

WT0B's thoughts about the BTech DMR-6X2 DMR Handheld radio (July 2020)

The **Anytone AT-D878UV** and the **BTech DMR-6X2** are FM Analog and DMR, Dual-Band (2-meter and 70cm), handheld radios, that usually end up in comparisons of upper end radios in DMR marketplace. The following is more information of the BTech DMR-6X2 and my comments about its programming and usage. The opinions are strictly my own.

The radio:

The radio stands about 5 inches high, not including its almost 6-inch female SMA based antenna, has a width and depth about 2 inches, and weighs a little over 10 to 11 ounces. The battery charger base can charge a battery by itself or with battery securely installed on the back of the radio. This is a nice that allows you charge the radio and then charge a spare battery while the radio is in use. The radio comes with two batteries and both charged up as expected. This radio is firmware defined and software programmed, providing a very flexible radio with new features that can be introduced by new releases of firmware. Once fully charged, the radio was turned on and I felt fear for a moment, as it took 2+ seconds before any life was shown on the color display. Total "boot up" time is about 10 seconds! The long boot up is the trade-off for having a such a versatile radio. Once booted, the radio is almost set to be used and tested!

The software:

But before getting on the air, the radio needed a firmware upgrade and then our local radio frequencies needed to be programmed into the DMR-6X2. This is done with a free software that creates "Code Plugs" for the radio. Also, with the download, you will get the latest firmware for the radio. Since the radio has been available, 3 to 4 firmware upgrades have been released per year. At the time of this writing, I just finished upgrading to the 3rd upgrade for this year.

The radio is packaged with the needed programming cable, which worked correctly, without exception, from its very first use. These USB programming cables look remarkably similar, so I recommend tagging and labeling each programming cable when they are unpacked. The firmware upgrade went as expected by following the instructions downloaded with the firmware and no issues have been observed with the upgrade.

A "Code Plug" is a term used by a commercial manufacturer, to define the combined sets of spreadsheet-like tables, of information about the radio, channels, scanning groups, and other features of DMR. CHIRP software does not currently support any DMR radios, so you must download the vendor's free program. However, if you are familiar with CHIRP, you will have a head start in using this program, at least with the analog channels.

There are several different philosophies about building code plugs which is outside the scope of this radio review. If you are experienced building code plugs, use whatever methodology you like. If you are new to DMR and code plugs, you may want to get started by using an existing code plug or ask for help. In addition to ham frequencies, you can program commercial FM broadcast frequencies for listening, as well as NOAA Weather Radio frequencies. With 3000 channels available, you will not be constrained in the number of repeaters and simplex frequencies you may want to use.

The radio has more than enough memory to hold the entire world's DMR radio Id's database with room to spare. I only loaded the North American continent Id's and only used a little over a third of available DMR ID Memory of this radio.

Radio Operation:

Once programmed, the radio ran flawlessly on both Analog and DMR. Audio is good and buttons, knobs and PTT feel solid. Although it is not a low-end entry radio, it is built to USA BTEch specifications, and it is shipped from the BTEch facility in South Dakota. This radio has become my new favorite carry radio.

From the supplier (BTEch) about the DMR-6X2



DMR-6X2 ADDITIONAL INFORMATION

The DMR-6X2 uses a loud 1 watt speaker; with adjustable volume options (customizeable in software) to set your preferences to accommodate both indoor and outdoor users.

The DMR-6X2 case is durable for the most extreme elements. The DMR-6X2 is rated IP54 for water and dust resistance.

The DMR-6X2 is firmware upgradeable with the free software and firmware update tools from BTECH.

DMR-6X2 BATTERY LIFE, WEIGHTS, AND DIMENSIONS

The DMR-6X2 can last for up to 35 hours on a single charge using the 3100mAh battery, and up to 18.5 hours on a single charge using the included 2100mAh battery (2100mAh Battery Not Included in Single Battery Kit)

The DMR-6X2 is: 5" tall (10.5" with included antenna), 2" wide, and 1.5" deep (2" with belt clip).

