

What is claimed is:

1. A station keeping buoy system comprising:

a buoy having a housing which is at least partially submerged in a body of water;

a real time position determining means having a first antenna disposed on said buoy and joined to a receiver for receiving a global positioning signal;

said real time position determining means further having a differential global positioning system antenna joined to said receiver to correct global positioning signal error;

a navigation system disposed in said buoy and joined to said real time position determining means, said navigation system including a computer programmed with information about a preselected position for said buoy and capable of determining a positional difference between the real-time position of said buoy and a preselected position for said buoy, said navigation system generating a control signal representative of said positional difference; and

a propulsor joined to said buoy and responsive to said navigation system control signal for maneuvering said buoy to said preselected position and maintaining said buoy at said preselected position.

2. A station keeping buoy system comprising:

a buoy having a housing which is at least partially submerged in a body of water;

a real time positioning determining means having a first antenna disposed on said buoy and joined to a receiver for receiving a global positioning signal;

a navigation system disposed in said buoy and joined to said real time position determining means, said navigation system including a computer program with information about a preselected position for said buoy and capable of determining a positional difference between the real time position of said buoy and a preselected position for said buoy, said navigation system generating a control signal representative of said positional difference;

said navigation system further including a compass for determining the orientation of said buoy and for providing directional information to said navigation system to use in generating said control signal; and

a propulsor joined to said buoy and responsive to said navigation system control signal for maneuvering said buoy to said preselected position and maintaining said buoy at said preselected position.

3. The system of claim 2 wherein said propulsor comprises at least one thruster mounted to said housing.

4. The system of claim 3 wherein said at least one thruster is positioned at the hydrodynamic center of drag of said buoy.

5. The system of claim 3 wherein said propulsor comprises first and second thrusters arranged substantially perpendicular to each other, each said thruster providing bi-directional thrust in response to said control signal.

6. The system of claim 5 wherein said first thruster is positioned within a first conduit and said second thruster is

positioned within a second conduit and said first and second conduits are substantially perpendicular to each other.

7. The system of claim 6 wherein said first and second thrusters are each controlled, with respect to each other, in direction and amount of thrust for providing thrust in response to said control signal to minimize said positional difference.

8. The system of claim 5 further comprising a stabilizer fin positioned on the bottom of and extending below said housing and oriented to prevent said buoy from spinning.

9. The system of claim 3 further comprising at least one battery joined to provide power to said propulsor, said real-time position determining means, and said navigation system.

10. The system of claim 2 wherein said propulsor comprises a rotational vane thruster having a motor and impellers attached thereto, a directional vane having an outlet for directing the thrust produced by said motor, and a direction control motor for rotating said directional vane, said motor and said direction control motor being joined to said navigation system for providing thrust in response to said control signal to minimize said positional difference.

11. The system of claim 10 further comprising at least one battery joined to provide power to said propulsor, said real-time position determining means, and said navigation system.

12. The system of claim 10 further comprising a stabilizer fin positioned on the bottom of and extending below said housing and oriented to prevent said buoy from spinning.

13. The system of claim 2 wherein said housing includes: a primary floatation chamber for providing a majority of the total floatation of said buoy; and

a second floatation chamber positioned above said primary floatation chamber for providing the remainder of the total floatation of said buoy, whereby a majority of said buoy remains under the surface of said water.

14. The system of claim 2 further comprising a mast extending from said housing to a position above the water line, said first antenna being mounted to said mast.

15. The system of claim 14 further comprising: a radio frequency antenna mounted on said mast; and a receiver joined to said radio frequency antenna and said navigation system to provide command signals to said navigation system.

16. The system of claim 15 further comprising: a payload positioned in said buoy for obtaining data from the surrounding body of water; and a transmitter joined to said radio frequency antenna and in communication with said payload for transmitting said obtained data.

17. The system of claim 16 wherein said payload comprises:

a hydrophone for acquiring acoustical data; and a data processor joined to said hydrophone and to said transmitter for processing said acoustical data.

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