AT-D868UV/D878UV CodePlug Programming Guide

AnyTone®

AT-D868UV/D878UV
Programming Guide

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AT-D868UV/D878UV CodePlug Programming Guide

INTRODUCTION

The AnyTone D868UV and D878UV radio are both VHF and UHF radios with both Digital DMR (Tier I and II) and Analog capabilities. It offers a total of 4,000 channels (Analog and Digital), 10,000 Digital Talk Groups, and up to 160,000 contacts, as well as multiple DMR ID numbers (Radio ID's) for a single radio. 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-D868UV/D878UV radios may have a locked key-board upon arrival. 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 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 together.

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-D868UV/D878UV radio has unique software 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.

Duane Reese has done several videos to help a beginner to program the 2 radios. Please do a search for "N0DMR videos" to get to see them.

1.0 GETTING STARTED

The programming cable for the AT-D868UV/D878UV radio is typically provided by AnyTone. There are several different types of programming cables available, and the one to use has a very small USB connector. Others use an electronic circuit inside the USB connector, and will not work. Make sure the computer has the correct driver for the cable – see the Device Manager on your PC.
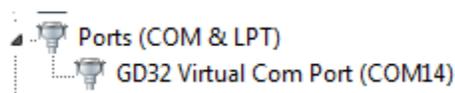
If you do not see this USB port driver, you should install the USB driver from the file USB ComPortDriver v2.0.2.4944 folder **as an Administrator** to your computer. Select the x64 or x86 version depending on the operating system of the computer you use.

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Open the Device Manager, and then double click on the "Ports" to display the driver (GD32 Virtual Com Port) and right click on the driver to open PROPERTIES. This will display the details of the driver, and under **Port Settings** update the "Bits per second" to 128,000 for faster read and write to the radio.

Note: Before you start any programming work read the current file from the radio into your PC so you have a baseline and something to start with.

The **Computer Programming Software (CPS)** for the AT-D868UV/D878UV radio may be updated from time to time to correspond to the firmware version used for the radio, and the AnyTone website (plus many retailer websites) will offer those updates at http://www.qx-tele.com/about/about8.html. So the CPS D868UVE_Setup_1.33.exe should be used for a radio with firmware V1.33 or V2.33 and so on. Do not mix versions of the CPS with non-matching firmware versions. Same for the D878UV where CPS and firmware has to match.

Install the CPS Programming software on your computer, and when you read (or write) software to or from the radio, it 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 over 120,000 names, and as a result consume up to 5 minutes to read or write to the radio.
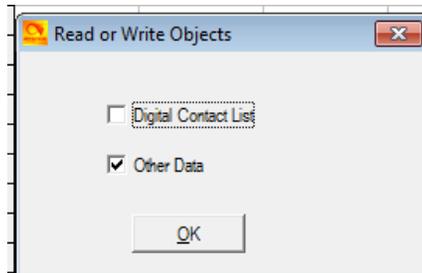
If you are living in an area where you may be the first to have to generate the codeplug with all your local repeater frequencies, there may be a codeplug for the AnyTone D868UV/D878UV radio from another geographical area which has most of the basic data as a starting point. The Minnesota DMR websites may be a good place to start looking for the codeplug which has all the DMR ID's already in the codeplug. That would save you a lot of time to use this codeplug as a start, and then update your local frequencies. Also, check if the "Contact Manager" made by N0GSG is available for this radio.

If the TOOL menu **Mode Select** shows up when you open the Programming software, just click "OK" as it is a requested option by a few users in California. If this option is selected you may

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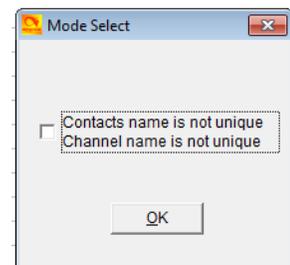
use the identical name for multiple Contact names and Channel names.

NOTE: The **D868UV** and the **D878UV** radios are very similar in programming and use, and the differences are not major enough to require a separate Programming Guide for each radio. So please understand that this Guide is a general guide to help programming and set-up of the basic parameters required to operate each radio.

STEP 1 – TALK GROUP (DIGITAL CONTACT) LIST

The AT-D868UV/D878UV program looks like an excel spreadsheet once opened, and the left side defines the many aspects of programming. Open the DIGITAL CONTACT Talk Group tab on the left side and double click on the first line (Line No. 1). The Digital Contact List typically contains the DMR Talk Groups which the user may want to use.

Start to program all applicable DMR Talk <u>Groups</u> (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 world wide 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 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". 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.
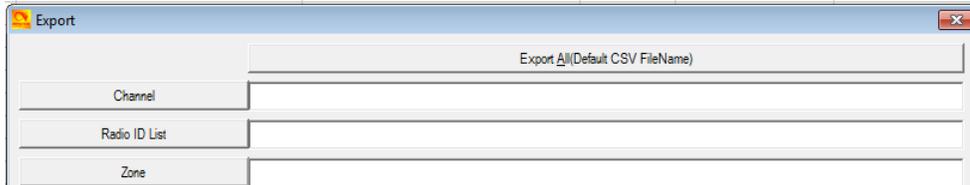
In the .csv format you can paste all or your required Talk Groups from the DMR-MARC website into the spread sheet. You get the format from the original radio Codeplug you just exported.

	A	B	C	D	E	F	G	H	I	J
1	No.	TG/DMR ID	Repeater Number	Name	City	State/	Country	Remarks	Call Type	Call Tips
2	1	1	World Wid	World Wide					Group Cal	None
3	2	2	Local 2	Local 2					Group Cal	None
4	3	3	North Ame	North America					Group Cal	None
5	4	4	UA All-La	UA All-Lang 1					Group Cal	None
6	5	8	Local 8	Local 8					Group Cal	None
7	6	9	Local 9	Local 9					Group Cal	None
8	7	10	WW German	WW German					Group Cal	None
9	8	13	WW Englis	WW English					Group Cal	None

Once all TG's are entered, the Contact List should be "imported" back into the Programming Software the same way you exported the file. Click on TOOL menu, and then "import" and in the new window click on Digital Contacts and select the .csv file you want imported.
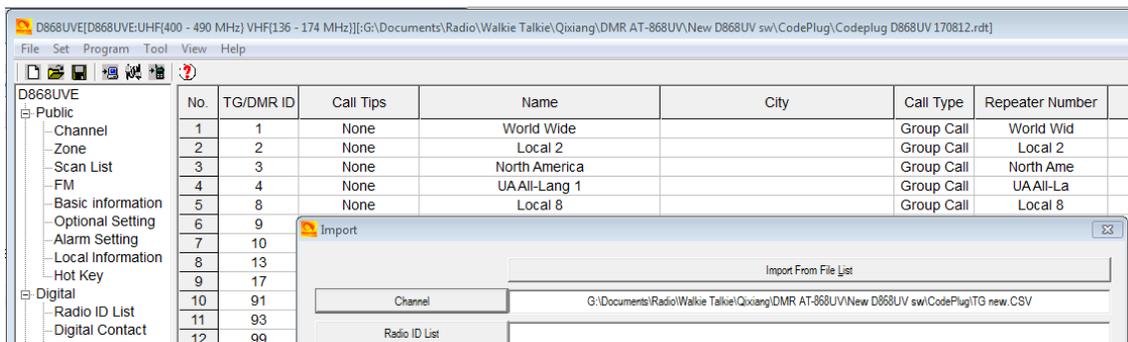
NOTE: If you import a Talk Group list with duplicate TG numbers, then the Receive Group Call List set-up will not function correctly, and may shut down the Programming software if you try to set up your Receive Groups.

STEP 2 – 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 DMR-MARK list is steadily growing and you may have to pare it down to your needs. See page 33 for an alternate display emphasizing the Call Sign instead of the name of the caller. Section 5.0 – 7.0 in this Guide provides optional ways to create the contact list.

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. Individual entries are not allowed.

A master list of DMR contacts is available at the new radioid website:

https://www.radioid.net/database/dumps#! and select the **"users.json"**

This database of contacts must be converted to .csv to be used for DMR ID's and imported into the radio as required. Download the list and convert it with a jsontocsv conversion program generated by AnyTone you will find on the internet. There is a video showing how to use this program made by Duane Reese (N6DMR).

The AnyTone conversion program will put all the contact data in the order required by the radio CPS program, and will then be ready to import to the CPS under the TOOLS menu.

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In the CPS Programming Software 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 divided in sections to accommodate up to 150,000 ID's. So 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.

```
DMR ID List
    1---20000
    20001---40000
    40001---60000
    60001---80000
    80001---100000
    100001---120000
    120001---140000
    140001---160000
```
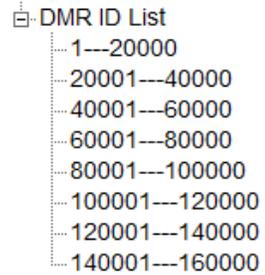
So now that you have both the DMR database and the radio original database open, copy the list of DMR ID's you want from the DMR database into the radio .csv file. Then back to the TOOL menu, and "import" so you can import the entire .csv DMR ID list into the radio. Note: You have to enter "Private Call" in all the CALL TYPE columns of the radio .csv database before loading it into the radio. The No. column can be left blank.

