign lookups on CD-ROM databases (assuming you have them). If you purchased the *LOGic* software by Personal Database Applications and prefer to use it instead, *TRX-Manager* has a toolbar "button" to bring it up automatically.

DX Spots

With *TRX-Manager,* you can establish either a telnet or packet radio connection to a DX PacketCluster and receive DX spots as they appear. Just double click your mouse on the spot information and suddenly your radio tunes to the frequency and mode.

Shortwave Listening

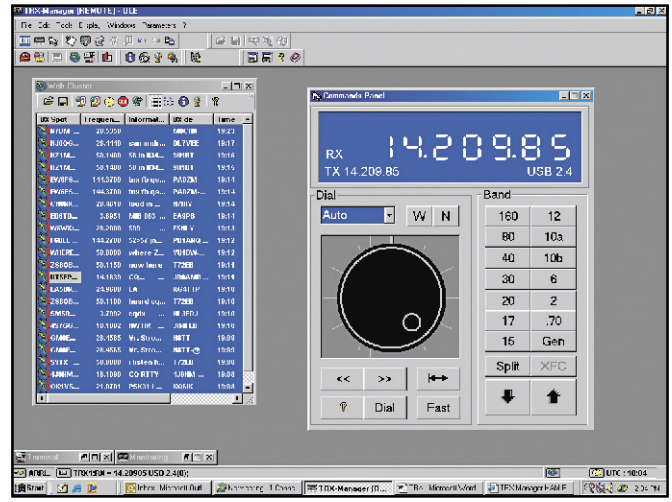
TRX-Manager maintains a separate database for shortwave listening. You can enter stations that you find on your own, or download broadcast schedules from sources such as Fineware at **www.fineware-swl.com/**. I downloaded an English-language schedule database and enjoyed a new appreciation of shortwave listening. I could sort by time of day, then simply click on the desired station and my IC-706 would tune automatically. *TRX-Manager* even provides a sound recorder that allows me to record programs by manual activation, or at specific times of the day when I'm away from the radio.

Remote Control

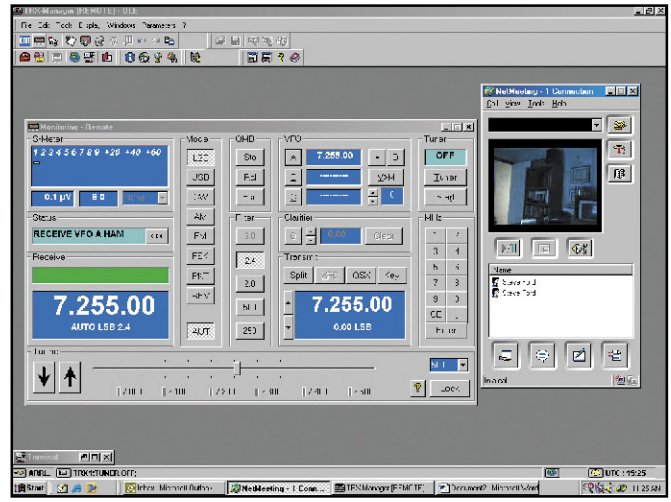
Remote control is one of the most fascinating and popular features of *TRX-Manager*.

With my DSL Internet connection at home, I have been able to use *TRX-Manager* to control my IC-706 remotely from my office computer at Headquarters. Before I leave for work, I turn on my transceiver and start *TRX-Manager* in its "slave" configuration. With the terminal window open, *TRX-Manager* is standing by for an Internet control connection via telnet.

At the office, I boot up *TRX-Manager* in the "master" mode, open its terminal window, enter my IP address in the telnet line and click on the green "connect" arrow. Within a few seconds, I'm in control of a transceiver that's 30 miles from my operating position.



Hunting DX with the PacketCluster function (left window).



Remote control with *TRX-Manager*. The right-hand window is Microsoft *Netmeeting* (not supplied with *TRX-Manager*), which I use to relay audio from my home station to my office.

Conclusion

If you want to try computer control of your radio, *TRX-Manager* should be at the top of your list—especially if you are interested in remote control. The software is so multifaceted, there still are several features I've yet to explore fully (such as the memories and bandscope). I experienced only one glitch, which involved loading a shortwave broadcast database. I posted my dilemma on the Yahoo *TRX-Manager* reflector (**groups.yahoo.com/group/TRX-Manager**) and had a solution within 24 hours. Try the free 30-day *TRX-Manager* demo. It's downloadable from **www.hosenose.com/trx-manager/**.

Manufacturer: Laurent Labourie, F6DEX, distributed in the US and Canada by Personal Database Applications, 1323 Center Dr, Auburn, GA 30011-3318; tel 770-307-1511; **www.hosenose.com.** *$69. LCU-3 serial interface: $25. System requirements:* Windows 95/98/2000/NT/XP *on a 100-MHz Pentium PC (minimum) with a CD-ROM drive.*

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