CSCPWG8-INF5

Informational Paper for Consideration by CSCPWG

New Presentation of Q130.1 and Q130.3 in the U.S. Chart No. 1, Edition 12

Submitted by:	USA (NOAA)
Executive Summary:	The US has modified the presentation of the IALA regions and the in-context lateral mark graphic from INT1 Q130.1, as well as the cardinal marks graphic from Q130.3 for use in Edition 12 of the US Chart No. 1. This information is being provided to CSCPWG and its INT1 sub-working group for their consideration for possible improvements to INT1.
Related Documents:	INT1, US Chart No. 1
Related Projects:	Standardization and Improvement of INT1

Introduction / Background

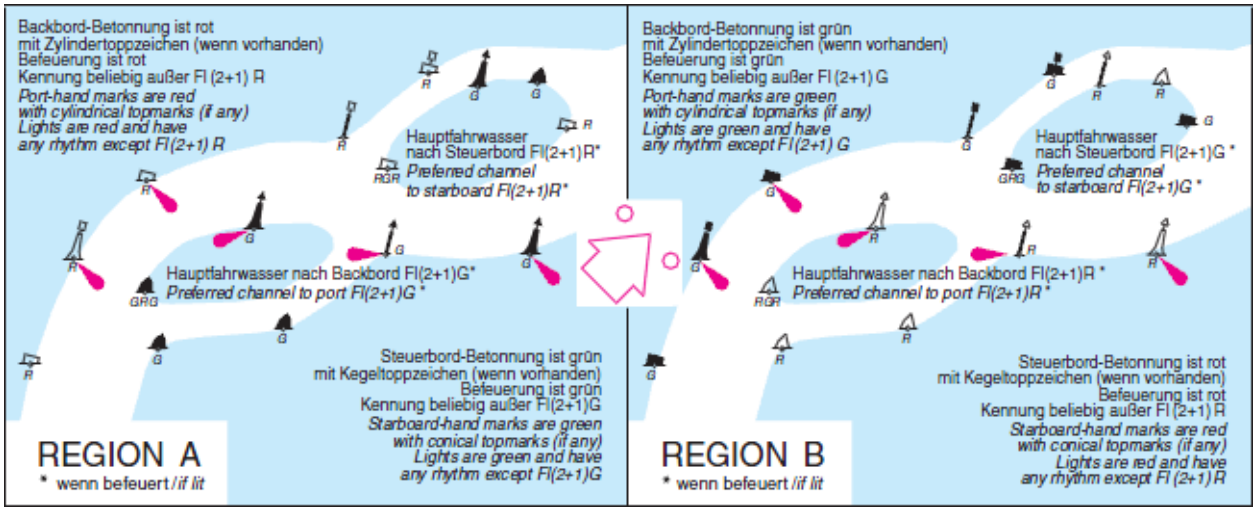
The United States has just released its first update of its Chart No. 1, *Nautical Chart Symbols, Abbreviations and Terms* since 1997; this will be Edition 11 of the U.S. Chart No. 1. Development of a subsequent update, which will show both paper chart (S-4) symbology and ECDIS (S-52) symbology side-by-side in a single document, is currently underway; this will be Edition 12. Edition 12 is being created in a landscape format to make room for the additional columns needed to include the ECDIS symbols. The landscape format has also enabled greater flexibility in how some sections of Chart No.1 (or INT1) can be presented. The graphics presented in Q130.1 and 130.3 have been modified to take advantage of the extra horizontal space, although some of the changes described here could easily be adopted for use within a portrait formatted document too.

These changes are presented here to the CSPCWG and the INT1 sub-working group for their consideration for use in future editions of INT1.

The working draft of the entire Q Section is presented as an annex to this document. Any comments or recommendations regarding how the S-52 symbology is presented or Edition 12 in general will be gladly accepted and may be sent to colby.harmon@noaa.gov.

Analysis/Discussion

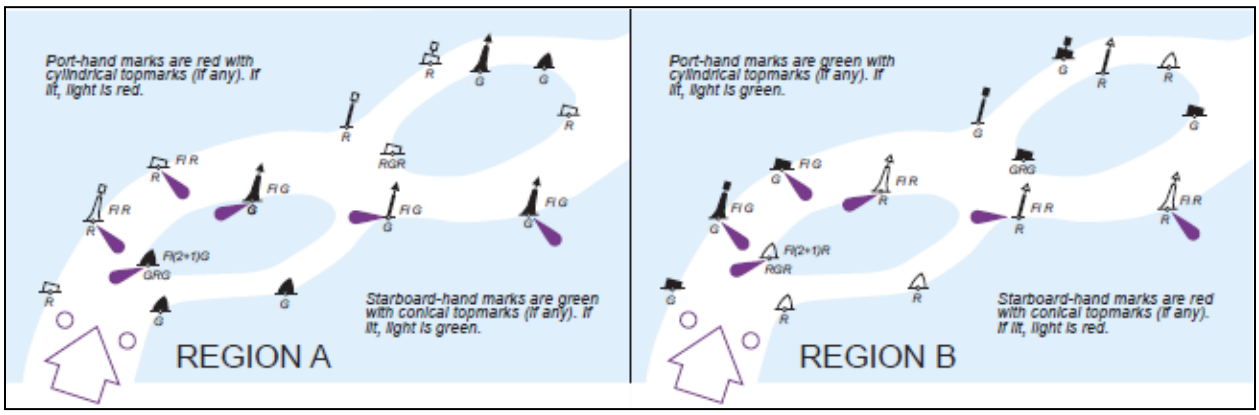
Existing Region A & B Channel Graphics in Q130.1



