



EchoLink  
Bob & Mike

19 Apr 2020  
Version #5

# Agenda

- Purpose
- Link Examples
- Website & Steps
- Operate
- Questions?

# Purpose

- EchoLink is software that runs on phones, tablets, laptops, desktops
  - MAC, Android, Windows, Linux, Proxy for restricted internet
- Uses internet to connect via voice (and text) to other computers, smart-phones and radios
- Can be a radio backup
- If not local, still connect to radios, repeaters, computers
- Example: Use EchoLink to connect to the HARC repeater

## How Echolink works

- Connects microphone and speaker to internet
  - Laptop, desktop, smart phone, radio transceiver
- Communication path options
  - Computer to computer
  - Computer to radio
  - Radio to computer
  - Radio to computer to computer to Radio
- Uses Voice over IP known as VOIP
  - Voice is digitized and sent as digital packets across internet
    - 19.8K bits per second using UDP packets
    - UDP packets are low latency, not assured transmissions
- Echolink “servers” provide list of stations around the world
  - Each is called a node and has a node number
  - Each is registered to a Ham Call sign – only hams can use echolink
  - Many but not all nodes are connected to Radio transceivers





## Why Use Echolink?

- Provides connection to Hams located beyond range of normal VHF/UHF communication
  - Those behind a hill or in a valley
  - Those elsewhere in the county or state
  - Those elsewhere in country or different country
- Maintains Ham radio “party line” awareness
  - Ensures all can hear important communications
  - Enables remote participants to contribute to event understanding
- Use in emergency operations when internet available
- Use for meetings when cannot get to location for direct RF
- Use for enjoyment and learning – connect to nets remotely
  - Listen to ham activity in a different city or state

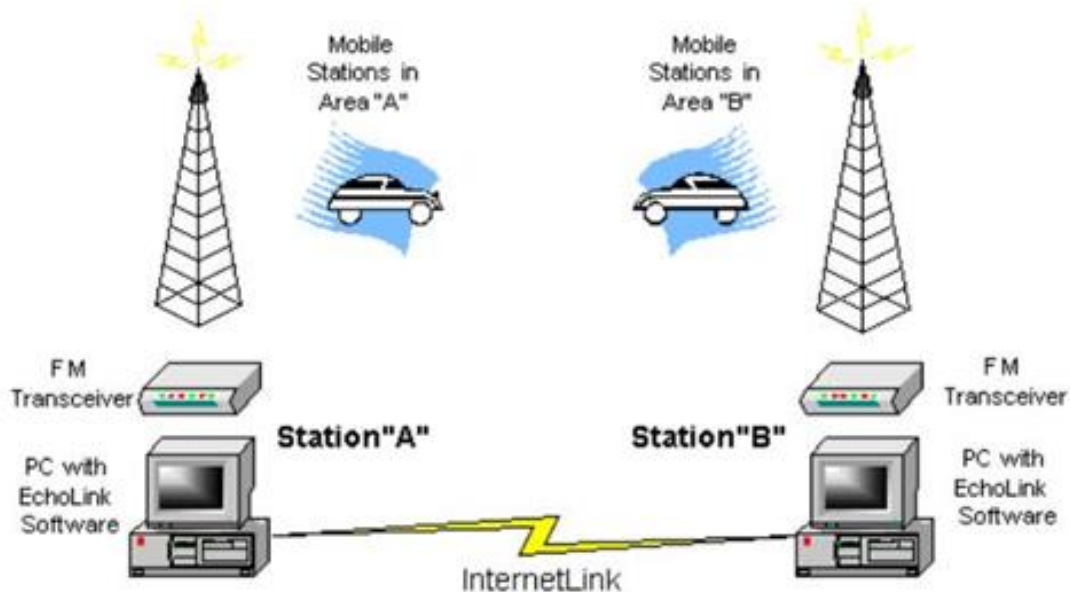


## Limitations of Echolink?

- It does depend upon an internet connection
- Voice quality varies with equipment used
- “Turn around” time can be long due to VOX and compounding of squelch tails
- However, not always
  - Computer to computer can be very fast – faster than normal repeater
  - Depending upon how the RF station is set up turn around can sound just like a normal repeater

# Link Example Overview

- Uses Internet to connect via voice (and text) to other computers, phones and radios



