

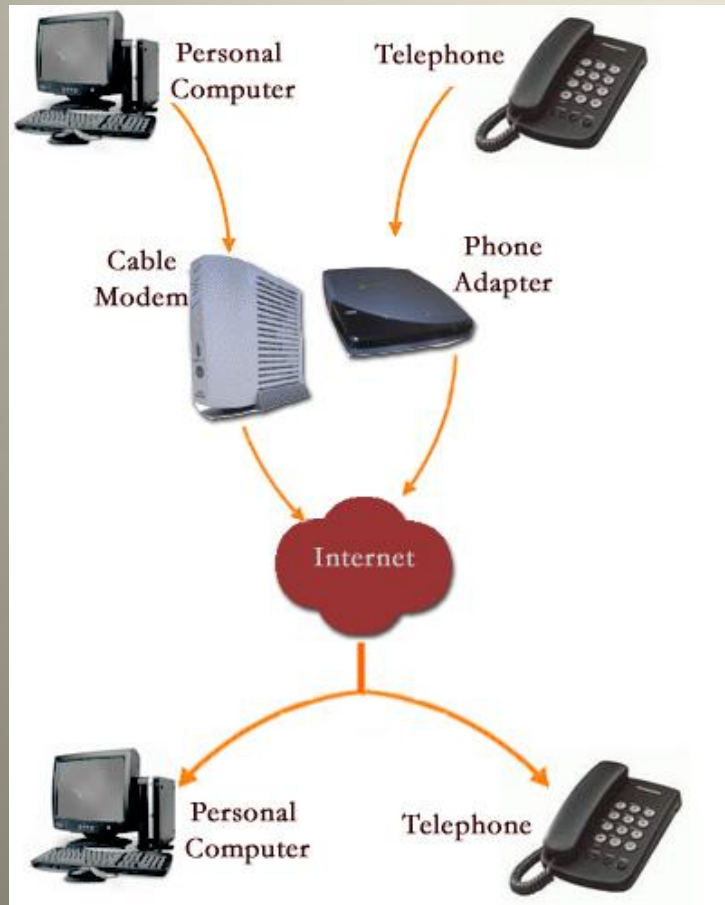
Echolink for Dummies

Seriously, if I can do it, so can you.

What is Echolink?

- A method for digitally linking transceivers or repeaters, regardless of location.
- A method for accessing remote transceivers
 - Sort of like remote control

What is Echolink?



- Echolink uses the internet to pass digitized packets of sound from one node to another.
 - Think of Netflix and how they send movies to your computer
 - However this is more like Skype, which sends Audio from one Skype location to another.
 - This is known as “Voice over Internet Protocol” (VOIP)

Three ways to connect

- Echolink connects in three different ways
 - Direct User
 - Internet enabled smart phone or Internet enabled computer with speaker and microphone
 - Echolink enabled Repeater
 - Audio feed of the repeater is received by Echolink node & relayed onto the echolink system (Breakfast club Net)
 - Echolink enabled simplex link
 - Audio feed of a single transceiver (NE8K-L on 145.570 Mhz)

Direct Connect User

- Smartphone offers Echolink app.
 - Like using a cell phone, but your audio is ported onto the echolink system over the internet.
 - Enables you to in essence, remotely control a host transceiver anywhere in the world
 - Some of our breakfast club net participants use their smart phones to participate by using NE8K's computer controlled ICOM in Haslett to transmit onto the net.

Direct Connect

- Via internet connected computer
 - If you have broad band internet (cable, DSL, etc.)
 - Uses your computer's speakers and internal microphone
 - Enables you to connect to a remote transceiver and participate in (inter)national nets and conferences, such as the *dodropin*

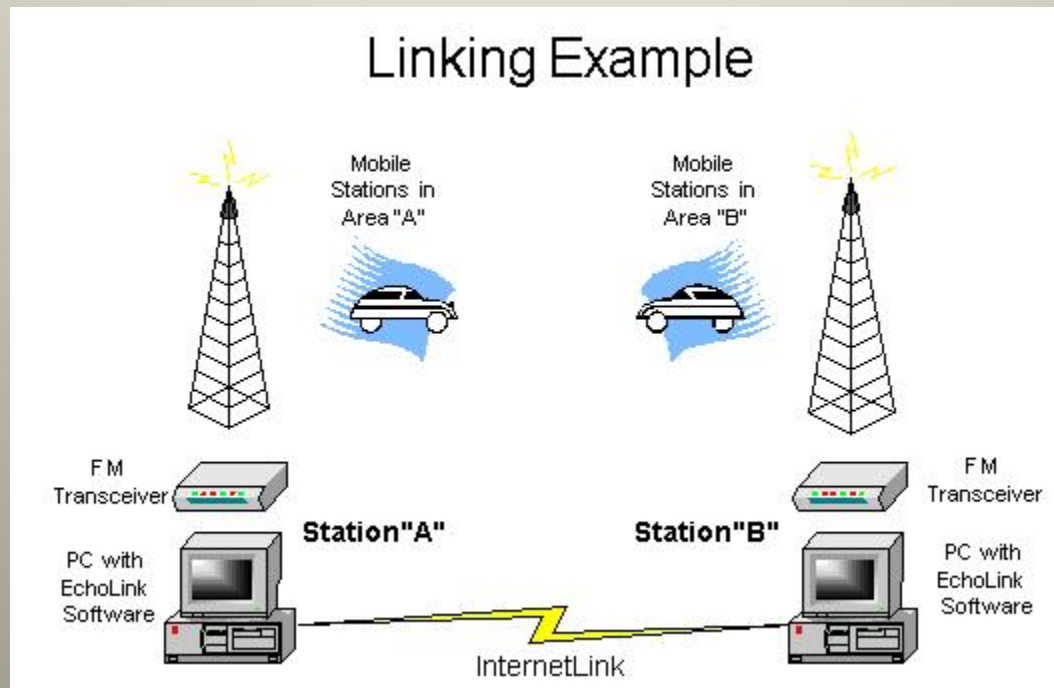
What is a conference?

- A conference is a linking of various repeaters, links, direct connect users and other conferences.
- Sort of like a big party line: Audio streams in from all the various connected nodes, users, and conferences. Echolink sorts it out to prevent doubling.