This is how it looks before being loaded into the radio – make sure the columns agree with the order of the ones from the radio Programming Software

1	No.	Radio ID	Callsign	Name	City	State	County	Remarks	Call Type	Call Alert
57945	57944	3127092	KD0ZSA	Riverbend Wirele	Faribault	Minnesota	United States			
57946	57945	3127093	W6GFN	Barry J Altman	Plymouth	Minnesota	United States			
57947	57946	3127094	KD0PNQ	Trygve N Svard	Minneapolis	Minnesota	United States			
57948	57947	3127095	KB0FFO	Carol Estey	Bloomington	Minnesota	United States			
57949	57948	3127096	KB9ENE	Lion Templin	Arden Hills	Minnesota	United States			

Once loaded into the radio, this is what it looks like

D868UVE[D868UVE:UHF[400 - 480 MHz] VHF[136 - 174 MHz]][:D:\Documents\RADIO\WALKIE TALKIE\Qixiang\DMR AT-D868UV\New D868UV sw\CodePlug\Codeplug D868UV World Contacts 171212 .rdt]

File Model Set Program Tool View Help

D868UVE
 Public
  Channel
  Zone
  Scan List
  FM
  Auto Repeater Offset F

No.	TG/DMR ID	Call Alert	Name	City	Call Type	Repeater Number	State/Prov	Country
57944	3127092	None	Riverbend Wirele	Faribault	Private Call	KD0ZSA	Minnesota	United States
57945	3127093	None	Barry J Altman	Plymouth	Private Call	W6GFN	Minnesota	United States
57946	3127094	None	Trygve N Svard	Minneapolis	Private Call	KD0PNQ	Minnesota	United States
57947	3127095	None	Carol Estey	Bloomington	Private Call	KB0FFO	Minnesota	United States
57948	3127096	None	Lion Templin	Arden Hills	Private Call	KB9ENE	Minnesota	United States

After you have created the Contact List in the radio Programming software, please save it on your PC so that you do not have to re-do this step. Depending on the size of the Contact list you decide to use, it may take some time to load and read with your PC – a full world 120,000 contact list may take 5 minutes to load into the radio!

Note: Any .cvs file being loaded back into the D868UV radio must be correct 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 .cvs for any inconsistency. The Contact database, downloaded from DMR-MARK, is not necessarily correct for each entry and have been found needing cleanup to work with the radio.

Note: The CPS has a new feature under "Digital" called **Friends List** where you can create a list of your special contacts. Search entering a DMR ID and build a Friends

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Member List so that you will hear a tone when those people come on the air.

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STEP 3 - RADIO ID LIST (Multiple Radio ID's)

The AT-D868UV/D878UV radio will allow multiple DMR Radio ID numbers to be used with the radio. This feature will allow one radio to be used for example as a Commercial Radio with its own DMR ID, and at the same time also be used as an Amateur radio with another DMR ID. Double click on a line and enter the data in the separate window. Click "OK" when done to save the data you entered.
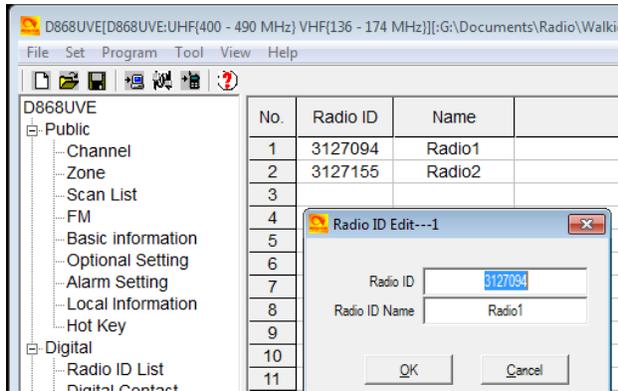
The multiple DMR ID numbers will later show up when programming the various frequencies used by the radio. So the radio can be used on multiple types of networks and be defined as appropriate for each network – Government, Commercial, and/or Amateur.

NOTE: If you download a CodePlug from the Internet for your radio, you must enter your DMR ID as per above before you load this CodePlug into the radio.

STEP 4 - SCAN LIST

Typically a scan list is created with one 'channel' for each repeater on slot 1, and one for the slot 2 channels. Initially just create an 'empty' scan list (with a name) to use during the channel creation step. Create the Scan list name that relates to your set of channels. In the Scan List menu, click on line No. 1 and open the Scan Edit window. NOTE: A channel number refer to the Channel Matrix (excel format) number No. to the very left of the matrix – there you can reference the DMR Talk Group for a channel.

Please note – when you want to change the scan list using the Menu on the radio, go to Scan List > Scan List > select the TG list you want > then go to bottom of the list and "Select Current List" to make the one you selected become the new scan list. Then go back to Scan List and select "Scan On/Off" and turn the scan on.

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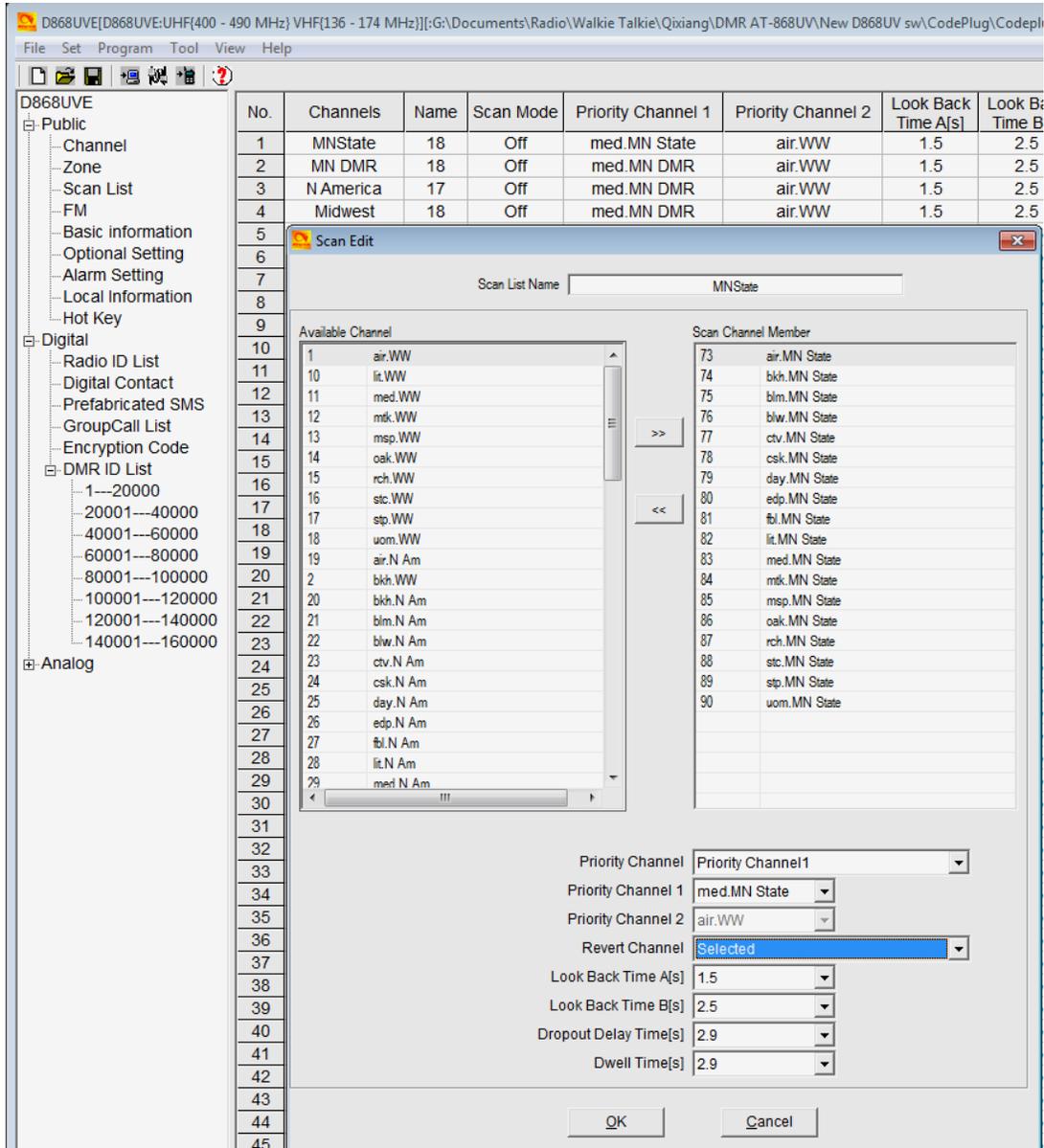
Scan List Name:	Name it so it relates to the scan channels
Available Channels:	Will list the channels you create
Scan Channel Memb.:	Move over the channels you need scanned to this area
Priority Channel select:	Select the priority channel or off
Priority Channel 1:	Sets which channel is priority 1
Priority Channel 2:	Sets which channel is priority 2
Revert Channel:	During scanning, when there is no call received, press the PTT key to transmit on this channel.
Look Back Time A:	During scanning, it will scan the priority channel when check the look back time A every time.