Description of Changes to Region A & B Channel Graphics in Q130.1

Change	Rationale
Moved the Direction of Buoyage Arrow to the entrance of each channel	Locating the arrow in the middle of the pair of graphics can be confusing as it appears to indicate movement from the graphic on the left to the one on the right. The new position not only indicates the direction of buoyage, but also emphasizes the entrance to the channel. The arrow in the middle also introduces white space that connects the channels in each diagram. The new position is more aesthetically pleasing and does not disrupt the depiction of the blue shallow water area.
Modified the Port-hand, Starboard-hand and Preferred channel notes within the graphic	In the previous set of notes, one would have to read all three notes to see that both port and starboard marks can have any rhythm, but that Fl (2+1) is reserved for preferred channel marks. The modified note puts all of this information in one place. This also precludes the need for a fourth part of the text, the asterisk with "if lit."
Added light to one of the preferred channel buoy	Shows in-context example of Fl (2+1) rhythm used on preferred channel marks and reinforces the difference between ordinary lateral marks and preferred channel marks (as described in the modified note).
Added generic (rhythm-less) Fl R and Fl G as appropriate to lit buoys.	More realistic representation of lit buoys and reinforces differences between ordinary lateral marks and preferred channel marks.
Augmented "preferred channel marks have horizontal bands" note	Clarifies that the top band indicates the preferred channel.
Modified "preferred channel buoy may also be a pillar or spar" note	Emphasizes that the shape also indicates the preferred channel.

Modified Region A & B Channel Graphics in Q130.1



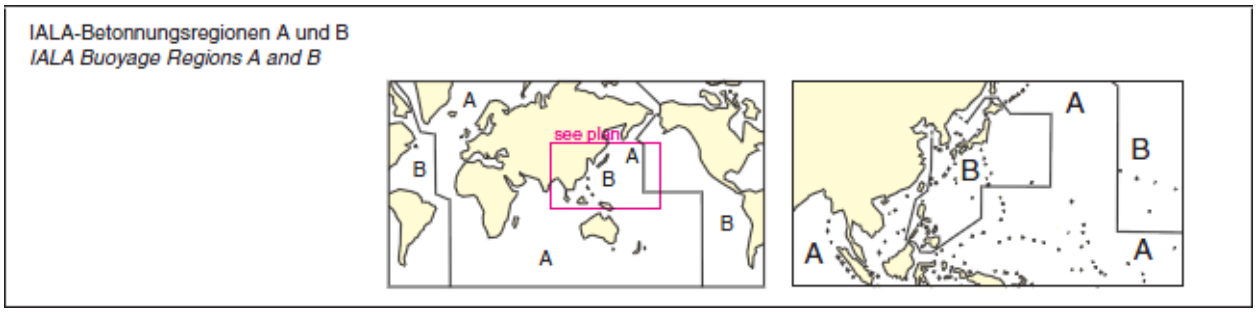
Modified Notes Accompanying Channel Graphics in Q130.1

If lit, lights on port-hand and starboard-hand marks may have any rhythm specified except Fl(2+1), which is used for preferred channel aids.

All preferred channel marks have horizontal bands of color; the top color indicates the preferred channel.

A preferred channel buoy may be a can or conical shape to indicate the preferred channel (in addition to the top color band), but may also have a pillar or spar shape.

Existing IALA Buoyage Regions Graphic in Q130.1



Description of Changes to IALA Buoyage Regions Graphic in Q130.1

Change	Rationale
Full page is used for graphic	Details of the extent of each region are much easier to discern and the need for an inset plan has been eliminated.
Colour coded land masses in each region	Colours augment the demarcation indicated by the orange IALA boundaries used in the graphic. This also easily depicts the Asian portion of Region B more simply. Letters A and B match the colour used for each region reinforcing the connection between the region and the portrayal of its extent.
Graphic is centred on 0° Meridian with "bump-outs" at 180°	Enables the portrayal of each region as a nearly uninterrupted area.
Note above the graphic in Q130 has been modified to provide a narrative description of each region.	Provides additional clarification of the extent of each region.
Graticule has been added	Enables users to more easily determine the limits of each region.

Modified IALA Buoyage Regions Graphic in Q130.1 is shown on the next page.

