CLAIMS

What is claimed is:

1. An antenna comprising:

a substrate;

a first antenna structure operating over a predetermined frequency range formed upon the substrate, comprising a first pattern upon a first surface of the substrate and a first ground plane formed upon a second surface of the substrate opposite the first surface of the substrate;

a second antenna structure operating over the predetermined frequency range formed upon the substrate, comprising a second pattern upon the first surface of the substrate and a second ground plane formed upon the second surface of the substrate;

a first feed structure electrically coupled to the first antenna structure and a first input feed; and

a second feed structure electrically coupled to the second antenna structure and a second input feed, wherein

the first antenna structure and the second antenna structure are disposed at 90° relative to each other relative to an axis of the substrate; and

the first input feed and the second input feed are aligned and are disposed parallel to either side of an axis of the substrate;

each of the first antenna structure and the second antenna structure comprises:

a loop structure; and

a loop feed structure comprising a differential feed comprising a pair of ports coupled to either end of the loop; and

at least one of:

a stub-line filter formed as a notched region within a parasitic element;

a first slot-line filter formed within an edge portion of the first ground plane beneath the differential feed of the first antenna element; and

a second slot-line filter formed within an edge portion of the second ground plane beneath the differential feed of the second antenna element.

~~2. The antenna according to claim 1, wherein~~

each of the first antenna structure and the second antenna structure comprises:

a loop structure; and

a loop feed structure comprising a different feed comprising a pair of ports coupled to either end of the loop.

3. The antenna according to claim 1, wherein

the first input feed and second input feed are each coupled to a different output port of a switch;

an input port of the switch is coupled to a first output port of a rat-race hybrid balun;

a pair of input ports of the rat-race hybrid balun are coupled to different ports of a RF signal processing circuit; and

a second output port of the rat-race hybrid balun is terminated in a predetermined impedance allowing a common mode of the rat-race hybrid balun to be absorbed.

4. The antenna according to claim 1, wherein

each of the first antenna structure and the second antenna structure comprises:

a loop structure;

a loop feed structure comprising differential ports coupled to either end of the loop;

a first parasitic element disposed within the center of the loop structure;

a second parasitic elements disposed to one side of the loop structure; and

a third parasitic elements disposed to the other side of the loop structure.

5. The antenna according to claim 2, further comprising

at least one of:

a stub-line filter formed as a notched region within first parasitic element;

a first slot-line filter formed within an edge portion of the first ground plane beneath the differential feed of the first antenna element; and

a second slot-line filter formed within an edge portion of the second ground plane beneath the differential feed of the second antenna element.

6. The antenna according to claim 4, further comprising

at least one of:

~~a stub-line filter formed as a notched region within first parasitic element;~~

~~a first slot-line filter formed within an edge portion of the first ground plane beneath the differential feed of the first antenna element; and~~

~~a second slot line filter formed within an edge portion of the second ground plane beneath the differential feed of the second antenna element.~~