

CLAIMS

What is claimed is:

1. A method, comprising:
 - measuring, by a circuit, a change in reactance of an antenna;
 - determining, by the circuit, a frequency offset of the antenna based on a change in an operating frequency of the antenna according to the change in reactance of the antenna; and
 - adjusting, by the circuit, the operating frequency of the antenna to mitigate the frequency offset of the antenna.
2. The method of claim 1, wherein the circuit comprises a reactive sensor.
3. The method of claim 2, wherein the reactive sensor comprises a capacitive sensor.
4. The method of claim 1, wherein determining the change in the operating frequency of the antenna comprises:
 - determining a current operating frequency of the antenna;
 - obtaining impedance characteristics of the antenna according to the current operating frequency of the antenna; and
 - determining the frequency offset according to the change in reactance measured and the impedance characteristics.

5. The method of claim 4, wherein the obtaining of the impedance characteristics of the antenna comprises retrieving the impedance characteristics of the antenna from a look-up table.
6. The method of claim 5, wherein the look-up table comprises a plurality of impedance characteristics of the antenna measured at a plurality of operating frequencies of the antenna.
7. The method of claim 1, wherein the determining the frequency offset of the antenna further comprises obtaining an impedance of a matching network coupled to the antenna.
8. The method of claim 1, wherein the change in reactance of the antenna comprises a change in a capacitance of the antenna.
9. The method of claim 1, wherein the frequency of the antenna is adjusted by modifying an electrical length of the antenna.
10. The method of claim 1, wherein the antenna comprises an aperture tuner to adjust a resonant frequency range of the antenna, and wherein the adjusting of the operating frequency of the antenna is performed by supplying a signal to the aperture tuner.
11. The method of claim 10, wherein the aperture tuner comprises a variable reactive element to adjust the resonant frequency range of the antenna.
12. The method of claim 10, wherein the aperture tuner comprises a switchable array of reactive elements to adjust the resonant frequency range of the antenna.
13. The method of claim 10, wherein the aperture tuner comprises one of a variable capacitor, a variable inductor, or a combination thereof.

14. An antenna structure, comprising:
 - a first antenna element; and
 - a sensor coupled to the first antenna element, wherein the sensor is coupled to a circuit that performs operations comprising:
 - measuring from the sensor a change in a reactance of the antenna;
 - obtaining impedance characteristics of the antenna;
 - determining a change in an operating frequency of the antenna according to the change in reactance of the antenna and the impedance characteristics of the antenna; and
 - adjusting the operating frequency of the antenna to counteract the change in the operating frequency of the antenna.

15. The antenna structure of claim 14, wherein the sensor measures a change in a capacitance of the antenna, a change in an inductance of the antenna, or a combination thereof.

16. The antenna structure of claim 14, wherein the obtaining of the impedance characteristics of the antenna comprises:
 - determining a current operating frequency of the antenna; and
 - obtaining from a look-up table the impedance characteristics of the antenna according to the current operating frequency of the antenna.

17. The antenna structure of claim 14, wherein the operating frequency of the antenna is adjusted by modifying an electrical length of the antenna.

18. A communication device, comprising:
 - an antenna structure;
 - a sensor; and
 - a circuit coupled to the sensor, wherein the circuit performs operations comprising:
 - measuring a change in a reactance of the antenna;
 - determining a frequency offset of the antenna according to the change in reactance of the antenna; and
 - adjusting an operating frequency of the antenna to reduce the frequency offset of the antenna.
19. The communication device of claim 18, wherein the sensor comprises a reactance sensor.
20. The communication device of claim 18, wherein the operating frequency of the antenna is adjusted by modifying an electrical length of the antenna.