



# D-RATS

## *Running your own Ratreflector*

### **Introduction**

The repeater application that comes with D-RATS is poorly named and is the source of constant confusion for users. Some call it the repeater, some call it the ratreflector, and others call it the network proxy. Regardless of what you call it, this document is aimed at explaining what it does, what you can do with it, and how to do some of those things.

### **What it Does**

The repeater application works like an ethernet switch, for those that understand that analogy. If not, imagine it like a Y-adapter or a USB hub. It allows multiple connections to talk to each other. Sort of a concentrator of D-RATS traffic that can bridge multiple modes. If you hook to radios to it, it will behave somewhat like a repeater: any data traffic that comes in on one radio will go out on the other radio. This could be useful for a cross-band digital data repeater. If you enable network access, then a user from a networked computer could connect to the repeater and see the RF traffic, as well as communicate with other RF users. This means you can locate your main D-RATS PC away from the radio (connected by a LAN) or allow multiple stations to share a single radio. It also allows you to let people come in from across the globe to communicate with RF stations in your area. If you establish a link between your repeater and another repeater over a network or the internet, then you can bridge your local RF users to remote RF users.

### **Topology**

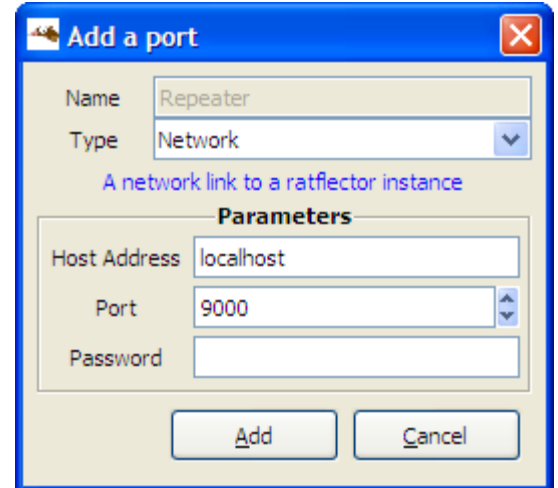
The repeater behaves somewhat like an ethernet switch. If a packet comes in via one path and has an explicit destination, the repeater will do one of two things:

- If the destination station is known to exist on one of the other attached paths, it will send the packet directly there and anyone else will not see it.
- If the destination station is not known (or was last heard more than ten minutes ago) then it will broadcast the packet to all connected paths.

Any packet addressed to CQCQCQ (such as a chat packet or a broadcast ping) will always be sent to every port. The repeater determines which station(s) it has heard on a given path by noting that the station has sent a packet from that path. This means that if you simply connect to a path of the repeater, the repeater doesn't know where you are until you send something to it (such as a chat message, a ping to another station, etc.)

## Running the Software

In order for you to see the traffic on the reflector, you will want to run D-RATS on the repeater machine itself. To do this, start D-RATS and go to **Preferences -> Radio**. Disable all of the ports, and create a new **Network** path. The hostname should be **localhost** and the port will be **9000** if you haven't changed it on the repeater. Your D-RATS preferences screen should look something like this -> Click Add to close the port box, and then Save to close the Configuration window. You will get an error message because the port you just created will not exist until you start the repeater proxy. Click Ignore and proceed to the next step. (If you are going to run D-RATS on a different machine than the repeater proxy, this step is unnecessary.)



### Scenario A: An Internet Reflector.

Start the program. Then make sure that "Allow incoming network connections" is checked and hit the "On" button. Simple! Internet users can connect to this proxy by connecting to your system via an IP address or DNS name. If you're behind a firewall, you'll need to forward ports (9000 in this case) through to your internal machine so people from the outside can connect.

