

# AnyTone AT-D878UVII Plus DMR/FM Handheld Transceiver

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The AnyTone AT-D878UVII Plus is the evolution of the popular AT-D878UV, reviewed in the July 2019 issue of *QST*. Like its predecessor, its robust appearance is quite impressive. It's relatively small (see Table 2), weighs 11.2 ounces, and holds well in hand. The manufacturer has paid particular attention to the finish, which is very high quality.

This review will cover only the improvements made with this version II, like the APRS reception capability, Bluetooth operation with its external PTT button, and internal contact memory expansion. I will also cover the customer programming software (CPS). It's important to note that the firmware used for this review may not be the latest, as there are frequent updates, so the features and their location in the CPS menus may be different in the newest firmware versions.

## Overview

The AnyTone AT-D878UVII Plus comes with many accessories in the box, as shown in Figure 5. It includes a 3100 mAh battery, a desk charger with its AC adaptor, a belt clip, a wrist strap, a dual-band antenna, a USB programming cable, a PTT Bluetooth button with an elastic strap, and a micro-USB charging cable. As for the documentation, you'll find two printed manuals — one for Bluetooth, and the operating manual.

Most of the AT-D878UVII Plus specifications are the same as those of its predecessor, the AT-D878UV Plus. The dual-band radio reception covers 136 – 174 MHz and 400 – 480 MHz. The RF power is programmable in four levels: 7, 5, 2.5, and 0.2 W for the VHF band, and 6, 5, 2.5, and 0.2 W for the UHF band. The display is the same as the previous model, with its customizable 1.77-inch color LCD. The radio is DMR Tier I and Tier II compatible and can hold 4,000 channels and 10,000 talk groups. It has 250 zones, with 250 channels per zone. This version can now handle up to 500,000 contacts in its internal memory. The DMR Radio ID database ([www.radioid.net/database/search](http://www.radioid.net/database/search)) contained more than 240,000 entries the last time I checked, and this radio can accommodate twice as much. You can upload the full DMR contact list into the radio, with spare room for years to come.

## Connecting the Radio to a Computer

You don't need a computer to start using this radio. You can easily program a new channel and start using it

in analog mode, but it's highly recommended to check the configuration with the CPS software.

If you want to use the radio with digital mode or APRS, you should use the CPS. Personally, when I receive a new radio, I always pass through all of the parameters and functions in the programming software. It's a good way to be sure not to forget a setting.

Programming the radio using a Windows PC with the CPS software was easy. The USB programming cable supplied with the radio doesn't need a specific driver. You just plug the USB cable into your computer and wait for Windows to install the proper driver. You'll get a notification in the system tray that a new device has been found, and another notification when the device is ready to operate. Unfortunately, the CPS software is available for only the Windows operating system.



## Working with Bluetooth

AnyTone's hands-free approach is interesting. The PTT button can strap on your finger or anywhere else in your car, and you simply push with your fingertips to start transmitting. Using Bluetooth, you can pair the radio with an external audio device, like your car's hands-free system or a Bluetooth headset, and with the remote Bluetooth PTT, you have a nice hands-free solution.

## Bottom Line

The AnyTone AT-D878UVII Plus offers added value compared to the first version of this radio. It can now receive and transmit APRS, and can store up to 500,000 contacts in its internal memory. It's a high-quality dual-band radio that also supports Bluetooth audio operations.

**Table 2****AnyTone AT-D878UVII Plus, serial number 1236213101130,  
FCC ID# T4KD878UVII, Firmware Version 3.01****Manufacturer's Specifications**

Frequency coverage: Receive, 136 – 174, 400 – 480 MHz.

Modes: DMR, analog FM.

Power requirements: 7.4 V dc,  $\pm 20\%$ .

**Receiver**

Sensitivity: For 12 dB SINAD,  $\leq 0.25$   $\mu$ V (wide),  $\leq 0.35$   $\mu$ V (narrow).

FM two-tone, third-order IMD dynamic range: Not specified.

FM two-tone, second-order IMD dynamic range: Not specified.

