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](#)

Initial Setup

The first time you run EchoLink after installing it, the Setup Wizard will appear to step you through the basic setup. The Setup Wizard gathers enough information about your system to get you started using EchoLink. Each screen of the Setup Wizard is described in detail below.

Mode

The first choice you will need to make is whether you want to run EchoLink in User mode or Sysop mode.

User Mode

Choose User mode if you expect to use your PC to connect to other EchoLink stations over the Internet, using your PC's microphone and speaker to communicate. This option is appropriate if you do **not** expect to connect radio equipment to your PC to operate a repeater or link node.

Sysop Mode

Choose Sysop mode if you have connected (or intend to connect) a transceiver to your PC, in order to make your rig accessible to other EchoLink users connecting over the Internet. This mode generally requires a special hardware interface between your PC and your transceiver. For more information, see Interfacing .

For more information about each mode, see Modes.

Interface

If you selected Sysop mode, you'll be asked to indicate which type of interface board you are using, and which COM port it is connected to, if it requires a serial port. The list of available COM ports (if any) is shown. Be sure to select the correct port, and verify that the port is not already in use by another application.

For more information about the types of interfaces EchoLink supports, see [Interfacing](#).

Settings

You'll be asked to enter some information about your station.

Callsign: Set the callsign exactly as you wish to be registered with EchoLink. If you have already registered, use the same callsign you used previously. The callsign must be at least 3 characters long and may not contain spaces or punctuation, except as part of an -L or -R suffix.

If you are planning to run in Sysop mode, put an -R or -L at the end of your call to indicate a "repeater" or "link", respectively (for example, K1RFD-L). Use -L to denote a simplex link, or -R if the link is tuned to the frequency pair of a local repeater.

If you are expecting to run in User mode, do not use a suffix after your callsign.

Password: If you had used EchoLink previously, type your original password here. Otherwise, select a password you can easily remember, and it will be assigned to you as you register. Be sure to make a note of it, in case you need to re-install the software.

First Name: This name will appear on the other station's screen when you establish a contact. Enter the name by which you wish to be called.

Location: Enter the location of your station, or a description of its function. This will appear in the list of available users. Examples: "Ridgefield, CT", or "Link to W2ABC/R, NYC".

Email Addr: Please enter your e-mail address. This address is used only for initial registration, and will not be published or displayed anywhere. After registration,

please use the EchoLink Web site to inform us of any change in your e-mail address.

Region

You will be asked to indicate in which general region of the world you are located. This information is used to select the nearest set of "addressing servers" for EchoLink to use. All servers carry the same set of information, so this choice is not particularly critical, but may yield slightly faster refreshes of the Station List.

Basic Operation

This section describes how to use the basic functions of EchoLink. As you read this section, you may find it useful to refer to the section [EchoLink Screen](#), which shows the layout of the EchoLink screen and the names of each of its parts.

Callsign Validation

If you have never used EchoLink before, the callsign you entered will need to be validated by the system before you will be able to access it. To gain access, you must provide proof of license to the EchoLink system; for details, please see the [Validation](#) section of the EchoLink Web site. Until the callsign has been validated, the Station List area of the screen will be blank, or may display a message indicating that your callsign is not yet validated. Once validation is complete, you will see the list of stations appear in the Station List area, and you can proceed to use EchoLink.

For more information about guidelines for callsign validation, see the [Support](#) section of the EchoLink Web site.

Connecting to a Station

To connect to another station, find the station's callsign in the Station List. Use the tabs at the bottom to select either Index View or Explorer View, depending on your preference. Once you've located the station you're looking for, double-click on the station's callsign to connect to it. After a few seconds, you should see the station's callsign and name appear near the bottom of the screen, and you should hear the "connected" signal. You are now in direct contact with the other station and you can begin conversing.

If, after about 30 seconds, you see the message "Timed out", it means that the attempt to connect to the other station failed. This can happen for several reasons. The other station may have already established a contact with someone else, or may have just logged off the system. Another possibility is that a network firewall/router problem is preventing your PC from receiving data from the remote station. If you suspect this might be the case, see [Firewall Issues](#) for more information. You may also be able to find solutions in the [Support](#) section of the EchoLink Web site.

Speaking Back and Forth

Once you're connected, you can converse with the remote station as in an ordinary QSO. The space bar works as a locking "push-to-talk" switch. Tap the spacebar once to begin "transmitting", tap it again to stop (don't hold it down). A red TX indicator appears on the screen whenever EchoLink is "transmitting", that is, sending audio over the Internet to the connected station.

If you prefer, you can click the lightning bolt icon near the upper left corner of the screen, instead of using the spacebar. You can also change the software so that the spacebar is held down to transmit and released to receive, more like a push-to-talk switch. See [Preferences](#) for details.

You can switch to Transmit only when the other station is not already transmitting. When the other station is transmitting, the letters RX appear in the status bar at the bottom right, and the sound-level meter moves from left to right to show incoming sound. If you see that the other station is speaking, but you do not hear audio from your PC speakers, you may need to increase the volume on your sound device. Click the loudspeaker icon near the bottom right-hand corner of your Windows screen to adjust. Also, be sure the volume knob on your speakers is turned up.

While transmitting, speak into the microphone and watch the sound-level meter at the bottom-center of the EchoLink screen. The meter moves farther to the right as the sound gets louder. For best results, adjust your Windows Recording Volume settings so that the meter moves vigorously, but does not reach full-scale except on peaks.

If you see the red TX indicator while transmitting, but see no indication on the sound-level meter while speaking into the

microphone, see [Sound Card Issues](#) for more information.

Chat

If the other station is also sitting in front of a PC (rather than communicating over a radio link), you can "chat" while connected by typing messages back and forth. Type a brief message in the box near the bottom-right corner of the screen and click Send. The message you sent, and any response you might receive, appear in the Chat window just above it. Note that you can send a Chat message even while the other station is transmitting.

Disconnecting

Once your conversation is finished, click on the red "broken link" icon near the top of the screen to disconnect. You should hear the "Disconnected" signal, and see the message "Not connected" near the bottom of the screen.

Modes

EchoLink operates in one of two modes. The choice of modes is made during Setup, and can be changed at any time via the [MyStation tab](#) on the Settings screen.

Single-User Mode

Choose Single-User mode if you expect to use your PC to connect to other EchoLink stations over the Internet, using your PC's microphone and speaker to communicate. This option is appropriate if you do **not** expect to connect radio equipment to your PC to operate a repeater or link node.

For this mode, no special interface is required to use EchoLink. If you plan to use single-user mode, enter your callsign without any special suffix.

Sysop Mode

Choose Sysop mode if you have connected (or intend to connect) a transceiver to your PC, in order to make your rig accessible to other EchoLink users connecting over the Internet. This mode generally requires a special hardware interface between your PC and your transceiver. For more information, see [Interfacing](#).

If you plan to use Sysop mode, enter your callsign with either a -L or -R suffix. -L signifies a Simplex Link and -R signifies a Repeater. Please use -R if your link will be tuned to the frequency pair of a local repeater (or directly connected to it), even if the callsign is not the same as that of the repeater.

Simplex Link

A simplex link is typically a transceiver tuned to a quiet simplex frequency. Stations in local range can communicate

with connected stations over EchoLink, but not with each other unless they are in simplex range of each other as well.

Repeater

A repeater link is typically a transceiver tuned to the frequency pair of a local repeater. This type of link acts as a bridge between the repeater and EchoLink. Any station in range of the repeater can communicate with connected stations over EchoLink, and also with any other station in the repeater's range.

If a PC and Internet connection are available at the repeater site, it is also possible to connect EchoLink directly to the repeater equipment. One advantage of this arrangement is that it may not be necessary to rely on VOX for carrier detection. For more information, see [Interfacing](#).

Interfacing

For use in Sysop mode, your transceiver connects to a hardware interface, which in turn connects to your computer.

Many interfaces require use of the computer's sound card and serial port. Audio from the receiver goes to the interface board or your sound card's line-in jack, and audio from the sound card's speaker out (or line out) goes through an attenuator to your transmitter's microphone input. (The attenuator is needed to reduce the sound card output to microphone level). If your rig has a line-in connection, sometimes available on a back-panel accessory jack, you can usually connect the sound card output directly to line-in.

Interface Types

Three types of interfaces are supported by EchoLink:

ASCII-controlled: This type of interface, which is specifically designed for EchoLink, accepts ASCII commands from the computer over its serial port. These commands key and un-key the transmitter, and request information about incoming DTMF digits. High-quality boards of this type may be available in kit or assembled form from various sources; please do an Web search for latest information. Details of the original WB2REM circuit were also described in QST for March, 2002.

Direct-controlled: This type of interface, which is commonly used for PSK31 and other digital modes, keys the transmitter in response to signals over the serial port's RTS or DTR pins. The interface usually includes an attenuator to simplify the connection between the computer's sound card and the transceiver's mic jack. This type of interface may be the best choice if you intend to use digital modes in addition to EchoLink, or if your set-up requires additional isolation between the computer and the transceiver. The interface does not include a DTMF decoder, but EchoLink's internal decoder may be used instead. The RIGblaster from West Mountain Radio is an example of this type.

VOX-controlled: A VOX-controlled device, such as the Tigertronics SignaLink, connects to your computer's USB port and has a self-contained sound card, which you use instead of your computer's built-in sound device. A special cable runs from this device to your FM transceiver. No additional connections are required to the PC. This type of device is very convienient to set up, although VOX-controlled switching may not be as reliable as other types, when used for FM communication.

Carrier Detect

In Sysop mode, EchoLink needs some way of knowing when there is activity on the local receiver. The most common way is to use EchoLink's built-in VOX (voice-operated switch). The VOX monitors incoming audio from the receiver. When properly adjusted, the VOX will trigger only when a station is being heard over the receiver. One advantage of using VOX is that no other connections between the receiver and the PC are required.

VOX is particularly useful when EchoLink is connected to a transceiver which is monitoring the output frequency of a repeater. The VOX will trigger only when a station is actually speaking through the repeater, and will not generally respond to the repeater's "tail", which could be as long as 10 seconds after each transmission.

However, VOX is not completely reliable, since it may be unable to detect a dead carrier. Also, it introduces an additional delay of a second or so after each transmission. To help circumvent these issues, EchoLink also supports a direct connection between the receiver and the computer's serial port for positive carrier detect. This type of connection is especially useful for simplex links.

Many transceivers have a back-panel connection (called "busy" or "carrier detect") which tracks the squelch circuit directly. This can be wired to the CD, DSR, or CTS pin of the PC's serial port, and EchoLink can be configured to respond to it instead of using VOX. Typically, this connection must be made through a simple interface, such as a one-transistor circuit. The circuit should drive the CD, DSR, or CTS pin high (+5V or above) when the squelch is open, and low (0V or below) when it is closed. Several versions of the interface

products mentioned above also support this feature; check the product literature for details.

To enable this feature, choose Sysop Settings from the Tools menu, select the RX Control tab, and choose Serial CD, Serial CTS, or Serial DSR.

Repeater Linking Tips

One of EchoLink's strengths is its ability to link any number of repeaters to each other, or to simplex stations. Here are some tips for setting up and configuring EchoLink to be used as a link to a local repeater.

Remote or Hard-Wired?

There are two ways a repeater can be connected to EchoLink.

With the "hard-wired" approach, the PC on which EchoLink runs is co-located with the repeater controller, and interfaced directly to it, with no additional RF hardware. This allows positive carrier and PTT control between the repeater controller and EchoLink, and eliminates extra "hops" in the audio chain. It also eliminates the need to ID a link transmitter. One disadvantage of this technique, however, is that it requires reliable Internet access at the repeater site, which may be in a remote location.

With the "remote-link" approach, an FM transceiver is connected to the EchoLink PC at a convenient location in range of the repeater, and tuned to the frequency pair of the repeater. In this configuration, the transceiver behaves very much like an ordinary local repeater user, transmitting on the repeater's input frequency (on behalf of EchoLink users) and receiving on the repeater's output frequency. Although this allows the EchoLink equipment to be placed in a more convenient location, it presents some challenges with respect to RX control.

With either approach, EchoLink should be configured with a callsign with a -R suffix, to indicate that the node is a gateway to a repeater, rather than a simplex frequency. If a remote link is being used, the software should be configured to identify itself on the air with the host station's callsign, which is not necessarily the same as the EchoLink callsign (or the callsign of the repeater). Since the link itself is not a repeater, a suffix such as /R in the ID is usually not appropriate (for U.S. stations).

Carrier Detect

One of the most important considerations for an EchoLink repeater node is the method of detecting the presence of a local RF signal. Although the best approach is usually to wire a COS signal into the COM port of the PC, it is often necessary (or desirable) to use VOX instead. Several techniques are described below.

COS from Repeater Receiver: If the node is hard-wired to the repeater controller, the best source of carrier detect is the COS output from the repeater receiver itself -- or an equivalent signal from the repeater controller. This ensures that EchoLink transmits to the Internet only when a signal is being received on the input. Also, the audio connection to the sound card should come from the receiver's audio output, rather than the repeater transmitter's audio path.

COS from Link Transceiver: If the node is remotely located, it may be desirable to use the COS signal from the link transceiver -- but only if the repeater's "tail" is extremely short. Otherwise, EchoLink will keep transmitting to the Internet 5 to 10 seconds after the local user finishes a transmission, severely interrupting the flow of a QSO. Some repeater-node operators have successfully incorporated DTMF tones in their custom Connect and Disconnect announcements to automatically shorten the repeater's "tail" while an EchoLink station is connected, on repeaters which support this type of remote command.

VOX: If the node is remotely located, but the repeater's "tail" cannot be shortened, VOX can be used. When properly adjusted, EchoLink will detect voice signals coming through the repeater, but ignore other incidentals such as the "tail", the courtesy tone, and the squelch crash at the end. This is very important when two repeaters are linked to each other,

to prevent endless ping-ponging of one repeater bringing up the other. Here are some tips for adjusting the VOX for use with a repeater:

1. Set the **VOX threshold** carefully. (This is the horizontal slider below the audio-level indicator.) The VOX threshold should be set just above the audio level of the repeater's dead carrier, so that it "trips" on voices, but not on the repeater's tail. Watch the purple SIG annunciator while adjusting the VOX threshold.

2. If necessary, adjust the **VOX delay**. The default value of 1200 ms is appropriate in most situations. (If you decide to change the value, type it in directly, rather than using the up-down buttons.)

3. Use the **"Smart VOX"** feature. This is enabled by checking the "Squelch Crash Anti-Trip" box on the RX Ctrl tab. When this feature is enabled, EchoLink's VOX will ignore short noise bursts, such as the repeater's courtesy tone and the squelch crash when the repeater's carrier drops. Set the time constant to a value slightly higher than the longer of these two signals. Typical settings are 250 ms for a repeater with a (short) courtesy tone, or 80 ms for a repeater with no courtesy tone. Note that the Smart VOX feature does not necessarily suppress these signals in the audio path, it merely prevents them from triggering (or holding open) the VOX.

4. **Anti-Thump:** Use the Anti-Thump feature if the squelch crash, as heard over the repeater when your transceiver stops transmitting, seems to be triggering the VOX. Start with a low value and move

it gradually higher until the SIG indicator no longer appears when your link stops transmitting.

When the VOX is properly adjusted, the "acid test" is to connect the link to the *ECHOTEST* conference server. After hearing the initial welcome message from the test server, the repeater should drop normally and then remain idle. If the repeater continues to be keyed up by responses from the test server, re-check the above settings.

When the settings are correct at both ends of a repeater-to-repeater link, both repeaters should remain idle except during an actual QSO, or while either repeater sends its ID.

CTCSS Control: If the node is remotely located, this may be the best technique of all -- but it requires cooperation from the repeater. In this set-up, the repeater transmits a CTCSS (a.k.a. PL) tone only while its receiver's COS is active; that is, only while a station is transmitting. The EchoLink transceiver is configured to open up only when this tone is received. The advantage of this system is that EchoLink triggers only on a true signal, and ignores incidentals such as courtesy tones and CW IDs. The disadvantage is that most PL-guarded repeaters transmit a continuous tone, even when no signal is present on the input, so it may require configuration changes to the repeater itself. (Note that this technique can be used whether or a not a PL is required to activate the repeater.)

System Requirements

EchoLink is designed to work on personal computers meeting the following minimum requirements:

- Intel (or compatible) CPU, meeting the minimum system requirements for the edition of Windows being used.

- Any of the following Microsoft Windows versions, either 32-bit or 64-bit:

  - Windows Vista (all editions)

  - Windows 7 (all editions)

  - Windows Server 2008 (and R2)

  - Windows Server 2012 (and R2)

  - Windows 8 (all editions)

  - Windows 8.1 (all editions)

  - Windows Server 2016

  - Windows 10 (all editions)

  - Windows Server 2019

- Color display with resolution of 800x600 or higher.

- 16-bit sound card or built-in sound hardware, with appropriate Windows drivers. Full-duplex capability is recommended for all modes, and is required for Sysop mode.

- Dedicated Internet connection, 24 kbps or higher in each direction. 128 kbps upstream (ISDN, cable modem, DSL or better) is recommended for Conferencing capability. Nearly all modern Internet

service connections easily meet this requirement. For TCP/IP port requirements, see [Firewall Issues](#).

- Approximately 10 MB free disk space.

- Sufficient RAM to meet the minimum operating-system requirement. EchoLink itself uses about 15MB.

- Mouse, or other pointing device (recommended).

- Microphone and speakers, or headset with boom mic, for Single-User mode. Most laptop computers have a built-in microphone, but a headset is preferred.

- ASCII, direct-serial, or VOX-controlled rig interface, for Sysop mode. (For more information, see [Interfacing](#).)

- Optional: Packet terminal-node controller (TNC), for APRS option in Sysop mode. The TNC serial port must run at 9600 bps. Although EchoLink is believed to work with most TNCs, only the AEA PK-232 has been tested.

Setup

Setup allows you to set basic features of EchoLink. Choose one of the tabs along the top to view the MyStation, Servers, Timing, and Audio options. Each of these tabs is described in detail below.

