Product Review Column from *QST* Magazine

July 1995

QST Compares: Dual-Band Hand-Held FM Transceivers
(Alinco DJ-582T; ICOM IC-Z1A; Kenwood TH-79A(D); Standard C-568A; Yaesu FT-51R)

Yaesu FT-11/41/51R ADMS-1 Programming Kit

QST Compares: Dual-Band Hand-Held FM Transceivers

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The title of this review is slightly misleading. We actually compared four top-of-the-line dual-band H-Ts—Alinco's DJ-582T; ICOM's IC-Z1A; Kenwood's TH-79A(D) and Yaesu's FT-51R—and one *tribander*, Standard's C568A. Each of the radios reviewed here offers FM operation on the 2-meter (144-148 MHz) and 70-cm (440-450 MHz) bands. The Standard C568A adds limited 23-cm (1240-1300 MHz) capability as well. As shown in Table 1, these versatile radios offer a host of features and can be the basic building block for a portable, mobile or home station.

By taking a glance at Table 1 and the specification tables, you'll learn something important: For the most part, the H-Ts reviewed here offer the same basic features. For example, all offer features to conserve battery power and at least three transmitter power levels ranging from several watts down to milliwatts. All offer sensitive, wide-coverage (some wider than others) receivers. All have CTCSS encoders, DTMF paging, crossband repeat/full duplex capability, and elaborate memory/scanning features built in.

Notice the predominance of the word "Yes" as you read across Table 1. Of course, you'll see a sprinkling of "Nos" and they may be worth your attention if you can't live without those particular bells and whistles. Don't forget to check the ARRL Lab results against the published specifications, too.

As is our practice, we purchased the radios from dealer stock. After the ARRL Lab checked the published specifications against actual performance, the rigs were turned over to our Headquarters review team: Brian Battles, WS1O, *QST* Features Editor; Jay Mabey, NUØX, *Repeater Directory* Editor; Pete Budnik, KB1HY, Educational Assistant; and myself. Here are our observations.

Alinco DJ-582T

When you pick up the Alinco DJ-582T, your eyes go directly to the oversized **VHF** and **UHF** buttons just below the LCD display. Even if it's the first dual-band radio you've ever owned, you'll know how to switch from 2 meters to 70 centimeters right away! There are also separate—and obvious—**VOLUME** and **SQUELCH** controls for each band. This forthright design will likely win the hearts of new hams in particular. It certainly impressed us.

The DJ-582T isn't loaded to the hilt with features, but we considered this to be one of its *strong* points. For example, most reviewers said they were able to program the radio immediately, without resorting to the manual. By examining the keypad and watching the display, you can indeed operate all the basic functions without extensive research.

Speaking of the manual, it's well designed and easy to read. In fact, the text is unusually conversational at times. When discussing the crossband repeater function, for example, one sentence reads, "Okay, you want to set up a crossband repeater? I hear you say, 'Right!'" Do you get the impression that the author was particularly

Table 1
Dual-Band Hand-Held Transceiver Features

Note: Standard features *only*—optional features requiring additional purchase are not considered.

	Alinco DJ-582T	*ICOM IC-Z1A*	*Kenwood TH-79A(D)*	*Standard C-568A*	*Yaesu FT-51R*
Total memory channels	42	104	82	40	80
Band, memory and programmed scan?	Yes	Yes	Yes	Yes	Yes
Auto battery-save mode?	Yes	Yes	Yes	Yes	Yes
Auto power off?	Yes	Yes	Yes	Yes	Yes
Standard battery	7.2 V @ 700 mAh	4.8 V @ 700 mAh*	6 V @ 600 mAh	7.2 V @ 700 mAh	4.8 V @ 600 mAh
Maximum output power with standard battery: 2 meters (ARRL Lab test)	3.5 W	1.8 W	3.2 W	3.2 W	2.4 W
70 cm (ARRL Lab test)	2.3 W	1.6 W	2.5 W	3.6 W	1.4 W
Auto repeater offset?	No	Yes	Yes	Yes	Yes
DTMF paging?	Yes	Yes	Yes	Yes	Yes
CTCSS (subaudible) encoder?	Yes	Yes	Yes	Yes	Yes
CTCSS decoder?	Yes	Yes	Yes	Yes	Yes
Crossband full duplex?	Yes	Yes	Yes	Yes	Yes
Crossband repeat?	Yes	Yes	Yes	Yes	Yes
AM aircraft receive?	Yes	No	Yes	Yes	Yes
Dimensions (H/W/D) with standard battery (inches)	5.6×2.3×1.3	4.9×2.2×1.4	5.1×2.2×0.9	5.3×1.8×1.4	4.9×2.3×1
Weight with standard battery (oz)	14.3	13.4	11.5	13.75	11.5
Suggested retail price**	$499	$715	$630	$690	$609
Typical selling price***	$405	$500	$490	$585	$485

*The review unit was equipped with a BP-171 4.8-V battery. ICOM reports that the IC-Z1A is currently being shipped with a BP-180 7.2-V, 600 mAh battery.
**The suggested retail prices shown were current as of May 22, 1995.
***The typical selling prices shown were current as of May 22, 1995, and do not include coupons or special promotions. Check with your favorite dealer for current pricing.

