AmRRON BTech UV-Pro

Basic User's Guide

Developed by codename Tango-Bravo 14

tangobravo14@protonmail.com

Version History

The most up to date document will always be located at https://gitlab.com/amrron/btech-uv-pro-guide.

v1.0	Initial Release	24 OCT 2025
v1.1	Formatting, added app store descriptions, provided custom Obtainium preset link, updated document location to git.	24 OCT 2025
v1.2	Added terminal bluetooth instructions and QtTermTCP instructions	24 OCT 2025

Table of Contents

Version History **2**
Table of Contents **3**
1. Introduction **4**
1.1: Purpose 4
1.2: Requirements 4
1.3: Terminology 4
1.4: Limitations 5
2. First Steps **5**
2.1: Download Apps 5
3. Initial Setup **6**
3.1: Connect to UV-Pro App 6
3.2: Apply Firmware update 6
3.3: Initial settings 7
3.3.1: Radio Panel *7*
3.3.2: Btech App Settings: *8*
4. APRSdroid **10**
5: WoAD **12**
5.1: Introduction 12
5.2: Settings 12
5.3: Making A Connection 15
6. YAAC on Linux **16**
6.1: Radio Setup 16
6.2: YAAC Setup 18
7. Bluetooth Connection via Terminal **21**
7.1: Pairing via terminal 21
7.2: RFCOMM Connection 22
8. QtTermTCP **23**
9. Conclusion **24**
Appendix **25**
A: Reasonably Private Android Phone for $30 25
Linux Setup *25*
Phone Setup *26*
2.1: Perform Factory Reset 26
2.2: Phone Settings 27
2.3: UAD-NG 28
2.4: Install Obtainium and Packages 29
2.4.1: ADB 29
2.4.2: File Browser 29
2.5: Obtainium Setup 30
2.6: Degoogled App Stores 30
Obtainium 30
F-Droid 31
Aurora Store 31
B: APRS Primer 32

1. Introduction

1.1: Purpose

AmRRON has begun testing and evaluating the use of BTech UV-Pro radios for use in disaster communications. These radios offer a few unique features that can be very useful for our operators. This guide is intended to collect the lessons learned during testing and will evolve as firmware / software changes and additionally capabilities are realized.

The capabilities easily accessible through these radios can be useful in various scenarios. Primarily this guide will be geared toward digital use in a Humanitarian Assistance / Disaster Relief (HADR) environment with consideration also given toward a privacy. To that end, some of the standard hobby features built in to the radio will be omitted or only briefly discussed. Many online resources are available for learning those features.

This guide is not a replacement for hands on training with your gear. It is designed to give an overview of configuration and advanced abilities these radios offer.

1.2: Requirements

- BTech UV-Pro VHF/UHF radio

While this guide is specifically designed around the Btech UV-Pro HT, various other radios are functionally equivalent and may vary slightly in menu structure. Some examples are the VGC-N76 HT and the mobile variants of the VGC-N7500 and N7600.

- Mobile device (Android or iOS)

Android apps have much greater capability than iOS at this time. It is highly recommended that you get an Android device for use with these radios. Having a dedicated device available for interoperability with other AmRRON operators during HADR will increase our effectiveness. See Appendix A for a recommendation and walk through of a $30 option.

1.3: Terminology

- **TNC –** Terminal Node Controller
- **KISS** – Keep It Simple Stupid. In this context refers the the KISS TNC built in to the radio that is accessible via Bluetooth. This is the key feature that allows for easy packet data modes with your attached device.
- **Packet**- Refers to the standard AX.25 protocol of sending data arranged as packets for data communication.

- **RFCOMM –** Bluetooth connection to the TNC of the radio which makes the TNC addressable to the device.
- **APRS** – Automatic Packet Reporting System. APRS is a data mode, primarily on the US frequency of 144.390, which is designed for messaging and position reporting.
- **YAAC** – Yet Another APRS Client. Linux based APRS program with offline mapping.

1.4: Limitations

- Currently, the only access available over bluetooth is the TNC. This limits us to ax.25 packet modes. While other modes would be nice, and may be possible later, this is not a huge limitation. Packet over 2M FM is still relatively quick and can send plenty of data for most uses.
- The radio can only be bluetooth connected to one device using the TNC at a time. That means if you have the radio connected to the Btech UV Programmer app, no other app will be able to access the TNC. A common point of frustration is users not getting X app to connect because they did not realize Y app already had a connection established. I recommend ensuring the app is disconnected and then fully close the app you are no longer using before trying to use another.
- These radios are not true dual VFO. While it has essentially 'tri-watch', (two displayed VFOs and a digital mode channel), if a channel is receiving none of the others will be able to hear at that time. For the best digital mode reliability, consider disabling Dual Watch and tuning your active channel to your digital channel. If your active voice channels are not busy then this should not be necessary but it is something of which to be aware.
- If you have problems with a program or device connecting to the radio, the first troubleshooting step is to power cycle the radio. This TNC sometimes has a hard time establishing a new connection after a previous attempt. This is more prevalent with using it connected to a computer. Quickly power off and back on and try again. This almost always clears the problem.

2. First Steps

2.1: Download Apps

- BTech UV Programmer

  Android: https://play.google.com/store/apps/details?id=com.benshikj.ht.btech.ham&hl=en

  iOS: https://apps.apple.com/us/app/btech-uv-programmer/id6478199714)

- APRSdroid (NA7Q fork recommended)

  https://na7q.com/aprsdroid-osm/

- WoAD (Winlink on Android)

  https://woad.sumusltd.com/download

NOTE: Your radio can only be connected to ONE app at a time. Ensure your radio is disconnected from all other connections before attempting to use another program.

3. Initial Setup

3.1: Connect to UV-Pro App

At this time, the official Btech UV-Pro app is required in order to access certain features and allows for loading and editing channels much quicker than from the front panel. Additionally, Firmware updates are only available from the Btech App.

After downloading and installing the app on your device, the initial pairing of the radio to your phone should be accomplished within the app.

- Ensure Bluetooth is enabled on your device.
- Open the app on your device. You will need to grant the app permissions on the first launch.
- Turn on your radio. Press the Green button for Menu, scroll down to Pairing and press the Green Button for 'OK'. The check box will become checked and the transmit/receive light on the top of the radio will start flashing rapidly green and red.
- After a few moments your app should pop up a notification saying:

"Detected new device UV-PRO, do you want to link now?"

IGNORE YES

- Select 'Yes' in order to pair your device.
- A new pop up will appear from your phone's OS asking you to pair and asking if you want to share contacts with the UV-Pro. Do not share contacts. Click Pair to finish the pairing.
- The next app pop up will ask if you want to Synchronize Signaling Settings. **Select No**

If you select yes, the app will hold the radio settings instead of the radio. This will mean that when you disconnect the app from the radio, settings will revert back to what the radio had. This may cause confusion. I recommend you select no so that any settings you change will persist in the radio regardless if the btech app is connected.

3.2: Apply Firmware update.

If you just unboxed a new radio, you may have a firmware update available. Normally, after connecting to the radio, with internet available on the device, the app will inform you if a firmware update is pending.

Btech has been very responsive and continually adds features and fixes to these radios. I recommend you apply the firmware updates when they are available and definitely when you initially set up the radio.

Please actually read the info screens about the firmware. An early firmware upgrade required special button presses after reboot to get the screen visible. These instructions were clearly posted during the update process yet many of us neglected to pay attention.

If you skipped the firmware update and want to check if one is available you can do so from the Settings → Firmware Version section of the app while connected to your radio.

3.3: Initial settings

3.3.1: Radio Panel

While most every setting can be controlled and set easily from the app. The below will discuss the recommended settings by using the radio panel to ensure you familiar with their locations.

