

GEOGRAPHIC RANGE TABLE

The following table gives the approximate geographic range of visibility for an object which may be seen by an observer at sea level. It is necessary to add to the distance for the height of any object the distance corresponding to the height of the observer's eye above sea level.

Distances of visibility for objects of various elevations above sea level.

Height		Distance Nautical Miles (NM)	Distance Statute Miles (SM)	Height		Distance Nautical Miles (NM)	Distance Statute Miles (SM)	Height		Distance Nautical Miles (NM)	Distance Statute Miles (SM)
Feet	Meters			Feet	Meters			Feet	Meters		
5	1.5	2.6	3.0	70	21.3	9.8	11.3	250	76.2	18.5	21.3
10	3.1	3.7	4.3	75	22.9	10.1	11.7	300	91.4	20.3	23.3
15	4.6	4.5	5.2	80	24.4	10.5	12.0	350	106.7	21.9	25.2
20	6.1	5.2	6.0	85	25.9	10.8	12.4	400	121.9	23.4	26.9
25	7.6	5.9	6.7	90	27.4	11.1	12.8	450	137.2	24.8	28.6
30	9.1	6.4	7.4	95	29.0	11.4	13.1	500	152.4	26.2	30.1
35	10.7	6.9	8.0	100	30.5	11.7	13.5	550	167.6	27.4	31.6
40	12.2	7.4	8.5	110	33.5	12.3	14.1	600	182.9	28.7	33.0
45	13.7	7.8	9.0	120	36.6	12.8	14.7	650	198.1	29.8	34.3
50	15.2	8.3	9.5	130	39.6	13.3	15.4	700	213.4	31.0	35.6
55	16.8	8.7	10.0	140	42.7	13.8	15.9	800	243.8	33.1	38.1
60	18.3	9.1	10.4	150	45.7	14.3	16.5	900	274.3	35.1	40.4
65	19.8	9.4	10.9	200	61.0	19.0	16.5	1000	304.8	37.0	42.6

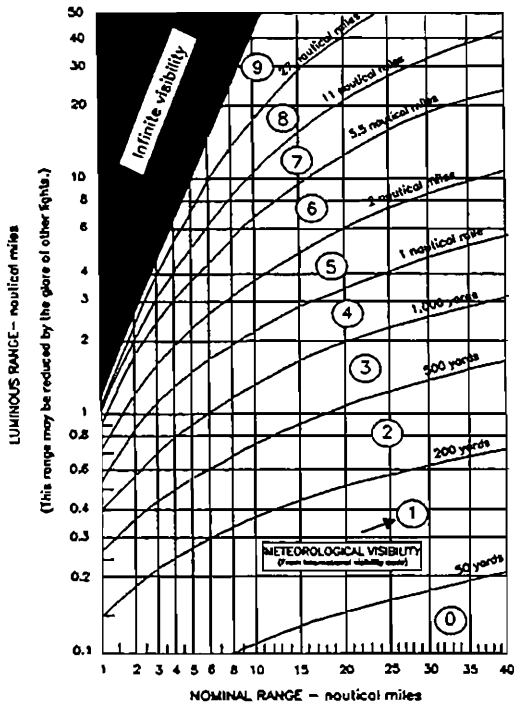
Example: Determine the geographic visibility of an object, with a height above water of 65 feet, for an observer with a height of eye of 35 feet. Enter above table;

Height of object	65 feet	9.4 NM
Height of observer	35 feet	<u>6.9 NM</u>
Computed geographic visibility		16.3 NM

