

## **Product Review Column from QST Magazine**

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The ICOM IC-2100H 2-Meter FM Mobile Transceiver

The Alinco DJ-280T and the Pryme PR-222/PR-52 Handheld FM Transceivers

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## The ICOM IC-2100H 2-Meter FM Mobile Transceiver

Reviewed by George Beloin, WA1PIX

I've owned a couple of dual-band mobile rigs over the years. I was very satisfied with them, but rarely used them on 70 cm. In the area of New England where I live, the vast majority of FM activity is still primarily found on 2 meters. Having 70-cm band transceive and the ability to set up for crossband repeat *are* neat features (I actually did operate crossband once), but these are capabilities that I just do not use.

Lately, we've been seeing a trend toward additional band coverage in both the VHF and HF markets. Attractive pricing on the "one band at a time" dual-band VHF/UHF mobiles has led to a noticeable decrease in the street prices of the single-banders. I decided to take full advantage of the present market conditions. Prices on all of the currently available 2-meter FM mobiles seem downright reasonable!

### The Selection Process

I decided to begin my radio selection process by making a list of a few of the basic features I consider essentials. Economy was an important factor.

I wanted a radio with a minimum of 50 memories. Radios with fewer memories that I've owned in the past seemed to fill up quickly. Expanded receive capability was also important. I enjoy listening to the commercial and public service communications that are found just to either side of our 2-meter band.

Built in CTCSS decode would be a nice bonus—it can sure come in handy when monitoring shared public service frequencies. Adding this ability later with an optional accessory board can be an expensive proposition. (All of the currently available 2-meter FM mobiles now include CTCSS encode; decode is still an option on some.)

Thumbing through the pages of May 1998 *QST*, I came across a full-page advertisement for the ICOM IC-2100H. As I read through the specifications and the features lists a few points quickly stood out. Here was a 2-meter mobile rig offering 100 "regular" memories, with 13 additional tossed in for things such as call channel and scan edge pairs. The receiver covers 136-174 MHz and CTCSS decode is built in. Power output is rated at 55 W and most of the enclosure is made up of a large integrated heat sink. This radio looked plenty rugged!

Admittedly, these were the first items that caught my eye, but I found the IC-2100H had some additional attractive features as



well. Like its predecessor, the IC-2000H, the '2100 has a large easy-to-read display and offers the ability to tag memories with up to 6 alphanumeric characters, a very handy feature for identifying both ham and public service frequencies.

Labels for six of the radio's eight front panel control buttons appear in the lower part of the LCD display, a very nice aid for locating specific controls under limited lighting conditions. The display background color can be toggled between amber and green, and the brightness is adjustable.

Another notable feature shown in the advertisement is the HM-98S multifunction microphone. The mike has well labeled backlit keys that can provide control of most of the radio's capabilities.

This transceiver was definitely in the running. I had a look back through some previous *QST* Product Reviews (incidentally, members can view these on-line on our Members-Only Web site at <http://www.arri.org/members-only/>) and contacted a few dealers for up-to-the minute pricing on the '2100 and some alternatives. The IC-2100H had the features I wanted and

the price seemed very reasonable. It was time to take the plunge.

Luckily, I have a ham radio dealer in my area. I had the opportunity to spend a few minutes playing with a variety of display models before putting down my hard-earned cash. Based on my specific requirements, the information I had gathered from various advertisements and *QST* Product Reviews, my brief evaluation of the display models and some price comparisons, I decided to purchase the IC-2100H. (We purchased a second unit for *ARR Lab* testing and independent evaluation. The performance data appearing in Table 1 is from our product review unit.—Ed.)

### Out of the Box

When I got home and liberated the new radio from its box, I began to wonder how long it would take me to get the rig into some state of operation and maybe even work a repeater or two. I hooked it up to my discone antenna and dc power supply.

Without peeking in the manual, it took about three minutes for me to figure out the basic operations. I decided to skim through the manual so that I could quickly set up some of the more advanced operating parameters. The manual is well organized and the instructions are clear and easy to follow. While I should have spent the time to read it through from cover to cover, I was anxious to get on the air. I'd save that for later.

One programming detail that may confuse some first-time ICOM purchasers is

### The Bottom Line

Those shopping for a wide variety of advanced features in an economically priced 2-meter mobile will find the ICOM IC-2100H worthy of serious consideration.

**Table 1****ICOM IC-2100H, serial number 04132****Manufacturer's Specifications**

Frequency coverage: Receive, 136-174 MHz; transmit, 144-148 MHz.

