

Maptech BSB File Format

Test Dataset Instructions

for

Raster Navigational Chart (RNC)

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1. Introduction

The *BSB File Format* was developed by Maptech, Inc. to describe and store raster image data and associated textual documentation. This file format is capable of representing a wide variety of mapping and charting formats. However, the *BSB File Format* is primarily used to represent nautical charts used for marine navigation purposes. In the United States, nautical charts currently available in *BSB File Format* include those issued by the Office of Coast Survey, National Ocean Service, National Oceanic and Atmospheric Administration (NOAA). The *BSB File Format* is also used by other national Hydrographic Offices such as the Canadian Hydrographic Service (CHS).

A detailed description of the scope and contents of the *BSB File Format* has been published, is available on request from Maptech, Inc. (www.maptech.com)*. To date, there are approximately 80 “value-added developers” (VADs) and over 200 user groups that use the *BSB File Format* for a variety of applications. One of the more important applications is in conjunction with electronic charting systems that are being increasingly used onboard a wide variety of vessels – including pleasure craft up to ocean-going ships.

This *Maptech BSB File Format – Test Dataset Instructions for RNC* document has been developed to provide a description of the necessary checks and verification procedures required to properly use this type of data as a Raster Navigational Chart (RNC). An RNC is raster data that complies with standards established by the International Maritime Organization (IMO) and the International Hydrographic Organization (IHO). It is an RNC that is the required type of data to be used for the Raster Chart Display System (RCDS) mode of operation in an Electronic Chart Display and Information System (ECDIS). This document is a companion document to another Maptech publication entitled: *Maptech BSB File Format, Version 3.0, Revision 3.07*.

* Note: The *Maptech BSB File Format – Test Dataset Instructions for RNC* document is subject to the same terms and conditions that are required for Value Added Developers (VAD). As such, companies or organizations that intend to use the RNC Test Dataset Instructions should first have in place a Maptech BSB File Format Value Added Development Agreement (license).

2. Background

The electronic chart is a new technology that provides significant benefits in terms of navigation safety and improved operational efficiency. More than simply a computer display, an electronic chart is a real-time navigation system that integrates a variety of information that is displayed and interpreted by the Mariner. As an automated decision aid capable of continuously determining a vessel's position in relation to land, charted objects, aids-to-navigation, and unseen hazards, the electronic chart represents an entirely new approach to maritime navigation. In terms of system components, features and functional capability, there are two basic types of electronic charts. The most advanced form is the Electronic Chart Display and Information System (ECDIS). All other types of electronic charts can be regarded, generically, as Electronic Chart Systems (ECS).

Performance Standards for ECDIS were formally adopted by the International Maritime Organization (IMO) in November 1995. Back-up arrangements for ECDIS were adopted by IMO in November 1996 and became Appendix 6 to the Performance Standards. The IMO

Performance Standards permit National Maritime Safety Administrations to consider ECDIS as the legal equivalent to the charts required by regulation V/20 of the 1974 SOLAS Convention. In conjunction with the ECDIS Performance Standards, the International Hydrographic Organization (IHO) developed technical standards for the digital data format and display. IHO Special Publication 52 (IHO S-52) is the IHO Specification for Chart Content and Display of ECDIS, while IHO Special Publication 57 (IHO S-57) is the IHO Transfer Standard for Digital Hydrographic Data. In August 1998, the International Electrotechnical Commission (IEC) published its own “Operational and Performance Requirements” publication that describes the operational methods of testing and required test results for an IMO-compliant ECDIS. IEC Publication 61174 is the basis for type-approval/certification process for an IMO-compliant ECDIS.

In December 1998, IMO adopted an Appendix to the ECDIS Performance Standards whereby a Raster Chart Display System (RCDS) could be an alternative “mode of operation”. As specified in Appendix 7, in the absence of official vector-based Electronic Navigational Chart (ENC) data, official Raster Navigational Chart (RNC) data issued under the authority of a national hydrographic office can be used where ENC coverage is not available. In March 1999, the IHO developed a RNC Product Specification and published it as IHO Special Publication No. 61 (IHO S-61). IHO S-61 defines the minimum requirements that a RNC is required to meet for the RCDS Mode of Operation. However, the IHO Product Specification for RNC does not define the raster data structures of a raster navigational chart. This matter is up to a national hydrographic office (e.g., NOAA) to decide.

