



PROGRAMING THE BAOFENG DM-1701 FOR DMR WITH PI-STAR (JUMBO HOTSPOT/MMDVM) AND CPS!

Using the BrandMeister Network



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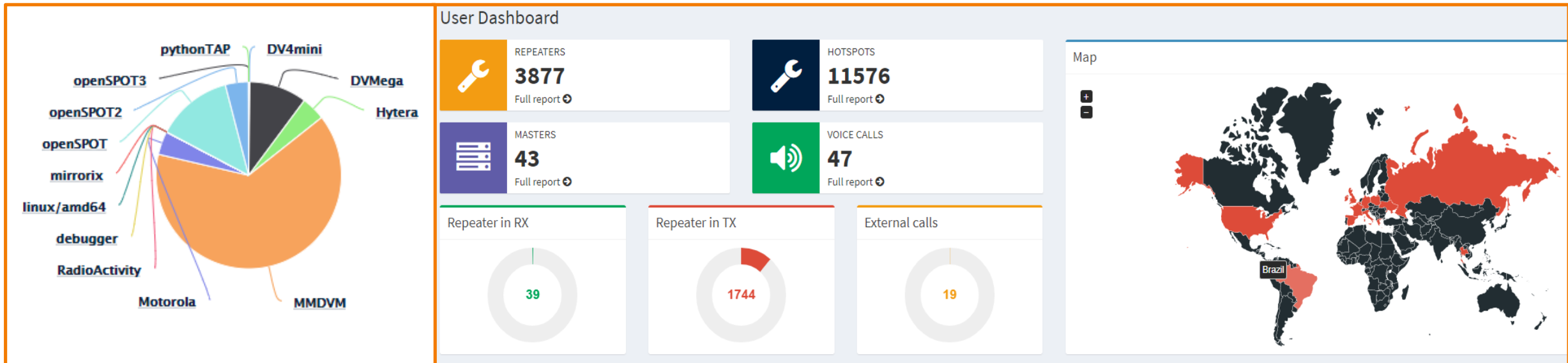
DMR – INTRO AND BASIC CONCEPTS

- DMR (Digital Mobile Radio) especially the **BrandMeister** format is based upon commercial models adapted to Amature Radio and the reason it might feel like a “**square peg in a round hole**”.
- Analog Radio was limited by geographic topologies and a **one to many broadcast concept** without required acknowledgement of transmission. Where as DMR (digital) **requires a complete topological network map** of sender, receiver and all waypoints (hops). As in the digital world, there can be a near infinite number of channels (think of the internet) requiring a **hierarchical ontology** to manage all of this much TCP/IP.

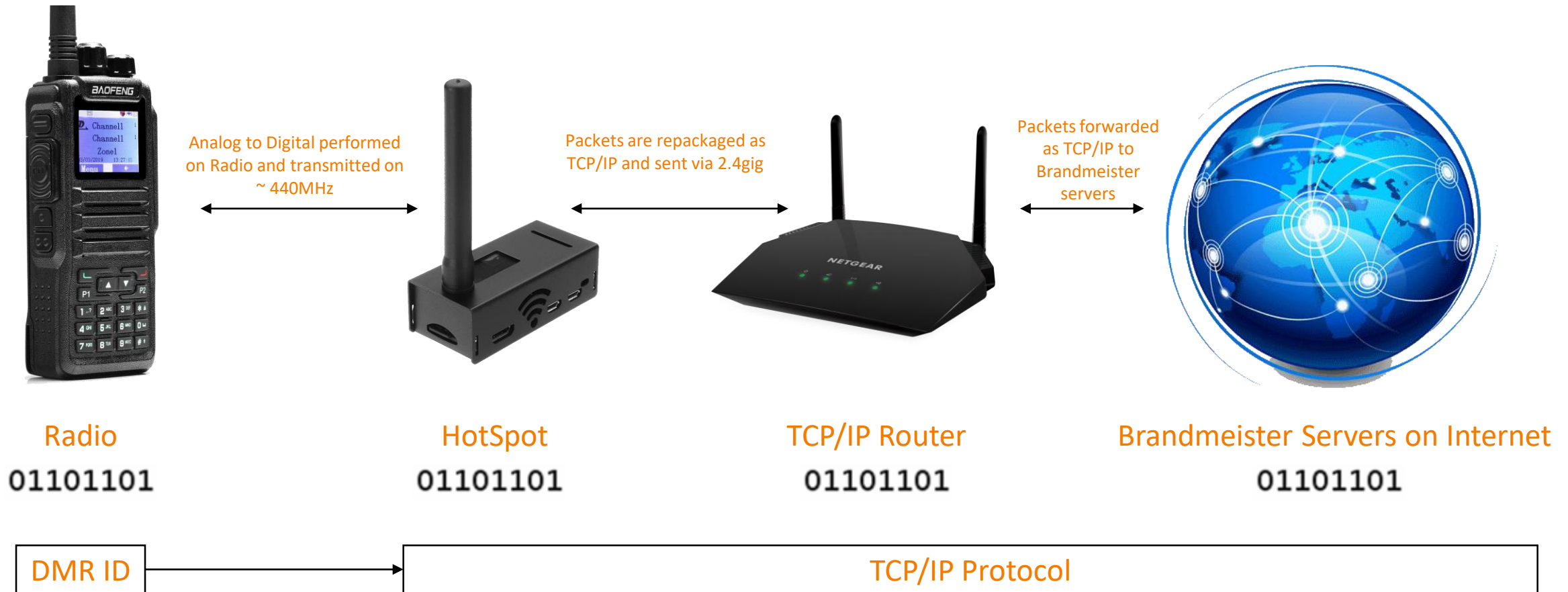
THE BRANDMEISTER NETWORK

The **Brandmeister DMR Network** was born from a handful of worldwide hams and software engineers who teamed together to create a global digital repeater network consisting of master servers and peer repeaters all over the world. The technology is based upon Motorola TRBO which utilizes TalkGroups as a means of grouping Radio ID's into a single contact resulting in near unlimited contact scenarios. The network has over 3877 repeaters and more than 11,576 hotspots across the globe and it's growing every day! Also note the MMDVM is the predominate HotSpot on the market!