IALA Maritime Buoyage System

IALA International Association of Marine Aids to Navigation and Lighthouse Authorities

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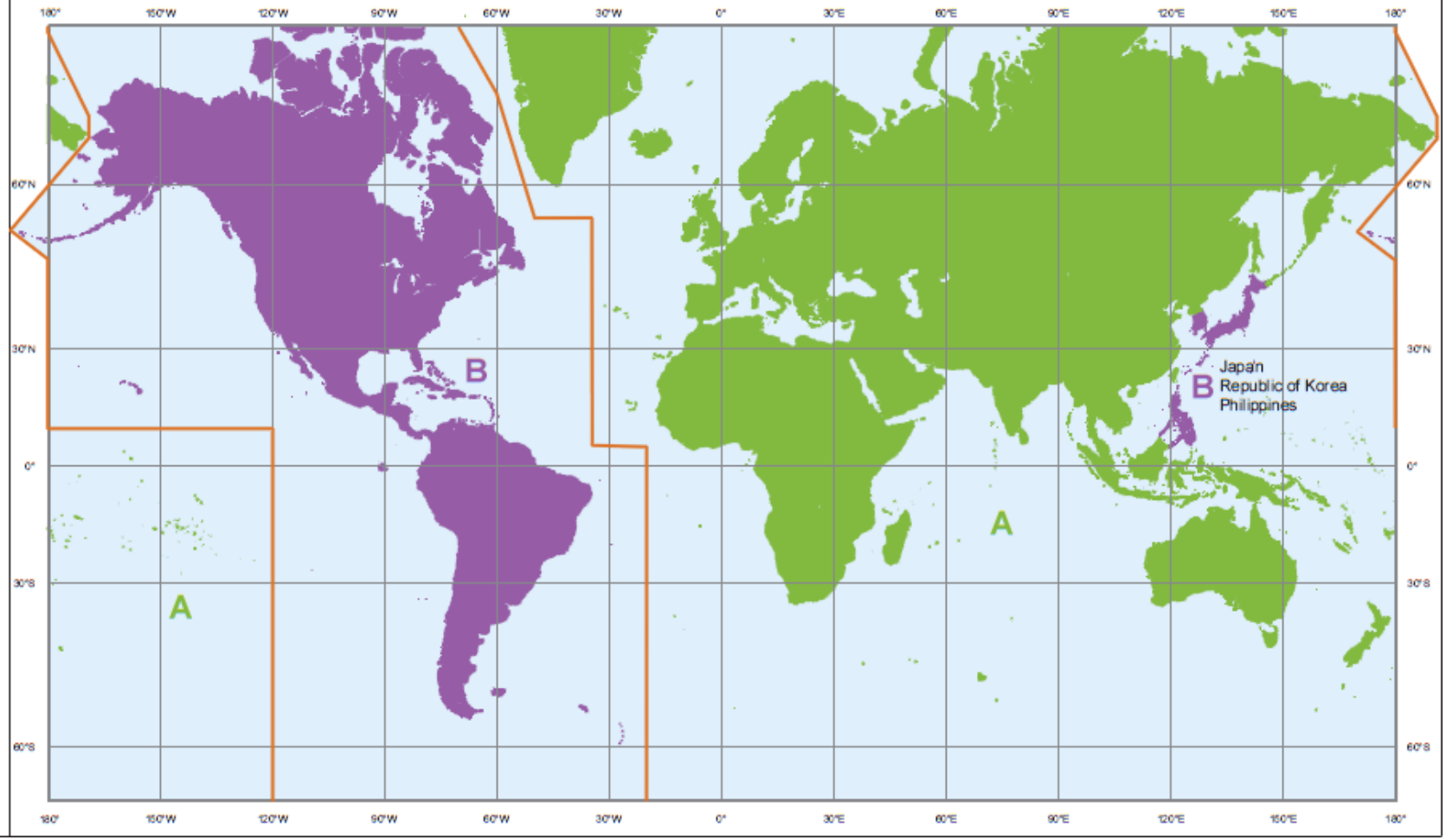
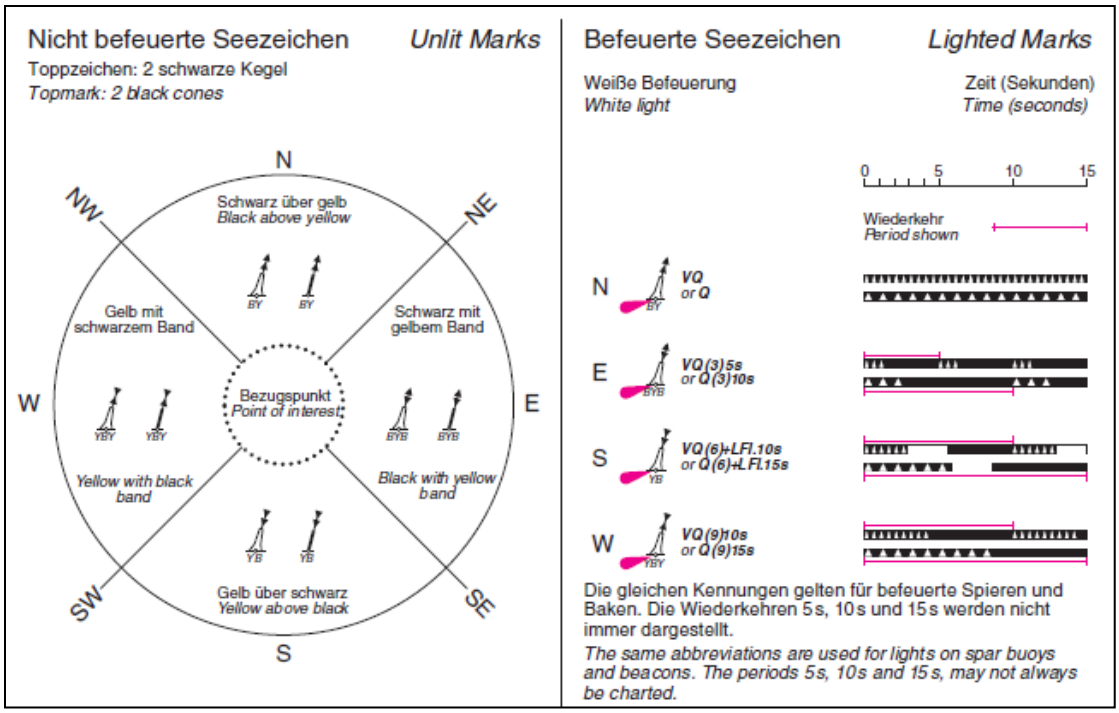
Where in force, the IALA System applies to all fixed and floating marks except landfall lights, leading lights and marks, sectored lights and major floating lights. The standard buoy shapes are cylindrical (can) , conical , spherical , pillar , and spar , but variations may occur, for example: light-floats . In the illustrations in Q130.1, only the standard buoy shapes are used. In the case of fixed beacons (lit or unlit), only the shape or the topmark is of navigational significance. Lateral marks are generally for well-defined channels.

