

WHAT IS CLAIMED IS:

1. An antenna for connecting to an underlying ground plane for transmitting and receiving radio frequency energy, comprising;
a spiral-shaped top plate bounded by one or more edges;
a shorting element extending from the top plate in the direction of the ground plane for electrically connecting the top plate to the ground plane; and
a sidewall extending from a top plate edge in the direction of the ground plane.
2. The antenna of claim 1 wherein a portion of the top plate overlies the ground plane when the antenna is operative with the ground plane.
3. The antenna of claim 2 wherein an area of the portion of the top plate overlying the ground plane is adjustable to affect antenna performance.
4. The antenna of claim 2 wherein the portion of the top plate overlying the ground plane includes a first region of the top plate from which the shorting element extends and excludes a second region of the top plate from which the sidewall extends.
5. The antenna of claim 1 wherein the ground plane comprises a conductive material disposed on a first region of the substrate and conductive material is absent from a second region of the substrate, and wherein the sidewall is disposed overlying the second region.
6. The antenna of claim 1 wherein the top plate comprises an inner spiral segment connected to an outer spiral segment.
7. The antenna of claim 1 wherein the top plate comprises a continuous spiral formed from a conductive material.
8. The antenna of claim 1 wherein the shorting element comprises a meanderline conductor.
9. The antenna of claim 8 wherein the meanderline conductor comprises an elongated transmission line having a zigzag configuration.
10. The antenna of claim 8 wherein the meanderline conductor comprises an elongated transmission line further comprising a first segment and a second segment, and wherein the first and the second segments are electrically connected and disposed substantially parallel to the top plate.

11. The antenna of claim 10 mounted overlying the ground plane, wherein the first and the second segments are substantially parallel to the ground plane and are disposed between the top plate and the ground plane.

12. The antenna of claim 1 further comprising a feed element connected to the top plate.

13. The antenna of claim 1 further comprising a feed element, wherein the top plate comprises an inner spiral segment and an outer spiral segment, and wherein the feed element is disposed at a terminal end of the outer spiral segment.

14. The antenna of claim 13 overlying a dielectric substrate further comprising a ground plane and a conductive feed region insulated from the ground plane, wherein the feed region is electrically connected to the feed element.

15. The antenna of claim 14 wherein the feed element comprises a conductive strip extending from the top plate to the conductive feed region on the dielectric substrate.

16. The antenna of claim 1 wherein the sidewall forms a substantially right angle with the top plate edge.

17. An antenna comprising:

a ground plane;

a spiral top plate further comprising first and second regions, wherein the first region overlies the ground plane;

a feed element in electrical communication with the top plate;

a first meanderline conductor extending from the top plate; and

a second meanderline conductor extending from the top plate.

18. The antenna of claim 17 wherein the ground plane comprises a dielectric substrate having conductive material disposed on a first region thereof, and wherein conductive material is absent from a second region of the substrate, and wherein a first region of the top plate substantially overlies the first region of the substrate.

19. The antenna of claim 18 wherein the first meanderline conductor extends from the first region of the top plate and further comprises an elongated conductor in a zigzag configuration, and wherein the first meanderline conductor connects the top plate to the ground plane. .

20. The antenna of claim 17 wherein the top plate further comprises a second region extending beyond an edge of the ground plane, and wherein the second meanderline conductor comprises a first conductive element extending from an edge of the second region and a second conductive element extending from the first conductive element.

21. The antenna of claim 20 wherein an angle formed between the first conductive element and the second region of the top plate is about 90°.

22. The antenna of claim 20 wherein an angle formed between the first conductive element and the second conductive element is about 90°.

23. An antenna for connecting to a spaced-apart ground plane for transmitting and receiving radio frequency energy, comprising;

a spiral-shaped top plate having one or more edges;

a sidewall extending from a top plate edge in a direction toward the ground plane; and

wherein when operative with the ground plane a first region of the top plate is disposed opposite the ground plane and a second region of the top plate extends beyond an edge of the ground plane.

24. The antenna of claim 23 wherein the sidewall extends beyond the edge of the ground plane.

25. The antenna of claim 24 further comprising a shorting element for electrically connecting the top plate to the ground plane.

26. The antenna of claim 25 wherein the shorting element comprises a meanderline conductor extending from the top plate.

27. The antenna of claim 23 further comprising a dielectric substrate having first and second substrate regions, wherein the ground plane is disposed on the first substrate region, and wherein the first top plate region is disposed opposite the first substrate region.

28. The antenna of claim 27 wherein the sidewall overlies the second substrate region.

29. An antenna for connection to a ground plane for transmitting and receiving radio frequency energy, comprising;

a spiral-shaped top plate;

a first meanderline element extending from the top plate in a direction of the ground plane for interconnecting the top plate to the ground plane;

a second meanderline element extending from the top plate; and

a sidewall extending from an edge of the top plate.

30. The antenna of claim 29 wherein a distance between the top plate and the ground plane is selected to achieve desired performance parameters for the antenna.

31. The antenna of claim 29 wherein a region of the top plate overlaps the ground plane when the antenna is configured for operation with the ground plane.

32. The antenna of claim 31 wherein an area of the overlapping region is adjustable to modify performance characteristics of the antenna.

33. The antenna of claim 32 wherein the first meanderline element is disposed in the overlapping region.

34. The antenna of claim 29 wherein the top plate comprises an inner spiral segment in electrical communications with an outer spiral segment.

35. The antenna of claim 29 wherein the top plate comprises a continuous spiral formed from conductive material.

36. The antenna of claim 29 wherein the second meanderline element extends from the top plate in the direction of the ground plane and comprises a substantially L-shaped meanderline element.

37. The antenna of claim 36 wherein the second meanderline element further comprises a first segment extending from the top plate and a second segment extending from the first segment, and wherein a length of the second segment is less than a length and a width of the top plate.

38. The antenna of claim 29 wherein the first meanderline element comprises an elongated meanderline transmission line including a segment substantially parallel to the top plate.

39. The antenna of claim 29 wherein the first meanderline element comprises an elongated transmission line further comprising at least two connected segments substantially parallel to the top plate.

40. The antenna of claim 29 mounted in a spaced-apart relation to the ground plane, wherein the first meanderline element comprises two substantially parallel elongated segments oriented substantially parallel to the ground plane and substantially parallel to the top plate.

41. The antenna of claim 29 further comprising a feed element.

42. The antenna of claim 41 wherein the feed element extends from the top plate in a the direction of the ground plane, and wherein the ground plane is disposed on a dielectric substrate, and wherein the dielectric substrate comprises a conductive feed region insulated from the ground plane and for electrical connection to the feed element.

43. The antenna of claim 29 wherein the second meanderline element is oriented between the sidewall and the first meanderline element.

44. The antenna of claim 29 wherein the sidewall comprises a first segment disposed at a substantially right angle from the top plate and a second segment connected to the first segment and disposed at substantially a right angle from the first segment.

45. An antenna for connecting to a spaced-apart ground plane for transmitting and receiving radio frequency energy, comprising;

a conductive sheet defining a slot therein, wherein the sheet further comprises one or more edges and a first and a second region thereof;

a sidewall extending from a sheet edge in a direction toward the ground plane when the antenna is operative with the ground plane; and

wherein when operative with the ground plane the first region is disposed opposite the ground plane and the second region extends beyond an edge of the ground plane.

46. The antenna of claim 45 wherein the sidewall extends from the second region.

47. The antenna of claim 24 further comprising a shorting element extending from the first region for electrically connecting the top plate to the ground plane.

48. The antenna of claim 46 wherein the slot defines a spiral shape.