Power requirements: 11.7-15.9 V dc; Receive, 1.0 A (max audio); transmit, 12.0 A (max, high power).

Size (height, width, depth): 1.6x5.5x7.1 inches; weight, 2.6 pounds.

**Receiver**

Sensitivity: 12 dB SINAD, 0.18  $\mu$ V, 144-148 MHz.

Two-tone, third-order IMD dynamic range: Not specified.

Adjacent-channel rejection: Not specified.

Spurious response: 60 dB.

Squelch sensitivity: 0.13  $\mu$ V.

Audio output: >2.4 W at 10% THD into 8  $\Omega$ .

**Transmitter**

Power output (H / M / L): 55 / 10 / 5 W.

Spurious signal and harmonic suppression:  $\geq$ 60 dB.

Transmit-receive turnaround time (PTT release to 50% of full audio output): Not specified.

Receive-transmit turnaround time ("tx delay"): 140 ms. Not specified.

\*Measurement was noise-limited at the value indicated.

**Measured in ARRL Lab**

Receive, as specified; transmit, 140-150 MHz.

Receive, 0.6 A; transmit, 9.9 A, tested at 13.8 V.

**Receiver Dynamic Testing**

For 12 dB SINAD: 0.16  $\mu$ V.

20 kHz offset from 146 MHz, 73 dB\*.  
10 MHz offset from 146 MHz, 93 dB.

20 kHz offset from 146 MHz, 73 dB.

IF rejection, 118 dB; image rejection: 85 dB.

0.08  $\mu$ V at threshold.

2.7 W at 10 % THD into 8  $\Omega$ .

**Transmitter Dynamic Testing**

53 / 9.4 / 4.7 W.

66 dB. Meets FCC requirements for spectral purity.

Squelch on, S9 signal, 200 ms.

the radio's lack of a "function" button for accessing the secondary operations of the front panel's push button controls. On this radio (and most of ICOM's other recent offerings), you simply press and hold a button to activate its secondary function. Many of the features that can be controlled using the front panel controls are also accessible from the microphone keypad. Some control operations performed when using the microphone keys do require using a function button located on the mike's keypad.

First I wanted to adjust the rig's output power to minimum. The available levels are 5, 10 and 55 W. These can be selected with a few quick presses of the front panel **DUP/LOW** button. Three individual dedicated power level buttons are also available on the microphone keypad.

Next thing on my "must do" list was to turn down the brightness of the display. This requires entering the "set" mode. The set mode contains menu items for display brightness and color, individual settings for the CTCSS encode and decode tones, repeater offset, tuning steps and scan resume condition settings. Quick presses of the **LOCK/SET** button cycle through the menu selections. When the appropriate menu title appears in the LCD display you dial up the desired setting using the main tuning knob or step through the choices with the mike **UP** and **DOWN** buttons. I punched up the item titled "DIM" and cranked down the brightness a bit. A quick press of the **SCANV/MHZ** button lets you exit the set mode.

A similar "initial set mode" menu is accessible by holding the **LOCK/SET** button while turning the power on. This menu includes settings for a time-out timer, automatic repeater offset, automatic power off, DTMF playback speed for autodial and a

beep feature for the keys. You'll also find a squelch delay that can help limit some of the annoying squelch cycling that can occur on weak fluctuating signals. You press the **POWER** button to exit the initial set mode.

It was time to try programming some repeater frequencies into the memories. This can be done using the front panel buttons and the tuning dial. You can also enter the frequency digits directly and perform the programming steps using only the microphone keys. The procedure was not particularly intuitive and did send me back to the manual for some additional information. A bit of practice and I had it down pat. I programmed in my three favorites and was eager to get on the air. I'd finish loading it up with more ham and scanning frequencies later.

On each of the repeaters I worked I received good transmit audio reports with no comments such as "Sounds a little tinny." or "Maybe a little more modulation would be nice." The receive audio sounded great and seemed plenty loud enough for my intended mobile application.

This radio was definitely a "keeper." I decided to load up all the memories, tag them with alphanumeric labels, and program some phone numbers into the autodial memories (this unit offers 14!). I settled back in my comfortable chair and gave the manual pages and the programming buttons a good workout.

This more thorough look through the manual turned up some interesting additional features. Some of the more notable ones include automatic scratch-pad memories. In VFO mode, the radio will remember the last three simplex and repeater frequencies you transmitted on. Later you can transmit these back to the VFO, then write them to a regular memory channel.

