



FIVE AND NINE PLUS

THE OFFICIAL NEWSLETTER
OF THE
APPLEDORE AND DISTRICT
AMATEUR RADIO CLUB

Club Callsigns: G2FKO and GX2FKO
Web Site : www.adarc.co.uk

CLUB'S OFFICERS

President	Terry Adams	G4CHD
Chairman	Mike Wogden	G4KXQ
Vice Chairman	David Boyes	2E0KVJ
Secretary	John Lovell	G3JKL secretary@adarc.co.uk
Treasurer	Alan Fisher	2E0EUZ

Committee	Stephanie Ebbans	M1CVJ
	Ben Louder	2E0FTZ
	David Harris	2E0IXX
QSL Manager	John Lovell	G3JKL
Web Master	John Lovell	G3JKL
Exam Secretary	John Lovell	G3JKL
Editor	Terry Adams	G4CHD terrywho35@gmail.com

July 2024

EDITORIAL

I'm delighted to announce that this month's Meeting on **July 15th** will be as follows :-

'DMR Repeater demonstration and video' by the North Devon Repeater Group



It will also be an ideal opportunity for any member contemplating offering a home for a Barnstaple area DMR Repeater to get first hand the answers to any questions they might have.

Terry (G4CHD)

LOCAL REPEATERS/GATEWAYS

Frequencies relate to **Repeater** and not your radio

GB3DN VHF FM/C4FM Repeater - Stibb Cross

Tone 77Hz (for analogue FM)

TX 145.6375 RX 145.0375

Keeper Tony G1BHM

Default Digital Connection : Wires-X Southern Fusion

<http://www.g0rql.co.uk/gb3dn.htm>

GB3ND UHF DMR Repeater - Holsworthy Beacon

TX 439.7375 RX 430.7375 colour code 1

Slot 1 local RF Slot 2 SW Cluster

Keeper Tony G1BHM

GB7FB UHF DMR Repeater - Bideford

TX 439.475 RX 430.4750 Colour code 5

Slot 1 Local RF/DoD Slot 2 SW Cluster

Keeper Drew M0MFS

GB3LZ VHF FM/C4FM Repeater - Winkleigh

Tone 77Hz (for analogue FM)

TX 145.6625 RX 145.0625

Digital Connection : Wires-X Southern Fusion - fixed

Keeper Simon G4MQQ

GB7LZ UHF DMR Repeater - Winkleigh

TX 430.9125 RX 438.5125 Colour code 1

Slot 1 DMR Southern Fusion Slot 2 Local/CQ UK/DoD

Keeper G4MQQ

The North Devon Repeater Group
will be at the Appledore and District Amateur Radio Club on the 15th July 2024

Subject: Short live demonstration of a Motorola DR3000 repeater (that powers ND, FB and BU)

Accompanying video

*With thanks to Mark G4SDR at the South West Cluster for allocating a test port for GB7NX



To facilitate the Demo, the Southwest Cluster guys have allocated a test port for GB7NX for use at the Appledore Club on the 15th

Many of us use local Repeaters such as GB3ND, GB7FB and GB3BU but like me have never seen just

how it all works so this month's Meeting will be a wonderful opportunity and many thanks to Rob (G0HFN) for organising everything.

MB6DT VHF Fusion Gateway - Barnstaple

Frequency 144.8125 MHz.
Gateway Keeper Darren (2E0LVC)
Operational

GB7TG - UHF DMR Repeater - Wembworthy

TX 430.9750 RX 438.5750 Colour Code 7
Default Connection : Slot 1 Local/DoD Slot 2 SW Cluster
Keeper G7SOJ

GB3NX VHF FM AllStar Repeater- Holsworthy Beacon

Tone 77Hz
Repeater TX 145.5875 RX 144.9875
Connection SW AllStar Network (SWAN)
Keeper G1BHM

GB3BU - UHF DMR Repeater - Bude

TX 430.9625 RX 438.5625 Colour Code 1
Default Connection : Slot 1 Local/DoD Slot 2 SW Cluster
Keeper G1BHM

CLUB MEETINGS

Meetings are held at the **Appledore Football Social Club** starting at 7.30pm for 8.00pm. Visitors always welcome. For further information, please contact the Secretary John. Presently, Meetings take the form of a general Natter Night over a cuppa, however once details are known of any talks etc, an announcement will appear in the Club Newsletter.

