

UK-IT

UK Interconnect Team



dplus Reflector User Guide

UK Version

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Version 1.1

Assumptions

This document assumes that your local D-Star Node is:

1. Connected to the K5TIT trust server via the G2 Gateway network.
2. The D-Star Node you are working through is running *dplus* version 2.1b or later.
3. The local D-Star Sysop has allowed user linking operations in the *dplus* configuration.

NB. At the time of writing all UK Gateway connected D-Star nodes meet the first two requirements.

If you've managed to programme your D-Star radio already, you should be familiar with the format of programming the four key fields, MYCALL, YOUR, RPT1 and RPT2. Follow the instructions below to connect to a *dplus* Reflector or a D-Star Node. If you get stuck, you can seek help via the UK D-Star Yahoo Group: <http://www.dstar.org.uk>

Introduction

Okay, so what is a *dplus* Reflector? A Reflector acts as a central conference hub where multiple D-Star Nodes/DV Dongle users can gather and all talk to each other. There was a recent World Wide Net; the objective of the net was to see how many D-Star Nodes and Dongle Users could connect to a Reflector to gauge scalability and performance. Twenty eight D-Star Nodes, and eighteen Dongle users connected to the Net. The system performed perfectly, and no performance issues were noted.

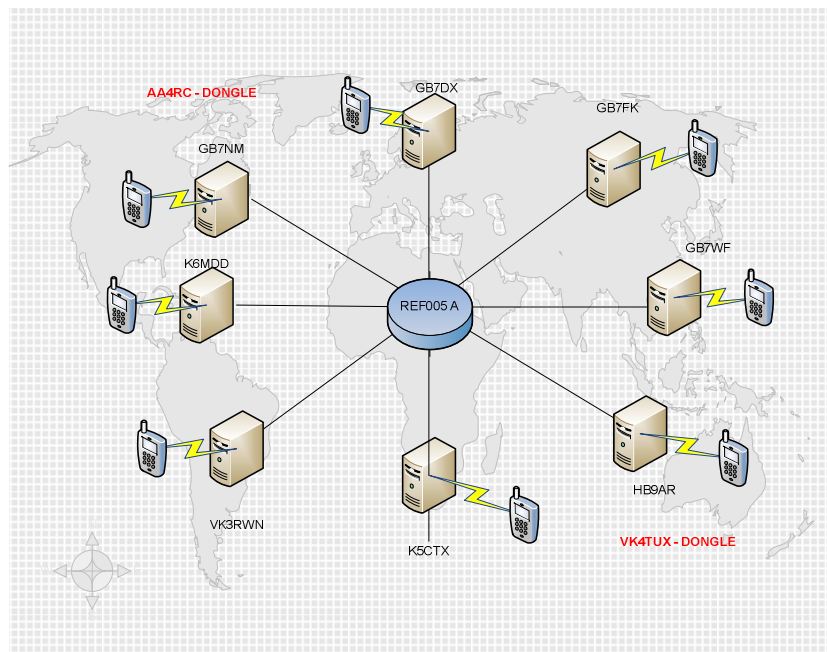


Fig.1 Example *dplus* Reflector (REF005 A) High Level Overview

dplus Reflectors can be compared to virtual conference rooms, the likes of which you might have heard if you have used EchoLink, IRLP or eQSO. Once your local D-Star Node is connected to a Reflector you are able to receive and transmit via your local D-Star Node to every other Node that is connected to the Reflector. In addition, Dongle Users are also able to connect directly to Reflectors. Good operating procedure is to make a call through the Reflector announcing which D-Star Node you are transmitting through. E.g. this is M0ABC on GB7DS port B calling on Reflector Five Alpha, or similar.

dplus Reflectors have a number of benefits over the standard Icom G2 Multicast facility:

- improved bandwidth utilisation for D-Star Node ADSL lines: only the Reflector server needs enhanced IP connectivity to support multiple simultaneous connections
- direct user control via D-Star radio for linking and unlinking, no need for Sysop to predefine Multicast Zones
- “sticky connection” so that only one user needs to link to the conference, other local users just need to ensure that they have programmed G in the RPT2 suffix.

