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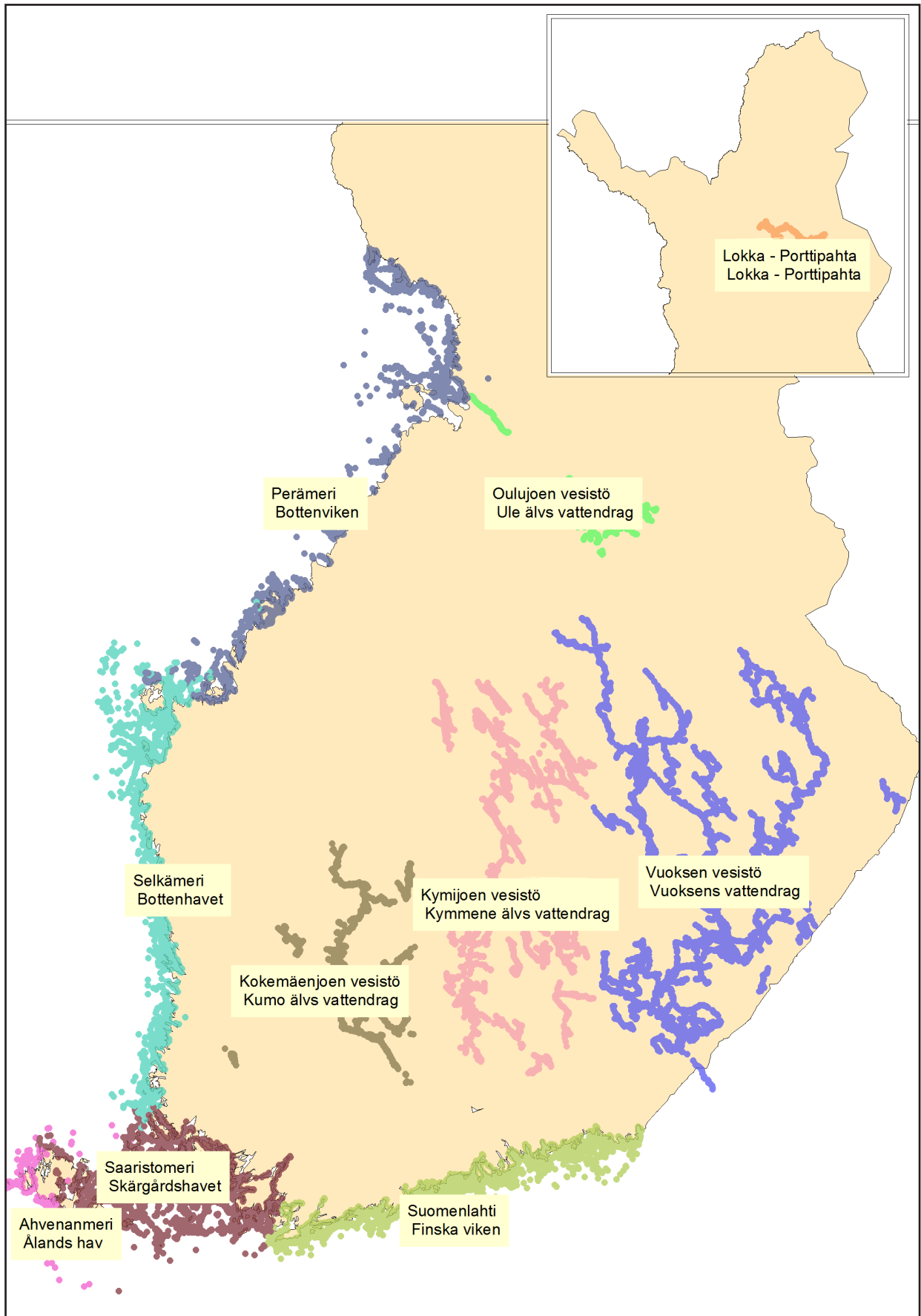
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1. AREAS



2. PREFACE

The Finnish List of Lights is an output from the Database of Channels and Aids to Navigation (VATU), which is maintained by the Vaylätörasto (Finnish Transport Infrastructure Agency, Traficom. The list comprises particulars of all lights, leading lights and light buoys needed by the mariner. The list describes the situation at the date of publishing. The date is shown at the top of each table. The text might refer to such freely available publications and services that are not a core part of the actual List of Lights, but that might be of interest to the mariner. The network links to such services has been listed at the beginning of this publication.

More details regarding Racons and DGPS-stations are found in the General information published annually in the publication Notices to Mariners. If the List of Lights is to be used without network access, it is recommended to retrieve the needed additional publications in advance.

Information of new editions and changes in the navigational aids is provided in Notices to Mariners.

2.1 LIST OF RELATED SERVICES

This is a list of related publications and services that might be of interest to the mariner.

Notices to Mariners

www.traficom.fi/en/nautical-charts

Navigational warnings

https://extranet.vayla.fi/pooki_www/merivaroitukset/list_en.html

Finnish Meteorological Institute, Ice conditions

<http://en.ilmatieteenlaitos.fi/ice-conditions>

Pilot orders

www.pilotorder.fi

Faults in Aids to Navigation

www.vayla.fi/vesivaylat/turvalaitteet/turvalaiteviat

GOFREP – Master's Guide

<https://www.tmfg.fi/en/vts/masters-guide>

VTS manuals for different areas:

<https://www.tmfg.fi/en/vts/masters-guide>

Winter navigation

<https://vayla.fi/web/en/merchant-shipping/winter-navigation>

Saimaa Canal

<https://vayla.fi/web/en/waterways/canals-and-bridges/the-saimaa-canal>

Fairway cards for the main fairways

<https://vayla.fi/web/en/merchant-shipping/navigating/fairway-cards>

Search and Rescue (SAR) instructions

www.raja.fi/manuals/sar

The national Emergency Response Centre

www.112.fi

3. GLOSSARY OF TERMS

AIS	Automatic Identification System
AtoN	Aid to Navigation
AIS AtoN	AIS Aid to Navigation
V-AIS	Virtual AIS AtoN
cd	candela
G	green
M	nautical mile
m	meter
min	minute
R	red
s	second
W	white
Y	yellow

3.1 LIGHT CHARACTERS

Light characteristics in Finnish nautical charts are indicated in English according to the INT chart symbols and in the WGS 84 coordinate system. In the older green charts, light characteristics are indicated using Finnish and Swedish abbreviations.

Finnish - Swedish	English	Description
Ki – F	F	Fixed light
Ka – Int	Oc	Single occulting
Ka – Int(2)	Oc(2)	Group occulting
Ka – Int(2+3)	Oc(2+3)	Composite group occulting
T – K	Iso	Isophase
V – B	Fl	Flashing light
V – B (2)	Fl(2)	Group flashing
V – B (2+1)	Fl(2+1)	Composite group flashing
KV – LB	LFl	Long flash
KiV – FB	FFl	Fixed and Flashing
Pv – Sx	Q	Continuous quick
Pv – Sx(3)	Q(3)	Group quick
NPv – Esx	VQ	Continuous very quick
NPv – ESx(3)	VQ(3)	Group very quick
ENPv – EXSx	UQ	Continuous ultra-quick
KeENPv – IntEXSx	IUQ	Interrupted ultra-quick
Mo (K)	Mo (K)	Morse code

4. INTRODUCTION TO THE TABLES

4.1 USING THE LIST OF LIGHTS

The arrangement in areas follows the structure of the fairway register (VATU). The areas are slightly different to those used in the Notices to Mariners. The lights are arranged by fairway, using the following order for the water areas. The Finnish names are displayed here, as in the tables.