\*UDP – User Datagram Protocol - low latency data packets

# Computer to Computer (smart phone to smart phone)

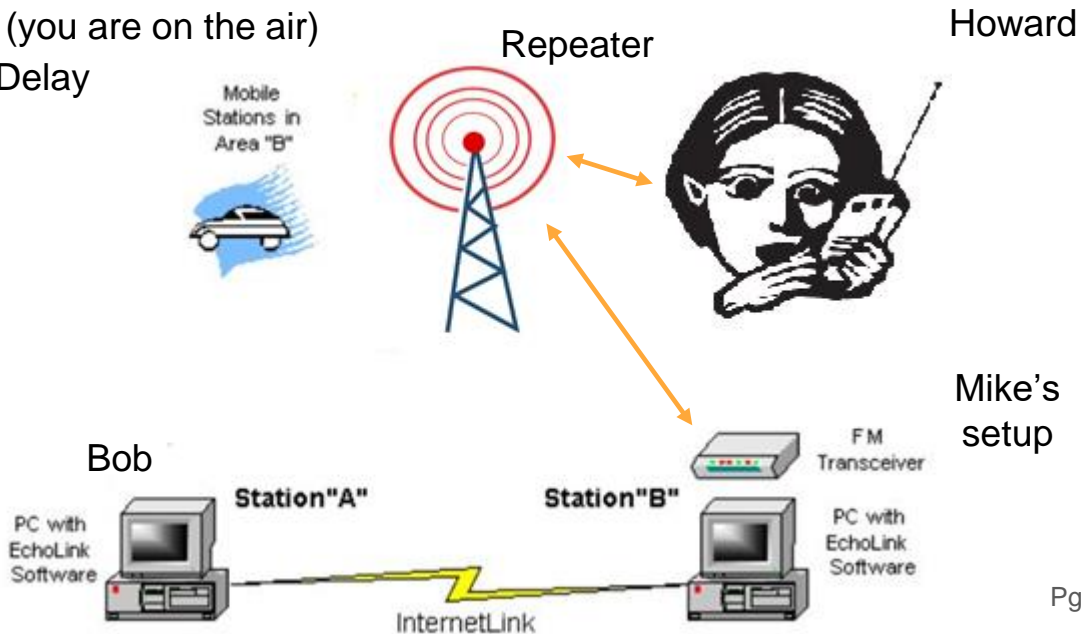
- Connect EchoLink users, with voice and text to other EchoLink users (computer, smart phone, etc)
- Multiple connections also possible (Mike, Bob, repeater)





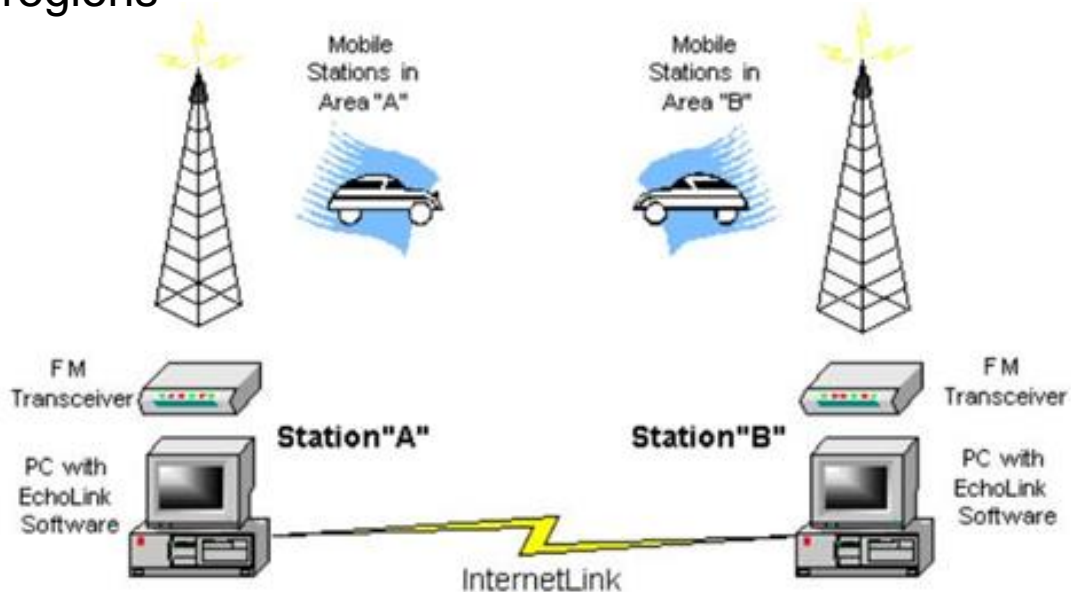
# Computer to Computer to RF

- Bob's connection example: EchoLink from his computer, to Mike's EchoLink computer, Mike's computer is connected to his RF radio. With Mike's Radio, Bob can connect to the HARC repeater or other stations on the frequency Mike's radio is tuned to.
- Station ID (you are on the air)
- Repeater Delay



# RF on both ends

- RF on both ends, EchoLink to connect to unconnected regions



# Website & Steps (pg 1 of 4)

1. Help Files
2. Download app
3. Install & setup
4. Validate - register call sign and create password
5. Don't need headset
6. Take a tour!

<http://www.echolink.org/>



## Introducing EchoLink

Available on the App Store  
[iPhone FAQ](#)  
[Android FAQ](#)

Select Language

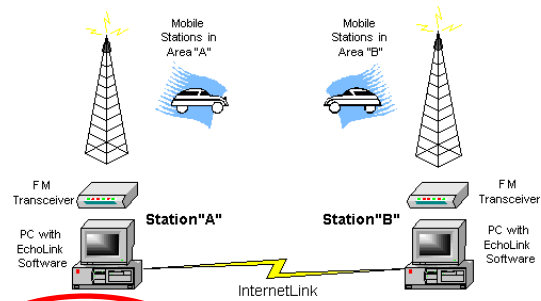
- [Take a Tour](#)
- [Download](#)
- [Validation](#)
- [Interfaces](#)
- [Support and FAQs](#)
- [Help Files](#)
- [News and Tips](#)
- [Vanity Node Numbers](#)
- [Conference Servers](#)
- [Routers and Firewalls](#)
- [Current Logins](#)
- [Link Status](#)

[ARRL Book on Internet Linking](#)

[Nifty E-Z Guide](#)

EchoLink® software allows licensed Amateur Radio stations to communicate with one another over the Internet, using streaming-audio technology. The program allows worldwide connections to be made between stations, or from computer to station, greatly enhancing Amateur Radio's communications capabilities. There are more than 200,000 validated users worldwide – in 151 of the world's 193 nations – with about 6,000 online at any given time.