MyStation Tab

The MyStation Tab configures the system mode, callsign, and other information about your station.
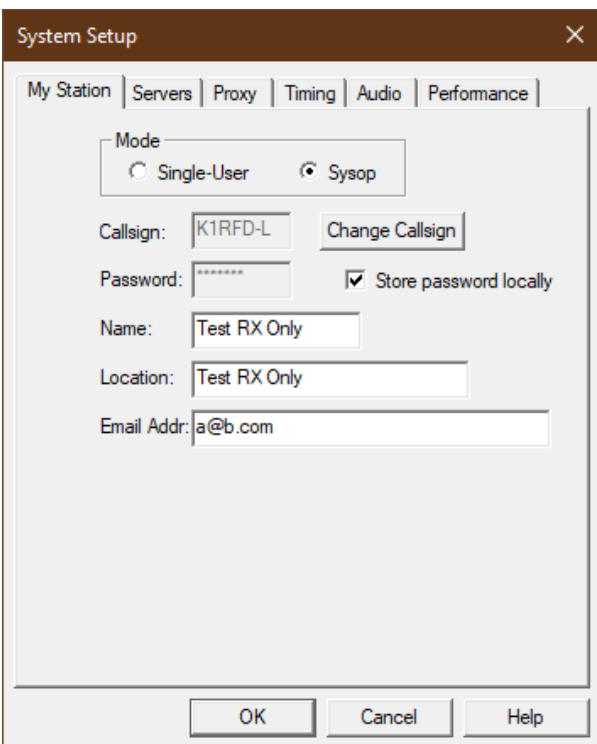
Mode: Choose the appropriate mode for EchoLink. The following modes are available:

- Single-User (no radio connected to your PC)

- Sysop (System operator; radio locally connected to PC)

For a complete description of each mode, see [Modes](#).

Callsign: Set the callsign exactly as you wish to be registered. If you have already registered, use the same callsign you used previously. The callsign must be at least 3 characters long and may not contain spaces or punctuation, except as part of an -L or -R suffix.

If you have selected Sysop mode, put an -L or -R at the end of your call, to indicate a "repeater" or "link", respectively (for example, K1RFD-L). Use -L if the link is tuned to a simplex frequency or -R if the link is tuned to the frequency pair of a local repeater.

If you have selected Single-User mode, do not use a suffix after your callsign.

Password: If you have registered previously with EchoLink, type your original password here. Otherwise, select a password you can easily remember, and it will be assigned to you as you register. Once established, you cannot select a new password using EchoLink, but if you realize you had entered it incorrectly, you can re-enter it after choosing Change Callsign.

For protection against casual glances, the password is shown only as a series of asterisks.

Store password locally: Leave this box checked if you want EchoLink to store your password on the PC (encrypted). This will allow EchoLink to log on automatically each time the program is started. If your PC is used by others, you may want to un-check this box. If this box is not checked, EchoLink will prompt you for the password each time the program is started.

Change Callsign: As a precaution against inadvertent changes, you cannot enter a different callsign or password without first choosing Change Callsign. Note that if you are connected to another station, you will be disconnected when you change callsigns.

Name: Enter your first name here. This name will appear on the other station's screen when you establish a contact.

Location: Enter the location of your station, or a description of its function. This will appear in the list of

available users. Examples: "Ridgefield, CT", or "Link to W2ABC/R, NYC".

Email Addr: Enter your e-mail address. This is used only during initial registration.

Servers Tab

The Servers tab configures the connection between EchoLink and one or more Registration Servers. Registration servers maintain information about which stations are registered, and which are currently on the system. Normally, this information does not need to be changed.
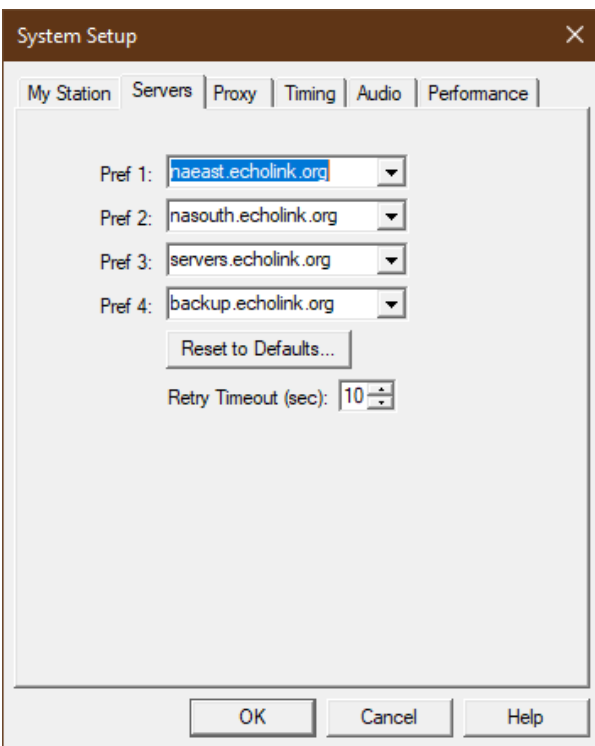

Pref 1 through **Pref 4:** Shows each of the server names (or addresses), in order of preference. If the server at Pref 1 cannot be contacted, the server at Pref 2 will be tried, and so on down to Pref 4.

Reset to Defaults: If you had found it necessary to change any of servers in the list, choose this option to restore the original settings. You will be asked to indicate in which region of the world you are located. This information is used by EchoLink to select the best combination of servers closest to you.

Retry Timeout (sec): Specifies the number of seconds EchoLink will wait while trying to contact each of the servers on the list. If the time expires without success, EchoLink moves to the next server on the list. The default is 10 seconds.

Proxy Tab
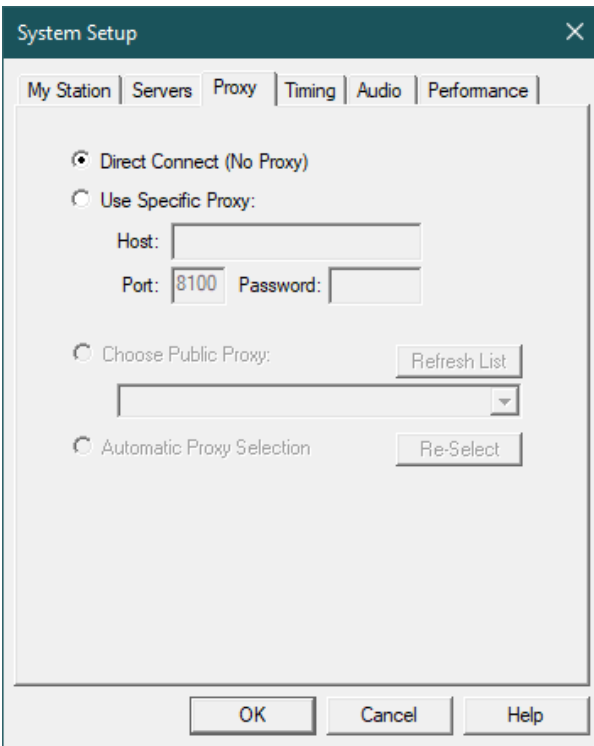
The Proxy tab sets options related to EchoLink Proxy servers. A Proxy is a convenience for EchoLink users who are behind restrictive routers or firewalls, such as public Wi-Fi "hotspots" or other shared public networks.

An EchoLink Proxy can be set up either as *public* or *private*. Private proxies are generally for the benefit of one specific user, wherease public proxies are offered for use by any EchoLink user who needs it.

For details on the EchoLink Proxy system, please see the Proxy page on the EchoLink Web site.

- **No Proxy (Direct Connect):** Choose this option for normal EchoLink use. When this option is chosen, EchoLink connects directly to other nodes in the EchoLink system, without using a proxy.

- **Use Specific Proxy:** Choose this option to have EchoLink use a proxy for all connections. Enter the host name (or IP address) of the proxy, along with its port number and password. The default port number is 8100. This option is normally used to designate a private proxy.

- **Choose Public Proxy:** Choose this option to access a public proxy. A list of available public proxies is displayed in the drop-down list when you click the small down-arrow icon on the right. Choose a proxy from the list, then click OK. The proxy's address, port number, and password are automatically entered.

- **Automatic Proxy Selection:** This option directs EchoLink to choose an available Public Proxy automatically, each time the program is started.

The Public Proxy and Automatic Proxy options are not available if EchoLink is running in Sysop mode.

When using a public proxy, please be aware that public proxies are scarce, shared resources. Priority should be given to EchoLink users operating in restricted public networks. If you are operating EchoLink at home and experiencing firewall-related problems, please try to troubleshoot the problem rather than using a public proxy. Direct Connect uses less Internet bandwidth and is typically more reliable. You may also be able to use a commercially-avalable VPN service instead of a proxy.

Timing Tab

The Timing tab configures several of EchoLink's time-out timers. Limiting the time allotted to certain features helps assure smooth operation of EchoLink and other stations on the system.
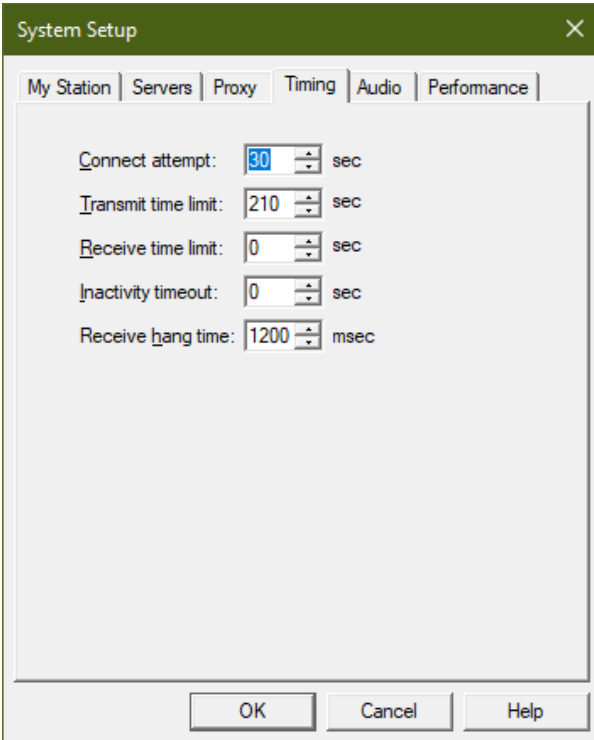
Connect Attempt: Specifies how long EchoLink will try to establish a connection with another station. If there is no response from the other station by this time, EchoLink cancels the request. The default is 30 seconds.

Transmit Time Limit: Specifies how long EchoLink will allow a single transmission (from this computer to another station on the Internet) to be. If the time limit is approaching, a special warning message appears near the bottom of the screen. If the limit is exceeded, EchoLink automatically stops transmitting. The default is 210 seconds. Enter 0 to configure no such time limit.

Receive Time Limit: Specified how long EchoLink will allow another station's transmission (from the Internet to this computer) to be. If the limit is exceeded, EchoLink automatically disconnects the other station. Enter 0 (the default) to configure no such time limit.

Inactivity Timeout: Specifies how long EchoLink will allow a connection to remain connected if neither station is making a transmission. If the time limit is exceeded, EchoLink automatically disconnects. Enter 0 to specify no such time limit, which is the default.

Receive Hang Time: Specifies how long EchoLink remains in "receive" mode after the remote station has stopped sending. This value is specified in milliseconds (1 second = 1000 ms). The default is 1200 ms, or 1.2 seconds. This value should rarely be changed.

Audio Tab

The Audio tab lets you specify which of your PC's sound cards to use, and select certain other audio-related options.
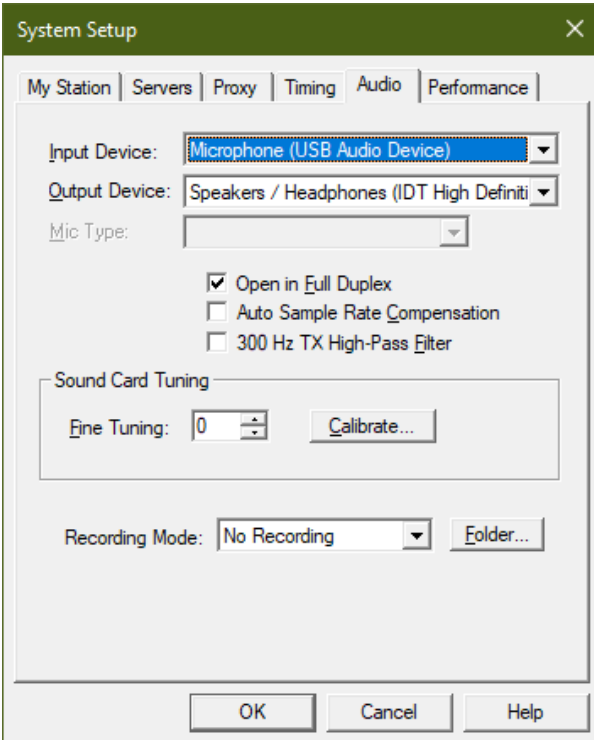
Input Device and **Output Device**: Specifies the sound card(s) or device(s) EchoLink should use for its audio. This is useful when EchoLink is used on a PC with more than one sound card installed. In most cases, the [system default] setting is appropriate for both items; when this choice is selected, EchoLink will use the Record and Playback sound devices that have been set up in your Windows Control Panel.

Note that the choices in the Input Device list may include two or more input jacks on the same sound device. For example, if you have a sound card with a Microphone input and a Line input, you may see these two choices listed as though they were separate devices.

Note: In Single-User mode, signals are always played using the Windows default playback device, irrespective of these settings. See [Signals](#).

Mic Type: If you are running in Single-User mode, choose the type of microphone you have connected to your PC. The choices are Communications Mic and General-Purpose Mic. The default setting is Communications Mic, which applies no shaping to the microphone audio. However, if you are using a general-purpose mic with a flat response, you might be able to improve intelligibility by choosing General-Purpose Mic, which adds a "boost" in the upper and midrange frequencies, to mimic the response of a communications-type mic. Note that this setting has no effect on audio received from other stations over the Internet, nor does it have any effect in Sysop mode.

Open in Full Duplex: Check this box *only* if you sometimes receive an error message, when you begin transmitting, about EchoLink being unable to open the sound device. When this box is checked, EchoLink will keep the sound device open for Recording at all times while the program is running. Do not check this box if your computer uses a "half duplex" sound card or driver.

Auto Sample Rate Compensation: Check this box to allow EchoLink to compensate automatically for variations among sound cards. Some sound cards may operate as much as 2% away from the desired sample rate, which can cause periodic gaps in received audio, even over a perfect Internet connection. When this feature is enabled, EchoLink detects this problem and inserts or removes packets to compensate for it dynamically. You might perceive this compensation as a slight skip or echo periodically.

300 Hz High-Pass Filter: Check this box to invoke a software-based DSP filter which rolls off outbound audio below 300 Hz. This is often useful to remove bassiness and

various pops and "booms" from your audio, particularly if you are using a PC-style or general-purpose microphone. This can also be used to filter out PL tones from a local RF signal in Sysop mode, if your receiver does not roll off audio below 300 Hz. This filter does not affect incoming audio (audio received over the Internet).

Fine Tuning: Adjusts the sampling rate of your computer's sound device. For best results, EchoLink requires that the sound device run at 8000 Hz. However, some sound cards are significantly off-frequency, which can cause periodic audio drop-outs. If you suspect this is the case, the sound card can usually be forced to run slightly faster by choosing a positive Fine Tuning amount, or slower by choosing a negative amount. However, please note that some sound cards do not allow this setting to be adjusted, in which case this adjustment will have no effect.

Calibrate: Choose Calibrate to have EchoLink automatically estimate the appropriate Fine Tuning amount by comparing the sound card's sample rate to the computer's high-resolution timer. However, note that this estimate is not always accurate, due to the effects of other applications running on your system. If in doubt, choose 0 as the Fine Tuning amount, which is the default.

Recording Mode: Enables or disables the auto-recording feature, and when enabled, specifies the recording mode. See the Record and Playback for more information.

Folder: Click this button to choose the folder in which EchoLink should save the audio files it records. This folder will also be the default folder for locating Playback files. By default, this is a subfolder called "wav" in the subfolder in which the EchoLink program file is installed.

Note: You can choose Adjust Volume from the Tools menu to adjust the Playback or Recording audio levels. For more

information, see [Sound Card Adjustment](#) .

Performance Tab
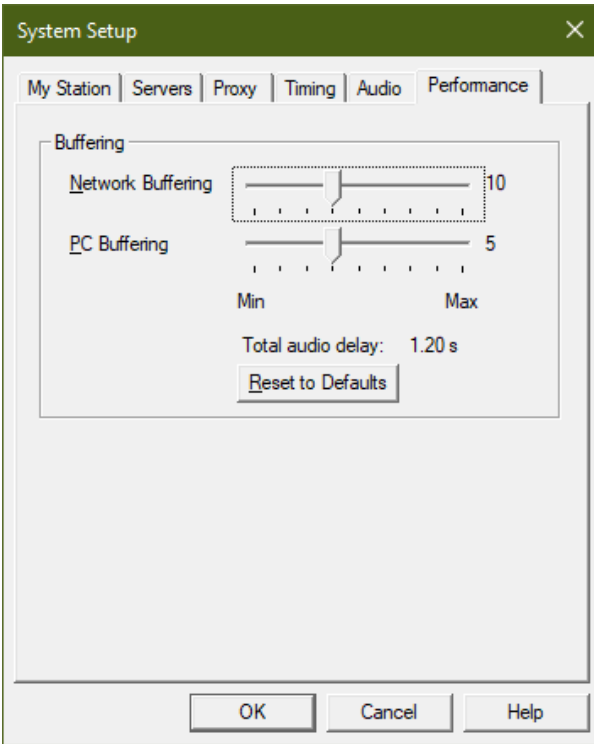
The Performance tab lets you make adjustments to compensate for a slow computer or slow (or fast) Internet connection.

Network Buffering: Controls how much data EchoLink will accept from the Internet before it begins to play it. This technique is known as "buffering", and helps ensure that incoming audio does not sound choppy due to variations in the timing of the Internet. Moving the slider to the right (for more buffering) may produce smoother audio on your system if you are connected to the Internet over a slow link. However, the further the slider is moved to the right, the longer the delay.

PC Buffering: Controls how much data EchoLink will send to your PC's sound card at once. As with Network Buffering, this technique helps ensure smooth-sounding audio. If your PC is an older machine, or is running other tasks at the

same time (particularly if there is a lot of hard-disk access), you may get smoother performance by moving the slider to the right.

The illustration above shows the default positions of these two sliders, which is recommended for normal operation.

