



**LEICESTERSHIRE
REPEATER GROUP**

GB3CF

A repeater for the 21st Century

History

GB3CF first went on air in 1978 and has for the last 40 years provided (almost) un-interrupted service for amateur radio operators in Leicestershire and surrounding areas. In 2015/6 after discussion with members, it was decided to make 'CF' a dual-mode repeater by adding Yaesu System Fusion (C4FM) to the existing analogue service.

The path to getting "Fusion" working has not been a particularly easy one as it was decided that the Yaesu DR1-X repeater could not provide sufficient analogue service and apart from a few short 'test' activations in 2016, the idea was shelved while a more appropriate solution could be found.

The "new" GB3CF

In early 2018, we started to investigate suitable options for a replacement of the GB3CF repeater and in the intervening years, Jonathan G4KLX had made major strides with his "MMDVM" (Multi Mode Digital Voice Modem) which is a device which can be retro-fitted into an analogue repeater and provide multi-mode digital operation (currently DMR, D-Star, Fusion, P25 and NXDN modes are supported). Unfortunately, it has no native support for analogue and being aware that there are still a large number of users without access to digital radios, we were keen to maintain this.

A solution was found using the Svxlink analogue repeater package and the audio output is switched between the Svxlink and MMDVM outputs depending on whether CTCSS 77hz or digital modes are detected.

After discussion with the RSGB ETCC, it was decided that there should be no problem adding D-Star and NXDN modes to the existing NoV for GB3CF and this was applied for (and granted) in April 2018.

One of the benefits of the MMDVM eco-system is that there are many options for connectivity which is achieved via various additional programs, the current connectivity offered by GB3CF is:

- Access to DCSxxx reflectors via D-Star
- Access to XRFxxx (D-Extra) reflectors via D-Star
- Access to REFxxx (D-Plus) reflectors via D-Star
- Access to the YSF reflector network via Fusion
- Access to the Brandmeister DMR network via Fusion (YSF2DMR room)
- Access to the 13 NDXN 'test' reflectors and Parrot service on TG10

We will also add any other connectivity options as appropriate in the future, and welcome any suggestions from members.

The repeater is currently configured with a 30 second "hang time" this means that once a transmission is received in a particular mode, the repeater will not accept a transmission in a different mode until a 30 second timeout has elapsed. This was necessary to ensure that a user is able to complete a QSO in a specific mode.

The analogue side of GB3CF is currently disabled (other than on Sunday mornings for the GB2RS news broadcast) due to abuse but it is hoped that we can re-enable this and also provide Echolink connectivity once the levels of abuse have subsided.

Please see overleaf for usage instructions...

Accessing GB3CF via Digital Voice

If you already have a D-Star, Fusion or NXDN capable radio then you are probably aware of most of this but as we realise a large number of people may have never used the digital side of their radios, here is a quick introduction.

System Fusion

You can either add CF as a dedicated "Fusion" repeater to your radio or operate System Fusion using the same settings as you would use to access GB3CF in analogue mode. Once setup, all you need to do is press the "Dx" button multiple times until "DN" is displayed (instead of "FM") and transmit!

If you want to control which Reflector the repeater is connected to, press and hold the "Dx" button for 2 seconds. Sometimes if the repeater is busy in another mode, this may fail but once successful, you will be in the Wires-X menu. GB3CF cannot be directly connected to the Yaesu Wires-X network because it is not a Yaesu repeater but many of the same features are offered via the alternative YSF network.

Once you are connected to the network, you can select a Reflector (or Room in Yaesu speak) to connect via. There are many to choose from.

We have also added YSF2DMR capabilities which allows access to the Brandmeister DMR network over Fusion. This is accessed via the special Room called YSF2DMR. Changing DMR TalkGroup is not currently possible but this is a feature that we hope to add soon.



To access GB3CF in D-Star mode, you need to first add the repeater into your radios memory. The process is slightly different for each radio but you need the repeater call sign (RPT1) as **GB3CF__C** and the gateway call sign (RPT2) as **GB3CF__G**. If you use software to manage your repeater list, this should get added automatically. Frequencies etc. are the same as analogue mode.

Once you are successfully connected to the repeater (usually a high-pitched beep is returned after you transmit and a report from the repeater should appear in the radio display) you can try to connect to a reflector or issue other commands. All commands are sent in the "To" (UR) field and must be exactly 8 characters in length with spaces used to fill the gaps. DTMF equivalent commands will also work.

The Repeater Status command (**_ _ _ _ _ I**) is a useful one as if you send that command, the repeater will always respond with a voice message telling you the current linked reflector. Similarly Echo Test (**_ _ _ _ _ E**) can be used to check what your audio sounds like. These will usually already be programmed under the "Your Call Sign" section.

If you want to connect to a reflector, the reflector ID is also entered in the "To" field and the last character should be "L" (link). So to connect to slot M of the DCS005 reflector (Midlands region) you would enter "**DCS005ML**" and press the PTT. Once you release the PTT, the repeater should respond with a voice prompt saying "Linked To DCS005 M". If the connection failed, it will say "Not Linked".

Many of the reflectors also provide cross-mode operation from D-Star to DMR/Fusion. If you wish for your call sign to appear in reflector last-heard lists etc., send the command: "**VIS _ _ _ ON**" to the repeater to enable "visibility" across the network. Otherwise your call sign will appear as * * * * *

NXDNTM We have completed limited testing with NXDN, it is a narrowband mode using much the same technology as DMR but uses less bandwidth due to only having a single "timeslot". **Use RAN 4 (radio access number)**
Next Generation Digital Narrowband