Look Back Time B: Only for analog use. During scanning, when the priority
                           channel has signal but with incorrect CTCSS/DCS, it will
                           scan the priority channel when check the look back time B
                           every time.
Dropout Delay Time: Only for analog use. When scanning with a signal and
                           starting a transmit, after release the PTT key, the radio will
                           resume scanning after reaching the Dropout Delay Time.
Dwell Time: Only for analog use. When press PTT key to transmit,
                           after release of the PTT key, the radio will resume
                           scanning after reaching the Dwell Time.

Once all done, click on "OK" to save this set-up.

STEP 5 - ZONE LIST CREATION

NOTE: Once you use the radio and with the up/down key switch between zones,
holding the key down for up or down rapidly switches the zones instead of repetitively
pushing it to switch.

Create a 'Zone' name (that relates to the name of the scan list in the step above) and
leave empty for the time being. 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, 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.

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.

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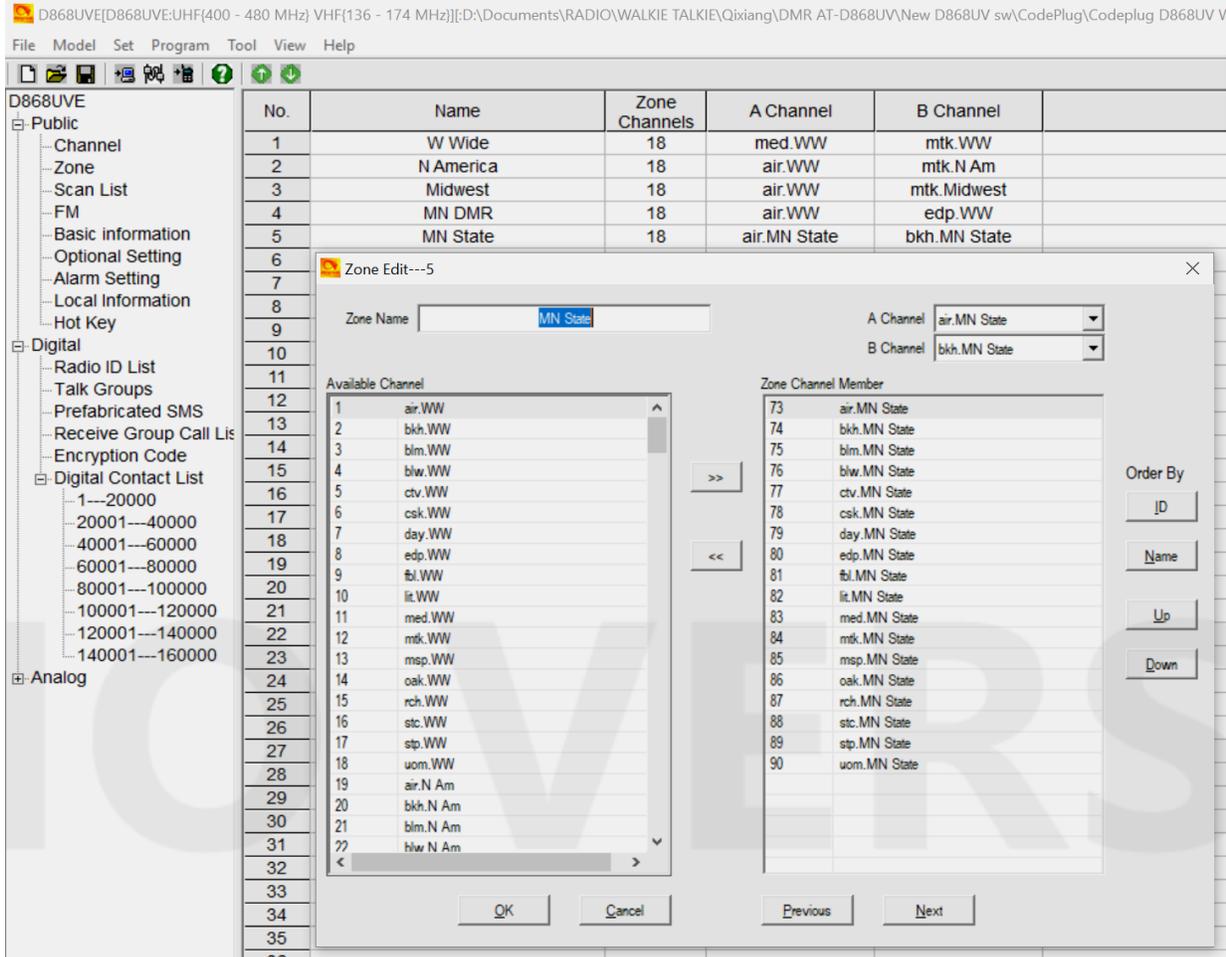
A Channel: The channel the radio starts up with for channel A
B Channel: The channel the radio starts up with for channel B

A typical display when the radio is in dual receive mode and you listen to two channels (A plus B). The upper A channel with the larger text is the TX channel. You can on the display see what channel number you listen to (CH-83 and CH- 19), what Talk Group **T2** and an **R**epeater with a different frequency. On the top bar the ColorCode **C11** is also displayed. The date line may from time to time change and show sequentially the TG, last call person name, and time if you are in dual mode. In single mode the bottom of the display will show this info.

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STEP 6 – RECEIVE GROUP CALL LIST SET-UP

You can leave this blank if all you want to do is to listen to the same channel as you transmit on. Then under Channel set-up in the section below you select "NONE" for the Receive Group List.

If you want to listen to more TG's besides the TG set up in the Channel set-up, add the TG in the Receive Group Call list, then under Channel set-up in the section below you select the list number. You can program up to 64 TG's per receive group.

Note: If the Talk Group List contains a TG with the same number as another one, then this Receive Group List will not work.

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STEP 7 - CHANNEL – FREQUENCY SET-UP

The AT-D868UV offers programming of 4,000 channels for UHF and VHF. To start double click on the first line No.1 to open the Channel Information programming window for that channel:

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 6W/2.5W/1W/0.5W
Wide Narrow:	Select the bandwidth of transmit
TX Permit:	Selects PTT transmit criteria – typically Same ColorCode
Scan List:	Select which Scan List to start scanning from
TX Prohibit:	Check if the frequency is a listening channel only
Alone:	Check if the "alone" emergency function should be allowed
Talk Around :	Check for RX freq. the same as the TX freq. (Simplex).

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Digital

Contact:	Select the Talk Group you want for this frequency
DMR/Radio ID:	Select which of the DMR ID's to use for this channel
Color Code:	Select which ColorCode is related with this channel
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
Encryption Type:	Select which types to use (Normal or Enhanced).
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 do it within a set time.
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.

Analog

CTCSS/DCS Decode	Select Off or CTCSS or DCS and tone frequency
CTCSS/DCS Encode	Select Off or CTCSS or DCS and tone frequency
Squelch Mode:	Select how to use the squelch
Optional Signal:	Select Off, DTFM, 2Tone or 5Tone
DTFM ID:	Select DTFM ID
2Tone ID:	Select 2 Tone ID
5Tone ID:	Select 5 Tone ID
PTT ID:	Select off, at start, at end or both
2Tone Decode:	Write how to decode
Custom CTCSS:	Enter value when requiring a custom CTCSS tone

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, and then work the entry of most data in the excel format. Then save it and "import" back into the codeplug. 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 original channel set-up in the 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 radio.

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Note: working the .csv file for channels, the No. column either should be empty, or show sequential numbers starting with 1 for channel 1, 2 for channel 2 etc.

