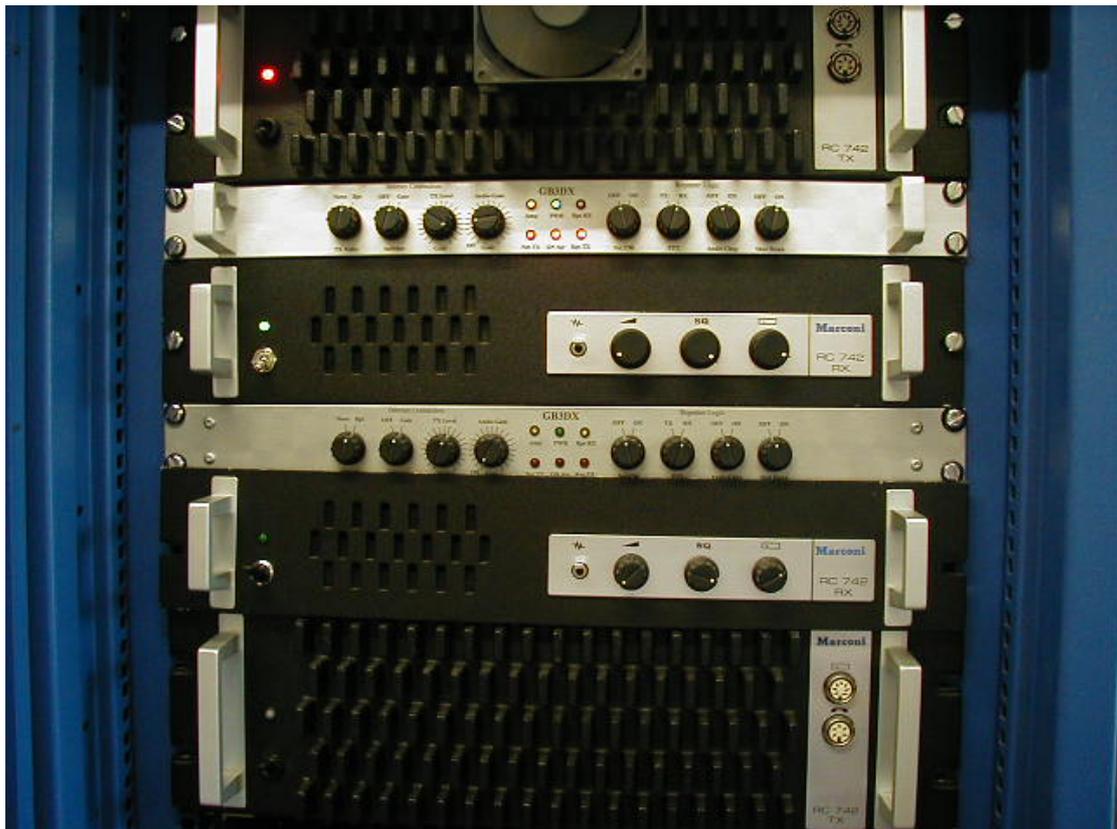# Birmingham Online Repeater Group

GB3DX

G4KQU – M0DZO – M0KQU – G8PWE – G4LCH

User Manual & Guide

Internet Linked repeater using EchoLink Node No. 7125

GB3DX New Marconi Transmitter & Receiver

www.gb3dx.com

GB3DX User Guide

GB3DX has established it self on the EchoLink system with node number 7125 and is well visited by many hundreds of radio amateurs from every part of the world via the internet and has become a meeting point on the EchoLink system for many amateurs. For more information on EchoLink visit there web site www.echolink.org

We have found there are a lot of new and old amateurs who are not sure how a repeater is used and with the added internet connection is a little confusing so we have put together some guidelines that are used on the GB3DX repeater that might help.

Stations have asked if they have to keep a log of all there contacts. Well if you are using RF than the answer is YES you do as normal rules and regulations are in place for that but if you connect to a node using your computer you do not have to keep a log of the contact. (I do, so I can remember who I have worked)

You will always find operators who will to give you advice in the true amateur fashion on the do's and don'ts of your local repeater so don't be afraid to ask as they were the same as you once. Remember that a lot of repeaters are 12.5k and that the audio needs to be set to narrow deviation.

