INTERNATIONAL HYDROGRAPHIC ORGANIZATION

ORGANISATION HYDROGRAPHIQUE INTERNATIONALE

CHART STANDARDIZATION & PAPER CHART WORKING GROUP (CSPCWG)

[A Working Group of the Committee on Hydrographic Requirements for Information Systems – CHRIS]

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To CSPCWG Members Date 18 October 2007

Dear Colleagues,

Subject: Draft revision M-4 Section B-450 to B-479

In accordance with our Work Plan, we are continuing the revision of M-4 Part B-400 in sub-sections. Annex A to this letter is the first draft of the next sub-section, B-450 to B-479. As usual, we have used 'track changes', with marginal comments where an explanation is needed. It is hoped that there is sufficient explanation of the changes; if not, then additional explanation can be made available. Changes which are directly due to the conventions or improvements to the English are already 'accepted' (in blue) to avoid cluttering the track change column. Where we propose a non-conventional change however (eg 'shall' to 'should' or 'may'), this is shown as a track change for your attention.

It is acknowledged that some of the graphics need modernizing, or amendment. This has been indicated as a 'DID' comment at present. These amendments will be done when the final version is converted to *InDesign* for incorporation into M-4. Page set-up and other format issues will also be resolved at that time.

Particular changes or issues of note are as follows:

1. We have tried to make clear whether abbreviations are 'International abbreviations'.
2. **Should 'Or' and 'Am' be retained as INT abbreviations, and should there be an abbreviation for 'metal colour' structures**?
3. B-450.3 (& B-470.7): we have suggested a 'standard' arrangement for details at lights and buoys.
4. B-450.5: we have added some advice on 'charting considerations' for navigational aids.
5. Fog signals: we have made the descriptions of the various types more consistent with M-12 and also clarified when and when not to use the symbol R1.
6. B-455.1: we have added 'Bn' as an International abbreviation (as proposed by INT1 subWG).
7. B-455.7 & B-460.6: we have included an option to add single quotation marks, or an abbreviation for 'number' to beacon or buoy designations where it will aid clarity (ie to avoid the number being mistaken for a sounding).

8. **B-455.8: Is there any reason why radar reflectors should be shown on IALA beacons, when they are not shown on IALA buoys or buoyant beacons?**
9. B-456.1: we have removed the term 'stake' which is confusingly used twice. **Can we make the term 'withy' and its associated symbol obsolescent, in the interests of simplification?**
10. B-456.4: we have added that 'Ref' should also be used for Antarctic refuges. Eventually, this will be described more fully in section B-300.
11. **B-458: Has the time come to delete this specification and the associated entries in INT1?** (Perhaps retain the method of showing a measured distance).
12. **B-460.5 & B-462: some nations have specially designed 'ice buoys'. Is there a need for a separate symbol, or is the general 'pillar' buoy symbol sufficient?**
13. **B-462: There is a national symbol for a racing mark in use (a 'flag' topmark – eg DK Qb; UK Qd). Should this be adopted as an INT symbol?**
14. **B-462.8: Is there any reason to differentiate between IALA and non-IALA light floats?**
15. B-463.1, B-464.3, B-466.2f: The Emergency wreck buoy has been included, pending approval by IALA. The colour abbreviations for the buoy have been reversed from what was agreed at CSPCWG3, to conform to the convention stated at B-464.3.
16. B-466.1: we have deleted references to a colour 'patch' as that does not allow multiple flares for sectored lights on multi-colour charts. **Does any HO still use colour patches rather than flares?**
17. B-470.4: at CSPCWG3, we agreed that colour sector arcs should normally be placed within 30mm of a light star. However, on reflection, it seems that sector arcs are often usefully placed much further from a light (eg to avoid clutter, to embrace the feature it is covering). **Can we omit this 'rule' and leave the placing of coloured sector arcs to cartographic judgement, as with black dashed sector arcs?**
18. **B-470.5: can we remove the option to show lights just as a dot, in the interests of standardization?**
19. B-471.2 (and subsequent paragraphs): we have replaced the term 'class' of light with 'character', which is the more usual term for the 'rhythm' part of the light description. However, strictly, character also includes colour if any (according to IALA). 'Rhythm' itself cannot be used, as some light characters are not rhythmic, eg Fixed.
20. B-471.8: we have introduced a new 'symbol' for lights placed in a triangle formation, and also clarified how different coloured lights on the same structure should be charted.
21. **B-474.5: do Watch (station) buoys still exist? Do we still need this specification?**
22. B-475: we have moved the specifications about legends on sector arcs from B-475.5 (where it was located under the sub-title 'White fairway sectors flanked by red and green….') to B-475.2, where the correct sub-title already existed. It seems that these paragraphs had become misplaced in M-4. The sub-title at B-475.5 has also been simplified.
23. B-476.2: we propose a simplification for the charting of air obstruction lights. The existing specification provides no guide on what is 'high' or 'low' intensity. Also, we believe the use of Aero (for Aeronautical) in this context is incorrect. Also, using a light star in these cases precludes the use of the appropriate symbol for the structure, increasing the use of legends. INT1 will need amendment.
24. **B-478.1: Do 'Bearing lights' still exist, and if they do, is there any point in having a specification if they are not to be identified in any special way on charts?**

No IHO Technical Resolutions have been identified which are affected, or can be cancelled, by this revision.

I would be grateful if you would now examine Annex A, paying particular attention to the track changes and comment boxes and the changes highlighted above. I will assume that any changes which are not commented on can be incorporated into the draft revision without further WG consultation. There are also some specific questions arising (in bold above); these are repeated in the response form at Annex B.

Please send me your responses and any suggestions for improvements **by 13 December 2007.**

Yours sincerely,

Peter G.B. Jones,
Chairman

Annex A: Draft Revision of M-4 Part B-440 to B449 ~~(separate document)~~.
Annex B: Response form

Annex A to CSPCWG Letter 12/07

B-450 AIDS TO NAVIGATION, AUDIBLE (SOUND) AND VISUAL: GENERAL

In the following paragraphs, aids to navigation refer to man-made features specifically constructed to assist navigation. Audible (sound) and visual aids are divided into the following categories:

a. Fog signals, which are usually associated with a lighthouse, major floating light or buoy. Associated lettering may be upright or sloping, depending on whether the supporting structure is fixed or floating.

b. Beacons, cairns, towers, and minor fixed marks, specially erected for navigational purposes. Associated lettering should be upright.

c. Buoys, including minor light-floats. Associated lettering should be sloping.

d. Major floating lights. Associated lettering should be sloping.

e. Lights on fixed structures and lighthouses of all sizes. Associated lettering must be upright.

For electronic aids to navigation, see B-480 and for signal stations, see B-490.

B-450.1 Aids to navigation have **international abbreviations** for:

- Colours of lights exhibited and colours of structures (ie the bodies or topmarks of buoys and beacons and, where required, lighthouses); see B-450.2. In certain cases, as described under the different types of aids, colour abbreviations may be omitted.
- Types of fog signals; see B-452.
- Characteristics of lights; see B-466.2 and B-471.

B-450.2 **The international abbreviations for colour are:**

Principal colours (as used in the IALA system)				**Subsidiary colours** (if required)		
White	W	P11.1	Q5	Blue	Bu	P11.4
Black	B		Q2	Violet	Vi	P11.5
Red	R	P11.2	Q3	Amber	Am	P11.8
Green	G	P11.3	Q2	Orange	Or	P11.7
Yellow	Y	P11.6	Q3			

Colour abbreviations must be in capital letters in all cases except for the second letter of two-letter abbreviations. These abbreviations must be used for the colours of lights and structures.

B-450.3 **Legends and abbreviations associated with navigational aids** should be inserted as close as possible to the symbol, but clear of any coloured circles around it if possible. They should also be placed clear of navigationally important detail, eg outside the navigation channel for lateral buoys if possible. Legends should usually be arranged in the following order:

Light description, eg:	*Fl.G.3s*
Fog signal	*Whis*
Any designation	*No 2*
Electronic aid (in magenta)	*Racon(Z)*

For fixed lights, the name (if named separately from the feature on which it stands), may be the most important detail, and should be at the top of the list, see B-470.1 and B-470.7.

Commentaire [c1] : Consider including TH and NPL in draft distribution.

Supprimé : considered as

Supprimé : listed below

Supprimé : The

Supprimé : of the abbreviations for fog signals

Supprimé : the nature of

Supprimé : basic

Supprimé : etc

Supprimé : **Colours** of a

Supprimé : shall

Supprimé : **standardised**

Supprimé : when used

Supprimé : colours of bodies or topmarks of buoys and beacons (and lighthouses, where necessary); and¶ <#>¶ colours of lights exhibited

Supprimé : In certain cases, as described under the different types of aids, abbreviations may be omitted.¶

Supprimé : **standard**

Supprimé : **colour**

Supprimé : shall be

Supprimé : requirednecessary

Commentaire [c2] : May need to move under IALA if emergency wreck buoy approved

Commentaire [c3] : Should Or and Am be retained as INT abbreviations? Should there be an abbreviation for metals, eg steel or aluminum (silver, grey)?

Abbreviations for the colour of structures should be placed under the symbol if space permits.

B-450.4 **For information about buoyage systems**, including the IALA buoyage system which may also apply to fixed marks, see B-461.

B-450.5 **Charting considerations.** Charted aids to navigation should normally be updated by Notice to Mariners; including details that are of little or no use to the mariner may result in unnecessary chart maintenance. Whether to include particular aids and their detailed description must be part of a general assessment on how to portray an area at the chart scale; they should not be considered in isolation. For example:

- It would be inconsistent to include buoys in the upper reaches of an estuary if the depths were not shown in sufficient detail to navigate in that area of the chart. However, lights with ranges that will make them visible in areas that are navigable when using the chart should be included.
- If it is known that a channel is stable and the aids rarely moved or changed, they should be considered for inclusion on charts. However, if they are subject to frequent change it may be better to omit them, especially on smaller scales. In such cases, consideration should be given to the inclusion of a legend, eg:

'*Channel marked by buoys and/or beacons*'.

When considering the omission of aids from smaller scale charts, the following should be taken into account:

- Vessels may not carry all the largest scale charts but may be forced by circumstance (eg adverse weather, equipment malfunction) to approach the coast, perhaps to shelter in a bay or to reach a port or harbour, on a smaller scale chart.

- Though pilotage may be compulsory, the master is responsible for the safety of his vessel and should be provided with enough detail to safely monitor the performance of the pilot or to take over if necessary.

- If the chart is of sufficient scale to be used in an emergency, at least the principal lights, buoys and beacons should be shown, with the most important details (see B-472).

B-451 AUDIBLE (SOUND) FOG SIGNALS

The term 'fog signal' refers to the sound emitted, not the apparatus. Fog signals are short range navigational aids and are, for various reasons, unreliable as indicators of position. Their importance relative to other aids has declined but they are still considered useful for the safe navigation of vessels with very limited (or non-functioning) electronic equipment.

Brief details of the type and characteristics of fog signals may be shown on charts on which vessels may navigate within range of the fog signals. The type of fog signal should be indicated by a legend (see B-452), at least on buoys (see B-454).

If it is appropriate to show only the existence of a fog signal on charts, the magenta symbol R1 should be used (see B-452.8).

Fog signals on shore are usually described in List of Lights and Fog Signals (LL), unlike fog signals carried by buoys, which are not always listed in LL.

For fog detector lights, see B-477.

B-451.1 **Whether to chart a fog signal** depends on some definition of its probable range. IALA defines the 'usual' range of a fog signal as:

> 'the distance at which, in foggy weather, an observer has a 50% probability of hearing a sound signal when he is situated on the wing of a ship's bridge [on a vessel with an average ambient noise level]… in relatively calm weather, with no intervening obstacles'

Although not precise enough to chart, for the guidance of cartographers, the following 'usual' ranges are assumed;

- Powerful diaphone: 4 to 5 miles,
- Horn: up to 3 miles (but signals at harbour entrances are usually much weaker).
- Wave actuated bell or whistle: about 1/2 mile or less.

B-451.2 **The position** from which a fog signal is emitted is usually on a buoy, or close enough to a light to be treated as sounded from the same position of the light. In cases where a fog signal is **not** closely associated with a light, its position should be shown by a small position circle and the magenta symbol R1, with a name added if appropriate.

B-451.3 **Abbreviations** for type, characteristic and period of a fog signal are the same for all **automatic** signals, whether ashore or afloat. For wave actuated signals on buoys, see B-454.1.

B-451.4 **Reserve fog signals,** eg a gong sounded when the normal siren is not functioning, should not be charted. For wave-actuated signals on buoys sounded in conjunction with automatic signals, see B-454.3.

Supprimé : fairly

Supprimé : necessary

Supprimé : , and also of well-equipped vessels whose equipment is not functioning

Supprimé : However, nations wishing to

Supprimé : should do so preferably by using

Supprimé : rather than by a national abbreviation.

Supprimé : always

Supprimé : charting of

Supprimé : **The scale of charts on which fog signals** should be shown

Supprimé : there is

Supprimé : it from

Supprimé : is

Supprimé : be worth charting

Supprimé : but

Supprimé : as

Supprimé : shall

Supprimé : normally

B-452 TYPES OF FOG SIGNAL

It is impossible to indicate on charts all the variations in the sounds emitted but some major differences can be conveyed to the mariner by distinguishing the following types of fog signal. For more details of fog signals, see IHO publication M-12 'Standardization of List of Lights and Fog Signals'.

Where appropriate to include, the following **international abbreviations** or legends must be used. For clarity, at a navigational aid with a charted light, the legend or the symbol **R1** should be shown, but not both.

B-452.1 Explosive:

Explos **R10**

A sound signal produced by the detonation of an explosive charge. It is now mainly used as a reserve signal and, if so, should not to be charted.

B-452.2 Diaphone:

Dia **R11**

A generally powerful, one or two-tone sound (a one-tone sound ends in a suddenly lowered pitch known as a 'grunt'). It is produced by release of compressed air.

B-452.3 Siren:

Siren **R12**

A sound produced by the release of compressed air through a rotating disc. Power and pitch vary considerably; it may emit a wailing sound.

