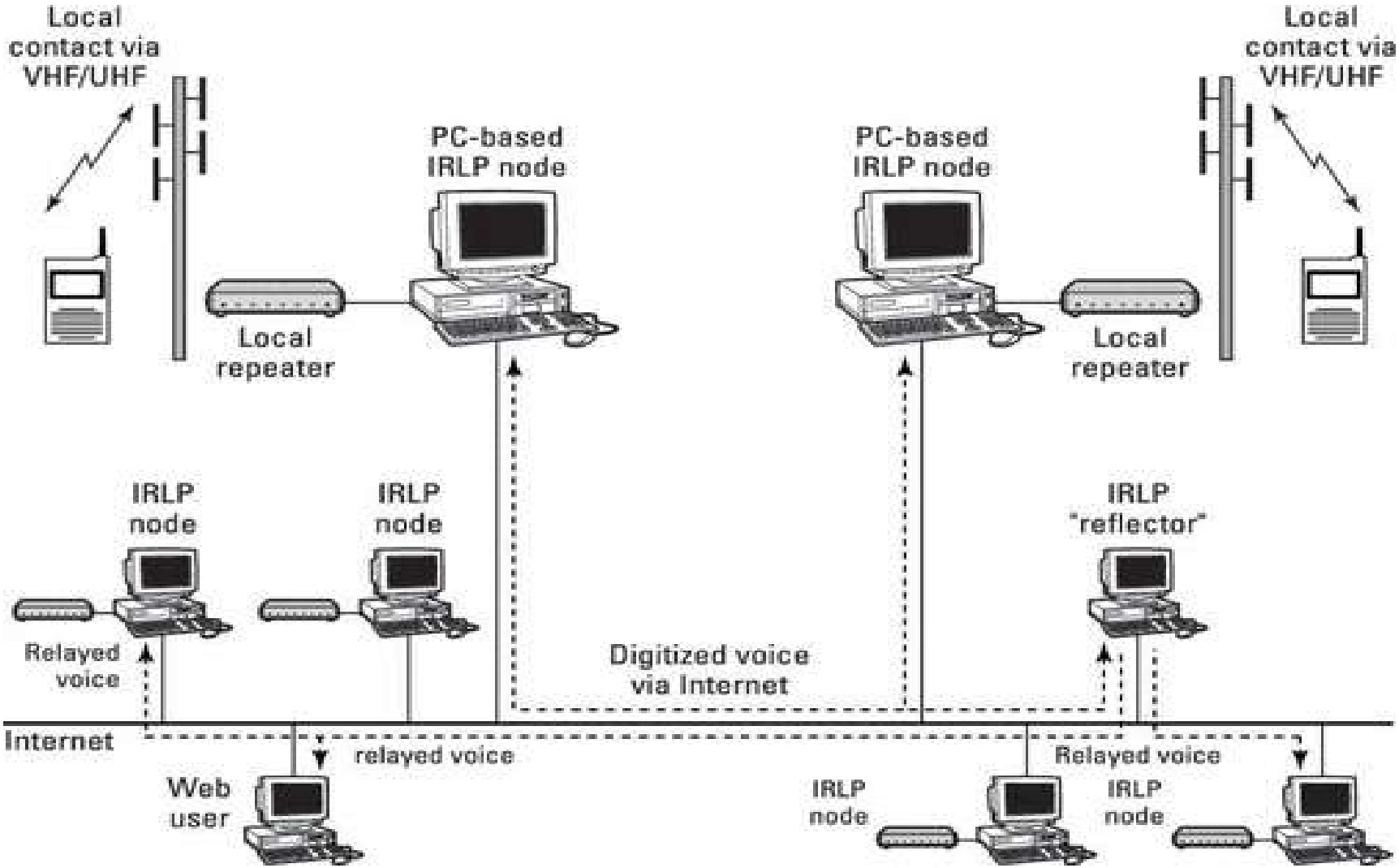
IRLP - AllStarLink – EchoLink

White Rock Amateur Radio Club

Bob VE7ADX

Objectives

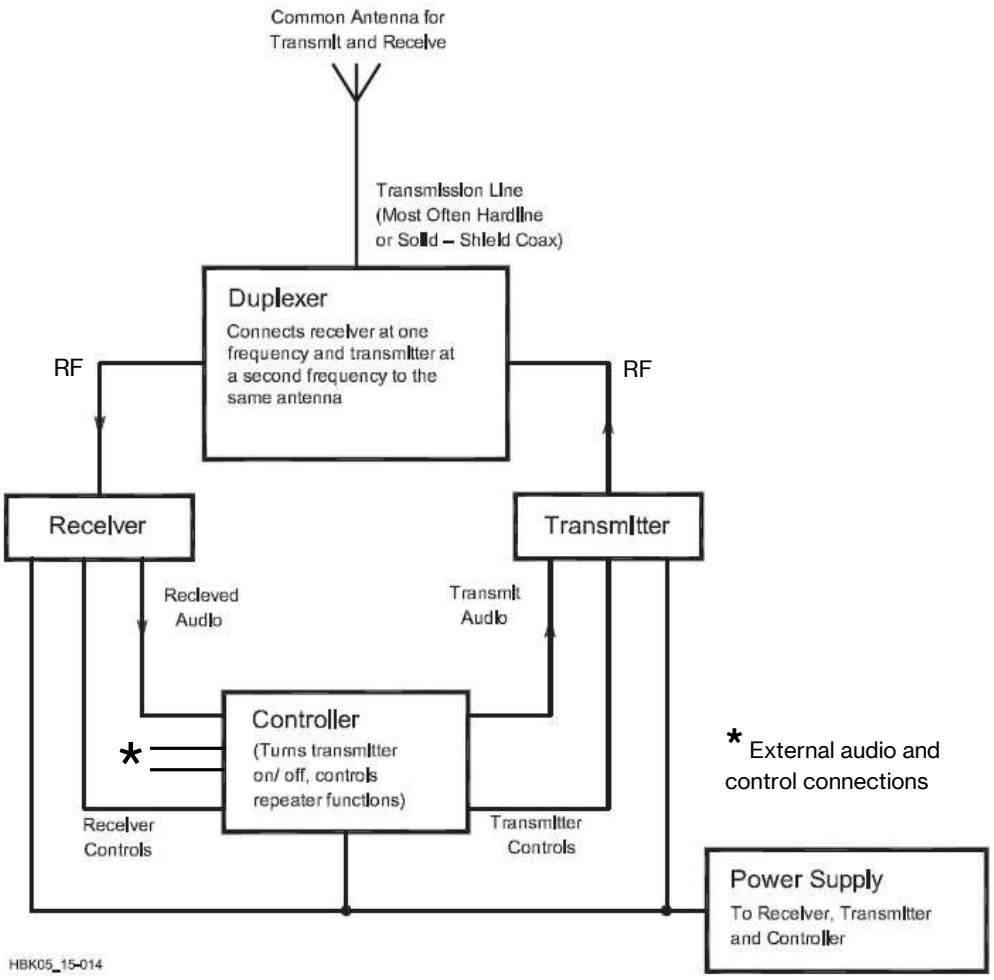
- Review repeater components and operation
- Describe requirements to connect a repeater to the Internet
- Define IRLP, AllStarLink & EchoLink and their features
- Using IRLP, AllStarLink & EchoLink


