

AE-2000 IMO Resolution Compliance Report – 1/19

The following is a list of statuses of compliance with the IMO Resolution MSC.148(77) Annex 10 (adopted on 3 June, 2003) for Narrow-Band Direct-Printing Telegraphic Equipment (NAVTEX receivers).

NOTES:

- (1) The “principal surveyor” referred to in the list is Oleg E. Petrenko representing the Russian Maritime Register of Shipping (RMRS, member of International Association of Classification Societies), St. Petersburg, Russia, who witnessed and supervised the required compliance tests conducted during the period from 2nd to 5th September, 2005 by Japan Marina Co. Ltd. (ref. to as “**JMC**” in the list) at its registered office location (36-2-1001 Udagawa-cho, Shibuya-ku, Tokyo 150-0042, Japan).
- (2) The EUT (equipment under test) referred to in the document represents the Model **NT-2000** NAVTEX receiver (serial # 05100002 and #S-003, software version 1.3). The **AE-2000** is an OEM version of the **NT-2000**, and the two models are identical in mechanical and performance characteristics.
- (3) NAVTEX simulators used in the tests: 8502E (s/n 9401/518 kHz, s/n 9403/490 kHz)
- (4) The indication “**OK**” in the Compliance Status column signifies being fully compliant with the applicable requirement in the above resolution.
- (5) The “manual” referred to in the list is the “**ALDEN NAVTEX RECEIVER MODEL AE-2000 INSTRUCTION MANUAL**,” filed in this documentation set.

Applicable Paragraph No. MSC.148(77) Annex 10	Compliance Status	Note / Supporting Information
1. INTRODUCTION	OK	The EUT is designed to comply with the provisions of Recommendation ITU-R M.540 and the general requirements specified in IMO Res.A.694(17) as indicated in the copy of the BV TYPE APPROVAL CERTIFICATE (#16005/A0 BV) filed in this documentation, in addition to the performance standards specified in IMO Res. MSC.148(77) Annex 10 as detailed below.
2. GENERAL 2.1 System configuration	OK	The EUT system comprises a dedicated 8-inch LCD for NAVTEX text display, a printer port (RS-232C port), a non-volatile message memory storing up to 200 messages each containing 500 characters average for each frequency, and an INS port (RS-422 port). The non-volatile memory's contents can be selectively downloaded to an INS/IBS device using IEC 61162-1 formatted commands. <i>The above configuration was confirmed by the RMRS principal surveyor.</i>
3. CONTROLS AND INDICATIONS 3.1. Display of rejected stations and message types	OK	The EUT displays a list of rejected stations and rejected message both at power-up and when a dedicated front panel key REJ is pressed. Figure 1 shows an example. <i>The above function was confirmed by the RMRS principal surveyor.</i>

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Applicable Paragraph No. MSC.148(77) Annex 10	Compliance Status	Note / Supporting Information
4. RECEIVERS		
4.1. Receiver configuration, message display priority and simultaneous dual frequency operation	OK	<p>The EUT has a dedicated 518 kHz NAVTEX receiver and a second receiver that receives either 490 kHz or 4209.5 kHz NAVTEX broadcasts, as selected by the user.</p> <p>Both receivers operate simultaneously, and the first receiver has the priority in displaying 518 kHz messages when NAVTEX broadcast occurs on both frequencies at the same time. Second receiver messages are automatically stored in memory while the EUT is receiving currently transmitted 518 kHz messages.</p> <p>The operation of one receiver does not prevent, or interfere with, the operation of the other receiver.</p> <p><i>The above configuration and performance specifications were confirmed by the RMRS principal surveyor.</i></p>
4.2. Receiver sensitivity: below 2 μV emf for 4% of CER (character error rate)	OK	<p>The sensitivity was measured to be 0.5 μV for displaying messages with CER=00%.</p> <p><i>The above numeric figure was confirmed by the RMRS principal surveyor.</i></p>
5. DISPLAY DEVICE AND PRINTER		
5.1. Minimum No. of characters displayed/line: 32	OK	<p>The EUT displays up to 40 message characters per line across its 8" LCD display.</p> <p><i>The above numeric figure was confirmed by the principal surveyor. See Figure 2 showing an actual text display.</i></p>
5.2.1. Indication of new NAVTEX message upon its reception until acknowledged or until 24 hours after its receipt.	OK	<p>The EUT is designed to show a new message immediately after its reception by attaching a tag (NEW MESSAGE) to its message ID. The tag can be removed by pressing CLR key to acknowledge the reception of that message or will be automatically removed 24 hours after the message is received. See Figure 3 showing an example tagged "NEW MESSAGE."</p> <p><i>The above performance was confirmed by the RMRS principal surveyor.</i></p>
5.2.2. Display of newly received messages	OK	<p>The EUT shows all new messages in real time as they are received.</p> <p><i>The above performance was confirmed by the RMRS principal surveyor.</i></p>