B-452.4 Horn:

Horn **R13**

A sound produced by a vibrating membrane or reed within a tube, it varies greatly in strength and pitch. The nautophone, reed, tyfon and klaxon are types of horn.

B-452.5 Bell:

Bell **R14**

A ringing sound with a short range. The apparatus may be operated automatically or by wave action.

B-452.6 Whistle:

Whis **R15**

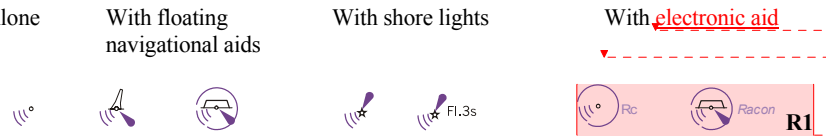
A shrill sound made by releasing compressed air or steam across an opening. The apparatus may be operated automatically or by air being forced up a tube by waves acting on a buoy.

B-452.7 Gong:

Gong **R16**

A sound produced by vibration of a disc, or discs, when struck. The apparatus may be operated automatically or by wave action.

B-452.8 Type of signal not stated. In these cases, the magenta symbol **R1** (oriented and placed as necessary for clarity) must be shown on the appropriate scale charts (see B-451.1). Examples of its use, alone or in conjunction with other aids to navigation are given below:



Supprimé : easily

Supprimé : Where a nation states the type of fog signal on its charts,

Supprimé : shall preferably

Supprimé : If the appropriate international abbreviation is used

Supprimé : may

Supprimé : omitted

Supprimé : , either discharged from a gun or in mid-air, shall be charted 'Explos' **R10**.

Supprimé : lowpitched

Supprimé : usually

Supprimé : controlled by a piston actuated by compressed air

Supprimé : rotary shutter

Supprimé : diaphragm

Supprimé : , by hand,

Supprimé : distinctive

Supprimé : sound made by a jet of air passing through an orifice.

Supprimé : , by hand,

Supprimé : by hand,

Supprimé : three arcs of concentric circles within an angle of 45°,

Supprimé : larger

Supprimé : radar or

Supprimé : radio station

Commentaire [c4] : DID: please change Rc to AIS

Commentaire [c5] : Submarine sound signals were obsolete in 1982, therefore consider they can be removed from M-4.

Supprimé : **B-452.9 Submarine sound signals** are no longer used.¶

B-453 FOG SIGNALS: RHYTHM AND PERIOD

The characteristic rhythm of fog signals (other than those actuated by waves, which are irregular) may be more important than their type when mariners are attempting to identify them. The number of sound emissions (eg blasts, strokes) and the period may be charted, as described below.

B-453.1 **A single sound (blast)** repeated at intervals should be shown by '(1)' following the type of signal, eg:

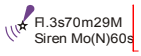
Horn (1).

Unless (1) is shown, it may not be clear to the mariner whether a single blast is implied or merely that the scale of the chart is considered too small to show the number of blasts. At a buoy, it also helps to distinguish from a wave-actuated sound signal, see B-454.1.

B-453.2 **Multiple sounds (blasts)** (other than Morse or composite signals) repeated at intervals must be shown by '(2)', '(3)', etc, following the type of signal, eg:

Horn (3)

B-453.3 **Morse code rhythms** must be shown by 'Mo' followed by the Morse letter in brackets, eg:



R20

B-453.4 **Composite rhythms** (other than Morse) where groups of blasts are sounded must be shown as eg:

Siren (2+3).

B-453.5 **The period** of a fog signal is the time taken for a complete sequence of sound emissions. Where space permits, it must be charted for major signals (and on the largest scale charts for minor signals where considered useful) following the number of blasts. The period must be given in seconds, even for periods of one minute or longer, eg:

Dia(1)30s Horn(2+3)90s.

B-454 FOG SIGNALS ON BUOYS

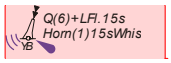
The existence of fog signals on buoys must be indicated by legends such as '*Bell*', '*Whis*' or '*Gong*' or the symbol **R1** . For general characteristics of buoys, see B-460 to B-469.

B-454.1 **Wave-actuated fog signals** have no regular rhythm and must be charted by a legend indicating the type of signal eg '*Bell*', '*Whis*', '*Gong*' against the buoy symbol, eg:

R21

B-454.2 **Fog signals operated automatically** should be charted on appropriate scales (see B-451.1) by a legend which includes the number of blasts (or strokes) and the period. Legends must follow the specifications in B-452 to B-453.

B-454.3 **Wave actuated signals in conjunction with automatic signals** should be charted as in the following example:



R22

Note: there is no R1 symbol included as there is already a light flare; see B-452.

Supprimé : well

Commentaire [c6] : The bit about not giving the characteristsics in conjunction with R1 is covered by B451.

Supprimé : together with the period if thought useful,

Supprimé : in the following paragraphs

Supprimé : In cases where the symbol **R1** is used, instead of an abbreviation for the type of signal, it is preferable **not** to give the characteristics of the signal (to avoid confusion with the characteristics of the lights with which most fog signals are co-located).

Commentaire [c7] : US and CA requested CSC to change the 'shall', as they do not consider it obligatory or necessary to show a single blast. However, the reasoning stated below remains good, so we have opted for 'should' rather than 'may'.

Supprimé : shall

Commentaire [c8] : DID: please delete the 3 arcs from the graphic.

Supprimé : rather than by the symbols for buoys' shapes,

Supprimé : the largest

Supprimé : , where space permits

Commentaire [c9] : DID: please delete the R1 fog arcs, and insert a space between 15s and Whis.

B-455 VISUAL AIDS: BEACONS AND DAYMARKS, IN GENERAL

The features described below are all types of fixed structures erected primarily in order to assist navigation by day. Most such features (except leading marks) are included in the IALA Maritime Buoyage system (see B-461). The specifications for IALA marks are given in more detail from B-460 onwards but generally also apply to those fixed marks which are part of the IALA buoyage system.

For natural and artificial landmarks, see B-340.
For lighted beacons, see B-457.
For buoyant beacons, see B-459.
For topmarks, see B-463.
For colours, see B-464.

B-455.1 **The term 'beacon'** and equivalents, eg 'balise','bake' **(international abbreviation 'Bn')** is used as a generic nautical term for a wide range of structures from simple poles to built-up towers. There are numerous other terms for particular types of beacon, but for the purposes of international standardization, such features should be classified primarily by their appearance and represented by symbols rather than legends. Where the appearance is not adequately known to the cartographer, a symbol for a 'beacon in general' must be used; see B-455.5.

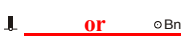
The term 'daymark' is used for a navigational aid (eg topmark) fixed to a structure which is not itself sufficiently visible or for a large unlit beacon. In North America, the term 'daybeacon' is also used. The following specifications for beacons apply equally to daymarks and daybeacons.

B-455.2 **Distinctive features.** Shapes and colours of beacons are standardized in the IALA Maritime Buoyage System (see B-461) but this standardization applies principally to topmarks, permitting great variations in the supporting structures. Beacons painted in distinctive colours and those having special topmarks should be charted in sufficient detail on the largest scale charts to permit positive identification.

B-455.3 **Upright symbols** and associated legends must be used for fixed structures to help distinguish them from floating spar buoys (which are less reliable for position fixing). Except for impermanent features (see B-456.1 and B-456.2), each symbol includes a small position circle (without central dot).

B-455.4 **Colours** of beacons must be indicated by the **international abbreviations** used for buoys (see B-450.2 and for placement see B-450.3).

B-455.5 The symbol for a **'Beacon in general'** is:



Q80

and must be used where:

- it adequately represents the feature,
- when the scale is too small to show additional detail,
- where the actual shape of the beacon is unknown.

The symbol (without legend 'Bn') should be used if space permits.

B-455.6 **Beacons situated above and below high water** must be charted by the same symbols, except for the special case of spars or poles placed on submerged rocks, where the following symbol may be used (topmarks as appropriate), eg:

Q83

Supprimé : eg perch, stake, stange, pfahl, espar, pricke, kummel, cairm

Supprimé : it is recommended that

Supprimé : shall

Supprimé : shall

Supprimé : generally

Commentaire [c10] : Is the term 'impermanent' appropriate?

Supprimé : shall

Supprimé : shall generally

Supprimé : same

Supprimé : as

Supprimé : shall be

Supprimé : it

Supprimé : No legend need be shown in the case of the pictorial symbol.

The symbol should be sloping to the right unless this is precluded by the need to avoid other detail.

B-455.7 **Numbered or lettered beacons** should, on at least the largest scales, have the numbers or letters placed alongside in upright figures, where space permits, in the form painted on the actual beacons if known. However, if necessary for clarity they may be surrounded by single quotation marks, or preceded by the abbreviation 'No' (for number) or equivalent. Where there is a sequence of numbered beacons, all the designations in the sequence should be depicted in the same manner.

B-455.8 **Radar reflectors** should not generally be charted on IALA system marks; see B-460.3 and B-465.

B-456 **SYMBOLS FOR VARIOUS TYPES OF BEACON**

Beacons conforming to the IALA Maritime Buoyage System should be represented by 'supports' and topmark symbols similar to those used for IALA buoys (see B-463.1) but upright instead of sloping (see B-455.6 for exception). The **international abbreviations** for colour (see B-450.2 and for placement see B-450.3) should also be used where appropriate and where space permits, with the order as for buoys (see B-464.3), eg:

Q81 Q82

The following illustrations cover 'non-standard' structures and indicate the type of structure on the left and the chart symbol (for the largest scales) on the right.

B-456.1 **Minor impermanent marks, usually in drying areas.** Perches, withies, poles, etc, without topmarks and usually marking one or both sides of minor channels should be charted by symbols as shown below. Alternatively, a legend, eg 'Marked by poles', or equivalent, may be shown.

Pole

Q90

PORT HAND STARBOARD HAND

Perch

Q91

Withy

Q92

B-456.2 **Minor marks, usually on land**

Cairns (piles of stones) should be charted by the symbol shown (on the largest scale charts). Most cairns have no navigational significance; those that do will usually be distinguished by a leading, clearing or transit line, see B-433.

Q100

Coloured (or white) marks on cliffs, rocks, walls, etc, should be charted by a fine outline of the

Supprimé : shown

Supprimé : shall

Commentaire [c11] : Is this last sentence true? Is there any reason why they should be charted on beacons but not buoys?

Supprimé : , OR DAYMARK

Supprimé : an upright

Supprimé : System

Supprimé : generally

Supprimé : IALA System format for

Commentaire [c12] : DID: the next sections, with peculiar sketch symbols, has already been reorganized in the current InDesign edition of M-4. This improved layout should be retained, although there are a few amendments to text to incorporate.

Commentaire [c13] : Is this the appropriate word here?

Supprimé : stakes

Supprimé : note

Supprimé : stakes'

Supprimé : Stake, pole

Supprimé : , stake

Commentaire [c14] : Withy is not listed in S32 (or The Mariner's Handbook). Propose make symbol obsolescent. Perch suffices. The term 'stake' also seems unnecessary and is confusing in appearing against two symbols.

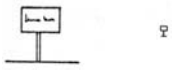
Supprimé : made of stones piles into a pyramidal shape,

patch and the international abbreviation 'Mk'. The actual colour may be shown, usually underneath, using the appropriate **international abbreviation**, see B-450.2

Q101

Notice boards indicating speed restrictions, cable landings, etc, may be charted, scale permitting, by the symbol shown. For leading beacons in the shape of painted boards, see B-456.3.

Supprimé : should be charted as beacons with rectangular topmarks and position circles to indicate the precise position;



Q126

B-456.3 **Beacons** are usually individually identifiable by colour and shape; in particular, they usually have distinctive topmarks. They should be charted by the 'Beacon in general' symbol Q80 plus topmark, unless one of the following special symbols is appropriate.

Supprimé : (proper)

International abbreviations for colour should be used, see B-450.2. On multi-coloured charts, the symbol (or just the topmark) may be shown in the actual colour, but the abbreviations will still be useful, as the colour may not be readily distinguishable under certain bridge lighting conditions. Illustrations of some typical beacons below show the appropriate symbol (for the largest scales) to the right of each drawing.

Supprimé : pictorially but in diagrammatic or simplified form with topmarks given prominence. **It is usually difficult to show coloration pictorially so**

Supprimé : normally

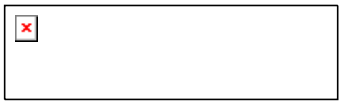
Supprimé : recommended

Q81

No distinctive topmark, so symbol for 'beacon in general' is used, with colour abbreviations.

Q102.1

Colour known or unknown. Topmark emphasised.



Q102.2

Commentaire [c15] : DID, please transfer graphic from existing M-4

Leading beacons consisting of **painted boards**. 'Stems' added to show that these are beacons.

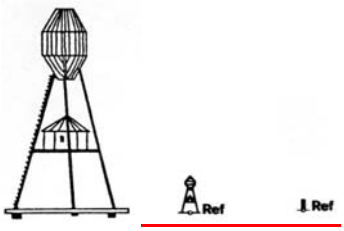
B-456.4 **Beacons which are major structures,** having a support as distinctive as the topmark, should be charted by individually designed pictorial symbols charted in their true position as shown below, or by pictorial sketch; see B-456.5, eg:

Beacon towers.

Q110

Commentaire [c16] : DID: please replace the rather fuzzy symbols by eps versions, in this whole section.

Refuge beacon, size at compiler's discretion, and with the **international abbreviation** 'Ref' (**T14**) alongside.



Q124

Note: This abbreviation should also be used for refuges in the Antarctic region.

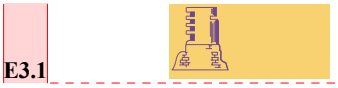
Lattice beacon.

Q111

B-456.5 **Beacons** with distinctive shape and colour may be shown by a small pictorial sketch, in black, with a small position circle showing the actual position of the beacon. Alternatively, a small pictorial sketch may be placed nearby, normally magenta but a different colour (other than black) may be used, and having no position circle at the base. (The use of colour is necessary to indicate that the sketch is not in its true position). If the sketch is placed some distance from the symbol (eg in a group of sketches), the name and geographic position of the beacon should be inserted in the same colour close to the sketch.

