CLAIMS

We claim:

1. A method comprising:

receiving a first radio frequency (RF) signal at a wireless repeater, the first RF signal communicated from a transmitter over a communications path toward a receiver;

determining a first signal quality value of ~~based on~~ the first RF signal at a first time;

~~analyzing the signal quality based on a set of parameters; and~~

comparing the first signal quality value with a first threshold signal quality value to determine if the first RF signal has degraded to a first signal quality level;

switching the wireless repeater to a regenerator repeater mode when the comparing the first signal quality value with the first threshold signal quality value indicates the first RF signal has degraded to the first signal quality level, the regenerator repeater mode improving one or more characteristics of the first RF signal, whereby latency is introduced into the communications path as the first RF signal is communicated toward the receiver;

determining a second signal quality value of the first RF signal at a second time, the second time being subsequent to the first time;

comparing the second signal quality value with the first threshold signal quality value to determine if the first RF signal has improved to a second signal quality level; and

switching the wireless repeater to a non-regenerator repeater mode when the comparing the second signal quality value with the first threshold signal quality value indicates the first RF signal has improved to the second signal quality level

~~selecting an operation mode of the wireless repeater based on the analyzing the signal quality~~.

2. The method of claim 1, further comprising generating a second radio frequency (RF) signal at the wireless repeater based on ~~the~~ an operation mode, the second RF signal being based on the first RF signal.

3. The method of claim 1, wherein a first radio access card (RAC) of the wireless repeater receives an intermediate frequency (IF) signal from a receiving radio frequency unit (RFU) that generates the IF signal based on the first RF signal.

4. The method of claim 3, wherein a first radio access card (RAC) of the wireless repeater receives a first intermediate frequency (IF) signal from a receiving radio frequency unit (RFU) that generates the first IF signal based on the first RF signal, the first RAC generates data based on the first IF signal, based on the operating mode, a second radio access card (RAC) of the wireless repeater generates a second intermediate frequency (IF) signal based on the data, and a transmitting radio frequency unit (RFU) generates the second RF signal based on the second IF signal.

5. The method of claim 3, wherein a first radio access card (RAC) of the wireless repeater receives an intermediate frequency (IF) signal from a receiving radio frequency unit (RFU) that generates the IF signal based on the first RF signal, the first RAC provides the IF signal to the second RAC, based on the operating mode, a second radio access card (RAC) of the wireless repeater provides the IF signal to a transmitting radio frequency unit (RFU), and the transmitting RFU generates the second RF signal based on the IF signal.

6. The method of claim 1, wherein the determining the first signal quality value of ~~based on~~ the first RF signal comprises monitoring a signal quality indicator (SQI) associated with the first RF signal.

7. The method of claim 6, where the receive SQI comprises radio signal level (RSL), a signal-to-noise ratio (SNR), or a bit error rate (BER).

8. The method of claim 6, wherein the ~~set of parameters includes whether~~ first signal quality value is compared with the first threshold signal quality value to determine if the SQI violates a transmitter (TX) spectrum mask out.

9. The method of claim 6, wherein the ~~set of parameters includes whether~~ first signal quality value is compared with the first threshold signal quality value to determine if the SQI is above or below a quality threshold.

10. The method of claim 1, wherein the operation mode comprises a first radio access card (RAC) of the wireless repeater providing an intermediate frequency (IF) signal to a second radio access card (RAC) of the wireless repeater, the first RAC receiving the IF signal from a receiving radio frequency unit (RFU) that generates the IF signal based on the first RF signal.

11. The method of claim 1, wherein the operation mode comprises a first radio access card (RAC) of the wireless repeater providing data to a second radio access card (RAC) of the wireless repeater, the first RAC generating the data based on an intermediate frequency (IF) signal.

12. The method of claim 1, further comprising muting a transmitting radio frequency unit (RFU) of the wireless repeater ~~before the selecting the operation mode of the wireless repeater~~.

13. The method of claim 1, further comprising unmuting a transmitting radio frequency unit (RFU) of the wireless repeater ~~after the selecting the operation mode of the wireless repeater~~.

