

made the filters seem—on paper anyway—way too narrow to pass intelligible audio.

On upper and lower sideband, the -6 dB bandwidths measured in the neighborhood of 700 Hz, but a second check at -30 dB revealed that the bandwidths at that lower level were closer to 1850 Hz. For AM, the -6 dB points indicated a mere 900 Hz of bandwidth, but the bandwidth at -30 dB measured 4 kHz. Although a poor IF filter shape factor can lead to this effect, a less than flat audio response (as was the case here) can also produce similar results.

While our Lab data pointed toward receiver audio that would sound seriously

constricted, our field observations didn't bear that out. The audio delivered by this radio actually sounds very nice.

Closing Considerations

The PC-16000A exhibits a level of overall performance that's reasonable for a HF transceiver in this price range with basic DSP, built-in Rockwell Collins filters, RF speech processing, keyboard control and an integrated full-featured RTTY and CW digital mode terminal built in.

If you are presently shopping for a conventional HF transceiver and have a particular interest in RTTY and keyboard CW operation, the PC-16000A provides

everything you'll need. Simply pull the radio out of the box; plug in the keyboard; lash it up to a suitable power supply and an antenna; and you are in business. No external TNC, no custom-built cabling and no personal computer are required.

Thanks to Michael Tracy, KC1SX, and the ARRL Lab for their assistance with this review.

Manufacturer: Patcomm Corp, 7 Flowerfield Suite M100, St James, NY 11780; 631-862-6512; fax 631-862-6529; patcomm1@aol.com; www.patcomm.net/.

Manufacturer's suggested retail price, \$1350.

RadioShack HTX-252 2-Meter FM Mobile Transceiver

*Reviewed by Rich Arland, K7SZ
QST Contributing Editor*

When I contacted *QST* Product Review Editor Joe Bottiglieri, AA1GW, with an offer to do this review, his immediate response was: "How did you manage to get your hands on an HTX-252? RadioShack hasn't even begun advertising them yet!"

I had been searching for a 2-meter mobile to install in the very limited space available in my Subaru Outback. When I caught my first glimpse of this radio at the RadioShack booth at the Murgas Amateur Radio Club hamfest back in July, I quickly began to suspect that my quest was nearing an end.

Barry Brutko, the manager of the RadioShack in Wilkes-Barre, Pennsylvania, along with his sales associate Walt Gouse (N3BSX), were manning the booth. Their store had received one of the earliest shipments of HTX-252s. They brought along a few to sell at the show.

I chatted with them, perused the *Owner's Manual*, looked over the list of features and decided to give this little rig a try. Believe me, Barry and Walt didn't have to resort to too much arm-twisting. (We purchased a second HTX-252 to put through ARRL Lab testing and to try out for ourselves. The measurement data presented in [Table 2](#) is from this second unit.—Ed.)

Bucking the Trend

Perhaps what is most immediately striking about this transceiver is its diminutive size. The overall dimensions are about $1\frac{5}{16} \times 5\frac{1}{8} \times 4\frac{7}{8}$ inches. This is one *tiny* radio! The weight is well under 2 lbs. I've owned some 2-meter H-Ts that were heavier than this mobile transceiver.

With their introduction of the HTX-252, it appears as if the folks in Fort Worth have decided to carve themselves a niche in the highly-competitive



2-meter FM mobile market by offering an extremely compact, moderately-featured, easy-to-operate transceiver.

This radio represents a refreshing departure from a current trend within the Amateur Radio industry—cram every conceivable bell and whistle into ever-smaller enclosures. Although the resulting products score high on the "Gee Whiz" scale, a significant—and growing—number of hams have voiced their displeasure with the difficulties they encounter programming and operating some of these "fully-loaded" models.

The '252 offers a blend of features that has been distilled down to just a tad more than the bare essentials. You'll find 10 memory channels (11 if you count the "Call" channel); 10 and 25 W RF power output settings; CTCSS encode and decode; extended receive coverage; prior-

ity watch, basic memory and VFO scan; and DTMF (for autopatch and repeater control)—and that's about it.

Some examples of the things that you *won't* find are high RF power output (50 W seems to be typical for VHF mobiles these days), an abundance of memories with alphanumeric tagging, direct frequency input from the microphone keypad and autodial memories. For my requirements, I consider these omissions to be reasonable tradeoffs. We'll revisit this topic shortly, but first let's take a closer look.