Alinco DJ-582T, serial no. T000812

Manufacturer's Specifications	*Measured in ARRL Lab*
Frequency coverage: Receive, 108-143 MHz (AM); 130-174 and 420-470 MHz (FM); transmit, 144-148 and 438-450 MHz.	As specified. Receive coverage extends down to 400 MHz and up to approximately 483 MHz with reduced sensitivity.
Receiver	*Receiver Dynamic Testing*
Sensitivity: Better than −16 dBμV (0.16 μV) for 12 dB SINAD.	For 12 dB SINAD: 146 MHz, 0.14 μV; 440 MHz, 0.16 μV. AM: 0.89 μV for 10 dB (S+N)/N.
Two-tone, third-order IMD dynamic range: Not specified.	20 kHz offset from 146 MHz, 63 dB; 20 kHz offset from 440 MHz, 61 dB; 10 MHz offset from 146 MHz, 72 dB.
Adjacent-channel rejection: Not specified.	20 kHz offset from 146 MHz, 62 dB; 20 kHz offset from 440 MHz, 58 dB.
IF rejection: Not specified.	146 MHz: ≥87 dB; 440 MHz: ≥124 dB.
Image rejection: Not specified.	146 MHz: ≥66 dB; 440 MHz: ≥55 dB.
Squelch sensitivity: Not specified.	0.08 μV at threshold.
Audio output: 250 mW at 10% THD into 8 Ω.	210 mW at 10% THD into 8 Ω with standard battery.
Transmitter	*Transmitter Dynamic Testing*
Power output with standard battery: ≈2 W.	146 MHz: 3.5 / 1.6 / 0.5 W; 440 MHz: 2.3 / 1.1 / 0.3 W.
Maximum power output with 13.8 V dc external supply or optional battery pack: ≈5 W with EBP-28N (12 V) battery.	With 13.8 V supply: 146 MHz, 5.2 W; 440 MHz, 4.7 W.
Spurious signal and harmonic suppression: −60 dB or better.	As specified. The DJ-582T meets FCC requirements for spectral purity for transmitters in its power class and frequency range.
Transmit-receive turnaround time (PTT release to 50% of full audio output): Not specified.	146 MHz: Squelch on, 150 ms; off, 130 ms. 440 MHz: Squelch on, 100 ms; off, 80 ms.

excited about this aspect of the DJ-582T?

The DJ-582T tosses in a couple of innovative goodies. Do you want to operate at a reduced power level? On most H-Ts you must do this from the **PROGRAM** mode. With the DJ-582T, you simply press the lower portion of the PTT switch when you speak. That's the "low-power" PTT. Press the middle of the switch and you're transmitting at high power. What could be easier?

If you use stereo headphones, plug into the jack on the far left and you'll get UHF in one ear and VHF in another. You can also attach stereo speakers to this jack. The manual warns you not to insert a mono plug into the jack. Apparently this will short circuit the UHF audio.

An AM aircraft receiver is provided as part of the DJ-582T's extended receive coverage. Although it isn't stunningly sensitive, it's more than adequate for casual monitoring. Another nice touch is the battery charger. It's actually a charger *stand*. This makes it easy to simply pop your DJ-582T into the stand and let it charge overnight. The Yaesu FT-51R also comes with a charger stand, but the other radios use plug-in chargers.

The DJ-582T includes the usual DTMF and CTCSS encoding and decoding functions. A memory autodialer makes using a repeater autopatch a breeze. Several scanning options are available, along with the ability to change the "direction" of the scan at will. Simply twist the VFO knob clockwise or counterclockwise and you instantly reverse the scan direction.

The DJ-582T lacks the automatic repeater offset function found in other H-Ts. This function is a valuable convenience because it automatically selects the transmit frequency according to the receive frequency. Some new repeater users consider auto offset to be a must-have feature, although veteran operators may not miss it as much.

ICOM IC-Z1A

This handheld received praise for effortless programming. You can program a memory channel for your favorite repeater in about 30 seconds once you get the knack of it. Other functions were nearly as simple to program and operate.

With its flexible DTMF paging function, not only can you page other stations, you can send brief messages as well. The message could be as simple as your call sign, or perhaps something more informative ("Come home"). Of course, this message/paging function works only if your friend owns an H-T that is compatible with the IC-Z1A.

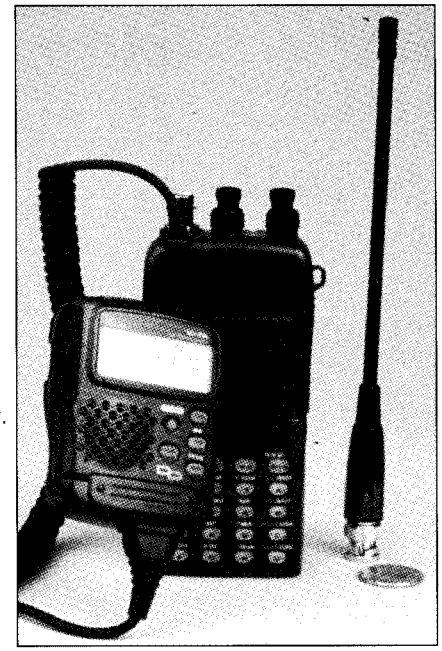
The LCD display is readable in most lighting conditions. There is a program function that will allow you to select from several levels of contrast. The IC-Z1A display even includes a clock!

