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Alinco DJ-VX50T VHF/UHF Handheld Transceiver

ICOM AH-705 Antenna Tuner

mAT-705 Antenna Tuner

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Product Review

Alinco DJ-VX50T VHF/UHF Hand-held Transceiver

Reviewed by Steve Ford, WB8IMY
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The Alinco DJ-VX50T is a dual-band (2-meter and 70-centimeter) FM transceiver that is designed to be a serious contender in the lower-cost handheld market. It sets itself apart from the competition in several ways, beginning with its rugged construction. The radio is housed in a dense ABS plastic case with a textured surface to minimize slippage. With the 1,800 mAh Li-ion battery attached, the DJ-VX50T has a hefty, almost heavy feel.

As I examined the exterior, I noticed the external microphone and speaker ports were covered by a shield that you can only open by removing a screw. The robust shield is sealed with a gasket and present because the DJ-VX50T is water- and dustproof, carrying an Ingress Protection (IP) rating of 67. The first number designates protection against solid objects, such as dust and sand. This number can range from 0, meaning no protection, to 6, meaning 100% protection. The second number rates protection against liquids. It ranges from 0 to 8. So, the DJ-VX50T is 100% protected against solid objects, and it has been tested to work after being immersed under a meter of water, which earns the 7 — not completely waterproof, but close. I couldn't bring myself to dunk the radio in a bucket to verify the rating; I'll take Alinco's word for it.

The DJ-VX50T is supplied with the usual flexible rubber antenna and a stand-up battery charger. The charger is well designed and highly convenient. To charge the battery, just place it into the charging cradle. After a few hours — four at most — you're good to go. During the time I was using the DJ-VX50T, a full charge seemed adequate for about 24 hours of normal operating that included a lot of listening time. Of course, the battery life depends greatly on how much transmitting you are doing.



Bottom Line
The Alinco DJ-VX50T represents an excellent value for an entry-level dual-band analog FM handheld.

Exploring the DJ-VX50T

I think the first thing most amateurs do when they encounter a new handheld transceiver is turn it on. To do so, they go searching for the **POWER** button, which is often on the side or front of the radio. On the DJ-VX50T the power on/off function is part of the volume knob. You just give the knob a twist and the 1¼ × ½ inch amber display lights up (there are two other selectable color settings). While the display shown in Figure 1 isn't overly large, I found it easy to read under all lighting conditions.

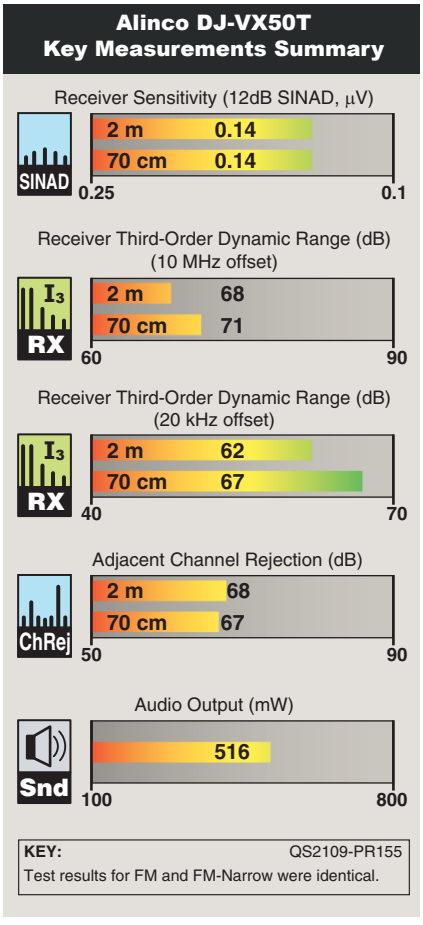


Table 1
Alinco, DJ-VX50T, serial number P001337

Manufacturer's Specifications	Measured in ARRL Lab
Frequency coverage: Receive, 136 – 174, 400 – 470 MHz (FM); 76 – 107.95 MHz (WFM); 118 – 135.995 MHz (AM). Transmit, 144 – 148 and 420 – 450 MHz.	Receive and transmit, as specified.
Modes: FM, FM-N (FM-Narrow). Receive only: WFM (FM broadcast band only), AM (air band only).	As specified.
Power requirements: 7.4 V dc ±20%. 7.4 V, 1,800 mAh Li-ion battery and rapid charger supplied.	At 8.2 V dc (full charge): Receive, 330 mA (no signal, max volume, lights on), 278 mA (lights off), 123 mA (standby, lights off); 22 mA (saver on); 0 mA (power off). Transmit (High/Med/Low), 146 MHz, 1.67/1.12/0.852 A 440 MHz, 1.68/1.18/0.843 A
Receiver	**Receiver Dynamic Testing***
FM sensitivity: For 12 dB SINAD, FM, 0.25 µV; FM-N, 0.5 µV.	For 12 dB SINAD: 146 and 440 MHz, 0.14 µV; 162 MHz, 0.13 µV; 100 MHz, 1.0 µV (WFM).
Two-tone, third-order IMD dynamic range: Not specified.	20 kHz offset: 146 MHz, 62 dB, 440 MHz, 67 dB. 10 MHz offset: 146 MHz, 68 dB; 440 MHz, 71 dB.
Two-tone, second-order IMD dynamic range: Not specified.	146 MHz, 84 dB; 440 MHz, 91 dB.
Adjacent-channel rejection: ≥60 dB.	20 kHz offset: 146 MHz, 68 dB; 440 MHz, 67 dB.
Squelch sensitivity: Not specified.	Squelch range, 146 MHz, 0.12 – 0.31 µV; 440 MHz, 0.12 – 0.25 µV.
S-meter sensitivity: Not specified.	For full-scale meter reading, 146 MHz, 0.38 µV; 440 MHz, 0.27 µV.
Audio output: 1 W at 10% THD.	516 mW into 8 Ω at 10% THD THD at 1 V_{RMS}, 1.8 %.
Transmitter	**Transmitter Dynamic Testing**
Power output: High/Med/Low, VHF, 5/2/1 W; UHF, 4/2/1 W.	At full charge, High/Med/Low: 146 MHz, 4.7/2.1/1.2 W 440 MHz, 4.4/2.5/1.2 W
Spurious signal and harmonic suppression: ≥60 dB.	146 MHz: >70 dB (High, Med); 67 dB (Low). 440 MHz: >70 dB. Meets FCC requirements.
Transmit-receive turnaround time (PTT release to 50% of full audio output): Not specified.	Squelch on, S-9 signal: 146 and 440 MHz, 266 ms.
Receive-transmit turnaround time (TX delay): Not specified.	146 MHz, 24 ms; 440 MHz, 34 ms.