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Applicable Paragraph No. MSC.148(77) Annex 10	Compliance Status	Note / Supporting Information
<p>5.3. Minimum No. of NAVTEX text lines to be displayed per screen page: 16</p>	OK	<p>The EUT displays up to 18 lines of NAVTEX message characters in addition to one additional line at the top and bottom ends of the screen to indicate receiving status, usable scroll keys, command prompts, warning/caution messages, etc. See Figure 4 showing 18 lines of NAVTEX text.</p> <p><i>The above specifications were confirmed by the RMRS principal surveyor.</i></p>
<p>5.4. Ease of message reading under all ambient lighting conditions at normal working distances and viewing angles</p>	OK	<p>The EUT uses a daylight-viewing high contrast color TFT LCD as its display device for ease of viewing at normal angles, and it is backlit with the brightness adjustable in 8 steps for ease of viewing in all ambient lighting conditions.</p> <p>The fonts used to display message characters are approx. 5 mm in size and in bold face, making it easy to read from more than 2 meters away. Regular size fonts are also user-selectable.</p> <p><i>The above statements and specifications were confirmed by the RMRS principal surveyor.</i></p>
<p>5.5. Indication of forced division of a word by line feed</p>	OK	<p>The EUT displays an internally generated carriage return symbol (↓) at the 40th character position of a line to indicate division of a word forced by a line feed.</p> <p>When output to a printer or an INS/IBS device via the EUT's interface connectors, the symbol is replaced with an underscore (_) (hex 5F); this is described in the following paragraphs of the manual:</p> <ul style="list-style-type: none"> • Page 1–4 paragraph ⑨ • Page 4–12 paragraph NOTE • Page 4–14 paragraph NOTE • Page 4–15 paragraph NOTE • Page 4–16 paragraph NOTE • Page 4–17 paragraph NOTE • Page 7–15 paragraph ⑩ • Page 9–2 paragraph (14) <p>See Figures 5 and 6 showing an on-screen example of the symbol and a printout equivalent, respectively.</p> <p><i>The above symbol and its output substitution were recommended, and their implementations confirmed, by the RMRS principal surveyor.</i></p>

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Applicable Paragraph No. MSC.148(77) Annex 10	Compliance Status	Note / Supporting Information
5.6. Delineation between adjacent NAVTEX messages on screen and on printout	OK	<ul style="list-style-type: none"> On-Screen Delineation The EUT inserts visual indication “STORED (CER=XX%)” at the end of each message, followed by 1 line feed. Figure 7 shows an example. Printout Delineation The EUT prints indication “STORED (CER=XX%)” at the end of each message, and then feeds 1 line before starting to print another message. Figure 6 shows an example. <p><i>The above visual and printout indications were confirmed by the RMRS principal surveyor.</i></p>
5.7. Indication of corrupt characters	OK	<p>The EUT shows corrupt (error) characters with asterisks (*). Figure 8 shows an example.</p> <p><i>The above error character indication was confirmed by the RMRS principal surveyor.</i></p>
5.8. Output to printer		<p>A serial printer, such as the optional PR-900, can be plugged into the RS-232C connector on the EUT’s rear panel.</p> <p><i>During the RMRS type-approval tests, a PC, operated in the Windows’ Hyper Terminal Mode as an alternative to a serial printer, was plugged into the RS-232C connector to monitor message outputs. This test method was employed for the tests in paragraphs 5.8.1 through 5.8.5 and was approved by the RMRS principal surveyor.</i></p>
5.8.1. All currently receiving messages	OK	<p>Realtime printing of a currently receiving NAVTEX message is enabled when the following setting is made via the menu system.</p> <p>SYSTEM MENU → 6:SELECT OUTPUT MESSAGES → 1:/*¹ RECEIVING MESSAGES → OFF ON ENT</p> <p><i>*1: This menu option title was suggested by the principal surveyor. See Figure 9.</i></p> <p><i>Realtime message outputting to the PC terminal was confirmed by the RMRS principal surveyor.</i></p>