Total Audio Delay: Displays the estimated delay between the moment the remote station speaks to the moment you hear the sound from your speakers. This value is updated automatically as you move the Network Buffering and PC Buffering sliders, so you can see the total effect.

Reset to Defaults: Returns the Network Buffering and PC Buffering sliders to their default positions.

Preferences

The Preferences window lets you customize several of EchoLink's features to suit your own taste. Choose one of the tabs along the top to view the Listing, Connections, Security, and Signals options. Each of these tabs is described in detail below.

Listing Tab

Items on the Listing tab control options for the station list area at the center of the EchoLink screen. This portion of the screen shows the callsign and location of each station currently on the system, and whether each is Busy (already in contact with another station) or On (ready for a new contact). For more information about the Station List area, see [Station List](#).
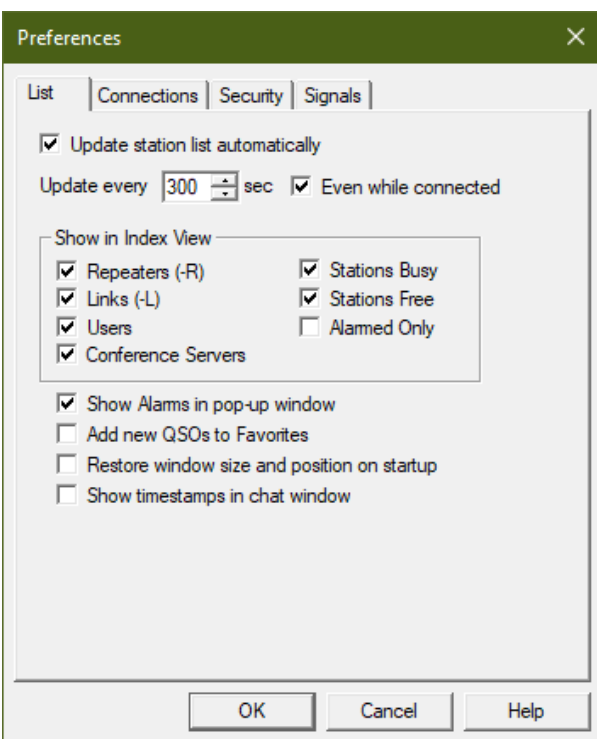
Update station list automatically: If this box is checked, the station list will refresh itself periodically. The box below it specifies the number of seconds between each refresh.

Even while connected: If this box is checked, the automatic refresh will occur even while you are in contact with another station. On slower Internet connections, this may interfere with smooth performance of the audio, so you may wish to un-check it. If the box is un-checked, EchoLink will refresh the station list as soon as your contact is

complete, unless less than 30 seconds has elapsed since the last refresh.

Show in Index View: This set of check boxes specifies which types of stations you wish to include in the Index View. Un-check any types of stations you do not wish to see. For example, if Stations Free is checked but Stations Busy is not, any station currently in contact with another will be omitted from the list.

Alarmed Only : If this box is checked, only those stations which have been added to your Alarms list will be displayed. For more information, see Tools Menu.

Show Alarms in pop-up window: If this box is checked, the Alarm Log window will automatically open each time an Alarmed station changes status, showing the station's callsign and status. You can also open or close the Alarm Log window from the View menu.

Add New QSOs to Favorites: If this box is checked, EchoLink will automatically add any stations to which you connect (or which connect to you) to your list of Favorites. (Favorites is one of the folders in the Explorer View). This is a convenient way of quickly re-connecting to a station you have spoken with recently.

Restore window size and position on startup: If this box is checked, EchoLink (on startup) will restore the main program window to the size and position at which you left it when it was last shut down. Otherwise, EchoLink always starts the program with the default size and position. If you should ever wish to return EchoLink to its default window sizes, un-check this option and restart the application.

Show timestamps in chat window: Check this box to prepend each incoming text-chat message with an extra line showing the current local time.

Connections Tab

The Connections tab includes controls for setting up the Conferencing features of EchoLink, and for setting text messages that appear during a contact.
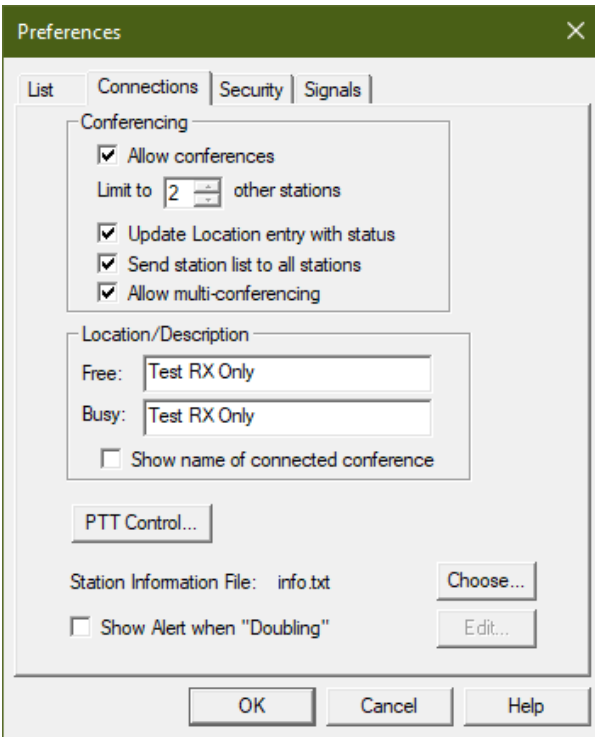
Allow conferences: Check this box if you wish to allow more than one other station to connect to your EchoLink software at a time. In the box beneath, enter the maximum number of stations you wish to allow at once (not including yourself), to a maximum of 99.

For more information about conferencing, see [Conferencing](#).

Update Location entry with status: If this box is checked, EchoLink will automatically update your station's entry in the Station List with a notation about the number of stations which have joined the conference. This allows other stations (who have not yet joined) to see the status of your conference. The notation is a number, in parentheses,

added to the end of your Location/Description entry. Note that your station will be listed as On (rather than Busy) as long as the maximum number of connected stations has not yet been reached.

Send station list to all stations: If this box is checked, EchoLink will periodically update the text screen of each connected station with a list of all stations in the conference, with an arrow indicating the station that is currently speaking. This takes the place of the Station Information file, if one had been configured. This list will also appear on your own screen, even if this option is not selected.

Allow multiconferencing: Check this box to allow a conference hosted on your PC to be connected to one or more other conferences. (By default, this type of connection -- known as *multi-conferencing* -- is inhibited by the software). See Conferencing for more information.

Location/Description: The text in these two boxes will be displayed next your station's callsign in the Station List that is viewable by all stations on the system. Different text may be specified depending upon whether your station is Free (not in conversation) or Busy. Normally, however, these two items are the same.

Show name of connected conference: When this box is checked, each time you connect to a conference, EchoLink will automatically update your Location listing with the name of the conference, instead of your usual Location/Description. The listing (that other stations see) will become "In Conference XXXXX", where XXXXX is the callsign of the conference server or EchoLink conference you are connected to. (Note that this information will not appear in your own Station List until the next refresh.)

PTT Control: Choose this button to open the PTT Options window, which has the following options:

Keyboard Key: Check this box, and choose the keyboard key to be used, if you wish to control the TX from the computer's keyboard. The choices are as follows:

> Space Bar
> Left Ctrl Key (the Ctrl key at the lower-left corner of the keyboard)
> Right Ctrl Key (the Ctrl key to the right of the space bar)
> Num Pad Plus (the + key on the far right-hand edge of the keyboard)
> Num Pad Enter (the Enter key on the far lower-right corner of the keyboard)

You can choose between two options for how this key behaves as a TX control. When the **Momentary** box is not checked (the default), tapping the key once will switch to TX, and tapping it again will switch out. When Momentary is checked, press and hold the key to TX, and release it to stop, like a conventional push-to-talk switch.

Note that the key you select for TX cannot also be used for its normal purpose. For example, if you select Left Ctrl Key, the left-hand Ctrl key cannot be used to invoke Ctrl commands, such as Ctrl-V. However, if Space Bar is selected, the space bar can still be used to create space characters in the Text Chat window.

Normally, the selected key will activate TX only when EchoLink has "focus", that is, when EchoLink is the topmost, active application on your Windows desktop. However, if you check the **System-Wide** box, the key will activate TX even when EchoLink is minimized or not activated. This is convenient if you wish to use other Windows programs while you are in an EchoLink QSO. (The System-Wide option is not available if Space Bar is the selected key.)

Serial Port CTS: Check this box, and choose the serial port to be used, if you wish to control the TX using a push-to-talk switch connected to the computer's serial port CTS pin. This is typically used for connecting a footswitch or push-to-talk switch to the PC for EchoLink operation.

Active Low: Inverts the sense of the CTS pin, so that TX is activated when the CTS pin goes low.

Middle Mouse Button: If you are using a three-button mouse (or a mouse with a clickable wheel), check this option to use the middle mouse button as a TX control as an alternative to the space bar. This option is not available if Windows does not detect a three-button mouse.

Station Information File: EchoLink sends a text message to the other station when you establish a connection, which appears on the other station's screen. By default, this message is "Station XYZ", where XYZ is your callsign. Choose "Edit..." to make changes to this message, or choose "Choose..." to select some other file (besides info.txt) as your Station Information File.

If "Edit..." is grayed out (not available), it means the station information file hasn't yet been created, or has been deleted. You can use Windows Notepad to create one, then click "Choose..." to locate it so it can be used by EchoLink.

Show Alert when "Doubling": Normally, EchoLink does not allow two stations to transmit at the same time. However, due to Internet latency, it is possible for two stations to *double* if they begin transmitting at exactly the same moment. Enable this option to display a warning message in the Chat window if you are doubling with another station.

Security Tab

The Security tab controls features which prevent undesired access to your EchoLink system. This is particularly of interest in the Sysop mode, although the Security settings work in either mode.
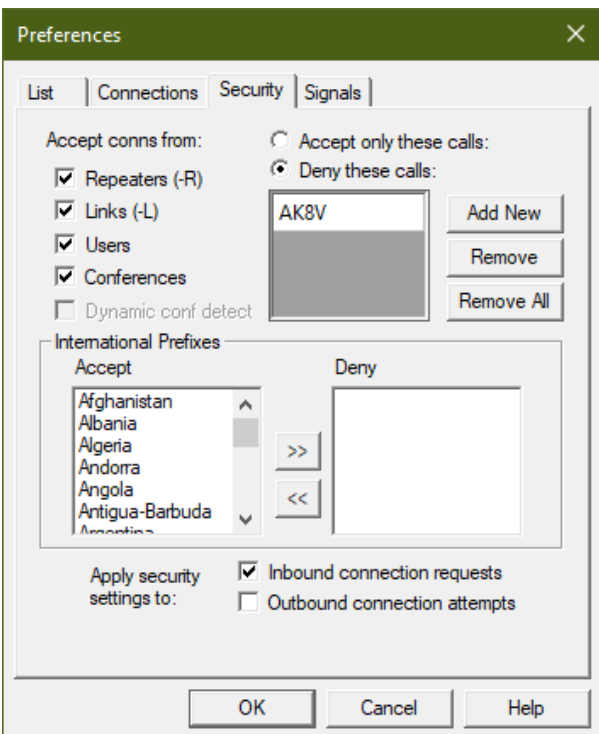
Allow connections with: These four checkboxes control which types of stations you are willing to connect with. If a station that has been excluded tries to connect, EchoLink will immediately deny access, and make a special notation in the Log file.

Note: Un-checking "Conferences" will block connections only with "conference servers", and conferences running EchoLink.

If Conferences is un-checked, EchoLink will not allow connections with conference servers or EchoLink conferences. It is possible, however, to be connected with a

station which later becomes a conference (when it connects with a third station). In this case, EchoLink will immediately disconnect, but only if **Dynamic conf detect** is checked.

Deny these calls: Select this option to set up a "banned list" of stations with which you do not want to connect. Any number of callsigns may be entered. To add a new callsign, choose Add New, then type the callsign (including any -L or -R suffix) into the blank space provided. To remove a callsign, select the callsign and choose Remove. Choose Remove All to clear all callsigns from the list. If the list is empty, no connections will be denied based on callsign.

Accept only these calls: Select this option to set up an "approved list" of stations with which you wish to allow connections exclusively. If this option is selected, no connection will be established with a station whose callsign is not listed. As with the Deny function, all callsigns must be fully spelled out, including any -L or -R suffix.

Note: Instead of (or in addition to) callsigns, you can also enter IP address ranges in this list, in CIDR notation. This is sometimes useful as a short-cut for accepting or denying several different stations who use the same Internet provider.

International Prefixes: Use this feature to control access to your station according to the international prefix of the other station's callsign. For convenience, EchoLink manages these prefixes internally, and displays only the names of each country in these lists. This feature has been provided to help you comply with your country's rules regarding reciprocal control-operator privileges or third-party traffic restrictions.

The countries in the Accept list are countries with which connections will be allowed; those in the Deny list will be denied. To move a country from one list to the other, select

the country name (by clicking on it), then choose one of the two arrow buttons in the center.

For example, if the only country in the Deny list is "United States", any station with a U.S. callsign prefix (AAA-ALZ, KAA-KZZ, NAA-NZZ, or WAA-WZZ) will be denied access; all others will be allowed.

Note that the countries listed are those in the ITU Prefix list. There is no recognition of DXCC entities for this feature, and thus no distinction between offshore territories and their host nations. Also, EchoLink has no way to detect when a callsign is being used outside of its country of origin.

Apply Security settings to: Use these two checkboxes to direct EchoLink to apply the above security settings to connections coming in to your station, to connections initiated by your station, to both, or to neither. For example, if both boxes are un-checked, the Security settings have no effect, and all connections are permitted.

Signals Tab

The Signals tab lets you change the sounds (signals) produced by EchoLink when certain events occur. EchoLink includes a set of default sounds, and you can silence them or substitute your own WAV files for each. **These settings apply to Single-User mode only.**
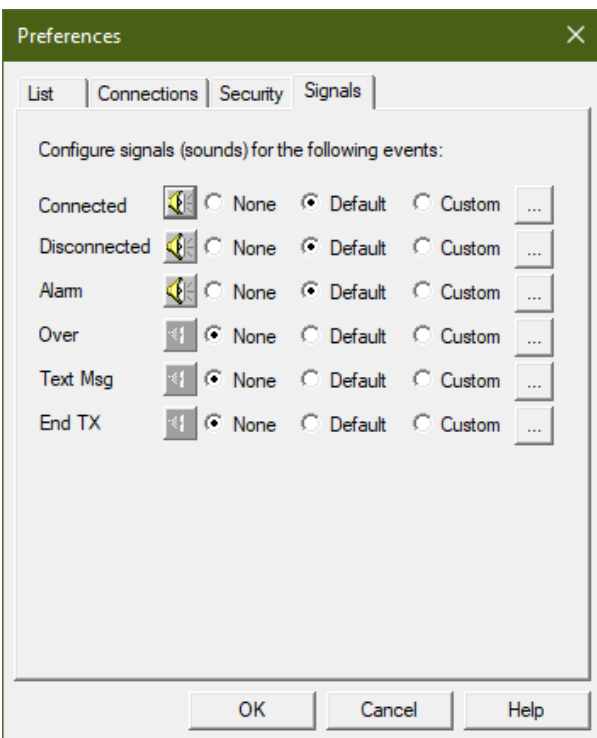
The signals are as follows:

- **Connected:** A station has just connected (either at your own request or theirs).

- **Disconnected:** A station has just disconnected.

- **Alarm:** A callsign in the Alarm list has just appeared (or changed status) in the Station List.

- **Over:** A station with which you are speaking has just finished a transmission (and has turned it over to you).

- **Text Msg:** A station to which you are connected has just typed a text message (in the Chat window).

- **End Tx:** You have stopped transmitting. This signal may be especially useful to visually-impaired operators.

To preview any of the signals, click on the small loudspeaker button. The corresponding signal will be heard from the PC speakers.

If your computer has multiple sound cards, note that signals (in single-user mode) are always played through the Windows default sound device, regardless of the settings on the Audio tab of Setup.

These signals are used only in Single-User mode. In Sysop mode, a separate set of signals is used. For more information, see [Signals](#).

Sysop Settings

Sysop Settings control many of EchoLink's features when it is running in Sysop mode. Choose one of the tabs along the top to view the RX Control, TX Control, DTMF, Ident, Options, Signals, Web, or RF Info options. Each of these tabs is described in detail below.

RX Control Tab

The RX Control tab sets up the interface between your PC and your receiver (or transceiver).
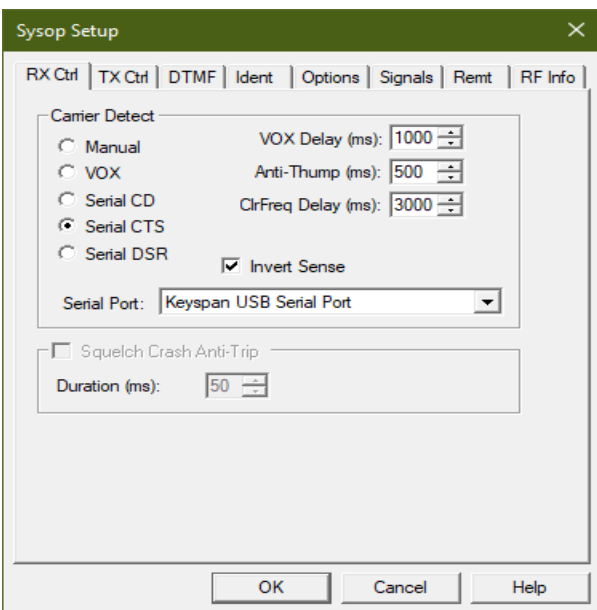
Carrier Detect: EchoLink needs to be able to detect when a signal is being received at the receiver. Normally, a built-in VOX system monitors the received audio and triggers EchoLink when it rises above a certain level. However, for more positive operation on simplex links, it is also possible to connect the carrier-detect signal directly from the receiver to one of the PC's serial ports.

> **Manual:** Select this option if you do not wish to use VOX or the serial port. In order to "transmit" to the other station over the Internet, you must click the Transmit icon or press the space bar. This would normally only be selected for testing.

> **VOX:** Select this option if you do not have a carrier-detect connection between your receiver (or transceiver) and your PC's serial port. This is the default. When VOX is enabled, and a connection is

established to a remote station, EchoLink will begin "transmitting" to the remote station whenever the peak audio level rises above the VOX threshold. The VOX threshold is set using a slider that appears just below the audio level indicator at the bottom of the EchoLink screen.

