

CLAIMS

What is claimed is:

1. A method, comprising:
 - introducing a phase difference between signals at antenna ports of an antenna structure such that a first signal at one of the antenna ports has a different phase than a second signal at another one of the antenna ports to provide antenna pattern control and to increase gain in a direction toward a far-field point, wherein the antenna structure comprises a plurality of antenna elements, each operatively coupled to a different one of the antenna ports, wherein electrical currents flowing in the antenna structure are such that the antenna ports are isolated at a desired signal frequency range; and
 - operating at a reduced power that is lower than a power used in a non-pattern control operation of the antenna structure such that a communications device utilizing the antenna structure satisfies an equivalent wireless link performance with the far-field point using reduced power compared to the non-pattern control operation, thereby reducing a specific absorption rate.
2. The method of claim 1, wherein the introducing of the phase difference between the signals comprises adjusting a relative phase between the signals using an electrically controlled phase shift device.
3. The method of claim 1, wherein the introducing of the phase difference between the signals comprises adjusting a relative phase between the signals using a phase shift network.
4. The method of claim 1, wherein the introducing of the phase difference between the signals comprises adjusting a relative phase between the signals by controlling a phase of a carrier signal provided at each of the antenna ports.

5. The method of claim 1, wherein the communications device is a cellular handset, personal digital assistance, wireless access point, or a data card for a computer.
6. The method of claim 1, wherein the plurality of antenna elements comprise helical coils, wideband planer shapes, chip antennas, meandered shapes, loops, or inductively shunted forms.
7. The method of claim 1, wherein the antenna structure comprises a planar structure fabricated on a printed circuit board substrate.
8. The method of claim 1, wherein the antenna structure comprises stamped metal part including a pickup feature for use in a pick and place assembly process.
9. The method of claim 1, wherein the antenna structure comprises a flexible printed circuit mounted on a plastic carrier or on a plastic housing of a device.
10. The method of claim 1, wherein the far-field point is a base station, a mobile terminal, or a router.
11. The method of claim 1, wherein the introducing of the phase difference between the signals comprises adjusting a relative phase between signals fed to neighboring antenna ports to maintain a communications link with equipment at the far-field point.

12. A method, comprising:
 - introducing a phase difference between signals at antenna ports of an antenna structure such that a first signal at one of the antenna ports has a different phase than a second signal at another one of antenna ports to provide antenna pattern control and to increase gain in a selected direction toward a far-field point; and
 - operating at a first power level that is lower than a second power used in a non-pattern control operation of the antenna structure to meet wireless link performance criteria with equipment at the far-field point using reduced power compared to the non-pattern control operation, thereby reducing a specific absorption rate.
13. The method of claim 12, wherein the introducing of the phase difference between the signals comprises adjusting a phase between the signals using an electrically controlled phase shift device.
14. The method of claim 12, wherein the introducing of the phase difference between the signals comprises adjusting the phase between the signals using a phase shift network.
15. The method of claim 12, wherein the introducing of the phase difference between the signals comprises adjusting the phase between the signals by controlling the phase of a carrier signal provided at each of the antenna ports.
16. The method of claim 12, wherein the antenna structure is utilized in a communication device, and wherein the communications device is a cellular handset, personal digital assistance, wireless access point, or a data card for computer.
17. The method of claim 12, wherein the equipment at the far-field point comprises a base station, a mobile terminal, or a router.

18. A method, comprising:
- introducing a phase difference between signals at antenna ports of an antenna such that a first signal at one of the antenna ports has a different phase than a second signal at another one of antenna ports to obtain an antenna pattern control; and
 - using a reduced power that is lower than the power used in a non-pattern control operation of the antenna such that a wireless link performance criteria is met with equipment at a far-field point using the reduced power compared to the non-pattern control operation, thereby reducing a specific absorption rate.
19. The method of claim 18, wherein the equipment at the far-field point comprises a base station, a mobile terminal, or a router.
20. The method of claim 18, wherein the introducing of the phase difference between the signals comprises adjusting the phase between the signals using a device that controls phase.