

# **Digital Mobile Radio**

## **A Novice's Perspective**

**November 2018**

**WE4TOM**

**DMR Radio**

(That's a little bit redundant)

**Digital Mobile Radio**



Things I've Learned  
Since Delving into DMR.

What Do You Need to Acquire?

**Repeaters**  
**HotSpots**  
**Radios**

Shopping List				
		Amazon	E-Bay	Radioddity
1	DMR Registration Number			
	DMR ID: <a href="http://RadioID.net">RadioID.net</a> - Free	\$0		
2	Access to DMR Network (DMR also works Simplex)			
	Access to DMR Repeater: Free	\$0		
	(Optional) DMR HotSpot: JumboSpot	\$100	\$65	
3	DMR Radio, Some Popular Models			
	Radioddity: GD-77	\$95	\$80	\$75
	Baofeng: RD-5R	\$80	\$75	
	TYT: MD-2017 with GPS	\$167	\$159	
	TYT: MD-2017 without GPS	\$157	\$149	
	AnyTone: AT-D868UV with GPS	\$179	\$179	
	AnyTone: AT-D868UV without GPS		\$159	
Prices as of 10-13-2018				



What Do You Need to Understand

## **Code Plug**

Consisting of:

**Contacts**

**Receive Group**

**Channels**

**Talk Groups**

**Zones**

**Time Slots**

**Color Codes**

What Do You Need to Acquire?

**Repeaters**

**HotSpots**

**Radios**

**Elmer**

# Elmers

One of the advantages I have as a Novice DMR Operator is that I had newer radios to pick from when I started buying.

## **PARC Members I've heard on the Tidewater DMR 31515 Talk Group**

**KF4HJW** [kf4hjl@kf4hjl.org](mailto:kf4hjl@kf4hjl.org)

Darrell Sutton

**KN4KV** [me@phildrummond.com](mailto:me@phildrummond.com)

Phil Drummond

**N4BC** [dick@n4bc.com](mailto:dick@n4bc.com)

Dick Barnes

**WZ4K** [WZ4K@arrl.net](mailto:WZ4K@arrl.net)

Howard Waxman



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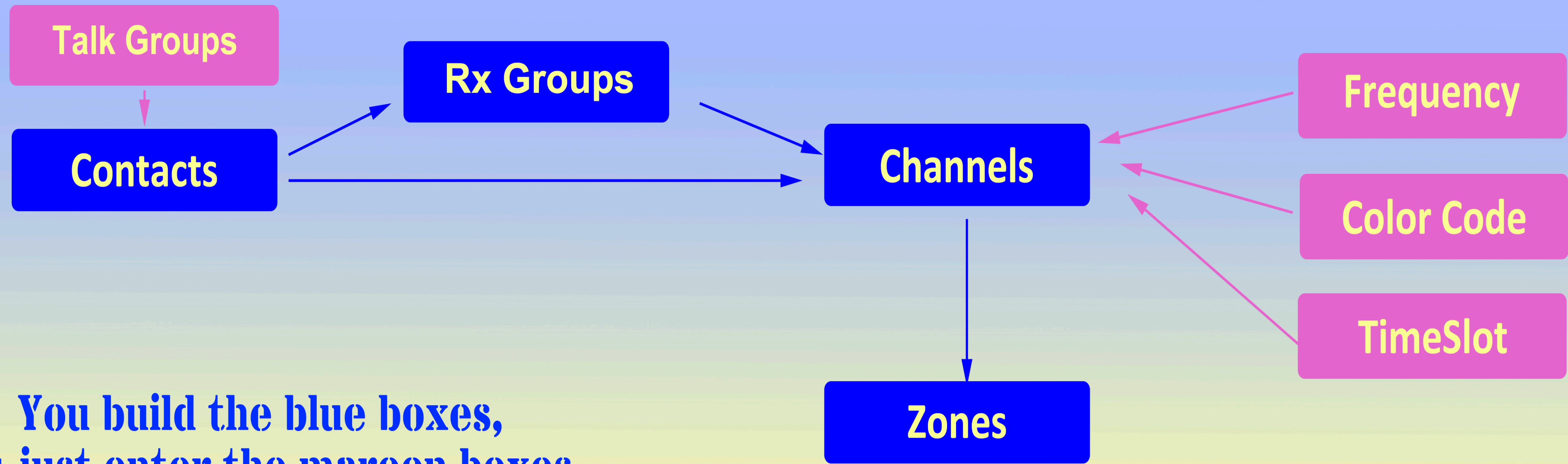
## Code Plugs

A Code Plug is what you call the file you create that holds the customized settings for your radio. All the terms just presented, go into making the code plug. There are also some “One Time Settings” you make such as Call Sign and DMR ID.