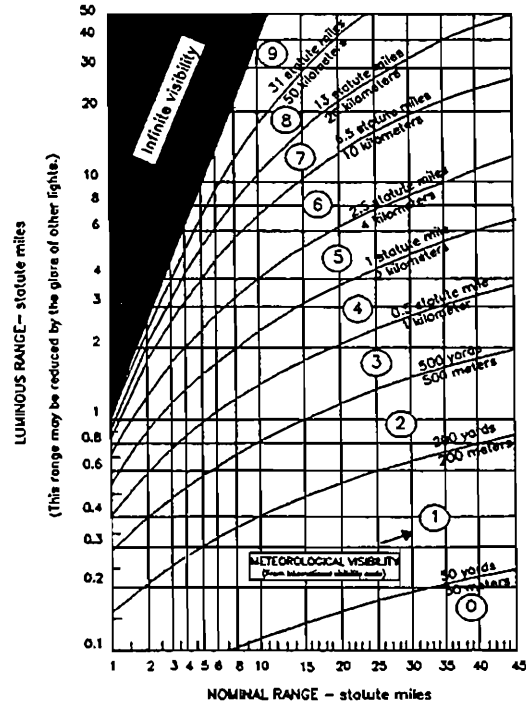
LUMINOUS RANGE DIAGRAM

The nominal range given in this Light List is the maximum distance a given light can be seen when the meteorological visibility is 10 nautical miles (or 11.5 statute miles on Lake Champlain). If the existing visibility is less than 10 NM (11.5 SM), the range at which the light can be seen will be reduced below its nominal range. And, if the visibility is greater than 10 NM (11.5 SM), the light can be seen at greater distances. The distance at which a light may be expected to be seen in the prevailing visibility is called its luminous range.

Nautical Miles



Statute Miles (For Lake Champlain)



METEOROLOGICAL VISIBILITY (From International Visibility code)			
Code	Metric	Nautical (approximate)	Statute (approximate)
0	Less than 50 meters	Less than 50 yards	Less than 50 yards
1	50-200 meters	50-200 yards	50-200 yards
2	200-500 meters	200-500 yards	200-500 yards
3	500-1,000 meters	500-1,000 yards	500-1,000 yards
4	1-2 kilometers	1,000-2,000 yards	1,000-2,000 yards
5	2-4 kilometers	1-2 nautical miles	1-2.5 statute miles
6	4-10 kilometers	2-5.5 nautical miles	2.5-6.5 statute miles
7	10-20 kilometers	5.5-11 nautical miles	6.5-13 statute miles
8	20-50 kilometers	11-27 nautical miles	13-31 statute miles
9	Greater than 50 km	Greater than 27 nm	Greater than 31 miles

This diagram enables the mariner to determine the approximate luminous range of a light when the nominal range and the prevailing meteorological visibility are known. The diagram is entered from the bottom border using the nominal range listed in column 6 of this book. The intersection of the nominal range with the appropriate visibility curve (or, more often, a point between two curves) yields, by moving horizontally to the left border, the luminous range.

CAUTION: When using this diagram is must be remembered that:

1. The ranges obtained are approximate.
2. The transparency of the atmosphere may vary between the observer and the light.
3. Glare from background lighting will considerably reduce the range at which lights are sighted.
4. The rolling motion of the mariner and/or of a lighted aid to navigation may reduce the distance at which lights can be detected and identified.



U.S. AIDS TO NAVIGATION SYSTEM

on navigable waters except Western Rivers

LATERAL SYSTEM AS SEEN ENTERING FROM SEAWARD

<p>PORT SIDE ODD NUMBERED AIDS</p> <p><input checked="" type="checkbox"/> GREEN LIGHT ONLY</p> <p>FLASHING (2) </p> <p>FLASHING (1) </p> <p>OCULATING </p> <p>QUICK FLASHING </p> <p>ISA </p> LIGHT LIGHTED BUOY CAN DAYBEACON	<p>PREFERRED CHANNEL NO NUMBERS - MAY BE LETTERED</p> <p>PREFERRED CHANNEL TO STARBOARD TOPMOST BAND GREEN</p> <p><input checked="" type="checkbox"/> GREEN LIGHT ONLY</p> <p>COMPOSITE GROUP FLASHING (2-1) </p> OR "A" OR "S" CAN CAN	<p>PREFERRED CHANNEL NO NUMBERS - MAY BE LETTERED</p> <p>PREFERRED CHANNEL TO PORT TOPMOST BAND RED</p> <p><input checked="" type="checkbox"/> RED LIGHT ONLY</p> <p>COMPOSITE GROUP FLASHING (2-1) </p> OR "B" OR "C" CAN CAN CAN LIGHT DAYBEACON	<p>STARBOARD SIDE EVEN NUMBERED AIDS</p> <p><input checked="" type="checkbox"/> RED LIGHT ONLY</p> <p>FLASHING (2) </p> <p>FLASHING (1) </p> <p>OCULATING </p> <p>QUICK FLASHING </p> <p>ISA </p> LIGHT LIGHTED BUOY CAN CAN LIGHT DAYBEACON
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AIDS TO NAVIGATION HAVING NO LATERAL SIGNIFICANCE