Face Front

The front panel of the '252 is remarkably—but somewhat deceptively—uncluttered. Three rubberized pushbuttons; a volume, squelch and tuning knob; a conventional 8-pin microphone jack and the $\frac{3}{4} \times 1\frac{3}{4}$ -inch display window are all you'll find. The "deception" lies in the fact that some of the control operations that are commonly accessed from front panel buttons on other VHF mobile transceivers have been relegated to four control buttons located on the HTX-252's hand mike.

The LCD window displays black segments on an amber background. Icons that show the state of the various settings pop up along the top edge of the window; a 4-section S/Rf meter is located in the lower portion. The displayed frequency digits, the memory channel numbers and the icons are large enough for easy viewing. The display illumination level is fixed. Readability is good over a wide range of angles and lighting conditions.

The three chassis-mounted buttons, located just below the display, are labeled **REV**, **VFO/T-SQL** and **MR/MS**. A brief press of the **REVERSE** button (when the transceiver is set up for repeater operation) will swap the transmit and receive frequen-

Bottom Line

RadioShack's HTX-252 provides just a smidgen more than the basic requirements for contemporary amateur 2-meter FM communications. What it may lack in "bells and whistles" however, it compensates for with its subcompact dimensions, ease of programming and simplicity of operation.

Table 2**RadioShack HTX-252, serial number 203257***Manufacturer's Claimed Specifications*

Frequency coverage: Receive, 136-174; transmit, 144-148 MHz¹.

Power requirement: Receive, 0.6 A; transmit, 5 A (high power).

Mode of operation: FM.

Receiver

Sensitivity, 10 dB S/N: <0.22 μ V.

Adjacent channel rejection: Not specified.

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

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

S-meter sensitivity: Not specified.

Squelch sensitivity: Not specified.

Receiver audio output: 2.5 W into 8 Ω , THD not specified.

Spurious and image rejection: 60 dB.

Transmitter

Power output (H/L): 25 / 10 W.

Spurious-signal and harmonic suppression: $\geq$ 65 dB

Transmit-receive turn-around time (PTT release to 50% audio output): Not specified.

Receive-transmit turn-around time (tx delay): Not specified.

Size (hwd): 1.3 $\times$ 5.1 $\times$ 5.5 inches; weight, 1.5 pounds.

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

¹A special power-on reset procedure, detailed in the manual, will expand the transmit range to 142 to 149.885 MHz for MARS/CAPS operation.

Measured in the ARRL Lab

Receive and transmit, as specified.

Receive, 0.71 A; transmit, 4.4 A. Tested at 13.8 V.

As specified.

Receiver Dynamic Testing

For 12 dB SINAD, 0.14 μ V.

20 kHz channel spacing: 55 dB.

20 kHz channel spacing: 57 dB.

10 MHz channel spacing: 90 dB.

80 dB.

Maximum indication: 3.0 μ V.

At threshold: 0.09 μ V.

2.4 W at 10% THD into 8 Ω .

First IF rejection, 94 dB
image rejection, 64 dB.

Transmitter Dynamic Testing

24 / 9.2 W.

60 dB. Meets FCC requirements for spectral purity.

S9 signal, 220 ms.

95 ms.

grammed with any simplex or repeater frequency desired. When this same button is pressed while in the function mode, the value of the current tuning step appears in the display. The step size can then be changed using the main tuning knob or the mike's **UP/DN** buttons.

The **SCAN/PRI** key is used to enter the scan mode. If the radio is in the VFO mode, the scan will cover the entire range of the receiver (136 to 174 MHz); when in the memory mode, memory channels will be scanned. Set the squelch knob to an "open" position, and the scan will stop on each frequency step—active or inactive—for 1 second, and then resume. If the squelch threshold is set above the level of the band noise, the scan will pause on an active frequency for 5 seconds before resuming. A specific "memory channel lock-out" feature is not included.

Program and enable the priority feature and the receiver will periodically switch to a selected VFO or memory frequency to check for activity.

The **LOCK/SHIFT** key can be used to disable five of the seven radio control keys (the **LOCK/SHIFT** and the **F/MHz** keys are the exceptions). Pressing this same button while in the function mode will permit variations in the duplex magnitude and direction. The factory default setting is 600 kHz (shown as "60" in the display), but this offset value can be set anywhere between 100 kHz and 8 MHz. Automatic repeater offset (a feature that automatically selects the appropriate duplex direction—+, – or off—for the portion of the 2-meter band to which the radio is tuned) is not included.