Getting access to the repeater

To gain access to the GB3DX repeater when it is not in operation you provide a 1750Hz or a CTCSS tone set at 67Hz while transmitting and keep the transmitter on for 3 second this will open the repeater and when accessed you will hear a "K" (-.-) in Morse come back and a 2nd "K" 3 seconds later.

Once the repeater is open no other tone is required and it will stay open while it is in use.

The repeater will give a "K" the end of a transmission that lasts longer than 2 seconds and another "K" 3 seconds later. If you wait for the 2nd "K" each time its your over it will allow others to break in and give those who are on the internet a chance to be heard.

If there is transmissions coming from the internet an "I" (..) in Morse will be transmitted once you hear the "I" you can transmit back to that station.

The trick with internet repeaters is to leave a good gap of about 4 seconds between overs or wait for the 2nd "K" as this will enable all the links and repeaters in the chain to re set.

If you have no tone burst or CTCSS tone you could try whistling it up or you can wait for one of the repeater announcement as this will open the repeater for about 10 seconds before closing down again.

The repeater has a 5 minute time out where time out pips will be heard at the same time as the rag chewer

Remote Receivers

The Birmingham online repeater group have had permission from the RMC to use a remote receiver

A receiver has been installed at a remote site north of Birmingham in the Walsall area and is connected to an antenna such that signals can be adequately received within the present footprint. The remote site receiver is configured to activate only with a continuous subaudible tone – of different frequency to that of the main site receiver 71.9Hz. The main site receiver is configured to mute on decoding this subaudible tone but will activate normally when presented with a 67Hz subaudible tone (or 1750hz toneburst)

RF - Users instructions for remote receivers:

GB3DX has two receivers one for south Birmingham and the city centre and another for the East and North of Birmingham

The main receiver is located at Yardley in Birmingham and can be activated with a 1750 hz toneburst or a CTCSS of 67 Hz

The remote receiver in Walsall is activated with a 71.9Hz CTCSS – you may hear your own voice coming back to you at the end of the over- its via a link (This is normal).

The remote receiver in Solihull is activated with a 77Hz CTCSS – you may hear your own voice coming back to you at the end of the over- its via a link (This is normal).

Summary:

Abundant broadband connections have made secure Echolink links available to many radio amateurs. Handheld and low power mobile coverage will be vastly improved within the present Footprint of GB3DX.

If, after a trial, the link is a success possibilities will exist to make split site repeaters on 2m without use of the normal single antenna duplexing equipment.

Reduced Sensitivity

When the repeater is on reduced sensitivity (Due to local noise or lift conditions) instead of the normal "K" being returned for the RF user an "L" will be sent at the end of the transmission. You may find that it is beneficial to use one of the remote receivers when in this mode.

Suggested Linked Repeater Operating Procedures

Linked Repeater Operation

1. Where repeaters are linked, your transmissions will be heard on the output of all the linked Repeaters, Gateway Links and PC Users so the golden rule is to listen listen listen.
2. Operation of a linked repeater is the same as a normal repeater, except that the coverage is much greater.
3. **Please remember that using the DTMF tones to move your repeater can be heard through the repeater and it can be annoying to others so keep them to a minimum also give your callsign and a brief explanation of what you are doing.**
4. **If you do move the repeater with the DTMF tones and connect to other Repeaters / Links don't forget to disconnect the repeater using the # key.**
5. There is about a 4 second delay when working through the internet links so don't forget to leave a good gap between overs to enable others to break in.
6. Use simplex wherever possible freeing the repeater for necessary uses.
7. Monitor the repeater (listen) or determine if the repeater is in use, and if there are any peculiarities in its operation. After listening for a few seconds, identify, un key and listen to see if it was quiet for a reason, and to allow someone to let you know if there is a reason not to continue (low audio, low signal strength, etc). Then, if all OK, proceed.
8. Don't break into a contact unless you have something to add. Interrupting is no more polite on the air than it is in person. Interruption without identification constitutes malicious (and illegal) interference.
9. Use the minimum power to key up the repeater. To make contact, simply indicate that you are on frequency. For example "M1KQU monitoring". Do not kerchunk.
10. Remember amateur radio transmissions are being monitored by many non-hams with scanners. Watch your language and your manners. Please don't bring disrepute on the Amateur Radio Service.
11. Repeaters are intended to facilitate mobile and portable operation. During rush hours, base stations should relinquish the repeater to commuting mobiles. Some repeater owners have strict rules requiring this.
12. Keep transmissions short and thoughtful. Do not monopolise the repeater. Pause between transmissions to allow other amateurs to identify themselves if they wish to use the repeater. Pausing also allows the timer to reset, avoiding a "time-out"
13. Identify legally. In the UK that means at the beginning and end of a contact or every 15 minutes of operation.
14. Repeaters are installed and maintained at considerable expense and inconvenience. Regular users of a repeater should financially support the individual or club owner in their efforts to keep the repeater working properly.