There are two international buoyage regions where lateral marks differ. Region A is primarily comprised of the waters surrounding Greenland, Africa, Europe, Asia (except for Japan, the Republic of Korea and the Philippines) and Australia. Region B is primarily comprised of the waters surrounding North and South America, Japan, the Republic of Korea and the Philippines.

130.1



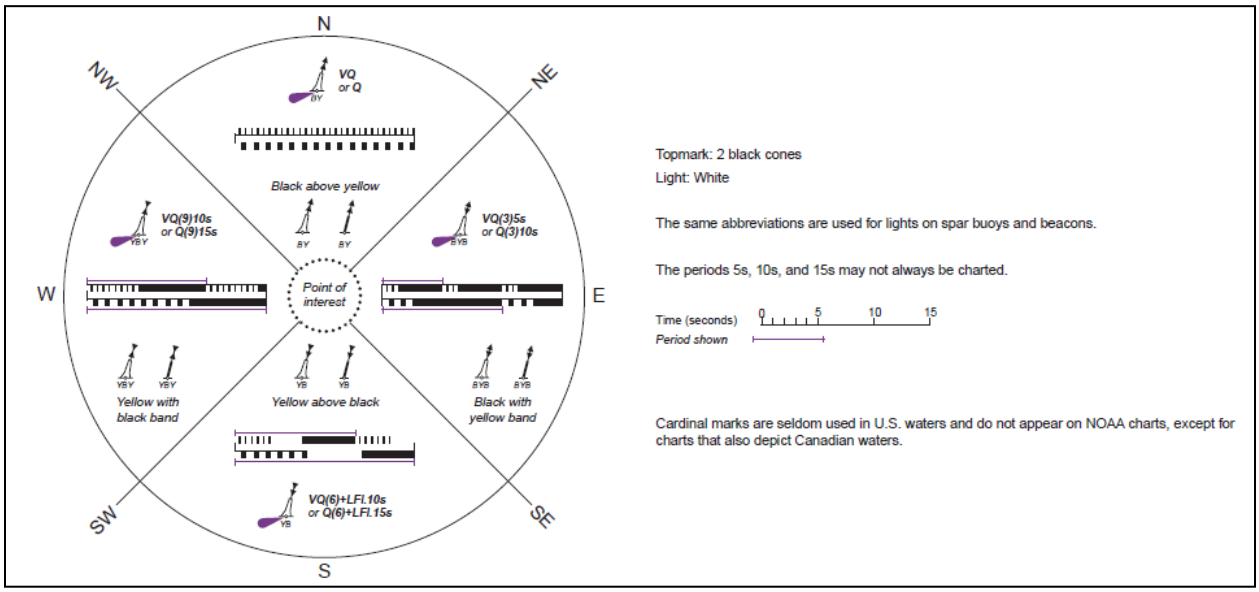
Existing Cardinal Buoy Graphic in Q130.3



Description of Changes to Cardinal Buoy Graphic in Q130.3

Change	Rationale
The elements for lighted aids, such as the buoy symbols and flash rate graphics have been combined with the cardinal graphic which shows the unlit buoys	Puts all the information in one place and reinforces the Q, 3, 6, 9 clock face relationship to cardinal positions.
Places all notes to one side	Makes it easier for the user to read all information regarding cardinal marks without having to scan from one part of the graphic to another.

Modified Cardinal Buoy Graphic in Q130.3



Conclusions

The depictions of Q130.1 and Q130.3 in U.S. Chart No.1, Edition 12 have several advantages and should be considered for use in future INT1 documents.

Action Required of CSPCWG

The CSPCWG is invited to:

a. Review the design concepts presented here for possible use in future INT1 documents
b. Provide any comments or recommendations regarding U.S. Chart No.1, Edition 12 to colby.harmon@noaa.gov.

Working Draft of U.S. Chart No. 1, Edition 12, Section Q, “Buoys and Beacons”

28 October 2011

Please send any comments to colby.harmon@noaa.gov.