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Applicable Paragraph No. MSC.148(77) Annex 10	Compliance Status	Note / Supporting Information
5.8.2 All stored messages	OK	<p>Printing of all messages stored in the message memory can be accomplished by making the following setting via the menu system:</p> <p>SYSTEM MENU → 6:SELECT OUTPUT MESSAGES → 2:ALL STORED MSG ENT</p> <p>See Figure 10.</p> <p><i>A specified number of messages were first input to the EUT from the 518 kHz and 490 kHz NAVTEX simulators, and then the above menu option was executed.</i></p> <p><i>Outputting of all messages to the PC terminal was confirmed on each frequency by the RMRS principal surveyor.</i></p>
5.8.3 All messages specified by frequency, station ID or message type	OK	<ul style="list-style-type: none"> • Printing of messages specified by frequency can be accomplished by making the following setting via the menu system: <p>SYSTEM MENU → 6:SELECT OUTPUT MESSAGES → 3:MSG SELECTED BY FREQUENCY ENT</p> <ul style="list-style-type: none"> • Printing of messages specified by station ID can be accomplished by making the following setting via the menu system: <p>SYSTEM MENU → 6:SELECT OUTPUT MESSAGES → 4:MSG SELECTED BY STATION ENT</p> <ul style="list-style-type: none"> • Printing of messages specified by message ID can be accomplished by making the following setting via the menu system: <p>SYSTEM MENU → 6:SELECT OUTPUT MESSAGES → 5:MSG SELECTED BY TYPE ENT</p> <p><i>The compliance of the results of the above checks was confirmed by the RMRS principal surveyor.</i></p>

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Applicable Paragraph No. MSC.148(77) Annex 10	Compliance Status	Note / Supporting Information
5.8.4 All currently displayed messages	OK	<p>Printing of all displayed messages can be accomplished by making the following setting via the menu system:</p> <p>SYSTEM MENU → 6:SELECT OUTPUT MESSAGES → *1 6:DISPLAYED MSG ENT</p> <p><i>*1: This menu option title was suggested by the RMRS principal surveyor. See Figure 11.</i></p> <p><i>The compliance of the test results was confirmed by the principal engineer.</i></p>
5.8.5. Selected messages	OK	<p>Printing of messages selected on the display can be accomplished by making the following setting via the menu system:</p> <p>SYSTEM MENU → 6:SELECT OUTPUT MESSAGES → *2 7:SELECTED MSG ENT</p> <p><i>*2: This menu option title was suggested by the principal surveyor. See Figure 12.</i></p> <p><i>The compliance of the test results was confirmed by the RMRS principal engineer.</i></p>
6. STORAGE 6.1. Non-volatile message memory		
6.1.1. (Test 1) Storage capacity: at least 200 messages of average 500 characters	OK	<p>A special small software routine was embedded in the EUT's software to instantly generate a total of 200 simulated NAVTEX messages of 500 characters each for the test on each NAVTEX receiver. It was then visually checked whether or not all the messages were stored in memory.</p> <p><i>The above test method was approved, and the compliance of the test results was confirmed, by the RMRS principal surveyor.</i></p>

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Applicable Paragraph No. MSC.148(77) Annex 10	Compliance Status	Note / Supporting Information
6.1 Non-volatile message memory (continued)		
6.1.1. (Test 2) Inhibition of user-initiated erasure of stored messages	OK	<p>1. Software</p> <ul style="list-style-type: none"> • No menu option is available for the user to erase any stored message. • Resetting the system does not clear the message memory. <p>2. Hardware</p> <p>Removing power from the EUT while in operation does not clear the message memory.</p> <p><i>The above statements were confirmed by the principal surveyor.</i></p>
6.1.1. (Test 3) Automatic overwriting of oldest message after storage to full capacity	OK	<p>Upon completion of (Test 1) to load a total of 200 simulated messages into memory, an additional new message was fed to the receiver from the NAVTEX simulators. It was then checked whether or not the oldest (1st) message was automatically deleted from memory.</p> <p><i>The erasure of the oldest message was confirmed by the RMRS principal surveyor.</i></p>
6.1.2. (Test 1) Tagging stored individual message for permanent retention in memory	OK	<p>Pressing STO MSG on the EUT's keypad attaches a PROTECTED tag to the ID of the desired message on display to indicate that the tagged message is protected from automatic time-based erasure. See Figure 13 showing an example.</p> <p><i>The function was confirmed by the RMRS principal surveyor.</i></p>
(Test 2) Maximum storage capacity for tagged messages: 25% of message memory	OK	<p>The EUT can store up to 50 tagged messages of 500 characters each. Attempting to tag an additional message causes a warning message prompt "STORAGE LIMIT IS REACHED !" to show up blinking for a few seconds at the bottom command/prompt line. See Figure 14 showing an example.</p> <p><i>The function was confirmed by the RMRS principal surveyor.</i></p>
(Test 3) User-initiated removal of message tag	OK	<p>Pressing CLR prompts the user to confirm the execution of the action. Selecting option "YES" removes the tag. See Figure 15 showing an example.</p> <p><i>The function was confirmed by the RMRS principal surveyor.</i></p>