An unusual feature worth mentioning is "one-touch PTT". When this is activated, a quick press of the PTT button toggles the radio between transmit and receive. While this may be handy in some applications, be careful. This seems like a personal invitation to "open mike night" to me! If you decide to engage this feature, you'll certainly want to activate the unit's "time-out timer" as well. Another feature, "repeater lockout," will prevent the transmitter from engaging if the receiver detects activity on the frequency. You'd no longer be the guilty party in a "double."

For those, like me, who enjoy scanning, this radio has more than just loads of memories to offer. There are three scan types: full band scan (136-174 MHz), programmed scan with three sets of programmable scan limits and memory scan with memory channel skip capability. Five different scan resume conditions are selectable from the set menu.

Some scanner enthusiasts may find the lack of AM aircraft receive capability a bit of a disappointment. This was not a major consideration for me.

The built in CTCSS decode board provides tone squelch, pocket beep and tone scan. A priority watch feature is also included that checks for activity on a specific memory channel or your programmed "call" channel while you're in the VFO mode. You can even set it up to watch for activity as it scans through memories while you're in the VFO mode.

PC programming software and cabling and radio to radio cloning cables are available as optional accessories from ICOM. I did all my programming manually. Speaking of optional accessories, ICOM's HM-90 wireless remote control microphone will work with the IC-2100H. A quick release-mobile mounting bracket is also optional. (The radio comes with a bolt on mobile mounting bracket.)

It was time to try this transceiver in the car.

**Intermod Rejection**

Connecticut has a fairly high population density. In our high-tech society there is a direct correlation between population and RF density. High-powered paging systems and an ever-increasing number of commercial transmitters operating in and near the VHF frequencies can wreak havoc with some receivers, causing them to emit all manner of squeaks and squawks. It's difficult to predict how a particular radio will behave in a specific RF environment. (Nearly anyone who's connected a gain antenna to the average H-T can fill you in on this.)

I decided to take this radio for a ride through my own local "intermod alley." I was totally delighted with the results. Only once did I hear a paging system's beep tones coming in on top of a distant repeater that I was monitoring. Although this is certainly not a scientific test, I commute through this area each workday. For my application, this unit proved plenty intermod resistant!

A look at the ARRL Lab data for the receiver two-tone, third-order IMD dynamic range reveals some very good numbers for 10-MHz offset, and respectable 20 kHz offset performance as well. These specifications are typically good indicators of a radio's overall intermod rejection capabilities.

ICOM designed the squelch system to automatically engage an increasing amount of attenuation as the squelch control is turned past 12 o'clock. This simple arrangement doesn't significantly affect reception of strong signals, and adds even more intermod fighting capability for local repeater or short range simplex operation.

### Some Minor Details

I tend to install and remove the radio from the car on a fairly regular basis. One minor annoyance is the location of the antenna connector and the external speaker jacks. Those nice cooling fins can make installing and removing the connectors a bit tough. Depending on your particular installation, the bottom-firing speaker may be partially blocked. I use an external speaker in my car.

Those wanting to use this radio on 1200-baud packet will find very little discussion of this in the manual, just a brief caution on keeping the squelch delay set to "short." The RJ-45 style microphone connection wiring diagram is included. This probably provides sufficient information for most experienced packeteers.

Overall, I'm very satisfied with my IC-2100H. ICOM has included all the features that I was looking for at a reasonable price. A look at *QST's* previous 2-meter mobile product reviews, including the comparison review that appeared in November 1996 (which features several of the currently available alternatives, but not Alinco's latest model, the DJ-140) will help you determine for yourself how this radio stacks up against the competition.

*Manufacturer:* ICOM America, Inc, 2380 116th Ave NE, Bellevue, WA 98004, tel 425-454-8155; fax 425-454-1509; <http://www.icomamerica.com>. Manufacturer's suggested retail price: IC-2100H, \$244. Typical current street price, \$200.

## The Alinco DJ-280T and the Pryme PR-222/PR-52 Handheld FM Transceivers

Reviewed by Joe Bottiglieri, AA1GW  
Assistant Technical Editor

The 1.25-meter band has long had a reputation for high priced equipment. Only a relatively small number of the world's hams, those within ITU Region 2 (the Americas), enjoy frequency allocations between 220 and 225 MHz. In Regions 1 and 3 (including the UK, Europe, Asia, Africa, Russia, Australia and New Zealand, to name a few) these frequencies are assigned instead to a variety of commercial, government, broadcasting, aeronautical, radionavigation and location services.

This relatively limited market and the associated reduction in profit potential have conspired to discourage Amateur Radio manufacturers from producing a sufficient volume of 1.25-meter equipment to drive transceiver prices down. Amateur radios manufactured for 2 meters and/or 70 cm will have sales potential in all three ITU regions, making these much more lucrative products.