Sea areas:

- Perämeri (Bay of Bothnia)
- Selkämeri (Sea of Bothnia)
- Ahvenanmeri (Sea of Åland)
- Saaristomeri (Archipelago Sea)
- Suomenlahti (Gulf of Finland)

Inland waterways:

- Vuoksen vesistö (Vuoksi watercourse)
- Kymijoen vesistö (Kymijoki watercourse)
- Kokemäenjoen vesistö (Kokemäenjoki watercourse)
- Oulujoen vesistö (Oulujoki watercourse)
- Lokka-Porttipahta

Channels are listed in almost the natural order. Parallel channels are listed after main channels. Aids to navigation are mostly listed in order of appearance. If an aid to navigation belongs to more than one channel, its particulars are repeated under each of these channels.

4.1.1 COORDINATE SYSTEM

The coordinate system of the Finnish charts, EUREF-FIN, is based on the international maritime standard WGS 84, which is used in GPS satellite navigation. EUREF-FIN and WGS 84 coincide so closely (precision 1m) that the difference is in practice negligible. All positions in the List of Lights are displayed using this system.

A few of the charts for the Inland waterways still in use (year 2016) have been published before 2003. These charts coordinates are based on the national geodetic chart coordinate system (KKJ). The International Spheroid 1924 (Hayford 1910) constitutes the reference ellipsoid. The WGS 84 Coordinate System, which is used in GPS (Global Positioning System) satellite navigational equipment, differs from the KKJ geodetic system. These older charts are green. The new charts have a blue color. In the older green charts, light characters are displayed as Finnish and Swedish abbreviations.

4.1.2 LIGHT SECTORS

Light sectors and lines are noted as true bearings from seaward toward the light clockwise in degrees (0° – 360°) so that 0° is from south to north, 90° from west to east, 180° from north to south, etc.

4.1.3 DATA IN THE TABLES

Fairways and Aids to Navigation particulars are described in Finnish and/or Swedish, depending of the area. All information is not available in the database in both languages. The List of Lights displays all information available in the database. The database contains only the local language.

Keskiniemen väylä - Keskiniemi farled(210)						Syvyys/Djup: 3,5m	2016-05-30	
Nro / nr Kv / Int	Nimi / Namn Sijainti / Läge	Paikka/Pos (WGS84)	Tunnus Karaktär	Kork Höjd	Kanto Vidd	Kuvaus Beskrivning	Sektor Sektorer	Lisätiedot Anmärkningar
8965 C4147.05	Keskiniemi Hailuodon LU-niemellä. På NV-udden av Hailuoto.	65° 04,84' 24° 39,24'	Fl 6 s 0,5+5,5=6,0 s	8,8m	6,5M	Apuloisto. Hjälpfyr. Kartiomainen.Yksivärinen. Valkoinen Konisk form.Enfärgad.Vit	W-000,0-360,0	Tutkaheijastin Radarreflektor Linjassa/Linje: 9140 Suunta/Rikting:105,0 Kartat/Kort: 56, 57, G844, G848

Kuva 1 Example of how a light is described in the List of Lights

Farled	(Fairway) Name, number and depth of the fairway are described in the first row of each table. The same row also displays the printing date of the table.
Nro/Nr	(Number) National number of the aid to navigation. Consists of 1 to 5 digits. The number is permanent. A particular aid to navigation may be referred to by its number.
Kv/Int	(International number) International number of aid to navigation, if available. Lack of international number is marked using a line '-'.
Nimi/Namn	(Name) Finnish / Swedish name of the aid.
Sijainti/Läge	(Position) Position of the aid described in Finnish/Swedish.
Paikka/Pos	(Position coordinates) Position Coordinates (latitude and longitude) according to the position of the aid to navigation in the nautical chart in the WGS 84 (EUREF-FIN) system.
Tunnus/Karaktär	(Character) Official character and exact character explained in detail. For the exact character, the duration of light and eclipse is given in tenths of seconds - or in some instances in hundredths of seconds. Example: 1.5 + 2.0 + 1.5 + 5.0 = 10 s., i.e. light 1.5 s., eclipse 2.0 s., light 1.5 s. and eclipse 5.0 s., total 10 s. For technical reasons, light periods cannot be noted in bold text anymore. The light character is composed of alternating light and dark periods. If it contains much repetition it may be difficult to interpret. Therefore light and dark periods can be grouped in long light characters, e.g. 0.5 + 0.5 + 0.5 + 0.5 + 0.5 + 5.0 = 7.5 is written 3* (0.5 + 0.5) + 4.5 = 7.5 s.
Kork/Höjd	(Height) Height of light above water level in metres..
Kanto/Vidd	(Range) Nominal range of light in nautical miles. Nominal range is explained later in this publication.
Kuvaus/Beskrivning	(Description) Construction of aid to navigation such as type, shape and colour.
Sektor/Sektorer	(Light sectors) Description of the light sectors. The colour of each sector is noted in an abbreviation in English, along with the initial and final angle (in degrees). The sectors are listed in order of increasing initial angle.
Lisätietoja/Anmärkningar	(Additional information) Information such as whether a certain aid to navigation is in line with another aid to navigation, is synchronized or has operational restrictions. If an aid to navigation exhibits two different lights (nighttime and daytime lights), descriptions of these lights are given one after the other. If aids to navigation mark a certain navigable line, the following descriptions are given (Linjassa = Line and Suunta = Direction): Linjassa/Linje: nnnnn Suunta/Rikting: aaa.a° The aids in line and the angle of the line in degrees are presented. If the aid is part of multiple lines, these are separated by a space. Also coastal charts and pages of the chart-folios containing the aid are displayed.

4.2 EXHIBITION OF LIGHTS AND DAYMARKS

All lighted aids to navigation are in operation from sunset to sunrise throughout the year, unless otherwise indicated. Exceptions are indicated in the tables.

Due to technical reasons, floating aids to navigation are fitted with IALA System A topmarks only by way of exception. Among edge marks, only lateral marks have System A topmarks. Cardinal edge marks are fitted with a radar reflector but not with a System A topmark.

4.3 SPECIAL SITUATIONS AND REPORTING OF FAULTS

Anyone who notices that a light or a lighted buoy is inoperative or that an aid to navigation is damaged, dragged off station or otherwise misleading, is obliged by law to notify the nearest pilot station, the Finnish Transport Infrastructure Agency or other authorities.

Notifications: phone 0800 – 181818.

The Finnish Transport Infrastructure Agency's website contains a real-time Aids to navigation information service. This information is available when using a web-browser or by subscription of an RSS-feed. The site also contains a form for reporting faults in aids to navigation. The link to the service is found in the list of related services.

4.3.1 BUOYS REMOVED FOR THE WINTER SEASON

Some buoys are removed for the winter season. These seasonal changes are not corrected in the register, and are thus not visible in the List of Lights. Seasonal and temporary changes are reported in Notices to Mariners. Some of the removed buoys are replaced by virtual AIS AtoNs during the winter.

