

A Aids to Navigation and Marine Safety

A1 Aids to Navigation

1 Canadian Aids to Navigation System and Private Buoy Regulations

CANADIAN AIDS TO NAVIGATION SYSTEM

The Canadian Aids to Navigation System is comprised of a mix of visual, aural and electronic aids to navigation which, when used singly or in combination, help the mariner to determine position and course, warn of dangers or obstructions and indicate the best or preferred route.

Visual Aids

Visual aids are short range aids to navigation including buoys, daybeacons, daymarks and lights. In Canada, a combined Lateral-Cardinal system of visual aids is used. Knowledge of the characteristics of each of these basic types of aids is a prerequisite to the safe use of the system.

Other Publications

For proper understanding and interpretation of their function, aids to navigation are to be used in conjunction with available marine publications, in particular, nautical charts, *List of Lights, Buoys and Fog Signals, Radio Aids to Marine Navigation, Sailing Directions*, the *Canadian Aids to Navigation System* booklet GPS/DGPS and the *Owner's Guide to Private Buoys*. Information concerning nautical charts and Sailing Directions may be obtained from the Canadian Hydrographic Service, Department of Fisheries and Oceans, Ottawa. (See Notice No. 14 for further details).

Retro-Reflective Material

Most buoys and many land-based aids are equipped with light retro-reflective material. This reflective material is coloured to signify the type or lateral significance of the aid and, for buoys at close range, displays the identification symbols, letters or numbers.

On lighted buoys, this material serves as a back-up to the light. On unlighted buoys, which are normally used in channels intended for daytime use, its role is to assist any vessel caught out after dark.

To make the best use of this retro-reflective material, the Canadian Coast Guard recommends that vessels depending on aids to navigation be equipped with searchlights to enable them to make use of this reflective material when necessary. It is recommended that large vessels be equipped with searchlights with at least 75,000 candelas, and small vessels carry a hand-held search light with at least a 3 watt bulb and 6 volt battery with a nominal power of 4,000 candelas.

Lateral Aids

The lateral system of buoyage in use in Canadian waters is IALA System B. Lateral aids may be in the form of either buoys or fixed aids. These aids indicate the location of hazards and of the safest or deepest water by indicating the side on which they are to be passed. The correct interpretation of lateral aids requires knowledge of the direction of buoyage known as the "upstream direction". The upstream direction is the direction taken by a vessel when proceeding from seaward, toward the headwaters of a river, into a harbour or with the flood tide. In general, the upstream direction is in a southerly direction along the Atlantic Coast, in a northerly direction along the Pacific Coast and in an easterly direction along the Arctic Coast. In some waters the upstream direction is indicated on the charts by the use of red lines and arrows.

When a vessel is proceeding in the upstream direction, starboard hand aids must be kept to starboard (right) and port hand aids must be kept to port (left).

Cardinal Aids

Cardinal aids may be in the form of either buoys or fixed aids.

However, their predominant use is in the form of buoys in the Canadian system.

Cardinal aids indicate the location of hazards and of the safest or deepest water by reference to the cardinal points of the compass. There are four cardinal marks, North, East, South and West, which are positioned so that the safest or deepest water is to be found to the named side of the mark (e.g. to the north of a north cardinal mark).

Aural Aids

Aural aids are sound producing devices which serve to warn the mariner of a danger under low visibility conditions. Such aids include buoy-mounted bells and whistles which are activated by wave action and fog signals on shore. Most fog signals are operated when visibility is reduced to less than two nautical miles.

Electronic Aids

The electronic aids used in the Canadian system include radar reflectors, radar beacons (RACONs), radio beacons, Global Positioning System (GPS), and Differential GPS (DGPS).

Radar reflectors are passive devices which are used to strengthen the radar image of aids to navigation, whereas RACONs are active devices which, by means of a coded radar image, provide precise identification of the location they are marking.

Radio beacons provide a medium range capability for homing and position fixing purposes as well as for hazard identification.

The Global Positioning System (GPS) is a world-wide satellite-based radio navigation system, which transmits information that enables users equipped with suitable receivers, on land, at sea, or in the air, to establish their position, speed and time, at any time of the day or night and in any weather conditions.

Differential GPS is a method of improving the accuracy of the position derived from GPS receivers by correcting the inherent inaccuracies of the GPS signal and comparing it to a known geographic position.

Reference:

1. A detailed listing of all lighted visual aids and all fog signals is contained in the publication "List of Lights, Buoys and Fog Signals". <https://www.notmar.gc.ca/list-livre-en.php>
2. A detailed listing of all electronic aids is contained in the publication "Radio Aids to Marine Navigation" (DFO 5470 and 5471). <https://www.ccg-gcc.gc.ca/publications/mcts-sctm/ramn-arnm/index-eng.html>
3. A complete description of the Canadian aids to navigation system is contained in the publication "The Canadian Aids to Navigation System". <http://www.ccg-gcc.gc.ca/publications/maritime-security-surete-maritime/aids-aides-navigation/page01-eng.html>

PRIVATE BUOY REGULATIONS

The Private Buoy Regulations (PBR) defines a private floating aid as a buoy that is not owned by the federal government, a provincial government or a government agency.

The Canadian Coast Guard (CCG) considers any aid owned by a municipal government to be private.

In Canada, it is permissible for private individuals, clubs, corporations, municipal government or other groups to establish aids to navigation or mooring buoys for their own use. Such aids to navigation are known as "private aids" and those that are advertised in the List of Lights and on the charts are so identified. While private fixed aids may take a variety of forms, all private buoys must conform to the *Private Buoy Regulations*. These Regulations describe the colour, shape, size and markings required for each buoy as well as the responsibilities of the person(s) placing them. The requirements for the colour and shape of private buoys as well as their placement and use are the same as those for buoys provided by the Canadian Coast Guard. However, the identification markings used must conform to *the Private Buoy Regulations* rather than the number and letter identification system used by the Coast Guard.

Authority: Canada Shipping Act 2001, Private Buoy Regulations
Transport Canada (Navigation Protection Program)