Size (height, width, depth): 4.7 × 2.4 × 1.5 inches (including protrusions); antenna length, 6.6 inches. Belt clip adds ½ inch to depth. Weight, 9.6 ounces with battery.

*There were no measured differences in sensitivity or adjacent-channel rejection between FM and FM-Narrow.

Below the push-to-talk button on the side of the radio, there are two smaller buttons. The top button accesses the squelch adjustment. You press and hold the button until the display switches to the squelch-adjust mode, after which you rotate the frequency/channel knob to set the desired level. The bottom **MONITOR** button opens the squelch whenever it is pressed. If you hold this button down for more than a couple of seconds, the squelch locks open continuously.

Tuning around the bands, I eavesdropped on several 2-meter and 70-centimeter repeaters. Despite the relatively small speaker, the audio was crisp and clear. The radio delivers more than half a watt of audio to the speaker, which I found to be more than adequate, even in a somewhat noisy mobile environment.

The DJ-VX50T is a dual-band radio, so you have the option of switching between the main and sub frequencies, but the way this is accomplished is not intuitive. For example, you won't find a button labeled **MAIN/SUB**. As the manual instructs, you must press the **UP** arrow button on the keypad to flip between them. The main frequency is displayed above the sub fre-



Figure 1 — The Alinco DJ-VX50T's simple display is easy to read under a variety of lighting conditions.

quency, and it is shown in a larger font for easy recognition.

Although the manual doesn't make this clear, I found the DJ-VX50T could receive on the main and sub frequencies simultaneously (but it can only transmit at the main frequency). You can listen to two frequencies within the same band or monitor two frequencies within separate bands.

If you get tired of listening to ham traffic, press the **FUNC** button, followed by the **1** button, and you're suddenly transported to the FM broadcast band. Reception is strictly monaural, though. More button presses will bring up AM reception in the aviation band, and even NOAA Weather Radio channels. These are features you don't always find in a transceiver in this price class.

Other than the lack of stereo, FM broadcast reception was excellent. With just the flexible antenna, I was able to enjoy not only the 50 kW behemoths, but also several low-power college stations in my area.

Aviation listening is always interesting, and I'm fortunate to have a substantial amount of air traffic in my area. Even so, monitoring aviation can be a challenge because of the constantly changing positions of the aircraft. While I was able to eavesdrop on high-altitude airplanes with the stock antenna, receive coverage was vastly improved when I connected the DJ-VX50T to an external antenna.

The DJ-VX50T sports several scanning modes, and I was pleasantly surprised to discover that they work even within the FM broadcast and aviation bands. You also have 200 memory channels to store whatever you stumble across, amateur or otherwise. Each memory channel can be labeled with alphanumeric characters.

On the subject of memories, like most modern transceivers, the DJ-VX50T memories can be programmed through external software. I couldn't test this feature with the DJ-VX50T, but I'm confident that it performs similarly to other software packages I've used. It is a matter of loading the transceiver's memory contents into your computer by attaching a USB cable to the rig and placing the radio in the clone mode. Once loading is complete, you can modify existing memories, add new ones, and make other changes. This is much easier than doing memory programming by hand through the keypad. The software and cable are available from RT Systems at **www.rtsystemsinc.com**.

On the Air

The DJ-VX50T is capable of 5 W output on 2 meters and 4 W on 70 centimeters. If you prefer to extend the battery life, you can select a lower output power setting.

With the flexible antenna and maximum output, I had little difficulty accessing all repeaters in my local area. Transmit audio reports were consistently good.

Taking the radio on the road, I replaced the flexible antenna with an SMA-to-BNC adapter and connected it to a dual-band magnetic mount antenna. Even at the lowest output power setting, the coverage was impressive.

The DJ-VX50T features voice-operated transmit/receive switching (VOX). I thought it might function only with an external speaker/microphone or headset, but I soon learned that the VOX works with the internal microphone as well. The feature toggles on or off with a push of the **FUNC** key, followed by the **3/VOX** key. I discovered right away that it pays to adjust the VOX delay setting in the transceiver menu. The default seemed to be 3 seconds, which can feel like an eternity when you're waiting for the radio to switch back to receive.

Speaking of voices, the DJ-VX50T is equipped with a voice annunciator that will call out the channel numbers when you are operating in the memory mode. This is convenient when you're in a low-light environment, or in those situations when you simply can't look at the display. The transceiver will also bark "Error!" if you're attempting to enter an incorrect frequency or trying to otherwise make the radio do something it prefers to avoid.

