Inside Echolink

Amateur Radio

meets

Voice over the Internet Protocol

Allan Larsen – ZL1AML

What is VoIP?

- Convert Voice to Digital 1’ 0’s (A/D)
- Compress Digital Data (Encode)
- Buffer digital sample data into packets
- Send packet buffers via Internet Protocol
- Receive and assemble packet buffers
- Uncompress Digital Data (Decode)
- Convert Digital 1’s 0’s to Voice (D/A)

What is THIS Echolink?

The simple answer is EchoLink software uses VoIP technology to link ham radio stations together around the world using the Internet as the “backbone” connection with the end user connecting using a direct connection through a computer, a cell phone or a radio transceiver connected to the Internet through a host gateway.

- EchoLink software allows licensed Amateur Radio stations to communicate with one another over the Internet. The program allows worldwide connections to be made between stations, or from computer to station, greatly enhancing Amateur Radio's communications capabilities.

- At this time there are more than 200,000 validated users worldwide, in 151 of the world's 193 nations with about 5,200 of these stations on-line at any given time.

- If you are in range of a FM repeater or simplex station equipped with EchoLink, you can use DTMF commands from your radio to access the EchoLink network. (ZL1AML-L 146.550mhz)

- If you are a licensed amateur with an internet-connected PC or Smartphone, you can access EchoLink stations directly from your PC or phone.

- EchoLink is a system designed to provide VoIP gateways for repeaters and simplex stations.

Using Echolink with a PC

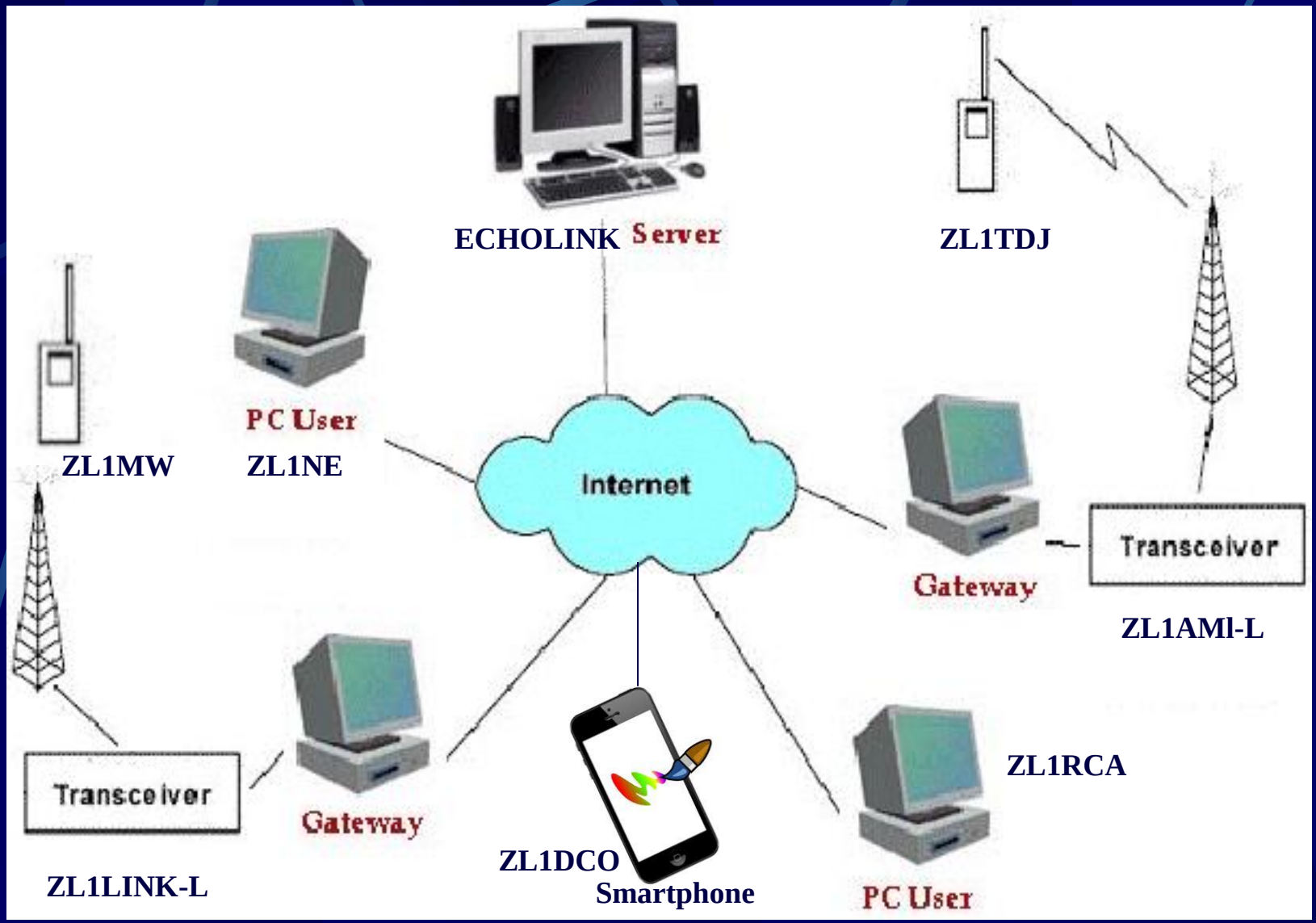
- Basically EchoLink offers two different modes, Single User and Sysop.
- In Single User mode the ham is directly connected to the Internet using a computer.
- Sysop – is for setting up a Repeater/Link, you would require an interface and transceiver.