Adjacent-channel rejection:  $\geq 65$  dB (wide),  $\geq 60$  dB (narrow).

Squelch sensitivity: Not specified.

S-meter sensitivity: Not specified.

Audio output: 1000 mW into 16  $\Omega$ .

**Transmitter**

Power output: VHF: 7/5/2.5/0.2 W, UHF: 6/5/2.5/0.2 W.

Spurious signal and harmonic suppression:  $\geq 57$  dB.

Transmit-receive turnaround time (PTT release to 50% of full audio output): Not specified.

Receive-transmit turnaround time ("tx delay"): Not specified.

Specified receiver bandwidth, 25 kHz (wide), 12.5 kHz (narrow).

Size (height, width, depth): 5.1  $\times$  2.4  $\times$  1.6 inches (including protrusions).

Belt clips, add 0.2 inches to depth.

Antenna length: 7.1 inches.

Weight: 11.2 ounces (including battery and antenna).

**Measured in the ARRL Lab**

Tested in the 2-meter and 70-centimeter amateur bands.

As specified.

Receive, 340 mA (max volume, max backlight); (3100 mAh battery); 325 mA (max volume, min backlight); standby; 80 mA (standby, backlight off); transmit, 146 MHz, 1.85 A (turbo), 1.46 A (high), 0.97 A (med), 0.38 A (low); 440 MHz, 1.86 A (turbo), 1.43 A (high), 0.96 A (med), 0.40 A (low), power off, <1 mA  
3100 mAh battery at 8.3 V dc (full charge).

**Receiver Dynamic Testing**

FM, for 12 dB SINAD, 0.16  $\mu$ V (wide), 0.13  $\mu$ V (narrow); 162.4 MHz, 0.15  $\mu$ V; 440 MHz, 0.15  $\mu$ V (wide), 0.15  $\mu$ V (narrow); 100 MHz (WFM), 0.72  $\mu$ V.

20 kHz offset, 146 MHz, 59 dB, 440 MHz, 58 dB; 10 MHz offset, 146 MHz, 70 dB, 440 MHz, 65 dB.

146 MHz, 85 dB; 440 MHz, 97 dB.

20 kHz offset, 146 MHz, 72 dB (wide), 75 dB (narrow); 440 MHz, 66 dB (wide), 70 dB (narrow).

At threshold, 146 MHz, 0.14  $\mu$ V (min), 0.26  $\mu$ V (max); 440 MHz, 0.13  $\mu$ V (min), 0.30  $\mu$ V (max).

For four bars, 146 MHz, 1.2  $\mu$ V; 440 MHz, 0.30  $\mu$ V.

507 mW at 10% THD into 16  $\Omega$ . THD at 1 V<sub>rms</sub>, 3.1%.

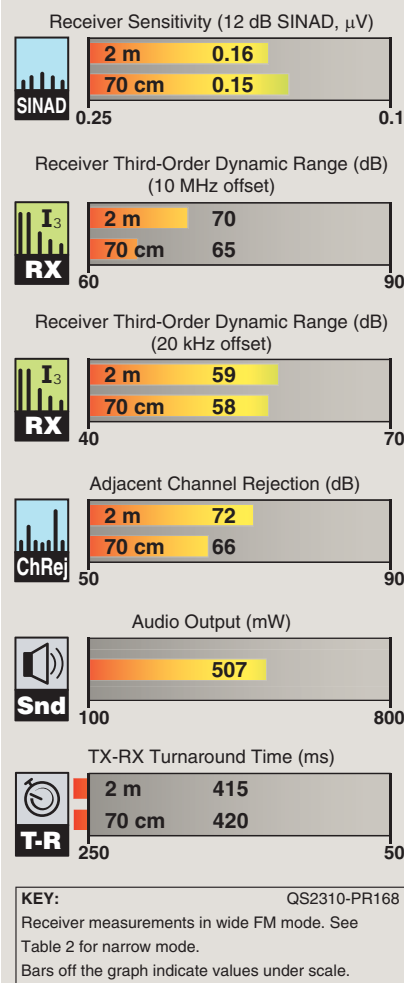
**Transmitter Dynamic Testing**

146 MHz, 8.7 W (turbo), 6.0 W (high), 2.6 W (med), 0.23 W (low); 440 MHz, 6.8 W (turbo), 4.9 W (high), 2.5 W (med), 0.25 W (low) at 8.3 V dc (full charge).