While many manufacturers will still offer a limited selection of gear for 1.25-meter operators, the uninitiated, especially newly licensed Novices eager to purchase 222 MHz FM equipment, are typically shocked when they see the price difference between these radios and nearly identical transceivers for 2 meters or 70 cm.

With the recent introductions of the DJ-280T from Alinco and the Pryme PR-222 from Premier Communications, Region 2 hams are finally seeing the price of 1.25-meter H-Ts dipping into the range one might even consider "affordable."

### The Alinco DJ-280T

The DJ-280T is essentially a 222 MHz version of Alinco's DJ-180/480 single-band 2-meter and 70-cm H-Ts. It shares the same enclosure, battery options and accessory lines. Even the owners manual included with the '280 is written for the '180/480. A one page "*DJ-280 Supplementary Sheet*" provides only an appropriate specifications table.

Two versions are available in the US—the DJ-280T and the DJ-280TH. The T indicates that CTCSS is installed. The H or "high power" version includes a 12 V 700 mAh battery for 4 W output in the high power setting. We purchased the TH version for this review.

The earlier '80 series radios were once very popular models in Alinco's US product line. The 2-meter version first appeared in *QST* ads in the fall of 1992. These ads included a small inset with a picture of a DJ-180 under a car's tire, exemplifying its durability (included, of course, was the requisite "don't try this at home" warranty disclaimer). Since that time, Alinco has released a new generation of 2-meter single-banders. Their current models are the sleek and feature-packed DJ-191T and a similar "stripped down" version, the DJ-190T.

This lineage has led to a radio that, at least by today's standards, might be consid-

ered a bit large and mildly unsophisticated.

Perhaps the relative simplicity and the generous dimensions of this "new" H-T are actually blessings in disguise!

Unlike many contemporary hand-held transceivers, actual rotary control knobs are provided for the volume, squelch and frequency encoder. The volume and frequency knobs are nearly 5/8-inch tall and 3/8-inch in diameter. The truncated squelch knob is tucked in close to the BNC antenna connection and has a grooved top surface. It's unlikely that you'll disrupt the squelch setting accidentally. Turn the volume control fully counterclockwise and the power switches off with a distinctive click.

The front panel has a total of 22 push buttons and a small LCD display window. Unlike most modern transceivers, *none* of the 16 buttons that make up the DTMF pad provide access to secondary functions. Even direct frequency entry from this keypad is not available. This leaves only six front panel buttons, a function button and the rotary knobs for controlling all of the radio's various parameters. Each of the remaining six buttons serve a primary and a secondary control function and are clearly labeled with both of their assignments—primary in white, secondary in light blue.

A vertical column of three buttons for the more often-used operations—**LAMP/KL.PL**, **MONI/H/L** and **TONE/MW**—is located just to the right of the DTMF pad. The function button is on the left side of the radio, above the PTT button, and allows activation of the

### The Bottom Line

Find an oasis from the crowded conditions on the busy 2-meter and 70-cm frequencies with a visit to 1.25 meters, or expand your horizons with the enhanced propagation you'll find on 6 meters. The Alinco DJ-280T, the Pryme PR-222 or the Pryme PR-52 can take you there—without taking you to the "cleaners!"



**Table 2****Alinco DJ-280TH, serial number T000855****Manufacturer's Specifications**

Frequency coverage: Receive, 220-225 MHz; transmit, 222-225 MHz.

Power requirements: 5.5-13.8 V dc; current consumption not specified.

Size (height, width, depth): 7×2.3×1.3 inches; weight, 16.8 ounces.

**Receiver**

Sensitivity: 12 dB SINAD, 0.16  $\mu$ V.

Two-tone, third-order IMD dynamic range: Not specified.

Adjacent-channel rejection: Not specified.

Spurious response: Not specified.

Squelch sensitivity: Not specified.

Audio output: Not specified.

**Transmitter**

Power output (H, low not specified): 4.5 W†.

Spurious signal and harmonic suppression: Not specified.

Transmit-receive turnaround time (PTT release to 50% of full audio output): Not specified.

Receive-transmit turnaround time ("tx delay"): Not specified.

\*Measurement was noise-limited at the value indicated.

†Current advertising specifies the maximum power output at 4 W.

**Measured in ARRL Lab**

Receive and transmit, as specified.

Receive, 0.12 A; transmit, 0.83 A, tested at 13.8 V.

**Receiver Dynamic Testing**

For 12 dB SINAD: 0.19  $\mu$ V.