The DMR-6X2 weighs 11.3 oz with the large battery and 10.4 oz

WHAT'S IN THE BOX

- DMR-6X2
- 2100 mAh standard battery
- 3100 mAh High Capacity battery
- 2 Belt Clips
- Programming Cable
- Charger Base and Transformer
- Earpiece Kit
- 6" Dual Band Antenna
- Wrist Strap
- User's Manual

TECHNICAL DETAILS:

Memory Channels: 4,000 channels, Digital Contacts: 200,000, DMR Talk Groups: 10,000

Power Output: VHF: 7/5/2.5/1W, UHF: 6/5/2.5/1W

Zones: 250 (Allows 250 Channels Per Zone)

Adjustable Power Modes: 6/7W, 4W, 2.5W, 1W

Modulation: ± 5.0 KHz at 25KHz, ± 2.5 KHz at 12.5KHz

4FSK Digital Modulation: 12.5KHz (data) 7K60FXD 12.5KHz (data+voice) 7K60FXE

Sensitivity(12dB SINAD): $\leq 0.25\mu V$ (wideband) $\leq 0.35\mu V$ (narrowband)

Digital Sensitivity: 0.3uV/-117.4dBm (BER 5%), 0.7uV/-110dBm (BER 1%)

GENERAL:

Frequency Range: 136-174MHz (V) , 400-480MHz (U)

Channel Capacity: 4000 channels

Channel Spacing: 25KHz (Wide Band) ,12.5KHz (Narrow Band)

Phase-locked Step: 5KHz, 6.25KHz

Operating Voltage: 7.4V DC 20%

Frequency Stability: 2.5ppm

Operating Temperature: -20C~ +55C

Size: 129x61x39mm (with battery pack)


Weight: 282g (with battery pack, antenna)

RECEIVER:

Sensitivity: (12dB SINAD) $\leq 0.25\mu\text{V}$ (WB), $\leq 0.35\mu\text{V}$ (NB)
 Digital Sensitivity: $0.3\mu\text{V}/-117.4\text{dBm}$ (BER 5%); $0.7\mu\text{V}/-110\text{dBm}$ (BER 1%)
 Adjacent Channel Selectivity: $\geq 70\text{dB}$ (WB) $\geq 60\text{dB}$ (NB)
 Spurious Emission: $\leq -57\text{dB}$ (WB) $\leq -57\text{dB}$ (NB)
 Spurious Rejection: $\geq 70\text{dB}$ (WB) $\geq 70\text{dB}$ (NB)
 Blocking: 84db
 Hum & Noise: $\geq 45\text{dB}$ (WB) $\geq 40\text{dB}$ (NB)
 Audio Distortion: $\leq 5\%$
 Audio Power Output: 1000mW/16 Ω

TRANSMITTER:

Power Output VHF: 7/5/2.5/1W, UHF: 6/5/2.5/1W
 Modulation: 5.0KHz@25KHz (WB) 2.5KHz@12.5KHz (NB) Adjacent Channel Power: $\geq 70\text{dB}$ (WB) $\geq 60\text{dB}$ (NB)
 Hum & Noise: $\geq 40\text{dB}$ (WB) $\geq 36\text{dB}$ (NB)
 Spurious Emission: $\leq -36\text{dB}$ (WB) $\leq -36\text{dB}$ (NB)
 4FSK Digital Modulation: 12.5KHz (data) 7K60FXD; 12.5KHz (data+voice) 7K60FXE
 Audio Distortion: $\leq 5\%$
 Error rate: $\leq 3\%$

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Options	BTech DMR-6X2	Anytone D868	Anytone D878	Alinco MD5T
Channels	4,000	4,000	4,000	4,000
Zones	250	250	250	250
Chan / Zone	250	250	250	250
Contacts	10,000	10,000	10,000	10,000
User DB	150,000	150,000	150,000	150,000
Scan Lists	250	250	250	250
Multi Scan Groups / Chan	yes	---	---	---
Priority Scan	yes	---	---	---
Adhoc Keypad TG Entry	yes	yes	yes	yes
Adhoc Hold Timer	Indefinite	---	---	---
Digital Simplex Repeater	yes	---	---	---
Digital APRS	yes	yes	yes	yes
Analog APRS	---	---	yes	---
GPS	yes	yes	yes	optional
Roaming	---	---	yes	---
Programmable Keys	5	5	5	2
Battery Capacity (mAh)	3,100	3,100	3,100	1,700
2nd Battery included	2,200	---	---	---
Earpiece/Microphone	yes	---	---	---
Part 90	yes	yes	yes	yes
NOGSG CPeditor Compatible	yes	yes	yes	---
LCD - Black/White	yes	yes	yes	yes
LCD - Blue/Black (Selectable)	yes	---	---	---
Analog / FM	yes	yes	yes	yes
Analog SQ level via Progr Key	yes	---	---	---
Digital Voice Recorder	yes	yes	yes	yes
Power Levels	4	4	4	4
Max Power	7w	7w	7w	5w
USB Progr Cable	yes	yes	yes	yes
TDMA Tier 1 & 2	yes	yes	yes	yes