<https://brandmeister.network/>

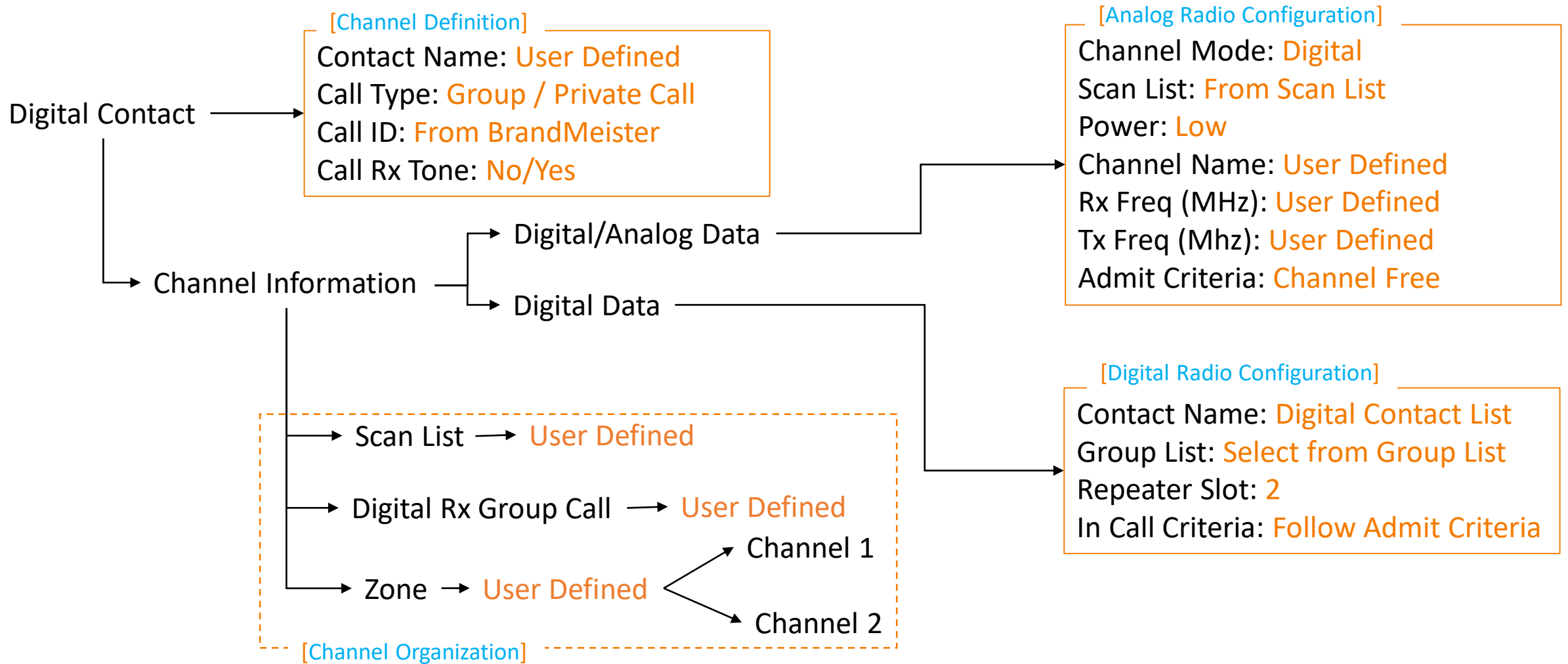


HOTSPOT DMR TOPOLOGY

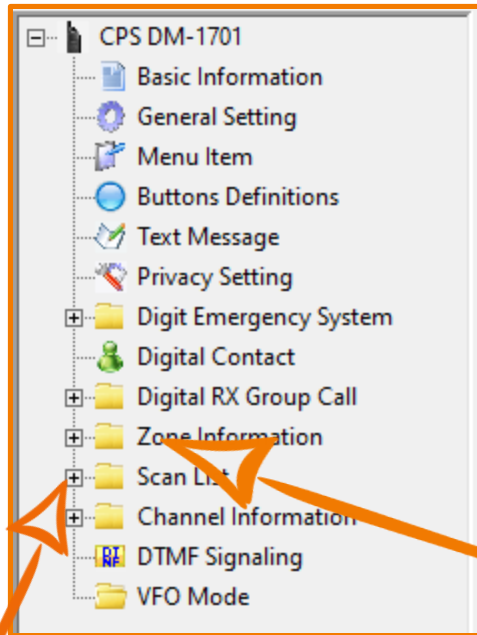


Important Note: Configuring the DM-1701 or any DMR radio for hotspot use will be slightly different then configuring the radio for use with a formal DMR repeater so please do not confuse the two.

