CLAIMS:

1. An antenna device comprising: a conformal antenna body which has a desired geometry corresponding to a front portion of a platform on which the antenna device is to be mounted; an antenna unit carried by the antenna body, the antenna unit comprising at least one phased array of antenna elements, the antenna elements of each phased array being arranged in a spaced-apart relationship in a closed loop path along a circumference of the antenna body having a desired geometry corresponding to a front portion of platform on which the antenna unit is to be mounted, each of the antenna elements is configured as an end-fire antenna element capable of emitting linearly polarized radiation, the array of the antenna elements being thereby operable as a forward looking end-fire antenna array; and

a phase controller circuit configured and operable to control phases of all the antenna elements in each antenna array to provide a desired boresight of the antenna array in accordance with a selected radiation direction, thereby enabling electronic steering of an antenna beam produced by all the antenna elements of said at least one phased array by controllably modifying phases of the antenna elements of said at least one phased array.

2. The antenna device according to claim 1, wherein the antenna body has a substantially cylindrical shape, and the antenna unit is spaced a predetermined distance from a base region of the cylindrical antenna body.

3. The antenna device according to claim 1, wherein the antenna body has a substantially conical shape, and the antenna unit is spaced a predetermined distance from an apex region of the antenna body.

4. The antenna device according to claim 1, wherein the antenna body is configured as at least a part of a substantially spherical shape.

5. The antenna device according to claim 1, wherein the antenna body is made of a metallic material.

6. The antenna device according to claim 1, wherein the antenna elements in the antenna array are equally spaced from one another along said closed loop path.

7. The antenna device according to claim 1, wherein the antenna unit comprises two or more of the antenna arrays arranged in a spaced-apart relationship along the antenna body.

8. The antenna device according to claim 7, wherein the different antenna arrays have the same number of antenna elements.

9. The antenna device according to claim 7, wherein the antenna arrays comprise arrays having different number of antenna elements.

10. The antenna device according to claim 1, wherein the phase controller is configured and operable for providing a predetermined phase pattern of the antenna array resulting in a circular polarization of the antenna radiation of said antenna elements.

11. The antenna device according to claim 1, wherein the phase controller is configured and operable to control the phases of all the antenna elements in the antenna array such that the phases of the antenna elements in the array are shifted one with respect to the other along a circular direction, and each successive antenna element in said direction has a phase shifted by a predetermined value with respect to a preceding antenna element.

12. The antenna device according to claim 11, wherein the phase shift $\Delta\varphi$ between each two successive antenna elements is determined as $\Delta\varphi=2\pi/n$ for the antenna array of n elements.

13. The antenna device according to claim 11, wherein said phase pattern corresponds to the antenna unit operation in a forward-looking direction.

14. The antenna device according to claim 1, wherein the phase controller is configured and operable to control the phases of all the antenna elements to be substantially the same, for each radiation direction in an angular range of up to 30 degrees of radiation directions.

15. The antenna device according to claim 1, wherein the phase controller is configured and operable to control the phases of all the antenna elements to be substantially the same, for each radiation direction in an angular range of 30 degrees or higher, for circular or arbitrary linear polarization of the antenna radiation.

16. An antenna device, comprising:

a conformal antenna body which has a desired geometry corresponding to a front portion of a platform on which the antenna device is to be mounted;

an antenna unit carried by the antenna body, the antenna unit comprising at least one phased array of antenna elements, the antenna elements of each array being arranged in a spaced-apart relationship in a closed loop path along a circumference of the antenna body having a desired geometry corresponding to a front portion of platform on which the antenna unit is to be mounted, each of the antenna elements is configured as an end-fire antenna element capable of emitting linearly polarized radiation, the array of the antenna elements being thereby operable as a forward looking end-fire antenna array; and

a phase controller circuit configured and operable to control phases of all of the antenna elements in the antenna array providing a predetermined phase pattern of the antenna array resulting in a circular polarization of the antenna radiation of said antenna elements of said array, to provide a desired boresight of the antenna array in accordance with a selected radiation direction, thereby enabling electronic steering of an antenna beam by controllably modifying phases of the antenna elements of the array.

17. An antenna device, comprising:

a conformal antenna body which has a desired geometry corresponding to a front portion of a platform on which the antenna device is to be mounted;

an antenna unit carried by the antenna body, the antenna unit comprising at least one phased array of antenna elements, the antenna elements of said at least one phased array being arranged in a spaced-apart relationship in a closed loop path along a circumference of the antenna body having a desired geometry corresponding to a front portion of platform on which the antenna unit is to be mounted, each of the antenna elements is configured as an end-fire antenna element capable of emitting linearly polarized radiation, the array of the antenna elements being thereby operable as a forward looking end-fire antenna array; and

a phase controller circuit configured and operable to control phases of all the antenna elements in each antenna array to provide a desired boresight of the phased array in accordance with a selected radiation direction, thereby enabling electronic steering of an antenna beam produced by all the antenna elements of said at least one phased array

by controllably modifying phases of the antenna elements of said at least one phased array;

wherein the phase controller is configured and operable to control the phases of all the antenna elements to be substantially the same, for each radiation direction in an angular range of up to 30 degrees of radiation directions.