LOCAL NETS

Weekday Zepp FM Net: Mon/Tues/Thurs/Fri :
145.450MHz - 4pm - 5pm
Wed via GB3DN - 4pm - 5pm
Net Control : Len (M0SXY)

2m Elevenses FM Net: Mon/Wed/Fri :
11 - 12.00 noon via GB3DN
Net Control ; Mike (G3PGA)

Friday Night 2m Net: Friday : 145.450 FM, 8 - 9pm

Sunday Top Band Net: Sunday 1.860 MHz
9.30 - 10.15am
(LSB - 32W pep max)

2m SSB Nets: Wed: 8 - 9pm 144.260MHz
USB SSB (Vertical polarised)
Sun: approx 10.30am (follows
Top Band Net) 144.260MHz
USB SSB (Vertical polarised)

Sunday FM Net: Sunday: 11 to noon via GB3DN
Net Control : Chris (G0FJY)

Note :- FM Nets which use GB3DN as shown above will continue despite the recent changes. GB3DN is disconnected from the Wires-X/ Southern Fusion Room just before the listed start and end of each FM Net

REPORT ON OUR JUNE MEETING

This was a Natter Night and a chance to catch up over a cuppa. It's was also an opportunity to get advice/help problems you might have as other members are always eager to help.

DIGITAL RADIO - PERSONAL EXPERIENCE

Finally at the risk of boring you all to tears, I have written the following article on my personal experiences using the Fusion and DMR digital modes. I stress that this is just my findings and that I certainly do not profess to be an expert!

Enjoy the read

Terry (G4CHD)

MY PERSONAL FINDINGS OF USING DIGITAL MODES by Terry (G4CHD)

Over the last few months I have setup both Fusion and DMR digital mode radios and what follows are my personal general conclusions on using digital modes. This article is based upon using a Yaesu FT70DE for Fusion and the Retevis RT3S for DMR.

So why the desire to explore these digital modes? Well as I'm now 83 I wanted to try to get to grips with these digital systems whilst I still had the mental capacity to do the necessary research! Also, God forbid, I may one day end up in a Care Home where antennas are a big no no but would still want to be able to have QSOs with local and distant amateurs.

But 'this is not real radio' I hear many of you cry - well yes and no. Both Fusion and DMR use digital modulation which can be used for local Simplex QSOs with all the benefits of digital where reception is either 100% or not at all ie no scratchy signals as with analogue FM. However using digital modulation does enable long distance QSOs via the Internet which otherwise may for various reasons not be possible.



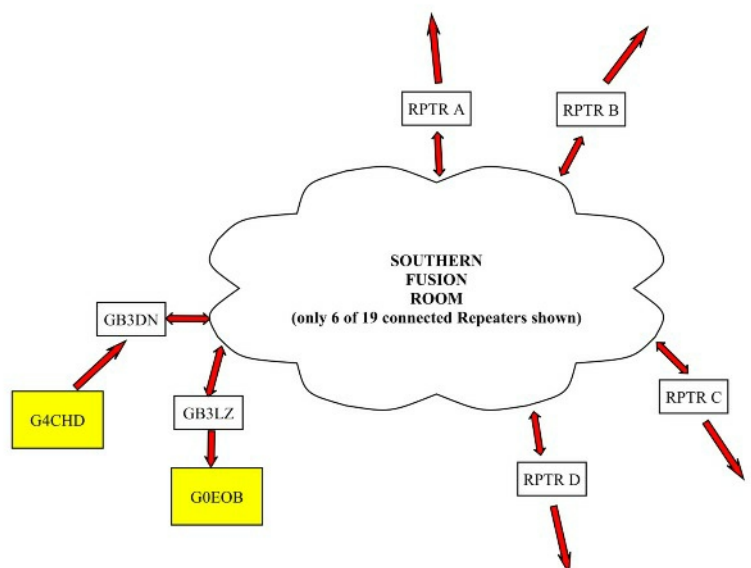
Why did I choose Fusion and DMR systems when there is also D Star? Basically it's because in North Devon we are lucky to have both a Fusion Repeater (GB3DN) at Stibb Cross and a Fusion Gateway (MB6DT) at Barnstaple together with a DMR Repeater (GB7FB) at Bideford, with others near Holsworthy. On the other hand, D Star is not so well served in our area. It is therefore possible from my QTH to access either a Fusion Repeater or Gateway or a DMR Repeater using just a Handheld radio.

