CLAIMS

1. An apparatus, comprising:

a keel;

a signal source coupled to a bottom portion of the keel; and

a wing coupled to a top portion of the keel and configured, when towed by a survey vessel through a body of water, to impart a force having lateral and vertical components that result from movement of the wing through the body of water;

wherein the wing includes a plurality of wing sections, wherein at least one of the plurality of wing sections is configured to separately rotate about a pivot point that couples the at least one of the wing sections to the keel.

2. The apparatus of claim 1, further comprising at least one actuator coupled to the wing and the keel, wherein the at least one actuator is operable to move the wing relative to the keel.

3. The apparatus of claim 1, wherein the wing is positioned such that a line passing through a longest direction of the wing is within 20 degrees of parallel to a centerline of the keel.

4. The apparatus of claim 1, wherein the wing is positioned such that at least a majority of a top surface of the wing is oriented within 20 degrees of parallel to a surface of the body of water when the apparatus is towed through the body of water.

5. The apparatus of claim 1, wherein the wing is directly coupled to the top portion of the keel.

6. The apparatus of claim 1, wherein the wing is coupled to the keel via a second pivot point, and wherein the wing is configured to rotate about the second pivot point in order to alter the lateral component of the force when towed through the body of water.

7. The apparatus of claim 1, wherein the wing is configured to slide along the keel.

8. The apparatus of claim 1, wherein one or more of the plurality of wing sections is configured to slide along the keel.

9. The apparatus of claim 1,

wherein the wing includes a forward wing section, a middle wing section, and an aft wing section;

wherein the forward and aft wing sections are rotatable relative to the keel; and

wherein the middle wing section is fixed relative to the keel.

10. The apparatus of claim 1, wherein the wing is further configured to impart a buoyant force to the signal source.

11. The apparatus of claim 1, wherein the signal source is not coupled to a signal source floatation device, and wherein the vertical component of the force is sufficient to maintain the signal source at a specified depth.

12. The apparatus of claim 1, wherein the apparatus is configured to adjust an effective tow point of a tow cable coupling the signal source to the survey vessel.

13. A method comprising:

towing a signal source through a body of water comprising a surface, wherein the signal source is coupled to a bottom portion of a keel; and

imparting a force to the signal source with a wing coupled to a top portion of the keel, wherein the force includes a lateral component and a vertical component;

wherein the wing includes a forward wing section, a middle wing section, and an aft wing section;

wherein the forward and aft wing sections are rotatable relative to the keel; and

wherein the middle wing section is fixed relative to the keel.

14. The method of claim 13, wherein imparting the force comprises using at least one of (1) a buoyant force acting on the wing in the body of water, and (2) water pressure caused by movement of the wing through the body of water.

15. The method of claim 13, wherein imparting the force comprises using both (1) a buoyant force acting on the wing in the body of water, and (2) water pressure caused by movement of the wing through the body of water.

16. The method of claim 13, wherein at least a majority of a top surface of the wing is oriented within 20 degrees of parallel to the surface of the body of water.

17. The method of claim 13, wherein a line passing through a longest direction of the wing is within 20 degrees of parallel to a centerline of the keel.

18. The method of claim 13, further comprising altering the lateral component of the force by rotating at least one section of the wing about a pivot point.

19. The method of claim 13, further comprising sliding the wing along the keel.

20. The method of claim 13, further comprising maintaining the signal source at a specified depth, wherein the signal source is not coupled to a signal source floatation device.

21. The method of claim 13, further comprising:

using a tow cable to tow the signal source from a survey vessel; and

using the lateral component of the force to maintain the signal source at a lateral displacement of at least 280 meters from a tow point on the survey vessel.

22. The method of claim 13, further comprising:

using a tow cable to tow the signal source from a survey vessel; and

using the lateral component of the force to maintain the signal source at a lateral displacement of at least one half of a deployed length of the tow cable.

23. The method of claim 13, further comprising:

towing the signal source from a survey vessel; and

adjusting an effective tow point of a tow cable coupling the signal source to the survey vessel.

24. A method, comprising:

towing a signal source through a body of water;

imparting a force to the signal source with a wing, wherein the wing is coupled to a top portion of a keel, and wherein the signal source is coupled to a bottom portion of the keel, and wherein the force includes at least one of a lateral component and a vertical component;

determining a desired lateral component and a desired vertical component of the force; and

adjusting an orientation of the wing to achieve the desired lateral component and the desired vertical component;

wherein the wing includes a plurality of wing sections, wherein at least one of the plurality of wing sections is configured to separately rotate about a pivot point that couples the wing to the keel.

25. The method of claim 24, wherein the adjusting includes rotating and/or sliding at least a portion of the wing.

26. The method of claim 24, wherein the adjusting includes separately rotating the at least one of the plurality of wing sections of the wing.

27. The method of claim 24, further comprising: adjusting a velocity of a survey vessel towing the signal source to achieve the desired lateral component and desired vertical component.