STEP 8 - OPTIONAL SETTING

The AT-D868UV radio basic configuration set-up is done in the Optional Setting window. This page contains a lot of important information for the radio operation. A new lay-out was implemented with update 1.29 and on.
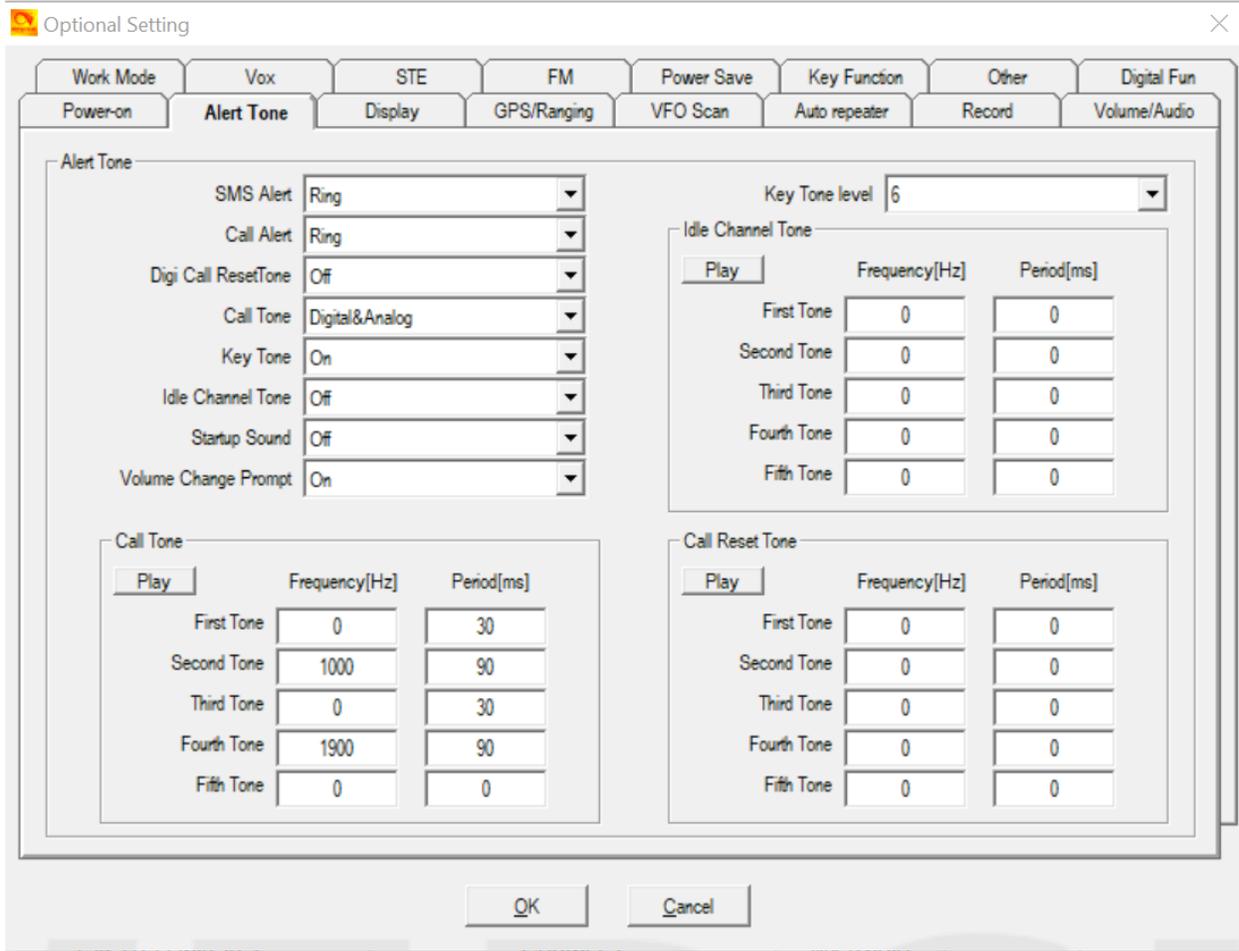
Once the Optional Setting window is open, there are several sub-sections to program. The above window shows all the 16 sub menus available in the Optional Settings.

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

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Main Channel Set: Select the "A" or "B" channel to become the main channel
Sub-Channel Mode: Select Off if only the "A" channel will be used; On for both A and B

VOX

VOX Level: Select Off or 1 to 3
VOX Delay: Select how many seconds of delay
VOX Detection: Select built-in mic or external mic or both

Squelch Tail Eliminate (STE) for simplex radio to radio 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

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

Key Function

Key Lock: Select Manual or Auto key lock function
PF1 Short Key: Select from several functions for the radio key below PTT
PF2 Short Key: Select from several functions for the radio key 2 below PTT
PF3 Short Key: Select from several functions for the orange radio key
P1 Short Key: Select from several functions for the P1 radio key
P2 Short Key: Select from several functions for the P2 radio key
PF1 Long Key: Select from several functions for the radio key below PTT
PF2 Long Key: Select from several functions for the radio key 2 below PTT
PF3 Long Key: Select from several functions for the orange radio key
P1 Long Key: Select from several functions for the P1 radio key
P2 Long Key: Select from several functions for the P2 radio key
Long Key Time: Select how many seconds to hold the key for Long duration
Knob Lock: Select Off or On to lock the knobs function
Keyboard Lock: Select Off or On to lock the keyboard
Side Key Lock: Select Off or On to lock the side keys (PF1 – P2)
Profession. Lock Key: Select Off or On when all others are locket to prevent unlock.

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Note: One of the 5 external programmable keys can be programmed to become the "Ranging" key. When pushed just after receiving a call, will initially display 2 screens while making a short GPS transmission, and after a few seconds display who called, the position and distance of the incoming caller if both radios are receiving GPS satellite position information. This can be very helpful to identify where the person you are talking to is located.

Other

TOT:	Max Total Time of Transmit or Off (no limit)
Frequency Step:	In VFO mode, selects the frequency steps
Language:	Select language for the programming software
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!
Analog Call Hold Time:	Select how long a call is held for Analog reception.
Call Channel maintained:	Set to Off or On allows a transmit on the sub-channel B if done within 5 seconds after the call carrier was dropped
Address Book…. Code:	Select On or Off to disable Analog Echo Link self ID trailing characters
Priority Zone A:	Select Off or which zone should become priority
Priority Zone B:	Select Off or which zone should become priority

Digital Function

Group Call Hold Time:	Select hang time for a Group Call
Person Call Hold Time:	Select hang time for a Private Call
Prewave Time:	Select the time to wake-up the radio from a power save
Wake Head Period:	Select the time for the preamble – 100 mS recommended
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 Confirmation:	Select Off or On to allow an SMS to be confirmed recommend On if sending SMS
SMS Format:	Select M (Motorola) or H (Hytera) format for SMS messages

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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
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

Alert Tone

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.
Talk Permit:	Select Off or Analog, Digital or combined Digital & Analog
Key Tone:	Select Off or On if you want a tone for pressing a key
Idle Channel Tone:	Select Off or On if you want a tone when a channel is idle
Startup Sound:	Select Off or On if you want a tone when powering on
Volume Change Prompt:	Select Off or On to show a volume screen when changed
Key Tone Vol. Level:	Select Adjustable (volume knob) or a level from 1 - 15

The programming also allows you to program the tone frequency for the <u>Idle Channel</u> Tone, the <u>Call Tone</u> and the <u>Call Reset</u> Tone as well as the duration of those 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
Menu exit time:	Set the time the Menu selection is left on - minimum 5 sec
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
Call Display Mode:	Select Name or Call Sign as primary display
Call Sign Display Color:	Select Red or Black for how to display the call sign
Call End Prompt Box:	Select Off or On to add a display box indicating end of call
Show Zone Name + TG:	Select Off or On to display zone name and talk group
Show Last Heard Name:	Select Off or On to show last heard name while in PTT
Ch Switching Last Caller:	Select Off or On to show last caller name keep last caller

GPS/Ranging

GPS:	Set On or Off (can also be changed under Menu)
Get GPS Positioning:	Select Off or On to allow other radio to check this radio

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Time Zone: Set the GMT time zone for the radio
Ranging Interval: Select from 5 to 255 sec for checking received GPS position
Ranging Display: Select meters or feet for the ranging display
GPS Template Inform.:   Select Off or On to include a GPS message (written below)
to be part of the GPS TX data – typically your call sign!

VFO Scan

VFO Scan Type: Select TO – 5 sec stop, CO – 2 sec stop 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

Auto Repeater A and B: When On, changing the TX frequency via keyboard, will also
change RX with correct offset.
Auto Repeater UHF: Set to Off or set the offset for the RX frequency for UHF
Auto Repeater VHF: Set to Off or set the offset for the RX frequency for VHF

Record

Record Function: Select Off or On to record each TX and RX internally
Record Delay: Select 0 to 5 sec to eliminate a short TX being recorded

Volume/Audio

Maximum Volume: Select 1 > 8 for higher max volume – 8 is max
Max Headset Volume: Select Indoor, or 1 > 8 for max volume for a headphone
Mic Gain: Allows increasing the mic sensitivity from 1 to 5 times
Enhanced Audio: Set to On for increased high pitch voice or Off for normal.

Once all the parameters have been programmed, click on "OK" to save what you have programmed.

POPULATE YOUR SCAN LIST

Go back to your Scan List, add the 'ON' channels for slot 1 and 2 to this list from the just created group of channels. You may also implement the alternative method, understanding the limitations.