HIERARCHICAL ONTOLOGY OF DMR



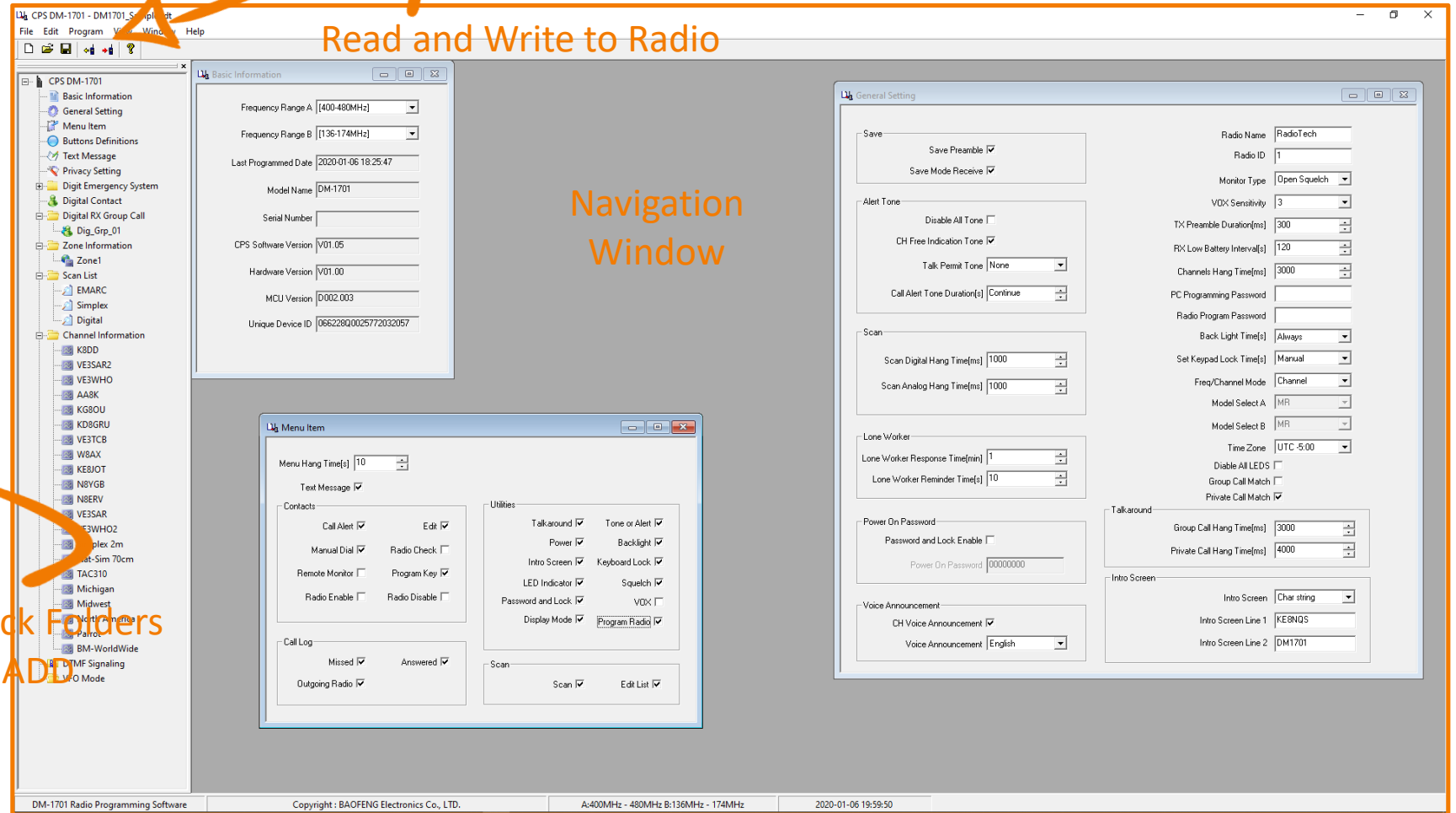
CPC SOFTWARE NAVIGATION PANE



Navigation Tree

Click to Expand

Right Click Folders
To ADD



Read and Write to Radio

Navigation Window

GENERAL SETTINGS

General Setting

Save Preamble

Save Mode Receive

Alert Tone

Disable All Tone

CH Free Indication Tone

Talk Permit Tone None

Call Alert Tone Duration[s] Continue

Scan

Scan Digital Hang Time[ms] 1000

Scan Analog Hang Time[ms] 1000

Lone Worker

Lone Worker Response Time[min] 1

Lone Worker Reminder Time[s] 10

Power On Password

Password and Lock Enable

Power On Password 00000000

Voice Announcement

CH Voice Announcement

Voice Announcement English

Radio Name RadioTech

Radio ID 12345678

Monitor Type Open Squelch

VOX Sensitivity 3

TX Preamble Duration[ms] 300

RX Low Battery Interval[s] 120

Channels Hang Time[ms] 3000

PC Programming Password

Radio Program Password

Back Light Time[s] Always

Set Keypad Lock Time[s] Manual

Freq/Channel Mode Channel

Model Select A MR

Model Select B MR

Time Zone UTC-5:00

Disable All LEDs

Group Call Match

Private Call Match

Talkaround

Group Call Hang Time[ms] 3000

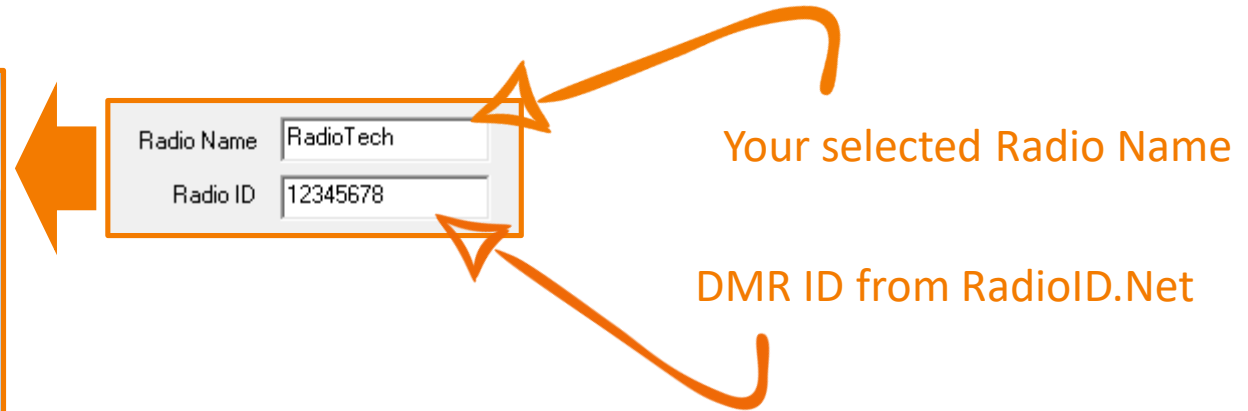
Private Call Hang Time[ms] 4000

Intro Screen

Intro Screen Char string

Intro Screen Line 1 KE8NQS

Intro Screen Line 2 DM1701



