

HI-N-10/1



LIST OF LIGHTS

ON SERBIA AND MONTENEGRO COAST OF THE ADRIATIC SEA AND LAKE OF SKADAR

e-book Edition v1.3 20060531

2006
NAVAL HYDROGRAPHIC INSTITUTE - LEPETANE

PUBLISHED BY THE NAVAL HYDROGRAPHIC INSTITUTE
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The List of Lights has been amended up to the NMs volume No. 2/06. It is keeping updated by coupons for amendments to the List of Lights. The amendments are being pasted on the left margin of the corresponding light. With a view of control, an index of amendments will be published periodically.

NOTATION OF AMENDMENTS

NMs No	Date Amended	NMs No	Date Amended	NMs No	Date Amended
3/06		6/07		3/09	
4/06		1/08		4/09	
5/06		2/08		5/09	
6/06		3/08		6/09	
1/07		4/08		1/10	
2/07		5/08		2/10	
3/07		6/08		3/10	
4/07		1/09		4/10	
5/07		2/09		5/10	

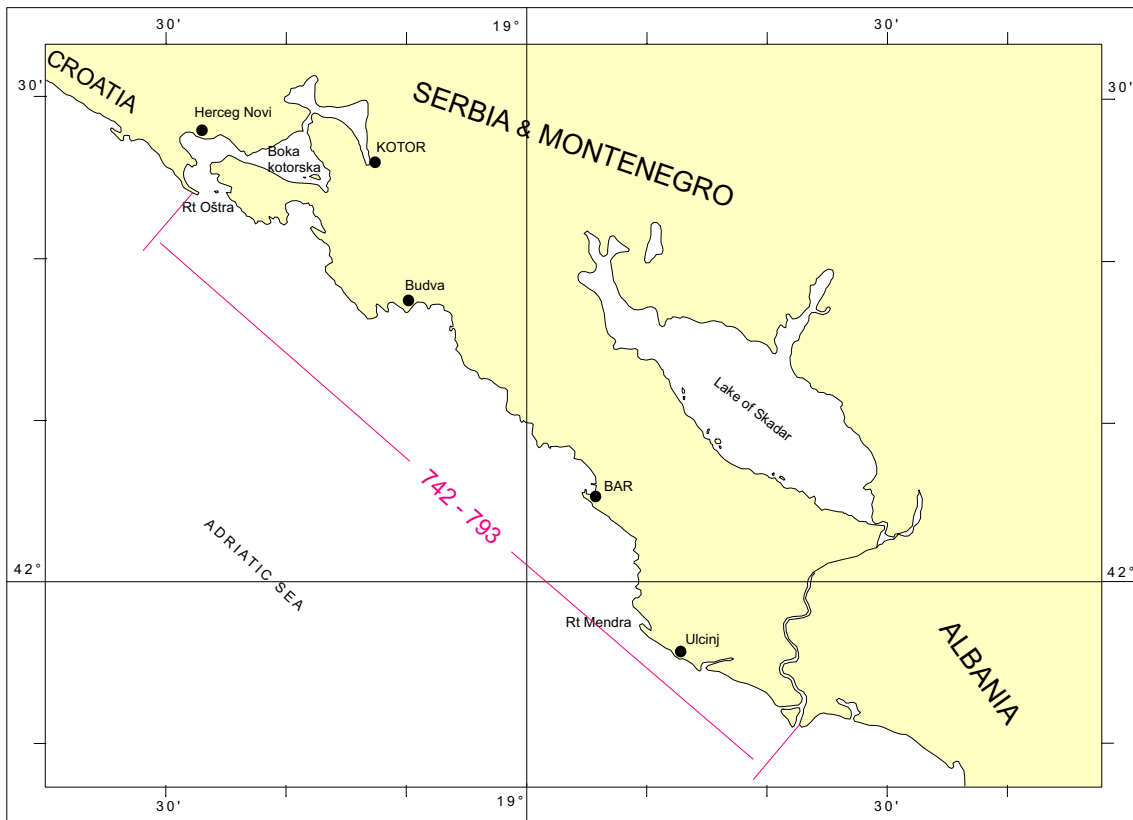


TABLE OF CONTENTS

PREFACE	6
INTRODUCTORY REMARKS.....	7
UPDATING	8
COLUMN DESCRIPTIONS IN THE TABLES	9
GEOGRAPHICAL RANGE TABLE	10
LUMINOUS RANGE DIAGRAM.....	11
INTRODUCTION TO THE TABLES.....	13
REGIONAL INFORMATION	33
SUMMARY OF SYMBOLS AND ABBREVIATIONS	34
TABLE OF LIGHTS	37
TABLE OF EQUIVALENT LIGHT NUMBERS.....	45
ALPHABETICAL INDEX	46
PHOTOGRAPHS OF CERTAIN LIGHT CONSTRUCTIONS ON SERBIA AND MONTENEGRO COAST.....	48

PREFACE

The List of Lights on Serbia and Montenegro Coast of the Adriatic Sea and Lake of Skadar represents the Excerpt from the List of Lighthouses on the Adriatic Sea, Ionian Sea and Islands of Malta (edition of HI JRM, 1988).

This publication is designed for all navigators, and especially it may be useful for the owners of small vessels (yachts, sailing yachts, boats, etc.); i.e. as for those dealing with this activity, as well as for others staying in this part of the Adriatic Sea for recreational and tourist reasons (nautical tourism).

This nautical publication is made as much as possible in accordance with General Regulations and Recommendations of the International Hydrographic Organization (IHO), while the TABLE OF LIGHTS is standardized and represented in English.

The List of Lights on Serbia and Montenegro Coast of the Adriatic Sea and Lake of Skadar does not cancel validity of the List of Lighthouses on the Adriatic and Ionian Sea and Islands of Malta; therefore they may be used together for the larger navigational area.

DIRECTOR

Captain
DUŠAN SLAVNIĆ

INTRODUCTORY REMARKS

This List of Lights contains all valid information on existing lights on the Serbia and Montenegro Coast of the Adriatic Sea and Lake of Skadar, as they are: lighthouses, coast lights, port lights and light buoys regardless of their elevation and range, as well as listed eventual existing fog signals.

Lighthouse is the most important maritime light providing safe orientation on the occasion of approaching land. Almost all lighthouses are constructed in the shape of a tower or very visible construction representing excellent points for orientation by day. They are usually equipped with a reserve light, too. Lighthouses are continuously controlled by light-keepers.

Coast light serves for orientation in the coastal navigation and signalizes prominent parts of the coast, passage ways, channels, harbour approaches and navigational obstacles. The light support is usually a round, conical or square tower with column and gallery.

Port light marks port entrance and berthing places, serving for orientation on the occasion of maneuvering and anchoring. The light support is usually a column or tower with column and gallery.

Light buoy marks position and boundaries of navigational obstacles, fairways, etc. The buoys are not reliable maritime beacons because they may be displaced or pulled off the position by the effect of current and waves.

Fog signals are nautophone, siren, bell, horn, fire-arms, etc., and they are usually placed on the lighthouses and port lights.

The most important information on amendments to the lights and corrections respectively are being issued **in the second part** of NOTICE TO MARINERS, serving to keep the Serbia and Montenegro Charts updated. It should be emphasized that many alterations to lights and light buoys, especially those of a *temporary character, but operational nature* are promulgated only as corrections to the List of Lights, also in the second part of Notice to Mariners, immediately after Chart corrections (Corrections to the Publication).

It means that before use of this List of Lights it should be made its updating through the Notice to Mariners. This List of Lights is conclusively amended through the corresponding NMs volume No. mentioned inside the title page.

Notices to Mariners, in edition of the NAVAL HYDROGRAPHIC INSTITUTE, are published periodically, after two months each (6 volumes annually), and all required NMs numbers may be obtained free of charge from one of the following Organizations:

1. **Naval Hydrographic Institute – Lepetane,**
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4. **Harbour Master`s Office – Bar**
phone: +381 85 31 27 33; **fax:** +381 85 30 20 60; **e-mail:** harbourm@cg.yu

UPDATING

The List of Lights is amended up to the Notice to Mariners volume No. 2/2006.

It is keeping updated by coupons for amendments to the List of Lights. They contain all valid information on the related lights. A new coupon changes all previous amendments (if they exist), and therefore it means cancellation of the existing coupon for that light..

It means that if the objective is activating of the light and there is no information on other amendments to the light, it will be enough to pull off the coupon which signed that the light had been temporary extinguished.

If the coupon contains data about amendments to the light, already included in the previous coupon, the older coupon will be pulled off and a new one will be pasted on the left margin of the corresponding light.

For the lights removing from their use there is the corresponding light number on the coupon with inscription "REMOVE FROM LIST". This coupon is pasted on the left margin of the corresponding light number.

With a view of amendments to be controlled, an index of amendments to the List of Lights will be published periodically, as an appendix of Notices to Mariners .

Notation of amendments to the List of Lights is recorded in the Table, inside the title page of the Publication.

COLUMN DESCRIPTIONS IN THE TABLES

The appearance and column contents are as follows:

National No. Int. No.	Location - Name	Lat. Long.	Characteristics	Elevation (metres)	Range (miles)	Structure and height of construction (metres)	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Information on lights is described in eight columns, according to the following layout:

COLUMN 1

The ordinal light number (national number), and beneath it the corresponding international light number from the Admiralty List of Lights of United Kingdom (**List of Lights and Fog Signals - Volume E**).

COLUMN 2

Location, name and approximate position of the light or buoy. The names of places and entities respectively are printed in CAPITALS. The names of lights placed on the coast with the range if equal or greater than 15 nautical miles (M) are given in **bold type**. The names of coastal lights with range less than 15 nautical miles (M) are given in normal type. The names of floating lights and light buoys respectively are given in *lowercase italic type*.

COLUMN 3

Geographical coordinates of light positions (geographical latitude ϕ and longitude λ , WGS84 Datum) are shown in degrees, minutes and at least tenth of a minute. Given positions are approximate.

COLUMN 4

Characteristics of lights, and luminous intensity (if it is included) is given in candelas, *in italics*, beneath the characteristics.

COLUMN 5

Elevation of lights above sea level is given in metres.

COLUMN 6

Range of lights is given in nautical miles (M). **Bold type** is used for the range if equal to or greater than **15 M**, and normal type is used for the range less than 15 M.

COLUMN 7

Description of the structure carrying a light and its height are given in metres (from ground level to the top of the light structure).

COLUMN 8

Complementary information on lights with respect to the light period, arcs of visibility, limits of sectors, reserve lights, temporary extinguished lights, and so on. The limits of sectors and of arcs of visibility are measured upon seaward, i.e. as they are being seen by an observer from the vessel. The bearings, limits of sectors, arcs of visibility, leading lights and sector of direction lights are true and measured clockwise, from 0 to 360 degrees. Sector borders are never sharp, especially when they are being observed from their neighbourhood. The light disappears gradually, not at once, behind the limit of sector when it has already been passed. Sectors obscured are also being seen on this way. Reserve light is usually near to a main light, having the same or similar characteristic, but less range.