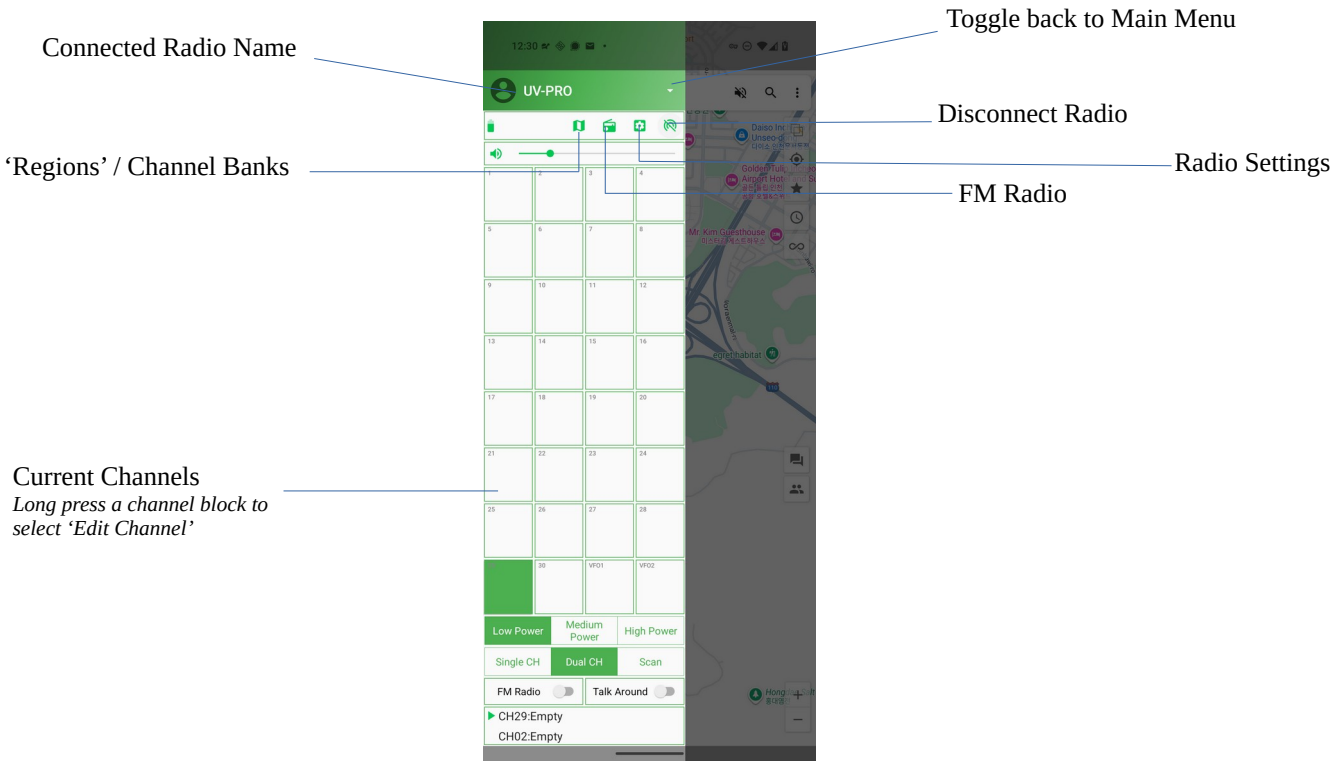
Unless a setting is mentioned, leave it at default. For our uses we will not be entering callsigns into the radio. The associated apps will handle the callsigns required for the various modes. In the below anything in green is a change from factory default. Not all settings are listed, just the ones we care about for our use.

Radio Settings:	**General Settings → Signaling Settings**
Dual Watch – your choice (see 1.4 -Limitations)	ID – (Default is last 4 of MAC)
Scan - Off	Allow Check - Off
Talk Around - Off	Signaling Preamble - Off
Squelch Level -1	**General Settings → APRS Settings**
TX Time Limit – 60sec	No changes, do not input callsign
Tail Elimination – Disabled	**General Settings → KISS TNC**
Digital Mute – Enabled	KISS TNC – Enable Kiss TNC
PTT Follow - Off	**General Settings → Digital Mode**
Audio Relay - Off	Digital Mode – Enable Selected
Enable Vox - Off	Smart Beacon - Off
VFO Step - 25KHz	Share Location - OFF
	Digital Mode – Digital Channel 29 You can use Current for now until you program channels.

3.3.2: Btech App Settings:

With the Radio Panel set up, there are a couple items to take care of in the Btech App.

Your main screen should look like this when connected to the radio:



Now that we are familiar with basic controls, set channels 26 -30 as follows for the SOI AmRRON Digital Channels (ADC): *(these channels and naming are a placeholder suggestion until official SOI designations are created)*

You can elect to Mute the channels in the Edit Channel page. Your TNC will still receive the digital traffic but you will hear the digital over the speaker.

CH Number	26	27	28	29	30
Name	ADC-A	ADC-B	ADC-C	ADC-D	APRS
Frequency	145.00000	145.60000	432.20000	433.50000	144.39000

Once your channels are created, click the Radio Settings button and select Programmable buttons. Set your side buttons functions as you desire. I like them to be simple and disable all functions except the following:

Button	Hold	Short Single	Double Click	Long Press
P1:	Disable	Dual CH main channel switch	Toggle Dual CH	Freq Sync Rapid Scan
P2:	Disable	Transmit Power Switch	Disable	Disable

Lastly, now that we have channels created for digital use, we can use the radio panel *(Menu → General Settings → Digital Mode → Digital Channel)* or the settings page *(Settings → Signaling Settings → Data Mode Channel)* to set the desired channel for our TNC to be listening. We do this so we can can use any two other channels in the dual watch of the radio and the TNC will still monitor and transmit on the selected Digital Channel. We DO NOT need the Digital channel selected as one of our two VFO's. This effectively allows you to operate three frequencies at a time.

4. APRSdroid

NA7Q maintains a fork of APRSdroid. This version has a few extra features that makes it more applicable for AmRRON usage. The main feature is an ability to use offline mapping. You can create and download custom maps which you will copy to your phone for offline usage. Check NA7Q's website for more information on offline maps.

While this guide will mostly apply to both versions, it is geared specifically to the NA7Q version.

APRSdroid is a full featured APRS app. This guide will walk through basic setup and connecting to your radio. Various online sources and videos are available for learning more about the in depth features available.

Follow the link from section 2.1 to download and install APRSdroid from NA7Q's website. Also, visit https://apps.magicbug.co.uk/passcode/. This website is a Passcode generator for your callsign. Most APRS apps use your passcode to act as a verification that you have a valid callsign. This passcode is derived from your callsign and will always be the same number for that callsign.

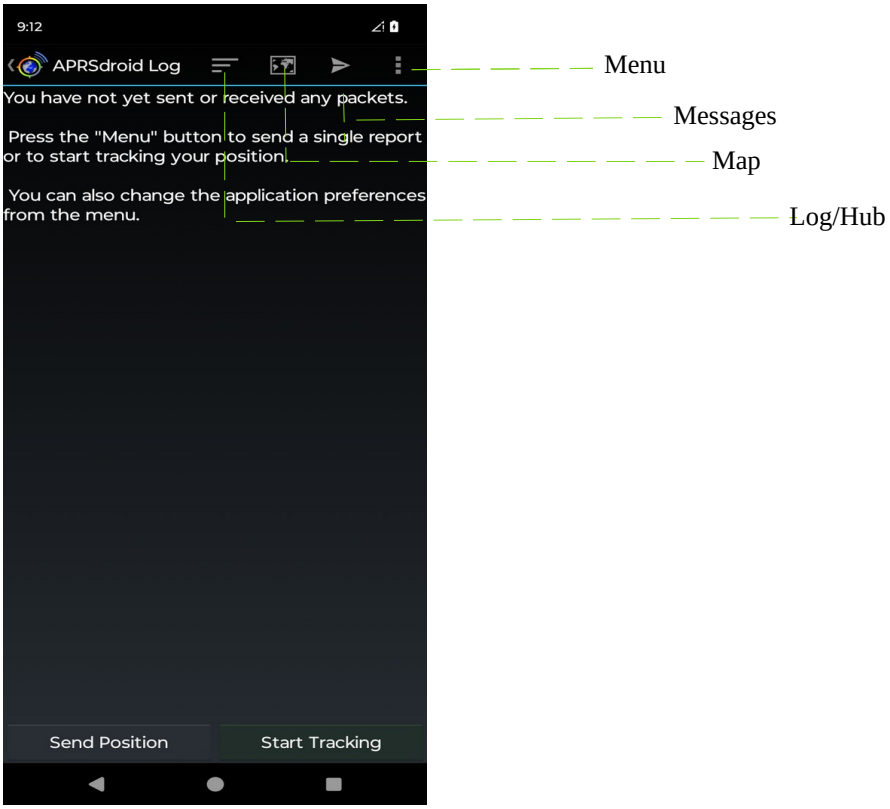
Before beginning ensure your radio digital channel is set to the APRS channel.