POPULATE THE ZONE LIST WITH CHANNELS

Go back to the Zone List you previously created and add in the first 16 channels of the most recent group you added. Most radios can only have 16 channels in a Zone, so

pick the ones you want. If you need more, then you create another Zone List and add the ones missing. If the Talk Group is in the less used second zone, you will need to change zones and channel to reply (unless you set a sufficient delay in scanning). With this method, your scan list will scan all active talk groups on any channel, then you rotate the channel selector to that talk group to respond.

OTHER SET-UP OPTIONS

ALARM SETTING

Analog and Digital alarm settings can be programmed via above set-up.

LOCAL INFORMATION

With the radio attached to the USB port on your computer, you can access Embedded Message information about the radio. To change or add any of the information it requires a separate software package from AnyTone only provided to dealers.

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CREATE ANALOG ZONE AND CHANNELS

Add a zone for your analog channels, and then add each repeater as a channel. Name your zone by its function or geography (choice is yours). Optionally you can also create scan lists for your analog channels and assign a scan list to a group of channels or an entire zone.

STEP 9 - ANALOG ADDRESS BOOK

The radio allows a set of addresses for the Analog mode. Open the Analog Address Book and click on the first line to open the Analog Address Book Edit window.
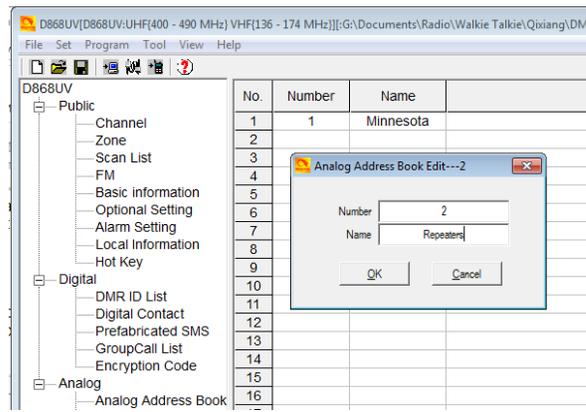
The Call ID reference the DTMF or 5Tone number programmed under its menu

STEP 10 - PREFABRICATED SMS

The radio has a function to send SMS messages from your radio to other Digital Contacts. There is an opportunity to create advanced SMS messages and have them stored in the radio. Open the Prefabricated SMS window, and click on the first line to open the Prefabricated SMS Edit window.

Here you can program SMS messages and store in the radio – see below.

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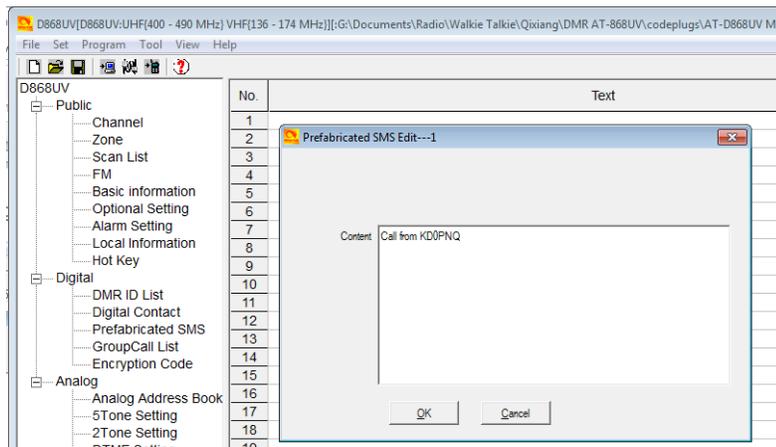
STEP 11 – ENCRYPTION CODE

You can edit the Encryption code as desired but this should not be used in the USA.

STEP 12 - ALARM SETTING

The radio offers a comprehensive alarm system to protect the user of the radio under several conditions. Open the Alarm Setting to gain access to the Emergency Information Edit window.

Analog Alarm

Emergency Alarm:	Select from Alarm, Transpond + Background, Transpond + Alarm, or Both
ENI Type Selected:	Select from None, DTMF or 5Tone
Emergency ID:	When ENI Type choose DTMF or 5Tone, you should edit the DTMF or 5Tone firstly, then choose the required number in this column
Alarm Times:	Select after what time the alarm should be initiated
Duration of TX:	Select the duration of the Alarm transmission
Duration of RX:	Select the duration of listening mode after an alarm reset
Emergency ENI:	Select which channel the Alarm should be sent out on
Emergency Ch.:	Select which channel to use
Emergency Cycle:	Select Continuous or a time

NOTE: A channel is the No. on the Channel Menu line for the selected frequency.

Work Alone

Response Time: Select the time for the radio to respond to an Alarm trigger
Warning Time: Select the duration if a warning transmission
Response: Select Key or Voice for a response to reset

Digital Alarm

Emergency Alarm: Select one of 4 options for how to initiate an Alarm
Alarm Time: Select after what time to initiate the Alarm
Duration of TX: Select the duration of the Alarm transmission
Duration of RX: Select the duration of listening mode after an alarm reset
Emergency ENI: Select which channel the Alarm should be sent out on
Emergency Ch.:   Select which channel to use
Emergency Cycle: Select Continuous or a time
Number: Channel number from the Channel Menu No. line
Name: Enter the name and license number you want transmitted.
City: Enter the location of your position to be transmitted
Call Type: Select the type of call you need for an Alarm
Call Tips: Select how you want the alarm to respond.

Enter OK to save.

LOCAL INFORMATION

Displays the USB COM port information

STEP 13 - HOT KEY

The Hot Key programming offers 3 sub-windows within the Hot Key Edit window.
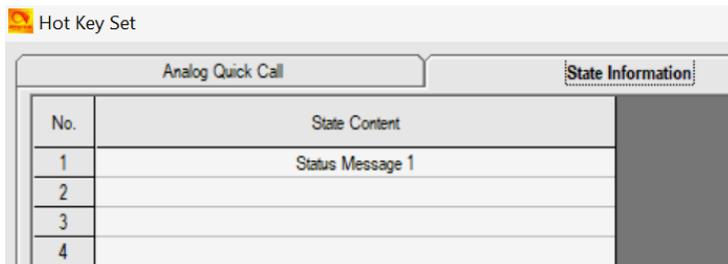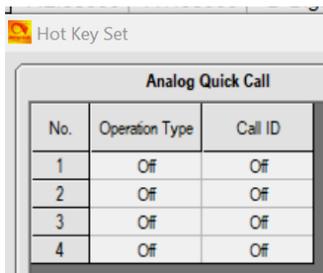
Analog Quick Call

The Call ID refer to the DTMF, 2Tone or 5 Tone set up under separate menu

State Information

Allows text messages to be entered and made available for digital calls and can be selected when using Hot Key's functions

Hot Key

The Hot Key window allows set-up of a keyboard key to access a function. See page 12 in your AT-D868UV Operating Manual for more details.
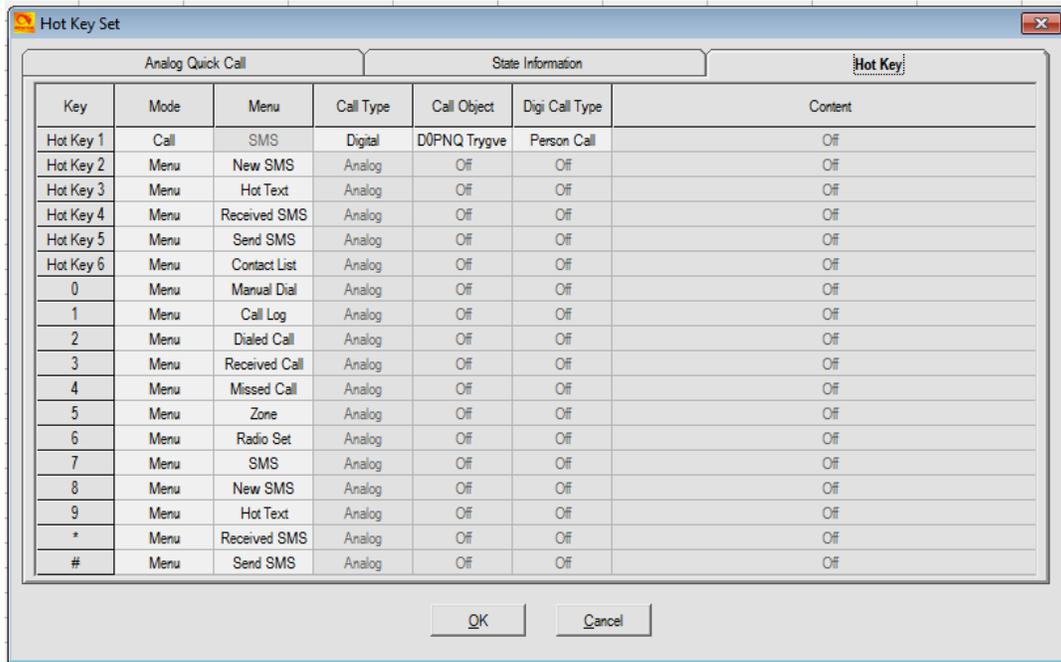
Key	Mode	Menu	Call Type	Call Object	Digi Call Type	Content
Hot Key 1	Call	SMS	Digital	D0PNQ Trygve	Person Call	Off
Hot Key 2	Menu	New SMS	Analog	Off	Off	Off
Hot Key 3	Menu	Hot Text	Analog	Off	Off	Off
Hot Key 4	Menu	Received SMS	Analog	Off	Off	Off
Hot Key 5	Menu	Send SMS	Analog	Off	Off	Off
Hot Key 6	Menu	Contact List	Analog	Off	Off	Off
0	Menu	Manual Dial	Analog	Off	Off	Off
1	Menu	Call Log	Analog	Off	Off	Off
2	Menu	Dialed Call	Analog	Off	Off	Off
3	Menu	Received Call	Analog	Off	Off	Off
4	Menu	Missed Call	Analog	Off	Off	Off
5	Menu	Zone	Analog	Off	Off	Off
6	Menu	Radio Set	Analog	Off	Off	Off
7	Menu	SMS	Analog	Off	Off	Off
8	Menu	New SMS	Analog	Off	Off	Off
9	Menu	Hot Text	Analog	Off	Off	Off
*	Menu	Received SMS	Analog	Off	Off	Off
#	Menu	Send SMS	Analog	Off	Off	Off