Supprimé : preferably magenta

Supprimé : Where it is cartographically necessary to displace a



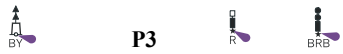
E3.1 **E3.2**

Commentaire [c17] : DID: insert the same graphic as in the latest M-4 edition, but removing the lighthouse. Also include a black version with a small position circle at the centre of the bottom, with number E3.1 alongside.

B-457 **LIGHT-BEACONS**

Some structures which may primarily be considered beacons (particularly those marking leading lines) also exhibit lights. On large-scale charts important light-beacons should be charted in such a way as to indicate the colour and shape of the features when used as daymarks, in addition to showing the characters of the lights exhibited.

B-457.1 **On large-scale charts** the same symbols as specified in B-456.3 and B-456.4 should be used for lighted beacons, but with small light stars in place of position circles, except for beacon towers, eg:



P3 **P4** (see also Q7 and 8)

Commentaire [c18] : This exception is current practice. Does anyone know why and is there any reason to change it?

The details of the light character are charted in the usual way, see B-471.

B-457.2 **On smaller scale charts** on which navigation within recognition range of a beacon by day is unlikely, light beacons must be charted solely as lights (unless the scale is so small that they should be omitted altogether).

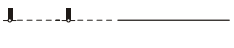
B-457.3 **Lighthouses,** ie large structures with distinctive shape and colour, must be shown as light stars (see B-470) but may in addition have a small pictorial sketch placed nearby, normally in magenta, but a different colour (other than black) may be used; see B-456.5.

E3.2

B-458 SPECIAL-PURPOSE BEACONS

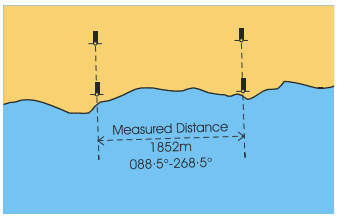
Beacons which conform to a standard shape and colour throughout a nation's waters may be charted in less detail (eg colour abbreviations may be omitted) where an adequate description of the standard system may be found in the Sailing Directions. The functions of beacons marking leading lines, cables, outfalls or measured distance should be clear from the associated line symbols; this is so there is no need for such legends as 'Cable Beacons', 'Leading Beacons', or equivalents.

As the IALA System is extended in application many special-purpose beacons will become yellow Special Marks.



Q120 Leading beacons

Q121 Beacons marking a clearing line



Q122 Beacons marking measured distance with quoted bearings

Q123 Cable landing beacon (example)

B-459 BUOYANT BEACONS

B-459.1 **A buoyant beacon** has a tall, spar-like body, fitted with a permanently submerged buoyancy chamber. The lower end of the body is secured to a seabed sinker either by a flexible joint or by a cable under tension. Other terms sometimes used for buoyant beacons include: resilient or elastic beacon, pivoted beacon, floating light-beacon, Sarus tower and articulated light. The beacon usually carries a light and topmark and conforms with the rules of the IALA Buoyage System. A buoyant beacon has very little freedom of movement; it does not rise and fall with the tide and normally remains in a vertical or nearly vertical position, so should be charted as other beacons, not as buoys.

B-459.2 **The symbols used for buoyant beacons** must be the same as those used for fixed beacons, eg:

Supprimé : where

Commentaire [c19] : So why add Bn or BnTr? No need, so symbols can be deleted.

Supprimé : ¶
BnTr P3 Bn P4¶
¶

Supprimé : nearly, but in a different colour

Commentaire [c20] : DID: Follow the instructions at B456.5, inserting black and magenta versions, but use the lighthouse sketch instead.

Supprimé : This practice is best suited to offshore lights.¶
¶

Commentaire [c21] : Is any of B-458 still relevant or is IALA system so widely in use to render it obsolete? Suggest we could delete (or reduce) section, and also Q120-121 in INT 1.

Commentaire [c22] : So presumably some do not. Should we state that they should be charted as beacons?

Supprimé : will conform

Supprimé : B

Supprimé : s

Supprimé : ve

The symbols used for buoyant light-beacons must be the same as those used for fixed light-beacons, eg:

P5

In all cases, the symbol and associated legends must be upright.

Radar reflectors should not normally be charted but the qualifications in B-465 'Radar reflectors on buoys', are appropriate for buoyant beacons also.

Supprimé : With

Supprimé : lettering

Supprimé : It is recommended that r

Commentaire [c23] : So why different from other beacons? Instructions about radar reflectors on buoys is at B-465 – but nothing about beacons.

B-460 VISUAL AIDS: BUOYAGE

The following paragraphs apply to navigational and special-purpose buoys, other than mooring buoys. For mooring buoys, see B-431.5-7 and B-445.4b.

Supprimé : Some of the remarks may not apply to spar buoys.

The physical characteristics of buoys affect charting practice and are therefore briefly described below.

All associated legends should be in sloping text.

B-460.1 **Buoy moorings** usually consist of a sinker and chain, the length of the chain being generally about three times the depth of water, where tides are significant. Accordingly, there may be a difference between flood and ebb positions of a buoy; this may be plottable at chart scale. Also, buoys are liable to drag their moorings out of position at times. **The position to be charted** is the position assigned by the buoyage authority. This is generally the mean of flood and ebb positions, and the position to which the mooring will be returned if the buoy is found to have dragged it away.

Supprimé : latter

B-460.2 **The body** of a buoy is principally a float which may be given a distinctive shape (see B-462), or may be a support for a superstructure which can be given a distinctive shape by means of lattice-work 'wings' or 'cages'. Some buoys, eg a fairway entrance buoy, have a tall superstructure to carry a light, fog signal, radar reflector, and possibly topmark. In such cases, the superstructure may not have been given any special shape; such buoys should be charted as pillar buoys, see B-462.5.

Supprimé : eg spherical

Supprimé : some

Supprimé : outer

Supprimé : it is recommended that

B-460.3 **Topmarks** are distinctively shaped for identification. Radar reflectors may be almost as prominent on buoys as topmarks, but are to be charted, if at all, solely by the special symbol S4, not as a topmark. In the case of the IALA Maritime Buoyage System, radar reflector symbols should be omitted; see B-465. Topmarks are liable to be damaged by ice, and may be omitted from buoys in areas which regularly freeze.

Supprimé : invariably

Supprimé : and may be intended either

Supprimé : of a particular buoy in a line of channel-marking buoys, or to be the principal means (other than colour and light-character) of showing where safe water lies in relation to the buoy

Supprimé : buoyage

Supprimé : it is recommended that

Supprimé : normally

B-460.4 **The size** of buoys varies with both the range of visibility required and the difficulties of the location (deep water and strong tidal streams need longer, heavier moorings and therefore larger floats). It is considered practicable to distinguish on charts between only two sizes of buoys (apart from major floating lights - see B-474, and spar buoys - see B-462.2):

a. 'Standard' buoys, including tall ones sometimes described as 'high focal plane'.

Supprimé : those

b. Superbuoys. Very large buoys, generally more than 5 m in diameter, which should be distinguished on charts because their unusually large size renders them a potential hazard even to large vessels and/or their function or attachments render them unusually costly, or are such that their destruction could result in a disaster. The three principal types of superbuoy are:

- Offshore tanker loading/discharge buoys, often known as single point moorings (SPM). (Very large floating offshore oil terminals, incorporating oil storage and regularly manned, should not be classified as superbuoys - they usually resemble fixed platforms rather than buoys: see B-445.2).

Supprimé : s (single point moorings).

Commentaire [c24] : May need to amend reference

- Certain very large oceanographic data acquisition systems (ODAS) buoys, usually moored in deep water, for the automatic collection of oceanographic and meteorological information. See B-462.9.

- Large automatic navigation buoys (LANBY) designed to take the place of a light vessel where construction of an offshore light station is not feasible. A Lanby generally has a principal dimension of 8m or more in the water-plane, and the elevation of the light is generally at least 10m above the waterline.

B-460.5 **Seasonal buoyage.** In certain waters many buoys and major floating lights are withdrawn for the duration of adverse seasonal conditions eg ice conditions in winter and heavy seas associated with

monsoons. Charts must show buoyage as found in summer or fair weather. Details of withdrawal in winter, heavy seas etc, should not normally be given on charts, although may be mentioned in a chart note. Their withdrawal and subsequent re-establishment is more usually the subject of a temporary Notice to Mariners.

Some buoys are laid in coastal waters as racing marks, or for other recreational purposes, in summer only. Such buoys may be charted with an appropriate legend, eg:

Q71

B-460.6 **Names or numbers** of buoys are normally painted on them. Names are sometimes abbreviated. Where space permits, the names, letters or numbers should be shown in sloping text, in the form painted on the buoys themselves if known, eg *Banc Fairy Sud, No3, NR3.E.* However, if necessary for clarity (eg to avoid the risk of a buoy number being mistaken for a sounding) numbers or letters may be surrounded by single quotation marks, or preceded by the abbreviation '*No*' (for number) or equivalent. Where there is a sequence of numbered buoys, all the designations in the sequence should be depicted in the same manner.

B-461 BUOYAGE SYSTEMS

Systems of buoyage are described as **lateral, cardinal,** or a combination of lateral and cardinal. Lateral systems depend on a **direction of buoyage** being defined, generally in accordance with the direction of the flood tide or an approach from seaward. The cardinal system depends solely on the main **points of the compass.**

Special-purpose buoys often mark the limits or centre of an area (eg an exercise area, a dumping ground) and do not necessarily have lateral or cardinal system characteristics.

B-461.1 **The 1936 Agreement for a uniform system of maritime buoyage,** commonly referred to as the 'Geneva Convention', provided for both lateral and cardinal systems. Its origins were an agreement in 1889 when some countries standardized on red conical buoys to mark the starboard hand and black can buoys to mark the port hand. Unfortunately, when lights for buoys were first introduced, some European countries placed red lights on the black port hand buoys to conform with the red lights to mark the port side of harbour entrances, whilst in North America red lights were placed on the red starboard buoys. The 1936 Agreement stated that lights should be red to port and white to starboard, but the USA and others were not signatories, and preferred their own system of using red lights and red daymarks to mark the starboard side of a channel.

The Geneva Convention was not ratified. However, aids established from 1946 onwards in Europe were broadly based on the Convention, though fairly wide differences in interpretation caused difficulties.

B-461.2 **The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA)** set up a committee in 1965 to harmonize the existing rules. By 1976 the rules for System 'A' (red to port) were completed and implementation began in 1977. The rules for System 'B' (red to starboard) were completed early in 1980 but were so similar to those for 'A' that the two were combined to become **'The IALA Maritime Buoyage System'**. Within the single system, lighthouse authorities are allowed the choice of using red to port or red to starboard on a regional basis, the two regions being known as Region A and B, respectively. To achieve this single set of rules some minor additions to System A rules were implemented. The new IALA System rules were adopted in November 1980.

IALA definitions are taken from the 'International Dictionary of Aids to Marine Navigation' published by IALA in several languages.

Supprimé : shall

Supprimé : ; nations should use their own discretion in charting such marks

Supprimé : Where s

Supprimé : are of real interest for navigation they

Commentaire [c25] : Some nations have a racing mark symbol, a buoy with flag topmark. Should we adopt as INT symbol?

Supprimé : It is recommended that on a

Supprimé : ll charts, w

Supprimé : basically

Supprimé : prevented by World War II but the

Supprimé : re-

Supprimé : which have

Supprimé : IALA (

Supprimé : proposed

B-461.3 **The IALA Maritime Buoyage System** details, including the extent of Regions A and B, are given in other publications. Although it is called a buoyage system, it applies to all fixed and floating marks except lighthouses, some sector lights, leading lights and marks, major floating lights and lights on offshore structures. The following specifications apply to both Regions.

B-461.4 **IALA System: Direction of buoyage.** The conventional direction of buoyage for lateral marks is defined by IALA as being governed by two principles:

> 'A direction specified for an area of sea or inland water in order to define the port and starboard sides of navigable water in the area. It may be indicated on charts or in other appropriate nautical documents. It is either:
>
> - the general direction taken by a vessel on approaching a harbour, river, estuary or other waterway from seaward, or
> - the direction determined by the appropriate authority, but it should be based wherever possible on the principle of following a clockwise direction around continents'.

Each hydrographic office should therefore consider issuing a suitable diagram (in Sailing Directions or elsewhere) to illustrate the second principle in its area of interest.

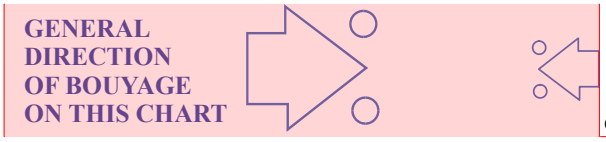
B-461.5 **Charting the Direction of buoyage.** On charts, the following assumptions are made:

1. In harbour approaches and estuaries, a knowledge of the first general principle quoted above, together with the channel buoy symbols, give competent navigators a clear indication of the conventional direction of buoyage without the need for a special arrow or other means of indication.

2. Isolated offshore buoys will generally be cardinal buoys (which do not depend on a conventional direction of buoyage).

3. Difficulties for navigators may arise:
   - if a lateral system is used in a one-way traffic lane where the direction of buoyage is opposed to the traffic direction;
   - where 'straight through' buoyage of a strait overrides the 'approach from seaward' convention;
   - where two opposing directions meet;
   - where the lateral system extends a long way offshore and, at its outer part, has a local direction opposed to the general direction (eg. as occurs in the northern part of the outer River Thames estuary in UK).
   - knowing which side to pass when confronted with a 'new danger' (described by IALA as one which has been marked by buoys but not yet charted).

For such potentially confusing situations, it is advisable to include a magenta symbol to indicate the direction of lateral buoyage. The symbol may be accompanied by an explanatory legend (in magenta), particularly if both general and local direction arrows are included on the same chart. The size of the arrows is at the discretion of the cartographer; however, usually a single 'general direction' arrow should be significantly larger than 'local direction' arrows.



Q130.2

On 'multi-coloured' charts (see B-140), the circles may be coloured red and green as appropriate.

