Using IRLP

Using IRLP is only slightly different than regular gab over a pair of linked repeaters. By now you should know how to use repeaters, links, and how they work, so I'll deal with the differences.

Our BeachNet system of linked repeaters, for example, operates as a single unit. It doesn't matter which repeater you use, you are actually using all of them, and can talk to anyone on any of our repeaters. This network is limited in geographical extent to our corner of the State, the links are permanent, and made with point-to-point dedicated radio circuits. BeachNet, in fact, is ***not*** connected with IRLP at all. Most repeaters are not. Only a small number of Amateur repeaters are also IRLP Nodes.

With IRLP, the linking between Nodes is accomplished using Voice over Internet Protocol (VoIP), and becomes very flexible. You can choose to connect to single stations or roundtable groups all over the world. The experience is just like being in a distant place, and making a call on a repeater or simplex station located there. You will find not every call receives an answer, but those that do are usually interesting contacts. The system is entirely under your control. All you need to access it is a radio with a DTMF keypad, and a local Node in range.

The most significant difference in OPERATING is the need to pause. Even with our local linked systems, one has to get in the habit of pausing after key up for the link to solidify, before talking. Using the Internet for the link, as IRLP does, means about a half-to-one second delay for the link to establish on each key up. So you have to get used to keying up and pausing to keep your first words from getting cut off. When you un-key, you need to be patient, because it takes a second or two for the link to turn around.

IRLP operation is either one-to-one, where you dial up a distant node and only the two of you are in conversation, or it can be a roundtable using a reflector with several nodes linked. The one-to-one is like a phone call; the reflector makes a multi-station connection, like a conference call.

Not every IRLP Node is a repeater. Some are "Simplex Nodes". These are radios working on a simplex frequency, but other than that, they work very similarly. Since you are remotely using a transceiver, usually at someone's house, they don't locally repeat what is being said. This can be confusing in a situation where several folks are trying to follow the conversation, hearing only one side if out of range of the other local user. Simplex Nodes also tend to have more limited coverage, since they are usually at someone's house rather than a mountaintop. Since a simplex node is cheaper and easier to set up, they are a popular option. In the listings on the IRLP website, you can spot simplex nodes by the "000" offset or the frequency will be in the simplex area of the band.

A Reflector is a unique class of Node. It has no radio associated with it, but is instead a computer address in cyberspace. The Node Numbers for Reflectors are all 9000-series numbers. You connect to a Reflector just as you would to any other node, by sending its number. The advantage of connecting to a Reflector is that any number of other stations can also connect to it, and have a roundtable discussion. For example, the Reflector 9100 is used by the WIN System to link together far flung stations in 17 States and 4 countries nearly full time. Each Reflector has 10 "channels". In other words, it can

support up to 10 separate conference calls at any one time. The WIN System Reflector is number 910, and the WIN System uses Channel 0, making the number 9100.

My node (Chinook, WA, 444.925 +5 82.5PL) on Megler, “idles” connected to the WIN System. Since it is a network of over 60 stations, it usually has someone on to talk to, unlike our local repeaters, which can be vacant for hours. I have gotten to know a lot of the folks on that network and enjoy having it up here. There are usually more nodes connected to this Reflector than any other, so someone ‘browsing’ for a busy node tends to end up there. I thought it would be nice to have ONE repeater that was talking even when all the others are quiet, so I let it idle that way, but if you want to disconnect and take the connection somewhere else, that is just fine with me.

I set up the node to be used for random contacts by whoever wanted to play with it, locals and tourists alike. The WIN System is only on to fill the empty hours. If you want to use the Chinook Node, feel free to do so. That is exactly what it is there for. You cannot ‘break’ it with DTMF commands. Enjoy.

The universal disconnect command across the IRLP community is “73”. You key up, wait a half second, and send 73 on the keypad and let go. The connection should drop and the radio should deliver some sort of a disconnect message. On my node, I also have the “#” key set up to act as a disconnect command. Either works. By the way, a "#" followed by a series of keys will read them back as a keypad test to let you know if you are getting into the repeater well enough to command it. The IRLP software keeps you informed about what is happening using voice feedback. If you send a command and no message comes back to tell you what happened (after several seconds) then your command probably didn’t ‘take’. Be patient.

Every Node (IRLP station) has a four-digit number assigned to it. It works like a phone number. Once the repeater drops off the air, you can key up, wait a half second, and send the four-digit node-number for the station you want, and unkey. In a few seconds, there should be a sign-on message announcing the node connection. It is a good idea to wait and listen for a few moments. You never know when you might have dropped into an on-going conversation. The node announces the connection on the far end too, so sometimes, someone will chime in with a welcome. If you don’t hear anything, then key up and give a call. Your voice will come out of the distant machine just like a local.

When you are done, send “73” and the connection will disconnect. Most nodes also have a time-out timer. Mine is set for twenty minutes. If the local receiver hasn’t heard a signal coming in for 20 minutes it will drop the connection. All that is necessary to keep the connection alive is a single kerchunk at 15-19 minute intervals. The exception is the “WINSystem” connection. If you connect to “9100”, it will time out like any other connection. But if you use the special command “*” (just a star) to make the connection, then the Node connects to the Reflector with the time out disabled.

The command link is full duplex, so you can send commands at any time, whether the repeater is talking or not. You can tell, on this node only, whether a station is local or not by the subtle courtesy tone. The tone beeps softly at the end of a distant station talking. For local stations using our repeater, there is no courtesy tone.