All DMR Radios seem to have the same components. After you understand one manufacturer, you’ll easily follow another. Code Plugs from dissimilar radios are not likely to be interchangeable, but dissimilar radios work well together. I’ve discovered they tend to have capabilities of importing and exporting CSV files.



# Oversimplified DMR Data Elements



**You build the blue boxes,  
you just enter the maroon boxes.**



Expect Repeaters to list their **Frequencies** on line, along with their **Color Codes** and **Time Slots** for their various **Talk Groups**.

**November 2018, WE4TOM**



# Talk Groups

Like a common meeting place. Like D-Star Reflectors - they can be worldwide. They are geographically oriented. There are also Talk Groups for various topics, such as vehicles, guns, and radio.

# Contacts

Contacts Manage what we contact.

Either a Talk Group or a DMR ID. As you add items to Contacts, they will appear in Drop Down Boxes when you build Receive Groups or Channels.

## Groups

**Receive Group List** - Seems to be needed to hear the other party. It seems to me that a Ham would expect it to be understood that you want to hear the person you are talking with. This feature could be more useful to First Responders or Support Groups, than to Hams. In most cases I have built a Receive Group of one Contact. A Contact can be a DMR ID or a Talk Group Number. Putting a bunch of people in one Talk Group gets very confusing.



# Channels

Contacts, Color Codes, and Time Slots, along with Frequencies (and a few other settings) create a Channel (Record). The Channels are kept in a “folder like” creation, called a Zone.

The Radio Displays seem to be limited to 10 Characters. This led me to using Creative Cryptic Channel Names.

# Frequency

This is the frequency the radio will transmit and receive. DMR is capable of both Duplex and Simplex.

# Color Codes

They are like Tones. They help prevent undesired transmissions. There are only 16 of them. Ironically they are not colors, they are numbers, 0 through 15.



# Time Slots

There are 2 Time Slots. These also can prevent transmissions. If you have the wrong Time Slot you won't be able to communicate with your intended recipient. However, their purpose is to allow two communications to happen at the same time on the same frequency. They don't interfere with each other. DMR uses TDMA.

**Per Wikipedia:** Time-division multiple access (**TDMA**) is a channel access method for shared-medium networks. It allows several users to share the same frequency channel by dividing the signal into different time slots. The users transmit in rapid succession, one after the other, each using its own time slot.

# Zones

Collections of Channels. Zones seem to be limited to 16 Channels each on the GD-77.

You select a Zone, then a Channel within that Zone.



# Zone Scheme

This is my Scheme. Feel free to use it. It makes sense to me, other schemes may be much better.

I was motivated by the fact that the display on the radio, displays only 10 characters in a name. I added a label on the back of the radio (the battery) to provide additional information. The label appears in blue below, in another slide.

# Zone Scheme Cont'd

## First Character

- A: Analog
- D: Digital
- H: HotSpot (Also Digital)

## Second Character

- Numeral: Identifier of a Group of Repeaters or HotSpots
- Lower Case: Sequence indicator in a Group of Simplex Frequencies

## Third through Fifth to Eighth Characters

- Call Sign for Repeaters
- Frequency for Simplex
- Name of HotSpot

## Suffix

- None
- Name: Abbreviation for Name of DMR ID Ham
- Hpt: Hampton
- u: UHF
- v: VHF
- NN: Newport News
- Gl: Gloucester
- CH: Chesapeake
- Chspk: Chesapeake
- Wmsb: Williamsburg
- SSB: Single Side Band
- X: WiresX
- TDW: Tidewater TalkGroup 31515
- TG2: TalkGroup 2
- 1: TalkGroup 1
- VA: State VA TalkGroup 3151
- 310 TalkGroup 310
- CL: Clear
- N1: PRN Chat 1
- N2: PRN Chat 2
- RN: NCPRN
- Prt: Parrot TalkGroup 9990 (Private)
- 0P: Frequency 0 KHz Peninsula
- 3S: Frequency 3 KHz Southside



