CLAIMS

1. An interference detection system in a point-to-point radio system, the point-to-point radio system including a first site in radio communication with a second site, comprising:

at least one processor; and

memory storing computer instructions, the computer instructions when executed by the at least one processor causing the system to perform,

gathering a temporal snapshot of radio parameter values associated with at least a first site of a point-to-point radio system, the radio parameter values including at least a receive signal level (RSL) value and at least one other radio parameter value correlated with signal degradation during the temporal snapshot;

determining whether the RSL value is greater than an RSL threshold;

determining whether the at least one other radio parameter value indicates a threshold level of signal degradation during the temporal snapshot;

at least when the RSL value is greater than the RSL threshold and the at least one other radio parameter value indicates a threshold level of signal degradation during the temporal snapshot, then determining that external interference is likely present during the temporal snapshot;

at least when the RSL value is not greater than the RSL threshold, then determining that the external interference is likely not present during the temporal snapshot; and

performing a responsive action to a determination of the external interference being likely present during the temporal snapshot.

2. The interference detection system of claim 1, wherein the radio parameter values include radio parameter values associated with a modem and a radio frequency unit at the first site during the temporal snapshot.

3. The interference detection system of claim 1, wherein the at least one other radio parameter value includes a Demodulator Not Locked (DNL) Alarm, and wherein the at least one other radio parameter value indicates a threshold level of signal degradation at least when the DNL Alarm is active.

4. The interference detection system of claim 1, wherein the at least one other radio parameter value includes Errored Seconds (ES) or Severely Errored Seconds (SES) value, and wherein the at least one other radio parameter value indicates a threshold level of signal degradation at least when the ES or SES value is increasing from a previous sample.

5. The interference detection system of claim 1, wherein the at least one other radio parameter value includes a signal-to-noise ratio (SNR) value, and wherein the at least one other radio parameter value indicates a threshold level of signal degradation at least when at least the SNR value is less than a threshold.

6. The interference detection system of claim 1, wherein the at least one other radio parameter value includes a change in an Uncoded Bit Error Rate (U-BER), and wherein the at least one other radio parameter value indicates a threshold level of signal degradation at least when the change in the U-BER is greater than a threshold.

7. The interference detection system of claim 1, wherein the at least one other radio parameter includes Adaptive Code Modulation (ACM) data, and wherein the at least one other radio parameter value indicates a threshold level of signal degradation at least when ACM is active and negative.

8. The interference detection system of claim 1, wherein the at least one other radio parameter value includes Automatic Transmit Power Control (ATPC) data, and wherein the at least one other radio parameter value indicates a threshold level of signal degradation at least when ATPC is enabled and a power adjustment is greater than a threshold.

9. The interference detection system of claim 1, wherein the computer instructions when executed by the processor further cause the system to perform

evaluating interference persistence; and

determining a false positive at least when the interference persistence is less than a minimum threshold duration.

10. The interference detection system of claim 9, wherein the computer instructions when executed by the processor further cause the system to perform

determining an amount of interference variation;

identifying the external interference as a steady interferer at least when the amount of interference variation is less than a threshold; and

identifying the external interference as a continuous bursty interferer at least when the amount of interference variation is greater than the threshold.

11. The interference detection system of claim 1, wherein the computer instructions when executed by the processor further cause the system to perform

determining first interference effects on a first receiver at the first site in space diversity with a second receiver at the first site;

determining second interference effects on the second receiver at the first site;

comparing the first interference effects with the second interference effects; and

at least when the first interference effects are substantially the same as the second interference effects, then validating the external interference.

12. The interference detection system of claim 1, wherein the computer instructions when executed by the processor further cause the system to perform

determining first SNR on a first receiver at the first site in space diversity with a second receiver at the first site;

determining second SNR on the second receiver; and

at least when the first SNR indicates signal degradation while the second SNR does not indicate signal degradation and when thereafter the first SNR improves or clears while the second SNR deteriorates, then identifying the external interference as a likely multipath interference.