As I mentioned earlier, the battery is sizeable, and I was pleased with how long it lasted on a full charge, even with frequent transmissions. Interestingly, however, the DJ-VX50T includes a clever "battery save" feature. When enabled, the radio will essentially go to sleep and then periodically reawaken. When asleep, power drain is minimal, so your battery life is extended greatly. The sleep mode deactivates if you're operating the controls, scanning frequencies or memories, or if there is a signal present on the frequency you've selected. It's only when everything is quiet that the radio decides to take a snooze.

Conclusion

The Alinco DJ-VX50T is a capable dual-band FM transceiver that departs from what could be considered basic. Its durable design and wide range of features distinguish it from its competitors, yet it is priced to appeal to a wide audience, including new amateurs.

Manufacturer: Alinco, Osaka, Japan; **www.alinco.com**. Distributed in the US by REMTronix, Lathrop, California; **remtronix.com**, and available from a number of amateur radio dealers. Price: $100.

Two Autotuners for the Icom IC-705: The Icom AH-705 and the MAT-TUNER mAT-705Plus

Reviewed by Phil Salas AD5X
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While it is often convenient to have resonant, matched antennas at your home station, this is often not the case when operating portable. The IC-705 low-power portable transceiver (reviewed in the February 2021 issue of *QST*) doesn't have an internal antenna tuner, but there are several compact manual and automatic tuners that can be used with this radio.

In this review, we will look at two autotuners that are made specifically to interface with the IC-705 via its tuner interface, which has connections for Start, Ground, and Key. The Icom AH-705 and the MAT-TUNER mAT-705Plus both cover 160 through 6 meters and are controlled directly from the IC-705.



Table 2
Icom AH-705 Automatic Antenna Tuner

Manufacturer's Specifications

Frequency range: 1.8 – 54 MHz (>98.4-foot antenna),
3.5 – 54 MHz (>23-foot antenna).
Maximum input power: 10 W.
Tuning power required: 5 – 10 W.
Tuning time: Average 2 – 3 seconds, maximum 15 seconds.
Power supply requirement: Two AA cells or 13.8 V dc ±15%.
Current drain: Less than 300 mA (while tuning); less than 1 mA (standby).
Tuning accuracy: Less than 2:1 VSWR.
Number of tuned memories: 45.
Dimensions (height, width, depth): 1.6 × 4.1 × 7.5 inches.
Weight: 15.8 ounces without batteries.

AH-705 Resistive Load and Loss Testing

Untuned Load		Power Loss (%) and Tuned SWR by Band (meters)					
SWR	(Ω)	160	80	40	20	10	6
10:1	5.0	16% 1.3	16% 1.3	16% 1.2	<3% 1.3	<3% 1.3	<3% 1.3
8:1	6.25	12% 1.2	12% 1.2	12% 1.2	<3% 1.2	<3% 1.1	<3% 1.3
4:1	12.5	6% 1.1	6% 1.2	6% 1.2	6% 1.2	<3% 1.1	<3% 1.6
2:1	25	4% 1.1	<3% 1.3	<3% 1.3	<3% 1.1	<3% 1.1	<3% 1.6
1:1	50	<1% 1.0	<1% 1.0	<1% 1.0	1% 1.0	1% 1.0	<1% 1.0
2:1	100	<3% 1.2	<3% 1.2	<3% 1.2	<3% 1.1	<3% 1.0	<3% 1.3
4:1	200	8% 1.2	6% 1.3	5% 1.3	<3% 1.3	<3% 1.1	6% 1.5
8:1	400	8% 1.1	6% 1.3	5% 1.3	4% 1.2	<3% 1.1	NT —
10:1	500	11% 1.4	<3% 1.3	<3% 1.2	<3% 1.1	8% 1.3	NT —

NT = no tuning solution found



Figure 2 — One end of the Icom AH-705 has a BNC jack for RF from the transceiver, a jack for control signals from the transceiver, and an external dc power connector. The control and power jacks are protected by rubber covers when not in use.



Figure 3 — The other end of the AH-705 has an SO-239 jack for the antenna feed line and a binding post for ground.

Icom AH-705

The Icom AH-705 is housed in a weather-resistant case. It is powered by two internal AA batteries, or it can be powered from an external 13.8 V dc power supply. The AH-705 comes with a 6.6-foot BNC-to-BNC coaxial cable, a 6.6-foot control cable, a mounting bracket for attaching the tuner directly to an antenna or other structure, and a dc power plug. Table 2 lists the AH-705 specifications.

The AH-705 is fairly large, and the IC-705 could sit right on top of it. The input side of the AH-705 has a BNC connector, a 3.5-millimeter control cable connector, and a 2.1 × 5.5 millimeter coaxial connector for external dc power. The control and dc connectors are covered by water-resistant flaps. The output side of the AH-705 has an SO-239 connector and a ground lug with a wing nut (see Figures 2 and 3). The two AA batteries are easily accessible under a cover on the bottom side of the unit, and no special tools are required to change batteries. There are no indicators on the AH-705.

Basic Testing

Standard ARRL resistive load and loss testing was performed on the AH-705. The results are given in Table 2. Open/short testing was also performed. Ideally, a tuner should not be able to match an open or short circuit. However, many antenna tuners can tune into their own internal losses on some bands. As shown in Table 3, matches were found on some bands. See my article, "Antenna Tuner Loss Measurements," in the March/April 2021 issue of *QEX* for more information.