4.3.2 THE COLD SEASON AND BUOYS OFF POSITION

There is often a small obscure angle between the sectors of various colours making it difficult, even impossible, to identify the colour of the light.

The angle may be widened by frost. The light may seem to have a white colour even in angles where it is normally coloured. The danger is greatest in green sectors.

In the winter, the windows of the light may be covered with a thick coat of snow or frost dimming or obscuring the light altogether. Service and repair may take much more time and effort than in the summer.

Many sectored lights do not emit light in certain sectors at all. Nevertheless, a light may be seen in these sectors, especially on short distances and if the light is strong. The light is of the same colour as the adjacent sector. These reflections appear frequently, if the windows of the light are covered with frost or ice.

Buoys and spar buoys may also get dragged off station. Owing to sea swell, snow or frost they may emit only a vague light. In winter time, moving ice can submerge them for longer periods. Their lantern fittings may also be damaged.

Special information on these dangers, which are a consequence of winter conditions, is not given. It is up to the seafarer to pay due attention to them. After the break-up of the ice it may take weeks to control all floating aids to navigation.

4.4. DEFINITIONS OF AIDS TO NAVIGATION

These definitions are based on the instructions issued in 2014 by the Finnish Transport Agency (currently the Finnish Transport Infrastructure Agency)

Aid to navigation	<p>(Turvalaite) A fixed or floating construction with devices designed and operated to enhance safe and efficient navigation of vessel traffic, for example a spar buoy, lighthouse or a waterway sign. AtoNs are also called navigation marks or seamarks.</p> <p>Floating aid to navigation (Kelluva turvalaite)</p> <p>Generic name for a floating aid to navigation, moored to the seabed with an anchor chain or wire. Usually buoys and spar buoys (see buoy and spar buoy)</p> <p>Beacon (Kiinteä turvalaite)</p> <p>Generic name for a beacon installed on shore or in the water (on the seabed), for example lighthouses, edge marks and lights.</p>
Beacon tower	<p>(Tunnusmajakka) An unlighted, substantial, usually wooden or stone structure resembling a lighthouse.</p>
Buoy	<p>(Poiju) Generic name for a floating aid to navigation moored to the seabed. The part above sea level has a height/diameter ratio of < 5:1. A buoy is typically moored with a slack anchor chain allowing it to float freely around its mooring position.</p> <p>Offshore buoy (Avomeripoiju)</p> <p>Large steel-framed ice buoy intended for use at open sea, where the wave and ice loads are greater than normal. The visible part of the buoy is 5.6 metres long and the diameter of the buoy at the waterline is 2.0 metres.</p> <p>Ice buoy (Jääpoiju)</p> <p>A spool-shaped steel buoy fit for ice conditions.</p> <p>Buoy, pretensioned (Poijuviitta)</p> <p>A buoy that is pretensioned in the same way as a spar buoy and the diameter of which is at least 800 mm at the waterline. Cylindrical shape.</p> <p>Buoy for small craft routes (Veneväyläpoiju)</p> <p>Light-framed buoy intended for buoyage of shallow fairways, such as small craft routes (charted as a spar buoy).</p>
Buoyage system	<p>(Viitoitusjärjestelmä) Maritime buoyage system recommended by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA). Finland belongs to Region A, where a combined cardinal and lateral system is applied. The system is also applied to spar buoys, buoys and edge marks. The mark types include cardinal marks, lateral marks, isolated danger marks, safe water marks and special marks.</p>
Cardinal mark	<p>(Kardinaalimerkki) Cardinal marks indicate that the deepest water in the area lies to the named side of the mark. The cardinal marks are North, East, South and West.</p>
Cairn	<p>(Kummeli) An unlighted aid to navigation raised as a landmark on the shore to provide rough position information. May be a white-painted mound of stones or a wood, concrete or steel construction.</p>
Cairn (lighted)	<p>(Valokummeli) Cairn lighted by a floodlight.</p>
Daymark	<p>(Päivämerkki) An aid to navigation that is visible in daylight (for example a board of a leading line or a daymark with retroreflective sheet).</p>
Daymark with retroreflective sheet	<p>(Levykummeli) Daymark equipped with retroreflective sheet. The sign may be equipped with a number or letter symbol.</p>
Daytime character	<p>(Päivätunnus) The daytime identifying visual characteristics of any aid to navigation. The most important special features are shape, colour pattern and colour as well as possible letter symbols (cf. Daymark).</p>
Daytime light	<p>(Päiväloisto) An aid to navigation fitted with a specific strong light visible in daylight (usually a leading mark).</p>
DGPS station	<p>(DGPS-asema) Electronic positioning station, via which the DGPS correction signal is transmitted to vessels.</p>
Direction light	<p>(Suuntaloisto) A light which marks the course to be followed. It is not in line with any other light. Lacks sectors presenting different colours.</p>

Edge marking	(Reunamerkintä) Generic name for buoyage indicating the position of the channel edge. Edge markings include spar buoys, buoys and edge marks.
Edge mark	(Reunamerkki) Beacon positioned at the charted distance (usually less than 50 m) from the channel edge. 'Edge mark' may also be used as a generic name to include all aids to navigation indicating the channel edge, such as buoys and spar buoys.
Fishing light	(Kalastusloisto) Beacon, for example a leading light or a sector light, used for fishing purposes. Usually only lit when necessary. Usually owned and maintained by a municipality or a private owner.
Floodlight	(Fasadivalo) Light which floodlights the surface of an aid to navigation in order to facilitate navigation (cf. shoreline light).
Isolated danger mark	(Karimerkki) An isolated danger mark indicates an isolated shoal or other danger surrounded by navigable waters. The mark is placed on top of the dangerous object.
Lateral mark	(Lateraalimerkki) Lateral marks indicate the port and starboard limits of a channel in its general direction.
Leading light	(Linjaloisto) Lighted leading beacon.
Leading beacon	(Linjamerkki) Beacon, which together with another leading beacon indicates the fairway line. The beacons of the same line are referred to as front and rear. Seen from the fairway, the front mark is located closer and lower down compared to the water surface. The daymark of a leading beacon is usually a board. If no board is used, a daytime light is usually affixed to the leading beacon. A lighted leading beacon is also called a leading light.
Light	(Loisto) Generic name for a lighted beacon.
Light character	(Valotunnus) The light character describes the flash type and rhythm (number and duration of flashes, periodic length).
Lighted aid to navigation	(Valaistu turvalaite) An aid to navigation with lantern fittings to facilitate navigation.
Lighthouse	(Majakka) Generic name for a substantial, lighted beacon.
Lighthouse (offshore)	(Merimajakka) A light located offshore at the mouth of the channel or as a solitary edifice at open sea far from actual channels. May be fitted with light sectors of different colours.
Light reflector	(Valoheijastin) Retroreflective material applied to an aid to navigation. Effectively reflects the light in the colours featured in the retroreflective character of the aid to navigation.
Light signals	(Valo-opasteet) Lights intended for guiding vessel and boat traffic, for example traffic signals in canal locks.
Luminous intensity	<p>Luminous intensity of a fixed light source (Io) (Kiinteä valovoima)</p> <p>The luminous intensity of a fixed light from a lantern unaffected by the light character or light-filtering factors (coloured glass, outdoor glass) reducing the luminous intensity. Candela (cd) is the SI unit of luminous intensity.</p> <p>Effective intensity (Ie) (Tehollinen valovoima)</p> <p>The luminous intensity of a lantern taking into account the effect of the light character and light-filtering factors (coloured glass, outdoor glass) reducing the luminous intensity. Candela (cd) is the SI unit of luminous intensity.</p>
Major light	(Pääloisto) The main light of a lighthouse or light (cf. Subsidiary light.)
Minor light	(Apuloisto) Lighted aid to navigation set up on one side of the channel to assist navigation, for example, for taking cross bearings or to indicate the start of a turn. It is not set up as a direction light. Normally displays a white light and does not have any light sectors. May also display a yellow or orange light.
Navigational mark	(Merimerkki) Generic name for a floating aid to navigation or beacon established to aid and ensure safe navigation.
Official light character	<p>(Virallinen valotunnus) Type of light character marking a lighted aid to navigation, conforming to the recommendation of IALA (International Association of Marine Aids to Navigation and Lighthouse Authorities). The abbreviation describing the type of light character is made up of a letter abbreviation describing the type of light character, the number of flashes and the length of the period, for example NPv – ESx – VQ(3) 5s = group very quick light, with three very quick flashes every 5 seconds (East cardinal mark).</p> <p>Exact light character (Tarkka valotunnus)</p> <p>Light character of a lighted aid to navigation indicated in seconds, for example VQ(3) 5s: 3 x (light 0.15 + dark 0.45) + dark 3.20 = period 5.00 s (East cardinal mark).</p>