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Applicable Paragraph No. MSC.148(77) Annex 10	Compliance Status	Note / Supporting Information
<p>6.1.2 (Test 4) Overwriting of message after removal of tag</p>	OK	<p>The oldest message (#1/200) was tagged first. Then the tag was ^{*1}manually removed and new messages were fed to each receiver from the appropriate NAVTEX simulator.</p> <p>It was then checked whether the oldest message was automatically erased.</p> <p><i>*1: Press CLR to remove the tag. User acknowledgement is required. See paragraph 3.8.3 on page 3-6 of the manual for removal procedure.</i></p> <p><i>The compliance of the above result was confirmed by the RMRS principal surveyor.</i></p>
<p>6.2. Message ID</p>		
<p>6.2.1. Minimum capacity of storage: 200 for each receiver</p>	OK	<p>A message ID and its associated message are inseparable in memory management. Storing an ID also stores its corresponding message together. Since the EUT can hold up to 200 messages, their IDs are also automatically stored in memory at the same time.</p> <p><i>The RMRS principal surveyor agreed to the above statement.</i></p>
<p>6.2.2. (Test 1) Automatic erasure of IDs after 60 to 70 hours of time passage</p>	OK	<p>Step (1)</p> <p>The EUT was switched on and left unattended for 59 hours continuously with some messages stored. Then it was checked whether the oldest message still remained in memory.</p> <p>Step (2)</p> <p>Exactly after 61 hours passed, it was checked whether the oldest memory was erased.</p> <p><i>The compliance of the check results was confirmed by the RMRS principal surveyor.</i></p>
<p>(Test 2) Automatic erasure of oldest ID after storage to full capacity</p>		<p>This test was conducted at the same time as (Test 1) in paragraph 6.1.1, since a message ID and its associated message are inseparably handled in memory management.</p> <p>It was checked whether or not the oldest message (together with its ID) was erased when an additional new message was loaded into the receiver after a total of exactly 200 messages were stored.</p> <p><i>The compliance of the check results was confirmed by the RMRS principal surveyor.</i></p>

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Applicable Paragraph No. MSC.148(77) Annex 10	Compliance Status	Note / Supporting Information
6.2.3 Storage of satisfactorily received messages only (CER <4%)	OK	<p>The EUT is designed to comply with IEC 61097-6 2nd Edition, paragraph 5.3.6, as follows:</p> <ul style="list-style-type: none"> • The EUT will store messages that are received with a character error rate (CER) of $\geq 4\%$ and $\leq 33\%$, and will replace those messages with subsequently received messages of the same IDs if they have smaller CERs. • If a new message is received with a CER $< 4\%$, it will store the message together with its ID and will not receive a subsequently transmitted message of the same ID. <p><i>The above compliance checks were confirmed by Masaharu Nakajima, surveyor, Yokohama Office of Bureau Veritas (BV, EU Notified Body #0062) on 17th Oct., 2005 during the BV type approval tests.</i></p>
6.3. Programmable control memories		
6.3.1. Retention of B₁ and B₂ characters for less than 6 hours of continuous power shutdown	OK	<p>The EUT is designed to retain all settings of selected/rejected stations and message types under a sustained power shutdown condition for at least consecutive 10 days.</p> <p>The RMRS test was conducted in the following manner:</p> <ol style="list-style-type: none"> (1) The current selection/rejection settings were noted. (2) The EUT (#2 unit) was turned off and left in that condition for 6 consecutive hours from 10:00 to 16:00 hours on 5th Sept., 2005. (3) It was checked whether or not the same settings were retained in memory. <p><i>The RMRS principal surveyor confirmed that all the settings were stored unchanged.</i></p>
7. ALARMS		
7.1. (Test 1) Indication of SAR message receipt	OK	<p>The EUT is designed to audibly (with a repetitive beep) and visually (with red colored ID, ALARM tag and text) warns the user immediately on receiving an SAR message.</p> <p><i>The above performance was confirmed by the RMRS principal surveyor.</i></p>
(Test 2) Manual reset	OK	<p>The SAR alarm can only be acknowledged by pressing STOP ALM.</p> <p><i>The above performance was confirmed by the RMRS principal surveyor.</i></p>