Supprimé : The direction taken by the mariner when approaching a harbour, river, estuary or other waterway from seaward; or¶
¶
<#> . . 2. In other areas it should be determined in detail by the appropriate authority in consultation with neighbouring countries. In principle it should follow a clockwise direction around land masses.¶
¶
. . IALA further states

Supprimé : In all cases the conventional direction must be indicated in appropriate nautical document

Supprimé : will

Supprimé : need to issue

Supprimé : . . As far as

Supprimé : are concerned

Supprimé : herein

Supprimé : or

Supprimé : or

Supprimé : The mariner's problem is not that of interpreting charted buoyage (where the side to be taken is clear from the charted buoyage) but of

Supprimé : recommended (in magenta)

Commentaire [c26] : DID: please correct spelling of BUOYAGE.

B-462 SHAPES OF BUOYS

The principal shapes are those recommended in the IALA System, namely: conical, can or cylindrical, spherical, pillar and spar. As far as possible, variants of these basic shapes must be classified under these headings, for symbolization on charts. In practice, there will remain some additional shapes, eg minor light-floats and barrel buoys, which will require their own symbols. Special marks may have any shape 'not conflicting with navigational marks'.

B-462.1 **Features common to all buoys.** The position of the buoy must be indicated by a small circle (without central dot) in the middle of the base of the buoy symbol.

Q1

The buoy symbol must be a stylized pictorial representation of the actual shape seen in profile from sea level.

Buoy symbols, but not major floating lights, minor light-floats or super-buoys, should normally be shown sloping to the right. To avoid other detail, the slope may be varied in particular instances, but the base of the buoy symbol must always be horizontal.

B-462.2 **Conical.**

Q20

IALA definition:

> 'A buoy of which the part of the body above the waterline, or the greater part of the superstructure, has approximately the shape or the appearance of a pointed cone with the point upwards'.

A conical buoy indicates that the buoy should be left to starboard, when following the direction of buoyage. The '**ogival**' shape (a shape in profile like that of a pointed arch) and the American '**nun**' buoy must also be represented by the conical symbol.

The conical symbol must not be used for the type of tall framework structure used **solely** as a support for a light and other aids: for this type of buoy, see **Pillar** B-462.5.

B-462.3 **Can or cylindrical.**

Q21

IALA definition:

> 'A buoy of which the part of the body above the waterline, or the greater part of the superstructure, has the shape or the appearance of a cylinder, or of a truncated cone that approximates to a cylinder, with a flat end uppermost'.

A can buoy indicates that the buoy should be left to port, when following the direction of buoyage. Tall cylindrical spar buoys are not to be charted as can buoys; see B-424.6.

B-462.4 **Spherical.**

Q22

Supprimé : ¶
Nations adopting the new buoyage rules are recommended to adopt the standard symbols shown below.¶
¶

Supprimé : The reference 'IALA Dictionary', refers to the 'International Dictionary of Aids to Marine Navigation' published by IALA in several languages.¶
¶

Supprimé : elevation

Supprimé : shall preferably

Supprimé : France: Bouée conique. Germany: Spitztonne.

Supprimé : It is necessary to add to this definition the i

Supprimé : mportant point that this symbol must be used only where a buoy has a shape specifically designed to show on which side it should be passed

Supprimé : Gothic

Supprimé : The American '**nun**' buoy is a variation of the conical shape and should be represented by the conical symbol.

Supprimé : France: Bouée cylindrique. Germany: Stumpftonne.

Supprimé : (It may be added that t

Supprimé : -shaped)

Supprimé : France: Bouée sphérique. Germany: Kugeltonne.

IALA definition:

'A buoy of which the part of the body above the waterline, or the greater part of the superstructure, has the shape or the appearance of a part of a sphere'.

A spherical buoy indicates that it is safe to pass either side.

B-462.5 **Pillar.**

Q23

IALA definition:

'A buoy of which the part of the body above the waterline is a pillar, or of which the greater part of the superstructure is a pillar or a lattice tower'.

Buoys (other than spars) which are relatively tall in relation to their diameter, but otherwise have no distinctive shape, must be charted by the symbol shown. This symbol should be used for both 'high focal plane' and similar, smaller pillar buoys. In the cardinal system, most such buoys will be fitted with topmarks and many with lights.

The shape of a pillar buoy has no navigational significance.

B-462.6 **Spar.**

Q24

IALA definition:

'A buoy in the form of a pole, or a very long cylinder, floating upright'.

Many such buoys carry topmarks; a few carry lights; the representation of these is shown in B-466.

The term 'floating beacon' should not be used. See B-459 for Buoyant Beacons.

Spindle buoys are similar in shape to spar buoys, but pointed, and should be charted by the same symbol.

B-462.7 **Barrel.**

Q25

IALA definition:

'A buoy in the form of a barrel or cylinder floating horizontally'.

It may be used in the IALA Maritime Buoyage System, but only as a special mark. For mooring buoy symbols, see B-431.5.

B-462.8 **Light-float**, A boat-shaped structure used instead of a light buoy in waters where strong streams or currents are experienced, or when a greater elevation than that of a light buoy is necessary, eg:

Q30 (part of IALA System)

Q31 (not part of IALA System)

Supprimé : France: Bouée charpente; bouée pylône. Germany: Bakentonne.

Supprimé : France: Bouée espar. Germany: Spierentonne. Sweden: Prick.

Supprimé : If thought necessary, the spar symbol may be broadened slightly to show a distinction between an open (or partly open) symbol, and a black 'filled in' (or partly black) symbol.¶
¶
It is recommended that t

Supprimé : phrase

Supprimé : (France: Fuseau. Germany: Spindeltonne)

Supprimé : fairly

Supprimé : France: Bouée tonne. Germany: Fasstonne.

Supprimé : Minor l

Supprimé : typically 9 metres or less in length, are used in partially sheltered locations where the velocity of the tide or current renders a float preferable to a buoy

Commentaire [c27] : Is there still a need to distinguish between IALA and non-IALA floats?

Formerly, unmanned light vessels were called 'major light floats'. These are now charted as major floating lights, see B-474.

Supprimé : for larger light-floats serving as major floating lights

B-462.9 Superbuoy.

 **Q26**

Supprimé : The basic symbol

Very large buoys are referred to as 'superbuoys', see B-460.4b.

Supprimé : should be used for the v

Supprimé : for major floating lights (see B-474).

The purpose of an Ocean Data Acquisition System (ODAS) buoy should be indicated by a legend:

Q58

For a superbuoy used as a tanker loading mooring, see B-445.4b.

Supprimé : is

For major floating lights (see B-474).

B-463 TOPMARKS

Many different topmarks are used on buoys (and on beacons) but in the IALA System the variations are reduced to a few important shapes. The term 'daymark' may be used instead of 'topmark' in the US.

A topmark must be in the same orientation as the symbol to which it is attached, eg, a buoy topmark must slope at the same angle as the rest of the buoy.

B-463.1 IALA system - Topmarks

a. Cardinal marks have double topmarks. There must be a clear separation between each cone; in particular, two cones base to base must not be shown as a diamond shape. The topmarks are all black.

Supprimé : Examples of recommended symbols are shown.

Supprimé : painted

Supprimé : See also B-464.1.

 **Q9**

The order of the topmarks above is North, South, East, West. It helps to remember that the point of the cone reflects the position of the black band(s) on the body of the buoy (or beacon), eg for a west mark, the black band is in the middle.

b. Isolated danger marks, which indicate the location of an isolated danger of limited size that is completely surrounded by navigable water, have two black spheres, one above the other.

Supprimé : that there is

Supprimé : all around

Supprimé : , painted black

 **Q9**

c. Safe water marks, as used for centre-lines of channels or as landfall marks, may have a single red sphere as a topmark. Spherical buoys indicate by their shape that there is navigable water all around its position, so topmarks may be omitted on such buoys.

 **Q9**

d. Lateral marks may have a single can (cylindrical) topmark on the port hand and a single conical topmark (point up) on the starboard hand, coloured red or green as appropriate for Region A and Region B. Can and conical buoys indicate by their shape which is the correct side to pass, so for these buoys topmarks may be omitted. If the buoy does not have a distinctive shape, a topmark will usually be fitted.

Supprimé : ly

Supprimé : must

 **Q9**

The order of the topmarks above is Region A: port, starboard, Region B: port, starboard.

e. Special marks, not primarily intended to assist navigation but indicating a special area or feature, may have a single yellow 'X' shaped topmark.

 **Q9**

Special marks may also be used to mark Traffic Separation Schemes, or channels within channels (eg a DW route within a wider navigation channel marked by standard lateral buoys) or special purpose channels (eg for small craft).

f. Emergency wreck buoys, intended for the temporary marking of a new wreck (on trial 2007), may have a yellow standing/upright (cruciform) cross topmark.

Q9

Commentaire [c28] : DID, please create a new topmark, consisting of a cruciform style cross, sloping 15° to the right.

B-464 COLOUR OF BUOYS

These paragraphs refer only to the colour of buoy (or beacon) bodies, and any retroreflective material applied to them, but not to the colour of any lights exhibited.

Commentaire [c29] : Is this true? See INT 1 note at Q6

Supprimé : and topmarks

Where buoys are painted in more than one colour, 'stripes' are vertical (or exceptionally on non-IALA buoys, diagonal) and '**bands**' are horizontal.

Within the IALA buoyage system:

- red and green are used for lateral marks,
- yellow is used for special marks,
- black and yellow bands are used for cardinal marks,
- black and red bands are used for isolated danger marks,
- red and white stripes are used for fairway or safe-water buoys,
- blue and yellow stripes are used for the emergency wreck marking buoy (on trial 2007).

Supprimé : The mariner can deduce the colour of a charted buoy by several means: the shading in of the symbol by lines, dots, or solid colour (usually black); abbreviations for colours; the shape of the buoy or topmark which, with knowledge of the buoyage system, indicates the colour; and from reference to another document such as Sailing Directions.

B-464.1 **Colour representation** is effective in the case of black and open (unshaded) symbols. The old scheme of lines, dots and chequers to represent colour(s) is obsolete and should no longer be used, as it cannot satisfactorily be used for topmarks and some types of buoy symbols (eg spar buoys and most multi-coloured buoys). On multi-coloured charts, buoys may be shown in their actual colour, or follow the rules for 'standard' coloured charts, which are:

Supprimé : very

Supprimé : internationally agreed

Supprimé : principally, red, green, and yellow

a. A black (ie filled-in) symbol must be used to represent a black buoy and, where green and black buoys have exactly the same significance to a navigator, it must also represent a green buoy,eg:

 **Q2**

Supprimé : For the IALA System, and possibly other systems, it is recommended that:¶ ¶

Note: a spar buoy is always charted black, irrespective of its actual colour, eg:

Supprimé : It must also be used for all s

 **Q5**

b. An open symbol (ie unfilled outline) must be used to represent any other colour of buoy, or multi-coloured buoy (except spar buoys and some preferred channel buoys), eg:

 **Q3**

c. A buoy symbol with a single line from top to bottom must be used to represent a striped buoy (if it is an open symbol), eg:

Q5

d. No change is made to the buoy symbol to represent bands. This can be deduced from the multiple letter abbreviations, the topmark and lack of vertical line, eg:

Q4

e. **Preferred channel (or bifurcation) buoys** are modified lateral marks within the IALA system (ie green with red band, or red with green band). The symbol used should follow the lateral convention, ie a black symbol must represent a predominantly black or green mark, and an open symbol must represent a predominantly red mark, eg:

Q130.1

B-464.2 **International abbreviations for colours** are specified in B-450.2. Where there is insufficient space on charts for abbreviations, the topmarks alone (for cardinal buoys) or the black and open symbols (for lateral buoys) may be considered adequate to indicate colours, without abbreviations.

B-464.3 **Abbreviations for multiple colours on buoys** must be shown in accordance with the following conventions:

a. Where the colours are in bands the sequence of colour abbreviations must be from top to bottom, eg in the IALA System:

- a north buoy (black above yellow): *BY*
- an east buoy (black with single broad horizontal yellow band): *BYB*
- a south buoy (yellow above black): *YB*
- a west buoy (yellow with a single broad horizontal black band): *YBY*
- a preferred channel buoy: *GRG* or *RGR*.
- an isolated danger buoy (black with one or more broad horizontal red bands): *BRB*

Q4

Note: It helps to remember that the point of the topmark cone (for cardinal marks) reflects the position of the black band(s) on the body of the buoy (or beacon), eg for a north mark, the black band is at the top.

b. Where the colours are in stripes (vertical or diagonal) or the sequence of horizontal bands is not known, the darker colour is to be given first, eg in the IALA System:

- a safe water buoy (red and white vertical stripes): *RW*

Q5

- an emergency wreck marking buoy (blue and yellow vertical stripes): *BuY*

B-465 **RADAR REFLECTORS ON BUOYS**

B-465.1 **Areas where radar reflectors are fitted to most buoys.** In many areas of the world, radar reflectors are fitted to nearly all major buoys and to many minor ones. In such areas, the symbol for a radar reflector should not be shown on buoy symbols, to reduce the complexity of buoy symbols

Commentaire [c30] : DID, please add open can buoy with letters RGR, a open conical buoy with letters RGR and a filled in can buoy with letters GRG underneath. (There are examples in Q130.1)

Supprimé : shall be those

Supprimé : Mark

Commentaire [c31] : Order changed from that agreed at CSPCWG3, to conform with convention above.

Supprimé : As an aide-memoire, it may be noted that the black topmarks on a cardinal buoy are a 'pointer' to the position of the black bands on the body of the buoy, ie, N topmarks point up, and black is above yellow; E topmarks point up and down, and black is above and below yellow; and so on.

Commentaire [c32] : Need to decide if beacons also covered

Supprimé : commonly

Supprimé : , or abbreviation,

Supprimé : no longer

Supprimé : . It is considered that the value to the mariner of knowing from his chart whether any buoy has a radar reflector is outweighed by the cartographic difficulties: it is desirable

and associated legends.

In these areas, nations wishing to show the radar reflector symbol on **unlit** buoys may, exceptionally, do so but will need to insert on each chart a note explaining why they are not shown on light buoys.