Operational status	<p>(Toimintatila) Term describing the operational duration of an aid to navigation.</p> <p>Continuous operation (Jatkuva toiminta) The aid to navigation is operated continuously throughout the year.</p> <p>Restricted operation (Rajoitettu toiminta-aika) The aid to navigation is kept unlit during separately announced periods, for example during the winter months.</p> <p>Operated when necessary (Toimii tarvittaessa) The aid to navigation is installed or adjusted for operation only occasionally for special purposes (for example OCCAS buoys and spar buoys, fishing lights)</p> <p>Temporary operation (Väliaikainen toiminta) The aid to navigation is only operated temporarily or periodically, for example to mark a new danger or for a special transport.</p>
Other light	(Muu loisto) A lighted mark without the characteristics of a navigation light. It has not been established as an aid to navigation, but mariners can use it for navigation (for example radio pylons and air obstruction lights).
Other mark	(Muu merkki) Other marks are structures that are not intended as aids to navigation but nevertheless can be used to assist navigation. May be lighted (cf. other light). Other marks typically include different mast and tower structures (e.g. radio masts, VTS masts, church towers).
Position line	(Sijoittaja) Fixed shore-based marks located two by two indicating the official position of spar buoys and buoys. Position lines may include shore-based constructions, white-painted stones, marks painted on the rock or other distinguishable objects. Position lines are used when installing floating aids to navigation and when checking positions. Nowadays, their use and significance is minor.
Racon (Radar Beacon)	An electronic additional device usually affixed to a beacon that, after receiving radar signals, returns a MORSE Code response visible on the radar screen. The name Racon is derived from Radar Beacon.
Radar reflector	(Tutkaheijastin) A device or construction affixed to an aid to navigation to increase the retroreflective capacity of the radar beam.
Radar beacon	(Tutkamajakka) An electronic additional device affixed to a (usually fixed) aid to navigation that, after receiving transmitted radar signals, returns a MORSE Code response visible on the radar screen. The name Racon is also used.
Ramark	(Tutkamerkki) A beacon fitted with radar reflectors built as a radar target. May be located in water or on the shore. Ramarks installed in the water resemble edge marks, but are set up more than 50 m from the channel edge.
Range	<p>(Kantomatka) The greatest theoretical distance from a lighted aid to navigation at which a light is visible.</p> <p>Range (geographical) (Maantieteellinen kantomatka) The geographical range is the theoretical range determined on the basis of geometric quantities, i.e. the curvature of the earth and the heights of the light source and the observer. In merchant shipping lanes the range is indicated as a 5-metre and in shallow fairways as a 2-metre observation height from the water surface.</p> <p>Range (nominal) (Nimellinen kantomatka) The nominal range is indicated as the distance at which a light can be seen at night when the meteorological visibility is 10 sea miles. The visibility is normally restricted by the optical range. If a strong light is situated low, the geographical range may be shorter than the optical range, in which case the geographical range is given as the nominal range. In other cases, the optical range is given as the nominal range.</p> <p>Range (optical) (Optinen kantomatka) The theoretical range determined on the basis of the luminous intensity and the meteorological visibility prevailing at a certain time.</p>
Safe water mark	(Turvavesimerkki) The safe water mark indicates that there are navigable waters both around and under the mark. The mark is used to indicate the centre of the fairway or the fairway line.
Sector light	(Sektoriloisto) A light presenting different colours over various parts of the horizon. White light is normally exhibited in the direction of the navigable channel. When a ship is heading towards the light, the white sector is flanked by a red sector on the left side and a green sector on the right side.

Spar buoy	<p>(Viitta) Generic name for a floating aid to navigation moored to the seabed. The part above sea level has a height/diameter ratio of > 5:1. The spar buoy is pretensioned so that the anchor chain or wire is tight; therefore, the spar buoy does not float around its position.</p> <p>Large spar buoy (Suurviitta) A distinctive, large spar buoy with a diameter of 335–500 mm.</p> <p>Light buoy (Valoviitta) A buoy fitted with a light, which may be pretensioned or floating freely like a buoy.</p> <p>Spar buoy (free-floating) (viittapoiju) A spar buoy that is moored like a buoy, with a slack anchor chain or wire allowing it to float freely.</p>
Special mark	<p>(Erikoismerkki) Special marks indicate a special area, device or feature referenced on a chart or in other sailing instructions. Special marks are used to indicate, for example, the following:</p> <ul style="list-style-type: none"> - Ocean Data Acquisition Systems (ODAS); - dredging areas and spoil grounds; - military exercise zones; - cables or pipelines; - recreation zones; and - border zones. <p>Special marks are usually spar buoys or buoys. They may also be used in other constructions, such as in wind turbines.</p>
Subsidiary light	(Lisäloisto) A light that is affixed to e.g. a lighted aid to navigation to supplement or to serve another purpose than that of the original light.
Synchronised	(Tahdistettu) The light of an aid to navigation is synchronised with the light of another aid to navigation, so that their lights flash synchronously (e.g. lights with the same characteristics flash simultaneously).
Top mark	(Huippumerkki) A characteristic shape secured at the top of an aid to navigation to aid in its identification, for example a cardinal or lateral shape. Used in chart symbols and in fixed constructions (nowadays only rarely used in floating marks).
Unlighted aid to navigation	(Valaisematon turvalaite) An aid to navigation with no lantern fittings to facilitate navigation.
Virtual aid to navigation	(Virtuaalinen turvalaite) An aid to navigation that only exists in electronic form, for example as a temporary danger mark, for temporary traffic management or in other corresponding situations where physical marking is difficult.
VTS mast	(VTS-masto) Mast construction containing radar equipment of the vessel traffic services. The equipment may also be installed in a construction of an aid to navigation.
Waterway sign	(Vesiliikennemerkki) Generic name for prohibitory signs, mandatory and restrictive signs, informative signs, auxiliary signs, cable and overhead cable boards and direction marks. Waterway signs are referred to as aids to navigation in the Decree on the buoyage of waterways (846/1979).