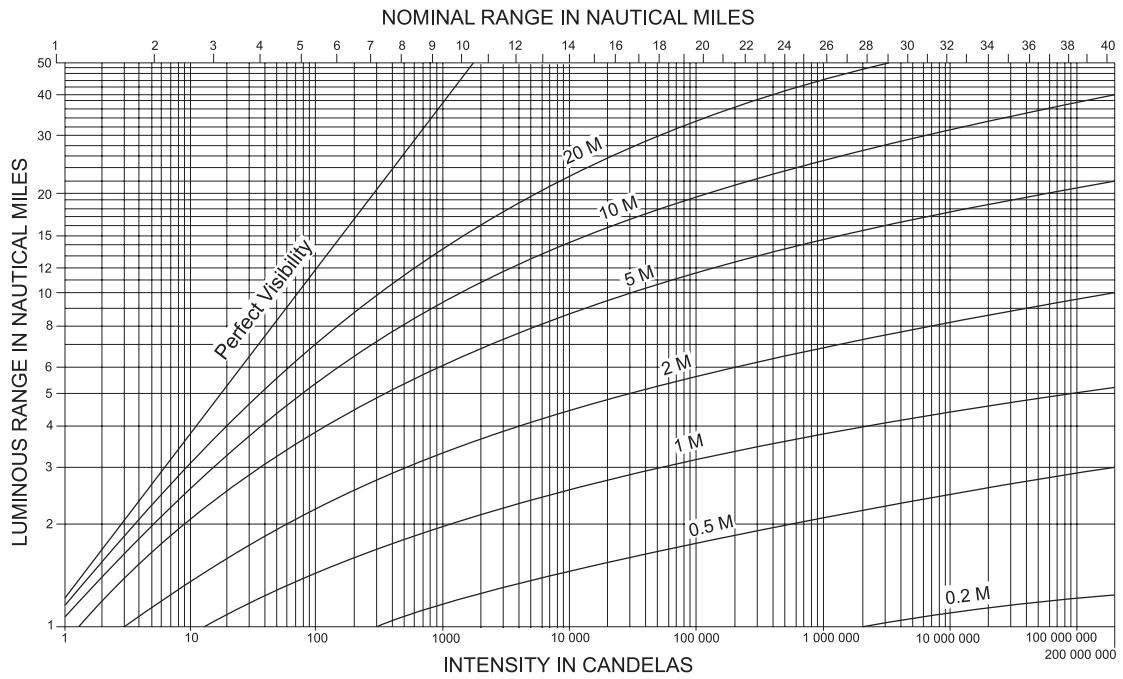
GEOGRAPHICAL RANGE TABLE

Note: A similar Geographical Range Table as well as directions for its use are given at the end of the part INTRODUCTION TO THE TABLES.

		height of the observer's eye in metres																						
		1	2	3	4	5	6	7	8	9	10	12	14	16	18	20	22	24	26	28	30	35	40	45
elevation of light in metres	0	2.0	2.8	3.5	4.0	4.5	4.9	5.3	5.7	6.1	6.4	7.0	7.6	8.1	8.6	9.1	9.5	9.9	10.4	10.7	11.1	12.0	12.9	13.6
	1	4.0	4.9	5.5	6.1	6.6	7.0	7.4	7.8	8.1	8.4	9.1	9.6	10.2	10.6	11.1	11.6	12.0	12.4	12.8	13.2	14.1	14.9	15.7
	2	4.9	5.7	6.4	6.9	7.4	7.8	8.2	8.6	9.0	9.3	9.9	10.5	11.0	11.5	12.0	12.4	12.8	13.2	13.6	14.0	14.9	15.7	16.5
	3	5.5	6.4	7.0	7.6	8.0	8.5	8.9	9.3	9.6	9.9	10.6	11.1	11.6	12.1	12.6	13.1	13.5	13.9	14.3	14.7	15.6	16.4	17.2
	4	6.1	6.9	7.6	8.1	8.6	9.0	9.4	9.8	10.2	10.5	11.1	11.7	12.2	12.7	13.2	13.6	14.0	14.4	14.8	15.2	16.1	16.9	17.7
	5	6.6	7.4	8.0	8.6	9.1	9.5	9.9	10.3	10.6	11.0	11.6	12.1	12.7	13.2	13.6	14.1	14.5	14.9	15.3	15.7	16.6	17.4	18.2
	6	7.0	7.8	8.5	9.0	9.5	9.9	10.3	10.7	11.1	11.4	12.0	12.6	13.1	13.6	14.1	14.5	14.9	15.3	15.7	16.1	17.0	17.8	18.6
	7	7.4	8.2	8.9	9.4	9.9	10.3	10.7	11.1	11.5	11.8	12.4	13.0	13.5	14.0	14.5	14.9	15.3	15.7	16.1	16.5	17.4	18.2	19.0
	8	7.8	8.6	9.3	9.8	10.3	10.7	11.1	11.5	11.8	12.2	12.8	13.4	13.9	14.4	14.8	15.3	15.7	16.1	16.5	16.9	17.8	18.6	19.4
	9	8.1	9.0	9.6	10.2	10.6	11.1	11.5	11.8	12.2	12.5	13.1	13.7	14.2	14.7	15.2	15.6	16.1	16.5	16.9	17.2	18.1	19.0	19.8
	10	8.4	9.3	9.9	10.5	11.0	11.4	11.8	12.2	12.5	12.9	13.5	14.0	14.6	15.1	15.5	16.0	16.4	16.8	17.2	17.6	18.5	19.3	20.1
	11	8.8	9.6	10.2	10.8	11.3	11.7	12.1	12.5	12.8	13.2	13.8	14.3	14.9	15.4	15.8	16.3	16.7	17.1	17.5	17.9	18.8	19.6	20.4
	12	9.1	9.9	10.6	11.1	11.6	12.0	12.4	12.8	13.1	13.5	14.1	14.6	15.2	15.7	16.1	16.6	17.0	17.4	17.8	18.2	19.1	19.9	20.7
	13	9.3	10.2	10.8	11.4	11.9	12.3	12.7	13.1	13.4	13.8	14.4	14.9	15.5	16.0	16.4	16.9	17.3	17.7	18.1	18.5	19.4	20.2	21.0
	14	9.6	10.5	11.1	11.7	12.1	12.6	13.0	13.4	13.7	14.0	14.6	15.2	15.7	16.2	16.7	17.2	17.6	18.0	18.4	18.8	19.7	20.5	21.3
	15	9.9	10.7	11.4	11.9	12.4	12.8	13.2	13.6	14.0	14.3	14.9	15.5	16.0	16.5	17.0	17.4	17.8	18.3	18.6	19.0	19.9	20.8	21.5
	16	10.2	11.0	11.6	12.2	12.7	13.1	13.5	13.9	14.2	14.6	15.2	15.7	16.3	16.8	17.2	17.7	18.1	18.5	18.9	19.3	20.2	21.0	21.8
	17	10.4	11.2	11.9	12.4	12.9	13.4	13.8	14.1	14.5	14.8	15.4	16.0	16.5	17.0	17.5	17.9	18.4	18.8	19.2	19.5	20.4	21.3	22.0
	18	10.6	11.5	12.1	12.7	13.2	13.6	14.0	14.4	14.7	15.1	15.7	16.2	16.8	17.3	17.7	18.2	18.6	19.0	19.4	19.8	20.7	21.5	22.3
	19	10.9	11.7	12.4	12.9	13.4	13.8	14.2	14.6	15.0	15.3	15.9	16.5	17.0	17.5	18.0	18.4	18.8	19.2	19.6	20.0	20.9	21.7	22.5
	20	11.1	12.0	12.6	13.2	13.6	14.1	14.5	14.8	15.2	15.5	16.1	16.7	17.2	17.7	18.2	18.6	19.1	19.5	19.9	20.2	21.1	22.0	22.8
	22	11.6	12.4	13.1	13.6	14.1	14.5	14.9	15.3	15.6	16.0	16.6	17.2	17.7	18.2	18.6	19.1	19.5	19.9	20.3	20.7	21.6	22.4	23.2
	24	12.0	12.8	13.5	14.0	14.5	14.9	15.3	15.7	16.1	16.4	17.0	17.6	18.1	18.6	19.1	19.5	19.9	20.3	20.7	21.1	22.0	22.8	23.6
	26	12.4	13.2	13.9	14.4	14.9	15.3	15.7	16.1	16.5	16.8	17.4	18.0	18.5	19.0	19.5	19.9	20.3	20.8	21.1	21.5	22.4	23.3	24.0
	28	12.8	13.6	14.3	14.8	15.3	15.7	16.1	16.5	16.9	17.2	17.8	18.4	18.9	19.4	19.9	20.3	20.7	21.1	21.5	21.9	22.8	23.6	24.4
	30	13.2	14.0	14.7	15.2	15.7	16.1	16.5	16.9	17.2	17.6	18.2	18.8	19.3	19.8	20.2	20.7	21.1	21.5	21.9	22.3	23.2	24.0	24.8
	35	14.1	14.9	15.6	16.1	16.6	17.0	17.4	17.8	18.1	18.5	19.1	19.7	20.2	20.7	21.1	21.6	22.0	22.4	22.8	23.2	24.1	24.9	25.7
	40	14.9	15.7	16.4	16.9	17.4	17.8	18.2	18.6	19.0	19.3	19.9	20.5	21.0	21.5	22.0	22.4	22.8	23.3	23.6	24.0	24.9	25.8	26.5
	45	15.7	16.5	17.2	17.7	18.2	18.6	19.0	19.4	19.8	20.1	20.7	21.3	21.8	22.3	22.8	23.2	23.6	24.0	24.4	24.8	25.7	26.5	27.3
	50	16.4	17.3	17.9	18.5	18.9	19.4	19.8	20.1	20.5	20.8	21.4	22.0	22.5	23.0	23.5	23.9	24.4	24.8	25.2	25.5	26.4	27.3	28.1
	55	17.1	18.0	18.6	19.2	19.6	20.1	20.5	20.8	21.2	21.5	22.1	22.7	23.2	23.7	24.2	24.6	25.1	25.5	25.9	26.3	27.1	28.0	28.8
	60	17.8	18.6	19.3	19.8	20.3	20.7	21.1	21.5	21.9	22.2	22.8	23.4	23.9	24.4	24.9	25.3	25.7	26.2	26.5	26.9	27.8	28.7	29.4
	65	18.4	19.3	19.9	20.5	21.0	21.4	21.8	22.2	22.5	22.8	23.5	24.0	24.6	25.1	25.5	26.0	26.4	26.8	27.2	27.6	28.5	29.3	30.1
	70	19.1	19.9	20.6	21.1	21.6	22.0	22.4	22.8	23.1	23.5	24.1	24.7	25.2	25.7	26.1	26.6	27.0	27.4	27.8	28.2	29.1	29.9	30.7
	75	19.7	20.5	21.2	21.7	22.2	22.6	23.0	23.4	23.7	24.1	24.7	25.2	25.8	26.3	26.7	27.2	27.6	28.0	28.4	28.8	29.7	30.5	31.3
	80	20.2	21.1	21.7	22.3	22.8	23.2	23.6	24.0	24.3	24.6	25.3	25.8	26.4	26.9	27.3	27.8	28.2	28.6	29.0	29.4	30.3	31.1	31.9
	85	20.8	21.6	22.3	22.8	23.3	23.8	24.2	24.5	24.9	25.2	25.8	26.4	26.9	27.4	27.9	28.3	28.8	29.2	29.6	29.9	30.8	31.7	32.4
	90	21.3	22.2	22.8	23.4	23.9	24.3	24.7	25.1	25.4	25.8	26.4	26.9	27.5	28.0	28.4	28.9	29.3	29.7	30.1	30.5	31.4	32.2	33.0
	95	21.9	22.7	23.4	23.9	24.4	24.8	25.2	25.6	26.0	26.3	26.9	27.5	28.0	28.5	29.0	29.4	29.8	30.2	30.6	31.0	31.9	32.7	33.5
	100	22.4	23.2	23.9	24.4	24.9	25.3	25.7	26.1	26.5	26.8	27.4	28.0	28.5	29.0	29.5	29.9	30.3	30.8	31.1	31.5	32.4	33.3	34.0
	110	23.4	24.2	24.9	25.4	25.9	26.3	26.7	27.1	27.5	27.8	28.4	29.0	29.5	30.0	30.5	30.9	31.3	31.7	32.1	32.5	33.4	34.2	35.0
	120	24.3	25.2	25.8	26.4	26.9	27.3	27.7	28.1	28.4	28.7	29.4	29.9	30.5	31.0	31.4	31.9	32.3	32.7	33.1	33.5	34.4	35.2	36.0
	130	25.2	26.1	26.7	27.3	27.8	28.2	28.6	29.0	29.3	29.7	30.3	30.8	31.4	31.9	32.3	32.8	33.2	33.6	34.0	34.4	35.3	36.1	36.9
	140	26.1	27.0	27.6	28.2	28.6	29.1	29.5	29.9	30.2	30.5	31.2	31.7	32.2	32.7	33.2	33.7	34.1	34.5	34.9	35.3	36.2	37.0	37.8
	150	27.0	27.8	28.5	29.0	29.5	29.9	30.3	30.7	31.1	31.4	32.0	32.6	33.1	33.6	34.1	34.5	34.9	35.3	35.7	36.1	37.0	37.8	38.6
160	27.8	28.6	29.3	29.8	30.3	30.8	31.2	31.5	31.9	32.2	32.8	33.4	33.9	34.4	34.9	35.3	35.7	36.2	36.5	36.9	37.8	38.7	39.4	
170	28.6	29.4	30.1	30.6	31.1	31.5	31.9	32.3	32.7	33.0	33.6	34.2	34.7	35.2	35.7	36.1	36.5	37.0	37.3	37.7	38.6	39.5	40.2	
180	29.4	30.2	30.9	31.4	31.9	32.3	32.7	33.1	33.4	33.8	34.4	35.0	35.5	36.0	36.4	36.9	37.3	37.7	38.1	38.5	39.4	40.2	41.0	
190	30.1	31.0	31.6	32.1	32.6	33.1	33.5	33.8	34.2	34.5	35.1	35.7	36.2	36.7	37.2	37.6	38.1	38.5	38.9	39.2	40.1	41.0	41.8	
200	30.8	31.7	32.3	32.9	33.4	33.8	34.2	34.6	34.9	35.3	35.9	36.4	37.0	37.5	37.9	38.4	38.8	39.2	39.6	40.0	40.9	41.7	42.5	
220	32.2	33.1	33.7	34.3	34.8	35.2	35.6	36.0	36.3	36.7	37.3	37.8	38.4	38.9	39.3	39.8	40.2	40.6	41.0	41.4	42.3	43.1	43.9	
240	33.6	34.4	35.1	35.6	36.1	36.6	37.0	37.3	37.7	38.0	38.6	39.2	39.7	40.2	40.7	41.1	41.5	42.0	42.4	42.8	43.6	44.5	45.2	
260	34.9	35.7	36.4	36.9	37.4	37.8	38.2	38.6	39.0	39.3	39.9	40.5	41.0	41.5	42.0	42.4	42.8	43.2	43.6	44.0	44.9	45.7	46.5	
280	36.1	37.0	37.6	38.2	38.6	39.1	39.5	39.9	40.2	40.5	41.2	41.7	42.2	42.7	43.2	43.7	44.1	44.5	44.9	45.3	46.2	47.0	47.8	
300	37.3	38.2	38.8	39.4	39.8	40.3	40.7	41.1	41.4	41.7	42.4	42.9	43.4	43.9	44.4	44.9	45.3	45.7	46.1	46.5	47.4	48.2	49.0	
320	38.5																							