This *BSB File Format Test Dataset Instructions* document deals with the minimum data requirements contained in the IHO Product Specification for RNC (IHO S-61). As such, this *BSB File Format Test Dataset Instructions* is intended to be used in conjunction with the test procedures that IEC has developed related to the methods of testing and required test results for the RCDS Mode of Operation an IMO-compliant ECDIS (IEC 61172, Edition 2, Annex H).

3. BSB File Format – A Brief Description

The BSB format consists of three primary types of chart files:

- Documentation File
- Image File
- Update Patch File

a) The **Documentation File** is an ASCII (format) file that accompanies the raster image data file(s) for each chart. This data file has the extension “.BSB” and contains information about the paper chart and data resulting from the chart production process. Since many paper nautical charts contain one or more chart panels, the designation “base” refers to the main chart panel while an “inset” pertains to a larger-scale coverage for a harbor or particular area of interest. “Extensions” are additional areas of coverage for features (such as rivers) that extend beyond the area covered by base area of the chart. Base, inset and extension panels are referred to as KAPPs. Depending on the number of chart insets and extensions, the Documentation File contains one or more KAPP specific records. Each KAPP has a unique number identifying it, and each record points to the associated KAPP Image File.

Further information on the Documentation File Format is contained in Chapter 2.0 of the *Maptech BSB File Format: Data Description and Specification*.

b) Each section within a chart (a KAPP) is represented by a distinct binary **Image File** having the file extension .KAP. The Image file consists of three major sections: a header, the binary image data, and a list of strip offset values. The binary image file for each chart section (base, inset or extension) is referenced by name from within the documentation file.

The BSB Image File Format:

- is designed to be comprehensive, yet as simple as possible.
- is extendable – to evolve gracefully as new needs arise.
- adopts the patented National Ocean Service (NOS) compression scheme, yielding effective compression of images obtained from cartographic sources.
- supports the storage of geographic referencing parameters, allowing for effective geographic to image coordinate system conversions and vice-versa.
- allows for the storage of strip offset tags. Strip offset tags reference strips within the binary image data, and permit efficient navigation of the binary image file in a compressed form.
- is intended to facilitate comprehensive exchange to other national and international standard formats.

Further information on the Image File Format is contained in Chapter 3.0 of the *Maptech BSB File Format: Data Description and Specification*.

c) **Update Patch Files** (".ptc") provide an efficient means of updating information contained in a Documentation File or an Image File. Each compressed patch file is made up of a header and image section. The image section contains one or more rectangular shaped "tiles" that cover the area of the chart on which updates need to be applied. As specified in the IMO Performance Standards for ECDIS and the RCDS mode of operation, the Update Patch File should be displayed on top of the Image File in a manner that permits toggling the update information on and off.

Three types of "updates" are supported:

1. New Chart Edition (NCE)
2. Notice-to-Mariners Updates (NTM)
3. Full File Replacement (CHT)

A New Chart Edition is issued when a new paper chart edition of the corresponding raster chart is printed. Raster Notice-to-Mariner updates are produced when corrections are made to a paper nautical chart during the period between printing of the Source Edition and release of the next New Chart Edition. In North America, Notice to Mariner Updates are based on the paper Notice-to-Mariners (NTMs) issued by the US Coast Guard (USCG), the National Ocean Service/NOAA, the National Imagery and Mapping Agency (NIMA), and the Canadian Hydrographic Service (CHS).

Update Patch Files are contained in Maptech's *Professional Version of Digital CharKit*®. These files are optimized for size to permit efficient communication via the Internet or other electronic means. Licensed users of Maptech's BSB File Format data are provided an Installation Program that will extract the Update Patch files from the compressed Patch File Archive file, and place the Update Patches on a specified directory.

Further information on Update Patch Files is contained in Chapter 4.0 of the *Maptech BSB File Format: Data Description and Specification*.

4. RNC Requirements: IHO Specifications – Maptech BSB Parameters

As defined in Appendix 7 of the IMO Performance Standards, a Raster Chart Display System (RCDS) is:

a navigation information system displaying RNCs with positional information from navigational sensors to assist the mariner in route planning and route monitoring, and if required, display additional navigation-related information.