Probably the biggest selling point of the ICOM IC-Z1A is its detachable front panel. You'll never have to purchase a remote speaker-mike for your IC-Z1A. (Speaker-mikes are usually expensive options.) The entire front panel—including the speaker, LCD display and keypad—can be removed and converted to a speaker-microphone in seconds! (A plastic shield snaps into place to cover the area formerly occupied by the controls.) Every control is at your fingertips while the rest of the radio is safely tucked away on your belt, under the car seat or wherever. (It is important to note that the "sister" unit of the IC-Z1A, the IC-W31A, is virtually identical except that it is slimmer and it does *not* offer the detachable front panel. The W31A carries a list price about $200 less than the Z1A and typically sells for about $80 less.)

Because the tiny speaker is housed in the detachable section, there is virtually no acoustic baffling. (Even a small H-T case offers *some* baffling.) The result is tinny audio, according to the review team. As the volume is increased to overcome local noise—in a car, for example—the audio becomes markedly distorted. If you plan to use the IC-Z1A as your mobile radio, consider using an external speaker. (An exter-

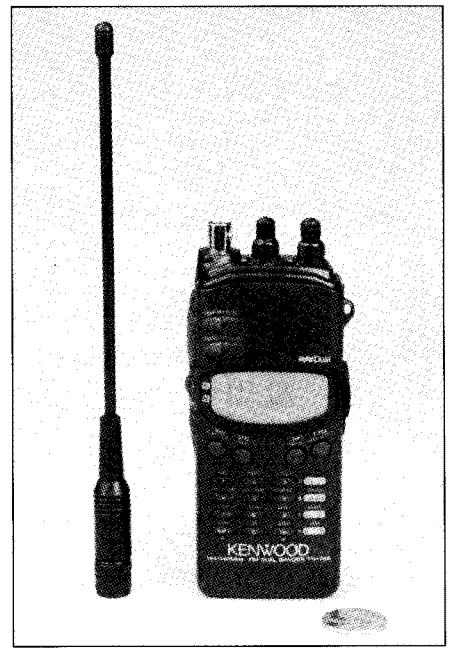
ICOM IC-Z1A, serial no. 01147

Manufacturer's Specifications	*Measured in ARRL Lab*
Frequency coverage: Receive, 136-174 and 400-470 MHz; transmit, 144-148 and 440-450 MHz.	As specified.
Receiver	*Receiver Dynamic Testing*
Sensitivity: Better than 0.16 μV for 12 dB SINAD.	For 12 dB SINAD: 146 MHz, 0.15 μV; 440 MHz, 0.16 μV.
Two-tone, third-order IMD dynamic range: Not specified.	20 kHz offset from 146 MHz, 60 dB; 20 kHz offset from 440 MHz, 60 dB; 10 MHz offset from 146 MHz, 78 dB.
Adjacent-channel rejection: Not specified.	20 kHz offset from 146 MHz, 63 dB; 20 kHz offset from 440 MHz, 61 dB.
IF rejection: Not specified.	146 MHz: ≥94 dB; 440 MHz: ≥107 dB.
Image rejection: More than 60 dB (more than 45 dB at the 2nd IF).	146 MHz: ≥80 dB; 440 MHz: ≥69 dB.
Squelch sensitivity: Less than 0.16 μV at threshold.	0.11 μV at threshold.
Audio output: More than 180 mW at 10% distortion with an 8 Ω load at 13.5 V.	190 mW at 6% THD into 8 Ω at 13.8 V; 75 mW at 5% THD with BP-171 4.8 V battery.
Transmitter	*Transmitter Dynamic Testing*
Power output with standard battery: Not specified.	146 MHz: 1.8 / 0.5 / 0.02 W (4.8 V battery); 440 MHz: 1.6 / 0.6 / 0.03 W (4.8 V battery).
Maximum power output with 13.8 V dc external supply or optional battery pack: 5 W with 13.5 V power supply.	With 13.8 V supply: 146 MHz, 5.2 W; 440 MHz, 4.9 W.
Spurious signal and harmonic suppression: Not specified.	Better than –60 dBc. The IC-Z1A meets FCC requirements for spectral purity for transmitters in its power class and frequency range.
Transmit-receive turnaround time (PTT release to 50% of full audio output): Not specified.	146 MHz: Squelch on or off, 160 ms; 440 MHz: Squelch on or off, 160 ms.