Echolink enabled repeater

- A local repeater that has its audio streamed onto the internet.
- Echolink users from anywhere in the world can connect and transmit onto the repeater.
- Echolink connection may be physically located at repeater, or may be remotely located
 - 145.390 is connected remotely, via NE8K's ICOM-V8000 in Haslett for the breakfast club net.

Cartoon illustration #1



Echolink connected Simplex Link

- Simplex link, like a repeater, connects Echolink to a local transceiver but is tuned to a simplex frequency.
- Local Simplex users may not necessarily hear each other, but may be able to use the same link.
- NE8K-L (145.570 Mhz) out of Haslett is periodically enabled for local participation with other Echolink nets during the evening.

Three different connections

- Direct: Smartphone, or computer
 - To remotely transmit/receive on actual repeaters & simplex links all over the world.
- Repeater:
 - You are, in essence, an echolink user whenever the repeater is connected to Echolink.
 - Breakfast club Net has international participation for over a month now.
- Simplex Link:
 - NE8K-L for chatting on international nets via HT from anywhere in Meridian Twp, and E. Lansing.

Installing Echolink

- Go to <http://echolink.org/> to download and install the software.
- Ensure that your computer has an operational mic and speaker. Most laptops already have these features. Desktop computers will need some kind of mic, such as: **Logitech Clearchat Stereo Headset (\$9 from Amazon.com)**



Registration of Echolink

- Either scan your license, Photograph it, or fax it for proof of licensure. Echolink requires proof that you are a ham. Save the graphic on your computer. Instructions are found on echolink.org website.
- You may also donate \$1 to Echolink.org via credit card for instant validation.
- It's Easy and painless. I can't believe I waited as long as I did.

Registering Echolink

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



Validation

EchoLink opens a world of new communications possibilities by joining Amateur Radio stations over the Internet. Since the Internet is a shared, public resource, security is naturally a very important part of the system.

Each new user of EchoLink must provide proof of license before access is granted. This is to ensure that only licensed Amateurs have access to the system, and to ensure that each user is using a valid callsign that he or she is authorized to use.

There are several different ways you can provide proof of license. These options vary somewhat by country. The various options will be explained on the pages that follow.

First, please be sure that you have downloaded, installed, and **run** the EchoLink software. This registers your callsign with the system. Then, please enter your callsign below, and click Continue.

Callsign:

Each connection type needs validation



Validation - Choose Callsign

The callsign you entered is: **NE8K**

EchoLink can be set up with any of several different callsign suffixes. The callsign **NE8K** (with no suffix) is used in Single-User mode, and the callsigns **NE8K-L** or **NE8K-R** are used in Sysop mode. (Sysop mode requires connecting a radio to your computer's sound card using a special interface device.) Each of these three is considered a separate callsign, and must be validated separately for EchoLink.

The following callsign(s) are registered with EchoLink:

Callsign	Status	Date Registered (UTC)
NE8K	Already validated	25-Jul-2011
NE8K-L	Already validated	27-Jul-2011
NE8K-R	Already validated	24-Aug-2011

Configuring your router

- Your router may work straight away. If it doesn't, like if you run a firewall, you may need to configure the port.
- Access your router and set up a pass-through.
- Open ports 5198 through 5201 for echolink access.
- Some routers will “trigger” on echolink, and open the port via port range triggering.
- If you are really stuck, See:
http://portforward.com/english/applications/port_forwarding/Echolink/Echolinkindex.htm

Port range triggering

LINKSYS
A Division of Cisco Systems, Inc.

Firmware Version: v1.02.2

Wireless-N Broadband Router WRT160N

Applications & Gaming

Setup | Wireless | Security | Access Restrictions | **Applications & Gaming** | Administration | Status


Single Port Forwarding | Port Range Forwarding | **Port Range Triggering** | DMZ | QoS

Port Range Triggering

Application Name	Triggered Range	Forwarded Range	Enabled
echolink	5198 to 5201	5198 to 5201	<input checked="" type="checkbox"/>
Winaprs	10150 to 10151	10150 to 10151	<input checked="" type="checkbox"/>
	0 to 0	0 to 0	<input type="checkbox"/>
	0 to 0	0 to 0	<input type="checkbox"/>
	0 to 0	0 to 0	<input type="checkbox"/>
	0 to 0	0 to 0	<input type="checkbox"/>
	0 to 0	0 to 0	<input type="checkbox"/>
	0 to 0	0 to 0	<input type="checkbox"/>
	0 to 0	0 to 0	<input type="checkbox"/>
	0 to 0	0 to 0	<input type="checkbox"/>
	0 to 0	0 to 0	<input type="checkbox"/>

[Help...](#)

Save Settings | Cancel Changes



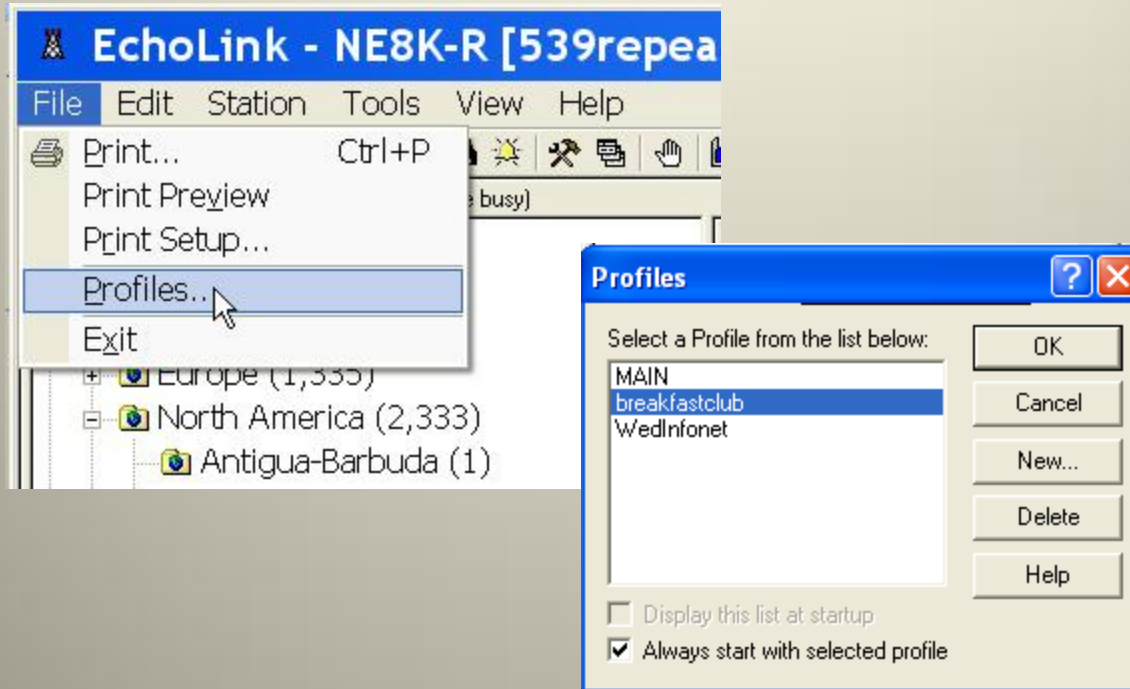
Okay, so far...

