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QST Compares: A Pair of "Six-Shooters"—the Alinco DR-M06 and Azden PCS-7500H 6-Meter FM Mobile Transceivers

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Time was that if you wanted to get on 6-meter FM, you had to resort to building your own gear. Or you had to convert a radio originally intended for commercial service. You'll still run into some of these sets. For example, during this review, we had a repeater QSO with a ham whose radio had come from a public works truck that had one day managed to end up at the bottom of a lake! This enterprising ham obtained the soggy radio, dried it out with a hair dryer, cleaned it up, found out it still worked, and converted it for ham use.

These days, you needn't go to such extremes. Getting on 6-meter FM is as easy as contacting your local Amateur Radio dealer and ordering a radio right off the shelf. Here, we consider a couple of possible choices: The Alinco DR-M06 and the Azden PCS-7500H 6-meter FM mobile transceivers.

Alinco DR-M06

Alinco markets the DR-M06 as a radio for those who might be "weary of regular contacts on the 2-m/70-cm bands." Indeed, it didn't take us long to find out that 6-meter FM can be a lot of fun!

Our first impression of the Alinco DR-M06 was that it was quite compact. Unlike the Azden, with its larger heat sink (for its 50-W amplifier), the Alinco can fit into the smallest of spaces (for example, into the cramped quarters offered by new cars, where under-dash space is at a premium).

The 'M06 display is quite good, especially considering that such a tiny radio has to pack lots of things into a small display, by necessity. The Alinco's display offers bold 0.3-inch digits on a light amber background. We noted, however, that the display sometimes was difficult to read from certain angles when the radio was mounted in a vehicle. A single horizontal LED bargraph serves double duty as an S meter and relative-output indicator.

Table 1
Alinco DR-M06, serial number T001224

Manufacturer's Specifications	*Measured in ARRL Lab*
Frequency coverage: Receive and transmit, 50-54 MHz.	As specified.
Power requirements: receive, <800 mA, (squelched); transmit, ≈3 A (high), at 13.8 V (± 10%).	Receive, 510 mA (max volume, no signal); transmit, 2.5 A (high), 1.1 A (low), tested at 13.8 V.
Size (height, width, depth): 1.6×5.6×4.6 inches; weight, ≈1.5 lb.	
Receiver	*Receiver Dynamic Testing*
Sensitivity: For 12 dB SINAD, –16 dBμ (0.158 μV).	For 12 dB SINAD, 0.15 μV.
Two-tone, third-order IMD dynamic range: Not specified.	20 kHz offset from 52 MHz, 68 dB.* 10 MHz offset from 52 MHz, 94 dB.
Adjacent-channel rejection: Not specified	20 kHz offset from 52 MHz, 68 dB.
First IF rejection: Not specified.	>120 dB.
First IF Image rejection: Not specified.	79 dB.
Squelch sensitivity: Not specified	0.07 μV at threshold.
Audio output: >2.5 W at 10% THD into 8 Ω.	3.1 W at 1% THD into 8 Ω.
Transmitter	*Transmitter Dynamic Testing*
Power output (high/low): ≈10 W/≈1 W.	11.4 W/1 W.
Spurious signal and harmonic suppression: at least –60 dBc.	As specified. Meets FCC requirements for spectral purity
Transmit-receive turnaround time (PTT release to 50% of full audio output): Not specified.	Squelch off, ≈145 ms.
Receive-transmit turnaround time ("tx delay"): Not specified.	≈83 ms.

*Measurement was noise limited at value shown.

The concise, 28-page bilingual *Instruction Manual* (14 pages each in English and Japanese) received its share of positive comments—the only fault being that it contains no mention of packet radio (and, yes, there *are* some people who operate 6-meter packet). Aside from that lack, the manual was otherwise complete, and reviewers judged it easy to use.

We found programming the little Alinco radio to be a snap. One ham called it "simple enough even for first-time users." Alinco apparently tried to keep it simple—and they succeeded quite well. It's relatively easy to program any of the radio's single bank of

Bottom Line

You'll find lots of FM fun packed into these 6-meter mobiles.

