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## Work the world with EchoLink !

### Introduction (I)

Developed in early 2002 by Jonathan Taylor, K1RFD, [Echolink](#) has spread rapidly among the ham community and is today used by over 170,000 radio amateurs in 158 countries, with a fast growing that reaches 30% yearly ! How can we explain such a success so rapidly ?

We have first to understand how works this application. Instead of using ionospheric layers to establish so-called long-distance communications, K1RFD suggested to amateurs to use the VoIP protocol, thus Internet in combination with RF linking and specially with V/UHF FM transceivers to work amateur stations.

In this way he has said, even users limited to V/UHF bands and having difficulties to work DX stations can use Internet to have conversations with amateurs located all over the world, at distances exceeding by far the performance of their FM transceiver. Indeed with time running it has appeared that this "web-assistance" has proven to be very useful and very performing.



### Access and settings

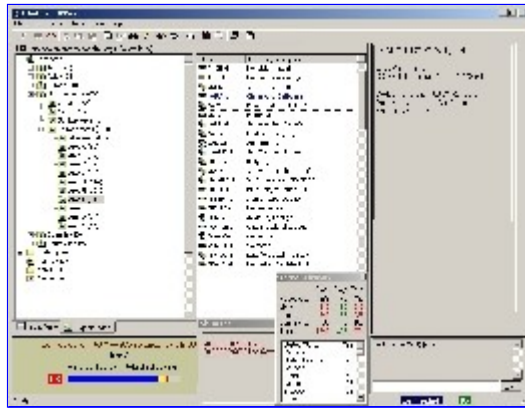
Basically, EchoLink uses two different modes or clients : **Single User** and **Sysop**. Single user does not use at all the radio while Sysop uses radio in two different ways, via repeaters or links (sometimes incorrectly referred to "Simplex Repeaters").

In **Single user** mode the ham is directly connected to the Internet through his computer using a low speed modem (as low as 36K), a fast DSL or a cablemodem (via the TV cabling system) connection.

In **Sysop** mode there are two possibilities :

- The **Simplex linking** : the ham uses a V/UHF handheld or mobile transceiver tuned to a simplex frequency. So, in this case the ham can be remote and emits by shortwaves to his base station. The linking can also be made using a wifi connection. The base station has a VOX interface linked to a computer that process signals digitally before to send them over the Internet. This method is very flexible. The amateur has to stay at distance of contact of his station but not necessary in his shack. He can work from his living room or his backyard as far in fact as the signal emitted by his handheld can be captured by the base station. In wifi, the distance can reach several hundred of meters.
- The **Repeater linking** : the transceiver is tuned to the frequency pair of a local repeater (or connected to it directly). Of course, by design, here also the ham works essentially remotely. Recall that in this mode, the amateur works with a fixed, portable or mobile VHF or UHF FM transceiver and emits to a FM repeater located a few dozen kilometers away. In very specific working conditions he could reach repeaters located over 100 km away.

A Sysop using simplex links receives a call sign with a -L suffix (e.g. ON4SKY-L), and he receives a -R suffix if he uses a repeater linking. This distinction is helpful to stations connecting to your link, since operating practices differ somewhat between repeaters and simplex frequencies, and it is useful to know, before



EchoLink Explorer View during a RF link via a UHF repeater. While I am linked in simplex to my PC, another OM is connected through his UHF transceiver to the relay located near Palomar observatory. For me it's a chat a bit special, for him it's a true ham radio communication !

connecting, which type of link is being provided.

NB. Many people have missed the fact that a -R station is used anytime you connect to a repeater pair while -L is only used for simplex frequency. This is true if using a direct wired connection or a RF linked connection to the repeater.

Who can use EchoLink ? All licensed hams - but only them - can use EchoLink, even if you are limited to V/UHF or novice (only valid in Europe). Don't care if you do not have a good antenna or if you only own a low power VHF or UHF transceiver.

Don't care no more if you don't own any ham equipment at all due to space limitations or financial reasons. Even if you are temporary abroad but if you can find an Internet connection in a cyber café or to friends using a portable computer with a modem connection, you own all necessary equipment to work with EchoLink !

If you want to work so-called "DX stations" or ragchewing in "local QSO", then there is no problem ! Surprised ? You can !

## Validation and activation

EchoLink is a freeware running under [Windows 98/2000/XP](#), [Linux](#) or [MacOS](#) that you can download from the Internet. This is a 1.5 MB file that you must install on your PC following the wizard instructions. The application is configured in a few seconds.

The only two conditions to meet are next : you must own a valid ham license (be listed in the callbook or licensed this year) and provide a valid email to EchoLink support team. These two data will be used to validate your access on the system as without them curious and hackers will be already stopped at the portal.

The validation request can be done by fax or letter or sending a copy of your ham certificate (FCC, HAREC or equivalent) by email to the support team. Once your call sign is validated you will receive a node number to assign to your computer and a password to activate your connection to the EchoLink server. Store preciously these information.

The validation delay can last between 1 hour and more than one day. In the worse case the validation is so long because the document you have sent does not proof that you are a licensed amateur.

Once the application set up and your call validated, the program will fetch data and will display a kind of Explorer listing users and repeaters currently online as shown above.