14. A system comprising:

means for receiving a first radio frequency (RF) signal at a wireless repeater, the first RF signal communicated from a transmitter over a communications path toward a receiver;

means for determining a first signal quality value of ~~based on~~ the first RF signal at a first time;

~~means for analyzing the signal quality based on a set of parameters; and~~

means for comparing the first signal quality value with a first threshold signal quality value to determine if the first RF signal has degraded to a first signal quality level;

means for switching the wireless repeater to a regenerator repeater mode when the comparing the first signal quality value with the first threshold signal quality value indicates the first RF signal has degraded to the first signal quality level, the regenerator repeater mode improving one or more characteristics of the first RF signal, whereby latency is introduced into the communications path as the first RF signal is communicated toward the receiver;

means for determining a second signal quality value of the first RF signal at a second time, the second time being subsequent to the first time;

means for comparing the second signal quality value with the first threshold signal quality value to determine if the first RF signal has improved to a second signal quality level; and

means for switching the wireless repeater to a non-regenerator repeater mode when the comparing the second signal quality value with the first threshold signal quality value indicates the first RF signal has improved to the second signal quality level

~~means for selecting an operation mode of the wireless repeater based on the analyzing the signal quality~~.

15. A system comprising:

a wireless repeater including a receiving radio access card (RAC) configured to receive a first intermediate frequency (IF) signal and determine a first signal quality value of a first radio frequency (RF) signal based on the first IF signal, the first RF signal communicated from a transmitter over a communications path toward a receiver;

a wireless repeater controller ~~control module~~ configured to:

compare the first signal quality value with a first threshold signal quality value to determine if the RF signal has degraded to a first signal quality level,

switch the wireless repeater to a regenerator repeater mode when the compare the first signal quality value with the first threshold signal quality value indicates the RF signal has degraded to the first signal quality level, the regenerator repeater mode improving one or more characteristics of the RF signal, whereby latency is introduced into the communications path as the RF signal is communicated toward the receiver,

determine a second signal quality value of the RF signal at a second time, the second time being subsequent to the first time,

compare the second signal quality value with the first threshold signal quality value to determine if the RF signal has improved to a second signal quality level, and

switch the wireless repeater to a non-regenerator repeater mode when the compare the second signal quality value with the first threshold signal quality value indicates the RF signal has improved to the second signal quality level,

~~analyze the signal quality based on a set of parameters and select an operation mode for the system based on the analyzing the signal quality,~~ the receiving RAC ~~is~~ further configured to generate data based on the first IF signal and provide the first IF signal to a transmitting radio access card (RAC) of the wireless repeater; and

the transmitting RAC configured to, based on ~~the~~ an operation mode, generate a second intermediate frequency (IF) signal based on the data or provide the first IF signal to a transmitting radio frequency unit (RFU).

16. The system of claim 15, wherein the receiving RAC is further configured to receive the first IF signal from a receiving radio frequency unit (RFU).

17. The system of claim 15, wherein the transmitting RFU is configured to generate a second radio frequency (RF) signal based on the first IF signal or the second IF signal.

18. The system of claim 15, wherein the determining the first signal quality value of ~~based on~~ the first RF signal comprises monitoring a signal quality indicator (SQI) associated with the first RF signal.

19. The system of claim 18, where the receive SQI comprises radio signal level (RSL), a signal-to-noise ratio (SNR), or a bit error rate (BER).

20. The system of claim 15, wherein the ~~set of parameters includes whether~~ first signal quality value is compared with the first threshold signal quality value to determine if the SQI violates a transmitter (TX) spectrum mask out.

21. The system of claim 15, wherein the ~~set of parameters includes whether~~ first signal quality value is compared with the first threshold signal quality value to determine if the SQI is above or below a quality threshold.

22. The system of claim 15, where the wireless repeater controller ~~control module~~ is further configured to mute the transmitting RFU ~~before the selecting the operation mode of the wireless repeater~~.

23. The system of claim 15, where the wireless repeater controller ~~control module~~ is further configured to unmute the transmitting RFU ~~after the selecting the operation mode of the wireless repeater~~.