Digital Radio Operating Manual

Compiled by Steve Wright EI5DD

Introduction

Prior to 2017 there were two Yaesu Fusion Repeaters located in the Limerick area and one in the Donegal area. Despite this there was very little C4FM activity heard. There were approximately 32 operators registered on the DMR Registrations site. Presumably these were those using D-Star and a handful experimenting with DMR through their own personal Hotspot systems.

Following some experimentation, in 2017, experimentation with AOR 9000 Digital Voice modems sparked an interest in Digital Communications in Galway. Initially, the interest was in Fusion and many had purchased Yaesu equipment. Around the same time, there were good offers on Chinese DMR Radios and these were readily snapped up. The infamous "Code Plug" was an initial stumbling block but, with a little practice, more an more appeared on air. D-Star has very little interest in the West of Ireland but facilities are available for this Digital mode.

2018 saw the introduction of the Brandmeister Server in Ireland before the summer of that year. DMR numbers increase rapidly.

With the server in place, plans to put equipment on air were making progress. By the autumn of 2018, SIRN placed their first Multimode Digital Repeater on air, Galway and Mayo placed multimode Digital Gateways on air in the same year.

2019 saw two more Multi-Mode Repeaters on air in the Waterford area. Galway place three DMR Repeaters, and one Wires-X gateway on air. The Galway Analog Repeater EI2TBR had been substituted for Yaesu Fusion Equipment and the old EI7AKR Repeater was on the bench being converted to for D-Star use.

2020 sees the location of the Fusion Repeater and the Loughrea DMR Repeater being placed just outside of Loughrea Town. Three Multi-mode Gateways were placed on air from Roscommon, Kildare and Mullingar. Galway will have the D-Star repeater running from the middle of the City whilst waiting for a new location. A Multimode repeater has been procured an may be substituted for the Repeater located on the West Side of Galway City thereby freeing a DMR Repeater for an alternative location.

With a growing interest in the building of Multimode Digital Gateways for the 2 metre band it should be possible to fill in the gaps where there is no existing equipment in use. These devices are reasonably cheap to build and provide an excellent service.

It is now down to the users of the Digital Network to make it work. There is little point in going to the trouble to make the infrastructure available if there are no users.

Digital systems offer communications with operators all over the world just at the press of the PTT. If you wish to talk to any specific part of the world, there is a Talk Group there for it.

Galway have set up the facility to "Roam" between its four DMR repeaters so DMR communication is guaranteed for the majority of any journey throughout the county.

The Digital network is there for you to enjoy so please use it. If you hear a lone voice seeking a contact, please answer him/her. The more that we can get on air the better.

Take a little time to consider that all of this equipment does cost hard earned money and feel free to donate to your local service providers. It is not just monetary help required. Assistance to get equipment onto site and donation of parts is also much appreciated.

The bottom line is to enjoy the facilities available.

Contents

The Brandmeister Network

Brandmeister Services

https://brandmeister.network/

Official Brandmeister Dashboard—Shows Map of the Active Network
Repeaters
Hotpots
Master Servers

Hoseline (Online Talk Group Streaming)

Irish Brandmeister Server is located in Waterford Institute of Technology Sysop John Ronan, EI7IG

The Irish Brandmeister Server Hosts the Following:

Ireland CALL TG 2722 **Area Clusters on TG8** **Leinster TG 27251**
Ireland Chat TG 2723 **Connacht TG 27250** **Ulster TG 27253**
C4FM Bridge TG 2724 **Munster TG 27251**
Southern Ireland Repeater Group TG 27254 **Galway Digital Radio Group TG 27255**
Southern Ireland Analog Network TG 27240

DMR - MARC Worldwide Network

http://www.dmr-marc.net/

The network is an all-digital group of over 500 DMR-MARC repeaters in 75 countries with 62261 registered users. There are 4142 registered DMR repeaters world-wide in our database. we are all amateur radio operators many of whom are Motorola Solutions employees, Motorola Service Station employees, dealers, system installers and Motorola equipment aficionados.

Repeaters on our network are connected all the time. TRBO radios have great voice quality, great coverage, and extended battery life all in LESS THAN 1/3 the channel bandwidth of a traditional analog FM repeater with TWICE as many voice channels! Our mission is to offer you a reliable and scalable choice in connectivity: local, regional, national and international. Isn't it time you upgraded to digital radio's cutting edge?

Phoenix Network

https://www.opendmr.net/

OpenDMR.net operates PHOENIX, the largest amateur radio DMR network in the UK and DMR-DL, a large network in Germany. Additionally we provide robust, stable, high availability infrastructure and world wide Talk Group services to repeater keepers across Europe.

It is wholly owned, operated and managed by radio amateurs who are themselves UK repeater keepers. It is totally self-funded and there is no cost to any repeater to join the network and no financial contributions are requested. OpenDMR.net is totally without politics and will always remain so.

FreeDMR

FreeDMR is a Network for Amateur Radio all around the world. FreeDMR is currently looking for OpenBridge connections to connect to a rapidly growing system

A Brief DMR Programming Tutorial

If you have Bought a Brand New DMR Radio it may come with a Standard UK Code Plug from the Supplier. Download this and save a copy as you may need it if you have to start from scratch. Study the Code Plug and its components and this will give a basic understanding of how to program. You can easily substitute your own information into parts of it. Whatever you do always back up a copy. If you are making headway with the program back up as soon as you finish. There is nothing worse than losing a few hours work at the click of a mouse button. This is really no different to using the program CHIRP for Analog Radios.

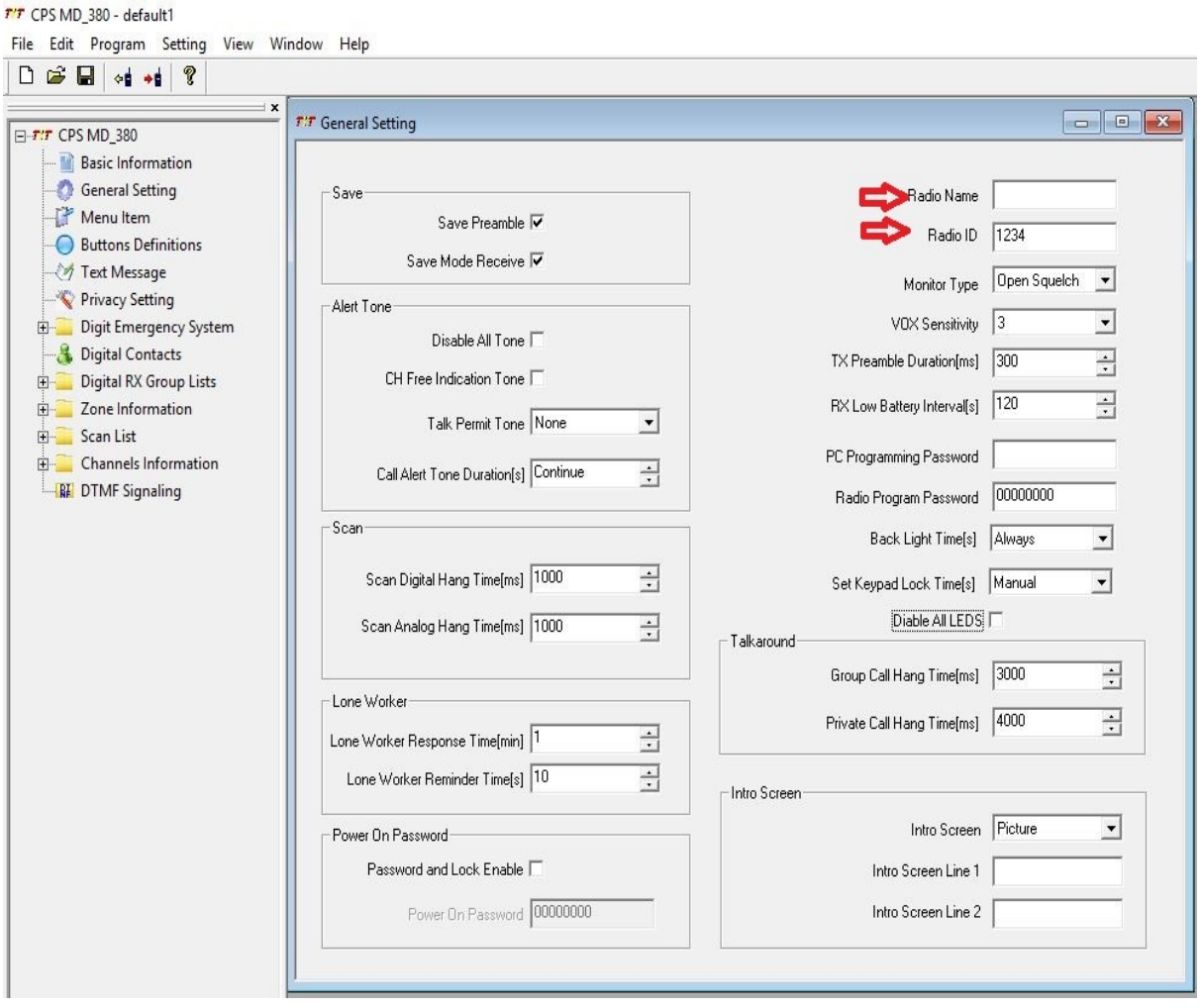
Obtain a DMR ID from https://radioid.net/#!

Using the code plug program supplied with this Radio open it up and from the side menu Click on General Setting which will open up the General Setting box. See Below:

1) General Settings:

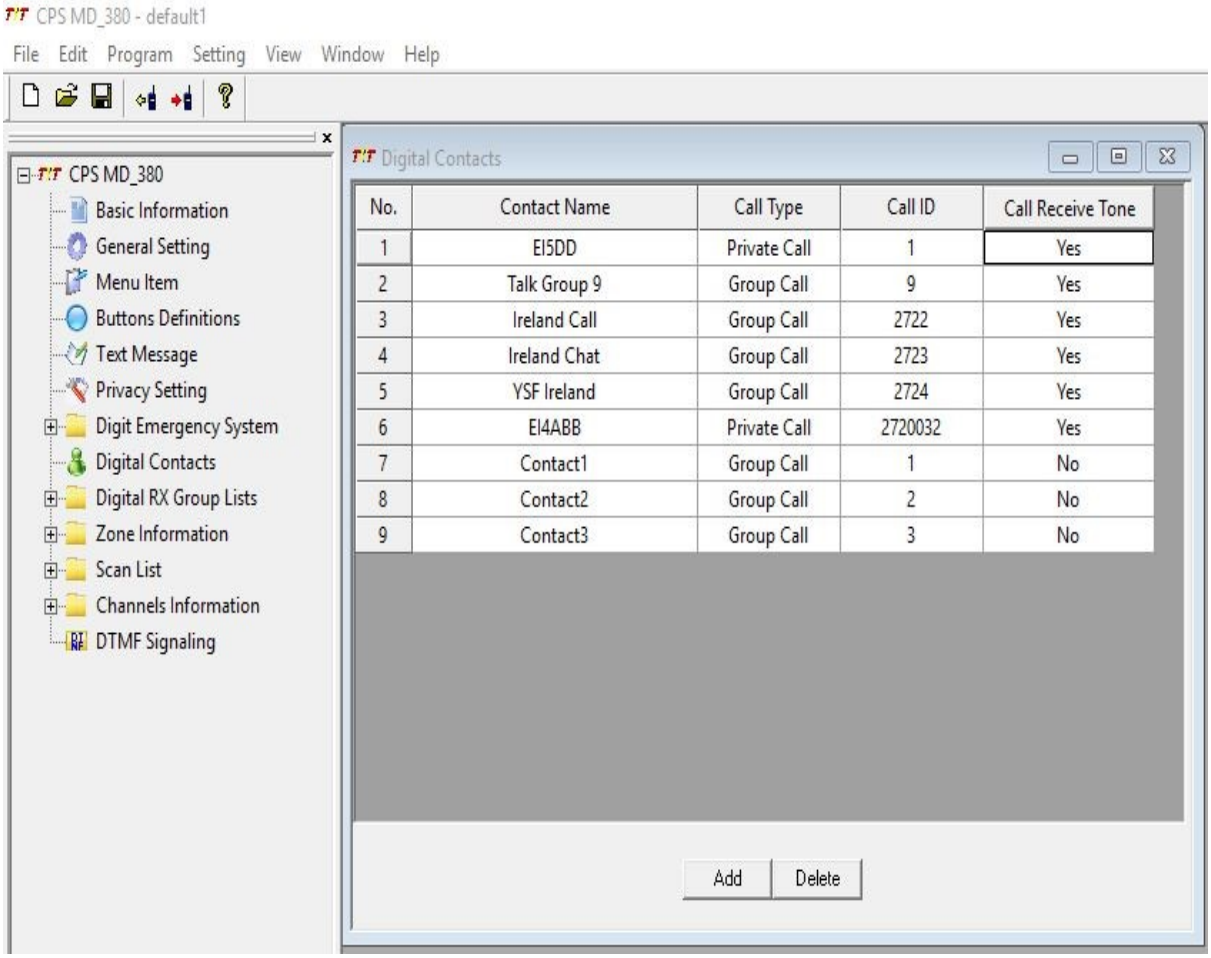
1) Add your Callsign to the Radio Name Box
2) Add Your DMR ID to the Radio ID box
3) If there is an Intro Screen Line 1 Box at the bottom of the Screen Place you Call here
4) If there is and Intro Screen Line 2 place your Name here.

3 & 4 are really cosmetic and place the Call and Name on the Screen when the rig is turned on General Settings is only really the basic setup for the Radio. There is nothing else to change on this panel. If you don't know what a setting is for don't alter it. As long as you have backed up the original program you downloaded you can always refer back



2) Digital Contacts see diagram below

1) On the side menu, Click on “Digital Contacts”
   This will bring up the Digital contacts Screen and where the initial Programming begins
   The Digital Contacts Screen will appear.
2) Click on the Add Button for the number of contacts you wish to enter
   Edit the first entry under contact name which will show as Contact 1 initially. Click on Contact 1 and rename it to EI5DD in this example.
3) Click the add button each time you want to make an entry
4) Click on the Private call box to obtain a dropdown menu. This has options Private Call Group Call, and All Call. **NEVER EVER USE ALL CALL**
5) A Personal Callsign is designated a **Private Call** and a Talk Group such as **IRELAND CALL** is a **Group Call**
6) Call ID is the number of the Talk Group for the named Contact e.g. 2722
7) Finally you can check the Call Receive tone Box which will facilitate a beep if a call is received.



It is best to populate the list with all the Talk Groups you wish to use before proceeding further.

If you have forgotten any Talk Group entries, it is possible to add them in and then move to Digital Contacts to assign them to a Repeater or hotspot

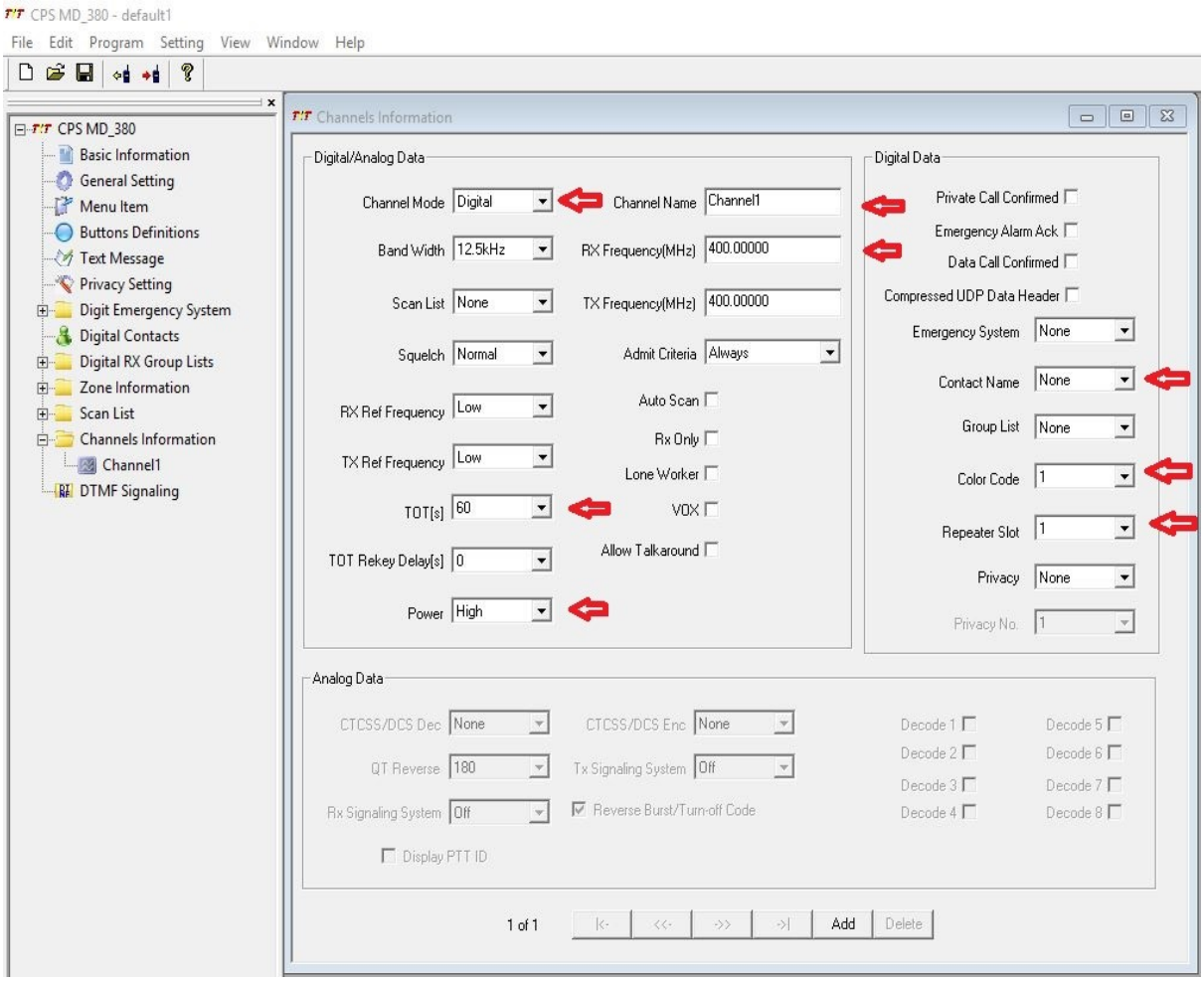
3) Program the Channels

From the side menu, select Digital Contacts to obtain the screen below

All of the positions with red arrows need to be filled in the following order

Channel Name - From our Example above this one can be named Ireland Calling Channel
Channel Mode - Generally defaults to Digital but, if not, the drop down menu will allow selection
Frequency - Your choice of Frequency for the RX and TX frequencies
Contact Name - Click on the down arrow and all of the contacts will display - choose the Ireland Calling Channel
Colour Code - This is can be any number 1 - 15 but generally set to 1 unless otherwise Required
Repeater Slot - Can only be set to 1 or 2 - in our case we set this to 2
TOT (s) - Set to 180s for network operation. Most Network items time out after 3 mins
Power - Set to Low power if using a Hotspot but, set to High power if going through a repeater.

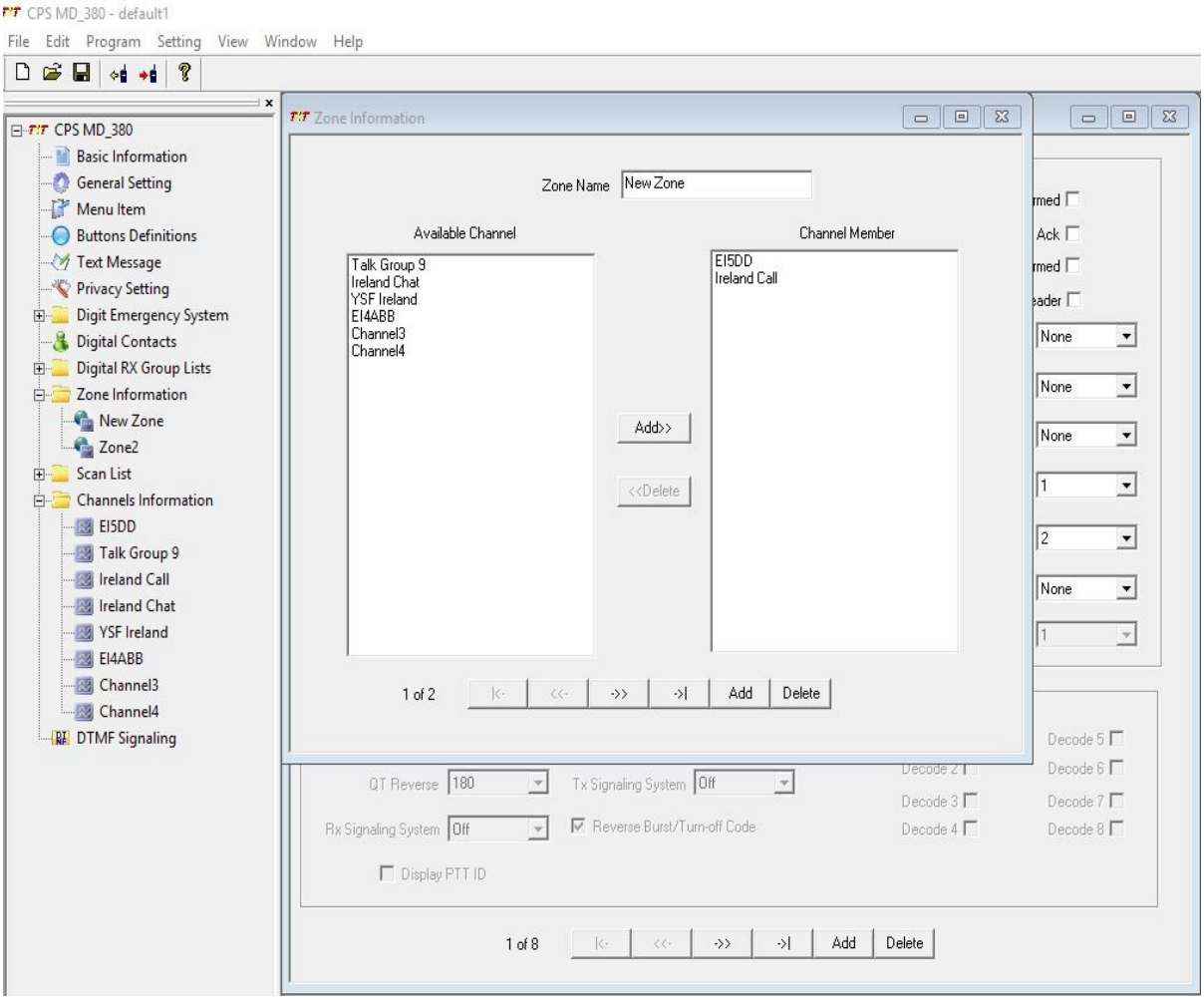
Best not to alter any of the other settings unless you have read more about them.



It is possible to program in Analog channels by selecting **Analog** in the Channel mode. The method is the same as for Digital Channels. CTCSS can tones can be added if the Analog mode is selected.

4) Creating Zones

A Zone is an are where you can store contacts - a memory bank by any other name.
Zones are named for easy reference and can be selectable from the knob on the top of the handheld or via a rocker switch or up/down buttons on the front of the Radio. Programmed logically these will give rapid access to a set of common channels e.g. all EI Talk Groups or all UK Talk Groups etc.



Programming a Zone

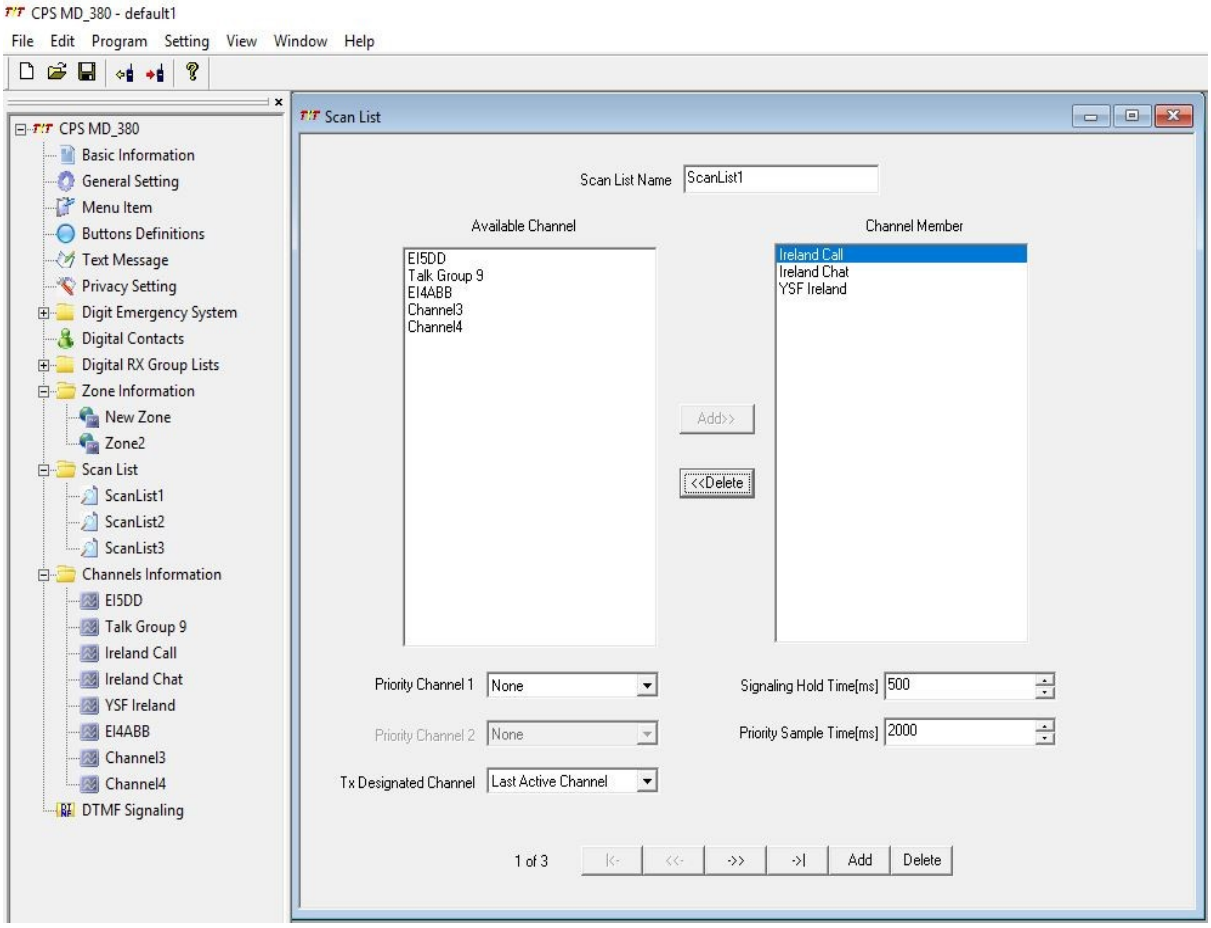
A Zone may contain just one or many channels depending on what is added.