A **Raster Navigational Chart (RNC)** is:

a facsimile of a paper chart originated by, or distributed on the authority of, a government-authorized hydrographic office. RNC is used in these standards to mean either a single chart or a collection of charts.

It is the BSB File Format Version 3.0 that is used for the distribution of official RNCs issued by National Ocean Service, NOAA.

For an RNC to be properly used in an ECDIS operating in the RCDS Mode of Operation, it must comply with the *Product Specification for Raster Navigational Charts (RNC)* published by the International Hydrographic Organization (IHO) as Special Publication No. 61 (IHO S-61). The various sections of the IHO S-61 define the minimum requirements a RNC must have in order to satisfy the RCDS Mode of operation. However, the IHO *Product Specification for RNC* does not define the underlying raster data structures of a RNC. For RNC data issued by Maptech under the authority the National Ocean Service/NOAA, this is specified in the *Maptech BSB File Format – Data Description and Specification*.

The following tables provide a cross-reference between the applicable sections of IHO S-61 (RNC Product Specification) and the three different types of chart files contained in the BSB File Format:

- a) Table 1 - Documentation File Parameters
- b) Table 2 - Image File Header Parameters
- c) Table 3 - Update Patch File Parameters

Parameters that are required in order to conform to the RNC Product Specification (IHO S61) are shown in “**Bold**” type font. However, in order to properly use the BSB File Format as an RNC, all parameters listed must be used.

Specific checks and verification procedures necessary to verify the proper use of BSB File Format data are described in Section 5 of this document.

Table 1 - Documentation File Parameters

This table provides a summary of Maptech BSB File Format **Documentation File Parameters** (i.e., metadata) with cross-references to applicable sections of IHO S-61 (Product Specification for Raster Navigational Charts).

Maptech BSB File Format (Version 3.0)		IHO RNC Product Specification (S-61)	
RECORD	FIELD NAME	Section Description	
VER	Format Version	n/a	---
CHT	<u>General Parameters</u>		
	NA Chart Name	3.4.2.2	RNC Name
	NU Chart Number	3.4.2.2	RNC number
CHF	Chart Format	n/a	---
CED	<u>Edition Parameters</u>		
	SE Source Edition	3.4.2.5	Chart edition date and/or number
	RE Raster Edition	n/a	---
	ED Edition Date	3.4.2.5	Chart edition date and/or number
NTM	<u>NTM Record</u>		
	NE NTM Edition Number	n/a	---
	ND NTM Date	3.4.2.6	Last update or NTM applied
	BF Base Flag	n/a	---
	BD Base Date	n/a	---
CHK	Number of KAPPs	n/a	---
ORG	Chart Originator	3.4.2.1	Producing agency identifier code
MFR	Manufacturer	n/a	---
Knn	<u>Knn Record</u>		
	NA Kapp Name	n/a	---
	NU Kapp Number	3.4.2.3	Chart identifier (number) if different than RNC
	TY Kapp Type	n/a	---
	FN Kapp File Name	n/a	---

Table 2 - Image File Header Parameters

This table provides a summary of **image file header parameters** with cross-references to applicable sections of IHO S-61 (Product Specification for Raster Navigational Charts).