  Like ZL1AML-L

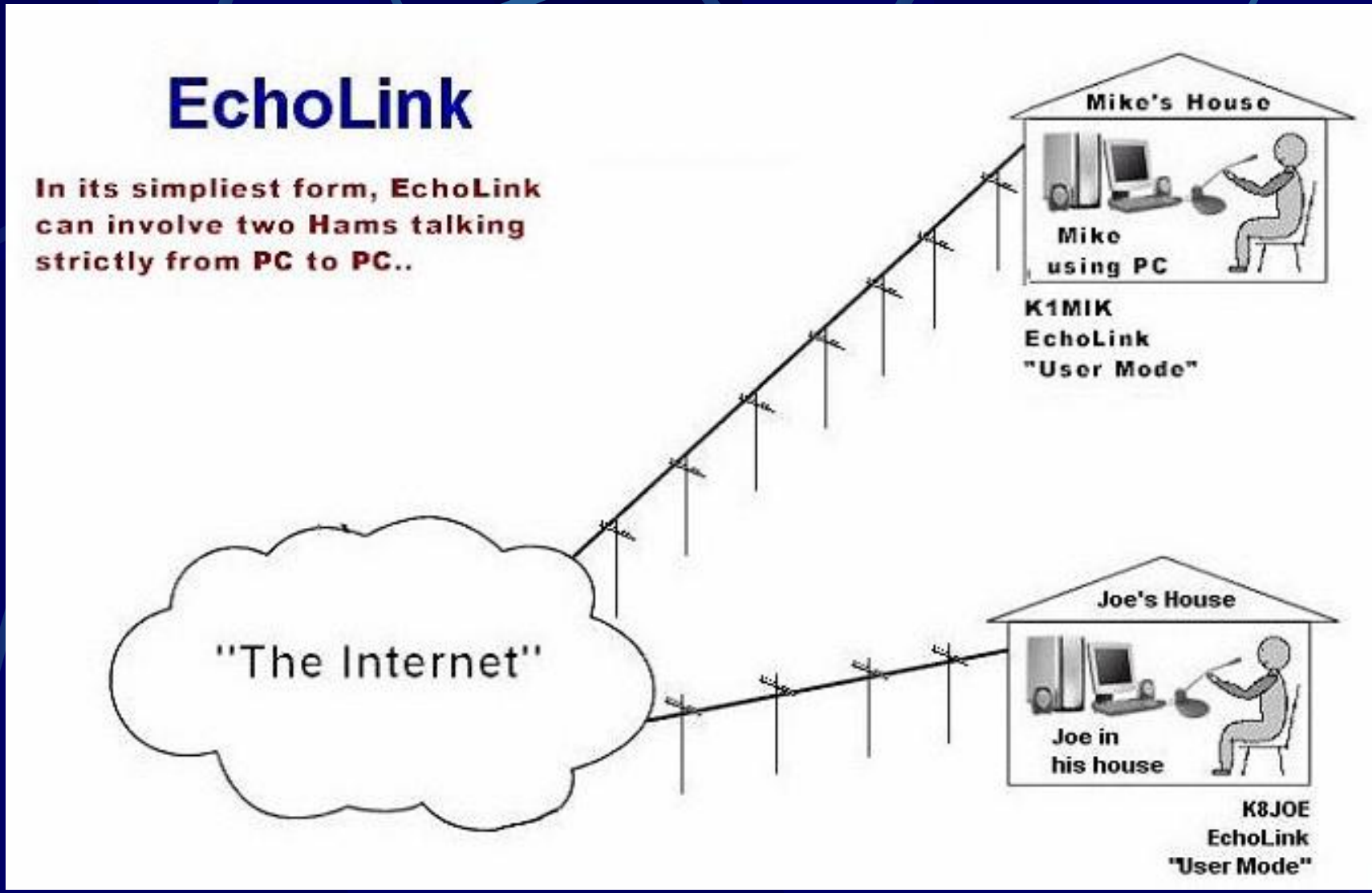
Simplex linking:

- The Radio Amateur uses a VHF/UHF Radio to tune to the simplex frequency of 146.550mhz preset on the ZL1AML transceiver which is connected to a PC on the EchoLink network and provides remote access to the Internet. (Sysop Mode)
- The PC then processes the received signal digitally before sending it over the Internet.