1) Right click on Zone information A Zone will appear as above with New Zone in the Header Rename this to indicate the type of channels you intend to place therein
2) A list of channels will be present in the left hand column. Highlight the channel you wish to add and then press the add button. Should you have clicked on the wrong one. Highlight the Channel in the "Channel Members" box and press the delete button.
3) In some handhelds it is only possible to place 16 channels in the box whilst others allow more.
4) Press the add button at the bottom of the box to create another Zone
5) Analog channels maybe placed in a Zone as well if they have been created in the Channels section

5) Creating a Scan List

The Scan list is much like a Zone and is set up in the same way

1) Right Click on Scan list located in the left hand menu
2) Type in the Name of the Scan list in the Scan List Name Box
3) Highlight the Channels you wish to add from the left hand column and click the Add Button in the centre
4) If you wish to make more than one Scan list click on the Add button at the bottom of the box



That completes the Programming of the Radio. The next part is to customise the buttons on the Radio which will give fast access to some of the facilities.

There are two side buttons on the side of most Chinese Handheld Radios. These are located on the side just bel ow the PTT.

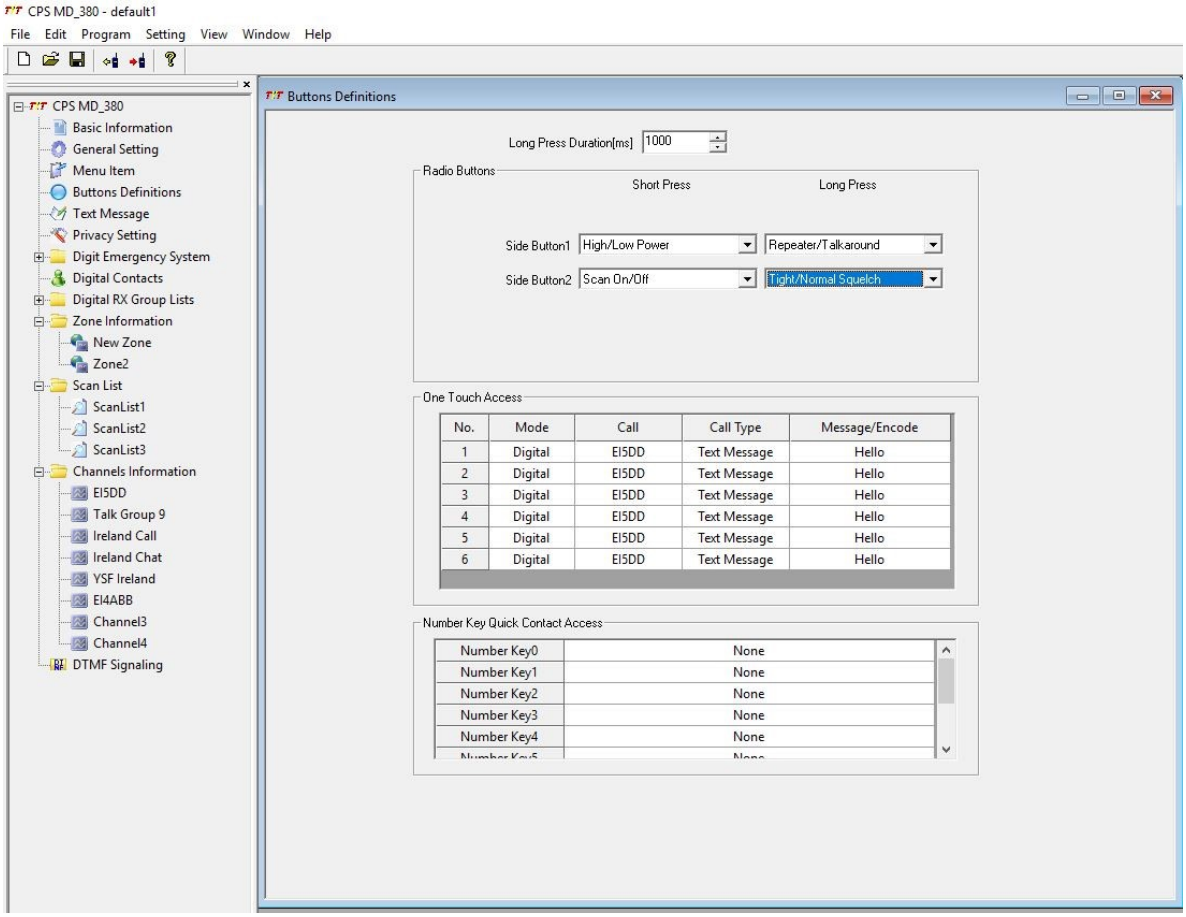
The two side buttons can be programmed for High and Low power setting or alternatively Talk Around which is useful if the station is perhaps close toy you and can be worked direct..

6) Side Button Programming

Click on the Button Definition item in the menu on the left hand side

From this menu, one can program the side button with a selection of definitions for the side buttons. Better still it is also possible to program the DTMF key pad

See Button Menu Illustration below



Most Radios will program similar to the procedure above with slight variation. Once you can program a Tytera or Retevis Radio the rest, even commercia radios will follow the same system.

Some Handhelds and radios require the channels to be placed in a Receive Group list to enable them to be heard. A Receive Group list is similar to programming a scan list. Any channels in a zone can also be placed in a receive group list common to that Zone. The Radioddity GD-77 is one radio that required a Receive Group list. To allow the channel in question to be received. So it is important to include this list.

Personal Hotspots

Many operators are not within the vicinity of a DMR Repeater or Gateway as the Network does not currently cover the entire country. To overcome this problem it is possible to purchase a Hotspot that will either work on VHF, UHF or Both. Very useful to maintain contact in areas not covered by the various Digital Networks around the country

A Hotspot will allow connectivity to a DMR, D-Star, or Fusion Network via the internet.

Basically, you transmit on the selected frequency of the Hotspot. It receives your transmission and routes it to the relevant server where it is further routed to the destination which may be via a Hotspot, Gateway or Repeater.

Typical examples of Hotspots are:

Shark RF Openspot 1, 2, or 3

This is a system operating on a programmable UHF Frequency of choice.
Will connect on any DMR Network
Will connect onto any D-Star Network
Will connect to the YSF Fusion Network
Will Connect to the FCS Network

DVMEGA (Windows or Raspberry Pi) Blue DV for Windows or Pi-star

This is a system operating on a programmable UHF or VHF Frequency of choice.
Will connect on any DMR Network
Will connect onto any D-Star Network
Will connect to the YSF Fusion Network
Will Connect to the FCS Network

MMDVM + Raspberry Pi using Pi-Star

This is a system operating on a programmable UHF / VHF Frequency of choice.
Will connect on any DMR Network
Will connect onto any D-Star Network
Will connect to the YSF Fusion Network
Will Connect to the FCS Network

ZumSpot (Windows or Raspberry Pi) Blue DV for Windows or Pi-Star

The Zumspot is a USB Dongle that will connect into the Raspberry Pi or Windows Computer. If using Windows, Use Blue DV for Windows as the Operating System
Will connect on any DMR Network
Will connect onto any D-Star Network
Will connect to the YSF Fusion Network
Will Connect to the FCS Network

These are for personal use only and should not be connected to an External antenna. On many occasions the connection to an external antenna has caused interaction with another personal hotspot in an area resulting in loop arounds and extensive QRM.

If you must cover a wider area than the boundary of your own property, consider setting up a Multi-mode Digital Gateway in your area and take the trouble to licence it for all to use. Such Gateways can fill a void where Digital Communications is not possible in an area.

Digital Repeaters in Southern Ireland

Digital Repeaters will reside in the allocation **439.000 - 440.000 with a - 9MHz split**. This means they will transmit on the 439 MHz area and receive in 430MHz.

Over time, the DMR repeater network will increase. Many of the "Homebrew" Repeaters will be multimode operation. That is to say, DMR, Yaesu Fusion, and D-Star. Others will be mode specific.

At the time of writing the following Repeaters are on air:

EI7RHD - DMR Repeater Located a Letteragh, Co. Galway covering along the coastal road in the Westerly Direction, The Coast Road to Fanore on the opposite side of the Bay, Kinvara, Gort the Dublin Road, the Tuam Road and towards Oughterard. There are patchy spots well beyond these areas that would be suited to base operation. Operating on **O/P 439.450, I/P 430:450 and CC 1**.

EJ7IBD - **DMR Repeater** Located at the East End of Inishbofin Island covering the western coastline of Connemara. Operating on **O/P 439.475, I/P 430.475 and CC1**

EI7AKR - **DMR Repeater** Located near Abbeyknockmoy, Co. Galway. Has a very wide coverage of the county spilling over into neighbouring counties. This Repeater will cover the majority of roads leading into Galway City. Operating on O**/P 438.425, I/P 430.825 and CC1**

EI7LRD - **DMR Repeater** Located near Kilnadeema Co. Galway. Covering the South East of Co. Galway With coverage into neighbouring counties. Operating on **O/P 439.500, I/P 430.500 and CC1**

EI2KMR - **Fusion Repeater** Located near Kilnadeema, Co Galway with good coverage of Mid to East Galway. Operating on **O/P 145.625 I/P 145.025.**

EI7SLR - **D-Star Repeater** Located Salthill, Galway - **O/P 434.950 I/P 433.350 . Analog Use - CTCSS 77Hz**

EI7DKD - Located on the Hill of Faughart, North of Dundalk with coverage as far as Drogheda Operating on **O/P 439.5625 and I/P 430.5625 and CC1**

EI7PMD - Located in Portmarnock, North Dublin, Operating on **O/P 439.4625 and I/P 430.4625 and CC1**

EI7CDD - **Multi-mode Repeater** Located at Carronadaverg between Dungarvan and Youghal, covering West Waterford and East Cork. DMR, D-Star and Fusion **O/P 439.650 MHz, I/P 430.650 MHz CC1**

EI7WCD - **Multi-mode Repeater** Located Tramore Co. Waterford covering East Waterford & Waterford City areas. DMR, D-Star and Yaesu Fusion **O/P 430.275 MHz, I/P 439.275 MHz CC1** also operational on Analog 103.5 Hz CTCSS Tones.

EI7MLD - **Multi-mode Repeater** Located on Mount Leinster. This repeater covers an area almost into Dublin and around the south midlands. Operating on **O/P 430.300, I/P 439.300 and CC1**

EI7FXD - **DMR Repeater**. Located at Farmers Cross, Cork City **O/P 430.250, I/P 439.250 CC!**

EI2IPG - **Fusion Repeater** Located at Cardonagh Co. Donegal
Operating on **O/P 145.71250 MHz, I/P 145.11250**

EI2JPG - **Fusion Repeater** Located at St John's Point Co. Donegal
Operating on **O/P 145.750 MHz, I/P 145.150 MHz**

Digital Gateways in Southern Ireland

Gateways are a relatively easy solution to securing activity in any area. A Gateway may consist of a Transceiver such as a Motorola GM350, an MMDVM Modem board, and a Raspberry Pi running Pi-Star software. The Motorola GM 350 needs minor modification to ensure flat audio is output from the accessory socket. The audio to and from the Modem board is passed to the Motorola GM350 via the rear accessory socket. Using Pi-Star, it is possible to set up Static Talk Groups on DMR. It is also possible to run multimode adding Fusion, D-Star and P25.

Care has to be taken not to host really busy Reflectors on D-Star otherwise the whole unit will be taken over with one mode only. More to the point, and out of consideration towards other users, one should disconnect from the system once finished. Running a Gateway from the Home QTH is often more than adequate to provide a service to the area of a town or City like Galway.

The Galway Gateway has TG 2722, TG 2723, TG2724 and Northern Ireland Calling TG 2354 set as static Talk Groups. These are not busy and do provide the opportunity to monitor for activity from Ireland. No doubt, as activity increases the status will be revised. Dynamic Talk Groups may be operated through the Gateway. Reflectors may accessed via TG 9 Local.

EI2GCD - Located at Letteragh on the West side of the City. The Gateway is situated at the same site as the EI7RHD Repeater. Coverage on the Gateway will be similar to the Repeater EI7RHD. Being VHF, and located on **144.8500 MHz**, good coverage in the vicinity of Galway and surrounding areas is expected. This Gateway operates on Time Slot 2 only. DMR Static TG 2722, D-Star Reflector DCS049 I, YSF - YSF.IE

EI2SHD - A Wires-X Gateway located in Salthill, Galway operating on **144.8125 MHz.** The Gateway has a wide Coverage of Galway City and Surrounding areas withing a radius of 25 - 30 miles. The Gateway resides on CQ—UK although can be changed by pressing the "X" button on the Radio and selecting from the many international Nodes.

EI2DOD - Located Co. Mayo and no longer operational.

EI2BED - Located at Ballybride just outside of Roscommon Town and operating on **144.8625 MHz** and CC1. A Good wide coverage is possible to the East and North East with coverage as far as Ballinasloe to the South East. Both DMR and C4FM modes are operational with the possibility of D-Star as required. DMR Static TG 2722, D-Star DCS 049i, YSF - YSF.IE

EI2KTD - Located at Kildare Town and operating on **144.8325 MHz** and CC1. This promises to cover a wide area from Athlone almost into Dublin. DMR, D-Star and C4FM modes in operation.

EI7SND - Located in Mullingar and operating on **431.150 MHz**. DMR, D-Star and C4FM modes in operation. It has a wide coverage of the midlands with marginal coverage into Dublin.

EI2PMD - Located in Portmarnock and operating on **144.825 MHz**. **CC-1** DMR. D-Star and C4FM modes with Good coverage of Dublin City.

Repeater Systems in Northern Ireland

Analogue repeaters in Northern Ireland

GB3CP	145.7375	145.1375	110.9Hz	Fermanagh
GB3DX	433.300	434.9000	110.9Hz	Londonderry
GB3KK	430.9750	438.5750	110.9Hz	Ballycastle
GB3LY	145.600	145.0000	110.9Hz	Limavady
GB3MT	430.900	438.5000	110.9Hz	Magherafelt
GB3NI	145.725	145.1250	110.9Hz	Belfast
GB3OM	430.950	438.5500	110.9Hz	Omagh
GB3PK	145.6625	145.0625	110.9Hz	Ballycastle
GB3TY	50.7800	51.28000	110.9Hz	Carrickfergus
GB3UL	433.050	434.6500	110.9Hz	Belfast
GB3WT	145.775	145.1750	110.9Hz	Omagh

Digital repeaters in Northern Ireland

GB7CX	430.8625	438.4625	CC 12	Coleraine	DMF	Brandmeister
GB7DN	439.4125	430.4125	N/A	Dungiven	D	
GB7HB	439.6250	430.6250	CC 1	Tandragee	M	Phoenix
GB7HI	439.7375	430.7375	CC 1	Lisburn	DMF	Brandmeister
GB7HZ	439.5875	430.5875	CC 5	Strabane	DMF	Brandmeister/Phoenix
GB7KK	430.9250	438.5250	CC 1	Ballycastle	DMF	Brandmeister
GB7KP	439.5750	430.5750	CC 1	Comber	DMF	Phoenix
GB7LY	439.6625	430.6625	CC 11	Londonderry	M	Phoenix
GB7MF	439.6750	430.6750	CC 3	Magherafelt	DMF	Phoenix
GB7MW	439.4875	430.4875	CC 15	Carrickfergus	DMF	Brandmeister
GB7NI	145.7500	145.1500	CC 1	Carrickfergus	DMF	Brandmeister
GB7NY	439.6875	430.6875	CC 1	Bessbrook	DMF	Brandmeister
GB7RK	439.4375	430.4375	CC 3	Belfast	DMFPN	Brandmeister
GB7UL	439.5250	430.5250	CC 1	Carrickfergus	M	Phoenix
GB7WT	439.6000	430.6000	CC 1	Omagh	DMF	Brandmeister
GB3OM	430.9500	438.5500	CC 1	Omagh	M	Phoenix

Key: D (D-Star) F (Fusion) M (DMR) N (NXDN) P (P25)

Please note: to use the Phoenix network on GB7HZ you must add either 100 or 1000 to the start of the Talk Group e.g. to talk on Talk Group 880, use 1000880. To use Talk Group 9990, use 100990 and to use Talk Group 81, use 1000081

Northern Ireland Digital Gateways

Simplex Gateway List Northern Ireland

MB6DY	144.8625	CC 3	Londonderry DMF		Brandmeister
MB6IBG	431.1375		Bangor	F	
MB6IMG	431.0875		Magherafelft	F	
MB6KA	144.8500	CC 3	Kilrea	D/M/F/P	Brandmeister
MB6LY	144.8500		Londonderry	F	
MB6NC	144.8250	CC 3	Coleraine	D/M/F	Brandmeister
MB6NI	144.8375	CC 3	arrickfergus	D/M/F/P/N	Brandmeister
MB6OM	144.8125		Omagh	F	
MB6PQ	144.8375		Ballycastle	D	
MB6RK	144.8125		Belfast	F/P/N	
MB7IAF	145.2875	118.8Hz	Lisburn	A	Echolink
MB7ICM	144.9625	110.9Hz	Enniskillen	A	Echolink
MB7IKP	144.9625	71.9Hz	Comber	A	Echolink
MB7INI	145.3375	77Hz	Carrickfergus	A	Echolink

Key: D (D-Star) F (Fusion) M DMR) N (NXDN) P (P25)

DMR Operation

DMR is a digital mode which uses TDMA technology. This allows for either two voice channels at the same time or one voice and one data channel. Slot 1 and Slot 2 are the respective audio channels available within a 12.5 KHz channel spacing. This is the equivalent of having two repeaters established on the same site.

The key to DMR operation is to program the radio with a Code Plug with a variety of popular Talk Groups. A short tutorial was included in an this book. It is probably best to program individual Zones for specific target areas. A Logical approach will dictate the ease of operation.

This is my personal system of Zones for 70cm Repeaters and Hotspots.

Hotspot Local	Contains all EI and UK Talk Groups
Hotspot International	Contains favourite International Talk Groups
EI7RHD Slot 1	Contains International, Chat Talk Groups and Bridges to other modes used on the EI7RHD Repeater Slot 1
EI7RHD Slot 2	Contains Cluster, EI Calling Channel and UK Calling Channels

The above list is programmed in a similar fashion for all Repeaters not just those shown. It does involve a little time and effort but is worth it in the long run as it gives quick and easy selection of Channels especially for mobile operation. Program a little at a time and get them to work before adding more.

To operate a DMR Radio, select the Zone with the desired Channels programmed. Select the desired Talk Group, and key once only to connect. If there is no activity on the channel place your call. If you wish to connect to another Talk Group, simply select the desired channel and repeat the action.

Talk Groups (TG) should be set to **TG 9** for **local repeater operation only** on Both Slot 1 and Slot 2

When operating through a repeater using **TG 9** Local, the repeater will retransmit the signal in just the same way as an Analog repeater does. **BUT**, once a Talk Group is accessed the Repeater acts like a Gateway. That is, the operator will be routing through the repeater to the destination Talk Group. **TG9** must be set as a Group Call. It is only in this manner that TG9 will act as local operation through the Repeater.

Time Slot 1 is defined for **International Operation, International Calling, all Chat Channels,** and **bridges to other modes such as C4FM, Analog or D-Star and chat channels**
Static Talk Group T**G2723** and Static **Talk Group TG 7** (Connacht Cluster) are established here
Short brief calls only with International Stations so as not to jam up the International Network. General QSOs and "rag chews" carried out here. Use **TG2724** here also.

Time Slot 2 is for "Local and Semi-Local and Regional working" The Irish Call channel **TG2722** is static along with **TG8** (The Galway Digital Radio Group cluster) Please do not activate **TG2723** on this Time Slot or any Bridges to other modes

Reflectors are no longer accessible on Time Slot 2

Bear in mind, that once connected to a Talk Group the Repeater effectively becomes a Gateway and will not repeat any station working that Talk Group. The use of Group Call **TG 9** will facilitate local repeater operation.

PLEASE NOTE: It is necessary to leave a **3 second gap** between overs or calls to allow the network components to keep up with the multiple connections locally and around the world. Ignoring this advice will lead to many problems.
A Repeater will disconnect from a User Accessed Talk Group after 15 minutes but unfortunately this is not the case on a Gateway System.

If using a Gateway please guard against selecting an exceptionally busy Talk Group and then leaving it operating in that mode. Gateways do not disconnect automatically after 15 minutes so it is necessary to Key Talk Group 4000 to disconnect. You will no be thanked for walking away and leaving a busy Talk Group active. Talk Group 91 Worldwide has been blocked on many Gateways to prevent such an occurrence.

Static Talk Groups are those pre-programmed into a Repeater or Gateway and, should any activity appear on them, will be transmitted by the Repeater or Gateway.

User Activated Talk Groups are not pre-programmed into the Repeater or Gateway, and are selected by the user.

A Talk Group must be pre-programmed into the Radio and selected as a channel from the Radio.

TG9 is implemented on both Time Slots. Two independent QSO's can take place on the same repeater. If Time slot 2 may be busy so it is a simple matter to switch to **TG9** on Time Slot 1. **TG9** does not route through the server so your QSO is through the Local Repeater only and not throughout the network.

Roaming

Many of the Commercial Radios have the roaming facility which enables them to switch from a repeater of a lower signal strength to one with a stronger received signal strength.

The Galway Hytera Repeaters have the IP multi-site connect facility enabling seamless roaming between repeaters provided that they all have a common Static Talk Group programmed. By Programming a roam list on your Radio it is possible to activate this whilst travelling over distance. The Roam list has to have a specific Talk Group programmed into a channel programmed for each repeater in the locality

Basically, if you are operating on **TG 2722** on the Galway City Repeater and are heading towards Loughrea, your signal Strength will reduce to a level e.g. Strength 6 when this happens the radio will roam seek one of the repeaters pre-programmed into the Roam list with a higher signal strength. The Loughrea Repeater will, on this occasion have a higher signal strength an the radio will seamlessly switch to the Loughrea Repeater.
If all DMR Repeaters in the country have a static Talk Group **TG 2722** programmed, it should be possible to roam, in a similar manner to the Cellular phone System, from one repeater to another across country.

A short note on the issue of Talk Groups.

There are currently three Talk Groups issued for National use as in **TG 2722** (Ireland Call Channel), **Talk Group 2723** (EI Chat Channel), and **TG 2724** (A Chat Channel Linked to YSF Ireland C4FM) These are more than adequate for the current numbers of users. There are Cluster Channels available that may only be operated through Linked Repeaters. Galway Digital Radio Group Repeaters are all linked to their respective Clusters

Galway has now implemented the Provincial, on **TG7** and the Galway Digital Radio Group Cluster, on **TG8**, on all of their Repeaters. These are Static Talk Groups and can be used in conjunction with Roaming

Clusters **TG 8** and **TG 7** are implemented on all of the Galway Repeaters in the Galway Network.

For a Club to propose a "personal Talk Group" is really not in the spirit of the system. By not using the commonly used EI channels and Clusters is unlikely that the desired effect of bringing more activity to the area will occur. Repeater SysOps do not place Repeaters on the air for private use. In other words it will just insulate a small group to own personnel. The object of the exercise at the end of the day is to bring as much activity from all over the country onto the existing Talk Groups. Good time and has been invested into a system for use by all Radio Amateurs and **NOT** for the use of exclusive cliques.

C4FM Operation

The C4FM digital mode is mistakenly referred to as "Yaesu Fusion" probably due to the fact that both C4FM and Analog operation is possible through the DRX-1 Repeater. Fusion is derived from the fact that both modes can be received automatically on the One Radio or Repeater without manual selection. One of the advantages is that a C4FM radio needs very little programming bar the Callsign entry on the radio for first use. The Radio can then operate through Repeaters and on Simplex channels in either the Digital C4FM or Analog Modes. It is only, when using the Wires-X mode, that the advantages of the system can be fully realised.

Yaesu C4FM Modes

The Four Operating Modes of System Fusion

V/D (Digital Narrow) – Voice + Digital or "V/D" mode

Voice FR (VW) Mode – Utilizes all available bandwidth for high-fidelity voice operation, providing the most crystal clear of voice communications.

Highspeed Data

Transfer data such as images or text messages at full rate with speeds up to 9600 Bits-per-second

Analog FM Mode

Maintains backwards compatibility with existing Analog FM Equipment, allowing a wide range of users to experiment with System Fusion Digital.

Capabilities such as Automatic Mode Select (AMS) On the DR-1X Repeater allow an even wider range of users to communicate, by running the repeater in "Fixed FM" mode on Transmit, and "Automatic Mode Select" on receive the repeater will automatically detect the incoming signal and convert it to an Analog FM Transmission. This mode allows digital users to communicate with existing Analog FM users without the need to switch their radios into FM Mode, allowing crystal clear Digital reception into the repeater that is converted into a conventional FM Signal.

Enhanced Communication Functions of System Fusion

Yaesu incorporated a suite of features within the System Fusion product line that are designed specifically for Amateur Radio Use. These features allow the operator to transmit High quality digital voice simultaneously along with Digital Data, and a High Rate (Data FR Mode) dedicated Digital Data mode that provides a method of transmitting Images, Text message and Telemetry Data at a high rate of speed.

What is WIRES X?