Local
contact via
VHF/UHF
PC-based
IRLP node
Local
repeater
Local
contact via
VHF/UHF
PC-based
IRLP node
Local
repeater
IRLP
node
IRLP
node
IRLP
"reflector"
Relayed
voice
Digitized voice
via Internet
Internet
relayed voice
Relayed voice
Web
user
IRLP
node
IRLP
node

Repeater Block Diagram

Controller

- Handles audio and control signals between the receiver and transmitter
- May respond to DTMF commands from the receiver
- May connect to external devices



Repeater Internet Connection Requirements

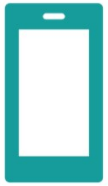
Internet access

Computer

Internet connection

Audio connection to repeater controller or directly to the radios

Control connection to repeater controller or directly to the radios



Interface software

Reacts to DTMF commands from receiver

Converts repeater audio to and from digital VoIP signals

Sends and receives commands to the repeater

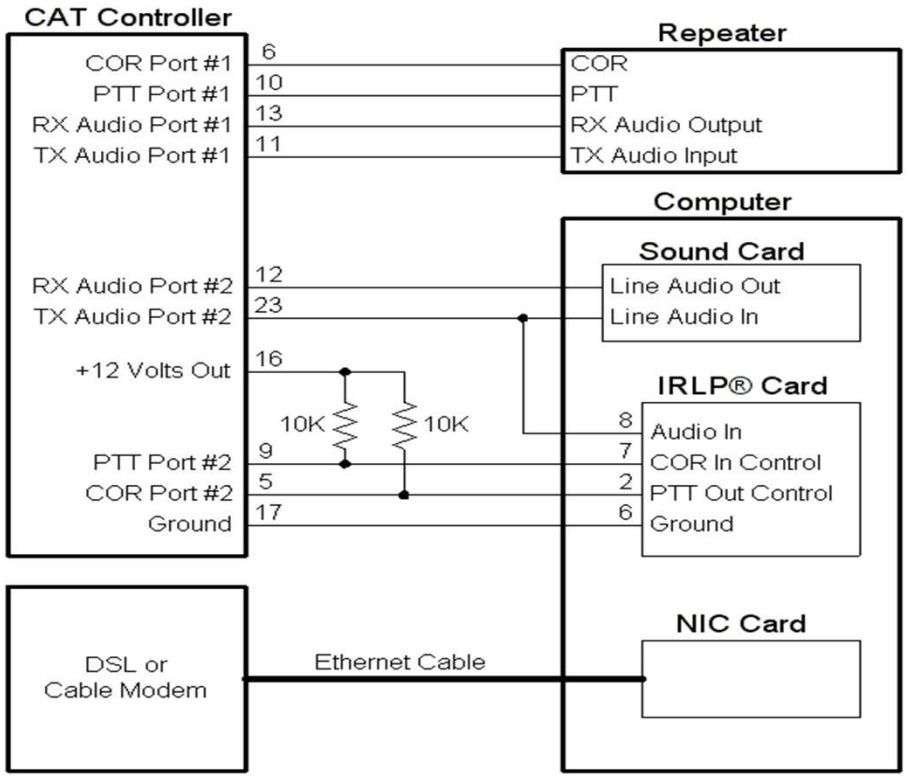
Blocks repeater tones and ID from the Internet

Internet Radio Link Project (IRLP)

- Designed by David Cameron VE7LTD to enable audio signals to travel through the Internet to link repeaters without RF or leased lines
- Is made up of nodes and reflectors, each with a unique number
- There is more than one way to connect a node to a repeater
  - A computer directly connected to a multiport controller which is also directly connected to the repeater radios
  - A computer directly connected to a transceiver which connects to the repeater using RF

Direct Repeater to IRLP Connection

- Requires a repeater controller with multiple ports and an Internet connection to the repeater site
- A controller made by Computer Automation Technology is shown, other controllers may have similar functionality