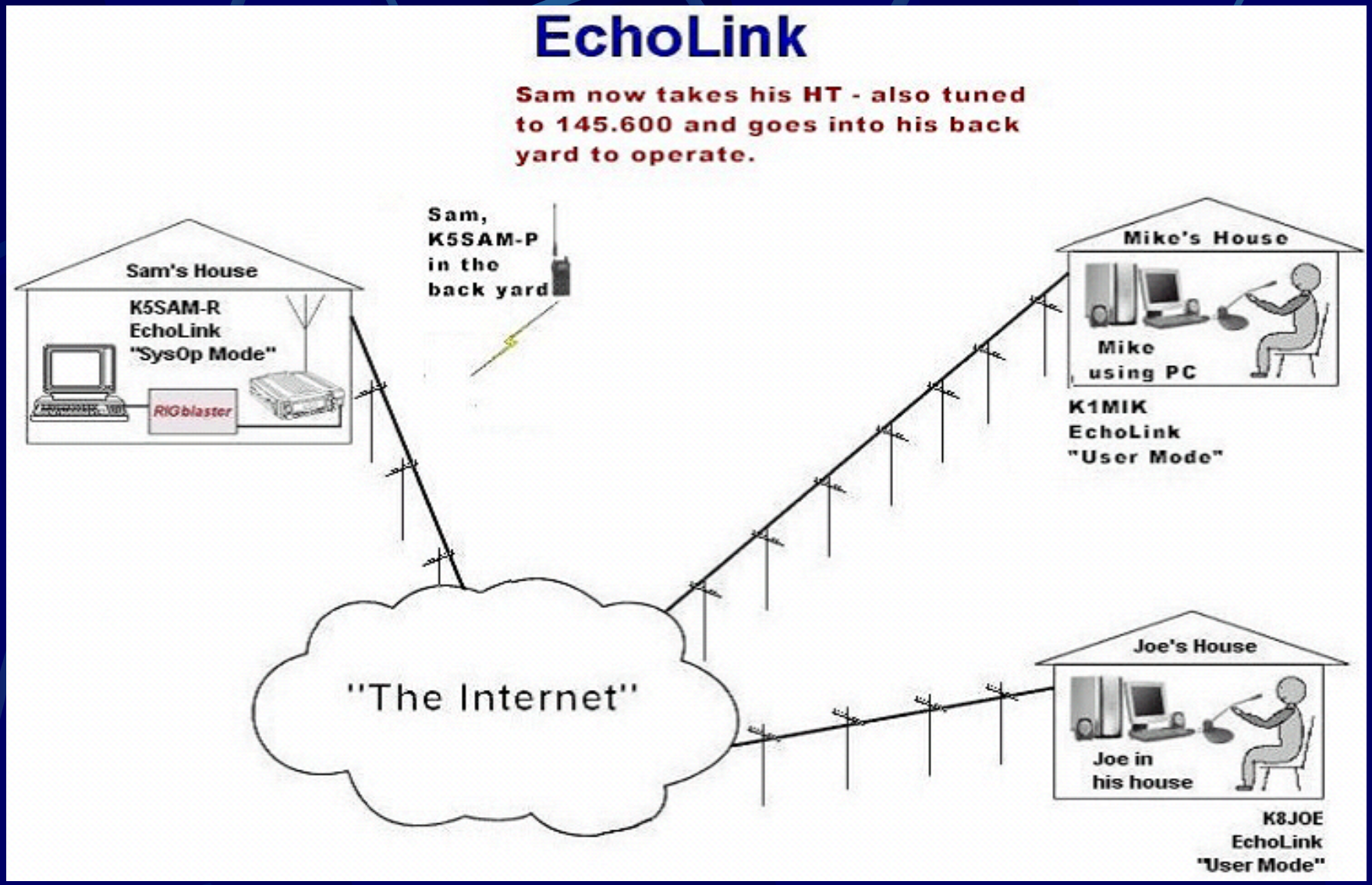
VoIP Network Topology



PC to PC


EchoLink
In its simpliest form, EchoLink can involve two Hams talking strictly from PC to PC..
Mike's House
Mike using PC
K1MIK
EchoLink
"User Mode"
"The Internet"
Joe's House
Joe in his house
K8JOE
EchoLink
"User Mode"