LUMINOUS RANGE DIAGRAM

Note: A similar Luminous Range Diagram as well as directions for its use are given in the part INTRODUCTION TO THE TABLES.



This diagram enables the mariner to determine the approximate range at which a light may be sighted, at night, in the meteorological visibility prevailing at the time of observation.

The diagram is entered from the top border, using the nominal range listed in the Table of Lights, in column 6, or from the bottom border, using the intensity, in candelas, from column 4 where listed.

The figures along the curves represent the estimated meteorological visibility at the time of observation, and those along the left-hand border the luminous range under those conditions.

Example: A light of an intensity of 100 000 candelas has a nominal range of about 20 miles. When the meteorological visibility is 20 miles, the light would be sighted at about 33 miles, given a sufficient elevation and height of eye; and when 2 miles, at about 5,5 miles.

As the scale along the top border is based on a meteorological visibility of 10 sea miles, the luminous range in the prevailing conditions, obtained from the 10-mile curve, will be identical to those with which the diagram is entered from the top border. If a line is drawn joining points where values from the left-hand border intersect equal values in the conditions prevailing at the time of observation obtained from intersections to the left of this line will be less than the estimated meteorological visibility, whilst those to the right will be greater. Due to their intensity, many lights will therefore be sighted at a greater distance than that of the estimated meteorological visibility.

The diagram can also be used to obtain an approximate meteorological visibility; for example, a light of an intensity of 100 000 candelas is sighted at 12 miles, the meteorological visibility will be about 5 miles.

CAUTION : - When using diagram it must be remembered that:

1. The ranges obtained are approximate.
2. The transparency of the atmosphere is not necessarily consistent between the observer and the light.
3. Glare from background lighting will reduce considerably the range at which lights are sighted. A light of 100 000 candelas has a nominal range of about 20 miles; with minor background lighting as from a populated coastline this range will be reduced to about 14 miles, and with major background lighting as from a city or from harbour installations to about 9 miles.

Approximate sighting ranges may be obtained by entering the diagram with the listed intensity divided by 10 for minor background lighting, and by 100 for major background lighting.

INTRODUCTION TO THE TABLES

1. GENERAL

The List of Lights and Fog Signals describe maritime signal installations on land or afloat producing light or sound signals (fog signals). Some secondary lights of low power and range situated within ports or zones where pilotage is obligatory and certain waterways installations may be omitted or are only briefly described. Aeronautical lights and air obstruction lights are included when visible from seaward.

In addition, these volumes contain information relating to certain other navigational aids: buoyage (day and night); signals (port signals, rescue signals, tide signals, etc.), radio-based aids (radio beacons, radar, radio navigation systems), etc.

In order to obtain descriptions of these aids and details of their mode of operation, users must consult appropriate publications (radio signal publications) or more general ones (Sailing Directions, etc.).

2. FINDING MARITIME SIGNAL INSTALLATIONS

2.1. Lights and fog signals are listed in the geographic sequence normally used in the Sailing directions, in ascending order of numbers. Area (chapter) and sub-area (chapter parts) designations quoted at the top of each page are complemented by the name of the area appearing within the tables.

Certain long range lights may exceptionally be described twice under two different numbers, the first when describing the lights visible from seaward following a direct route, and the second when describing the lights visible during coastal navigation.

Maritime radio beacons operating from lights or in their immediate neighbourhood are shown at the corresponding geographic positions.

2.2. Searching for a light or fog signal is simplified by using:

- a table giving corresponding international and national numbers of lights;
- an alphabetical index.

3. DEFINITIONS

3.1. Light Signals

- *General Terms*

Character - distinctive combination of various aspects of a light (i.e. when lit, extinguished, coloured or white) which appear regularly or rhythmically allowing it to be identified (for example: fixed, flashing, group flashing, alternating).

Fixed light - a light exhibiting without interruption or change of character and of constant colour.

Rhythmic light - a light exhibiting its character in recurring regular cycles (flashes, group flashes, alternating).

Alternating light - a rhythmic light exhibiting different colours during each cycle.

Period - time interval between the beginnings of two successive cycles of a rhythmic light.

Phase - each successive element of a rhythmic light's cycle (i.e. flash, eclipse).

Bearings - the limits of light sectors and areas of visibility of lights and the alignments of leading lights and directional lights are given as bearings from seaward. The bearings of sectors are given in clockwise order.

- Descriptive terms

Aeronautical Light - a light generally of great intensity and elevation, principally for aircraft navigation. Because of their intensity, these are often the first lights to be seen when approaching land.

Aeromarine Light - marine light in which the upper edge of the beam has been deflected at an angle of 10° to 15° above the horizon, so that the light is usable for aircraft navigation.

Daytime Light - a light operating 24 hours a day without change of character, except in specific cases which will be mentioned in the text. The intensity may be increased by day.

Direction Light - a light illuminating a very narrow sector, used to mark a direction to be followed. This sector may be flanked by sectors of greatly reduced intensity or by sectors of different colour or character.

Elevation of a Light - vertical distance between the focal point of the light and mean sea level (where there is a little appreciable tide at the adjacent shoreline) or another appropriate High Water Datum.

Fog Detector Light - a light positioned in order to detect fog automatically. There are various types; some are visible only over a narrow arc; some exhibit a bluish-white flash lasting approximately one second.

Fog Light - a light which is operated only when visibility is reduced.

Height of the light structure - vertical distance between ground level and the top of the light structure, including any signal, but excluding all aerials, antennas and arrays.

Leading Lights - two or more lights associated so as to form a leading line to be followed.

Lights in line - light associated to form an alignment used to indicate the limit of an area, cable runs, alignments for mooring, etc. They do not mark alignments to be followed.

Loom - diffused light resulting from atmospheric effects observed when a light is below the horizon or is hidden by an obstacle.

Luminous intensity - Luminous flux emitted by a light source in a given direction in one unit of solid angle; the luminous intensity is expressed in candelas.

Main Light - the most important light in a group of two or more lights on the same support or on neighbouring supports.

Air Obstruction Light - light marking obstruction to aircraft; it is usually red.

Occasional Light - shown only in certain circumstances; for example shown when vessels are expected or fishing lights.

Sector Light - a light presenting differing appearances (particularly in colour) over various parts of the horizon of interest to marine navigation.

Subsidiary Light - a secondary light placed on or near to a main light's support and having a special navigational function: for example a passing light on a leading light structure.