### Linking Example



The program runs on Microsoft Windows®. It is offered free of charge and may be downloaded [here](#).

# Website & Steps (pg 2 of 4)

- Download User Guide #1 (terrible graphic on pg 40 !!)
- Look at Help pages #2

#1

EchoLink Help

PDF Format Italiano Español

English [Home] [Support and FAQs]

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## Table of Contents

(please allow Java applet to load)  
Table of Contents (Java applet)

## Introducing EchoLink

Congratulations on installing EchoLink! EchoLink is software which allows Amateur Radio stations to communicate with one another over the Internet, using voice-over-IP (VoIP) technology. The program enables worldwide connections to be made between stations, from computer to station, or from computer to computer.

The sections that follow introduce the basic capabilities of EchoLink and outline the system requirements. You can also choose an item from the "tree" of choices on the left.

**Please select from the choices below:**

- [First-Time Setup](#)
- [Basic Operation](#)
- [Interfacing](#)
- [Configuration](#)

#2

# Website & Steps (pg 3 of 4)

1. Signup/register:  
send email with copy  
(jpg, etc) of your ham  
license (call sign)

2. Validate: use your  
call sign and create a  
password

<http://www.echolink.org/>



## Introducing EchoLink

Select Language ▾

[Take a Tour](#)

[Download](#)

[Validation](#)

[Interfaces](#)

[Support and FAQs](#)

[Help Files](#)

[News and Tips](#)

[Vanity Node Numbers](#)

[Conference Servers](#)

[Routers and Firewalls](#)

[Current Logins](#)

[Link Status](#)



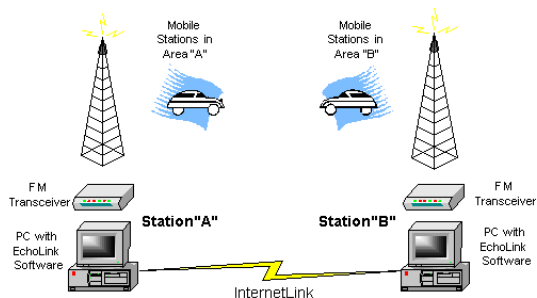
[ARRL Book on  
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[Nifty E-Z  
Guide](#)

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### Linking Example



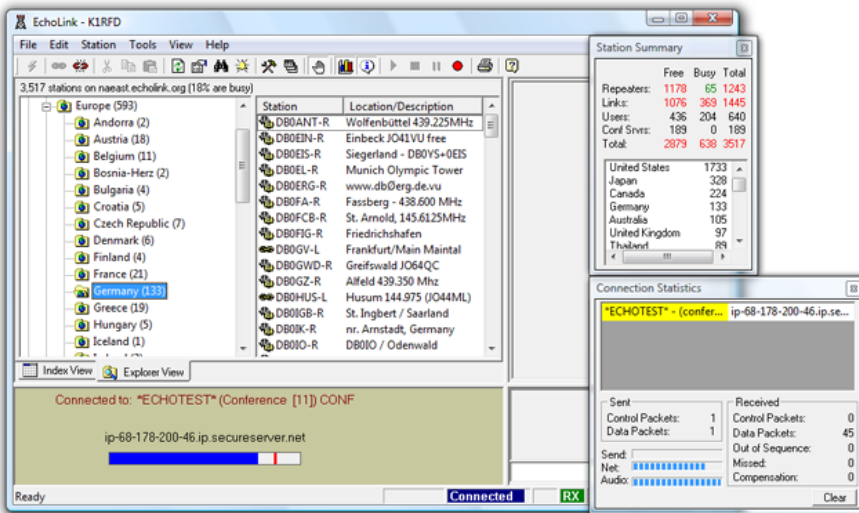
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[iPhone FAQ](#)  
[Android FAQ](#)

# Website & Steps (pg 4 of 4)

- More info, go to ARRL Web Site for more info about EchoLink



EchoLink is a full-featured software package with many important and useful features. For a brief overview, [take a tour](#) !

For more information about Internet linking programs such as EchoLink, see QST for February, 2003, page 44, or download the PDF from the [ARRL Web site](#).