Simplex Link

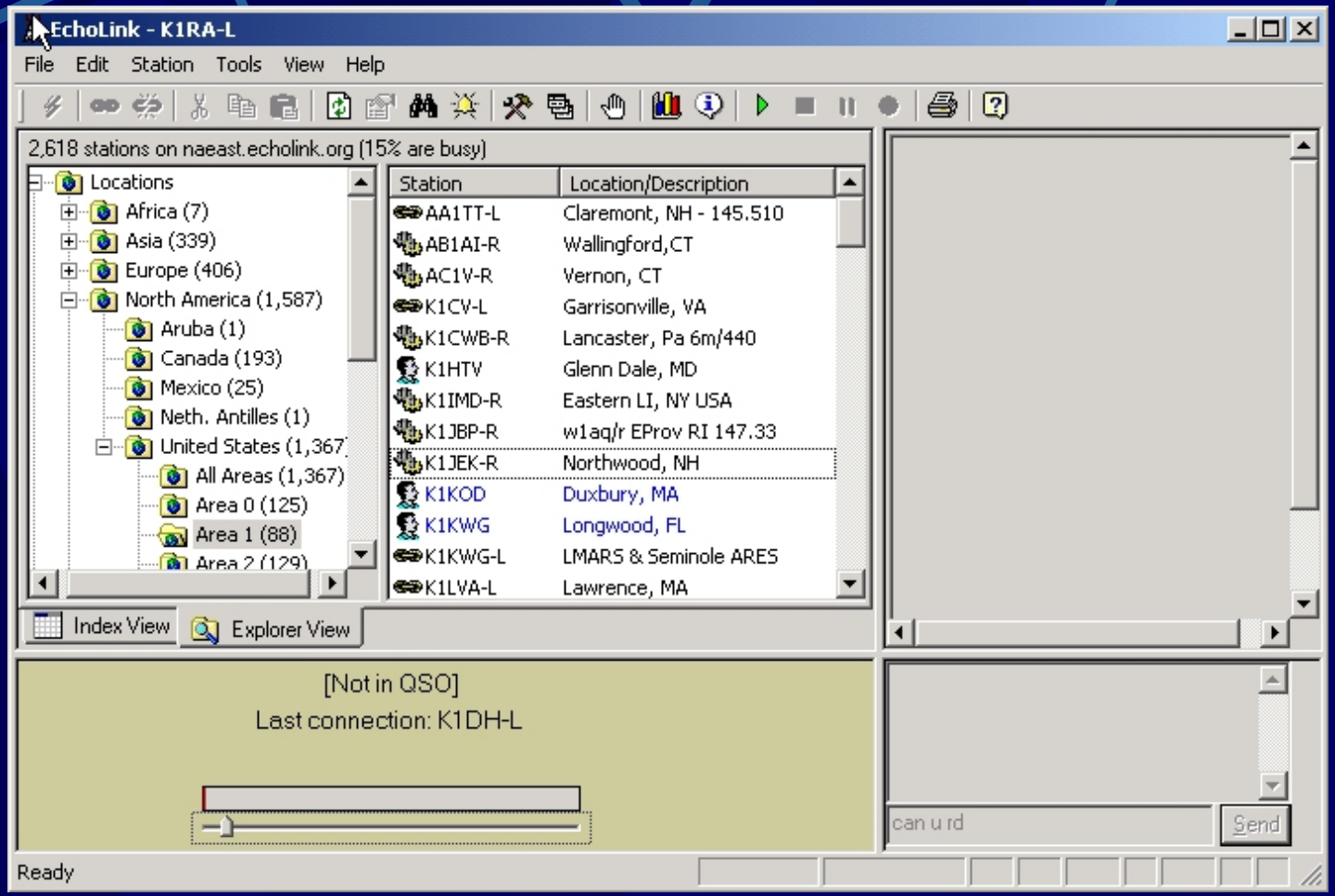


The Software

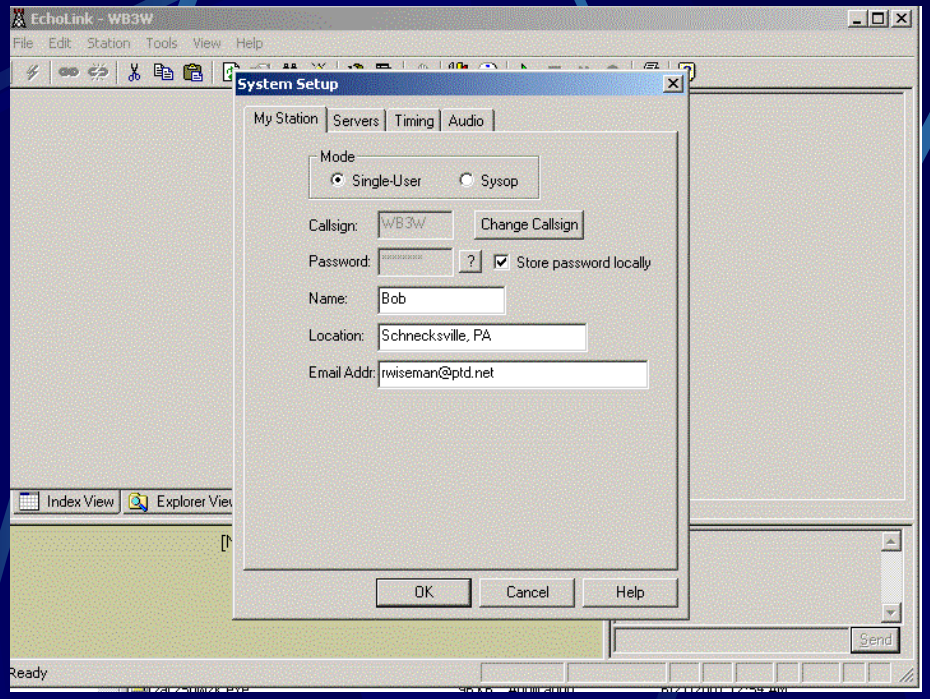
If you want to use EchoLink via a PC
Using Microphone/Speakers

- Windows