- You've installed the software
- You've gotten a microphone & speakers
- You have an internet connection
- You have validated via echolink
 - Now what??

Open the Echolink software.

- Log into your profile.
- Pick your preferences.
- Set the sysop settings.
- Try connecting to conference *ECHOTEST*
- Adjust your audio.
- Echotest is an audio echoing conference. It will echo back whatever audio you stream to it.

Choose your profile



Echolink main screen

The screenshot shows the EchoLink software interface. The title bar reads "EchoLink - NE8K-R [breakfastclub]". The menu bar includes "File", "Edit", "Station", "Tools", "View", and "Help". The toolbar contains various icons for functions like power, mute, volume, copy, paste, and search.

The main window is divided into several sections:

- Top Left:** A tree view showing "5,137 stations on naeast.echolink.org (19% are busy)". The tree includes "Locations", "Node Types", "Conferences (252)", "Links (2,183)", "Repeaters (1,960)", "Users (742)", "Alarms (2)", "New (67)", and "Favorites (14)".
- Top Center:** A table listing stations and their locations/descriptions.
- Top Right:** A chat window titled "EchoLink 2.0.908 - NE8K-R (1)" showing a conversation with "Daniel".
- Bottom Left:** A status area indicating "1 station connected" and "*DODROPIN*". Below this is a "TX" indicator and a progress bar.
- Bottom Right:** A chat window titled "VE3SNE-L>(11:05) *DODROPIN* (NE8K-R Daniel) CONF Connected" showing a message about a timeout timer.

At the bottom of the window, there is a "Ready" status on the left and a "Connected TX SIG" status on the right.

Station	Location/Description
4K6RMA-R	*AZERBAIJAN* [1/100]
4X4ARC-R	TelAviv R-70 438.650Mhz
4Z4IZ-R	HAIFA REPEATER R-12
4Z7DFA-R	RESCUE EILAT
4Z7GAI-R	[Svx] Jerusalem Repeater
5B4CY-R	Nicosia RV58
6K0EA-R	Jongsori net (1)
6N0KK-R	EchoLinkÀ±¼-ÇÖÈ , (8)

Chat Log (Top Right):

```
EchoLink 2.0.908 - NE8K-R (1)
> NE8K-R Daniel
*DODROPIN* (NE8K-R Daniel) CONI
```

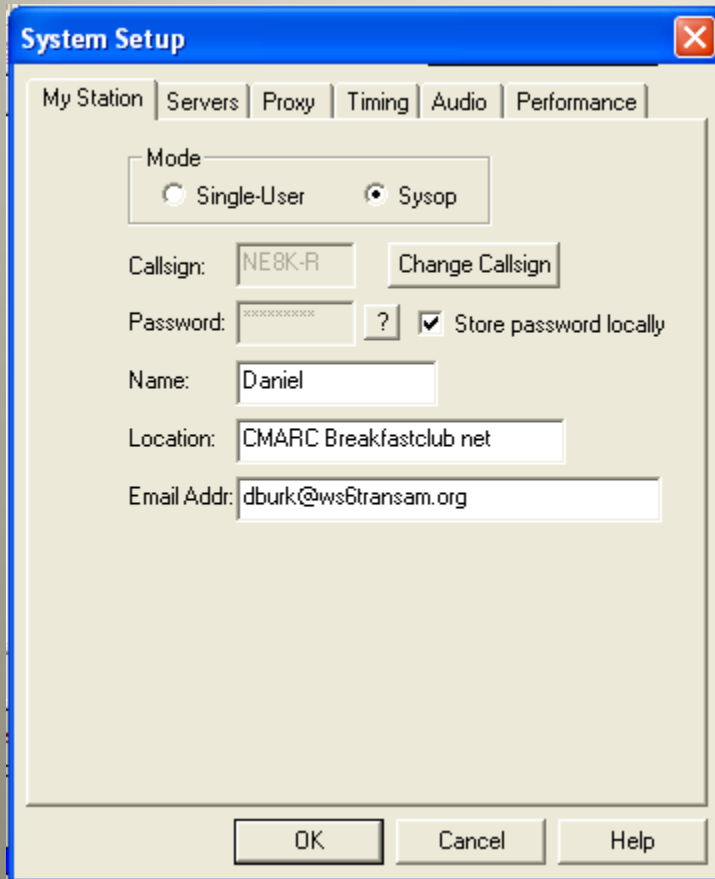
Chat Log (Bottom Right):

```
VE3SNE-L>(11:05) *DODROPIN* (NE8K-R Daniel) CONF Connected
*DODROPIN*>NE8K-R you have timed out!
The timeout timer on this conference is set to 160 seconds.
NE8K-R>Are we going to break the record number of checkins?
```