4.5 LIGHT FEATURES

Adjacent aids to navigation are fitted with different lights for distinction. Each light is divided into periods by means of eclipses of various lengths. The period, which is unique for each aid to navigation, is called the light's character.

In addition, adjacent aids to navigation are distinguished by the colours of the light they exhibit. Aids to navigation exhibit red, green, yellow and white light. The International Maritime Buoyage System specifies the use of different colours in floating aids to navigation. In beacons, such as sector lights, leading lights and minor lights, these colours are still used extensively, a fact that the navigator should bear in mind. Generally, beacons are distinguished from System A seamarks through different colours and light characters. Leading lights primarily exhibit the white light, but if another colour is required, the yellow light is normally exhibited.

4.6 LIGHT RANGES

In the List of Lights the light range in nautical miles is noted as a nominal range. If a light exhibits white light, only the range for white light is noted. If a light exhibits only coloured, i.e. yellow, red or green light, the range for the coloured light is noted. When coloured glass is used, yellow has about 50 per cent, red and green about 20 per cent of the intensity of the white colour.

Nominal range is the luminous range of a light at night when the meteorological visibility is 10 nautical miles. If the light construction is so low that the geographical range of light is shorter than the nominal range, only the geographical range is noted. It is then noted for a height of eye 5 metres above water level. The actual range of light during other conditions of visibility is obtained from the table.

The nominal range noted in the List of Lights is shown on the horizontal scale. The actual range is read off the vertical scale on a height equal to the intersection between the vertical curve denoting light range and the visibility area. The height of the intersection on the vertical scale indicates the actual range of light in the visibility conditions in question.

The horizontal scale beneath the nominal range scale shows the corresponding luminous intensity in candelas.