- Mac
- Linux

- Sysop
- User



Basic Setup

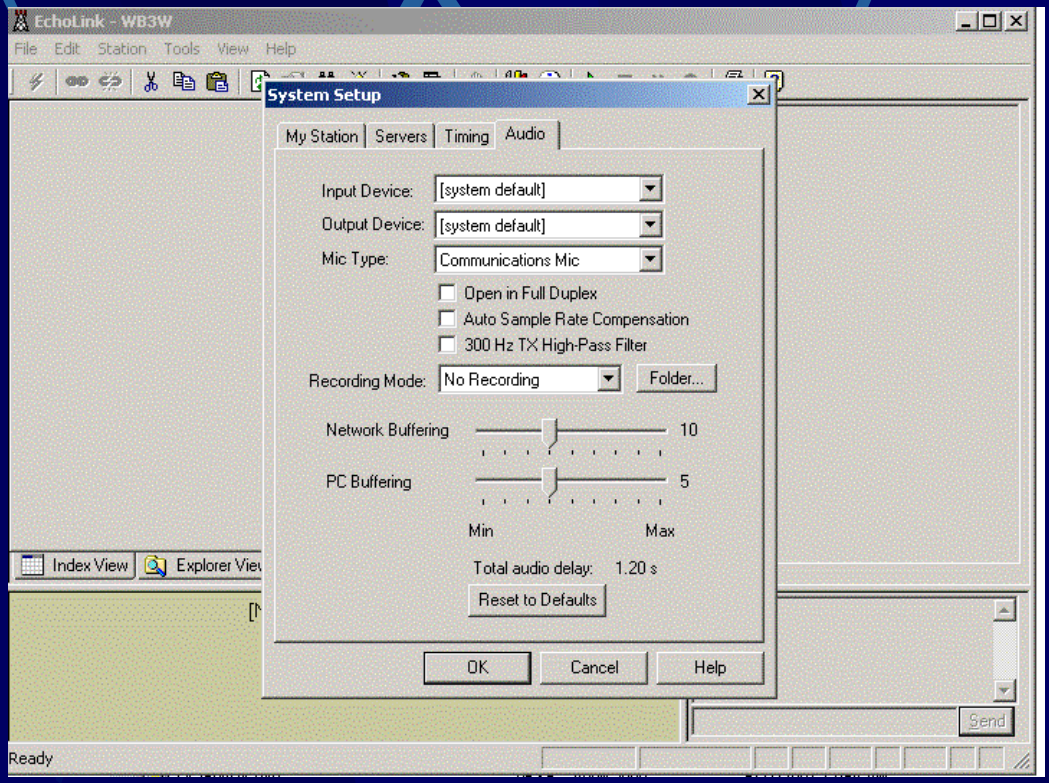


- The first thing to do after installing the software is to configure your Station Setup.