WIRES X (Wide-coverage Internet Repeater Enhancement System) is digital communication developed by Yaesu to further the interest of the Amateur Radio Communication. It uses a form of VOIP (Voice over IP) to connect Amateur Radio Station utilizing the Internet. It supports the new C4FM Digital Communication mode. C4FM digital signals are repeated without deterioration of audio and data communications and sent over the Internet to Amateur Radio Stations.

WIRES X uses local Node (station connected to the Internet via a PC) as access points which relay the communications of conventional Amateur Radio Stations.

An amateur Radio operator calls a local Node's radio which is connected to the Internet via a PC. The local Node radio relays the amateur's call to the Internet via the PC. The PC relays the amateur call to another Node's PC that is also connected to the Internet, then send sit to the Node radio. Then local Node radio then relays the call to the receiving amateur radio station.

A wires X-Gateway is a standalone access point enabling an operator to select the Wires-X mode by pressing the “DX” button on the radio. A list of Nodes will appear and either touching the screen of the radio or by the push of a button makes it possible to connect to a node anywhere in the world. Such a node may be connected to many other nodes allowing a wider coverage in the area. This is similar to connection to D-Star Reflectors.

A Wires-X Gateway may be a standalone access point or an integral part of a repeater and will allow connection of local operators on the repeater with operators on a distant repeater, users of a node with many others connected or to output on a single node in another country.

WIRES-X supports digital communications which can transmit and receive digitized data, e.g. text, image and audio on the same Global Network. The WIRES X Network extends the reach of an Amateur Station located in Ireland to an Amateur Station located withing range of a Wires-X node anywhere else in the worked. This can be accomplished by using just a hand held or base station radio connecting to a local Node then onto the distant Node then to the destination amateur radio station.

A Wires-X Node is made up of a C4FM Radio, a HRi200 Wires-X Modem and a computer controlled. Sadly, the Raspberry Pi has not been adapted at the time of writing. The system is then connected to the internet by Ethernet cable. More recent Firmware allows the C4FM Radio to act as both transceiver and modem with a connection to the Internet.

Some budget priced Yaesu C4FM radios may not have the facility of the DX button but will still be able to work through a Wires-X node if operated on the frequency of that Node. There will be no facility to change the Node or room to which the local node is connected. This applies to both operation on a Wires-X Gateway and through a Wires-X Repeater.

Receiving and Transmitting WIRES X

To listen or to receive a WIRES X signal, one has to find a Local Node or a WIRES X Repeater within the range of your transceiver .

Basically all WIRES X Nodes are Amateur Radio Stations that are voluntarily registered with Yaesu. The Amateur Radio Station information such as their location and operating mode is listed in Yaesu Website; https://yaesu.com/jp/en/wires-x/index.php. You can use the Yaesu list to search for nearby local Nodes, and other Nodes on the internet use by Amateurs that you want to communicate with.

Once you find that there is a WIRES Node in your area.

Now you are ready to connect to a Local Node to experience WIRES X.
Use the following procedure to set up your transceiver to receive and transmit on a Local Node.
Note: You do not need to set the transceiver to WIRES X mode to use the Local Node.
For the your particular radio…if you have a dual band;

1. Set the radio to use VFO A.
2. Enter the frequency of the WIRES X Node.
3. Set the mode to “DN”.

Use the key to change to the “DN” mode’.

Note: Pressing the key repeatedly cycles thru the transceivers modes, e.g. **FM > DN > VW > FM**

At this point you are ready to receive and transmit using the Local Node or WIRES X Repeater on the frequency that you found

Additional Uses for the "DX" Key on the Transceiver

The "**"DX" K**ey is use to connect to a local Node in digital node, in addition to selecting the communication mode of the transceiver. This section will discussing the use of the "**DX**" key in the digital mode. You can use the "**DX**" key to connect to the Local Node.

NOTE: The "**DX**" key can also be used to determine if there is a Local Node on the current frequency.
When you press the "**DX**" key for over a second a flashing **X** symbol appears on the left of the frequency in the transceiver. The **X** symbol continues to flash until a node is found. When a local node is found, the **X** symbol is lit solid; the node and city name appears on the lower part of a transceiver's screen. If a node is not found within 5 minutes; the symbol disappears and the transceiver's screen returns to normal.

Now that the transceiver is in the WIRES X digital mode you can do the following;

1. **Search an accessible node or room from an internal list that you create on the transceiver**
2. **Specify the node or room number by DTMF ID to connect.**
3. **Specify the node or room by name to connect to**
4. **Selecting the most recently connected node or room**

All Wires-X capable model of transceiver have the "**DX**" button and work in much the same way. It is best to consult the manual for each radio. Basically they wok in the same way. The FT1D and the FTM100 are not touch screen radios and so Wires-X operation is via ad therefore operate by push button for Wires-X node selection whereas the FTM400 and FT2D are touch screen radios and the node can be selected by simply touching the screen

Group Monitor (GM)

Digital Group Monitor automatically checks whether users within a communication group are in or out of range and displays information such as distance and orientation on the screen of the client radio for up to 24 Stations.
Each individual group can share Text and Picture messages between themselves, allowing intelligent control of how content is distributed amongst a large operating group.
Group Monitor is almost an invaluable feature when an operator or group of operators needs to track resources, such as in an emergency communication operation. Resources can easily be tracked and controlled, letting operators know when they are going to fall out of range and may need to return to the coverage area, or providing invaluable telemetry data for locating and tracking individual operators.

Snapshot Function (Picture Messaging)

By simply connecting the optional MH-85A11U Speaker Microphone with Camera, an operator can quickly take advantage of the high-speed data functions of any System Fusion C4FM radio and can easily transmit images to other C4FM users.
Transfer data such as images or text messages at full rate with speeds up to 9600 Bits-per-second
Image data which sent from a group member is displayed on the full-colour screen of the FTM-400DR or Monochromatic display of the FT2DR. This image data also retains a time record and the GPS location data of the snapshot. It is easy to navigate to that pictured location by using back track function. In addition, you can observe on the screen whether the transmitted data was successfully received by the member station. The snapshot image or received data is stored in a high capacity micro SD card, and you can recall and send that image data from the SD card anytime. The pictures and data files may be easily viewed and edited by using a personal computer by simply inserting the SD Card into any SD Card reader.

Smart Navigation Functions/Backtrack Function

The Smart/Real-time navigation function enables location checking at any time. In digital V/D mode, information such as position data is transmitted together with voice signals so the distance and direction to the other stations can be displayed in real-time while communicating with them.

The Backtrack Function enables navigation to a registered location at the touch of a button. When hiking or camping, simply register your starting point or campsite before departure, and the distance and orientation from the current location are displayed on the screen.

Text Messaging
Text messaging could not be simpler, with direct entry via T9 Text input or the On-Screen Keyboard (FTM-400), messages can be sent quickly to an individual operator or group of operators (GM Mode).

Alternatives to Wires-X

YSF and FCS are two independent systems that can be used with Yaesu equipment. A station on a given reflector system can only operate on that system unless it is bridged to another. YSF Ireland Room is linked to CQ-Ireland on Wires-X. They both react in the same way and the pressing of the "**DX**" button is used to access the list on available Nodes as with the Wires-X system.

Wires-X operation is only available on Yaesu Repeaters or through Wires-X Gateways.

YSF and FCS reflectors are found on Multi-mode Repeaters or Gateways using the Pi-Star operating system. They are also accessible using personal Hotspots.

A full list of YSF and FCS rooms may be found on the internet.

Yaesu's C4FM equipment is the easiest of the Digital modes to operate and there is plenty of activity. Try CQ-UK which will provide plenty of activity throughout the day. During the night the VK operators join CQ-UK making it a very active area.

America-Link is a location with a huge number of regional American Nodes connected. This is an area which will always produce a high level of activity.

In Japan the operation of Wires-X Gateways is far more popular than Repeater operation. A Good network of Gateways is obviously equally as workable as a Repeater Network.

APRS Via C4FM

Sending an APRS signal via C4FM is not possible at present. Location information is sent between individual radios and from a radio via a repeater to the recipient. This will show up on the recipient radio as a compass bearing indicating the location of the transmitting station and also a distance between the two stations may be seen on screen.

It is, however, possible to transmit APRS packets via the Analog section of the radio to one of the many APRS Digitpeaters found on 144.800 MHz.

Undoubtedly, this facility may be incorporated into the Wire-X network in a future software release.

D-Star Operation

It is essential to ensure that D-Star Registration is completed before trying to operate the D-Star Radio. It is worth taking care to ensure all is correct here. Probably the best way to register is via the ICOM UK website. The next task is to read the manual as most problems encountered are the result overlooking essential set up instructions.

Like the other Digital Modes, the operation via the Gateway system from Repeater to Repeater seems to be more popular than going through the local repeater.

To transmit in D-STAR and have other people hear you, you'll need to set four parameters: MYCALL, URCALL, RPT1, and RPT2. Of course, you'll also need to set the mode ("DV") and frequency, and if you're trying to talk through a repeater, the offset. At least there are no PL tones to worry about. (If you just want to receive for now, you can ignore MYCALL, URCALL, RPT1 and RPT2.)

MYCALL is your own call sign, eight characters maximum. You're allowed to add "/" and then other characters; The original intent was so that you could sign "/P", "/M", or "/7", but for D-STAR some people get creative, like "/Fred" for someone named Fred, or "/5100" for someone using an IC-5100.

URCALL can hold routing information or linking commands; to just use the local repeater, URCALL should be set to "CQCQCQ" most of the time unless directing to a specific call or location.

RPT1 should be set to the local repeater and module that you're trying to access. The Repeater you are talking to. (The setting doesn't matter for simplex.) See below for what I mean by a module.

RPT2 designates where you want your signal to be routed on your local repeater; normally RPT2 is set to the call sign of the local repeater, followed by "<space>G". (The Repeater or Gateway you want to appear on)

Don't get too worried about exactly what URCALL, RPT1, and RPT2 are for, because there is a simple web tool you can use that will tell you what to enter: The D-STAR Calculator. Just tell the calculator what you want to do, and it will tell you what to put in MYCALL, URCALL, RPT1 and RPT2. When using the calculator only change one thing at a time, and each time you change something the page will take several seconds to reload; be patient. Hints: always select "Local Repeater with Gateway" rather than "Local Repeater"; have a look at the Calculator's help page http://www.dstarinfo.com/calculator.aspx

The "module", "port", or "node" (all three words mean the same thing) of a D-STAR repeater refers to the band. ICOM makes modules for 2m (144 MHz), 70cm (440 MHz), and 25cm (1.2 GHz), and a repeater can have nodes for more than one band; some D-STAR repeaters have modules for all three bands.

"A" port or module is on 1.2 GHz,
"B" port is for 70cm
"C" port is for 2m.

So if you set RPT1 for "EI7RHD B", that would be the 70cm module / port / node of repeater EI7RHD (In the RPT2 setting "G" is often used, e.g. "EI7RHD G". In this case "G" doesn't refer to a module, but rather the gateway, which is a computer that connects the repeater to the internet.)

Set-Up

Enter My Call
My Station > Enter Callsign

Making a point to point call Simplex

` **Dial in a Simplex Frequency**
Set offset to none
Set mode to DV (probably was FM by default) (DV is the D-STAR Voice Modulation mode)
UR CALL CQCQCQ

Don't worry about the RPT1, RPT2, and UR call signs when working simplex.
Note RPT 1 and RPT 2 to do not matter on Simplex so these can be left blank

Basic Repeater Operation

Set frequency to the repeater's frequency
Set offset to the repeater's offset
Set mode to DV Sit back and listen.
You should hear any activity on the repeater

Programming a Repeater
Using the local repeater (no routing)

EI5DD wants to talk to other local ops using his local repeater EI7RHD, which is on 70 cm (node B).

MYCALL: EI5DD
URCALL: CQCQCQ
RPT1: EI7RHD B
RPT2: EI7RHD G

Call sign routing to a specific repeater and node

EI5DD is using his local repeater EI7RHD (the B module on 70 cm), and he wants to route his transmissions to the B module of the EI7MLD repeater on Mount Leinster.

MYCALL: EI5DD
URCALL: /EI7MLDB
RPT1: EI7RHD B
RPT2: EI7RHD G

If someone is already transmitting on the EI7MLD repeater node B when EI5DD starts transmitting, then EI5DD's transmission will be blocked on the remote repeater, and EI5DD's radio will display "RPT?EI7MLD" to notify him that his transmission didn't go through.

Call sign routing to the repeater and node last used by a specific Operator

EI5DD is on his local repeater EI7RHD, and his friend EI4ABB is on holidays; EI5DD wants to route his transmissions to whatever repeater his friendEI4ABB used most recently, in the hope of talking to his friend.

MYCALL: EI5DD
URCALL: EI4ABB
RPT1: EI7RHD B
RPT2: EI7RHD G

In this example it might look as though EI5DD is calling person-to-person, but it's repeater-to-repeater, and anyone listening to either repeater will hear the conversation.

When calling another repeater using call sign routing, one should announce what repeater and node one is calling from, for example "This is EI5DD calling CQ from repeater EI7RHD, node B, in Galway City, West Coast

of Ireland. CQCQCQ from EI5DD on repeater EI7RHD node B, CQ." Mentioning the Repeater or Node you're calling from allows people on the other repeater to set up their radios manually if they can't use their "RX->CS" buttons for some reason.

(More on the **"RX->CS"** button later.) **

Be patient and wait at least a couple minutes, so that an operator on the other repeater can stop what he or she is doing and program the radio to route his or her transmissions to your repeater and node.

It is important to note that it's easy to cause unintentional interference with call sign routing, because you won't hear transmissions from people using the other repeater unless they set up their radios to talk to you. If you're routing your transmissions to another repeater, either to call CQ or to call a specific ham, you might be interrupting a QSO or a net, so keep your transmission short and don't call more than once or twice. But don't be afraid to do it, because meeting new people on the air is what ham radio is all about!

If you use call sign routing to talk to someone on another repeater, be sure to change URCALL back to "CQCQCQ" immediately after you've finished. If you forget, your transmissions for your next QSO with someone on the local repeater will be inadvertently routed to the other repeater you were routing to earlier!

By the way, when D-STAR users outside the Ireland are looking for a QSO then they are more likely to call CQ, similar to the way it's done on SSB, rather than announce that they are "monitoring".

** *Every ICOM D-STAR radio has an "**RX->CS**" button. The **"RX->CS"** button gives you an easy way to automatically set URCALL, RPT1, and RPT2 to route your transmissions to the repeater and node that the previous caller, or any one of the last several callers, called from. Read your radio's manual to discover exactly how to use **"RX->CS".***

DPlus Linking

Call sign transmission routing works well, but there are a couple disadvantages: there is no easy way to link more than two repeaters, and a caller routing his or her transmissions to another repeater has no idea whether the other repeater is busy or not.

Software called DPlus, which can be installed on the gateway computer that connects a D-STAR repeater to the internet. DPlus adds several functions, most importantly the ability to link a repeater to another repeater, or to a D-STAR reflector. With DPlus-style linking, a lasting link to another repeater or a reflector can be set up. Anything said on any linked repeater will automatically be routed to every other linked repeater, with no special radio configuration required.

A D-STAR reflector is a computer connected to the internet that runs special software. The nice thing about reflectors is that lots of repeaters can be connected to one reflector. For instance, reflector 14C "fourteen-Charlie" is the popular reflector for D-STAR repeaters on the West Coast of the US and Canada; link your local repeater to reflector 14C, and half the D-STAR users from San Diego to Vancouver will hear you when you transmit. And then there is Reflector 1C, the "D-STAR Mega Reflector", used world-wide. That reflector is always busy with operators from all over the world.

There is a list of reflectors here http://www.dstarinfo.com/reflectors.aspx

DPlus Linking to Another Repeater

EI5DD wants to link his local repeater EI7RHD to the 70cm "B" module of repeater EI7MLD.

MYCALL: EI5DD
URCALL: EI7MLDL
RPT1: EI7RHD B
RPT2: EI7RHD G

After setting up the radio, the operator should key the microphone for about one second to transmit the command. If the command succeeds, the repeater will play a recording saying, "remote system linked". After linking, the operator should immediately change URCALL back to CQCQCQ

Most D-STAR users outside Japan use DPlus linking rather than call sign routing. So why mention call sign routing? Every D-STAR radio owner should know how to use call sign routing, because that was the original intent of the designers of D-STAR. It works well and knowing how to use it will allow you to talk to the thousands of D-STAR users who prefer connecting that way.

DPlus Linking to a Reflector

EI5DD wants to link his local repeater to Reflector 14C, to which many other West Coast repeaters are already linked.

MYCALL: EI5DD
URCALL: REF014CL
RPT1: EI7RHD B
RPT2: EI7RHD G

After setting up the radio, the operator should key the microphone for about one second to transmit the command. If the command succeeds, the repeater will play a recording saying, "remote system linked". After linking, the operator should immediately change URCALL back to CQCQCQ.

There are a couple other useful tools available to users of DPlus-equipped repeaters: Echo Testing and the information message. An echo test is a good way to find out how you sound on the local repeater; when you key up a few seconds of your audio are recorded, and then the recording is played back. The Information message tells the linking status of the repeater. See the examples for more information.

Please Note, Unlinking is very important – If you link to a Repeater, or Gateway, it is always good operating protocol to leave it as you find it. If you have linked to a busy Reflector like REF 001 C, please Unlink when you have finished. By not doing so, you will leave almost continuous activity transmitting through the Repeater or Gateway unnecessarily putting the system under stress and ultimately overheating. Repeaters or Gateways are generally left linked to a national or local reflector. In our Case DCS 049 i

Unlinking

EI5DD wants to unlink his local repeater EI7RHD from the reflector or other repeater that it's currently linked to.

MYCALL: EI5DD
URCALL: <space><space><space><space><space><space><space>U
RPT1: EI7RHD
RPT2: EI7RHD G

After setting up the radio, the operator should key the microphone for about one second to transmit the command. If the command succeeds, the repeater will play a recording saying, "remote system unlinked". After unlinking, the operator should immediately change URCALL back to CQCQCQ.

Echo Test

EI5DD wants to hear how he sounds on his local D-STAR repeater, EI7RHD.

MYCALL: EI5DD
URCALL: EI7RHD E
RPT1: EI7RHD B
RPT2: EI7RHD G

After setting up the radio, EI5DD keys up the radio and announces an echo test: "This is EI5DD performing an echo test, hello test test test". The repeater records the audio and then plays it back. After an echo test, URCALL should be changed back to CQCQCQ.

Information Message

EI5DD wants to discover whether his local repeater EI7RHD is currently linked.

MYCALL: EI5DD
URCALL: EI7RHD I
RPT1: EI7RHD B
RPT2: EI7RHD G

After setting up the radio, EI5DD keys up the radio for about one second (no need to speak into the microphone). If the repeater is linked, he will hear the message "remote system linked", and a text message should scroll across the screen announcing what the repeater is linked to. After asking for the information message, URCALL should be changed back to CQCQCQ.

The Most Recent D-Star radios have a facility to select **U** for Unlink, **I** for Information, and **E** for Echotest.

Please do not use Echotest unless absolutely necessary as there are plenty of operators to answer your calls. Echotest is more often used when setting up levels on gateways and Repeaters and unless you love the sound of your own voice it is not necessary.

D-Star Reflector systems include REF DCS, XRF and XLS

REF
The first reflectors where the REF reflectors. To convey the DStar information the software used to run a REF reflector uses a network protocol called DPlus to communicate with the repeaters. The DPlus protocol requires you to be registered into the US-Trust system. To connect your repeater to a REF reflector you'll issue a command REFxxxaL on your radio, replacing xxx with the wanted number and a with the wanted module.

XRF

The second type of reflectors that came up were the XRF reflectors. The software used to run the XRF reflector uses another network protocol called DExtra. To connect your repeater to an XRF reflector you'll issue a command XRFxxxaL on your radio, replacing xxx with the wanted number and a with the wanted module.

DCS

The DCS reflectors arrived later and originated in Germany. It is/was a centralized system ran by German Operators. If you wanted to run a reflector you had to give admin rights to some German Operators who would install the software for you on your server. Quite awkward. Ok focus back. The DCS reflectors also come with their own network protocol. The protocol here is simply called DCS. Recently the operators in charge of the DCS decided to drop the system, but some fellow ops decided to take it over. To connect your repeater to a DCS reflector you'll issue a command e.g. DCSxxxxL on your radio—replace xxxx with a DCS Reflector of your choice

XLX

Having gone through all three historical reflectors, you are probably thinking XLX is a reflector that speaks XLX protocol" …Continue reading!

The software used to run the XLX reflectors speaks all three previous protocols REF, XRF, DCS and, in addition, its own protocol which is only used to interconnect reflectors together. As a side note, XLX reflectors are very versatile and can also be accessed through DMR and Fusion with full audio transcoding.

What is D-Star

Advanced Multi-Band Excitation (AMBE) is the technology that is used in D-STAR to compress the voice for transmission. AMBE is implemented in the AMBE-2000 or AMBE-2020 chips which are found within every D-STAR radio. The AMBE-2000™ Vocoder Chip, which is manufactured by Digital Voice Systems, Inc. (DVSI), implements DVSI's patented and award winning AMBE® Voice Compression Algorithm. The field-proven success of this technology has resulted in its recognition as the standard for voice quality in communication systems around the globe. Satellite systems such as ACeS, AMSC/TMI, ICO, Inmarsat, Iridium, Optus and Thuraya use this technology because of its superior voice quality at low bit rates.

How D-STAR Works

D-STAR is digital modulation
Voice is converted from analog to digital for transmission
Data is combined with digitised voice for transmission at 4800 bps
2400 bits for Voice 1200 bits for voice Forward Error Correction
1200 bits for Data
Callsign is sent with each transmission

What can D-STAR Do?

Transmit or receive voice and 1200 baud data simultaneously on 2m, 440 and 1.2 GHz (no TNCrequired)
128 Kb data transmission on 1.2 GHz with Internet connectivity (Ethernet bridge to Internet with IP address)
D-PRS (digital APRS) automatic position reporting simultaneous with voice with GPS
Flexible repeater linking with Gateway and Internet connection
Reflectors act as conference bridge for linking multiple repeaters

Enhancing D-Star Functions with the RS-MS1A Android App

By using data in place of voice frames, the ID-5100A and ID-51A PLUS transfers data 3.5 times faster (3480 bps) than in the conventional DV mode (with voice). Pictures taken by an Android™ device can also be quickly transmitted in the DV Fast Data mode

Text Messaging
Share Pictures
D-STAR Stations and Repeater Sites Mapping
Repeater List Viewer – highlights repeaters in an area according to current GPS position
D-PRS converts the D-STAR GPS information to APRS™ compatible strings and presents it to the APRS-IS (APRS Internet Server) and other APRS™ client/

DR Functions and Remote Settings using the RS-MS1A

You can set the transceiver's "FROM" and "TO" fields and change some of the transceiver's function settings from your Android™ device. When used with the optional Bluetooth™ headset, VS-3, you can wirelessly control the ID-5100A from a remote place

D-Star for Emergency Communications

Voice and data communications in one radio (no TNC required Operates over wide areas with
Internet repeater linking (ad-hoc nets)
Serves local area through local repeater
Same capabilities on simplex
Expanded capabilities with no infrastructure required
Live D-PRS allows live position updates at HQ
Transmission of near Live Pictures

D-Rats

D-RATS is a full function data communications tool for D-STAR and more…and it's FREE
Written by Dan Smith, KK7DS
Utilises D-STAR low-speed data mode (~1200 baud)
PC connects directly to D-STAR radio (No TNC required)
Windows, Linux and Mac versions available
Can be used without radio over Internet or with DV Dongle
Provides chat, messaging, email, forms, file transfer (unattended), mapping (maps included)
Ideal for use on Emergency Communication Operations

DVStick-30

Since the digital ham radio systems borrow technology from commercial systems, the codec definitions have been adopted. Although there are free open source codecs available, these free codecs are not compatible with commercial systems because they use different protocols. Every digital radio for D-Star, DMR, P25, C4FM, NXDN etc contains such a codec chip as a component of the radio. All radios need such a codec chip to transform the Digital Data into Analog and vice versa. This is exactly what the DVMEGA DVstick-30 does.

The DVStick30 retails for approximately €95.00 and provides an excellent opportunity to sample D-Star without spending a fortune on D-Star radios. It is possible to access REF, DCS, XRF and XLS reflectors. The benefit of such a 'radio less' application in ham radio is the possibility to stay in touch with the friends at home when traveling without a radio, or where no suitable digital repeaters are nearby. The requirements for the Internet data rate are, thanks to the capable codec chip, quite low, usually an ISDN line with 64 kbps is enough.

In Conclusion

D-Star has always got bad press as it is only possible to operate from ICOM Radios. Not strictly true as Kenwood also produce and expensive handheld. With the introduction of MMDVM Pi-Star systems it is easy enough to manufacture a Gateway or Repeater. Some Analog repeaters have been successfully converted for D-Star use.

Indeed, D-Star Registration can be a little difficult, but going direct to the ICOM UK website and submitting requested information will have the registration fully completed within 24 hours.

Take time to read the basic manual and you will be on the air quickly. There is a considerably larger manual which supplies plenty of information to cover the more advanced features of D-star.

Some Say:

D-STAR is a proprietary standard. **Incorrect** – D-Star, like most all the rest of these technologies, is an open standard. Like all the other digital technologies, they all use a proprietary Codec
D-STAR is a fad that will go away **Incorrect** – It has lasted the test of time and, whilst other modes have become popular, D-star has not suffered any losses. In fact, many have taken an interest in D-Star as a result of trying other Digital Modes.
D-STAR requires the Internet. **Incorrect** – It is possible to link Repeater systems via a 23cms Link. One can adopt a standalone network using D-Star's own linking system.
Only one vendor supports D-STAR. **Incorrect** – Kenwood supplies a D-Star Handheld. There are numerous systems allowing the manufacture of D-Star compatible Repeaters or Gateways.
D-STAR radios are too expensive. **Incorrect** – Compare to any other specialist type of Radio and the prices are comparable e.g. the Yaesu FT3D is the same price as an ICOM ID-51E Plus2 handheld.
Note the DVStick 30 gives a cheap way to discover the wonders of D-Star.
D-STAR is too complicated. **Incorrect** – If one takes the time to read the manual all will be revealed and understood. Sadly most operators seem to have an aversion to the reading ofmanuals

Glossary of D-Star Terms

AMBE – This is the chip that encodes it. (3600 bits per second data stream) made by Digital Voice Systems Incorporated (Its proprietary) and about $20

Busy Lockout – It is a function that has the rig check to see if a frequency is busy. If it is, then helps prevent you from doubling with another Operator.