# Zone Scheme Cont'd

Frequencies Sorted by KHz

Digital Repeaters are sorted  
by Repeater Order  
Dig Simplex by Freq  
(Rounded below Whoops)

Zn	Rec	Freq		Zn	Rec	TalkGrp
A1	01	147.000	Popular Peninsula Analog Repeaters	D1	01	31515
A1	02	444.100		D1	02	2
A1	03	147.165		D1	03	3151
A1	04	145.170		D2	01	8951
A1	05	145.200		D2	02	310
A1	06	147.225		D2	03	27500
A1	07	145.230		D2	04	27000
A1	08	145.300		D2	05	27501
A1	09	145.370		D2	06	27502
A1	10	145.490		D2	07	9998
A1	11	448.500		D2	08	9990
A1	12	444.550		D2	09	2
A1	13	146.730		Da	01	441
A1	14	146.760		Da	02	446
A1	15	442.900		Da	03	433
A2	01	145.150	Popular SouthSide Analog Repeaters	Da	04	447
A2	02	147.300		Da	05	146
A2	03	146.700		Da	06	146
A2	04	146.790		H*	01	3102814
A2	05	443.800		H*	02	3109969
A2	06	146.820		H*	03	3109968
A2	07	146.850		H*	04	1151237
A2	08	146.895		H*	05	310
A2	09	146.970		H*	06	311
Aa	01	446.000	Popular Analog Simplex Frequencies	H*	07	312
Aa	02	447.000		H*	08	3100
Aa	03	432.100		H*	09	9990
Aa	04	446.500		H*	10	31515
Aa	05	147.510		H*	11	3151
Aa	06	146.520				
Aa	07	145.550				
Aa	08	144.555				
Aa	09	147.555				

H1: Kathy H2: Tom H3: Pat H4: Ken



# Operating

Select a Zone.

From that Select a record (Channel).

Listen before talking. Catch 22. Some repeaters require that you Kerchunk before you are recognized to hear anything on the Talk Group you want to hear. After all, until you send it information, how will it know what you want to listen to? People jumping in are likely to be stepping on QSOs in progress. To comply with FCC regulations you must identify yourself.

# Operating

**Tidewater DMR Net** on TalkGroup 31515 Thursday Nights at 2100 Hours. WZ4K ramrods it.

We are still learning. Sometimes I can't be heard by some participants, while others can hear me. Sometimes I can't hear some participants while others can hear them. This tells me there is something I still don't understand. In general, it works well. On rare occasions, in a one to one QSO, the other fellow will drop out. On occasion he'll return, explaining what he did. I would guess that better than 90-95% of the time it is working well.

## **Brandmeister**

<https://brandmeister.network>

This offers a listening service called a Hose line. It is found under Services.



# Operating Hose Line


brandmeister.network


Amazon Alexa Alexa Skills ...s & Templates Ebay EmComm-AUXCOM Google Financ...rket for free Prime Number...d Calculator Tsunami 2018


BrandMeister Register Login EN Settings


### User Dashboard

- User Dashboard
- Last Heard
- Repeaters **2484**
- Hotspots **7290**
- Masters **44**
- Alerts
- Data Visualisation
- Information
- Services
  - Hose line**
  - Extended Routing
  - Extended Routing (Old version)
  - SelfCare