100 memory channels. You begin by pressing the **M/VFO** button to get into VFO mode, then dial in a receive frequency (you can use the VFO knob or the **UP/DOWN** keys and/or the **MHz** button to enter a frequency). Then, set the required repeater shift (+ or –), repeater offset frequency (up to 15.995 MHz), and CTCSS (subaudible) tone, if required. Finally, press the function (**FUNC**) key and use the VFO knob to select an available memory channel. Press the memory write (**MW**) key, and you're done. While we're not sure why you'd need 100 memory channels—unless, perhaps, you travel a lot to different parts of the country—we did find programming the Alinco to be much easier than the Azden.

Alinco provides a way to reset the 'MO-6 to its factory defaults and erase all memory channels. Simply hold in the function (**F**) key and turn the radio on to force a "hard" microprocessor reset. (The Azden radio has no similar provision.)

The DR-M06 has two scanning modes, VFO and memory. Both scan modes stop for up to five seconds if the radio hears a signal. You can set a priority frequency or memory for scanning.

A front-panel high-low switch (**H/L**) on the DR-M06 lets you select either 10 W or 1 W output. The display indicates **LOW** when you choose low power. We generally left the radio set for 10 W, which worked okay for local repeater use. (If the repeaters in your area are right nearby, you might find 1 W will do the trick; we didn't try it here, however.) Nevertheless, while using the DR-M06, we sometimes wished for a bit more power when trying to access distant repeaters here in hilly New England. Enhanced propagation and a good antenna can make all the difference in the world, however.

One Saturday when Peter, KB1HY, was at home using his six-element, monoband Yagi to check out 52.525 FM simplex, he was lucky enough to catch a band opening and worked a station in Florida! So, yes, it *is* possible to work some relatively long-haul "DX" on 6-FM with a 10-W radio. This is one of the reasons that 6 meters is fondly referred to as "the magic band."

Overall, the Alinco DR-M06 received good grades for its compactness, ease of programming and concise *Instruction Manual*. A time-out timer is included; it can be set from 0 to 450 seconds (7.5 minutes). This handy feature can help you avoid the embarrassment of timing out the local repeater. By using the Alinco's timer, you time out *your* radio before you time out the repeater!

While some of us would have liked a lighted keypad on the Alinco, the condenser microphone is rounded and more comfortable than the Azden's, and the keypad buttons are easy to use. For other ops, the only shortcoming of the Alinco DR-M06 might just be its maximum output of 10 W. Again, we found that works fine to access local repeaters while mobile. A small linear amplifier can give you a boost if you feel you need it. Overall, this little radio works very well.

Manufacturer: Alinco Electronics Inc, 438 Amapola Ave, Unit 130, Torrance, CA 90501; tel 310-618-8616; fax 310-618-8758. Manufacturer's suggested retail price, $381.

Azden PCS-7500H

If you've seen the Azden PC-7000H 2-meter mobile radio, you already know what the PCS-7500H looks like. The Azden PCS-7500H looks just like its various siblings for other bands. Azden makes similar mobile transceivers for 10 meters through UHF bands. Considering that the Azden PCS-7500H is a 50-W radio, it's quite compact. While the Azden is roughly the same height and width as the Alinco, it's nearly 3 inches deeper.

The Azden '7500H has a pleasant LCD display with 0.3-inch black numerals on a dark amber background. Rounding out the generally handsome display is a horizontal LCD bar-type meter that serves as an S meter on receive and as a relative-output indicator during transmit.

What's *missing* from the front panel is a VFO (tuning) knob! To move around the band, you must use separate UP/DOWN arrow buttons that allow you to step through the band in either 5-kHz or 1-MHz increments (you can change the default tuning step size). Azden calls this system "feather-touch" tuning. While this system works just fine, our reviewers would have preferred an honest-to-goodness, old fashioned, round VFO knob.

The 21-page *Owners Manual* is straightforward and complete. The text provides easy-to-follow steps for most tasks and, when necessary, helpful pointers to find related information. Like the Alinco DR-M06 manual, the Azden PCS-7500H manual says nothing about using this radio for packet. A separate document included with the manual contains both schematic and block diagrams for the PCS-7500H.