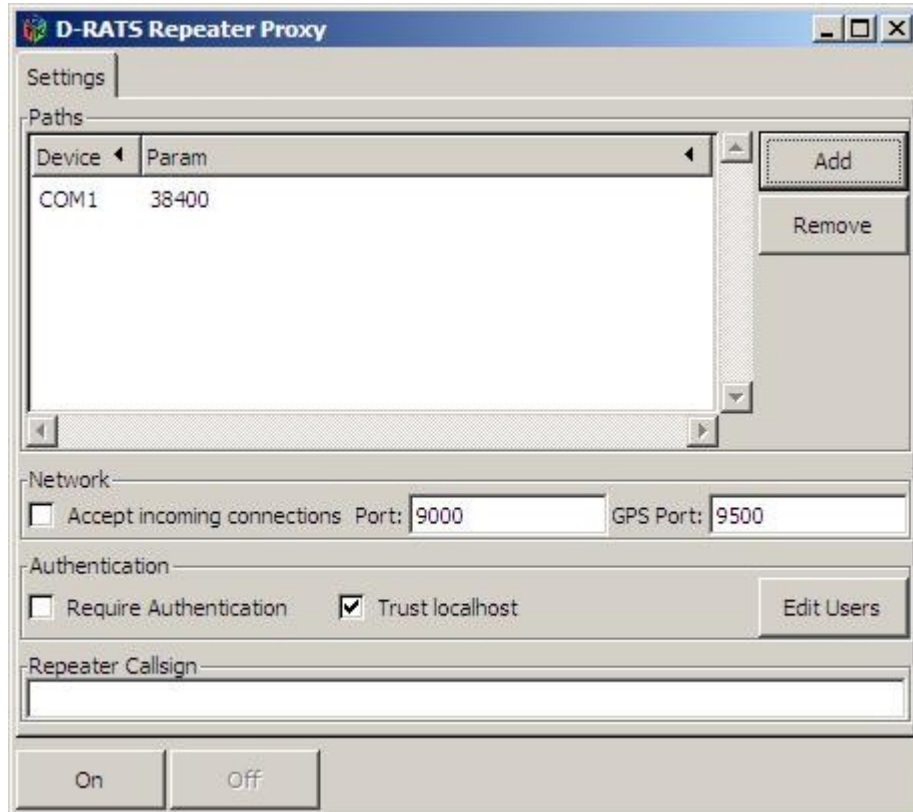
#### *Determining your IP Address*

*Open your web browser and go to <http://www.whatismyip.com/>. Your IP address will appear at the top of the screen. This is the number that D-RATS users will put in the host address line when making a connection to your ratflector. This should be a "static" or unchanging address, or a Domain Name. If you have a "dynamic" or changing IP address, it is only temporary and may change every time you start your computer. It will work in the short term, for testing*

**A Note about Ports and Anti-Virus:** You may need to tell your computer and/or your router to allow TCP and UDP access to the port number(s) selected for D-RATS use. If running the D-RATS repeater on a windows platform, you may also have to tell your anti-virus and anti-malware software to allow the D-RATS repeater access to the Internet. If it "just won't work", try temporarily turning off the firewall and anti-virus long enough to determine if they are blocking D-RATS.

**Scenario B: Allowing users on the network to communicate with local RF users.**

Just add the single serial port that corresponds to your attached radio and the appropriate baud rate to the list. Then make sure that "Allow incoming network connections" is checked and hit the "On" button. Your proxy screen should look something like this:

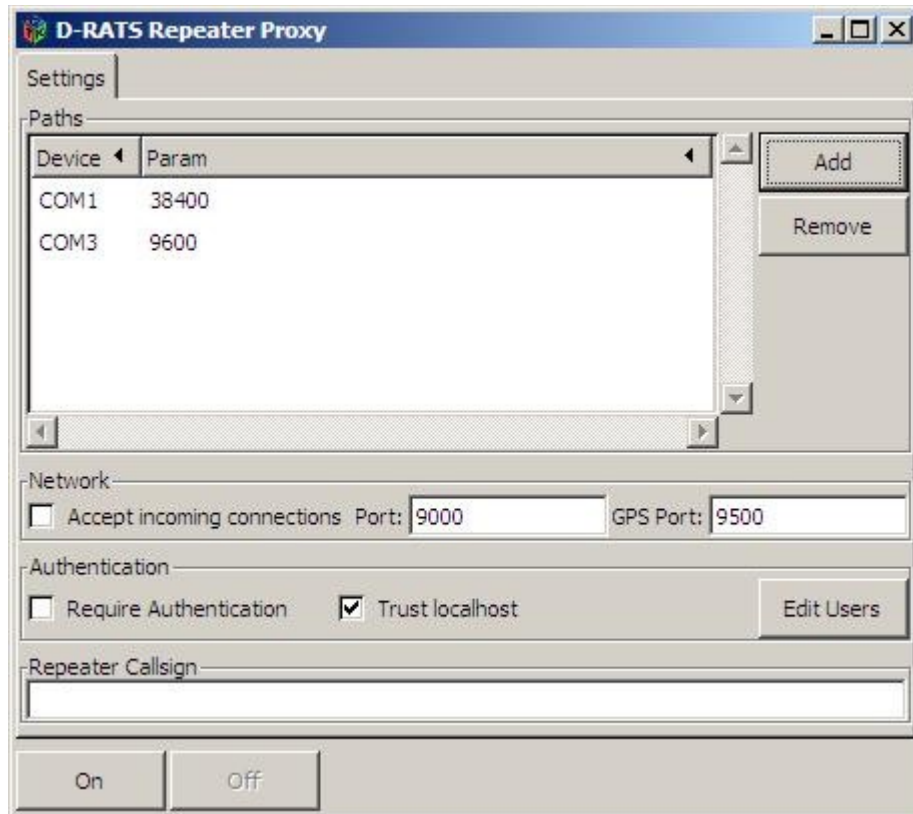


The D-RATS repeater has the capability to extract GPS information from the D-STAR data stream and makes it available on Port 9500 for use by APRS/DPRS programs.

