Digital voice net ettiquette.

Definitions
People:

Net	On air conference conducted on amateur radio
Net Controller, Net OP	The person running the net
OP(s), Ordinary Participant(s)	Net participant(s)
Coach	Experienced Net assistant (monitoring dashboards etc)

Actions:

Checkin	Your first call in to a net
Over (noun)	The time an OP is addressing the net
Hand off, hand over. Hand to	An OP calling the next OP
Break in	Potential OP random call
Round	When all OPs have had an Over

Net types

Return to Net Controller	OPs always hand back to Net Controller
Round Robin	OPs hand over to the next OP
Regular Net	Nearly the same Ops each time e.g. Club or special interest.

No one likes rules so here are some suggestions:

How you can help a digital voice net to run smoothly.

It gets a little complex here as there are a number of ways a net can be run effectively
The object is to ensure everyone gets a go and there is no interference between stations.

Model 1.
A Round robin net with **NO** break ins (except when called for)
This is the most time efficient.

1   The *Net Controller* calls for participants to checkin (sometimes by category eg portable & mobile before home stations etc).
2   *OPs* listen for the other checkin call, wait a random time then call in once only *OPs* should not repeat their call at this stage). It is helpful and good manners for *OPs* to be on time for the first calls for checkins.
3   The *Net Controller* will read out the list of callsigns heard and will call for any new or missed calls
4   *OPs* should **listen** to the list and only call again if aware of not being on the list. *OPs* that have not previously called can call at this time.
5   The process is repeated until no new calls are heard.
6   Late callers or callers who believed they have been missed or ignored do not panic, There will be another chance to call at the end of the first round (see notes about latency).
7   The *Net Controller* welcomes all to the net, reads any news items for the net, advises how the net is to run and reads out the current order of *OPs* in order, (This may include any special guests).

8   *OPs* listen for the list (and at least take note of the next *OP* to hand to.)
9   *Net Controller* hands to the first *OP* for an over.
10   At the end of an over the *OP* hands to the next *OP* and so on until the first round is completed when the last *OP* hands to the *Net Controller*. Always hand off to someone specific. If you lost track of the list hand it to the *Net Controller*.
11   *Net Controller* calls for any new, late or missed calls at this time.
12   *Net Controller* may give new call an opportunity to have an over at this time before beginning the next round. This process can be repeated at the end of each round. If done consistently this will reduce the tenancy to break in.
13   *Net Controller* announce the beginning of the final round.
14   *Net Controller* closes the net. No further 73s or going QRT announcement from *OPs* are required

Notes:
Do as much as you can to originate a quality signal:
Test what power you need to access a repeater then use the next step up.
Hotspot users recheck your config (RX & TX offset) from time to time. It may have drifted off.
Use the "Parrot" function (TG 9990 in DMR) to hear how your audio sounds to others. (A common fault s too much audio on transmit.

Get signal reports from several stations (some seem reluctant to give a bad report).
Give an honest report if requested. If a signal is not perfect describe the to imperfection ie "dropping out", "distortion", "clicks & shrieks" etc. Say whether it is usable or difficult to read.

Have something important to get across!
You may have experienced this. You expounded on something important to you only to find no one heard it. The cause could be anything.
To avoid this: When it comes to your over, Introduce yourself in the usual way then say "just resetting to make sure I'm not doubling" (or such). Then drop your PTT for a two second break & listen for a clear channel before proceeding. If there's a risk you may timeout do the same. Announce any such intentional break as no announcement may be taken as a dropout or end of over.

Despite the accepted convention there may be break ins. The next *OP* hearing a break in should acknowledge that the callsign has been heard so that the call in is not repeated and the Net Controller is also advised of the new call.

What if an *OP* hands to the wrong next *OP* (according to the list)? The station called should should answer. The station expecting to be called should not attempt to break in. If aware of the error the station called may intermediately hand to the listed next *OP* or to the *Net Controller* to resolve. If not aware of the error the called station will proceed as normal. If you are the station that missed out you should wait until any *OP* or *Net Controller* calls you in. If you seem to have been forgotten take the time allowed at the end of the round to recheck in.

What if (as you release the PTT button) you hear others talking. Possibly you may have timed out or a network glitch has lost you some time during your over. Listen in case you are called.. If not just wait till the end of the round and re checkin.

What if (as you release the PTT button) and you hear nothing. It is possible that you timed out (or network glitched) right near the expected end of your over. Rekey advising "I might have timed out"

and hand to the next *OP*. Alternatively hand to the *Net Controller* to advise what of you over was heard and what to do about it.

It is also possible that the station you handed to is not listening (may be called away etc). Use same procedure.

Despite what is commonly thought for this type of net you do not need nor should you leave a break of any more than 2 to 3 seconds. The reason being that you only need time for network equipment to reset not for breakers (except where called for).

Be aware thar the long gap you may hear between overs can be because of delays (latency) across the network. The same break will have and apparently different duration depending on where in the network you are connected. The long break you experience is not an opportunity to break in as you may be interfering with other stations you have not heard **YET.**

The potential for doubling (talking over someone else) is more likely with these systems.

There are several consequences of doubling in a digital network.
1. Some listeners could hear one of the two station & other listeners hear the other.
2. A network server may buffer (queue up traffic) and then let it go when the path is free (could add minutes of delay)
3 May cause errors resulting in automatic equipment resets to occur eg watchdog entries in equipment logs. Users may experience dropouts, degraded audio, loud clicks and shrieks because of this.

