OCRA Guide to IRLP

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This document briefly describes the Internet Radio Linking Protocol (IRLP), instructs readers how to operate IRLP on OCRA's 145.23MHz repeater, and details the best practices for operating IRLP.

What is IRLP?

IRLP is a technology for linking amateur radio systems together using the Internet. Systems linked together via IRLP are referred to as 'nodes', and are assigned a node number. The 145.23 repeater's node number is 4179.

The IRLP web site (http://www.irlp.net/) has substantial information about the history of IRLP (http://www.irlp.net/bckground.html) and how it works (http://www.irlp.net/how-does-it-wrk.html). Primarily, IRLP is used to link a repeaters together that are beyond VHF/UHF radio linking range.

IRLP is similar to EchoLink in that both are protocols that transmit voice over the Internet. Unlike EchoLink, IRLP only connects repeaters to other repeaters – thus amateur radio practices and procedures always apply. EchoLink allows users to connect their computers to repeaters (or other computers), which can lead to a breakdown in amateur radio operating practices.

IRLP Connection Modes

There are two connection modes for an IRLP connection: One-to-one direct connections, and one-to-many Reflector connections.

Direct connections are just like they sound, where repeater (node) "A" connects directly with node "B". With this type of link the two nodes are interconnected and no connections from other IRLP nodes are possible. While nodes "A" and "B" are connected, any other node attempting to connect with either node will be told by a recording that - *"The node you are calling is currently connected to callsign".* Direct connection is preferred for a city to city chat.

The most common type of connection in use today, however, is one-to-many connections via Reflector Nodes. A reflector is a computer that is not connected to any radio, but rather allows many nodes to be inter-connected. Each reflector has 9 sub channels allowing up to 10 separate virtual reflectors to operate. These sub channels are identified by the last digit of the node number. For example - 9250 is the main channel with 9251, 9252, 9253, etc. being virtual reflectors with identical capability as the main channel.

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. Some of the reflectors can be monitored from a computer – see http://www.irlp.net/listen_live.html.

What Nodes (Repeaters) are Available for Linking?

The primary method to find other IRLP nodes is to use http://status.irlp.net. This page allows you to search by various parameters (country, zip code, lat/long). Under the 'Information' tab, you can also sort nodes by state or city.

A Google Earth display of IRLP nodes is available. From the IRLP home page, click 'Node Info' in the menu on the left hand side (or directly link there using http://www.irlp.net/status.html). Then choose “Google Earth IRLP Interactive node mapping”.

Finally, if you simply want to test the system, you can connect to an echo server which will repeat your transmissions back to you after a 10 second delay.

How Do I Connect to an IRLP Node Using the 145.23Mhz Repeater?

1. Verify that your radio is correctly set up for the repeater (145.23MHz, -600Hz offset, 107.2 Hz tone). This repeater is located on top of the Mary Ellen Jones building near to the UNC Hospital in Chapel Hill.
2. If you don't know how to transmit DTMF tones from your radio, then grab your manual and look it up.
3. Find an IRLP node to connect to using http://status.irlp.net.
4. Announce on the repeater that you are about to activate IRLP by saying “This is <your call sign> about to call IRLP node <1234> in <location>.”
5. Activate IRLP on the 145.23 repeater by transmitting DTMF tones 4-7-5-7. This code spells I-R-L-P on a telephone keypad. Unkey and you'll hear the repeater say 'IRLP Link Open'.
6. Transmit DTMF tones of the IRLP node you wish to connect to. When the connection is created, a voice ID of the destination node will be announced on 145.23. Simultaneously, the voice ID of the 145.23 repeater is transmitted to the far-end node.
7. Wait at least 15 seconds for these voice IDs to be transmitted, and to verify that no conversation was already in progress on the far-end node.
8. Announce yourself on the far-end node by saying “This is <your call sign> monitoring from Chapel Hill, NC via IRLP”.
9. Enjoy your QSO
10. When you are ready to disconnect, say “This is <your call sign> closing IRLP link to <location>.
11. Transmit DTMF tones 7-3 to close the connection.
12. Deactivate IRLP on the 145.23 repeater by dialing 4-7-5-8. Unkey and you'll hear the repeater say 'IRLP Link Closed'.

Best Operating Practices

The remainder of this document contains a version of “IRLP Guidelines” available from http://irlp.net, which has been updated and adapted by Dan KR4UB.

Reflector Use

With reflector use the first thing we must all 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
Pause

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. If we hear a local conversation (all participants coming from the same node) that continues, I, or one of the other reflector control ops will likely ask them to disconnect. If attempts to break into the conversation are unsuccessful, the node may be blocked from the reflector (more on blocking later).

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. If more than two nodes are involved, then moving to one of the lesser used reflectors might be an alternative, especially if one of the stations can check the web site for an available reflector. In the future, moving to one of the available sub-channels will become an option.

