



## Thoughts for Operating Linked EchoLink Nodes

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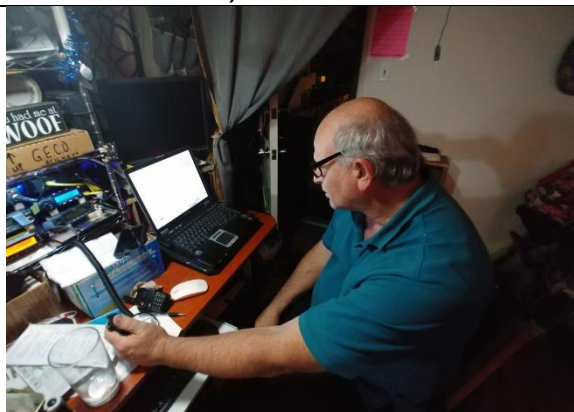
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For the past few years, Joe N6WZK has been experimenting with linking two or more EchoLink nodes. The experiment uses selected EchoLink SysOp nodes (Link or Repeater stations). These stations are within RF (radio frequency) LOS (line of site) of each other. This adds to EchoLink resilience.

In a recent test, the following EchoLink nodes were interconnected. For now, the practice is for the participating nodes directly linking to the node with the highest speed Internet\*.



*Joe, N6WZK at the KM6EON-R linking to a network of 4 EchoLink SysOp stations.*

Call Sign	Node #
<b>KM6EON-R*</b>	717585
N6UQX-L	718202
N6WIV-R	464430
N6UQX-R	56643

Joe is very concerned about audio quality when multiple EchoLink systems are linked. Each station should optimize all settings, especially audio quality. This will affect the ability of connected stations to communicate effectively. Since the nodes linked are RF enabled, incoming radio audio quality

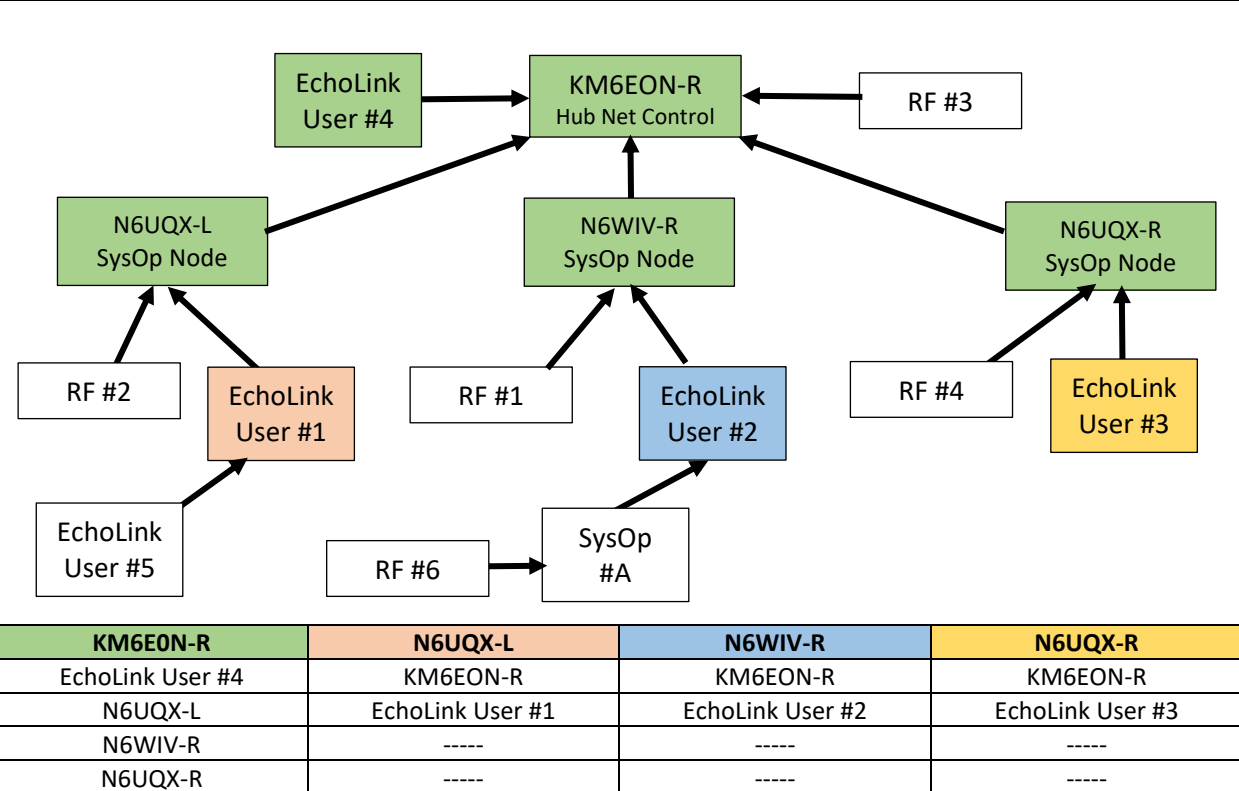
will also affect the communications quality. Each node must be diligent in their set up