When you open APRSdroid for the first time you will be prompted for your callsign and passcode; enter those and click OK to continue.

You will now be at the main APRSdroid Log page. Tap the three dots in the top right and select the Preferences option. There are many options to configure but this guide will focus on a few important options to get up and running with the Btech UV-Pro. your Callsign already filled in from your first start entry.

- Tap SSID to adjust appropriately for your station.
- Change APRS digi path to WIDE1-1,WIDE2-2 (no space between the comma and WIDE2-2)
- Tap Connection Preferences, you may need to allow notifications on the popup. This menu has many sub menus to go through. We will focus on using APRS over RF and not Internet based.
    - Tap Connection Protocol, select TNC (KISS)
    - Tap Connection Type, select Bluetooth SPP (you may need to allow permissions on the popup)
    - Tap TNC Bluetooth Device, select your radio.
- Press your device's back button to return to the Preferences menu.
- Tap Unit Preference, change to Imperial units.
- Tap APRS symbol, select your icon.
- OPTIONAL: Tap Voice Frequency, enter the frequency you are monitoring for voice. This will be a note on your beacon so other users know where to tune if they want to have a QSO.
- Tap Comment Field, set as desired.
- Tap Position Privacy, select your desired level of position resolution.

Back out of Preferences, you will be back at the APRSdroid Log screen. At this time, APRSdroid is set to use your radio. Before we start beaconing, lets familiarize with the app buttons.



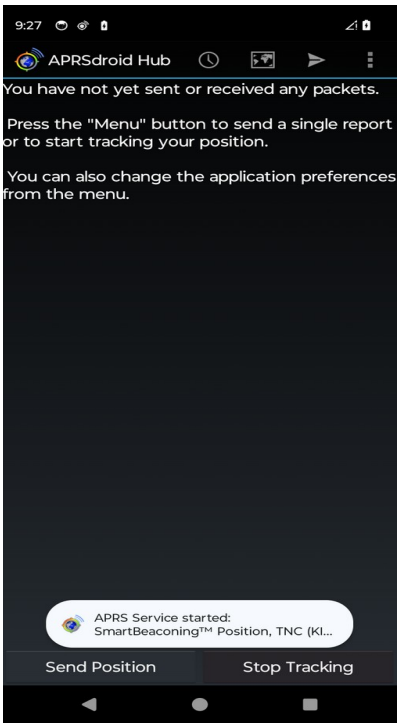
To start beaconing, press the Start Tracking button at the bottom of the screen. You should see a notification pop up saying

"APRS Service started, SmartBeaconing Position, TNC (KISS)"

At this point, you should see your radio screen show the rectangle connection icon.

NOTE: GPS is being provided by your phone to determine position. If you do not have GPS lock, the app will not beacon your position. Messaging will still operate and is a useful method to confirm your app and radio are communicating properly.

NOTE: You MUST tap STOP Tracking to release the radio from the app. If you close APRSdroid and do not press Stop Tracking, the app will likely keep the TNC connection to the radio and prevent other apps from interacting.



5: WoAD

5.1: Introduction

Requirements: You will need your FCC Callsign and Winlink passcode available.

WoAD is Winlink on Android. It can be a complicated program but is pretty powerful and in depth. You will need to practice with it to understand its features.

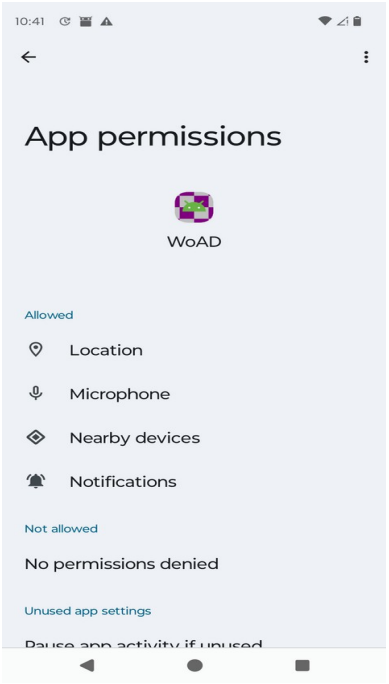
As the name implies, WoAD is designed for performing Winlink connections. The basic setup is similar to RMS Express; users will draft messages, post them to their outbox, and then establish a connection to a winlink station in order to send any pending outbox messages and retrieve any waiting messages.

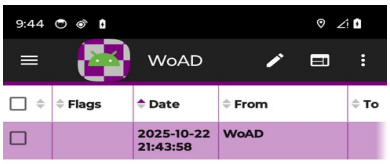
Understanding this operates in that manner is crucial to understanding how to use the software.

5.2: Settings

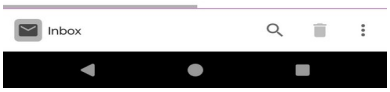
After installing WoAD, go to your Android Settings → Apps → WoAD and ensure permissions are allowed.

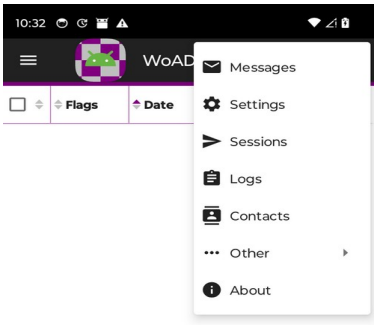
This will use Location for showing nearby winlink stations, microphone and nearby devices for your audio connection to the radios.



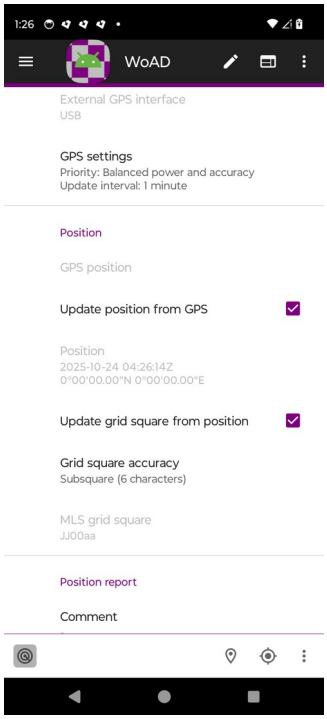


On first launch, you'll be greeted with the Inbox. You'll have a default message from WoAD in your inbox that you can view.

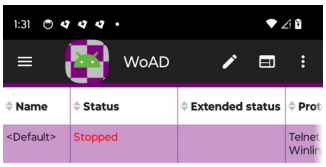




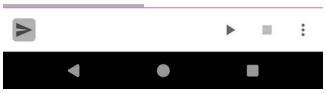
- Tap the three dots in the top right and select the ***Settings*** menu.
- Enter your Callsign, select an SSID, and enter your Winlink password.



- Tap the three dots in the top right and select Other → Position Report menu.
- Under Position, if the app is showing a proper Lat/Long for your location, you can leave the settings how they are. If it is showing all zeros or you don't want to use gps for the app, then uncheck ***Update position from GPS*** and ***Update grid sqare from position***. You can now tap the ***MLS grid square*** entry and type your current location.



Now tap the three dots again and select ***Sessions.*** This is where you will create your various sessions for connections. You will see a default Telnet Winlink session already present. If you entered your callsign and password properly, you can press the play button on the bottom of the screen to initiate a telnet winlink (over the internet) session to verify your passcode is correct.