Echolink setup

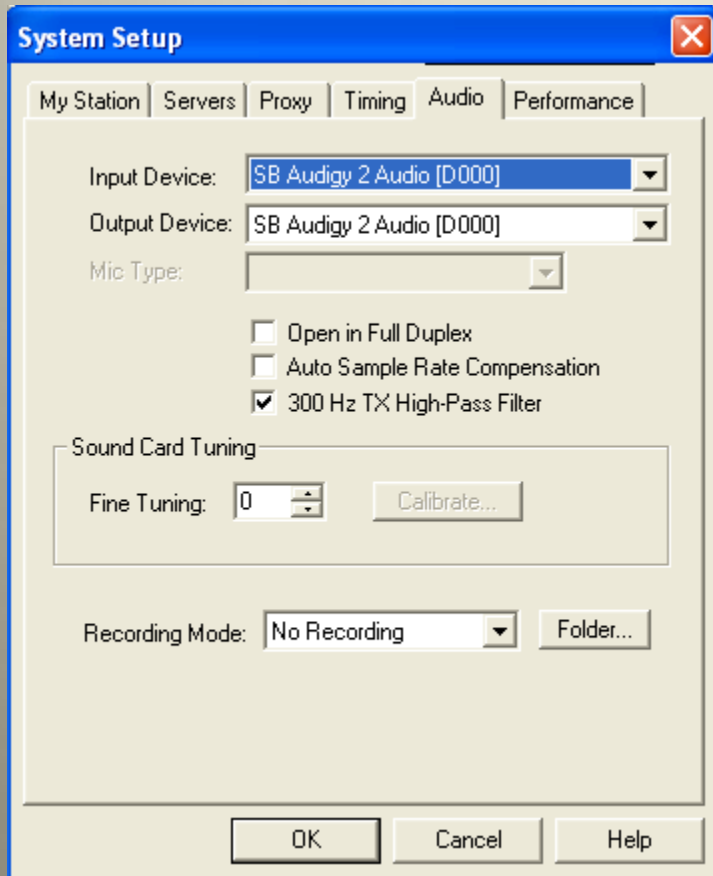
- Your setup will depend on how you use the software
- Use it as standalone for direct connection
 - No physical radio
- Use it as a transceiver controller
 - Either to control a repeater or a simplex link
- Use it remotely via ftp
 - For power users: will not discuss at this time

Echolink setup



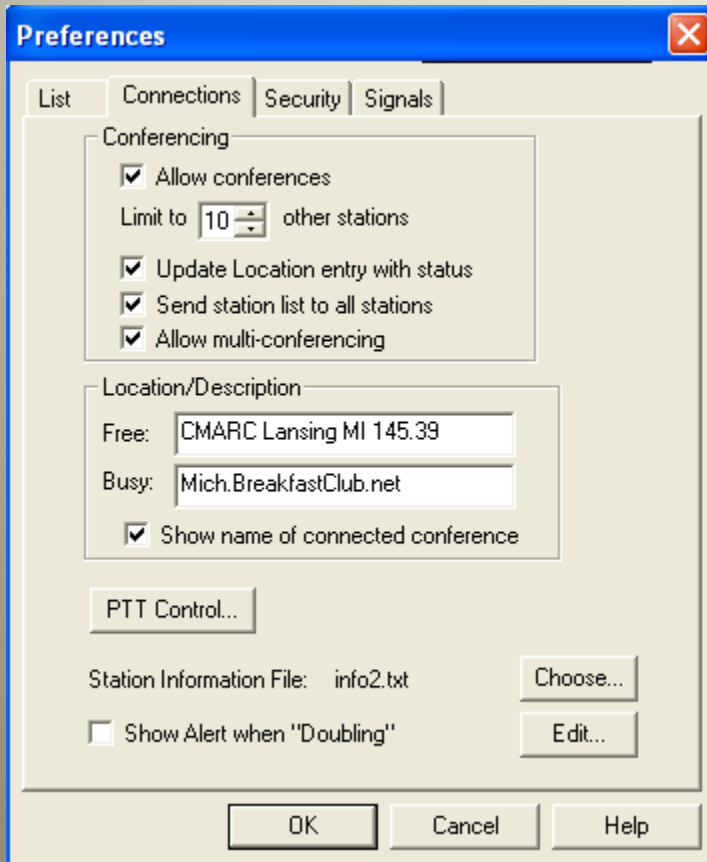
- System setup determines how you will use Echolink.
 - Single user for direct connect
 - Sysop for links and repeater use

Echolink setup



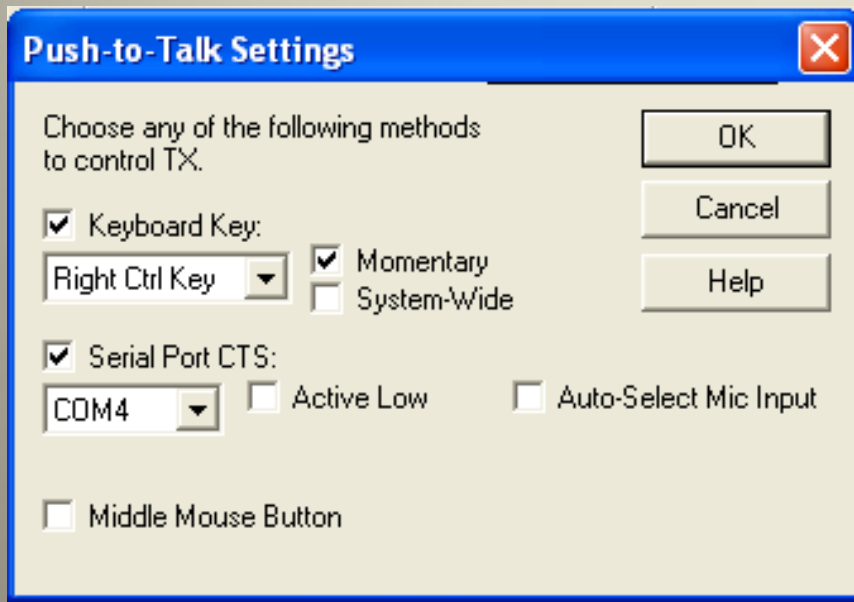
- Audio is critical: You must select the input device, which is your sound card but could also be a set of USB headphones.
- The output device might be your sound card or it might be your microphone.