### Don't have you forgotten something ?

To use EchoLink you need either a V/UHF RTX or a PC equipped with a sound card and Internet but also a microphone and two speakers or an headset to work simplex... You can buy these last to the nearest computer shop or department store.



The soundcard being already installed in the computer, add to your installation an **electret microphone**, the only model providing high-fidelity signals (e.g. the Creative Labs SD-50 model). Select also a headset or **speakers** including a volume control and

providing a quality sound (e.g. Creative Labs [SBS250](#) speakers or a higher model including a bass), Rekcon about 20 € for each of these components. Bargain to work the world !... Note that if you experiment trouble, EchoLink provides online support including an \*ECHOTEST\* conference server to test your audio.

At last, if you are addict to EchoLink or if you are regularly in conversation with friends, it should be a good idea to buy a small **webcam** (e.g. Logitech 4000 Pro coming with a mic and various functions like a zoom and a head tracking). Rekcon about 80 €. Connect it simply to your USB port and use it with MSN or Yahoo Messenger to get simultaneously a real-time image of your correspondent. In this way you can be in video conferencing with at least four other amateurs located anywhere in the world !

NB. As soon as you establish an Internet connection, be aware to the computing security. Internet is not secure. You can be attacked by viruses and you must prevent your computer to spread viruses on the web as well. To be quiet and reinsured about the reliability of your system, install a complete **anti-virus** solution, e.g. [McAfee](#), [Symantec](#) (Norton) or [Kaspersky](#) anti-virus. It is not a suggestion but a warm recommendation, a must if you want to protect your system ! Know that an idle computer, without application running but connected to the Internet can be under attack in less than 5 minutes... Most viruses and even ActiveX applets will not tell you that they are coming... but they will infect discreetly your executables, mailbox, dll and the registry, preventing you to work. So to avoid any problem install an anti-virus now !

Good luck and have fun !

#### Note

If you see well users and your call sign in your national container but cannot establish any connection, verify if your modem or router is not faulty. Check also your firewall settings reading the documentation provided on Echoling FAQ page. In last resort, switch off all devices, then reboot your system and run EchoLink alone without loading any other application (neither your email system or Internet). You can also check your drivers in booting in "safe mode with networking" (pressing F8 at boot on Windows). Load your other applications once EchoLink is running.

If your configuration works properly, now browsing containers and users you can contact everybody if you like, even hams located on the other side of the Earth on the clic of the mouse ! This, without QRM, without be disturbed by the propagation or near stations arriving 59+ 0.5 kHz up or down. All stations arrive "59+" as if they worked you in the adjacent room ! I do not exaggerate.

### **See all stations currently connected to EchoLink !**

#### **Users, repeaters and live conferences**

The demo at which I participated could not be more convincing, and was a complete success that totally convinced me of the utility and the power of this new tool, a feeling that I repeated to my correspondant who was very happy of my reaction.

Let's imagine...

### **Working DX in prime time !**

Imagine a friend using EchoLink for long times ready to make you please in preparing a demonstration of the capabilities of this product.

Sitting in front of his XP computer Guenter had installed an independent electret microphone and two large external speakers for a few tens of euros. Launching EchoLink, a window opened displaying an Explorer à la "User Manager" showing standby/connected users and relays. At my request Guenter selected one user listed in the "Europe", "Monaco", container with the hope to find a French speaking ham. At that time of the demo

the folder contained no amateurs online but an active VHF repeater, 3A2MZ-L. Click space bar to emit (similar to the Push-To-Talk button) and a TX appeared in red at the bottom of the screen followed by the word "Connected" written in blue and bold. He was on the air... I didn't really believe him yet...

Guenter spoke as usual at good distance of his mic : *"CQ DX, this is LX2MG calling in the company of LX3SKY. Do you hear me ?"*. Some seconds of expectations...

Then as surprised as we could be we got a prompt answer, very loud and clear - what surprised me first - in our speakers connected to Guenter's computer : *"Hi OM, this is JS1....from Chiba, Japan. Hello. Do you speak French, parlez-vous français ?"*.

Imagine my surprise, as was Guenter to hear a Japanese speaking French ! In the morning I have tried to hear VK and JA stations on the 20, 15 and 10m using my magnetic loop. I was quasi impossible to get out a JA station due to QRM and bad propagation conditions.. So the comparison was easy to do and I realized with some seconds of delay how powerful was this tool... Is this really a JA station, an OM calling from Japan that answered us by voice via Internet through a relay in 3A ? I didn't believe what I heard... But I knew very well computer performances, packet radio and other chat via Internet, and thus the idea was quickly accepted as possible, HI !

Whaow ! What a demonstration !... The QSO or rather the conversation continued so for about 15 minutes or more. At last we entered the call sign of our friend Ryu in the Alert log in order that his call sign be highlighted and bip the next time that it will reappear on screen.

For short, without necessary using ham radio equipment but using only a microphone and a speaker connected to a PC or better, using V/UHF relays connected to the Internet you can enter in contact with DX stations in a couple of seconds, loud and clear at all moment ! At the time of the QSO there were about 1500 licensed hams connected to EchoLink, unbelievable ! Today there are 30% more.

### Listen to EchoLink



EchoLink emergency QSO worked by KI4BTD (FL) on the K40BX-R VHF relay (VA) on Sep 17, 2003 14:37 UTC (.wav file of 664 KB). Published with permission.