So, specifically, let’s say we want to connect to the Sisters, Oregon Node (as an example). First, send “73” to drop the WIN System connection. Once the repeater has

disconnected and dropped off the air, key up and ID with your callsign, *then let it drop again*. Now, key up and send the four digit Node-code "3089" and unkey. You should hear the repeater key up and announce the connection. Wait a moment, then key up and announce your presence and callsign. You are talking out of W7DUX's home station, in Sisters, Oregon, on 147.420. If someone comes back, talk to them. When you are all done, send "73" again. Lastly, when you are all through, send a "*" to put it back on the WIN System.

If another party wants to call into this node, they would do the same thing, but use "3105", the Node-code for the Chinook station. If it is connected to the 9100 Reflector (the normal condition) then they will get a message that "the node you are calling is currently connected to reflector 9100", and the Megler station will say "call from 3089" (or whatever node). This is the only down side to having our local node always connected. If you want to arrange with another ham to call into here to talk to you, things are not as simple as they might be.

They can connect to 9100, wait for a lull in the conversation, and give you a call. If you hear them, you can acknowledge and suggest a switch to a one-on-one connection. You both disconnect and one of you connects to the other. Yes, it takes some coordination. The other way to handle it is to just let them know that if you hear them try to connect, they are to stand by for a few minutes, and you can drop the link here and connect to them. Of course, this means in either case you would have to be listening…

If you want to work a "schedule" with a specific ham at a specific day/time, it is perfectly acceptable for you to drop the link ahead of time and wait for them to connect. Of course, it's just as easy for you to be the one who calls. You can dial up the target node, and wait for them to come on the air. Just remember, if you dial up a connection and want it to "stay alive" you will have to make a call every 15 minutes or so to avoid the time-out timer.

To get the list of Node Numbers, go to: http://status.irlp.net/IRLPstatus.php?option=2
This is a list of all active nodes sorted by State/Province.

To get more information on my node, go to:
http://status.irlp.net/IRLPnodedetail.php?nodeid=3105

To get information on what stations are connected to the WIN System, go to:
http://status.irlp.net/IRLPnodedetail.php?nodeid=9100
And scroll down to "Channel 3".

For information on the WIN System, go to: http://winsystem.org
I got to know this crowd when I was sailing around Southern California. They have an Insomnia Net every night at 11 with a fun-quiz on trivia.

For the official IRLP website, go to: http://irlp.net

More Advanced Stuff

Some IRLP nodes use "pre-codes" before the four-digit number. The most common pre-code is "#". If you are traveling and want to use a node you have stumbled across, try to raise the node owner or a control operator. Ask if it is alright to use the node. Ask if there

are any pre-codes. If the operator doesn't want to divulge the code, ask if he would dial up a call for you. Most IRLP nodes are put up specifically for general use, and you will usually find the operators friendly and helpful. I have found that emailing the node owner ahead of time will usually get you a welcome and any pre-codes necessary. An email contact is available on the node-specific web page.

You can get into our Node from 2-meters. The 146.86 Ilwaco repeater has a link to the UHF machine. The link command (on '86) is "925" and to drop the link "000". Only club members are supposed to use these codes. If you find yourself using the '86 repeater a lot, consider joining the club.

If you are closer to Raymond, WA, Jody, K7IEU operates a Simplex node from his house: IRLP Node 3993; 147.570 simplex 127.3Hz PL tone. The polite thing to do is to contact him and ask about using it, but he is happy to have you do so.

One special node to keep in mind is the Echo Reflector. This is a tool used for setting up a node, but it can also be a great help when learning how to use them. The Echo Reflector is dialed up just like any other node. The code is 9999. When you successfully dial up the Echo Reflector, and make a transmission, the Echo Reflector records you. When you unkey, the computer will play your transmission back with a ten second delay. That is exactly how you sound on any IRLP node. This can give you a wealth of information on the operation of your radio, and the quality of your signal.

If you have Google Earth on your computer, you can download an overlay from the IRLP website that puts every node and its status on the map, in real time. If you are planning a trip, this is the easiest way to look for IRLP nodes that might be available near your destination and along the way.

The Chinook, WA 3105 node uses an Internet connection at my house in Nahcotta. If my DSL goes down, so does the IRLP operation. This is generally not to be relied on for emergency communications, although there have been instances where the phone didn't work but the Internet did. In an emergency, the repeater itself can still be used as a stand-alone repeater, even if the IRLP is not functioning.

Using your DTMF keypad to best effect

The biggest problem in designing DTMF decoders for radio receivers is that they have to ignore all the other tones that might come at them in normal speech. On a telephone line, where DTMF was originally designed to work, the volume of the Touch-Tones is jacked up ten-fold over the normal voice level. That makes it easy for the decoders to tell when a command is being sent. On FM radio, the tones have to be at the normal voice level to ensure they aren't distorted.

It's considered better to ignore a valid tone than to false-trigger on noise or regular voice. That makes decoder circuits very finicky about signal quality. Most decoders have a 'time window' when they will accept commands, and they will ignore you outside the window. Usually this means that you have about 5 seconds to send the first code, and a couple of seconds between codes or the decoder will ignore you. The digit string isn't evaluated until you unkey, so if you talk after sending your digit string, that can also make the decoder ignore you.

It usually takes longer for the decoder to accept the first digit in a string of tones, because it has to decide that you are actually sending a command. Once it switches to decoding a valid signal, the remaining digits will decode more rapidly. Your signal has to be very clean to get the DTMF tones to “take”. The decoder is specifically going to ignore tones embedded in noise.

Tips for sending DTMF (Touch-Tone) codes over the air:

1) Key up once, identify, and let the repeater drop all the way off, to ensure that it won’t ID in the middle of your tones.

2) Key up and wait one second, then press the first button and hold it for one second, then press each remaining button in turn, deliberately (don’t ‘jab’ or ‘flick’ it, PRESS it). As soon as you are finished, un-key.

3) When making command transmissions, ***only send commands***. Any spoken transmissions should be separate calls.

73, Frank