Call Sign Routing – A method to send a voice 'Envelope' to another user by sending it to the gateway system to find out where that last call sign was heard and spiting it out there, or if not found where that call sign is registered at.

D-STAR - (Digital Smart Technologies for Amateur Radio) is a digital voice and data protocol specification developed as the result of research by the Japan Amateur Radio League to investigate digital technologies for amateur radio. While there are other digital on-air technologies being used by amateurs that have come from other services, D-Star is one of the first on-air and packet-based standards to be widely deployed and sold by a major radio manufacturer that is designed specifically for amateur service use.

DV – Digital Voice mode: basically, your transmitting voice and Data at the same time.

DVADAPTOR – A Device plugged into the Antenna line of an HF rig to add D-Star capabilities to another rig (Typically HF on 6-10 meters)

DVAP – A device plugged into a USB port on a computer to allow another D-Star rig (typically an HT) to use the computer to connect to the D-Star Gateway network.

DV-Dongle – A device plugged into a USB port allowing an operator to talk to other DPlus enabled gateway repeaters though a computer with a broadband connection.

Falling off the cliff – A term used to describe when someone has moved out far enough that no single can be received / sent. (This is like the FM Analog term of 'Falling into the static' because of the abrupt nature that this has, hence the term 'Falling off the Cliff.')

Gateway 2.0 – The software on the repeater's Gateway system that makes it all possible. It runs on Linux, and CentOS is the Linux distribution that it recommends.

Linking – Creates a link from one repeater node to another repeater node or Reflector allowing for everyone on the node (who is registered on a gateway) to communicate with the other target.

My Call – One of the 'Magic 4 Fields' normally the operator using the rig.

Memory Bank/group – A method of organizing memory entries.

Node – Often used to refer to a node or module of a Repeater stack e.g. EI5DD Node C (144.850)

Node Routing – Sends a 'Voice envelope' to a node on either the same repeater or another node on another repeater.

One Touch Reply – A function of a D-Star rig to be able to quickly answer a call sign route, or a Node route, by pressing a button putting the caller's call sign into your "Your Call" field. This way you can 'call sign route back to them.

R2D2 – A term used to describe 'Noise' in a D-Star communication. "I got a bunch of R2D2 on that" meaning that some of the signal made it through but not all of it, thus it creates a lot of robot-like noise when that happens. It also happens when doubling, and if enough power to trip the repeater but not enough to get a full signal into it.

RPT* - Shown on a rig when the gateway confirms transmission. Different models tend to show different things.

RPT1 – Normally the repeater node your calling in from (EI5DD C) for example. (It's what repeater node you're talking into)

RPT2 – Normally that repeaters Gateway, usually the call sign with a G in the 8th position.

Slash Field – The field following the call sign field that contains 4 spaces to put letters or numbers after my call. (Ex: EI5DD /800H) normally this is where you put your rig's model number. Dongles use /DNGL and DVAP use /DVAP automatically.

Text Insert – A 20-character field that you turn on and when you key down, your 'my call' then Slash field, then what ever is in the Text Insert that you have selected. Normally it is, "Name, Location, Country" i.e., Galway City. This way all who look at the screen when you key down, have that information. Sometimes it is used for stating who net control is, or for special events.

UR Call – the most volatile field, used to direct what you want to do.

D-Star is, undoubtedly, the more complex of the modes and the full manual for D-Star Handhelds and Mobile transceivers is normally about 300 pages.

Digital Radio Operating Procedures

There are a large number of Band Police in this world and sooner or later you will fall foul of them. Even in Ireland believe it or not.

1) Listen before Transmit.

2) Count to number 3 in the head before pushing the PTT with a reply to a contact. This allows components of the Network to reset. This is particularly relevant to anything to do with Fusion Repeaters in Ireland. They are connected to the DMR network via a Bridge network which allows Fusion and DMR operators to talk to each other on the Fusion Network. When the station drops carrier even on the repeater count to 5 before reply. This allows the system to Reset its timers, allows the latency to catch up and prevents a long roll around occurring on the Network. Sudden drop outs are generally down to not observing this rule.

3) Set Time out Timers for 3 minutes maximum. Most items on the network Time Out after 3 minutes. Be conscious of this. You may lose your contact if you time out.

4) Where possible avoid using a Parrot to repeat your own voice back to you. There are plenty there to give you a signal report if you ask. Parrots waste network time!

5) Do Not Call **CQ** this is **NOT** worldwide DX. It is easier to talk to somebody in Australia than to talk to somebody in Galway**!** A Call such as "EI0XXX is listening on the Ireland Calling Channel for any call. Do this a couple of times and you will get a response. Do Not say "Breaker for a copy" otherwise you may never get a contact.

6) Do not appear on channel and say this is EI0XXX listening as most will **not** want to spoil your pleasure and will let you continue to listen.

7) If you have contacted on a calling Channel, QSY to another Chat Channel, before somebody moans at you. Particularly common in the UK. UK Call >> UK Chat 1 or UK Chat 2 etc. Generally not enough activity to justify this but manners maketh man!

8) Whilst digital does include your call sign on the transmission it is still good practice to announce your callsign and that of the person you are working - there are no changes in our licence conditions yet.

9) Do >>**NOT**<< Key up with a Blank Transmission on a Repeater of Gateway more than once without speaking. You will be blocked from the Server for at least an hour. This is a built in protection on all Brandmeister systems.

10) Support activity on your local Gateways or Repeaters these are installed for the benefit of all of the Amateur Radio Fraternity. All activity is welcomed and rewarding.

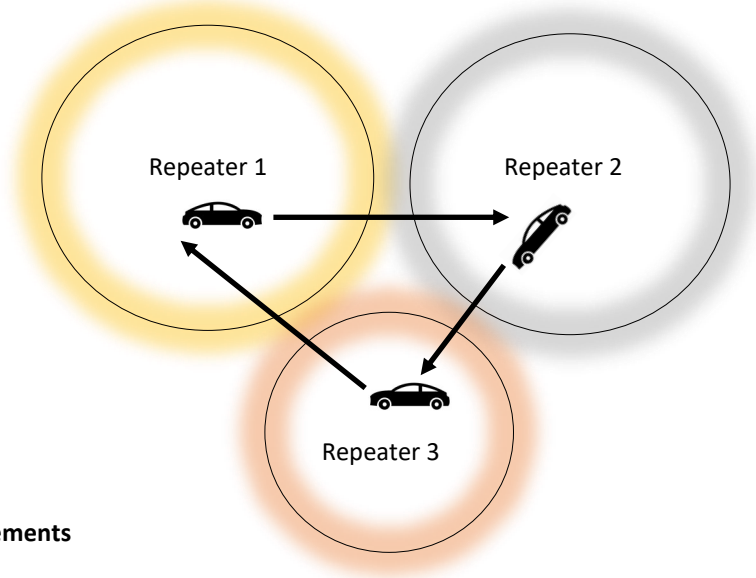
11) Above all be courteous to other users. Remember you were new to Digital once upon a time and many would have assisted and encouraged you into this aspect of the Hobby.

12) The use of **Private Call** is >>**NOT**<< encouraged on the Brandmeister Network. SMS messaging is, however, not a problem.

Roaming on The Galway DMR Repeater Network

Roaming is possible when a radio is set to automatically move between Repeaters depending on which receives the strongest signal. In a roaming system it is necessary to set the RSS threshold which is the minimum signal strength that he radio will consider strong enough before it starts searching for a stronger signal. The RSSI needs to be programmed into the radio.

Consider a radio moving between three repeater coverage areas. As the radio moves from Repeater 1 the signal strength slowly reduces and reach a point where the signal from Repeater 1 reduces below the pre-programmed RRSI threshold. At this point the radio will search through a list of Repeaters programmed into a ***Roam List*** to see if they have a stronger signal at that location. The ***Roam List*** is simply a list of all Repeaters that the radio could use. If one Repeater in the Roam List does have a stronger signal the radio will switch to using that repeater automatically so as the user moves closer to Repeater 2 the radio will switch to Repeater 2 and as the Radio moves closer to Repeater 2 the RSSI level will increase and the radio will stop searching for other repeaters. If the radio starts to move towards Repeater 3, the signal will fall below the RSSSI level and the radio will start searching for a stronger signal. It should detect Repeater 3 and switch to that channel. Once the RSSI is strong enough the radio should stop searching for a stronger repeater and remain with Repeater 3 until the signal, once again, falls below the RSSI threshold.



Requirements

Repeaters have to be able to connect to each other and relay the same audio at the same time on at least one Talk Group. On Hytera and Motorola systems this is called IP Multi-site Connect. This works well in commercial systems dedicated to only a few users but in Amateur radio this can be more difficult. On amateur radio Repeaters, many Talk Groups are used and are linked differently. Some Talk Groups are linked to all other repeaters all over the country, whilst others are linked to repeaters within a specific area and some are user activated. Area specific Talk Groups can be programmed in such a way that the radio will only roam on Repeaters that have that Talk Group.

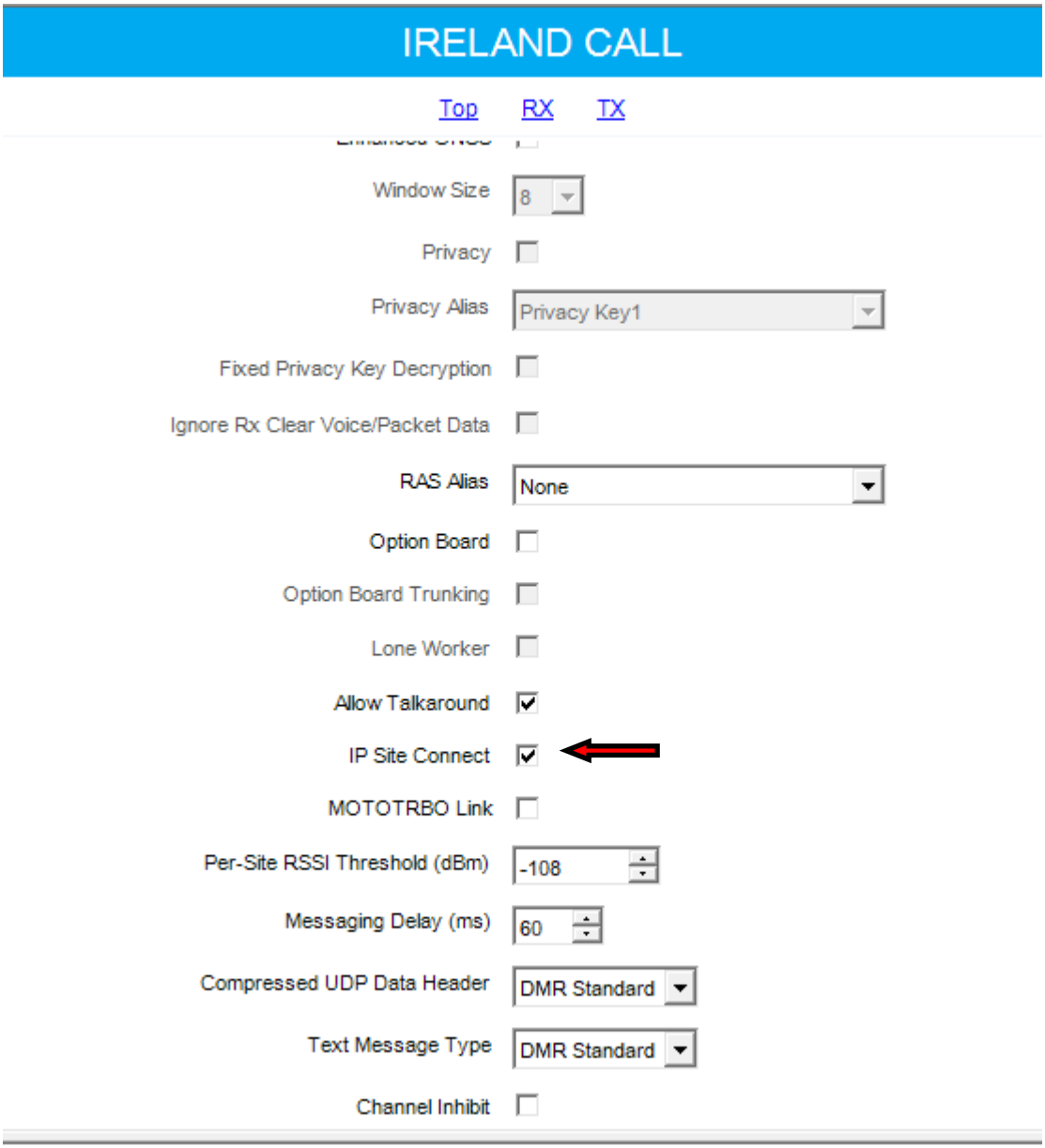
Issues

The major problem is that somebody may be operating on another Talk Group on a Repeater when you roam onto it. This is where roaming would fail in amateur radio. The conversation would have to be terminated or manually set the radio to use another Repeater. A second issue is with user activated Talk Groups. User activated Talk Groups will only become activated on a specific repeater only when you have manually transmitted onto that Talk Group. If you activate the Talk Group on one repeater and then roam into the coverage of another repeater, the Talk Group will not be activated on the second repeater.

Ensure that the desired Static Talk Groups are programmed onto each repeater in the network and this will work. The only time there maybe problems is if another operator is occupying the Repeater and using a different Talk Group.

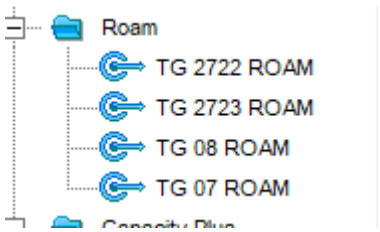
Roaming on the Motorola DM Series Radios

Program the channel on which you wish to roam in the channels list.



Check the IP site connect Box

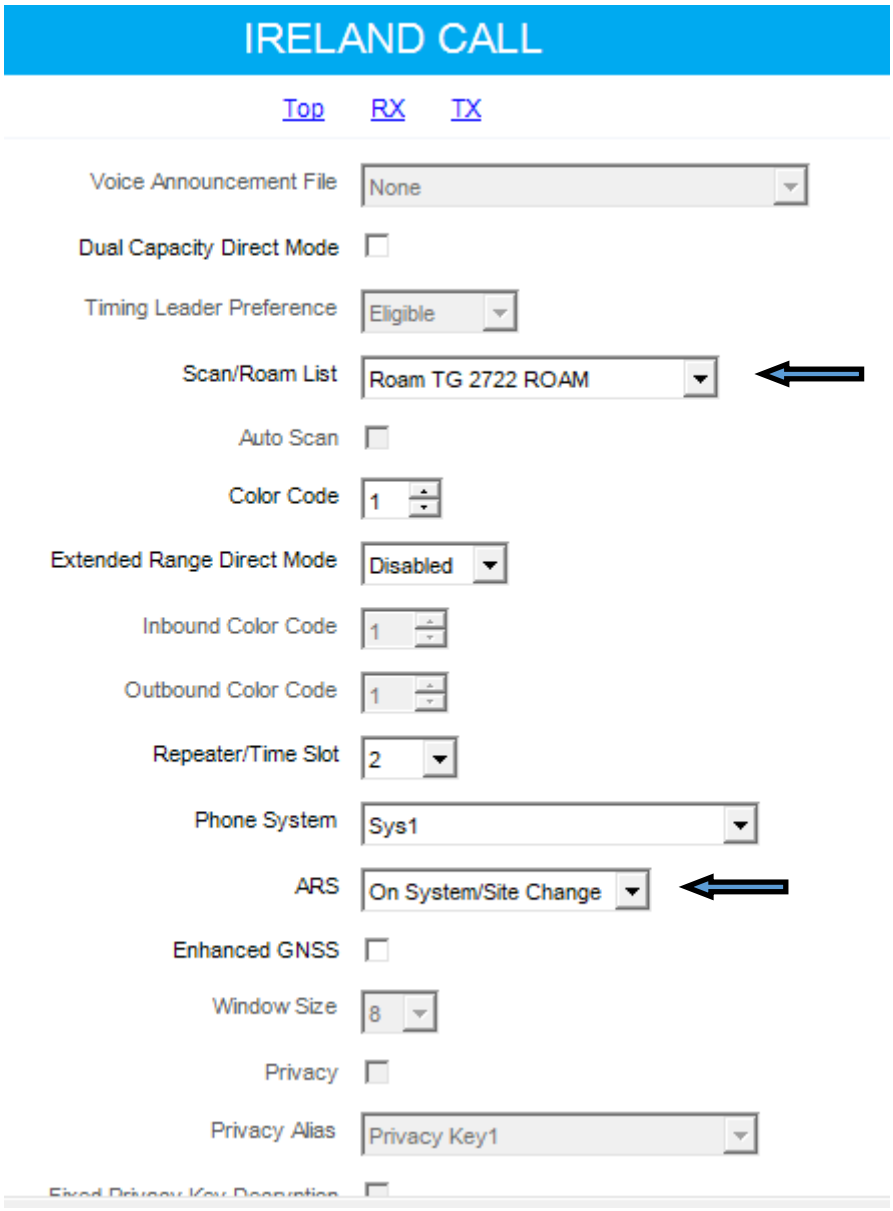
Next create a Roam list for each channel you wish to roam



Go back to the channel you created and click on the dropdown box labelled Scan/Roam List

Select The Roam list created for the Channel—in this cast Ireland call

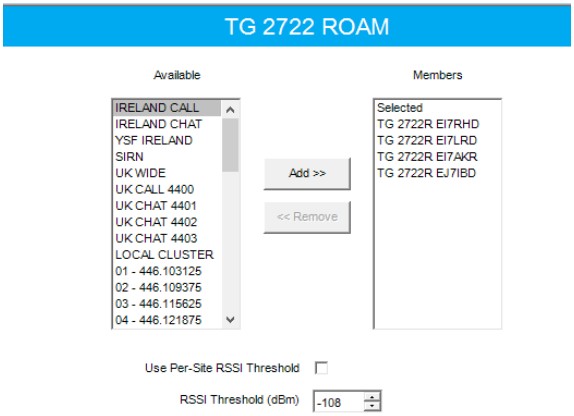
Click on the Dropdown box labelled ARS and select “On system Site Change



Finally select the Roam list created for the channel required and select the desired Channel from each of the Repeaters and Add it to the members list.

Roaming will only work on Clusters where the chosen Talk Group is Static.

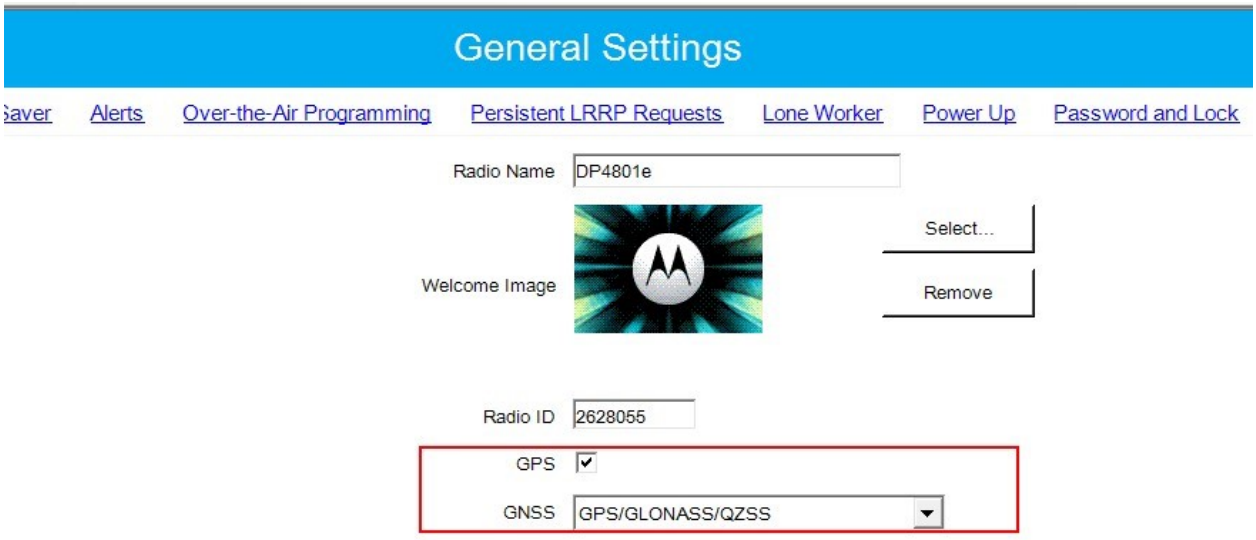
Roaming will not work on hotspots or gate-ways as these are not IP multi-site connect devices



MOTOTRBO Radio Using APRS and SMS in Brandmeister Network

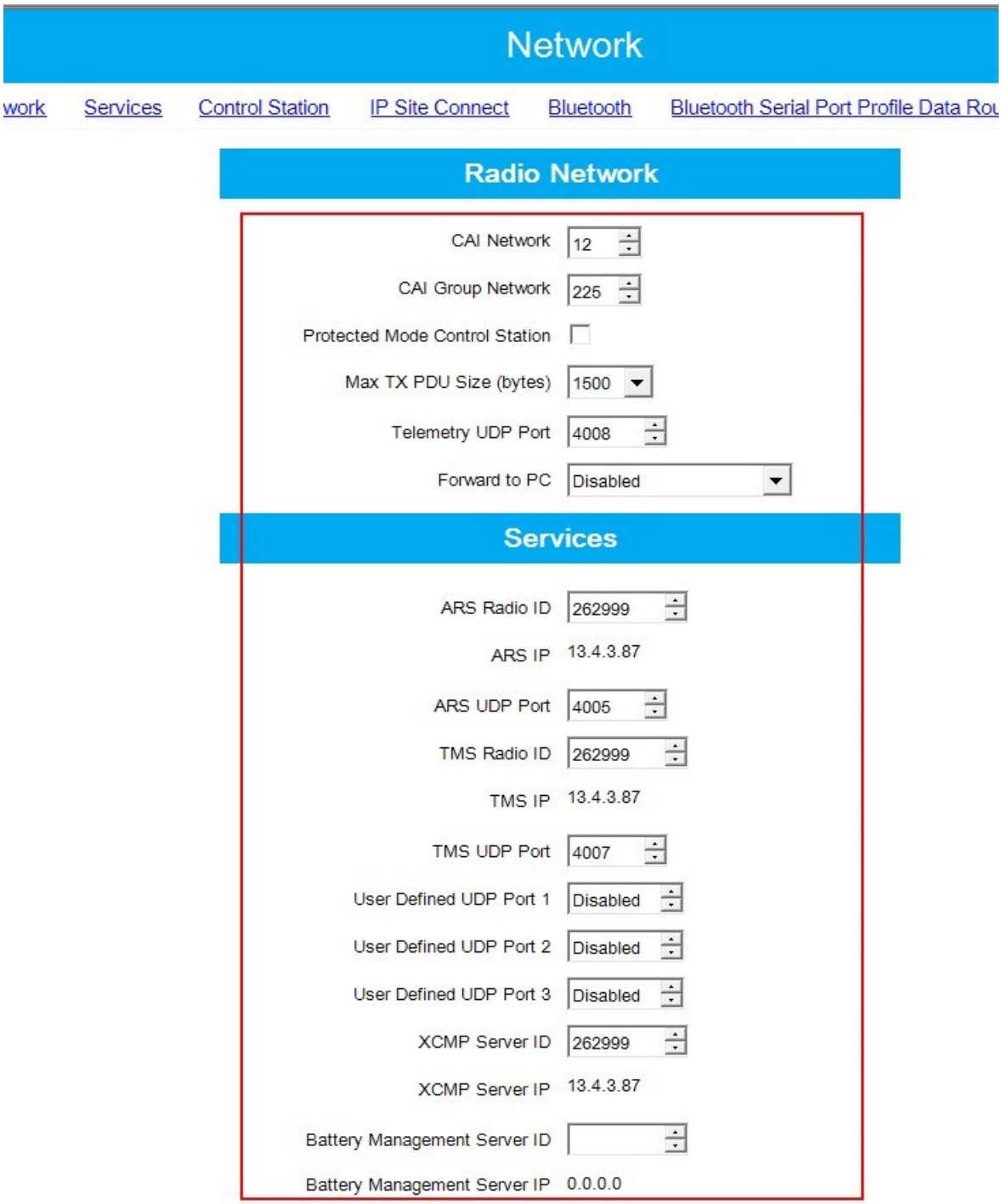
This example shows the settings for Brandmeister 262 Germany, in other countries it may be necessary to use another server. In Germany for APRS and messaging the address is 262999.
Note that the CPS has expert view enabled. I used CPS 13.5 EMEA to create this example.

First have a look at the general settings, to enable GPS. Depending on the GPS hardware of your radio it may be useful having a look if all satellite systems are enabled. For my DP4801e only GPS was enabled, and adding GLONASS improved time to fix quite a bit in some situations.