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Applicable Paragraph No. MSC.148(77) Annex 10	Compliance Status	Note / Supporting Information
8. TEST FACILITIES		
8.1. Provision for internally testing receivers, display and memory	OK	<p>The EUT has a self-diagnostic function that can be activated by the user via the unit's menu system. The following components are tested:</p> <ul style="list-style-type: none"> • Receivers (checking receiving functions on 518 kHz & 490/4209.5 kHz) • Display (showing all internally generated character fonts) • ROM (checking software integrity) • RAM (checking store/recall functions) • Alarm (checking audible alarm function) • Keypad dimmer lamps <p>Figure 16 shows an example of the self-diagnostic tests.</p> <p><i>Execution of the above tests was confirmed by the RMRS principal surveyor.</i></p>
9. INTERFACES		
9.1. At least one interface for transfer of message data from memory to INS/IBS	OK	<p>The EUT has an RS-422 port accessible from the rear panel RS-422 connector, through which the stored data can be downloaded in IEC 61162-1 format to an INS/IBS or other communications device. Figure 17 shows the rear panel connectors.</p> <p><i>Data transfer to a PC via the RS-422 port was confirmed by the RMRS principal surveyor.</i></p>
9.2. Compliance of all I/O interfaces with IEC 61162	OK	<p>In addition to the RS-422 port, the EUT has an RS-232C interface and an auxiliary interface termed "I/O DATA," all accessible from their corresponding rear panel connectors. The port parameters (i.e. bit format, baud rate and protocol) are selectable to comply with relevant IEC 61162-1 and IEC 61162-2 specifications.</p> <p><i>The above statement was confirmed by the RMRS principal surveyor.</i></p>
9.3. Built-in printer interface	OK	<p>The EUT has an RS-232C serial interface as standard that can be used to connect a serial printer, such as an optional PR-900 NAVTEX printer, for a realtime printing of NAVTEX messages or for an off-line, on-demand printout of stored messages.</p> <p><i>The availability of the printer port was confirmed by the RMRS principal surveyor.</i></p>

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Figure 1 List of Rejected Stations and Message Types – Example
[as per MSC.148(77) Annex 10, paragraph 3.1]

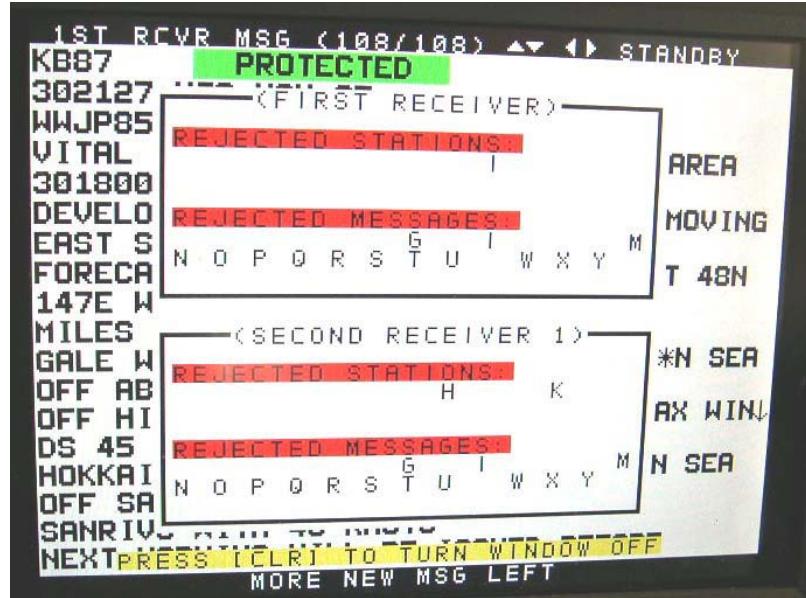
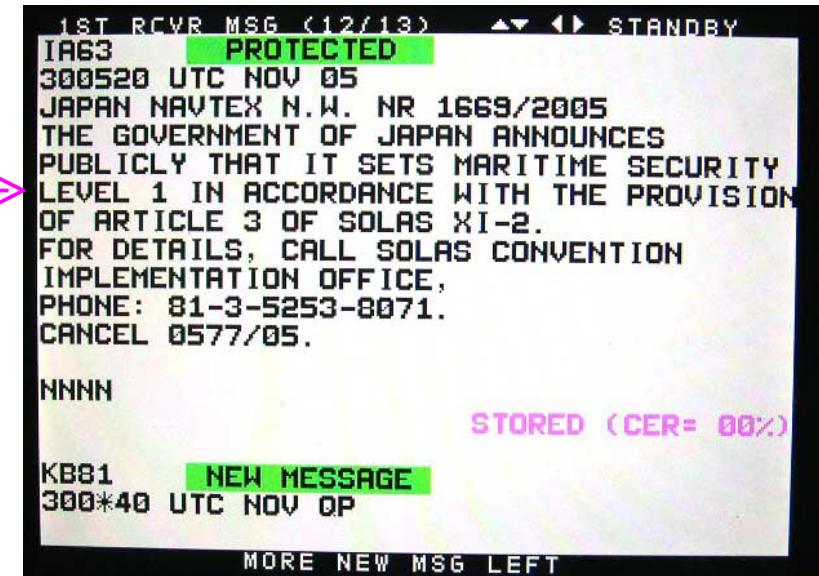


Figure 2 40 NAVTEX Text Characters/Line Display – Example
[as per MSC.148(77) Annex 10, paragraph 5.1]



→ This line displays 40 characters including 5 space characters.