Welcome message on NH6XO-R relay located at Honolulu, Hawaii on Sep 17, 2003 at 14:48 UTC (.wav file of 64 KB)

Time running, each time I use EchoLink I am impressed again by its ease of use - ever on portable via Wifi -, the readability of signal, and its ability to be turned off and on to any repeater set up for this purpose. I can't no more go without this tool.

But don't be mistaken about my interests. I miss the bands noise, the weak signal but well readable coming from far DX stations, people calling CQ, pile-ups hubbub, without to forget the omnipresent QRM and QRN, as much characteristics that sign ham activities.. EchoLink has not simulated all these "features" and we can no more feel these very special sensations.

### Single-user and sysop modes

In the "single-user" mode, in which you are directly connected to the Internet, there is no need to invest 4000 € in an high-end RTX and a 7 bander Titanex beam placed 20m high to work DX stations. Amateurs are online, some through their computer others through their 2m/70cm portable (or even 6m in UK). You can even make conferences with amateurs in

VK and JA simultaneously or create a true conference server on your PC in installing a small software called "theBridge".

During all conversations if you use a high speed connection (DSL or cable modem) you can in parallel browse a website or send to your contact a picture without QRM (not as can be SSTV, HI!) or any other document by email as his coordinate are listed in a small window opened in the program with other useful data.

Echolink is complete enough to support a direct connection to your V/UHF transceiver and relay the information over the Internet and vice versa. Let's see now how to configure a RF link (-L node) and a repeater (-R node) under Echolink

### **Can I work with two call signs or two PCs ?**

You can install and configure EchoLink on two different PCs with the same call sign, but be sure not to run them both at the same time.

If the two PCs are configured with different call signs, you can run EchoLink on them at the same time, but only if the two PCs use different "public" Internet addresses. The two cannot be run simultaneously if they are sharing the same external address, as is commonly the case with a home network.

You can run only one instance of EchoLink on a given PC. However, you can easily switch EchoLink between any of several call signs that you hold, as long as each call has been validated. An easy way to do this is with the Profiles feature.

Each call sign must have a different node number. As far as EchoLink is concerned, ON4SKY and LX3SKY or LX3SKY-L are different call signs. When a call sign is validated, a node number is assigned to it. The node number does not change unless you request a change. One of the changes you can request is to "swap" the node number between two call signs that you hold, for example, LX3SKY and ON4SKY. Easy, isn't it !

**Next chapter**

**Install your own node**

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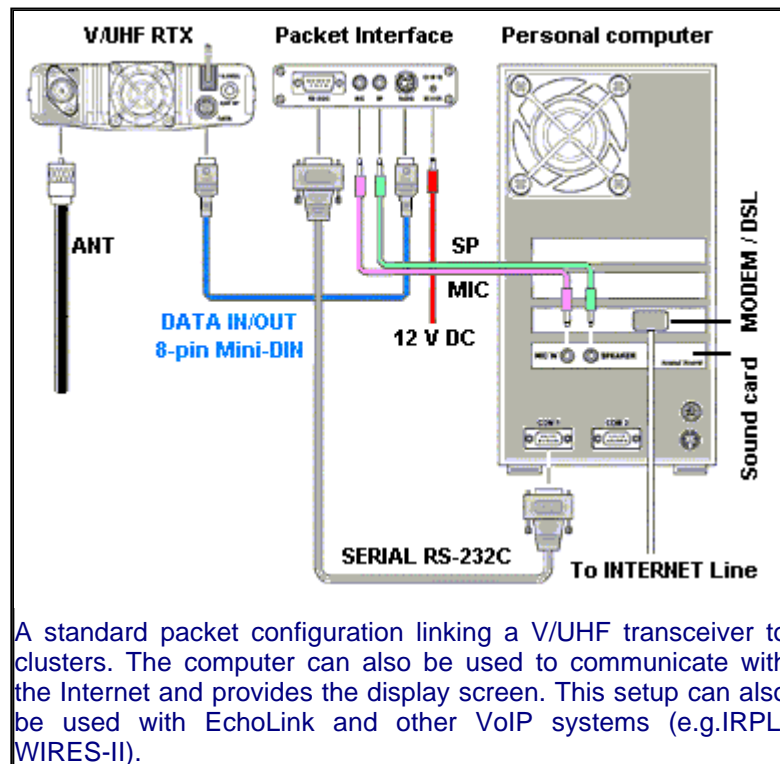
Dites-le à un ami

## Work the world with Echolink !

### Install your own node (II)

If you like to work Echolink with a transceiver and your favorite antenna (simple whimp or ground plane antenna), there is no problem. You can take advantage of the "sysop" mode of operation so that you can communicate from your V/UHF transceiver with amateurs connected behind their PC or using a V/UHF transceiver as well.

You must thus own a VHF or UHF FM transceiver, the appropriate antenna system and you have to build or to buy an interface, the simplest being the VOX simplex interface to place between your transceiver and the computer connected to the Internet (see manufacturers at the end of 3d page). EchoLink supports thus portable and mobile activities too in either -L or -R linking ! In this configuration it is not different from packet radio. Then, how to proceed ?