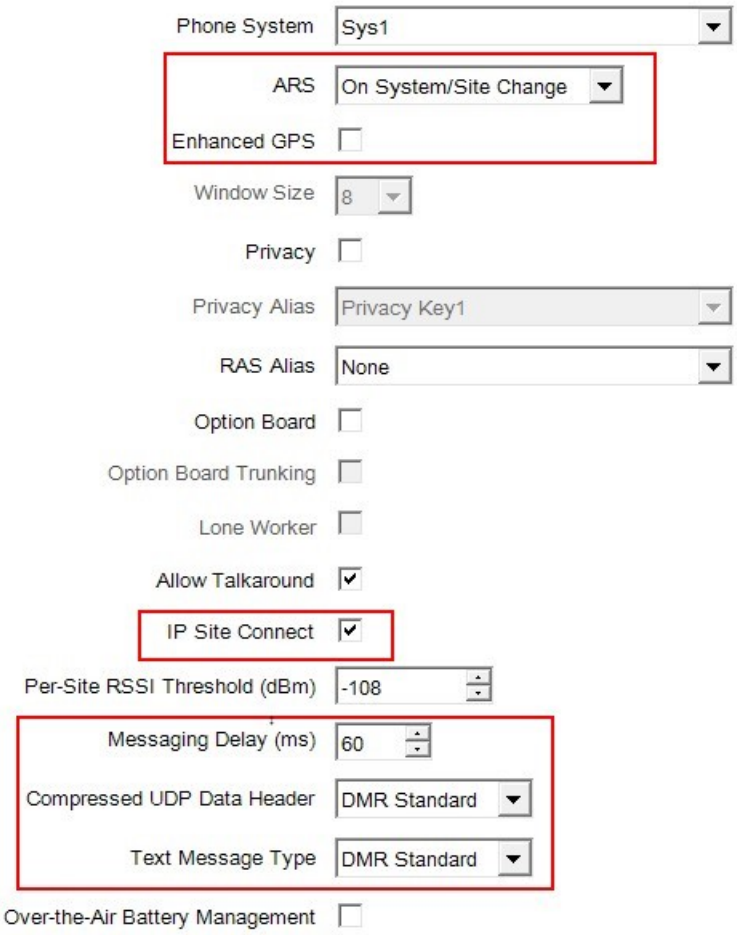


Now go to General / Persistent LRRP Request and set it like this, to make APRS transmission more reliable. It is a kind of cache to store the settings sent from the server to your radio.

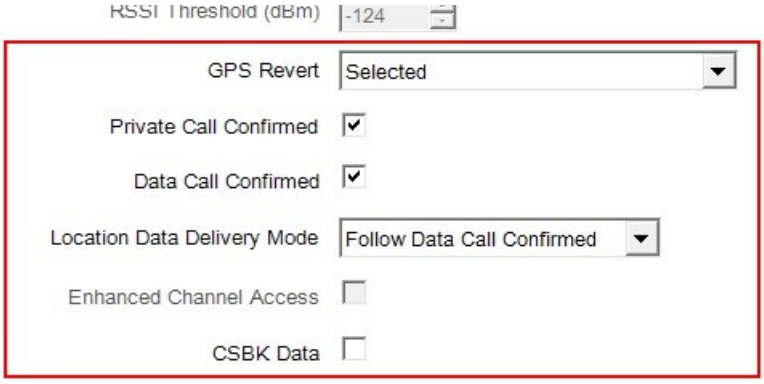
The next step is doing some network settings. Navigate to the network page and set the stuff like shown below. I do not want to go into detail, just note that that the three occurrences of 262999 may need to be adjusted to your master servers address. Not all here entered settings are necessary for APRS, but I set them to be prepared for future use, and some are needed for text messaging TMS/SMS.



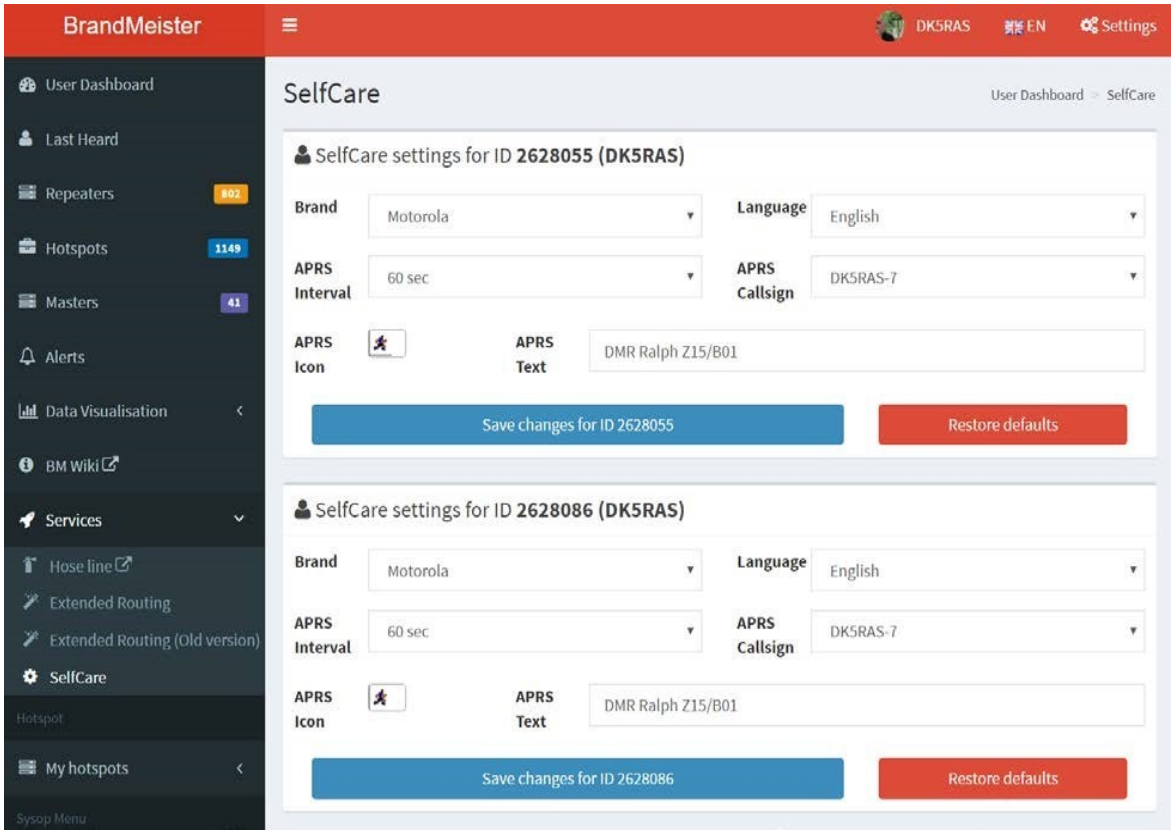
The next settings need to be made in each single channel that wants to use messaging and APRS. So you may face now some work to be done, depending on the size of your Code Plug ☺ These items from the common part of the channel data are important:



And here the settings from the channels TX section:



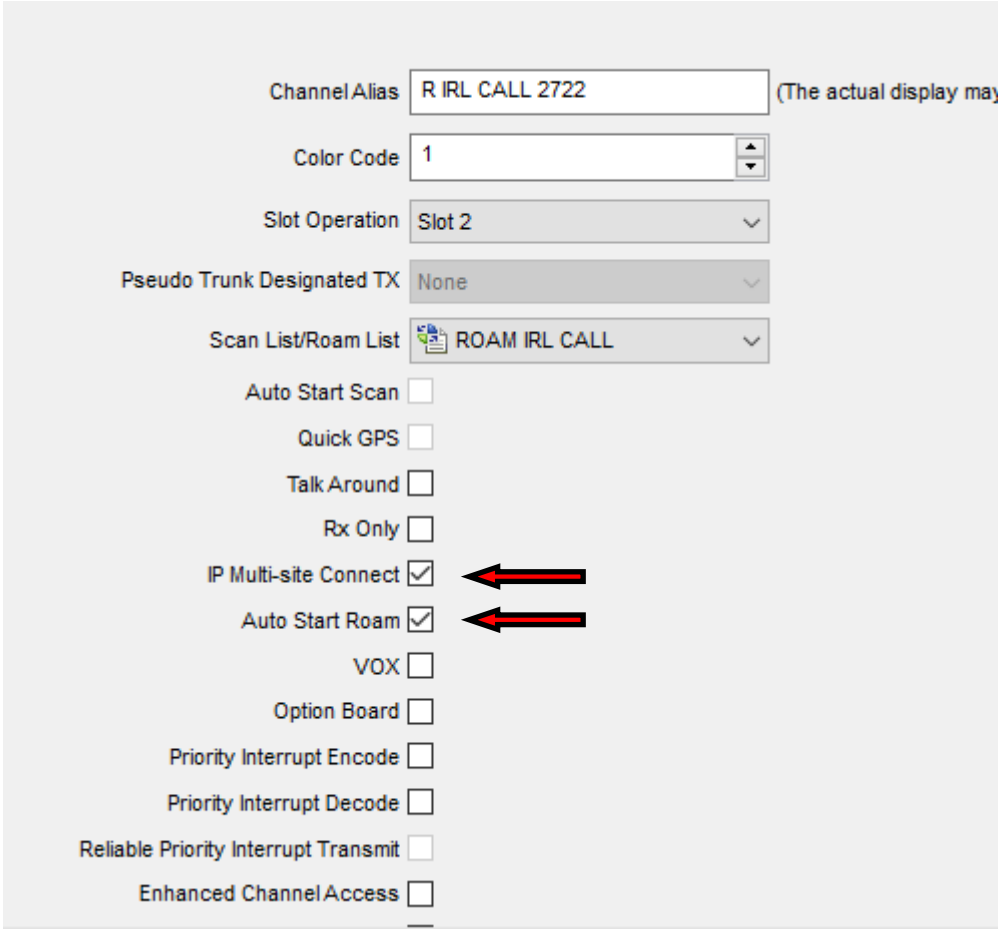
Not to forget about the Brandmeister dashboard settings! Log into your dashboard account at https://brandmeister.network and adjust your settings for all affected personal IDs, similar to this example:



Now you should be ready to to go. Set your radio to a BrandMeister repeater or hotspot, wait for a GPS fix and watch your data showing on http://aprs.fi!

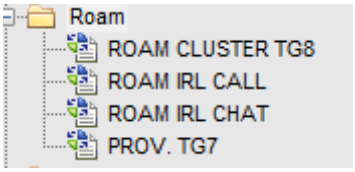
Roaming on the Hytera MD 785 Radio

In the same way as programming the Motorola, program the desired channel.



Select IP Multi-site Connect and also Auto Start Roam

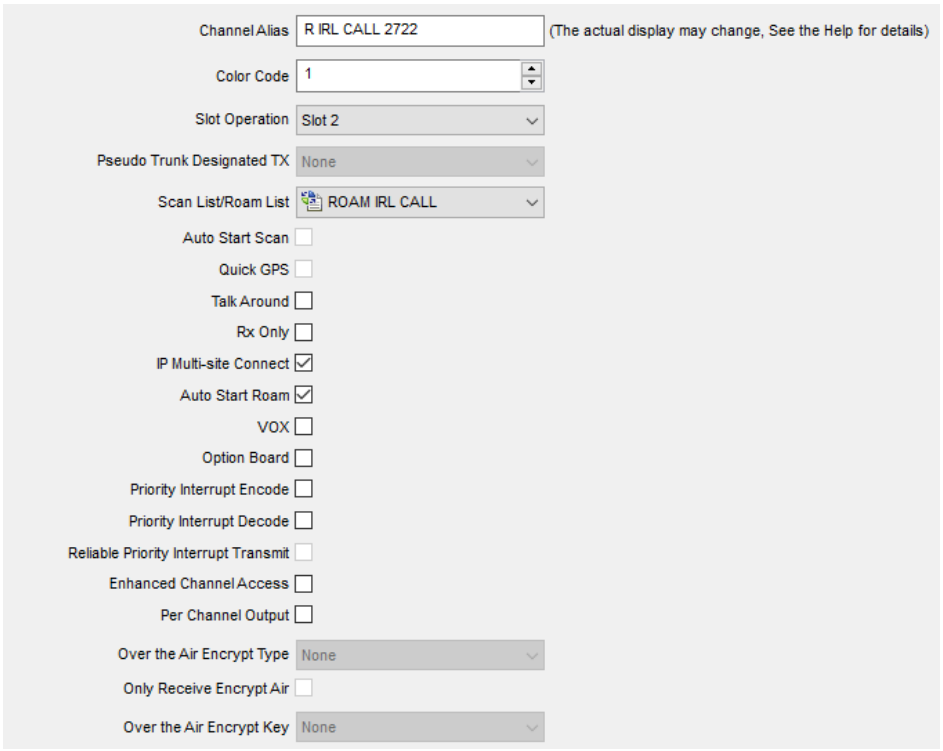
Got to the Roam list and Set up a Roam list for the appropriate channel - in this case Ireland Call



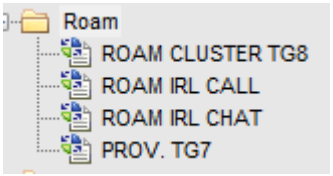
Go back to the IRL Call Channel in the first Diagram click on the dropdown box associated with the Scan List/ Roam List and select the appropriate Roam list.

Roaming on the Hytera MD785G

Set up the channel that you want to Roam on each repeater as follows:



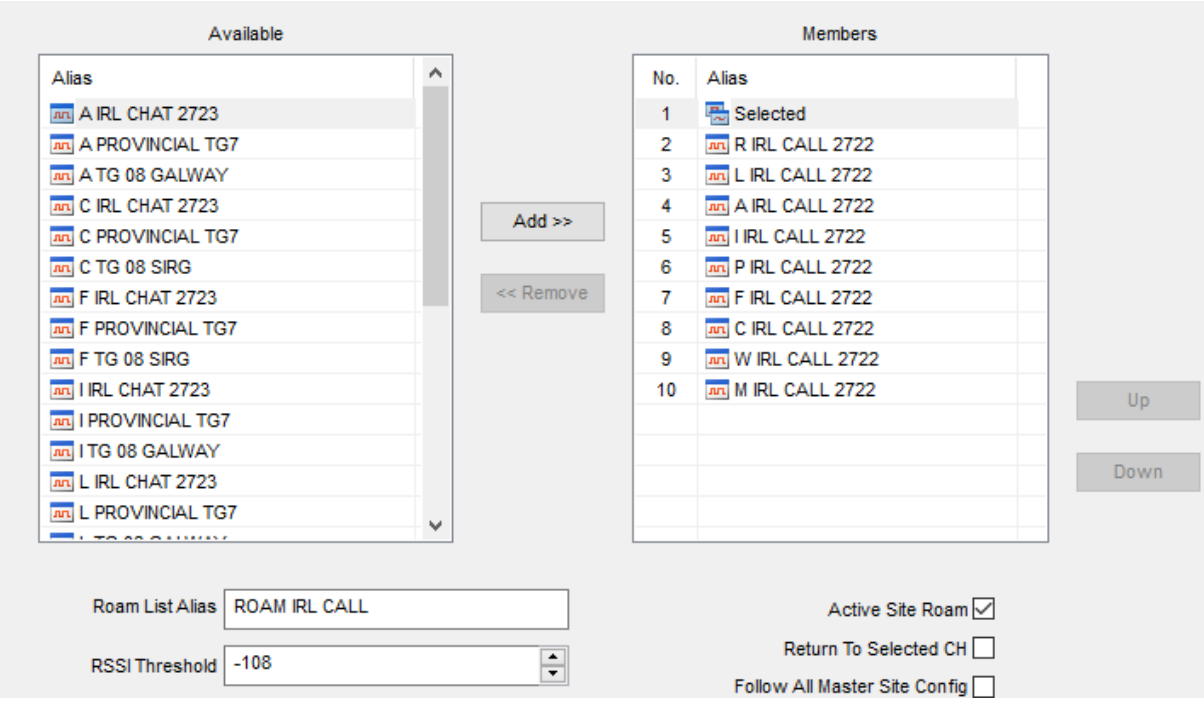
You have to go down to the Roam section and set up a Roam list like so



Then go to channel as shown in the first diagram select the 5th box down and select the desired Roam list – in this case Roam IRL Call 2722

Then select the Roam list from the section shown in the 2nd diagram – in this case Roam IRL CALL.

See Diagram on next page:



From the list on the left hand side, add into the right hand box.

Populate the Roam list with the appropriate channel for all the repeaters on which you wish to Roam

Do not change the RSSI Threshold as this value is the deault and will work in most cases without change.

This works exceptionally well and starts roaming from the time you select a designated roaming channel.

If you don’t want the set to roam it is possible to turn off roaming from the menu selection

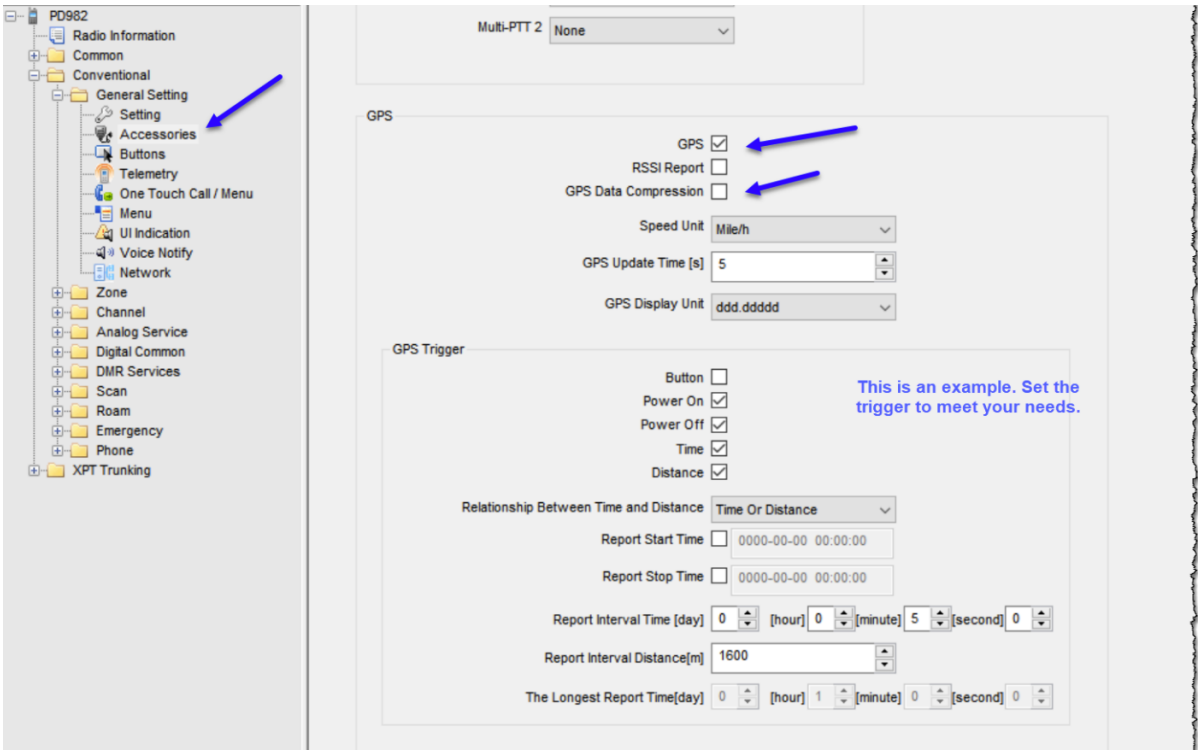
Finally go into the Brandmeister Self-care account and select Hytera/Kenwood as the Radio

Programming GPS on the Hytera MD 785 G

Open the Programming for the Hytera Radio

On the left hand side click on Conventional /. General Settings / Accessories

Program the following Settings



The following items must be checked:

GPS - On

GPS Data Compression Unchecked

GPS Trigger As in Example shown - Do not set the interval too short or the distance interval too short otherwise your set will jam up the channel with GPS Packets

Power on - Checked

Power Off - Checked

Time - Checked

Distance - Checked

Report interval Time - 5 minutes

Report interval Distance - 1600 Metres

Scroll down further to check the following Boxes:

Voice with GPS - Checked

PTT - Checked Causes GPS data to be sent each time the PTT is pressed

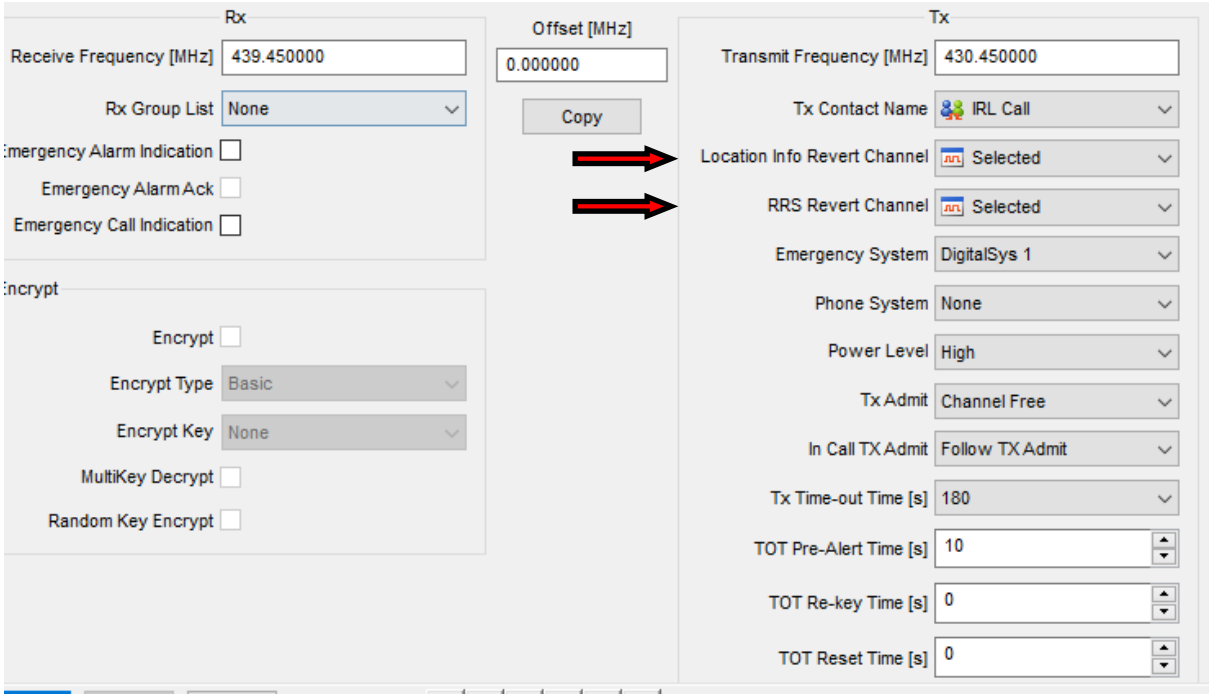
Conventional General Settings / Network:

Radio to Radio Network - Subnet 10

Radio Services & GPS Radio ID - **272999**

Channel Setting should be as follows:

Set the arrowed boxed to “Selected” as shown



This system will show up on APRS.FI

Other Radio Systems

Many of the Chinese Handhelds, an example of which is the Anytone, have a facility to Roam. Whilst the Roaming is not Multi-Site connect it normally operates a Pseudo-Roaming system where the Radio will start to scan for another Repeater if the signal disappears. This can save a lot of channel switching.

GPS facilities are also available and each set has its own way of achieving APRS operation so please check the manual. Naturally, with lower power, this facility may be limited.

Talk Groups and Time slots

All Irish Repeater have Four Talk Groups set Static. These are:

TG2722 on Time Slot 2

TG 2723 on Time Slot 1

TG 8 Local cluster on time slot 2

Provincial TG 7 on Time Slot 1

Irrespective of where you are in Southern Ireland this will be the layout on each Repeater so please ensure that these are programmed in accordingly.

UK Talk Groups are not set **Static** on the Irish Network but the General Rule of thumb is that Regional or Calling channels are programmed to Time Slot 2 and any Chat Channels or Bridges to other modes Digital or Analog are programmed to Time Slot 1. It is not as though there will be a huge amount of activity from EI to UK Channels so this would appear to be the best way of programming.

International Channels are all programmed to Time slot 1

One should remember that **Analog Repeaters** only have one channel and any activity will completely take over the single channel.

DMR Repeaters have two Time slots allowing the activity to be divided between the two Time Slots.

Remember that it is possible to confine one's transmissions to the local area by utilising Talk Group 9 on either Time Slot 1 or Time Slot 2. There is little point in transmitting through the network if you only want to chat to somebody in your own neighbourhood.

News Bulletins

The IRTS News is read on **TG 08** in the Galway Area at **8pm on Sundays** via the **Local Cluster.** This may also be accessed by Using TG 27255 via a Hotspot or Time Slot 1 on a local Repeater.

The RSGB News is read on **Talk Group 2354** on **Sunday Mornings at 12 Noon** by MI0HOZ with a brief net and call-ins afterwards. The Galway Network Automatically switched on a Static Talk Group on **TG 2354 at 11:30 am** on Sunday Mornings to facilitate this broadcast in the Galway Area.

Please follow the recommended layout of Talk Groups and Time Slots to avoid turning on both Time slots at the same time on the Same Repeater. This will cause unnecessary QRM by having the same Talk Group active on both Time slots of the Repeater.

Digital Systems On Air.

We are fortunate to have 2 Large networks - one to the West of Ireland and the other to the South East of Ireland. More recently the Dublin Area has coverage via the EI7PMD Repeater and EI2PMD Gateway. Hopefully more systems will follow although one should not take it for granted they will be supplied but more consider the possibility of placing something on the air in your area.

The 2m gateway system is a reasonable way of bringing Digital Activity to areas not covered by Repeaters. This can be DMR, C4FM, and D-Star.

The attachment of an antenna system to a personal hotspot is grossly illegal. A Gateway for public use should be both regulated by the Repeater Co-ordinating Committee and Licenced via ComReg. This is after all, an Automatic Station. Such practices have resulted in Loop arounds due to several closely situated Hotspots being placed on the same frequency. Spare a thought for those who run legitimate services!