Choosing your preferences



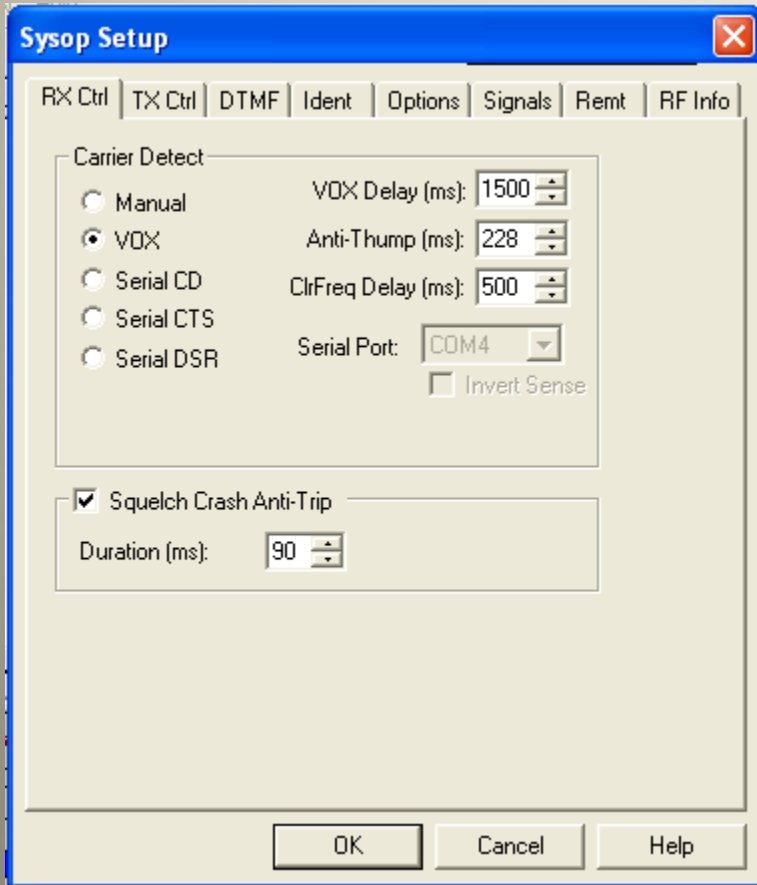
- Here's the nuts and bolts of your Echolink.
- If you are setting up a link or repeater, enable conferencing but limit the max number of stations to 2 to 5 unless you have lots of bandwidth.

PTT Control



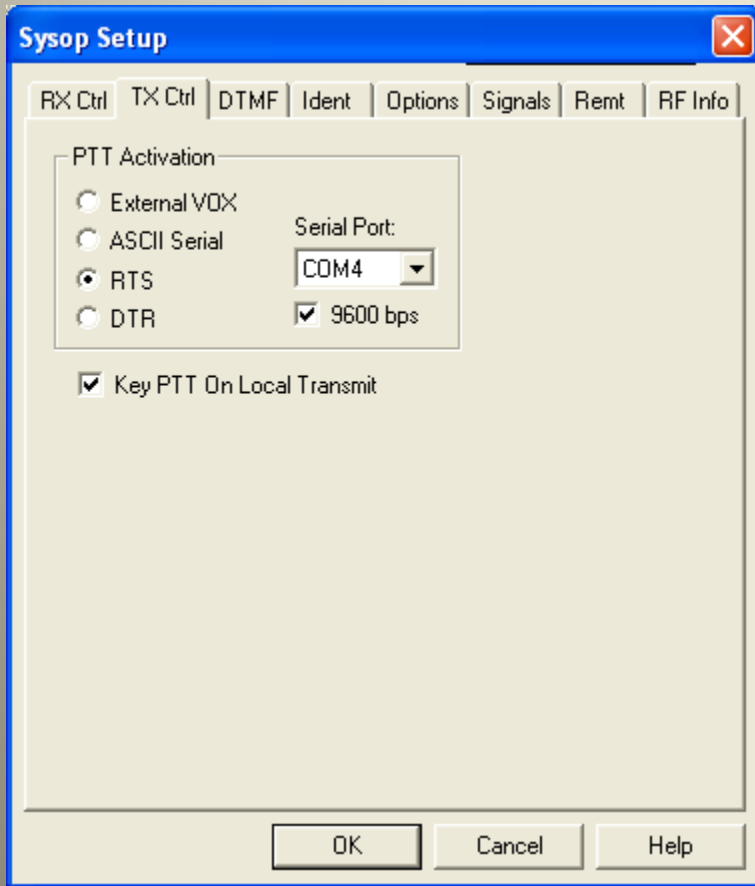
- I like the control key but you can use the space bar.
- Be sure to click “Momentary”!
- The serial port is for when you use a TNC and an actual radio.

Sysop settings: RX control



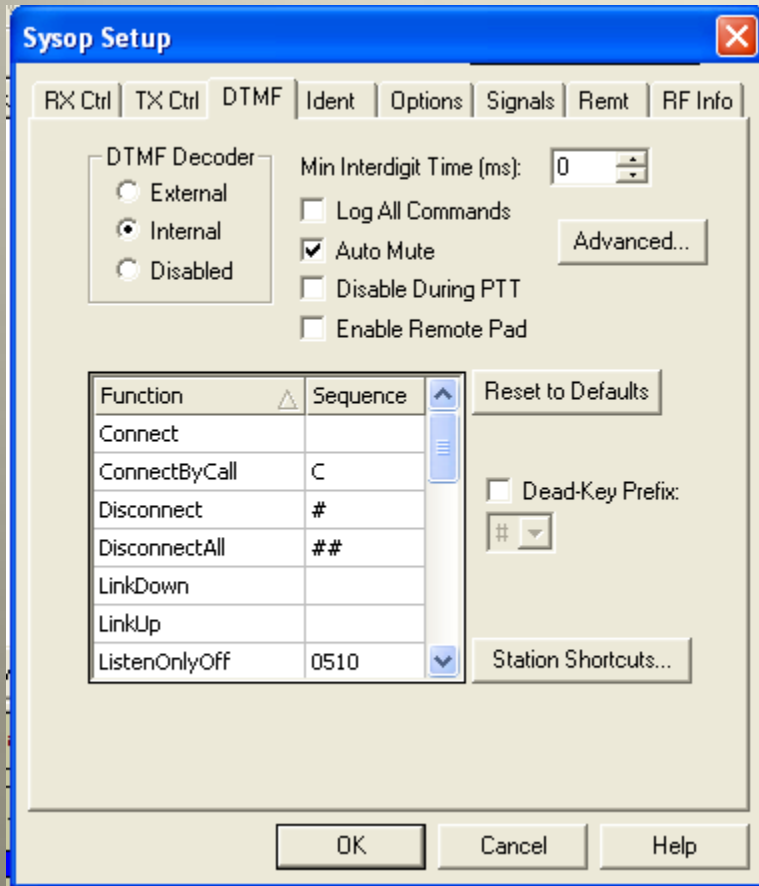
- Receive control is an important window.
 - Use VOX if you are bringing audio in from a receiver. Squelch must be aggressive to prevent open air transmit the net.
 - Use Manual if you are connecting direct with your computer