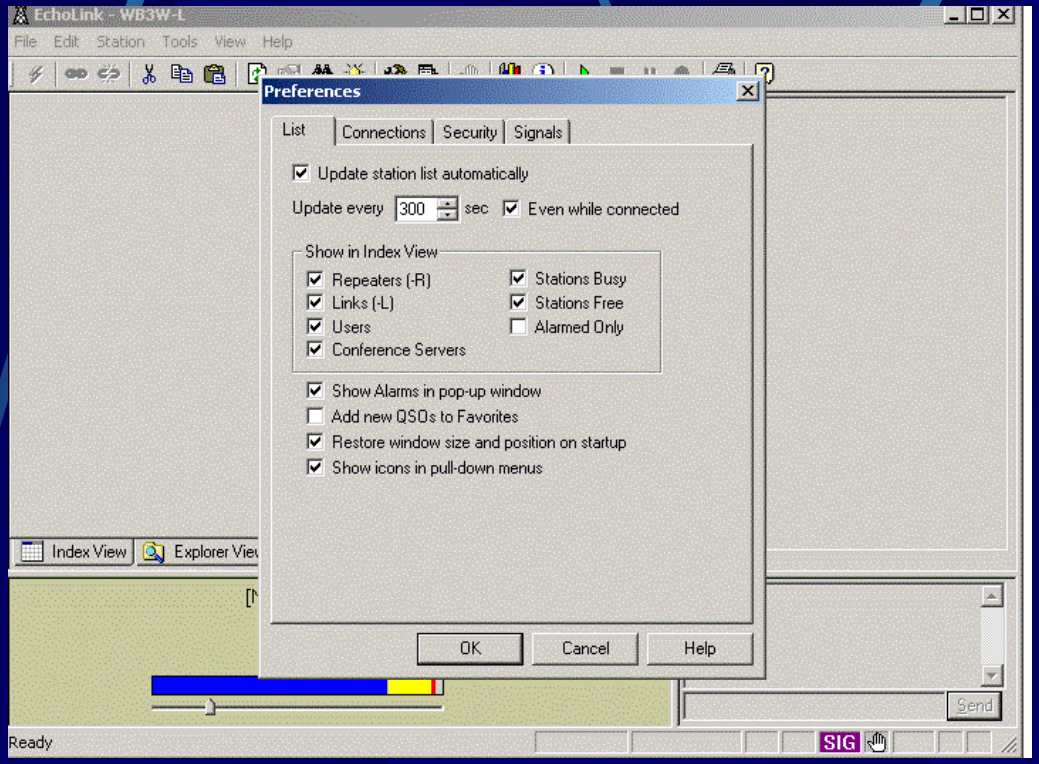
The first time you use Echolink, you will have to wait to be validated, before you are connected to the EchoLink server.

Audio Setup

This includes your Audio details, for the PC Speakers and Microphone.

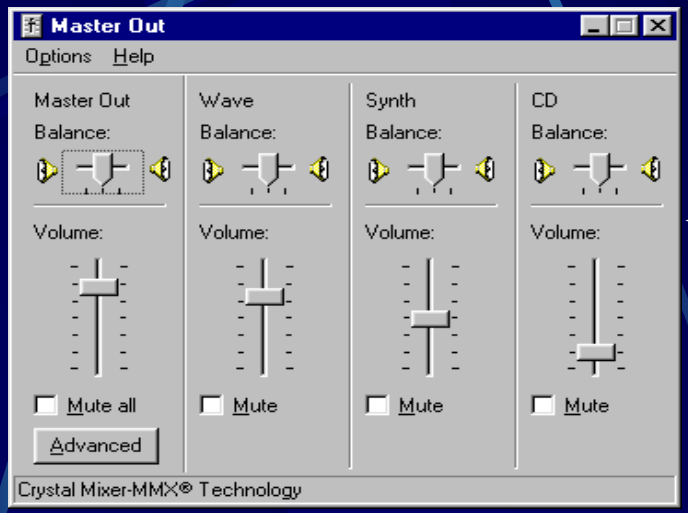


Connection Setup



This Screen allows you to configure the various Internet connections you are willing to accept.

The Two Pc Audio Screens



This is the Output

This is the Input

ZL1AML – L
The Swanson Echo link Transceiver

- Echolink node #**960059**
- **Status** ZL1AML-L #960059,
- Swanson, Waitakere City - Auckland ON
- 146.550MHz - no offset
- Supports 4+ simultaneous users
- Access is Open 24/7

Node DTMF Commands Given as an example

- Status – 08
- Connect – 4, 5, 6 digit node number
  - Echo Test Server = 9999
  - Disconnect - #
  - Help File - *
- Reconnect – 09

