CLAIMS

What is claimed is:

1. A compressible dielectric standoff configured to mount at least one antenna on a ground plane of an antenna assembly, the compressible dielectric standoff comprising:

a ground plane end configured to contact the ground plane; and

at least one antenna end configured to contact the at least one antenna;

a resilient frame extending between the ground plane end and the at least one antenna end;

wherein the compressible dielectric standoff is movable between a compressed state in which the ground plane end is spaced apart from the at least one antenna end a first distance, and an expanded state in which the ground plane end is spaced apart from the at least one antenna end a second distance, the first distance being smaller than the second distance.

2. The compressible dielectric standoff according to claim 1, wherein the resilient frame includes at least one resilient arm extending between the ground plane end and the at least one antenna end.

3. The compressible dielectric standoff according to claim 2, wherein the at least one resilient arm includes at least one resilient joint at which the at least one resilient arm is configured to bend.

4. The compressible dielectric standoff according to claim 2, wherein the at least one resilient arm includes two or more maximum compression stops configured to abut each other when the compressible dielectric standoff is in the compressed state and prevent the ground plane end and the at least one antenna end from being spaced apart less than the first distance.

5. The compressible dielectric standoff according to claim 2, wherein the at least one resilient arm has a serpentine shape.

6. The antenna assembly according to claim 13, wherein the maximum expansion lock includes a flexible thread attached to and extending between the ground plane end and the at least one antenna end, a length of the flexible thread between the ground plane end and the at least one antenna end being the second distance.

7. The antenna assembly according to claim 13, wherein the maximum expansion lock includes a semi-rigid arm extending between the ground plane end and the at least one antenna end, a length of the semi-rigid arm between the ground plane end and the at least one antenna end being the second distance.

8. The antenna assembly according to claim 7, wherein the semi-rigid arm is configured to bend upon a compression force sufficient to move the compressible dielectric standoff from the expanded state to the compressed state and is configured to resist bending upon an incidental force that is less than the compression force.

9. The compressible dielectric standoff according to claim 1, further comprising an anti-buckling mechanism configured to resist movement of the compressible dielectric standoff from the expanded state to the compressed state upon an incidental force that is less than a compression force sufficient to move the compressible dielectric standoff from the expanded state to the compressed state.

10. The compressible dielectric standoff according to claim 16, further comprising:

a first dielectric standoff portion extending from the ground plane end to the first stacked antenna end; and

a second dielectric standoff portion extending from the first stacked antenna end to the second stacked antenna end.

11. The compressible dielectric standoff according to claim 10, further comprising:

a spring embedded in the first dielectric standoff portion;

wherein the second dielectric standoff portion contacts the spring embedded in the first dielectric standoff portion at the first stacked antenna end such that when the compressible dielectric standoff moves from the expanded state to the compressed state, the second dielectric standoff portion compresses the spring.

12. The compressible dielectric standoff according to claim 11, wherein an outer diameter of the second dielectric standoff portion is less than an inner diameter of the first dielectric standoff portion.

13. An antenna assembly, comprising:

a ground plane;

at least one compressible dielectric standoff mounted on the ground plane;

at least one antenna mounted on the at least one compressible dielectric standoff such that the at least one antenna is spaced apart from the ground plane; and

a maximum expansion lock configured to prevent a ground plane end and at least one antenna end from being spaced apart more than a second distance;

wherein the at least one compressible dielectric standoff is moveable between a compressed state in which the ground plane is spaced apart from the at least one antenna a first distance, and an expanded state in which the ground plane is spaced apart from the at least one antenna the second distance, the first distance being smaller than the second distance.

14. An antenna assembly array, comprising:

a first antenna assembly, including:

a first ground plane;

at least one first compressible dielectric standoff mounted on the first ground plane; and

at least one first antenna mounted on the at least one first compressible dielectric standoff such that the at least one first antenna is spaced apart from the first ground plane; and

a second antenna assembly, including:

a second ground plane;

at least one second compressible dielectric standoff mounted on the second ground plane;

at least one second antenna mounted on the at least one second compressible dielectric standoff such that the at least one second antenna is spaced apart from the second ground plane;

wherein the at least one first compressible dielectric standoff and the at least one second compressible dielectric standoff are moveable between a compressed state in which the at least one first antenna and the at least one second antenna are respectively spaced apart from the first ground plane and the second ground plane a first distance, and an expanded state in which the at least one first antenna and the at least one second antenna are respectively spaced apart from the first ground plane and the second ground plane a second distance, the first distance being smaller than the second distance; and

wherein the antenna array assembly is moveable between a reduced-volume state in which the second antenna assembly is stacked over the first antenna assembly

such that the at least one first antenna and the at least one second antenna contact each other in a face-to-face relationship and hold the at least one first compressible dielectric standoff and the at least one second compressible dielectric standoff in the compressed state, and an expanded-volume state in which the second antenna assembly is not stacked over the first antenna assembly such that the at least one first compressible dielectric standoff and the at least one second compressible dielectric standoff are in the expanded state.

15. The antenna assembly array according to claim 14, wherein in the expanded-volume state, the second antenna assembly is laterally adjacent the first antenna assembly with a flexible panel-to-panel interface connecting the first ground plane of the first antenna assembly to the second ground plane of the second antenna assembly.

16. A compressible dielectric standoff configured to mount at least one antenna on a ground plane of an antenna assembly, the compressible dielectric standoff comprising:

a ground plane end configured to contact the ground plane; and at least one antenna end configured to contact the at least one antenna, wherein the at least one antenna end includes:

a first stacked antenna end configured to contact a first stacked antenna; and

a second stacked antenna end configured to contact a second stacked antenna stacked above the first stacked antenna;

means for moving the compressible dielectric standoff between a compressed state in which the ground plane end is spaced apart from the at least one antenna end a first distance, and an expanded state in which the ground plane end is spaced apart from the at least one antenna end a second distance, the first distance being smaller than the second distance.