

# Alinco's DJ-X7T: Big Radio in a Tiny Package

By Jim Clarke NR2G

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**T**he Alinco DJ-X7T is a hand-held wide-band communications receiver. It's about the size of a pack of cigarettes – 100's, that is – but only half as thick. Frequency coverage for the US 'T' version is 0.100-1299.995 MHz, with cellular blocked, of course. The modes of reception are AM, NFM, and WFM.

### Ergonomics

Five buttons on the front-panel, two on the left side, and one multi-function knob on the top, referred to as the "dial," facilitate listener input to the X7T. Settings are changed using the buttons and/or dial directly, executing function-key sequences, or scrolling through a parameters-menu using the dial. Don't be fooled by the quantity of controls; there are plenty of features built into this little radio.

Small size and weight – less than four ounces – makes it easy to carry in your shirt-pocket without feeling or looking like you're walking around with a brick in your pocket.

The display measures about 0.5" X 1.5" and is backlit from the bottom by three green LEDs.

A front-panel speaker that is approximately 1" provides sound on the X7T. Acceptable audio levels can be achieved without any appreciable distortion as long as you are in a fairly quiet area. If the background noise is moderate or higher, using the earphones would be a better choice.

### Tuning

The X7T has three frequency modes, selected by using the front-panel V/P/M button: VFO mode, factory-preset mode, and user-programmed memory mode.

In VFO mode, the dial changes frequency according to the user-specified, or automatically selected, step-size. Pressing the 10M/1M button scrolls through 10 MHz steps, 1 MHz steps, and the manually/automatically selected step size. The 10 MHz and 1 MHz steps are not persistent; after a few seconds it returns to the previously selected step size.

In factory-preset mode, the dial selects frequencies, or channels, based on the band in use. The three bands for the factory-preset mode are: AM radio (0.531-1.620 MHz), FM radio (88.1-107.9 MHz\*), and TV (channels 1-62). The operator changes bands by pressing the BAND button repeatedly until they have selected the desired band. I didn't find anything in the manual specifying the ranges for each of the bands, nor did I find a frequency list to correspond to the TV channels.

In user-programmed memory mode,

the dial selects channels within a bank. The X7T features 1000 memory channels divided into 10 banks of 100 channels. Banks 0-9 are selected by repeatedly pressing the BANK button until the desired bank is selected. By using the free software available from Alinco, the number of banks can be increased to 50, but that will reduce the number of channels per bank to 20, since channels are limited to 1000. Settings (other than frequency and mode) that are stored to a memory channel are shift frequency, shift direction, CTCSS tone frequency, tone squelch setting, scrambling frequency, and scrambling decode number. A Write-Protect function allows the user to protect the contents of memory against accidental deletion or over-write.

Another feature that, technically, tunes the radio, is Priority Monitoring. There are 10 channels specifically set aside for priority frequencies. When the Priority Monitoring function is enabled, every 5 seconds the receiver switches to the selected priority channel for 0.5 seconds and, if no signal is detected, returns to the original frequency. If a signal is detected, the receiver will stay tuned to that channel for 5 seconds, then return to the original frequency.

### Scanning

Other frequency selection methods include four scanning options: VFO Scan, Programmed Scan, Preset Scan, and Memory Scan. Scanning stops upon detection of a signal and can be set to resume with either a timer or loss of signal. The direction of scan can be changed at any time during scanning, by rotating the dial in the opposite direction.

The VFO Scan steps through channels using the currently selected step size, in the direction corresponding to dial rotation.

Programmed Scan sweeps between two user-programmed frequencies; the X7T has memory allocated for 50 such pairs of start-stop frequencies.

To aid VFO and Programmed Scan, Alinco has provided a bank of 100 "skip-search" channels that the user can populate with frequencies they want to avoid while scanning.

Memory Scan mode checks each user-programmed memory channel in a selected bank, banks that the user has linked beforehand, or all banks.