Using the AH-705

Most operators will probably use the internal AA batteries for powering the tuner. This minimizes required equipment in the field, as the AH-705 cannot be powered from the IC-705. While the AH-705 draws up to 300 mA during tuning, latching relays are used so that when tuning completes, the AH-705 draws very little current. As noted in the manual, when the AH-705 will not be used for a while, the control cable should be disconnected from the tuner to prevent

Table 3
AH-705 Open/Short Test Results

Band (Meters)	Open Circuit	Short Circuit
40	1.52:1	1.8:1
20	1.2:1	2.17:1
15	1.3:1	—
10	1.65:1	—

Table 4
AH-705 Tuned SWR with 43-Foot Vertical

Band	160	80	40	30	20	17	15	12	10	6
SWR	1.2:1	1.1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1

depleting the batteries. The AH-705 draws a small amount of battery current (about 0.33 mA) whenever the control cable is plugged in, even if the IC-705 is powered off.

To enable tuning, on the IC-705 display select **FUNCTION**, and then press and hold **TUNER**. Except for extreme SWR conditions, tuning occurs within about 2 seconds, unless that particular frequency has been tuned before. In that case, tuning is almost instantaneous as the information is already stored in the AH-705 memory.

My primary antenna is a 43-foot vertical, which connects to my ham station with 60 feet of FSJ4-50B ½-inch Heliax. With the IC-705 and the AH-705 located in the station, the AH-705 tuned the antenna on 160 through 6 meters, typically in less than 2 seconds. Frankly, I was surprised that it tuned the antenna on 160 meters, as the 43-foot vertical is less than half the recommended length (greater than 98.4 feet) for this band. Once I'd tuned each band, returning to that same frequency from another band resulted in an instant tuning solution from memory as soon as I touched my CW key or pressed the PTT switch on the IC-705. Table 4 lists the tuned SWR on the different bands.

Manufacturer: Icom America, 2380 116th Ave. NE, Bellevue, WA 98004; **www.icomamerica.com**. Price: $349.95.

MAT-TUNER mAT-705Plus

The mAT-705Plus is noticeably smaller than the AH-705. The mAT-705Plus is powered by internal lithium batteries, which are charged by a standard USB charger. The original mAT-705 used a 9 V battery, and replacement required disassembling the tuner and removing the PC board. The rechargeable batteries in the Plus model are a big improvement, and they can be recharged anywhere with USB power.

The tuner comes with a control cable and a USB-C charging cable. A 39-inch BNC-to-BNC interface cable for connecting the IC-705 to the mAT-705Plus is a $10 option.

Like the AH-705, the mAT-705 has no power switch. However, unlike the AH-705, the mAT-705 is turned on and off with the IC-705, so there is no need to disconnect the control cable to keep from drawing standby current when not in use.

The RF input and output ports are BNC connectors. Both of these connectors and the 3.5-millimeter control port are located on one side of the unit. The

Table 5
MAT-TUNER mAT-705Plus Automatic Antenna Tuner

Manufacturer's Specifications

Frequency range: 1.8 – 54 MHz.
Power handling: 30 W PEP, 10 W continuous.
Matching range: 5 to 1,500 Ω.
Tuning time: 5 seconds or less.
Power requirements: Internal rechargeable #10440 lithium batteries. USB-C charging cable included (500 mA charging current).
Size (height, width, depth): 1.1 × 2.6 × 5.9 inches; weight 8 ounces.

mAT-705Plus Resistive Load and Loss Testing

Untuned Load		Power Loss (%) and Tuned SWR by Band (meters)					
SWR	(Ω)	160	80	40	20	10	6
10:1	5.0	27% 2.7	8% 1.4	<3% 1.1	<3% 1.4	<3% 1.3	<3% 1.7
8:1	6.25	17% 2.2	6% 1.3	3% 1.2	<3% 1.6	<3% 1.1	<3% 2.0
4:1	12.5	<3% 1.2	<3% 1.2	<3% 1.1	<3% 1.3	4% 1.5	4% 1.6
2:1	25	<3% 1.1	<3% 1.1	<3% 1.1	<3% 1.2	4% 1.3	16% 1.5
1:1	50	<1% 1.0	<1% 1.1	<1% 1.1	<1% 1.1	<1% 1.4	<1% 1.5
2:1	100	<3% 1.2	<3% 1.1	<3% 1.2	<3% 1.2	<3% 1.4	4% 1.5
4:1	200	5% 1.2	3% 1.1	<3% 1.0	<3% 1.1	<3% 1.2	4% 1.8
8:1	400	6% 1.2	6% 1.2	4% 1.0	3% 1.1	6% 1.6	6% 1.7
10:1	500	6% 1.5	6% 1.2	5% 1.3	3% 1.3	9% 1.5	36% 2.2





Figure 4 (left) — The MAT-TUNER mAT-705 front panel has indicator LEDs and a USB jack for charging the internal batteries.

Figure 5 (right) — The mAT-705 rear panel has the jack for transceiver control and BNC connectors for transceiver and antenna.

Table 6
mAT-705Plus Open/Short Test Results

Band (Meters)	Open Circuit	Short Circuit
20	—	2.1:1
15	—	2.2:1
10	2.34:1	—

Table 7
mAT-705Plus Tuned SWR with 43-Foot Vertical

Band	160	80	40	30	20	17	15	12	10	6
SWR	NT	1.1:1	1.1:1	1.1:1	1.1:1	1.1:1	1.5:1	1.2:1	1.5:1	1.7:1

NT = no tuning solution found

opposite side of the mAT-705 has the USB charging port, and **PWR/CHARGING** and **ONLINE/TUNING** LEDs (see Figures 4 and 5). Table 5 lists the mAT-705 specifications.

Basic Testing

Standard ARRL resistive load and loss testing and open/short testing was performed, and the results are shown in Table 5. While there were a few matches found in the open/short testing, no matches with less than a 2:1 SWR occurred, as shown in Table 6.