4.6.1 NOMINAL RANGE

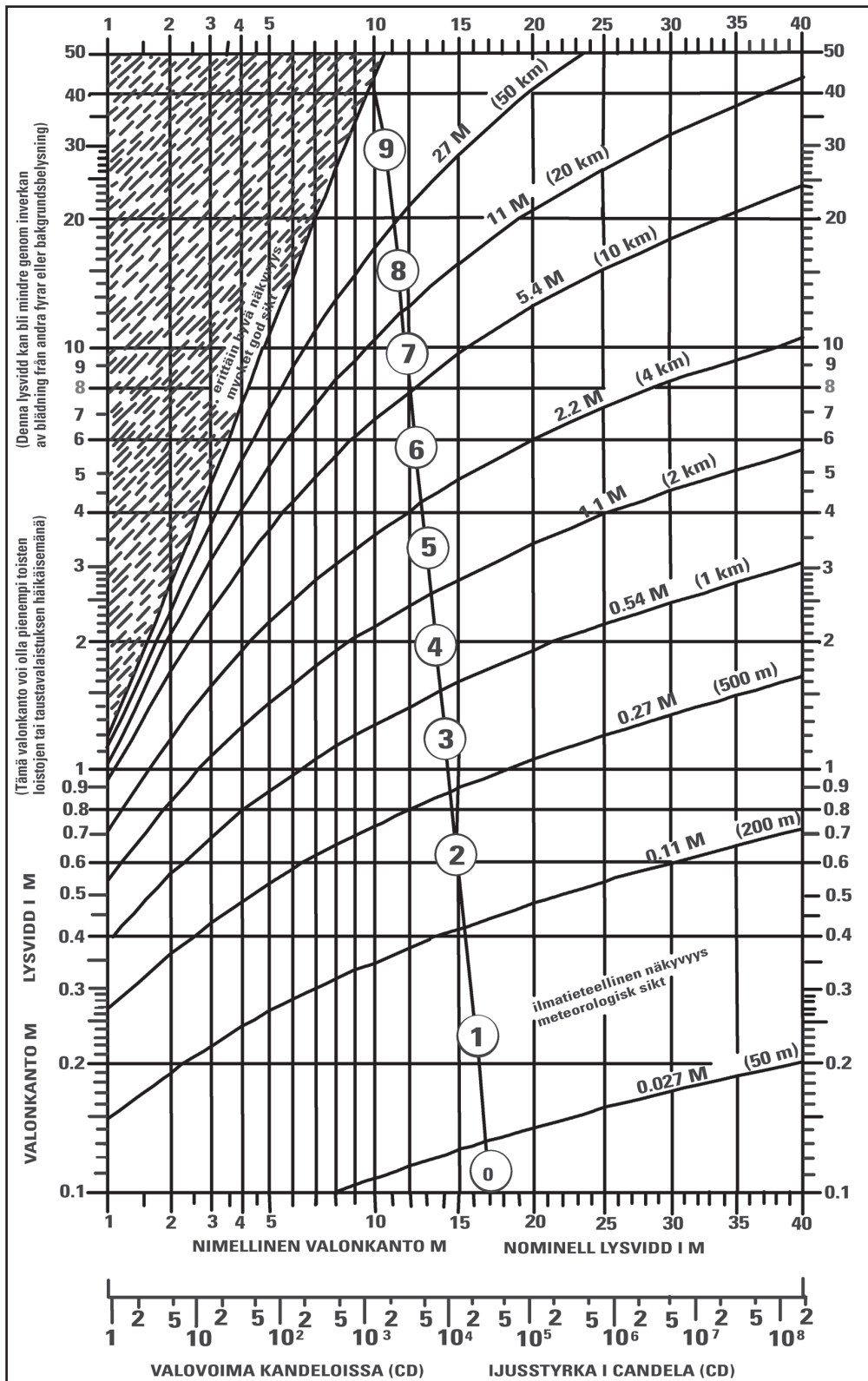


Figure 2 Nominal range

4.6.2 GEOGRAPHICAL RANGE

<p>Maantieteellinen valonkanto meripeninkulmina. Geografisk lysvidd i sjömil. Geographical range of light in nautical miles.</p>											
<p>Valon korkeus vedenpinnasta metreinä Ljusets höjd över vattenytan i meter Height of light over water level.</p>											
<p>Silmän korkeus vedenpinnasta Ögats höjd över vattenytan Height of eye over water level</p>											
	0 m	2 m	3 m	4 m	5 m	6 m	8 m	10 m	12 m	15 m	20 m
2	2,9	5,9	6,5	7,1	7,6	8,0	8,8	9,5	10,1	11,0	12,2
3	3,6	6,5	7,2	7,8	8,3	8,7	9,5	10,2	10,8	11,7	12,9
4	4,2	7,1	7,8	8,3	8,8	9,3	10,0	10,7	11,4	12,2	13,5
5	4,7	7,6	8,3	8,8	9,3	9,7	10,5	11,2	11,9	12,7	14,0
6	5,1	8,0	8,7	9,3	9,7	10,2	11,0	11,7	12,3	13,2	14,4
7	5,5	8,4	9,1	9,7	10,2	10,6	11,4	12,1	12,7	13,6	14,8
8	5,9	8,8	9,5	10,0	10,5	11,0	11,8	12,5	13,1	13,9	15,2
9	6,2	9,2	9,8	10,4	10,9	11,3	12,1	12,8	13,4	14,3	15,5
10	6,6	9,5	10,2	10,7	11,2	11,7	12,5	13,2	13,8	14,6	15,9
12	7,2	10,1	10,8	11,4	11,9	12,3	13,1	13,8	14,4	15,3	16,5
14	7,8	10,7	11,4	11,9	12,4	12,9	13,7	14,4	15,0	15,8	17,1
16	8,3	11,3	11,9	12,5	13,0	13,4	14,2	14,9	15,5	16,4	17,6
18	8,8	11,8	12,4	13,0	13,5	13,9	14,7	15,4	16,0	16,9	18,1
20	9,3	12,2	12,9	13,5	14,0	14,4	15,2	15,9	16,5	17,4	18,6
25	10,4	13,3	14,0	14,6	15,1	15,5	16,3	17,0	17,6	18,5	19,7
30	11,4	14,3	15,0	15,6	16,0	16,5	17,3	18,0	18,6	19,5	20,7
35	12,3	15,2	15,9	16,5	17,0	17,4	18,2	18,9	19,5	20,4	21,6
40	13,2	16,1	16,8	17,3	17,8	18,3	19,0	19,7	20,4	21,2	22,5
45	14,0	16,9	17,6	18,1	18,6	19,0	19,8	20,5	21,2	22,0	23,3
50	14,7	17,6	18,3	18,9	19,4	19,8	20,6	21,3	21,9	22,8	24,0
60	16,1	19,1	19,7	20,3	20,8	21,2	22,0	22,7	23,3	24,2	25,4
70	17,4	20,3	21,0	21,6	22,1	22,5	23,3	24,0	24,6	25,5	26,7
80	18,6	21,5	22,2	22,8	23,3	23,7	24,5	25,2	25,8	26,7	27,9
90	19,7	22,7	23,3	23,9	24,4	24,8	25,6	26,3	26,9	27,8	29,0
100	20,8	23,7	24,4	25,0	25,5	25,9	26,7	27,4	28,0	28,9	30,1
120	22,8	25,7	26,4	26,9	27,4	27,9	28,7	29,4	30,0	30,8	32,1
140	24,6	27,6	28,2	28,8	29,3	29,7	30,5	31,2	31,8	32,7	33,9
160	26,3	29,3	29,9	30,5	31,0	31,4	32,2	32,9	33,5	34,4	35,6
180	27,9	30,8	31,5	32,1	32,6	33,0	33,8	34,5	35,1	36,0	37,2
200	29,4	32,4	33,0	33,6	34,1	34,5	35,3	36,0	36,6	37,5	38,7
<p>Taulukko on laskettu seuraavan kaavan mukaan</p>											
<p>Tabellen är beräknad enligt formeln</p>											
$x = 2,08 (\sqrt{HL} + \sqrt{HS})$											
<p>jossa x on maantieteellinen valonkanto (M)</p>											
<p>HL = valon korkeus vedenpinnasta (m).</p>											
<p>HS = silmän korkeus vedenpinnasta (m).</p>											
<p>i vilken x är den geografiska lysvidden (M)</p>											
<p>HL = fyrljusets höjd över vattenytan (m).</p>											
<p>HS = ögats höjd över vattenytan (m).</p>											
<p>The table is calculated in accordance with the formula</p>											
$x = 2,08 (\sqrt{HL} + \sqrt{HS})$											
<p>where x is the geographical range in nautical miles (M).</p>											
<p>HL = height of light above water level and</p>											
<p>HS = height of eye above water level in metres.</p>											

Figure 3 Geographical range

4.7 LIGHT CHARACTERS

Lyhenne Förkortning Abbreviation	Valoluokka Fyljus Class of light	Kuvas Schematisk beskrivning Illustration	Jakson pituus Periodens längd Period shown
F	Kiinteä valo Fast ljus Fixed light		
Katkeava (valon kokonaiskesto pidempi kuin pimeä jakso) Intermittent ljus (ljus med korta förmörkelser) Occulting (total duration of light longer than total duration of darkness)			
Oc	Katkovalo Intermittent ljus Single-occluding light		
Oc(2)	Ryhmäkatkovalo Gruppvis intermittent ljus Group-occluding light		
Oc(2+3)	Yhdistetty ryhmäkatkovalo Sammansatt gruppvis intermittent ljus Composite group-occluding light		
Tasarytminen (valon ja pimeän kesto yhtä pitkä) Isofas (ljus och mörker lika långa) Isophase (duration of light and darkness equal)			
Iso	Tasarytmivalo Isofas, klippsken Isophase light		
Vilkkuva (valon kokonaiskesto lyhyempi kuin pimeä jakso) Blixt (fylljus som visar regelbundet återkommande ljusblixtar) Flashing (total duration of light shorter than total duration of darkness)			
FI	Vilkkuvalo Blixt Flash light		
FI(3)	Ryhmävilkkuvalo Gruppblixt Group-flashing light		
FI(2+1)	Yhdistetty ryhmävilkkuvalo Sammansatt gruppblixt Composite group-flashing light		
LFI	Kestovilkkuvalo (vilkun kesto 2 s tai enemmän) Lång blixt (blixten 2 sek eller längre) Long-flashing (flash 2 s or longer)		
Pikavilkku (toistotiheys 50-79, tavallisesti joko 50 tai 60 välähdystä minuutissa) Snabblixt (frekvensen 50-79, vanligen 50 eller 60 blixtar/min) Quick (repetition rate of 50 to 79 - usually either 50 or 60 - flashes per minute)			
Q	Jatkuva pikavilkku Oavbruten snabblixt Continuous quick light		
Q(3)	Ryhmäpikavilkku Gruppsnabblixt Group quick light		
Nopea pikavilkku (toistotiheys 80-159, tavallisesti joko 100 tai 120, välähdystä minuutissa) Extrasnabblixt (frekvensen 80-159, vanligen 100 eller 120, blixtar/min) Very quick (repetition rate of 80 to 159 - usually either 100 or 120 - flashes per minute)			
VQ	Jatkuva nopea pikavilkku Oavbruten extrasnabb blixt Continuous very quick light		
VQ(3)	Nopea ryhmäpikavilkku Extrasnabb gruppblixt Group very quick light		