### Tone Modes

The X7T can be set to open the squelch only when a received signal contains one of the CTCSS sub-audible tones. And, if you don't know the CTCSS tone frequency of a received signal, you can use the Tone Scan function to determine what tone is being used.

### Descrambler?

Sorry, not in the 'T' version, but for those able to get the 'E' version, there is a built-in analog-inversion voice descrambler.

### Frequency Shift

Frequency Shift is a feature found mainly on amateur radio transceivers. Once a shift has been entered, whenever the user presses the SHIFT key, the receive frequency is changed according to the shift and remains there as long as the button is held down. If the receive frequency was the output of a VHF repeater and the shift frequency set for the input shift for the repeater, the operator can quickly check the signal at the input of the repeater with the press of a button.

### Antenna Flexibility

The X7T has an interesting selection of antenna options. There are three antennas available: the antenna you connect to the SMA connector, an internal bar antenna, and the headphone cord. Both AM and shortwave have the internal bar antenna available. This setting is changed in the parameters-menu and allows the bar to be enabled or disabled for either AM or shortwave independently. If the bar is disabled, the radio uses one of the two remaining antennas, which is also set using the parameters-menu. In this case, the choice is enabling or disabling the SMA antenna jack. When the SMA is disabled, the radio uses the headphone cable for an antenna.

### Other Miscellaneous Features

In addition to items previously described, the parameters-menu allows the user to set backlight brightness, automatic power-off, battery-save, key-touch beep, received-signal bell, monitor/mute mode, 'MONI' button mode, and modulation mode.

Cloning functionality is also built-in to the X7T.

### Power

Power is provided to the X7T by a small, removable, 3.7 Vdc, 600 mAh lithium-ion battery. There is provision for external power, by plugging 3.7-6.0 Vdc into the power/charger socket on the right-hand side of the radio.



## What's in the Box?

The X7T comes with the Li-Ion battery, an AC adapter for power and simultaneous charging, a 4-inch SMA "ducky" style antenna, a curly-cable earphone, an SMA jack-cap, and the instruction manual.

## How does it play?

I normally don't get my hopes too high when I use radios in this class, so I tried to approach this one with an open mind. Hopefully, as time goes by, that stereotype will diminish as the physical limitations that affect performance are overcome.

I started my "field testing" with some casual listening on the AM broadcast band. Using the built-in bar antenna, reception was very good as I tuned into some local radio stations, where the bar's bi-directional characteristics were quite noticeable. Audio was acceptable, given the mainly talk-radio station formats.

Next I tried some afternoon shortwave reception. At first, I used the built-in bar antenna, but that yielded virtually no reception. I then tried the earphone antenna, which did provide some signals, but their signal level was poor; see Table 1 for sensitivity measurements. Then, just for grins, I hooked up my 500-foot loop-skywire to the SMA jack. Let me tell you, that certainly made things come alive, but, unfortunately, it also overloaded the front-end. Numerous 'phantom' signals were heard on 15 MHz while tuned to WWV, and the only way to make them go away, aside from changing to a smaller antenna, was to enable the X7T's 20 dB attenuator. That fixed the overload problem, but didn't leave a whole lot of signal to

Table 1. Receive Sensitivity

AM 10dB (S+N)/N, FM 12 dB SINAD			
Freq (MHz)	Mode	Level (uV)	Specs(uV)
1 AM	2.65	1.0	
5 AM	1.4	1.0	
10	AM	0.9	1.0
15	AM	0.8	1.0
20	AM	0.8	1.0
25	AM	0.8	1.0
54	NFM	0.2	0.25
179	NFM	0.23	0.25
449	NFM	0.14	0.25
900	NFM	0.12	0.5

be detected.

Tuning around, it sounded like the selectivity was a little on the wide side, exhibiting a fair amount of adjacent channel interference in the shortwave broadcast bands. So, looking to try another antenna, I connected my roof-mounted 26-1300 MHz discone. Well, overload was less, but still required the attenuator, and, once again, the desired signals took a pretty good whack with it enabled. An antenna preselector or smaller antenna would fix this problem.