>70 dB; meets FCC requirements.

Squelch on, S-9 signal, 146 MHz, 415 ms; 440 MHz, 420 ms.

146 MHz and 440 MHz, 221 ms.

**AnyTone AT-D878UVII Plus  
Key Measurements Summary**

You'll hear the audio received by the radio the same way it's received by a cellular phone. By default, when activating a Bluetooth audio device, the speaker and microphone inside the radio are deactivated.

Pairing a Bluetooth device was straightforward. The radio can connect only one Bluetooth audio device at a time, so if your earbud is in your pocket and connected to your radio, this could cause conflict when trying to connect your Bluetooth to the car's audio system.

I tried two different setups during my tests. The first one was a PlayStation Bluetooth headset borrowed from my



**Figure 5** — The AnyTone AT-D878UVII Plus with the included accessories.

son. Pairing the PlayStation Bluetooth headset worked like a charm, and audio was good both ways (RX/TX). I also gave my GMC Canyon pickup IntelliLink System a try. The pairing was a little bit more complex but relatively fast. This kind of pairing uses a PIN code that you have to program in your radio. After setting the same PIN code, pairing was easy. When using a Bluetooth device, you can see which audio device is connected to the radio directly in its menu. I strapped the **PTT** button on the transmission lever to facilitate the operation from the driver's seat. I was thinking about strapping the **PTT** button directly to the steering wheel, but I found that it was not the best location while driving.

I made some contacts using the car's hands-free system, and the comments were relatively good, but the quality was not as good as if I was operating with the internal microphone and speaker. Using the hands-free system, you get the same quality as a phone call, meaning the other end will hear all the noise in the cabin mixed with your voice.

## Using APRS

The radio can transmit and receive APRS analog sig-

nals, which is another improvement from its predecessor that was only able to transmit. You can set the radio to automatically send your position at fixed intervals of time and monitor other stations. Using the incorporated GPS, when you're on the move your loved ones will be able to follow you from [www.APRS.fi](http://www.APRS.fi), assuming your signal can be received by an APRS internet gateway. You should use the CPS software to configure the radio with the proper APRS parameters. Using the CPS in the **APRS COMMON SETTING** section, you will find all parameters to set your radio. These parameters are standard.

To receive APRS data, you should program a specific channel on the radio with APRS parameters activated. I programmed channel 42 on my radio for APRS receiving using the national APRS frequency. I set the channel in analog mode and activated the function **APRS RX**. You can set the function **ANA APRS MUTE** to mute the sound of APRS signals, and activate **PTT PROHIBIT** to prevent causing interference on the channel in case you push the **PTT** button accidentally.

The last thing to do before using the radio in APRS mode is to activate **ANALOG APRS** in the radio. You'll have to go to **APRS MENU** and enter the first setting (**UPLOAD TYPE**) to select the second option (**SEL A APRS**). This will activate the analog APRS.

After all settings are established, you can use the programmed channel to receive others and transmit your position according to the programmed interval time.

## Conclusion

This radio offers a lot of high-end features. APRS transmit and receive make the AT-D878UVII Plus a great portable radio for hiking and expeditions. The included Bluetooth features make the radio even more portable-friendly. You can leave the radio anywhere nearby in your house and use only a headset and the **PTT** button to operate without having to hold the radio. Its internal memory for digital contacts lets you add the complete list of worldwide DMR users.

Although it is best to first program the radio using the CPS software, keep in mind that you can edit or add a new channel and change a parameter very easily from the keypad.

*Manufacturer:* Qixiang Electron Science & Technology Co., Ltd., Fujian, China, [www.anytone.net](http://www.anytone.net). Available from several US dealers. Price: \$314.99.