Table 2
Azden PC-7500H, serial number C352528

Manufacturer's Specifications	*Measured in ARRL Lab*
Frequency coverage: Receive, 46-54 MHz; transmit, 50-54 MHz.	As specified.
Power requirements: receive, 600 mA; transmit, 10 A (high), at 13.8 V (± 15%).	Receive, 600 mA (max volume, no signal); transmit, 8.3 A (high), 3.8 A (low), tested at 13.8 V.
Size (height, width, depth): 2×5.5×7.3 in; weight, 3 lb.	
Receiver	*Receiver Dynamic Testing*
Sensitivity: For 12 dB SINAD, 0.19 µV or less.	For 12 dB SINAD, 0.14 µV
Two-tone, third-order IMD dynamic range: Not specified.	20 kHz offset from 52 MHz, 75 dB. 10 MHz offset from 52 MHz, 110 dB.
Adjacent-channel rejection: Not specified	20 kHz offset from 52 MHz, 81 dB.
First IF rejection: Not specified.	>120 dB.
First IF Image rejection: Not specified.	97 dB.
Squelch sensitivity: <0.12 µV at threshold.	0.04 µV at threshold.
Audio output: ≥2 W at 10% THD into 8 Ω.	2.8 W at 10% THD into 8 Ω.
Transmitter	*Transmitter Dynamic Testing*
Power output (high/low): 50 W/10 W	55 W/11 W.
Spurious signal and harmonic suppression: at least –60 dBc.	As specified. Meets FCC requirements for spectral purity
Transmit-receive turnaround time (PTT release to 50% of full audio output): Not specified.	Squelch off, 250 ms.
Receive-transmit turnaround time ("tx delay"): Not specified.	≈60 ms.

They call this *wireless*?

For mobile installations, we advise wiring the radio's dc power leads *directly* to your vehicle's battery. Be sure to fuse *both* the positive and the negative leads right at the battery. A direct battery connection helps eliminate a couple of potential problems. Tapping into the wiring harness or (Heaven forbid!) using the cigarette lighter increases the likelihood that your radio will receive noise from, or transmit RF into, your vehicle's electrical systems. You also might discover such makeshift connections suffer from excessive voltage drop. For more mobile installation tips, see "Mobile Installations and Electromagnetic Compatibility" (Lab Notes, *QST*, Mar 1995, p 74).

Alinco provides you with a dc power cord that's more than eight feet long with the DR-MO6, and Azden provides one that's more than five feet long with the PCS-7500H. Even so, you still may find you need to extend the stock power leads to reach your vehicle's battery. If so, be sure to use wire that's sized for the maximum amount of current the radio can draw. Today's microprocessor-controlled rigs can do strange things when the supply voltage drops due to inadequate wiring! The ARRL Lab found that both of these radios still worked okay at 11.5 V, however, although power output was down slightly. (For more information on all aspects of mobiling, check out the ARRL publication *Your Mobile Companion.*)—*Glenn Swanson, KB1GW*

Programming the two banks of 10 memories (20 total) in the PCS-7500H turned out to be a bit of a chore. Our advice: Don't attempt to program this radio on the fly (ie, while mobile). Why not? Because it takes lots of steps to program. For example, to program in a repeater's output frequency, you first press the function (**F**) key, then the program (**PROG[WR]**) key. Then you dial up an empty memory channel using the UP arrow key and press the program (**PROG[WR]**) key again. The frequency display will blink, indicating that you should enter the repeater's output frequency (your receive frequency). Now you press the function (**F**) key and use the **UP/DOWN** arrow keys to input the first two digits of the repeater's output frequency (say, 53 MHz). Wait three seconds until you hear a beep, then use the **UP/DOWN** arrow keys to input the remaining three digits of the repeater's receive frequency (say, 575 kHz). And those are just the steps required to store the repeater's *output* frequency. We've yet to store any CTCSS tones (if needed). That takes three more steps. Nor have we programmed in a repeater's input frequency (your transmit frequency); that adds several more steps you'll need to perform to complete the process of programming just *one* of the radio's 20 memories.

One op attempted programming the '7500H while at home—where there were fewer distractions than in mobile operation. In that more-relaxed atmosphere, he reported that the Azden was fairly easy to program "even after a couple of glasses of wine."