Erittäin nopea pikavilkku (toistotiheys 160 tai useampi, tavallisesti joko 240-300 välähdystä minuutissa) Ultrasnabblixt (frekvensen 160 eller fler, vanligen 240-300 blixhtar/min) Ultra quick (repetition rate of 160 or more - usually either 240 to 300 - flashes per minute)		
UQ	Erittäin nopea pikavilkkuvalo Oavbruten ultrasnabblixt Continuous ultra quick light	
IUQ	Keskeytetty erittäin nopea pikavilkkuvalo Avbruten ultrasnabblixt Interrupted ultra quick light	
Mo(K)	Morsevalo Morsekod Morse Code light	
Valojen värit <i>Fyrljusfärger</i> <i>Colours of Lights</i>		
W	Valkoinen Vit White	
R	Punainen Röd Red	Valojen värit Ljusets färger Colours of lights shown <i>monivärikartoilla på moderna kort on multicoloured charts</i> <i>sektorivalot monivärikartoilla på sektorbågarna i moderna kort on multicoloured charts at sector lights</i>
G	Vihreä Grön Green	
Bu	Sininen Blå Blue	
Y	Keltainen Gul Yellow	
Or	Oranssi Orange Orange	
Esimerkki loiston tunnusesityksestä	Exempel på en fullständig redovisad fyrljusbeskrivning	Example of a full Light Description
<p>FI(3) Luokka: ryhmävilkkuvalo, jossa toistuu kolmen valon ryhmä Fyrljus: gruppblxt som upprepar en grupp av 3 blixhtar Class of light: group flashing light repeating a group of three flashes</p> <p>WRG Värit: valkoinen, punainen ja vihreä omassa sektoreissaan. Sinisillä merikartoilla valkoinen valo kuvataan keltaisilla kaarilla ja sektoreilla. Färger: vitt, rött, grönt anger att fyrens sektorer lyser med dessa färger. På blåa sjökort betecknas vitt sken med gula cirkelbågar och sektorer. Colours: white, red, green, exhibiting the different colours in defined sectors. On Finnish charts the white lights are marked with yellow arcs and sectors.</p> <p>15s Jakso: kolmen välähdysten ryhmän välisen pimeän vaiheen kesto: 15 sekuntia Period: 15 sek är den tid det tar att visa en hel sekvens av 3 blixhtar och förmörkelse Period: the time taken to exhibit one full sequence of 3 flashes and eclipses: 15 seconds</p> <p>21m Korkeus: valon polttopiste 21 metriä vertaustason yläpuolella Fyrljusets höjd över medelvattenytan Elevation of focal plane above datum: 21 metres</p> <p>15 M Valkoisen valon nimellinen kantomatka. Nominell lysvidd för vitt sken. Nominal range for the white light.</p> <p>occas Loisto, joka sytytetään vain tarvittaessa (kalastusaluksille, lautoille yms.) Fyrar, som tänds tillfälligt vid speciella behov (för fiskefartyg, färjor) Lights exhibited only when specially needed (for fishing vessels, ferries)</p>		
Huom.	Alempien linjalointien valotunnus on Suomessa yleensä pikavilkku (Q) ja ylempien kestopilkkuvalo (LFI).	
Obs.	Karakteren för nedre ensfyr är i Finland i allmänhet snabblixt (Q) och för övre ensfyr lång blixt (LFI).	
NB.	The character of the lower leading light in Finland is normally Quick (Q) and that of the upper leading light long flashing (LFI).	

4.7.1 CHARACTERS INCLUDED IN THE IALA MARITIME BUOYAGE SYSTEM

According to IALA the marks in the maritime buoyage system can be indicated by other characters than those mentioned below. The Finnish Transport Infrastructure Agency has chosen the following characters for use in normal conditions.

Type of mark	Colour of light	Abbreviation of character
		– type of character – number of flashes – period
Cardinal marks	white light	
North mark		VQ
South mark		VQ (6) + LF1 10 s
West mark		VQ (9) 10 s
East mark		VQ (3) 5 s
Lateral marks	red and green light	
Port or Starboard mark		Fl 3 s (preferably) Fl (2) 6 s
Isolated danger	white light	Fl (2) 10 s
Safe water mark	white light	LFl 10s
Special mark,	yellow light	Fl (4) 20 s
ODAS-buoy	yellow light	Fl (5) 20 s

4.8 AIS AIDS TO NAVIGATION (AIS ATO NS)

AIS Aton is information about an aid to navigation which is transmitted in the AIS system. Newer equipment on merchant vessels might be able to display these aids on the stations (radar, ECDIS). The ability to display AIS AtoNs depends on the make and age of the equipment.
















AIS AtoNs might be visible at a longer range than the radar echo. AIS AtoNs can also broadcast additional information about for example floating aids to navigation which have moved out of position. The AIS AtoN can also send information about its own functions or provide environmental data.

AIS AtoNs are normally divided into three groups.

Real	The AIS transmitter is placed in the actual AtoN. It might be connected to local positioning- or meteorological equipment.
Synthetic	The AtoN has no own AIS transmitter. The AIS message is broadcasted from another station. Data of the position of the aid might be fixed or monitored and sent via a separate link. Normally the mariner will not notice the difference between real and synthetic AIS AtoN.
Virtual, V-AIS	There is no real AtoN. The AIS message is broadcasted from another station. Virtual aids can be used to replace destroyed or removed aids. Since 2014, the Finnish Transport Infrastructure Agency has replaced some removed buoys with virtual AIS. These are usually situated at open sea at the entrances of fairways.

Information of new AIS AtoN is available in Notices to Mariners.

4.9 FIGURES OF LIGHTS

	Bengtskär		Långskär		Porkkala		Suomenlinna
	Bogskär		Längden		Porvoo		Sälgrund
	Flötjän		Marjaniemi		Raahelighthouse		Sälskär
	Harmaja		Merikarvia		Rauma		Säppi
	Helsinki		Märket		Ritgrund		Tainio
	Isokari		Nahkiainen		Russarö		Tankar
	Jussarö		Norrskär		Sandbäck		Tauvo
	Kaijakari		Nyhamn		Strömmingsbådan		Tiiskeri
	Kalbådagrund		Oulu1		Stubben		Ulkokalla
	Kemi1		Pietarsaari		Suomenleijona		Utgrynnan
	Keminkraaseli		Pori		Suomenlinna		Utö
	Kokkola		Porkkala		Sälgrund		Valassaaret
	Kotka		Porvoo		Sälskär		Yttergrund
	Kristiina		Raahelighthouse		Säppi		
	Kylmäpihlaja		Rauma		Tainio		

5. REGIONAL INFORMATION

5.1 SEARCH AND RESCUE

In Finland, MRCCs receive distress messages by telephone and via the Global Maritime Distress Safety System (GMDSS). Contact between the MRCCs and both vessels in distress or danger and the subsidiary and maritime SAR units operating at sea takes place via the marine VHF radio distress and working channels and digital selective calling (DSC).

5.1.1 PRIMARY EMERGENCY RADIO FREQUENCIES

VHF-DSC channel 70
VHF channel 16
MF-DSC frequency 2187.5 kHz (sea areas)

The Finnish Coast Guard's radio network covers GMDSS areas A1 and A2. These areas cover Finland's Search and Rescue Region in its entirety. The VHF network in area A1 comprises 22 VHF base-stations. The A2 area is covered by a MF-network of 4 MF base-stations.

5.1.2 MARITIME RESCUE CONTACT INFORMATION

MRCC Turku		MRSC Helsinki	
Alarm number	+358 294 1001	Alarm number	+358 294 1002
Phone (non-urgent)	+358 294 1010	Phone (non-urgent)	+358 294 1090
Fax-number	+358 294 1019	Fax-number	+358 294 1099
e-mail	mrcc@raja.fi	e-mail	mrsc.helsinki@raja.fi
MMSI	002301000	MMSI	002302000

MAS-service +358 294 1006
Inmarsat-C 423002211 (AOR-E)

Maritime SAR: 0294 1000

Also the aviation frequencies 121.5 and 123.1 MHz are available.