When VOX is enabled, EchoLink monitors your receiver's audio continuously, and the audio level indicator will be active at all times, even when your system is not connected to another station.

VOX Delay: When the VOX has been triggered by a local signal, EchoLink will continue sending audio to the station on the Internet for a short amount of time after the signal stops. VOX Delay controls this time period, in milliseconds. Increase this number if local stations tend to leave silent pauses frequently in their transmissions. This setting also controls the delay when using Serial CD, Serial CTS, or Serial DSR for carrier detect.

Anti-Thump: When using VOX, to avoid false triggering after going key-up, enter a non-zero value for Anti-Thump. The default is 500 milliseconds. This feature is particularly useful when operating a repeater node, to avoid having EchoLink's VOX trigger on your station's own squelch tail. This setting also applies when using Serial CD, Serial CTS, or Serial DSR for carrier detect.

ClrFreq Delay: Sets the size of the "clear-frequency" window. This is the length of time EchoLink will wait, after the VOX releases, before determining that the local frequency is clear (i.e., not busy). During this time, the Hand annunciator appears at the bottom of the screen. The default is 3000 milliseconds. Certain functions, such as announcements and station IDs, can

be automatically deferred until EchoLink determines that the frequency is clear.

Serial CD, Serial CTS, and Serial DSR: Select one of these options if you prefer to use a directly-connected carrier-detect signal rather than VOX. In many cases, this will provide better results than VOX when operating a simplex link, since it allows EchoLink to positively track the incoming station's carrier rather than relying on its audio level. When this option is enabled, select the Serial Port to which the signal is connected from the drop-down list. EchoLink expects the signal to be low (inactive) when the receiver is squelched, and high (asserted) when a signal is being received. If **Invert Sense** is checked, the opposite is true. For more information about this connection, see [Interfacing](#).

Note that the VOX Delay setting (despite its name) applies to any of these options as well. If you are using direct carrier-detect, consider reducing the VOX Delay to a somewhat smaller amount than the default.

Squelch Crash Anti-Trip: If you are using VOX, check this box to enable a special feature that improves VOX behavior when your link is tuned to a local repeater. When this feature is enabled and properly adjusted, EchoLink's VOX will ignore short noise bursts, such as squelch-tail "crashes" and courtesy tones. This can significantly improve repeater-to-repeater linking.

Set the Duration value to the size of the "window", in milliseconds, inside of which the noise pulse must fit in order for EchoLink's VOX to ignore it. Typical values are 40ms for squelch crashes and 300ms for courtesy tones. Experiment with this setting until the purple SIG annunciator no longer appears when the undesired noise is heard.

When this feature is enabled, all outbound audio is passed through a delay line as part of the detection process, approximately three times the Duration value in length. Note that this feature makes no effort to suppress noise bursts in the audio stream itself; it is only intended to prevent the VOX from tripping.

TX Control Tab

The TX Control tab sets up the interface between your PC and your transmitter (or transceiver).
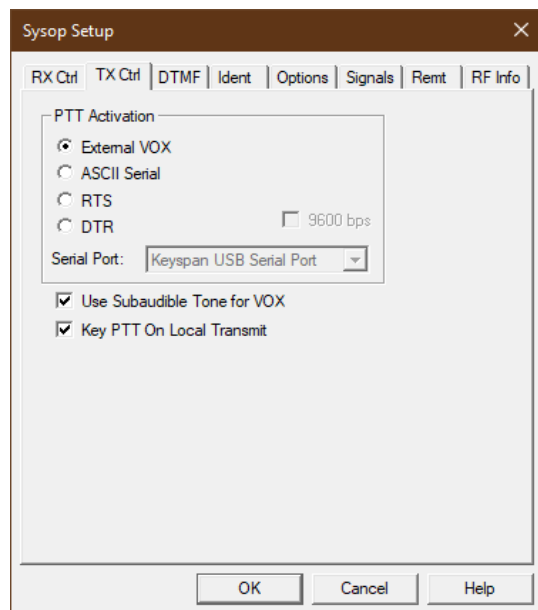
PTT Activation: These options determine how EchoLink keys the local transmitter when a signal is received from a station on the Internet. If no signal is being received by the local receiver, EchoLink keys the local transmitter when any audio is received from the distant station, then un-keys it when the distant station stops its transmission.

> **External VOX:** Select this option if you do not have any connection between your PC and your transmitter's push-to-talk (PTT) circuit. Although not commonly found on FM rigs, your transmitter may have VOX control, which can be enabled when this option is selected. Choose this option if you are using an external VOX-controlled interface such as a Tigertronics SignaLink. You will probably also want to enable the Send Subaudible Tone option, described below.

ASCII Serial: Select this option if you are using a WB2REM/G4CDY or VA3TO interface board, or an equivalent. This type of interface board is designed to receive ASCII commands from your computer's serial port. From the Serial Port list, select the port to which the board is connected. The serial-port speed is preset to 2400 bps; check the box marked 9600 bps if you are using an older interface which operates at that speed.

RTS and DTR: Select one of these option if you are using a RIGblaster (or equivalent) PC-to-radio interface. This type of interface activates the transmitter's PTT line when either the RTS or DTR pin of the serial port is asserted. From the Serial Port list, select the port to which the board is connected.

Use Subaudible Tone for VOX: When enabled, EchoLink will put a continuous subaudible tone under each local transmission, to ensure that the VOX remains continously engaged, even during silent pauses. This is a low-frequency tone which is well below the audio passband of most transceivers, and thus would not be heard over the air.

Key PTT on Local Transmit: Check this box to force the transceiver's PTT to be keyed when you tap the spacebar to begin transmitting, and to un-key when you stop. This feature is useful if you are running a Sysop link, and also wish to be able to join an EchoLink QSO from the local keyboard and microphone.

This feature can also be used in conjunction with the Serial Port option on the PTT Control screen of Preferences/Connections. If Auto-Select Mic Input is enabled, EchoLink will switch automatically between the transceiver audio and the local mic when transmitting locally. See [PTT Control](#) for more information.

DTMF Tab

Items on the DTMF tab list each of the functions EchoLink supports by entering DTMF (a.k.a. TouchTone) commands over the local link, or a secondary link receiver. DTMF commands may be used to activate or de-activate the link, or to connect or disconnect a distant station.
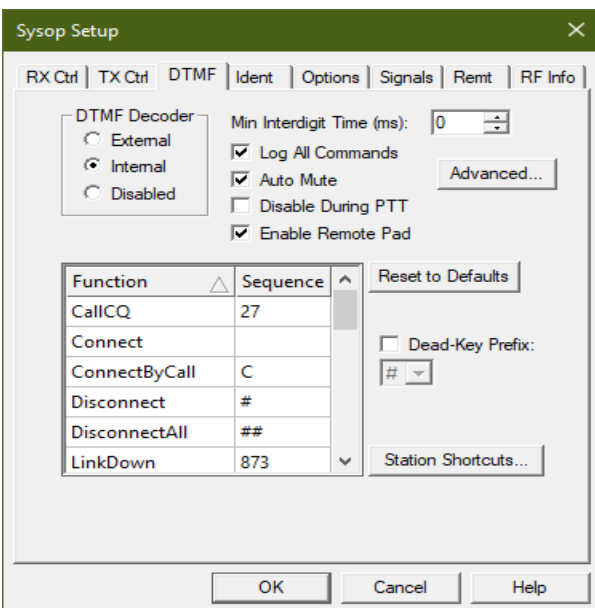
DTMF Decoder: Select one of the three options, depending on your equipment set-up.

> **External:** Select this option if you are using a WB2REM or VA3TO interface board, or equivalent. These interfaces have an on-board DTMF decoder which communicates with EchoLink over the serial port.

> **Internal:** Select this option if you are using another type of interface, such as a RIGblaster. When this option is selected, EchoLink itself detects DTMF tones as they are received at the PC's sound input, using digital signal-processing techniques.

Disabled: Select this option if you do not wish to accept DTMF commands. When this option is selected, none of the items in the DTMF Command list will be available.

Min Interdigit Time: Sets the minimum amount of time, in milliseconds, that EchoLink will allow between incoming DTMF digits. Set this to 0 for the default timing. Set this to a higher value (such as 200 or 500 ms) if you find that noisy signals are causing single digits to be interpreted as multiple digits.

Log All Commands: When this box is checked, EchoLink will log all DTMF sequences that are received, even those which do not trigger a function. These entries will appear in the System Log.

Auto Mute: When this box is checked, EchoLink will suppress DTMF signals (received over the local link) from going to the remote station over the Internet. DTMF signals are suppressed completely if the Internal decoder is used; when using the External decoder, the first part of the first digit may "sneak" through.

Disable During PTT: When this box is checked, DTMF signals are not decoded while the local link transmitter is keyed. In some audio configurations, audio from the sound card might be fed into either the internal decoder or an external decoder. This can cause DTMF signals received over the Internet to be interpreted by EchoLink's decoder, which may be undesirable.

Enable Remote Pad: When this box is checked, stations connecting to your link using EchoLink version 1.6 or above can send DTMF commands to (or through) your link radio using the program's built-in DTMF encoder pad. Enable this feature if there are DTMF-controlled repeater or remote-base functions you wish to provide to remote users. The

remote user's DTMF pad is not available if either node is participating in a conference.

Note that EchoLink's built-in DTMF decoder itself does not normally respond to signals received over the Internet; however, certain audio configurations may cause this to happen if they allow the sound card's output to be fed into its input, or to an external DTMF decoder.

Also note that this setting controls only the ability of the remote user to use EchoLink's built-in DTMF pad. It does not affect DTMF signals from other sources.

Advanced: When using the Internal DTMF decoder, opens a window which allows the frequency tolerance, "twist", and signal-to-noise ratio to be adjusted. If you have difficulty getting DTMF digits to decode reliably with the Internal decoder, you may find that adjusting these settings, particularly the frequency tolerance, will help. However, you may wish to try lowering the audio level of the receiver first.

DTMF Command List: The list shows the name of each DTMF command and the sequence of digits that is required to activate it. To change any of the function sequences, click on the appropriate entry in the Sequence column and edit it. To disable a function, leave the item in the Sequence column blank, or replace it with the letter X.

Reset to Defaults: Returns all DTMF function codes to their default values. This also adds any new function codes which may have been added since a previous version of the software.

Dead-Key Prefix: Some repeater controllers have a feature that mutes DTMF tones so that they are not heard on the output. Typically, however, these controllers provide a work-around in the form of a prefix that can be used to disable the DTMF muting feature (such as #). If you are running a link to such a repeater, and receiving audio from the

repeater's output, users wishing to send EchoLink DTMF commands will have to prefix all EchoLink commands with this sequence.

In some cases, however, EchoLink receives and decodes this command prefix along with the command itself, which is usually not desirable. To avoid this problem, enable the Dead-Key Prefix option. This will cause EchoLink to always ignore the chosen command prefix, unless it is the only digit received.

Station Shortcuts: Opens the Station Shortcuts window. This window allows you to create custom DTMF sequences for connecting to specific stations, like a personal phone book. For example, you could create the shortcut 99 to connect to K1RFD. This makes it easier for mobile stations to connect to a frequently-used station without having to memorize the station's node number. Be sure to use sequences that do not conflict with other functions; two- or three-digit sequences are usually good choices. Note that Station Shortcuts are implicit "connect" commands, not simply abbreviated node numbers.

For more information about DTMF commands, see [DTMF Functions](#) .

Identification Tab

For general courtesy, and to help comply with your country's Amateur Radio regulations, EchoLink supports automatic identification of your link over the air. A Morse ID or voice ID (either an internally-generated one, or your own custom recording) can be played at the beginning and/or end of a connection, and periodically while the connection is active. EchoLink can also play an ID periodically when no connection is active, if desired.
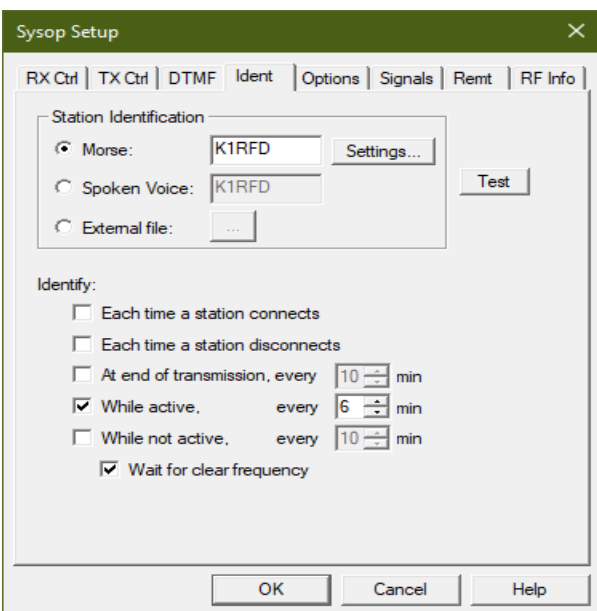
Voice ID Source: Choose whether to use the internally-generated ID, or a custom WAV file you have created.

> **Morse:** Enter the callsign you wish to use to identify. When the time comes to identify, EchoLink will send the callsign (as entered) in Morse, mixed with any other audio which may be present. The main advantage of a Morse ID is that it tends not to interrupt or delay the progress of a QSO. Click Settings to adjust the Morse speed, pitch, and audio level.

Internal: Enter the callsign you wish to use to identify. When the time comes to identify, EchoLink will "read" the letters and digits as entered. Punctuation is not recognized, except that you can add a -L or -R suffix to generate the word "link" or "repeater" after your callsign, if desired.

External file: If you prefer to create your own voice ID, select this option and choose the "..." button to locate the file. This file must be a WAV file in 8-bit, 8000Hz, PCM Mono format. It is recommended to keep it as brief as possible, since a long announcement may interfere with smooth audio operation while in contact with another station.

Test: Choose this button to have EchoLink key the radio and identify according to the selected options.

Note: It is appropriate for a Sysop station to use its own callsign as the "legal" ID, without any sort of special suffix. In the U.S. (and likely in most other countries), there is no requirement that this ID be the same as that of the repeater to which it is tuned, since it is considered a separate station.

Identify: Select any of these options, in any combination, to specify when EchoLink should send an on-air station ID.

Each time station connects: If this option is selected, your callsign will be announced immediately before the "connected" announcement when a station connects over the Internet. Note that if Auto-Announce is enabled (on the Options tab), you will hear both your own call and the call of the connecting station, as in "K1RFD Link Connected AK8V Repeater". If Morse is selected, the Morse ID is played concurrently with the announcement.

Each time a station disconnects: If this option is selected, your callsign will be announced immediately after the "disconnected" announcement when a station disconnects.

At end of transmission, every *n* min: Select this option, and enter the number of minutes, to have EchoLink announce your callsign periodically during a lengthy connection. If this option is selected, your callsign will be announced immediately after the remote station has finished speaking, and just before EchoLink un-keys the transmitter, but not more often than the number of minutes specified.

While active, every *n* min: Select this option, and enter the number of minutes, to have EchoLink announce your callsign periodically while the link is in use. The ID will be played the first time the transmitter is keyed, and then at *n*-minute intervals thereafter if there has been any transmission since the last ID. If the option **Wait for clear frequency** is selected, EchoLink will defer the ID if the link receiver is busy when it comes time to ID.

While not active, every *n* min: Select this option, and enter the number of minutes, to have EchoLink announce your callsign periodically when there has not been any transmissions on the link (regardless of whether anyone is connected). The first ID will be played when EchoLink starts up. If the option **Wait for clear frequency** is selected, EchoLink will defer the ID if the link receiver is busy when it comes time to ID.

Options Tab

The Options tab controls several other options for EchoLink.
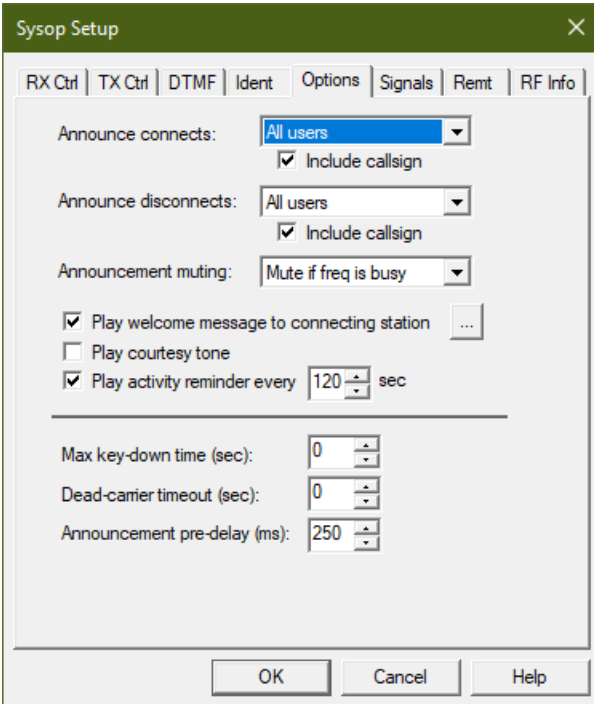
Announce connects: Select one of the available options to control how EchoLink signals that a station has connected.

- **None**: No Connect announcement is made when a station connects (unless a local DTMF command invoked it).

- **All users**: A Connect announcement is made each time a station connects.

- **First conferencee only** : A Connect announcement is made when a station connects, but only if no other users are already connected.

Include callsign: If this box is checked, EchoLink will include the callsign of the newly-connected station in the Connected announcement.

Announce disconnects: Select one of the available options to control how EchoLink signals that a station has disconnected.

- **None:** No Disconnect announcement is made when a station disconnects (unless a local DTMF command invoked it).

- **All users:** A Disconnect announcement is made each time a station disconnects.

- **Last conferencee only:** A Disconnect announcement is made when a station disconnects, but only if no other users remain connected.

Include callsign: If this box is checked, EchoLink will include the callsign of the newly-disconnected station in the Disconnected announcement.

Announcement muting: Select one of the available options to control how Connect and Disconnect announcements are done if the link frequency is busy.

- **No muting:** Connect/Disconnect announcements are played even if the frequency is busy.

- **Mute if freq is busy:** Connect/Disconnect announcements are not played if the frequency is busy.

- **Defer if freq is busy:** Connect/Disconnect announcements are not played if the frequency is busy, but are deferred until the frequency becomes clear. The announcement is cancelled if more than 2 minutes has elapsed since the event.

