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For the Portrayal of S-57 and/or S-101 ENC Data in ECDIS**

Submitted by:	DIPWG Chair
Executive Summary:	This paper provides a comparison of the simplified and paper chart symbols and a list of complex lines and specified in S-52. It briefly discusses some items to consider as DIPWG evaluates whether to retain or remove simplified symbology in the future. The paper does not provide an argument for either the retention or removal of simplified symbols.
Related Documents:	S-52
Related Projects:	S-101

1. Some simplified symbols are similar to their paper chart counterparts, such as daymarks and flight floats.
2. Some simplified symbols, such as safewater or even conical lateral buoys are not intuitive and recognition by the mariner depends on specific training.
3. Some fairly simple paper chart symbols, such as conical and can buoys, could be color-filled as the simplified buoys are and eliminate the need for the simplified symbol.
4. Some elements of paper chart symbols, such as the top marks, might have to be enlarged if simplified symbols are eliminated.
5. Several different paper chart symbols can be represented by a single simplified symbol. That is, some information that is provided visually with paper chart symbols must be obtained through a pick report with simplified symbols.

Simplified and Paper Chart Symbols

Paper Chart	Simplified	Simplified Alpha Code	Simplified Symbol Name
* 		SY(BCNCAR01)	cardinal beacon, north, simplified
* 		SY(BCNCAR02)	cardinal beacon, east, simplified
* 		SY(BCNCAR03)	cardinal beacon, south, simplified
* 		SY(BCNCAR04)	cardinal beacon, west, simplified
		SY(BCNDEF13)	default symbol for a beacon, simplified
      		SY(BCNISD21)	isolated danger beacon, simplified
		SY(BCNLAT15)	major lateral beacon, red, simplified
		SY(BCNLAT16)	major lateral beacon, green, simplified
		SY(BCNLAT22)	minor lateral beacon, green, simplified
		SY(BCNSAW13)	major safe water beacon, simplified
		SY(BCNSAW21)	minor safe water beacon, simplified
		SY(BCNSPP13)	major special purpose beacon, simplified
		SY(BCNSPP21)	minor special purpose beacon, simplified
* 		SY(BOYCAR01)	cardinal buoy, north, simplified
* 		SY(BOYCAR02)	cardinal buoy, east, simplified
* 		SY(BOYCAR03)	cardinal buoy, south, simplified
* 		SY(BOYCAR04)	cardinal buoy, west, simplified
		SY(BOYDEF03)	default symbol for buoy, simplified
* 		SY(BOYISD12)	isolated danger buoy, simplified
		SY(BOYLAT13)	conical lateral buoy, green, simplified
		SY(BOYLAT14)	conical lateral buoy, red, simplified

		SY(BOYLAT23)	can shape lateral buoy, green, simplified
		SY(BOYLAT24)	can shape lateral buoy, red, simplified
  		SY(BOYMOR11)	installation buoy and mooring buoy, simplified
*		SY(BOYSAW12)	safe water buoy, simplified
		SY(BOYSPP11)	special purpose buoy, spherical or barrel shaped, or default symbol for special purpose buoy, simplified
		SY(BOYSPP15)	special purpose TSS buoy marking the starboard side of the traffic lane, simplified
		SY(BOYSPP25)	special purpose TSS buoy marking the port side of the traffic lane, simplified
		SY(BOYSPP35)	special purpose ice buoy or spar or pillar shaped buoy, simplified
		SY(BOYSUP02)	super-buoy ODAS & LANBY, simplified
		SY(DAYSQR01)	square or rectangular daymark, simplified
		SY(DAYTRI01)	triangular daymark, point up, simplified
		SY(DAYTRI05)	triangular daymark, point down, simplified
		SY(LITFLT02)	light float, simplified
		SY(LITVES02)	light vessel, simplified
		SY(RETRFL02)	retro reflector, simplified

* Several different paper chart symbols correspond to this simplified symbol. Paper chart symbols display both the buoy or beacon shape symbol in addition to the topmark.

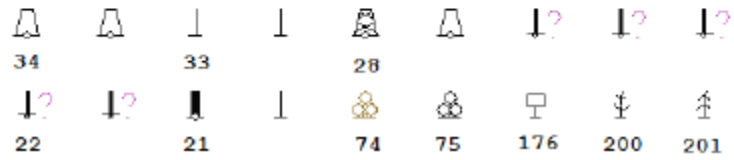
S-52 ECDIS Chart 1

Paper Chart Buoys and Beacons

Buoys

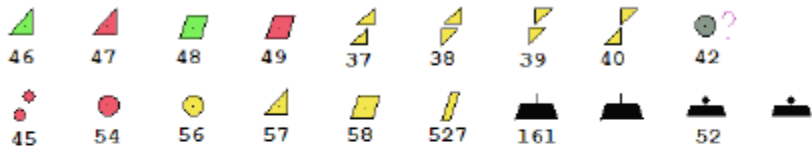


Beacons

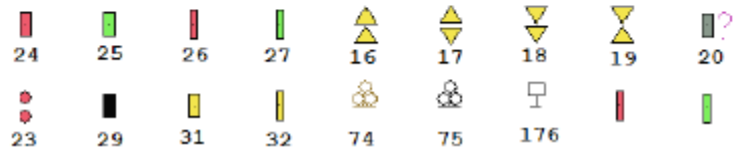


Simplified Buoys and Beacons

Buoys































Beacons












Complex Lines

1. Some complex lines appear in both the symbolized boundaries and the plain boundaries lookup tables
2. The difference between the symbolized and plain boundaries is sometimes just the replacement of the primary line element, such as a "T" dash, with an ordinary line dash.
3. Symbolized boundaries are used primarily at larger scales
4. About half of the complex lines are used to portray linear objects, such as recommended tracks, not boundaries or area features.
5. Not all complex lines have a plain counterpart.