Other setting in this pane are subject to the user's personal preference regarding the operation of the radio and not directly associated to the sole functionality of DMR

MENU ITEMS

Menu Item

Menu Hang Time[s] 10

Text Message

Contacts

Call Alert <input checked="" type="checkbox"/>	Edit <input checked="" type="checkbox"/>
Manual Dial <input checked="" type="checkbox"/>	Radio Check <input type="checkbox"/>
Remote Monitor <input type="checkbox"/>	Program Key <input checked="" type="checkbox"/>
Radio Enable <input type="checkbox"/>	Radio Disable <input type="checkbox"/>

Call Log

Missed <input checked="" type="checkbox"/>	Answered <input checked="" type="checkbox"/>
Outgoing Radio <input checked="" type="checkbox"/>	

Utilities

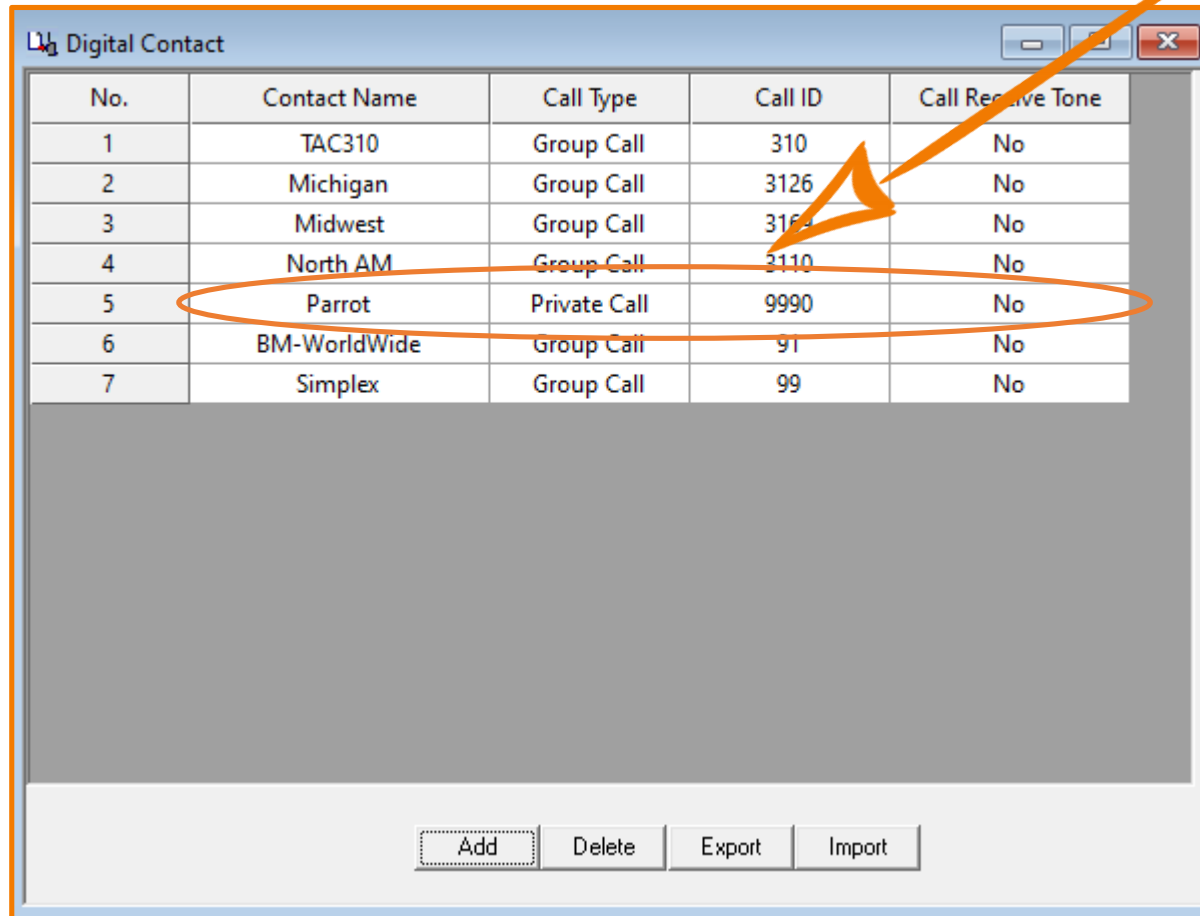
Talkaround <input checked="" type="checkbox"/>	Tone or Alert <input checked="" type="checkbox"/>
Power <input checked="" type="checkbox"/>	Backlight <input checked="" type="checkbox"/>
Intro Screen <input checked="" type="checkbox"/>	Keyboard Lock <input checked="" type="checkbox"/>
LED Indicator <input checked="" type="checkbox"/>	Squelch <input checked="" type="checkbox"/>
Password and Lock <input checked="" type="checkbox"/>	VOX <input type="checkbox"/>
Display Mode <input checked="" type="checkbox"/>	Program Radio <input checked="" type="checkbox"/>