- **Suppress all:** No Connect/Disconnect announcements are ever played, even if invoked from a local DTMF command.

Play welcome message to connecting station: Select this option if you wish to prepare a voice message to be played to stations that connect from the Internet. This message will not be heard over the local link. If this option is selected, choose the "..." to locate the WAV file to be played. The WAV file **must** be recorded at an 8kHz (8000 Hz) sample rate, using one channel (mono).

It is recommended that you keep such a message very brief (under 5 sec), as a long message may interfere with normal voice operation.

Play courtesy tone: Select this option if you wish EchoLink to play a brief tone at the end of each transmission from the Internet. To use a custom WAV file instead of the default tone, select a custom signal for Courtesy Tone on the Signals tab.

Play activity reminder every *n* sec: If you are running a Repeater link, select this option to have EchoLink to play a brief tone in between overs on the local link periodically while a station is connected. This tone serves as a reminder to stations engaged in a local QSO that at least one station is (still) connected to the link, and thus to leave a longer pause between overs to allow the remote station to break in. To use a custom WAV file instead of the default tone, select a custom signal for Activity Reminder on the Signals tab.

Max key-down time (sec): Enter the maximum number of seconds you wish to allow the local transmitter to remain keyed in a single transmission. If an incoming signal (from the Internet) exceeds this time, EchoLink will disconnect the station and un-key the local transmitter. To disable this feature, enter 0.

Dead-carrier timeout (sec): Enter the maximum number of seconds you wish to allow a station to transmit to your

station (over the Internet) without providing any audio. If an incoming signal exceeds this time, EchoLink will disconnect the station. To disable this feature, enter 0.

Announcement pre-delay (ms): Enter the amount of time, in milliseconds, that EchoLink should pause between keying the PTT and beginning an announcement. The default is 150ms. This can be extended if announcements are being clipped at the beginning when heard.

Signals Tab

The Signals Tab controls announcements which are made on-air when certain system events occur.
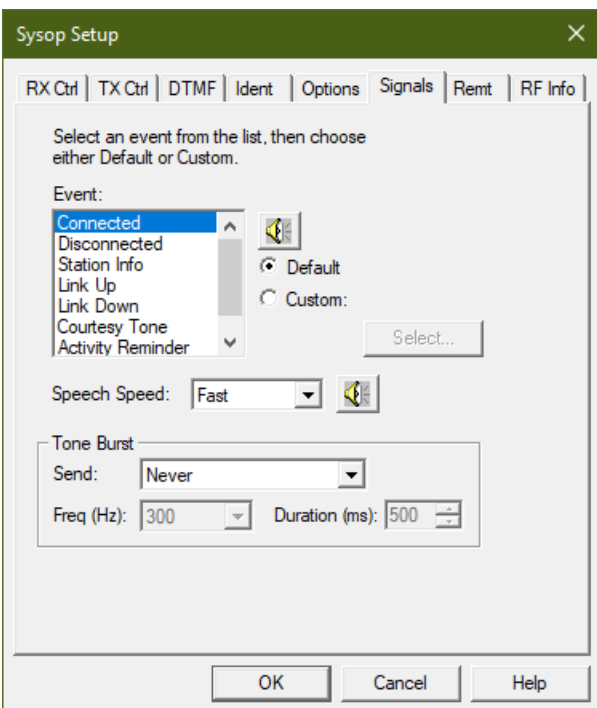
For each event in the list, there is the option of using either the Default announcement, or a custom WAV file you provide.

Note that any custom WAV files you provide must be in 8-bit or 16-bit, 8000Hz PCM Mono format. Selection of any other type of WAV file will produce an error message.

To change the setting for a particular event, select the event in the list, and select either Default or Custom. If Custom is selected, choose "Select..." to locate the WAV file you wish to use.

To test the announcement signal for an event, select the event and click the loudspeaker icon. (This function works only when no station is connected.)

The Station Info announcement is played whenever a station enters the Station Info DTMF sequence, which by default is the star key (*).

The Courtesy Tone sound is played only if "Play courtesy tone" is enabled on the Options tab.

The Activity Reminder sound is played only if "Play activity reminder" is enabled on the Options tab.

Note that the events in list apply only to Sysop mode.

Speech Speed: Select Normal, Slow, or Fast. If Fast is selected, words are overlapped slightly to shorten announcement time; if Slow is selected, extra space is placed between words to improve intelligibility. (These settings do not apply to any Custom WAV files.)

Tone Burst: Some repeaters require a brief tone signal to activate them. If the local repeater has such a feature, EchoLink can send a tone burst at the beginning of each transmission, or when a remote station initially connects. Several tone frequencies are available (1750 Hz is the most common), and the duration is adjustable.

Remt (Remote Control) Tab

For convenient "wireline" remote control, EchoLink has two built-in options.

The first is a built-in, password-protected Web server which allows the station to be remotely controlled from any Web browser connected to the Internet. The Web server displays an HTML page which displays the current status of the program, and allows the link to be enabled or disabled, and stations to be connected or disconnected. The page also shows recent entries from the System log. Settings in the top section of this tab control whether the Web server is enabled, and how it is configured.

The second option works with a "voice modem" connected to your PC, and allows EchoLink to be remotely controlled from a touch-tone telephone. The program answers an incoming call, accepts DTMF commands over the call, and allows the caller to monitor the audio going through the link.
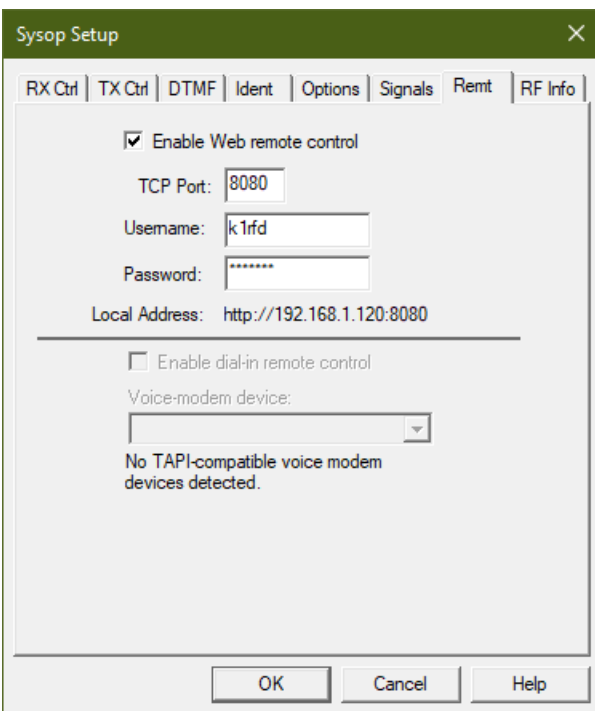
Enable Web remote control: Select this option to enable the built-in Web server. If you select this option, be sure to enter the other information below.

TCP Port: The TCP port number on which the Web server will operate. The default is 8080, to avoid conflict with other Web services which may already be running on port 80. You may need to change this setting if your firewall (or ISP) does not permit inbound traffic on port 8080.

Username, Password: If you would like the Web server to be password-protected (recommended), enter a user name and password. When accessing EchoLink from a remote Web browser, a box will pop up prompting you to enter this information in order to gain access.

Notes:

If you have activated the Web server on port 8080, the URL for accessing it will be http://hostname:8080/ , where "hostname" is the name or IP address of your computer. (Keep in mind that your external hostname and/or IP address may change from time to time, depending on the type of Internet service you are using.)

If you are operating EchoLink behind a firewall (such as a cable or DSL router), be sure to configure the firewall to forward inbound traffic on TCP port 8080 to the computer running EchoLink.

Voice-modem device: If more than once voice modem is connected to your PC, choose the device you wish to use with EchoLink. If this option is disabled, it means that EchoLink did not detect any compatible devices. See Notes for more information.

Answer on *n* rings: Determines how many times the line will ring before EchoLink answers the call.

Timeout (sec): Sets the amount of time after the last DTMF command that EchoLink will keep the line open before hanging up. (Most voice modems will also hang up the line shortly after the caller hangs up.) Set the timeout to 0 to keep the line open as long as the caller remains off-hook.

Audio level: Sets the audio level from EchoLink to the telephone line. Move the slider to the right to increase the level.

Audio Monitor: Check this box to allow audio from the QSO to be heard over the telephone line while the control operator is connected. Un-check this box if your voice modem is not able to detect DTMF digits while sending audio through the phone line.

Passcode: Sets the DTMF sequence that the caller must supply before being allowed access to the link. This field may be left blank.

Notes:

This feature requires that a TAPI-compatible *voice modem* be installed. In contrast to a conventional modem, a voice modem is one that can place or accept voice calls, and is often used with speakerphone or answering-machine PC software. The most common (and inexpensive) type of voice modem is the internal PCI "winmodem" type, although not all winmodems are voice modems. Check the product literature for references to "telephone answering machine" or "speakerphone" to determine if a particular modem has voice capability. These devices were once commonly available, but more recently have become rare.
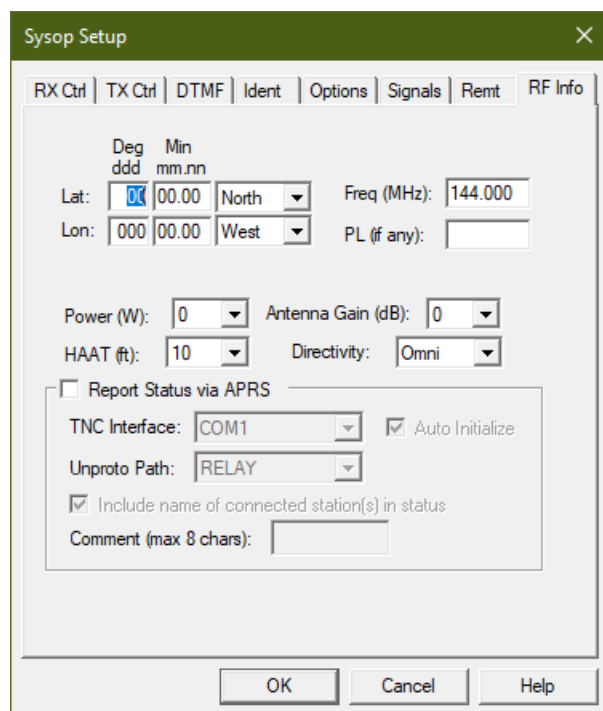
Although EchoLink has been tested with several different makes and models of voice modems, compatibility with all models cannot be assured. When installing the modem, be sure that the matching voice-modem drivers are installed as well.

When dialing in to EchoLink over the telephone, EchoLink will pick up the line and announce "EchoLink <callsign>" to the caller. If a passcode was configured, the caller must enter the correct DTMF passcode. Echolink then announces "Enabled". At this point, it is ready to accept DTMF commands, and the caller will hear the link audio, if a QSO is in progress and the Audio Monitor box is checked. Since there is no carrier detect over the telephone, allow 3 seconds after each DTMF sequence for the command to be recognized, or use the pound sign (#) as a terminator.

If the telephone line and the voice modem both support Caller ID, the caller's name and telephone number will appear in the System log.

RF Info Tab

The RF Info tab is used to provide information about your link which may be helpful to nearby stations trying to locate it. EchoLink includes an implementation of the Automatic Voice Reporting System (AVRS), which uses the APRS´┐Ż network and protocols to disseminate real-time information about VoIP links such as EchoLink nodes. This feature was developed in collaboration with Bob Bruninga, WB4APR. The program also provides a mechanism for collecting and displaying this information on the Web, as an adjunct to APRS.

If you wish to disseminate basic information about your simplex link, or the repeater to which your repeater link is connected, you can enter it here. By default, the information is transmitted to a central database on the Internet upon startup, and again each time a station connects or disconnects from your link. This information will be displayable and searchable on the EchoLink Web site.

If a packet TNC is connected to your computer, and the APRS option is enabled, the same information will be sent periodically to local users using APRS. Mobile stations equipped with APRS often have alphanumeric displays which will show the location and status of your node, if they in range of your APRS transmission or a nearby digipeater. Future APRS software may include the ability to allow a mobile station to send a general query for local EchoLink activity.

The information fields on the RF Info Tab are defined by the AVRS spec as follows:

- **Lat:** Station latitude, in degrees and decimal minutes. For example, 41.1175 degrees is 41 degrees, 07.05 minutes. Be sure to indicate East or West.

- **Lon:** Station longitude, in degrees and decimal minutes. Be sure to indicate North or South.

- **Power (W):** Transmitter power, as measured at the feedpoint of the antenna.

- **HAAT (ft):** Antenna height above average terrain, in feet. Note that this is the height of the antenna above average ground, **not** the elevation above sea level.

- **Antenna gain (dB):** Antenna gain in the favored direction, rounded to the nearest decibel.

- **Directivity:** General direction, if any, in which signals are favored by the antenna.

- **Freq (MHz):** Frequency on which the link receives. If the link is to a repeater, this is the output frequency of the repeater.

- **PL (if any):** CTCSS frequency, if any, required to activate the link (or to activate the repeater to which

the link is tuned).

If you do not wish to provide or disseminate any of this information, enter 00 00.00 for Lat and 000 00.00 for Lon.

Values for some of these items are limited to a small set of choices, due to the way the data is encoded in the AVRS specification.

The following options are also available:

Report Status via APRS: If using a TNC to disseminate status information over APRS, check this box and confirm the settings below.

> **TNC Interface:** Serial port to which the packet TNC is connected. EchoLink will access the TNC through this port at 9600 bps. Be sure this port is not already in use by another application. However, if you are using the program UIView32, you can configure UIView32 to communicate directly with the TNC, and choose the UIView32 option to have EchoLink share the TNC with UIView32. The only limitation is that UIView32 cannot use the TNC in KISS mode.

> **Auto Initialize:** Check this box to have EchoLink set the TNC parameters automatically at startup. If enabled, EchoLink will attempt to put the TNC into command mode, set the UNPROTO path, and then put the TNC into converse mode. Otherwise, EchoLink assumes that these steps have been performed manually before EchoLink is started.

> **Unproto Path:** If Auto Initialize is enabled, choose one of the paths from this list. This affects the way outgoing packets are addressed, and whether they will be accepted and relayed by a digipeater. A common setting is RELAY.

Include name(s) of connection stations in status: If checked, EchoLink will include the callsign of the connected station when it sends a status report over the APRS network. Otherwise, the report only indicates that the link is in use.

Comment: Enter up to 8 characters (letters, numbers, or spaces) which will be appended to the report. This information will appear along with the APRS status report, and is visible on the screen of some mobile stations.

For more information about the AVRS specification, please see http://web.usna.navy.mil/~bruninga/avrs.html

APRS is a registered trademark of Bob Bruninga.

The EchoLink Screen

The diagram below shows the key parts of the EchoLink screen. A description of each part of the screen follows.
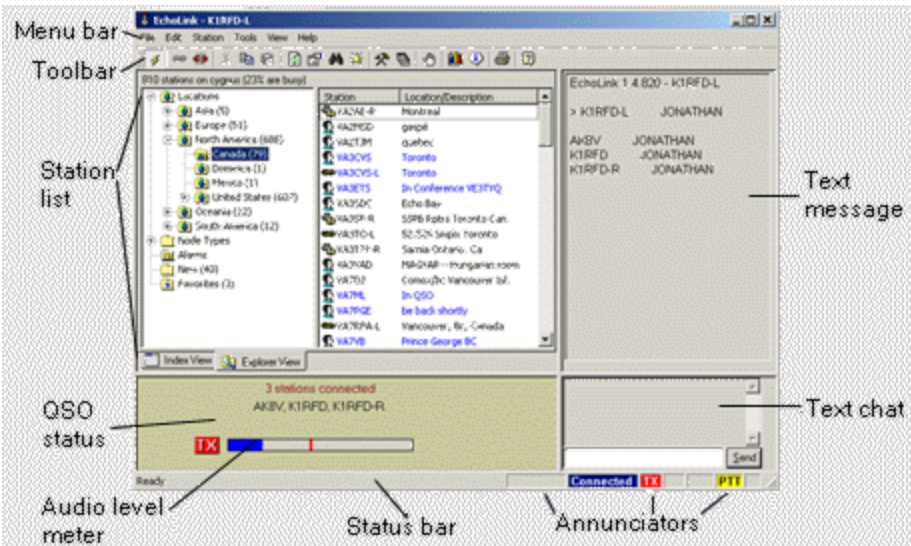
Menu Bar and Toolbar: Nearly every EchoLink command is available from the Menu Bar. Many of the commonly-used commands are also available by pressing a key, or by clicking on one of the icons in the Toolbar. For details, see Menus and Toolbars. The toolbar can be shown or hidden (to save screen space) by choosing Toolbar from the View menu.

Station List: The Station List shows each station which is currently using EchoLink, including the station's callsign, status, local time, location, and node number. The list refreshes itself periodically while EchoLink is running. Two different "views" of the Station List are available, by selecting the tabs at the bottom: Index View and Explorer View. Both views list the same stations, but in different formats. For details, see Station List .

QSO Status: The QSO Status window shows information about the station that is currently connected. The station

callsign, country, and Internet address (or hostname) are shown.

Audio level meter: Incoming and outgoing audio levels are shown on a bar-graph type meter, with zero at the left end and maximum level at the right. A red line shows the peak level. The meter is visible only when EchoLink is connected to another station, or when using Sysop mode.

Status Bar: The status bar at the bottom of screen shows descriptions of menu items, when selected. The status bar can be shown or hidden (to save screen space) by choosing Status Bar from the View menu.

Annunciators: Nine areas at the bottom of the screen indicate when certain functions are active. From left to right, these annunciators are described below:

DTMF: In Sysop mode, this area displays DTMF digits that have been received.

Connected: Indicates when EchoLink is connected to another station over the Internet.

TX: Indicates when EchoLink is sending audio to a station over the Internet.

RX: Indicates when a station is sending audio to EchoLink over the Internet.

SIG: In Sysop mode, indicates when a signal is being received by the local receiver.

✋: Busy indicator. In Sysop mode, indicates when EchoLink has determined that the local frequency is in use.

PTT: In Sysop mode, indicates when the local transmitter is transmitting.

⚠: Low-bandwidth indicator. Flashes when the Internet connection is not fast enough to send voice data. (See

[Low-Bandwidth Indicator](#)).