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Figure 3 Indication of New Message – Example
[as per MSC.148(77) Annex 10, paragraph 5.2.1]

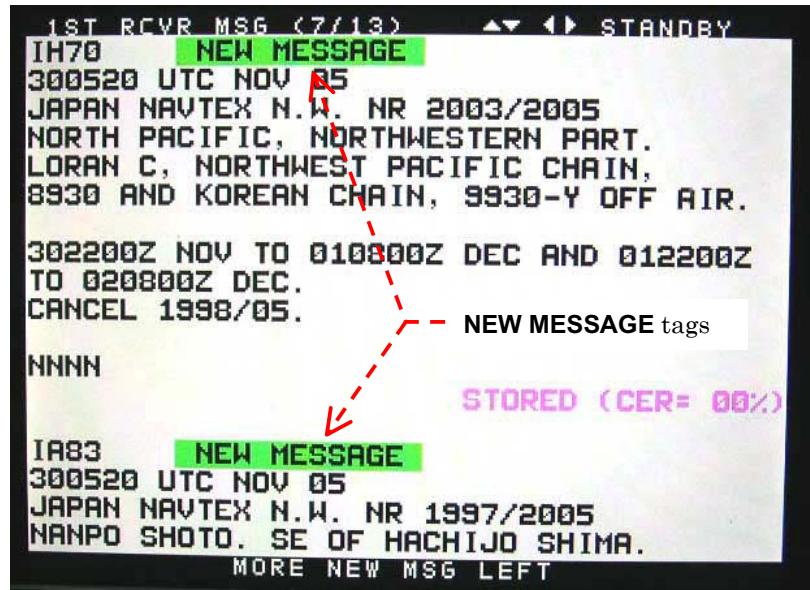
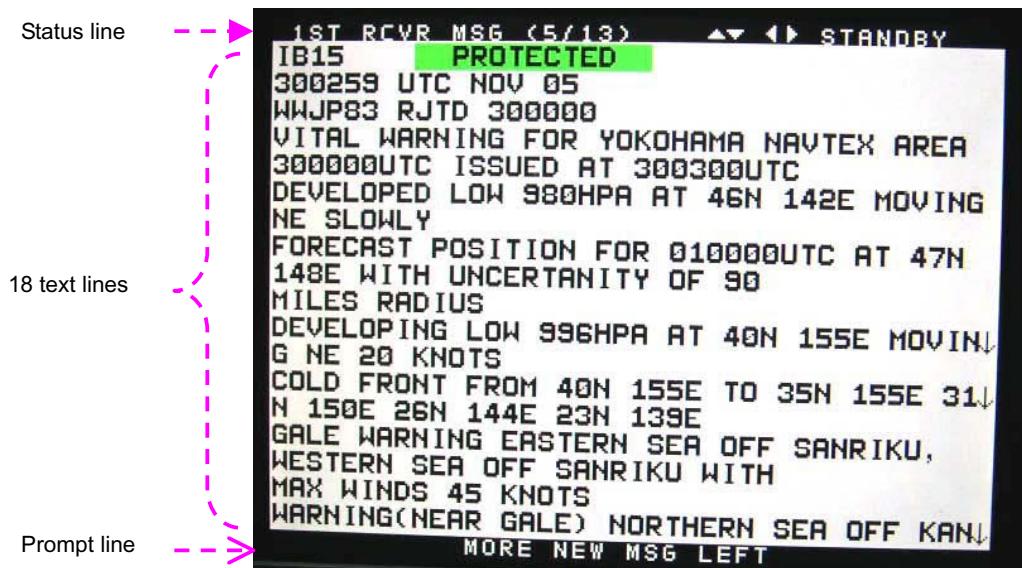


Figure 4 NAVTEX Message Comprising More Than 18 Lines/Screen Page – Example
[as per MSC.148(77) Annex 10, paragraph 5.3]



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Figure 5 Forced Carriage Return Symbol – Example
[as per MSC.148(77) Annex 10, paragraph 5.5]

