

To set up or Linking Nodes there are a couple of steps.

6. Setup your radio to access your local repeater that has a node associated with it. In this example we would access VK3RMC.
7. To access VK3CHN Node 6136 operating 145.400 simplex in Sunbury, you would operate your PTT and send 6136 in DTMF tones from a DTMF microphone.
8. Release the PTT and wait for the connection confirmation announcement coming back to your radio from Node 6136.
9. You can then call on VK3CHN on 145.400 in the Sunbury area by using your PTT in the usual way.
10. The QSO progresses until completed with the alternate overs.
11. To release the link between the 6300 (VK3RMC) and 6136 (VK3CHN) Operate the PTT and send the code 7 and 3 in DTMF.
12. Release the PTT and wait for the link released message from node 6136. (repeat step 11 until release of link occurs)

VoIP Voice or audio is passed between nodes over the internet using a system called VoIP (Voice over Internet Protocol) during the QSO (conversation). The node converts the audio from the transceiver to VoIP .

1. Sample the audio using an A/D converter . (analog to digital) The A/D converter used by IRLP network is the input source of a standard PC sound card. This creates a continuous mono 16-bit digital stream of raw audio at 8000Hz (120000 bps).
2. Compress the audio by down sampling the stream and using an 4-bit ADPCM algorithm (Analog to Digital Pulse Code Modulation) to reduce the size of the stream by a factor of four (32000 bps)
3. Split the sample into small chunks (or packets).
4. Transmit the packets to the remote host using a UDP stream (User Datagram Protocol). UDP does NOT confirm the reception of packets, so it uses a "fire and forget" method.
5. Receive the packets on the remote node.
6. Join the split packets back into a 4-bit ADPCM stream.
7. Uncompress the ADPCM stream back into an 16-bit raw stream of audio.
8. Play the raw audio stream through a D/A converter (digital to analog) being the output device of a computer sound card.

Control of the Audio over the Internet. - The audio is passed between the linked nodes in a forward and backward direction in simplex mode. The node control software controls the VoIP stream in the sending node using COS (carrier operated squelch) or CTCSS to start and stop the stream. When you are transmitting COS is present, the computer detects it through the Node interface board. The audio from the radio is processed and sent over the internet as UDP stream.

In the receiving node the VoIP stream is converted to audio by the use of a computer sound card. The PTT is operated on the receiving node radio and the audio is transmitted from the receiving node.

This process is reversed when the far end is transmitting.

Connecting multiple Nodes together. - Connecting multiple nodes together (or Repeaters) is done by using a Reflector. A Reflector is connected to the internet and will support a large number of connections from nodes. The VoIP stream from the Transmitting station which there can be only one at any time. (simplex mode) is received by the reflector and

sent to all the other connected nodes. Reflectors have a NodeID eg 9500 in Sydney

In other words a reflector can be seen as a digital repeater of sorts. It takes one digital bit stream in, and repeats that bitstream to all other connected sites making a digital "partyline".

GENERAL USER GUIDELINES

It does take some time to adopt to operating procedures that differ from conventional FM repeater use. This guideline for those wishing to use their local IRLP and enabled repeater node linking.

COMMON MODES

There are two connection modes for an IRLP connection. "Directly linked nodes". or, "Multipal connected nodes".

Direct linked is just like it sounds where repeater (node) "A" connects direct with node "B". With this type of link the two nodes are interconnected and no other IRLP connections are possible. While repeaters "A" and "B" are connected, anyone attempting to connect with either node will be told by a recording that -"The node you are calling is currently connected to call sign" note that all local traffic on each repeater will be heard on the other repeater while they are linked.

You can always check which stations are connected to the reflectors main and sub-channels by visiting <http://status.irlp.net> and looking for nodes connected to individual nodes or reflectors.

REFLECTOR USE

With reflector use the first thing you must remember is to leave a gap between transmissions. Having said that, this is a good time to list the three main rules when connected to a reflector:

Pause

Pause

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Due to the slight increase in delays created by multiple Tone Squelch radios in the links between the repeater and IRLP link radio, a slight change in our normal operating procedures is required with IRLP.

By leaving a pause between transmissions it

• allows users on other nodes a chance to check in.

• allows other nodes time to send touch-tone commands to drop their node.

The most important guideline to remember is leaving a pause after pressing the PTT button as well as between transmissions.

Avoid local traffic while connected to the reflector.

By its nature, the reflector has a large footprint and a wide audience, therefore if local users would like to have a discussion, they should disconnect from the reflector. Along the same line, if two stations become engaged in an extended dialog involving only themselves, then I would recommend they both move off the reflector and make a direct node to node connection, freeing up the reflector for others.

Calling CQ DX :-)

It IS acceptable to call CQ, in fact, if you really want to make a contact, it is preferable to

say "This is VK3xxx calling CQ, is anyone available for a contact?" as opposed to "VK3xxx Listening" ...silence for 2 minutes, followed by a disconnect.

A few other Reflector operational guidelines:

Listen first. When connecting to the main channel on a Reflector, odds are that you are dropping into an existing conversation. **Wait for at least 15 seconds** to make sure you are not interrupting an existing QSO before calling.

Pause between transmissions. Many nodes are connected using simplex links, therefore the only time it is possible for them to disconnect is between transmissions. Be sure to pause **AT LEAST 5 seconds** between transmissions.

Key your transmitter and wait before speaking. There are propagation delays across the Internet, as well as delays caused by sub audible tone decoders and other devices that cause a delay before the audio path is cut through. If you speak immediately upon PTT, the beginning of your transmission will not be heard.

ERROR MESSAGES

From time-to-time you may receive error messages when attempting to connect with a node or reflector. The most common ones are:

"The node you are calling is not responding, please try again later"

This is caused by a loss of internet connectivity to one end of the call attempt.

"BEEP Error- The call attempt has timed out, the connection has been lost"

This error occurs when a node is OFF-LINE. Some nodes such as in the UK use dial-up connections and then, only for short periods. Also there may be temporary net or node problems.

"The Connection Has Been Lost"

If the internet connection drops, this error message will be heard. I found this out when I accidentally kicked out my network cable while working around the node computer.

DO'S and DON'TS

In summary then a few do's and don'ts

DO pause between transmissions to let other in or others to enter DTMF command.

DO identify before sending DTMF command tones.

DO hold your microphone PTT for about 1 second before talking to allow all systems time to rise.

DO NOT rag-chew on your local repeater while connected to the reflector.

DO pause for 10 seconds or when entering the reflector before talking.

DO NOT start or plan a Net without pre-authorization from the reflector owner

IRLP QSLing

Many users of IRLP express desires to exchange QSL cards. With many IRLP users not being on HF they may have never considered having QSL cards printed. Now here is a new Internet technology for you to easily exchange QSL cards. eQSL

References - the IRLP website listed above.