13. The interference detection system of claim 1, wherein the computer instructions when executed by the processor further cause the system to perform

comparing a near-end interference condition with a far-end interference condition; and

at least when the near-end interference condition is not substantially similar to the far-end interference condition, the validating the external interference.

14. The interference detection system of claim 1, wherein the computer instructions when executed by the processor further cause the system to perform

searching a historical database for records indicative of an interference pattern or correlation with external events; and

using the interference pattern or correlation with external events to assist in identifying future interferences as not being due to an external interferer.

15. The interference detection system of claim 1, wherein the computer instructions when executed by the processor further cause the system to perform

gathering a bin of radio parameter information, the bin of radio parameter information including maximum and minimum levels of RSL values and the at least one other radio parameter value occurring during a specific time period; and

evaluating the bin of radio parameter information to determine a likelihood of the external interference occurring in any temporal snapshot within the specific time period, before performing an analysis of any temporal snapshot of radio parameter values within the specific time period.

16. The interference detection system of claim 15, wherein the specific time period includes a 15-minute time period.

17. An interference detection method in a point-to-point radio system, the point-to-point radio system including a first site in radio communication with a second site, comprising:

gathering a temporal snapshot of radio parameter values associated with at least a first site of a point-to-point radio system, the radio parameter values including at least a receive signal level (RSL) value and at least one other radio parameter value correlated with signal degradation during the temporal snapshot;

determining whether the RSL value is greater than an RSL threshold;

determining whether the at least one other radio parameter value indicates a threshold level of signal degradation during the temporal snapshot;

at least when the RSL value is greater than the RSL threshold and the at least one other radio parameter value indicates a threshold level of signal degradation during the temporal snapshot, then determining that external interference is likely present during the temporal snapshot;

at least when the RSL value is not greater than the RSL threshold, then determining that the external interference is likely not present during the temporal snapshot; and

performing a responsive action to a determination of the external interference being likely present during the temporal snapshot.

18. The interference detection method of claim 17, further comprising

evaluating interference persistence; and

determining a false positive at least when the interference persistence is less than a minimum threshold duration.

19. The interference detection method of claim 18, further comprising

determining an amount of interference variation;

identifying the external interference as a steady interferer at least when the amount of interference variation is less than a threshold; and

identifying the external interference as a continuous bursty interferer at least when the amount of interference variation is greater than the threshold.

20. The interference detection method of claim 17, further comprising

determining first interference effects on a first receiver at the first site in space diversity with a second receiver at the first site;

determining second interference effects on the second receiver at the first site;

comparing the first interference effects with the second interference effects; and

at least when the first interference effects are substantially the same as the second interference effects, then validating the external interference.

21. The interference detection method of claim 17, further comprising

determining first SNR on a first receiver at the first site in space diversity with a second receiver at the first site;

determining second SNR on the second receiver; and

at least when the first SNR indicates signal degradation while the second SNR does not indicate signal degradation and when thereafter the first SNR improves or clears while the second SNR deteriorates, then identifying the external interference as a likely multipath interference.

22. The interference detection method of claim 17, further comprising

comparing a near-end interference condition with a far-end interference condition; and

at least when the near-end interference condition is not substantially similar to the far-end interference condition, the validating the external interference.

23. The interference detection method of claim 17, further comprising

searching a historical database for records indicative of an interference pattern or correlation with external events; and

using the interference pattern or correlation with external events to assist in identifying future interferences as not being due to an external interferer.

24. The interference detection method of claim 17, further comprising

gathering a bin of radio parameter information, the bin of radio parameter information including maximum and minimum levels of RSL values and the at least one other radio parameter value occurring during a specific time period; and

evaluating the bin of radio parameter information to determine a likelihood of the external interference occurring in any temporal snapshot within the specific time period, before performing an analysis of any temporal snapshot of radio parameter values within the specific time period.