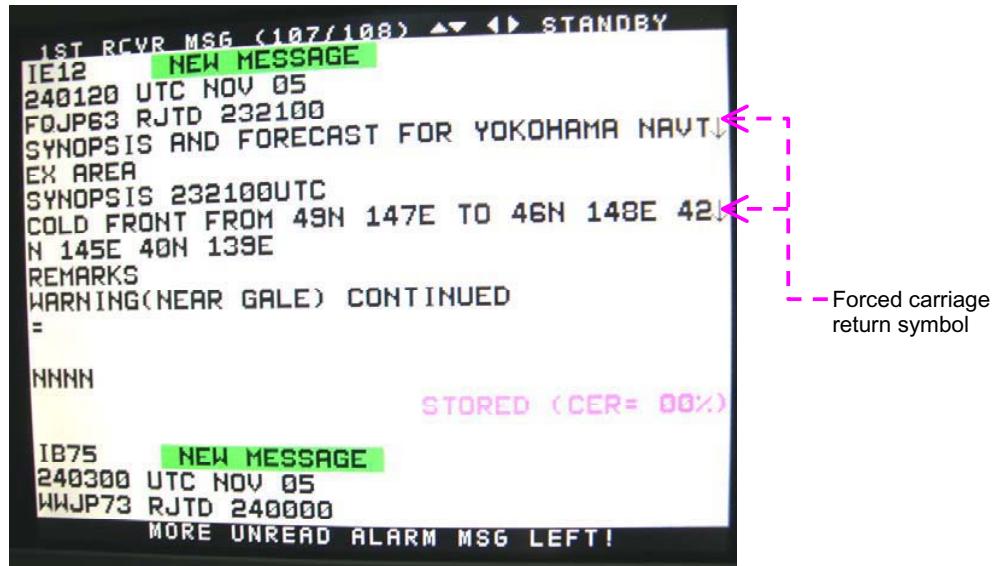


Figure 6 Printout of Above NAVTEX Message Screen – Example
[as per MSC.148(77) Annex 10, paragraphs 5.5 and 5.7]

1ST RCVR MSG

IE12

240120 UTC NOV 05

FQJP63 RJTD 232100

SYNOPSIS AND FORECAST FOR YOKOHAMA NAVT_

EX AREA

SYNOPSIS 232100UTC

COLD FRONT FROM 49N 147E TO 46N 148E 42_

N 145E 40N 139E

REMARKS

WARNING(NEAR GALE) CONTINUED

=

NNNN

STORED (CER= 00%)

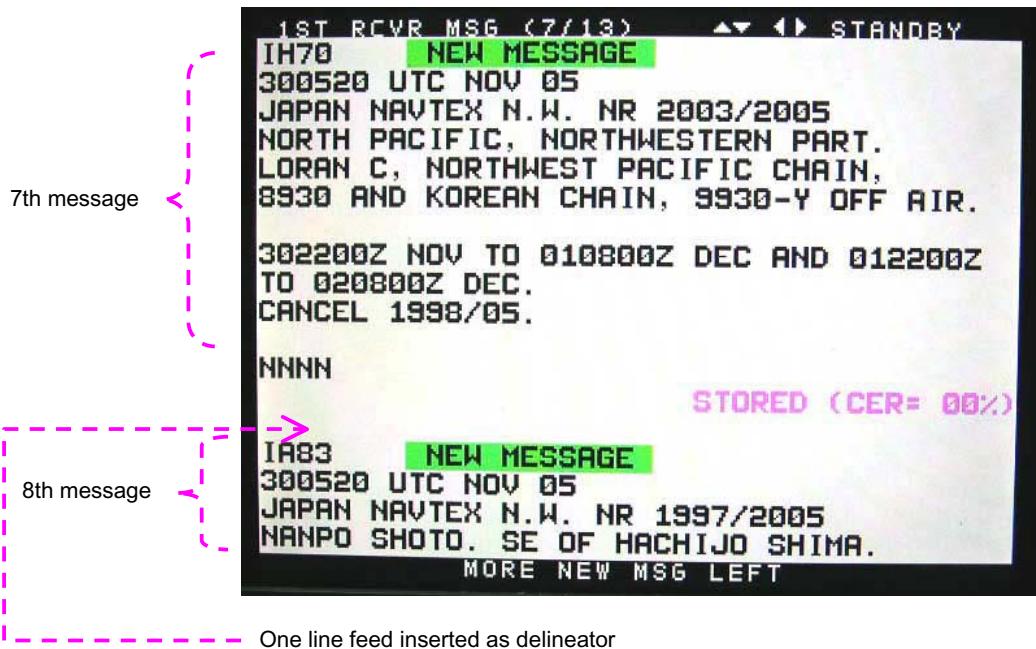
A pink dashed arrow points to the forced carriage return symbol in the first message's synopsis line.

A pink dashed arrow points to the 'STORED (CER= 00%)' line, with the text 'Storage and CER indication serving also as Message-to-message delineation'.

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Figure 7 Message-to-Message Delineation – Example
[as per MSC.148(77) Annex 10, paragraph 5.6]



1ST RCVR MSG (7/13) ▲▼◀▶ STANDBY
IH70 NEW MESSAGE
300520 UTC NOV 05
JAPAN NAVTEX N.W. NR 2003/2005
NORTH PACIFIC, NORTHWESTERN PART.
LORAN C, NORTHWEST PACIFIC CHAIN,
8930 AND KOREAN CHAIN, 9930-Y OFF AIR.

302200Z NOV TO 010800Z DEC AND 012200Z
TO 020800Z DEC.
CANCEL 1998/05.