Unwatched Light - light which operates automatically and which is controlled automatically over a considerable period of time, with only periodic maintenance visits.

3.2. Sound Signals

- General Terms

Sound Signals - sound transmitted to convey information.

Fog Signal - sound signal to warn or guide ships in condition of poor visibility.

Morse Code Fog Signal - fog signal emitting one or more characters of the Morse Code.

True Range - maximum distance, measured from the place of emission, at which the information carried by the signal can be understood, in existing propagation and listening conditions.

- Fog Signals and sound producing systems

Bell - equipment producing a characteristic sound by striking a metal bell-shape.

Diaphone - equipment producing a characteristic sound using a reciprocating piston with vents operated by compressed air. Output can be in the form of two tones at different sound levels, the second tone being at a lower frequency. If there is only one tone, it ends in a suddenly lowered pitch known in English as a "grunt".

Explosive Signals - sound fog signals produced by detonating explosive charges.

Gong - a flat disc or tray producing a distinctive resonant sound.

Horn - equipment consisting of a tube of varying transverse dimensions producing a characteristic sound :

- Klaxon is a nautophone of smaller size, sometimes operated by hand.
- Membrane Horn produces its sound by means of a membrane vibrated by compressed air, steam or electricity.
- Nautophone is a horn in which the membrane is activated electrically.
- Reed is a horn in which the membrane is replaced by a steel reed vibrated by compressed air.
- Typhon is a horn in which the membrane is vibrated by steam or compressed air.

Siren - a deep sounding for warning in which the sound is produced by the passage of air across slits or holes in a rotating disc. It can emit a wailing sound.

Underwater fog signals - low frequency sound emitted in water by large-sized membranes vibrated by electricity. Their range (up to 50 nautical miles) is far greater than that of signals in air and using specialised hydrophones, bearings can be obtained with sufficient accuracy.

Hooter - equipment in which the frequency of sound varies periodically about a mean value.

Whistle - equipment producing a shrill sound by releasing compressed air or steam across an opening.

4. READING THE TABLE OF LIGHTS

The lights and fog signals are listed and described in an eight-column table. The column contents are as follows:

- column 1 : national and international number
- column 2 : area, name and location
- column 3 : approximate latitude and longitude
- column 4 : character, colour and period of light
- column 5 : elevation (metres)
- column 6 : range (nautical miles)
- column 7 : description of structure
- column 8 : additional information

4.1. Column 1 - National and international numbers

National number

National light numbers are four, five or six figure numbers in upright type. These numbers may change between successive editions of the List of Lights and Fog Signals.

International number

In the first column, under the majority of national numbers is listed an alpha-numeric group in italic type, with one capital letter followed by four, five or six figures.

These alpha-numeric groups are the international numbers assigned to lights to avoid confusion when referring to them. These numbers correspond to the numbers given in the Admiralty List of Lights and Fog Signals.

4.2. Column 2 - Area, name and position

Information designed to allow unambiguous description of each light is contained in this column.

- on occasion, the place or geographic feature (area, port, roadstead, island,...) and/or the feature (alignment,...) to which the light belongs, particularly when the light has no specific place name associated with it.
- name of the light.
- on occasion, an abbreviated description of the location of the equipment.

The toponymic form used follows the official rules. Differences may exist between the listed forms and those on earlier editions of nautical charts and other marine publications. The superseded toponymic form may be then shown in brackets.

The typographic elements employed allow the following distinctions to be made:

CAPITALS	: geographic entities
lowercase upright and bold	: land based lights with nominal range at least 15 nautical miles
lowercase upright and light	: other land based lights
<i>lowercase italic</i>	: all floating lights

Where an area includes lights belonging to different countries, the light names or locations are followed by the abbreviated names of the countries in brackets.

4.3. Column 3 - Geographic positions

Geographic positions are shown in degrees, minutes and at least tenths of a minute (latitude and longitude). However, in the case of leading or transit lights, the position of the rear light may be given by bearing and distance from the leading light.

Longitudes are referred to the International meridian (Greenwich). Positions given are approximate. They are included only to help in the identification of features on charts. It is possible to find differences, especially in longitude, of several tenths of a minute between these positions and those on charts in use, as a result of the variations between geodetic reference systems.

All positions are referred to the World Geodetic System 1984 Datum and can be plotted directly only on charts with same datum. For charts that are referred to Hermannskögel Datum (Bessel 1841 ellipsoid) it is necessary to move positions 0.02 minutes SOUTHWARD and 0.3 minutest EASTWARD to agree with these charts.

4.4. Column 4 - Characteristics of lights and fog signals:

The following information is given for lights:

- the character
- the rhythm (for rhythmic lights)
- the colour (white included)
- the period in seconds (the symbol “s” is used)
- on occasion :
 - a complementary term (Dir, Aero, etc.)
 - the luminous intensity, given in candelas (in italics, beneath the characteristics), corresponding to the longest flash in the case of the Morse Code lights.

Ex.: Dir Fl.W.4s
170

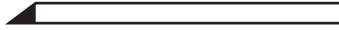
The following information is given for fog signals:

- the type of signal source
- the rhythm
- the period

All this information is given using standardized international abbreviations.

The following tables give description of the various light characters with examples illustrating each one of them.

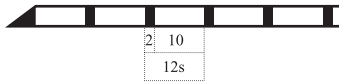
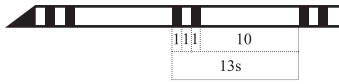
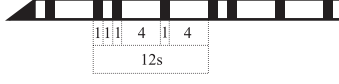
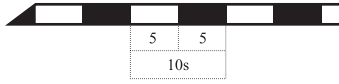
LIGHT CHARACTERS

Description	Local Abbrev.	Example	Int. Abbrev.	Remarks
<p style="text-align: center;">1.</p> <p style="text-align: center;">FIXED</p> <p>A light which appears continuously and steady and of constant colour to an observer whose position remains unchanged in relation to it.</p>	<p>there is no abbreviation for fixed lights, just color of light</p>	 <p style="text-align: center;">B FW</p>	F	

2.

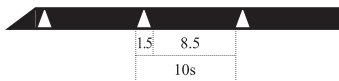
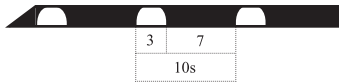
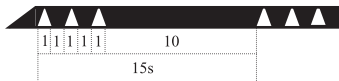
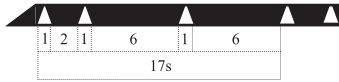
OCCULTING

A light in which the total duration of light in each period is clearly longer than the total duration of darkness, and the intervals of darkness (eclipses) are usually of equal duration.

<p style="text-align: center;">2.1.</p> <p style="text-align: center;">Occulting</p> <p>An occulting light in which an eclipse is regularly repeated.</p>	Pk	 <p style="text-align: center;">B Pk12s Oc W12s [2]</p>	Oc	
<p style="text-align: center;">2.2.</p> <p style="text-align: center;">Group Occulting</p> <p>A light in which a number of eclipses are regularly repeated. The total duration of light in each period may be equal to the total duration of darkness.</p>	Pk (...)	 <p style="text-align: center;">B Pk(2)13s Oc (2)W13s [1;1;1;10]</p>	Oc (...)	
<p style="text-align: center;">2.3.</p> <p style="text-align: center;">Composite Group Occulting</p> <p>A light similar to a group occulting light except that successive groups in a period have different numbers of eclipses. The total duration of light in each period may be equal to the total duration of darkness.</p>	Pk (..+.)	 <p style="text-align: center;">B Pk (2+1)12s Oc (2+1) W 12s [1;1;1;4;1;4]</p>	Oc (..+.)	
<p style="text-align: center;">3.</p> <p style="text-align: center;">ISOPHASE</p> <p>A light in which all the durations of light and darkness are clearly equal.</p>	Izo	 <p style="text-align: center;">B Izo 10s Iso W 10s</p>	Iso	




4.
FLASHING


A light in which the total duration of light in a period is shorter than the total duration of darkness and the appearances of light (flashes) are usually of equal duration.

Description	Local Abbrev.	Example	Int. Abbrev.	Remarks
<p>4.1. Flashing</p> <p>A flashing light in which a flash is regularly repeated at a rate of less than 50 flashes per minute.</p>	Bl	 <p style="text-align: center;">B Bl 10s Fl W 10s [1.5]</p>	Fl	<p>1. The convention is to show the length of to 0.1s.</p> <p>2. When the length of a flash is too brief to be expressed, it is shown as Fl and the duration of the eclipse is equal to the period.</p>
<p>4.2. Long flashing</p> <p>A flashing light in which an appearance of light of not less than 2 s duration (long flash) is regularly repeated.</p>	D Bl	 <p style="text-align: center;">B DBl 10s LFl W 10s [3]</p>	L Fl	
<p>4.3. Group Flashing</p> <p>A flashing light in which a group of flashes, specified in number, is regularly repeated.</p>	Bl (..)	 <p style="text-align: center;">B Bl(3) 15s Fl(3) W 15s [1;1;1;10]</p>	Fl (..)	
<p>4.4. Composite Group Flashing</p> <p>A light similar to a group flashing light except that successive groups in a period have different numbers of flashes.</p>	Bl (..+.)	 <p style="text-align: center;">B Bl(2+1) 17s Fl(2+1) W 17s [1;2;1;6;1;6;]</p>	Fl (..+.)	

5.
QUICK





A light in which flashes are repeated at a rate not less than 50 flashes per minute but less than 80 flashes per minute.

<p>5.1. Quick</p> <p>A quick light in which a flash is regularly repeated.</p>	K	 <p style="text-align: center;">B K Q W</p>	Q	
<p>5.2. Group quick</p> <p>A quick light in which a specified group of flashes, specified in number, is regularly repeated.</p>	K (..)	 <p style="text-align: center;">BK (3) 10s Q (3)W 10s</p>	Q (..)	<p>An exceptional light character reserved to indicate a South cardinal mark.</p>
		 <p style="text-align: center;">K(6)+B DBl 15s Q(6)+L FlW 15s</p>		

Description	Local Abbrev.	Example	Int. Abbrev.	Remarks
<p>5.3.</p> <p>Interrupted Quick</p> <p>A quick light in which the sequence of flashes is interrupted by regular repeated eclipses of long and constant duration.</p>	K Pk	 <p>BK Pk 15s IQ W 15s</p>	IQ	



6.
VERY QUICK

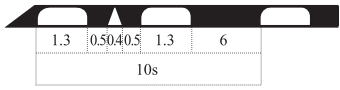


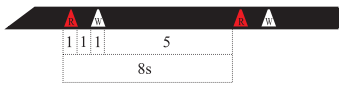
A light in which flashes are repeated at a rate of not less than 80 flashes per minute but less than 160 flashes per minute.

