AT-D168UV Programming Guide

Also for the Radioddity GD-168 radio

INTRODUCTION

The AnyTone AT-D168UV radio released late 2024 is similar to the AT-D868UV and AT-D878UV radios. This is an advanced one chip digital/analog radio complying with the ETSI Tier I and II specifications and offering 4 inherent power levels of 5W/2.5W/1.0W/0.2W. The frequency bands include both 144—148 MHz and 420—450 MHz. If a channel is programmed for digital and analog reception type, the radio will auto-sense digital or analog transmissions and connect accordingly. It offers 4,000 channels as well as VFO tuning and for DMR operation offers 2 channels per frequency. The radio has 10,000 Talk Groups and 500,000 Digital Contacts.

The radio includes a vertical 1.77 inch TFT color LCD display which allows ease of seeing the many operating modes including icons for a successful connection to a repeater as well as the caller ID and name etc. The LCD also shows signal strength of received signal. The bandwidth is 12.5k/25k for analog, and 12.5k for digital DMR operation. The radio offers text messaging, voice messaging, roaming function, 4 hours of analog and digital voice recording, digital encryption, and ranging between radios are now standard features. Firmware can as well be user updated. All typical CTCSS/DCS, and DTMF/2TONE/5TONE encode and decode features are also included with the radio. The digital part of the radio allows SMS texting functions via the keyboard and includes a vibrating radio for receipt of messages. You can even talk/listen to satellites with the radio.

Two batteries are delivered with the radio. One of them will be a 2,600 mAh Li-ion battery: and the other a 1,800 mAh Li-ion battery. The radio battery charger included has the new USB-C connection to facilitate standardize use. A 2 Amp phone charger with the USB-C connector can therefore also be used to charge the battery.

AT-D168UV Programing Guide

With the enhanced capabilities of the radios, this Programming Guide will help users to understand all aspects of how to program and set up the radio for maximum usability. Please note that the AT-D168UV radio may have a locked key-board upon delivery. The FCC requires per 47CFR90.203 that an unauthorized user shall not be able to enter any frequencies and transmit on a frequency not authorized. Frequencies should only be programmed by service (amateurs) or maintenance personnel. This Guide is primarily provided for such service or maintenance personnel. For such person to open up the keyboard, press the “Menu” key (green bar) and the “*” (star) key at the same time. US radios are set to 144 – 148 MHz and 420 – 450 MHz ham band and the key lock is unlocked when delivered. In some cases dealers request the radios to be shipped with the full band of 136 – 174 MHz and 400 – 480 MHz professional mode with a locked keyboard. This mode requires the radio to be set to amateur mode in the CPS Optional Settings to be able to open the keyboard as per above.

The software which programs the radio frequencies and all other user defined aspects of the operation is called a “codeplug”. Creating a codeplug is a ‘bottom up’ process where the lowest (common) elements must be created first, then built upon until a fully functional codeplug, that can be loaded into a radio, has been created. The AT-D168UV radio has unique software called Computer Programming Software (CPS) for both creating the codeplug and writing it into the radio for use. When you start creating a new codeplug, many lists and groups are populated with single entries, which may be used as placeholders for initial creation of lists. The programming software (also called CPS) allows “importing” and “exporting” most of the programming parameters for the creation of large amount of input data to the radio – for example large lists of contact names.

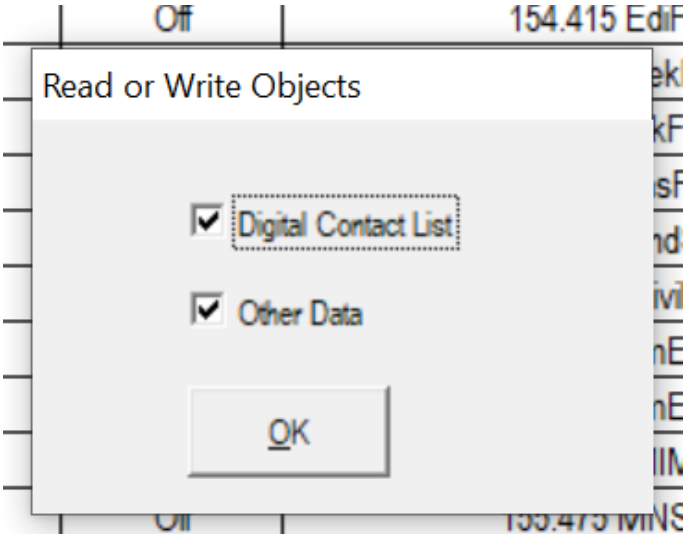
1.0 GETTING STARTED

The programming cable for the AT-D168UV radio is provided by AnyTone. There are several different types of programming cables and a USB to USB-C must be used. Make sure the computer has the correct driver for the cable – see the Device Manager on your PC and make a note what USB port the computer uses for the radio.

The **Computer Programming Software (CPS)** for the AT-D168UV radio may be updated from time to time to correspond to the firmware version used for the radio, and the AnyTone website https://www.anytone.net/download (plus many retailer websites) will offer those updates. Do not mix versions of the CPS with non-matching firmware versions.

Install the CPS Programming software on your computer, and read software from the radio first so you use the correct set-up. The AT-D168UV radio, used in Europe and the USA, uses different frequency bands. The CPS asks the question if you want to read only the “other data” – which is all programming parameters of the radio - and/or the “Digital Contact List”. The DMR contact list could contain up to 500,000 names, and as a result

consume up to 5 minutes to read or write to the radio. Make sure you use the correct port the radio is attached to. You should read everything (2 checkmarks below) the first time.



If you are living in an area where you may be the first to have to generate the codeplug with all your local repeater frequencies, or there may be a codeplug for the AT-D168UV radio from another geographical area which has most of the basic data as a starting point. There are typically codeplugs available on the Internet for your location. If those codeplugs are for a different AnyTone radio they still serve as a good starting point. Load a codeplug for example from the AT-D878UV radio or AT-D578UV radio into the AT-D168UV radio CPS and it should work – require Optional Settings to be updated.

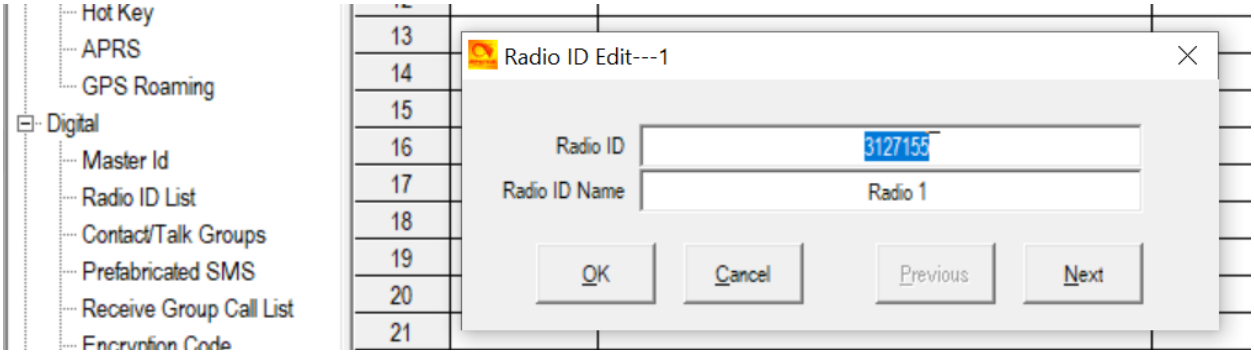
The recommended operation is as described below:
1) Use the AT-D168UV CPS to read the radio, and check the Model information to understand which frequency mode the radio is.
2) Use the AT-D168UV CPS to open an existing codeplug .rdt file from a D878UV or D578UV codeplug. Check the Mode information to understand which frequency band the codeplug is generated for.
3) If the codeplug has a matched frequency band with the radio's frequency band, than it will work. The user just has to examine the Optional Settings, as they are different, before loading the codeplug into AT-D168UV.
4) If the codeplug has a mismatched frequency band with the radio's frequency band, the user needs to change either the frequency band in the radio or the frequency band of the codeplug.
Option A: to change the radio's frequency band to be the same as the codeplug's band, it can be done by a special program released to dealers only (you must request their help if you want any changes to the band other than for amateur use). This program will open a different frequency band for the radio.

Read the radio first with the special program described above, select the new frequency band and write it into radio so it will change the band to something else than the amateur band. Then you can go back to step 1 to check the radio's frequency band, make sure it is the same as the codeplug's frequency band.

Option B: create a new codeplug using the correct frequency band.
Use the AT-D168UV CPS to open a codeplug, then use "export all" to export the files.
In the AT-D168UV CPS, "Set Initialization" (from the top menu), and then in "Model Information" (top menu), select a frequency band which matches that with the radio's frequency band – no password required. Then use "import" to import the files.

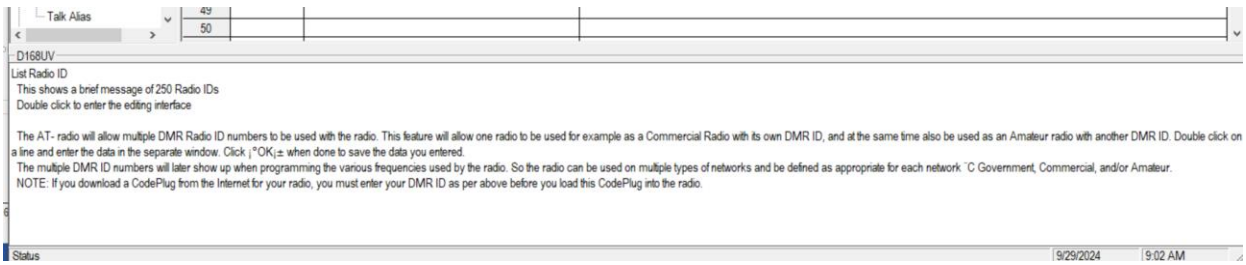
2.0 FIRST THING FIRST – RADIO DMR ID LIST

If you copy a codeplug or build your own the first thing to do is to set your DMR number in the radio. To do this you must expand the DIGITAL list on the very left side of your CPS.