<p>ISOLATED DANGER NO NUMBERS - MAY BE LETTERED</p> <p><input type="checkbox"/> WHITE LIGHT ONLY</p> <p>R (2) SA </p> OR "A" OR "C" LIGHTED UNLIGHTED	<p>SAFE WATER NO NUMBERS - MAY BE LETTERED</p> <p><input type="checkbox"/> WHITE LIGHT ONLY MORSE CODE</p> <p>M (A) </p> OR "A" OR "B" UNLIGHTED UNLIGHTED																								
<p>RANGE DAYBEACONS MAY BE LETTERED</p> <table border="1"> <tr> <td>KGW</td><td>KWG</td><td>KOB</td><td>KOW</td><td>KWR</td><td>KRW</td><td>KRB</td><td>KBR</td><td>KOB</td><td>KBG</td><td>KOR</td><td>KRG</td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>		KGW	KWG	KOB	KOW	KWR	KRW	KRB	KBR	KOB	KBG	KOR	KRG												
KGW	KWG	KOB	KOW	KWR	KRW	KRB	KBR	KOB	KBG	KOR	KRG														
<p>DAYBEACONS - MAY BE LETTERED</p> <p><input type="checkbox"/> WHITE LIGHT ONLY</p> <p>NR </p> <p>RG </p> <p>MB </p> <p>ORV </p> <p>OW </p> <p>OB </p> <p>SPECIAL MARKS - MAY BE LETTERED</p> <p><input type="checkbox"/> YELLOW LIGHT ONLY</p> <p>FIXED </p> <p>FLASHING </p> <p>UNLIGHTED </p> <p>OR "A" OR "C" OR "N" OR "B"</p> <p>SHAPE OPTIONAL-BUT SELECTED TO BE APPROPRIATE FOR THE POSITION OF THE MARK IN RELATION TO THE NAVIGABLE WATERWAY AND THE DIRECTION OF BUOYAGE.</p> <p>LIGHTED </p> <p>OR "B" OR "A"</p>																									

Aids to Navigation marking the Intracoastal Waterway (ICW) display unique yellow symbols to distinguish them from aids marking other waters. Yellow triangles \triangle indicate aids should be passed by keeping them on the starboard (right) hand of the vessel. Yellow squares \square indicate aids should be passed by keeping them on the port (left) hand of the vessel. A yellow horizontal band provides no lateral information, but simply identifies aids as marking the ICW.