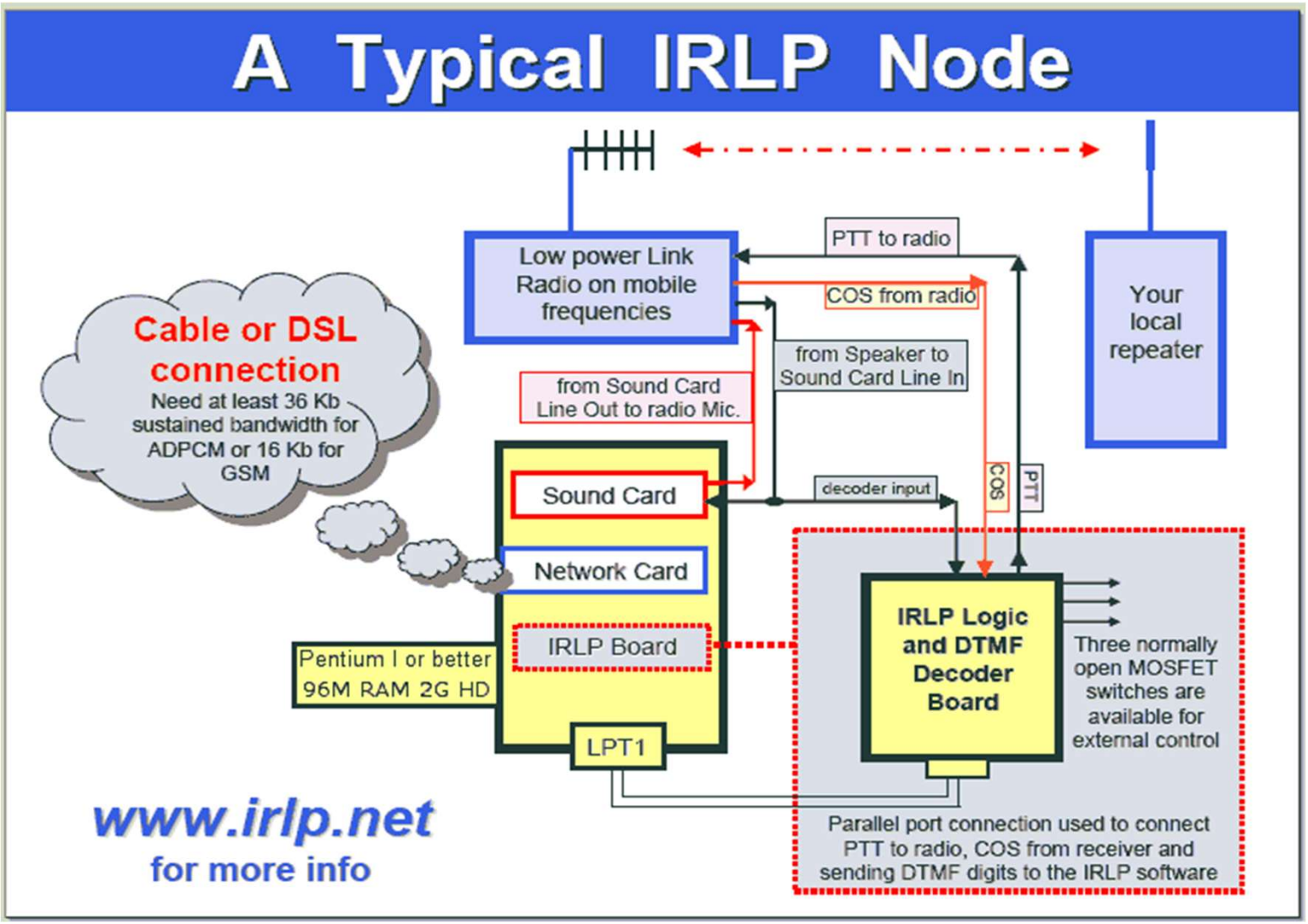
The ground connection from the repeater to the controller is not shown.

Shielded cable is recommended for all audio connections. RG-174 works well for this.

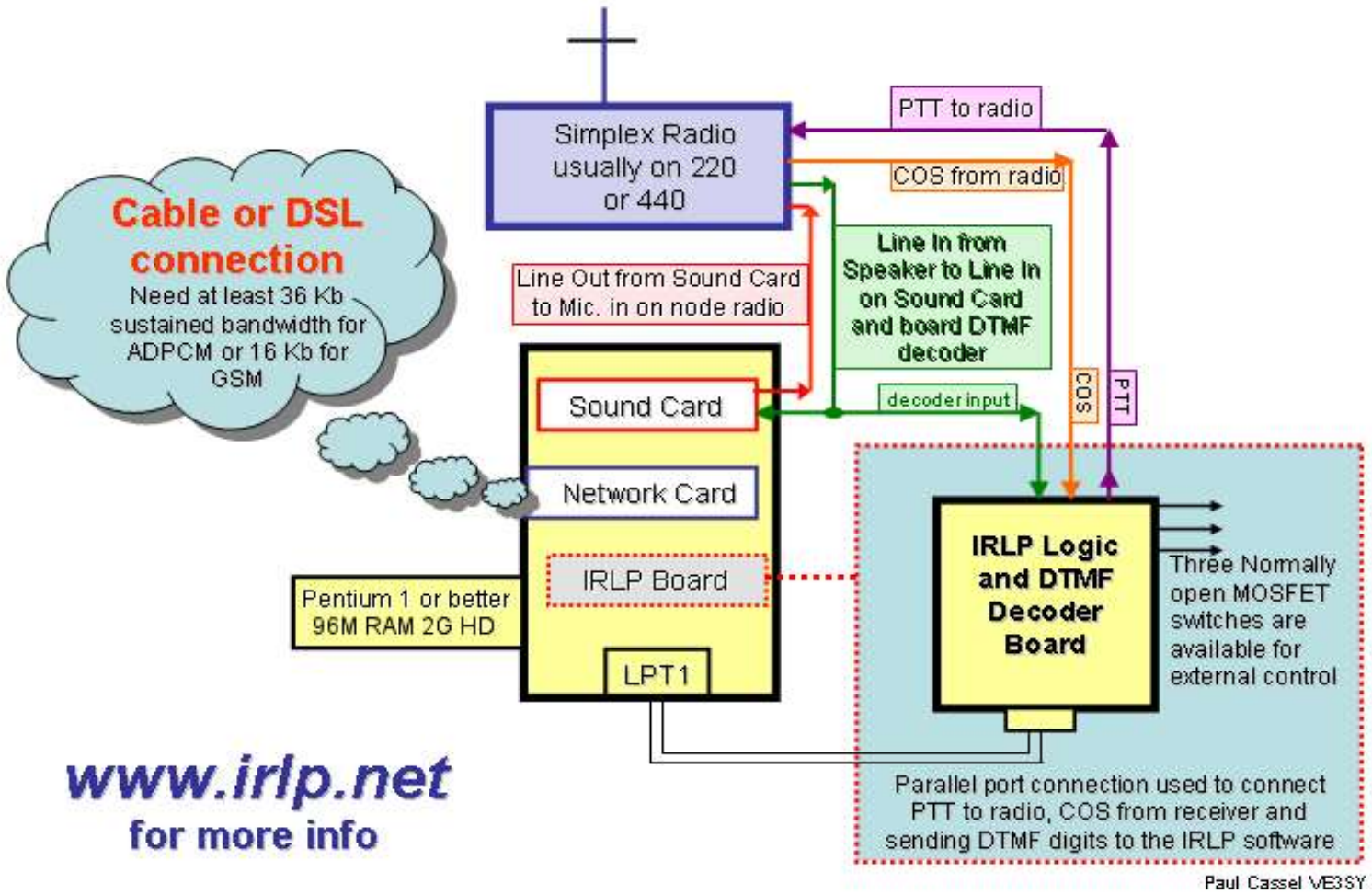
Set the COR jumper on the IRLP card and both the COR input and the PTT output on the repeater controller for active low. The PTT output from the IRLP card is active low.