You will there see "Radio ID List" which you should open. Double click on the first line and you get a second window like seen above. Fill in your DMR number and click on OK. The Manual goes into further details as you can have several DMR numbers in the radio. You will also see "Master ID" and all digital channels will change to that ID if used.

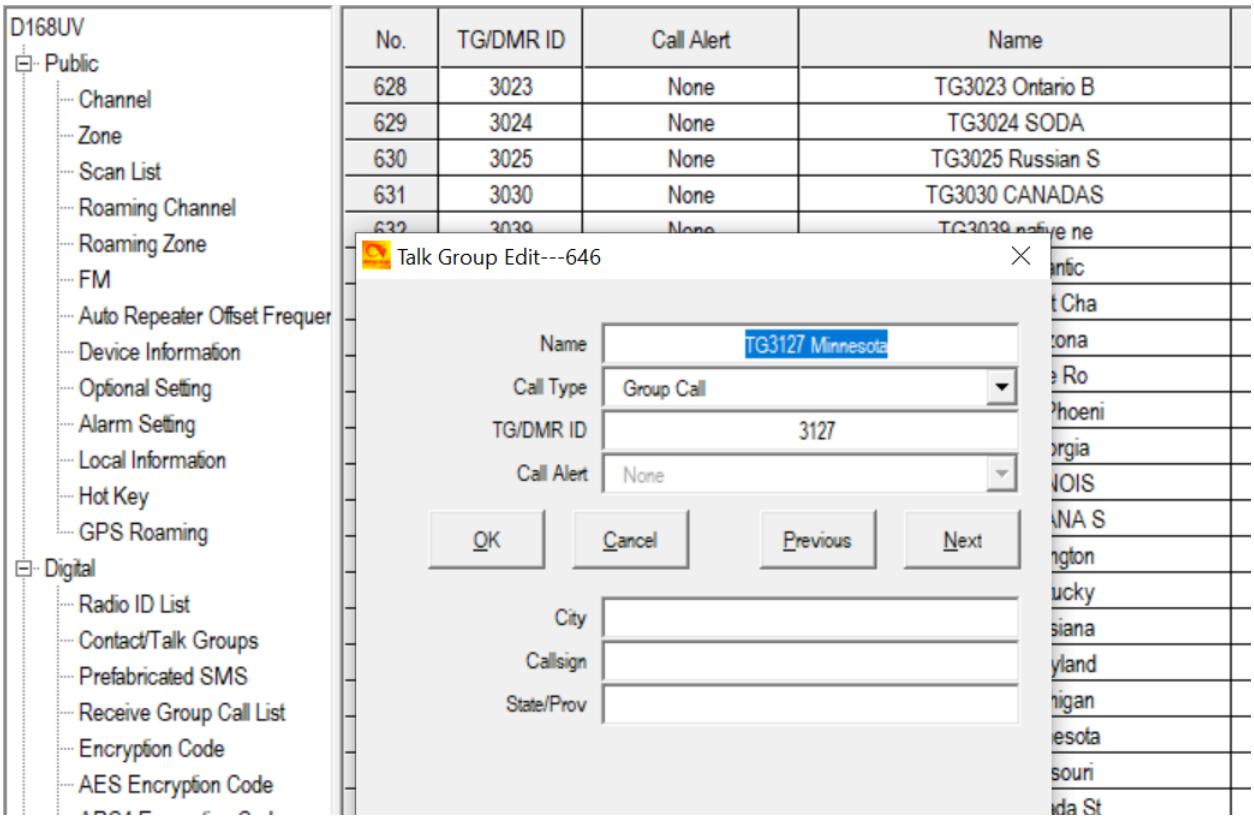
Please note that each page that requires programming have a text field at the bottom of the page. This field can be made taller if so required to read all the text by moving the line separating the text and the upper window. An example of set-up for the radio DMR list is shown below:



3.0 TALK GROUP (TG) LIST

The second thing is to fill the Contact Talk Group (TG) list you also find under the expanded DIGITAL area to the left of the CPS Program. The AT-D168UV program looks like an excel spreadsheet once opened, and the left side defines the many aspects of programming. Open the CONTACT TALK GROUPS tab on the left side and double click on the first line (Line No. 1). The Digital Contact/Talk Group List typically contains the DMR Talk Groups which the user may want to use.

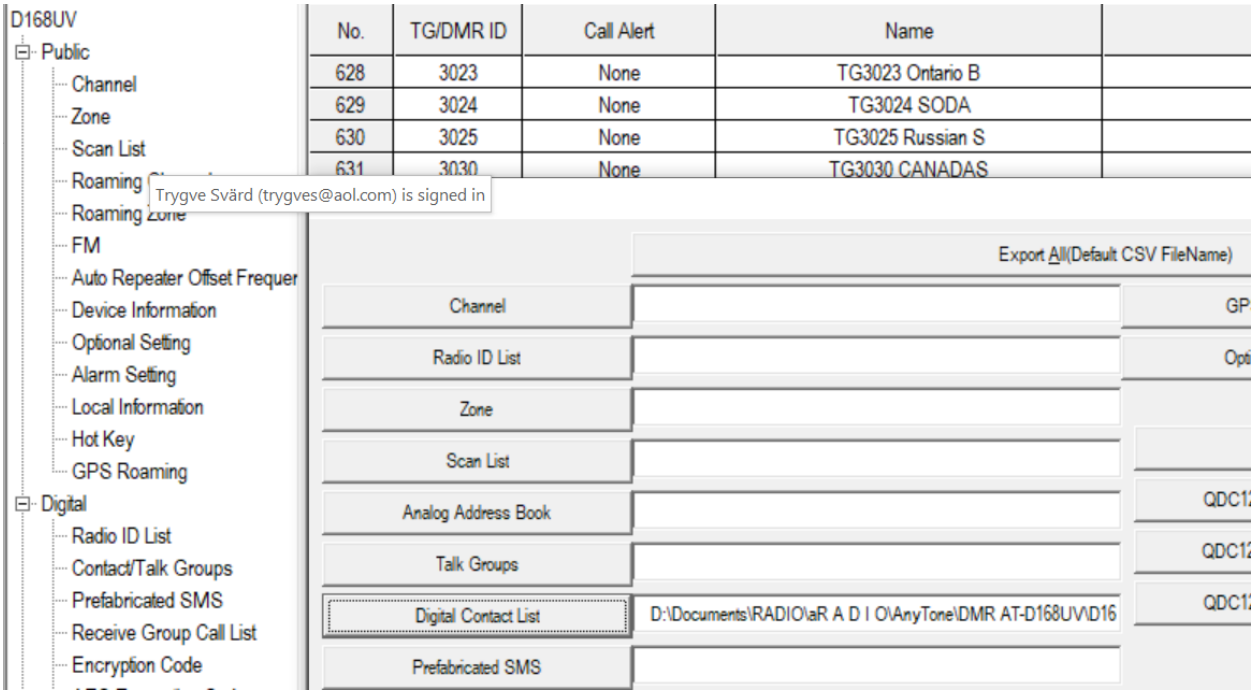
Talk Groups can be found on the Internet. Start to program all applicable DMR Talk Groups (TG uses Group Call) you which to monitor or talk on. This list of Talk Groups may include up to 100+ different groups. A list of worldwide Talk Groups can be found at http://www.mw0mwz.co.uk/dmr_bm_talkgroups.php



The Talk Group list can also be generated by exporting the original radio Digital Contacts Talk Groups (from an AT-D878UV for example) and then add in to that list in an excel format. In the Programming Software there is import and exports features in the taskbar – open the TOOL menu and do an “export” where you have the original Talk Groups. This opens up a new screen where you click on “Digital Contact”. A new screen shows up where you define where to save the list on your PC.

In the .csv format you can paste all or your required Talk Groups from the DMR-MARC website into the spread sheet. You get the format from the original radio codeplug you just exported.

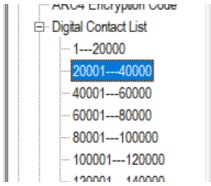
Once all TG's are entered in the .csv file, the Contact List should be "imported" back using the Programming Software for the AT-D168UV radio the same way you exported the file. Click on TOOL menu, and then "import" for TG's and in the new window click on Digital Contacts and select the .csv file you want imported. Please note that the radio can have up to 10,000 Talk Groups.



4.0 DIGITAL CONTACT LIST

The next step is to fill the radio with all possible contacts you may ever encounter. By doing this, the radio will for each contact you make display the name, DMR ID, Call sign etc. of the individual you are connected with.

The Contact List is a "look-up" table for the radio to display all the details of the contacted person instead of only the DMR ID number. If you do not update the Contact List from time to time you may see the DMR number for new people instead of their name. A master list of DMR contacts is available at the new radioid.net website:
https://www.radioid.net/database/dumps
and select the **"user.csv"** file to download and import to the AT-D168UV radio. This database of contacts must be the.csv format to be used for DMR ID's and imported into the AT-D168UV radio as required. The radio holds 500,000 names in the look-up table.