5.1.3 MARITIME ASSISTANCE SERVICE (MAS)

MRCC Turku, MAS-service +358 294 1006

5.1.4 EMERGENCY ALERTS ON INLAND WATERWAYS

The national Emergency Response Centre is the primary point of contact on the inland waterways, outside the areas with active VHF monitoring. Through the emergency number 112, you can also contact Maritime SAR services. Note the mobile GSM coverage in the area. Prepare to communicate your position using coordinates or using chart names and well-known landmarks. The national Emergency Response Centre is using the WGS84-coordinate system, with coordinates in the form of 'ddd°mm.mmm', ie. degrees, minutes and decimals of minutes.

The Emergency Response Centre has a freely available mobile app for satellite positioning of the caller's mobile phone. More information is found on the website of the Emergency Response Centre.

Emergency Response Centre: 112

Maritime SAR: 0294 1000
VHF-DSC channel 70
VHF channel 16

5.2 SAFETY RADIO

Turku Radio is responsible for safety radio communications in Finland. The safety radio communication includes navigational warnings, weather and ice reports. Turku Radio continuously monitors DSC channel 70, channel 16 and all channels of the safety radio network. The base stations are displayed in the image below. In addition to the duplex channels shown in the image, all stations include channel 16 and 70 (DSC). Saimaa VTS is responsible for emergency and safety radio communications in the Saimaa area.

Turku Radio

turku.radio@tmfg.fi

MMSI 002300230

Call sign OFK

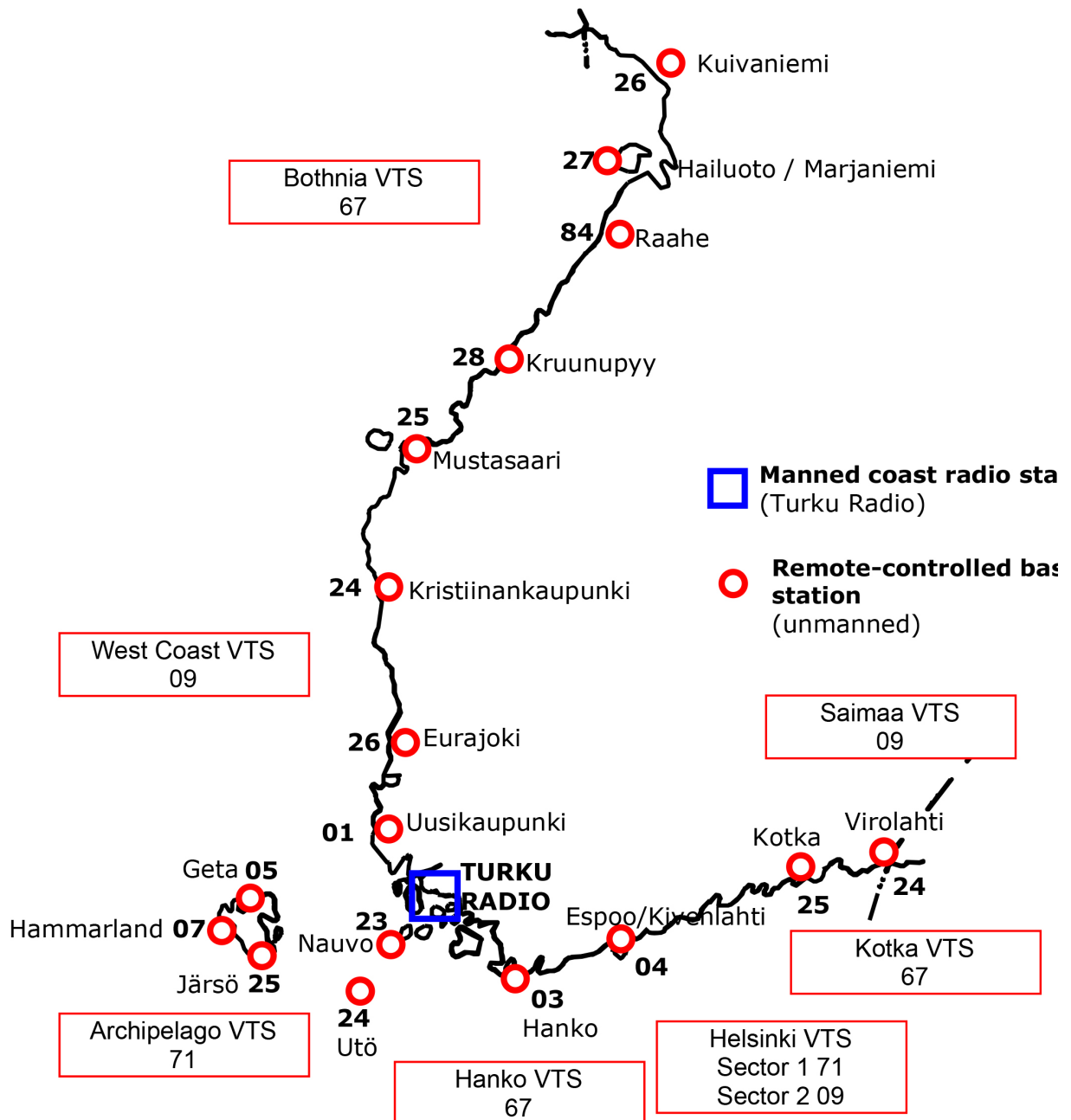


Image 4 Turku Radio working channels and channels used by VTS.

5.2.1 PERIODICAL BROADCASTS

Turku Radio transmits periodical broadcasts on the channels in the safety radio network. Periodical broadcasts are announced on channel 16.

0233	UTC	navigational warnings
0633	UTC	navigational warnings + weather forecast
0803	UTC	positions of icebreakers
1033	UTC	navigational warnings + ice reports
1433	UTC	navigational warnings
1833	UTC	navigational warnings + weather forecast + ice reports
2233	UTC	navigational warnings

5.2.2 VHF CHANNELS

Channels 9, 67 and 71 are designated for Vessel Traffic Service (VTS) in Finland. Channel 10 in the Gulf of Finland is to be used for the Russian Federation's VTS communications only. Channel 60 is the primary GOFREP channel within the Finnish area of responsibility, whereas channel 80 is the reserve channel. The channels in the Estonian area of responsibility are 61 and 81, respectively.

Archipelago VTS	71
West Coast VTS	09
Bothnia VTS	67
Helsinki VTS Sector 1	71
Helsinki VTS Sector 2	09
Hanko VTS	67
Kotka VTS	67
Saimaa VTS	09

5.2.3 NAVTEX

NAVTEX warnings generally cover the high seas, i.e. the area seaward of the pilot boarding points. The warnings contain information on discontinued lights, on wrecks, flotsam and other obstructions. Information on winter conditions etc. is also included.

In Finland, NAVTEX transmissions are received from the stations Bjuröklubb (id H) and Tallinn (id U).

5.2.4 INMARSAT

Telemar Finland is the Finnish Inmarsat PSA (= Point of Service Activation) to whom you may turn for all questions concerning satellite communications.

Telemar Finland
+358 20 741 8820
sales@telemar.fi