

Rick Muething Discusses WINMOR's Built-in "busy Channel" Detector

WINMOR uses a busy channel detector. Currently this works in two modes:

Narrow band detection. Modes like CW, PSK, RTTY, P1, P2 etc.

Generally modes that look "peaky" on a spectrum display. The detector analyzes the peak to average ratio over the WINMOR bandwidth and compares it against a threshold (rolling average threshold).. Above the trip means there is a "peaky" signal in the passband.

Wideband detection. This handles modes like P3, MT63, SSB, etc modes that have fairly flat frequency distribution but are also "pulse" or "bursty". This is done by looking at the rolling time average of the entire WINMOR spectrum.

These detectors aren't perfect .they won't detect everything especially when it is down in the noise because it would be giving too many false positives if the threshold is set too low. But it is fairly good.

There is also some discussion on using some "templates" which you might consider to be something like a waterfall (frequency spectrum vs. time) that may be good at identifying specific types of modulation. I haven't done much on that yet.

The way these detectors are used is as follows:

The client (which always initiates a connection) first must check for channel busy and must see a minimal time of channel clear before enabling a connect request. (Of course the client is usually "manned" so there SHOULD also be an operator that "listens first" although unfortunately some don't! If a channel is busy then the client just can't connect until the channel is deemed clear.

The Server (which always answers a connection) will only answer a connect request if:

It is a call to that specific Server call sign and it for an accepted bandwidth for this server freq. (e.g. if the server is set for 200 Hz BW only on this freq and a connect request is for a 2000 Hz connection then it will NOT be answered.

AND The server has seen a minimal clear channel time on this frequency. This will be some sysop settable threshold .perhaps 5 seconds or so. I haven't worked out those details yet. This will protect against the hidden transmitter problem (The client thinks the channel is clear but the server has heard another transmitter (which the client did not hear) before the connect request. The logic of all this is fairly simple but the time and detect thresholds are what are tricky.

AND the connect request frequency is within the set capture range of the Server (currently I have this coded at +/- 200 Hz though it could easily be changed. There is never any manual tuning required by either the client or the server.

The Goal of course is to provide good protection against these problems but not cause too many false positives which would make normal and legitimate connections difficult. As with any mode having a competent operator initiating the connection after listening is also important.

Just as in Pactor (at least in the Winlink system) the WINMOR Server is automated (no manual control operator) but a server NEVER initiates a connection. The Client is semiautomatic. The connection is normally initiated by a manual operator and then all tuning and forwarding are done automatically without any intervention. Technically it is LEGAL to have a fully automated session (the client automatically initiates the connection .say when it has traffic pending) but this would have to be ALWAYS within the autoforward sub bands. In WL2K we have always discouraged this and most of the WL2K software clients (Paclink, AirMail cannot do an automated connection initiation on the ham bands.

One other thing is important. These detectors detect signals INSIDE the WINMOR passband (200, 500 or 2000 Hz depending on the BW selected). If a signal is OUTSIDE the WINMOR passband it is not considered. This makes sense but if for example a PSK station is using a wide open panoramic receiver and WINMOR starts transmitting over an otherwise clear channel it will probably "pump" the receiver AGC. Good communication practice dictates the receiving station limit its bandwidth to the amount needed which of course limits the effectiveness of panoramic receiver displays and waterfall tuning used by many PSK programs.

WINMOR - <http://groups.yahoo.com/group/WINMOR/>