Yaesu System Fusion (YSF)

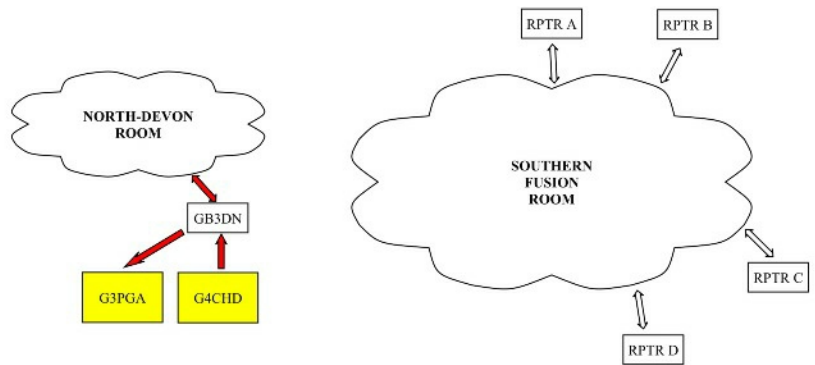
The assumption is that users of this system own Yaesu radios and therefore there is no requirement to register your callsign to get a personal ID number before using the system. All Fusion Repeaters and Gateways are however registered with Yaesu and given an individual ID number to form a single network of interconnected Repeaters/Gateways via the Internet controlled by a system called Wires X. However within this network of Fusion Repeaters/Gateways, there are sub-groups called Rooms eg Southern Fusion which consists of 19 linked Repeaters and CQ-UK which consists of approx 25 linked Repeaters plus many others.

Setting up a radio to use a Fusion Repeater or Gateway I found to be extremely easy and only required entry of the Repeater's frequencies and setting the radio mode to DN (Digital Narrow). There is also no need for a CTCSS tone. This will enable you to use the Repeater/Gateway in its present setup eg in the case of GB3DN, is by default connected to the Southern Fusion Room ie linked to 18 other Repeaters. This means that when you call into GB3DN (using DN modulation), not only is your signal retransmitted locally (just as with an Analogue FM Repeater) but it is also routed to and transmitted from every other Repeater connected within the Southern Fusion Room. This not only dramatically increases the geographical range of your signal (ie the whole of the South of England plus South Wales) but also greatly increases your chance of a reply. However any subsequent QSO via eg GB3DN is relayed to every other Repeater in this Room ie all 19 Repeaters are in use and thus tied up as shown in the diagram opposite.

This is why it is considered good practice to leave at least a 5 secs or more gap after each over to allow anyone else to either join in with your QSO or use their Repeater. This becomes even more important when using a very large Room eg with 50 or more Repeaters!



But what if you want to have a local QSO via eg GB3DN without tying up all the other 18 Repeaters in the Southern Fusion Room? The solution is to change the Room GB3DN is connected to from Southern Fusion to the North-Devon Room which has no other Repeaters connected to it as shown in the diagram opposite. This effectively disconnects GB3DN from Southern Fusion and it then acts in a similar way to when it is in analogue FM mode leaving Southern Fusion Room Repeaters to host a different QSO.



However to be able to change Rooms, you must connect to the Wires X system via GB3DN which then gives you the necessary rights to change Rooms. Note that only one person needs to change Rooms.

However, once the QSO is completed, it is considered again good practice to return GB3DN back to the Southern Fusion Room.

Finally, you may be wondering what is the difference between a Fusion Repeater and a Gateway. The answer lies in the fact that Repeaters are Duplex (ie effectively use two transceivers so they can receive AND transmit at the same time) whereas gateways are Simplex (ie only uses one transceiver so can either transmit OR receive but NOT both at the same time). Hence, unlike a Repeater, a Gateway can only feed a received signal onto the Internet and cannot simultaneously retransmit it locally. Hence if an amateur is transmitting into a Gateway and their signal is simultaneously heard by another local amateur, this can only be heard DIRECTLY and not by retransmission from the Gateway.