STEP 14 - ANALOG PROGRAMMING

The programming of Analog channels are done the same way as for the digital channels. Analog and digital channels can be mixed, but will be easier to find if programmed as a separate group at the end of all digital DMR channels. Exporting and working all this in the .csv format will allow to sort the channels before loading into the radio, so that the digital channels appear first, and the analog following rather than intermixed.

If you by means of this Guide feel confident to program digital channels, entering your analog channels should be very easy.

FINAL STEP - WRITE YOUR CODEPLUG TO YOUR RADIO

The AT-D868UV radio comes with a special programming cable. This cable requires the computer to find a driver so that it will work correctly – most computers will find this

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driver automatically when inserted into the USB connector and radio for the first time. Per note on page 1 please update the read and write speed of the driver.

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!

2.0 TOOL Pull-down Menu

The pull-down TOOL menu offers several unique features such as listening to all recorded information, importing and exporting file data to an excel format for separate programming, mode function, extended settings, firmware updating, adding a boot image, and default channel settings.

2.1 RECORD

The radio Menu under "Record" has to be set under Record Switch to On for the radio to record all conversation. A maximum of 3 hours of recordings are offered with the standard radio – options exist for up to 300 hours. Recordings can be played back directly from the radio. A new feature is to "loop" playback to hear all recordings, one after the other. The list of recordings can also be accessed from the TOOL menu in the CPS. Once the List of Recordings is opened, click on "Read Record Data" to import a list of all recorded data stored in the radio. The recording can then be saved to your computer or played to hear what was said.

2.2 IMPORT and EXPORT

This feature allow importing to an excel spreadsheet each of the programming features so that all the features of excel can be used to build and enhance a CopePlug. Some details are described above in the Contact Information section.

2.3 MODE

The Mode Selection allows the CPS software not to check for Channel names and Contact names to be identical. This feature has been requested by the California Amateur clubs due to the amount of repeaters they cover. Add a check to allow same Contact and Channel numbers.

2.4 EXTENDED TG FUNCTION SETTING
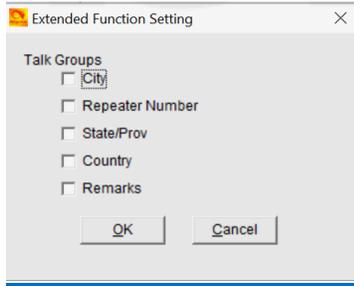
This menu is available under the TOOL pull-down as "eXtended", and define which parts of the Talk Group information in Step 1 above will be displayed on the LCD display screen during reception of a call. If nothing is selected, then the Name of the TG is displayed at the bottom of the screen, and if any of the items in this menu is selected those will be displayed at the bottom of the display.

2.5 FIRMWARE UPDATES

If you have the Firmware Update Software (described in section 4.0 below) installed on your computer, this is a direct way to access this firmware.

2.6 START-UP SCREEN STARTUP PICTURE CHANGE

The TOOL menu in the CPS has an option to replace the Startup Picture to something you desire. Here are the options:
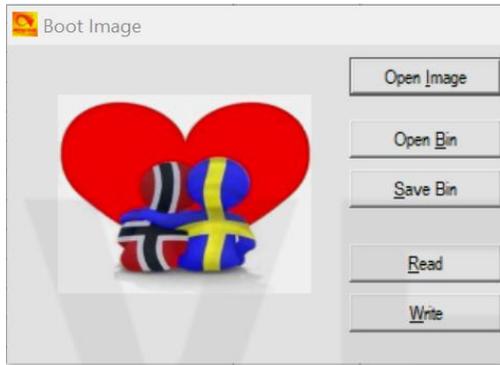
- Open Image – accepts JPG images from your photos or files (size not critical as software will re-size)
- Open Bin – opens a .bin image file instead of a .jpg file (gives you an option)
- Save Bin – saves the image you opened to a .bin file
- Read – read your loaded image file from the radio (if you loaded one)
- Write – write your new image file to the radio

2.7 DEFAULT CHANNEL INFORMATION

This TOOL Menu accesses the first channel of your list of channels.

2.8 EXPORT DATA CONVERSION FILE

This function is used to export the codeplug to a format .dcf which can be read by the Contact Manager described in section 6.0 below where it then can be fully manipulated. The CPS can import the .dcf file just as it can a .csv file.

2.9 MODEL INFO

The Model pull-down menu allows checking which of the 10 frequency bands the radio is programmed for. To check – read in the current codeplug with the CPS, and open the

Model > Model Information to see what Band the radio is set for. Changes can only be done by the manufacturer or an authorized retailer.

2.10   FRIEND LIST EDIT

The CPS will allow you to create a list of your close friends (their DMR ID number must be included in the Digital Contact List) by entering the DMR ID in the search field and then moving those names over to the Friend Member side of the set-up panel. Once those persons are sending a call, your radio will beep to identify you that your friend is on line.

2.11   DIGITAL APRS INFORMATION

The D868UV radio now allow the Brandmeister network to forward the GPS information to the APRS.fi website to show the physical location of the radio on the map. The radio has limited CPU memory so that set-up of APRS can only be done via the CPS software and then loaded in to the radio. No Menu set-ups are available by the radio.

The set-up is done as shown below:

Manual TX Intervals: Set interval time for GPS APRS TX to avoid TX at every PTT
APRS Auto TX Interv.:   Set interval for auto TX at select Report Channel
Transmit Power: Set power level for the APRS GPS data TX
Fixed Location Beacon: Set to Off for GPS reporting or On for below position reporting.
                                      The GPS symbol must be "red" to allow reporting in Off select
Report Channel: Select DMR channel where the GPS data shall be reported on

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(also set APRS to On and APRS Report Channel in *channel set-up* for the channel you will be using for APRS data TX)

APRS Talk Group: Enter country Brandmeister TG for APRS – USA = 310999
Call Type: Brandmeister US Talk Group is "Private Call"
Channel Slot: Select Channel Slot or if required a different slot.

The Report Channel should be selected from the programmed list of channels or the same channel you use for the voice transmission. The sample above shows a dedicated APRS channel being used.

Please note that you also have to set up the Brandmeister **SelfCare** Settings in order for the APRS to work. Check your own set-up at
https://brandmeister.network/index.php?page=selfcare
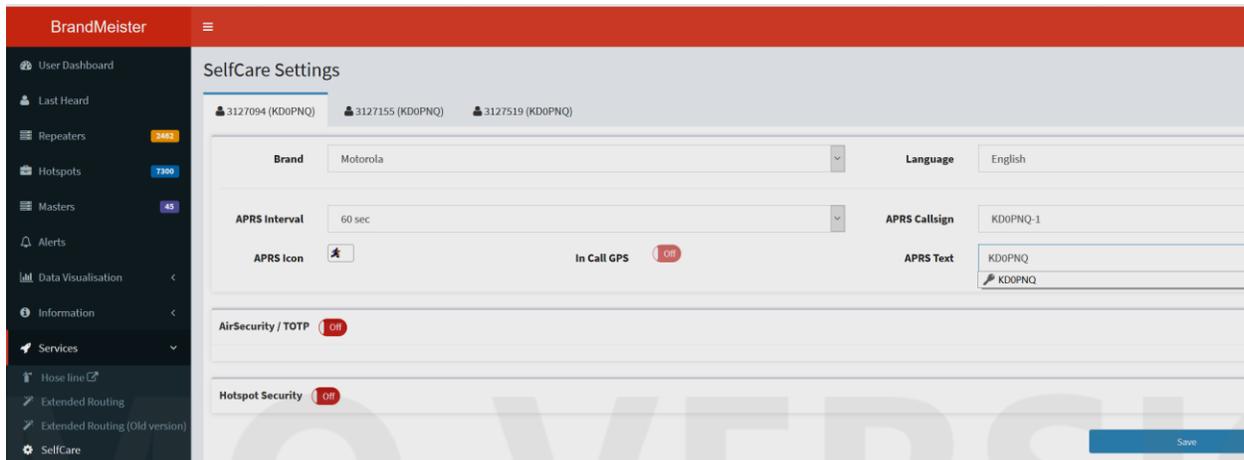
A typical APRS.fi display looks like below. You may have to do a Track Callsign as it was set up at the Brandmeister SelfCare site – in example it is KD0PNQ-2