Kenwood TH-79A(D), serial no. 60802510

Manufacturer's Specifications	*Measured in ARRL Lab*
Frequency coverage: 144-148 and 438-450 MHz.	Receive: 118-136 MHz (AM); 136-174 MHz and 438-450 MHz (FM). Transmit: 144-148 and 438-450 MHz.
Receiver	*Receiver Dynamic Testing*
Sensitivity: For 12 dB SINAD: 146 MHz, 0.16 μV or less; 440 MHz, 0.18 μV or less.	For 12 dB SINAD: 146 MHz, 0.14 μV; 440 MHz, 0.16 μV. AM: 0.47 μV for 10 dB (S+N)/N.
Two-tone, third-order IMD dynamic range: Not specified.	20 kHz offset from 146 MHz, 62 dB; 20 kHz offset from 440 MHz, 67 dB; 10 MHz offset from 146 MHz, 85 dB.
Adjacent-channel rejection: Not specified.	20 kHz offset from 146 MHz, 56 dB; 20 kHz offset from 440 MHz, 53 dB.
IF rejection: Not specified.	146 MHz: ≥95 dB; 440 MHz: ≥104 dB.
Image rejection: Not specified.	146 MHz: ≥79 dB; 440 MHz: ≥72 dB.
Squelch sensitivity: 0.1 μV or less.	At threshold: 146 MHz, 0.11 μV; 440 MHz, 0.08 μV.
Audio output: 200 mW or higher (10% distortion, 8 Ω load).	211 mW at 10% THD into 8 Ω with standard battery.
Transmitter	*Transmitter Dynamic Testing*
Power output with standard battery: HI setting: 146 MHz, ≈2.7 W; 440 MHz, ≈2 W. LO, ≈0.5 W; EL, ≈0.03 W.	146 MHz: 3.2 / 0.4 / 0.03 W; 440 MHz: 2.5 / 0.2 / 0.03 W.
Maximum power output with 13.8 V dc external supply or optional battery pack: ≈5 W with 13.8 V supply or optional 9.6 V battery.	With 13.8 V supply: 146 MHz, 6.4 W; 440 MHz, 5.4 W.
Spurious signal and harmonic suppression: –60 dB or less.	As specified. The TH-79AD meets FCC requirements for spectral purity for transmitters in its power class and frequency range.
Transmit-receive turnaround time (PTT release to 50% of full audio output): Not specified.	146 MHz: Squelch on or off, 205 ms. 440 MHz: Squelch on or off, 205 ms.



nal speaker is a good addition to any mobile installation built around an H-T. —*Ed.*)

The IC-Z1A is a joy to operate, with one exception—the **VOLUME** control. Tweaking the volume isn't as simple as twisting a knob. You must press a button *first*. Unless you've configured the button for an automatic five-second latch, you may even be required to press and hold the button *while turning the volume control*. The reviewers found this highly annoying. One reviewer described an incident where he was in a grocery store when his IC-Z1A began blaring a conversation on the local repeater. As other shoppers turned and stared, he fumbled desperately with the H-T in an attempt to reduce the volume. After about 15 seconds of frustration, he simply turned the radio off.

Kenwood TH-79A(D)

The TH-79A(D)'s approach to programming is largely intuitive, and that's an advantage when you're trying to become acquainted. Jumping from memory channels to VFO (and back) is as simple as pressing a single button. The same is true for hopping from 2 meters to 70 cm, or vice versa. When you're in the memory mode, twisting a single knob will step you through the channels. The same knob functions as a freewheeling frequency control when in the VFO mode.

If you forget how to use a specific feature, the "guide" function is ready to assist. Simply press the **F** key followed by the **GUIDE** button. By rotating the **ENC** knob, you're presented with a list of functions. Each is described with text flowing from right to left across the display, Thanks to Kenwood's unique dot-matrix LCD, the scrolling instructions are easy to read.

After you've programmed the TH-79A(D), you can share the contents of the memory channels with other TH-79s through a *wireless* cloning feature. In fact, one TH-79AD can upload data to several others *at once!*

Several team members commented favorably on the multipurpose timer functions. A battery-saving mode shuts down many of the energy-intensive functions if the radio is not used after 10 seconds. The time-out timer answers the prayers of many long-winded hams. If your favorite repeater drops out after, say, three minutes of continuous babble, you can program the timer to cut you off well before then. (The TH-79A(D) simply drops back to the receive mode.) Finally, the TH-79A(D)

Standard C568A, serial no. 53U010093

Manufacturer's Specifications	***Measured in ARRL Lab***
Frequency coverage: 144-148, 438-450 and 1240-1300 MHz.	Receive: 100-200 MHz, 310-400, 400-500, 800-976 MHz (cellular phone frequencies locked out) and 1200-1300 MHz. The C568A exhibits reduced sensitivity near the edges of these ranges. Transmit: 144-148, 438-450 and 1240-1300 MHz.
Receiver	*Receiver Dynamic Testing**
Sensitivity: 146 MHz, 0.16 μV; 440 MHz, 0.18 μV (L) and 0.16 μV (R); 1240 MHz, 0.28 μV.	For 12 dB SINAD: 146 MHz, 0.14 μV (L) and 0.22 μV (R); 440 MHz, 0.18 μV; 1240 MHz, 0.32 μV. AM: 0.54 μV for 10 dB (S+N)/N.
Two-tone, third-order IMD dynamic range: Not specified.	20 kHz offset from 146 MHz, 66 dB; 20 kHz offset from 440 MHz, 66 dB (L), 61 dB (R); 10 MHz offset from 146 MHz, 76 dB (L), 65 dB (R).
Adjacent-channel rejection: Not specified.	20 kHz offset from 146 MHz, 58 dB; 20 kHz offset from 440 MHz, 51 dB (L), 55 dB (R).
IF rejection: Not specified.	146 MHz: ≥91 dB (L), ≥83 dB (R); 440 MHz: ≥91 dB (L), ≥98 dB (R); 1240 MHz: ≥76 dB.
Image rejection: Not specified.	146 MHz: ≥70 dB (L), ≥52 dB (R); 440 MHz: ≥23 dB (L), ≥65 dB (R); 1240 MHz: See text.
Squelch sensitivity: 0.1 μV.	0.06 to 0.17 μV at threshold depending on band and receiver "side."
Audio output: 250 mW (10% distortion, 8 Ω).	238 mW at 10% THD into 8 Ω with standard battery.
Transmitter	*Transmitter Dynamic Testing*
Power output with standard battery: 146 and 440 MHz, Hi ≈2.6 W; Mid ≈2.5 W; Low, ≈0.35 W;EL, ≈0.05 W. 1240 MHz (EL only), ≈0.035 W.	146 MHz: 3.2 / 2.4 / 0.4 / 0.07 W; 440 MHz: 3.6 / 2.0 / 0.3 / 0.06 W; 1240 MHz: 0.05 W.
Maximum power output with 13.8 V dc external supply or optional battery pack: ≈5 W with 13.8 V supply or optional 9.6 V battery.	With 13.8 V supply: 146 MHz, 5.4 W; 440 MHz, 4.7 W; 1240 MHz, 0.05 W.
Spurious signal and harmonic suppression: –60 dB or better.	As specified, except –42 dB at 1270 MHz. The C568A meets FCC requirements for spectral purity for transmitters in its power class and frequency range.
Transmit-receive turnaround time (PTT release to 50% of full audio output): Not specified.	160 ms (L); 170 ms (R), squelch on or off, all bands.