The Far Side

The back panel contains a comparatively large heatsink, a chassis-mounted SO-239 antenna connector, a 1/8-inch external speaker jack and a 9-inch long dc power pigtail terminated in a conventional T-type connector. A 5 1/2-foot fused power cord with a mating connector is provided for wiring the radio to a 13.8 V dc power source.

An internal speaker is located in the top cover of the enclosure. A simple U-shaped mobile mounting bracket, fastened to either side of the chassis with large plastic-capped thumbscrews, facilitates radio mounting above or below a supporting surface and at a range of angles. The thumbscrews make for quick and easy removal or installation—a very convenient setup for those who like to employ one radio for a variety of missions.

And Now, Back to Our Show

Personally, I feel that RadioShack did a pretty good job of condensing the long list of possible features down to the

cies. This is a convenient way to quickly determine if a station you are communicating with through a repeater is close enough to attempt simplex (non-repeater) operation.

The **VFO/Tone-SQUELCH** button is used to move from the memory mode to the VFO mode or, when used in conjunction with a microphone-mounted "function" key, to set and activate the CTCSS encode and decode tones.

The remaining front-panel key—**Memory Recall/Memory Store**—switches the radio from the VFO to the memory mode. Hit the function key first though, and this same button will allow you to store any current VFO information—the operating frequency, the duplex value and direction, and CTCSS settings—into one of the 10 memories or the Call channel.

One in the Hand...

The microphone sports a conventional 4-row/4-column DTMF pad. As previously noted, these keys are used for generating DTMF tones only. Frequency or memory channel numbers can not be directly input from this keypad. A slide switch is provided that can disable these keys to prevent accidental DTMF trans-

mission during normal voice operation. None of the keys on the microphone are backlit.

Located just above this keypad is a row of four radio control keys. From left to right, these are **F/MHz**, **CALL/STEP**, **SCAN/PRI** and **LOCK/SHIFT**.

Pressing the **Function/MHz** button will evoke the secondary assignments of the other control buttons in this group and those on the front panel. While the radio is in the function mode (this state is indicated by a **FUNC** icon that appears in the display) the main tuning knob and **UP/DN** buttons located on the top of the microphone will allow VFO frequency excursions in 1-MHz increments. Touching the PTT button while in the function mode will toggle the radio between the 10 W and 25 W RF power output levels.

Press and hold the **F/MHz** button for a second or two and the squelch will open. This is handy for checking for weak signals that may be below the setting of the rotary squelch control or for signals that are obscured by a CTCSS tone squelch setting.

The **CALL/STEP** key provides one-touch access to the Call channel. The factory default frequency setting is 146.52 MHz, but the Call channel can be repro-

essentials, but—needless to say—not everyone will be content with their choices.

Folks who like to use the expanded receive coverage of an amateur transceiver for monitoring public service and commercial communications will no doubt whine about the limited number of available memory channels and the lack of a memory channel lockout capability. For my mobile radio shack, I prefer to use a separate dedicated multiband scanning receiver. This leaves my transceiver free for instant (and *simultaneous*) 2-way ham communications.

The expanded receive range, in spite of the limited number of memories, is still handy for *casual* non-amateur listening though—such as for checking a NOAA Weather Broadcast or for listening in on a couple of the local VHF police, fire or emergency medical service frequencies.

Others may be concerned that being restricted to 25 W of maximum RF power output might seriously degrade their effective range. I found that this power level is more than sufficient for my typical communications needs. As most of us know, reducing a transmitter's power from 50 to 25 W only results in a signal strength decrease of about $1/2$ of an S unit at a distant receiver. This slight reduction is rarely enough to make a substantial difference in the range of typical FM communications. Pairing this rig with an antenna that provides some gain—such as a $5/8$ - λ as opposed to a $1/4$ - λ mobile antenna—could help compensate for this “shortcoming.”

An *advantage* of the lower RF power output is the associated reduction in the current requirements. The *Specifications* table in the *Owner's Manual* lists the current needed for 25 W operation as 5 A. This is within the range of what's available from most vehicle cigarette lighter sockets (please refer to your vehicle owner's manual). If you prefer not to have to run dc lines through the firewall and directly to the vehicle's battery, you *may* be able to simply install a cigarette lighter plug on the end of the dc power cord, plug it in, and play. Be aware however, that direct battery connection often alleviates problems with RFI and ignition interference.