The voltage on the top end of the two 10K resistors is not critical. The diagram shows +12 volts. Im almost all cases a +5 volt source would work just as well.

A Typical IRLP Node

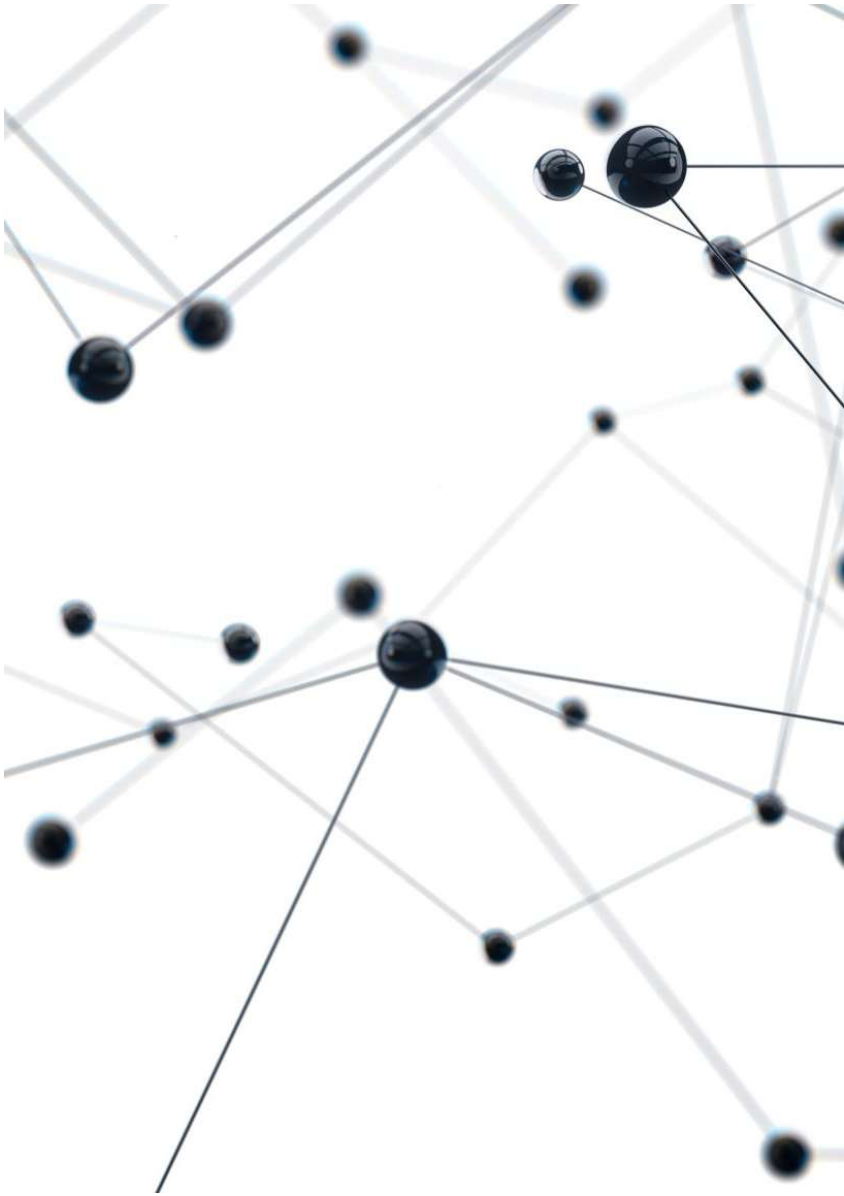


Typical IRLP Simplex Node



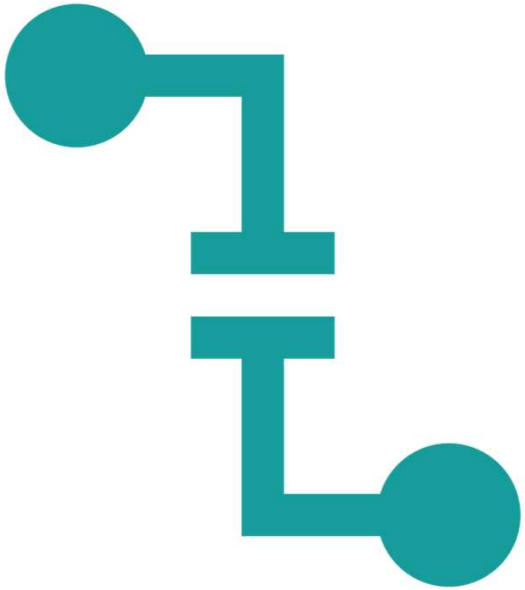
IRLP Reflectors

- Implemented on a computer with a high bandwidth Internet connection running IRLP reflector software
- Reflectors are not directly connected to a radio
- Provide point to multipoint “party line” type connections - audio passed to and from all connected nodes
- Each reflector can support up to 10 connected nodes
- Reflector status is shown on https://status.irlp.net/



Using IRLP

- Identify on the repeater with your callsign
- Send your repeater's DTMF IRLP access code plus the four-digit number of the node or reflector you want to connect to (IRLP nodes and reflectors are listed on the website https://status.irlp.net/)
- Only one connection from a node at a time is allowed
- Leave a gap between transmissions to allow for additional Internet delay
- Connect to a reflector using a node and channel number for example "9009" for node 9000 channel 9
- It is OK to call CQ on a reflector but avoid local traffic
- To release the connection, use your repeater's DTMF IRLP access code plus 73