20022	2089290	None	Jean Pierre BERN	Etretat	Private Call	F4ALR
20023	2089291	None	Joel CHABASSET	Perpezac le Noi	Private Call	F5MIW
20024	2089292	None	Claude	Douai	Private Call	F8AQI
20025	2089293	None	Michel MICHEL	AULNOYE	Private Call	F6IGI
20026	2089294	None	Laurent	PERPEZAC LE NOI	Private Call	F1MCO
20027	2089295	None	Radio-Club des F	Feignies	Private Call	F5KDB
20028	2089296	None	Jerome VILLY	La Chapelle de	Private Call	F4UAN
20029	2089297	None	Christophe DENIS	Houdelmont	Private Call	F4EMU

In the CPS Programming Software for the old radio, like a AT-D878UV, open the TOOL menu and do an “export”. This opens up a new screen where you click on “DMR ID List” and on the second screen select where you want to save it on your PC. This list is automatically divided in sections to accommodate up to 150,000 ID’s. If your list you work in the .csv format is more than 20,000 names, when loaded into the radio, they will split up and be distributed between the several lists in the radio.

So now that you have both the DMR database and the radio original database open, copy the list of DMR ID’s you want from the DMR database into the radio .csv file. Then back to the TOOL menu on the AT-D168UV, and “import” so you can import the entire .csv DMR ID list into the radio. Note: You have to enter “Private Call” in all the CALL TYPE columns of the radio .csv database before loading it into the radio. The No. column can be left blank.

Note: Any .csv file being loaded back into the AT-D168UV radio must be in the correct format and have no stray information in any cell outside the ones being used by the radio. If the “import” seems to not work – check the .csv for any inconsistency. The Contact database, downloaded is not necessarily correct for each entry and have been found in some cases needing cleanup to work with the radio. Therefore, it may be important to “export” the original list when the radio was new to see the format of the .csv file.

5.0 CHANNEL – FREQUENCY SET-UP

The AT-D168UV offers programming of 4,000 channels for UHF and VHF. The channels can be either analog or digital. To start, double click on the first line No.1 to open the Channel Information programming window for that channel as seen on page 11 below.

If you plan to import the channel list from a different radio like a AT-D878UV you need to make sure it is from a radio with the same frequency band. See above description for details of importing date to the new radio AT-D168UV.

The Channel Information Edit window contains several options which will be explained below:

Channel Name:	The name of the channel (typically name of repeater and TG)
Receive Freq.:	the VHF or UHF frequency
Transmit Freq.:	the VHF or UHF frequency
Channel Type:	Select Analog, Digital, Mixed Analog or Mixed Digital
Transmit Power:	Select one of four levels and to 5W/2.5W/1W/0.2W for VHF, 4.5W/2.2W/0.5W/0.2W for UHF
Band Width:	12.5 kHz or 25 kHz: Select the bandwidth of transmit for Analog only
TX Permit:	Selects PTT transmit criteria of 4 – typically Same ColorCode (CC)
Scan List:	Select which Scan List to start scanning from (create list first)
APRS Report Type:	Select Off, Analog or Digital.
Analog APRS PTT:	Select Off, Start or End of transmission
Digital APRS PTT:	Select Off or On
Digital APRS Ch.:	Select 1 through 8
Exc. Ch. Fr. Roam.:	Select On or Off
DMR Mode:	Select Repeater for normal mode or simplex, double slot or split. (simplex and double slot with same time slot between radios but without repeater. Split with repeater and with different time slots between TX and RX)
Analog APRS Freq.:	Select 1 through 8
DMR CRC Ignore:	Select Off or On
PTT Prohibit:	Check if the frequency is a listening channel only
Work Alone:	Check if the “alone” emergency function should be allowed
Talk Around:	Check for RX freq. the same as the TX freq. (Simplex).
Data ACK Disabled:	Check to ignore the repeater data service request for a confirmation.
Auto Scan:	Sets up automatic scan of that channel

Digital

Contact 1:	Select the Talk Group you want for this frequency **(very important!)**
Radio ID:	Select which of the DMR ID’s to use for this channel
RX Color Code:	Select which ColorCode (CC) is for the channel used.
TX Color Code:	Select typically the same as RX CC

(please note that this is a new feature that may require older codeplugs to be updated)

Slot:	Select which slot (1 or 2) applies to this “Channel”
Receive Group List:	If programmed select which Talk Groups you want to listen to, or select NONE to listen to only the programmed Talk Group for the transmission (TX and RX TG the same)
Digital Encryption:	Select Off or which of 32 numbers to use for encryption
Extend Encryption:	not used at this time
ARC4 Encryption:	not used at this time
AES4 Encryption:	not used at this time
Multiple Key:	not used at this time
Random Key:	not used at this time

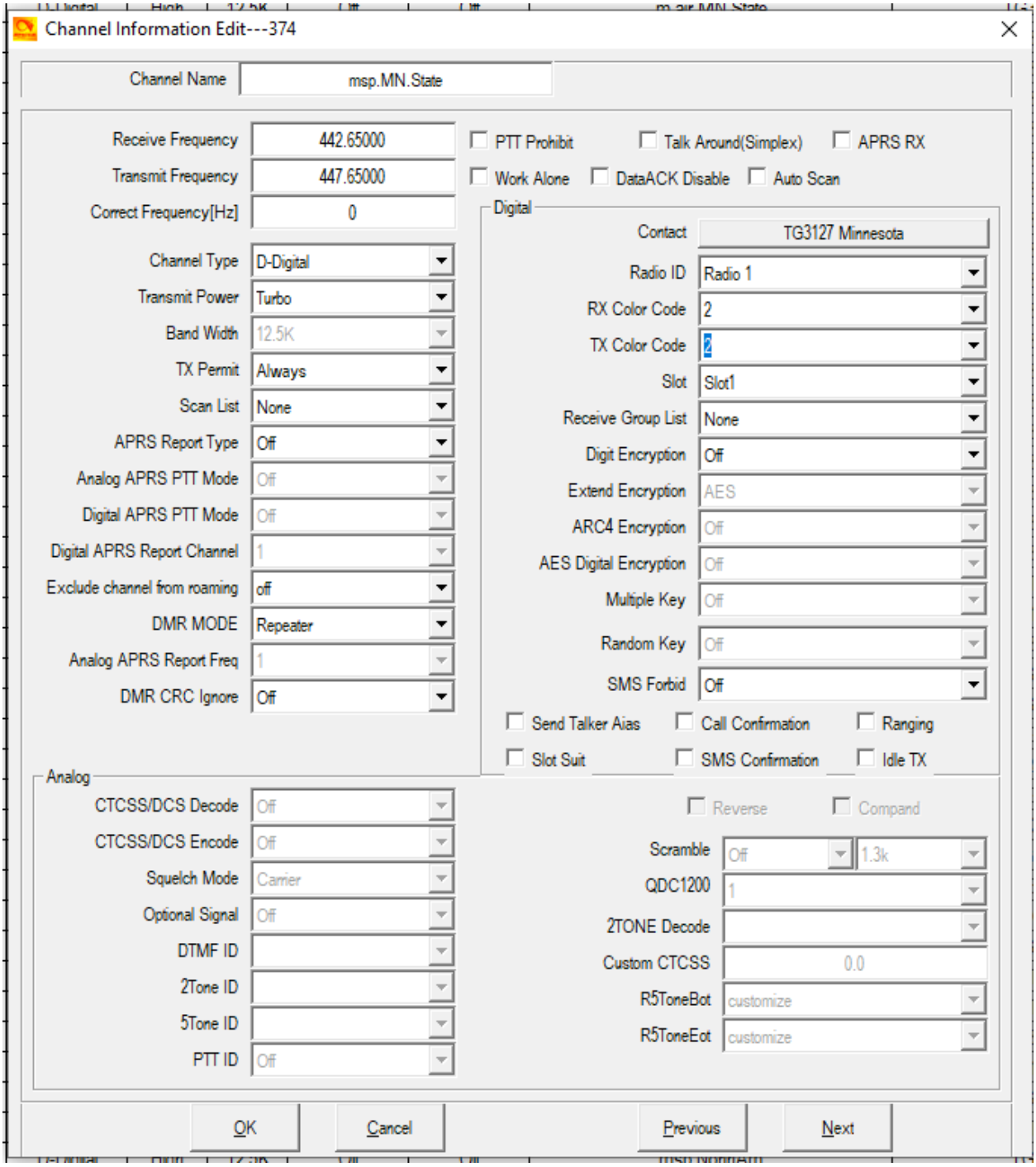
SMS Forbid:	Select ON or OFF
TX Prohibit:	Check if no transmit on this frequency / TG
Work Alone:	Check if you want the radio to make an emergency call if you do not press any key or PTT within a set time as set under the left “Public” and Alarm Setting.
Talk Around:	Check if you are not using a repeater and want simplex
Through Mode:	Check if TX and RX use different frequencies w/o repeater
Simplex TDMA:	Check if working without repeater and using 2 slots
TDMA Adaptive:	Check if for adaptive slot selection between slot 1 and 2
Call Confirmation:	Check if the receiver has to transmit before accepting private calls.
Ranging:	Check if you want to allow 2 radios to check distance between them.
Send Talker Aias:	Check if you want talker alias on this channel
Call Confirmation:	Check if the receiver has to transmit a confirmation before accepting a private call
Ranging:	Check if the radio accepts ranging on this channel
Slot Suit:	Check if the radio shall ignore the slot setting on this channel
SMS Confirmation:	Check if the radio shall request an SMS confirmation from the RX radio on a private call
Idle TX:	Check if you want the TX to change the slot if the programmed slot is busy. Both TX and RX radios must have this function set.