Using the mAT-705Plus

When you turn on the IC-705 with the mAT-705Plus connected via the control cable, the **PWR/CHARGE** LED on the tuner should light up solid green. If it flashes green, the tuner needs to be charged. While charging, the **PWR/CHARGE** indicator turns red. The tuning cycle is started by pressing **FUNCTION** on the IC-705 display, and then pressing and holding **TUNE**. The mAT-705Plus **ONLINE/TUNING** LED lights up red during the tuning cycle, and then turns green when tuning is complete. The mAT-705Plus uses latching relays, so minimal current is drawn after tuning is complete.

I ran tuning tests with my 43-foot vertical. The mAT-705Plus always seemed to take at least 5 seconds to tune the first time. After the initial tuning cycle, the tuner jumped to the prior tuning solution in a fraction of a second when I returned to a pre-tuned frequency. With 16,000 memory channels, you can expect quick re-tunes after initial tunes on many different frequencies, as long as you don't change antennas. As you can see in Table 7, the mAT-705Plus was unable to tune my 43-foot vertical on 160 meters but did find a solution on the other bands.

Manufacturer: Hengshui MAT-TUNER LLC, Hebei, China. Distributed in North America by Vibroplex, 1001 N. Broadway St., Knoxville, TN 37917; **www.vibroplex.com**. A 1-year parts and labor warranty is administered in the US and Canada by Vibroplex, and repair services are available. Price: $229.95. Optional BNC-to-BNC interface cable, $10.

Wrap Up

Autotuners provide simple and fast matching solutions when antennas aren't ideal. Both the Icom AH-705 and the MAT-TUNER mAT-705Plus simplify antenna tuning when used with the IC-705. There are some differences in matching ranges, tuning solutions, size, weight, and cost between these autotuners. As always, the end user needs to weigh the tradeoffs when making a purchase decision.

Bottom Line

Both the Icom AH-705 and the MAT-TUNER mAT-705Plus autotuners provide a seamless interface to the Icom IC-705 portable transceiver. They make antenna tuning with less-than-perfect antennas a simple operation.

MFJ-261 Dry Dummy Load

Reviewed by Jim Bogard, KY4L
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The MFJ-261 is a small, inexpensive 50 Ω dummy load with impressively flat SWR response over a very wide frequency range. The MFJ-261 is air cooled with a finned aluminum heatsink. Its power ratings are 100 W peak (30 seconds maximum, followed by 5 minutes off), and 15 W average (continuous duty). It connects directly to your transceiver with a PL-259 UHF connector, and so it requires no patch cable. MFJ specifies this device to present an SWR less than 1.15:1 from dc to 500 MHz, and with dimensions of 1⅝ inches round by 3 inches long, you can carry it in your pocket.

I measured the SWR curve of my MFJ-261 with a Rigol DSA815-TG spectrum analyzer, equipped with a VB1032 VSWR Bridge. While the MFJ-261 does not quite meet the manufacturer's specs, it still has low SWR up to 500 MHz. The SWR measures less than 1.15:1 in the 160-meter through 6-meter amateur bands, as shown in Figure 6. The SWR exceeds 1.15:1 in the 1.25-meter and 70-centimeter bands, but is still very usable at around 1.5:1 (see Figure 7).[1]



The MFJ-261 dummy load on which these measurements were made is actually the second I have owned. The connector became separated from the

Bottom Line

The MFJ-261 is an affordable dry dummy load for use up to the 70-centimeter band. It's rated for 100 W peak, but heed the 30-second limit at full power.

[1]The spectrum analyzer equipped with a tracking generator and SWR bridge actually provides a return loss measurement (RL, in decibels), which must be converted to SWR for the device under test. The formula is

$$VSWR = \frac{1+10^{-\frac{RL}{20}}}{1-10^{-\frac{RL}{20}}}$$

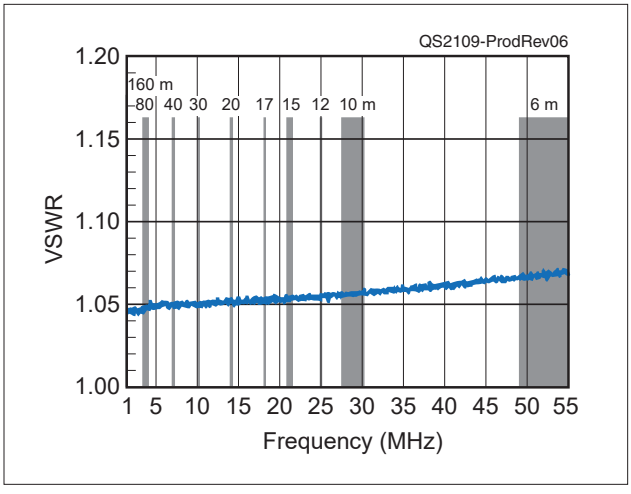


Figure 6 — The SWR trace for the MFJ-261 dummy load from 0 MHz to 55 MHz. Shaded areas show the amateur bands in this frequency range.