**NEW** [Windows XP Service Pack 2 Information](#)

# EchoLink user interface

## New EchoLink version 2.0.908

Menu Bar

Toolbar

Station list

QSO status

Audio level meter

Status bar

Annunciators

The screenshot shows the EchoLink application window with the following components:

- Menu Bar:** File, Edit, Station, Tools, View, Help
- Toolbar:** Contains icons for various functions like search, refresh, and volume control.
- Station List Table:**

Station	Stat	Time	Location	Node
2E0EVP-R	On	21:29	In Conference *WWARG*	917690
2E0UKH-R	On	21:29	Kettering England	432802
3B8FP-R	On	00:44	[3B8 Repeater Network]	790496
400LPG-R	On	22:44	R0, Podgorica, MNE	971573
401HQ-R	On	22:45	R5, Herceg Novi, MNE	969587
407JAZ-R	On	22:40	R3, Lovcen, MNE	968395
4S6ARA-R	On	02:13	ARA-Lanka(Repeater 01)	803348
4S7RS-R	On	02:15	RSSL (Net:15.30 UTC)	226020
4X1ZQ-R	On	23:29	Allstar link [0/20]	583325
4Z11Z-R	On	23:42	KM72OR93 Haifa Rep R12	169676
6K0FR-R	Busy	05:41	nodetype>conf>*.korea*	764314
6K0UZ-R	On	05:43	%4c»èμζ±×¶ó'ì	731313
- QSO Status:** Connected to: \*ECHOTEST\* (Conference [12]) CONF  
ec2-204-236-179-116.us-west-1.compute.amazonaws.com
- Audio Level Meter:** A horizontal bar with a red indicator showing the current audio level.
- Status Bar:** Shows 'Ready' on the left and 'Connected' in the center.
- Annunciators:** A row of colored buttons including 'RX' (green) and 'PTT' (yellow).
- Users and text messages:** A chat window titled 'CONF Audio test server [13]' showing the user 'KK6WYW Bob' and a message: 'This test server simply records and plays back transmissions for testing purposes. Use it all you like.'
- Text chat:** A text input field at the bottom right with a 'Send' button.

Users and text messages

Text chat

# Find

Search example “MDV” to find N6MDV (Mike, typically pointed to HARC (W6HA) repeater)  
Or “MAX” to find WB6MAX- R (his radio is usually pointed at the WB6VMV repeater)

EchoLink - KK6WYW

File Edit Station Tools View **Help**

5,922 stations on newest.echolink.org (12% are busy)

Station	Stat	Time	Location	Node
N4VAL	Busy	15:36	Ventura, CA - 146.460	180576
N5EXT	Busy	17:37	Google Pixel 2 XL User	266361
N5JN	On	18:54	Midland, Georgia USA [0/20]	70090
N5KB	On	17:36	LGE LGL62VL User	382678
N5QLA	Busy	17:33	NET CONTROL	7800
N5RIV	On	02:49	Klein Texas	776011
N6BEN	On	15:33	Fresno, CA USA	404606
N6BOY	On	15:38	samsung SM-G935T User	326777
N6BXO	On	16:37	Fort Collins CO USA	485316
N6BYH	On	15:32	samsung SM-G900V User	29848
N6JCC	On	15:36	qingguo 7S+ User	584949
<b>N6MDV</b>	<b>Busy</b>	<b>15:33</b>	<b>Manhattan Beach DM03</b>	<b>686426</b>

Station N6MDV

Mike  
Manhattan Beach DM03

Connected to: N6MDV Mike  
United States  
47.144.133.231

Ready **Connected** RX



# Connect/Disconnect

Connect & Disconnect: connects you to another EchoLink user

The screenshot shows the EchoLink software interface. The title bar reads "EchoLink - KK6WYW". The menu bar includes "File", "Station", "Tools", "View", and "Help". The toolbar contains various icons, with the "Connect" icon (a green circle with a white lightning bolt) circled in red. Below the toolbar, a status bar indicates "5,922 Stations on newest.echolink.org (12% are busy)".

The main window displays a list of stations with the following columns: Station, Stat, Time, Location, and Node. The "N6MDV" station is highlighted in blue. The status bar at the bottom indicates "Connected to: N6MDV Mike" with the location "United States" and IP address "47.144.133.231".

Station	Stat	Time	Location	Node
N4VAL	Busy	15:36	Ventura, CA - 146.460	180576
N5EXT	Busy	17:37	Google Pixel 2 XL User	266361
N5JN	On	18:54	Midland, Georgia USA [0/20]	70090
N5KB	On	17:36	LGE LGL62VL User	382678
N5QLA	Busy	17:33	NET CONTROL	7800
N5RIV	On	02:49	Klein Texas	776011
N6BEN	On	15:33	Fresno, CA USA	404606
N6BOY	On	15:38	samsung SM-G935T User	326777
N6BXO	On	16:37	Fort Collins CO USA	485316
N6BYH	On	15:32	samsung SM-G900V User	29848
N6JCC	On	15:36	qingguo 7S+ User	584949
N6MDV	Busy	15:33	Manhattan Beach DM03	686426

Station N6MDV  
Mike  
Manhattan Beach DM03

Connected to: N6MDV Mike  
United States  
47.144.133.231

Ready Connected RX

# Push to talk

\* Old EchoLink interface (old version) \*

1. Push to start talk

2. Push to stop talk!!

Also use space-bar

... or other keys you wish to assign

The screenshot shows the EchoLink software interface. The title bar reads "EchoLink - KK6WYW". The menu bar includes "File", "Edit", "Station", "Tools", "View", and "Help". The toolbar contains various icons, with a red circle highlighting the "Push to Talk" icon (a microphone with a slash). Below the toolbar, it says "5,965 stations on newest.echolink.org (11% are busy)".