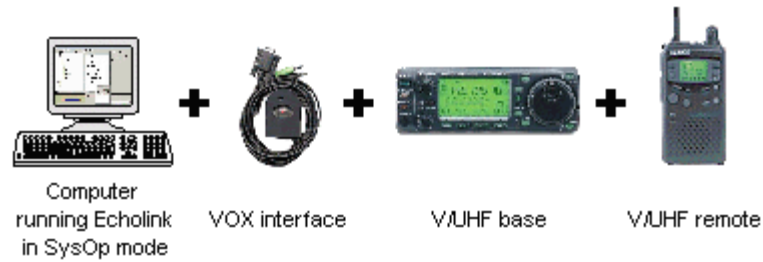
### Simplex RF Link (callsign-L)

First ask EchoLink support team the permission to create a new call sign, with a trailing -L (e.g. ON4HAM-L). In return you need to know how to drive the emitter (on what COM port), how to driver the Carrier Operated Squelch (with a VOX), etc. Then you will need either a VOX or a Rigblaster interface and the sound card of your PC to drive your node and the proper cabling system to link your computer to your base V/UHF radio station (via the serial port).

Then you need to setup Echolink in "SysOp mode", specially submenus "Tools/Setup/My Station" and "Tools/SysOp Setup" to define among other settings the Carrier Detect mode, the PTT activation, the COM port, the TCP Port and other options like the delay of response.

At last you need to check the audio level when you will transmit on the air via the submenu "Tools/Adjust Volume/Recording".

## To read : How to configure Echolink in SysOp mode, by NPARC



How EchoLink works with a VHF transceiver ? The audio which you would receive on the 2m transceiver is fed via the line, or mic input of the soundcard out to the Internet via the software control. Then audio coming back from the Internet comes out of the line out, or speaker output of the soundcard, and via the interface (Rigblaster or any other one VOX compatible like the G3VFP controller) into the mic input on the VHF transceiver. That is how EchoLink works with a simplex RF link operating on a single frequency, the famous RF link (-L).

### Repeater Linking (callsign-R)

If you want to setup a repeater, aka relay (e.g. ON4HAM-R), in order to connect several transmitters directly to a local relay or via the air, in respect to the regulation you will have to ask to your national telecom administration a special license to be allowed to drive an automatic station. Without that license you could only manage it under your direct control and responsibility. In that case you can only listen to this node. Many countries deny amateur to work in this mode.

To link your node to a relay you also need the permission of the relay responsible who will ask himself the permission to his national administration. Then you will have to decide what nodes will be allowed to connect to yours : only relays, simplex links or PC users. You can also limit incoming calls, outgoing calls or to specific prefixes (e.g. only LX stations, etc). The sysop will set up the program according to these choices. He could even define what commands are available to users.

As you see you can customize the software according to nodes and users wishes. But beware of the CPU usage when using such connections because using a repeater, EchoLink can quickly transform a sleeping relay in a hyperactive relay. If your computer uses a slow CPU and lack of memory, it can be useful to reduce its functionalities to avoid hanging or even a crash disk.

With a full duplex repeater, the receiver and transmitter are running at the same time but on different frequencies with a split of say 600 kHz on 2 m or 1.6 MHz on 70 cm, and both RF local users can use the repeater as they would normally, and also interface via a controller to EchoLink at the same time.

From a V/UHF relay or from the user connected in front of his PC, data (this is not audio) are transferred between the receiving station and transmitting station by an indirect peer to peer system. Then data go to a server which then connects the user to another user from its referral database. In other words it is IP to IP.

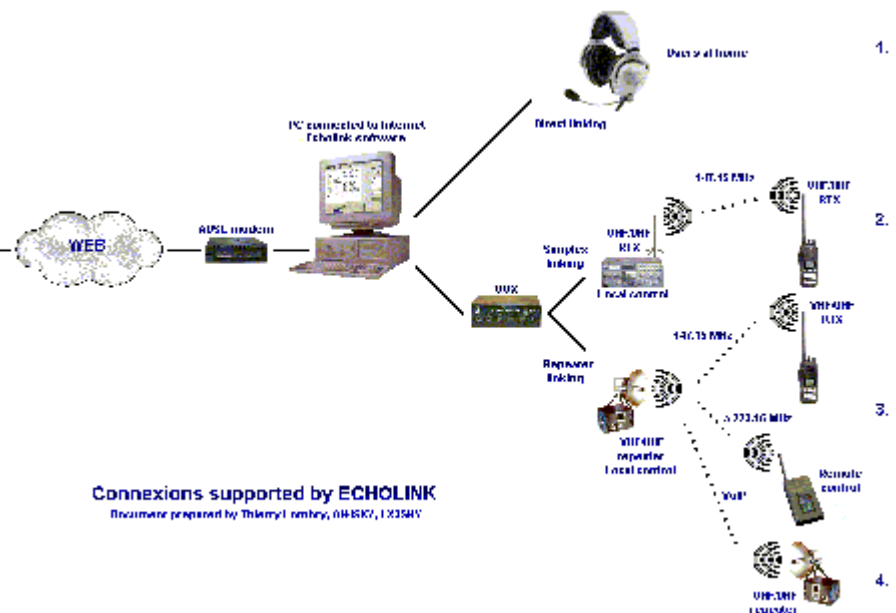
Amateur  
radio stations  
can be  
operated  
manually or by  
automatic  
systems.  
There are two  
possible  
linkings : using  
simplex (1, 2)  
or repeaters

(3, 4). The first link using a direct connection to the Internet and thus no RTX at all has nothing to do with amateur radio.