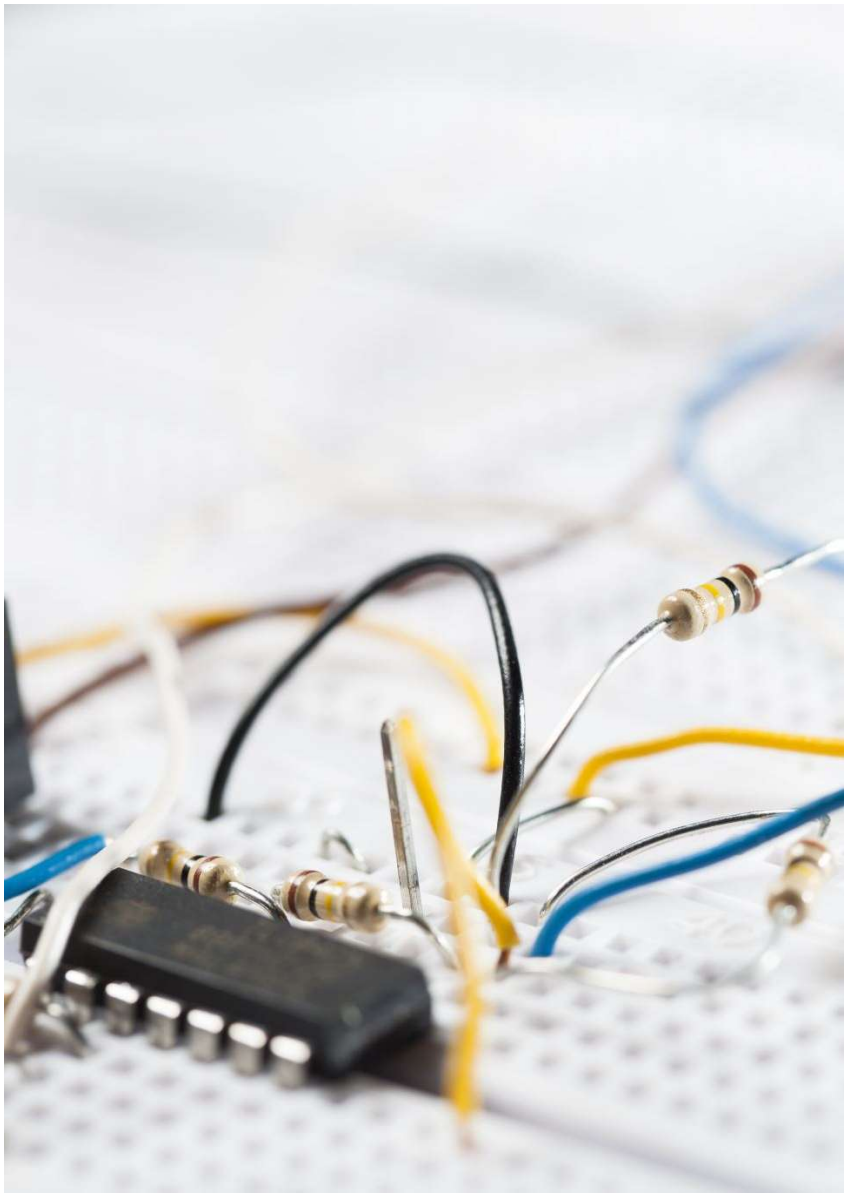


AllStarLink

- Links repeaters, remote base stations and hot spots using VoIP over the Internet
- Primary use is as a dedicated computer node wired to your repeater or radio
- Connections from EchoLink, other VoIP clients and telephone calls are supported, including Broadcastify
- Made up of nodes and hubs
- A node is software running on a computer that connects to the AllStarLink network
- Each node is assigned a unique node number
- A hub is used to link multiple nodes
- Any node can be configured as a hub

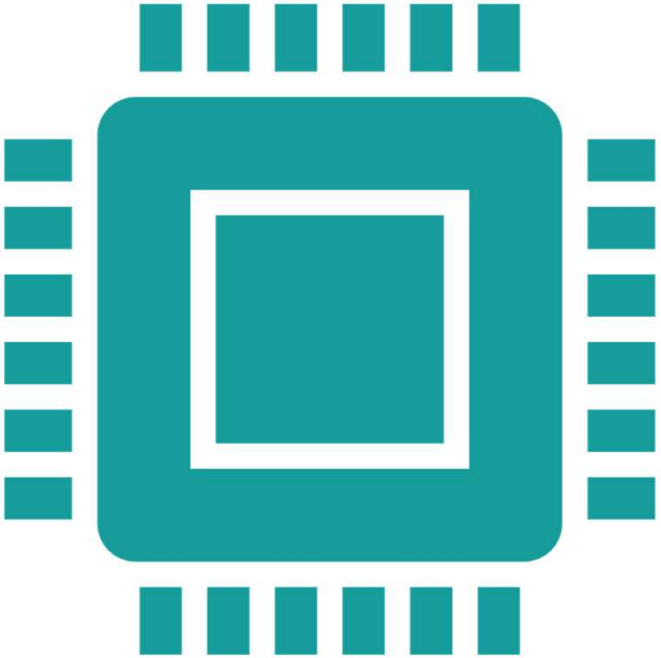
AllStarLink Nodes and Hubs

- A node is usually built by connecting a computer directly to the radio using a commercially available adapter
- A node can be associated with a repeater or a hot spot
- A hot spot is made up of a computer and a simplex transceiver
- A hub can be located anywhere there is power and Internet