Analog

CTCSS/DCS Decode: Select Off or CTCSS or DCS and tone frequency (receiver)
CTCSS/DCS Encode: Select Off or CTCSS or DCS and tone frequency (transmitter)

Squelch Mode:	Select how to use the squelch where “Carrier” is the most common
Optional Signal:	Select Off, DTFM, 2Tone or 5Tone
DTFM ID:	If DTFM ID was selected: Step 1: Analog->DTMF, input the DMTF self ID and DTMF encode. Step 2：Channel->Analog->Optional setting, set to DTMF Step 3: Channel->Analog->Squelch mode, set to Optional Signal Step 4: Channel->Analog->DTMF ID, select the DTMF code Step 5: Optional Setting->Key function, assign a key to Call. Step 6: Press the Call key to send the selected DTMF ID.
2Tone ID:	If 2 Tone ID was selected: Step 1: Analog->2Tone, complete the settings in Encode page. Step 2：Channel->Analog->Optional setting, set to 2Tone Step 3: Channel->Analog->Squelch mode, set to Optional Signal Step 4: Channel->Analog->2Tone ID, select the 2Tone code Step 5: Optional Setting->Key function, assign a key to Call. Step 6: Press the Call key to send the selected 2Tone.
5Tone ID:	If 5 Tone ID was selected:

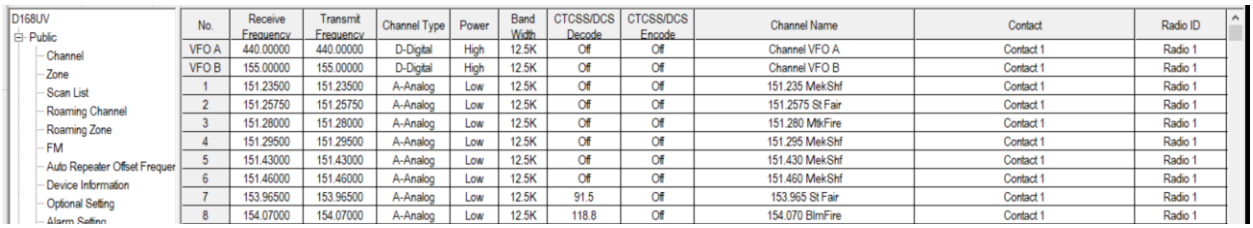
	Step 1: Analog->5Tone, input the 5Tone self ID and complete the settings in Encode page. Step 2：Channel->Analog->Optional setting, set to 5Tone Step 3: Channel->Analog->Squelch mode, set to Optional Signal Step 4: Channel->Analog->5Tone ID, select the 5Tone code Step 5: Optional Setting->Key function, assign a key to Call. Step 6: Press the Call key to send the selected 5Tone.
PTT ID:	Select off, at start, at end or both. To get the PTT ID working, the optional signal shall be set to DTMF or 5Tone, and the EOT/BOT in the DTMF & 5Tone page shall be set up first. OFF: Select OFF Start: Select Start, press PTT key to send a series of DTMF codes or 5Tone code. End: Select End, release PTT key to send a series of DTMF code or 5Tone code. Start & End: Select Start and End, press and release PTT key to send a series of DTMF code or 5Tone code.
Scramble:	Select a frequency to offer a more confidential communication while other radios will hear only a noise.
QDC1200:	If the QDC1200 code was selected: Step 1: Analog->QDC1200, complete the settings in Encode page. Step 2：Channel->Analog->Optional setting, set to QDC1200 Step 3: Channel->Analog->Squelch mode, set to Optional Signal Step 4: Channel->Analog->QDC1200, select the QDC1200 code Step 5: Optional Setting->Key function, assign a key to Call. Step 6: Press the Call 1 key to send the selected QDC1200.
2 Tone Decode:	Write how to decode
Custom CTCSS:	Enter value when requiring a custom CTCSS tone
R5 Tone Bot:	Select if a R5 tone is to be sent at PTT
R5 Tone Eot:	Select if the R5 tone is to be sent at the release of the PTT
Reverse:	Reverse TX and RX frequencies on the channel
Compand:	Select to allow the TX signal to be better heard by the RX without noise at further distances.



Once completely filled in, click OK to save this Channel. There is also an option to first “export” the channel data into a .csv file, from the original AT-D168UV CPS, where the radio was read to get all the data in the correct format, and then work the entry of most data in the excel format. Then save it and “import” back into the codeplug of the radio. For large channel data entries, this may be the easiest method where copy and paste function will allow easier generation of a lot of channels.

The channel set-up can also be created by first exporting the channel set-up from for example an AT-D878 radio, and then as a .csv excel file edit, copy and paste as many channels and frequencies you need. As each repeater being programmed may have the same Talk Groups, working all of this in a excel format and then importing it all back into the radio is the most efficient method of building a large channel database for the AT-D168UV radio.

The completed Channel data should look something like below:



No.	Receive Frequency	Transmit Frequency	Channel Type	Power	Band Width	CTCSS/DCS Decode	CTCSS/DCS Encode	Channel Name	Contact	Radio ID
VFO A	440.00000	440.00000	D-Digital	High	12.5K	Off	Off	Channel VFO A	Contact 1	Radio 1
VFO B	155.00000	155.00000	D-Digital	High	12.5K	Off	Off	Channel VFO B	Contact 1	Radio 1
1	151.23500	151.23500	A-Analog	Low	12.5K	Off	Off	151.235 MekShf	Contact 1	Radio 1
2	151.25750	151.25750	A-Analog	Low	12.5K	Off	Off	151.2575 St Fair	Contact 1	Radio 1
3	151.28000	151.28000	A-Analog	Low	12.5K	Off	Off	151.280 MtkFire	Contact 1	Radio 1
4	151.29500	151.29500	A-Analog	Low	12.5K	Off	Off	151.295 MekShf	Contact 1	Radio 1
5	151.43000	151.43000	A-Analog	Low	12.5K	Off	Off	151.430 MekShf	Contact 1	Radio 1
6	151.46000	151.46000	A-Analog	Low	12.5K	Off	Off	151.460 MekShf	Contact 1	Radio 1
7	153.96500	153.96500	A-Analog	Low	12.5K	91.5	Off	153.965 St Fair	Contact 1	Radio 1
8	154.07000	154.07000	A-Analog	Low	12.5K	118.8	Off	154.070 BlmFire	Contact 1	Radio 1

6.0 ZONE LIST CREATION

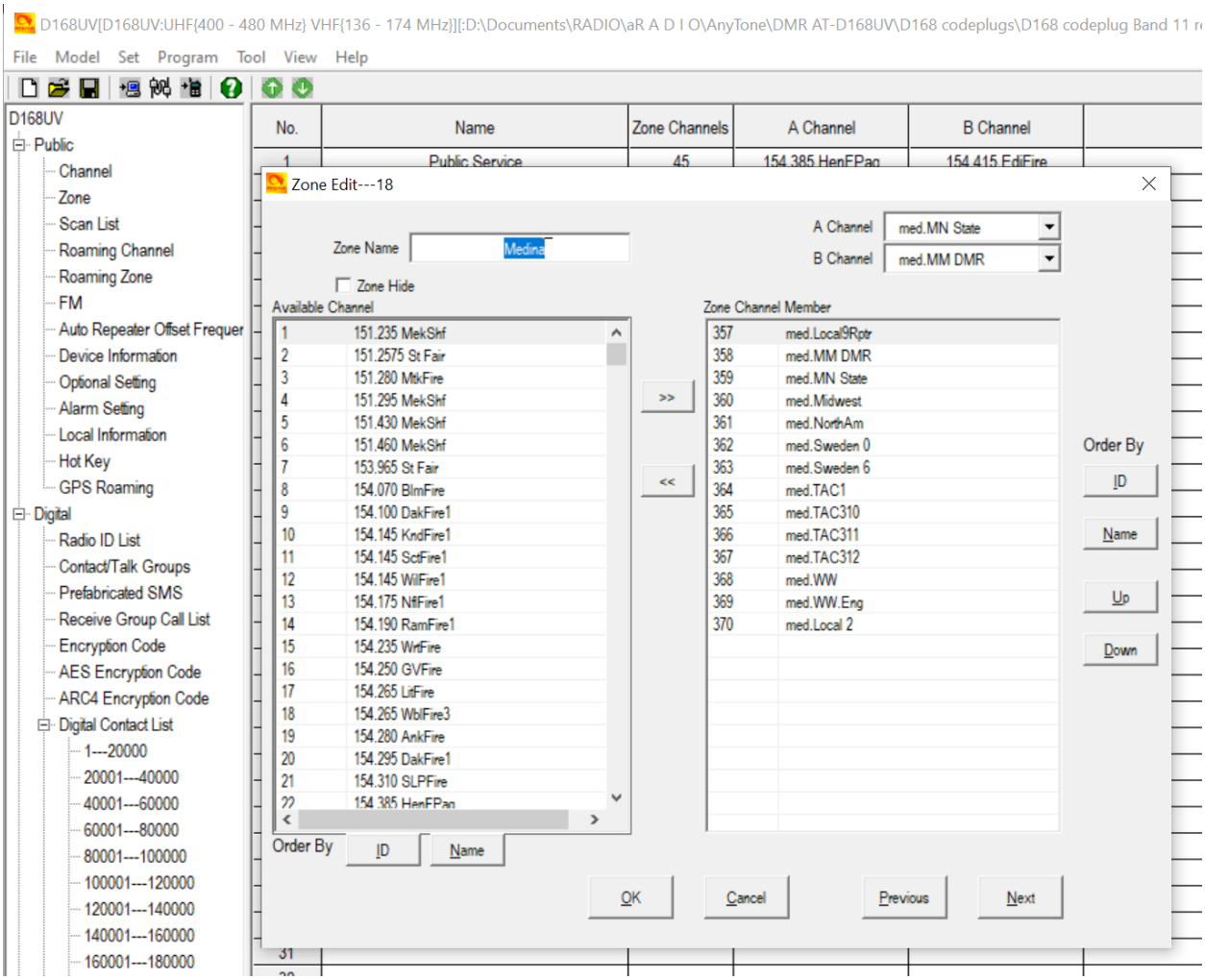
NOTE: You have to use the AT-D168UV radio with the up/down key arrow button to go between zones.

