CLAIMS:

1. An antenna device, comprising: a conformal antenna body which has a selected geometry corresponding to a front portion of a platform having a platform nose on which the antenna device being mounted; and an antenna unit carried by the conformal antenna body, the antenna unit including 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 conformal antenna body having a proper geometry corresponding to a front portion of platform on which the antenna unit being mounted, wherein: each of the antenna elements of said at least one phased array is configured as an elongated end-fire antenna element having a boresight parallel to the elongated surface thereof and being capable of emitting linearly polarized radiation; each of the end-fire antenna elements of said at least one phased array extends along a longitudinal axis of the body; each of the end-fire antenna elements of said at least one phased array is associated with a respective operational module comprising a phase shifting utility; and the entire phased array of the end-fire antenna elements being operable as a forward looking end-fire antenna array producing an antenna beam in a generally forward-looking direction relative to the platform nose, enabling electronic steering of the antenna beam produced by the entire phased array by controllably modifying phases of the antenna elements of the phased array to provide a predetermined phase pattern of a proper radiating beam in accordance with a selected radiation direction around said generally forward-looking direction.

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

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

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

5. The antenna device according to claim 1, wherein the conformal antenna body has a distal conical portion and a proximal tubular portion, the antenna elements of said at least one phased array being arranged in at least one of the distal or proximal portions of the conformal antenna body, being spaced a predetermined distance from an apex region of the conical distal portion.

6. The antenna device according to claim 1, wherein the antenna unit includes two or more of the antenna arrays arranged in a spaced-apart relationship along a longitudinal axis of the conformal antenna body.

7. The antenna device according to claim 6, wherein adjacent antenna elements of the two or more of the antenna arrays are arranged in a chess-like fashion.

8. The antenna device according to claim 1, further comprising a phase control circuit in communication with the operational modules of the antenna elements for controlling phases of all the antenna elements of each of the at least one phased array of the end-fire antenna elements to provide a predetermined phase pattern providing a proper radiating beam of the antenna unit in accordance with a selected radiation direction.

9. The antenna device according to claim 8, wherein the phase control circuit is configured and operable to selectively carry out one of the following: (i) for each radiation direction in an angular range from about zero up to about 40 degrees of radiation directions, providing a predetermined phase pattern of the at least one phased array of the end-fire antenna elements resulting in a circular polarization of the antenna radiation of said antenna elements; or (ii) for each radiation direction in an angular range of about 40 degrees or higher, providing a predetermined phase pattern of the at least one phased array of the end-fire antenna elements resulting in circular or arbitrary linear polarization of the antenna radiation.

10. The antenna device according to claim 8, wherein the phase control circuit is configured and operable to provide a predetermined phase pattern of the at least one phased array of the end-fire antenna elements for each radiation direction in an angular range from about zero up to about 40 degrees of radiation directions, said phase control circuit operating to shift the phases of the end-fire antenna elements in the phased array one with respect to the other along a circular direction, such that each successive antenna element in said direction has a phase shifted by a predetermined value with respect to a

preceding antenna element, resulting in a circular polarization of the antenna radiation of said antenna elements.

11. The antenna device according to claim 8, wherein the phases of the end-fire antenna elements in the phased array are shifted by a phase shift $\Delta\varphi$ between each two successive antenna elements in the antenna array of n elements array a value determined as $\Delta\varphi=2\pi/n$.

12. The antenna device according to claim 10, wherein the phases of all the end-fire antenna elements in the phased array are controlled to be similar, for each radiation direction in an angular range from about zero up to about 40 degrees of radiation directions.

13. The antenna device according to claim 8, wherein the phases of all the antenna elements are controlled to be similar, for each radiation direction in an angular range of about 40 degrees or higher, for circular or arbitrary linear polarization of the antenna radiation.

14. The antenna device according to claim 1, further comprising an additional antenna unit comprising one or more phase arrays of antenna elements configured with a boresight perpendicular to a longitudinal axis of the conformal antenna body.

15. The antenna device according to claim 1, wherein each of said elongated end-fire antenna elements having the boresight parallel to the elongated surface thereof is configured as an end-fire waveguide dimensioned for propagating two orthogonal linearly polarized wave energy modes.

16. The antenna device according to claim 1, wherein each of said elongated end-fire antenna elements having the boresight parallel to the elongated surface thereof is configured to produce a radiation beam whose axis is either parallel to the longitudinal axis of the antenna element or makes an angle with said longitudinal axis other than 90 degrees.

17. The antenna device according to claim 1, wherein each of said at least one phased array formed by said elongated end-fire antenna elements having the boresight parallel to the elongated surface thereof is configured and operable such that all the antenna elements in said array emit radiation contributing to the predetermined phase pattern of the

radiating beam of the antenna array for each selected radiation direction around said generally forward-looking direction.

18. A sensing system, comprising: an antenna device; and one or more additional sensor device comprising at least one of optical and RF sensor elements; wherein the antenna device includes: a conformal antenna body which has a proper geometry corresponding to a front portion of a platform having a platform nose on which the antenna device is to be mounted; and an antenna unit carried by the conformal antenna body, the antenna unit comprising at least one phased array of antenna elements, the antenna elements of each of said at least one phased array being arranged in a spaced-apart relationship in a closed loop path along a circumference of the conformal antenna body having a proper geometry corresponding to a front portion of platform on which the antenna unit is to be mounted, wherein: each of the antenna elements of said at least one phased array is configured as an elongated end-fire antenna element having a boresight parallel to the elongated surface thereof and being capable of emitting linearly polarized radiation; each of the end-fire antenna elements of said at least one phased array extends along a longitudinal axis of the body; and each of the end-fire antenna elements of said at least one phased array is associated with a respective operational module comprising a phase shifting utility, the entire phased array of the end-fire antenna elements being operable as a forward looking end-fire antenna array producing an antenna beam in a generally forward-looking direction relative to the platform nose, enabling electronic steering of the antenna beam produced by the entire phased array by controllably modifying phases of the antenna elements of the phased array to provide a predetermined phase pattern of a proper radiating beam in accordance with a selected radiation direction around said generally forward-looking direction.

19. A platform having a front portion defining a platform nose, the platform comprising: an antenna device mounted on said front portion; the antenna device including: a conformal antenna body which has a proper geometry corresponding to a front portion of a platform having a platform nose on which the antenna device is to be mounted; and an antenna unit carried by the conformal 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 conformal antenna body having a proper geometry

corresponding to a front portion of platform on which the antenna unit is to be mounted, wherein: each of the antenna elements of said at least one phased array is configured as an elongated end-fire antenna element having a boresight parallel to the elongated surface thereof and being capable of emitting linearly polarized radiation; each of the end-fire antenna elements of said at least one phased array extends along a longitudinal axis of the body; and each of the end-fire antenna elements of said at least one phased array is associated with a respective operational module comprising a phase shifting utility, the entire phased array of the end-fire antenna elements being operable as a forward looking end-fire antenna array producing an antenna beam in a generally forward-looking direction relative to the platform nose, enabling electronic steering of the antenna beam produced by the entire phased array by controllably modifying phases of the antenna elements of the phased array to provide a predetermined phase pattern of a proper radiating beam in accordance with a selected radiation direction around said generally forward-looking direction.