B-465.2 **In other areas** where radar reflectors are not widely fitted to buoys, the existence of a radar reflector should be indicated by the symbol **S4** (in black), eg:

Q11

B-466 LIGHTED BUOYS

Some nations give full details of their light-buoys in their Lists of Lights and Fog Signals (LL); others do not. The largest scale charts should give rhythm, colour (unless white) and period of lights on buoys, if scale permits, irrespective of LL practice. Height and range should not generally be charted for buoys, except superbuoys (see B-466.4).

B-466.1 **The symbol for a lighted buoy** must be the same as that for an unlit buoy but with the addition of the light description and light flare symbol. Older buoy symbols included a light star on top, but these must no longer form part of the symbol, to avoid conflict with the important information conveyed by the topmarks.

a. Light descriptions on floating marks, including the order of the various elements, should be the same as those used for fixed marks (see B-471). The text should be sloping.

b. The flare should be in magenta, or in the appropriate colour on multi-coloured charts. It should be positioned about 1 millimetre from the point indicating the exact position of the buoy, orientated to avoid overprinting other detail, eg:

Q7 and 8

Q41

B-466.2 **The rhythm of a light on a light-buoy.** The special features of the IALA System require the following range of abbreviations (and definitions). (Note: these also apply to light beacons which are part of the IALA system):

a. Cardinal marks:

Where two similar cardinal buoys are laid fairly close to each other, a Buoyage Authority may wish to distinguish them from each other by the different flashing rates.

North Cardinal mark. A white light that is either 'very quick flashing' (either 120 or 100 flashes per minute) or 'quick flashing' (either 60 or 50 flashes per minute), without interruption. The **international abbreviations** are: VQ (for Very Quick Flashing) and Q (for Quick Flashing):

Q130.3

East Cardinal mark. The VQ or Q white light is interrupted after 3 flashes, the total period of a sequence of flashes followed by darkness being 5 or 10 seconds respectively. The **international abbreviations** are VQ(3) and Q(3), with periods being added on the largest scale charts, where space permits:

Supprimé : It is strongly recommended that at least t

Supprimé : reasonably

Supprimé : full characteristics

Supprimé : including rhythm, colour (unless white) and period,

Supprimé : should

Supprimé : "patch" (or "

Supprimé : The star, which duplicates the latter, should no longer be shown so as not to confuse

Supprimé : The "patch" should preferably be in the form of a magenta flare drawn from a point about 1 millimetre from the point indicating the exact position of the buoy

Commentaire [c33] : DID: these graphics are badly cropped, please replace.

Supprimé : Abbreviations for lights on buoys: rhythm. Abbreviations for lights on floating marks should generally be the same as those used for fixed marks (see B-471). However, t

Supprimé : some extension of

Supprimé : . The abbreviation for the rhythm shall be the first part of any light description

Supprimé : light-buoy

Supprimé : The

Supprimé : uninterrupted

Supprimé : Where two North (or other cardinal) buoys are laid fairly close to each other, certain Buoyage Authorities wish them to be distinguishable from each other by the different flashing rates.

Commentaire [c34] : DID, please insert 51s time bar below the 'ribbon' (as for other Q130.3).

Supprimé : light-buoy

Supprimé : very quick flashing

Supprimé : quick flashing

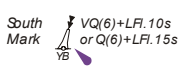
Supprimé : for the VQ and Q lights

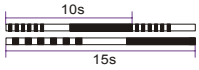
Supprimé : also

Q130.3

South Cardinal mark. The first phase of the white light is 6 VQ or Q flashes, followed immediately by a 'long flash' of two seconds or more, and then an eclipse; the total period of a sequence of flashes followed by darkness being 10 or 15 seconds respectively. The **international abbreviations** are VQ(6)+LFl and Q(6)+LFl, with periods being added on the largest scale charts, where space permits.

Supprimé : either
Supprimé : for 6
Supprimé : either
Supprimé : (VQ) or 15 seconds (Q).

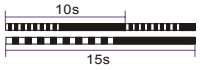




Q130.3

West Cardinal mark. The VQ or Q white light is interrupted after 9 flashes, the total period of a sequence of flashes followed by darkness being 10 or 15 seconds respectively. The **international abbreviations** are VQ(9) and Q(9), with periods being added on the largest scale charts, where space permits:

Supprimé : light-buoy
Supprimé : either VQ or Q,
Supprimé : either
Supprimé : seconds (VQ)
Supprimé : (Q)



Q130.3

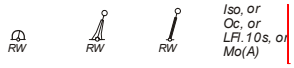
The unique character of these lights is such that periods could be omitted to avoid excessive length.

As an aide-memoire, the numbers of flashes: 3, 6 and 9, were chosen by IALA to correspond to the positions of figures on a clock face.

b. Safe Water mark. A white light that may be Isophase (Iso), Single Occulting (Oc), Long Flashing with a period of 10 seconds (LFl.10s), or Morse (A) (Mo(A)).

Supprimé : light-buoy

Supprimé : It is proposed to use, in the last case, the abbreviation: LFl with the period.



Q130.5

Commentaire [c35] : DID: please add flares to buoys

c. Isolated Danger marks. A white light that will exhibit a group of two flashes.

d. Lateral marks may exhibit red or green lights of any rhythm (but not fixed), including Long Flashing lights. A composite group flashing red or green light (eg Fl.R(2+1)) is exhibited only from modified lateral (preferred channel) buoys, see B-464.1e.

Commentaire [c36] : DID: please add graphic Q130.4
Supprimé : light-buoys
Supprimé : also
Supprimé : exhibit

e. **Special marks.** A yellow light is exhibited, which may have any rhythm except those used for white lights on Cardinal, Isolated Danger or Safe Water marks. An ODAS buoy will have a group of five flashes in a period of 20s.

f. **Emergency Wreck Marking buoy.** (On trial 2007). The proposed light is an alternating occulting blue and yellow light, with 1 second periods of light separated by 0.5 second periods of darkness (Al.Oc(2)BuY.3s) .

B-466.3 **The colour of a light on a light-buoy** must be shown by the **international abbreviations** listed in B-450.2, except that the omission of a colour abbreviation from the chart means that a light is white. The abbreviation for colour (if any) must follow the abbreviation for the rhythm.

Supprimé : standard
Supprimé : abbreviations
Supprimé : shall

B-466.4 **The period of a light on a light-buoy** is the time taken to exhibit one full sequence of phases. It must be expressed in seconds, using the **international abbreviation** 's', eg 15s (with no space between figure and letter). Periods of less than 3 seconds may be given to the nearest half second, eg 2,5s.

Supprimé : See also B-450.3 for capitalization of the letters of the abbreviation.

The period should normally be the final part of the light-description, except in the case of 'superbuoys' (see B-460.4b and B-462.9) where height and/or range may be added. For periods of light-buoys in the IALA System see B-466.2. In general, the period is the least important part of a light description and must be omitted first if there is no space to give full details, or if the chart is on a relatively small scale. However, the positive identification of a single aid is often vital to mariners. If, for example, adjacent buoys have Iso 4s and Iso 8s lights respectively, they should not both be abbreviated simply to 'Iso', but should also include the period of the light.

Supprimé : shall

B-470 LIGHTS: GENERAL POINTS

These specifications include lights of all types other than those on buoys and minor light-floats. Major floating lights (light-vessels, major light-floats and Large Automatic Navigation Buoys (LANBY) have functions similar to those of major lights on land; see B-474.

B-470.1 **Charts and other publications.** Positions of lights, and bearings of leading and sectored lights, are best shown graphically, but full details of a major light and its structure cannot easily be charted. There is inevitably duplication of some information on charts and in Lists of Lights and Fog Signals (LL) and Sailing Directions.

Full (or abridged – see B-472) descriptions of lights should be shown on charts, but limited information about light structures (such as lighthouses) can be shown. Details of the structure and additional details about the light (eg intensity, phases) should be given in LL, so the name of the light or the name of its location should be shown to facilitate between the chart and the LL.

B-470.2 **Definitions of the technical terms** used in these specifications are given in IHO publication M-12 'Standardization of Lists of Lights and Fog Signals', and are repeated or expanded here only where special distinctions are needed in chart symbols and abbreviations.

Charts and LL should agree in definitions, names and abbreviations used, as well as in the characteristics of the aids. However, short term differences may have to be tolerated.

B-470.3 **The IALA Maritime Buoyage System** rules will apply to minor lights but not to leading lights, some sector lights, landfall lights or major floating lights. Increasingly sector lights follow IALA convention when used for marking a channel. The IALA System is primarily concerned with buoyage, so general information is given in B-461.

B-470.4 **Colours of lights**

a. General rules on 'multi-coloured' charts:

The use of colours additional to the 'standard' four colours (see B-140) is particularly useful for depicting light sectors marking intricate inshore channels. The following specifications should be adhered to on such charts, to achieve conformity:

- Colours for flares and sector arcs should be chosen to be easily distinguishable from any background tint. They should also be tested for visibility under bridge lighting.
- Light flares must be in the appropriate colour:
  - Yellow/orange should be used for white, yellow, amber and orange lights.
  - Red should be used for red lights. Alternatively, magenta may be used.
  - Green should be used for green lights.
  - Blue/cyan should be used for blue lights.
  - Magenta may be used for violet lights.
- Flares should be used rather than circular patches, as more than one colour flare can be located at a light star (when the actual sectors are not charted).
- Sector limits should be fine dashed lines, but may be shown as fine firm lines. Emphasis may be provided by 1mm wide colour bands where marking the sides of a fairway (see B475.1, 475.5 and INT1 P41.2).
- Sector arcs should be fine dashed lines, but may be shown solely by coloured arcs. The **international abbreviation** for the colour or character of the light (see B475.1 and INT1 P40.2) should be added, in case the colour is difficult to distinguish under bridge lights.
- Coloured sector arcs should be depicted within 30mm of the light star, situated if possible to avoid conflict with significant detail. If colour arcs (including circles for 360° lights) are placed within 30mm of the light star, the flare(s) may be omitted. Where this cannot be achieved,

Supprimé : points relating particularly to them are given in

Supprimé : the

Supprimé : In practice, it has been found best to give reasonably f

Supprimé : details

Supprimé : very

Supprimé : together with an effective means of finding a charted light in the other publications. Normally a light is found first by looking up its name or the name of the locality and then, if necessary, by latitude and longitude.

Supprimé : the introductory pages of national LL

Supprimé : obviously

Supprimé : when major changes, such as in the definition of the range at which a light is visible, are in progress.

Supprimé : ed

Supprimé : : use of colour plates

Commentaire [c37] : These specifications were agreed at CSPCWG 3 (see report)

Supprimé : Full standardization of the charting of light colours is not practicable at present.¶
¶

Commentaire [c38] : Is anyone aware of any nation still using patches?

Commentaire [c39] : We are uncertain about this '30mm rule'. It is often clearer to show the sector much further out, eg to embrace the feature it is covering. Can we delete 'depicted within 30mm of the light star' and from 'Where this cannot be achieved…' to the end of the bullet?

coloured arcs should be broken to clear significant detail, or the arc moved further from the light. In the latter case, coloured flares should be located at the light star.

- Coloured sector arcs should be 1mm wide. Faint sectors may be 0.5mm wide. In very narrow sectors, a wider wedge of colour should be shown, so that it is clearly visible.
- Coloured sector arcs (or circles) should be used on all major lights, including un-sectored lights. Leading lights (with narrow sectors) and minor lateral lights should usually be shown by flares.
- Alternating and oscillating lights should be shown by parallel or overlapping different coloured arcs (or circles).
- The floodlight symbol (P63) should be yellow/orange.
- The Moiré effect symbol (P31) and strip light symbol (P64) should be coloured as appropriate to the light.

b. **On 'standard-coloured' charts.**

Complex sector lights must be charted in black, with magenta light flares. Fairway sectors may be emphasised by using continuous bold lines (see B-475.5). This economical representation does not prevent navigators from hand colouring sectors of interest to them and, indeed, may be quite adequate for the masters of piloted ships. It has some advantages relative to multi-coloured portrayal: it is easier for the user to correct charts, and is not subject to changing appearance under certain types of bridge lighting.

B-470.5 **Position of lights.** The exact position of a light should be shown by a five-pointed star in one of two sizes. The larger star should be used for the majority of lights. The smaller star may be used where there are numerous minor lights, eg the corners of quays and dolphins in a harbour.

P1

A bold dot may be used in lieu of a light star, but is not recommended because the star symbol is more distinctive (dots are used for spot heights, posts, small islets, etc) and widely used on the charts of many nations.

Position of lights - special cases. A light star must not be used for:

- Floating lights, see B-460 (light-buoys) and B-474 (major floating lights).
- Navigational lights on non-navigational structures, eg water towers, stranded wrecks, wind turbines. These should be indicated by a light flare from the small position circle (similar to the depiction of a light-buoy), eg:

- Offshore platforms, see B-445.2.
- Minor air obstruction lights on masts, chimneys, etc which are to be indicated only by legends in brackets against the features, see B-476.2.

To avoid clutter and to give precedence to the symbol, the term 'light', or its equivalent, must not normally be inserted against the position of a light. When a light description is unavoidably sited some distance from the light star, eg to avoid obscuring detail close to the light, the light falls outside the chart limits, it is permissible to include the **international abbreviation 'Lt' (P1)** in the name, eg Eddystone Lt. The abbreviation may also be used in legends: eg '(R Lts)' against masts, indicating air obstruction lights, 'LtHo (disused)' where no light is now exhibited.

B-470.6 **Light flares.** The point of a light flare **P11** should be about 1 mm from the charted position of the light.

On 'multi-coloured' charts, the flare(s) should be in the colour(s) of the light, see B-470.4.