Assuming that all of the prerequisites on page 2 are in place, you should be able to access the Reflectors and link your D-Star Node to another D-Star Node or a *dplus* Reflector. If you are not sure, check with local users on the D-Star Node or ask the Sysop for that D-Star Node. There are currently six *dplus* Reflectors for use with D-Star Nodes:

<u>Reflector</u>	<u>Location</u>	<u>Notes</u>
REF001:	USA	
REF002:	USA	
REF003:	Australia	
REF004:	USA	
REF005:	London	module A is preferred for the UK conference module B is preferred for French language
REF006:	London	module B is preferred for German language

As previously mentioned, there are currently six Reflectors. You might see them referred to as REF001, REF002, REF003 and so on. In addition all the Reflectors have three modules, A, B or C. So for example, the World Wide Net mentioned above, took place on REF001 module C.

NOTE: In the context of a *dplus* Reflector the A, B and C references are modules and NOT ports that you use on a D-Star Node. Reflector modules can be likened to having three different conference rooms on each of the Reflectors; they can all be active at the same time.

To accommodate many simultaneous connections a Reflector Server requires at least 10Mbit symmetrical (upstream and downstream) bandwidth. The UK Reflectors run on servers using fast connections with 100Mbit IP bandwidth. The main UK Reflector is REF005 module A.

Linking D-Star Nodes to each other or being connected to a Reflector does not impact on other stations connecting up to your local D-Star Node. If your D-Star Node is connected to a Reflector and there is a call via the Gateway, the caller should be heard on all linked D-Star Nodes/Reflectors.

DV Dongle users can also connect to the Reflectors directly. However, if a Dongle user connects to your D-Star Node whilst it is linked to a Reflector, the Dongle user will not be heard on the Reflector. You should ask the Dongle user to connect directly to the Reflector; this will enable all users that may be monitoring to hear both sides of the conversation.

It's quite frustrating to listen to a one-sided conversation, so please make sure that all RF users have set their RPT2 suffix to G (G in the eighth position). You can connect to any of the six Reflectors, so therefore you have a total of eighteen "conference rooms" to use. It is also possible that the number of Reflectors available will change, although we currently talk about six, you may wake up some morning and discover eight or three. To monitor the status of the UK-IT hosted *dplus* Reflectors you can use the web pages below for REF005 and REF006 respectively:

<http://www.ukit.org.uk/ref005.html>

<http://www.ukit.org.uk/ref006.html>

Linking and Unlinking Nodes and Reflectors

The key thing that all users need to remember to make Reflector access work, is to set your RPT 2 field to include a G suffix in the 8th position.

For example in the case of users on GB7DS:

Your: CQCQCQ
RPT1: GB7DS B (2 spaces)
RPT 2: GB7DS G (2 spaces)

This way you will be heard by all stations connected to the Reflector or by all stations connected to the linked D-Star Nodes. This should be your standard setting for working your local D-Star Node. One of the things you should remember is that you might turn on your radio and not realise that you are connected up to a Reflector/D-Star Node, so if you put a call out don't be surprised if you get a reply that you weren't expecting.

There is a facility currently which will allow us to make timed announcements to indicate that the D-Star Node is linked. This is useful to inform local users that the D-Star Node is linked. However, this is not proving totally reliable, as it is knocking out some transmissions and currently causing more issues than it solves. We are still playing with this feature and trying to make it work in a non-destructive way. The issue has been raised with the UK Interconnect Team (UK-IT) and an investigation is underway.

To connect to a Reflector, (E.g. REF005 A from GB7DS) all you need to do is set your routing up as follows (your D-Star radio does the rest).

To Link:

YOUR: REF005AL (L is in position no. 8)
RPT1: GB7DS B (2 spaces)
RPT2: GB7DS G (2 spaces)

This links your D-Star Node to Reflector No. 5, module A. Substitute the A with a B or C if you wish to connect to module B or C. Or change the 5 to 1,2,3,4 or 6 for one of those Reflectors.

To Unlink:

YOUR: *****U (U is in position no. 8, and the * represents spaces)
RPT1: GB7DS B (2 spaces)
RPT2: GB7DS G (2 spaces)

This Unlinks the D-Star Node from the Reflector. NB. The * characters are spaces and this will Unlink any connected Reflector/D-Star Node. So you only need one memory in your radio to unlink any Reflector that's connected.