20 kHz offset from 223.5 MHz, 64 dB\*.

10 MHz offset from 223.5 MHz, 80 dB.

20 kHz offset from 223.5 MHz, 64 dB.

IF rejection, 103 dB; image rejection: 82 dB.

0.1  $\mu$ V at threshold.

263 mW at 10% THD into 8  $\Omega$ .

**Transmitter Dynamic Testing**

3.7 / 0.45 W.

70 dB. Meets FCC requirements for spectral purity.

Squelch on, S9 signal, 170 ms.

50 ms.



secondary features. These keys control the display backlighting, keypad and PTT locks, receive monitor, power output level, CTCSS encode and decode and the memory write function.

The three remaining buttons, slightly smaller and partially protected in a recessed area to the right of the display, are **V/M/OFF-SET**, **SCAN/STEP** and **CALL/APO**. These provide access to the VFO or memory, duplex offset, scan, tuning step size, call channel and an automatic power off feature.

The display window is small but the frequency digits are large enough to allow reasonably easy viewing. A single lamp located under the center of the translucent green display background supplies excellent backlighting. Tiny icons are provided for the usual suspects (hi/low power, tone/tone squelch, duplex direction, low battery indicator, memory channel number, etc). No signal strength or relative RF power output metering is included. **BUSY** and **ON AIR** icons indicate receive and transmit.

Most moderately experienced operators should be up and running, at least in the VFO mode, without cracking the manual. Storing frequencies in the memories, while not difficult, will probably require a glance at the manual.

The manual is surprisingly brief, including only about 10 pages of actual programming instructions. The procedures are simple and clearly explained, and once performed, most programming sequences are easy to remember.

One section of the manual that may lead to some confusion involves references to the CTCSS encode and decode capabilities. US versions of this radio come with the "optional" EJ-17U encode and decode board installed. Provisions for programming independent tones for transmit and receive on the same frequency or repeater frequency pair,

however, are not included.

The DJ-280 comes with 10 memories. Alinco also offers optional plug-in memory units that replace the included memory board and provide your choice of either 50 or 200 total memories. Installation is easy and instructions are included in the last few pages of the manual.

I've never owned equipment for 222 MHz. It took a few minutes to turn up my worn copy of the *ARRL Repeater Directory* and to program in a sampling of our local repeaters. I set the unit into scan to listen for activity. While I did scare up a handful of contacts over the review period, 1.25-meter activity in this area today is only a fraction of that found on the 2-meter and 70-cm bands. That's quite a change from 20 years ago, I'm told, when the greater Hartford area was a hotbed of 220 activity. Some of these contacts were through repeater systems with links from 1.25 meters to other VHF and UHF bands.

Transmit audio reports were always good. The receive audio level and clarity is plenty adequate for most hand-held use, but as with almost all H-Ts, this unit would benefit from a larger external speaker for mobile applications.

Some of the more advanced features that we've come to expect in the typical example of "new generation" H-Ts are not included on the '280. You won't get direct keypad frequency entry, keypad backlighting, DTMF autodial memories, tone scan, alphanumeric memory naming and tiers of hidden menus loaded with "features" of questionable utility. What you will get is a simple, easy to program, durable and reasonably priced H-T with all the important capabilities included, for a band that definitely deserves more attention.

**Manufacturer:** Alinco Electronics, 438 Amapola Ave Suite 130, Torrance, CA 90501; tel 310-618-8616; fax 310-618-8758;

<http://www.alinco.com>. Manufacturer's suggested list price: DJ-280T/TH, \$250/\$280. Typical current street prices, \$200/\$230.

**The Pryme PR-222 and PR-52**

Premier Communications first entered the US Amateur radio market about five years ago with a line of accessories. These were soon joined by a 2-meter H-T—the ADI AT-200, and a 2-meter FM mobile—the AR-146.

Since that time, Premier has released a succession of transceivers: a pair of single-band VHF and UHF handhelds—the AT-201 and 400; a dual-band 2-meter/70-cm handheld—the AT-600; and a 70-cm FM mobile—the AR-446. All of these units carry the ADI label. These have earned Premier a reputation for providing radios with good performance and advanced features at a reasonable price.

Premier continues to expand their growing equipment line with the introduction of single-band handhelds for 1.25 and 6 meters. Information on their Web site indicates that the makers of their ADI products also manufacture the Pryme transceivers. The PR-222 and the PR-52 are virtually identical in appearance and features. Let's consider the Pryme PR-222 first.