Irish Talk Groups

Talk Group Number	Talk Group Name	Description
2722	Ireland Calling channel	Calling Channel QSY t once established
2723	Ireland Chat Channel	QSY here after call is established
2724	Ireland Wires-X Bridge	Link to CQ Ireland Wires-X

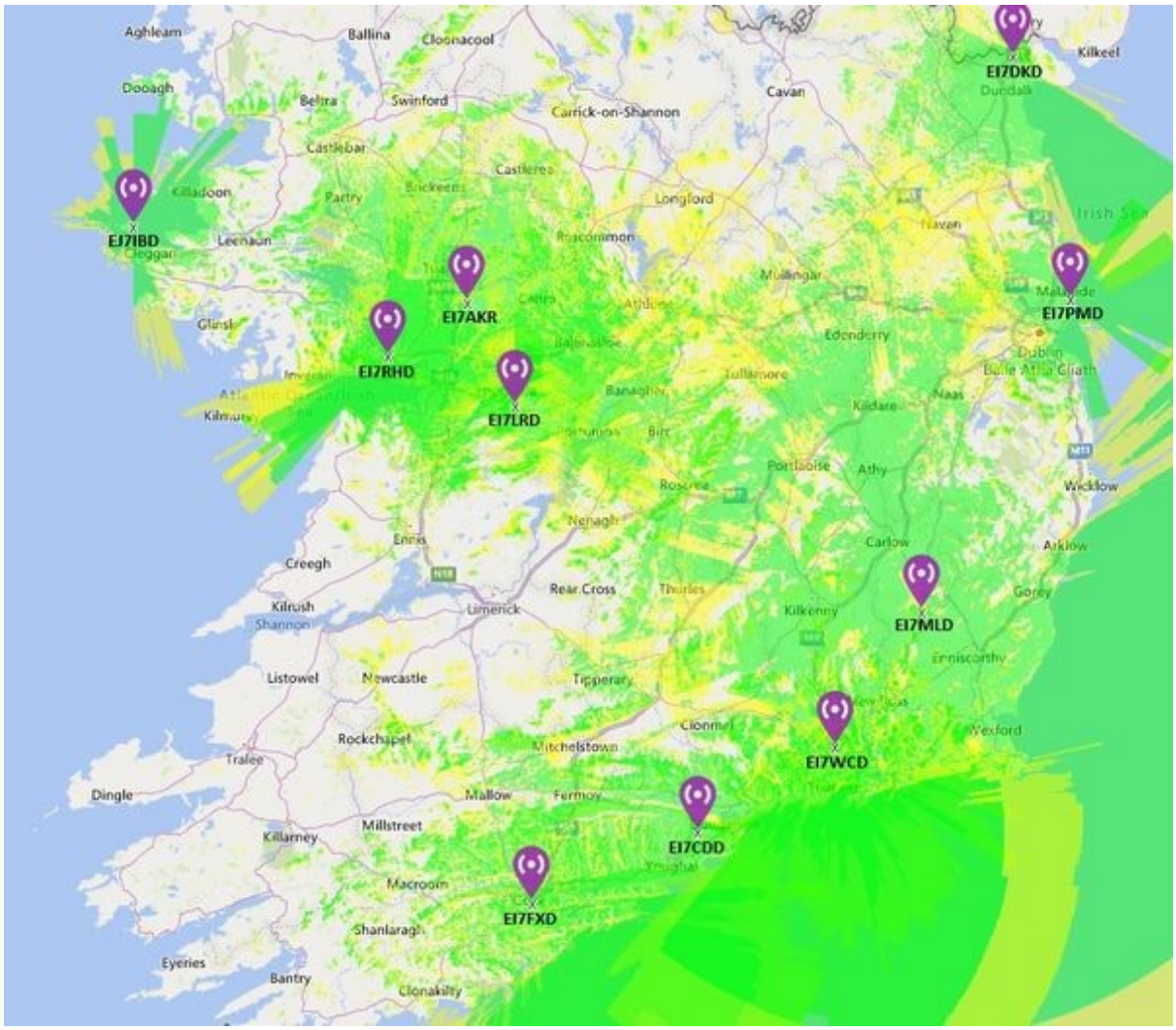
Special Talk Groups

Talk Group	Time slot	Description
07	1	Provincial cluster
08	2	Regional Repeater Clusters - Contact Sysop for more information
09	1 & 2	Local Repeat only - does not route through the Server
2722	2	Ireland Calling Channel - QSY after call is established - No Nets here
2723	1	Ireland chat Channel—QSY once Call has been established on TG 2722
2724	1	Bridge to C4FM (IE YSF IRELAND & CQ IRELAND Wires-X)
27240	1	Southern Ireland Analog Repeater Network
27246	1	XLX 922 E home of AUS Repeater Net, CQ UK-1., CQ UK-2 Aberdeen Chat
27250	1	Provincial Cluster TG7 Connacht (Use Slot 2 if in Connacht Province)
27251	1	Provincial Cluster TG7 Leinster (Use Slot 2 if in Leinster Province)
27252	1	Provincial Cluster TG7 Munster (Use Slot 2 if in Munster province)
27253	1	Provincial Cluster TG7 Ulster (Use Slot 2 if in Ulster Province)
27254	2	Southern Ireland Repeater Group Cluster - Use Time Slot 1 if elsewhere
27255	2	Galway Digital Radio Group Cluster - Use Time slot 1 if elsewhere
272907	1	JOTA Ireland
27299	3	Data / APRS
	27297	PARROT
	27299	RRS / GPS / APRS

Talk Groups 7 , Talk Group 8, Talk Group 2722 and Talk Group 2723 are set as Static on all Repeaters

Talk Group 8 links all Repeaters in a specific area together. Transmit into one Repeater and it will relay transmission to all of the Repeater in the Cluster

Southern Ireland Repeater Network



In four years we have come to this point with the Digital Repeater Network. There are plans to Expand further but Rome wasn't built in a day. It is good to see the East Coast on the Network as there is a large number of Digital operators in that catchment area.

There are a large number of DMR IDs issued and yet very few heard on the air. In Some cases this could be down to the reluctance to program the infamous Code Plug although this should not be a stumbling block. Once a few channels have been added the it is just repetition and maybe slightly time consuming but not beyond anyone's reach.

Do Spare a thought for the SysOps of the Digital Network. Much time and effort has gone into the network into fruition and there is absolutely no reward at he end of the day. Not even the costs of the equipment are covered. The SysOp of the Brandmeister Server, located in the Waterford College, spends his own time maintaining the system and performing Software updates.

Note: All of this work is voluntary!

If you have any axe to grind with the current operation of the Digital System please ensure that you have contributed financially before registering your gripe!

Digital Radio Data Card

EI Digital Repeater Network

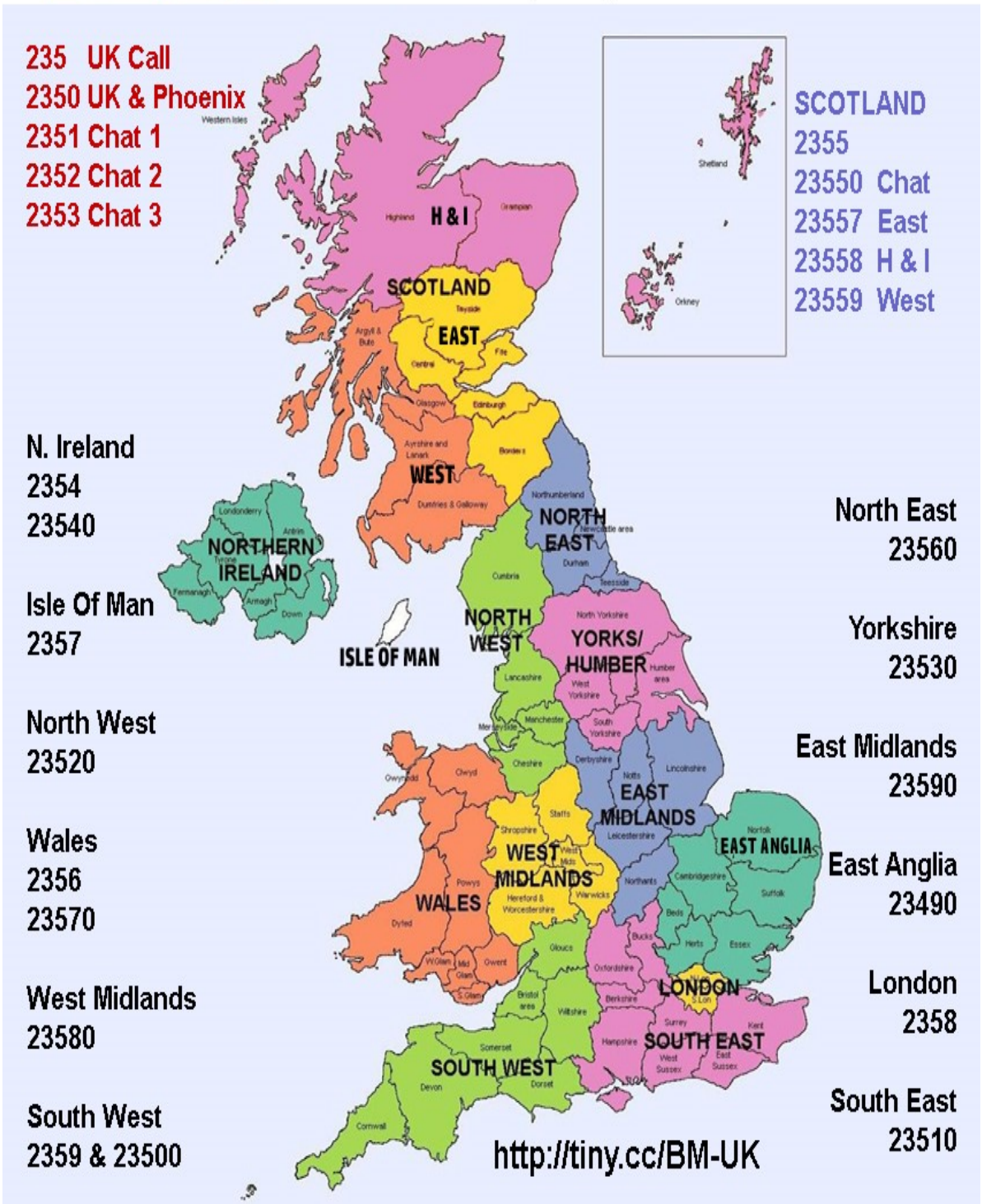
UK Talk Groups

Talk Group	Name	Description
235	UK Wide	(Time Slot 2) Not generally Monitored
2350	UK Calling Channel	(Time slot 2) Short QSOs Permitted
2351	UK Chat 1	(Time slot 1) Chat Channel
2352	UK Chat 2	(Time slot 1) Chat Channel
2353	UK Chat 3	(Time slot 1) Chat Channel
23500	UK S. West	(Time slot 1) Chat Channel
2359	Cornwall	(Time slot 2) Regional Channel
23516	Jersey	(Time slot 2) Regional Channel - Channel Islands
23510	UK S. East	(Time slot 2) Regional Channel
23580	UK W. Midlands	(Time slot 2) Regional Channel
23575	Shropshire	(Time slot 2) Regional Channel
23590	UK E. Midlands	(Time slot 2) Regional Channel
23562	UK Trans Pennine	(Time slot 2) Regional Channel
23530	UK Yorkshire	(Time slot 2) Regional Channel
23561	UK Tyne & Wear	(Time slot 2) Regional Channel
23520	UK N. West	(Time slot 2) Regional Channel
23560	UK N. East	(Time slot 2) Regional Channel
2357	Isle of Man	(Time slot 2) Regional Channel
2356	Wales Call Channel	(Time slot 2) Short QSOs Permitted
23560	Wales Chat	(Time slot 1) Chat Channel
2355	Scotland Calling	(Time slot 2) Short QSOs Permitted
23550	Scotland Chat	(Time slot 1) Chat Channel
23559	Scotland West	(Time slot 2) Regional Channel
23557	Scotland East	(Time slot 2) Regional Channel
23558	Scottish Highlands	(Time slot 2) Regional Channel
23526	UK Hubnet	Bridge to Allstar / Echolink and other Analog systems
27246	UK Wires-Bridge	(Time slot 1) Bridge to CQ UK Wires-x
23555	Scotland RAYNET	No Go Area except for RAYNET Operations
2354	GI Calling Channel	(Time slot 2) Short QSOs Permitted
23540	GI Chat Channel	(Time slot 1) Chat Channel

United Kingdom Talk Groups

BrandMeister

http://tiny.cc/BM-UK



Phoenix Network Talk Groups as used in Northern Ireland

Talk Group	Time Slot	Description
1	1	Worldwide
2	1	Europe
13	1	Worldwide - English Speaking
119	1	Worldwide Chat - User Activated
129	1	Worldwide Chat - User Activated
235	1	UK wide
80	1	Chat Channel - User Activated
81	1	Chat Channel - User Activated
82	1	Chat Channel - User Activated
83	1	Chat Channel - User Activated
84	1	Chat Channel - User Activated
880	2	Northern Ireland
9	1 & 2	Local Repeat Only - not routed through Network

Operating Procedure

Call on any of the international Talk Groups then move to one of the chat Talk Groups. Call on UK 235 then move to one of the 80-84 chat Talk Groups.

You may call on 880 and stay on that Talk Group, no need to move.

GB7HZ only has Talk Group 880 as static on Phoenix but you may activate any other Talk Group as you wish.

The RSGB News is Read on Sunday Evening at 7:30 pm Local Via the Phoenix Network on TG 880

The RSGB News is Read at 12:00 Noon every Sunday via the Brandmeister Network on TG2354. The Galway Network is set to a Temporary Static Talk Group on Time Slot 1 to facilitate this - call-ins are always welcome. MI0HOz is the News Reader

Brandmeister Talk Groups

At the time of publication the following is an up-to-date list of active Brandmeister Talk Groups and is a fine example of what is available on a worldwide basis.

TG 1	Local
TG 2	Cluster
TG 8	Regional
TG 9	Local
TG 91	World-wide
TG 92	Europe
TG 93	North America
TG 94	Asia, Middle East
TG 95	Australia, New Zealand
TG 98	Radio Test
TG 202	Διεθνές Ελλάδα
TG 204	Nederland
TG 206	Belgium
TG 208	France
TG 213	Andorra
TG 214	Spain
TG 216	Hungary
TG 218	Bosnia and Herzegovina
TG 219	Croatia
TG 220	Serbia
TG 222	Italia
TG 226	Romania
TG 228	Switzerland
TG 230	Czech Republic
TG 231	Slovak
TG 232	Austria
TG 235	UK Call - QSY to 2351 or 2352
TG 238	Denmark
TG 240	Sweden
TG 242	Norway
TG 244	Finland
TG 246	Lithuania
TG 247	Latvia
TG 248	Estonia
TG 255	Ukraine
TG 259	Moldova
TG 260	Poland
TG 262	Deutschland
TG 263	Multimode DL
TG 268	Portugal
TG 270	Luxembourg
TG 272	Ireland
TG 278	Malta
TG 280	Cyprus
TG 283	Armenia
TG 284	Bulgaria
TG 286	Turkey
TG 292	San Marino
TG 293	Slovenia
TG 295	Liechtenstein
TG 297	Montenegro
TG 302	Canada Wide
TG 310	Tac 310 NOT A CALL CHANNEL
TG 311	TAC 311 USA
TG 312	TAC 312 USA
TG 313	TAC 313 USA
TG 314	TAC 314 USA
TG 315	TAC 315 USA
TG 316	TAC 316 USA
TG 317	TAC 317 USA
TG 318	TAC 318 USA
TG 319	TAC 319 USA
TG 330	Puerto Rico
TG 334	XE
TG 338	Jamaica
TG 352	Grenada
TG 358	Saint Lucia
TG 362	Curaçao
TG 368	Cuba
TG 370	Dominican Republic
TG 372	Haiti
TG 374	Trinidad / Tobago
TG 400	Azerbaijan
TG 401	Kazahstan
TG 404	India
TG 415	Lebanon
TG 420	Saudi Arabia
TG 422	Oman
TG 425	Israel
TG 426	Bahrein
TG 427	Qatar
TG 430	United Arab Emirates
TG 440	Japan
TG 450	South Korea
TG 452	Vietnam
TG 454	Hong Kong
TG 460	China
TG 470	Bangladesh
TG 502	Malaysia National
TG 505	Australia
TG 510	Indonesia
TG 515	Philippines
TG 520	Thailand
TG 525	Singapore
TG 530	ZL National
TG 602	Egypt
TG 604	Morocco
TG 655	South Africa
TG 704	Guatemala
TG 706	El Salvador
TG 708	Honduras
TG 710	Nicaragua
TG 712	Costa Rica
TG 714	Panama
TG 716	Perú
TG 722	Argentina
TG 724	Brazil Nacional
TG 730	Chile
TG 732	República de Colombia
TG 734	Venezuela
TG 740	Ecuador
TG 748	Uruguay
TG 899	Repeater Testing
TG 907	JOTA
TG 910	German
TG 913	English
TG 914	Spanish
TG 915	Portuguese
TG 916	Italian
TG 918	YOTA
TG 920	DL, OE, HB9
TG 922	Dutch
TG 923	European English
TG 924	Swedish
TG 927	Nordic
TG 930	PanHellenic Chat
TG 937	Francophonie
TG 940	Arabic
TG 955	WWYL
TG 969	DMR-Caribbean
TG 973	SOTA
TG 2021	Περιοχή 1 Εθνική
TG 2022	Περιοχή 2 Εθνική
TG 2023	Περιοχή 3 Εθνική
TG 2024	Περιοχή 4 Εθνική
TG 2025	Περιοχή 5 Εθνική
TG 2026	Περιοχή 6 Εθνική
TG 2027	Περιοχή 7 Εθνική
TG 2028	Περιοχή 8 Εθνική
TG 2029	Περιοχή 9 Εθνική
TG 2041	Noord Nederland
TG 2042	Midden Nederland
TG 2043	Zuid Nederland
TG 2044	Oost Nederland
TG 2045	Nederland Techtalk
TG 2061	Belgium North
TG 2062	Belgium South
TG 2063	Belgium East
TG 2064	Belgium OnDemand 4
TG 2065	Belgium OnDemand 5
TG 2066	Belgium OnDemand 6
TG 2067	Belgium OnDemand 7
TG 2068	Belgium OnDemand 8
TG 2069	Belgium OnDemand 9
TG 2080	Urgences FR
TG 2081	Région Ile de France
TG 2082	Région Nord-ouest
TG 2083	Région Nord-est
TG 2084	Région Sud-est
TG 2085	Région Sud-ouest
TG 2089	France Dom-Tom
TG 2140	Spain Link
TG 2141	Regional EA1
TG 2142	Regional EA2
TG 2143	Regional EA3
TG 2144	Regional EA4
TG 2145	Regional EA5
TG 2146	Regional EA6
TG 2147	Regional EA7
TG 2148	Regional EA8
TG 2149	Regional EA9
TG 2161	Hungary East
TG 2162	Hungary West
TG 2163	Hungary North
TG 2164	Hungary South
TG 2165	Hungary Test
TG 2169	Local repeater
TG 2260	MULTIPROTO YO
TG 2262	District YO2
TG 2263	District YO3
TG 2264	District YO4
TG 2265	District YO5
TG 2266	District YO6
TG 2267	District YO7
TG 2268	District YO8
TG 2269	District YO9
TG 2280	Schweiz Deutsch
TG 2281	Suisse Romande
TG 2282	Valais / Wallis
TG 2283	Bern / Solothurn
TG 2284	Basel
TG 2285	Aargau / Zentralschweiz

Brandmeister Talk Groups

TG 2286 Ticino
TG 2287 Graubünden
TG 2288 Zürich
TG 2289 Ostschweiz
TG 2300 Czech Crossconect
TG 2301 Bohemia
TG 2302 Moravia
TG 2311 Slovakia
TG 2320 OE-Master
TG 2321 Wien
TG 2322 Salzburg
TG 2323 Niederoesterreich
TG 2324 Burgenland
TG 2325 Oberoesterreich
TG 2326 Steiermark
TG 2327 Tirol
TG 2328 Kaernten
TG 2329 Vorarlberg
TG 2350 United Kingdom
TG 2351 Chat 1
TG 2352 Chat 2
TG 2353 Chat 3
TG 2354 Ireland
TG 2355 Scotland
TG 2356 Wales
TG 2357 Isle of Man
TG 2358 London
TG 2359 Kernow
TG 2381 Denmark Nordjylland
TG 2382 Denmark Midtjylland
TG 2383 Denmark Syddanmark
TG 2384 Denmark Copenhagen
TG 2385 Denmark Sjaelland
TG 2386 QSY1 Chat
TG 2387 QSY2 Chat
TG 2388 D-Star DCS699B
TG 2389 XLX238 Interlink
TG 2400 Regional SM0
TG 2401 Regional SM1
TG 2402 Regional SM2
TG 2403 Regional SM3
TG 2404 Regional SM4
TG 2405 Regional SM5
TG 2406 Regional SM6
TG 2407 Regional SM7
TG 2410 DCS010D
TG 2411 SM Tactical
TG 2415 DCS010V
TG 2416 Swedenlink
TG 2421 Sør- og Østlandet
TG 2424 Vestlandet
TG 2426 Midtnorge
TG 2429 Nordnorge
TG 2440 AX OH0
TG 2441 FI OH1
TG 2442 FI OH2
TG 2443 FI OH3
TG 2444 FI OH4
TG 2445 FI OH5
TG 2446 FI OH6
TG 2447 FI OH7
TG 2448 FI OH8
TG 2449 FI OH9
TG 2501 Russia Global
TG 2502 XRF250A Bridge
TG 2503 DSTAR-SU / 24009 (WIRES-X)
TG 2504 *RUSSIA* (EchoLink)
TG 2505 Bridge to Radiocult (FRN)
TG 2506 XRF250C Bridge
TG 2555 Ukraine bridge DMR D-STAR YSF
TG 2559 Emergency Ukraine
TG 2600 Polonia TG
TG 2601 Regional SP1
TG 2602 Regional SP2
TG 2603 Regional SP3
TG 2604 Regional SP4
TG 2605 Regional SP5
TG 2606 Regional SP6
TG 2607 Regional SP7
TG 2608 Regional SP8
TG 2609 Regional SP9
TG 2620 Sachsen-Anhalt/Mecklenburg-Vorpo
TG 2621 Berlin/Brandenburg
TG 2622 Hamburg/Schleswig-Holstein
TG 2623 Niedersachsen/Bremen
TG 2624 Nordrhein-Westfalen
TG 2625 Rheinland-Pfalz/Saarland
TG 2626 Hessen
TG 2627 Baden-Württemberg
TG 2628 Bayern
TG 2629 Sachsen/Thüringen
TG 2681 North
TG 2682 Center
TG 2683 Capital
TG 2684 Alentejo
TG 2685 Algarve
TG 2686 Azores
TG 2687 Madeira Is.
TG 2701 XLX270 A
TG 2705 LX ADRAD
TG 2706 LX RLX
TG 2707 LX Laru
TG 2722 IE Calling
TG 2723 IE Chat
TG 2724 Bridge to YSF-IE
TG 2729 AREN Logistics
TG 2802 Nicosia
TG 2803 Famagusta
TG 2804 Larnaca
TG 2805 Limassol
TG 2806 Paphos
TG 2807 Kyrenia
TG 2842 Sofia
TG 2843 Plovdiv
TG 2860 Turkey 0.Region
TG 2861 Turkey 1.Region
TG 3020 Newfoundland & Labrador
TG 3021 Nova Scotia
TG 3022 Quebec
TG 3023 Ontario
TG 3024 Manitoba
TG 3025 Saskatchewan
TG 3026 Alberta
TG 3027 British Columbia
TG 3028 Nunavut, Yukon & NWT
TG 3029 New Brunswick
TG 3100 BM US Nationwide Bridge
TG 3101 Alabama
TG 3102 Alaska
TG 3104 Arizona
TG 3105 Arkansas
TG 3106 California
TG 3108 Colorado
TG 3109 Connecticut
TG 3110 Delaware
TG 3111 D.C.
TG 3112 Florida
TG 3113 Georgia
TG 3115 Hawaii
TG 3116 Idaho
TG 3117 Illinois
TG 3118 Indiana
TG 3119 Iowa
TG 3120 Kansas
TG 3121 Kentucky
TG 3122 Louisiana
TG 3123 Maine
TG 3124 Maryland
TG 3125 Massachusetts
TG 3126 Michigan
TG 3127 Minnesota
TG 3128 Mississippi
TG 3129 Missouri
TG 3130 Montana
TG 3131 Nebraska
TG 3132 Nevada
TG 3133 New Hampshire
TG 3134 New Jersey
TG 3135 New Mexico
TG 3136 New York
TG 3137 North Carolina
TG 3138 North Dakota
TG 3139 Ohio
TG 3140 Oklahoma
TG 3141 Oregon
TG 3142 Pennsylvania
TG 3144 Rhode Island
TG 3145 South Carolina
TG 3146 South Dakota
TG 3147 Tennessee
TG 3148 Texas
TG 3149 Utah
TG 3150 Vermont
TG 3151 Virginia
TG 3153 Washington
TG 3154 West Virginia
TG 3155 Wisconsin
TG 3156 Wyoming
TG 3166 DVSwitch
TG 3167 Allstar
TG 3169 Midwest
TG 3171 NoCo
TG 3172 Northeast
TG 3173 Mid-Atlantic
TG 3174 Southeast
TG 3175 Southern Plains
TG 3176 Southwest
TG 3177 Mountain
TG 3180 Missouri Lakes
TG 3190 PADMR
TG 3195 Chemung Storm Chasers
TG 3199 US Hurricane Net
TG 3300 PRadise Repeaters
TG 3304 Distrito Arecibo
TG 3305 Distrito Bayamon
TG 3306 Distrito Carolina
TG 3307 Distrito Guayama
TG 3308 Distrito Humacao
TG 3309 Distrito Mayaguez
TG 3341 XE 1
TG 3342 XE 2
TG 3343 XE 3
TG 3581 Castries