Connections 2, 3 and 4 use RF links through relays and are thus all three amateur radio activities.

The legality of these systems mainly concern the base station control, how the node's transmitter is operated. If the control operator works at the base station he can control RF links using any VHF/UHF FM transmitter or a dedicated wireline (by phone or connected to the Internet) as any other FM simplex operation.

If the control operator uses a remote station, e.g. an handheld transmitter, he must execute commands (e.g. switch on/off of the node's transmitter) using an auxiliary station working on frequencies from 223.15 MHz and above (and outside CW, SSB and satellite bands on 70 cm). This regulation is applied in most countries from the U.S.A to Germany or Australia, excepted in France, Belgium and some other countries that refuse to interconnect private and public networks for so called security reasons. These few countries have however to recognize that these stations are properly operated (monitored, managed and proactively secured), whatever their feeding mode. In Belgium only repeaters and users can be linked to Echolink. Click on the drawing to enlarge it.



The success of EchoLink is found in its simplicity. If you want to use your favorite portable or handheld transceiver, EchoLink does not require dedicated hardware to drive it. All timing functions and DTMF decoding are managed by the software without additional hardware. Check if your computer includes well a sound card, and plug your microphone and headphone or speaker (free-hand or external models) in the dedicated jacks of this interface. Only the sysop mode of EchoLink requests a VOX interface between the computer and your base VHF/UHF transceiver. This is simple and efficient.

### Others VoIP-assisted software

EchoLink has some challengers, among them [I-link](#) from [M0CSH](#) which activity has



much decreased since the rising of EchoLink. To work a RF link I-link requests a dedicated hardware supporting digital modes (e.g. ULI or Rigblaster interface).

[eQSO](#) from M0ZPD uses dedicated servers, separated from EchoLink. It can be accessed from Internet or using radio linkings. Access are not validated by your call sign but administrators control your access type according to your license privileges (hams or SWL). The system offers therefore on-line and off-line "chat room". eQSO is however less secure than EchoLink.

At last [IRLP](#) (created by VE7LTD) and [WIRES-II](#) (created by Yaesu/Vertex Standard) are true VoIP system based on radio linkings. You cannot use IRLP without radio and you cannot access WIRES-II nodes directly from Internet.

IRLP is a Linux-based system created by a group of dedicated Canadian amateurs to provide a linking system which is fully compliant with the radio regulations of Canada as well as Great Britain and Australia. The IRLP system is currently growing at about 50 new gateways per month and exceeded 1000 nodes worldwide on January 2003.

Working on fixed, portable or mobile station, once you reached a node repeater to make a call IRLP and WIRES-II request that the user enters an access code. Usually it is a DTMF code in several digits, sometimes completed with CTCSS subaudibles tones. This way managers can fully control access without be harrassed by hackers, and other unsolicited users. These two VoIP-oriented systems are thus more secure against pirates access than EchoLink but their usage is not so simple.

Plus side, EchoLink allows also the sysop to block or accept some DTMF commands, to deny or allow connections from individuals, as well as to allow some nodes. These features are not available with IRPL and WIRES-II. So globally it appears that EchoLink in best suited to manage relays and individual nodes.

### **W4MQ, an alternative : Operate a remote RTX**

#### **Security aspects**

Nowadays the security over the Internet is of the uttermost importance as there is no policeman on the web to regulate communications and their contain. So some stricts access rules have to be implemented in all software interconnecting people or systems. We have discussed about some activation "keys" like the mandatory user's call sign that must be validated or better, DTMF and CTCSS codes that offer an excellent protection. Some are software others hardware.

#### **How to use DTMF codes ?**

All EchoLink nodes working on V/UHF repeaters can be accessed from a 2m transceiver tuned to the repeater frequency. In this mode you do not need of any PC or Internet but only a V/UHF transceiver equipped with a DTMF generator, an option that is today practically built-in in all portables RTX. For the others, you can buy a microphone equipped with DTMF functions or even use a manual DTMF dialer that you will maintain in front of your microphone when you will enter keys. At last, if you want to answer to incoming calls only or participating in the current QSO, you even to do not need of a DTMF.

Let's take the example of ON0OST-R, a 70 cm repeater located on the belgian seacoast, which node code is 82010. It is accessible on 430.100 MHz. The same procedure applies to links too (e.g. K0RGR-L, code 19475).

Here are the commands that the EchoLink gateway usually responds to :

<b>DTMF Code</b>	<b>Function performed</b>
nnnnn	Connect to station index number nnnnn
00	Connect to random station
01	Connect to random repeater station
02	Connect to random conference server
03	Connect to random PC user
04	Status
05	Query by call

06	Query by node
A5	Reconnect link to previous station
A73	Shut down link
A88	Bring link up
#	Disconnect
*	Play station information

To establish an EchoLink connection, perform the following steps :

- Open the relay configured for EchoLink RF links sending a carrier (tone) during about 1 second.
- Identify your station on the relay. Optionally, you can determine if the EchoLink gateway is operational by keying a "\*" (star) DTMF tone. The synthetised voice of the gateway node will respond with status information. You can also send a DTMF code 08 to listen if the node is already linked to others.
- Using DTMF tones from your transceiver, key the four or five digit station code for the station or repeater that you wish to link to. In our example enter the code 82010.
- After a few seconds delay, the EchoLink node will respond with a "Connected" message if the link was successful. If the link is broken, key a "#" to disconnect the gateway node.
- Following a successful connection, announce your presence on the linked repeater by calling CQ as usual.
- During a QSO using linked repeaters, let the repeater frequency tail completely drop before transmitting to avoid any timeout problems.
- At the end of the QSO, disconnect the link by keying a "#" DTMF tone. The EchoLink gateway will respond with confirmation that the link has been disconnected.