Maptech BSB File Format (Version 3.0)			IHO RNC Product Specification (S-61)	
RECORD	FIELD	NAME	Section	Description
VER		Format Version	n/a	---
CRR		Copyright Record	n/a	---
BSB		<u>General Parameters</u>		
	NA	Chart Name	3.4.2.2	RNC Name
	NU	Chart Number	3.4.2.2	RNC number
	RA	Image Width Height	n/a	---
	DU	Drawing Units	3.4.2.15	Pixel resolution of the image file
KNP		<u>Detailed Parameters</u>		
	SC	Scale	3.4.2.8	Chart scale
	GD	Geodetic Datum Name	3.4.2.11	Horizontal datum
	PR	Projection Name	3.4.2.10	Projection and associated projection parameters
	PP	Projection Parameter	3.4.2.10	Projection and associated projection parameters
	PI	Projection Interval	3.4.2.10	Projection and associated projection parameters
	SK	Skew Angel	3.4.2.9	Orientation of north
	TA	Text Angle	n/a	---
	UN	Depth Units	3.4.2.14	Depth and height units
	SD	Sounding Datum	3.4.2.13	Vertical datums
	DX	X Resolution	n/a	---
	DY	Y Resolution	n/a	---
CED		<u>Edition Parameters</u>		
	SE	Source Edition	3.4.2.5	Chart edition date and/or chart edition number
	RE	Raster Edition	n/a	---
	ED	Edition Date	3.4.2.5	Chart edition date and/or chart edition number
NTM		<u>NTM Record</u>		
	NE	NTM Edition Number	n/a	---
	ND	NTM Date	3.4.2.6	Last update or NTM applied
	BF	Base Flag	n/a	---
	BD	Base Date	n/a	---
OST		Offset Values Section	n/a	---
IFM		Compression Type	n/a	---
RGB		Default Color Palette	3.4.2.17.1	Colors used for daytime viewing
DAY		Day Color Palette	3.4.2.17.1	Colors used for daytime viewing
DSK		Dusk Color Palette	3.4.2.17.2	Colors used for dusk and nighttime
NGT		Night Color Palette	3.4.2.17.2	Colors used for dusk and nighttime
NGR		Night Red Palette	n/a	---

Table 2 - Image File Header Parameters (continued)

REF	Reference Point Record	3.4.2.16	Mechanism to allow geographical positions to be converted to RNC (pixel) coordinates
CPH	Phase Shift Value	n/a	---
WPX	Polynomial L to X	n/a	---
PWX	Polynomial X to L	n/a	---
WPY	Polynomial L to Y	n/a	---
PWY	Polynomial Y to L	n/a	---
ERR	Error Record	n/a	---
PLY	Border Polygon Record	n/a	---
DTM	Datum Shift Record	3.4.2.12	Horizontal datum shift to WGS84

Table 3 - Update Patch File Parameters

This table provides a summary of required **update patch file parameters** with cross-references to applicable sections of IHO S-61 (Product Specification for Raster Navigational Chart).

	Maptech BSB File Format				IHO RNC Product Specification (S-61)			
	<u>NTM</u>		<u>New Edition</u>		<u>Header</u>		<u>Section</u>	<u>Description</u>
	KAP	BSB	KAP	BSB	KAP	BSB		
VER	R	R	R	R	R	R	n/a	---
TYP	R	R	R	R	R	R	n/a	---
ORG	R	R	R	R	R	R	3.4.2.1	Producer Agency ID
MFR	R	R	R	R	R	R	n/a	---
NA	R	R	R	R	R	R	3.4.2.2	Chart name
FN	R	N	R	N	R	N	n/a	---
NU	R	R	R	R	R	R	3.4.2.2	Chart number
RA	R	N	R	N	R	N	n/a	---
ED	R	R	R	R	R	R	3.5.1.5.1	Chart ed. date update applies to
SE	R	R	R	R	R	R	3.5.1.4	RNC to which update applies
RE	R	R	R	R	R	R	3.4.2.2	RNC number
ND	R	R	R	R	O	O	3.5.1.3	Update date
NE	R	R	R	R	O	O	3.5.1.2	Update number
NR	R	R	R	R	O	O	n/a	---
ADNnnnn	O	N	N	N	N	N	3.5.1	Metadata used for update
FST	R	N	R	N	N	N	n/a	---
NTL	R	N	R	N	N	N	n/a	---
TLnnnn	R	N	R	N	N	N	n/a	---

R – Required
O – Optional
N – Not applicable

5. Verification and Testing Procedures

In order to verify the proper use of Maptech BSB File Format data as a Raster Navigational Chart (RNC) in conjunction with the Raster Chart Display System (RCDS) mode of operation for ECDIS, there are a number of checks and verification procedures that should be performed. Some are specific to the data itself (e.g., documentation and image files) while others pertain to the overall functionality of the RCDS mode of operation in ECDIS (means/process of updating an RNC in ECDIS).

Specific checks/verifications listed in Sections 5.1 – 5.4 pertain to the required parameters of an RNC. These are listed in Section 4 (Tables 1, 2, and 3). All checks and verification procedures require the use of the *BSB File Format RNC Test Dataset* (see Appendix 1).

Additional tests associated with the overall functionality of RNC data when used in the RCDS mode of operation in ECDIS are contained in IEC Publication 61174, Annex H. Specifically, in Section 17 of Annex H lists the “Methods of Testing and Required Test Results” for the RCDS mode of operation.