Text Chat: Comments typed at the keyboard from the other station(s) appear here. To send a comment, type it in the line at the bottom and click Send (or press Enter). Text Chat is only available while connected.

Text Message: A welcome message from the station to which you are connected may appear here. If you are a member of a conference, this window lists the callsign of each station, with a small arrow indicating which station is currently speaking.

Menus and Toolbars

As with other standard Windows applications, EchoLink offers a set of pull-down menus in a bar across the top, and a toolbar with clickable icons as shortcuts to many of the commonly-used menu items.

The Toolbar

The EchoLink toolbar is shown below. For descriptions of each function, see the descriptions of the matching menu items, below.

Transmit Connect Cut Paste Refresh Find Settings ListBusy Station Summary Stop Record Help

Disconnect Copy Info Alarms Preferences Statistics Play Pause Print
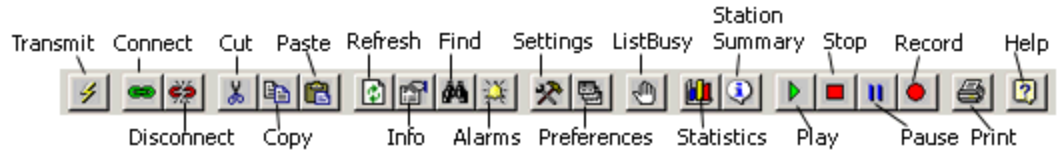
Menus

As with other Windows applications, EchoLink includes a row of pull-down menus along the Menu Bar. Each menu is described in detail below.

File Menu

Print: Prints the current contents of the Station List.

Print Preview: Displays the current Station List as it would appear when printed.

Print Setup: Allows you to select a printer and set printer options for use with EchoLink.

Profiles: Selects a new profile, or creates or deletes an existing one. (A profile is a collection of EchoLink settings. For more information, see Profiles .)

Exit: Log off the system and exit the program. This is the same as clicking the Close icon (the X in the upper right-hand corner).

Edit Menu

Cut: Copies the current selection to the Clipboard, and deletes it.

Copy: Copies the current selection to the Clipboard.

Paste: Places the contents of the Clipboard into the selected location.

Delete: Deletes the current selection.

Items on the Edit menu apply to the current selection of the EchoLink window which has "focus". This can be the Index View, the Explorer View, the Text Message window, the Text Chat window, or the Text Chat Send box. To change focus to a different window, click on it, or or type one of the keyboard commands listed in [Keyboard Shortcuts](#).

Station Menu

Transmit: This item becomes active when you are connected to another station. Check this item to "transmit" (speak to the remote station), and un-check it to stop transmitting. This is the same as clicking the Transmit icon in the toolbar, or tapping the space bar on the keyboard.

Connect: This item becomes active when you select a station's callsign in the Station List area (by clicking on it). Choosing Connect will attempt to establish a connection with that station. This is the same as double-clicking the station's callsign, or selecting the station and pressing Enter on the keyboard.

Connect To: Opens the Connect To dialog, which allows you to enter either the callsign or the node number of a station you wish to connect to. EchoLink will try to connect to that station only if it is currently listed in the Station List.

Connect To Test Server: Connects to a special conference server, called *ECHOTEST*, which simply records and plays back any transmissions you send to it. This is useful for general system testing and setting audio levels. (You cannot connect to *ECHOTEST* if another conference is already connected.)

Reconnect: Re-connect to the station you most recently disconnected from. This is especially useful if your conversation had become disconnected due to a timeout or a network problem.

Disconnect: Disconnect from the current station. If more than one station is connected (in Conference mode), you will be prompted to disconnect a specific station, or to disconnect all stations at once.

Call CQ: Open the Call CQ dialog to set your CQ preferenes and initiate a CQ call. EchoLink will try to connect you to some other station that is also calling CQ with matching preferences. For more information, see [Calling CQ](#)

Info: Opens up a dialog which displays basic information about the selected station.

Find: Opens the Find dialog, which prompts you to enter a callsign or location. Find then searches the Station List for a match (or partial match), and shows the result. The Find dialog remains open so you can repeat the search or start a new one.

Refresh List: Updates the Station List immediately.

Tools Menu

Alarms: Opens the Alarms dialog, which lets you manage a list of callsigns for which to set Alarms. If any of these stations comes online (or switches from Free to Busy, or vice versa), EchoLink sounds an alarm and notes the event in bold just below the Station List. Any number of callsigns may be specified. Alarmed stations are also listed in a special folder in Explorer View. You can also set up the Index View to show only stations which are in your Alarms list. For more information, see [Preferences](#).

List Me as Busy: If not currently connected, changes your station's listed status from On to Busy. This is useful to discourage other stations from trying to connect to yours during periods when you would like to run EchoLink but do not wish to accept incoming connections.

Disable Link: In Sysop mode, enables or disables the program. When EchoLink is disabled, your callsign will no longer appear in the Station List, and incoming connections will not be accepted. Choose this item again to re-enable the link.

Listen-Only Mode: In Sysop mode, prevents any transmissions received over the RF link from being sent over the Internet to the remote station. This is useful for monitoring a conference, while assuring that any local RF activity (IDs, squelch tails, etc.) does not interrupt it inadvertently. Select this item again to clear Listen-Only mode and return to normal operation. EchoLink will also return to normal operation automatically when the current connection is dropped.

Setup: Opens the Setup dialog, which provides access to basic configuration of EchoLink. For more information, see

[Setup](#).

Preferences: Opens the Preferences dialog, which provides access to user-preference options. For more information, see [Preferences](#).

Sysop Settings: This item is available only if EchoLink is running in Sysop mode. Opens the Sysop dialog, which provides access to advanced features applicable only to Sysop mode. For more information, see [Sysop Settings](#).

Link Setup Wizard: Starts a wizard which creates a basic Sysop configuration based on answers to a few questions about your link. This Wizard is recommended for first-time users who have a transceiver connected to the PC for linking operation.

Adjust Sound Device: Opens up the Windows Volume Control panel for adjusting the playback or recording levels.

Tone Generator: In Sysop mode, keys the local transmitter and plays a sine-wave signal at the specified frequency and amplitude. This is useful for tests and adjustments.

Start Recording: Starts recording the current QSO. While in Recording mode, EchoLink will create one or more WAV files containing the transmitted and received audio. See the Recording setting on the Audio tab of Setup, and [Record and Playback](#) for more information..

Play Sound File: Opens and plays a WAV or MP3 sound file, sending the audio to the connected station(s). If your system has a full-duplex sound device, the audio will also be heard through the local speakers, or over the air if running in Sysop mode.

Stop: If playing a sound file, stops playback, closes the file, and stops TX. If recording, stops recording and closes the file.

Pause Playback: If playing a sound file, temporarily suspends playback and stops TX.

View Menu

Toolbar: When checked, displays the Toolbar near the top of the screen, just below the menu bar. The Toolbar provides quick one-click access to several frequently-used menu items. Un-check this item if you wish to hide the Toolbar and allow EchoLink to occupy less space on the screen.

Status Bar: When checked, displays the Status bar at the bottom of the screen. The Status Bar includes indicators which show the transmit/receive/connect status, and descriptions of the menu and toolbar items. Un-check this item if you wish to hide the status bar.

Connection Statistics: When checked, displays the Connection Statistics window. This window "floats" on top of the EchoLink screen, and may be moved or closed if desired. The Connection Statistics window shows detailed information about the current connection, if any. For more information, see [Connection Statistics](#).

Station Summary: When checked, displays the Station Summary window. This window "floats" on top of the EchoLink screen, and may be moved or closed if desired. The Station Summary window shows summary totals of the stations in the Station List, grouped by type, status, and country. For more information, see [Station Summary](#).

Alarm Log: When checked, displays the Alarm Log window. This window "floats" on top of the EchoLink screen, and may be moved or closed if desired. The Alarm Log displays the list of Alarmed stations which have changed status since the program was started. If "Show Alarms in pop-up window" is checked (see [Preferences](#)), the Alarm Log window opens automatically when an Alarm is sounded. Note that you can

close and re-open the Alarm Log window at any time without losing the information it contains.

DTMF Pad: When checked, displays the pop-up DTMF encoder pad. This is a utility that allows DTMF signals to be sent over the Internet to the connected station, which is useful for certain remote-control functions that the other station might be supporting. The DTMF Pad is not available unless EchoLink is connected to a station which has specifically permitted it (see [Sysop Settings](#)). It is also not available if either station is participating in a conference. The DTMF Pad closes automatically when the station disconnects.

Server Message: Displays any informational message that might have been returned by the server the last time the Station List was updated. Check this message if you suspect that the Station List area is not working correctly, or if you are in Auto Proxy mode and want to see which of the public proxies is currently being used by your node.

System Log: Offers the option to View or Edit the current System log file. Choosing View opens the log using a built-in, read-only viewer. Choosing Edit opens the file using a Windows text editor, such as Notepad. This log file (called QSOLog.txt) maintains detailed information about each station that connects or disconnects, and other system events.

Callsign Log: Offers the option to View or Edit the current Callsign log file. Choosing View opens the log using a built-in, read-only viewer. Choosing Edit opens the file using a Windows text editor, such as Notepad. This log file (called CallLog.txt) logs one line for each station contacted, at the conclusion of the QSO, with the date and time the contact began and ended, and the callsign and name of the other station.

Help Menu

Contents: Opens the main Help menu. (If the Help window does not open, check to be sure your system has the latest Microsoft HTML Help controls installed.)

Search: Opens the Help system, and allows you to search for a particular keyword.

Index: Opens the Help system, and displays the index of Help items.

EchoLink Web Site: Navigates your Web browser to the EchoLink Web site's home page.

Help on the Web: Links to a Web site containing detailed and up-to-date Help topics. Choosing this item will open your default Web browser and navigate to the EchoLink Help page.

Software Updates: Opens a window which gives you the opportunity to automatically check the EchoLink Web site to see if a new version of the software is available.

About EchoLink: Displays EchoLink's current version number and copyright information.

Keyboard Shortcuts

As an alternative to using EchoLink with a mouse, the following commands

can be entered from the keyboard:

Key	Function
Alt+1	Activates the Station List area
Alt+2	Activates the Text Message area
Alt+3	Activates the QSO Status area
Alt+4	Activates the Text Chat area
F6	Activates the next area (in the sequence above)
Shift-F6	Activates the previous area (in the sequence above)
Ctrl+PgDn	Switches between Index View and Explorer View in the Station List
Tab	Switches between the left and right sides of Explorer View, or between sections of the Text Chat area
Space	Begins (or ends) transmitting
Ctrl+F10	Keys (or un-keys) the local transmitter (Sysop mode)
Ctrl+F9	Simulates COS function of local receiver (Sysop mode)
Alt+A	Alarms
Alt+B	List Me As Busy
Ctrl+C	Copy

Alt+ C	Connect (the selected station)
Alt+ D	Disconnect
Alt+ E	Setup
Ctrl+ F	Find
Alt+ M	Server Message
Ctrl+ O	Connect To...
Ctrl+ P	Print
Alt+ P	Preferences
Alt+ Q	Call CQ
Alt+ R	Reconnect
Ctrl+ V	Paste
Ctrl+ Z	Undo
Del	Delete
Ctrl+ X	Cut
F1	Help (Contents)
Alt+ F4	Exit
Alt+ F10	Alarm Log
Alt+ F11	Station Summary
Alt+ F12	Statistics
Alt+ F2	Recording start/stop
F5	Refresh (station list)
Alt+ F9	DTMF Pad
Alt+ Y	Sysop Setup

Explorer View Shortcuts

The following keyboard commands are available when Explorer View is active:

Key	Function
Enter	Connect to selected station, or expand selected folder
Tab	Switch between left and right sides of Explorer View
UpArrow	Select previous item in list
DownArrow	Select next item in list
RightArrow	Expand selected folder (left side)
LeftArrow	Collapse selected folder (left side)
* (on num pad)	Expand selected folder and all sub-folders (left side)
PgUp	Scroll to the the previous page of items
PgDn	Scroll to the next page of items

Station List

The Station List area of the screen shows each station that is currently logged on to the system, and each station's current status.

Stations are frequently joining or leaving the system, or changing their status from "On" (available for a QSO) to "Busy" (already in a QSO). However, the Station List updates itself periodically, so it always shows fresh information.

Two different views of the Station List are available: Index View and Explorer View. You can switch from one view to the other at any time by selecting one of the tabs at the bottom of the Station List, or pressing Alt-PageDown.

Although both views display the same list of logged-on stations, Index View shows the stations as a single list, whereas Explorer View organizes the stations into various folders and sub-folders, similar to Microsoft Windows Explorer. Many operators will prefer Explorer View, particularly when many stations are logged on at once. Each view is described in detail below.

Index View

In Index View, all logged-on stations are displayed as a scrollable list.

The heading above the list shows the number of stations currently logged on, and the percentage of stations whose status is "busy".

Columns in the list show the station's type and callsign, status, local time, location, and node number. These columns are described in detail below.

Station: Displays the callsign and an icon indicating the station type. Station types are repeaters, links, users, and conference servers. Note that repeater links have a -R suffix after the callsign, and simplex links have a -L suffix. Each station type is also shown in a different color; stations that are on your Alarms list are displayed in red. Use the keyboard or mouse to scroll or select a station in the list. To connect to a station, double-click it, or select it and press Enter.

Status: Indicates whether the station is available for a QSO. "On" indicates that the station is free, or ready. "Busy" indicates that the station is already in a QSO or is otherwise not accepting connections.

Time: Shows the local time, as reported by each station. This is helpful for understanding time differences among stations around the world. Since this is the time to which the station's PC clock is set, you may notice some errors due to some PC clocks being

incorrectly set. (A common error is to confuse AM with PM).

Location: Shows the station's location or description, as entered by the operator. If this information was entered by the operator in uppercase, it is displayed here in mixed case to save space. Operators sometimes use this field to show comments about their current status. A number in parentheses usually indicates the number of other stations that are currently connected.

Node: Shows the node number of the station. Node numbers are uniquely assigned. Knowing a station's node number is useful if you wish to connect to it using DTMF commands over a simplex link or repeater.

The list can be sorted several different ways. By default, the list is sorted by the Station column (station type and callsign). All repeater links are shown first, followed by simplex links, then users, then conference servers. Within each station type, stations are listed alphabetically by callsign.

To sort on a different column, click the column heading at the top. If you click the same heading a second time, the list will be sorted in reverse order.

The Index View can also be navigated using the keyboard. For details, see [Keyboard Shortcuts](#).

Stations that have just logged on since the last update are highlighted in yellow. Stations whose status has changed (from free to busy, or vice versa) since the last update are shown with their status column highlighted in yellow. Stations that have been added to your Alarms list are shown in red.

EchoLink provides several options for filtering items that are shown in the Index View. These options are available on the Listing tab of the Preferences screen. For details, see [Listing Tab](#).

Explorer View

In Explorer View, all logged-on stations are displayed within each of several groups of folders and sub-folders. This presentation is familiar to users of Microsoft Windows Explorer, although the information displayed is stations, rather than files.

Many of the folders contain sub-folders. To see the list of sub-folders, click the small plus sign to the left of the folder list on the left-hand side. If you double-click on a folder, its contents are displayed on the right-hand side. A folder can contain stations, sub-folders, or a combination of both. The number in parentheses after a folder name indicates the total number of stations it contains, including those in any sub-folders.

Within each folder, stations are listed alphabetically. An icon indicates whether the station is a repeater link, simplex link, conference server, or user. Busy stations are shown in blue. Moving the mouse over a station's name displays additional information about the station.

To locate and connect to a station, open the appropriate folder until the station is displayed in the list on the right-hand side, then double-click the station's callsign.

The Explorer View can also be navigated using the keyboard. For details, see [Keyboard Shortcuts](#).

Explorer View also includes special folders for Alarms, Favorites, and New stations, containing information not

available in Index View. Each type of folder is described below.

Locations

This folder contains logged-on stations organized by continent and country. Because of the large number of stations in the United States, U.S. stations are further broken down by call area.

Note: Location information is based solely on ITU callsign prefix, not on other categorizations such as DXCC entities. For this reason, stations in offshore territories appear in same the folder as stations in their recognized nation, even if they may be located in a different part of the world.

Node Types

This folder contains sub-folders for each of the four node types. Each station in the Locations folder is also listed here.

New

This folder contains stations that have logged on to EchoLink since the last time the list was "refreshed". Normally, the list refreshes itself every 5 minutes. You can also refresh the list by pressing F5, or clicking the Refresh icon in the toolbar. Each time the list is refreshed, the contents of the New folder are cleared and updated. Stations in the New folder also appear in the Locations and Node Types folders.

Alarms

This folder contains stations that have been added to your Alarms list. These stations may or not be currently logged on. If a station is logged off, its callsign appears in gray text, rather than black or blue, and its icon is dimmed. An alarm will sound when EchoLink detects that any of the stations in this list log on, log off, or change status. (This notification is

not immediate, since it depends on periodic updates to the Station List.)

Favorites

This folder contains stations that you have placed into it for future reference. This makes it easy to locate certain "favorite" stations, even when many stations are logged on. You can create your own sub-folders in Favorites to organize stations into groups. You can also have each new QSO added to Favorites automatically; see [Preferences](#).

Recent QSOs

This folder contains stations you've recently connected with. The 20 most recent stations are listed, in alphabetical order, without any duplicates.

Adding Stations to Alarms or Favorites

You can add a station to Alarms or Favorites in several ways:

- Right-click the station's callsign (in any other folder), and choose Add to Alarms or Add to Favorites. If the station is already in either of these folders, the corresponding choice will be dimmed.

- Use the mouse to "drag" a station (or several stations) from a list on the right-hand side into the Favorites or Alarms folders on the left-hand side, then release the mouse button to "drop" it. You can also drag and drop an entire folder, to add many stations at once. Dropping a folder to Alarms causes all of its stations to be added to Alarms, whereas dropping a folder to Favorites copies the folder(s) themselves to Favorites.

- Use Copy and Paste. These choices are available either from the Edit menu, or by right-clicking the mouse.

- Open the Alarms or Favorites folder, right-click anywhere in the right-hand side, choose New, and type the callsign of a station. This is a way to add a station that may not be currently logged on.

- Choose Alarms from the Tools menu to add a station manually to the Alarms list.

Deleting Stations from Alarms or Favorites

To delete a station from Alarms or Favorites, select the station(s) and press the Delete key, or right-click and choose Delete.