Create a ‘Zone’ name (that relates to the name of the scan list) and insert it for the time being to create a group of channels for example all tied to one repeater. Creating a ‘Zone’ allows you to put your configured ‘channels’ into logical groups. You can use the same ‘name’ for these (as your Scan List names) to help you keep things straight in your mind, however they are in two different sections, so there is no conflict. You will need to create a zone in order to select the group of channels you will be adding. Naming choice is up to you, and the ‘Zones’ do not have a limit of 16 channels on this radio. You can name each zone by the geographical location or any other name you wish. Add your channels in the order you wish them to be accessed by the channel select knob or menu selection. Please note that you are able to sort the order of the channels or move one up or down to better reflect where you want it when turning the channel knob. You may wish to use a name for your zones that relates to its ‘Scan Lists’.

In the Zone menu, double-click on Line No.1 to open the Zone Edit window.
The green up and green down arrow in the picture below allow re-sorting the Zone list names to achieve a different order. This may help to put them in alphabetical order.

The below sample for MN State allows scanning the same channel but from several different repeaters so that when driving around the city there is always an available connection. Other set-ups for scanning uses one repeater and scans all programmed Talk Groups on that repeater.

To create a Zone you name it like the repeater name or “UHF Analog”. Then you see all your Channels on the left side of the open window. You have to move with the >> the Channels you want over to the right side. The A and B Channel visible on top at the right is the opening Channel for that Zone.



7.0 SCAN LIST

This set-up is very similar to how the CPS works. You double click on the top channel and see a new window. You name it as you find appropriate. You then drop the channels you want in this scan list by using the >> double arrows to the right to build a list on the right side of the display of the channels you want in the scan list. It is very similar of how you create zone lists. See page 18 in the radio manual for further descriptions.

Please note that you have selections at the bottom of the page to set up. The Revert Channels has a bit of further explanation here.

When the radio finds a signal during scanning, press Menu key on radio to stay at the channel with the signal permanently. Please note the channel might be from a different zone.
Selected: During scanning, press PTT key to transmit at the initial channel before scanning
Selected + Talk Back: When there is no signal during scanning, press PTT to transmit at the initial channel before scanning. When there is a signal, press PTT to transmit at the channel with signal.
Priority Channel Select: During scanning, press PTT to transmit at the Priority Channel.
Last Called: When there is no signal during scanning, press PTT to transmit at the last channel had received the call.
Last Used: When there is no signal during scanning, press PTT to transmit at the last channel had used.
Priority Channel Select + Talk Back: When there is no signal during scanning, press PTT to transmit at the initial channel before scanning. When there is a signal, press PTT to transmit at the Priority channel.

8.0 OPTIONAL SETTING

The AT-D168UV radio basic configuration set-up is done in the Optional Setting window. This page contains a lot of important information for the radio operation.

Once the Optional Setting window is open, there are several sub-sections to program. The below window shows all the 17 sub menus available in the Optional Settings. This guide tries to help in programming each of the 17 pages. Recommended settings are from the creator of this programming guide and underlined to help first time users.

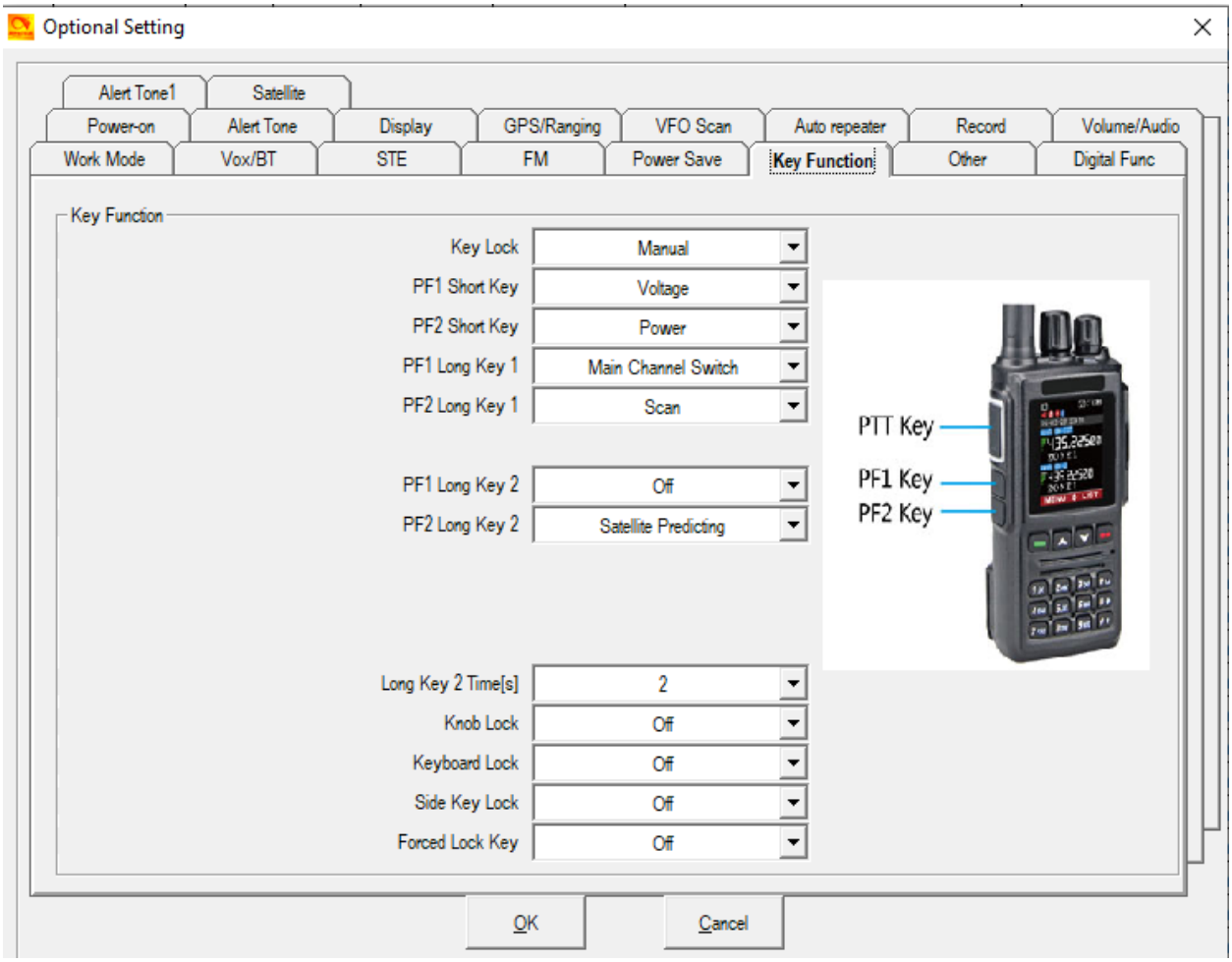
Alert Tone1

2 tones programmable at up to five tones each

Power On

Power-on Interface:	Select Default, Custom Char. or Custom Picture at start-up
Power-on Display Char.:	Enter your unique characters for the start-up display (your callsign and name for example)
Power-on Password:	Select On or Off
Power-on Password Ch.:	Write in keyboard characters to unlock the radio
Default Startup Chan.:	Select Off or On
Startup Zone A:	Select which Zone A you want the radio to power on with
Startup Channel A:	Select which Channel in the above Zone you want
Startup Zone B:	Select which Zone B you want the radio to power on with
Startup Channel B:	Select which Channel in the above Zone you want

Startup Reset: Select Off or On should be “on” to allow PTT + PF1 to reset the radio after installing new firmware.



Alert Tone

Please note that the radio may consume up to 38 mS before it sounds the beginning of a tone. Therefore, make the first choice longer than 38 mS.

SMS Alert: Select which notification you want when receiving an SMS

Call Alert: Select which notification you want when getting a digital call

Dig Call Reset Tone: Select Off or On, Digital call has a group call hold time and a private call hold time to prevent voice missing after the call. When set Digi Call Reset Tone is On, it will beep when the hold time terminates.

Call Tone: Select which tone notification you want when doing a digital or analog call. Set the frequency and timing below.