*Note: The C568A has two receivers that use separate (and different) IFs for 146 and 440 MHz. Standard refers to these as the "left" and "right" side of the display. We measured receiver performance on both "sides." If performance differs by less than 3 dB, we report only the worst-case number. If performance differs by 3 dB or more, we report both left (L) and right (R).

offers a timer that shuts down the radio completely if it hasn't been used for one hour. All of these timers are programmable, or they can be disabled altogether.

One interesting feature of the TH-79A(D) is not mentioned in the manual, although it is mentioned in the advertising: AM aircraft receive capability. As it turns out, the TH-79A(D) has a hot aircraft receiver. Team members enjoyed listening to airliners in contact with Boston Center, or on approach to Bradley International Airport near Hartford, Connecticut.

The TH-79A(D) was judged awkward in only one respect: the operation of the squelch. There is no squelch control on the TH-79A(D) in the traditional sense (a knob). Instead, you must select among several the squelch *levels* by bringing up the appropriate program menu. Most team members didn't find it too objectionable, but it might drive you up the wall if you're the type who often fiddles with the squelch.

Standard C568A

This is a dual-band H-T with something extra—1.2 GHz coverage! In this sense, the C568A is really a tribander. Standard also offers the C558A 2-m/70-cm transceiver, which we reviewed in our last dual-band H-T roundup (see March 1994 *QST*, pages 71-76). The C558A lists for about $25 less than the C568A reviewed here.

The C568A is designed for maximum wear and tear. Several reviewers commented on its ruggedness. All controls are clearly labeled with sufficient spacing for even the largest fingers. Independent **VOLUME** and **SQUELCH** knobs were a welcome sight. The LCD display is clear under all lighting conditions and the backlight function is particularly well engineered. (It's a *bright* backlight, not the sickly dim green you often see.)

As shown in the specifications table, the C568A has incredible receive coverage. There are plenty of scanners on the market with less! A programmable AM detector is included for aircraft monitoring. The C568A incorporates two receivers (called "left" and "right") that use separate (and different) IFs.

ARRL Lab testing found significant differences in the performances of the two receivers. In general, the left receiver works better on 2 meters; the right receiver works better on 70 cm. In normal use as a dual-band radio, this is exactly how the user would program the radio.

The Standard design has achieved a good balance between cost and performance, concentrating performance where the user needs it. On each band, the second receiver is quite functional, but it is apparent that the engineering effort is concentrated on the primary receiver for each band. (The alternative would be a more expensive radio, so this should be considered in that context.)

There was a surprise on 1.2 GHz, though—the image response was actually 2.8 dB stronger than the desired response! The wide receiver frequency coverage necessitates a broadband receiver front end (or expensive designs such as tracking filters). The first IFs of the receivers are 21.8 MHz for the left receiver and 23.05 MHz for the right. With this combination, the image frequency is within the designed passband of the receiver; it is not surprising that the receiver hears them both about the same. This could be corrected with a more expensive design, but it is probably not worth the cost for a band that has been added as an "extra." In real-world use, the image response may not pose a problem. If there is no signal on the image frequency, there is nothing to hear, and the unit would work just fine.

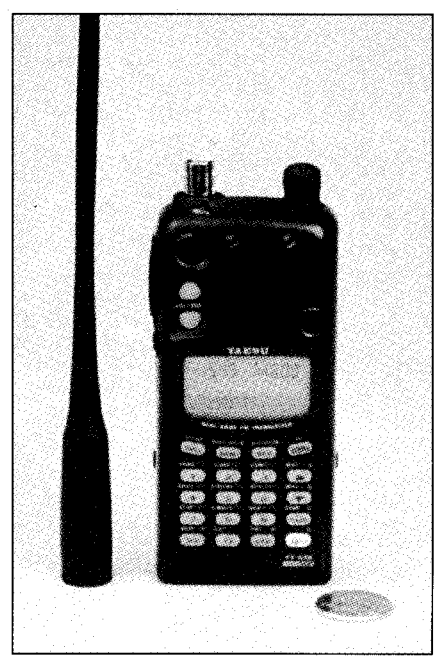
With more than 3 W output on 2 meters and 70 centimeters, the C568A has sufficient power for most applications. The RF output on 1.2 GHz, however, is rated at only 35 *mW*. Unless the repeater you're using is extraordinarily sensitive (or extremely close), 35 mW may not be very effective on this band. If you need reliable coverage on 1.2 GHz with the C568A, you're going to need an amplifier. The alternative is a directional antenna connected to the C568A via low-loss coax or Hardline. Although we were unable to test the C568A on a local 1.2-GHz repeater, we did use it on simplex.