Brandmeister Talk Groups

TG 3582 VieuX Fort
TG 3622 PJ2 Tech
TG 3740 REACT
TG 3741 Woodbrook
TG 3742 Port of Spain
TG 3743 San Fernando
TG 3744 Tobago
REF 4000 Disconnect
REF 4269 BARS
TG 5021 West Malaysia
TG 5022 East Malaysia
TG 5050 XLX500 G
TG 5051 Australian capital territory
TG 5052 Australia New South Wales
TG 5053 Australia Victoria
TG 5054 Australia Queensland
TG 5055 South Australia
TG 5056 Western Australia
TG 5057 Tasmania
TG 5058 Australia Northern territory
TG 5151 NCR
TG 5152 CRIRCV
TG 5153 Cluzon
TG 5154 BICOLR
TG 5201 R1-Central
TG 5202 R2-East
TG 5203 R3-L.Northeast
TG 5204 R4-U.Northeast
TG 5205 R5-U.North
TG 5206 R6-L.North
TG 5207 R7-West
TG 5208 R8-U.South
TG 5209 R9-L.South
TG 5301 ZL1 Regional
TG 5302 ZL2 Regional
TG 5303 ZL3 Regional
TG 5304 ZL4 Regional
TG 6041 Rabat
TG 6471 La Réunion
TG 6558 SARL Hamnet
TG 7081 Honduras zone 1
TG 7082 Honduras zone 2
TG 7083 Honduras zone 3
TG 7084 Honduras zone 4
TG 7085 Honduras zone 5
TG 7086 Honduras zone 6
TG 7087 Honduras zone 7
TG 7088 Honduras zone 8
TG 7089 Honduras zone 9
TG 7101 Managua Capital
TG 7102 Zona del Pacifico
TG 7103 Zona Del Atlantico
TG 7104 Zona Norte
TG 7141 Panama City
TG 7142 Colon
TG 7143 wires-x fusion link
TG 7144 Chiriqui
TG 7145 GREMPA
TG 7146 UPRA
TG 7147 HP PANAMA HUB
TG 7148 RadioClubPanama
TG 7166 Peru Zona OA6
TG 7221 AR AMBA
TG 7227 Argentina LINK
TG 7229 AR Test
TG 7300 CE0
TG 7301 CE1
TG 7302 CE2
TG 7303 CE3
TG 7304 CE4
TG 7305 CE5
TG 7306 CE6
TG 7307 CE7
TG 7308 CE8
TG 7309 CE9
TG 7320 Colombia HK0 Zone
TG 7323 Colombia HK3 Zone
TG 7325 Colombia HK5 Zone
TG 7326 Colombia HK6 Zone
TG 7400 Ecuador-HC3-Loja-DMR/YSF
TG 7401 Ecuador HC3 Loja
TG 7402 Ecuador DX Club
TG 8515 Dstar Italia XLX-77 Link
TG 9071 JOTA Tac 1
TG 9072 JOTA Tac 2
TG 9073 JOTA Tac 3
TG 9074 JOTA Tac 4
TG 9075 JOTA Tac 5
TG 9076 JOTA Tac 6
TG 9077 JOTA Tac 7
TG 9078 JOTA Tac 8
TG 9101 Worldwide Maritime
TG 9102 Worldwide Aviation
TG 9107 XRF007 B
TG 9112 Emcom EU
TG 9201 EURAO
TG 9371 Francophonie C4FM
TG 9410 ATV Talk
TG 9480 ICQ Podcast
TG 9500 Collegiate
TG 9800 Cafe Gratis
TG 9911 Emcom US
TG 9990 Parrot
TG 20201 Hellenic Tech 1
TG 20202 Hellenic Tech 2
TG 20203 Hellenic Echolink Bridge
TG 20206 XLX145/DStar
TG 20207 RAAG XLX737
TG 20208 YSF202 Greece
TG 20231 PATRAS Group
TG 20241 Trikala Greece
TG 20261 Ioannina Greece
TG 20281 Corfu Island Greece
TG 20401 Wires-X Hobbyscoop
TG 20413 Noordenveld
TG 20421 Regio Keistad
TG 20422 Rijk van Nijmegen
TG 20423 Utrecht
TG 20424 Rijnmond
TG 20426 Drechtsteden
TG 20427 NHNoord
TG 20431 Limburg
TG 20432 Noord Brabant
TG 20433 Maasdriehoek
TG 20441 Regio IJsselmond
TG 20443 Gelderland midden
TG 20492 Veteranendag
TG 20601 Belgium North YSF Bridge
TG 20602 Belgium South YSF Bridge
TG 20610 Belgian CW
TG 20681 Gembloux
TG 20800 YSF France
TG 20803 Dépt Allier
TG 20810 Dépt Aube
TG 20812 Dépt Aveyron
TG 20813 Dépt Bouches-du-Rhône
TG 20820 Dépt Corse
TG 20830 Dépt Gard
TG 20837 Dépt Indre-et-Loire
TG 20843 Dépt Haute-Loire
TG 20844 Dépt Loire-Atl
TG 20845 Dépt Loiret
TG 20853 Dépt Mayenne
TG 20857 Dépt Moselle
TG 20859 Dépt Nord
TG 20866 Dépt Pyrénées-Orientales
TG 20867 Dépt Bas-rhin
TG 20869 Lyon Rhone-Alpes
TG 20872 Département Sarthe
TG 20877 Dépt Seine-et-Marne
TG 20883 Dépt Var
TG 20887 Dépt Haute-Vienne
TG 20895 Dépt Val-d'Oise
TG 21401 Provincial Araba
TG 21402 Provincial Albacete
TG 21403 Provincial Alicante
TG 21404 Provincial Almería
TG 21405 Provincial Avila
TG 21406 Provincial Badajoz
TG 21407 Provincial Illes Balears
TG 21408 Provincial Barcelona
TG 21409 Provincial Burgos
TG 21410 Provincial Cáceres
TG 21411 Provincial Cádiz
TG 21412 Provincial Castellón
TG 21413 Provincial Ciudad Real
TG 21414 Provincial Córdoba
TG 21415 Provincial Coruña
TG 21416 Provincial Cuenca
TG 21417 Provincial Girona
TG 21418 Provincial Granada
TG 21419 Provincial Guadalajara
TG 21420 Provincial Gipuzkoa
TG 21421 Provincial Huelva
TG 21422 Provincial Huesca
TG 21423 Provincial Jaen
TG 21424 Provincial Leon
TG 21425 Provincial Lleida
TG 21427 Provincial Lugo
TG 21428 Provincial Madrid
TG 21429 Provincial Málaga
TG 21430 Provincial Murcial
TG 21431 Provincial Navarra
TG 21432 Provincial Ourense
TG 21433 Provincial Asturias
TG 21434 Provincial Palencia
TG 21436 Provincial Pontevedra
TG 21437 Provincial Salamanca
TG 21438 Provincial Tenerife
TG 21439 Provincial Cantabria
TG 21440 Provincial Segovia
TG 21441 Provincial Sevilla
TG 21442 Provincial Soria
TG 21443 Provincial Tarragona
TG 21444 Provincial Teruel
TG 21445 Provincial Toledo
TG 21446 Provincial Valencia
TG 21447 Provincial Valladolid
TG 21448 Bizkaia
TG 21449 Provincial Zamora

Brandmeister Talk Groups

TG 21450	Provincial Zaragoza
TG 21451	Provincial Ceuta
TG 21452	Pronvical Melilla
TG 21460	BM-CAT
TG 21461	Multimode Spain
TG 21462	Técnico
TG 21463	TG de uso libre
TG 21464	TG de uso libre
TG 21466	TG de uso libre
TG 21467	TG de uso libre
TG 21468	Multimodo
TG 21469	TG de uso libre
TG 21470	TG de uso libre
TG 21471	TG de uso libre
TG 22201	Lazio
TG 22202	Sardegna
TG 22203	Umbria
TG 22211	Liguria
TG 22212	Piemonte
TG 22213	Valle d'Aosta
TG 22221	Lombardia
TG 22231	Friuli Venezia Giulia
TG 22232	Trentino Alto Adige
TG 22233	Veneto
TG 22241	Emilia Romagna
TG 22251	Toscana
TG 22261	Abruzzo
TG 22262	Marche
TG 22271	Puglia
TG 22281	Basilicata
TG 22282	Calabria
TG 22283	Campania
TG 22284	Molise
TG 22287	IT CISAR
TG 22288	IT ARI
TG 22289	IT ERA
TG 22291	Sicilia
TG 22292	Dstar ITALY
TG 22298	Wires-X ITALY-NORD
TG 22299	WIRESX-Room-ITA
TG 22601	Diaspora YO
TG 22603	Gate to ROLINK
TG 22691	YO Start
TG 22801	UA 1
TG 22802	UA 2
TG 22803	UA 3
TG 22804	UA 4
TG 22810	HB9-BM-WIRESX
TG 22811	Vaud
TG 22812	Genève
TG 22813	Alpes Vaudoises
TG 22814	Alpes Valaisannes
TG 22815	Neuchâtel
TG 22817	Fribourg
TG 22860	Swiss-Italiana
TG 22877	Poschiavo
TG 23200	TAC 1 Austria
TG 23207	Suedtirol
TG 23225	P25 Austria
TG 23229	Vorarlberg Tech
TG 23299	TAC 2 Austria
TG 23490	East Anglia
TG 23500	S.West
TG 23510	S.East
TG 23515	Guernsey
TG 23516	Jersey
TG 23520	N.West
TG 23526	Hubnet UK
TG 23530	Yorkshire
TG 23531	RAYNET UK
TG 23540	Ireland Chat
TG 23550	Scotland Chat
TG 23557	Scotland East
TG 23558	Scotland Highland & Islands
TG 23559	Scotland West
TG 23560	North East
TG 23562	M62 Corridor
TG 23570	Wales Chat
TG 23575	SALOP Cluster
TG 23580	West Midland
TG 23590	East Midlands
TG 23810	YSF238 YSF DENMARK
TG 23811	WiresX CQ-SWEDEN
TG 23812	WiresX CQ-DENMARK
TG 23824	BornHack
TG 23888	OZ0FT Link
TG 24080	SM XIL
TG 24098	Robust Packet
TG 24201	Chatrom 1
TG 24202	Chatrom 2
TG 24203	Chatrom 3
TG 24204	Chatrom 4
TG 24400	AX OH0 QSY
TG 24409	AX OH0 SAR/FRT
TG 24410	FI OH1 QSY
TG 24420	FI OH2 QSY
TG 24421	FI OH2 PKS
TG 24422	FI OH2 L-U
TG 24423	FI OH2 I-U
TG 24430	FI OH3 QSY
TG 24431	FI OH3 Tre
TG 24432	FI OH3 Lahti
TG 24440	FI OH4 QSY
TG 24450	FI OH5 QSY
TG 24451	FI OH5 EKa
TG 24452	FI OH5 Kymi
TG 24460	FI OH6 QSY
TG 24461	FI OH6 K-S
TG 24462	FI OH6 Pjm
TG 24470	FI OH7 QSY
TG 24471	FI OH7 OSa
TG 24472	FI OH7 PKa
TG 24480	FI OH8 QSY
TG 24490	FI OH9 QSY
TG 24804	ES4 Narva Region
TG 24810	Estonia-RUS / ham-dmr.ee
TG 25011	Russian Tech
TG 25501	Kyiv city
TG 25502	Vinnyts`ka obl
TG 25503	Volyns`ka obl
TG 25504	Dnirpo obl
TG 25505	Donets`ka obl
TG 25506	Zhytomyrs`ka obl
TG 25507	Zakarpats`ka obl
TG 25508	Zaporiz`ka obl
TG 25509	Ivano frankivs`ka obl
TG 25510	Kyivs`ka obl
TG 25511	Crimea
TG 25512	Kropyvnyts`kyj obl
TG 25513	Lugans`ka obl
TG 25514	Lvivs`ka obl
TG 25515	Mykolaivs`ka obl
TG 25516	Odes`ka obl
TG 25517	Poltavs`ka obl
TG 25518	Rivnens`ka obl
TG 25519	Sums`ka obl
TG 25520	Ternopils`ka obl
TG 25521	Kharkivs`ka obl
TG 25522	Khersons`ka obl
TG 25523	Khmel`nyts`ka obl
TG 25524	Cherkas`ka obl
TG 25525	Chernigivs`ka obl
TG 25526	Chernivets`ka obl
TG 25527	Sevastopol
TG 25599	Emergency Zakarpattia
TG 25701	Belarus / Minsk
TG 25999	MD Tech Group
TG 26011	Szczecin GRYF
TG 26018	PAAROS Club
TG 26021	Trojmiasto
TG 26022	Trojmiasto C4FM
TG 26026	SPEC Pomorskie
TG 26040	Poland Tech
TG 26041	Warmia Mazury
TG 26042	Lomza
TG 26043	Podlasie
TG 26045	Podlasie EmComm
TG 26053	Mazovia
TG 26055	SP5KAB Club
TG 26056	SP5KAB Club
TG 26057	MASR
TG 26059	Kurpie
TG 26071	Lodz
TG 26073	Busko Zdroj
TG 26075	Kielce C4FM
TG 26076	Skarzysko Kamienna
TG 26078	Kutno
TG 26079	Sandomierz
TG 26091	BASR
TG 26093	KPGK
TG 26094	Krakow
TG 26095	Nowy Sacz
TG 26097	Bytom
TG 26200	TAC 1
TG 26207	Sachsen-Anhalt
TG 26209	Brandenburg
TG 26212	Berlin-City
TG 26217	Mecklenburg - Vor-pommern
TG 26220	Grossraum Hamburg
TG 26221	Hamburg-City
TG 26222	Ostholstein-Nord
TG 26223	Chaoswelle
TG 26224	Elbe-Weser
TG 26225	AFU-Nord
TG 26226	DMR Netzverbund Nord
TG 26227	DMR Netzverbund Nord
TG 26228	Ostholstein-Sued
TG 26229	Suedholstein
TG 26231	NI Mitte
TG 26232	Dreiländereck Mitte Deutschland
TG 26233	TAC 3
TG 26234	NI-Sued
TG 26235	NI Suedheide
TG 26236	NI-Nord
TG 26238	G38 - Wegberg
TG 26239	NI Ost
TG 26241	Rheinland
TG 26242	Muensterland
TG 26243	Ruhrgebiet
TG 26244	Separee D/ME

TG 26245	Rheinland-Sued
TG 26246	Niederrhein
TG 26247	DG Velbert
TG 26249	IGFS IG Funk Siebeng-
ebirge	
TG 26250	Saarland
TG 26255	Kaiserslautern
TG 26256	Eifel-Hunsrueck
TG 26257	Siegerland
TG 26260	Mittelhessen
TG 26261	Nordhessen
TG 26262	Rhein-Main-Neckar
TG 26263	Bergstrasse
TG 26264	Odenwald
TG 26265	Taunus
TG 26266	TAC 4
TG 26270	Stuttgart
TG 26271	Baden
TG 26272	Neckar-Odenwald
TG 26273	BW-Ostalb
TG 26274	BW-Böblingen
TG 26275	Schwarzwald-Nord
TG 26276	Neckar-Alb
TG 26277	Schwarzwald
TG 26278	BW Herrenberg
TG 26279	BW-Mittlerer-Neckar
TG 26280	Niederbayern
TG 26282	Schwaben
TG 26283	Region München
TG 26284	Region Franken
TG 26285	Oberbayern
TG 26286	Coburg-Rennsteig
TG 26287	Allgäu-Bodensee
TG 26288	Region Bayern Oberland
TG 26289	Oberpfalz
TG 26296	Weimar
TG 26297	Dresden
TG 26298	Thüringen
TG 26299	TAC 2
TG 26301	Sachsen-Erzgebirge
TG 26302	Leipzig
TG 26322	OV D22 Soziale Medien
TG 26331	NI Ost
TG 26338	afu38
TG 26339	Magdeburg
TG 26345	Paderborn
TG 26346	Ostwestfalen-Lippe
TG 26347	IGA Rhein-Erft
TG 26348	Westmuensterland
TG 26349	Hochsauerland
TG 26355	Agfaa
TG 26370	Ulm / Donau
TG 26371	Schwarzwald-Baar-
Heuberg	
TG 26374	ARIG-MN
TG 26375	Bodensee-
Oberschwaben	
TG 26377	Ortenau
TG 26379	Hochrhein
TG 26384	Schrobenhausen
TG 26385	Jura
TG 26386	Suedostbayern
TG 26387	Cham
TG 26388	Region Bayern Chiemgau
TG 26390	Neumarkt
TG 26421	C4FM DL-Hamburg
TG 26429	DL-Nordwest
TG 26444	Inselfreunde
TG 26446	Multibridge OWL
TG 26447	OWL-Talk
TG 26861	CU1-Sta.Maria Isl.
TG 26862	CU2-S.Miguel Isl.
TG 26863	CU3-Terceira Isl.
TG 26864	CU4-Graciosa Isl.
TG 26865	CU5-S.Jorge Isl.
TG 26866	CU6-Pico Isl.
TG 26867	CU7-Faial Isl.
TG 26868	CU8-Flores Isl.
TG 26869	CU9-Corvo Isl.
TG 27051	LX ADRAD Test
TG 27062	XLX270 B
TG 27070	LX LARU On-Demand
TG 27071	LX LARU North
TG 27072	LX LARU Center
TG 27073	LX LARU South
TG 27079	LX LARU EMCOMM
TG 27230	AREN logistics
TG 27240	SIRN Gateway
TG 27247	XLX 925 D
TG 27248	XLX 925 C
TG 27250	Connacht
TG 27251	Leinster
TG 27252	Munster
TG 27253	Ulster
TG 27254	Southern Ireland Re-
peater Group	
TG 27255	Galway Digital Radio
Group	
TG 27273	EMF Camp Hub
TG 27291	AREN Tactical 1
TG 28091	Youth 1
TG 28092	Youth 2
TG 28096	XLX146
TG 28097	WiresX Cyprus
TG 28430	LZ0PLD-R
TG 28600	YSF DMR
TG 28601	Turkey Adana
TG 28606	Turkey Ankara
TG 28614	Turkey Bolu
TG 28616	Turkey Bursa
TG 28617	Turkey Canakkale
TG 28627	Turkey Gaziantep
TG 28633	Turkey Mersin
TG 28634	Turkey Istanbul
TG 28635	Turkey Izmir
TG 28641	Turkey Kocaeli
TG 28645	Turkey Manisa
TG 28646	Turkey K.Maras
TG 28677	Turkey Yalova
TG 30271	Canada BC 1
TG 30272	Canada BC 2
TG 31000	Parrot (Group Call)
TG 31001	Net Talk Group 1
TG 31002	Net Talk Group 2
TG 31010	Alabama Link
TG 31011	Gulf Coast DMR
TG 31012	QuadNet
TG 31013	ALERT-K4NWS
TG 31014	HSV
TG 31015	Central Alabama
TG 31016	NW Alabama
TG 31017	Alabama East
TG 31019	Alabama TAC
TG 31021	AK Contesting
TG 31040	AZ EmComm
TG 31041	Arizona TAC
TG 31051	ARWX
TG 31055	NC Arkansas
TG 31058	NW Arkansas
TG 31060	PVARC
TG 31061	Cal 1
TG 31062	Mountain West
TG 31063	Mtn West 1
TG 31064	Santa Clara County
TG 31066	SoCal
TG 31067	SoCal 1
TG 31068	NorCal
TG 31069	NorCal 1
TG 31070	VCDRC
TG 31072	California TAC
TG 31073	SBARC
TG 31075	BayNet
TG 31076	CDM
TG 31077	PAPA Chat
TG 31078	PAPA Bridge
TG 31079	Alert Radio
TG 31080	Colorado Chat
TG 31082	Colorado-Link
TG 31083	CO Severe WX
TG 31084	NOCO Mountain FR
TG 31085	SkiCountryARC
TG 31086	Western Colorado
TG 31088	Colorado HD
TG 31089	Hytera USA
TG 31090	Connecticut TAC
TG 31092	Connecticut Chat
TG 31093	PVRA
TG 31094	CDRA
TG 31100	Delaware TAC
TG 31120	TAC- Florida
TG 31121	First Coast DMR
TG 31122	WC Florida
TG 31123	Treasure Coast
TG 31124	South-East-Florida
TG 31125	Disney
TG 31127	FL State ARES
TG 31128	NE FL ARES
TG 31130	Georgia ARES
TG 31131	Atlanta Metro
TG 31132	South Georgia
TG 31133	SETN NWGA
TG 31134	North Georgia
TG 31135	Central GA
TG 31136	Southwest GA
TG 31137	KingsLand Digital
TG 31139	Georgia Skywarn
TG 31150	Hawaii 2
TG 31151	Maui County
TG 31152	Honolulu County
TG 31153	Hawaii County
TG 31154	Kauai County
TG 31158	HMASN
TG 31159	Hawaii DEM
TG 31160	ARES Idaho
TG 31161	ARES ID N
TG 31162	ARES ID CENTRAL
TG 31164	ARES ID SE
TG 31165	ARES ID SW
TG 31166	TC ID ARES
TG 31167	Southeastern Idaho
TG 31170	Round Lake Area
TG 31171	Illinois Link
TG 31172	CHI-NET

Brandmeister Talk Groups

TG 31173	N Ill EComm
TG 31174	ECntrl Ill WxOps
TG 31175	NA Astronomy
TG 31176	Chi Metro
TG 31177	East Central IL
TG 31178	WXCTAC
TG 31179	Woodford County IL ARES
TG 31180	Indiana TAC
TG 31181	Indiana Link
TG 31183	Indiana WX Ops
TG 31184	Parke-Vermillion CO
TG 31188	SIN
TG 31189	Crossroads Statewide
TG 31190	Iowa Chat
TG 31191	IA DSM 1
TG 31193	IA NW 3
TG 31194	IA SW 4
TG 31195	IA SE 5
TG 31196	IA CID 6
TG 31197	WCARES
TG 31198	NWS DVN
TG 31199	NWS DMX/SEOC
TG 31200	Ks Sw ARES
TG 31201	BYRG
TG 31203	KansasLink
TG 31204	Central Kansas
TG 31205	KC Skywarn
TG 31206	Cen Ks Skywarn
TG 31208	WY CO RACES
TG 31209	WY CO CERT
TG 31211	KY ARES Statewide
TG 31212	NE KY WX Spotters
TG 31213	East Kentucky
TG 31214	Kentucky TAC
TG 31220	Louisiana Chat
TG 31222	LA AUXCOMM
TG 31225	Southeast Louisiana
TG 31226	Gulf Coast Link System
TG 31229	ArkLaTex
TG 31240	RC CGR DST
TG 31242	MD TAC
TG 31250	Massachusetts TAC
TG 31251	Metro Boston
TG 31252	Berkshire County
TG 31254	XRF054 C
TG 31255	HCRA
TG 31257	NEARC
TG 31260	Michigan WX ARES EmComm
TG 31261	Mi5-STATEWIDE1
TG 31262	Mi5-STATEWIDE2
TG 31263	Mi5-EVENT1
TG 31265	Mi5-EVENT3
TG 31267	West Michigan
TG 31268	UP of Michigan
TG 31269	WMTG
TG 31270	Minnesota TAC
TG 31271	CMNDMR
TG 31272	Minn Metro
TG 31273	Northstar DMR
TG 31274	AARG
TG 31275	Southern MN
TG 31280	Mississippi TAC
TG 31281	XRF813 A
TG 31285	NorthEast MS
TG 31290	Missouri ARES
TG 31291	SWMO
TG 31292	STL Metro
TG 31293	Branson Area
TG 31294	NW Missouri
TG 31295	SE Missouri
TG 31296	Central Missouri
TG 31297	SW MO SkyWarn
TG 31298	KCN ARES
TG 31299	CASS County ARES
TG 31300	Montana Chat
TG 31301	MPRG
TG 31302	MPRG 2
TG 31303	BGV
TG 31304	NW7RG-USA
TG 31305	Bitterroot Valley
TG 31310	Nebraska EmComm
TG 31311	Nebraska_Hub
TG 31319	Nebraska Chat
TG 31320	NV TAC
TG 31321	NV 1
TG 31322	NV ARES
TG 31323	ENARS
TG 31324	NV4
TG 31325	HXO
TG 31326	Burning Man
TG 31327	Las Vegas
TG 31328	SNARS (Reno/Tahoe)
TG 31329	SNARS 2
TG 31330	EmComm
TG 31340	CNJHAM
TG 31341	South Jersey
TG 31342	North Jersey
TG 31343	New Jersey TAC
TG 31349	N2MO OMARC
TG 31350	NM Chat / TAC
TG 31360	NY-NJ-PA TriState
TG 31361	Upstate NY
TG 31362	NY-Metro
TG 31363	ADK
TG 31364	Lower Hudson Valley
TG 31365	K2MAK
TG 31366	NY METRO ARES
TG 31367	Southern Tier NY
TG 31368	Mid-Hudson Valley
TG 31369	Monroe County
TG 31370	NC TAC
TG 31371	Triangle, NC
TG 31373	Eastern NC
TG 31374	Carolina Link
TG 31375	The Hornet's Nest
TG 31376	WNC TacComm
TG 31377	Outer Banks
TG 31378	NC Weather
TG 31390	Ohio TAC
TG 31391	NorthEast Ohio
TG 31392	Central OH WX
TG 31393	SouthEast Ohio
TG 31394	SW Ohio
TG 31395	ARES
TG 31396	W8SDR DMR
TG 31398	EMCOMM
TG 31399	Ohio-Link-YSF
TG 31400	OK TAC
TG 31401	OK Central
TG 31402	OK East
TG 31403	YSF Oklahoma Link
TG 31404	SE OK EM TAC
TG 31408	Oklahoma WX
TG 31410	Oregon TAC
TG 31411	Central Oregon
TG 31419	RepeaterBook
TG 31420	PEMA EmComm RACES
TG 31421	PA Tac (Inside State Communications)
TG 31422	Western PA
TG 31423	North-Central PA
TG 31424	North East PA
TG 31425	PA Cross-mode
TG 31427	Tri-County
TG 31428	RF-IT
TG 31429	Zednet
TG 31441	Rhode Island Chat
TG 31444	Rhode Island Digital Link
TG 31445	Quahog Repeater Network
TG 31450	SC ARES
TG 31451	SC TAC
TG 31456	Low Country
TG 31457	Upstate
TG 31458	Midlands
TG 31459	Pee Dee, SC
TG 31460	SD ARES
TG 31466	SD Digital Hub
TG 31471	NWS Memphis
TG 31472	TN Skywarn MTEARS
TG 31473	Knox-Metro area
TG 31474	Fusion-Link
TG 31475	Tennessee TAC
TG 31478	TEMA
TG 31480	TX Chat
TG 31481	North Texas
TG 31482	South Texas
TG 31483	West Texas
TG 31484	SouthEast Texas
TG 31487	TX ARES EmComm
TG 31488	Central Texas
TG 31489	Texas TAC
TG 31490	76ers
TG 31491	Northern Utah
TG 31492	Davis Utah
TG 31499	Utah TAC
TG 31500	Vermont TAC
TG 31510	VA TAC
TG 31511	Richmond Metro
TG 31512	ARES Emcomm
TG 31513	Southwest Virginia
TG 31514	Shenandoah Valley
TG 31515	Tidewater VA
TG 31516	VA PENINSULA
TG 31530	PNW-West
TG 31531	Olympic Peninsula
TG 31538	Washington State ARES
TG 31539	Washington State ARES TAC
TG 31540	West Virginia TAC
TG 31550	Wisconsin TAC
TG 31551	WI--Fusion
TG 31555	WI-DMR
TG 31556	WI Ares/Emcomm
TG 31560	SE Wyoming chat
TG 31561	Wyoming Tac
TG 31563	Wyoming Severe WX
TG 31564	SW Wyoming
TG 31565	NW Wyoming
TG 31566	NE Wyoming
TG 31567	Central Wyoming