Scan

Scan <input checked="" type="checkbox"/>	Edit List <input checked="" type="checkbox"/>
--	---

Not directly related to DMR, however this is a useful add to allow manual programming

DIGITAL CONTACTS



No.	Contact Name	Call Type	Call ID	Call Receive Tone
1	TAC310	Group Call	310	No
2	Michigan	Group Call	3126	No
3	Midwest	Group Call	3164	No
4	North AM	Group Call	3110	No
5	Parrot	Private Call	9990	No
6	BM-WorldWide	Group Call	91	No
7	Simplex	Group Call	99	No

Buttons: Add, Delete, Export, Import

Parrot is a test Private call ID which “Parrots” back what ever is said and used for testing...

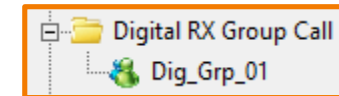
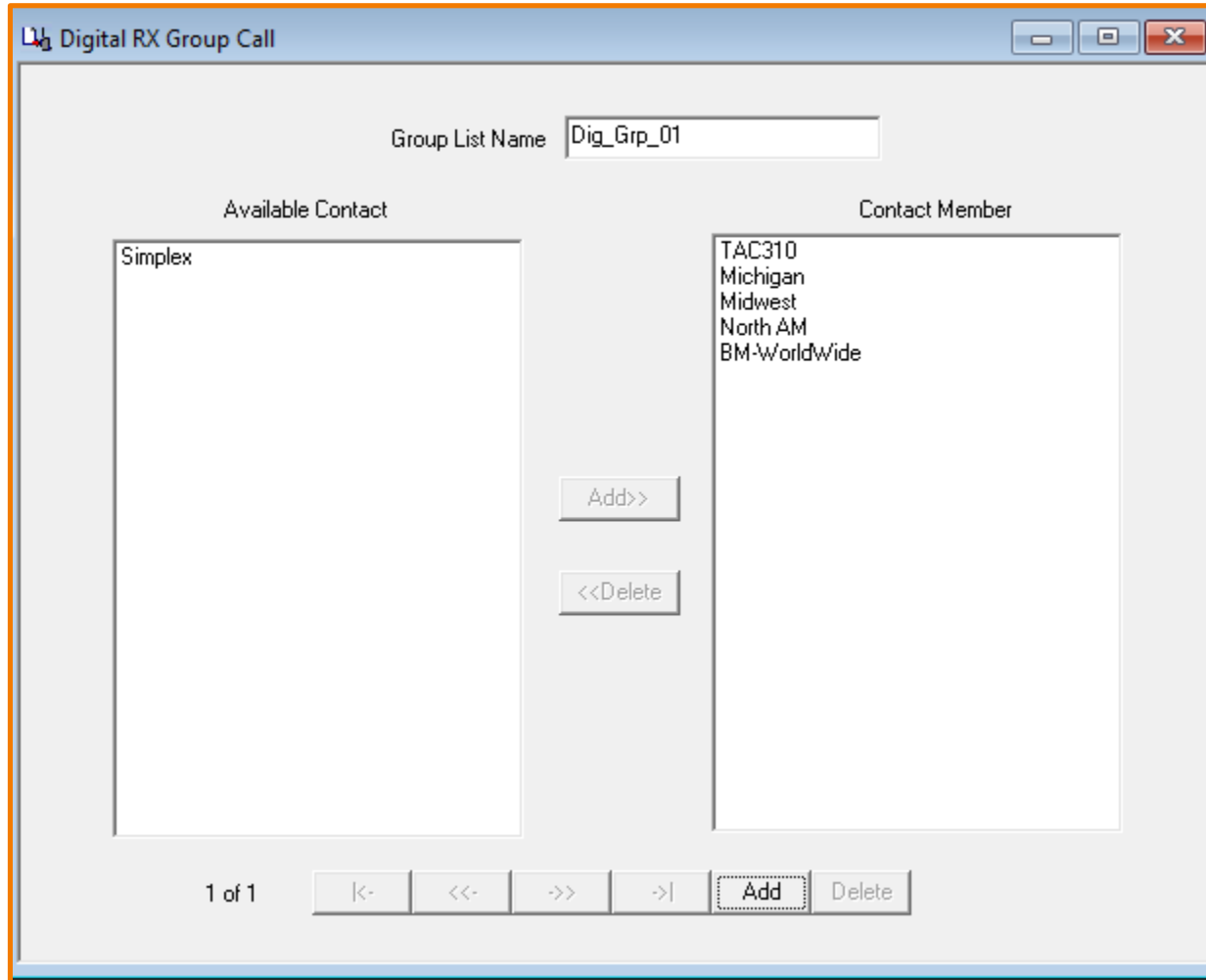
Contact Name: User Defined
Call Type: Group / Private Call
Call ID: From BrandMeister
Call Rx Tone: No/Yes