<p>6.1.</p> <p>Very Quick</p> <p>A very quick light in which a flash is regularly repeated.</p>	VK	 <p>B VK VQ W</p>	VQ	
<p>6.2.</p> <p>Group Very Quick</p> <p>A very quick light in which a specified group of flashes, specified in number, is regularly repeated.</p>	VK (..)	 <p>B VK(3) 5s VQ(3) W 5s</p>  <p>VK(6)+B DBI 10s VQ(6)+L FIW 10s</p>	VQ (..)	An exceptional light character reserved to indicate a South Cardinal mark.
<p>6.3.</p> <p>Interrupted Very Quick</p> <p>A very quick light in which the sequence of flashes is interrupted by regularly repeated eclipses of constant and long duration.</p>	VK Pk	 <p>B VK Pk 10s IVQ W 10s</p>	IVQ	

7.
ULTRA QUICK

A light in which flashes are repeated at a rate of not less than 160 flashes per minute.

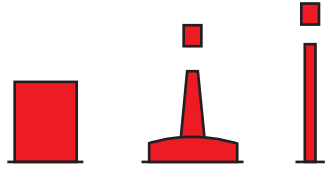
<p>7.1.</p> <p>Ultra Quick</p> <p>An ultra quick light in which a flash is regularly repeated.</p>	UK	 <p>B UK UQ W</p>	UQ	
<p>7.2.</p> <p>Interrupted Ultra Quick</p> <p>An ultra quick light in which the sequence of flashes is interrupted by eclipses of long duration.</p>	UK Pk	 <p>B UK Pk 12s IUQ W 12s</p>	IUQ	

<p>8. MORSE CODE A light in which appearances of light of two clearly different durations are grouped to represent a character or characters in the Morse Code.</p>	<p>Mo (..)</p>	 <p>B Mo(K) 10s Mo(K) W 10s [1.3;0.5;0.4;0.5;1.3;6]</p>	<p>Mo (..)</p>	
<p>9. FIXED AND FLASHING A fixed light varied, at regular intervals, by a flash of higher luminous intensity.</p>	<p>Sj</p>	 <p>B Sj 5s F Fl W 5s</p>	<p>F Fl</p>	<p>The flashing light may have any of the characters in (4).</p>
<p>10. ALTERNATING A light showing different colours alternately.</p>	<p>Pm</p>	 <p>BC Pm 10s Al WR 10s</p>  <p>CB PmBl(2) 8s Al Fl(2) RW 8s [1;1;1;5]</p>	<p>Al</p>	<p>An alternating light may be occulting, isophase, flashing or fixed and flashing.</p>

[IALA buoyage region A]

1. LATERAL MARKS

a) Fairway marks



Port-hand

Red

Cylindrical, with pillar or spar

Red cylinder

Red

Any, except for group flashing (2+1)



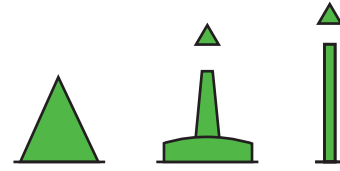
Colour

Shape of buoy

Topmark (if exists)

Light, if exists

Rhythm



Starboard-hand

Green

Conical, with pillar or spar

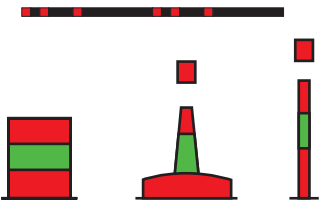
Green cone

Green

Any, except for group flashing (2+1)

b) Bifurcation marks

A modified lateral mark may be used on the point of bifurcation signing the **main channel** as more suitable route).



Main channel is starboard-hand

Red with green horizontal band

Cylindrical with pillar or spar

Red cylinder

Red

Group Flashing (2+1)



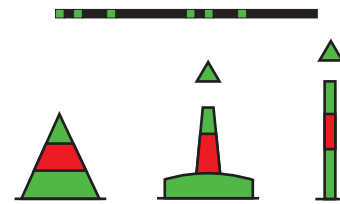
Colour

Shape of buoy

Topmark (if exists)

Light, if exists

Rhythm



Main channel is port-hand

Green with red horizontal band

Conical with pillar or spar

Green cone

Green

Group flashing (2+1)

2. CARDINAL MARKS

N QUADRANT

2 black cones (see picture)
 Black above yellow
 Pillar or spar
 White
 VQ or Q

Topmark

Colour

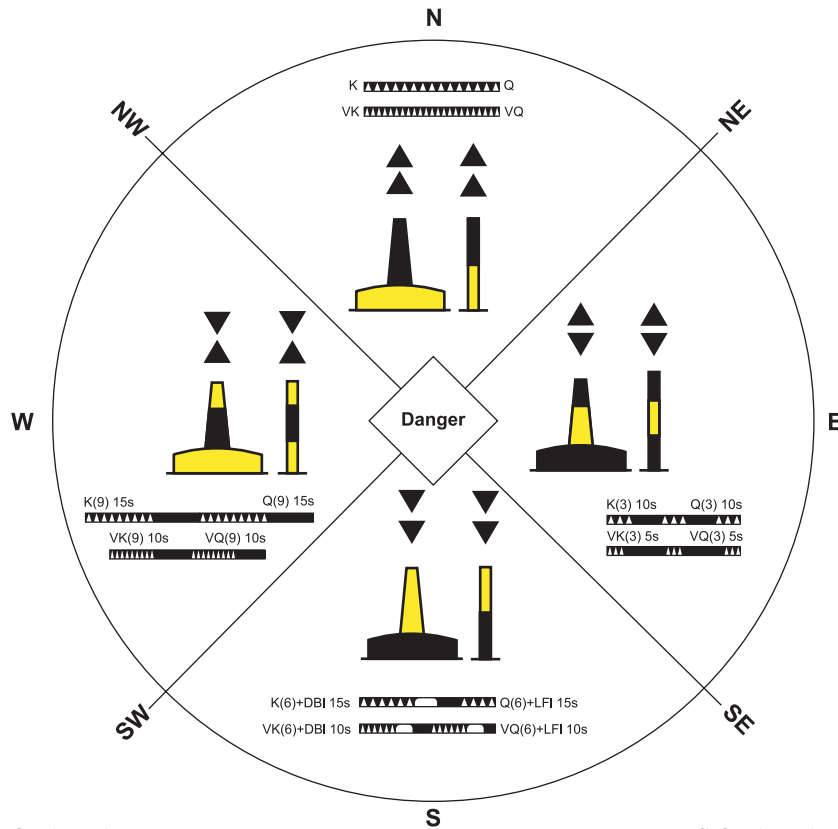
Shape

Light, if exists

Rhythm

E QUADRANT

2 black cones (see picture)
 Black with yellow horizontal band
 Pillar or spar
 White
 VQ(3) 5s or Q(3) 10s



W QUADRANT

2 black cones (see picture)
 Yellow with black horizontal band
 Pillar or spar
 White
 VQ(9) 10s or Q(9) 15s

Topmark

Colour

Shape

Light, if exists

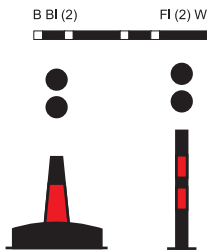
Rhythm

S QUADRANT

2 black cones (see picture)
 Yellow above black
 Pillar or spar
 White
 VQ(6)+LFI 10s or Q(6)+LFI 15s

3. ISOLATED DANGER MARKS

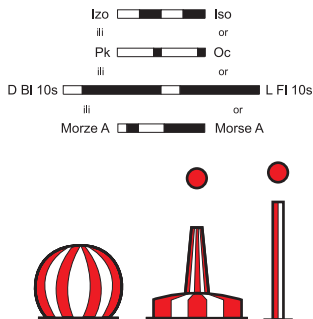
It may be fixed on the navigational obstacle or anchored above that danger surrounded with navigable waters.



Topmark	2 black spheres
Colour	Black with one or more red horizontal bands
Shape	Any, (pillar or spar), different from lateral marks
Light, if exists	White
Rhythm	Group flashing (2)

4. SAFE WATER MARKS

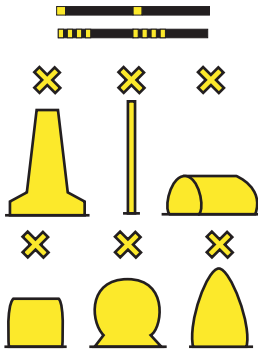
They show that their surrounding waters are navigable and without danger for navigation. This mark is laid down to sign mid-channel or approach way to the coast.



Colour	Red and white vertical stripes
Shape	Spherical with pillar or spar
Topmark	Red sphere
Light, if exists	White
Rhythm	Iso, Oc+LF1 10s or Morse A

5. SPECIAL MARKS

Their primary intention is not to serve as navigational marks, therefore they are being used to sign special areas or facilities on charts and other nautical publications.



Colour	Yellow
Shape	Any, but different from the other navig. marks
Topmark	Yellow mark "X"
Light, if exists	Yellow
Rhythm	Any, except for cardinal marks, isolated danger marks or safe water marks.

4.5. Column 5 - Elevation of light

The elevation of the light is its altitude above sea level. It is given in metres. The reference datum in most cases is mean sea level. When it is otherwise, the adopted reference datum is given under *Regional Information*.

4.6. Column 6 - Range

Ranges of lights are given in nautical miles (M) : in **bold type** if equal to or greater than 15 M, in normal type if less. When a light has different ranges, depending on its sector colours, these are given against the corresponding colours.

Ranges are usually nominal. However, some countries quote different ranges (geographical, luminous or mean) without always clarifying which is in use. This is mentioned in *Regional Information*.

- *Definitions*

To be seen at a given distance, the light must :

- a) be above the apparent horizon of the observer,
- b) have a sufficient luminous intensity,
- c) not be obscured by meteorological conditions between it and the observer (meteorological visibility).

One can define various types of range when considering the largest distance at which a light would be visible if one took account of only one or other of the conditions given above.

Geographic range

The geographic range depends on the elevation of the light, the height of the observer's eye and the atmospheric refraction. The table of Geographic Ranges at the end of this Introduction gives the geographic range in nautical miles as a function of the height of the observer's eye and of the elevation of the light in metres. In some cases, the elevation of the light must be adjusted for tide. The formula used to determine the geographic range is mentioned below the table.

Luminous range

The luminous range of a light depends primarily upon its luminous intensity and the clarity of the air, and to a lesser degree upon the character, the length of flashes and the intervals between them.

The luminous intensity in candelas may be included in italics beneath the characteristics in column 4.

Meteorological stations broadcast information relating to horizontal visibility at the surface in kilometres on a ten point scale from 0 to 9 (code VV) for a given time in a given area.

The *luminous range diagram* at the end of this Introduction allows the luminous range of a light in nautical miles to be determined as a function of its luminous intensity (in candelas) and its horizontal visibility (in nautical miles). To enter the diagram, the luminous intensity may be replaced by the nominal range (see below), shown in column 6.

For example, for a nominal range of 10 M (or an intensity of 1300 candelas) and a meteorological visibility of 7 (lying between 10 and 20 km), the luminous range will lie between 6.5 and 10 M.

It should be noted that determination of the luminous range, using this diagram is imprecise as the transparency of the atmosphere is not necessarily constant between the observer and the light.

Nominal range

The International Association of Lighthouses Authorities (IALA - AISM) has recommended the adoption of a nominal range in nautical miles (M), defined as the luminous range in a homogeneous atmosphere with a standard meteorological visibility of 10 M.