**NOTE:** Please take into consideration the RF network you're providing access to. If you're linked to a repeater, make sure the owner approves of the additional data load. If that repeater is linked to a reflector, it's probably not appropriate to provide access to external users that don't realize this unless the reflector owner has made specific provisions for data use. **If you abuse the ability to link network users to RF you will inevitably find data operation banned on the various network nodes.**

### Scenario C: Creating a simple cross-band data repeater

To do this, you will need two radios, a UHF unit and a VHF unit. You cannot use something like an IC-2820 for this because the 2820 does not have two DV chips. Assume for the sake of this example that the two radios are connected to COM1 and COM3. First, start the repeater application and add a path each for COM1 and COM3, selecting the proper baud rate for the radios. Your screen should look something like this:

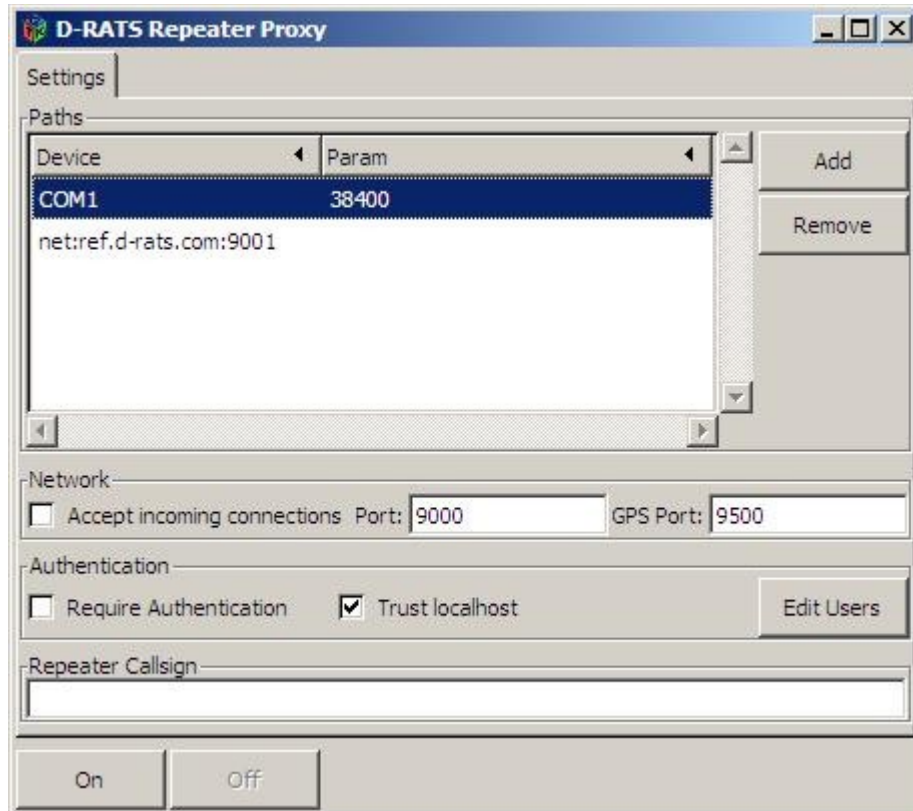


When you have it set, click the "On" button. Now, anything received on one radio will be transmitted on the other radio and vice-versa, and network users can communicate with RF users.

D-RATS is not just for D-STAR radios. One of the RF connections in the above example could be a KISS mode TNC and packet radio combination. Read [D-RATS and Packet Radio](#) for more information.

### Scenario D: Bridging local RF users to the public ratreflector

This is almost exactly the same as **scenario B**, except that you need an additional path back to the ratreflector. To do that, add **net:ref.d-rats.com:9001** to the list of paths (the baud rate doesn't matter). Once you've done that, you can click **On** to establish a link to the ratreflector, accept incoming connections, and begin repeating out to RF.



### Authentication

If you decide that you need a minimal level of security in the form of rejecting casual users, you can enable authentication on the proxy. This will require people to configure D-RATS with a password in order to connect. To do this, create a text file in the working directory of the repeater called **users.txt** and place lines such as the following inside:

```
KK7DS foobar  
K7TAY girlie
```

The format of the file is one record per line, each line is the callsign followed by a space, followed by the password that user must supply. On Windows, this file should go in **C:\Program Files\D-RATS\users.txt** unless you installed D-RATS to an alternate location. On Linux or MacOS it will go in the directory from which you spawn the repeater.