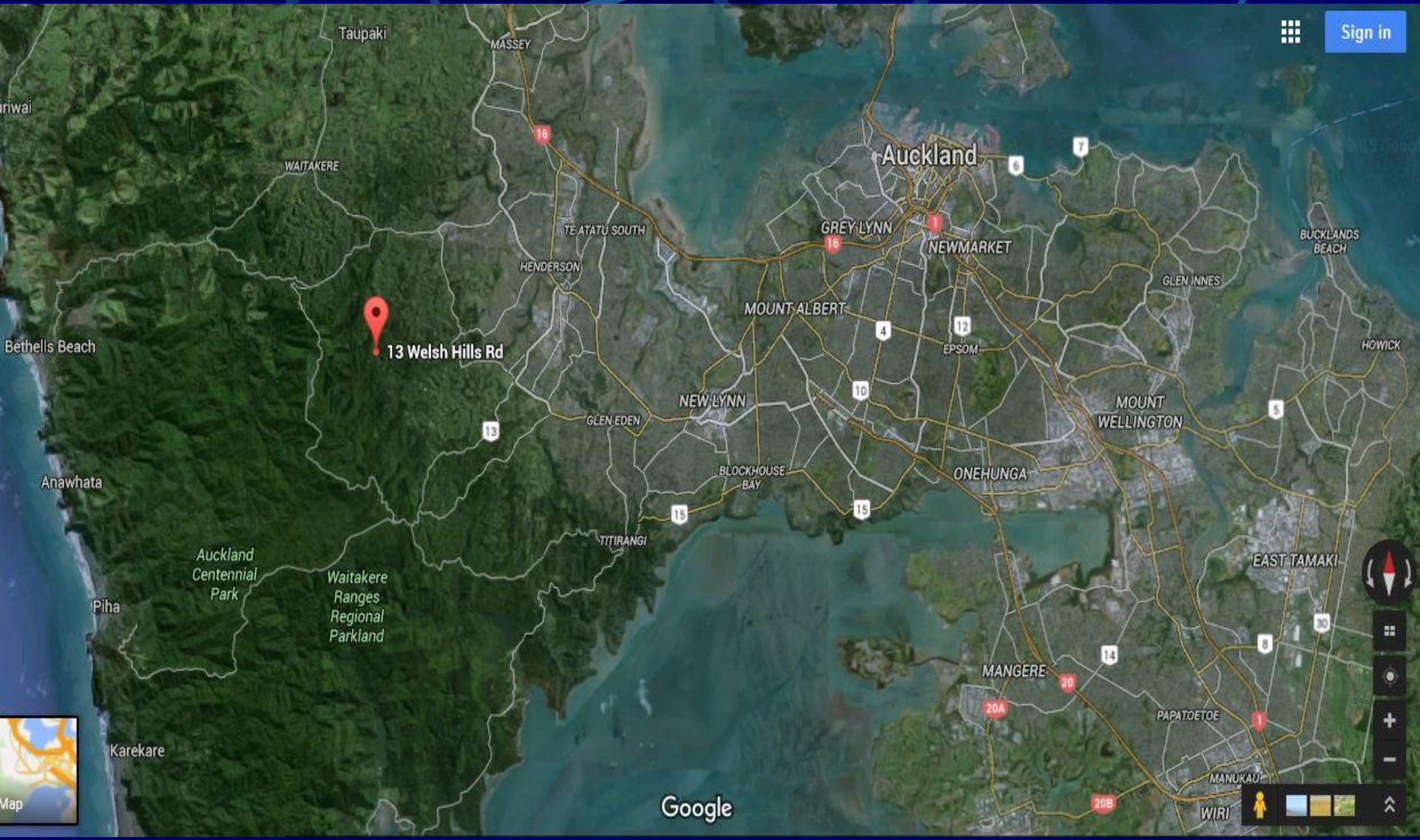
Good Operating Practices

- Identify Yourself
  - When connecting
  - When sending DTMF
- Pause, Wait, Listen
  - Use DTMF Status Command 08
- Rag chewers beware
  - 3 minute timeout

Common Problems

- Connection Timeout
- Disconnects
- Audio issues
  - Broken
  - Garbled
  - Drop outs

ZL1AML-L Link



146.550mhz FM - 80 Watts - 300m Elevation – 5/8 Ground Plane

Local EchoLink Nodes List

Google Earth View (requires Google Earth software) [More Info]

Links Near auckland NZ (Online only)