4.7. Column 7 - Description of structures - topmarks - heights

The structure carrying a light or fog signal is described in the national language : nature (and function for buoys) - form and material used in construction - colours. The topmark, if one exists, is shown by its symbol, accompanied by its colour, using international abbreviation. However, colours of cardinal marks are not included (neither are colours of cardinal structures), as these are strictly controlled. The height is the vertical distance, above ground level, to the top of the structure, including any signal, but excluding aerials, antennas and arrays, given in metres.

Note : To avoid ambiguity, only INT abbreviations are used. Terms in national languages are always written out in full.

4.8. Column 8 - Complementary information

In this column is found :

a) with respect to light character (column 4):

- the limits of intense sectors and corresponding width.

Example : Intens 136,5 - 146,5 (10).

- the full descriptions of the phases for rhythmic lights (except those for cardinal marks) by enumeration of all lights and eclipses durations in conformity with the bracketed group of characteristic numbers in column 4 (examples are given in the table of section 4.4.).

- the colour sectors of a sector light. The sectors are described clockwise, either from the North if the light is seen all round, or following the most important obscured sector if one exists.

Example : 015-**W**-078-**R**-154-**Obscd**-282-**Unintens W**-336-**G**-015.

- the visible sectors when an obstacle partly masks the light.

Example : **Vis** 050 - 280 (230).

Bearings are given from seaward in degrees and, if required, in tenths of a degree. The abbreviations for colours and description, such as **Vis**, **Obscd**, **Intens**, are in **bold type**.

With the exception of the very narrow sectors of directional lights, sector limits and sector widths are not precise and should not be used for positioning.

- b) with respect to fog signal characters (column 4), the description of the phases of the sound signals, in the same way as the phases of a light.
- c) other information.

Such information may relate to the light or fog signals :

- circumstances of activation (control, times, seasonal alterations, provisional characteristics, temporary interruption, “destroyed”, “private” light, etc..).
- reference to a mention of the light under another number.

Mention may also be made of additional features of the station which relate to navigation (radar reflector, radar beacons, radio beacons, radio buoys or D/F stations, various signals), and which are carried by the same structure or near to it. Detailed description of these features appear in the List of Radio Aids and in Sailing Directions.

Associated secondary lights with summary description, and nearby air obstruction lights may also be included in this column.

Lastly, one also finds provisional or temporary information thought to be of use to the navigator.

Note : All information in this column is in the national language. However, the only abbreviations used are the international ones, also used on charts.

5. INFORMATION RELATING TO LIGHTS

5.1. General - detection - type and position

- lights at high elevations are more frequently obscured by clouds than are those at or near sea level.
- light floats may be removed without warning for repair and not be replaced.
- the positions and status of lit buoys are to be treated with caution.
- aeronautical lights are often very powerful and as a result of their high elevation, may be visible at much larger distances than ordinary navigational lights. However, they are positioned only approximately on charts, and they may at times be switched off without warning. In addition, these lights being administered by Organizations other than those dealing with marine lights, may have their colours or character altered before it is possible to notify navigators through Notice to Mariners.
- as with aeronautical lights, air obstruction lights are not meant for marine navigation and the same reservations apply equally to them.

5.2. Visibility - range

- the distance between a light and an observer cannot be estimated using the apparent brightness of the light.
- fog, mist, dust, smoke and rain are amongst factors which considerably reduce the range at which a light is visible.
- a brightly-lit area behind a light can have a big influence on a light's visibility.
- in cold weather, and especially when there are sudden temperature changes, ice, rime or condensation may form on light glasses considerably reducing visibility and turning certain colours to white.

5.3. Colours

- colour differences should be treated with caution. Atmospheric light propagation conditions and eye strain can contribute to a considerable reduction in the ability to distinguish colours. At night, it is particularly difficult to distinguish a white light from a yellow or a blue one seen in isolation except when close up. In certain atmospheric conditions, a white light can take on a reddish hue. By day, colours are unclear when looking toward the sun, and a bright red has a tendency to appear orange. In particular, the alternating character of a light may be altered.

5.4. Characters

- the apparent characters of lights having phases of varying luminous intensities can vary, depending upon the distance from which they are viewed, because certain phases may not be distinguishable.
- lights with very short flashes may not be visible at expected distances.
- the length of a short flash seems to be reduced when it is observed at a distance close to its maximum range and in poor atmospheric conditions.
- the apparent characters of floating lights should be treated with care, as they can be totally different from the actual characters, due to variations of the height and orientation of the optical device.

GEOGRAPHICAL RANGE TABLE

Elevation [meters]	Range [nautical miles]
2	2.9
3	3.6
4	4.1
5	4.6
6	5.0
7	5.5
8	5.8
9	6.2
10	6.5
12	7.2
14	7.7
16	8.3
18	8.8
20	9.3
25	10.4
30	11.3
35	12.3
40	13.1
45	13.9
50	14.7
55	15.4
60	16.1
70	17.4
80	18.6
90	19.7
100	20.8
120	22.7
140	24.6
160	26.3
180	27.9
200	29.4
250	32.8
300	36.0
350	38.9
400	41.6

Note:

Values given from this table are calculated according to the following formula:

$$range = 2.08 \cdot \sqrt{h_{obj}}$$

If the height of the observer's eye is taken into account, the above formula will be modified to read:

$$range = 2.04 \cdot \left(\sqrt{h_{obj}} + \sqrt{h_{eye}} \right)$$

range : geographical range (in nautical miles)

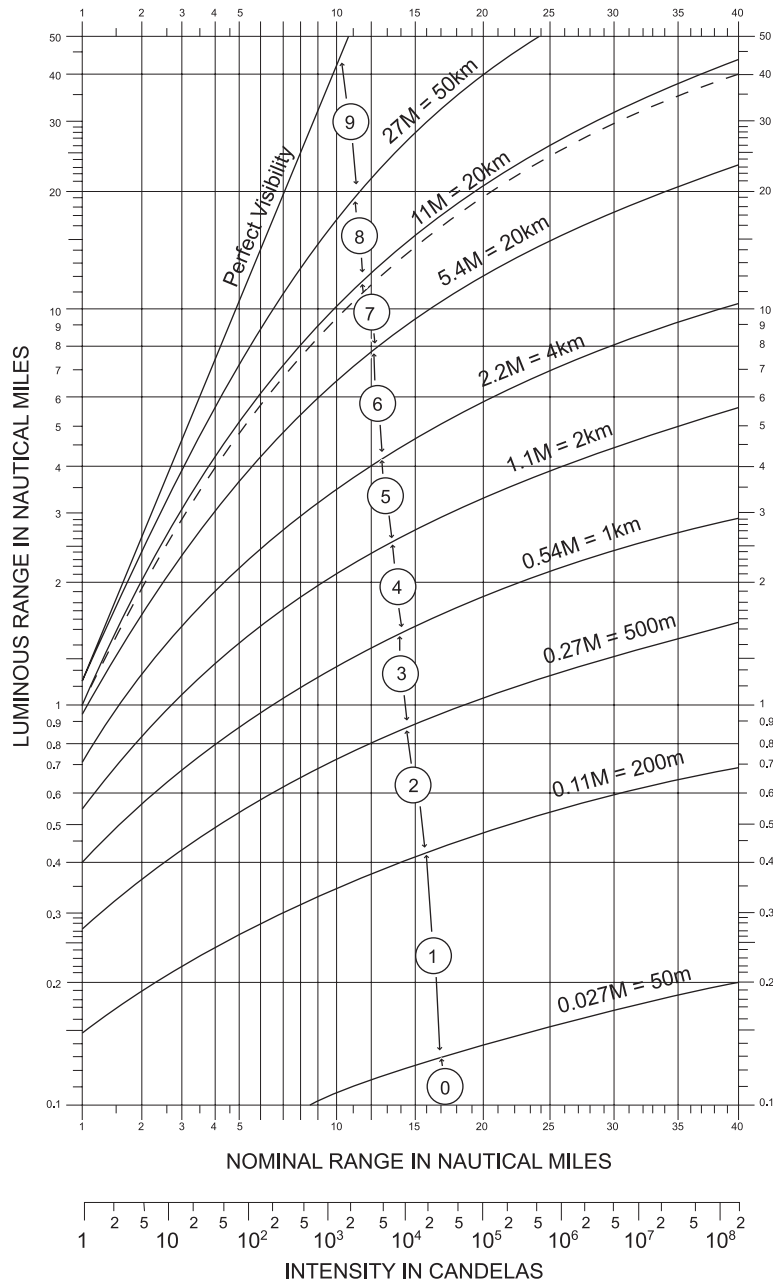
h_{obj} : elevation of the object (in meters)

h_{eye} : height of the observer's eye (in meters)

Values given according to the second formula are shown in the Table of geographical range, on the page 14.

LUMINOUS RANGE DIAGRAM

Note: Luminous Range Diagram in relation to ten point scale from 0 to 9 (meteorological visibility code “VV”) which are broadcasted by certain meteorological stations (similar with the diagram on the page 15).



⑦ : code “vv” of meteorological visibility

----- : curve along which the luminous range equals the nominal range

5.5. Sectors

- in most cases, sector limits should be treated with care. They are in general ill-defined, with lit and unlit sectors merging gradually into each others. Colour changes between sectors are also gradual, sometimes occurring over several degrees (the angle of uncertainty).
- when a light is masked by sloping ground, the bearing on which it disappears or appears varies with all distance and height of the observer's eye.

REGIONAL INFORMATION

Range of lights on the Serbia and Montenegro Coast of the Adriatic Sea is represented in the List of Lights as a nominal and luminous range respectively when the standard meteorological visibility is 10 nautical miles.

The height and elevation of the light respectively are calculated in relation to mean sea level.

Maintenance of aids to navigation on the Montenegro part of the Adriatic Sea is within complete competence of Maritime Safety Department of Montenegro - Bar.

RADIO METEOROLOGICAL REPORT

The coastal radio-station Bar issues meteorological reports by radio-telephone (area code BARRADIO) at 0850, 1420 and 2050 UT on frequency of 1720.4 KHz and VHF channels 24 and 16.

Radio meteorological reports contain an eventual warning about heavy weather, situation in general, daily forecast for the Adriatic Sea and Straits of Otranto as well as weather description in certain areas of the Adriatic Sea.

Radio broadcasts are being promulgated in the Serbian and English language.

PROMULGATION OF RADIO NAVIGATIONAL WARNINGS

The coastal radio-station Bar broadcasts radio navigational warnings immediately upon the issue of meteorological reports on the same frequencies and channels.

The issues are being promulgated in the Serbian and English language by radio-telephone, and in the English language by radio-telegraph.

Radio navigational warnings contain information on changes endangering safety of navigation, relating to the east part of the Adriatic Sea. Radio navigational warnings are being repeated by regular issues up to their cancellation or promulgation in Notice to Mariners. If there is an immediate danger on the safety of navigation, radio navigational warnings will be promulgated immediately upon they are received on 500 and 2182 KHz and VHF channel 16, and they will be repeated after the forthcoming period of radiotelephone pause.