The RSGB Repeater Management Committee web site is a very good and well worth a visit as it will give you all the information on UK repeaters coverage maps tones to be used frequencies and a lot more. www.coldal.org.uk

DTMF Functions

Please remember that using the DTMF tones can be heard through the repeater and it can be annoying to others so keep them to a minimum also give your callsign and a brief explanation of what you are doing.

If you do move a repeater with DTMF tones and connect to other Repeaters / Links don't forget to disconnect the repeater when you have finished.

There can about a 4 second delay when working through the internet links so don't forget to leave a good gap between overs to enable others to break in and connecting repeaters to reset.

Table Below of Suggested EchoLink UK Repeater Station Shortcuts. This idea originated from Jon G4TSN as its easy to remember a 3 figure number rather than some of the long node numbers.

The short cuts are used on GB3DX GB3AL GB3AM GB3IN GB3NK Repeaters

Repeater	Node	Description	Sysop	In Use	Shortcut
GB3AE-R	117405	Tenby	GW0WBQ		702
GB3AG-R	117931	Forfar, Angus	GM1CMF		714
GB3AH-R	126469	Dereham, Norfolk	G8PON		703
GB3AL-R	19063	Amersham, Buckinghamshire	G0RDI	*	704
GB3AM-R	4125	Amersham, Buckinghamshire	G0RDI	*	705
GB3BC-R	39300	Near Cardiff, Gwent	GW4ERA		720
GB3BN-R	1938	Bracknell, Berkshire	G4HLF		717
GB3DV-R	120618	South Yorkshire	G4LUE		716
GB3DX-R	7125	Birmingham	G4KQU	*	701
GB3EK-R	48360	Margate	G4TKR		706
GB3GN-R	19583	Aberdeen Scotland	GM1XEA		715
GB3HD-R	114580	Hudersfield, West Yorkshire	G1FYS		707
GB3HE-R	115293	Hastings	G4FET		708
GB3HH-R	97616	Buxton, Derbyshire	G4IHO		721
GB3IE-R	27871	Plymouth	G7DQC		709
GB3IN-R	98258	Huthwaite, Notts	G4TSN	*	710
GB3IR-R	1353	North Yorkshire	G4FZN		711
GB3LY-R	39437	Coleraine, Northern Ireland	GI3USS		712
GB3NK-R	54760	Erith, Kent	G4EGU	*	713
GB3OH-R	37878	Central Scotland	GMOMZB		722
GB3PA-R	22022	Langbank - West Scotland	GM7OAW		723
GB3PZ-R	2591	Manchester	G4ZPZ		718
GB3SB-R	116678	Scottish Borders	GM0FTJ		719
ENGLAND	7889	England Conference Server	G4LCH		

Check the GB3DX web site from time to time for updates www.gb3dx.com

The table below lists each of the common EchoLink DTMF commands.