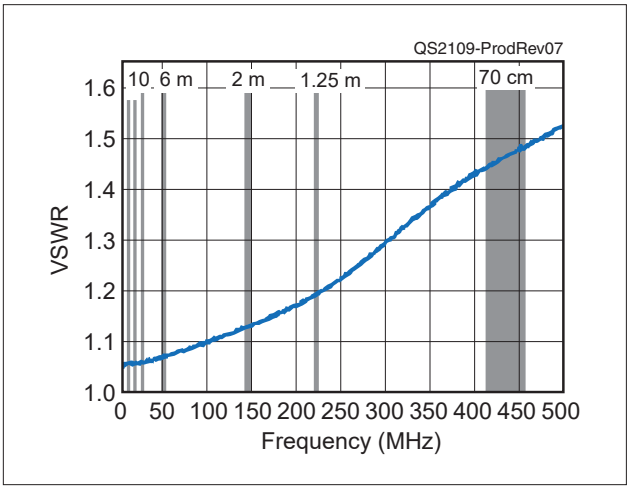


Figure 7 — The SWR trace for the MFJ-261 dummy load from 5 MHz to 500 MHz. Shaded areas show the amateur bands in this frequency range.

load in the first one. It still seems to work after being force-fit back together, but the attachment of center pin to load is compromised, so I got the second unit. The later design appears more sturdily constructed, with the knurled connector nut affixed firmly to the body of the dummy load to prevent the connection from breaking. The nut no longer spins freely.

Although the MFJ-261 doesn't quite meet its specifications above 2 meters, I'd still recommend it as a very useful and affordable addition to any ham station with MF/HF through 70-centimeter capability.

Manufacturer: MFJ Enterprises, 300 Industrial Park Rd., Starkville, MS 39759; **www.mfjenterprises.com**. Price: $34.95.

HAMRS Logging App for iOS

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Jarrett Green, KBØICT, created *HAMRS* with the idea that a mobile logging app should be able to support activities that require specific types of information. Not only that, it should also do so in a way that is straightforward and user friendly. *HAMRS* is available for a variety of platforms, including iOS, Android, Windows, macOS, Ubuntu, and Raspbian. This review focuses on the iOS app, but features and operation are similar with the other versions.

When you open *HAMRS* for the first time, you are asked to set up a profile (your name, call sign, and preferred language) as well as a new logbook. At the time this review was written, *HAMRS* provided logbook templates for Parks on the Air (POTA), ARRL Field Day, Winter Field Day, Summits On The Air (SOTA), or a generic log. Jarrett has been adding features regularly, and by the time you read this, there may be templates for other operating activities as well. As this review wrapped up, the latest version of *HAMRS* was 0.10.6.

POTA with *HAMRS*

I installed *HAMRS* onto my Apple iPad and chose the Parks on the Air (POTA) template. POTA is an ideal activity for mobile app logging, so I decided to give it a real-world test.

I loaded my transceiver, antenna, and iPad into the car and headed for a nearby state park. When I was set up at my destination and ready to take to the airwaves, I fired up *HAMRS*, chose FT8 from the mode menu, and started calling CQ using my FT8 software. The mode menu supports SSB, CW, AM, FM, RTTY, FT8, SSTV, C4FM, JS8, FT4, PSK31, digital voice, and D-STAR.

During a contact, it was simple to use the iPad keyboard to enter the call sign and signal report. (Note

Bottom Line

HAMRS is a logging application that's tailored for portable/mobile operation. Templates for several popular outdoor operating programs are available in addition to a generic logbook. New features and refinements have been added regularly.

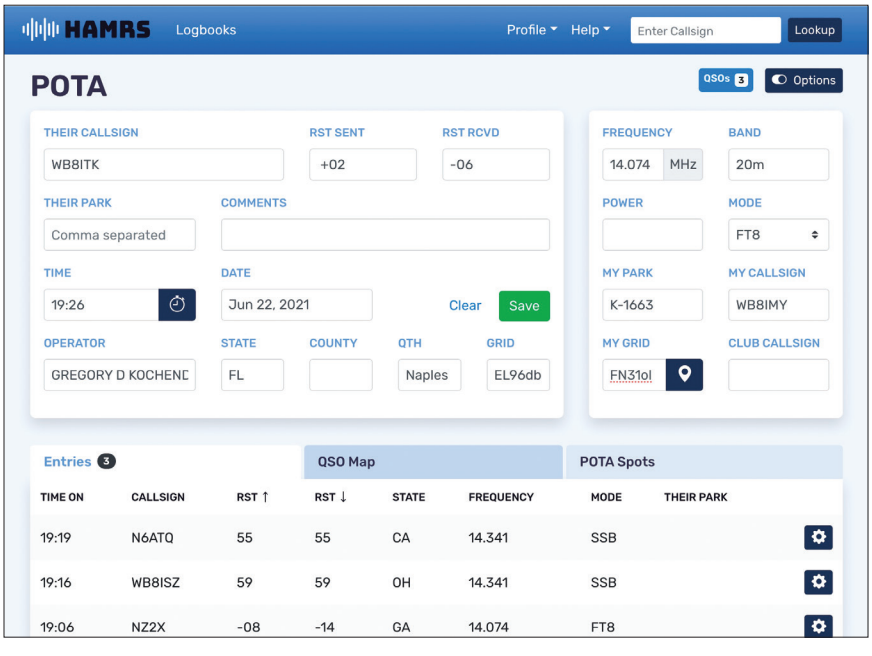


Figure 8 — Logging Parks on the Air (POTA) contacts with *HAMRS*. The Expanded Mode and QRZ Lookups options are enabled, so the other operator's name and location are filled in automatically and displayed in the lower section of the QSO entry window.