PREGLED SIMBOLA I SKRAĆENICA
SUMMARY OF SYMBOLS AND ABBREVIATIONS

SVJETLA – Skraćenice
LIGHTS – Abbreviations

	Srpski		English
B, C, Z	fiksno, stalno	F	Fixed
Pk	na prekide	Oc	Occulting
Izo	izofazno	Iso	Isophase
Bl	bljesak	Fl	Flashing
DBl	dugi bljesak	LFl	Long Flashing
K	kratki	Q	Quick
KPk	kratki na prekide	IQ	Interrupted quick
VK	vrlo kratki	VQ	Very quick
VKPk	vrlo kratki na prekide	IVQ	Interrupted very quick
UK	ultrakratki	UQ	Ultra quick
UKPk	ultrakratki na prekide	IUQ	Interrupted ultra quick
Mo	Morse	Mo	Morse
Sj	stalno sa sjajem	FFl	Fixed and flashing
Pm	promjenjivo	Al	Alternating
Bl (..)	bljeskovi u grupi	Fl (..)	Group flashing

Ostale skraćenice
Other abbreviations

	Srpski		English
Aero	aeronautičko svjetlo	Aero	Aeronautical light
Aero RC	aeronautički radio far	Aero RC	Aeronautical radiobeacon
Dia	diafon	Dia	Diaphone
Dir	direkciono svjetlo	Dir	Direction light
Gong	gong za maglu	Gong	Fog gong
(hor)	horizontalno	(hor)	Horizontal
m	metar	m	metre
M	nautička milja	M	Sea miles
Nauto	nautofon	Nautophone	
Pištaljka	pištaljka za maglu	Whis	Fog whistle
Pog	pogašeno	Extinguished	
Pok smer	svjetla pokrivenog smeru	Ldg Lts	Leading lights
Pot	potamnjeno	Obscd	Obscured
Privat	privatno	Priv	private
Priv pog	privremeno pogašeno	TE	Temporarily extinguished
Prov	provizorno	P	Provisional, preliminary
Ra	radio stanica	Ra	Radio station

Srpski		English	
Racon	radar stanica odgovarač	Racon	Radar responder beacon
RC	kružni radiofar	RC	Circular radiobeacon
Ra refl	radar reflektor	Ra refl	Radar reflector
Rez sv	rezervno svjetlo	Reserve light	
Rog	rog za maglu	Horn	Fog horn
RT	radio telefon	RT	Radio telephone
s	sekunda	s	second
sekt	sektor	Sector	
Sig mag	signal za maglu	Fog signal	
Sig st	signalna stanica	Sig Stn	Signal station
Sirena	sirena za maglu	Siren	Fog siren
Sv	svjetlo	Lt	Light
(T)	privremeno	(T)	Temporary
ta	tama	ec	Eclipse
(vert)	vertikalno	(vert)	Vertical
Vid	vidljivo	Vis	Visible
zvono	zvono za maglu	Bell	Fog bell

BOJE COLOURS

Srpski		English	
B	bijelo	W	White
C	crveno	R	Red
Z	zeleno	G	Green
Cr	crno	B	Black
Ž	žuto	Y	Yellow
Pl	plavo	Bu	Blue
Nar	narandžasto	Orange	
Smeđe		Brown	
Sivo		Grey	
LJ	ljubičasto	Vi	Violet

SVJETLA – Konstrukcija
LIGHTS – Construction

Srpski	English
Svjetlo	Light
Svjetionik	Lighthouse
Oznaka	Beacon
Stub	Column, Post, Pilaster
Kuća	Dwelling
Toranj, rešetkasta kuća	Framework tower
Kuća	House
Kulica	Hut
Jarbol, Stub	Mast
Postolje	Pedestal
Nosač, Stub	Support, Post
Kula	Tower
Beton, Cement	Concrete
Kameni, Zidan	Stone, Masonry
Drveni	Wooden
Pojas	Band
Pruga	Stripe
Znak na vrhu	Topmark
Okrugli	Round
Čunjast	Conical
Kvadratast, Četvrtast	Square
Trougao	Triangle
Dolfin, Stub za vez	Dolphine
Lukobran	Breakwater
Pristan	Quay
Gat	Wharf
Molo	Mole
Plutača	Buoy

TABLE OF LIGHTS

All positions are referred to the World Geodetic System 1984 Datum and can be plotted directly only on charts with same datum. For charts that are referred to Hermannskögel Datum (Bessel 1841 ellipsoid) it is necessary to move positions 0.02 minutes SOUTHWARD and 0.3 minutest EASTWARD to agree with these charts.

ADRIATIC SEA - SERBIA AND MONTENEGRO

National No. International No.	Location - Name	WGS84 ϕ i λ (N/E)	Characteristics	Elevation (m)	Range (M)	Structure and height of construction (m)	Remarks
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BOKA KOTORSKA

742 - Rt Oštra. Cape E 3620	42 23.574 18 31.874	LFl (2) W 10s	73m	18M	Red tower above house, 2m	[2;2;2;4] Sig. Stn, Reserve light 11M
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743 - Ostrvce Mamula. Islet. E 3622	42 23.726 18 33.472	Fl W 3s	34m	6M	Red column with gallery beside brick tower, 8m	[0.3]
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743.5 - Dobreč E 3622.5	42 25.314 18 32.799	Fl G 5s	6m	6M	White round tower with black spiral and platform, 5m	[0.5]
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HERCEGNOVSKI ZALIV

744 - Rose. Pier. W side E 3623	42 25.691 18 33.379	F G	5m	2M	Green column, 4m	
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745 - HERCEG-NOVI. E 3624 Breakwater. Head	42 26.977 18 31.943	Fl(2) G 5s	9m	5M	Square stone obelisk, 7m	[0.5;0.5;0.5;3.5]
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746 - Zelenika. Quay. NW E 3628 corner	42 26.981 18 34.279	Fl R 3s	9m	4M	White tower with column and gallery on pedestal, 5m	[1] Vis 315-135 (180)
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KUMBORSKI TJESNAC

747 - Đenovići. Metal bridge. E 3632 Head	42 25.951 18 36.217	Fl R 3s	14m	6M	Red tripod on house corner, 2m	[0.3]
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747.5 - Baošići. Mole. Head E 3632.5	42 26.427 18 37.759	Fl R 5s	7m	5M	Red cylindrical metal tower with column and gallery, 5.5m	[1.5]
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748 - Pristan. Mole. Head E 3630	42:25.541 18:36.108	Fl G 3s	7m	5M	White round tower with black stripes and platform, 6m	[0.3]
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ADRIATIC SEA - SERBIA AND MONTENEGRO

TIVATSKI ZALIV

749 - Krašići. Pier. Head <i>E 3648</i>	42 24.556 18 39.161	F G	5m	2M	White column, 4m	
750 - Bjelila (Oko). Pier. NW corner <i>E 3647</i>	42 24.370 18 39.966	F G	6m	4M	Green column, 5m	Obscd 216-245 (29) over Tunja shallow
751 - Žukovac. Pier. <i>E 3646</i>	42 24.242 18 41.169	Fl G 3s	7m	2M	Green tower with column, 5m	[0.3] Obscd 135-168 (33)
752 - Plićina Tunja. Shallow. <i>E 3645</i>	42 24.971 18 40.655	Fl(2) WR 5s	8m	W6M R4M	Pyramidal stone tower, block in the sea, 7m	[0.5;1;0.5;3] 274-R-14 (100) over islands Oi Otok and Stradioti
753 - Kalimanj <i>E 3644</i>	42 25.604 18 41.975	F R	6m	4M	Red column, 5m	
753.5 - Plićina Kalimanj. Shallow.	42 25.521 18 42.018	Fl R 4s	6m	3M	White round tower with red stripes and platform, 4.6 m	[0.5]
754 - TIVAT. S Mole. Head <i>E 3639</i>	42 25.890 18 41.432	Fl WR 3s	8m	W6M R3M	Black-white square tower with column and gallery, 7m	[0.3] 140-R-167 (27) over Seljanovo cape
755 -- Pristan Staničić. Mole. NW corner <i>E 3643</i>	42 25.815 18 41.706	Fl(2) R 6s	5.6m	3M	White round tower with red spiral, 4.6m	[0.5;0.5;0.5;4.5]
756 - Rt Seljanovo. Cape. <i>E 3638</i>	42 26.341 18 41.054	Fl R 3s	7m	5M	White round tower with red bands and platform, 6m	[0.3]
757 - Donja Lastva. Quay. In front of the church <i>E 3637</i>	42 26.851 18 41.173	F R	7m	4M	Red column, 6m	

TJESNAC VERIGE

758 - Rt Sv. Nedelja. Cape <i>E 3652</i>	42 27.598 18 40.575	Fl R 2s	7m	5M	White round tower with gallery, 7m	[0.3]
759 - Rt Opatovo. Cape <i>E 3654</i>	42 27.565 18 40.889	Fl G 2s	9m	4M	Square stone tower, block in the sea, 8m	[0.3]
760 - Lepetane. Wharf <i>E 3655</i>	42 28.086 18 41.115	F G	6m	3M	Green column, 5m	
761 - Kamenari. Wharf <i>E 3656</i>	42 27.986 18 40.495	F R	6m	4M	Red column, 4m	

ADRIATIC SEA - SERBIA AND MONTENEGRO

762 - Turski rt. Cape <i>E 3658</i>	42 28.709 18 41.203	Fl(2) W 5s	9m	6M	White conical tower with gallery, 8m	[0.5;1;0.5;3]
763 - Rt Verige (Gospa). Cape <i>E 3660</i>	42 28.647 18 41.408	Fl G 3s	10m	4M	Round tower with black stripes on the house beside small chapel, 6m	[0.5]
MORINJSKI ZALIV						
764 - Kostanjica. Mole. Middle <i>E 3661</i>	42 29.196 18 39.955	F R	4m	3M	White pyramidal metal framework tower, 4m	
765 - Morinj. Quay. NE corner <i>E 3662</i>	42 29.419 18 39.019	F G	4m	4M	Green column, 3m	
766 - Lipci. On concrete block <i>E 3662.4</i> in the sea	42 29.807 18 39.497	Fl G 3s	7m	3M	Green tower with column and gallery, 5m	[0.3]
RISANSKI ZALIV						
767 - Risan. Mole. Head <i>E 3663</i>	42 30.806 18 41.659	Fl(3) G 6s	5m	2M	White round tower with column and gallery, 5m	[0.5;1;0.5;1;0.5;2.5]
767.5 - Gospa. Islet <i>E 3663.6</i>	42 29.181 18 41.344	Fl(2) R 6s	5m	6M	Round stone tower, 4m	[0.5;0.5;0.5;4.5]
768 - PERAST. Wharf. Middle <i>E 3664</i>	42 29.145 18 41.906	Fl(3) R 7s	5.6m	3M	White round tower with red spiral, 4.6m	[0.5;0.5;0.5;0.5;0.5;4.5]
KOTORSKI ZALIV						
769 - Stoliv. Mole. Head <i>E 3666</i>	42 28.352 18 42.717	F G	5m	2M	White column, 4m	
770 - Dobrota. Sv. Stasije <i>E 3670</i>	42 28.020 18 45.769	Fl R 5s	6m	6M	White metal framework tower with gallery, 5m	[0.5] TE 2001
770.5 - Prčanj. Markov rt. Cape <i>E 3671</i>	42 27.938 18 44.035	Fl(2) G 6s	7m	6M	White round tower with black bands, 4.6m	[0.5;0.5;0.5;4.5]
771 -- Marina. N Breakwater <i>E 3674</i>	42 27.221 18 44.937	Fl(3) G 7s	5.6m	3M	White round tower with black bands, 4.6m	[0.5;0.5;0.5;0.5;0.5;4.5]
772 - Rdakovo. Cape. N <i>E 3676</i>	42 26.941 18 45.249	Fl G 5s	8m	6M	White square tower with column and gallery, 7m	[0.5]