5.1 Documentation File Parameters

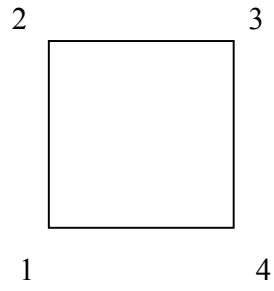
Using the Maptech Raster Navigational Chart (RNC) Test Dataset, confirm that the chart metadata values are as listed below:

<u>Record/Field</u>	<u>Name</u>	<u>RNC Test Dataset value</u>
VER	Format Version (number)	3.0
CHT	General Chart Parameters	--
NA	Chart Name (same as paper chart)	CHESAPEAKE BAY ENTRANCE
NU	Chart Number (same as paper chart)	558
CHF	Chart Format	Coastal
CED	Chart Edition Parameters	--
SE	Source Edition	70
RE	Raster Edition	01
ED	Edition Date	09/12/1998
NTM	NTM Record	--
NE	NTM Edition Number	70.00
ND	NTM Date	10/30/99
BF	Base Flag	on
BD	Base Date	10/26/99
CHK	Number of KAPPs	1,558
ORG	Producing Agency identifier code	USA-NOAA/NOS
MFR	Manufacturer (of the RNC)	MAPTECH
Knn	Knn Record	--
NA	Kapp Name	CHESAPEAKE BAY ENTRANCE
NU	Kapp Number	558
TY	Kapp Type	Base
FN	Kapp File Name	12221_1.kap

5.2 Image File Parameters

The following parameters should be checked and verified:

<u>Record/Field</u>	<u>Name</u>	<u>RNC Test Dataset values</u>
VER	Format Version	
CRR	Copyright	2001, Maptech, Inc. All Rights Reserved
BSB	General Parameters	--
NA	Chart Name (same as paper chart)	CHESAPEAK BAY ENTRANCE
NU	Chart Number (same as paper chart)	558
RA	Image Width Height	11547, 9767
DU	Drawing Units	254
KNP	Detailed Chart Parameters	--
SC	Scale	1:80,000
GD	Geodetic Datum	NAD83
PR	Projection	MERCATOR
PP	Projection Parameter	37.083
PI	Projection Interval	10.00
SK	Skew Angle	0.0
TA	Text Angle	90.00
UN	Depth Units	FEET
SD	Sounding Datum	MEAN LOWER LOW WATER
DX	X Resolution	8.00
DY	Y Resolution	8.00
CED	Chart Edition Parameters	--
SE	Paper Chart Source Edition	70
RE	Raster Chart Image Edition	01
ED	Paper Chart Edition Date	09/12/1998
NTM	NTM Record	--
NE	NTM Edition	70.00
ND	NTM Date	10/30/99
BF	Base Flag	on
BD	ADN Record	10/26/99
OST	Offset Values Section	1
IFM	Compression Type	4
RGB	Default Color Palette	see “.pdf” file in Test Dataset
DAY	Day Color Palette	see “.pdf” file in Test Dataset
DSK	Dusk Color Palette	see “.pdf” file in Test Dataset
NGT	Night Color Palette	see “.pdf” file in Test Dataset
NGR	Night Red Color Palette	see “.pdf” file in Test Dataset
REF	Reference Point Record	[see Image File Printout]
CPH	Phase Shift Value	0
WPX	Polynomial L to X	[see Image File Printout]
PWX	Polynomial X to L	[see Image File Printout]
WPY	Polynomial L to Y	[see Image File Printout]
PWY	Polynomial Y to L	[see Image File Printout]
ERR	Error Record	[see Image File Printout]
PLY	Nav Boundaries-Border Polygon Record	



1. $36^{\circ} 48' 48''$ N / $76^{\circ} 27' 00''$ W
2. $37^{\circ} 24' 53''$ N / $76^{\circ} 27' 00''$ W
3. $37^{\circ} 24' 53''$ N / $75^{\circ} 29' 00''$ W
4. $36^{\circ} 48' 48''$ N / $75^{\circ} 29' 00''$ W

DTM Datum Shift Record 0, 0

5.3 Update Patch File Parameters

For the following parameters, check that the correct values are shown:

VER	Version Number	3.0
MFR	Manufacturer	MAPTECH
ORG	Producer Agency ID	USA-NOAA/NOS
NA	Chart Name (same as paper chart)	CHESAPEAKE BAY ENTRANCE
NU	Chart Number (same as paper chart)	12221
ED	Update applies to chart edition	09/12/1998
SE	Update applies to the RNC number	70
RE	RNC number	01
ND	correct update numbers are shown	08/05/2000
NR	correct update numbers are shown	01
ADNnnn	required metadata is provided.	[see Patch Update Printout]

5.4 RNC Geo-referencing Verification

The following procedures should be performed to verify that the software is correctly handling the georeferencing supplied in the BSB File Format “.KAP file”. Using chart 12221_1.KAP in the Maptech Raster Navigational Chart (RNC) Test Dataset, perform the following checks:

1. Open the Maptech RNC test file 12221_1.KAP
2. Set File/Preference to “Local” datum display mode.
3. Pan to the upper left corner of the RNC. Locate the intersection of 37° 20’ 00’’ N - 76° 20’ 00’’ W.
4. With cursor located at intersection confirm that the software displays a Latitude of 37° 20’ 00’’ N - 76° 20’ 00’’ W.
5. Pan to the upper right corner of the RNC and locate the intersection of 37° 20’ 00’’ N - 75° 30’ 00’’ W.
6. With cursor located at intersection confirm that the software displays a Latitude of 37° 20’ 00’’ N - 75° 30’ 00’’ W.
7. Pan to the lower right corner of the RNC. Locate the intersection of 36° 50’ 00’’ N - 75° 30’ 00’’ W.
8. With cursor located at intersection, confirm that the software displays a 36° 50’ 00’’ N - 75° 30’ 00’’ W
9. Pan to the lower left corner of the RNC and locate the intersection of 36° 50’ 00’’ N - 76° 20’ 00’’ W.
10. With cursor located at intersection confirm that the software displays 36° 50’ 00’’ N - 76° 20’ 00’’ W
11. Pan towards the center of the RNC and locate the Chesapeake Bay Bridge-Tunnel. Locate the opening between Trestle B and Trestle C.
12. With cursor located over the base of the R “14” buoy, confirm that the software displays a 37° 02’ 30’’ N - 76° 04’ 04’’ W.

6. Reference Documents

In addition to this Test Dataset Instructions document, the following documents should be referred to for detailed information pertaining to the use of Maptech BSB File Format data for RCDS Mode of Operation in ECDIS.

a) **BSB File Format Version 3.0, Revision 3.0.7, August 2000**

This is the main document that fully describes the BSB File Format, and how it is used to store raster image data and associated textual documentation. The document is available on request from Maptech (www.maptech.com), but may not be used without prior written consent from Maptech, Inc.

a) **IMO Performance Standards for ECDIS**

Performance Standards for ECDIS were formally adopted by the International Maritime Organization (IMO) on 23 November 1995 and issued as *IMO Resolution A.817(19)*. Back-up arrangements for ECDIS were adopted by IMO as MSC 64(67) in November 1996 and became Appendix 6 to the Performance Standards. The IMO Performance Standards permit National Maritime Safety Administrations to consider ECDIS as the functional equivalent of the charts required by regulation V/20 of the 1974 SOLAS Convention.

Raster Chart Display Systems (RCDS) was adopted by IMO in 1998 (MSC 86(70) and became Appendix 7 to the IMO Performance Standards for ECDIS. As a simplified “mode of operation” for an otherwise IMO-compliant ECDIS, official HO-provided raster data can be used as an interim, optional solution where IHO S-57ed3 ENC data coverage is not available. However, in order to conform to SOLAS regulations, ECDIS equipment operated in the RCDS mode of operation must be used together with an appropriate folio of up-to-date paper charts. This document is available from IMO (www.imo.org)

b) **IHO Data Standards and Display Specifications**

In conjunction with the IMO Performance Standards for ECDIS, the International Hydrographic Organization (IHO) developed technical standards for the digital data format and display. IHO Special Publication 52 (IHO S-52) is the *IHO Specification for Chart Content and Display of ECDIS*. It includes appendices describing the means/process for updating, colour and symbol specifications, and a glossary of ECDIS-related terms. The 4th edition of IHO S-52 was issued in December 1996. IHO Special Publication 57 (IHO S-57) is the *IHO Transfer Standard for Digital Hydrographic Data* that was formally adopted as the official IHO standard at the XIV International Hydrographic Conference, Monaco, 4-15 May 1992. It includes an object catalog, DX-90 format, an ENC Product Specification, and ENC updating profile. The current edition (Edition 3.0) was released in November 1996. Both IHO-57 and S-52 are specified in the IMO Performance Standards for ECDIS.