If you are in the US, you can use this page to look up various BrandMeister TalkGroup IDs

https://wiki.brandmeister.network/index.php/United_States_of_America

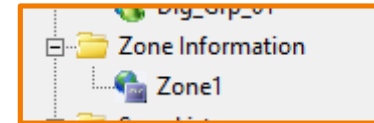
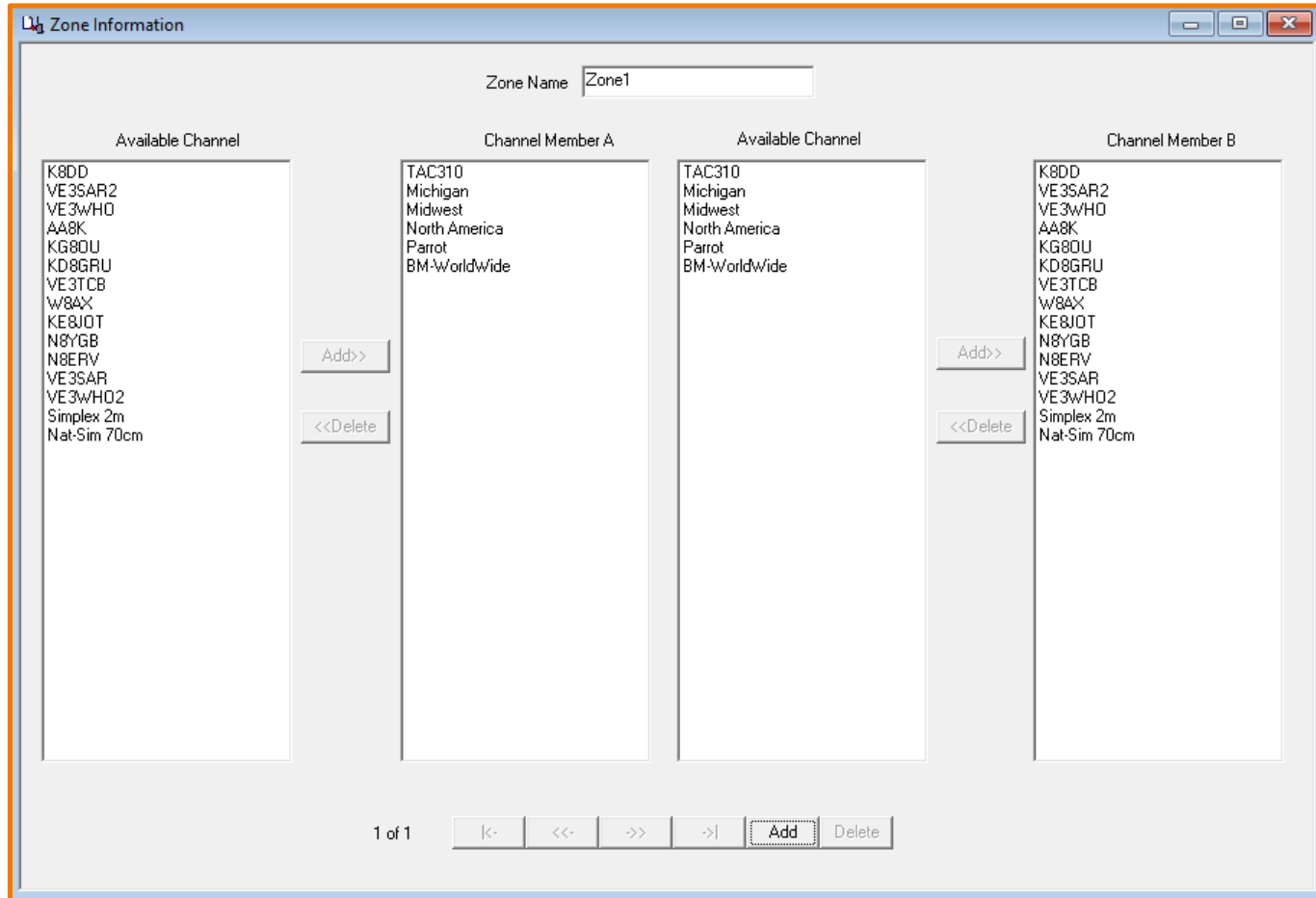
Worth additional note, **Digital Contacts** forms the crux of the DMR configuration and can be thought of as a “postal code” if you will.

DIGITAL RX GROUP CALL



The purpose of Digital Rx Group Call is more a repeater (instead of a hotspot as we are program) as you could have two RX Lists, one for slot 1 and the other slot 2. This way all TGs for slot-1 are in the slot-1 RX List, and the same for slot 2. So if you are on a slot 1 talk group can hear any activity on other TG's in that time slot. Same if you're on a slot 2 channel you will hear other slot 2 activity. However for our purpose since we will just have Slot-2, you can simply place them into one group (suggestion: name it Hotspot).