You can also link directly to another D-Star Node if you wish. So to connect to GB7AA from GB7DS:

YOUR: GB7AA BL (L is in position no. 8, B is the module designator)
RPT1: GB7DS B (2 spaces)
RPT2: GB7DS G (2 spaces)

NOTE: Once you have connected to the Reflector you should revert the YOUR: callsign field to CQCQCQ, otherwise the local D-Star node will try to re-link every time you transmit.

Local users of a D-Star Node should also note that where two D-Star Nodes are linked, for example in the case where GB7AA is linked to GB7BB, if you are on GB7AA and you try to route to GB7BB with GB7BB in the "YOUR" callsign field, it won't work. So if you try to route to a D-Star Node, and its not working as expected, it's an indication that you might be linked via a reflector to the D-Star Node you are targeting. So while you are linked, all you need is to do is described above: RPT2 set to G, and YOUR set to CQCQCQ. Just try setting RPT2 to GB7AA G, and it should work fine. So the message is, set RPT 2 to G, and enjoy the new functionality that *dplus* brings to D-Star.

If you are linked to a Reflector via a D-Star Node and another station comes in via your Gateway, E.g. a Multicast user, they will also be heard via the Reflector and Node(s) that you are linked through to.

NB. You can still route your radio calls on the D-Star network in the normal way, none of that changes. The Reflectors add additional capability for you to use. If you link two D-Star Nodes together, the YOUR callsign field stays on CQCQCQ and there is no need to hit the "one touch reply" button on the various Icom radios in the UK. All traffic on the linked Nodes will be heard by all on both nodes. At the risk of labouring the point, make certain that RPT2 is set with G in the eighth place, this should be your standard mode to access all D-Star Nodes.

I have input all the *dplus* Reflectors 001-006 and A-C into my radio memories, so all I have to do is select a memory and link to any Reflector I wish. All you need to do is dial up whichever Reflector/D-Star Node you want to link to and press the PTT button for 1 second. You will hear a voice announcement saying "*Remote System linked (or unlinked)*" to indicate your command has been successful.

You are now linked to the *dplus* Reflector and D-Star Node(s). Do not stay on this memory as it's only used to link/unlink the Reflector/D-Star Node. If you stay on this memory every time you press the PTT you will hear the message "*Link Currently Established*". To transmit via the Reflector, go to whichever memory you have for your local D-Star Node, ensuring that RPT2 has G set in the 8th position after the node callsign. The YOUR field should be set to CQCQCQ

Set this up as your standard memory for working your local D Star D-Star Node Eg. GB7DS:

YOUR: CQCQCQ
RPT1: GB7DS B (2 spaces)
RPT2: GB7DS G (2 spaces)

Notes

Not all of the UK D-Star node Sysops have enabled user control of linking to the *dplus* Reflectors.

There will be no indication that you are linked to somewhere else other than the initial announcement, so local users may not be aware that you are linked up to a Reflector/D-Star Node. We don't want to only hear half a conversation so please remember to state that you are on the Reflector so other users know to have RPT2 set with G in the 8th position.

Automatic GPS beacons that beacon every few minutes will go out on all connected Reflectors; these can clash with other transmissions and prevent voice traffic from making it into the Reflector. I would encourage users who want to beacon GPS to set their radios to send their beacon on PTT rather than automatically.

Get into the habit of leaving pauses to allow others to get into the conversation if they wish to join. Due to the nature of the Reflector and the capacity to have a lot of people connected, there is potential for a lot of activity on the Reflector, so 3 to 4 second pauses allow other stations to join.

I hope that this all that makes sense, go and have a play and get used to how it works, there are plenty of people able to help and support on the Reflectors.

Thanks go to:

- Darren, G7LWT, from the UK Interconnect Team for editing my attempts at producing this document; please let me have any corrections that you may spot
- the providers of the International Reflector servers and bandwidth (you know who you are)
- Robin, AA4RC, without whom there would be no *dplus* and therefore no D-Star Reflector technology.