Key Tone: Select Off or On if you want a tone for pressing a key

Idle Channel Tone:	Select Off or one of 3 if you want a tone when a channel is idle (Type 1 selected)
Startup Sound:	Select Off or On if you want a tone when powering on
Key Sound Adjust:	Select Adjustable (volume knob) or a level from 1 – 15 Ana.
Ana. Idle Channel Tone:	Select Off or On if you want a tone when a channel is idle

Call Tone

Call Tone:	Select frequency and duration of this tone if you want one in front of a transmission. You can set if you want this above.

Idle Channel Tone

Idle Channel Tone:	Select frequency and duration of this tone when a channel is idle

Call Reset Tone

Call Reset Tone:	Select frequency and duration or tones.

Display

Brightness:	Sets the display brightness – 5 is the brightest
Auto Backlight Duration:	Sets the time the display is on or "Always" for always on
Backlight Delay:	Select Off or one of 30 times
Night Mode:	Select On or Off (if on then in turns back light to 1 in standby)
Menu Exit Time:	Set the time the Menu selection is left on - minimum 5 sec (40)
Time Display:	Select Off or On to show current time at top of LCD screen
Last Caller:	Select Off or what to display on the screen (show both)
Call Display Mode:	Select Name or Call Sign as primary display
Call Sign Display Color:	Select the color for how to display the call sign shows (green)
Display Channel No:	Select how the channel should be displayed (actual channel)
Display Current Ch.:	Select On or Off
Standby Char Color:	Select the color for this display of characters (green)
Standby Picture:	Select Default or one of 2 you must load
Show Last Call Launch:	Select Off or On to show last heard name
Separate Display:	Select On or Off if the display shows 1 or both channels
Ch Switching Last Caller:	Select Off or On to show last caller name and keep last caller
A Ch Name Color:	Select a color (white)
RX Backlight Delay:	Select Always or 1 – 30
B Ch Name Color:	Select a color (white)
Zone Name A:	Select a color (yellow)
Zone Name B:	Select a color (yellow)
Display Ch Type:	Select On or Off

Display Time Slot:	Select On or Off
Display CC:	Select On or Off
Date Format:	Select how the date should be shown (yyyy/mmn/dd)
Night Star Hours:	Select On or Off (the radio will switch to night time display)
Night Start Hours:	Select between 0 to 23 hours to start the night time
Night Start Minutes:	Select between 0 to 59 minutes
Night End Hours:	Select between 0 to 23 to terminate the night time
Night End Minutes:	Select between 0 to 59 minutes

Note: The AT-D168UV if programmed for display of 1 channel the switching will the show the second channel. Also note that the channel the transmitter works on if both channels are shown has a larger line under the line so that the word ANA or DIG is bigger than the channel used for listening only.

GPS/Ranging

GPS:	Select Off or On (option not yet available for the radio)
Get GPS Positioning:	Select Off or On (option not yet available for the radio)
Time Zone:	Set the GMT time zone for the radio (important for satellite reception)
Ranging Intervals:	Select 5 to 255
Distance Units:	Select Metric or Inch System
GPS Template Info.:	Select Off or On
GPS Mode:	Select GPS or any of the other modes offered
GPS Roaming:	(option not yet available for the radio)

VFO Scan

VFO Scan Type:	Select TO – 5 sec start after voice, CO – 2 sec start after voice or SE stops scan
VFO Scan Start UHF:	Set start frequency for a UHF Analog scan
VFO Scan End UHF:	Set stop frequency for a UHF Analog scan
VFO Scan Start VHF:	Set start frequency for a VHF Analog scan
VFO Scan End VHF:	Set stop frequency for a VHF Analog scan

Auto Repeater

The D168UV can not be used as a repeater.

Auto Repeater A:	Select Off, Positive or Negative offset frequency for TX
Auto Repeater B:	Select Off, Positive or Negative offset frequency for TX
Auto Repeater1(UHF):	Select off
Auto Repeater1(VHF):	Select off

Auto Repeater2(UHF):	Select off
Auto Repeater2(VHF):	Select off
Repeater Check:	Select on or off
Repeater Check Interv.:	Select 5 to 50 seconds
Repeater Check Recon.:	Select 3, 4 or 5 times
Alert Out Of Range:	Select 1 to 10 times
Auto Roaming:	Select on or off
Timed Roam Start Cond.:	Select Fixed Time or Out Of Range
Auto Roam Interv.:	Select 1 to 256 minutes
Roaming Effect Wait:	Select None up to 30 seconds
Roaming Zone:	Select Zone wanted
Frequencies:	Select what frequency is wanted for the repeater under UHF or VHF and repeater 1 or 2.

Record

Record Function:	Select Off or On to record each TX and RX internally from both analog and digital voices sent or received. You should set up PF1 and PF2 to be the start and stop of recording by using Record Switch (enable/disable) and Record (start/stop) not to have to use the radio menu each time.
Record Delay:	Select 0.0 to 5 sec to eliminate a short TX being recorded

Volume/Audio

Maximum Volume:	Select 1 - 8 for higher max volume – 8 is the max
Max Headset Volume:	Select Indoor, or 1 - 8 for max volume for a headphone (2)
Mic Gain:	Allows increasing the mic sensitivity from 1 to 5 and Auto
Enhanced Sound Qual.:	Set to On for increased high pitch voice or Off for normal.
Ana Mic Gain:	Set for analog microphone gain 1 - 5 including Auto.
TX Noice Reduction:	Set On or Off for higher pitch of the microphone
RX Noice Reduction:	Set On or Off for higher pitch when receiving
DRC Dynamic Range:	Set On or Off for Automatic Gain Control (AGC) of strong signals to make overmodulated signals weaker.

Work Mode

Display Mode:	Defines what the radio display will show when in receive mode – frequency or channel name
VFO/MEM A:	Select VFO or MEM for the “A” upper channel
MEM Zone A:	Selects any of the programmed Zones to start on power up.
VFO/MEM B:	Select VFO or MEM for the “B” lower channel
MEM Zone B:	Selects any of the programmed Zones

Main Channel Set:	Select A or B for radio startup
Sub-Channel Mode:	Select On or Off
Chose Working Mode.:	Select Amateur or Professional Mode (the professional mode will lock positions of the keyboard)

VOX / BT

VOX Level:	Select Off or 1 to 3 as you can speak into the mic to start a transmission
VOX Delay:	Select how many seconds of delay after a transmission ends
VOX Detection:	Select built-in mic or external mic or both

STE (Squelch Tail Eliminate) for simplex radio to radio in analog mode only

STE Type CTCSS:	Select Off, Silent or a selected tone phase shift
STE When No Signal:	Select Off or 55.2 Hz or 259.2 Hz
STE Time:	Set the time for analog and note recommendation (250 mS)
Dcs STE:	Set 134.4 Hz or 55.2 Hz

FM

FM VFO/MEM:	Select VFO or Memory
FM Work Channel:	Select the FM channel to listen to (after set-up done)
FM Monitor:	When in FM mode select On if the radio shall receive calls

Power Save

Auto Shutdown:	Select Off or minutes before auto shut-down
Power Save:	Select Off or 1:1 or 2:1 for saving power
Auto Shutdown Type:	Select Is or Not affected by call

Key Functions

Key Lock:	Select “Manual” or “Auto”
PF1 Short Key:	Select Off or one of many functions listed below (quick key)
PF2 Short Key:	Select Off or one of many functions listed below (see above)
PF1 Long Key 1:	Select Off or one of many functions listed below (1 sec and a beep is heard)
PF2 Long Key 1:	Select Off or one of many functions listed below (see above)

PF1 Long Key 2:	Select Off or one of many functions listed below (2 sec and the beep and a low tone is heard)
PF2 Long Key 2:	Select Off or one of many functions listed below (see above)
Long Key 2 Time:	Select 1 – 5 seconds for holding the PF1 and PF2
Knob lock:	Select On or Off
Keyboard Lock:	Select On or Off
Side Key Lock:	Select On or Off
Forced Lock Key:	Select On or Off

The choices for PF1 and PF2 are many and are listed below:

Off, Voltage, Power, Repeater, Reverse, Digital Encryption, Call, VOX, V/M, Scan, FM, Record Switch, Record, SMS, Dial, Main Channel Switch, Hot Key 1 – 6, Work Alone, Nuisance Delete, Digital Monitor, Sub CH Switch, Priority Zone, VFO Scan, MIC Sound Quality, Last Call Reply, Channel Type Switch, Roaming, Max Volume, Slot Switch, APRS Type Switch, Zone Select, Timed Roaming Set, APRS Set, Mute Timing, CTC/DCS Set, Bluetooth, GPS, Ch. Name, CDT Scan, APRS Send, DIM Shut, GPS Roaming, WX Alarm, Sq. Level, CH Setting and Satellite Predicting.