**The Pryme PR-222**

The PR-222 1.25-meter FM H-T is a short, stout little handheld. Unlike most of the slim "shirt pocket" H-Ts on the market today, it will stand upright on a desktop with reasonable stability. The included high-power 12 V 600 mAh NiCd battery attaches to the back side of the radio. It's about a 50/50 split of transceiver to battery pack.

On the top of the unit there's a single knob that provides volume and power on/off control. You'll also find external speaker and

**Table 3****Pryme PR-222, serial number 000058****Manufacturer's Specifications**

Frequency coverage: Receive and transmit, 222-225 MHz.

Power requirements: 5.0-16.0 V dc; receive, 25 mA (stand by); transmit, 0.95 A (max, high power) at 13.8 V.

Size (height, width, depth): 4.3×2.0×0.8 inches; weight, 14.6 ounces.

**Receiver**

Sensitivity: 12 dB SINAD, 0.16  $\mu$ V.

Two-tone, third-order IMD dynamic range: Not specified.

Adjacent-channel rejection: Not specified.

Spurious response: Not specified.

Squelch sensitivity: Not specified.

Audio output: 300 mW at 10 % THD into 8  $\Omega$ .

**Transmitter**

Power output (H / M / L): 5 / 2.5 / 0.5 W.

Spurious signal and harmonic suppression: Not specified.

Transmit-receive turnaround time (PTT release to 50% of full audio output): Not specified.

Receive-transmit turnaround time ("tx delay"): Not specified.

\*Measurement was noise-limited at the value indicated.

**Measured in ARRL Lab**

As specified.

Receive, 0.19 A (max volume, no signal); transmit, 1.1 A, tested at 13.8 V.

**Receiver Dynamic Testing**

For 12 dB SINAD: 0.25  $\mu$ V.

20 kHz offset from 223.5 MHz, 65 dB\*.

10 MHz offset from 223.5 MHz, 74 dB.

20 kHz offset from 223.5 MHz, 65 dB.

IF rejection, 74 dB; image rejection: 41 dB.

0.17  $\mu$ V at threshold.

405 mW at 10% THD into 8  $\Omega$ .

**Transmitter Dynamic Testing**

5.2 / 2.3 / 0.46 W.

70 dB. Meets FCC requirements for spectral purity.

Squelch on, S9 signal, 140 ms.



microphone jacks, a BNC antenna connector and an LED transmit/busy indicator. Surprisingly, the microphone jack also serves as the connection point for the battery charger.

On the upper third of the front panel there's a speaker grill with a vertical column of four control buttons along the right edge. The primary function of each is labeled in white just above each key; secondary functions are labeled diagonally to the lower right of the button, in yellow. These buttons are **UP/LOCK**, **DOWN/LAMP**, **CALL/M.S** and **MR/MW**. On the upper left side of the radio, just above the PTT button, is a **FUNC** button that provides access to the secondary functions.

The center section of the front panel contains the display. The display background is a matte gray—the LCD segments appear in black. Light green lamps behind either end of the display panel can be switched on to provide backlighting. Each time you turn on the power, the LCD comes up in a "test mode" activating the backlighting and all the segments. Six rectangular segments along the bottom of the display window make up a bargraph style signal strength and RF power output meter.

The lower third of the front panel contains the typical four-row by four-column DTMF keypad. The large rubberized pushbuttons are mounted nearly flush. This arrangement works very well to prevent your fingertip from accidentally activating neighboring keys. No keypad backlighting is provided.

While in receive, the number buttons (**0-9**) on this keypad can be used to directly enter frequencies. The six remaining buttons—**SAVE/STEP**, **MHz/s/SEL**, **Bz/CHG**, **SFT/COPY**, **MHz▲/FCH** and **MHz▼/ENT**—control a wide variety of features and programming.

When the radio is in transmit, all 16 of these keys provide the usual DTMF tones. The vertical column of white control keys along the right edge will now activate the DTMF "A," "B," "C" and "D" tones. The

two buttons in the bottom row, to the left and right of the **0** button will activate the "\*" and "#" tones. These particular keys are only labeled with their primary and secondary control functions, not these DTMF assignments. No provisions for memorizing sequences for DTMF autodialing are included.

A handful of unusual programming sequences and initial setting can make trying to "hack" your way onto the air without breaking out the owner's manual an exercise in futility. This is not to say that the unit is particularly difficult to program. Carefully follow the steps given in the manual and you'll do just fine.

When we first received this radio from the dealer, the box contained both a manual and a one-page addendum sheet covering several corrections. Since that time Premier has put together an updated version of the manual with several additional corrections. If you need a copy of the new manual, or if you wish to look through the manual before you purchase the radio, you can download a copy from their Web site; <http://www.adi-radio.com/>.