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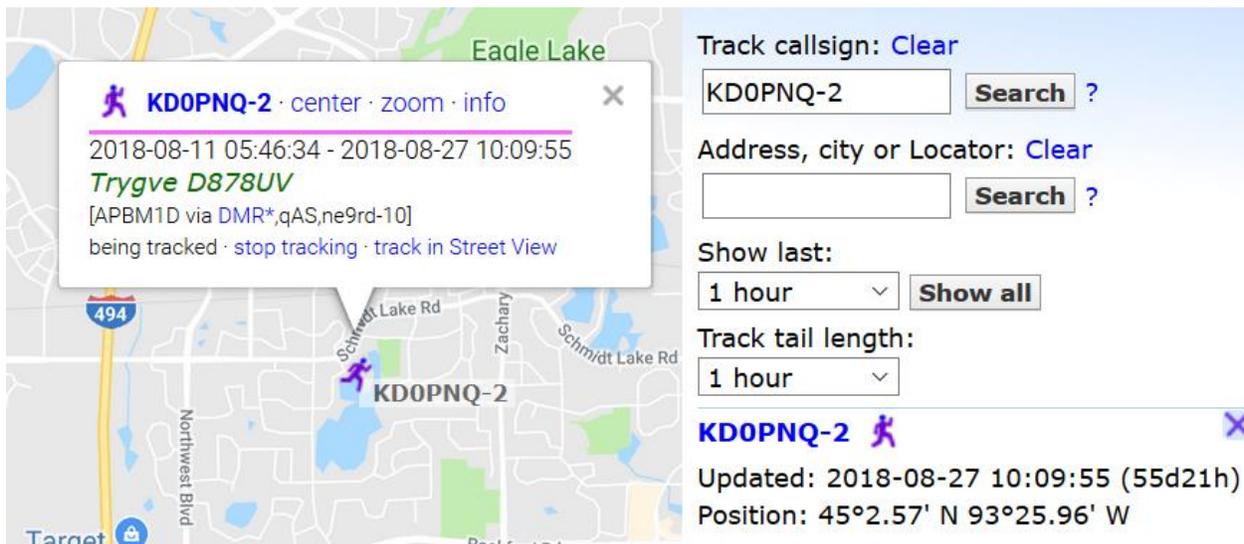
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3.0 RADIO LCD DISPLAY

On the top row of the LED display the following indications can appear:

- Reception bars left side is showing signal strength
- Within a square "**L/M/H/T**" transmit power levels showing from Low to Turbo
- Speaker = Digital Monitor is turned on for 1 or 2 slots (promiscuous mode)
- Microphone = You have turned On the recording feature of the radio (3 hours)
- GPS symbol **gray** = no GPS signal received, **red** = GPS signal received
- "**A**" indicates a set-up for Automatic Power Off
- **CC11** for Digital reception shows the ColorCode for the primary channel
- **DCS** or **CTC** for Analog reception indicates a tone signaling squelch
- The date line changes and shows sequentially date/last heard/current TG
- **DIG/ANA** CH-796 – shows the channel type and number of the channel.
- **T1** or **T2** time slot shown for the digital channel used as "A" and/or "B"
- **R** next to a digital channel = repeater with different RX and TX frequency. A red **R** indicates reversed RX and TX frequencies.

4.0 AT-D868UV RADIO FIRMWARE UPDATE

NOTE: Please follow procedures very carefully and make sure you use correct version of firmware – check radio DEVICE INFO for your version (1 or 2)!

The AT-D868UV radio is a newly designed DMR radio, and AnyTone may from time to time issue updates to the operating system (firmware) for the radio. The firmware update is done in a similar manner as loading a codeplug into the radio – it requires the programming cable.

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Obtain the firmware updating software from AnyTone:

QXCodePro_Update_dpinst_Setup_1.02.exe

Run this program to install a small program to allow the download of the firmware into the radio. It will install **QXCodePro_Update_dpinst 1.02** on your computer. Open this program and you will see the following window. This could also be accessed via the TOOL menu if you have the above program installed on your computer.
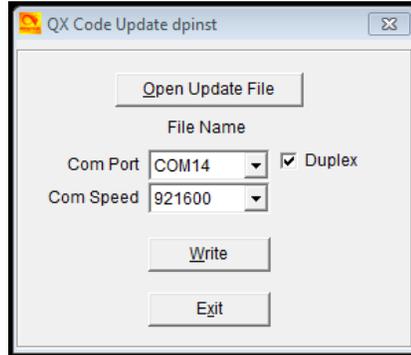
NOTE: The AT-D868UV radio may from time to time be significantly updated with features which may require a different firmware compared to earlier manufactured radios. A recent update now offers an optional memory chip inside the radio for up to 300 hours of voice recording. This model goes under Version 2 (Hdw V.1.10) compared to the original radio being Version 1 (Hdw V. 1.00). The firmware for those different radios is also identified with V1.19 or V2.19 for example and will be supported forever. Please check your radio's Menu under Settings and Device Info for version number before loading any firmware into the radio. Also – save your CodePlug before you do a Firmware update!

Make sure that Com Speed is set to 921600, and place a checkmark in the Duplex box.
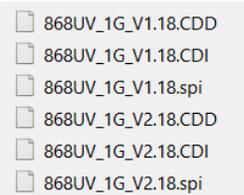
Download your 3 firmware files from
http://www.qx-tele.com/about/about8.html
and note that you need to determine what version of the radio you own so you select the 3 correct files: V1.xx, or V2.xx and place the correct files in the same folder as the above program.

Click on "Open Update File", and open the "**D868UV_xxxxx.spi**" file and you should see

Connect the radio (powered of) to the programming cable and connect it to the computer USB port.

Power on the radio while holding the **top orange**, and the **PTT** button pushed in – the red LED on the top of the radio should start blinking.
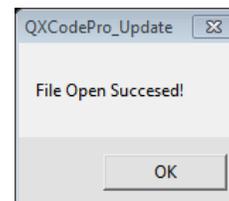
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Click "Write" and the firmware should load into the radio. You will see the progress on a separate display on your computer. The radio will re-start after the firmware has been updated.

Most firmware updates may specify that a Radio System Reset must be done before continuing – see below for how to do this.
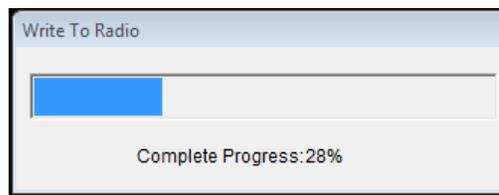
4.1 AT-D868UV RADIO TOTAL SYSTEM RESET

NOTE: Do not do this without having your codeplug saved on your computer!

If the AT D868UV radio becomes un-operative, there is a solution to reset the entire radio. This is <u>not recommended</u> if the radio operates ok, but can become a final solution for a major problem. Also – after some firmware updates this may be a required operation.

To reset the radio, power it on while holding the **PTT** and the **PF1 button below the PTT** at the same time. The radio may ask you to confirm that you want to perform a full reset – reply Confirm. The radio will start up with a note on the display stating MCU Reset, Please Wait – and do not turn the radio off while it restarts.

After a re-start the radio will display the setting for time zone, the date and the time. Use the up-down key to set the current time zone. Move to the year by pushing the **P1 key**. Set the year, and use the **P1 key** to move forward each step. Once done, click the Menu key to save the time zone, date and time.

You may now see the Chinese language. If it starts with Chinese, click Menu, scroll down to the grey cogwheel globe and click Menu, click Menu 1 more time (Radio Set) and scroll down to item #11 (Language) and click Menu and select English.

The codeplug has also been replaced as part of the system re-set, so you need to re-load your codeplug into the radio to make it work the way it should. Please remember to update your DMR ID number and the start-up display if you use a codeplug from the Internet.

4.2 AT-D868UV RADIO ICON SOFTWARE UPDATE

NOTE: This is a very rare update but may be require to be done!

D868_1G_ICON_V1.1.CDD
D868_1G_ICON_V1.1.CDI
D868_1G_ICON_V1.1.spi

Download 3 firmware files from AnyTone:

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With a different QX Code Update software V1.02, "Open Update File" and open the D868_1G_ICON_Vx.x.spi file

Connect the radio (powered off) to the programming cable and then to the computer USB port.