- To add a new session, tap the three dots in the lower right and select Add. This will take you to the Session editor.
- Lets name the new session **UV-Pro**.
- Tap **Protocol** and change it to **Packet.**
- Tap **Settings.** Select **Destination address** and then tap **RMS channel selection**.
    - You'll be brought to a blank screen the first time. Tap the three dots in the bottom right and select **Update via internet.** This will update the RMS channel list and sort based upon your location settings you set up earlier.
- Select your local RMS station (Make a note of the listed frequency) that you can access and press the check mark at the bottom to accept the choice. You'll be returned to the **Destination address** screen with the channel details filled in.
- Tap back to return to the **Packet (Outgoing)** menu. You'll see the Destination address is now the callsign-ssid of the station you selected.
- Tap **TNC type,** select **KISS**
- Tap **TNC Configuration.** Change Connection type to **Bluetooth.**
- Tap **Connection configuration**. Tap **Device**. Select your radio.
- You can now back out or tap the top thee dots and select Sessions to return to the Session menu.

5.3: Making A Connection

At this point, your software is setup for your first connection. Configure your radio for the channel required. On the radio panel, go to ***Menu → General Settings → Digital Mode → Digital CH.*** If you have the frequency as a preset then select that channel number. Otherwise, Select **CURRENT** for the **Digital CH.**

To toggle your current band from Memory to VFO mode, hold down the * button for a couple seconds. You can now enter the frequency of your RMS station for the radio.

With the radio configured, and your new Packet Session highlighted in the app, tap the play button at the bottom of the screen to start the session. You should see the radio transmit and attempt the session connection.

To connect to different stations, you can either create new Sessions for your other stations or edit the current one and change the RMS Channel to the new station. If you want separate sessions, you can copy the existing one and then edit it for the new channel.

You can also create listener sessions for accepting inbound connections.

6. YAAC on Linux

Read Primer on APRS Appendix B

YAAC is Yet Another APRS Client which can be ran on Linux. Since the Btech UV-Pro TNC (or a 50w capable VGC N7500/N7600) can be accessed via bluetooth, you can use the radio with YAAC for a full featured APRS station. This allows for VHF APRS station without complected cords, expensive TNC's, etc.

If you used the AmRRON-Setup-Scripts, YAAC should be already installed on your computer with a Desktop icon for launching. If not, it is available in the Setup Script Menu under Packet Programs. Go ahead and run that to install if needed. You'll want to also select the Icons option when you select the Categories in the setup script so it will generate your desktop icon for YAAC and you can avoid having to make one.

6.1: Radio Setup

6.1.1: Connecting via GUI

If you wish to connect your radio to your PC using the terminal commands, see section 7.1.

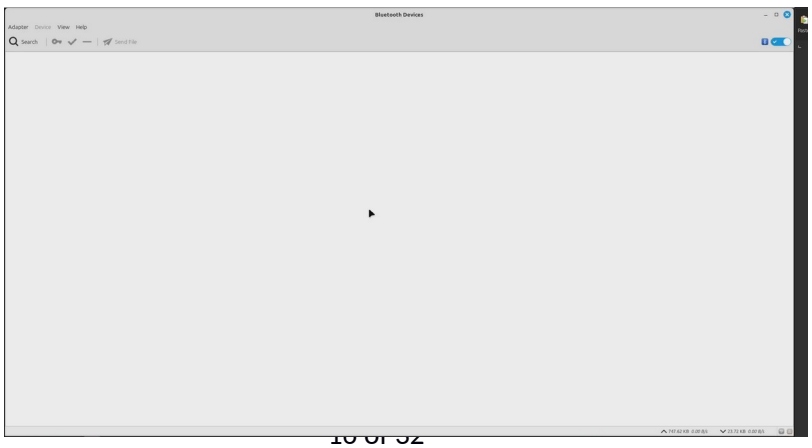
Make sure the Btech APP is disconnected from the radio at this time. You should NOT have the small rectangle showing phone connected to the radio in the top of the radio screen.

Ensure your radio is set up as described in 3.3.1. Change General → Digital Mode → Digital Channel is set to your APRS channel (channel 30 per recommendation).

Go back to Main Menu scroll down to pairing. Don't enable yet.

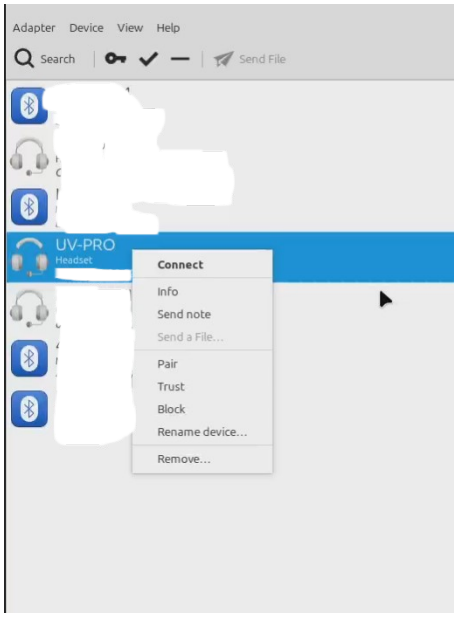
Left click on your bluetooth icon in your system tray:

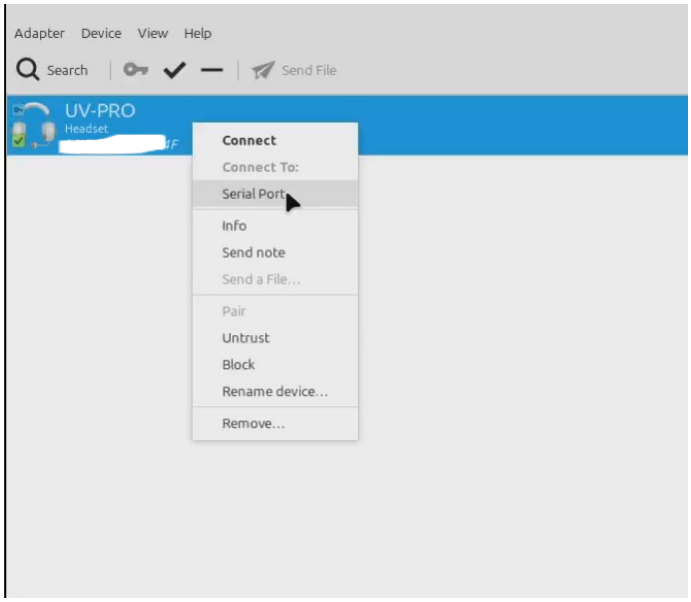
This will open the Bluetooth Devices window:



Click the Search Button on the top left. Now enable pairing on your radio. You'll see your UV-Pro pop up. Right click on the radio and select Connect

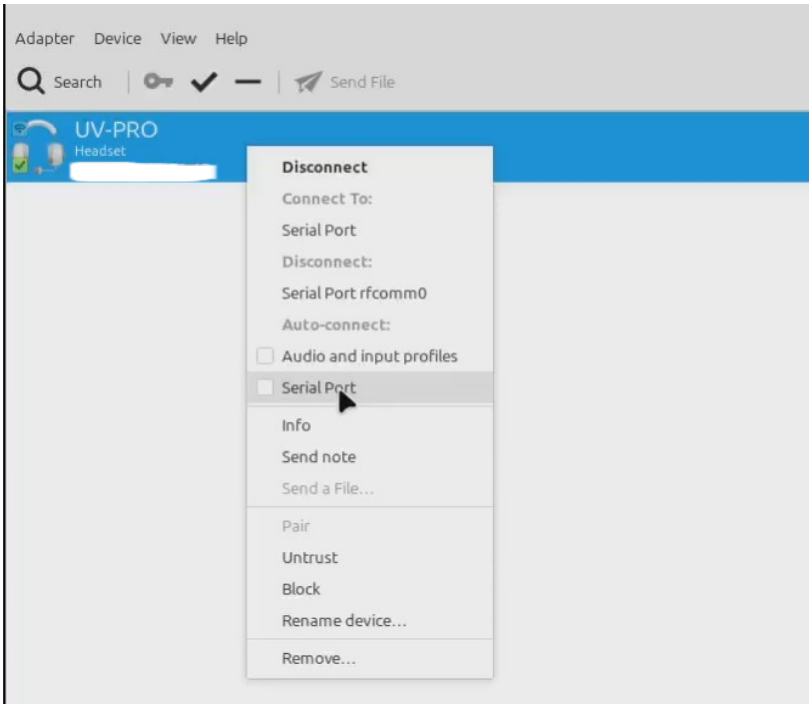
This will most likely Connect then disconnect with an error. No problem. Either way, right click on the UV-Pro entry again, and select Trust. The entry will now have a green check mark on it.