You might want to program your favorite repeater frequencies into memory channel A0. You can access this "call" channel from either the front panel or the microphone. Unlike most FM mobile radios we've used, this radio defaults to the *same* memory channel (A0) every time you power it up, instead of to the last-used memory channel. If your favorite frequency is in any other memory, you'll need to dial up that memory channel *each and every time* you turn the radio on!

In addition to the 20 standard memories, Azden includes a single "temporary" (or scratch-pad) memory. It's good for storing such things as a repeater's output frequency or a simplex frequency that you might happen upon while scanning, for example. The Azden offers both delay and hold scan modes. Delay mode monitors an occupied channel for six seconds, then moves on.

The PCS-7500H offers extended-range receive capabilities, covering 46 to 54 MHz (50 to 54 MHz on transmit), and it's modifiable for MARS and CAP coverage, too. Contact Azden for information on these modifications. We found in ARRL Lab testing that the '7500H can actually tune and hear a little bit outside of its specified range, but the useful sensitivity drops off pretty rapidly once you do.

One minor complaint: The rectangular, clunky-feeling dynamic hand mike was quite a handful and a bit awkward to hold. On the other hand, it does offer a sizable lighted keypad, and that feature won plenty of praise.

During extended transmit sessions, we noticed that the built-in fan on the back of the '7500H came on when the radio got warm. Indeed, the rear right-hand quadrant of the radio does get *quite* warm when you transmit a lot. The cooling fan keeps things under control, however, and we noted no adverse effects from this increase in temperature. (If the radio should sense a high SWR at the antenna port, it will default to memory A0 and emit a "beep" to warn you of a high-SWR condition.)

Azden strongly cautions against tampering with the PCS-7500H to increase its power output, as some owners have done. The manufacturer says such a modification could very likely have unfortunate consequences, degrading your radio's spectral purity and shortening the life of the output transistors.

Overall, this radio worked well and we enjoyed the advantages of 50 W. Once over the programming hump, we found it was fun to use, and the radio received uniformly good reports.

Manufacturer: Azden Communications Division, 147 New Hyde Park Rd, Franklin Square, NY 11010; tel 516-328-7501; fax 516-328-7506. Manufacturer's suggested retail price, $389.

Conclusions

We admit that some of us involved with this review initially had our doubts as to how much activity we'd find on 6-meter FM—even here in New England where 6 meters is fairly heavily used. We certainly found more FM activity than we'd expected to find! We even discovered that 6-meter FM is a very popular mode for links to other bands. For example, on his way to work one morning, Peter, KB1HY, checked into a repeater in north-central Connecticut where he was greeted by George Murphy, K3RQ, who was mobile in New Hampshire. Peter at first thought there might be a band opening, until he learned that K3RQ was using a 440-MHz FM radio to access a repeater with a cross-link to 6 meters! Peter said this added a new twist to repeater operating. "While I've always had a 2-meter FM rig in my truck, I found that operating on 6-meter FM was so much fun that I hardly ever listened to 2 meters anymore!"

Those who work VHF in major metropolitan areas with lots of 6-meter activity will be pleased to note that ARRL Lab tests reveal the Azden's adjacent channel rejection is 81 dB, quite good for a radio in this class. The Alinco radio posted a respectable 68 dB (see Tables 1 and 2).

On-the-air checks with both radios revealed transmit audio to be extremely good—both during repeater use and on 52.525-MHz simplex. Receive audio output was adequate, especially considering the understandably small speakers. A good external speaker might be a useful accessory.

During ARRL Lab tests, both radios exhibited a little quirk in their respective low-power positions. When you transmit, the power initially spikes well above the low-power specification, in excess of 7 W in the Alinco and approaching the full 50 W of power in the Azden. This could present problems if you're driving an amplifier that's expecting the specified "low-power" level.

What do we think after using this pair of *six-shooters* out on the range? For those with a *clean shot* to a 6-meter repeater, the Alinco DR-M06—with its 10 W of output power—will do just fine. It also has lots more memories than the Azden. (CTCSS tone decoding is available as an option for both units, by the way.) For those who need a bit more *firepower*, the Azden PCS-7500H, with its 50 W, should fit the bill. Either way, one of these hot little *pistols* should help you find plenty of fun on 6-meter FM. As always, we recommend trying out each radio, or at least checking out the instruction manual, before making a decision.

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