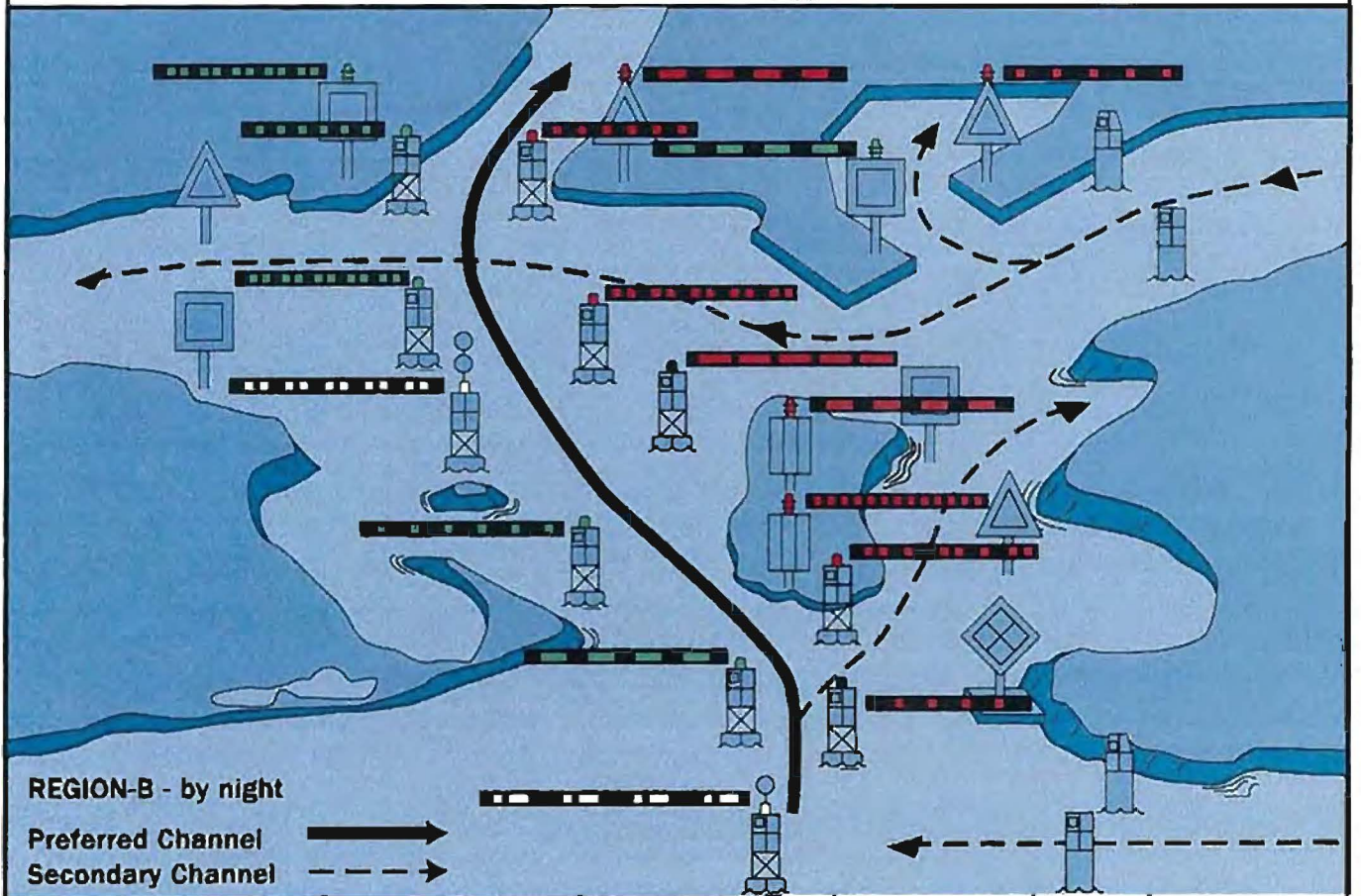
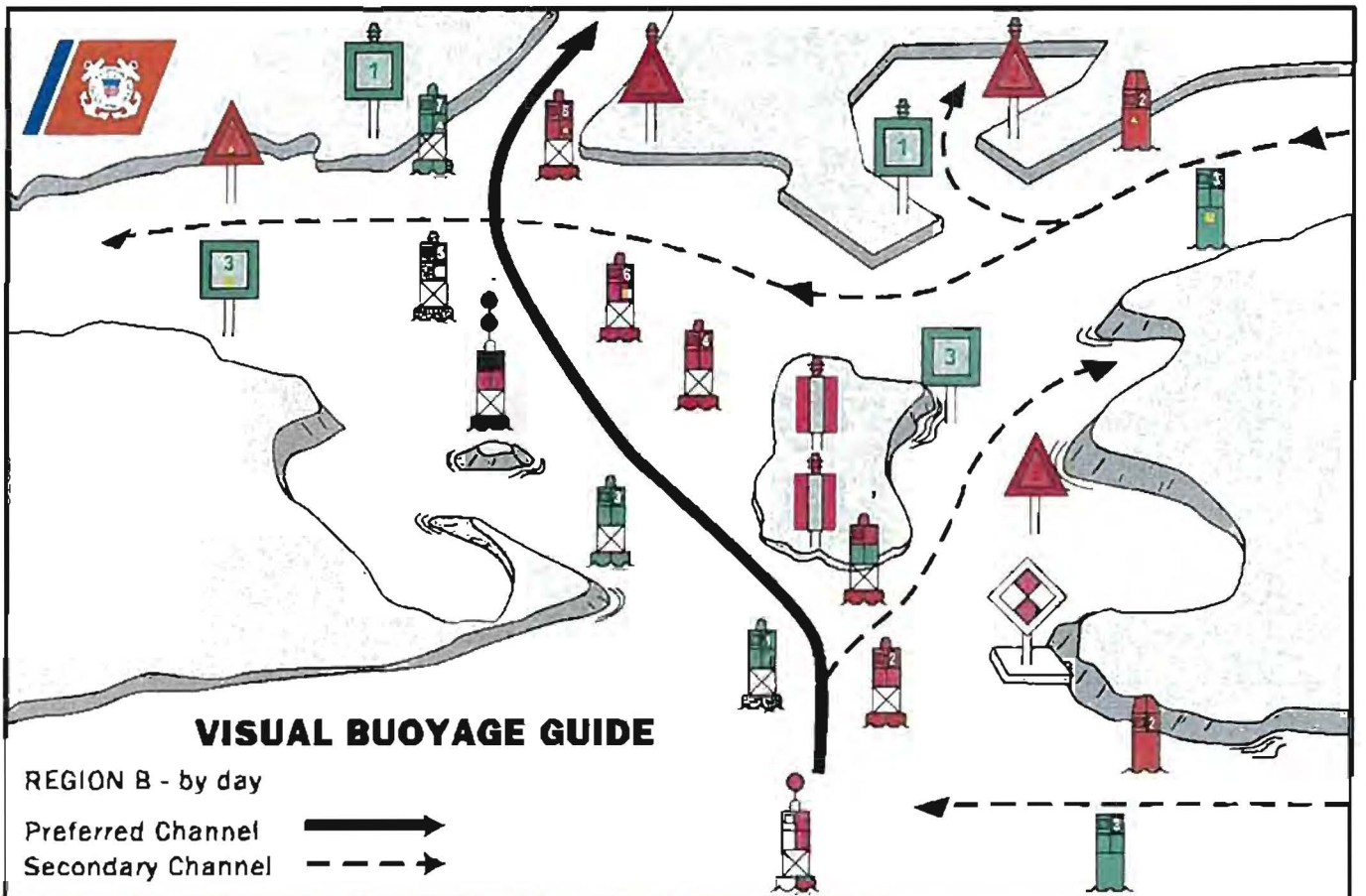
TYPICAL INFORMATION AND REGULATORY MARKS