Station	Stat	Time	Location	Node
2E0EVP-R	On	21:29	In Conference *WWARG*	917690
2E0UKH-R	On	21:29	Kettering England	432802
3B8FP-R	On	00:44	[3B8 Repeater Network]	790496
4O0LPG-R	On	22:44	R0, Podgorica, MNE	971573
4O1HQ-R	On	22:45	R5, Herceg Novi, MNE	969587
4O7JAZ-R	On	22:40	R3, Lovcen, MNE	968395
4S6ARA-R	On	02:13	ARA-Lanka(Repeater 01)	803348
4S7RS-R	On	02:15	RSSL (Net:15.30 UTC)	226020
4X1ZQ-R	On	23:29	Allstar link [0/20]	583325
4Z1IZ-R	On	23:42	KM72OR93 Haifa Rep R12	169676
6K0FR-R	Busy	05:41	nodetype>conf>*.korea*	764314
6K0UZ-R	On	05:43	%ç»êµç±*¶óì	731313

At the bottom, it shows "Connected to: \*ECHOTEST\* (Conference [12]) CONF" and "ec2-204-236-179-116.us-west-1.compute.amazonaws.com". The status bar at the bottom indicates "Ready", "Connected", and "RX".

# Record, play, stop, pause

Record, play, stop, pause

The screenshot shows the EchoLink - KK6WYW application window. The menu bar includes File, Edit, Station, Tools, View, and Help. The toolbar contains various icons, with a red circle highlighting the playback controls: a right-pointing triangle (play), a vertical bar (stop), two vertical bars (pause), and a red circle (record). An arrow points from the text 'Record, play, stop, pause' to this red circle. Below the toolbar, a status bar indicates '5,965 stations on newest.echolink.org (11% are busy)'. The main area displays a table of stations with columns for Station, Stat, Time, Location, and Node. The bottom status bar shows 'Ready', 'Connected', 'RX', and 'PTT' indicators.

Station	Stat	Time	Location	Node
2E0EVP-R	On	21:29	In Conference *WWARG*	917690
2E0UKH-R	On	21:29	Kettering England	432802
3B8FP-R	On	00:44	[3B8 Repeater Network]	790496
400LPG-R	On	22:44	R0, Podgorica, MNE	971573
401HQ-R	On	22:45	R5, Herceg Novi, MNE	969587
407JAZ-R	On	22:40	R3, Lovcen, MNE	968395
4S6ARA-R	On	02:13	ARA-Lanka(Repeater 01)	803348
4S7RS-R	On	02:15	RSSL (Net:15.30 UTC)	226020
4X1ZQ-R	On	23:29	Allstar link [0/20]	583325
4Z1I2-R	On	23:42	KM72OR93 Haifa Rep R12	169676
6K0FR-R	Busy	05:41	nodetype>conf>*.korea*	764314
6K0UZ-R	On	05:43	¼ç»èµ¿±×¶ò'ì	731313

CONF Audio test server [13]  
KK6WYW Bob  
This test server simply records and plays back transmissions for testing purposes. Use it all you like.

Connected to: \*ECHOTEST\* (Conference [12]) CONF  
ec2-204-236-179-116.us-west-1.compute.amazonaws.com