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 K9DC calling CQ, is anyone available for a contact?" as opposed to "K9DC Listening" ...silence for 2 minutes, followed by a disconnect. However long CQ calls are unnecessary and should be avoided. Odds are we heard it the first time.

It IS acceptable to talk about the weather, or anything else that is geographically significant. But like anything else, within reason. A station in Indiana that says to a Colorado op, "Hey I heard that you have a mountain out there" will probably cause eyes to roll worldwide.

In general though, long winded, channel consuming conversations should be avoided. Remember there are usually a dozen or two connected systems, with perhaps hundreds of users that might like a chance to use the system.

Listen and Pause

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 conversation 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.

Programming Your Radio For Use With IRLP

Establishing IRLP connection and disconnecting is done by sending DTMF tones via your radio's keypad. This is done by pressing the PTT button, stating your intention, and then pressing the appropriate keypad codes as explained in the paragraph below. Most radios incorporate program settings that determine if DTMF tones will be transmitted when buttons on the key pad are pressed. If you press a button on your keypad while PTT is pressed, and do not hear the distinctive DTMF tone, consult your radio manual and set the appropriate program settings.

Making A Direct Connection

First of all listen on your local machine for at least 15 -30 seconds before transmitting and then ask if the repeater is currently in use. Assuming all is clear, **identify your self** and give the node name or number you wish to call . Example: *"VE3xyz for the Sydney node"* - - then enter the 4 digit code for the node and release your PTT. Your local repeater should come up with a carrier as it waits for the connection to be authenticated. This can take a few seconds of dead-air so don't be concerned. When the connection is confirmed, the voice ID of the destination node will be transmitted back to you as well as your nodes voice ID to the other repeater.

To disconnect the connection, identify your self for example VE3xyz closing connection to Sydney Node (name) or, give node 4 digit code, then key in the DTMF characters "73".

> **NOTE:** If your node is already connected to another node or reflector, a greeting will play saying; - *"your node is currently connected to...ID of the connection") In this case confirm if anyone desires the connection to remain up before dropping by using the OFF code.*

Once connected and after hearing the confirming voice ID, **wait** at least 15 seconds before transmitting as.....

> *The repeater may be in use, and your entry may have occurred between transmissions.*

The voice ID of your node is longer than the voice ID of their node, and the connection is not made until the ID is fully played.

Their computer may be slower, and hence take longer to process the connection than yours.

Press and hold the microphone PTT for a second and then announce your presence and your intention such as you are calling someone specifically or just looking for a conversation with another ham in that city.

If no response is heard, announce your call and your intent to drop the link and then send the DTMF "73" OFF code to drop the connection. *Not a good idea to transmit DTMF commands without first giving your call-sign. Not only is this courteous it is a regulatory issue in some countries who may be connected to the reflector.*

Some nodes are configured so you cannot connect to them if that repeater is active. In this case you will receive the message *"The node you are calling is being used locally".* If you receive this message wait 5 or 10 minutes and then try again.

If you stay connected to a node and there is no activity on your repeater for 4 minutes, the connection will time out and automatically disconnect with a voice ID disconnect message on both nodes.

Connecting To A Reflector

As above, listen to your local machine for local use and then announce your intention for the Reflector before keying the 4 digit code. When you hear the confirmation ID always WAIT at least 15 seconds before transmitting as you are most likely now connected with many repeaters and a conversation could be in progress. If after 15 seconds you hear nothing, identify yourself and indicate you are listening to the Reflector from *"City and, Prov./State, Country". With the world wide IRLP activity your local repeater now has world wide coverage thus the suggestion to better detail your QTH.*

Don't be in a hurry to hear someone come back to you. You may have to do a bid of pleading from time-to-time to dislodge someone from whatever they are currently involved with.

By default, connections to the reflectors now time out with no activity however many node owners set this period for a long period so it is not unusual for repeaters with minimal traffic to stay connected to the Reflector for extended periods of time. When or if the node times out from a Reflector connection a standard time-out greeting will precede the timeout saying, *"Activity time out ... Reflector xxxx, link off".*

Disconnecting Before You Leave The Repeater Frequency

When you establish a connection to another direct node or reflector, you should continue to monitor the repeater for the duration of the connection. If you can no longer monitor the frequency and there is no one else locally that you know will continue to be on the repeater frequency, you should disconnect from the node as explained above. Reason? If you establish a connection and then leave, other local users may begin an extended local conversation on the repeater without knowing that someone had previously connected the machine to a node such as a reflector, where such conversation may not be appropriate.

If you hear or wish to engage in a prolonged rag-chew on your local repeater *(long discussion*

of a local nature) out of courtesy to other node listeners drop the distant node connection.

What Are The Node/Reflector Codes?

The 4 digit node codes can be found at the web site http://status.irlp.net. Find the node you wish to contact and click on the node number. Additional information will be displayed about the node.

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.

DOs 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*