Saved Favorites

Your Favorites are stored in a text file called "favorite.txt" in the same directory as EchoLink.exe. You may be able to edit this file directly if you wish.
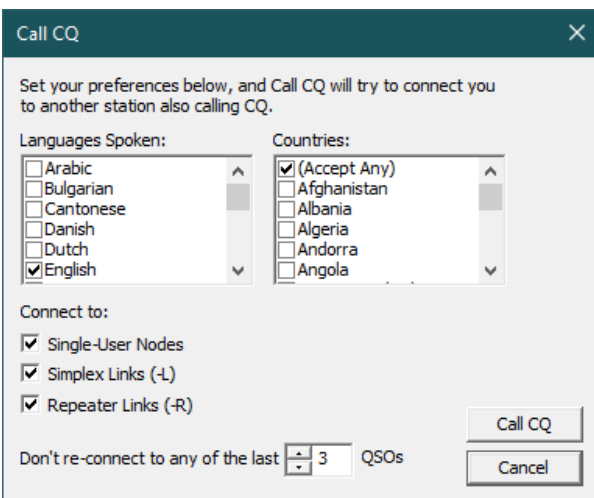
Note: Outside of the U.S., "Favorites" appears as "Favourites".

Calling CQ

There are thousands of EchoLink nodes online around the world, but sometimes it can be hard to find another station seeking a QSO.

The Call CQ function is a quick way to be matched up with another station also seeking an EchoLink connection. Each node calling CQ chooses a set of preferences such as language spoken and node type, and then automatically connects with any other node that is also calling CQ at the same time with matching preferences. If no such station is already waiting when you call CQ, EchoLink will keep your callsign in the queue until a match is found.

Call CQ can be invoked from the Station menu. If you are running in Sysop mode, mobile and portable RF stations in range of your node can invoke Call CQ via a DTMF command. (The default command is 27, which is the letters C and Q on the dialpad). Use the pound-key (#) to cancel.

To keep the conversation interesting, you can choose to ignore CQ calls from any station you've already connected with recently.

CQ will not connect to Conference servers, nor to nodes that are not running EchoLink for Windows version 2.1 or above. CQ is supported on recent versions of EchoLink for iOS and Android.

If you have blocked certain countries or node types in your main Security preferencs, CQ will automatically apply those settings in addition to any choices you make in the CQ preferences, as long as at least one country is allowed. However, you cannot call CQ if you have restricted your node to a specific allow-list of callsigns.

Connection Statistics Window

The Connection Statistics window displays detailed information about the currently-connected station (or stations). This display is useful in Conference mode, when more than one station is connected, or to help diagnose network-related problems. To display the Connection Statistics window, choose the Connection Statistics item from the View menu. The window "floats" over the EchoLink screen, and can be moved as desired by dragging the title bar.
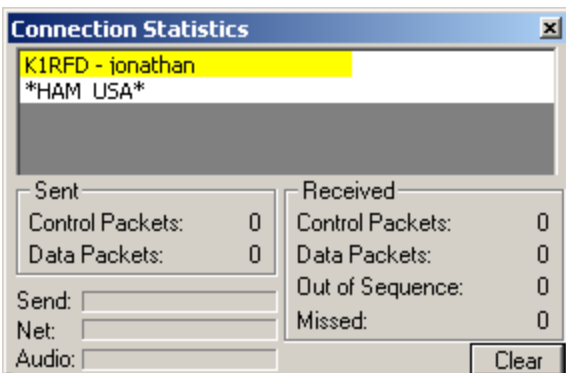
The upper half of the window shows each station that is currently connected (by callsign and name), along with its hostname or IP address. If one of the connected stations is currently transmitting, its callsign is highlighted in yellow. Right-click on any station's callsign to display a menu of the following options:

Disconnect: Disconnects this station. This is particularly useful when a conference is in progress, and you wish to disconnect only one station from the conference.

Station Info: Display's the station's Information file, which is normally shown on the main EchoLink screen, except when a conference is in progress. This is a convenient way to read a station's Information file while a conference is in progress.

The lower half of the window displays counts of "packets" that have been sent or received during the current connection (or since the first connection, if more than one station is connected). The Compensation item displays the number of packets added or dropped to compensate for mismatched sample rates, if the Auto Sample Rate Compensation option is enabled. Choose Clear to reset these counters to zero.

Three "progress bars" show the size of each of several buffers used by EchoLink.
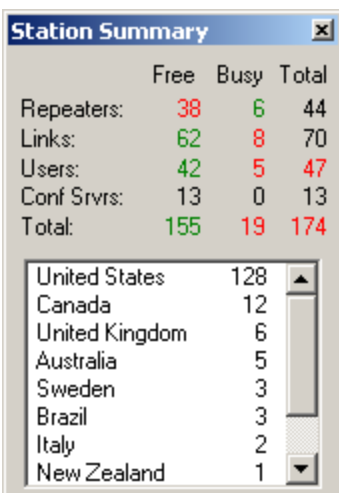
The Send bar shows the number of packets waiting in queue to be sent over the Internet; on a good Internet connection, this bar should be near zero. If the bar grows to the right, it may indicate a temporary bandwidth problem with the Internet connection.

The Net bar shows the number of packets received from the Internet waiting to be processed by EchoLink. Normally, while receiving a signal from another station, this bar should be approximately half scale.

The Audio bar shows the number of sound buffers waiting to be processed by the sound card.

Station Summary Window

The Station Summary window displays statistics about stations in the Station List, organized by type, status, and country of origin. To display the Station Summary window, choose the Station Summary item from the View menu. The window "floats" over the EchoLink screen, and can be moved as desired by dragging the title bar.

The displayed statistics are updated each time the Station List is refreshed. The numbers are the count of stations in each category. Counts which have increased since the last refresh are displayed in green; counts which have decreased are displayed in red; and counts which have stayed the same are displayed in black.

The lower half of the window shows the count of stations by country, in descending order, according to the station's callsign prefix. The names of countries and their derivation from callsign prefixes is based on the ITU Prefix list, so it does not necessarily reflect DXCC entities.

DTMF Functions

In Sysop mode, EchoLink can be configured to accept commands through the local receiver using DTMF tones (TouchTones). These commands are used to enable or disable the link, or to connect or disconnect a station on the Internet.

Each command consists of a sequence of digits (or the special keys *, #, and A through D). Although a set of default sequences is assigned to each function, any sequence can be customized using the DTMF tab of the Sysop Settings page.

The table below lists each of the DTMF commands.

Note: If you have upgraded from an earlier version of EchoLink, you may need to choose "Reset to Defaults" to make all of the following commands available.

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+**#**
Random Node	Selects an available node	**00**

	(of any type) at random, and tries to connect to it.	
Random Link	Selects an available link or repeater (-L or -R) at random, and tries to connect to it.	**01**
Random Conf	Selects a conference server at random, and tries to connect to it.	**02**
Random User	Selects an available single-user station at random, and tries to connect to it.	**03**
Call CQ	Puts EchoLink in Call CQ mode, to try to connect to another station	**27**

	also calling CQ.	
RandomFavNode	Selects an available node (of any type) at random from the Favorites List, and tries to connect to it.	**001**
RandomFavLink	Selects an available link or repeater (-L or -R) at random from the Favorites List, and tries to connect to it.	**011**
RandomFavConf	Selects a conference server at random from the Favorites List, and tries to connect to it.	**021**
RandomFavUser	Selects an available single-user	**031**

	station at random, and tries to connect to it.	
Disconnect	Disconnects the station that is currently connected. If more than one station is connected, disconnects only the most-recently-connected station.	#
Disconnect All	Disconnects all stations.	##
Reconnect	Re-connects to the station that most recently disconnected.	**09**
Status	Announces the callsign of each station currently connected.	**08**

Link Down	Disables EchoLink (no connections can be established).	(none)
Link Up	Enables EchoLink.	(none)
Play Info	Plays a brief ID message.	*
Query by Call	Looks up a station by its callsign, and reads back its node number and status.	**07**+call+**#**
Query by Node	Looks up a station by its node number, and reads back its callsign and status.	**06**+num
Profile Select	Switches to a different stored set of configuration settings (0 through 9).	**B#**+num
Listen-Only On	Inhibits	**0511**

	transmission from RF to the Internet.	
Listen-Only Off	Restores normal transmission from RF to the Internet.	**0510**

Connect

The default for the Connect command is to simply enter the 4- 5-, or 6-digit node number to which you wish to connect. To prevent interference with other DTMF functions, however, you may wish to configure a special prefix, such as A or 99.

Link Up and Link Down

No defaults are provided for these functions. To enable these functions, enter a DTMF sequence for each one, using the DTMF tab of the Sysop Settings page.

Profile Select

Profiles are numbered from 0 to one less than the number of profiles shown under File->Profiles. Profile 0 is always MAIN.

Station Shortcuts

Custom DTMF commands can be created to connect to specific stations. These commands are called Station Shortcuts, and are not shown in the table above. To manage your Station Shortcuts, click the Station Shortcuts button on the DTMF tab of Sysop Settings.

Entering Node Numbers

To enter a node number (for the Connect or Query by Node commands), enter the 4-, 5-, or 6-digit node number. If the specified node is not among the stations currently logged on, EchoLink will say "NOT FOUND".

Entering Callsigns

To enter a callsign (for the Connect by Call or Query by Call commands), press two digits for each letter and number in the callsign. The first digit is the key on which the letter appears (using 1 for Q and Z), and the second digit is 1, 2, or 3, to indicate which letter is being entered. To enter a digit, press the digit followed by 0. When finished, end with the pound key (#).

For example, the letter "K" is entered as "52", the letter "Q" is entered as "11", and the digit "7" is entered as "70".

Callsigns need not be entered in full. If a partial callsign is entered, EchoLink will find the first match among the stations currently logged on. If no match is found among the stations currently logged on, EchoLink will say "NOT FOUND".

Examples

(These examples assume that the default DTMF codes are configured.)

- To connect to node number 9999:

Enter: **9 9 9 9**

EchoLink responds with:

"CONNECTING TO CONFERENCE E-C-H-O-T-E-S-T"

followed by

"CONNECTED"

because 9999 is the node number of conference server "*ECHOTEST*".

- To get the status of K1RFD:

Enter: **0 7 5 2 1 0 7 2 3 3 3 1 #**

EchoLink responds with:

"K-1-R-F-D 1-3-6-4-4 BUSY"

because 13644 is the node number of station K1RFD, and K1RFD is currently busy.

- To connect to a random link or repeater:

Enter: **0 1**

EchoLink responds with:

"CONNECTING TO K-1-O-F REPEATER"

followed by

"CONNECTED"

because K1OF-R was selected at random.

Signals

EchoLink can play sounds, called "signals", when certain events occur. Two different sets of signals are used. One set is used when EchoLink is in single-user mode; the other set is used when EchoLink is in Sysop mode.

Single-User Mode

In single-user mode, the default signals are sounds that are played through the PC speakers. Using the Signals tab of the Preferences page, you can disable any of these signals, or substitute another WAV file for each. The following signals are defined:

Connected: A station has just connected over the Internet, either by your own request or theirs.

Disconnected: The station to which you had just been connected has disconnected, either at their request or yours, or because of a timeout.

Alarm: A callsign in the Alarms list has just logged on or off, or changed status.

Over: The other station has finished a transmission, and is turning it over to you.

Text Msg: The other station has typed a text "chat" message, which has just appeared on your screen.

Sysop Mode

In Sysop mode, signals are pre-recorded words or phrases that are played over the air using the local transmitter. Certain signals include a node number or callsign, which is assembled by "reading" a string of digits or letters. The following signals are defined:

CONNECTED: A station has just connected over the Internet, either by your own request or theirs. If the "Announce stations on connect" option has been enabled, this will be followed by the station's callsign.

DISCONNECTED : The station to which you had just been connected has disconnected, either at their request or yours. Check the System Log for more information.

NOT CONNECTED: You have requested a disconnect, but no station is currently connected.

NOT FOUND: The requested station is not currently logged on. This signal is sent in response to any of several DTMF functions that search for a particular callsign or node number.

BUSY: The requested station is listed as busy. This signal is included in the response to either a connect request or a status query.

ENABLED: The Link Up command has been received and EchoLink is now available for connections.

DISABLED: The Link Down command has been received and EchoLink is no longer available for connections.

ALREADY IN CONFERENCE: EchoLink is already participating in a conference, and thus cannot join another one. For details, see the section [Conferencing](#).

NOT AVAILABLE: A connection could not be established to the requested station. The station is busy, or it is denying access based on its inbound security settings or your own outbound security settings.

TIMEOUT: The station was disconnected because of a timeout, or an attempt to connect to another station failed because the station did not respond. There are several different types of timeouts; check the System Log to determine the exact cause.

Record and Playback

EchoLink has built-in functions for recording a QSO as a WAV file, or playing back a previously recorded WAV or MP3 file during a QSO. These functions are described below.

Recording Mode

EchoLink can record QSOs automatically when they begin, and stop recording when they end. This is particularly useful for Sysop nodes that wish to keep detailed logs of activity.

To enable this feature, choose the desired Recording Mode on the Audio tab of the main Setup window. The available modes are as follows:

No recording: QSOs are not automatically recorded. However, a QSO already in progress can be recorded by choosing Start Recording from the Tools menu.

Record by QSO: QSOs are automatically recorded. Each QSO is saved as a single WAV file, named according to the time and date the QSO began.

Record by Callsign: QSOs are automatically recorded. Each transmission during the QSO is saved as a separate WAV file, named according to the callsign of the station making the transmission, and the date and time.

EchoLink will create all WAV files in a single folder. By default, this is a folder called "wav" in the folder in which the EchoLink program file is installed. To change the folder, choose Setup from the Tools menu, click the Audio tab, and click the Folder button.

Note: WAV files use about 27 MB of disk space per hour of audio recorded. To save disk space, periods of silence between transmissions are removed from the WAV files produced by EchoLink. However, when making recordings, check your computer's free disk space periodically to avoid running low.

Record and Playback Controls

Record and playback controls are provided on the Tools menu, and also as icons on the toolbar. These controls are available only while a QSO is in progress (i.e., only while a station is connected).

Start Recording: Begins recording the QSO as a single WAV file. A flashing red indicator appears in the status bar to remind you that a WAV file is being recorded.

Play Sound File: Opens a dialog box that allows you to select a WAV or MP3 file for playback. If a WAV file is selected, it must be in PCM, 8000 Hz, Mono format. Immediately after the file is selected, EchoLink transmits and begins playing the file. While playing, audio is heard by all connected stations. You will also hear audio through the PC speakers if your computer has a full-duplex sound device. (In Sysop mode, the audio is also transmitted over the local link.) A flashing green arrow appears in the status bar to remind you that a sound playback is in progress.

Stop: Stops record or playback. (If recording, the file is automatically deleted if nothing but silence had been recorded.)

Pause Playback: Temporarily suspends playback of a sound file, and stops transmitting. Choose this control again to resume playback. While playback is paused, the flashing green arrow in the status bar continues to appear, to remind you that sound-file playback is paused.

Profiles

Changes made to any of EchoLink's settings are stored to the computer's hard disk, and are restored each time the program is started.

For convenience, EchoLink also allows any number of different combinations of settings to be stored separately, and given a descriptive name. This is useful if you want to be able to switch back and forth between two (or more) commonly-used settings, such as the callsigns of a husband and wife sharing the same computer.

To use this feature, choose Profiles from the File menu. A list of the currently-defined profiles is shown; by default, only the profile called MAIN is defined. (The MAIN profile cannot be deleted or re-named).
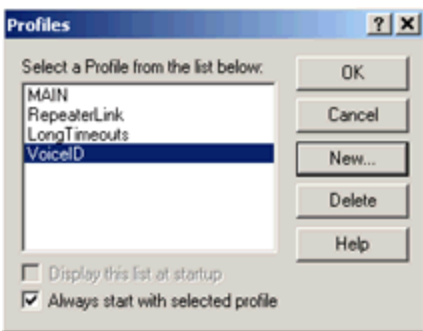
To create a new profile, choose New, and enter a name for the profile. Choose whether you want the new profile to initially contain all of the current settings, or begin with default settings. (If you choose default settings, the Setup Wizard will appear the first time the profile is invoked.) EchoLink will create a shortcut in the Programs section of your Windows Start menu for the new profile, and optionally also create a shortcut on your Windows desktop. You can use either of these shortcuts to start up EchoLink directly with any of the profiles you have defined.

To switch from one profile to another, double-click the name of the profile in the list of available profiles. You also have the option of whether to be prompted to choose a profile each time EchoLink starts, or to start up in a specific profile automatically. (By default, EchoLink always starts with the MAIN profile). If you are running in Sysop mode, you can also use the DTMF command ProfileSelect to switch to another profile remotely.

If a profile other than MAIN has been selected, the name of the profile will appear in the program's title bar. Any changes made to program settings are automatically stored in the selected profile; no other profiles are affected. If there is a setting you want to apply to all profiles, you will have to switch to each profile separately and make the same change to each profile.

Profiles, and all other EchoLink settings, are stored in the Current User section of the Windows Registry. If you are using the Windows User Profiles feature, in which each user of the PC logs in to Windows on startup, remember that changes made to EchoLink settings by one user will not apply to others.

EchoLink will also accept a profile name as a command-line argument when the program starts. The format of this argument is "-p" followed by the name of the profile, without any extra spaces. For example, to start up with the profile called "LINK", use "echolink.exe -pLINK". This allows you to create a set of shortcuts to invoke different EchoLink profiles from your Windows desktop.

In Sysop mode, a DTMF command is available which will switch the system from one profile to another remotely. By default, this command is B#n, where n is the number of the desired profile. The MAIN profile is always 0, and the other profiles are numbered according to the order listed on the Profiles window, beginning with 1. Use this command with

caution, since the selected profile might switch EchoLink into single-user mode, in which DTMF commands are no longer accepted to switch it back.

Conferencing With EchoLink

Conferencing refers to EchoLink's ability to be connected to more than one station at a time over the Internet. Each such station becomes a participant in a *conference*. It is conventional for participants in a conference to take turns transmitting, in roundtable fashion. When connected in this fashion, each member of the conference can hear each other member's comments. Text Chat messages are also sent to all single-user participants.

EchoLink supports conferencing as an option, in either the Single-User or Sysop modes. Conferencing is disabled by default. To enable conferencing, change the settings on the Connections tab of the Preferences window. For more information, see [Preferences](#).