Ready Connected RX PTT

# More Regarding Echolink

April 19, 2020

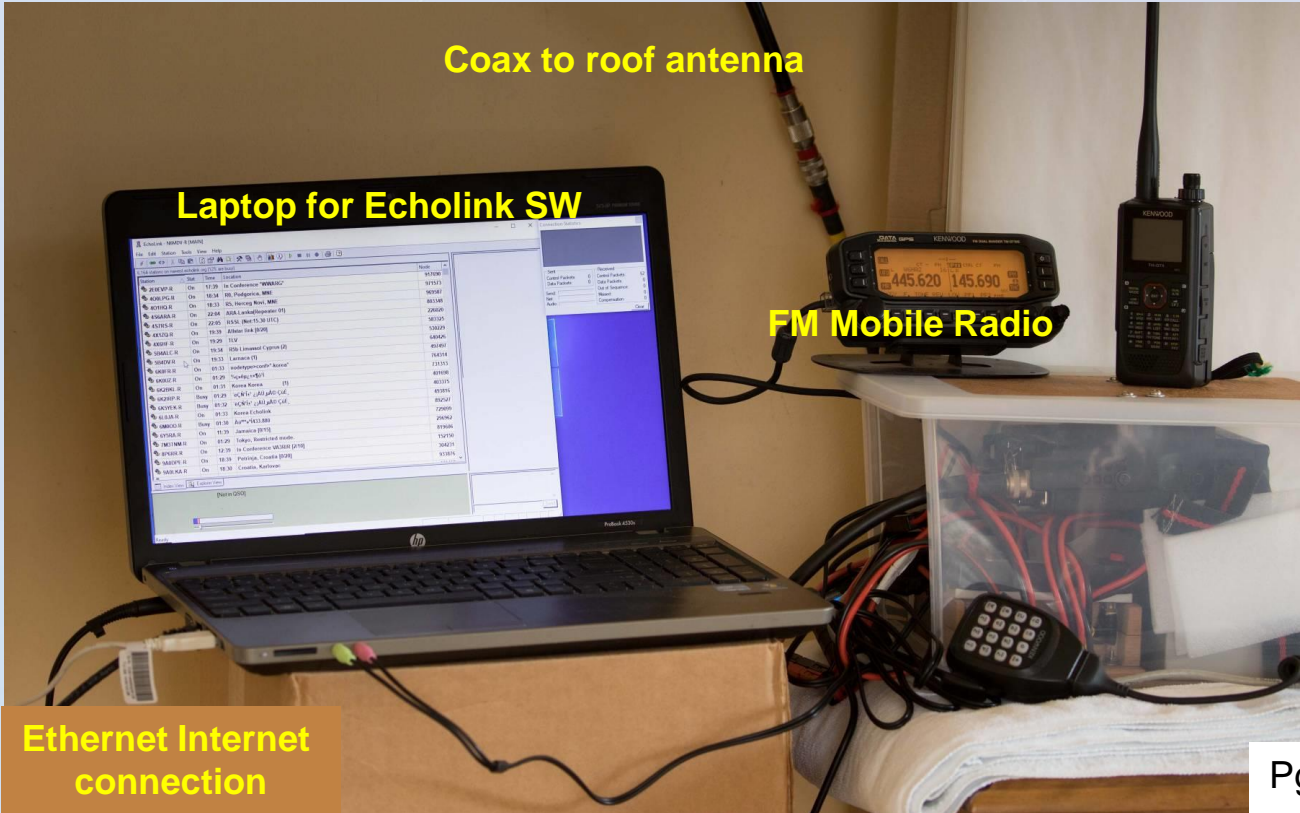


## Details of Echolink Sysop Mode Used by nodes connected to RF transceiver

- Connections radio and computer
  - Radio microphone is connected to computer speaker output
  - Radio speaker is connected to computer microphone
  - Push to Talk to control RF transmission
    - May just use VOX – activates when loud enough
    - May have dedicated control signal (better control)
  - Some radios have dedicated connectors for direct connect to computer
    - Others may require adaptor box to set levels and buffer electronics

