

CLAIMS

1. A wave phased array manufactured using additive manufacturing technology (AMT), the wave phased array comprising:
 - a radiator;
 - a radiator dilation layer supporting the radiator;
 - a beamformer supporting the radiator dilation layer;
 - a beamformer dilation layer supporting the beamformer; and
 - a substrate support layer supporting the beamformer dilation layer,wherein at least one of the radiator, the radiator dilation layer, the beamformer, the beamformer dilation layer and the substrate support layer is fabricated at least in part by an AMT process.
2. The wave phased array of claim 1, wherein the radiator includes a spiral antenna.
3. The wave phased array of claim 2, wherein the radiator further includes a vertical launch surrounding feed lines for the spiral antenna.
4. The wave phased array of claim 3, wherein the radiator further includes Faraday walls disposed around the feed lines and the vertical launch.
5. The wave phased array of claim 4, wherein the wave phased array is configured to produce an electromagnetic signal having a frequency in the range of 24 GHz to 75 GHz.
6. The wave phased array of claim 4, wherein the wave phased array is configured to produce an electromagnetic signal having a frequency of approximately 30 GHz.

7. The wave phased array of claim 1, wherein the radiator has a thickness of approximately 97 mils.

8. The wave phased array of claim 7, wherein the radiator dilation layer has a thickness of approximately 23 mils.

9. The wave phased array of claim 8, wherein the beamformer has a thickness of approximately 52 mils.

10. The wave phased array of claim 9, wherein the substrate support layer embodies chips and DC logic and has a thickness of approximately 6 mils.

11. The wave phased array of claim 1, wherein the wave phase array has a total thickness of approximately 177 mils.

12. An AMT process for fabricating a wave phased array including a radiator, a radiator dilation layer supporting the radiator, a beamformer supporting the radiator dilation layer, a beamformer dilation layer supporting the beamformer, and a substrate support layer supporting the beamformer dilation layer.

13. The process of claim 12, wherein process steps include at least one of the following: milling; conductive ink deposition; and lamination under CAD control.

14. The process of claim 12, wherein the wave phased array is configured to produce an electromagnetic signal having a frequency in the range of 24 GHz to 75 GHz.

15. The process of claim 12, wherein the wave phased array is configured to produce an electromagnetic signal having a frequency of approximately 30 GHz.

16. The process of claim 12, wherein the radiator has a thickness of approximately 97 mils.

17. The process of claim 16, wherein the radiator dilation layer has a thickness of approximately 23 mils.

18. The process of claim 17, wherein the beamformer has a thickness of approximately 52 mils.

19. The process of claim 18, wherein the substrate support layer embodies chips and DC logic and has a thickness of approximately 6 mils.