The next step sometimes has issues so be patient. We want to connect to it with the Serial Device. Right click on the UV-Pro entry and select Serial Port under the Connect To: heading.

If it fails to get rfcomm channel, reboot your computer and try again.

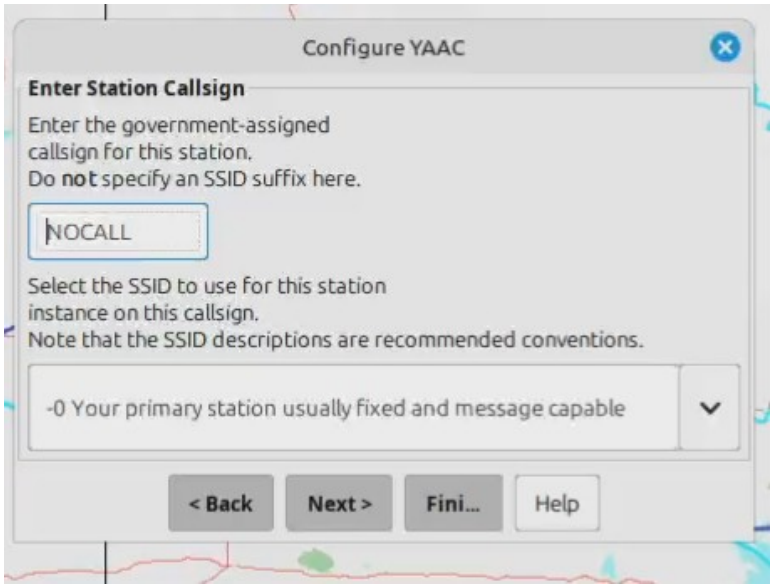


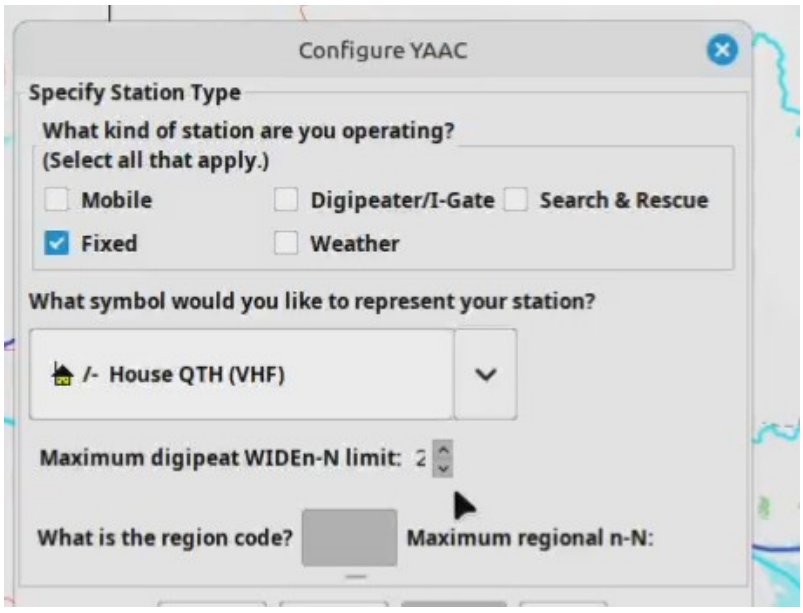
Last time, with the radio connected to your computer as serial port, now you should see the phone connection icon on the radio screen. Right click again on the UV-Pro entry and now select Serial Port under the Auto-Connect: section so your radio will automatically connect as a Kiss TNC when your computer sees it. This is optional and can be left unchecked if you wish to manually initiate the connection. Your radio is now paired to the computer and you can close out of the bluetooth devices window.

6.2: YAAC Setup

Launch YAAC from the desktop launcher. If you have not used it before it should pop up with a menu asking if you would like help configuring YAAC. Click Yes to enter the setup wizard.

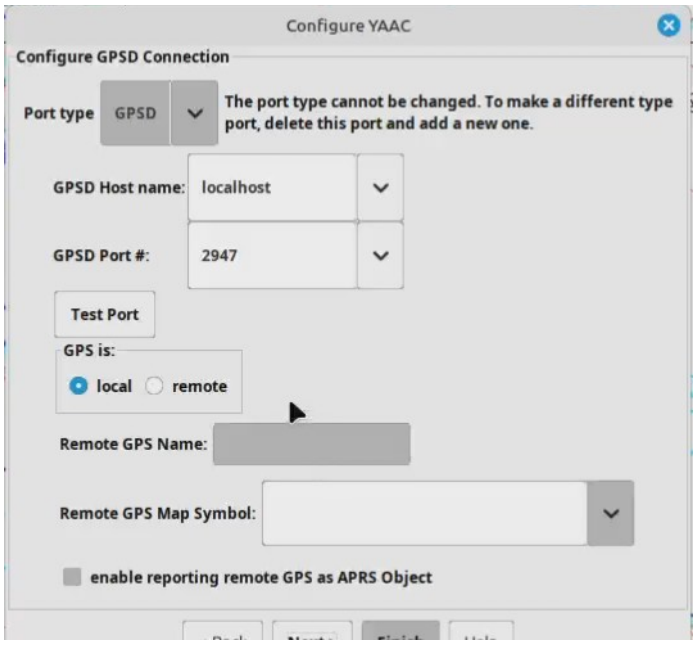
Enter your callsign and choose a SSID. Hit next.





Select your Station Type and symbol. You can leave the other options alone for now. YAAC can operate as a digipeater and/or I-Gate. If you want to do that, select the icon / type as appropriate. This example will assume you're just setting up a home fixed station.

The next screen will ask for your location. You can either enter in a Lat Long or select to use a GPS device if you have one connected to your computer. If you are using the standard AmRRON setup with an operable GPS for time, select Yes, via GPSD.



If you selected Yes, via GPSD. Your next screen will have the port configuration for the GPSD. Leave all as defaults and click Next.

Your next screen is Add and Configure Interfaces this is where we will add the KISS TNC to YAAC.

Select **Add Serial Kiss TNC Port:**

The next window is the configuration for the TNC:

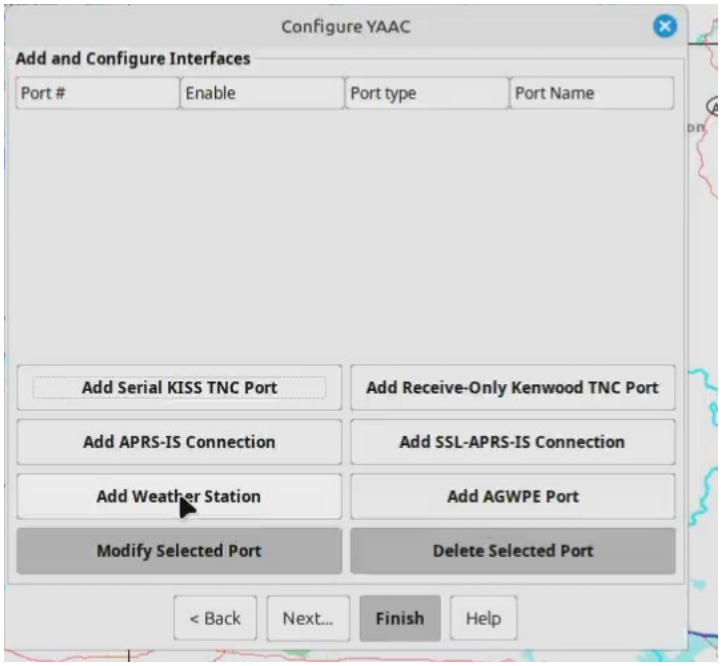
Port Type: Serial_TNC

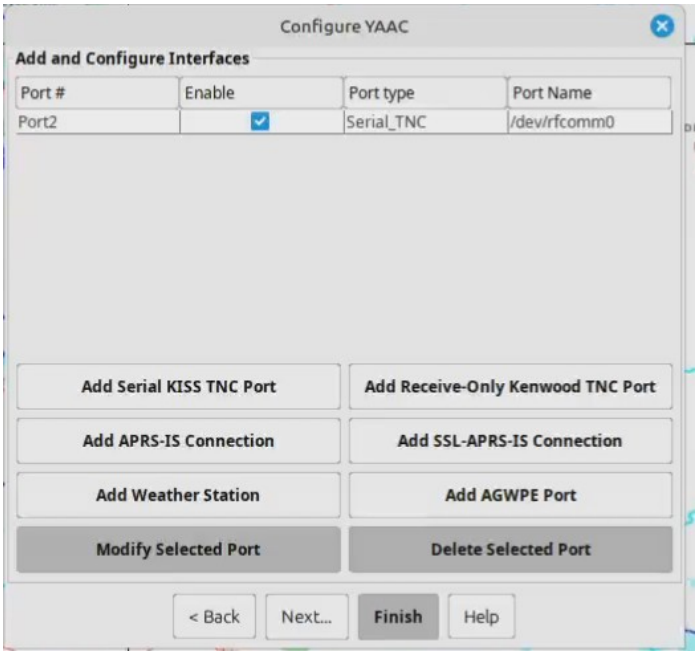
Device Name: use drop down to select *dev/*rfcomm0

Callsign: Should be filled with your call and ssid from earlier.

Transmit: Enabled

Everything else can stay as defaults for now.





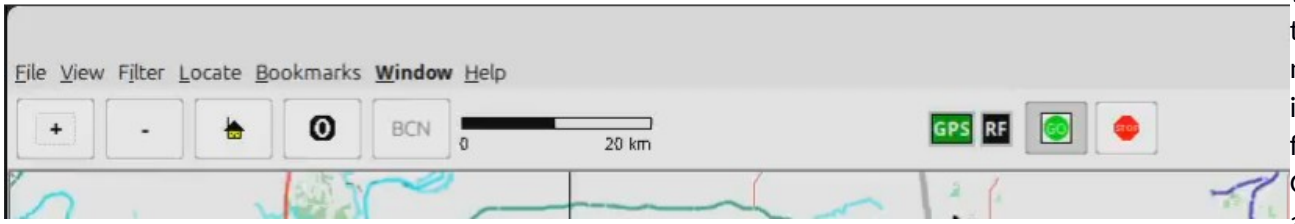
Click next and you should be back at the previous screen with a new Port listed and checked as Enable.

Click Next:

Set your beacon info as desired.

Click Finish:

You should now be at your map



with two new icons for GPS and RF at the top:

If you watch your radio screen and click the BCN button on the top bar of YAAC you should see it transmit a beacon.

Now, check out the extensive online information on how to use YAAC.

7. Bluetooth Connection via Terminal

7.1: Pairing via terminal

IF YOU ALREADY PAIRED USING THE GUI INSTRUCTIONS IN YAAC THIS STEP IS NOT REQUIRED. See section 6.1 for GUI instructions.

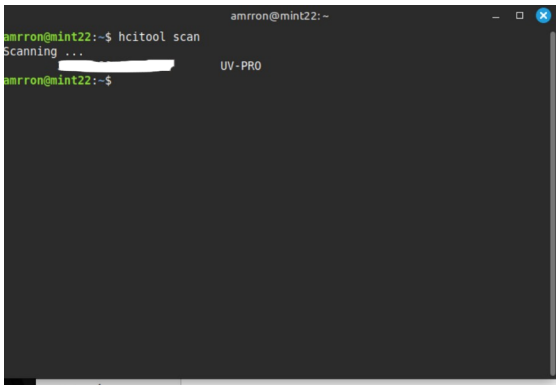
The YAAC guide showed how to establish the bluetooth connection to your computer via the Linux Mint graphical interface. This works but sometimes has consistency issues. Another method is using terminal commands to establish the connection. This can be quicker and more reliable at times and is repeatable on other distributions you may be using.

The goal is to establish a bluetooth connection to the radio's TNC as a serial device so we can use it with our other programs. To do so we need to know the bluetooth MAC address of the radio we are trying to connect.

You can determine the MAC address a few ways, if your radio has been paired to your phone, you can look at your bluetooth saved devices and see the MAC address. It will be a number/letter combination address in the format of XX:XX:XX:XX:XX:XX. This section will use **<MAC>** as a placeholder for your actual MAC address. Replace **<MAC>** with your full address

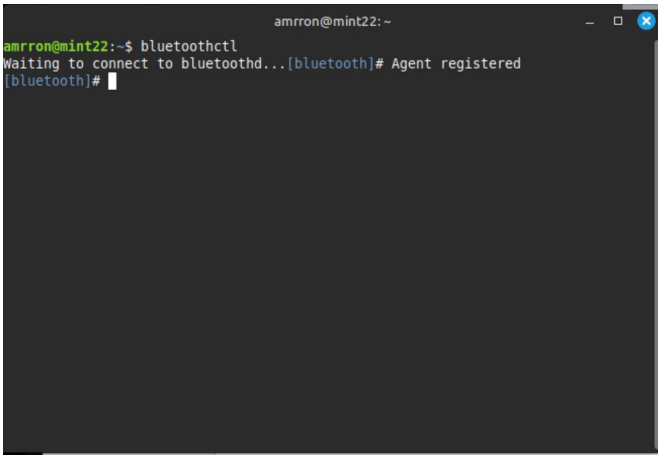
Using linux, we can also scan for the device and see what is being broadcast. To do so, open a terminal, place your radio in pairing mode (lights should be flashing), and type the command:

```
hcitool scan
```



This command will scan for devices in pairing mode and list the MAC address and name. Find your UV-Pro and note the MAC. For this

Next will will pair and trust the radio using the bluetoothctl command. Entering the command will drop you into the bluetoothctl interface, indicated by the [bluetooth]# prompt.



From here, run the command

```
scan on
```

With the controller now scanning, place the radio back into pairing mode. Now establish the connection with the command:

```
pair <MAC>
```

You may see the device connect and then disconnect, don't worry about it.

With the pairing established now set trust level by using the command:

```
trust <MAC>
```

Pairing and trust are now established, we can now exit by running the command:

```
exit
```

This will bring us back to the main user terminal prompt.

7.2: RFCOMM Connection

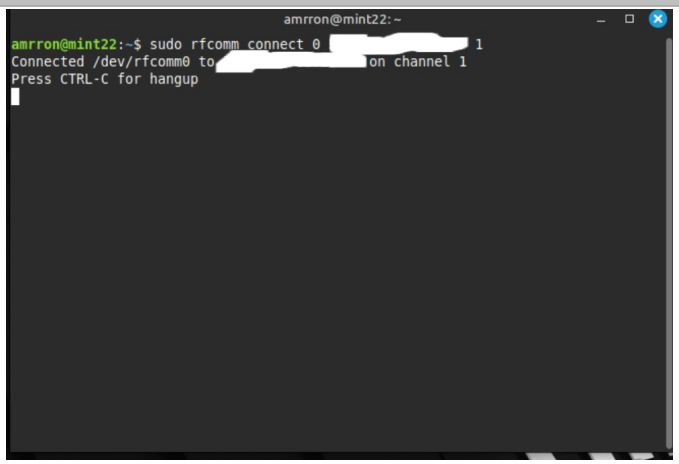
Now that the system has been paired and trusted, we can establish the rfcomm serial connection to the device when we want to use it.

As mentioned elsewhere, the bluetooth connection to the TNC is not always released cleanly. I recommend a quick power cycle of the radio before connecting it to a new device or doing a re-connection.