INFORMATION AND REGULATORY MARKERS

WHEN LIGHTED, INFORMATION AND REGULATORY MARKERS MAY DISPLAY ANY WHITE LIGHT RHYTHM EXCEPT QUICK FLASHING, MOAL AND FLASHING (2)

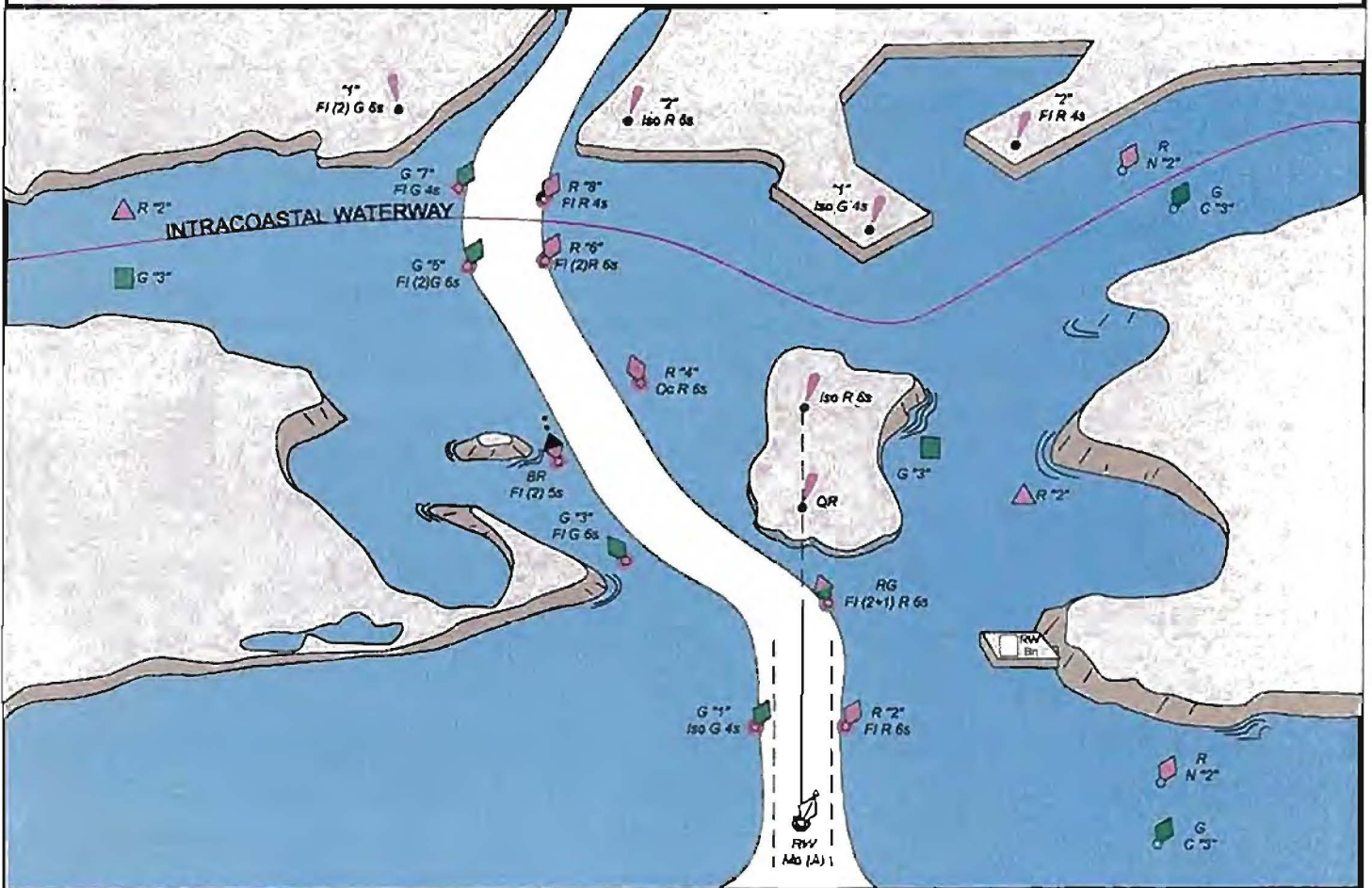
<p>WOODING BUOY</p> <p>WHITE WITH BLUE BAND</p> <p>MAY SHOW WHITE REFLECTION OR LIGHT</p>	<p>SWIM AREA</p> <p>EXPLANATION MAY BE PLACED OUTSIDE THE DESIGNATED SHAPE, SUCH AS DASH, SAND, SPA, AREA, ETC.</p>	<p>ROCK</p> <p>THE NATURE OF DANGER MAY BE INDICATED INSIDE THE DESIGNATED SHAPE, SUCH AS ROCK, WRECK, TRAIL, CAK, ETC.</p>	<p>SLOW</p> <p>NO WAKE</p> <p>TYPE OF CONTROL IS INDICATED IN THE CIRCLE, SUCH AS SLOW, NO WAKE, ANCHORING, ETC.</p>	<p>DANGER</p> <p>MAY SHOW WHITE LIGHT MAY BE LETTERED</p>
<p>REGULATORY MARKER</p> <p>FOR DISPLAYING INFORMATION SUCH AS DIRECTIONS, DISTANCES, LOCATIONS, ETC.</p>	<p>REGULATORY MARKER</p> <p>BUOY USED TO DISPLAY REGULATORY MARKERS</p>	<p>REGULATORY MARKER</p> <p>MAY SHOW WHITE LIGHT MAY BE LETTERED</p>		

PLATE 1





FICTITIOUS NAUTICAL CHART





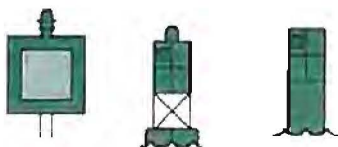
U.S. AIDS TO NAVIGATION SYSTEM on the Western River System

AS SEEN ENTERING FROM SEAWARD

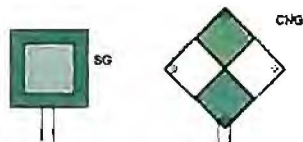
PORT SIDE
OR RIGHT DESCENDING BANK

GREEN OR WHITE LIGHTS

FLASHING (2) (2)