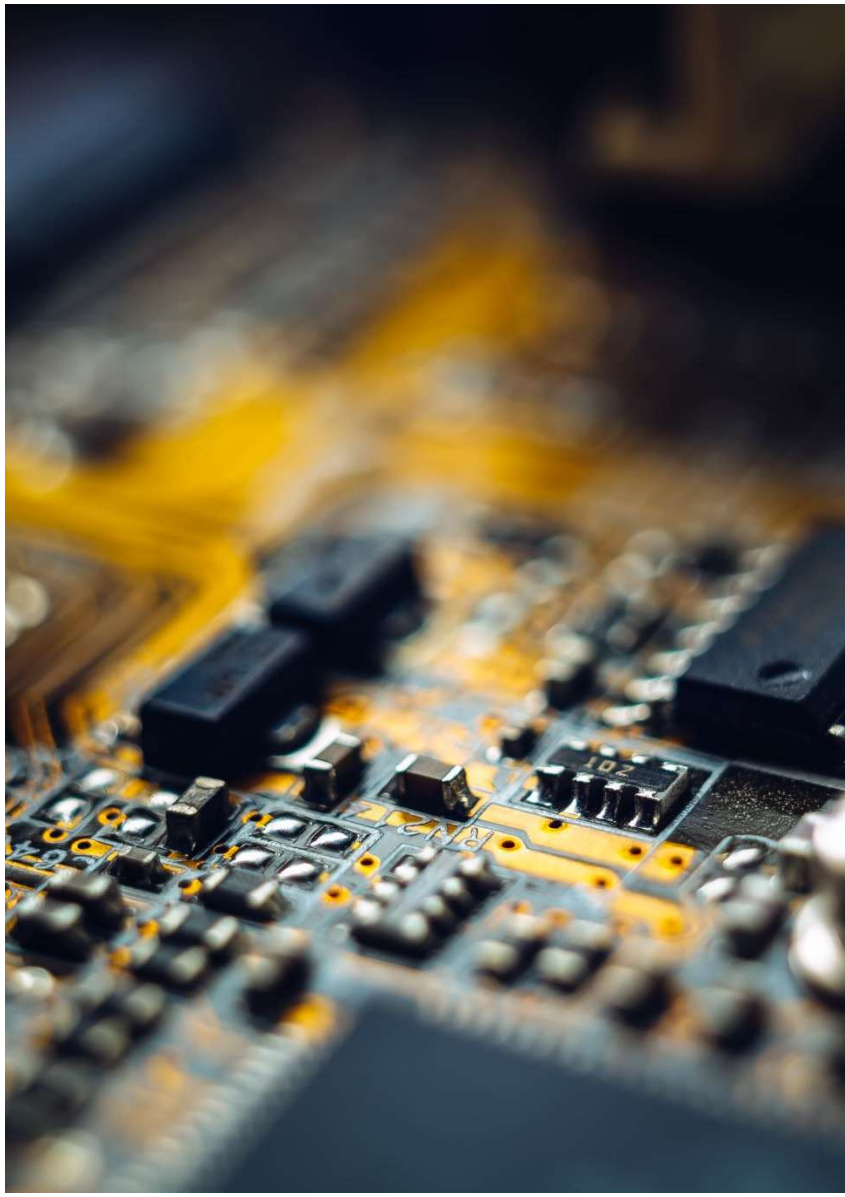
AllStarLink

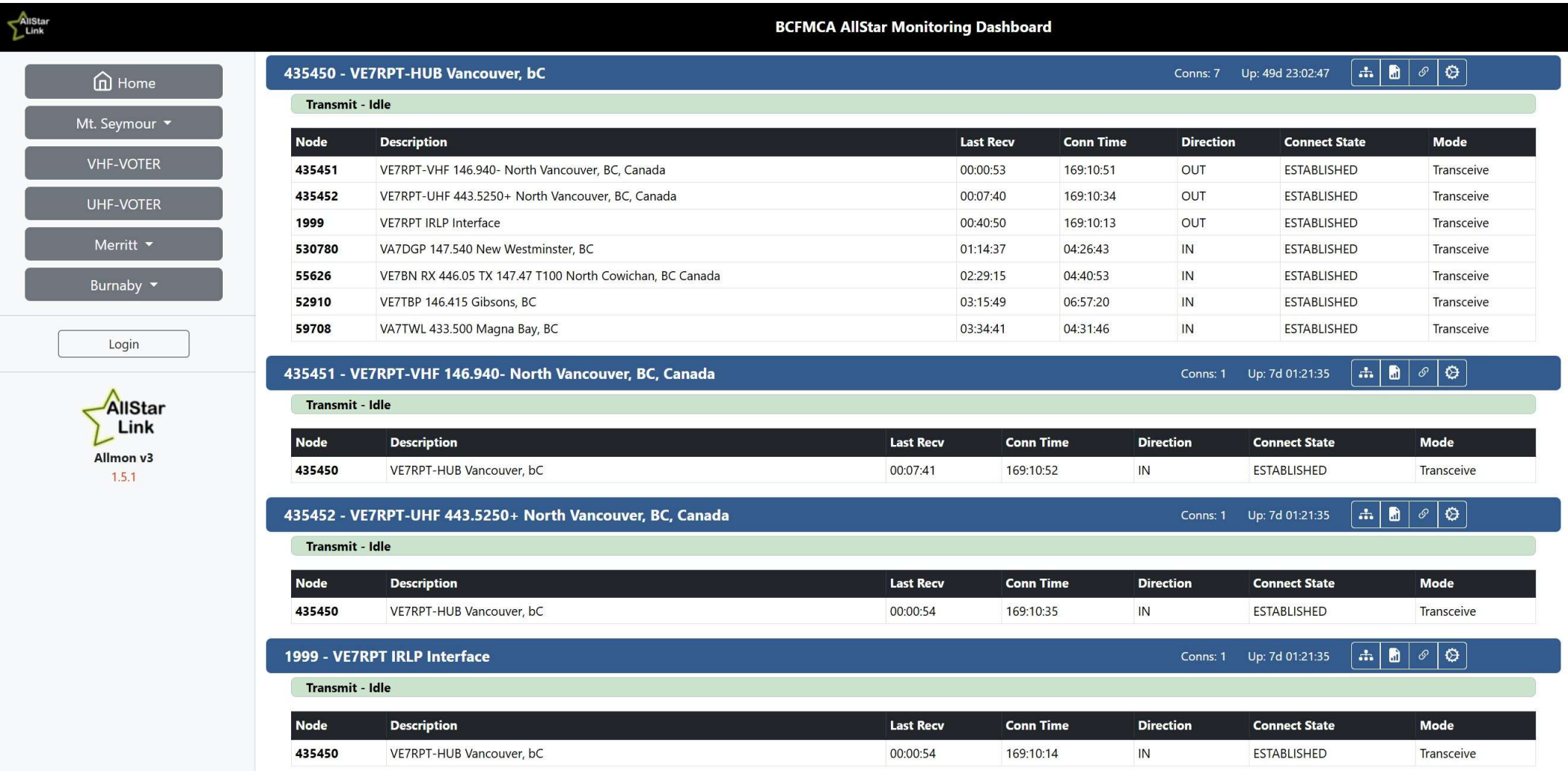
- Provides enhanced features and control for complex repeater installations
  - Status dashboard
  - Phone patch
  - Multiple receiver control
- You use AllStarLink when
  - You access an enabled repeater
  - You connect to a private hotspot
  - With apps like EchoLink or DVSwitch