Open a terminal, to establish the connection to your radio enter the following command:

```
sudo rfcomm connect 0 <MAC> 1
```

You should see the connection established message with Ctrl-C to close the connection. Your device is now connected to /dev/rfcomm0 as a serial device on your computer. You should also see the Connection icon on your Radio screen.



Now, open the software program you are using and direct it toward the serial port of /dev/rfcomm0 for communication to your radio.

8. QtTermTCP

QtTermTCP is a packet terminal program available for linux. This is a useful standalone program for accessing Bulletin Board Systems (BBS) or other packet connection. YAAC is capable of some of the same functions but if you want a dedicated program, QtTermTCP is an option.

Download the QtTermTCP64 file from https://www.cantab.net/users/john.wiseman/Downloads/

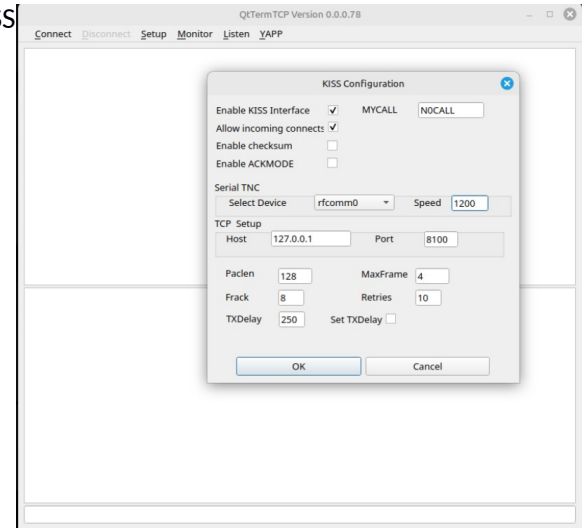
In order to run the file, you will need to make the file executable. You can do this by right clicking on your downloaded file, selecting Properties, select the Permissions tab, and check 'Allow executing file as program'.

Alternatively, you can accomplish the same thing with the chmod +x command pointed at your file.

```
chmod +x ~/Downloads/QtTermTCP64
```

With the rfcomm serial connection established, Now double click the file to start QtTermTCP.

Select the Setup menu and click on Kiss Setup. Ensure Enable KISS Interface is checked, enter your callsign, and change the serial TNC to rfcomm0 and 1200 baud. Click OK.



Now to establish a connection, click Connect → Kiss Connect. Enter the destination callsign and any Digis you will be using. Ensure Modem channel remains in A. Your frequency control is still accomplished via your radio Digital CH setting.

9. Conclusion

Hopefully this guide has helped you understand some of the capabilities of the Btech UV-Pro. Many people are working on new programs designed to leverage the capabilities these radios offer. Understanding how the radio talks with other devices and the basic methods outlined using the programs listed here will help you navigate new apps that are released.

Get out and use the radio, play with the various apps and learn the advanced features. If you find an app useful for AmRRON's mission, please pass them along.

If you have encountered any issues with the guide please reach out with as many details as possible. My email is tangobravo14@protonmail.com

Appendix

A: Reasonably Private Android Phone for $30

*This section will walk you through procuring a stand alone Android device for radio work. Following these instructions **are not required.** This is a guide for those that wish to have an inexpensive device, dedicated to the radio for radio work. This process will remove as much Google "bloat" from the phone giving you a cleaner, more private, and longer running device.*

Doing the debloating process on any other device could cause issues. Make sure you know what you are doing if you choose to attempt this on your daily phone.

This guide is designed around a specific device, the Moto G Play 2024 Straight Talk wireless 64GB phone model XT2413V. This phone can be found at Walmart and purchased for $30 as of October 2025.

You do not need to purchase any phone plans as we will be using this offline / wifi only. While this guide will likely work for other devices, it will only focus on this specific model due to its wide availability and low cost.

This process has been adapted from a YouTube Video from DexGaming. His video will bring you through almost every single step. You will need to watch this video before continuing with the debloater software.

Watch video in full: How To De-Google The HECK Out of Any Android Phone. - DexGaming YouTube

Linux Setup

In order to use the Universal Android Debloater – Next Generation software, you will need to install Android Platform Tools. To do this on Linux Mint, enter the following command in the terminal:

```
sudo apt install android-platform-tools-base
```

Next, download the UAD-NG program from their github repository. Use your browser to navigate to https://github.com/Universal-Debloater-Alliance/universal-android-debloater-next-generation.

You'll see **Releases** on the right side of the screen with a version tagged 'Latest'. Click the version number to be taken to the release page.

You will see a list of **Assets** on this page, click the **uad-ng-linux** asset to download. This should be about a 14.5 MB file. Return to your teminal window when the download is complete.

From the terminal, navigate to your Downloads directory:

```
cd ~/Downloads
```

Then list your files to confirm uad-ng-linux is present:

```
ls
```

Now make the file executable:

```
chmod +x uad-ng-linux
```

Lastly, we will need to Download Obtainium from https://obtainium.imranr.dev/ (choose the Download Uversal APK link) for installing apps. A preset list for Obtainium (https://gitlab.com/amrron/btech-uv-pro-guide) is available with all the programs listed below in section 2.6 to get started with once we remove everything from the phone. *(Click on the obtainium-amrron-presets.json file to view it, then click the download button in the upper right.)*

Your computer is now ready. Before we continue we need to prepare the phone.

Phone Setup

Even with a brand new phone, perform a full factory reset from the emergency recovery. This will ensure your phone is in its stock form, the recovery partition is working, and you know how to perform the recovery.

Seriously, take the minute to ensure you know how to do it.

2.1: Perform Factory Reset

Ensure you device is properly charged before beginning:

1) Power down the phone.
2) With phone off; Hold the Volume down button. While holding Volume down, press the Power button for a few seconds to power up the device.
3) Your phone should come up to a terminal type screen with up and down arrows. Use the Volume Buttons to change items and the Power Button to select. Navigate to Recovery Mode and press the Power Button.
4) Your phone will reboot and show a screen with a dead robot and 'No command'. Hold the Power Button and tap the Volume Up button to go to the Recovery Menu.

Navigate Down to Wipe data/factory reset and press the Power Button to select it.

5) Select Factory Data Reset
6) When ‘Data wipe complete’ is shown, select Reboot system now and press the Power Button to confirm.
7) Your phone will now reboot to the initial setup menus.

2.2: Phone Settings

- Click Start to begin the setup.
- Do not connect to WiFi yet, select ‘Set up Offline’ and Continue to skip this step.
- Deselect all sharing options, click ‘Accept & Continue’
- Confirm Date & Time , click Next
- Deselect all Google Services options and click Accept
- Click ‘Skip’ to bypass setting a PIN, confirm Skip
- Deselect Motoroloa data sharing, click Next
- Deselect TracFone Device Pulse sharing, click Next
- Deselect Lock Screen live updates, click Next
- Click Next (Not Try Now), for Glance setup.
- Click Next to use Buttons
- You will now be in the phone. First action is to swipe down from the top of the screen and Turn OFF WiFi, Bluetooth, and Mobile Data.
- Swipe Up from the bottom to see the apps, select Settings.
- Select About Phone at the bottom.
- Scroll to Build Number. Tap Build Number until ‘You are now a Developer’ is displayed. (8-10 taps)
- Go back to Settings, select System → Developer options.
- Turn on USB debugging.

2.3: UAD-NG

- Plug your phone into your computer.
- You should get a pop up to Authorize USB Debugging from this computer. Authorize it.
- In a terminal, navigate to your Downloads directory.

```
cd ~/Downloads
```

- Use adb to ensure the device is recognized. You should see a Serial number and 'device' listed.

```
adb devices
```

- Launch uad-ng-linux

```
./uad-ng-linux
```

With the phone connected and UAD-NG running, the software should download a list of all packages on the device and show it is connected to motorola moto g play 2024 up at the top.

From the drop downs it should default to user0 / Recommended / Enabled / All lists.