Once you charge up the battery and take a quick look through the manual, you'll probably want to start out by deactivating the CTCSS tone squelch function. When you turn the power on for the first time (or after you reset the microprocessor), the unit will come up in the VFO mode at 223.00 MHz (the display will read 23.00, the leading digit is not shown). You'll also notice two display icons, **tone** and **SQL**, in the upper right of the LCD. These indicate that both CTCSS tone encode and tone squelch are on.

Press the **MHz/s/SEL** (*select*) button. The first press will bring up the tuning step size (in kHz). You can change the setting with the **UP** and **DOWN** buttons in the upper right corner of the front panel. This menu item can also be accessed using the **SAVE/STEP** key. A second press of the select button displays the CTCSS encode tone (the default setting

is 88.5 Hz, the decimal point is not shown). You can deactivate the transmit tone by using the **UP** or **DOWN** buttons to change this setting to 000. Now—the important one—press the select button a third time. The number now displayed is the CTCSS receive tone—again 88.5 Hz. If you don't start out by deactivating this one, you won't hear any of the signals you receive unless the transmitting station just happens to be transmitting a CTCSS tone of 88.5 Hz! Use the **UP** or **DOWN** buttons to set this to 000.

A fourth press of the select button brings up the repeater offset setting. You can change the offset value with the **UP** or **DOWN** buttons, and set the duplex to positive, negative or simplex with the **Bz/CHG** button. You can also access this menu item by holding down the **FUNC** button and pressing the **SFT/COPY** key. Incidentally, for most programming procedures you have a maximum of 5 seconds between each keystroke. If you pause too long the radio reverts to the frequency display mode.

A fifth press of the select button will bring up a setting for DTMF group paging identification. I'll leave it to you to read up on this capability.

If you are in the memory program mode when you enter this select menu, you'll find three additional menu items. These include a "Busy Lock" which will prevent transmitting on an active frequency, a "PTT Lock" which prevents transmission altogether and a "Channel Lockout" for locking a memory channel out in the scan mode. The state of all of these settings can be programmed into any of the unit's 40 memories. You toggle between the VFO and memory mode with the **MR/MW** button.

In VFO mode, to enter a frequency using the keypad be sure to start with **0** for the leading digit. Though this leading digit does not show up in the display when you enter it, it's necessary to include it. When you finish punching in the digits, make sure you press

**Table 4****Pryme PR-52, serial number 000086****Manufacturer's Specifications**

Frequency coverage: Receive and transmit, 50-54 MHz.

Power requirements: 5.0-16.0 V dc; receive, 25 mA (stand by); transmit, 0.95 A (max, high power) at 13.8 V.

Size (height, width, depth): 4.3 x 2.0 x 0.8 inches; weight, 15.4 ounces.

**Receiver**Sensitivity: 12 dB SINAD, 0.16  $\mu$ V.

Two-tone, third-order IMD dynamic range: Not specified.

Adjacent-channel rejection: Not specified.

Spurious response: Not specified.

Squelch sensitivity: Not specified.

Audio output: 300 mW at 10 % THD into 8  $\Omega$ .**Transmitter**

Power output (H / M / L): 5 / 2.5 / 0.5 W.

Spurious signal and harmonic suppression: Not specified.

Transmit-receive turnaround time (PTT release to 50% of full audio output): Not specified.

Receive-transmit turnaround time ("tx delay"): Not specified.

\*Measurement was noise-limited at the value indicated.

**Measured in ARRL Lab**

As specified.

Receive, 0.16 A (max volume, no signal); transmit, 0.93 A, tested at 13.8 V.

**Receiver Dynamic Testing**For 12 dB SINAD: 0.20  $\mu$ V.

20 kHz offset from 52 MHz, 67 dB\*.

10 MHz offset from 52 MHz, 98 dB.

20 kHz offset from 52 MHz, 67 dB.

IF rejection, 96 dB; image rejection: &gt;144 dB.

0.15  $\mu$ V at threshold.281 mW at 10% THD into 8  $\Omega$ .**Transmitter Dynamic Testing**

5.8 / 2.8 / 0.57 W.

63 dB. Meets FCC requirements for spectral purity.

Squelch on, S9 signal, 150 ms.

160 ms.



the **MHz▼/ENT** key to enter the frequency. You can also tune the VFO by your preset frequency step setting using the **UP** and **DOWN** buttons, or by 1 MHz steps by holding in the **FUNC** button and pressing the **MHz▲F/CH** and **MHz▼/ENT** keys. In memory mode, the **UP** and **DOWN** buttons allow you step through the memories.