Power on the radio while holding the **PTT** and the **button with the two lines** below the PTT. The radio should display UPDATE MODE on the front display.

Make sure you have selected the correct COM PORT as it may be a different one from the one used above. Click "Write" and the firmware should load into the radio showing the progress.

Turn off the radio, and power it back on to restart it.

5.0 CPS Programmer – Programming Software Helper for AT D868UV

A German Amateur Klaus DL5MCC has developed a comprehensive software program to help with coduplug programming for several types of DMR radios, now also the D868UV radio. His software can be downloaded from:
http://dl5mcc.de/cpsprogrammer/
Download the two software files and open the **CPSProgramer**_xxxxxx.exe This small program first of all will allow you to convert the DMR-MARK contact list to the format needed by the D868UV radio. Download the database from:
http://www.dmr-marc.net/cgi-bin/trbo-database/datadump.cgi?table=users&format=csv&header=1
Then in the CPSProgrammer use the pull-down menu Convert CSV and select **Convert Contacts CSV** – once opened you see a new window where you under "Select Contacts CSV" open the downloaded contacts database which may be in a .cgi format, but that is ok. Make sure the "Target" displays AT-D868UV. Then at the bottom of the open window, click **Convert CSV**, and you will see the program operate for a while converting all the contacts to the D868UV format.

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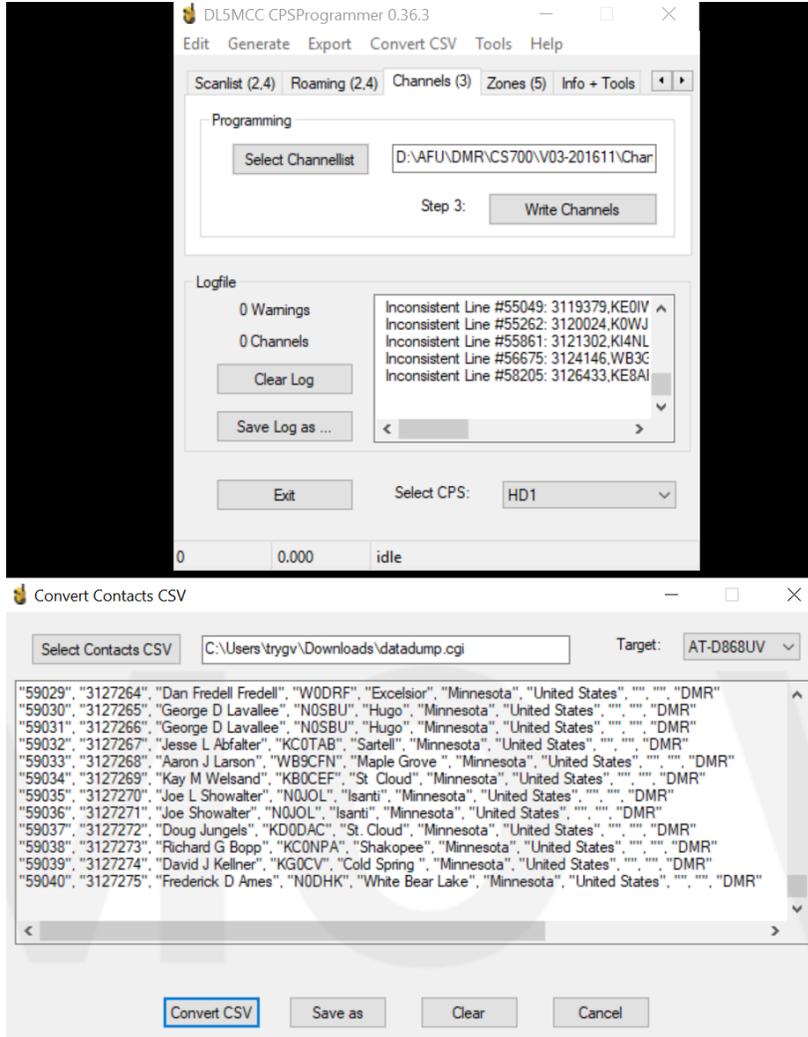
After the conversion, Save the file in a place so you can open it under the D868UV Programming Software as a file to Import for all the Contacts. This makes updates of the Contact List very easy and quick. Please note that this program changes the position of the "name" and the "call sign" in the excel .csv program so that the display on the radio will emphasize the Call Sing instead of the Name as follows:
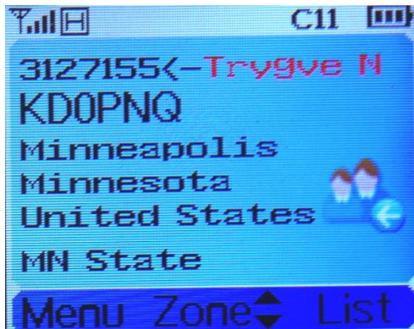
CPS Programmer display

Normal D-868UV display

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The 1.23 version of the CPS allow selection which format as shown above you like:
Open the Optional Settings > Digital Function > Call Display Mode to set the radio display to either of above formats.

6.0 Contact Manager - CodePlug Converter Help for the AT-D868UV

A US Amateur Tom N0GSG has created a **Contact Manager** piece of software which can convert an .rdt codeplug software from several different radios to the D868UV specific format. This software can also update the contact list with all the 100,000+ DMR names and help to input this into the radio. This software is available at his web site http://n0gsg.com/contact-manager/
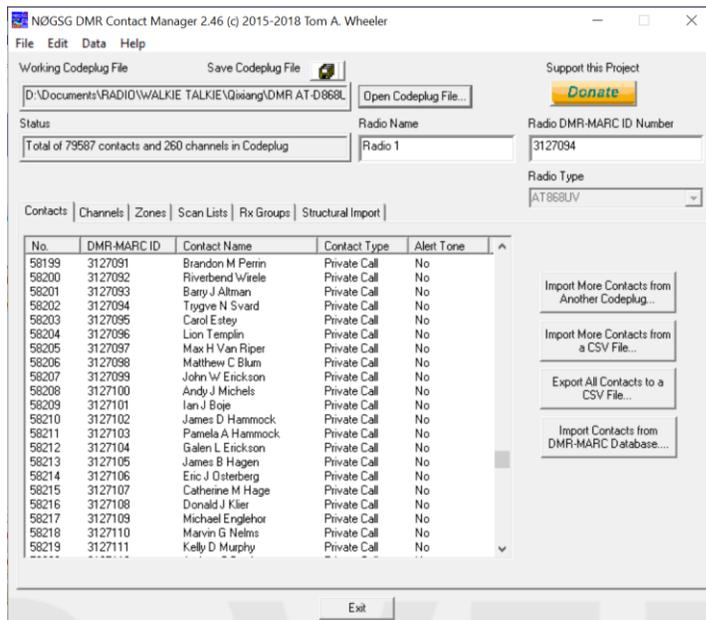
Please note that saved .rdt codeplug files saved directly from the CPS software may not work correctly with the Contact Manager. The CPS version 1.26 or later offers under TOOLS > Export Data Conversion File the option to export the codeplug into a .dcf file which the Contact Manager can open and work correctly with. This process is required for all of the D868UV codeplug programs generated after CPS version 2.21.

The best feature of the Contact Manager is the conversion of for example the TYT MD-2017 codeplug (or any other similar dual band codeplug ending in .rdt) to the AnyTone D868UV format. Here is what you do:

- Open the Contact Manager 2,50 or later.
- In AnyTone CPS program save the original "blank" codeplug from the radio.
- Now open the "blank" AT D-868UV codeplug you just saved in Contact Mgr.
- You may see some errors, but ignore them for the moment
- Then click the **Structural Imports**
- Select all checkmarks and click **Import Selected Structures**…
- Select the TYT MD-2017 codeplug you want to use for the conversion
- You will see a window telling what you have imported for the D868UV codeplug

- To add any missing DMR ID's click **Import Contacts from DMR-MARK Database**
- Click **Entire Database (WW)** and the program loads 90,000+ names
- Or type a country in the search area and click "search" if you do not want all.
- Click **Add All Records** and you will add any missing DMR contact

V-1.33/2.33&V1.11

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- Click **Done Searching** to complete the addition into the codeplug

- Update the **Radio DMR-MARK ID Number** on the top right with your number
- Save the new D868UV codeplug so you can open it with the CPS program

You need to review the **Optional Settings** in the CPS to make it unique for your needs. Then load it into the D868UV radio and you have a new codeplug originally made for another radio!

7.0   Custom Digital Contact Wizard

Marshall Dias W0OTM is offering a **Contact Wizard** on-line program which can download contact names for the AnyTone D868UV radio sorted from the entire list, by country only, or even by State alone and then it will generate a .csv file you can load into the AnyTone Programming Software (CPS) via the TOOL submenu > Import > Contacts. The on-line help can be found at: http://www.amateurradio.digital/wizard.php

Select the radio, then click on Step 2 and then Step 3 to create your .csv file.