- Select the top left check box to check all items that are in the current filter (137 on mine), then click Review selection on the bottom right. Review you are uninstalling all those packages and click Apply.
  You will get a handful of Failed to perform ADB operation errors for packages that can not be deleted.
- Uncheck the checkbox top left, change Recommended to Advanced, and recheck the box. My device has another 71 selections. Review and apply as well.
- Uncheck the checkbox top left, change Advanced to All Removals. Search for and click uninstall on the following packages:
  - com.google.android.gsf
  - com.google.android.gms
  - com.google.android.overlay.gmsconfig.common
  - com.google.android.overlay.gmsconfig.comms
  - com.google.android.overlay.gmsconfig.geotz
  - com.google.android.overlay.gmsconfig.personalsafety
  - com.android.vending
  - com.swishme.tracfone
  - com.tracfone.generic.mysites

2.4: Install Obtainium and Packages

We have two ways we can get our obtainium apk install file on to the device; using adb or restoring the 'files' app we removed and then later removing it again. Since you have adb installed, it is likely the easier method.

2.4.1: ADB

If you choose to use this ADB install method you can close UAD-NG at this time.

If you have followed along, you should have downloaded the Obtainium app-release.apk universal APK from their website and it should be in your Downloads directory. Your phone should still be connected to your computer, you can verify with the previous adb devices command again.

- From the terminal, navigate to your ~/Downloads and install the app-release.apk with the following command:

```
adb install app-release.apk
```

- You will see 'Performing Streamed Install' for a few seconds and then 'Success'. Your app is installed.
- Swipe down from top, expand the Android System Notification, tap "Charging this device via USB."
- Select Use USB for: File Transfer.
- On your computer, copy the My Obtainium Presets.json file to your Moto G play → internal shared storage → Download folder.

2.4.2: File Browser

If you performed the ADB install of obtainium in 2.4.1 then you can skip this step.

To install Obtainium via the file browser instead of using ADB, find the package com.google.android.apps.nbu.files in UAD-NG and click Restore. You will now have the default google file browser on your phone.

- Swipe down from top, expand the Android System Notification, tap "Charging this device via USB."
- Select Use USB for: File Transfer.
- On your computer, copy the app-release.apk and My Obtainium Presets.json file to your Moto G play → internal shared storage → Download folder.
- Now on the phone, open your file browser, navigate to Downloads, tap on the apk file install Obtainium.
- Go back to UAD-NG remove com.google.android.apps.nbu.files

2.5: Obtainium Setup

- Open Obtainium on your phone.
- Allow notifications.
- Read and click OK to the welcome.
- Tap Import/Export
- Tap Obtainium import, tap the three lines on the top left (Hamburger), select your Downloads directory and your My Obtainium Preset.json file you copied in earlier.
- Connect your device to WiFi.
- Tap Apps in the bottom left, tap the small dotted square above that to select all, and finally tap the Download icon. You'll be prompted to update / install. Select to do both and Continue.
- If asked for the obtainium release apk version, use the app-arm64-v8a-release.apk
- When the first of the apps is downloaded you will receive a notification to Install unknown apps from Obtainium. Select Allow from this source and then tap the back arrow.

2.6: Degoogled App Stores

Now that you have a phone with out google play, you no longer have access to the Google Play App Store. As an alternative you know have three options:

Obtainium

This app allows you to follow projects that do not release their apps through other conventional app stores. Projects that use Github/Gitlab for their releases are a prime example. With Obtainium you can add these projects and they will be tracked and updated in a normal 'App Store' manner. This allows for easier version control and seeing when updates are released. The list you imported into Obtainium is an initial recommendation of apps. Feel free to modify and add other projects you find useful. You can also add in projects that are normally released on F-Droid to be tracked with Obtainium.
The major advantage to this is the ability to export your list of apps to a file and maintain that in your backups. You can then share that file or use it the next time you set up a device to easily restore the apps you curated over time.

If you used the linked Obtainium preset list, you will have the following apps on your device:

- **AndFLMSG** – Android variant of FLMSG
- **Aurora Store** – Google Play app store alternative
- **Calculator**

- **Camera**
- **CoMaps** – powerful, open source offline / online mapping and routing using Open Street Maps
- **Contacts**
- **F-Droid Basic** – Open Source app store
- **Fennec** – Degoogled firefox browser alternative
- **Gallery** – view your pictures
- **HeliBoard** – system keyboard alternative to google's Gboard
- **Material Files** – File Browser
- **Messages** – SMS message client
- **My Location** – Simple GPS status and position information
- **Obtainium** – App manager for alternative release methods.
- **Open Notes** – Note taking app
- **Orbot** – TOR VPN. Route all your online traffic via the TOR network
- **Phone** – Basic Dialer
- **Privacy Browser** – Alternative privacy focused internet browser
- **RHVoice** – Open Source text to voice, used with apps like CoMaps for voice guidance.
- **Seal** – Video downloader. Download youtube videos and playlists to your device for offline viewing. Save helpful AmRRON videos for reference!
- **Tubular** – YouTube video player.
- **Warpinator** – Android client for Warpinator on Linux Mint. Allows transfer of files between devices on the same network.

F-Droid

F-Droid is an open source app store for Android. There are countless projects and apps that can be found including many of the apps you would normally find on the Google Play App store. The interface allows searching out apps by category, provides some privacy analysis of the apps, and notifies of what features the app has that you may not like depending on your level of 'Open Source' dedication.

Aurora Store

The Aurora Store is your alternative to Google Play for all the normal apps you would find there. For example, downloading the Btech UV-Programmer app will need to be done through the Aurora Store. This store offers the ability to log in with your Google Account if you want to purchase paid apps or log in with an anonymous account for everything else. Generally, downloading apps from the Aurora store is my last choice but it is still a required option.

B: APRS Primer

It is my opinion that many in AmRRON unfairly dismiss APRS as just a tracking system and thus do not understand its real world use cases. While in a 'Red Dawn' scenario you would not want to be using APRS, it has countless uses during virtually all other scenarios. APRS is a powerful, well established system that is designed to provide situational awareness to its users. With an extensive network of digipeaters throughout the nation, there are few locations where APRS is not accessible.

While often used as a tracking system, APRS is designed to allow the user to quickly see what amateur radio services are available in a region. After listening for a period of time, your station should show where repeaters, users, net schedules, etc are occurring in your region. This is a powerful Situational Awareness capability. Users can set beacons for locations other than their own. For example, during a weather emergency a user could mark the location of a bridge that is closed. This beacon will populate at the assigned location on all other user's maps. User's could mark streets that are closed due to large protests. Leveraging the existing digipeater infrastructure, this quickly propagates throughout the area.

I recommend users research the options available with routing and understanding the WideN-n system. http://wa8lmf.net/DigiPaths/ is a great resource explaining in detail now relays operate and the best practices. Pay specific attention to the middle section titled *** THE "New Paradigm": Changes In Path Settings ***

In a very simplistic explanation, Wide1-1 is used for fill-in digipeaters while Wide2-2 is used for the main digipeaters. A fill-in digipeater is usually something like your home station running YAAC. If your HT can not make it to a Wide2 repeater, the fill-in can relay your packet to get to the Wide2 without decrementing the relays. Then the Wide2 digipeaters will do their job. In the case of having Wide1-1,Wide2-2 set for your routing, the first digipeater will repeat your beacon / message and remove a number from the routing, e.g. Wide2-1. The next set of digipeaters that hear your relayed beacons will again strip a number and repeat, now Wide2-0. The final set will hear your beacon but not repeat it any further. This process ensures your beacons cover your immediate geographical area while not overloading the network by relaying it out of your area.

Additionally, many of these digipeaters are also I-Gates, or internet linked. This allows for the packets they hear to be routed to APRS-IS for viewing online. If a user does not want to have their beacons relayed to the internet, they can add RFONLY to their routing and their packets will not be included. In that case it would look like WIDE1-1,WIDE2-2,RFONLY.

Some programs, APRSdroid and YAAC included, allow for position ambiguity. This feature allows you to provide your general location but not provide exact positioning. This is a useful feature for some users who want to use the features of APRS but not give the exact position of their QTH or vehicle.