The orientation of flares should be such as to avoid obscuring other detail. In the case of a leading light (see B-475.6), lights in line (see B-475.6) and direction lights (see B-475.7), the flares should

Supprimé : The numerous coloured light sectors in some waters, eg Scandinavian, are complex and most clearly represented by the use of **"multi-coloured charts"**, having a yellow plate for white (and yellow) lights and red and green plates for red and green lights. Unsectored lights naturally also have flares or "patches" of the appropriate colour; features shown in magenta on **"standard charts"** are, on existing multi-coloured charts, shown in red or yellow or (more rarely) green. It is assumed that nations printing multi-coloured charts will wish to continue the practice.¶
¶
On the other hand, it is feasible to print charts with c

Supprimé : using

Supprimé : plate chiefly to show lights and light sectors

Supprimé : but with a varying degree of use of magenta - at the minimur ... [1]

Supprimé : and, at the maximum, outlining

Supprimé : fairway sectors

Supprimé : (as on many Swedish charts).¶ ... [2]

Supprimé : In addition, it

Supprimé : both printed

Supprimé : and plates

Supprimé : it can be used under red

Supprimé : , and printing is easier and cheaper. In charting the tidal estua ... [3]

Supprimé : In the specifications which follow, emphasis is given t ... [4]

Supprimé : , the size depending on the relative importance of the light

Supprimé : is the 'normal' size

Supprimé : is permissible

Commentaire [c40] : We sug ... [5]

Supprimé : Dots can be hand-drawn more easily on compilation drawin ... [6]

Supprimé : Major f

Commentaire [c41] : DID, p ... [7]

Supprimé : such

Supprimé : Lt Tr

Supprimé : **or patches** on 'standard' (as opposed to 'multi-coloured' ch ... [8]

Supprimé : drawn from a point

Supprimé : the point showing

Supprimé : exact

Supprimé : circular patches centred on the light position may be used inst ... [9]

Supprimé : may

be oriented to seaward along the line, provided this does not obscure the front light star, or other detail.

Flares must not be inserted against minor air obstruction lights (see B-476.2) or traffic signal stations (see B-495), where light stars are usually omitted.

B-470.7 **Names of lights** are very important, as stated in B-450.3 and B-470.1. If a light has a name which is unrelated to any other charted feature, the name must be inserted against the position of the light, above or preceding the description of the character of the light, and should be in the same style as the light character.

If the name of a light is obviously that of the named feature on which the light stands, eg Saint Catherine's Point, the name of the light need not be repeated above the light description. The name must be in the style appropriate to the feature, eg a headland or a shoal, and in many cases can be sited immediately above the light description. Where, as mentioned in B-470.5, a light description is unavoidably sited some distance from the light star, the name of the light should be repeated above the light description, in the same style as the description.

Minor lights may be identifiable in LL by a charted general name and a (possibly uncharted) descriptive term, eg Royal Pier, Names or descriptions of individual lights of a pair of leading lights, eg 'Rear' or 'Upper', 'Front' or 'Lower', can normally be deduced from the positions shown on the chart and, to save clutter and translation, should only exceptionally be inserted on charts.

Rear Lt *or* Upper Lt **P22** Front Lt *or* Lower Lt **P23**

For names of major floating lights, see B-474.

B-471 LIGHT DESCRIPTIONS

The various elements of a complete (but abbreviated) description of a light must be charted in the order of the following paragraphs. Light descriptions may be **abridged** but the characteristic rhythm, number of flashes or occultations in a group, and colour (unless white) must all be charted if any details of the light are shown.

B-471.1 **The type** of light is only shown on charts in a few special cases, in particular:

- Aeronautical lights (Aero), see B-476.
- Direction lights (Dir), see B-475.7 and B-475.8.
- Leading lights (Ldg), only where, because of scale, the two lights appear at a single position on the chart, and the leading line cannot be charted, see B-475.6.

Supprimé : , pointing seaward

Supprimé : fairly

Supprimé : normally

Supprimé : , SE Head

Supprimé : in many instances

Supprimé : Minor lights may be omitted entirely from some medium scale charts, see B-472.

Supprimé : shall be

Supprimé : only

Supprimé : (Some lights are not always exhibited throughout the hours of darkness and must have, for example, a warning that they are 'occasional'. This should follow the rest of the light description. See B-473).¶

B-471.2 The principal character of a light is its rhythm (although, strictly, fixed lights and some alternating lights are not 'rhythmic'). The basic **international abbreviations** are:

Character of light	Abbreviation	Illustration (period shown)	INT1 ref.
Fixed	F		P10.1
Occulting (total duration of light longer than total duration of darkness)	Oc		P10.2
Isophase (duration of light and darkness equal)	Iso		P10.3
Flashing (total duration of light shorter than total duration of darkness)	Fl		P10.4
Long-flashing (flash 2s or longer)	LFl		P10.5
Quick (repetition rate of 50 to 79 - usually either 50 or 60 - flashes per minute)	Q		P10.6
Very quick (repetition rate of 80 to 159 - usually either 100 or 120 - flashes per minute)	VQ		P10.7
Ultra quick (repetition rate of 160 or more - usually 240 to 300 - flashes per minute)	UQ		P10.8
Morse code	eg Mo(K)		P10.9
Fixed and flashing	FFl		IP10.10
Alternating	eg Al.WR		P10.11

Commentaire [c42] : The term 'class' does not appear in S32 or M12. It may be a 'higher level' than character, ie fixed, rhythmic or alternating. If so, it is not appropriate here (which will affect INT 1). 'Character' is consistent with the opening sentence.

Supprimé : Class

Commentaire [c43] : DID: use improved version of tables in current M-4, but reverse letters in the diagram for alternating, to agree with description, ie W/R/W/R etc

Some examples of abbreviations derived from the basic ones:

Character of light	Abbreviation	Illustration (⊢ period shown)	INT1 ref.
Group occulting (showing 2 occultations)	Oc(2)		P10.2
Composite group occulting (showing 2 + 3 occultations)	Oc(2 + 3)		P10.2
Group flashing (showing 3 flashes)	Fl(3)		P10.4
Composite group flashing (showing 2 + 1 flashes)	Fl(2 + 1)		P10.4
Group quick (showing 3 quick flashes)	Q(3)		P10.6
Interrupted quick	IQ		P10.6
Group very quick (showing 3 very quick flashes)	VQ(3)		P10.7
Interrupted very quick	IVQ		P10.7
Interrupted ultra quick	IUQ		P10.8

Supprimé : Class

One of the principles on which the abbreviations above are based is that a capital letter is always used for the first letter of any word abbreviated; other letters are lower case. Another principle is to keep the abbreviations as compact as possible; see B-471.9.

B-471.3 **The colour(s)** of a light must always be charted by the **international abbreviations** listed in B-450.2. They must be charted in capital letters (except for the second letter of two-letter abbreviations).

Supprimé : As stated in B-450.3, t

The omission of a colour abbreviation signifies that a light is white. However, where there is more than one colour exhibited, as in some sector lights and in alternating lights, the abbreviation W must be included. In the case of sector lights, the brightest colours are given first, eg WRG. For the charting of colours on the sectors, see B-475.

Supprimé : (as with light-buoy (B-466.3))

B-471.4 **Coloured flares** may be used on 'multi-coloured charts', **in addition to the abbreviations,** to indicate the colour of lights (see B-470.4a). For the additional use of colours on sectored lights see B-475.

Supprimé : or circular "patches"

Supprimé : red, green and white (shown as yellow)

B-471.5 **The period.**

IALA definition:

'The time taken for the completion of all the different **phases** of a light signal.'

Supprimé : of a light is the time taken to exhibit a full sequence of phases

IALA defines a phase as:

'A visually discrete part of a light signal. It is bounded by changes

between darkness and light, or between different colours, or between distinctly different luminous intensities, and it may be further discriminated by its duration.'

The period must be expressed in seconds, even where it is one minute or more, and the **international abbreviation** 's' must be used, eg:

90s **P12**

Where periods are quoted in the LL to an accuracy of better than one second, they may be quoted on the chart to 0,1s, eg 1,3s, 7,5s to accord with the LL.

Supprimé : These specifications also apply to lighted buoys (B-466.4).

Navigators may time the period of an observed light to confirm an identification obtained firstly from the character (rhythm) and colour. The period is important in identifying a simple flashing light but less important when a light has a more distinctive character, eg group occulting. This should be taken into account when abridging a light description by omission of the period. Where practicable, periods of all lights should be shown on the largest scale charts at least.

B-471.6 **The elevation** of a light is the vertical distance between the light source and the plane of reference for heights on the chart, as quoted in the chart title notes. It must be expressed in metres, using the **international abbreviation** 'm', eg:

Supprimé : sea level

12m **P13**

The elevation must be measured from mean sea level where there is little appreciable tide at the adjacent shoreline. Elsewhere, an appropriate High Water datum must be used.

Supprimé : ¶
Comment: See Comment at B-302.2.¶

The height of a light structure is the vertical distance between its top and ground level and should not normally be shown on charts. Exceptionally, where the height of the structure is particularly remarkable, it may be shown as specified in B-303, but not as part of the light description.

Supprimé : shall

To a mariner, the significance of a charted elevation may be:

- In estimating or looking up (in the Geographical Range Table in LL) the distance at which a landfall light should first be sighted.
- In identifying particular lights, eg leading lights, where they could be confused with other lights.
- In warning him that a light is at a great elevation and is more likely to be obscured by cloud than one at a lower elevation.
- In enabling distance off a headland to be calculated, by day, if radar or other aids are not available.

Supprimé : (the elevation becomes more important as charted geographical ranges are replaced by luminous ranges, see B-471.7)

It follows that the elevations of landfall lights should be charted, at least on the largest scales. Elevations of other lights where the elevation seems significant, eg leading lights, should also be charted on the largest scales. The elevations of minor lights are of little significance and should be omitted from charts.

B-471.7 **The range** (distance) at which a light will be visible can be calculated either from its brightness (giving a **luminous range)** or from the eclipsing effect of the earth's curvature (giving a **geographical** range). Luminous range depends not only on the intensity of the light but on the variable conditions or meteorological visibility. IALA defines **nominal range** as:

'the luminous range of a maritime signal light in a homogeneous atmosphere having a meteorological optical range of 10 nautical miles for an observer of conventional threshold of illuminance.'

Supprimé : In tabulating and charting luminous ranges it is convenient to assume a meteorological visibility of 10 sea miles; this gives the **nominal range.**¶
¶

The nominal range is given in LL and must normally be used for charts. It must be expressed in sea miles, rounded to the nearest whole mile (0,5M rounded down) using the **international abbreviation** 'M', eg:

Supprimé : It is recommended that the range shown on charts must be the nominal range.

15M **P14**

Exceptionally, where the 'normal' visibility of an area differs widely from 10 miles, a non-standard luminous range may be charted (agreeing with that given in the LL), provided a note defining the range is given on the charts affected.

Geographical range (standardized on an observer's height of eye of 5 metres) should not normally be charted because it does not indicate a light's intensity and the arbitrary height of eye does not apply to all vessels. However, in areas where geographical range is known to be useful it may be inserted, where it is less than nominal range, in place of or in addition to nominal range, with a suitable explanatory note.

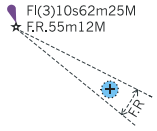
Supprimé : shall

The ranges of minor lights within very restricted waters are of little significance and should generally be omitted. Where space permits, ranges of all other lights are useful to the mariner and should be charted on at least the largest scales. Ranges of landfall lights should be shown on all appropriate large and medium scale charts.
For ranges of sector lights, including those intensified on certain bearings, see B-475.
For lights with more than one range, see B-471.9.

B-471.8 **Lights exhibited from the same structure** (or charted at the same light star).

a. **If more than one light** is exhibited from a light structure the description of the main one (eg a light visible from all directions) should be shown on one line and the subsidiary light (eg a red sector of different character, covering a danger) on a line below.

Supprimé : preferably



P42

Two short descriptions may be shown on one line linked by '&'. This also applies where two separate lights which are close together are charted by one light star, because of scale, eg:

Supprimé : In the case of

Supprimé : simple legends

Supprimé : they

Ldg Oc.R & F.R **P20.3**

b. **Disposition of lights.** Lights exhibited from the same structure which are disposed horizontally or vertically must be charted by the abbreviation '(hor)' or '(vert)' P15, as appropriate, immediately following the colour in the light description.

Two (or more) fixed lights **of the same colour** disposed horizontally or vertically must be charted, respectively, eg:

- 2F.G(hor) means that two fixed green lights are disposed horizontally
- 2F.R(vert) means that two fixed red lights are disposed vertically
- 3F.R(vert) means that three fixed red lights are disposed vertically

It is possible to show lights exhibited from the same structure arranged in other ways by means of a geometric symbol, eg:

- 3F.R(Δ) means 3 fixed red lights disposed in the shape of a triangle.

Commentaire [c44] : This has appeared on some national charts. If accepted, it may require a new entry in INT 1.

Two (or more) lights **of different colour** disposed horizontally or vertically must be charted, eg:

- F.GR(vert) means that 2 fixed lights are disposed vertically, the uppermost being green, the lower being red.
- F.RGR(hor) means that 3 fixed lights are disposed horizontally, the middle one being green.

The '&' sign is not required, as the qualifier (vert) or (hor) clearly indicates that there is more than

one light. These conventions must not be used for Traffic Signals (see B-495).

c. If a fixed light is varied at intervals by a flash of greater intensity, it is charted as FFl, P10.10.

B-471.9 **Combining the elements of a light description** must be achieved in a way that enables complex descriptions to be shown compactly. However, some spacing of the elements is needed for ease of interpretation. Full stops are specified below to ensure spacing, but the full stops may be omitted providing the spacing is retained:

a. Insert full stops (or spaces):
- at the end of the characteristic rhythm (except where there is a bracket);
- at the end of all colours (not between colours);
- after Al (Alternating) - although Al is not a rhythmic characteristic it is often juxtaposed with one.

b. Omit full stops:
- after s (seconds);
- after m (elevation);
- after M (range);
- where there is a bracket;
- at the end of the light description.

c. If more than one range is given in the light description for a single light, show as follows:

eg	15/10M	P14	Light with two different ranges (use forward slash).
eg	15-7M	P14	Light with three or more different ranges (use hyphen).

Normally, the colours of a light are arranged in order of brightness (see B-471.3), and the ranges will similarly give the longest first. However, in the case of a FFl light, the flash is always brighter so the ranges should be shown in the same order as the character to which they refer, eg: FFl.10/15M

d. Example of a full light description:

☆ Name
Fl(3)WRG.15s21m15-11M **P16**

Fl(3) *Character of light: group flashing repeating a group of three flashes*

WRG. *Colours: white, red, green, exhibiting the different colours in defined sectors*

15s *Period: the time taken to exhibit one full sequence of 3 flashes and all eclipses: 15 seconds*

21m *Elevation of focal plane above height datum: 21 metres*

15-11M *Nominal range: white 15 miles, red between15 and 11 miles, green 11 miles*

(For additional remarks see B-475.5).