The bottom line on the C568A's 1.2 GHz coverage is that you're getting an extra band for no additional cost. Most users will appreciate the opportunity to try this band. It's a fair bargain!

The C568A offers an outstanding list of features including 40 memories, CTCSS encoding *and* decoding, a handy paging system, DTMF squelch, a battery-saving

Yaesu FT-51R, serial no. 4M032449

Manufacturer's Specifications	***Measured in ARRL Lab***
Frequency coverage: Receive, 110-180 and 420-470 MHz; transmit 144-148 and 430-450 MHz.	Receive: 110-137 MHz (AM); 137-180 MHz and 420-470 MHz (FM). Transmit: 144-148 and 430-450 MHz.
Receiver	*Receiver Dynamic Testing*
Sensitivity: For 12 dB SINAD: VHF, <0.158 μV; UHF, <0.18 μV.	For 12 dB SINAD: 146 MHz, 0.15 μV; 440 MHz, 0.16 μV. AM: 0.43 μV for 10 dB (S+N)/N.
Two-tone, third-order IMD dynamic range: Not specified.	20 kHz offset from 146 MHz, 62 dB; 20 kHz offset from 440 MHz, 61 dB; 10 MHz offset from 146 MHz, 79 dB.
Adjacent-channel rejection: VHF, >65 dB; UHF, >60 dB.	20 kHz offset from 146 MHz, 66 dB; 20 kHz offset from 440 MHz, 58 dB.
IF rejection: Not specified.	146 MHz: ≥100 dB; 440 MHz: ≥133 dB.
Image rejection: Not specified.	146 MHz: ≥66 dB; 440 MHz: ≥62 dB.
Squelch sensitivity: Not specified.	0.18 μV at threshold.
Audio output: 200 mW at 8 Ω for 10% THD.	151 mW at 12.5% THD into 8 Ω with standard battery.
Transmitter	*Transmitter Dynamic Testing*
Power output with standard battery:, Hi setting: 146 MHz≈2 W; 440 MHz, ≈1.5 W. Low, ≈1.5 and 0.5 W; EL, ≈0.02 W.	146 MHz: 2.4 / 2.0 / 0.5 / 0.03 W; 440 MHz: 1.4 / 1.4 / 0.5 / 0.02 W.
Maximum power output with 12 V dc external supply or optional battery pack: ≈5 W.	With 12 V supply: 146 MHz, 5 W; 440 MHz, 4.2 W.
Spurious signal and harmonic suppression: –60 dB or less.	As specified. The FT-51R meets FCC requirements for spectral purity for transmitters in its power class and frequency range.
Transmit-receive turnaround time (PTT release to 50% of full audio output):	146 MHz: Squelch on or off, 125 ms. 440 MHz: Squelch on or off, 125 ms.



mode and automatic shutdown. Flexible scanning makes it easy to monitor the C568A's extensive receiving range. You can toggle between busy, pause or hold scanning within frequency limits that you program yourself. The same applies when you're scanning memory channels or even the entire receive range.

A number of users noted the C568A's excellent audio quality. Because of their small size, H-Ts don't often score well when it comes to receive audio. The C568A is an exception, providing ear-splitting sound with low distortion. This is important when you're operating in a noisy environment. Transmit audio was equally clean. Several stations commented on its "full-bodied" quality. The C568A wins the award as the most "musical" H-T. Single beeps and strings of beeps signal the use of virtually every function. Even when you turn the rig off you're rewarded with five rapid notes sliding downward in pitch!

Yaesu FT-51R

Yaesu's FT-51R is billed as a dual-band H-T with "windows." They're not talking about Microsoft *Windows,* although the ad headline wiggles that tantalizing word at you. No, they mean a split-display scheme that offers the usual numeric information in the top window while communicating additional data in the bottom window.

Most reviewers appreciated the "windows" features of the FT-51R. The help function was especially...well...*helpful*! If you attempt to use some functions incorrectly, a sentence describing the *right* way to do it scrolls from right to left through the lower window. The *Spectrascope* function also uses the lower window. Basically, Spectrascope allows you to watch for activity on nearby frequencies. Activity above and below the chosen frequency is indicated by the use of "o" and "0" ASCII characters. Signal strength is indicated as well.

Spectrascope works well. The only problem the review team encountered was figuring out a practical use for it. Some team members found that they could use it to monitor the activity of several repeaters simultaneously. However, this was a curiosity tool more than anything else.

You adjust volume on the FT-51R through the use of **UP/DOWN** pushbuttons. That's easy enough. Tweaking the squelch, however, is a little more involved. Like several other H-Ts we reviewed, the FT-51R opts to assign the squelch control to a secondary program function. That is, you must press the **F** key, then quickly use the **UP/DOWN** buttons—the same used to adjust volume—to set the squelch. And as with the other H-Ts, many reviewers missed having a dedicated squelch knob or similar control. The good news is that you can dedicate the **UP/DOWN** buttons to adjust the volume or squelch—your choice.