However the registration of your call sign is not a secure method whatever say EchoLink support team. Anyone could get registered under a false or Silent Key call sign... Even during the validation process, the simple scanning of your HAREC certificate can be digitally copied too. Of course if you discover an usurper on EchoLink you can always close your access ("busy" button), disconnect your connection or better, inform the support team that a specific node is pirate. But you do not solve the problem this way as it will never be a proactive action.

In fact if a pirate wants to access a system, no barrier can stop him, neither the protocol (TCP/IP, SMTP) or the operating system (Windows, Linux) or any regulation. By nature any system offers at one level or another lacks in security that can become as much access points to hackers to the kernel and thus to all the environment under control. CIA and many big institutions know the problem very well but they continue to be the pray of hundreds hackers each month and they cannot avoid them to penetrate their system, excepted in isolating physically their network from the public access node. Unfortunately, Internet is a public network that will be for ever "under attack" by dishonest people.

The problem comes from the fact that there are so many hacking and intrusion software on the Internet that a good programmer or an IT administrator who want to test his knowledges can penetrate any protection using back-doors and other ActiveX. The situation is still worst in the Linux world because most administrators are often programmers and know the Linux kernel by hearth, and therefore its weakness too.

At last implementing hardware or software security features is not enough to protect a system against malevolent actions. About 30% of the protection can be installed at hardware or software level and perform very well in authenticating or denying users's access. But 70% of the protection concern the users's awareness to security issues.

### **Awareness to IT security and ham spirit**

As licensed ham validated to EchoLink or any other communication system using VoIP let's image that you give access to the network to your unlicensed friend. In this case you

become the weakest link of the system. If you leave your friend alone in the shack, who knows if he or she will not install a virus or special cookies in your system to serve dishonest interests. Even if (s)he is not doing this voluntarily, the disk that (s)he used or the file that (s)he just downloaded contains maybe a virus...

Therefore if you manage an EchoLink repeater or a server, you have to be aware about security issues, to the various kinds of malevolent acts and intrusions methods that a hacker can execute on local or remote systems with powerful tools that keep on a single diskette. As local administrator of your system, this becomes of your concern and not the fact of EchoLink or your national regulation. In this case you become the control operator and it is up to you to manage your node as will do a honest administrator respecting the ham regulation.

Not all hams want to play this role, some reminding that they practice a hobby and don't care about these issues and thus they are not willing to play the policeman. But in respect to the ham spirit these hams should understand that if their system is infected or get a "denial of service" due to hackers present on the system, this is all their marvelous communication tool that will fail to work.

So to preserve the good health of amateur radio I warmly suggest you to act sometimes as the security officier of your favorite VoIP-assisted system as we sometimes have to regulate the traffic on bands (e.g. during pile-ups). Remember that this can be done with courtesy and diplomacy, e.g. explaining to your visitor or remote contact for what reasons these rules have been edicted and how this new mode of communications is governed in respect with the regulation for the pleasure of all the ham community.

**Last chapter**  
**Is this always amateur radio ?**

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## Work the world with Echolink !

### Is this always amateur radio ? (III)

Without wishing to initiate a controversy, a question is often asked that might anger some of us : will the "old fashion" amateur radio survive this true revolution ? Because it is ! This is much more than one more "big chat room", or another [Messenger](#) or [Skype](#) system as say some hams. Of course EchoLink and other VoIP systems do not (yet) transmit video as Messenger does. But Messenger does not connect to repeaters located in the middle of nowhere either !

Some hams resist to the idea of integrating VoIP among the modes accessible to amateurs for several reasons, some acceptable others much less. Here are some :

- Using Internet, this is no more ham radio. This assertion is only true if both hams work without RF linking and communicate only from their PC in single-user mode.
- VoIP is not ham radio as you do no more work on the air. This argument is valid for purists and some "oldtimers" who still do believe that a ham radio has to use a transceiver, an antenna and shouldn't incorporate new modes and technologies to make a QSO.

But in that case we can also answer them : do no more work in SSB neither because in the first time of ham radio all OM worked only CW with a dipole or so... So where have you to place your technical approbation ? In that case what technology or accessory do you "accept" or not to work a station ? For some radio amateurs clusters as all digital modes are already consider as "artificial" modes. And even if these new modes work with RF some hams refuse to use them... At last there are indecisive people that should accept to use EchoLink but refuse it because if it can use repeaters and VHF/UHF transceiver, it works with VoIP which is not an RF linking. Right. This is an individual opinion that we have to respect too.