Other

Address Book…:	Select On or Off
TOT:	Max Total Time of Transmit (TOT) or Off (no limit)
Frequency Step:	In VFO mode, selects the frequency steps (5 kHz)
SQL Level A:	Set the squelch level for the “upper” channel – set at 1
SQL Level B:	Set the squelch level for the “down” channel – set at 1
TBST:	Tone Pulse Freq. Selection to open certain repeaters – to initiate this tone push the PTT + PF1 key below the PTT together to send tone! (1000 Hz)
Analog Call Hold:	Select how long a call is held for Analog reception. (0)
Call Channel Maintained:	Set to Off or On to allow a transmit on the sub-channel B if done within 5 seconds after the call carrier was dropped
Priority Zone A:	Select Off or which zone should become priority
Priority Zone B:	Select Off or which zone should become priority
Mute Timing:	Select 1 minute to 256 minutes
Encryption Type:	Select Common or Extended
TOT Predict:	Select On or Off as the radio beeps 5 sec before the TOT time
TX Power AGC:	Select On or Off and the transmitter will send with a lower power level if the received signal is strong

Digital Function

Group Call Hold Time:	Select hang time for a Group Call (5 sec)
Person Call Hold Time:	Select hang time for a Private Call (5 sec)
Manual Dial – Group:	Select hold time for group TG (3 sec)
Manual Dial- Private:	Select hold time for private TG (3 sec)
Voice Header Repetition:	Select 2 to 8 (3) allows you to set the voice header repeat time
TX Preamble Duration:	Select time and note the suggestion (120 mS)
Filter own ID in miss call:	Select Off or On then the radio will not remind of a miss call when receiving a call with same ID.
Digital Remote Stun/Kill:	Select Off or On to allow remote shut-down of a radio
Digital Monitor:	Select Off or Single or Dual Slot to allow promiscuous mode
Digital Monitor CC:	Select Any or Same to allow same Color Code monitor
Digital Monitor ID:	Select Any or Same to allow monitor for a DMR ID
Monitor Slot Hold:	Select Off or On to monitor Slot continuously
Remote Monitor:	Select Off or On to allow other radio to check this radio
SMS Format:	Select SMS format as option is given below:

Select M (Motorola) or H (Hytera) or DMR Standard format for SMS message

DMR CRC Ignore:	Select On or Off to ignore cyclic redundancy checks to receive more digital signals.

SATELLITE

Satellite Location:	Select GPS (not available yet) or 1 of the 8 manual positions.
Satellite TX Power:	Select the power output when in satellite mode. Use Turbo
Satellite Analog Squelch:	Select 0 to 5 squelch level
Satellite AOS Limit:	Select the elevation degrees for the satellite as 0 to 30.
Satellite Fix Point Name:	Allows to name the 8 fixed positions programmed under APRS with numerical numbers like 93.45..45.05 for location 1

Once all the parameters have been programmed, click on “OK” to save what you have programmed. This completes the main programing in the CPS of the AT-D168UV radio.

RECORD

You have the option in the radio to record up to 4 hours and that is every call with the AT-D168UV radio if you have “Record” in the radio menu set to ON. You can either listen to all those recordings on the radio, or via TOOL menu download the recordings to your computer and listen to them on the radio speaker. First make sure you have the Com port selected correctly to be able to download the voice-clips.

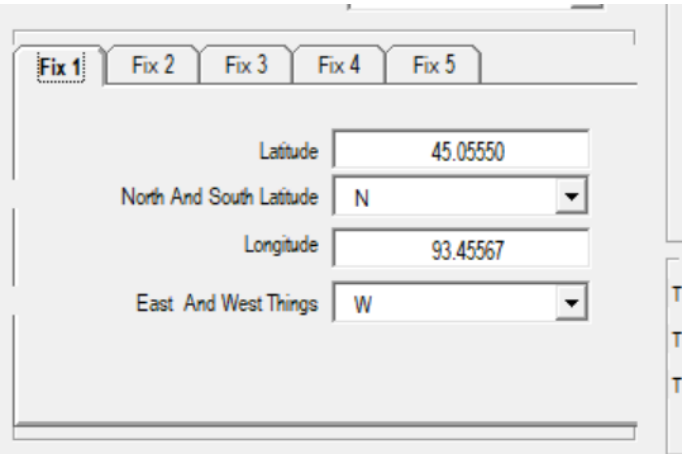
Use the TOOL and “Radio Recording” to open the menu for the recordings from the radio. The following set-ups are required:

By SE Time:	Select if you want to select Start and End Time – see table

By DI Time:	Select if you want Duration or Individual Time as set in table
Start Time:	Select start times for messages to hear.
End Time:	Select end times for messages to hear
DI Time Duration:	Select messages with a specific duration to hear
DI Time Interval:	Select messages with a specific interval to hear
Call Type:	Select Private, Group or All messages
RX/TX:	Select what type of messages to hear
Call ID:	Select caller ID for messages to hear from the list shown
Get File List:	If the Com port is correct this downloads the messages specified
Sound:	This adjusts the computer sound card in a separate window
Play:	This plays the highlighted message on the radio speaker
Play one by one:	This plays one message highlighted
Pause:	Stops playing momentarily
Stop:	Eliminates any further playing
Prev Page:	Go to previous page if there are more than one
Next Page:	Go to the next page
Export:	You select the name of the recording you want to export to the computer in .amb format. Please note that there may be no audio app that allows playing the saved file on the computer as of yet.

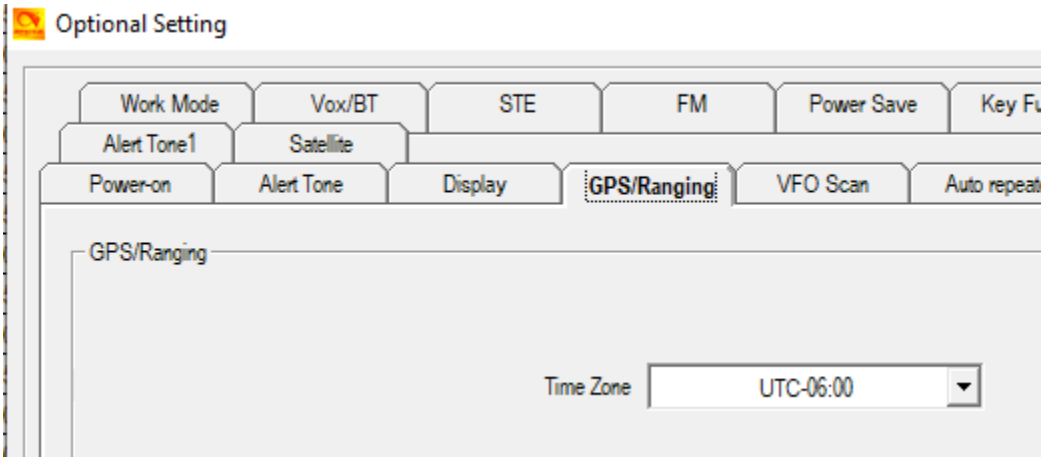
9.0 SATELLITE RECEPTION

The AT-D168UV radios has no GPS included but by using your “fixed” position the satellite reception function is still available from the radio. To get started first use the TOOL menu and select APRS to get it to show up as a menu item on the left side under the Public menu on the left side in the CPS. In the APRS window, that you now can open, look for the latitude and longitude and put in your location (the example below shows a location in Minnesota).



This will place the radio in the correct position related to the satellites. There are 8 such positions available for different radio locations to select on the radio. Make sure the radio time is set correct or your satellite times when to listen may be off.

Also make sure the UTC time (-6.00 hours for Minnesota) is set correct as part of the **Optional Settings** and **GPS/Ranging** shown in the CPS. As the AT-D168UV does not have GPS yet. Also make sure TX power and squelch is set correctly in this window – see “satellite” set-up. The TX power is shown in red color in the upper right corner of a satellite display together with the green signal strength bar. The TX power can also be changed during satellite reception by using the “*” button on the front of the radio bottom right.



A brief education on azimuth and elevation is given here. Azimuth is 0˚ for direct north, east is 90˚, south is 180˚ and west is 270˚. Elevation is the vertical angel between you (the local horizon) where you are located and the satellite. The radio circle and the red dot should tell you where the satellite is located and if the elevation is negative, it is below the horizon and any communication with the satellite is not possible (the picture below on the right shows -14˚ but will show + in 5.43 minutes).

The next step is to go to the radio menu and select “satellite”. If you now select “location” and then “fixed” you will see the latitude and longitude position as you entered it under APRS above – select that. Please make sure it is correct. You also will see your location as a 6-letter version for amateurs called Grid Square Locator (or Maidenhead Locator System) as mine was EN35GB.

Please note that you can send out an APRS transmit under satellite menu by pressing PTT +PF2 button if set up correctly in the APRS set up menu in the CPS and also under TOOL, GPS Satellite Data Update where you set the APRS frequency.

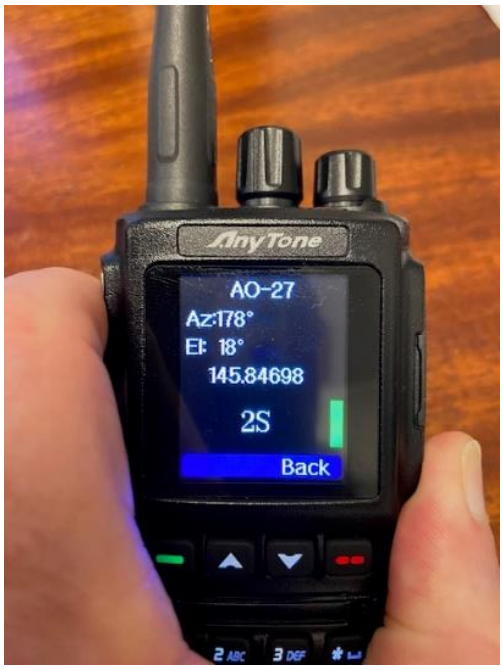
In the menu of the radio, you then can go to “satellite” and it may take a short time during “Predicting” and you will see a list of satellites with the nearest satellite highest up on the list. Once you select a satellite, the picture may look like the ones below:

By using the up/down arrows you can go between the three pictures shown above. The channel knob on top of the radio will control the squelch so you can cancel the squelch function and hear the satellite and with the noise it creates (it is almost required to use no squelch when listening to a satellite). You may hear amateur voices just when the satellite is in the right position and the red dot is in the center of display to the left above. If you try to transmit when the satellite is not accessible you will hear the radio beep at you.