Command	Description	Default
Connect	Connects to a station on the Internet, based on its node number.	num
Connect by Call	Connects to a station on the Internet, based on its callsign.	C+call+#
Random Node	Selects an available node (of any type) at random, and tries to connect to it.	00
Random Link	Selects an available link or repeater (-L or -R) at random, and tries to connect to it.	01
Random Conf	Selects a conference server at random, and tries to connect to it.	02
Random User	Selects an available single-user station at random, and tries to connect to it.	03
RandomFavNode	Selects an available node (of any type) at random from the Favorites List, and tries to connect to it.	001
RandomFavLink	Selects an available link or repeater (-L or -R) at random from the Favorites List, and tries to connect to it.	011
RandomFavConf	Selects a conference server at random from the Favorites List, and tries to connect to it.	021
RandomFavUser	Selects an available single-user station at random, and tries to connect to it.	031
Disconnect	Disconnects the station that is currently connected. If more than one station is connected, disconnects only the most-recently-connected station.	#
Disconnect All	Disconnects all stations.	##
Reconnect	Re-connects to the station that most recently disconnected.	09
Status	Announces the callsign of each station currently connected.	08
Link Down	Disables EchoLink (no connections can be established).	(none)
Link Up	Enables EchoLink.	(none)
Play Info	Plays a brief ID message.	*
Query by Call	Looks up a station by its callsign, and reads back its node number and status.	07+call+#
Query by Node	Looks up a station by its node number, and reads back its callsign and status.	06+num
Profile Select	Switches to a different stored set of configuration settings (0 through 9).	B#+num
K4TQR-R	Birmingham Alabama Repeater	AA

GB3DX web site www.gb3dx.co.uk
EchoLink web site www.echolink.org
eQSO web site www.eqso.org
IRLP web site www.irlp.net
RSGB RMC web site www.coldal.org.uk

Birmingham Online Repeater Group

GB3DX History

16th June 2004

Reduced Sensitivity Indicator
When the repeater is on reduced sensitivity (Due to local noise or lift conditions) instead of the normal "K" being returned for the RF user an "L" will be sent at the end of the transmission. You may find that it is beneficial to use one of the remote receivers when in this mode.

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5th June 2004

Permission to use a remote receive was given by the RMC

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1st June 2004

A total re vamp of the repeater has taken place over the past few weeks.

A larger cabinet has been obtained to house the repeater plus the backup systems

New 24 volt power supply and 12 volt supply fitted

New logic housed in a 1 U case with extra control functions added. The old logic unit has been re housed in a 1U case and the added extras fitted

Extra squelch functions added to both receivers

High and low RF sensitivity added which is controllable remotely

New circulator fitted (Old unit getting noisy)

Facility to enable the RSGB News to be played through the repeater

CW Indent gain reduced (Request by some users)

CW Indent tone changed to 800 Hz

Extra cooling for the transmitter

System health check

Update the EchoLink software to Ver. 1.9.890Link receiver link GB3DX-L Node number 188546 obtained

Remote link receiver installed in Walsall uses GB3DX-L on EchoLink 71.9Hz CTCSS

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27th March 2004

The repeater team was at it again this week end replacing the repaired antenna and fitting extra guide ropes to the mast. There is a noticeable difference in performance now as we are getting the full benefit from the antenna and the Cellflex LCF CU2Y that was fitted last week.

The repeater had a complete systems check of Transmitter - Receiver - Duplexers - Antenna & Feeder

TVI - BCI Checks were made and No interference problems were Identified

Marconi Transmitters RC 742 TX = 15 Watts

Marconi Receivers RC 742 RX = Sensitivity 0.2u Volt for 12 SINAD

The cavities RX & TX were also checked. 95db isolation with the Duplexers and 20 db in the circulator which gives a Total Isolation of 115db

The feeder "Cellflex LCF Cu2Y" and Watson Antenna Checked OK near perfect SWR 1.1 to 1

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26th March 2004

There had been some RF interference to the repeater that had been steadily getting worse. The RF Directional Finding team sprung into action to find where the interference was coming from.

There was 2 sources of interference found.

The first interference was located in a building close by (A Surgery) on the 2nd floor from a Phillips low energy light bulb that was left on 24/7. This produced a mains hum effect on the input of the repeater when the transmitter was in TX mode. A new low energy light bulb was purchased and the old bulb was replaced with a Osram Delux EL 20 watt type.

The second source of interference was found a in a house again on the 2nd floor from a Dell computer monitor. This produced a strong carrier on the input of the repeater. This was only there when transmitter was in TX mode. A new Packard Bell 15 inch monitor was purchased and given free to the owner of the computer system on the understanding that he would not use the old monitor again. (He was very happy with his new monitor.)