Complex Line	Alpha Code	Complex Line Name	Method *
	LC(ACHRES51)	boundary of an area where anchoring is prohibited or restricted	CSP RESARE03
	LC(ENTRES51)	boundary of an area where entry is prohibited or restricted	Earlier versions of CSP RESCSP
	LC(FSHRES51)	boundary of an area where trawling or fishing is prohibited or restricted	CSP RESARE03
	LC(LOWACC01)	safety contour of low accuracy in position	earlier versions of CSP DEPCNT
	LC(LOWACC11)	contour of low accuracy in position	earlier versions of CSP DEPCNT
	LC(LOWACC21)	coastline or shoreline construction of low accuracy in position	CSP QUALIN01 CSP SLCONS03
	LC(LOWACC31)	area of wrecks or obstructions of low accuracy	CSP OBSTRN05
	LC(LOWACC41)	danger line of low accuracy surrounding a foul area	CSP OBSTRN05 CSP WRECKS03
	LC(NONHODAT)	boundary of non-HO data	CSP DATCVR02
	LC(SCLBDY51)	chart scale boundary, the double line indicates the larger scale	CSP DATCVR02
	LC(CTYARE51)	boundary of area to be navigated with caution	Sym CSP RESARE03
	LC(ARCSLN01)	boundary of archipelago sea lane	Sym Plain
	LC(MARSYS51)	boundary between IALA-A and IALA-B systems of lateral buoys	Sym Plain

		and beacons	
	LC(ESSARE01)	boundary of an ESSA or PSSA	Sym Plain
	LC(ACHARE51)	boundary of an anchorage area	Sym
	LC(ADMARE01)	jurisdiction boundary	Sym
	LC(CBLARE51)	boundary of a submarine cable area	Sym
	LC(CTNARE51)	boundary of area with a specific caution	Sym
	LC(DWRUTE51)	boundary of a deep water route	Sym
	LC(NAVARE51)	boundary of a navigation feature such as a fairway, magnetic anomaly, etc.	Sym
	LC(PIPARE51)	boundary of a submarine pipeline area with potentially dangerous contents	Sym
	LC(PIPARE61)	boundary of a submarine pipeline area with generally non-dangerous contents	Sym
	LC(PRCARE51)	boundary of a precautionary area	Sym
	LC(RESARE51)	boundary of a restricted area	Sym
	LC(TIDINF51)	boundary of an area for which there is tidal information	Sym
	LC(QUESMRK1)	object which is not sufficiently described to be symbolized, or for which no symbol exists in the symbol library	Sym Line
	LC(CBLSUB06)	submarine cable	Line
	LC(DWLDEF01)	deep water route centreline, direction not defined in the data	Line

	LC(DWRTCL05)	two-way deep water route centreline, not based on fixed marks	Line
	LC(DWRTCL06)	two-way deep water route centreline, based on fixed marks	Line
	LC(DWRTCL07)	one-way deep water route centreline, not based on fixed marks	Line
	LC(DWRTCL08)	one-way deep water route centreline, based on fixed marks	Line
	LC(FERYRT01)	ferry route	Line
	LC(FERYRT02)	cable ferry route	Line
	LC(FSHFAC02)	fishing stakes	Line
	LC(NEWOBJ01)	new object	Line
	LC(PIPSOL05)	oil, gas pipeline, submerged or on land	Line
	LC(PIPSOL06)	water pipeline, sewer, etc	Line
	LC(RCRDEF11)	regulated recommended route centreline, details not defined	Line
	LC(RCRTCL11)	regulated two-way recommended route centreline, not based on fixed marks	Line
	LC(RCRTCL12)	regulated one-way recommended route centreline, not based on fixed marks	Line
	LC(RCRTCL13)	regulated two-way recommended route centreline, based on fixed marks	Line
	LC(RCRTCL14)	regulated one-way recommended route centreline, based on fixed marks	Line

	LC(RECDEF02)	non-regulated recommended track, direction not defined in data	Line
	LC(RECTRC09)	non-regulated recommended two-way track, not based on fixed marks	Line
	LC(RECTRC10)	non-regulated recommended two-way track, based on fixed marks	Line
	LC(RECTRC11)	non-regulated recommended one-way track, not based on fixed marks	Line
	LC(RECTRC12)	non-regulated recommended one-way track, based on fixed marks	Line
	LC(CHCRDEL1)	line deleted by a manual update	-
	LC(CHCRID01)	line manually updated	-
	LC(ERBLNA01)	electronic range/bearing line, dash	CSP VRMEBL01
	LC(PLNRTE04)	planned route for own ship	CSP LEGLIN03

* Lookup table or CSP that uses the complex line

Line = line symbols

Plain = area symbols with plain boundaries (for general use)

Sym = area symbols with symbolized boundaries (for large scale display)