**REPEA...**  
**2484**  
Full report

**HOTS...**  
**7290**  
Full report

**MAST...**  
**44**  
Full report


**VOICE...**  
**10**  
Full report

Repeater in RX

Repeater in TX

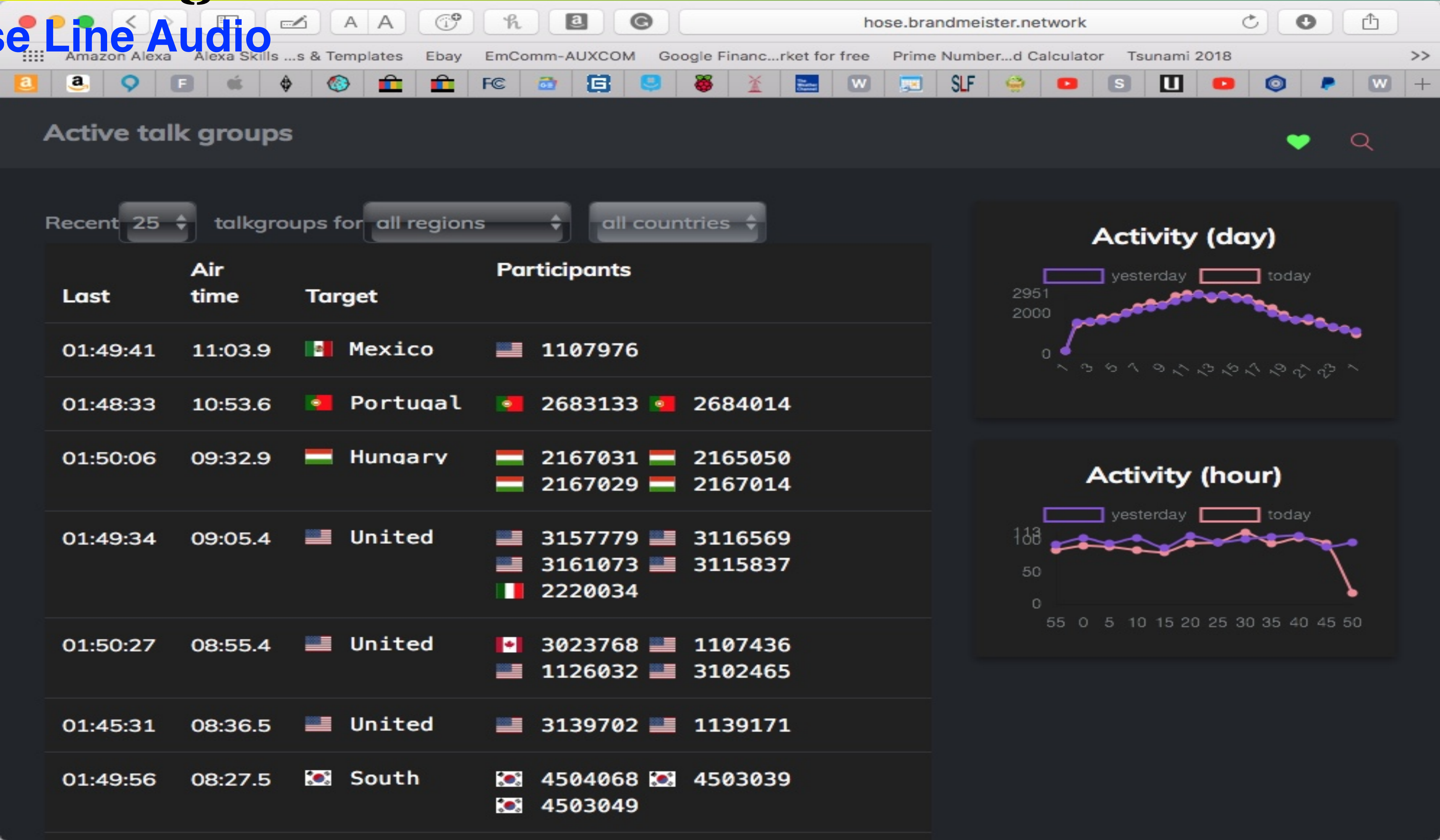
External calls

Map





# Operating Hose Line Audio





# Sources of Info:

## **DMR Registration Number**

DMR ID: <http://www.RadioID.net> - Free

## **Virginia Repeaters**

DMRVA: <http://www.dmrva.org/>

## **Radio Reviews**

VA3XPR – Toronto, Canada: <http://www.va3xpr.net/>

## **Hams' DMR Network**

BrandMeister: <https://brandmeister.network>

## **HotSpot Software**

PiStar.UK - Pi-Star Digital Voice Software: <http://www.pistar.uk>

## **Talk Groups**

BrandMeister Talk Groups: [http://www.mw0mwz.co.uk/dmr\\_bm\\_talkgroups.php](http://www.mw0mwz.co.uk/dmr_bm_talkgroups.php)

## **ARRL Inputs**

Digital Mobile Radio (DMR) - ARRL Ohio Section: <http://arrl-ohio.org/digital/digital.html>

Introduction to Digital Mobile Radio (DMR):

<https://www.qsl.net/kb9mwr/projects/dv/dmr/Introduction%20to%20Digital%20Mobile%20Radio.pdf>







Jump in  
and  
Enjoy!

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**November 2018**