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19th March 2004

The coax which was Westflex that had been used on the repeater was replaced with Cellflex LCF CU2Y. This will give less loss and make a little improvement we hope.

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14th March 2004

High winds had a devastating effect with the repeater antenna. This happened while the GB3DX team were at the Wythall Radio Rally. We had a call to get another stronger inline coupling while at the rally. See the Photos HERE

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7th March 2004

You can now listen to the live audio that is being transmitted from the GB3DX Repeater thanks to the efforts of Mark G4LCH. See the web site page for more information.To Listen to Live Audio From GB3DX Click
HERE

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1st March 2004

Tests were made to see the feasibility of using a remote receiver in the Walsall area connected back to GB3DX. The test was very successful. Small hand held radios were used which could hear the repeater but not work through it due to there low power. When the remote receiver was activated the small small hand held radios gained access to the repeater with ease.

Further ongoing tests will take place.

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07th February 2004

GB3DX has had its new mast installed 40ft. Now it's at full height it should extend the range of the repeater. So far we have had good reports of increase signals form our RF users.

02nd February 2004

We have added an ***ENGLAND*** conference server on the EchoLink system with the node number of **7889**. this server has a 2 Meg ADSL connection provided By Mark G4LCH

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18rd January 2004

New update of EchoLink Version 1.8.874 (Beta Version) Installed
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03rd January 2004
We have now added *GB3DX* conference server on the EchoLink system the node number 160469. This will double the bandwidth allowing another 20 internet connections. Run by Steve M1KQU
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14th December 2003
Full system tune up and health check of Transmitter - Receiver - Duplexers - Antenna & Feeder

Main Transmitter RC 742 TX and Receiver RC 742 RX now in operation and back ups units in store.
TVI - BCI Checks were made and No interference problems were Identified
Marconi Transmitters RC 742 TX = 20 Watts
Marconi Receivers RC 742 RX = Sensitivity 0.2u Volt for 12 SINAD
The processed audio was adjusted and the original sound achieved as it was with the PYE equipment.
The cavities RX & TX were also re tuned. 95db isolation with the Duplexers and 20 db in the circulator which gives a Total Isolation of 115db
Coax and Watson Antenna Checked ok near perfect SWR 1.1 to 1
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9th December 2003
24 Volt 15 Amp Switch Mode Power Supply fitted
12 volt regulator fitted to the logic board so everything now uses 24 volt.
Clip on Filters have been fitted to all leads going into the logic compartment.
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1st December 2003
New Marconi Receiver RC 742 RX and Transmitter RC 742 TX has been Donated by Ian G8PWE who tuned them up and helped to install them.
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22nd November 2003
New DG834 ADSL Firewall Router Fitted
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2nd November 2003
New Packard Bell computer put on line.
1.3 Gig Pentium 4. Running Windows XP with the EchoLink software and all the associated programs that runs the repeater setup.
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11th October 2003
The Repeater had a full tune up.
The cavities RX & TX were also re tuned. 95db isolation with the Duplexers and 20 db in the circulator which gives a Total Isolation of 115db
TX Output Power 10W. This will be the maximum power used.
RX Sensitivity 0.5u Volt for 20db sinad
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5th October 2003
A new 4 pot Sinclair Duplexer Fitted (FP 20110 Mk3)
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28th August 2003
New EchoLink node number purchased New Node Number 7125
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14th July 2003
Another G8CUL logic built plus the internet connection units for audio fitted in spare 19 ins rack. The old unit now used as backup system.

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23rd June 2003
Repeater put onto single Antenna working. Circulator also fitted.

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18th June 2003
The Repeater had a full tune up.
The cavities RX & TX were also re tuned
RX (3 set) cavities 2db insertion loss with 80db attenuation
TX (3 set) cavities 0.8db insertion loss with 90db attenuation
TX Output Power 15W   RX Sensitivity -113db

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22nd May 2003
Tests were run using IRLP. The system run OK with the IRLP but it was found not to be as lively as the EchoLink that the repeater is connected to. We hope to be able to have both eQSO and EchoLink on at the same time with a cross link.