RPT Connections

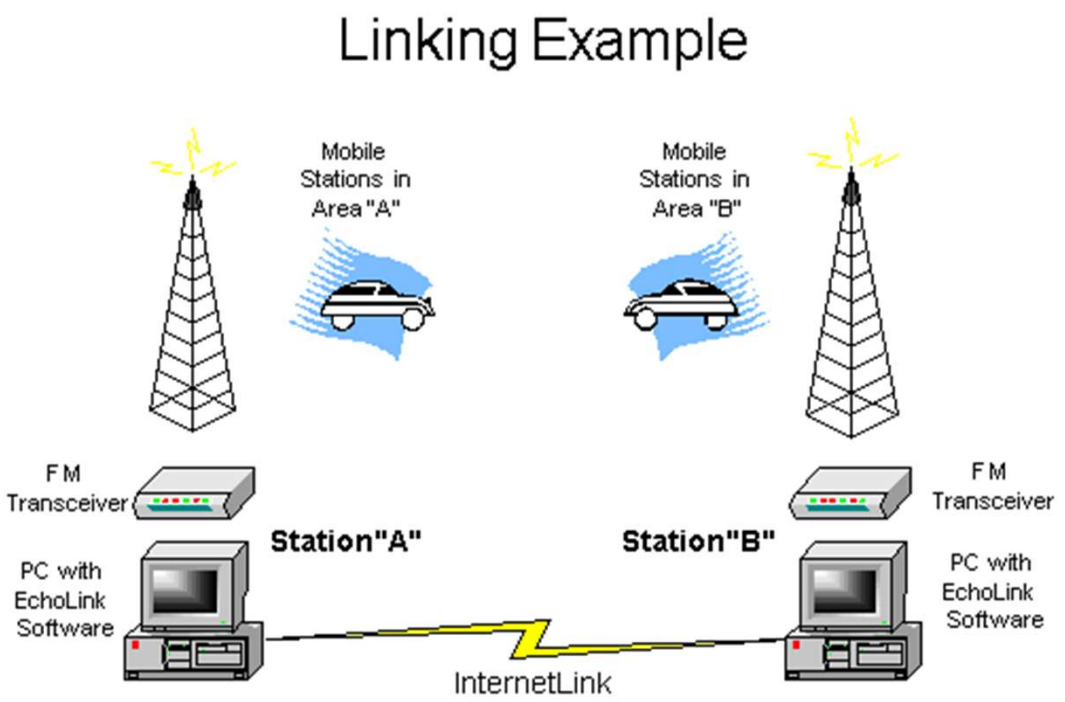
- A computer running AllStarLink supports nodes 435451, 435452 and 1999 and is functionally the RPT controller
- A computer running IRLP software is hard-wired to the AllStarLink computer running node 1999
- A wireless link to UBC is used to connect the on-site AllStarLink computer to the Internet
- The AllStarLink computer that acts as the RPT hub is in the BC Wireless Amateur Radio Network (BCWARN) server farm at UBC




BCFMCA AllStar Monitoring Dashboard
Home
Mt. Seymour
VHF-VOTER
UHF-VOTER
Merritt
Burnaby
Login
AllStar Link
Allmon v3
1.5.1
435450 - VE7RPT-HUB Vancouver, bC
Conns: 7
Up: 49d 23:02:47
Transmit - Idle
Node Description Last Recv Conn Time Direction Connect State Mode
435451 VE7RPT-VHF 146.940- North Vancouver, BC, Canada 00:00:53 169:10:51 OUT ESTABLISHED Transceive
435452 VE7RPT-UHF 443.5250+ North Vancouver, BC, Canada 00:07:40 169:10:34 OUT ESTABLISHED Transceive
1999 VE7RPT IRLP Interface 00:40:50 169:10:13 OUT ESTABLISHED Transceive
530780 VA7DGP 147.540 New Westminster, BC 01:14:37 04:26:43 IN ESTABLISHED Transceive
55626 VE7BN RX 446.05 TX 147.47 T100 North Cowichan, BC Canada 02:29:15 04:40:53 IN ESTABLISHED Transceive
52910 VE7TBP 146.415 Gibsons, BC 03:15:49 06:57:20 IN ESTABLISHED Transceive
59708 VA7TWL 433.500 Magna Bay, BC 03:34:41 04:31:46 IN ESTABLISHED Transceive
435451 - VE7RPT-VHF 146.940- North Vancouver, BC, Canada
Conns: 1
Up: 7d 01:21:35
Transmit - Idle
Node Description Last Recv Conn Time Direction Connect State Mode
435450 VE7RPT-HUB Vancouver, bC 00:07:41 169:10:52 IN ESTABLISHED Transceive
435452 - VE7RPT-UHF 443.5250+ North Vancouver, BC, Canada
Conns: 1
Up: 7d 01:21:35
Transmit - Idle
Node Description Last Recv Conn Time Direction Connect State Mode
435450 VE7RPT-HUB Vancouver, bC 00:00:54 169:10:35 IN ESTABLISHED Transceive
1999 - VE7RPT IRLP Interface
Conns: 1
Up: 7d 01:21:35
Transmit - Idle
Node Description Last Recv Conn Time Direction Connect State Mode
435450 VE7RPT-HUB Vancouver, bC 00:00:54 169:10:14 IN ESTABLISHED Transceive