Reception in the VHF/UHF range was average, typical for a radio in this class. Continuing to use the discone, I was able to receive more than one NOAA weather radio station, which, by the way, not every radio I hook up is capable of. Another good check is the county sheriff's dispatch – which isn't always a given at my location – with the results being about average.

FM sounded reasonable, with the audio favoring the high side, even with a set of headphones.

## Final Thoughts

The quest for smaller and smaller handhelds that do more and more, for less and less, continues with Alinco's new DJ-X7T. Unfortunately, small size, high-performance, and low-cost are attributes of a receiver that are always in contention. I don't know about you, but I can't wait until we get the performance of a DSP tabletop receiver in a package the size and price of the X7T. While the X7T is not a high-end performer, it does fair job, with a decent collection of features in a very small package, and for a reasonable price.

I found many websites advertising the DJ-X7T, with prices ranging anywhere from \$170 to \$200, so shop around before you buy.

For more information, visit the Alinco website at <http://www.alinco.com/usa.html>.

*\*In our review model, the FM radio range matched the Japanese FM broadcast range of 76.1-89.9 MHz, not the US range. I verified that I was, in fact, holding a USA 'T' model, and also checked the manual for a key sequence to change FM radio frequency ranges, but found none. Apparently this is an error which appears in the first runs of the X7T.*

*The error was corrected in later manufacturing runs, but if you find you have a model with the incorrect presets, it can be corrected by cloning it from an X7T with the correct US bandplan, and your dealer should be able to help you.*

*The DJ-X7T is also available from Grove Enterprises (<http://www.grove-ent.com>; 1-800-438-8155; 7540 Hwy 64 West, Brasstown, NC 28902) for \$179.95 plus shipping*

# MT REVIEW

## AOR LA380 Active Loop Antenna

By Bob Grove W8JHD

Loop receiving antennas have the advantage of providing highly-directional signal response, useful for both determining bearings of arriving signals and nulling interference from specific directions. They are not capable of handling transmitter power.

Active antennas are electrically-small elements attached to preamplifiers to provide gain in lieu of capture area. They are usually confined to lower frequencies, below 30 MHz or so, and are useful alternatives to much larger, passive antennas like dipoles and verticals.

AOR has erased that limit with their release of the LA380, a compact, active loop antenna with unusually wideband performance – 10 kHz-500 MHz.

Its internal preamplifier provides 20 dB gain and offers excellent overload immunity from strong signals; it has a very respectable third-order intermodulation (IP3) figure of +10 dBm.

Where competitive loop antennas require separate plug-in antennas for different frequency ranges, the LA380 uses just one permanent ele-

ment, the 12" loop with a BNC connector at its base.

A five-position band switch is used to select specific frequency ranges, fine-tuned by a variable capacitor. A 60 kHz setting is for WWVB standard time/frequency reception; 3-10 MHz for nighttime shortwave monitoring; 9-40 MHz daytime shortwave and low-band FM communications; a single position for both 60 kHz-3 MHz and 40-500 MHz; and lastly, a 40 kHz position intended for Japanese time signals.

Power is provided by the supplied AC wall adaptor (12 VDC @ 50 mA); while no provision is made for internal battery operation, an external supply of 9-15 volts may be substituted by the user if minimum power-line interference is an issue.

The LA380 is intended for indoor use only; it is ruggedly built, but without weatherproofing, and its controls must be manually operated with band changes. If desired,

the loop may be removed from the control box and suspended in a window frame, connected by a 3.33' length of BNC-fitted coaxial cable (included). For longer separations, the user may provide another length of cable.

### ❖ Our Test

The LA380 was connected to a wideband receiver and tested through all its frequency ranges. It provided crisp, hum-free reception. Tuning was sharp and gain was excellent, equally the response

of a much larger passive antenna.

Construction is very professional, not the familiar home-brew look of many loops made for the hobby.

The AOR LA380 is available from Grove Enterprises for \$369.95 plus shipping. For orders, call toll-free (800) 438-8155, or email [order@grove-ent.com](mailto:order@grove-ent.com).