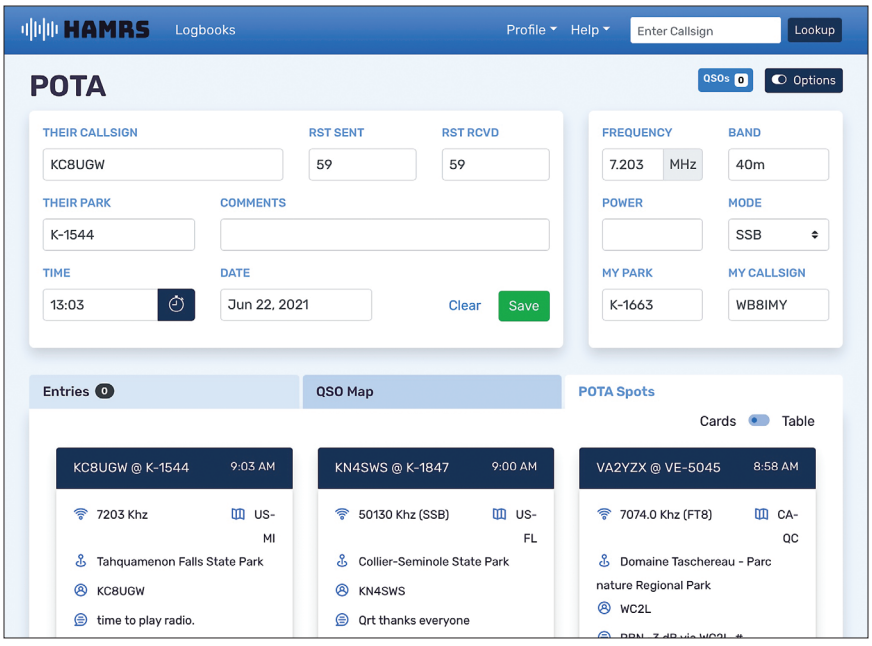


Figure 9 — If your device is connected to the internet, *HAMRS* will display POTA spots from the **pota.app** website. Clicking **COPY** on a spot transfers the call sign, frequency, park designator, and other information to the QSO entry window.

that the program accepts the SNR reports, for example +02, used for FT8 as well as RST.) *HAMRS* filled in the date and time automatically. In Figure 8, you'll also notice the right-hand window that contains my operating frequency, band, mode, and POTA park number. The information in this window remains fixed unless you change it.

If you happen to be using a device with access to the internet, with the **QRZ LOOKUPS** option enabled, *HAMRS* will automatically look up the name and location of the other operator after you enter their call sign. With **EXPANDED MODE** enabled, this information is displayed on the log entry screen, as shown in Figure 8. When you tap the **SAVE** button, the contact information is added to the log displayed in the lower portion of the screen, and the fields are cleared for your next contact.

A recent addition is the **POTA SPOTS** tab, which is used to display current spots from the **pota.app** website if your device is connected to the internet (see Figure 9). Click the **COPY** button on a spot, and the app will populate the fields with the spotted station's call sign, park, frequency, band, and mode.

After I finished my last contact, I tapped on **LOGBOOKS** in the upper left corner. *HAMRS* responded with a list of available logs and gave me the option of exporting the information to an ADIF (.adi) file. This is the format required for submission for POTA credit, and it's accepted by most other logging applications and ARRL's Logbook of The World (LoTW). I tapped the gear symbol, followed by **EXPORT ADI**. *HAMRS* allowed me to choose where I wanted the log file to be stored, or where I wanted to send it. I chose to send it to my home via email, and later I imported it into my primary station log.

Another recent addition is the **QSO MAP** tab (see Figure 10). This feature displays contacts for which *HAMRS* has logged location information (from the QRZ Lookups feature).

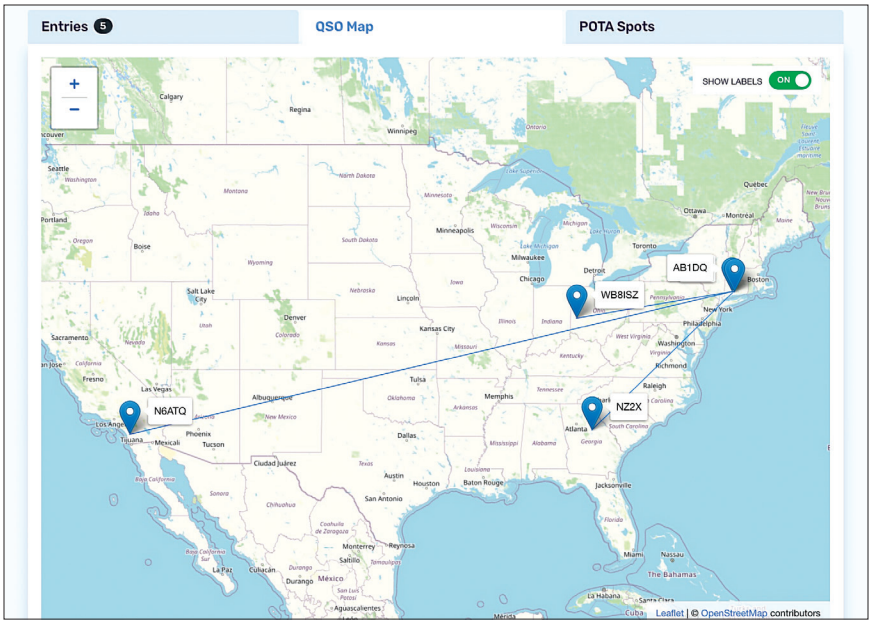


Figure 10 — Logged contacts can be displayed using the **QSO MAP** feature.

Quick and Simple

When activity is intense, it is a blessing to have logging software that doesn't require much attention. You want to log the contact with as few keystrokes as possible, save it,

and then go on to the next contact. That's exactly how *HAMRS* is designed to operate. It achieves this with a layout that is visually clean, not cluttered with a bunch of distracting fields and virtual buttons.