No.	INT	Description	NOAA	NGA	Other NGA	ECDIS	
Buoys and Beacons							
IALA Maritime Buoyage System, which includes Beacons → Q130							
		Default buoy symbol if no other refining attribution is provided					default symbol for buoy, paper-chart
							default symbol for buoy, simplified
		Default beacon symbol if no other refining attribution is provided					default symbol for a beacon, paper-chart
							default symbol for a beacon, simplified
1		Position of buoy or beacon					
Colors of Buoys and Beacon Topmarks						Supplementary national symbols: p	
Abbreviations for Colors → P							
2	G B G G G	Green and black (symbols filled black)	G				
3	R R Y Y R	Single color other than green and black	R				
4	BY GRG BRB	Multiple colors in horizontal bands, the color sequence is from top to bottom	RG				
5	RW RW RW	Multiple colors in vertical or diagonal strips, the darker color is given first	RW				
6		Retroreflecting material					
	Note: Retroreflecting material may be fitted to some unlit marks. Charts do not usually show it. Under IALA Recommendations, black bands will appear blue under a spotlight.						
Lighted Marks							
Marks with Fog Signals → R							
7	Fl.G G Fl.R R	Lighted marks on standard charts	Fl	Fl R R			
8	Fl.R R Iso RW Fl.G G	Lighted marks on multicolored charts					

Q Buoys, Beacons

No.	INT	Description	NOAA	NGA	Other NGA	ECDIS	
Topmarks and Radar Reflectors							
For Application of Topmarks within the IALA-System → Q130 For other topmarks (special purpose buoys and beacons) → Q							
9		IALA System buoy topmarks (beacon topmarks shown upright)					topmark for beacons, flag or other shape, paper-chart
							topmark for buoys, flag or other shape, paper-chart
							topmark for buoys, cone point up, paper-chart
							topmark for buoys, 2 cones point upward, paper-chart
							topmarks for buoys, 2 cones point downward, paper-chart
							topmark for buoys, 2 cones base to base, paper-chart
							topmark for buoys, 2 cones point to point, paper-chart
							topmark for buoys, sphere, paper-chart
							topmark for buoys, 2 spheres, paper-chart
							topmark for buoys, cylinder, paper-chart
							topmark for beacons, cone point up, paper-chart
							topmark for buoys, x-shape, paper-chart
10	2 Name R	Beacon with topmark, color, radar reflector and designation					beacon in general with topmark, paper-chart
11	Name 3 G	Buoy with topmark, color, radar reflector and designation		No 3 G			conical buoy with top-mark, paper-chart
	Note: Radar reflectors on floating marks usually are not charted.						
Buoys							
Shapes of Buoys							
Features Common to Buoys and Beacons → Q1-11							
20		Conical buoy, nun buoy, ogival buoy	N				conical buoy, paper-chart
21		Can buoy or cylindrical buoy	C				can buoy, paper-chart

No.	INT	Description	NOAA	NGA	Other NGA	ECDIS	
22		Spherical buoy	SP				spherical buoy, paper-chart
23		Pillar buoy	P				pillar buoy, paper-chart
24		Spar buoy, spindle buoy	S				spar buoy, paper-chart
25		Barrel buoy, tun buoy					barrel buoy, paper-chart
26		Superbuoy					super-buoy, paper-chart
							super-buoy ODAS & LANBY, simplified
							LANBY, super-buoy, paper-chart
Minor Light Floats							
30	Fl.G.3s Name	Light float as part of IALA System					light float, paper-chart
							light float, simplified
31	Fl.10s	Light float not part of IALA System					light float, paper-chart
							light float, simplified
Mooring Buoys						Supplementary national symbols: m, n	
Oil or Gas Installation Buoy → L							
40		Mooring buoys					mooring buoy, can shape, paper-chart
							mooring buoy, barrel shape, paper-chart
							installation buoy and mooring buoy, simplified
41	Fl.Y.2,5s	Lighted mooring buoy (example)		Fl Y 2s			mooring buoy with light flare, barrel shape, paper-chart

Q Buoys, Beacons

No.	INT	Description	NOAA	NGA	Other NGA	ECDIS	
42	1 2	Trot, mooring buoys with ground tackle and berth numbers					
43		Mooring buoy with telegraphic or telephonic communication					mooring buoy, can shape, paper-chart
							mooring buoy, barrel shape, paper-chart
							installation buoy and mooring buoy, simplified
44	*Small Craft Moorings*	Numerous moorings (example)	*Numerous mooring buoys*	*(5 buoys) Moorings*			
45		Visitors' mooring					
Special Purpose Buoys							
Note: Shapes of buoys are variable. Lateral or Cardinal buoys may be used in some situations.							
50	*DZ*	Firing danger area (Danger Zone) buoy				conical buoy with top-mark, paper-chart	special purpose buoy, spherical or barrel shaped, or default symbol for special purpose buoy, simplified
51	*Target*	Target					
52	*Marker Ship*	Marker Ship					
53	*Barge*	Barge					
54	*DG*	Degaussing Range buoy					
55	*Cable*	Cable buoy	*Tel*				
56		Spoil ground buoy					
57		Buoy marking outfall					
58	***ODAS*** ***ODAS***	ODAS buoy, Data collecting buoy (Ocean Data Acquisition System)	*ODAS*	*ODAS*			super-buoy ODAS & LANBY, simplified