TX Control



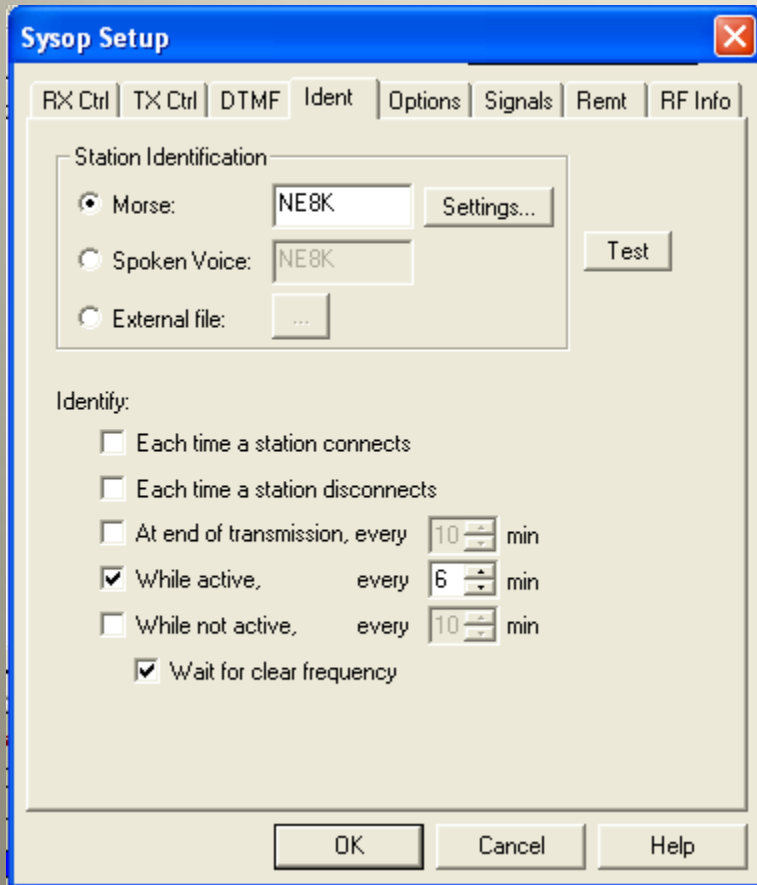
- When transmitting from echolink onto your local transceiver, PTT activation will enable the echolink traffic from remote users to key up your radio .
- RTS seems to work best when using rigblasters.

DTMF control



- On-air control of Echolink is possible with DTMF commands.
 - Connect, disconnect, system status, etc.
- Turn on “auto mute” to keep your DTMF commands off the echolink.

Identity



- When using Echolink with a transceiver, your link can auto-identify for you.

RF Info

The screenshot shows the 'Sysop Setup' dialog box with the 'RF Info' tab selected. The dialog has a blue title bar and a close button. The tabs are: RX Ctrl, TX Ctrl, DTMF, Ident, Options, Signals, Remt, and RF Info. The RF Info tab contains the following fields and controls:

- Lat: 42 45.00 North (Deg ddd, Min mm.nn)
- Lon: 084 19.00 West
- Grid Square: EN72us
- Freq (MHz): 146.940
- PL (if any): 100
- Power (W): 25
- Antenna Gain (dB): 3
- HAAT (ft): 20
- Directivity: Omni
- Report Status via APRS
- TNC Interface: COM1
- Auto Initialize
- Unproto Path: RELAY
- Include name of connected station(s) in status
- Comment (max 8 chars):

Buttons at the bottom: OK, Cancel, Help.

- This is information that is presented to other users of Echolink. It describes the physical location of your echolink node.

Echolink setup summary

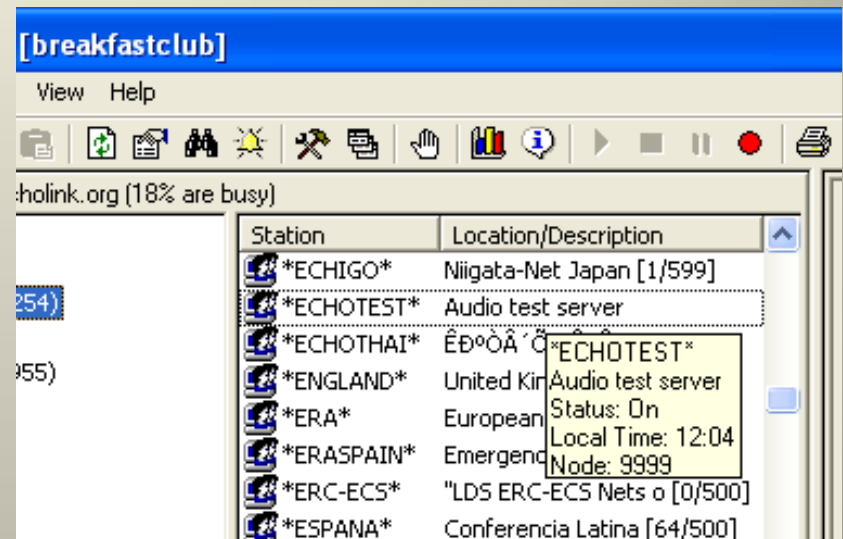
- In summary,
 - Set up your profile as either user, link, or repeater
 - My Station tab of system setup
 - Set up your sound card
 - Audio tab of system setup
 - Set up your preferences
 - Connections tab of Preferences
 - PTT Control

Echolink Setup summary

- If transceiver is used, set up your Sysop settings
 - RX Control
 - TX Control
 - DTMF Control
 - Identity
 - RF Information

Time to tune.

- Once you are set up, try to connect to `*echotest*` conference.
- Echotest will echo back anything you transmit.
 - Enables you to hear yourself and to tune both your transmit and receive audio.
- Once Echotest is working you are good to go.