# N6MDV-R Setup

- Laptop with echolink software
- D710 in plastic carrying case with batteries



Coax to roof antenna

Laptop for Echolink SW

FM Mobile Radio

Ethernet Internet connection

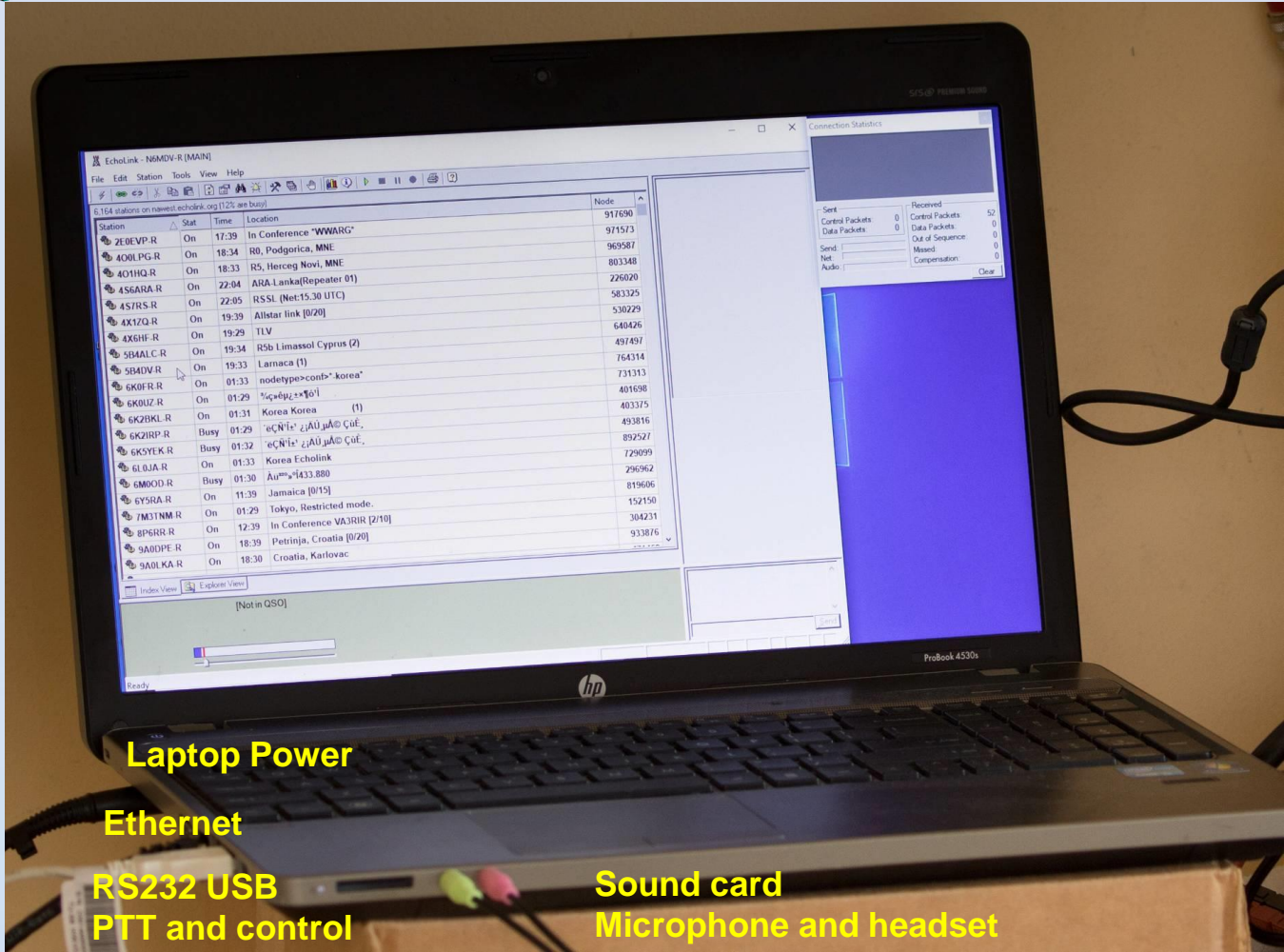
# N6MDV-L Setup

- Kenwood D710 Mobile FM radio
  - Directly supports Echolink with data and sound connections
  - Sysop mode on B channel of radio – showing simplex
- Kenwood D74A used to monitor echo link RF transmissions





# N6MDV-R Echolink Sysop



Laptop Power

Ethernet

RS232 USB

PTT and control

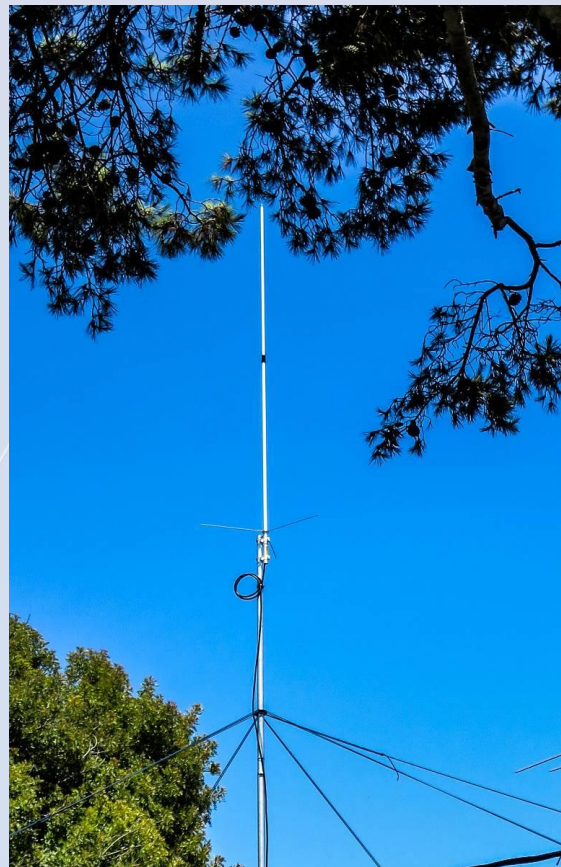
Sound card

Microphone and headset



# N6MDV Echolink RF

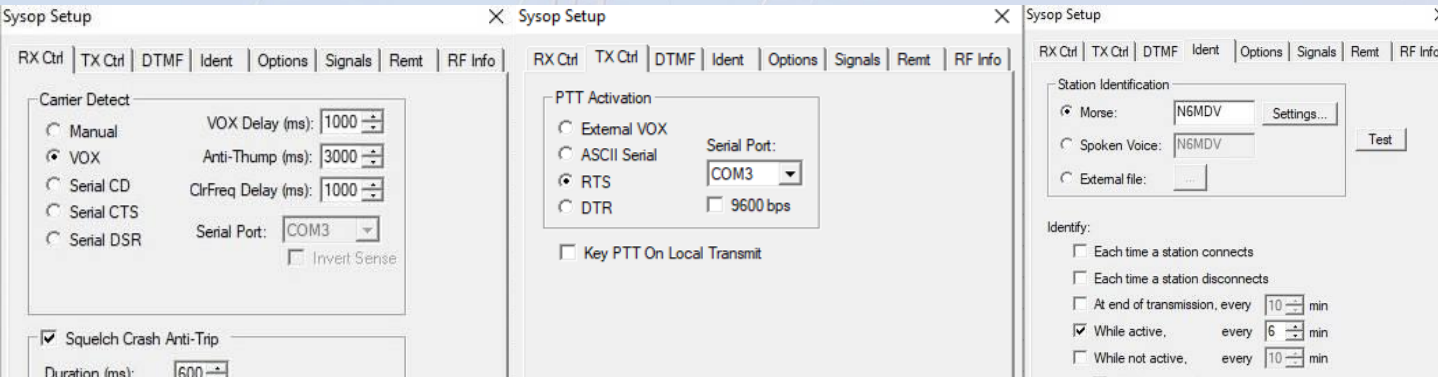
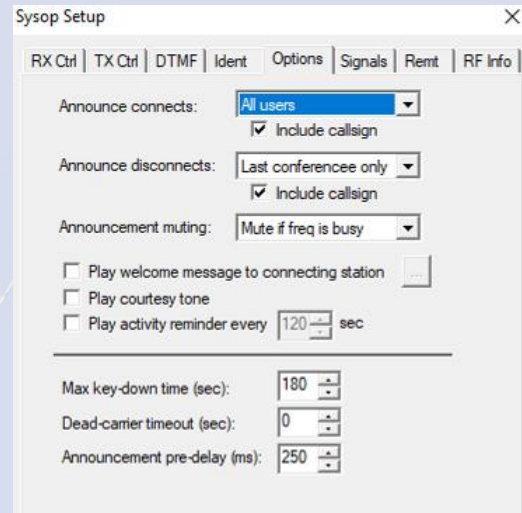
- Kenwood D710
  - 5 or 10 Watts , 3 minute timeout
  - Battery backup
- Comet CX-333 antenna
  - 6.5 to 9 dBi antenna base at 18 feet clear view to N, E, and S
  - Location: DM03tv
  - 25 feet LMR 400UF