ADRIATIC SEA - SERBIA AND MONTENEGRO

773 - Rt Plagente. Cape <i>E 3678</i>	42 26.165 18 45.822	Fl(2) R 5s	8m	6M	white round tower with red spiral, 5m	[0.5;1;0.5;3]
774 - Muo. Quay. Head <i>E 3678</i>	42 26.096 18 45.438	Fl(2) G 5s	5m	5M	round white tower with platform	
775 - KOTOR. Coast. NW <i>E 3682</i>	42 25.567 18 46.003	Fl R 3s	8m	5M	stone obelisk with gallery, 7m	[0.3]
ZALIV TRAŠTE						
776 - Rt Trašte. Cape <i>E 3684</i>	42 21.462 18 41.271	Fl W 3s	9m	5M	White round tower with gallery on pedestal, 6m	[0.3] Vis 010-278 (268)
777 - Bigovo. Pier <i>E 3684.5</i>	42 21.358 18 42.258	Fl R 3s	7m	2M	Red round metal tower, 5m	[0.3]
778 - Rt Platamuni. Cape <i>E 3685</i>	42 16.046 18 46.737	Fl W 6s	32m	9M	Stone tower with column and gallery, 10m	[1] TE 2004
BUDVA						
779 - Buoy I	42 16.404 18 50.649	Fl G 2s		2M	Green pillar buoy	[0.3]
779.5 -- II	42 16.393 18 50.563	Fl R 2s		2M	Red pillar buoy	[0.3]
780 -- III	42 16.734 18 50.765	Fl G 3s		2M	Green pillar buoy	[0.3]
780.5 -- IV	42 16.789 18 50.545	Fl(2) R 5s		2M	Red conical buoy	[0.5;0.5;0.5;3.5]
781 - Breakwater. Head. N corner <i>E 3688</i>	42 16.760 18 50.364	Fl R 3s	6m	3M	Red tower with column and gallery, 5m	[0.5] Obscd 270-090 (180)
783 - Ostrvce Sv. Nikola. Islet <i>E 3686</i>	42 15.539 18 51.482	Fl(3) W 10s	23m	8M	White tower beside house, 3m	[0.5;1;0.5;1;0.5;6.5]. Vis 248-113 (225) TE 2004
783.2 - Katići <i>E 3688.5</i>	42 11.731 18 56.156	Fl R 4s	25m	6M	White round tower on concrete block, 5m	[0.5]

ADRIATIC SEA - SERBIA AND MONTENEGRO

BARSKO SIDRIŠTE

783.5 - Crni rt. Cape <i>E 3689</i>	42 08.175 19 00.640	Fl W 6s	142m	25M	White round tower on concrete block, 4m	[1]
784 - Rt Volujica. Cape <i>E 3690</i>	42 05.304 19 04.223	Fl(2) W 10s	30m	20/ 16M	Six-sided tower with white and black stripes, 6m	
784.5 - <i>Pilot buoy "P"</i>	42 06.489 19 03.680	Fl R 5s	3.8m	2M	Orange conical buoy with written letter "P" on it	[0.5] Radar target enhancer

BAR

785 - W Breakwater. Head <i>E 3691</i>	42 05.949 19 04.734	Fl G 4s	19m	6M	White round tower with gallery, 13m	[1]
786 - N Breakwater. Head <i>E 3693</i>	42 05.815 19 04.913	Fl(2) R 5s	6.5m	3M	White tower with red rings and platform, 5.5m	[0.5;1;0.5;3]
786.5 - Marina. N Mole <i>E 3694</i>	42 05.987 19 05.206	Fl(3) G 5s	7m	3M	White round concrete tower with green platform, 5m	[0.5;0.5;0.5;0.5;0.5;2.5]
786.6 - Marina. S Mole <i>E 3694.1</i>	42 05.954 19 05.247	Fl(3) R 5s	6m	3M	White round concrete tower with red platform, 6m	[0.5;0.5;0.5;0.5;0.5;2.5]

ULCINJ

788 - Rt Mendra. Cape <i>E 3696</i>	41 57.157 19 08.978	LF1 W 10s	35m	11M	White tower beside house, 8m	[2]
789 - Vrh tvrđave. Castle, Peak <i>E 3698</i>	41 55.344 19 12.082	Fl W 3s	27m	8M	White square tower, 4m	[0.3]
791 - Sv. Đorđe	41 51.8 19 21.0	Fl(3) R 4s	7m	1M	Red round metal tower with lamp on the top, 6m	[0.5;0.5;0.5;0.5;0.5;1.5] Obscd. toward Albanian border.

LAKE OF SKADAR - SERBIA AND MONTENEGRO

SKADARSKO JEZERO

792 - <i>VIRPAZAR, Channel, Entrance, Buoy.</i>	42 15.016 19 06.695	Fl G 3s	4M	Green conical buoy	[0.3]
793 -- <i>Buoy</i>	42 15.579 19 06.290	Fl R 3s	3M	Red conical buoy	[0.3]
794 - <i>Pličina Pjeske, Shallow, Buoy.</i>	42 15.0 19 11.7	Fl W 3s	5M	Green conical buoy	[0.3]
795 - <i>Rijeka Crnojevića, Channel Entrance, Buoy.</i>	42 18.410 19 05.249	Fl R 3s	4M	Red conical buoy	[0.3]

TABLICA EKVIVALENTNIH BROJEVA SVJETALA
TABLE OF EQUIVALENT LIGHT NUMBERS

E 3620	–	742	E 3664	–	768
E 3622	–	743	E 3666	–	769
E 3622.5	–	743.5	E 3670	–	770
E 3623	–	744	E 3671	–	770.5
E 3624	–	745	E 3674	–	771
E 3628	–	746	E 3676	–	772
E 3632	–	747		–	773
E 3632.5	–	747.5	E 3678	–	774
E 3630	–	748	E 3682	–	775
E 3648	–	749	E 3684	–	776
E 3647	–	750	E 3684.5	–	777
E 3646	–	751	E 3685	–	778
E 3645	–	752		–	779
E 3644	–	753		–	779.5
	–	753.5		–	780
E 3639	–	754		–	780.5
E 3643	–	755	E 3688	–	781
E 3638	–	756	E 3686	–	783
E 3637	–	757	E 3688.5	–	783.2
E 3652	–	758	E 3689	–	783.5
E 3654	–	759	E 3690	–	784
E 3655	–	760		–	784.5
E 3656	–	761	E 3691	–	785
E 3658	–	762	E 3693	–	786
E 3660	–	763	E 3694	–	786.5
E 3661	–	764	E 3694.1	–	786.6
E 3662	–	765	E 3696	–	788
E 3662.4	–	766	E 3698	–	789
E 3663	–	767	E 3700	–	791
E 3663.6	–	767.5		–	792
				–	793
				–	794
				–	795

ALPHABETICAL INDEX

B

BAOŠIĆI, Mole, Head.....	747.5
BAR, Marina, N mole.....	786.5
BAR, Marina, S mole.....	786.6
BAR, N Breakwater, Head.....	786
BAR, W Breakwater, Head.....	785
BARSKO SIDRIŠTE, Pilot buoy	784.5
BIGOVO, Pier.....	777
BJELILA (OKO), Pier, NW corner....	750
BUDVA, Breakwater, Head, N cor. ...	781
BUDVA, Buoy I.....	779
BUDVA, Buoy II	779.5
BUDVA, Buoy III	780
BUDVA, Buoy IV	780.5

C

CRNI RT	783.5
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D

DOBREČ	743.5
DOBROTA, Sv. Stasije.....	770
DONJA LASTVA, Quay.....	757

Đ

ĐENOVIĆI, Metal bridge, Head	747
Sv. ĐORĐE.....	791

G

GOSPA.....	767.5
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H

HERCEG NOVI, Breakwater, Head.....	745
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K

KALIMANJ	753
KALIMANJ, plićina, Shallow	753.5
KAMENARI.....	761
KATIĆI	783.2
KOSTANJICA, Mole, Middle	764
KOTOR, Coast, NW	775
KRAŠIĆI, Pier, Head.....	749

L

LEPETANE.....	760
LIPCI.....	766

M

MAMULA, Islet	743
MENDRA, rt, Cape.....	788
MORINJ, Quay, NE corner.....	765
MUO, Quay, Head	774

N

Sv. NEDELJA, rt, Cape	758
Sv. NIKOLA, Islet	783

O

OPATOVO, rt, Cape.....	759
OŠTRA, rt, Cape.....	742

P

PERAST, Wharf, Middle	768
PLAGENTE, rt, Cape	773
PLATAMUNI, rt, Cape	778
PRČANJ, Markov rt, Cape	770.5
PRČANJ, Marina, N Breakwater.....	771
PRISTAN, Mole, Head	748

R

RDAKOVO, Cape, N	772
RISAN, Mole, Head.....	767
ROSE, Pier, W side	744

S

SELJANOVO, rt, Cape.....	756
STANIČIĆ, Mole, NW corner	755
STOLIV, Mole, Head.....	769

T

TIVAT, S Mole, Head.....	754
TRAŠTE, rt, Cape.....	776
TUNJA, plićina, Shallow	752
TURSKI rt, Cape	762

U

ULCINJ, Castle, Peak789

V

VERIGE, rt, Cape763

VIRPAZAR, Buoys..... 792, 793

VOLUJICA, rt, Cape784

Z

ZELENIKA.....746

Ž

ŽUKOVAC, Pier751

**PHOTOGRAPHS OF CERTAIN LIGHT CONSTRUCTIONS ON
THE SERBIA AND MONTENEGRO COAST**



783, BUDVA, O. Sv. Nikola



770.5, KOTORSKI ZALIV, Prčanj, Markov rt



779.5, BUDVA, *Buoy II*



772, KOTORSKI ZALIV, Rdakovo



775, KOTORSKI ZALIV, KOTOR



743.5, BOKA KOTORSKA, Dobreč



762, TJESNAC VERIGE, Turski rt



759, TJESNAC VERIGE, Rt Opatovo



789, ULCINJ, Castle, Peak



752, TIVATSKI ZALIV, Plić. Tunja