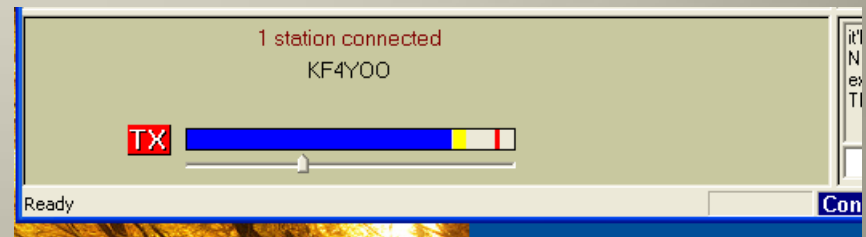
Audio adjust

- Click on start > control panel > Sounds and Audio
- Sound playback is for the sound coming OUT of your computer, i.e. audio from Echolink
- Sound recording is for the sound going IN, namely, your audio.



Audio adjust

- Watch the bar on the lower-right. Blue represents instantaneous audio level. Red bar represents the momentary peak.
- The object is to adjust the red bar has high up as possible without hitting the very top.

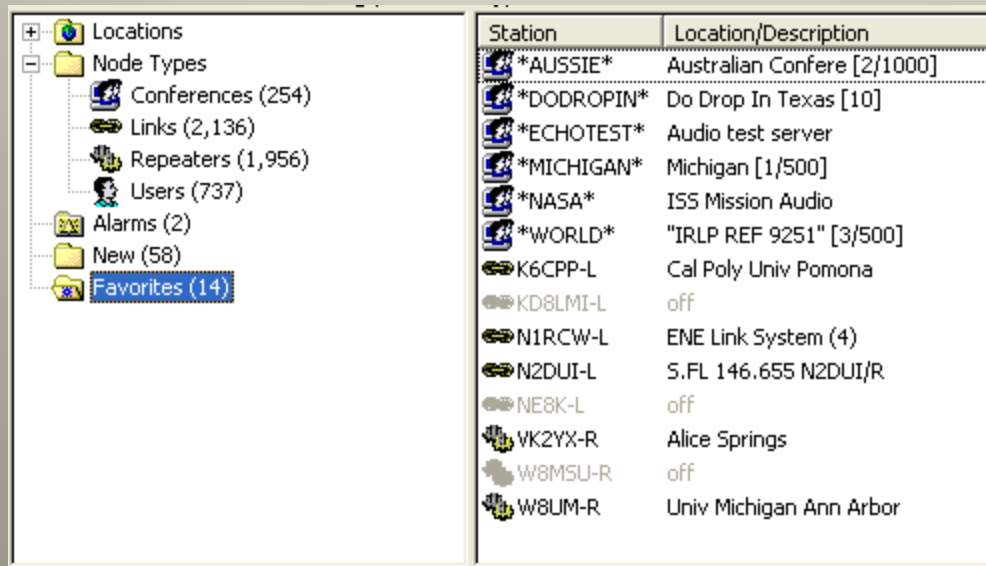


Exploring Echolink

- Echolink lets you connect to repeaters across the world. Some are in English, many are not.
- http://echolink.g4eid.co.uk/status/all_conferences.html
- This link shows you instantly which conferences are hot; i.e. lots of users.
- Other buttons show which connections have multiple connections.

Popular places

- Echolink lets you save your favorite users, links, repeaters, and conferences, as well as set up alarms when they come online.



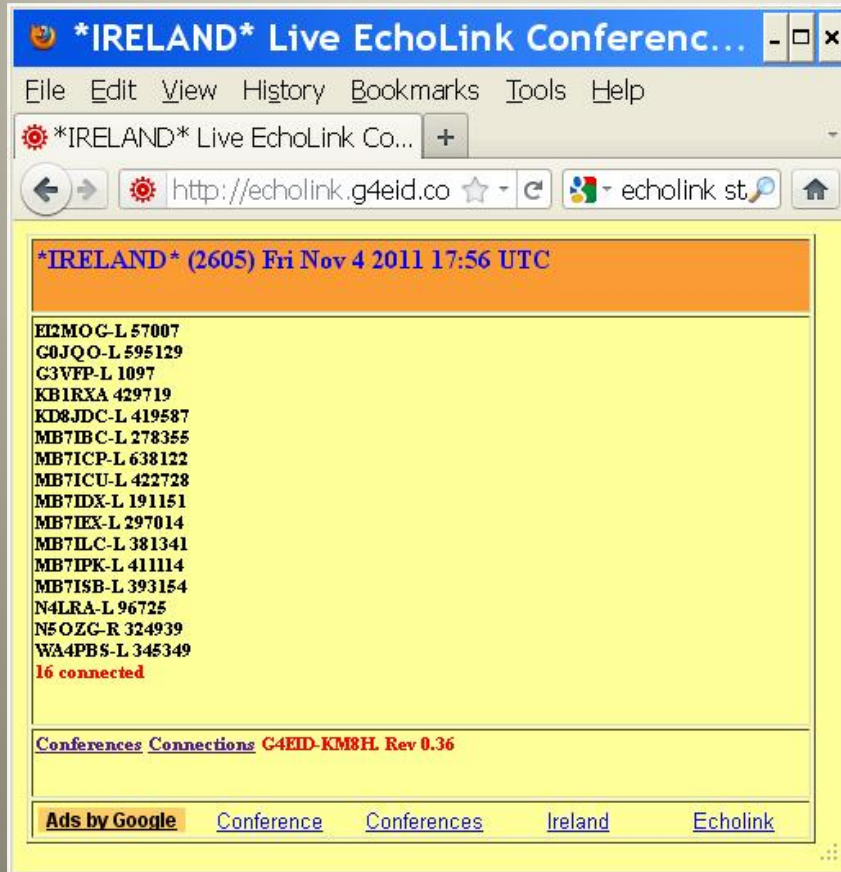
The screenshot shows the Echolink software interface. On the left is a tree view under 'Locations' with the following items:

- Node Types
 - Conferences (254)
 - Links (2,136)
 - Repeaters (1,956)
 - Users (737)
- Alarms (2)
- New (58)
- Favorites (14)**

On the right is a list of stations with the following columns: Station and Location/Description.