No.	INT	Description	NOAA	NGA	Other NGA	ECDIS	
59	Y	Buoy marking wave recorder or current meter					conical buoy with top-mark, paper-chart
							special purpose buoy, spherical or barrel shaped, or default symbol for special purpose buoy, simplified
60		Seaplane anchorage buoy	*AERO*				conical buoy, paper-chart
61		Buoy marking traffic separation scheme					
62	Y	Buoy marking recreation zone					conical buoy with top-mark, paper-chart
Seasonal Buoys							
70	Y *(priv)*	Buoy privately maintained (example)	*Priv* *(maintained by private interests, use with caution)*		Y *(occas)* Y *(01.04.–31.10.)*		conical buoy with top-mark, paper-chart
71	Y *(Apr–Oct)*	Seasonal buoy (example)					special purpose buoy, spherical or barrel shaped, or default symbol for special purpose buoy, simplified
Beacons						Supplementary national symbols: o	
Lighted Beacons → P		Features Common to Beacons and Buoys → Q1-11					
80	Bn	Beacon in general, characteristics unknown or chart scale too small to show	Bn	G Bn R Bn			beacon in general, paper-chart
81	BW	Beacon with color, no distinctive topmark	R G RW Bn				
82	R BY BRB	Beacons with colors and topmarks (examples)					beacon in general with topmark, paper-chart

Q Buoys, Beacons

No.	INT	Description	NOAA	NGA	Other NGA	ECDIS	
83	BRB	Beacon on submerged rock with colors (topmark as appropriate)		BRB			isolated danger beacon, simplified
Minor Impermanent Marks Usually in Drying Areas (Lateral Marks of Minor Channels)							
Minor Pile → F							
90		Stake, pole	○ Pole ● Pole	R			
91	PORT HAND / STARBOARD HAND	Perch, stake	○ Stake ● Stake	R			
92		Withy					
Minor Marks, Usually on Land							
Landmarks → E							
100		Cairn	○ Cairn	CAIRN			conspicuous cairn
101	Mk	Colored or white mark					square or rectangular day mark, paper chart
							square or rectangular day mark, simplified
							triangular day mark, point up, paper chart
							triangular day mark, point up, simplified
							triangular day mark, point down, paper chart
							triangular day mark, point down, simplified
102.1	RW	Colored topmark (color known or unknown) with function of a beacon					
102.2	RW RW	Painted boards with function of leading beacons					

No.	INT	Description	NOAA	NGA	Other NGA	ECDIS	
Beacon Towers							
110	R G R G BY BRB	Beacon towers without and with topmarks and colors (examples)	RW Bn				beacon tower, paper-chart
							beacon tower with top-marks, paper-chart
111		Lattice beacon					
Special Purpose Beacons							
Leading Lines, Clearing Lines → M							
Note: Topmarks and colors shown where scale permits.							
120		Leading beacons		Bns in line 270°			
121		Beacons marking a clearing line		Bns in line 270°			
122	Measured Distance 1852m 090°–270°	Beacons marking measured distance with quoted bearings	MARKERS MARKERS COURSE 270°00' TRUE				
123	Y	Cable landing beacon (example)		W			
124	Ref Ref	Refuge beacon					
125		Firing danger area beacons					
126		Notice board					