B-472 **LIGHT DESCRIPTIONS: ABRIDGING, OMISSION**

The significance of the various elements of a light description is stated in B-471. The order of

Supprimé : The foregoing does not apply to, say, a fixed and flashing light where

Supprimé : brilliancy

Supprimé : spacing alone is adequate if desired, it is recommended that the following rules be applied:

Supprimé : oblique stroke

Supprimé : OF ALL DETAILS¶

Supprimé : In B-471 t

Supprimé : wa

Supprimé : For convenience, t

omission of details in an abridged (shortened) description is given below. It is not the same for all types of lights. For light-buoys, see B-466.4.

B-472.1 **Major lights.** When reducing the detail to be charted as the chart scale decreases, the following must be the order of omission:

a. Elevation of light, eg 23m
b. Period of light, eg 10s
c. Range (visibility) eg 22M
d. Character and colour (however, where useful on some smaller scale charts, a light star, major floating light symbol, or offshore platform symbol may be shown with flare and possibly name but without light description); see also C-414.1.

B-472.2 **Lights within harbours and in restricted channels.** It may be advisable to abridge light descriptions even on the largest scale charts to eliminate details of little interest to the mariner, especially where space is very limited. The order of omission must be:

a. Range
b Elevation
c. Period
d. Character and colour. Where numerous quays, wharves, etc, are uniformly lighted along a river channel, the light star and flare may be retained and a standard note covering them all may be used, eg:

LIGHTS
Light stars without legends represent two fixed lights displayed vertically. They are seen as red to port *[or starboard]* and green to starboard *[or port]* when proceeding upriver.

B-472.3 **Omission of all details (including light stars).** In general, the lights selected for insertion on a chart should be those within range of which navigation on the particular chart is possible. As a guide, only those lights visible from 15 miles and over should be inserted on charts at scales smaller than 1:500 000. B-401 to B-404 deals generally with full and partial depiction of chart detail. A well designed chart should not require any warning about omission of certain lights, but if particular attention to omissions is required, a brief note such as 'Only the principal lights are shown on this chart', or equivalent, is sufficient.

B-473 **LIGHTS: TIME OF EXHIBITION**

Lights are normally exhibited from about sunset to about sunrise, although, in fog, some lights may be shown during the day also. The following paragraphs refer to circumstances in which charts may carry warnings that a light cannot be relied on, or that its characteristics may differ from those charted. Usually such comments will be contained in LL, but if required, may be added to the chart.

B-473.1 **Unwatched (unmanned) lights** have in some instances been noted as such on charts. Generally the reliability of unwatched lights is such that no special warning is needed on charts.

If required, important lights that are unwatched (unmanned) may be indicated by means of the abbreviation '(U)', or equivalent.

eg  **P53**

B-473.2 **Occasional and private lights.** Some lights are exhibited only in response to a specific request or during the occurrence of a particular local condition. Examples are harbour lights shown only when required by particular vessels, eg fishing vessels, ferries and lights exhibited during military exercises. Privately-maintained lights which are not regularly exhibited, eg leading lights to a private quay, are also considered 'occasional'. **The international abbreviation** '(occas)', must be inserted at the end of the light description, for all types of occasional lights, where required to be

Supprimé : quite

Supprimé : All other details together
Supprimé : except that
Supprimé : relatively

Supprimé : All other details together
Supprimé : except the light star and flare.
Supprimé : end of

Supprimé : rough
Supprimé : shall
Supprimé : a nation wishes
Supprimé : ly to draw
Supprimé : it is recommended that
Supprimé : should be
Supprimé : , or need not,
Supprimé : Lights may still be accidentally extinguished but important unwatched lights are likely to have standby arrangements that can be brought into service automatically. There may also be an emergency light for service when the permanent or standby light has failed, often providing a reduced intensity or possibly different characteristics.

Supprimé : Where no standby or emergency arrangements are available
Supprimé : of a suitable
Commentaire [c45] : So infrequently used that we suggest not required as an INT abbreviation

Supprimé : The characteristics of temporary lights put into service for a limited period eg during repair work, are not to be charted.¶
Supprimé : when specially needed
Supprimé : in brackets,

charted.

P50

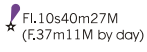
Private lights required to mark a danger such as an outfall, which are regularly exhibited, are not 'occasional'. They may have the **international abbreviation** '(priv)', or equivalent added, eg:

P65

For descriptions of lights used for signalling purposes, see B-490.4.

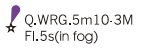
B-473.3 **In high latitudes** lights may not be exhibited in the midsummer period, or in winter when ice closes an area to traffic. No charted note is required.

B-473.4 **Daytime lights** of great intensity may be used in ports for such purposes as marking a leading line. Where lights are shown throughout the 24 hours without change of character no special note is required on the chart. **Where the character shown by day differs from that shown at night,** the former together with the word 'Day', or equivalent, must be shown in brackets beneath the night-time character, eg:



P51

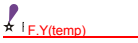
B-473.5 **Fog lights** may be exhibited by day in reduced visibility. They can be synchronised with audible (sound) fog signals so that an estimate of range can be made. The fog light description, together with the word 'Fog', or equivalent, must be shown in brackets beneath the main light character, eg:



P52

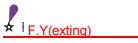
For Fog detector lights, see B-477.

B-473.6 **Temporary lights** should not normally be charted. However, if required to be charted, the **international abbreviation** '(temp)' may be added to the light description.



P54

B-473.7 **Extinguished lights.** A light which is known to be temporarily extinguished, or even destroyed, may be marked by the **international abbreviation** '(exting)' if there is a possibility that it will be re-established, eg:



P55

B-474 MAJOR FLOATING LIGHTS

B-474.1 **Major floating lights** are generally classed as those with a nominal range in excess of 10 nautical miles. Special circumstances, eg an isolated location, may mean that a floating light of lower range is given this status. The structure on which the light is fixed will be a light-vessel, a major light-float or a LANBY (Large Automatic Navigational BuoY).

B-474.2 **The symbol for a major floating light** must be

P6

The colour of the structure does not indicate on which side it should be passed and therefore should not be charted (this is consistent with the omission of colour from major shore light structures).

Supprimé : are sometimes

Commentaire [c46] : DID: use graphic from latest version of M-4, including use of Univers type

Supprimé : It is recommended that t

Commentaire [c47] : DID: use graphic from latest version of M-4

Supprimé : usually

Supprimé : one of the following:¶ ¶ a.

Supprimé : , hull length approximately 21 metres, usually unmanned

Supprimé : , hull length approximately 17 metres, unmanned

Supprimé : , circular float diameter approximately 12 metres, unmanned

Details of the structure should be given in LL.

B-474.3 **The name of the light** must be given, in sloping lettering, on all large and medium-scale charts and must be in the same form as that painted on the structure. It should normally be placed above the light description, space permitting.

Supprimé : shall

B-474.4 **The light description**, which should be in sloping lettering, must otherwise conform to the specifications for shore lights, including the charting of both height and range on larger-scale charts (see B-470 to B-473). The heights of lights are, of course, above sea level rather than above a fixed datum. Riding lights (lights shown by an anchored vessel), which are of relatively low power, should not be charted.

B-474.5 **Watch (or station) buoys** are sometimes moored near manned light-vessels to give crews an indication of dragging. They are normally unlit and may be moored up to a mile from the light-vessel. They should be shown on at least the largest scale charts because they are a collision hazard at night or in fog.

Commentaire [c48] : Do these still exist? Should we delete the specification?

B-475 SECTOR LIGHTS AND OTHERS NOT VISIBLE ALL ROUND

An all-round (or omni-directional) light is one that presents the same character over the whole horizon of interest to marine navigation. Where a large-scale chart shows a light without sector or leading lines (or where the light description does not indicate different sectors, 'Ldg' or 'Dir') the mariner will assume that it is an all-round light. If a light is not visible on some bearings, or changes its character as the bearing changes, this must be shown, usually by inserting sector limits and arcs on at least the largest scale charts.

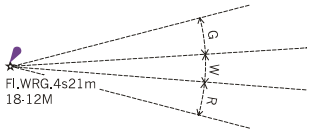
Supprimé : the cartographer must give this information

In the following specifications 'sector limit' is used to denote the line or bearing of a light where the character changes or the light is obscured. 'Sector arc' is used to denote the curved line against which the character of the light in that sector is inserted. In practice, on most lights there is a small 'angle of uncertainty' between sectors, where, say, the colour is indefinite, or, at the edge of the arc of visibility, the intensity appears to be reduced. It is impracticable to indicate the angle of uncertainty on charts although, exceptionally a 'faint sector' may be represented, see B-475.3. It is possible, on certain lights which are specially designed to show a narrow sector with very small angles of uncertainty, to indicate this fact by using the abbreviation 'Dir' for 'Directional light': see B-475.7.

Supprimé : blanked out

There are many different types of light visible on certain bearings only. The following specifications list the main ones, starting with the simpler cases.

B-475.1 **Symbols for sector limits and sector arcs.** Limits of sectors and arcs, should be charted as fine dashed lines (about 10 dashes to 10mm), except for fairway sector limits, see B-475.5. Small arrowheads should be inserted at the ends of the sector arcs, eg:



P40.1

Sector limits must not extend beyond the nominal range of a light. Very short sector arcs may be omitted.

Where light is deliberately excluded from a sector, it must be shown without an arc, eg:

P44

On 'multi-coloured' charts, the sector limits may be shown as fine firm lines, emphasized by colour if required. Sector arcs may be shown solely by coloured arcs, (together with an abbreviation for the colour or character of the light, see B-475.5), eg:

P40.2

For further details, see B-470.4a.

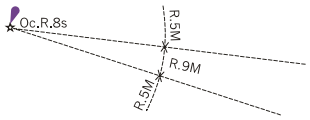
B-475.2 **Legends on sector arcs** must be **international abbreviations**, see B-450.2 and B-471.

Where sectors are differentiated by colour only, the abbreviations for colours must be inserted on the sector arcs, (including on 'multi-coloured' charts where coloured arcs may be used **in addition** to the abbreviations, see B-470.4a). Where sectors are very wide and there is a risk of a single abbreviation being 'lost' in the charted detail, the abbreviation may be repeated at intervals.

Where sectors are differentiated by the use of various rhythms, the abbreviations for the rhythms must be inserted on the sector arcs, together with the colour where necessary.

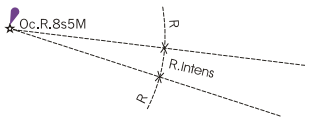
The range of each sector may also be inserted on the sector arcs, following the character or colour, and omitted from the light description at the light star.

Where a light is intensified in a sector, the ranges of all the sectors should be shown on the sector arcs, eg:



P46

If that is impracticable for any reason, the **international abbreviation** 'Intens' should be used, as appropriate, eg:



P46

In exceptional cases where there could be confusion, **full details** including name, may be shown on a sector arc. This also applies where it is necessary to show a sector of a light although the light itself lies beyond the limit of the chart.

Commentaire [c49] : DID: use latest version of graphic from M-4 (currently shown as P40)

Commentaire [c50] : DID: please insert P44 graphic

Commentaire [c51] : DID: please insert multi-colour version of graphic.

Supprimé : No sector limits may extend beyond the nominal range of a light.

Supprimé : , as specified in the following paragraphs,

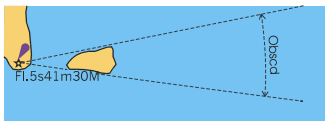
Supprimé : in abbreviated form, preferably using only the

Commentaire [c52] : Moved from B-475.5 (more logical place)

Supprimé : If thought desirable, t

Supprimé : or equivalent

B-475.3 **All-round lights partially obscured by obstructions.** The arc over which a light is visible may be obscured by an obstruction, such as higher land. To alert the mariner to this deficiency (unless it is obvious) a sector limit, corresponding as closely as practicable to the bearing on which the light disappears, should be inserted on large-scale charts, together with the **international abbreviation** 'Obscd' on the obscured sector arc, eg:

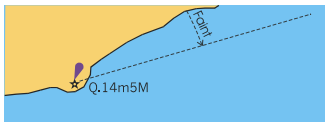


P43

Details of obscured arcs are normally to be taken from LL. Where visibility is obscured by sloping land close to the light, the arc of visibility will increase with distance offshore so this should be taken into account when deciding where the lines should be drawn.

Where an arc of visibility is deliberately restricted (ie the light is not an all-round one) the above representation is not appropriate; see B-475.1.

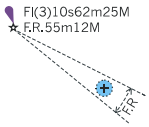
A decrease in the apparent intensity of a light may occur in the case of partial obstructions. Where particularly important, an arc may be labelled with the word 'Faint' or equivalent, eg:



P45

For multi-coloured charts, see B-470.4a.

B-475.4 **Sector light marking a danger.** In some waters it is common to use a red subsidiary light to 'cover' a danger; see also B-471.8. The sector limits should extend at least as far as the danger and the character of the subsidiary light, eg 'F.R', should be inserted on the arc of visibility. The full description of the subsidiary light, including its range, must be given at the position of the light, below the description of the main (all-round) light, eg:



P42

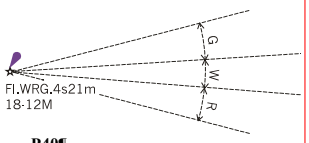
In other cases, the main light itself may have a red sector over the danger; in such cases a single light description, eg 'Fl.WR', is used.

B-475.5 **Sector lights marking fairways.**

Sector limits and sector arcs: where a narrow light sector marking a fairway between off-lying dangers, the sector limits marking the edges of the fairway should be long enough to show the extent of the channel. The fairway may include a number of 'legs' demarcated by white sectors from more than one light. In such cases, on charts where the sector limits are normally shown by fine dashed lines, those lengths of the sector limits which mark the sides of the fairway should be shown by fine firm lines, in order to highlight the channel. Sector limits may also be omitted where they cross the fairway., eg:

Commentaire [c53] : Duplication removed.

