Claims

1. A radar apparatus for a ship comprising,
a solid state transmitter and/or receiver enclosed within a housing, and an antenna coupled to the solid state transmitter and/or receiver, in which the external shape of the housing is substantially frusto-pyramidal and in which a bottom of the housing is defined at least in part by a re-entrant surface to improve structural rigidity of the housing.

2. A radar apparatus according to claim 1 comprising a solid state transmitter for generating pulses of energy enclosed within the housing, and
an antenna supported by the housing, the antenna being electrically coupled to the solid state transmitter for radiating the pulses of energy, in which the external shape of the housing is substantially frusto-pyramidal.

3. A radar apparatus according to claim 1 or 2 in which the external shape of the housing is a pentagonal-based, hexagonal-based, or heptagonal-based frusto-pyramid.

4. A radar apparatus according to claim 1, 2, or 3 in which the housing is shaped as a frusto-pyramid, the base of the frusto-pyramid being defined on a first plane, the housing having a top face defined on a second plane substantially parallel to the first plane, and a plurality of side faces angled at between 10 degrees and 35 degrees from a direction perpendicular to the first plane, preferably between about 12 degrees and 30 degrees from the direction perpendicular to the first plane, for example about 15 degrees from the direction perpendicular to the first plane.

5. A radar apparatus according to any preceding claim in which the housing has a monocoque structure in which the edges defining the frusto-pyramidal shape of the housing, and preferably at least three side faces of the housing, are a unitary component formed from a composite material, for example carbon fibre.

6. A radar apparatus according to any preceding claim in which the housing comprises means for electromagnetically shielding the solid state transmitter and/or receiver from the external environment.

7. A radar apparatus according to any preceding claim in which the external shape of the housing as defined by a top face and side faces is shaped as a first frusto-pyramid having a base defined on a first plane and side faces angled between 10 degrees and 35 degrees from a direction perpendicular to the first plane, the housing having a re-entrant

bottom surface substantially shaped as a second frusto-pyramid having the same base as the first frusto-pyramid and side faces angled between 45 degrees and 85 degrees from a direction perpendicular to the first plane.

8. A radar apparatus according to any preceding claim in which the solid state transmitter and/or receiver is mounted in contact with means for removing heat from the housing.

9. A radar apparatus according to any preceding claim, further comprising a motor located within the housing, the motor being mechanically coupled to the antenna for rotating the antenna, preferably in which the antenna is directly driven by the motor.

10. A radar apparatus according to claim 9 in which the motor is coupled to the antenna via a carbon-fibre composite yoke.

11. A radar apparatus according any preceding claim further comprising an inverter and/or an AC/DC convertor.

12. A radar apparatus according to any preceding claim in which at least one opening is defined through a side face of the housing, the at least one opening being closed by a removable panel.

13. A radar apparatus according to claim 12 in which one or more components of the apparatus are mounted on an internal surface of the removable panel such that the one or more component is removed from the apparatus when the removable panel is removed.

14. A radar apparatus according to any preceding claim in which communication to and from the apparatus is by means of optic fibre.

15. A radar apparatus according to any preceding claim having a total up-mast weight of less than 100 kg, preferably lower than 60 kg.