One notable feature, or lack thereof, is an adjustable squelch. The original manual contained information and adjustment instructions for a menu-based squelch level control. The updated manual does state that the squelch level is fixed.

While there was quite a bit of speculation before the field evaluation concerning the viability of a fixed squelch level, in actual use the preset level seemed to work out very well. It is set sufficiently low to open up on all but the weakest signals, but is still high enough to stay closed on most levels of band noise. Those trying to work extremely weak simplex signals can toggle the squelch off with a **SQL OFF** button conveniently located below the PTT. It worked fine for all our repeater operations.

The available power output levels with the included battery are 1, 2 or 5 W. These are adjusted while transmitting by pressing the **UP** or **DOWN** buttons.

Transmit audio reports on simplex and over repeaters were consistently very good to excellent. Receive audio was clear and the volume level was adequate for most handheld applications. Battery life between recharges was surprisingly good, even when operated at high power. A beep will sound every 5 seconds when the battery is nearly depleted.

Those who take the time to learn this H-T's somewhat unique programming sequences will be richly rewarded. With 40 memories, independent CTCSS encode and decode tones, direct keypad frequency entry and three power output levels, the

Pryme PR-222 offers some attractive features for an equally attractive price.

**The Pryme PR-52**

The Pryme PR-52 6-meter FM H-T is nearly an exact duplicate of the PR-222. The most noticeable difference is its longer 6-meter rubber duck antenna. You'll also find that the antenna connector used on the '52 is a female TNC type (this is very similar to the BNC, but has a threaded outer section instead of the "bayonet" studs). While this connector is not as common as the BNC, it provides firm attachment for the heavier antenna and will probably prove more durable in this application.

The two units share the same manual and programming procedures (so you'll probably want to start out by disabling the CTCSS tone squelch on this transceiver as well!).

While the repeaters on most of our other VHF and UHF bands use fairly standard offset values and duplex directions, you'll find a wide variety in use on 6 meters. Keep a copy of the *ARRL Repeater Directory* handy when trolling for new repeaters.

When directly entering frequencies from the keypad, you will *still* need to enter a leading digit—in this case **0**—before punching in the digits for tens of megahertz, megahertz, etc. For example, if you wish to enter 52.525, you press **0-5-2-5-2-5**—and don't forget to finish with the **MHz▼/ENT** key.

I handed this unit off to one of HQ's most experienced 6-meter operators—Pete Budnik, KB1HY.

After some confusion related to the initial CTCSS tone squelch setting (I decided not to warn him), and a short adjustment period to the "unique" programming procedures, Pete began to fall for this little H-T.

He gave the radio quite a workout, operating from his shack, mobile and while hiking. Pete sums it up this way:

"Once I got used to the programming

scheme, I found it very easy to program and operate. The 40 memories are more than adequate for loading in lots of repeaters and simplex frequencies. I went a whole week and then some on one battery charge. Just add a mag-mount antenna and it makes a great mobile set-up. I'd give it a 9 out of 10."

It broke his heart to turn it back in...

Several additional accessories for both the PR-222 and the PR-52, including a car cord, a mobile battery charging cable and a DOS-based PC programming software and cabling kit should be available shortly. Contact Premier for details.

*Distributor:* Premier Communications, 480 Apollo Suite E, Brea, CA 92821; tel 714-257-0300; fax 714-257-0600; [premier@adi-radio.com](mailto:premier@adi-radio.com); <http://www.adi-radio.com/>. Manufacturers suggested list price: PR-222, \$299; PR-52, \$299. Typical current street price (either model), \$220.

**FEEDBACK**

Due to a measurement error, some of the image rejection figures published in the data tables appearing in *Product Review* in *QST* October 1998 and November 1998 were incorrect. Please note the following corrections:

Alinco DJ-C5T: UHF image rejection, listed as ">144 dB," should have read 67 dB. (See *Alinco's Amazing Credit Card H-Ts*, October 1998, p 74.)

ICOM IC-207: UHF image rejection, listed as ">142 dB," should have read 71 dB.

Kenwood TM-V7A, VHF image rejection, listed as "126 dB," should have read 105 dB.

Kenwood TM-G707, UHF image rejection, listed as ">133 dB," should have read 75 dB.

Yaesu FT-8100: UHF image rejection, listed as ">146 dB," should have read 92 dB.

(See *QST Compares: Dual Band FM Mobile Transceivers*, November 1998, p 62) **QST**