Station	Location/Description
AUSSIE	Australian Confere [2/1000]
DODROPIN	Do Drop In Texas [10]
ECHOTEST	Audio test server
MICHIGAN	Michigan [1/500]
NASA	ISS Mission Audio
WORLD	"IRLP REF 9251" [3/500]
K6CPP-L	Cal Poly Univ Pomona
KD8LMI-L	off
N1RCW-L	ENE Link System (4)
N2DUI-L	S.FL 146.655 N2DUI/R
NE8K-L	off
VK2YX-R	Alice Springs
W8MSU-R	off
W8UM-R	Univ Michigan Ann Arbor

Other places



- IRELAND conference
 - Europe's ragchew central
- DODROPIN conference
 - USA's ragchew channel
- NASA channel
 - Live audio feed from ISS (users muted)
- WORLD Conference
- Lots of Individual links and repeaters

Echolink hardware for link.

- Echolink linked hardware enables you to roam your neighborhood with an HT and still access the world.
- You need
 - a computer
 - Transceiver
 - HT for roaming
 - TNC
 - Such as Rigblaster Pro
 - Plenty of choices
 - Useful for packet,
 - Slow scan TV
 - And more.

Types of TNCs

- www.westmountainradio.com
 - Rigblaster series. Good quality, higher cost.
- <http://www.tigertronics.com>
 - Integrated sound card, looks nice. Available through HRO, Universal Radio, etc. \$110.
- www.ilinkboards.com
 - Less than \$100
- www.mfjenterprises.com
 - MFJ-1275 for about \$105

Connections to TNC



- Audio wire from radio to your mic input on the computer
- Audio wire from speaker-out of computer to the TNC
- RS232 cable from computer to TNC for PTT operation.
- TNC to MIC input of the radio

Connecting the RS232

- Most computers require a USB to RS232 adapter cable
- Each time you plug it into a different USB port, a new COM port is assigned. So don't do that.
- When installing the cable, you may need to provide a driver disc, especially if using an older operating system like Windows XP (or older!)
- Get the driver off the manufacturer's website if you don't have the disc.

Verifying your RS232 port

- Right-click on “My Computer” and select Properties. Open the device manager and click on ports.
- This will tell you the COM port number that is assigned to your RS232 link.

System Properties



System Restore

Automatic Updates

Remote

General

Computer Name

Hardware

Advanced

Device Manager



The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.

Device Manager

Drivers



Driver Signir compatible v how Window

Drive

Hardware Profiles



Hardware pr different han

Device Manager

File Action View Help



- + Human Interface Devices
- + IDE ATA/ATAPI controllers
- + IEEE 1394 Bus host controllers
- + Keyboards
- + Mice and other pointing devices
- + Modems
- + Monitors
- + Network adapters
- + PCMCIA adapters
- Ports (COM & LPT)
 - ↳ Prolific USB-to-Serial Comm Port (COM4)
- + Processors
- + Secure Digital host controllers
- + SM Driver
- + SM Driver

Final testing

- Once the COM port is enabled, and the TNC is connected, and the radio is ON, dial up a simplex channel and experiment with audio levels using *Echotest* like before.
 - Note, Echotest can also be used to create an echo repeater on your simplex link!
- You can now communicate via Echolink with a VHF transceiver, such as a small HT from about the home and neighborhood.

Main window view

The screenshot shows the EchoLink software interface. The title bar reads "EchoLink - NE8K-R [breakfastclub]". The menu bar includes "File", "Edit", "Station", "Tools", "View", and "Help". The toolbar contains various icons for functions like power, mute, volume, and search.

The main window is divided into several sections:

- Tree View (Left):** Shows a hierarchy of "Locations" including "Node Types", "Conferences (252)", "Links (2,187)", "Repeaters (1,956)", "Users (727)", "Alarms (2)", "New (65)", and "Favorites (14)".
- Station List (Middle):** A table with columns "Station" and "Location/Description". The selected station is "4K6RMA-R" with location "*AZERBAIJAN*" [1/100]. Other stations include "4X4ARC-R", "4Z4IZ-R", "4Z7DFA-R", "4Z7GAI-R", "5B4CY-R", "6K0EA-R", "6N0KK-R", "6N0KW-R", and "6Y5RA-R".
- Chat Log (Right):** Shows the current session with "EchoLink 2.0.908 - NE8K-R (1)" and messages from "NE8K-R Daniel" and "*DODROPIN* (NE8K-R Daniel) CONI".
- Bottom Panel:** Displays "1 station connected" and "*DODROPIN*". It features a "TX" button and a progress bar. The status bar at the bottom shows "Ready", "Connected", "TX", and "SIG".

Echolink additional features

- Text box for online chat to computer connected and phone connected users
 - Share text, pictures, or clickable links
- Audio recording and playback
- Remote audio playback (if enabled on remote conference)
- Configuration of DTMF commands
 - (system operators only, if you are running a link or repeater connection)
- Remote operation through FTP / proxy

Radio DTMF commands

- Remote control of the link is possible via DTMF, much like control of a conventional repeater station.

Some DTMF commands

Command	Description	Default
Connect	Connects to a station on the Internet, based on its node number.	num
Connect by Call	Connects to a station on the Internet, based on its callsign.	C+call+#
RandomFavNode	Selects an available node (of any type) at random from Favorites	1
RandomFavConf	Selects a conference server at random from the Favorites List	21
Disconnect	Disconnects the most recent station currently connected.	#
Disconnect All	Disconnects all stations.	##
Reconnect	Re-connects to the station that most recently disconnected.	9
Status	Announces the callsign of each station currently connected.	8
Play Info	Plays a brief ID message.	*

http://www.echolink.org/Help/dtmf_functions.htm

Additional information

- Plenty of additional information may be found at:
- <http://www.echolink.org>
 - Help files, software downloads, etc.
- <http://dodropin.org>

Echolink for Dummies

- NE8K – Daniel Burk
- Simplex channel 145.570 Mhz, 10 watts
 - NE8K-L node number 613391
- Repeater channel 145.390 Mhz, 25 watts
 - NE8K-R node number 620311
- NE8K transceiver – ICOM-V8000, typ. 10 watts into a hand-made super J-pole at 32 ft.
- Approx. 10 mile radius effective simplex range

NE8K Station



NE8K VHF Station



NE8K VHF Station



Rigblaster TNC and base mic



Super J-pole @ 32 ft.