As of: 11/29/2015 21:30 UTC

Showing Results **1** To **30** Of **30**

Call	Description	Node	Latitude Longitude	Grid Square	Dist (mi)	Freq (Mhz)	Tone (Hz)	Pwr (W)	Haat (ft)	Ant	Last Status	Comment	Last Update (UTC)
ZL1AML-L	West Auckland - NZ	960059	36°53.63' S 174°33.93' E	RF73qc	11.3	146.550		81+	320	3dB omni	Online	On @2129	11/29/2015 21:29
ZL1VK-L	Auckland NZL 146.500	6504	37°04.43' S 174°58.48' E	RF72lw	18.4	146.500		16	40	6dB omni	Online	On @2123	11/29/2015 21:23
ZL1LINK-L	Waikato nr Pukekohe NZ	5223	37°14.35' S 174°53.08' E	RF72ks	26.6	146.450		9	640	5dB omni	Online	On @2128	11/29/2015 21:28
ZL1SQ-R	Te Awamutu	510226	38°01.14' S 175°21.49' E	RF71qx	86.1	147.225		25	160	3dB omni	Online	On @2126	11/29/2015 21:26
ZL3DMH-L	Christchurch NewZeal (1)	886964	43°29.50' S 172°40.26' E	RE66im	471.4	431.015	71.9	4	20	0dB omni	Conn	=EL-CONF at 2129	11/29/2015 21:29
ZL3CAR-R	Christchurch NZ	101553	43°36.73' S 172°38.04' E	RE66hj	479.9	438.400	88.5	25	1280	6dB omni	Online	On @2126	11/29/2015 21:26
VK2RPM-R	Port Macquarie, NSW, AU	916007	31°42.00' S 152°40.00' E	QF68ih	1309.3	146.700	91.5	49	1280	4dB omni	Online	On @2132	11/29/2015 21:30
VK2RNC-R	Newcastle 146.975 Rpt	1474	32°53.00' S 151°32.00' E	QF57sc	1343.3	146.975		4	1280	3dB omni	Online	On @0841	11/27/2015 08:41
VK2JTP-L	Sydney [Nth] 146.425	3133	33°44.36' S 151°11.58' E	QF56oq	1344.7	146.425		9	10	0dB omni	Online	On @1933	11/29/2015 21:29
VK2BGL-R	Illawarra Coast Link (1)	1484	34°38.59' S 150°46.49' E	QF55ji	1351.9	146.975		25	80	6dB omni	Conn	=VK2MT at 2122	11/29/2015 21:22
VK4RBN-R	Brisbane, Australia	888046	27°19.00' S 152°44.82' E	QG62iq	1444.7	147.000		25	2560	3dB omni	Online	On @2046	11/29/2015 21:26
VK4RRC-R	Redcliffe, Australia	4464	27°02.15' S 152°49.37' E	QG62jx	1451.4	438.325	91.5	25	640	3dB omni	Online	On @0542	11/29/2015 21:22
VK4RC-R	Redcliffe	44666	27°02.13' S 152°49.17' E	QG62jx	1451.6	146.925		25	640	3dB omni	Online	On @1938	11/29/2015 21:28

http://www.echolink.org/links.jsp

Local EchoLink Nodes

Part of A chain of Echolink stations providing mobile coverage from Auckland to SW Waikato:

- 146.550MHz ZL1AML-L Swanson West Auckland #960059
- 146.500MHz ZL1VK-L Papakura South Auckland #6504 ?
- 146.450MHz ZL1LINK-L Pukekohe Waikato # 5223
- 147.225MHz ZL1SQ-Rptr Te Awamutu # 510226

How do I get started?

Using EchoLink via (Radio)

In this example, we'll connect to one of the UK's most popular conference servers, the Ireland Conference Server (Node: 2605)

•From your ham radio, tune to the frequency of the EchoLink gateway – ZL1AML-L. 146.550mhz, When selecting the node number, you need to send DTMF tones. Many radios have a numeric keypad, and you use this to send the DTMF tones . Assuming you are on frequency and no one else is using the EchoLink gateway, hold down your PTT key and type in the DTMF code for the node: 2605.

- You should now be connected too the station or server.
- EchoLink Audio message will confirm connection to the Node. Put out a CQ call & see if you get a reply.
- When you finish the QSO don’t forget to send the DTMF # to disconnect the remote server.

<u>Some common DTMF commands:</u>

- Play Info: Plays a brief ID message & help file: *
  Disconnect node: #
  Status: Announces the call sign of each station currently connected: 08

Using EchoLink (Computer, Smartphone)

- You can obtain a free application for your computer,, tablet or smartphone. Details at wwww.echolink.org

- The software can be used to contact other amateurs over EchoLink, join conferences, listen to conversations or send text messages over EchoLink. To use this, you will need to be a licensed amateur radio operator, which has to be confirmed by uploading a scan of your licence to the EchoLink site.

How does EchoLink handle security?

PC or Smartphone only – Not required to use on Radio Links

Each new user must be validated before being granted access. After having been validated, each EchoLink user must provide a password, along with their callsign, to log in. Each time a connection is made for a QSO the EchoLink servers verify both the sender and receiver before communication can begin. EchoLink can also be configured to accept connections only from certain types of stations: repeaters, links, users, or all three. You can also setup a list of any number of “banned” callsigns or block or accept connections according to their international callsign prefix, in order to comply with your country’s rules regarding reciprocal control-operator privileges or third-party traffic restrictions.

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Summary

EchoLink allows amateur radio contacts to be made using a combination of RF (radio) and the Internet. When it's not possible to make contact with another amateur using radio, EchoLink can bridge the gap. Here is what Echolink offers:

- A network of worldwide gateways accessible from your amateur station, handheld radio, computer or smartphone
- Join a conference using one of the many worldwide conference servers
- Listen to other amateurs talking from around the world
- Have a QSO with an amateur that you can't reach by radio

Questions?

Tnx & 73s !

Allan Larsen
ZL1AML