Brandmeister Talk Groups

TG 31600	USA - Area 0
TG 31601	USA - Area 1
TG 31602	USA - Area 2
TG 31603	USA - Area 3
TG 31604	USA - Area 4
TG 31605	USA - Area 5
TG 31606	USA - Area 6
TG 31607	USA - Area 7
TG 31608	USA - Area 8
TG 31609	USA - Area 9
TG 31619	CRTS
TG 31620	Kings of Digital
TG 31621	HRCC
TG 31622	South East FL
TG 31623	Public Safety Chat
TG 31629	SwiNe
TG 31630	STEM
TG 31631	Chicago Star
TG 31648	Billy Bob's Amateur Radio Klub
TG 31650	SDFARC
TG 31652	RVing Hams
TG 31653	KC2RC WIRESX
TG 31654	4SQRP
TG 31655	Venture Overland
TG 31656	America-Link
TG 31660	Ocean County NJ
TG 31661	OMIK
TG 31662	LIMARC
TG 31663	Truck-N-Travel
TG 31664	Nature Coast
TG 31665	DMR Campfire
TG 31666	DMR of Anarchy
TG 31667	Old Friends
TG 31668	Sta-Mar
TG 31670	Florida Gulf Coast
TG 31671	Youth ARC
TG 31672	PI-Star Chat
TG 31673	R5AUXCOMM
TG 31674	Maritime Radio Historical Society
TG 31675	REF020A Bridge
TG 31676	Allstar 46031/Wires-X
TG 31677	OEI Repeater Group
TG 31678	Catawba Valley DMR
TG 31679	BlindHamsgroup.io
TG 31681	Search and Rescue USA
TG 31682	Search and Rescue TAC1
TG 31683	C.A.R.E.S.
TG 31684	San Francisco Bay Area
TG 31685	Skywarn Licking County Oh
TG 31686	Metropolitan Amateur Repeater System
TG 31688	Ham Shack Hotline
TG 31689	FDMRCCU
TG 31694	Maritime Radio Historical Society 2
TG 31697	Russian Americans
TG 31699	Greek Americans
TG 31700	CRRG DMR
TG 31707	Sonoma County
TG 31771	PNWR
TG 31773	Geeks in Jeeps
TG 31774	Weather Watching
TG 31775	PINOYHAMS
TG 31777	DX-LINK SYSTEM
TG 31801	The Gathering Spot
TG 31820	K2DMR
TG 31821	Jefferson State
TG 31900	900 Mhz Repeaters
TG 31933	Rizal Latitude
TG 31990	Handi-Hams
TG 33010	Distrito Ponce
TG 33011	Distrito San Juan
TG 33016	Alpha & Omega Tech Group
TG 33017	PRnet
TG 33020	Western PR English
TG 33033	KP3AV Systems
TG 33057	Puerto Rico D-ZONE
TG 37022	RDNet
TG 37030	Skynet NO BRIDGING!!!
TG 37040	DMR DOMINICAN RE-PUBLIC
TG 40407	Kerala
TG 40430	New Delhi
TG 42201	Muscat
TG 44155	shounanYSF
TG 46001	National Multi mode
TG 46007	China 7 区
TG 46600	Taiwan 全
TG 46609	HAMTalk Club
TG 46610	Taiwan CTARL
TG 50210	MY Wires-X YSF Bridge
TG 50297	JOTA Malaysia
TG 50298	JOTA Malaysia
TG 50501	XLX389A
TG 50503	XLX389C
TG 50510	XLX510 D
TG 50521	IARS Chat
TG 50525	P25 50525 Bridge
TG 50526	CCARC
TG 50531	VK3 Chat 1
TG 50533	S.P.A.R.C
TG 50539	NEX-GEN
TG 50566	WICEN
TG 50590	VK2HK-2-ROOM Wires-X
TG 50591	VK2GP-ND wires-x
TG 50592	VK3KAY-ROOM wires-x
TG 50593	XRF740 C
TG 50594	VK2RFG-ROOM
TG 51518	DX1ARM
TG 51525	SCAN I
TG 51546	SCAN I
TG 51569	BADMG
TG 52001	NBTC (HS0AB)
TG 52002	RAST (HS0AC)
TG 52008	DTDXA
TG 52009	Thailand Emergency
TG 53020	XLX626A
TG 53021	IFROAR
TG 53029	XLX299X
TG 53050	XLX751
TG 53060	Taupo ARC NZART
TG 53099	XLX750
TG 70403	Guatemala Evento Especial
TG 70404	Guatemala Area 4
TG 70405	Guatemala Area 5
TG 70406	Guatemala Area 6
TG 70407	Guatemala Area 7
TG 70408	Guatemala Area 8
TG 70409	Guatemala Area 9
TG 71200	CRLinkHub
TG 73090	CE3SER Coordination
TG 73099	Chile Link
TG 73203	Colombia Digi-Link
TG 73257	Colombia-Links
TG 74801	Montevideo
TG 74802	Montevideo
TG 74803	Artigas
TG 74804	Canelones
TG 74805	Cerro Largo
TG 74806	Colonia
TG 74807	Durazno
TG 74808	Flores
TG 74809	Florida
TG 74810	Lavalleja
TG 74811	Maldonado
TG 74812	Paysandú
TG 74813	R Negro
TG 74814	Rivera
TG 74815	Rocha
TG 74816	Salto
TG 74817	San José
TG 74818	Soriano
TG 74819	Tacuaremb'
TG 74820	Treinta y Tres
TG 74830	CX TAC 1
TG 74840	CX TAC 2
TG 91665	Marines RNLMC
TG 95150	Global NorCal 5150
TG 97911	Red Américas EMCOM
TG 98001	WWARG
TG 98002	HamFurs
TG 98003	Reddit
TG 98004	W8IRC IRC Chat
TG 98005	SBE
TG 98006	AMSAT
TG 98007	IECRO
TG 98008	Military Veterans
TG 98009	World Events
TG 98010	DX Explorers
TG 98011	FT8DMC
TG 98012	LBGTQ
TG 98229	Sicily FREE
TG 98638	WVNET
TG 98977	OpenGD77
TG 202011	DV4 Chat
TG 202012	DMO Chat
TG 202020	Hellenic RoIP
TG 202030	Greek QSO net
TG 202199	HAREN
TG 204907	JOTA NL CQ
TG 204911	EmComm NL
TG 208003	RPT Fontenay JN18kq
TG 208647	Reunion Island
TG 208963	RPT Capelle L.G. JO11ea
TG 214012	Galicia
TG 214112	Emergencias
TG 222001	TAC1-ITA
TG 222002	TAC2-ITA
TG 222003	TAC3-ITA
TG 222004	TAC4-ITA
TG 222005	TAC5-ITA
TG 222006	TAC6-ITA
TG 222007	TAC7-ITA
TG 222008	TAC8-ITA
TG 222009	TAC9-ITA
TG 222010	TAC10-ITA
TG 222030	Cluster Brescia

Brandmeister Talk Groups

TG 222112	Emergenza-112
TG 222907	JOTA IT
TG 222990	Special Activation
TG 226112	YO EMCOMM 112
TG 226123	YO QSO PARTY
TG 226777	CafeGratis Arges
TG 228111	Room Verbier
TG 235907	JOTA UK
TG 240240	DCS010B
TG 240888	SM Openspot
TG 240907	JOTA SE
TG 250011	Russia / Ukhta
TG 250014	Russia / Khabarovsk
TG 250021	Russia / Cheboksary
TG 250024	Russia / Krasnoyarsk Region
TG 250029	Russia / Arkhangelsk region
TG 250030	Russia / Astrakhan'
TG 250043	Russia / Kirov
TG 250051	Russia / Murmansk region
TG 250052	Russia / Nizhniy Novgorod
TG 250071	Russia / Tula
TG 250111	Russia / SmokingRoom
TG 250112	Radio Amateur Rescue Service
TG 250116	Russia / Kazan
TG 250163	Russia / Samara
TG 250212	Russia / Joshkar-Ola (Mari El)
TG 250246	Russia / Ramenskoe
TG 250250	Motorola users RF
TG 250351	Russia / Chelyabinsk
TG 250500	Russia / Rostov-on-Don
TG 250600	Russia / Ivanovo
TG 250601	Russia / Tarko-Sale / RT9K
TG 250602	Russia / Tarko-Sale / RT9K / Emergency
TG 250603	Russia / Moscow / UA3AAT
TG 250604	Russia / Moscow / ICS
TG 250605	Russia / Ekaterinburg (1)
TG 250606	Russia / Chekhov
TG 250607	Russia / Verkhnaya Pyshma
TG 250608	Russia / Sochi
TG 250609	Russia / Syktyvkar
TG 250610	Russia / Vladivostok
TG 250611	Russia / Moscow / RD3ANL
TG 250612	Russia / Omsk
TG 250614	Russia / Domodedovo
TG 250615	Russia / Podolsk
TG 250616	Russia / Rostov Region
TG 250617	Russia / Caucasus
TG 250618	Russia / Moscow / R2AZW
TG 250619	Russia / Volgodonsk
TG 250620	Russia / Moscow / R2AJV
TG 250621	Russia / Moscow
TG 250622	Russia / Krasnoyarsk (1)
TG 250624	Russia / Mozhaysk
TG 250625	Russia / Krasnogorsk
TG 250626	Russia / Narofominsk
TG 250627	Russia / Krasnodar
TG 250628	Russia / Egorievsk
TG 250629	Russia / Orel
TG 250630	Russia / Sergiev Posad
TG 250631	Russia / Uglich
TG 250632	Russia / Syberia and Far East
TG 250633	Russia / Ufa
TG 250634	Russia / Kurganinsk
TG 250635	Russia / Irkutsk, Chita
TG 250636	Russia / Sarov
TG 250637	Russia / Tver
TG 250638	Russia / Crimea
TG 250639	Russia / Far East
TG 250640	Russia / Maikop
TG 250641	RuDiVo (Russia)
TG 250642	Russia / Snezhinsk
TG 250643	Russia / Yaroslavl region
TG 250644	Russia / Novosibirsk
TG 250645	Russia / Mytischi
TG 250646	Russia / Veliky Novgorod
TG 250647	Russia / DMR Technical Group
TG 250648	Russia / Belgorod
TG 250649	Russia / Shakhty
TG 250650	Russia / Voronezh
TG 250651	Russia / Tyumen
TG 250652	Russia / Ulan-ude
TG 250653	Russia / Stupino
TG 250654	Russia / Shatura
TG 250655	Russia / Obninsk
TG 250656	Russia / Altai region
TG 250657	Russia / Balabanovo
TG 250658	Russia / Izhevsk
TG 250659	Russia / Ryazan
TG 250660	Russia / local R2AWN
TG 250661	Russia / Liza Alert Resque Team
TG 250663	Russia / Zelenograd (Moscow)
TG 250707	Russia / Sevastopol
TG 250775	Russia / Kaliningrad-2
TG 250777	Russia / Kaliningrad
TG 250812	Russia / Saint Petersburg
TG 250813	Russia / SPBR7
TG 250888	Russia / Shumerlya
TG 250907	JOTA RU
TG 260014	Poland Tech
TG 260015	SP EmCom
TG 260019	Homebrew testing
TG 260041	DstarLinkXLX132G
TG 260042	WiresX Link
TG 260112	Szczecin
TG 260460	Elblag
TG 260947	Scout Radio
TG 262339	Hannover-XLink
TG 262810	Pegasus-Projekt
TG 262826	DM0QN
TG 262841	Region Ingolstadt
TG 262872	Amberg
TG 263112	HiOrg-Talk EmComm
TG 263113	(Un)Wetter Netz
TG 263301	Bahnfreunde
TG 263333	Twitterrunde
TG 264555	IG HamSpirit
TG 268112	EmComm PT
TG 268117	Emergencia 117
TG 268901	Oporto group
TG 268902	R. A. T. A.
TG 268903	ARAT Club
TG 268907	JOTA PT
TG 268911	PT Hotspot(1)
TG 268912	PT DSTAR<>DMR
TG 268913	PT DMR<>Fusion
TG 268914	PT DMR<>CS5LART
TG 268915	PT Hotspot(2)
TG 268916	YSF BR
TG 268940	XRF040 A
TG 268941	XRF040 B
TG 268942	XRF789 B
TG 268945	XLX766 D
TG 268950	XLX950 E
TG 272907	JOTA IRL
TG 283001	Armenia Global
TG 284112	EmComm BG
TG 284359	XLX359B
TG 286112	AFET ACIL DURUM
TG 310799	WNYFLDMR
TG 310877	FVMKC/W3ZIC
TG 310997	Parrot
TG 311037	BRARA SE-FL
TG 311416	SACValley
TG 311433	BAYAREA-DMR
TG 311573	Flower City
TG 311584	SCPA Chat
TG 311662	UORRT
TG 311678	HSCAREN
TG 311898	Genesee Valley
TG 311899	Central IL SKYWARN
TG 311953	VARG
TG 311995	SW-LA
TG 312130	IARPN
TG 312186	SCARC
TG 313444	Elizabeth Schools
TG 314215	PADMR Local
TG 330013	IslaComm DMR Rpts
TG 330911	Emergencia
TG 460666	CHINA SUIZHOU AR
TG 505999	XLX626B&NZXLXYSF
TG 530999	XLX626A&YSF
TG 647647	Reunion Island
TG 714911	EMERGENCIA PMA
TG 724942	XLX-YSF 724
TG 724943	XRF724 C
TG 724949	Wires-X BR
TG 724952	YSF 722
TG 730911	EMCOMM Chile
TG 732911	HK EMMCOMM
TG 2049125	PI2NOS
TG 2049881	XRF088 A
TG 2049882	XRF088 B
TG 2080332	France/DCS033C 16
TG 2080673	France/XRF067C 17
TG 2709112	LX EMCOMM
TG 5059742	XRF740 C

Phoenix Network Talk Groups and Links

SLOT 1	SLOT 2	HOTSPOT ACCESS	INTERLINK	NAME
TG1	- - -	YES	- - -	WORLD WIDE (CALLING)
TG2	- - -	YES	- - -	EUROPE (CALLING)
TG9	- - -	- - -	- - -	LOCAL (SECONDARY)
TG13	- - -	YES	- - -	WORLD WIDE ENGLISH (CALLING)
TG80	- - -	YES	FREEDMR	UK WIDE - USER ACTIVATED 1
TG81	- - -	YES	FREEDMR	UK WIDE - USER ACTIVATED 2
TG82	- - -	YES	FREEDMR	UK WIDE - USER ACTIVATED 3
TG83	- - -	YES	FREEDMR	UK WIDE - USER ACTIVATED 4
TG84	- - -	YES	FREEDMR	UK WIDE - USER ACTIVATED 5
TG113	- - -	YES	- - -	WORLD WIDE ENGLISH - USER ACTIVATED 1
TG119	- - -	YES	- - -	WORLD WIDE - USER ACTIVATED 1
TG123	- - -	YES	- - -	WORLD WIDE ENGLISH - USER ACTIVATED 2
TG129	- - -	YES	- - -	WORLD WIDE - USER ACTIVATED 2
TG23426	- - -	YES	FREESTAR	WORLD WIDE - USER ACTIVATED
TG235	- - -	YES	FREEDMR	UK WIDE (CALLING)
TG2350	- - -	YES	BM UK	UK WIDE (CALLING / USER ACTIVATED)
TG2351	- - -	YES	- - -	YSF CQ-UK WIRES-X (USER ACTIVATED)
TG23526	- - -	YES	- - -	HUBNET UK (USER ACTIVATED)
TG23531	- - -	YES	BM UK	RAYNET (USER ACTIVATED)
TG23550	- - -	YES	DVS	SCOTLAND CHAT (USER ACTIVATED)
- - -	TG8	- - -	- - -	SPECIAL LINK (NORTHERN IRELAND)
- - -	TG9	- - -	- - -	LOCAL (PRIMARY)
- - -	TG801	YES	FREEDMR	REGIONAL : SOUTH EAST ENGLAND
- - -	TG810	YES	FREEDMR	REGIONAL : SOUTH WEST ENGLAND
- - -	TG820	YES	FREEDMR	REGIONAL : NORTH WEST ENGLAND
- - -	TG830	YES	FREEDMR	REGIONAL : MIDLANDS
- - -	TG840	YES	FREEDMR	REGIONAL : EAST OF ENGLAND
- - -	TG841	YES	- - -	SPECIAL LINK (GB7AL, GB7CT, GB7DS , GB7MK , GB7ND, GB7WS)
- - -	TG842	YES	- - -	SPECIAL LINK (GB7CT, GB7EX, GB7HA)
- - -	TG850	YES	FREEDMR	REGIONAL : SCOTLAND + EXPERIMENTAL LINK TO XLX922-C SERVER
- - -	TG860	YES	FREEDMR	REGIONAL : NORTH EAST ENGLAND
- - -	TG870	YES	FREEDMR	REGIONAL : WALES & MARCHES
- - -	TG880	YES	FREEDMR	REGIONAL : NORTHERN IRELAND
- - -	TG9990	- - -	- - -	ECHO SERVER
- - -	TG23555	YES	DVS	DV SCOTLAND (USER ACTIVATED)
- - -	TG23556	YES	DVS	DV SCOTLAND (USER ACTIVATED)

DMR+ Talk Groups

TG 1 World-wide English
TG 2 Europe English
TG 3 North-America English
TG 4 Asia English
TG 5 Oceania English
TG 6 D-STAR Bridge
TG 7 C4FM Bridge
TG 8 Regional
TG 9 Local/Reflector
TG 10 WW German German
TG 11 WW French French
TG 12 WW Dutch/flemish Dutch
TG 13 WW English English
TG 14 WW Spanish Spanish
TG 15 WW Portuguese Portuguese
TG 16 WW Italian Italian
TG 17 WW Nordic Nordic
TG 18 WW Russian Russian
TG 19 WW Polish Polish
TG 20 DEU-AUT-CHE German
TG 21 EU French French
TG 22 EU Dutch/flemish Dutch
TG 23 EU English English
TG 24 EU Spanish Spanish
TG 25 EU Portuguese Portuguese
TG 26 EU Italian Italian
TG 27 EU Nordic Nordic
TG 28 EU Russian Russian
TG 29 EU Polish Polish
TG 30 NA
TG 31 NA French French
TG 33 NA English English
TG 34 NA Spanish Spanish
TG 40 AS Mandarin Mandarin
TG 41 AS
TG 42 AS Hindi Hindi
TG 43 AS English English
TG 45 AS
TG 47 AS Arabic Arabic
TG 48 AS Russian Russian
TG 49 AS Cantonese Cantonese
TG 50 OC Mandarin Mandarin
TG 51 OC French French
TG 52 OC Dutch/flemish Dutch
TG 53 OC English English
TG 54 OC Spanish Spanish
TG 58 OC Indonesian Indonesian
TG 59 OC Cantonese Cantonese
TG 60 AF German German
TG 61 AF French French
TG 62 AF Dutch Dutch
TG 63 AF Englisch Arabic
TG 67 AF Arabic Arabic
TG 70 SA
TG 71 SA French French
TG 73 SA English English
TG 74 SA Spanish Spanish
TG 75 SA Portuguese Portuguese
TG 84 P25 Bridge
TG 85 NXDN Bridge
TG 86 D-STAR Bridge
TG 87 C4FM Bridge
TG 110 TAC German German
TG 111 TAC French French
TG 112 TAC Dutch/flemish Dutch
TG 113 TAC English English
TG 114 TAC Spanish Spanish
TG 115 TAC Portuguese Portuguese
TG 116 TAC Italian Italian
TG 117 TAC Nordic Nordic
TG 118 TAC Russian Russian
TG 119 TAC Polish Polish
TG 120 TAC German German
TG 121 TAC French French
TG 122 TAC Dutch/flemish Dutch
TG 123 TAC English English
TG 124 TAC Spanish Spanish
TG 125 TAC Portuguese Portuguese
TG 126 TAC Italian Italian
TG 127 TAC Nordic Nordic
TG 128 TAC Russian Russian
TG 129 TAC Polish Polish
TG 130 TAC German German
TG 131 TAC French French
TG 132 TAC Dutch/flemish Dutch
TG 133 TAC English English
TG 134 TAC Spanish Spanish
TG 135 TAC Portuguese Portuguese
TG 136 TAC Italian Italian
TG 137 TAC Nordic Nordic
TG 138 TAC Russian Russian
TG 139 TAC Polish Polish
TG 140 TAC German German
TG 141 TAC French French
TG 142 TAC Dutch/flemish Dutch
TG 143 TAC English English
TG 144 TAC Spanish Spanish
TG 145 TAC Portuguese Portuguese
TG 146 TAC Italian Italian
TG 147 TAC Nordic Nordic
TG 148 TAC Mandarin Mandarin
TG 149 TAC Polish Polish
TG 150 TAC German German
TG 151 TAC French French
TG 152 TAC Dutch/flemish Dutch
TG 153 TAC English English
TG 154 TAC Spanish Spanish
TG 155 TAC Portuguese Portuguese
TG 156 TAC Italian Italian
TG 157 TAC Nordic Nordic
TG 158 TAC Mandarin Mandarin
TG 159 TAC Polish Polish
TG 202 Greece Greek
TG 204 Netherlands Dutch
TG 206 Belgium Belgian
TG 208 France French
TG 214 Spain Spanish
TG 216 Hungary Hungarian
TG 219 Croatia Croatian
TG 220 Serbia Serbian
TG 222 Italy Italian
TG 226 Romania Rumanian
TG 228 Switzerland
TG 230 Czechia Czech
TG 232 Oesterreich German
TG 234 Isle Of Man UK English
TG 235 United Kingdom English
TG 238 Denmark Danish
TG 240 Sweden Swedish
TG 242 Norway Norwegian
TG 244 Finland Finnish
TG 250 Russia Russian
TG 259 Moldova Romanian
TG 260 Poland Polish
TG 262 Deutschland German
TG 263 OpenBridge DEU German
TG 268 Portugal Portuguese
TG 270 Luxembourg
TG 272 Ireland Irish
TG 280 Cyprus Greek
TG 284 Bulgaria Bulgarian
TG 286 Turkey Turkish
TG 293 Slovenia Slovenian
TG 294 North Macedonia Macedonian
TG 302 Canada English
TG 303 Canada English
TG 310 TAC English English
TG 311 TAC English English
TG 312 TAC English English
TG 313 TAC English English
TG 314 TAC English English
TG 315 TAC English English
TG 316 TAC English English
TG 317 TAC English English
TG 318 TAC English English
TG 319 TAC English English
TG 320 QuadNet-Array English
TG 321 Tech-Chat English
TG 330 Puerto Rico Spanish
TG 334 Mexico Spanish
TG 335 Mexico Spanish
TG 370 Dominican Republic Spanish
TG 401 Kazakhstan
TG 425 Israel Hebrew
TG 440 Japan Japanese
TG 441 Japan Japanese
TG 450 South Korea Korean
TG 454 Hong Kong Chinese
TG 502 Malaysia Malaysian
TG 505 Australia English
TG 530 New Zealand English
TG 537 Papua New Guinea
TG 541 Vanuatu
TG 542 Fiji
TG 604 Morocco Arabic
TG 647 French Indian Ocean TerriTG

DMR+ Talk Groups

655 South Africa
TG 704 Guatemala Spanish
TG 706 El Salvador Spanish
TG 708 Honduras Spanish
TG 716 Peru Spanish
TG 724 Brazil Portuguese
TG 725 Brazil Portuguese
TG 730 Chile Spanish
TG 734 Venezuela Spanish
TG 744 Paraguay Spanish
TG 748 Uruguay Spanish
TG 2321 OpenBridge OE1 German
TG 2322 OpenBridge OE2 German
TG 2323 OpenBridge OE3 German
TG 2324 OpenBridge OE4 German
TG 2325 OpenBridge OE5 German
TG 2326 OpenBridge OE6 German
TG 2327 OpenBridge OE7 German
TG 2328 OpenBridge OE8 German
TG 2329 OpenBridge OE9 German
TG 2620 OpenBridge ST-MV German
TG 2621 OpenBridge BE-BB German
TG 2622 OpenBridge HH-SH German
TG 2623 OpenBridge NI-HB German
TG 2624 OpenBridge NW German
TG 2625 OpenBridge RP-SL German
TG 2626 OpenBridge HE German
TG 2627 OpenBridge BW German
TG 2628 OpenBridge BY German
TG 2629 OpenBridge SN-TH German
TG 5055 GPS Home Gps
TG 5056 GPS Camping Gps
TG 5057 GPS Portable Gps
TG 5058 GPS Boat Gps
TG 5059 GPS Mobile Gps
TG 9050 GPS Fixed Gps
TG 9055 GPS Home Gps
TG 9056 GPS Camping Gps
TG 9057 GPS Portable Gps
TG 9058 GPS Boat Gps
TG 9059 GPS Mobile Gps
TG 9066 DAPNET-Message Text
TG 9071 Jamboree On The Air
TG 9072 Jamboree On The Air
TG 9073 Jamboree On The Air
TG 9074 Jamboree On The Air
TG 9075 Jamboree On The Air
TG 9076 Jamboree On The Air
TG 9077 Jamboree On The Air
TG 9078 Jamboree On The Air
TG 9112 EMCOM English
TG 9990 Echo-Test
TG 232999 GPS Mobile Gps
TG 262999 GPS Mobile Gps

Talk Group Programming Scratch pad

Channel #	Contact Name	Call Type	Call ID	Call Receive Tone
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

Hytera