Conferencing is not recommended if you are connected to the Internet over a slow connection. Even with high-speed connections, be judicious about setting the connection limit, since each additional station in the conference requires about 17 kbps of upstream bandwidth. For more information, see [Low-Bandwidth Indicator](#) .

Note that when conferencing is enabled, you can assemble a conference by establishing connections to other stations yourself, or by waiting for them to connect to you. An interesting feature in Sysop mode is the ability to assemble a conference by entering commands into EchoLink's built-in Web server from some remote location on the Internet.

Please use discretion when assembling a conference. It is considered poor operating practice to "conference-in" a station to an existing conversation, unless you are certain the new station will welcome it.

Multi-Conferencing

Multi-conferencing is the connection of one conference to another. Previous versions of EchoLink included safeguards to prevent multi-conferencing, since there was no reliable way to detect and prevent *conference loops*, in which more than one path is established between conferencees.

Multi-conferencing is disabled by default. To enable it, check the **Allow multi-conferencing** box on the Connections tab of the Preferences window.

When multi-conferencing is *enabled*, the software will allow you to host a conference consisting of any type of station, including conferences and conference servers.

When multi-conferencing is *disabled*, EchoLink enforces the following rules:

1. If a station is already connected, EchoLink will not connect to a conference server.

2. If a station is already connected, EchoLink will not connect to an EchoLink station to which a station is already connected.

3. If already connected to a conference server, no additional stations may connect.

4. If EchoLink is already connected to an EchoLink conference, no additional stations may connect.

Repeater Linking Tips

One of EchoLink's strengths is its ability to link any number of repeaters to each other, or to simplex stations. Here are some tips for setting up and configuring EchoLink to be used as a link to a local repeater.

Remote or Hard-Wired?

There are two ways a repeater can be connected to EchoLink.

With the "hard-wired" approach, the PC on which EchoLink runs is co-located with the repeater controller, and interfaced directly to it, with no additional RF hardware. This allows positive carrier and PTT control between the repeater controller and EchoLink, and eliminates extra "hops" in the audio chain. It also eliminates the need to ID a link transmitter. One disadvantage of this technique, however, is that it requires reliable Internet access at the repeater site, which may be in a remote location.

With the "remote-link" approach, an FM transceiver is connected to the EchoLink PC at a convenient location in range of the repeater, and tuned to the frequency pair of the repeater. In this configuration, the transceiver behaves very much like an ordinary local repeater user, transmitting on the repeater's input frequency (on behalf of EchoLink users) and receiving on the repeater's output frequency. Although this allows the EchoLink equipment to be placed in a more convenient location, it presents some challenges with respect to RX control.

With either approach, EchoLink should be configured with a callsign with a -R suffix, to indicate that the node is a gateway to a repeater, rather than a simplex frequency. If a remote link is being used, the software should be configured to identify itself on the air with the host station's callsign, which is not necessarily the same as the EchoLink callsign (or the callsign of the repeater). Since the link itself is not a repeater, a suffix such as /R in the ID is usually not appropriate (for U.S. stations).

Carrier Detect

One of the most important considerations for an EchoLink repeater node is the method of detecting the presence of a local RF signal. Although the best approach is usually to wire a COS signal into the COM port of the PC, it is often necessary (or desirable) to use VOX instead. Several techniques are described below.

COS from Repeater Receiver: If the node is hard-wired to the repeater controller, the best source of carrier detect is the COS output from the repeater receiver itself -- or an equivalent signal from the repeater controller. This ensures that EchoLink transmits to the Internet only when a signal is being received on the input. Also, the audio connection to the sound card should come from the receiver's audio output, rather than the repeater transmitter's audio path.

COS from Link Transceiver: If the node is remotely located, it may be desirable to use the COS signal from the link transceiver -- but only if the repeater's "tail" is extremely short. Otherwise, EchoLink will keep transmitting to the Internet 5 to 10 seconds after the local user finishes a transmission, severely interrupting the flow of a QSO. Some repeater-node operators have successfully incorporated DTMF tones in their custom Connect and Disconnect announcements to automatically shorten the repeater's "tail" while an EchoLink station is connected, on repeaters which support this type of remote command.

VOX: If the node is remotely located, but the repeater's "tail" cannot be shortened, VOX can be used. When properly adjusted, EchoLink will detect voice signals coming through the repeater, but ignore other incidentals such as the "tail", the courtesy tone, and the squelch crash at the end. This is very important when two repeaters are linked to each other,

to prevent endless ping-ponging of one repeater bringing up the other. Here are some tips for adjusting the VOX for use with a repeater:

1. Set the **VOX threshold** carefully. (This is the horizontal slider below the audio-level indicator.) The VOX threshold should be set just above the audio level of the repeater's dead carrier, so that it "trips" on voices, but not on the repeater's tail. Watch the purple SIG annunciator while adjusting the VOX threshold.

2. If necessary, adjust the **VOX delay**. The default value of 1200 ms is appropriate in most situations. (If you decide to change the value, type it in directly, rather than using the up-down buttons.)

3. Use the **"Smart VOX"** feature. This is enabled by checking the "Squelch Crash Anti-Trip" box on the RX Ctrl tab. When this feature is enabled, EchoLink's VOX will ignore short noise bursts, such as the repeater's courtesy tone and the squelch crash when the repeater's carrier drops. Set the time constant to a value slightly higher than the longer of these two signals. Typical settings are 250 ms for a repeater with a (short) courtesy tone, or 80 ms for a repeater with no courtesy tone. Note that the Smart VOX feature does not necessarily suppress these signals in the audio path, it merely prevents them from triggering (or holding open) the VOX.

4. **Anti-Thump:** Use the Anti-Thump feature if the squelch crash, as heard over the repeater when your transceiver stops transmitting, seems to be triggering the VOX. Start with a low value and move

it gradually higher until the SIG indicator no longer appears when your link stops transmitting.

When the VOX is properly adjusted, the "acid test" is to connect the link to the *ECHOTEST* conference server. After hearing the initial welcome message from the test server, the repeater should drop normally and then remain idle. If the repeater continues to be keyed up by responses from the test server, re-check the above settings.

When the settings are correct at both ends of a repeater-to-repeater link, both repeaters should remain idle except during an actual QSO, or while either repeater sends its ID.

CTCSS Control: If the node is remotely located, this may be the best technique of all -- but it requires cooperation from the repeater. In this set-up, the repeater transmits a CTCSS (a.k.a. PL) tone only while its receiver's COS is active; that is, only while a station is transmitting. The EchoLink transceiver is configured to open up only when this tone is received. The advantage of this system is that EchoLink triggers only on a true signal, and ignores incidentals such as courtesy tones and CW IDs. The disadvantage is that most PL-guarded repeaters transmit a continuous tone, even when no signal is present on the input, so it may require configuration changes to the repeater itself. (Note that this technique can be used whether or a not a PL is required to activate the repeater.)

Low-Bandwidth Indicator

EchoLink includes a feature that displays a warning indicator whenever the available Internet bandwidth is not sufficient to handle the rate of data being sent by EchoLink. Typically, this can occur when Conferencing is enabled, and the Internet connection does not have enough capacity to support the number of conferencees who are connected. This can easily occur over a dial-up connection if two or more stations have joined the conference. (For this reason, enabling Conferencing is not recommended for EchoLink stations on a dial-up connection.)

Remember that for each station joining a conference, the station hosting the conference needs an additional 17 kbps of upstream Internet bandwidth. If two stations have joined the conference, each transmission from the host station must be sent to both conferencees, requiring a minimum of 34 kbps.

This is rarely a problem with any modern Internet connection, which typically supports a minimum of 128 kbps upstream, and quite often many times that amount.

A "low bandwidth indicator" will appear in the bottom right-hand corner of the screen when insufficient Internet bandwidth is available. The indicator is a yellow triangle with an exclamation mark: ⚠. When this happens, the program will continue to work normally, but stations at the other end will probably hear drop-outs or gaps in the audio. The indicator will disappear once sufficient bandwidth is restored.

Programming Interface

Advanced EchoLink users who are familiar with programming

may be interested in EchoLink's Programming Interface, which allows external programs to interact with EchoLink to implement additional features. For example, scripts or Visual Basic programs can be written to send commands to EchoLink, and to react to significant events, such as stations connecting or DTMF commands received.

The Programming Interface is built in to the EchoLink program file, and is implemented as a COM Automation server. Complete documentation is available as a separate download. To download, choose the Download link on the EchoLink Web site.
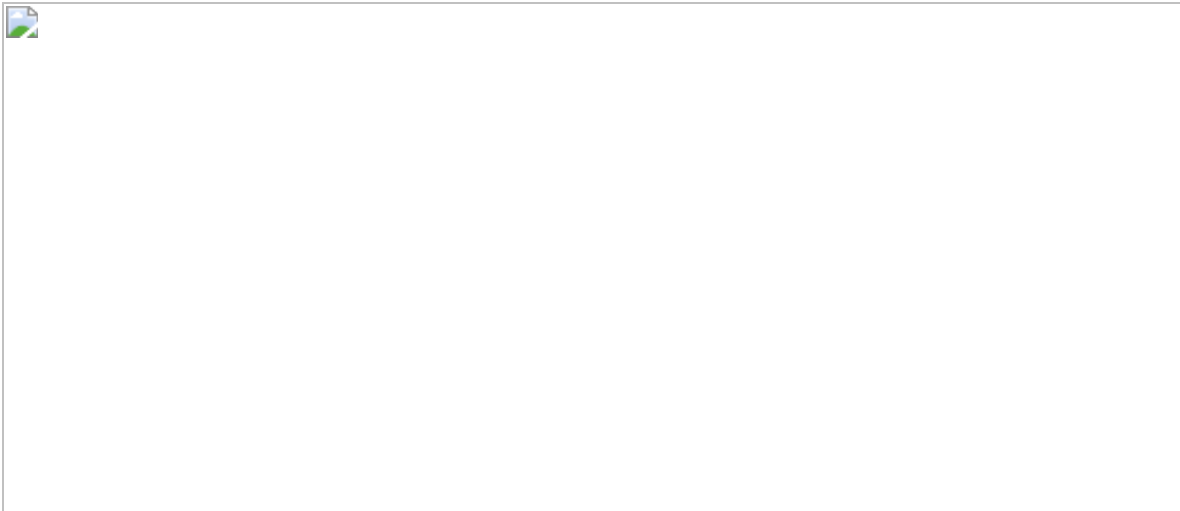
EchoLink Proxy

Background

EchoLink is a peer-to-peer system, by design. This means that when your node is connected to another node over the Internet, the voice and text signals are sent directly from one node to the other, rather than going through some central server. This helps ensure that the system is scalable and reliable.

Unfortunately, there are certain situations in which peer-to-peer connections such as these are difficult to establish. A growing number of Internet providers are offering "one-way" access to the Internet — allowing your computer to initiate a connection, but not to accept one. These include *wireless community networks*, or *hotspots* . An example is the wireless Internet service now being provided by many hotels to their guests. Guests with wireless-enabled laptop computers can check their e-mail and surf the Web from their rooms. The hotel uses a router with a fast Internet connection and a single public address (or a small pool of addresses) shared amongst all guests. This arrangement does not work with EchoLink, because the guests' computers are not reachable from the Internet.

A Solution

A solution to this problem is to split the EchoLink software into two pieces — one that runs on your laptop, and the other that runs on a PC in some other location with good Internet access. With this arrangement, the laptop need only establish a single, outbound Internet connection to the PC. Then, the EchoLink software on the laptop "tunnels" all traffic through this connection to the remote PC, and the PC in turn establishes all of the necessary peer-to-peer connections to other EchoLink nodes. In this scenario, the PC is acting as a proxy on behalf of the laptop.

EchoLink now offers special software to make this possible. The proxy software, which is designed specifically for use with EchoLink, is called EchoLink Proxy. The diagram below illustrates how EchoLink Proxy can be used.

Is EchoLink Proxy For You?

Consider setting up EchoLink Proxy *only* if *both* of the following are true:

1. You have a fast, true, dedicated Internet connection at your home or office, or at some other place to which you have access to a PC, and

2. You have "one-way" Internet service at some other location, or you often travel to such a place, such as an airport lounge or hotel room.

Note that EchoLink Proxy will *not* help if you are simply having trouble connecting to other stations from your home PC. In fact, you must first ensure that EchoLink works correctly on the machine on which the proxy will be installed.

Also, note that a given EchoLink Proxy can be used by only one EchoLink client machine at a time, since each logged-in EchoLink node (or its proxy) must still have a unique public IP address. You can run more than one instance of EchoLink Proxy on a PC only if the PC has multiple public Internet addresses, which is uncommon.

More Information

For more information about EchoLink Proxy, including installation, set-up, and frequently-asked questions (FAQs), please see the [EchoLink Web site](#).

Firewall and Router Issues

Background

A *firewall* is a system that isolates your computer from the Internet, usually for security reasons. A firewall helps prevent unauthorized access to your computer from other people on the Internet. A firewall can be implemented using software on your computer (such as Windows Firewall), or with an outboard hardware device such as a router.

A *router* (as used in the home) is a device which allows more than one computer to communicate over a single connection, such as a connection to the Internet. Routers have become more common in homes as home networks and high-speed connections, such as cable or DSL, have become more popular. Typically, cable companies and DSL service providers allocate only one Internet address to an entire household, in which there may be several computers. The router must decide which computer should receive each packet of data which comes in from the Internet.

Do I Have a Router or Firewall?

If you have *broadband* Internet service, such as with a cable modem or DSL modem, there's a good chance that there is a router somewhere in your system. Even if you didn't purchase and install your own router, many cable modems and DSL modems now come with built-in routers. The equipment that your cable company or telephone company provided might fall into this category.

Using Firewalls and Routers with EchoLink

Firewalls are usually configured to allow your computer to make requests anywhere on the Internet, and receive replies. Some programs, however, must be able to accept unsolicited data from the Internet. EchoLink is an example of such a program. When you are connected to another station using EchoLink, you and the other station take turns sending data to each other, so each station's PC must be able to receive data without having requested it.

The protocol for this type of exchange is called UDP, or User Datagram Protocol. If you are using a firewall or router to connect to the Internet, you will probably need to configure it to accept UDP information on specific *ports*. (A port is part of an address.)

EchoLink uses UDP ports 5198 and 5199. To use EchoLink, you must configure your router to direct all incoming data on these two ports to the PC on which EchoLink is installed. Typically, there are two ways to configure this:

- Forwarding. Most routers allow data on specific ports to be "forwarded" to specific computers. If you expect to use EchoLink on only one PC, configure your router to forward UDP ports 5198 and 5199 to that computer.

- Port triggering. Some routers implement a smart forwarding scheme which tries to direct data to the computer which is most likely to use it, based on requests each computer has recently made. If you expect to use EchoLink on any of several different computers at different times, you may wish to try this option. Configure the router to direct ports 5198 and 5199 to any computer which makes outbound requests over TCP port 5200.

EchoLink also uses TCP port 5200. Most routers will handle these requests correctly, since EchoLink always initiates them from the local computer. If you are using firewall software, however, you may need to "open up" outbound connections to this port. (EchoLink does not use TCP for incoming connections.)

How Do I Adjust My Router?

Routers and firewalls are manufactured by many different companies, and each has its own peculiar set of instructions for configuration. Some newer DSL modems have routing or firewalling features built in. For details on how to configure your router or firewall, consult the documentation that came with your device, or the company's Web site. Another excellent resource is the portforward.com Web site, which is a collection of instructions for adjusting specific makes and models of routers and modems. Locate your make and model of equipment on the list provided. (This site is *not* affiliated in any way with EchoLink, and while the information on the site can be very useful, we are not necessarily recommending the software for sale there.)

For more information, please see the Firewall Solutions page on the EchoLink Web site.

Sound Card Adjustment

Modern PCs are usually equipped with a "sound card", which allows sounds to be captured and reproduced by the computer. EchoLink relies on the sound card (or built-in equivalent) to exchange audio with other stations on the Internet.

The most common configuration for EchoLink is to connect a pair of amplified speakers to your computer's "speaker out" connector, and to plug a microphone into the "mic in" jack. Many other multimedia programs work with this same configuration.

Playback Volume

On Windows, Playback Volume is adjusted in two different places:

- **Mixer:** Right-click the speaker icon in the bottom-right corner and choose "Open Volume Mixer". This will display a row of volume sliders. You can adjust the master slider on the left, or the EchoLink slider. The master slider affects playback from all programs on the computer, and the EchoLink slider affects only EchoLink's playback volume.

- **Control Panel:** Right-click the speaker icon in the bottom-right corner and choose "Playback Devices". This opens the Playback tab on the Sound control panel. This will display a row of volume sliders. You can adjust the Wave or Master Volume levels, which affect all applications.

Recording Volume

On Windows, Recording levels are adjusted on the Recording tab of the Sound control panel. To open this panel, right-click the speaker icon in the lower-right corner, and choose "Recording Devices".

The Recording tab shows a list of sound input devices. If you have a device with more than one jack (for example, Microphone and Line In), each jack might be listed separately. The one with the green check mark is the default device. To adjust the recording levels, right-click the name of the device and choose Properties, then choose the Levels tab. If the device has adjustable levels, one or more sliders will be shown.

If you want to use a different device (or jack) for EchoLink, you can change the default device here, or go to EchoLink's own Setup page, choose the Audio tab, and choose a specific device from the list of Input devices there.

Monitoring Your Levels

While you are speaking with another station using EchoLink, watch the Audio Level Meter near the bottom of the screen as you speak. The meter should jump at least into the yellow area on voice peaks, but should not go full-scale. Adjust the Microphone slider (described above), if necessary.

Support and Troubleshooting

EchoLink is offered free of charge to the Amateur Radio community, and is supported by a network of volunteers.

Experience has shown that the majority of questions about EchoLink are similar, and can be answered by reading the Help documentation or one of the Frequently-Asked Questions sections. Most likely, you'll find that your particular question or problem has already been answered or addressed.

For a complete set of FAQs and other support information, please visit the EchoLink Web site:

http://www.echolink.org/support.htm

Technical Credits

Efforts by the following people and organizations are gratefully acknowledged:

- Graeme Barnes, M0CSH, the developer of iLINK.

- Audio compression functions developed by Jutta Degener and Carsten Bormann, Technische Universitaet Berlin.

- Grid control developed by Chris Maunder and Joe Willcoxson.

- DSP functions provided by Intel.

- Support for iconic pull-down menus provided by Brent Corkum.

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