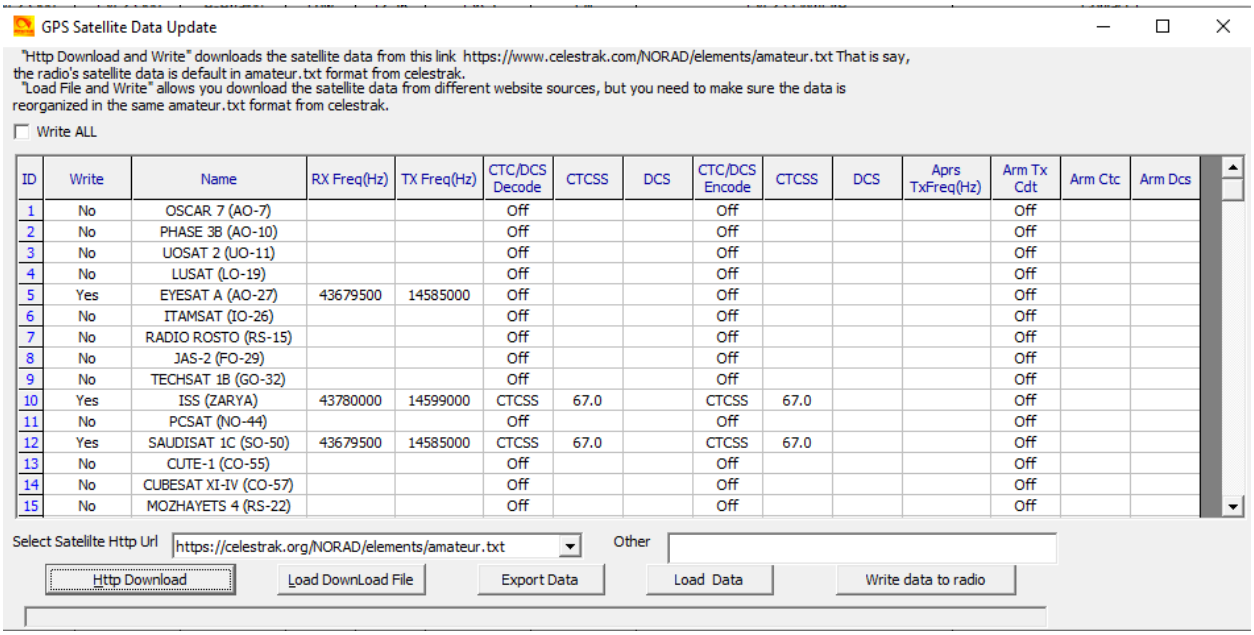
The middle picture above describes when in UTC time when the satellite will pass at what elevation and for how long. The third display above tells the current azimuth and elevation the satellite is as well as the transmit and receiver frequencies and any CTC code required.

When you are on the second picture above the PF1 and PF2 below the PTT acts and will show the different passes when the satellite will pass in your area. The times in UTC will also be shown so you may know how long you have to wait for other passes.

Wait for the time displayed to go to 0. It also will show the signal strength with the green bar on the right. Use the PTT to transmit to the satellite when the satellite is in position and you have the indication that you can do so. It is only a short time for each satellite. When you transmit it will show how many seconds you do it on the display and the frequency you transmit on (145.84698MHz in the example below and varies a little due to the doppler effect) – as shown below. Wait and see if you hear another amateur from the satellite you just transmitted to. A different antenna (directional) are be required to give a result like the one shown in this YouTube video with voices via satellites on an AnyTone radio: **https://www.youtube.com/watch?v=QvBr44P02_4**



The satellite data (new data as the satellites are updated) can be accessed from the TOOL menu and there under “Satellite Data Updating”. New satellite data can be downloaded from the website indicated in an amateur.txt format as shown below as “Select Satellite http URL”. By clicking on “HTTP Download” the display is updated with the current data from the web. A few more options are given. The radio is updated with the correct and most current data from the website by clicking on “Write Data to Radio”.



Please note that in the Optional Settings you can program Key Functions of either PF1 or PF2 to be “Satellite Prediction” so you can access that easy instead of going through the menu on the radio and down to Satellite and so on.

If you are looking for a phone application to monitor all the amateur satellites with a repeater onboard you may try **Satellite Tracker** by Star Walk which has a subscription fee of $0.99 per month. There you can see where the satellite is in comparison to you location.

The website https://celestrak.org/NORAD/elements/amateur.txt and what each line of a satellite means can be found on https://celestrak.org/columns/v04n03/#FAQ01 and another clarification on https://celestrak.org/NORAD/elements/table.php?GROUP=amateur&FORMAT=tle. You can also use site www.amsat.org/tle/dailytle.txt for the .txt file as it seems to be updated more frequent than the celestrak list.

10. FINAL STEP - WRITE YOUR CODEPLUG TO YOUR RADIO

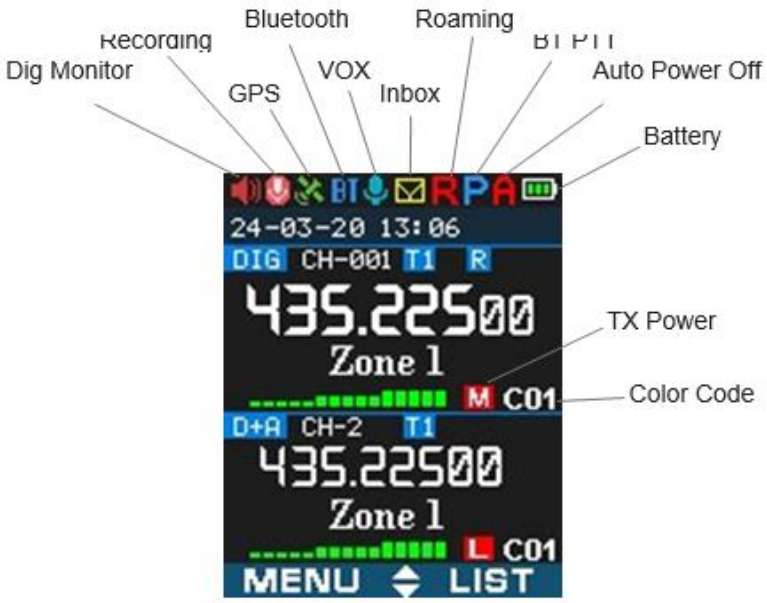
The first thing to do is to check that your Comm Port is correct. You can do that on the sign between reading from and to the radio. See below for the picture of checking the Comm Port. You can also use “Set” and “Set COM” on the top line doing the same.

In the worst case you have to right-click “This PC” on your computer and open “Manage” and then “Device Manager” to make sure the cable you have works correctly – take it off and on to see what Port (COM & LPT) it opens.

The AT-D168UV radio comes with a special programming cable – USB to USB-C.
Select if you want to write just the “Other Data” (all radio parameters) and/or Digital Contact List when loading the CodePlug into the radio. Write the file to your radio. Save the file to your PC with a name that you will remember. You may wish to use version numbers in your file naming to help you with progressive updates. At some point you may ‘break’ your CodePlug by setting something differently and this may affect the radio operation. It helps to be able to ‘go back’ to an earlier working version. Some CodePlug Programming Software (CPS) may also require that you update the clock in the radio by another function, be sure to do this if you want an accurate time display!

Please note that the AT-D168UV radio offers many more set-ups but those are best described in the Manual that comes with the radio. The Manual also talks about how to safely use the batteries. Note that even with the LCD display on the radio lit up all the time (“Always” in the display setting) the radio has battery power for several days before requiring recharging. What has been covered in this Programming Guide are those parameters important to get the radio up and running.

Please note that the satellite reception in the D878UV radios is very similar to what is described here for the D168UV radio.



The radio display looks like what is shown above with all the top abbreviations explained here.

Satellite Explanation

Satellite		Norad No.	uplink	downlink
LILACSAT	CAS-3H	NORAD ID 40908	145.825	144.390
AO-27	EYESAT-1	NORAD ID 22825	145.850	436.795
ISS	SPACE STATION			
SO-50	SAUDISAT 1C	NORAD ID 27607	145.850	436.795
AO-91	FOX-1B	NORAD ID 43017	435.250	145.960
PO-101	DIWATA-2	NORAD ID 43678	437.500	145.900
AO-7	OSCAR 7	NORAD ID 7530	432.125-432.175	145.975-145.925
AO-10	OSCAR-10	NORAD ID 14129	435.0	145.0
UO-11	OSCAR 11	NORAD ID 14781		145.825
LO-19	OSCAR-19	NORAD ID 20442	145.840-145.900	437.125/437.150
IO-26	OSCAR-26	NORAD ID 22826	145.875-145.950	435.822/435.867
FO-29	OSCAR-29	NORAD ID 24278	145.900-146.000	435.900-435.800
IO-86	OSCAR-86	NORAD ID 40931	145.880/145.825	435.880/145.825
AO-73	FUNcube-1	NORAD ID 39444	435.130-435.150	145.970-145.950
JO-97	JY1Sat	NORAD ID 43803	CW only	
XW-2B	CAS-3B	NORAD ID 40911	435.090-435.110	145.750-145.730
MO-122	OSCAR-122	NORAD ID ?	145.910-145.940	435.810-435.840

More data for amateur satellite data and frequencies can be found on this site:

https://www.amsat.org/amateur-satellite-index/