While we're on the subject of dc power connection... the power cord that's supplied with the HTX-252 is fused near the *radio* end of the cable. Those making direct connections to the battery terminals (as I did) should fuse the *battery* end of the cable. Otherwise, if the positive lead's insulation is compromised anywhere between the battery terminal and the included fuse holder, and that conductor shorts to ground, the wire will light up like the element inside a toaster! This, my

friends, is *not* a good thing.

If you've got packet or APRS applications in mind, you'll be presented with a couple of challenges. The first is programming. You'll want to set your operating parameters—such as the frequency and the power level—*before* you disconnect the hand microphone and connect your radio-to-TNC cable to the 8-pin mike jack. Obviously, the control functions that are accessed from the microphone buttons will not be available once you've unplugged it.

The second challenge is determining the microphone pin configuration for making up an interconnect cable. Unfortunately, RadioShack neglected to include this information in the *Owner's Manual*.

Setting Up Shop

Installation of this transceiver in my Subaru Outback went fairly smoothly, although I must admit that I had to resort to asking a mechanic at my car dealership for his help in locating the fasteners that hold down the center console.

I was able to mount the radio in an existing cubbyhole, but this did require pulling out the console and cutting the back wall out of that compartment. I needed to open up enough space to allow air to freely circulate around the heatsink fins.

I won't go into the specific details of my antenna and dc power cable installations. Needless to say, every vehicle, antenna system and radio mounting configuration will present a unique set of considerations.

Once I had completed my installation, it was time to load the memories. I found the HTX-252 very easy to program. This is not to say that you won't need to refer to the manual initially—you probably will. Once you use the radio for a little while though, you'll be amazed with how quickly you'll become familiar with its programming architecture.

The 39-page $4\frac{1}{4} \times 7$ -inch *Owner's Manual* is nicely organized and the programming instructions are simple to follow. A 3-page *Quick Look at the Controls* table is perhaps all that most moderately experienced operators will need to get up and running. About the only deficiencies that I could spot in the included documentation are the aforementioned lack of a microphone wiring diagram and the absence of a schematic.

On the Road and On the Air

What I like most about the HTX-252 (its small size notwithstanding) is its ease of operation. This radio's designers did a commendable job of selecting which control buttons to mount on the front panel and which to locate on the microphone.

The more commonly needed control operations are readily available from the microphone—a tremendous convenience when operating while underway.

Ergonomically, the only gripe I can come up with is related to the volume and squelch controls. I would have preferred larger knobs and wider spacing, but there is enough “drag” in their action to prevent inadvertent rotation of one while adjusting the other.

Reports from the locals on the quality of the HTX-252's transmit audio have ranged from “very good” to “excellent.” Pre-installation checks on my test bench of the available volume level and sound quality using the built-in speaker indicated that these should fit the requirements of most vehicle environments, but my final “cubbyhole” mobile installation necessitated the use of an external speaker. The audio from that speaker sounds marvelous.

ARRL Lab data generated from tests of the HTX-252 that was purchased by HQ (see [Table 2](#)) points toward good overall performance.

The FM sensitivity; the 10-MHz offset two-tone, third-order IMD dynamic range; and the first IF rejection numbers all compare quite favorably with those posted by other recently-reviewed VHF FM mobile transceivers. The image rejection figure however, does fall considerably short of the running average for this measurement, but it still easily meets RadioShack's published specification.

Wrap it Up (I'll Take It)

The convenience of having a VHF amateur transceiver permanently available in your vehicle and the capabilities it can offer, especially in an emergency situation, far outweigh the minor hassles you may run into when initially setting up your mobile system.

The RadioShack HTX-252 is a definite “winner” in my book. This rig has just enough features to be really useful but not so many that you have to spend the better part of an afternoon consulting the manual trying to figure out how to change a basic setting.

With the ever-shrinking amount of unoccupied space in today's vehicle interiors, the HTX-252 will surely find a ready market among those of us who really want to install a permanent mobile FM rig in the car, but can't figure out where the blazes to put it.

Manufacturer: RadioShack Corp, Fort Worth, TX 76102; 800-842-7422; fax 718-415-2303; www.radioshack.com.

Manufacturer's suggested retail price, \$179.95. *Typical current street price,* \$179.95.