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20th March 2003
New transmitter and a new receiver were installed and the repeater is running at its full power now as the new receiver is quiet sensitive. The old TX and RX will be serviced and kept as backup in case of problems.
(Thank you Bill G3TZM for the TX &RX)

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18th March 2003
New version of EchoLink installed (Ver. 1.6.846). All the voice announcements have been switched on. If there is a problem some of the announcements they will be turned off.

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22nd February 2003
Repeater direct connection to the internet via EchoLink. Node Number 62872

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17th February 2003
System check. All OK no problems detected or reported. We have had good reports from stations using the repeater in the 1st week.

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10th February 2003
A little bit of tweaking was done due to harsh audio

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9th February 2003
The GB3DX Repeater was switched on.
Low power of 12 watts to be used while system is running in.
The 1st station to work through the repeater was Mark M0EQY

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8th February 2003
Tests were made for Interference TVI BCI. None were detected and final check was made before switch on day.
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1st to 8th February 2003
The logic board was completed by Amanda M0DZO also tune up of all the TX & RX. All was put in the cabinet and tested ready for the big switch on day
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29th January 2003
The Notice of Variation (NOV) received. and letter sent off to the local RA office and local RMC repeater manager informing them that the repeater would be operational on 9th February 2003
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24th January 2003
The Internet linking interface was built and mounted the cabinet
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5th January 2003
The Duplexers were tuned by John G8VIQ
RX 2db insertion loss with 80db attenuation
TX 0.8db insertion loss with 90db attenuation
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24th December 2002
The Internet linking interface was built and mounted in the cabinet. tests were made with a crosslink with eQSO and EchoLink. This was done to determine which system to have the repeater linked to.
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19th December 2002
Letter received from the RSGB informing us that the RA had moved the application for the repeater to the NFAP (Frequency Allocation Panel). The 19ins cabinet to house the repeater and duplexers was donated by Steve M1KQU and and all the units were fitted into the cabinet
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5th December 2002
The PYE transmitter T30FM and receiver R18FM was donated by Bill G3TZM
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30th November 2002
The set of 6 duplexers were built this month (Never Again). This was one of the hard parts of building the repeater. Lucky for me I had friends who had a lath and could silver solder. Thank you Peter & Mick.
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26th November 2002

The Radiocommunications Agency (RA) received the application for the repeater from the RMC and was submitted as part of the November 2002 batch.

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5th November 2002

The site clearance arrived from the RMC's proposals manager.

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27th October 2002

Repeater Logic ordered from G8CUL.

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13th October 2002

GB3DX Domain name was bought and web site built (The website you are looking at now). www.gb3dx.co.uk

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5th October 2002

The application form RA356 handed over to the RMC at there meeting for processing.

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28/29th September 2002

Many miles were covered by some of the local amateurs as a coverage map was made. 20 watts was the power used during the tests. Thank You All who took part.

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28th September 2002

The repeater antenna (Watson W300) Donated by Steve M1KQU was placed on the mast and feeders fitted ready for trials and use in the making of the coverage map.

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25th September 2002

A meeting was held with G4KQU M0DZO & M1KQU to select a Callsign, Frequency, Name for the group, Site for the repeater.
After checking with the available callsigns.The Callsign selected was GB3DX. This seemed to be a good name as the repeater was going to be internet linked and stations from all over the world would have access to the repeater via the internet making a very interesting system.
145.7125MHz / 145.1125MHz RV57 had been monitored for a few weeks and these frequencies seemed to be clear of any interference.
The name for the group was to be the Birmingham Online Repeater Group. (B.O.R.G.)
The site that was chosen was in the Yardley area 8K S.E. of Birmingham IO92CL.

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24th September 2002
The local RSGB repeater manager Bill G3TZM was approached for advice on what had to be done and what paper work was required to put on the repeater.

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23rd September 2002
The Repeater Management was approached at the Leicester Radio Rally and the question was asked if it was possible to have a VHF repeater in the Birmingham area and the answer was yes that they could not see any problem.

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Enjoy the system

Peter G4KQU Repeater Keeper
www.gb3dx.com