LIGHT LIGHTED BUOY CAN



PASSING DAYBEACON CROSSING DAYBEACON

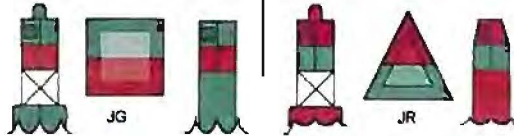
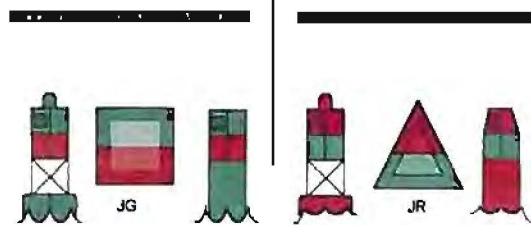


MILE BOARD

PREFERRED CHANNEL
MARK JUNCTIONS AND OBSTRUCTIONS
COMPOSITE GROUP FLASHING (2+1)

PREFERRED CHANNEL
TO STARBOARD
TOPMOST BAND GREEN
Fl (2+1) G

PREFERRED CHANNEL
TO PORT
TOPMOST BAND RED
Fl (2+1) R



DAYBOARDS HAVING NO LATERAL SIGNIFICANCE

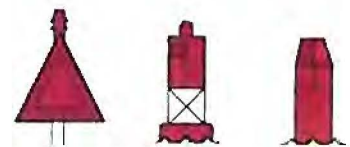
MAY BE LETTERED WHITE LIGHT ONLY



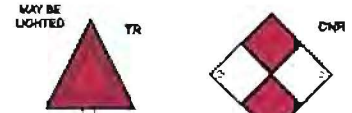
STARBOARD SIDE
OR LEFT DESCENDING BANK

RED OR WHITE LIGHTS

FLASHING (2) (2)



LIGHT LIGHTED BUOY NUN

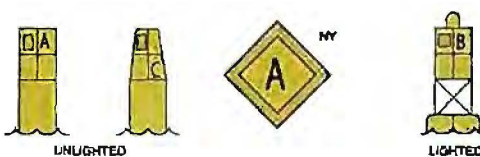


PASSING DAYBEACON CROSSING DAYBEACON



MILE BOARD

SPECIAL MARKS—MAY BE LETTERED



UNLIGHTED

LIGHTED

SHAPE: OPTIONAL—BUT SELECTED TO BE APPROPRIATE FOR THE POSITION OF THE MARK IN RELATION TO THE NAVIGABLE WATERWAY AND THE DIRECTION OF BUOYAGE.

YELLOW LIGHT ONLY
FIXED FLASHING



MOORING BUOY
WHITE WITH BLUE BAND
MAY SHOW WHITE REFLECTOR OR LIGHT

TYPICAL INFORMATION AND REGULATORY MARKS

INFORMATION AND REGULATORY MARKERS

WHEN LIGHTED, INFORMATION AND REGULATORY MARKS MAY DISPLAY ANY LIGHT RHYTHM EXCEPT QUICK FLASHING, Mo(x) AND FLASHING (2)

HW WHITE LIGHT ONLY



BOAT EXCLUSION AREA



ANGER



CONTROLLED AREA

EXPLANATION MAY BE PLACED OUTSIDE THE CROSSED DIAMOND SHAPE, SUCH AS DAM, RAPIDS, SWIM AREA, ETC.

THE NATURE OF DANGER MAY BE INDICATED INSIDE THE DIAMOND SHAPE, SUCH AS ROCK, WRECK, SHOAL, DAM, ETC.

TYPE OF CONTROL IS INDICATED IN THE CIRCLE, SUCH AS SLOW, NO WAKE, ANCHORING, ETC.



INFORMATION



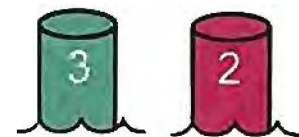
BUOY USED TO DISPLAY REGULATORY MARKERS



MAY SHOW WHITE LIGHT
MAY BE LETTERED

FOR DISPLAYING INFORMATION SUCH AS DIRECTIONS, DISTANCES, LOCATIONS, ETC.

STATE WATERS



THE LAND (STATE) WATERS OF THE INDUCTION MARK MAY SHOW WHITE REFLECTOR OR QUICK FLASHING WHITE LIGHT



BLACK AND WHITE STRIPED BUOY

Used to indicate an obstruction to navigation, extends from the nearest shore to the buoy. This means "do not pass between the buoy and the nearest shore." This aid is replacing the red and white striped buoy within the USWMS, but cannot be used until all red and white striped buoys on a waterway have been replaced.