It sometimes helps to have a *Coach* in your *Net*. This is usually an experienced operator who has access to some of the network server dashboards. The coach can sometimes see where things are getting confusing. You may officially appoint a coach but often with a regular net somebody will have a reputation for being the one, The coach may sometime break convention in order to calm the chaos.

Model 2.
A Round Robin Net with breakins any time, this is not the most time efficient.

Rules for Model 1 apply except a longer break between over is require. Understand that a breakers call may not always be heard first time.

Model 3
Return to *Net Controller*

The *Net Controller* can call for checkins at any time. This could be after some time (like 5 to 10 minutes) or the end of the first round.
In a large net the *Net Controller* may call for checking after a small number of overs so that potential *OPs* can be confident they are in the net list.
The net controller is mainly there to keep the net running smoothly.
Sometimes the *Net Controller* is there to answer questions from *OPs* or sometimes to call in an expert or someone knowledgeable about a subject (may even call in a club secretary about meeting times etc).
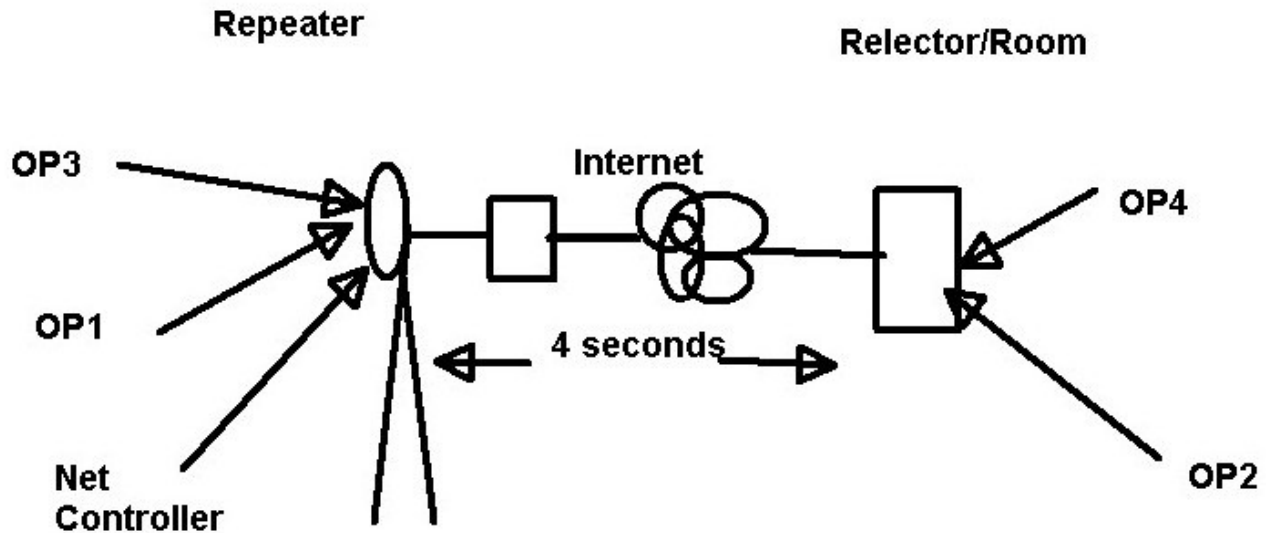
Latency in digital voice nets:
In the example pictured we have a network that can be accessed by radio repeater and also by a reflector accessed by hotspots, droidstar etc.
The delay from one repeater *OP* to another is 1 second (for this example but usually less).
The delay between *OPs* on the reflector is I second.
The delay between a repeater *OP* to a reflector *OP* is about 4 seconds.
All *OPs* are well behaved and leave 2 seconds before responding to any calls.
All *OPs* can announce a callsign in 3 seconds

The *Net Controller* calls for checkins
After *Net Controller* drops *OP* 1 hears *Net Controller* drop after 1 second, waits 2 seconds before replying (3 seconds to give a callsign)
Net Controller hears *OP* 1 reply after 1+2+1=4 seconds. ending at 7 seconds
OP 2 hears *Net Controller* drop after 4 seconds waits 2 seconds then replies.
Net Controller hears *OP* 2 replies after 4+2+4=10 seconds ending at 13 seconds

Now *OP* 3 hears *Net Controller* drop after 1 second and hears *OP* 1 replying at 1+2=1=4 seconds ending 7 seconds (same as *Net Controller*) .
OP 3 leaves a gap of 2 seconds before replying (at 9 seconds for 3 seconds) *Net Controller* receives *OP* 3 1 second later at 10 seconds.
But this is the same time *Net Controller* receives the reply from *OP* 2. So there is a collision.
OP 3 would not have received *OP* 2 before beginning transmission.
OP 2 would be transmitting before it could hear *OP* 3 not hear *OP* 3 until 1+2+4=7 seconds.
OP 4 listening on the side would hear *Net Controller* call and *OP* 2 reply but not *OP* 1 reply.

In this example (one of the simplest examples at that) no one was rude or impatient yet crashes still occurred. The *Net Controller* could have split the call for checkins firstly to repeater *OPs* then on reflector *OPs*

Contributors

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