Personally and like most users, I do not find many arguments con this tool, excepted these ones :

- You need to be in contact with your correspondant to hear him, excepted when you are in conference mode (one ham or a conference server is contacted by more than one user)
- If your contact has a bad upbringing he can disconnect without notice (never or very rarely practiced on the air)
- QSL are not valid for the DXCC, HI !, but you can send eQSL if you like.
- The application is limited to voice transmission, it is VOICE over IP. There is no option yet to work CW, SSTV, DATV, etc, even if some tools can solve this problem (e.g. InterAce to send images, etc).
- An option (the white hand, "List Me as Busy") allow you to close the access to a conversation that you initiated. This let the door open to all private conversations. In respect with the ham spirit and the near-public access to the EchoLink network I



Guenter, alias LX2MG, is very involved in "software" communications like Echolink or Skype. But as you see he is always addict of conventional ham radio, working on HF or V/UHF. Image published with the courtesy of Guenter Meier, pictured by T.Lombry in 2005.



consider that this option should be disabled. However there are situations where groups of users involving emergency services do not wish to be disturbed while discussing local issues. There are also clubs who wish to have a local-only net. So while most do run an "open system" there are those who do not, and EchoLink support team decided to respect their wishes.

- ...anything else ? I don't think so.

At the end Echolink is not very different from the famous [TNC](#) used by thousands amateurs since the years '80s that allows to link a computer to a VHF transceiver, base or hand-held. Today [packet radio](#) is interfaced with many services including DX Clusters, chat bridges, networking, emergency communications, satellite operations, APRS, and much more. Most amateurs also consider that these new modes of transmissions are an integral part of the "Art of radio". Then why not Echolink ? ...

In fact whether or not EchoLink is amateur radio depends on how you use it. If you are talking computer to computer, of course it is just like any chat program. But EchoLink is much more...

### Examples of RF linkings handled by EchoLink

The difference between EchoLink and Internet chat rooms is that you can talk to stations that are mobile or portable in V/UHF going through their locally linked repeater. You can also use wireless adapters. Thus you are no more limited to computer to computer connections. Beside of my Japanese contact worked via the 3A2MZ-L simplex repeater, here is another and more complex example.

You can use EchoLink to talk from your portable RF transceiver (e.g. UHF), connected to a local UHF repeater, then out over EchoLink, itself connected the local CATV company RF fiber optic line, then to a satellite link to Oceania, to another RF link, to a VHF repeater, to talk at last with a ham working mobile on his 2m portable located somewhere in Australia in the middle of nowhere ! In this special case, both amateurs radio picture that this transmission uses much more RF than "wired" lines ! In fact, technically speaking each of them does not really work DX but only to their nearest repeater.

You can complexify this link in using wireless PC connections too. Imagine that you want to use your portable computer outdoor, in your garden, but of course there is no Internet connection available outside your house. This is not a problem. There are two possibilities : [Wi-Fi](#) and Air-base. The first is a public wireless network requesting one base station using a DSL or cable modem connection linked to the Internet. This connection can be shared at no charge by several remote users (you can always share you telephone bill with them, HI!).

Air-base is more respectfully of the ham spirit. To use your portable PC running EchoLink a few hundreds meters from your home, you have to plug in the portable an USB or PCMCIA wireless adapter (e.g. D-link). This card emits a RF signal to its "Air-base" and links your remote portable to the



Several devices using the Wi-Fi technology : a real revolution is under way.



Internet.

The Air-base consists in an small external peripheral equipped with an antenna and wired to your main computer serial adapter. The signal is then handled by EchoLink.

So EchoLink is great for "on the fly" linking of/to V/UHF repeaters, wireless stations, or even "link" stations. But of course it can also be nothing more than two hams sitting at their computers talking like in a "chat room" to each other via the switched line... But even connecting directly computers, EchoLink is useful to lighten your phone bill if you are regularly in contact with ham friends abroad !

### CQ iDX Award

Working by Internet, you can get the new [CQ iDX award](#). Introduced by CQ Magazine in June 2005, you need to confirm between 25 and 100 different DX "entities" through the use of Internet-linked repeater systems or remote bases. Echolink users are welcome at the condition that at least one people in each contact is transmitting via the radio in the amateur bands (thus through -L or -R contact only and not purely Echolink QSOs between users connected to their respective computer). SWLs may qualify. Confirmation can be done by traditional QSL cards, eQSL, and emails.

### The old-fashion nostalgia

However it is sometimes difficult for some radio amateurs to grasp this new technology. They remain intimidated, timorous, and most than probably misinformed about how it really works, how to connect all that stuff, and therefore they seem to compensate for their lack of knowledge by criticizing new tools. These same folks are probably intimidated by computers too.

Those who do not accept EchoLink appear to know very little about the actual operation of EchoLink, or what it is really capable of (e.g. most resistants ignore the RF linking feature). Their arguments seem very similar to those "oldtimers" who criticized AM saying that it would never replace the spark gap, or those elders who criticized SSB saying it would never be "real ham radio" like should be CW, or at last those who criticized digital displays in the '80s and who bought later a VCR or a digital radio.

If you are strictly amateur radio-oriented and you won't involve other applications that "spoil your hobby", what are you doing in reading this electronic article dealing with amateur radio, what are you doing in SSB, on ham radio forums, with APRS and other digital modes like [packet radio](#) ? Internet is definetly not ham radio, but you are probably using it too to share or to get information dealing with amateur radio, isn't it... Up to now we have never say that these hams didn't practice an amateur radio activity... EchoLink works not a different way than the other digital modes, but it is only more complete.