Product Specification for Raster Navigational Charts (RNC) – As stated in Appendix 7 of the IMO Performance Standards, the Raster Navigational Chart (RNC) must conform to IHO standards. The necessary RNC Product Specification was adopted by IHO in October 1998 and issued as *IHO Special Publication No. 61 (S-61)*. This document is available from IHO (www.iho.org)

c) **IEC Testing Procedures**

At the request of IMO, the International Electrotechnical Commission (IEC) published a testing document that describes the operational methods of testing and required test results for an IMO-compliant ECDIS. IEC 61174 was officially published as an International Standard in August 1998, and is the basis for type-approval/certification process for an IMO-compliant ECDIS.

RCDS Mode of Operation – To accommodate testing additional ECDIS requirements (e.g., Back-up Arrangements and **RCDS**), IEC has developed testing procedures for Appendix 7 (RCDS Mode of Operation) of the IMO Performance Standards for ECDIS. These testing procedures are contained in Annex H (RCDS mode of operations) to *IEC Publication 61174, 3rd Edition, 2008*.

Maptech BSB File Format – RNC Test Dataset

In order to perform the necessary checks, inspections and verification procedures, Maptech has prepared a Raster Navigational Chart (RNC) Test Dataset in the BSB File Format. The Test Dataset has been designed to meet the testing requirements for the RCDS mode of operation as specified in IEC 61174 (Edition 3), Annex H. This Test Dataset has been provided to the International Hydrographic Bureau (IHB) on Monaco, and is available on request from IHO (www.iho.int).

The Maptech BSB File Format – RNC Test Dataset CD-ROM is comprised of six parts:

1. *Acrobat Reader 4.05* directory
 - installer for Adobe Acrobat Reader 4.05 (ar405eng.exe)
2. *Test Dataset Instructions for RNC* directory
 - copy of Test Dataset Instructions for Maptech BSB File Format when used as a RNC.
3. *Bsbchart* directory
 - BSB File Format data of the NOAA Chart # 12221: Chesapeake Bay Entrance (1:80,000 scale)
4. *Example Text Files* directory
 - text files of:
 - Documentation File (12221_BSB.txt)
 - Image File (12221_KAP.txt)
 - Update Patch File (12221_NCE.txt, 12221_NTMSB.txt)
5. *Example Patch Updates* directory
 - includes example patch updates including:
 - a) a Patch File Archive (PFA)
 - b) two (2) Notice to Mariner updates (NTM)
 - c) a new Chart Edition (NCE)
 - d) full file replacement (CHT)
6. *Print* directory
 - “.pdf” files of the Chesapeake Bay Entrance paper nautical chart. This includes four (4) chart color palettes:
 - Normal (Day) Color (12221_1_NormalColor.pdf)
 - Dusk Color (12221_1_DuskColor.pdf)
 - Night Color (12221_1_NightColor.pdf)
 - Night Red Color (12221_1_NightRedColor.pdf)

Note: In order to fully utilize the *Maptech BSB File Format Test Dataset Instructions for RNC*, it must be used in conjunction with the *Maptech BSB File Format Specification*. This document is provided to licensed, Value-Added Developers (VADs).

For those companies/organizations that are not currently VADs with Maptech, Inc., please contact:

Maptech, Inc.
Attention: Tim Sullivan
10 Industrial Way
Amesbury, MA 01913 USA
tsullivan@maptech.com
(978) 792-1000

Other Test Data Sets:

Although not directly related to this Test Dataset for RNC, other Maptech BSB File format test datasets are available for testing such items as:

- datum shift handling
- multi-hemisphere charts
- crossing the international date line

Those wishing to obtain these other types of test datasets should contact Maptech, Inc. (www.Maptech.com)