IALA Maritime Buoyage System

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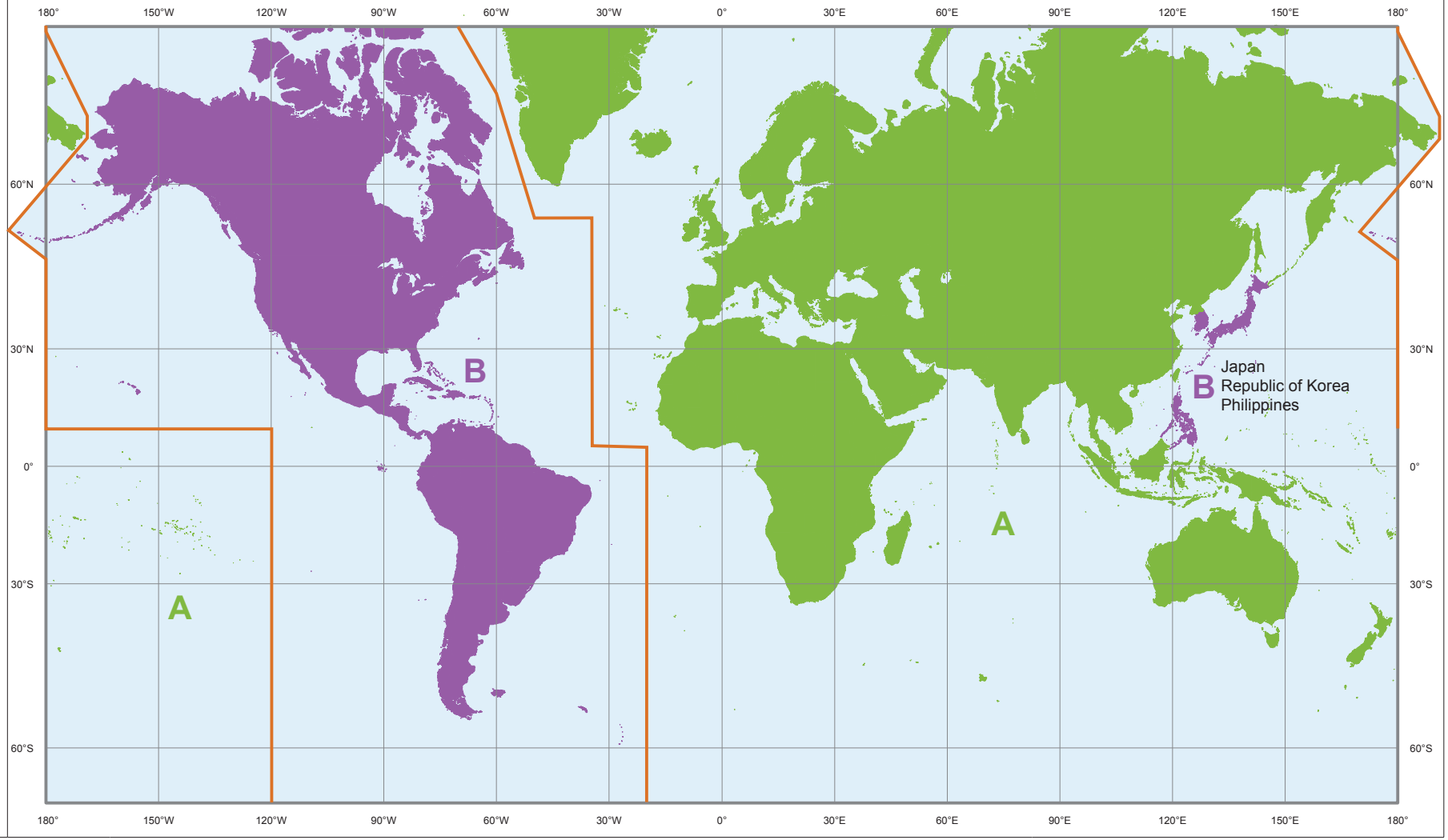
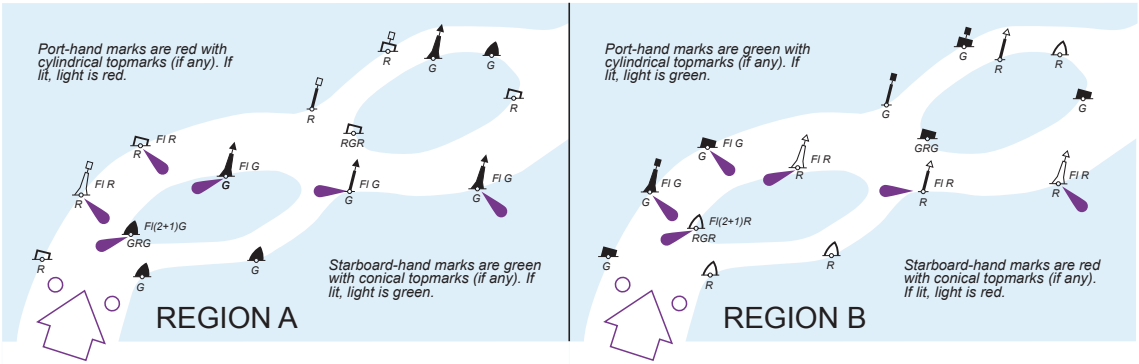
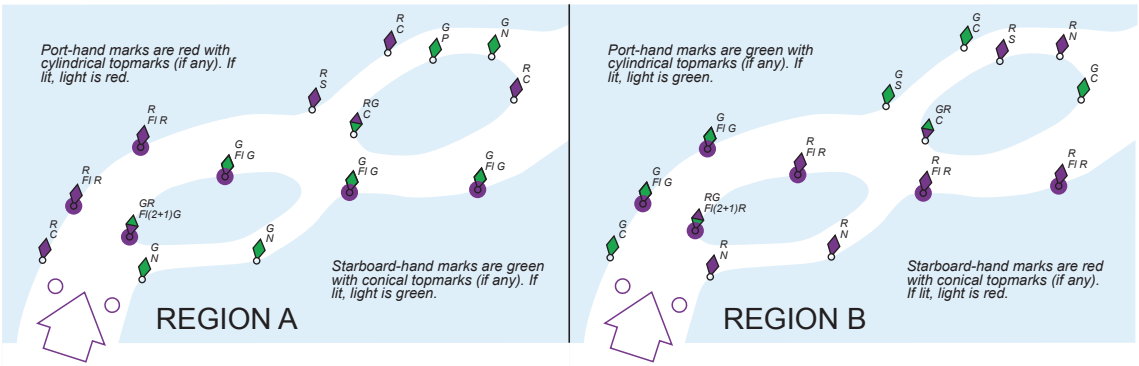
Where in force, the IALA System applies to all fixed and floating marks except landfall lights, leading lights and marks, sectored lights and major floating lights. The standard buoy shapes are cylindrical (can) , conical , spherical , pillar , and spar , but variations may occur, for example: light-floats . In the illustrations in Q130.1, only the standard buoy shapes are used. In the case of fixed beacons (lit or unlit), only the shape or the topmark is of navigational significance. Lateral marks are generally for well-defined channels.