HAMRS has been enthusiastically received in the ham community, and it will be interesting to watch the evolution of this app in the months to come. An interactive section of the *HAMRS* website is available for support, bug reports, and feature requests.

Manufacturer: Lost Cabins, LLC; **www.hamrs.app**. Mobile app versions available in the Apple App Store and Google Play, $4.99.

Pacific Antenna Wall Wart Tamer 2.0 Kit

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If you're like me, you have a collection of "wall warts" in a box somewhere, waiting for them to be needed. Figure 11 shows just a few from a box under my workbench. Many are added, but few are removed. It's not always easy to find one with the right voltage or current ratings for a new project, especially if you need well-filtered and regulated dc.



Pacific Antenna recognized this problem and designed the Wall Wart Tamer. This small kit is neatly built on a 2.3 × 4.3 inch PC board. It accepts input voltages from 5 to 25 V, either ac or dc. It is not polarized for dc — you can connect either wire from the wall wart to either of the input terminals.

The Wall Wart Tamer board includes a rectifier, filter capacitors, and a regulator to provide clean, stable dc output. Output is adjustable from approximately 1.25 V minimum to about 3 V below the input voltage (for example, 12 V output maximum for a 15 V wall wart). Output current can be as high as 1.5 A, assuming the wall wart can supply that much current. This PC board can also be connected to any sort of other power source, such as a surplus computer power supply.

Bottom Line

The Pacific Antenna Wall Wart Tamer kit transforms a surplus wall cube into a well-filtered, well-regulated, adjustable, low-current power supply.

Construction

The eight-page construction manual is a PDF downloaded from the Pacific Antenna website. A schematic is not supplied, but the manual says a bridge rectifier, capacitive filter, and LM317 adjustable regulator are used.

The parts list includes the component designation, value, and a photo of the part. Step-by-step instructions include a brief description and picture for each part installed on the board. When a part must be installed in a certain way (polarized capacitors, for example), the instructions for that step make it clear which way the part needs to be positioned. I found it helpful to keep the PDF with the instructions open on my computer, because some of the illustrations are very small when printed on 8½ × 11 inch paper.

Three large 2,200 µF capacitors may be supplied with axial or radial leads, and the board is designed to accept either style. The 0.1 µF capacitors may be

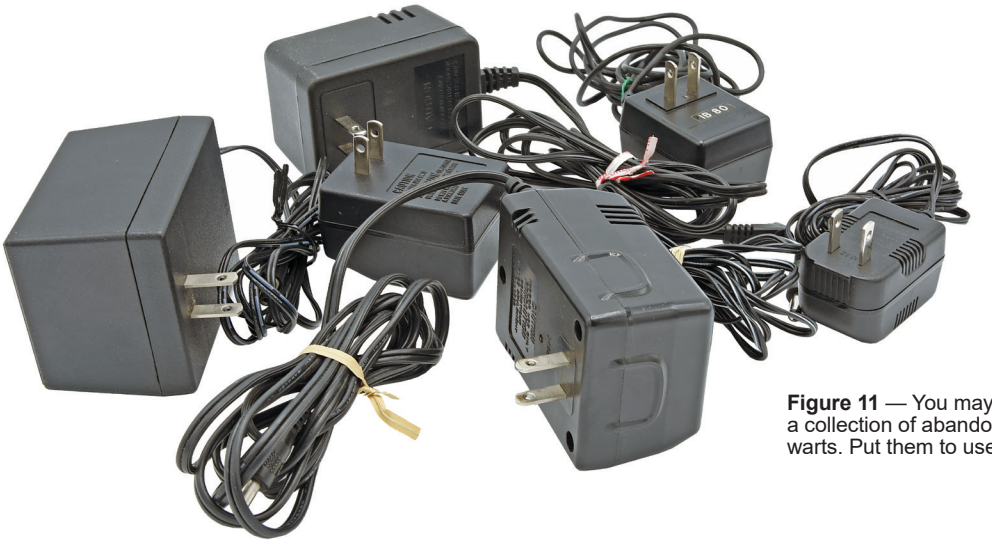


Figure 11 — You may already have a collection of abandoned wall warts. Put them to use with this kit.

marked with the code 104. Construction time is on the order of one or two short evenings, and this would be a good experience for first-time kit builders.

Final Steps

There is no formal check-out procedure. Make a visual inspection for short circuits or bad solder joints. Then connect the input power leads from the wall wart and look for the two LEDs to light. Attach a voltmeter, set the output voltage with a tiny screwdriver for the miniature potentiometer, and you are finished. I used my digital voltmeter to check the output voltage regulation under varying inputs and loads. Only the right-hand decimal place moved slightly (for example, it jittered between 9.36 and 9.37 V).

Another characteristic that's important to me is what happens when the load decreases suddenly, and whether the output voltage jumps up and then recovers. I could not find any evidence of that behavior. As an additional test, I set the voltage in the evening, turned everything off, and then turned it back on in the morning. The output voltage stayed the same (drastic changes in room temperature might affect that stability).

The only difficulty I ran into was with several of my wall warts, not the Wall Wart Tamer board. When I tried to draw current near the limit shown on the wall wart label, the wall wart output voltage collapsed. For example, a wall wart marked as 10 V went to 2 V when I tried to draw current near its maximum rating with the PC board output set to 6 V. The poor quality wall warts went off to recycling, and I was able to reduce the size of my collection a bit.

If you need an adjustable power supply quickly, the Wall Wart Tamer offers a flexible solution. Just add this little circuit to one of the wall warts from your collection, and you're ready to go.

Manufacturer: Pacific Antenna, P.O. Box 10301, Fayetteville, AR 72703; **www.qrpkits.com**. Price: $20 plus shipping.