So to summarise, Fusion is a very easy system to setup. However, Yaesu Fusion radios are relatively more expensive than DMR radios - eg the FT70DE costs approx £170 whereas the RT3S costs approx £85. Note that the TyT MD-UV380 radio is effectively identical to the Retevis RT3S.

DMR

It is generally accepted that a DMR radio is more difficult to set up than a Fusion one and that is exactly what I found. However once setup, DMR does have some advantages over Fusion as I hopefully will be able to explain later in this article.

DMR was developed for the Commercial world for use in a relatively closed environment eg a Departmental Store etc and hence its use in the more open amateur world does cause some difficulties in getting your head around its use. The perhaps main difference and I think advantage, is that two QSOs can occur at the SAME time on any frequency. These are called Slot 1 and Slot 2. Furthermore, any transmission has embedded in it a Colour Code (numbers 1 to 15) which is similar to a CTCSS tone. Hence for two stations to communicate, each MUST use not only the same frequency, but also the same Slot and Colour Code. Finally, a Networked group of interconnected Repeaters is referred to as a TalkGroup (equivalent to a Fusion Room).

Ultimately your decision as to whether to use Fusion or DMR will come down to what local Repeaters there are in your area - in my case having GB7FB in Bideford was reason enough to delve into DMR.

In the case of GB7FB, it uses Colour Code 5 and Slot 2 is by default connected to the South West Cluster (SWC) TalkGroup (950) which has 20 networked DMR Repeaters stretching from the Lizard Peninsular to Bristol and Andover. Hence in a similar way to the way Rooms work in the Fusion system, any QSO via Slot 2 on GB7FB will be relayed to all other 19 Repeaters with all the advantages of increased geographical coverage and larger audience. However, if you wanted to have a local QSO using just GB7FB and not tying up all 20 Repeaters in the SWC, Slot 1 which can be used even if Slot 2 is busy, is connected to TalkGroup 9 which is similar to the North Devon Fusion Room in that your signal is NOT fed onto the Internet, but is just reradiated as RF locally. In this way, I could be working via Slot 1 with eg Mike G3PGA and at the same time, Fred G0EOB could be having a QSO with someone near the Lizard via Slot 2.

In the Fusion System, if you changed the Room GB3DN is connected to eg from Southern Fusion to CQ-UK then any other local amateur wanting to use GB3DN to contact a friend via Southern Fusion would have to wait until the QSO is finished and GB3DN reconnected to Southern Fusion.

In DMR, if you wanted to connect to a TalkGroup other than SWC, then on Slot 1 there is an option called Dial on Demand (DoD). This allows you to dial in the required TalkGroup number eg 23450 which is the Yorkshire Net TalkGroup and make a QSO whilst a different QSO is simultaneously taking place via the SWC on Slot 2. Of course upon completing the QSO, connecting to TalkGroup 4000 will effectively disconnect from eg Yorkshire Net returning Slot 1 back to Slot 9 for local QSOs. I found this very easy to do and quite reassuring that I was not tying up the Repeater completely and QSOs on Slot2 via the SWC are unaffected.

I have deliberately not gone into all the details of how to use DoD etc as it depends upon which make of DMR radio you are using.

Some DMR radios have a menu option called Roaming which enables a mobile station to automatically move between repeaters connected to the same TalkGroup (eg SWC) based on which repeater has the strongest signal which for /M operation must be very useful. Ultimately in a perfect world, you could drive from North Devon to Lands End and continue a QSO over the whole journey - not something I have tried as the RT3S doesn't support Roaming.

Finally, there is optional Firmware OpenGD77 for many DMR radios including the RT3S which I have not tried personally but many local amateurs have and claim it to be far better than the manufacturer's Firmware.

I hope this article has not bored you to tears, but perhaps for anyone tempted to give a digital mode a go, it may be enough to make you decide to try it. I certainly found all the effort well worth while and there are plenty of local amateurs who will be able to help. It hasn't lessened my preference to ragchew on 40m when it's open but it's reassuring to have alternatives.

As a final postscript, if anyone does feel tempted to try the RT3S or equivalent DMR radio, then I have written a step by step guide on how I set one up which anyone is welcome to - just let me know.

Terry (G4CHD)