There are two international buoyage regions where lateral marks differ. Region A is primarily comprised of the waters surrounding Greenland, Africa, Europe, Asia (except for Japan, the Republic of Korea and the Philippines) and Australia. Region B is primarily comprised of the waters surrounding North and South America, Japan, the Republic of Korea and the Philippines.

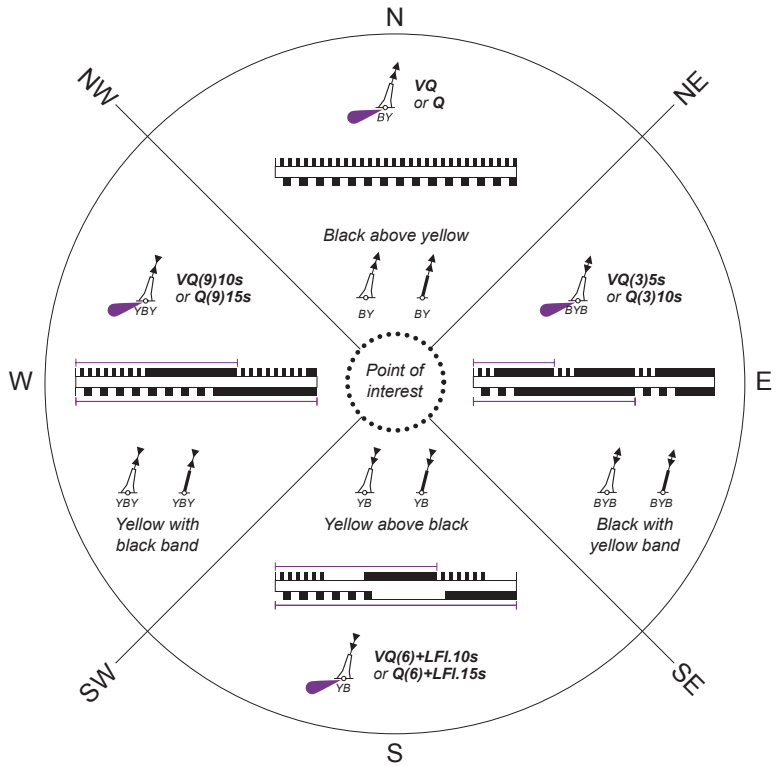
130.1



130.1	INT		If lit, lights on port-hand and starboard-hand marks may have any rhythm specified except Fl(2+1), which is used for preferred channel aids. All preferred channel marks have horizontal bands of color; the top color indicates the preferred channel. A preferred channel buoy may be a can or conical shape to indicate the preferred channel (in addition to the top color band), but may also have a pillar or spar shape.
	NOAA		
130.2	Direction of Buoyage: The direction of buoyage is that taken when approaching a harbor from seaward. Along coasts, the direction determined by buoyage authorities, normally clockwise around land masses.		
	Symbol showing direction of buoyage where not obvious	Symbol showing direction of buoyage on multicolored charts	

Q Buoys, Beacons

130.3 Cardinal Marks: indicating navigable water to the named side of the marks. In the illustration below all marks are the same in Regions A and B.



Topmark: 2 black cones

Light: White

The same abbreviations are used for lights on spar buoys and beacons.

The periods 5s, 10s, and 15s may not always be charted.

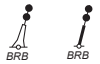
Time (seconds) 0 5 10 15

Period shown

Cardinal marks are seldom used in U.S. waters and do not appear on NOAA charts, except for charts that also depict Canadian waters.

130.4 Isolated Danger Marks stationed over dangers with navigable water around them.

Body: *black with red horizontal band(s)*
Topmark: *2 black spheres*



Light: *white*

Fl(2)

130.5 Safe Water Marks such as mid-channel and landfall marks.

Body: *red and white vertical stripes*
Topmark (if any): *red sphere*

Light: *white*

Iso *or*
Oc *or*
LFl.10s *or*
Mo(A)

130.6 Special Marks not primarily to assist navigation but to indicate special features.

Body (shape optional): *yellow* *
Topmark (if any): *yellow x*

Light: *yellow, rhythm optional*

Fl.Y

* In special cases yellow may be in conjunction with another color.

No.	INT	Description	NOAA	NGA	Other NGA	ECDIS
Supplementary National Symbols						
a		Bell buoy	BELL	BELL		
b		Gong buoy	GONG	GONG		
c		Whistle buoy	WHIS	WHIS		
d		Fairway buoy (red and white vertical stripe)	RW			
e		Mid-channel buoy (red and white vertical stripe)	RW			
f		Starboard-hand buoy (entering from seaward - US waters)	R "2"			
g		Port-hand buoy (entering from seaward - US waters)	G "1"	"1"		
h		Bifurcation, Junction, Isolated danger, Wreck and Obstruction buoys	BR RG GR G			
i		Fish trap (area) buoy	Y			
j		Anchorage buoy (marks limits)	Y			
l		Triangular shaped beacons	R	RG Bn		
		Square shaped beacons	G	GR Bn W Bn B Bn		
		Beacon, color unknown	Bn			
m		Mooring buoy with telegraphic communications		Tel Tel		
n		Mooring buoy with telephonic communications		T T		
o		Lighted beacon			Bn	
q		Security barrier	Security Barrier			
r		Scientific mooring buoy				
s		FLOAT				
t		White and Blue buoy		WBuW		