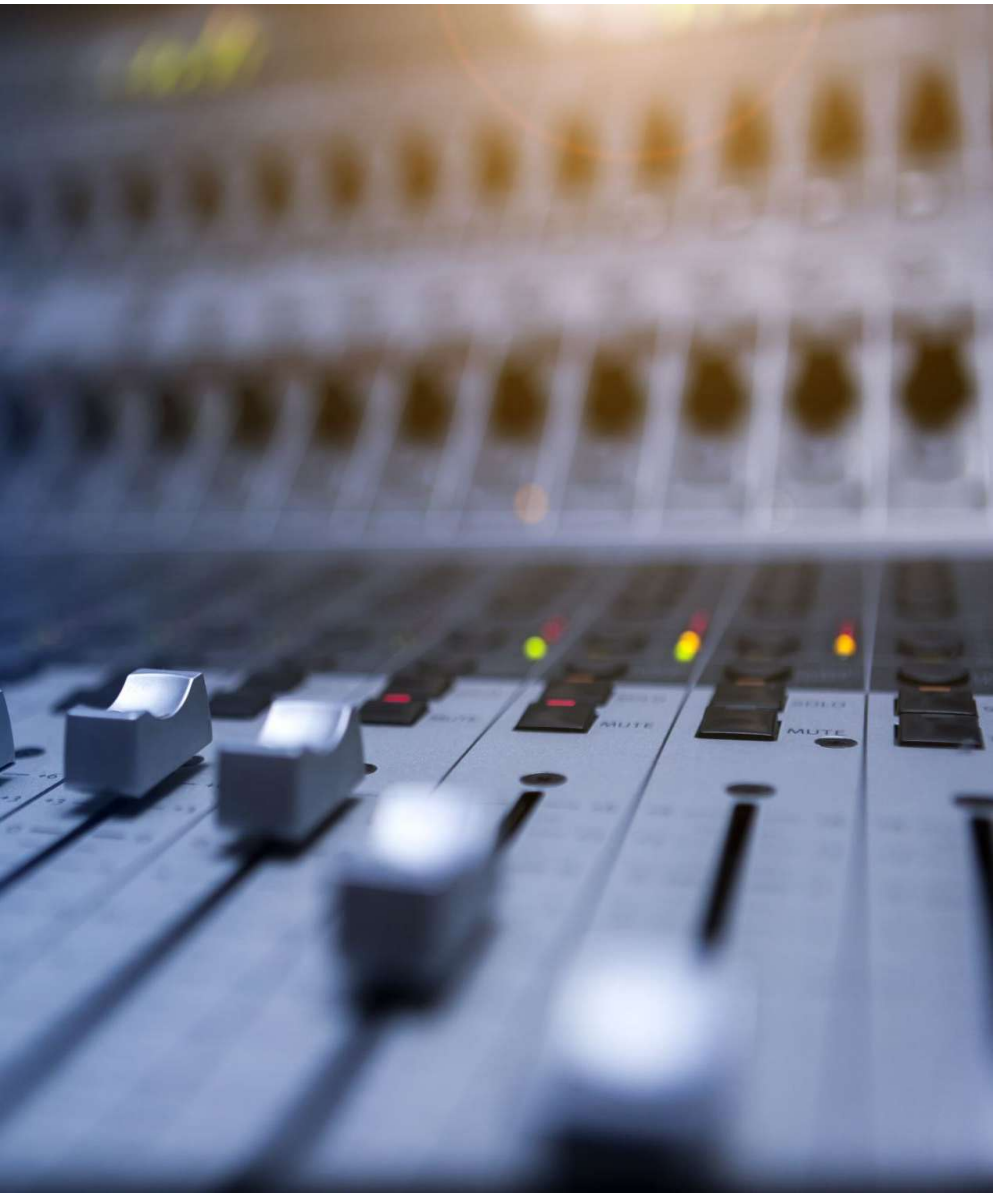
EchoLink

- Just like IRLP and AllStarLink every node has a unique number
- Access to the EchoLink Internet network is possible from a PC or other device running EchoLink software
- Connection from an RF device through a computer is also possible



EchoLink Features

- Allows worldwide connections between stations, or from computer to a station
- EchoLink software runs on Windows, Android & iOS
- Web browser access is available
- A Node is a PC or other device running EchoLink software
- A Sysop Node allows access from an RF device to the EchoLink network using a repeater or a simplex connection
- A Sysop Node can be used as a Conference Server

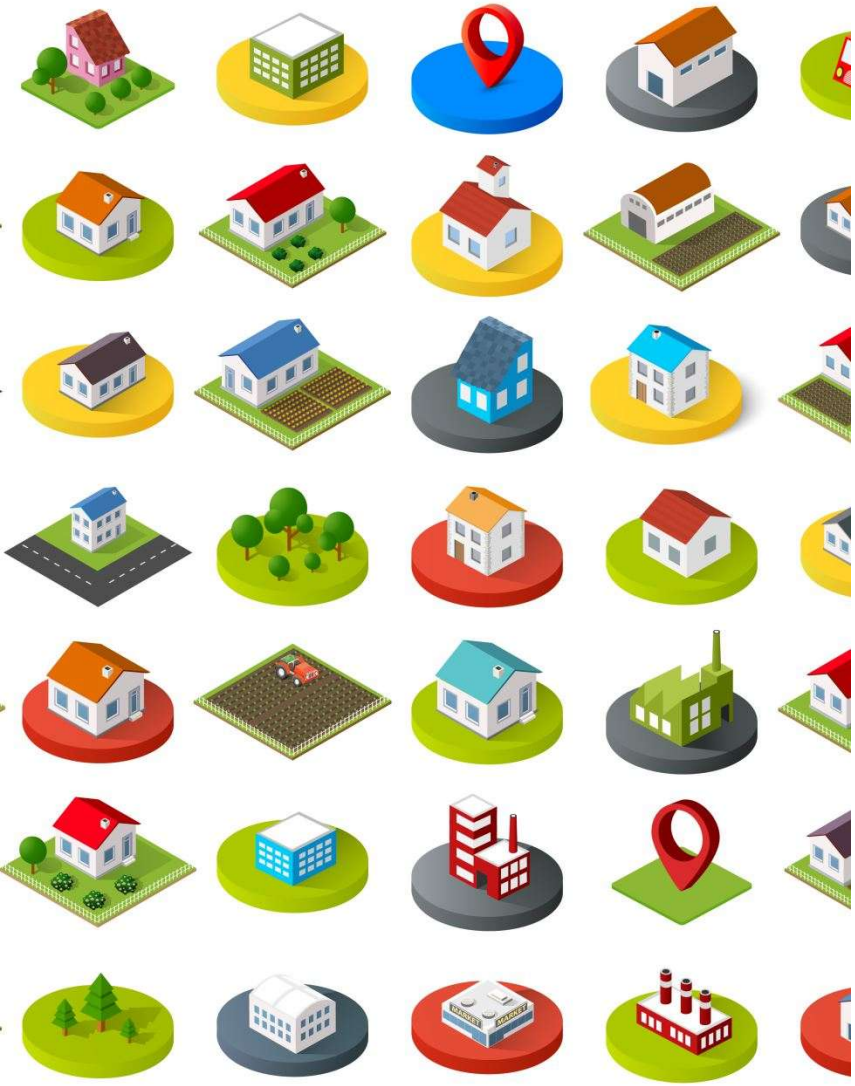


Using an EchoLink App

- Register with EchoLink
- Download and install the EchoLink client https://www.echolink.org/download.htm
- Connect to the EchoLink node you are interested in
  - Node info is available at https://www.echolink.org/
- Verify the audio setting on your device using *ECHOTEST*
- Follow the PTT instructions

Security

- Licensed amateurs only! Verification is required to obtain access to IRLP, AllStarLink and EchoLink
- Encryption techniques are used to protect all three networks from unauthorized access through the Internet



References

- ARRL Handbook – Chapter 18 “Repeater Systems”
- IRLP Website: https://www.irlp.net/
- Repeater Builder: https://www.repeater-builder.com/rbtip/index.html#main-index
- AllStarLink Website: https://www.allstarlink.org/
- AllStarLink Wiki: https://wiki.allstarlink.org/wiki/Main_Page
- EchoLink Website: https://www.echolink.org/
- Lee Woldanski VE7FET - BCFMCA