### Test Evaluation Topics:

- 1) **Connection Load:** Determine the optimum number of connections for each node. The optimum load may not be the maximum load. We need to determine the number of connections for each node without adversely affecting audio quality.
- 2) **Hub Connection Load:** Determine the optimum number of connections for the Hub Net Control node. The key goal is to determine the number of mixed connections without adversely affecting audio quality. 2a) This should include connecting network nodes only. 2b) A mix of connecting network nodes and individual user nodes.
- 3) **Develop and Test Linked EchoLink Net Operating Protocol:** We know not all stations participating in a Linked EchoLink Net will be visible to the Hub Net Control station. For example, any RF participants through any SysOp node will not show up on any SysOp node EchoLink log. EchoLink stations connecting to the Hub Net Control station are visible to all EchoLink stations directly connected to Hub Net Control. However, EchoLink stations connecting to a participating SysOp node often may not be displayed on the EchoLink logs of any other connected the SysOp station. It will be difficult to accurately log the net participants. It will require the utmost coordinate especially when handling EmComm traffic.

### What Stations Appear on Which SysOp Node Station's Log

The table below shows which stations show up on the key SysOp nodes in the Linked EchoLink Net. Each SysOp station only sees EchoLink stations directly connected to them. All other stations will not appear on a SysOp station log. Notice Hub Net Control (KM6EON-R) sees only 4 stations connected. They cannot see any of the RF stations or any of the other EchoLink stations connected to the other Linked Net EchoLink SysOp stations. It can be hard for Hub Net Control to effectively call the roll of all Linked EchoLink Net participants.



### Proposed GECCO Net Operations:

GECCO prefers to use Directed Net format for radio nets.

- A **normal directed net** begins with an announcement 15 min prior to the start of the net. This alerts all stations on the frequency to stand-by for the net.
  - The net begins at the appointed time with general announcements.
  - Then the roll is called for stations who regularly check-in.
  - After the roll call, there is a call for late or missed members.
  - Finally, a call for guest check-ins.
  - A round-table for discussion or announcements from individual stations may occur.
  - Finally, a closing announcement returning the frequency to general use.
- A **Linked EchoLink Directed Net** begins with an announcement 30 min prior to the start of the net. This alerts all stations on the frequency to stand-by for the net. [**Note:** Link and Repeater nodes should connect to the Hub node (KM6EON-R) 25 minutes **BEFORE** the time the net starts. This gives time for nodes to test connection and audio quality.] Non-Link and Repeater stations participating in the net should connect to their preferred EchoLink SysOp station 10 minutes **before** the net.

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Grassroots Emergency Communications Operations

- **Hub Net Control** is the station control operator of KM6EON-R (or the designated Hub station).
- **Node Controllers** should announce the time of the net 10 minutes before the start of the net to alert RF stations in their area BEFORE they connect to the Hub station. A Node Controller is the station control operator of the connecting Link or Repeater (e.g. N6WIV-R node).
  - The Net begins with Hub Net Control announcing the start of the net and makes any announcements from Hub Control.
  - Hub Net Control then calls the Node Controllers in order as they are listed on the Hub Control display.
  - Node Controllers respond by making any node announcements and state how many stations are connected to their node. RF stations should be included in the count.
  - Once all nodes have checked in, Hub Net Control calls on each Node Controller in turn to take the roll call for their node. Node Controllers call the roll and ask for announcements from the stations on that node. They should clearly announce if a station is connecting via RF. Once each node roll call is complete, Node Control informs Hub Net Control of the call sign of the station on that node with an announcement. Hub Net Control makes a note, then continues the Node roll call. The last node control returns the mic to Hub Net Control. [**Note:** All stations should listen carefully and make a list of the call signs checking in by node. If they want to contact a station, they know the proper call sign.]
  - Call for Late or Missed Members: Hub Net Control will then give each Node Controller a chance to call for late or missed members. The last Node Control returns the mic to Hub Net Control.
  - Call for Guest Check-ins: Hub Net Control will then give each Node Controller a chance to call for guest check-ins. The last Node Control returns the mic to Hub Net Control.
  - Stations with Announcements: Hub Net Control calls each station with an announcement. Station makes the announcement and return mic to Hub Net Control.]
  - Round Table: Depending on the number of stations participating in the net, there may or may not be a round table discussion. For example, a Round Table would be easier to hold with fewer stations rather than more stations.
- **Hub Net Control** announces the close of the Net and returns frequency to general use.

We have not yet actually used these suggested procedures. We fully expect modifications after gaining practical experience operating Linked EchoLink Nets. 🌱

***Comments and Suggestions to improve these suggested procedures are welcomed.***