Other aspects of the FT-51R earned praise from the team. The battery voltage indicator, sensitive AM aircraft receiver, large keypad and crossband repeater operation were mentioned often. The FT-51R includes a number of scanning modes, plus a neat function that switches on the LCD backlight whenever the scan stops on an active frequency. One reviewer described how he used the FT-51R to scan a portion of the 2-meter band while lying in bed—in the dark. Every time the FT-51R stumbled upon a signal, the LCD display would glow so that he could see the frequency. Just what the leisurely ham needs!

Programming the FT-51R is relatively easy, considering its plethora of features. The manual is also a big help in this regard. If you have an IBM PC or compatible computer running Microsoft *Windows*, you can purchase software from Yaesu that makes it extremely simple to program the FT-51R using your mouse and keyboard. See our review of the Yaesu software package in this issue.

Summary

Hams often ask us "Okay, so which radio should I buy?" To make a purchase decision, you'll need to look beyond features and specifications. *All* of these rigs are quality products, but there are significant differences that could be critical to your satisfaction. Do you plan to use the H-T for mobile operation or public service work? Consider audio quality, size and RF output power. Are you confused by complicated programming? Pick an H-T that offers simple programming. Do you travel, or do you live in an area with lots of repeaters? Look for an H-T with a large memory capacity. Do you enjoy listening outside the amateur bands? Choose an H-T with wide receive coverage.

And before you reach for your checkbook or charge card, seek out other hams who own these radios and ask what *they* think. Using this review as your foundation, go fishing for more opinions and cast your net as far as possible. This kind of careful research runs counter to the urge for instant gratification, but you'll be happier in the long run!

Yaesu FT-11/41/51R ADMS-1 Programming Kit

By Steve Ford, WB8IMY
Assistant Managing Editor

If you've ever had to grapple with the task of programming a hand-held transceiver (H-T), you know how exasperating it can be. The instructions are often murky and the keypads are designed for impossibly small fingers. Wouldn't it be great if H-T programming was as simple as pointing and clicking a mouse cursor on a computer screen? Well, that day has finally arrived—at least if you own a Yaesu FT-11/41/51R series hand-held transceiver. I used the software with an FT-51R, but the comments apply to the FT-41 and FT-11 as well.

RT Systems, an authorized Yaesu dealer in Huntsville, Alabama, developed a software package that allowed a *Windows*-equipped PC to program *any* function of an FT-51. It worked so well that Yaesu purchased the rights to the product and began selling it as their own. I saw it in action for the first time at the 1995 Dayton Hamvention.

The software comes on a single 3.5-inch diskette. A programming cable is included with a prewired 1/4-inch, three-conductor plug and a DB-25 female connector. The DB-25 connector attaches to your PC's serial port and the three-conductor plug mates with the external speaker (earphone) jack on the H-T.

There are directories on the diskette for the different radios. I wanted to try the system on my FT-51, so I simply popped the disk into the drive and ran the FT-51 install program from the *Windows* Program Manager. The software installed in seconds and created its own icon and program group (see Figure 1). It was smooth sailing from there.

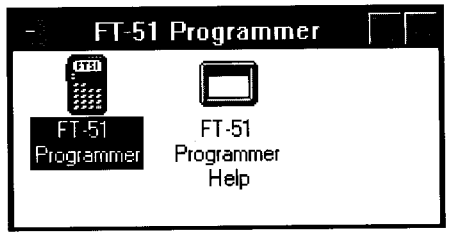


Figure 1—The Yaesu software installs quickly in *Windows* and creates its own program group.

The Clone Mode

The secret of the software's magic is the *clone* mode featured on the FT-51. The mode was originally designed to allow one H-T to swap memory contents with another. The data is sent and received as audio tones via the external speaker jack. It wasn't long before an ingenious programmer figured that it might be possible to send the tones to and from a *computer* instead. (If you can clone from H-T to H-T, why not H-T to PC?) With the proper program running on the PC in question, it should be possible to read the current settings of an FT-51 and change them at will. Indeed it is! That's where the software comes into play.

I entered the clone mode by turning on the FT-51 while holding down the **F/M** button on the keypad. Pressing the keypad

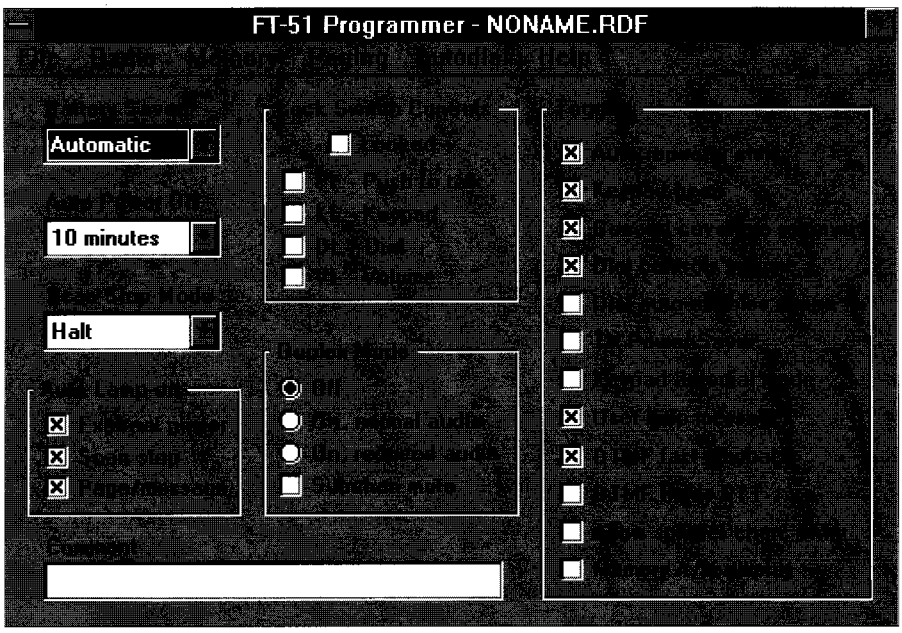


Figure 2—From this window you can program every function of a Yaesu FT-51 in minutes.