ZONE INFORMATION

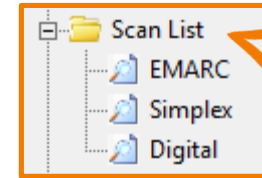
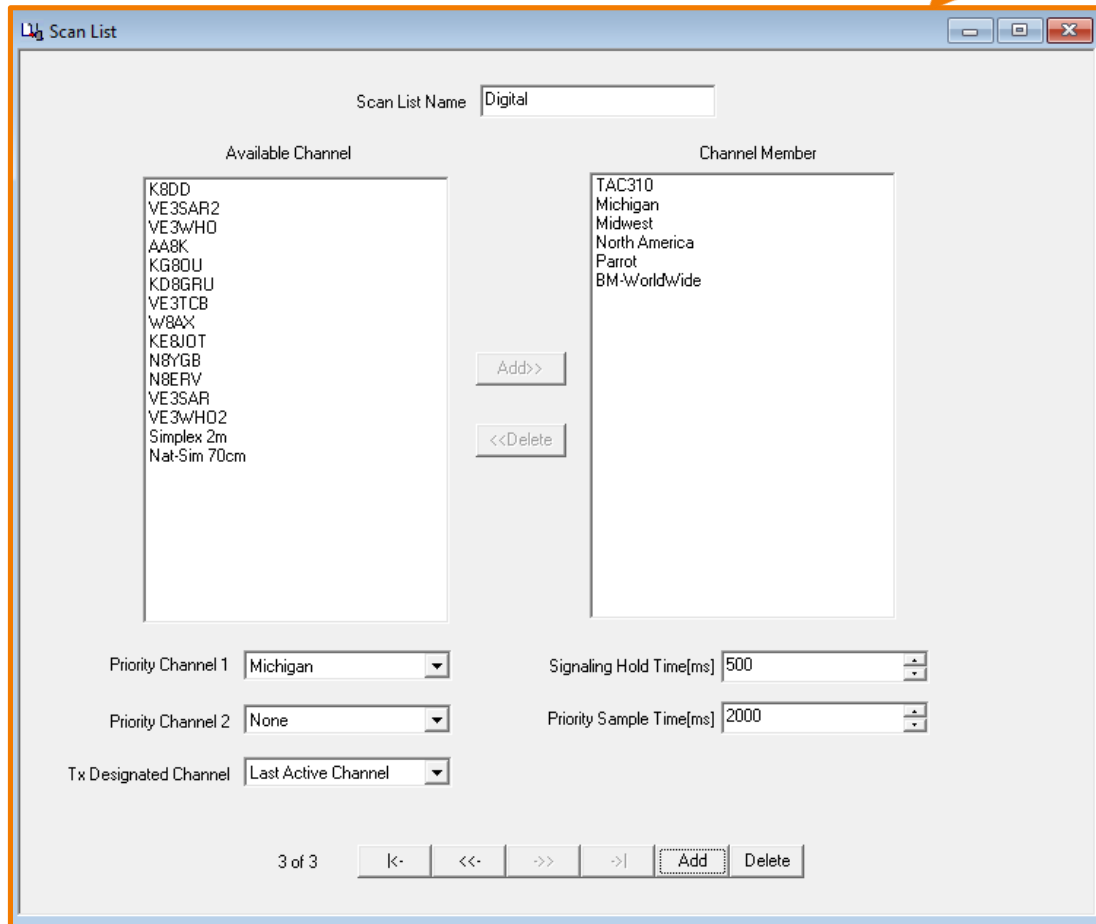


To use a Channel on the radio, it needs to be added to a Zone. Zones can contain analog channels too.

Here you will notice that I have added my digital channels to Channel "A" and my analog channels to Channel "B".

Zones are a way to organize vast numbers of channels.

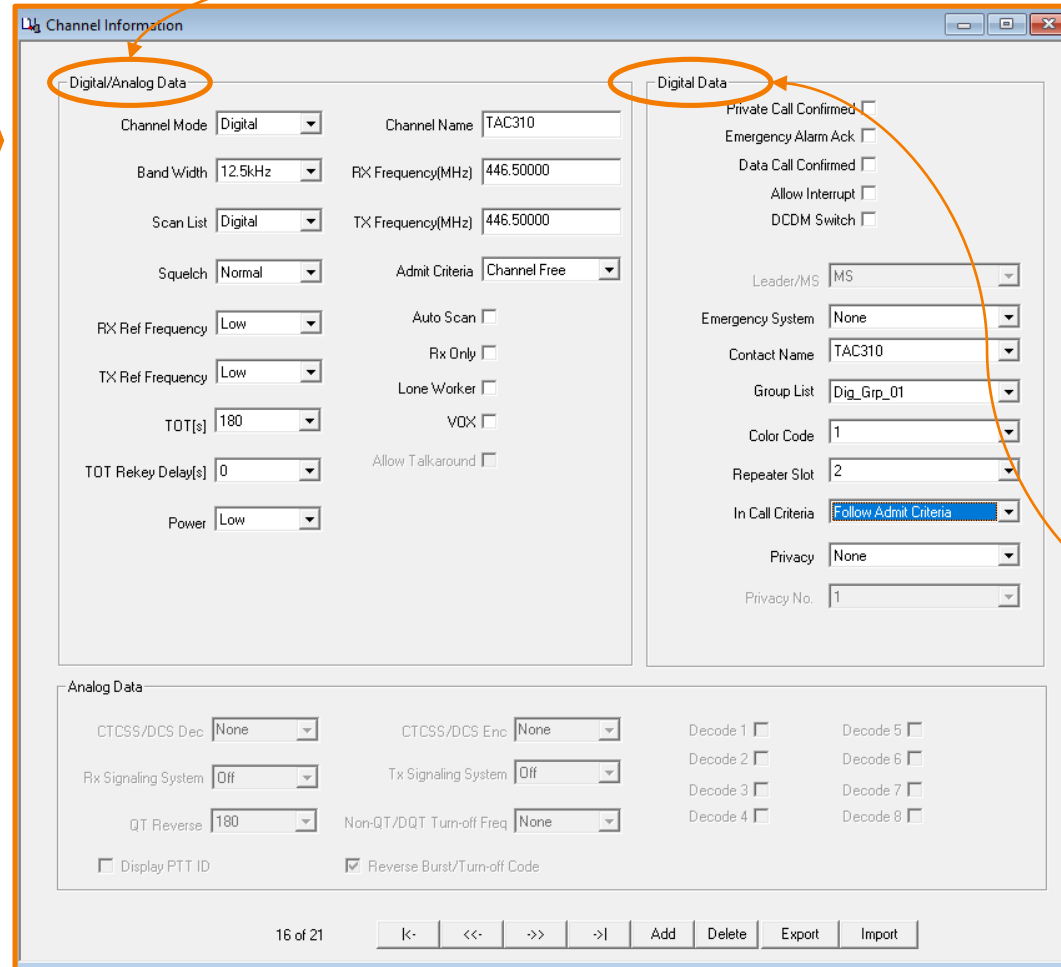
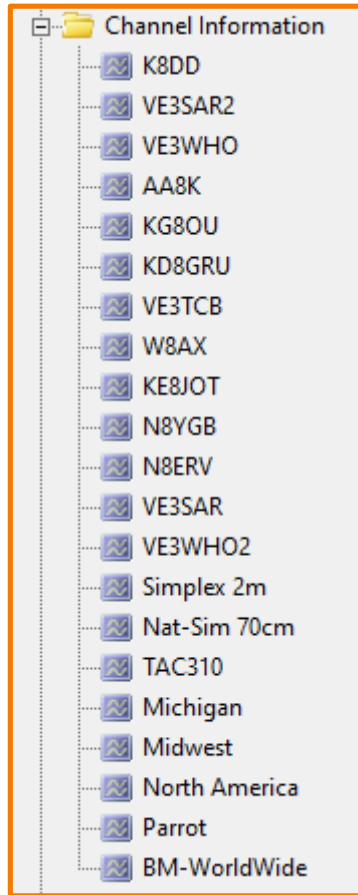
SCAN LIST