Supprimé : Legends (light descriptions) at positions of lights: Light descriptions at light stars must generally follow the specifications in B-471 and B-472. Colours must be charted in the order WRG eg:¶
¶



P40¶
¶
Ranges may be omitted when shown on sector arcs (and in restricted waters where the ranges are of little significance). Where ranges are given in the main light description it is recommended that if two different ranges only are concerned they be shown, eg:¶
¶
15/10 M **P14**¶
¶
and if three or more ranges are concerned they be shown, eg:¶
¶
¶
15-7 M **P14** (longest to shortest)¶

Supprimé : particular (major)

Supprimé : curtailed

Supprimé : adjoining

Supprimé : fine dashed line

Supprimé : drawn

Supprimé : the

Supprimé : , or equivalent,

Commentaire [c54] : DID, use graphic from latest version of M-4

Supprimé : 4 to B-475.7

Supprimé : light

Supprimé : White fairway sectors flanked by red and green sectors, or sectors with different rhythms

Supprimé : fairway

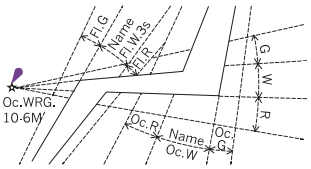
Supprimé : leads

Supprimé : its

Supprimé : shall normally

Supprimé : and the approximate margin of safety provided by keeping to the fairway sector. O

Supprimé : it is recommended that



P41.1

On 'multi-coloured' charts the fairway edges may be emphasized by the use of a yellow/orange line in addition to the black lines, eg:

Supprimé : overprinting

P41.2.

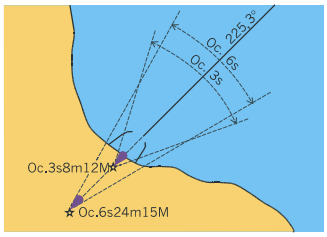
Commentaire [c55] : DID: please insert multi-colour version

B-475.6 **Leading lights and lights in line.** B-433 specifies the charting of leading lines and associated legends on the lines but does not cover the charting of arcs of visibility and legends specific to lights.

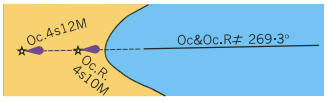
The 'in-line' symbol should not be used where only the bearing is shown on the transit.

Light flares should be oriented along the transit line for all leading lights or lights in line, unless the flare would thereby obscure the front light or other important detail.

Where a chart shows lights with a leading line it will be assumed by the mariner that the lights are, to some extent, special purpose ones and not necessarily all-round lights; therefore it is not necessary to show the arcs of visibility unless there is a good reason for doing so (eg the light has other sectors which are not visible on the leading line, the leading sectors are much wider than the actual lead). Where it is decided to show the arcs of visibility, the legends on the sector arcs must repeat as much of the light description as necessary (including, possibly, the names of the lights), see B-475.2. Relatively uninformative legends such as 'Arc of visibility' must be avoided if possible.



P20.1



P20.2

In the examples above, the cartographer will determine how much of the light details will be shown on the arc, on the lead and at the light star. It should not usually be necessary to duplicate the information, see B-433.2.

Where the representation may leave the mariner in doubt whether a light is a leading light (eg if the scale is too small to show the leading line), the **international abbreviation 'Ldg'** must precede the light description, eg:

P20.3 (on small-scale charts)

Lights in line marking a danger or a limit may be charted similarly except that the abbreviation 'Ldg' must not be used, and the transit line must be dashed throughout, eg:

P21

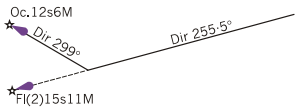
B-475.7 **Direction lights** of several types are in use but all have in common a very narrow sector intended to mark a direction to be followed. The narrow sector may be flanked by:-

Supprimé : (a) darkness or unintensified light, or (b) sectors of different colour or character.

a. Darkness or unintensified light. The central line of the sector must be charted in a manner similar to a leading line but with the **international abbreviation** 'Dir', and the course to be followed, against the line, eg:

Supprimé : In case (a) t

P30.1



P30.2

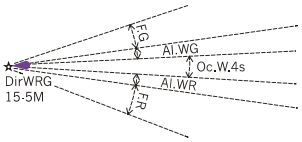
The abbreviation 'Dir' should only be used in the light description at the position of the light if the course line cannot be charted.

Supprimé : only

b. Sectors of different colour or character. This type of directional light is also known as a Port Entry Light (PEL). PEL sector lights are so precise that a complete colour change at a sector boundary occurs over an angle of less than 1 minute (0.02°) in most models. This corresponds to a lateral distance of just 1 metre at a viewing distance of 3.5 km. In addition the intensity is maintained right to the edge of the beam, and does not reduce the further the observer is away from the axis. The sector limits and arcs must be charted, if possible, in the same way as a sectored light (see B-475.1). However, 'Dir' may be inserted at the beginning of the light description, where appropriate, to inform the navigator that the fairway sector has a particularly precise 'cut-off' or very small angle of uncertainty (unlike the average fairway sector), eg:

Supprimé : In case (b)

Supprimé : 5



P30.3

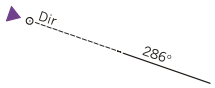
Commentaire [c56] : DID: please insert additional coloured version, as example in French INT 1, but include abbreviations on arcs.

In the example shown, the light oscillates from side to side, so that between the fixed colour sectors, there is a narrow sector of alternating colour.

B-475.8 **A moiré effect mark (or variable arrow mark)** is a short-range (normally up to 2 km) type of direction 'light'. Sodium lighting gives a yellow background to the screen (up to 3 m square) on which a vertical black line will be seen by an observer on the centreline, or variable arrow marks when course alteration is needed. The system can be used by day and night. It can also be used as a stop line (seen abeam) for vessels berthing along quays; it should not normally be charted when used for this function (except on very large-scale berthing plans).

The symbol must be a small black position circle with a magenta triangle (all sides of 2.5 mm) pointing in the

direction which the mark faces, with the abbreviation ‘Dir’ (in black), eg:



P31

The triangle is charted instead of a conventional light flare. On multi-coloured charts, it should be in the appropriate colour for the light.

B-476 AERONAUTICAL AND AIR OBSTRUCTION LIGHTS

B-476.1 **Aeronautical (Aero) lights,** established for aeronautical navigation, may be of higher power than marine lights and visible from well offshore. Where that is known or thought likely to be the case, their characteristics should be charted (with light star and flare), eg:

AeroAl.Fl.WG.7,5s11M **P60**

The **international abbreviation** 'Aero' is a warning that they could be altered or extinguished without notification to mariners.

B-476.2 **Air obstruction lights** marking such features as radio towers and chimneys may, if likely to be visible from seaward, be charted (without light star or flare) by the appropriate **international abbreviations**, in brackets, against the structure, eg:

(89) (R Lts) **P61.2**

B-477 FOG DETECTOR LIGHTS

Fog detector lights may be fitted to the structure of a major light or may be established some distance from the light. Their purpose is to detect fog automatically and to switch on fog signals. There are a variety of types in use, some only visible over a narrow arc; in some cases they are liable to alteration without notice. For these reasons it is recommended that their characteristics should not be charted. However, as they may be powerful lights and, in some cases, sweep back and forth so that they could be mistaken for signals, the **international abbreviation** 'Fog Det Lt' should be inserted where appropriate on at least the larger scale charts.

Fog Det Lt **P62**

If not at the same position as a charted light, a small position circle, B22, should be used.

Supprimé : prefixed by the **international abbreviation**

Supprimé : The cautionary note to that effect is given in the preface to LL. Eg:¶ ¶ AeroAl.Fl.WG.7,5s11M **P60**¶

Commentaire [c57] : Simplification proposed. Old version does not distinguish intensities (high and low are subjective) and P61.1 uses the abbreviation Aero incorrectly (see B-476.1).

Supprimé : in one of two ways:¶ ¶ a. If of high intensity their characteristics should be charted in the same way as aeronautical navigation lights, ie they should be prefixed 'Aero', eg:¶ ¶ AeroFR.353m11M RADIO MAST (353) **P61.1**¶ ¶ b. If of low intensity they should be charted

Supprimé : descriptive legend, preferably in

Supprimé : eg R Lts

Supprimé : it is recommended that

B-478 VARIOUS SPECIAL FORMS OF LIGHTING

B-478.1 **A bearing light** is one which enables its approximate bearing to be obtained without the use of a compass. Various systems can be employed, but all involve multiplying the interval of time between two specified flashes from two separate optical systems in the same light structure by a given factor, to give the bearing or its reciprocal.

Such lights should be charted with standard characteristics and not identified on the chart in any special way.

B-478.2 **Floodlighting** of a structure (eg a pier, pier-head lighthouse) or a danger close to navigable water, may be indicated by the symbol:

P63

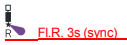
by the legend '(illuminated)', the abbreviation '(illum)', or equivalent, against the structure or feature being lit, on the appropriate side if known. The symbol should be in magenta, but may be in yellow/orange on 'multi-coloured' charts.

Exceptionally on very large scale charts, if it is required to chart the actual floodlight, this should be by means of a small position circle and the legend 'Floodlight', or equivalent.

B-478.3 **Synchronized lights.** A group of lights, usually on buoys or beacons, which:

- all flash at the same time (synchronous),
- flash one after another in series (sequential),
- a combination of the above,

are referred to as 'synchronized' lights. They often occur on lateral marks in a channel, or special marks marking an area or feature. Details of their type of synchronicity is best given in LL, Sailing Directions and/or a chart note. The **international abbreviation** '(sync)' may be added to the light description, eg:

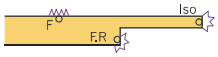


P66

B-478.4 Not currently used

B-478.5 A **Strip light** is a light whose source has a linear form, generally horizontal, which can reach a length of several metres. This type of light may be used, eg on heads of piers, along quay walls, at the corners of quays, on dolphins. It may have a rhythmic character and may be coloured. It may replace or be in addition to a painted strip.

The symbol for a strip light must be a small black position circle with a magenta serrated (zig-zag) line instead of the conventional flare, eg:



P64

On multi-coloured charts, the serrated line should be in the appropriate colour. The light-description should be in conventional form.

Commentaire [c58] : Do such lights still exist? Do we need a specification?

Supprimé : It is recommended that the

Supprimé : is

Supprimé : is

Supprimé : either

Supprimé : or

Supprimé : **The synchronisation** of the rhythm of lights in a harbour channel is a feature which is increasingly used. No special memtion or indication is required on charts.¶

Supprimé : Flares or flames at offshore production platforms and oil refineries and chemical industries on land: see B-445.6

Supprimé : For light structures as daymarks, see B-457.¶

Supprimé : **s (bordures lumineuses).** These are found mainly in French waters. A "bordure lumineuse" is described

Supprimé : and

Supprimé : conventional

Supprimé : and normal light-description in abbreviated form,

Supprimé : to draw attention to it

QUESTIONS ARISING FROM DRAFT REVISION OF B-450 TO B-479

Response form

(please return to CSPCWG Secretary by 13 December 2007)
andrew.coleman@ukho.gov.uk

Para	Specification	Question	YES	NO
2	B-450.2	a. Should 'Or' and 'Am' be retained as INT abbreviations?		
		b. Should there be an abbreviation for 'metal colour' structures?		
8	B-445.8	Is there any reason why radar reflectors should be shown on IALA beacons, when they are not shown on IALA buoys or buoyant beacons? (If you answer Yes, please explain below)		
9	B-456.1	Do you agree to make the term 'withy' and its associated symbol obsolescent, in the interests of simplification?		
11	B-458	Do you agree to the deletion of this specification (and INT 1 subsequently amended)?		
12	B-460.5 & 462	Is there a need for a special ice buoy symbol?		
13	B-462	Should the national racing topmark 'flag' be adopted as an international symbol?		
14	B-462.8	Is there any reason to differentiate between IALA and non-IALA light floats?		
16	B-466.1	a. Does your HO still use coloured patches instead of flares?		
		b. Do you know of any HO which still uses colour patches? (If so, please advise below)		
17	B-470.4	Do you agree to omit the 'rule' to place coloured sectors within 30mm of a light star?		
18	B-470.5	Do you agree to remove the option to use a dot instead of a star for a light position?		
21	474.5	a. Do Watch (station) buoys still exist?		
		b. Do we still need this specification?		
24	B-478.1	a. Do 'Bearing lights' still exist?		
		b. Do you agree to remove this specification if they are not to be identified in any special way on charts?		

Comments: ……

Name....…….

Member State……..……..

Page 27: [1] Supprimé **colemana** **12/02/2007 14:57:00**

but with a varying degree of use of magenta - at the minimum, merely drawing attention to the positions of lights

Page 27: [2] Supprimé **colemana** **12/02/2007 13:49:00**

(as on many Swedish charts).

----------Saut de page----------

Page 27: [3] Supprimé **colemana** **12/02/2007 15:03:00**

, and printing is easier and cheaper. In charting the tidal estuaries of the German and Netherlands coasts, where complex light sectors are also common, the correctional problem is very significant, especially for "multi-coloured charts".

Page 27: [4] Supprimé **colemana** **12/02/2007 13:53:00**

In the specifications which follow, emphasis is given to standardizing legends and line symbols on the black plate. The meaning of the terms "multi-coloured chart" and "standard chart" should be clear from the above.

Page 27: [5] Commentaire [c40] **colemana** **19/10/2007 08:48:00**

We suggest removing this from INT specs in the interests of standardization.

Page 27: [6] Supprimé **colemana** **12/02/2007 15:10:00**

Dots can be hand-drawn more easily on compilation drawings but, lacking a coloured flare, they are not sufficiently distinctive when editing and revising drawings and single colour proofs.

Page 27: [7] Commentaire [c41] **colemana** **19/10/2007 08:48:00**

DID, please insert 5011 Pc.

Page 27: [8] Supprimé **colemana** **12/02/2007 16:01:00**

or patches on ‘standard’ (as opposed to ‘multi-coloured’ charts) shall be in the form of small magenta flames or flares

Page 27: [9] Supprimé **colemana** **21/02/2007 11:52:00**

circular patches centred on the light position may be used instead. **P11**. See also B-475 for sector lights