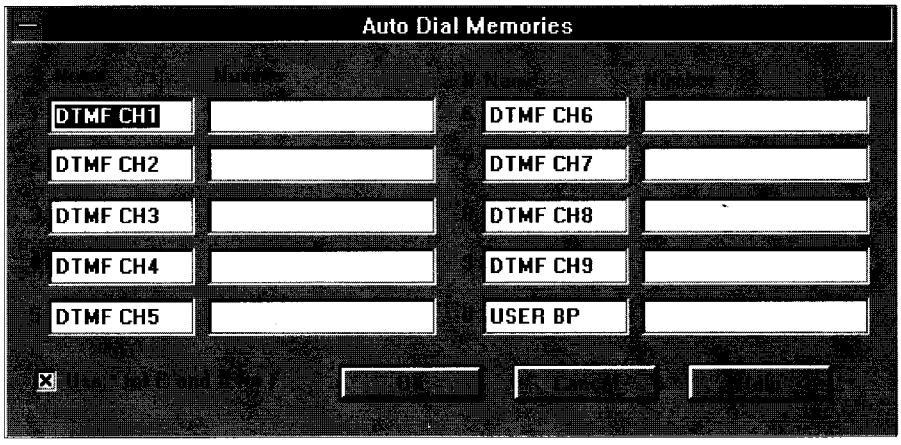


Figure 3—Entering telephone numbers for the FT-51 autodialer is as simple as selecting the field and taping the keys.

UP ARROW places the H-T in the data *send* mode. Pressing the **DOWN ARROW** toggles the data *receive* mode. I clicked the **RADIO** function on the main window (see Figure 2) and selected "Get data from . . ." Another window popped up to indicate that the software was ready to grab data from the H-T. I pressed the **UP ARROW** on the FT-51 keypad and away it went! Within five seconds the contents of my H-T's memories were displayed before my eyes.

Changes, Changes

It was like sitting before a lump of clay on a potter's wheel. I could change anything I wanted, shaping my H-T to be even more useful than it was before. I never bothered using many of the FT-51's features because they were too much trouble to program. With the Yaesu software, however, I simply made my choices and the computer did the rest.

For example, I jumped to the window that programs telephone numbers for the autopatch autodialer (see Figure 3). It was simple in the extreme! I merely entered the telephone numbers I desired, jumping from field to field as I went.

Programming transmit/receive frequency and CTCSS memories is just as easy. You can fill the FT-51's channel memories with just a few minutes at your PC keyboard.

When I decided I was finished, I powered up the FT-51 in the clone mode again. This time I toggled the **DOWN ARROW** to enter the data receive function. Seconds later the Yaesu software had loaded the new data into the rig. My FT-51 was ready for action!

Saving Multiple Configurations

As I exited the software, I was prompted to save the settings I had just selected. Why not? If the FT-51 ever suffered a memory wipe, I could simply reload the program from my PC.

This would be a boon to traveling hams. Imagine being able to preprogram your H-T before you ever left home. You could sit down with a copy of the *ARRL Repeater Directory* and create a file that contained the frequencies, CTCSS tones and so on for the repeaters at your destination. Load the settings into your H-T and you're all set. If you traveled to the same cities often, you could have several files with names like "newyork," "dayton," "seattle," or whatever. Each file would contain the configuration for the repeaters in those cities. Just load and go!

And think of how hospitable you could be to visiting hams. If they own an FT-51, FT-41 or FT-11, you could offer to instantly update their rigs for the repeaters in your area.

Conclusion

It isn't often that I can recommend a product without at least some qualification. This is the exception. If you own a Yaesu FT-51, FT-41 or FT-11, and a PC with *Windows*, buy the Yaesu programming kit. You'll get more use out of your H-T than you ever thought possible because you'll have easy access to *every* feature. If you can click a mouse, you can program even the most complex functions.

FM-active hams need more H-Ts with data-cloning capability, and software like this to work with them. Perhaps the success of the Yaesu package will encourage other manufacturers to equip all H-Ts for remote, PC-based programming. Who knows? It could be the opening salvo in a revolution of user-friendly H-Ts!

Manufacturer: Yaesu USA, 17210 Edwards Rd, Cerritos, CA 90703, tel 310-404-2700. Suggested list price: $39.

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New Products

HIGH SIERRA HF MOBILE ANTENNA KIT

◊ High Sierra Antennas has announced that their popular HS-101 all-band HF mobile antenna is now available in kit form. The kit sells for $193 (shipping included in the continental US).

The HS-101 kit uses machined parts throughout, connectors on major assemblies, and heavy-duty stainless-steel hardware. No soldering is required, although previous kit building experience is recommended.

For more information, contact High Sierra Antennas, Box 2389, Nevada City, CA 95959, tel 916-273-3415, fax 916-273-7561.

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