Right Click the folder and select "**Add**" to add new Scan List Names

Most functionality here is self obvious and again my preference is to separate the Digital and Analog channels into to, two separate groups

CHANNEL INFORMATION



The "Channel Information" configuration window for channel TAC310. It is divided into two tabs: "Digital/Analog Data" and "Digital Data".

Digital/Analog Data Tab:

- Channel Mode: Digital
- Channel Name: TAC310
- Band Width: 12.5kHz
- RX Frequency(MHz): 446.50000
- Scan List: Digital
- TX Frequency(MHz): 446.50000
- Squelch: Normal
- Admit Criteria: Channel Free
- RX Ref Frequency: Low
- Auto Scan:
- TX Ref Frequency: Low
- Rx Only:
- TOT[s]: 180
- Lone Worker:
- TOT Rekey Delay[s]: 0
- VQX:
- Power: Low
- Allow Talkaround:

Digital Data Tab:

- Private Call Confirmed:
- Emergency Alarm Ack:
- Data Call Confirmed:
- Allow Interrupt:
- DCDM Switch:
- Leader/MS: IMS
- Emergency System: None
- Contact Name: TAC310
- Group List: Dig_Grp_01
- Color Code: 1
- Repeater Slot: 2
- In Call Criteria: Follow Admit Criteria
- Privacy: None
- Privacy No.: 1

Analog Data Tab:

- CTCSS/DCS Dec: None
- CTCSS/DCS Enc: None
- Decode 1:
- Decode 5:
- Rx Signaling System: Off
- Tx Signaling System: Off
- Decode 2:
- Decode 6:
- QT Reverse: 180
- Non-QT/DQT Turn-off Freq: None
- Decode 3:
- Decode 7:
- Display PTT ID:
- Reverse Burst/Turn-off Code:
- Decode 4:
- Decode 8:

At the bottom, there are navigation buttons: K-, <<, >>, >|, Add, Delete, Export, Import. The page number "16 of 21" is displayed at the bottom left.

[Analog Radio Configuration]

Channel Mode: Digital
Scan List: From Scan List
Power: Low
Channel Name: User Defined
Rx Freq (MHz): User Defined
Tx Freq (Mhz): User Defined
Admit Criteria: Channel Free

[Digital Radio Configuration]

Contact Name: Digital Contact List
Group List: Select from Group List
Repeater Slot: 2
In Call Criteria: Follow Admit Criteria

ADDENDUM ONE

Channel Information

Digital/Analog Data

Channel Mode: Digital Channel Name: TAC310

Band Width: 12.5kHz RX Frequency(MHz): 446.50000

Scan List: Digital TX Frequency(MHz): 446.50000

Squelch: Normal Admit Criteria: Channel Freq

RX Ref Frequency: Low

TX Ref Frequency: Low

TOT[s]: 180

TOT Rekey Delay[s]: 0

Power: Low

Digital Data

Private Call Confirmed

Emergency Alarm Ack

Data Call Confirmed

Allow Interrupt

DCDM Switch

Leader/MS: IMS

Emergency System: None

Contact Name: TAC310

Group List: Dig_Grp_01

Color Code: 1

Repeater Slot: 2

In Call Criteria: Follow Admit Criteria

Privacy: None

Privacy No.: 1

Analog Data

CTCSS/DCS Dec: None CTCSS/DCS Enc: None

Rx Signaling System: Off Tx Signaling System: Off

QT Reverse: 180 Non-QT/DQT Turn-off Freq: None

Display PTT ID Reverse Burst/Turn-off Code

16 of 21

K- << >> >| Add Delete Export Import

If you have issues, try changing TOT[s] from 180 to 300

Time Out Timer or **TOT[s]** can be set to 180s (3 min) max for repeater & hotspot, 600s (10 min) max for simplex channels. This is used to set the continuous emission maximum time of handy-talkies. When it is overtime, the radio will stop transmitting and prohibit re-transmitting in that period of time.

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