But we can help people resisting to new technologies. We have maybe to share our knowledge about this product and educate these "naysayers" to help them understand exactly how EchoLink works. That will not be easy, but if they demonstrate a willingness to learn, they may someday come to understand it and appreciate its features.

So, although I am using a computer at one side and a transceiver equipped with a digital display on the other side, like you I am still using RF to talk to other hams, I still have to follow my national ham regulation, and I still have to follow all these undocumented rules of the ham community because I want to respect the [ham spirit](#) using actively amateur radio bands. As many hams I am just using occasionnally remote repeaters to get contact with close friends. That still sounds like amateur radio to me, doesn't it ?

### A new mode, right, but keep preserving our rights on bands too

There is another side to Echolink, much more subtile that could ruin our activities on

bands. With EchoLink of course, you could never work EME or by satellite, at least up to now. It is right. You could never hear noises on bands, tuning made by fool hams on your frequency, ducky voices of hams in QSO a fraction of kilohertz up, or participating in pile-ups or contests. Of course.

However I would like to highlight a fact that could have consequences in the future if we do not care of it. In the "full Internet" mode of EchoLink, single-user, you do no more use the least amateur equipment. In working this way, you lost most of the advantages you have won in entering the ham community : the protection of ham bands for which IARU and national ham associations have fought hardly at WARC/WRC conferences against all civilian and military services, quality transceivers, antennas and accessories, contests, QSL buros, awards without to forget the feeling that offers the fact to be on the air, free to call DX or ragchewing.

Echolink is a fine new mode, right, but keep preserving our rights on amateur radio bands too. So, I warmly recommand you to keep using your transceiver in as many modes as you can, CW and SSB being the most important, far beyond all digital modes. If one day we lost these modes or even amateur bands because of there is no more amateur working, do not blame your neighbor connected to the Internet... Another way to work in preserving in the same time our bands, is buying a V/UHF FM transceiver and activating EchoLink relays, HI !

### Check EchoLink RF nodes

Looking at the other systems EchoLink is really fantastic. Already from a pure accessibility point of vue : it is accessible to all licensed amateurs (and only them), contacts are easy, it uses the power of your computer if necessary (for sendings mails, etc), contacts are free of QRM and fading, there is no propagation problems, no dedicated material is required (in single-user mode), no other connection excepted Internet, and last but not least, if you are already using an Internet connection, the price of your connection time is already included in your fixed price.

Today many countries including the U.S.A., Germany or the small Luxembourg allow EchoLink to use V/UHF relays or, say differently, they allow amateurs to use VoIP. However some countries are opposed to this mode because private (ham radio) and public (Internet) networks are interconnected (e.g. France and Belgium) but until further notice exceptionally they accept that repeaters work this way. In fact, legally most national regulations do not regulate such systems (e.g. interconnections of stations with Internet) but they focus on how stations are operated (manually or automatically, using or not simple VoIP node, and on what frequencies). These issues are more important than checking how your station is feeded... So guardianship ministeries (FCC, ART, IBPT, OFCOM, SRR, etc) have recognized that EchoLink counts among ham tools, like SSTV or PSK31 to name a few. Like packet radio, EchoLink allows you to enlarge the spectrum of ham activities, experimenting new antennas or interfaces if you want to work with a repeater.

In the mind of many users like in mine, EchoLink is only a new mode, nothink else, but an easy mode to work DX that every licensed ham, even the one restricted to V/UHF can use freely and that gives to amateur radio a new breath through the use of new technologies. So I really think that both activities, the "old-fashion" radio and the VoIP of EchoLink or any other software, have each their place in the ham world, each of us finding plus and minus sides to both activities. Now if you really want to contact your family or friends living abroad using a webcam, sure Messenger is for you, all the more that it is free.

To close this thought, remind you that amateur radio is much more than just radio. But it is nothing without radio. So let's put it into context and stay balanced.

Before giving your opinion on the air or on forums about this tool, I suggest you to check by yourself, to validate your call sign and to work only once with EchoLink, simplex of course but also via repeaters... If you are open-minded I bet that like many amateurs you will appreciate its features. Once accepted you can no more ignore EchoLink, still less when you will use repeaters to call abroad, à la DX !

Have fun with EchoLink !

Thierry, ON4SKY, LX3SKY, node 2273.

*A summary of this article was published in December 2005 issue of [CQ magazine](#), VHF Plus column.*

### **For more information**

[EchoLink website](#)

[Echolinker](#) (dedicated forum)

[ARRL QST review of EchoLink](#) (599 KB)

[eHam article about EchoLink](#)

[UBA CQ-QSO July 2003](#)

[AMI VoIP EchoLink Interface](#)

[Echolink SysOp Mode](#), by NPARC

[Enhanced Multimode Linking Interface](#)

[G3VFP EchoLink Interface Controller](#)

[EchoLink using a RigBlaster II Interface](#), by KH6JPL

[ISS transmission on \\*AMSAT\\* Echolink Conference server](#), recorded by G4LCH (7.5

MB Mpeg)

[Port Forwarding](#) (router setup)

[Comment fonctionne un router](#) (in French)

[Wi-Fi](#)

[Skype](#)

[Kaspersky anti-virus](#)

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