# Echolink Setup with D710

- N6MDV-R
  - Tuned to W6HA club repeater 445.620- 127.3
- N6MDV-L
  - Tuned to 145.690 PL 127.3
  - Per TASMA band plan simplex for echolink like stations
- Connection to radio
  - Kenwood PG-5G cable set
    - Audio in and out via data jack
    - Control via RS232
  - Currently VOX exploring CTS



# EchoLink

- Questions ??



# Questions?

## New EchoLink Interface (version 2.0.908)

Menu Bar

Toolbar

Station list

QSO status

Audio level meter

Status bar

Annunciators

The screenshot shows the EchoLink software window titled "EchoLink - KK6WYW". It features a menu bar (File, Edit, Station, Tools, View, Help) and a toolbar with various icons. The main area is divided into several sections:

- Station List:** A table showing 5,965 stations on the newest.echolink.org server. The table has columns for Station, Stat, Time, Location, and Node. The first few rows are:
 

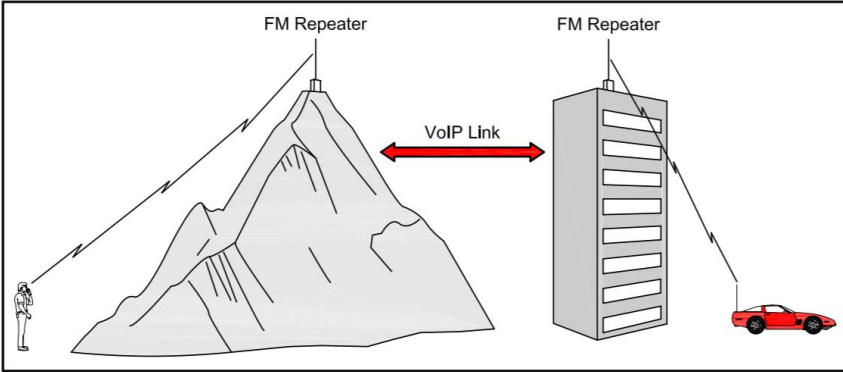
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6K0FR-R	Busy	05:41	nodetype>conf>*.korea*	764314
6K0UZ-R	On	05:43	%4c»èµ±±×¶ó'ì	731313
- QSO Status:** A green bar at the bottom of the station list area showing "Connected to: \*ECHOTEST\* (Conference [12]) CONF" and the IP address "ec2-204-236-179-116.us-west-1.compute.amazonaws.com".
- Audio Level Meter:** A blue and red bar at the bottom of the QSO status area.
- Text Chat:** A panel on the right side titled "CONF Audio test server [13]" containing the text "KK6WYW Bob" and a message: "This test server simply records and plays back transmissions for testing purposes. Use it all you like." Below the chat is a text input field and a "Send" button.
- Status Bar and Annunciators:** A bar at the very bottom of the window showing "Ready" on the left, "Connected" in a blue box, "RX" in a green box, and "PTT" in a yellow box.

Users and text messages

Text chat

# More Examples

- From ARRL website PDF



- Connect two repeaters
- Use you radio to connect to your EchoLink

Figure 1—Two FM repeaters linked via VoIP.

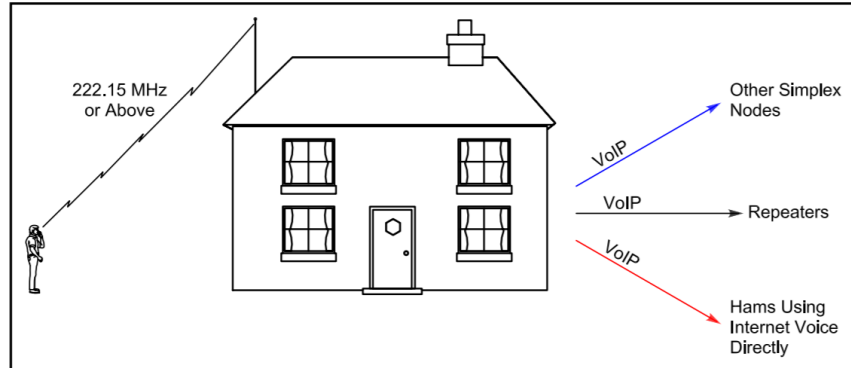


Figure 2—A diagram of a VoIP simplex node. If a control operator is not physically present at the station location and the node is functioning with wireless remote control, the control link must operate above 222.15 MHz. See the sidebar, "Is It Legal?".

# Operate (from user guide)

- Terrible graphic on pg 40 ... see next page ...  
\* Old EchoLink interface (old version) \*