NNNN
STORED (CER= 00%)

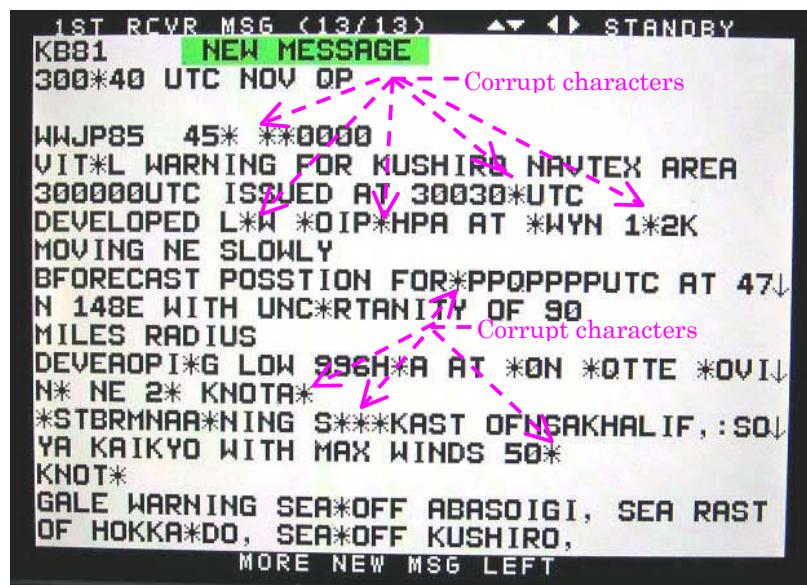
IA83 NEW MESSAGE
300520 UTC NOV 05
JAPAN NAVTEX N.W. NR 1997/2005
NANPO SHOTO. SE OF HACHIO SHIMA.
MORE NEW MSG LEFT

7th message

8th message

One line feed inserted as delineator

Figure 8 Indication of Corrupt Characters – Example
[as per MSC.148(77) Annex 10, paragraph 5.7]



1ST RCVR MSG (13/13) ▲▼◀▶ STANDBY
KB81 NEW MESSAGE
300*40 UTC NOV 0P Corrupt characters
WWJP85 45* **0000
VIT*L WARNING FOR KUSHIRO NAVTEX AREA
300000UTC ISSUED AT 30030*UTC
DEVELOPED L*W *OIP*HPA AT *WYN 1*2K
MOVING NE SLOWLY
BFORECAST POSSTION FOR*PPOPPPPUTC AT 47↓
N 148E WITH UNC*RTANIY OF 90
MILES RADIUS Corrupt characters
DEVEROPI*G LOW 996H*RA AT *ON *OTTE *OVI↓
N* NE 2* KNOTA*
*STBRMNA*NING S***KAST OF NAKHALIF, :SO↓
YA KAIKYO WITH MAX WINDS 50*
KNOT*
GALE WARNING SEA*OFF ABASOIGI, SEA RAST
OF HOKKA*DO, SEA*OFF KUSHIRO,
MORE NEW MSG LEFT

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Figure 9 Menu Option for Outputting Currently Receiving NAVTEX Messages
[as per MSC.148(77) Annex 10, paragraph 5.8.1]

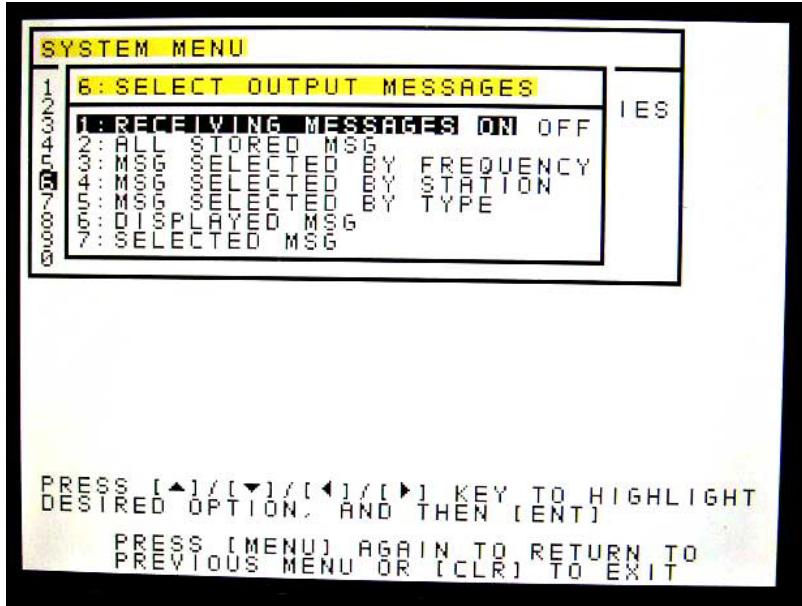
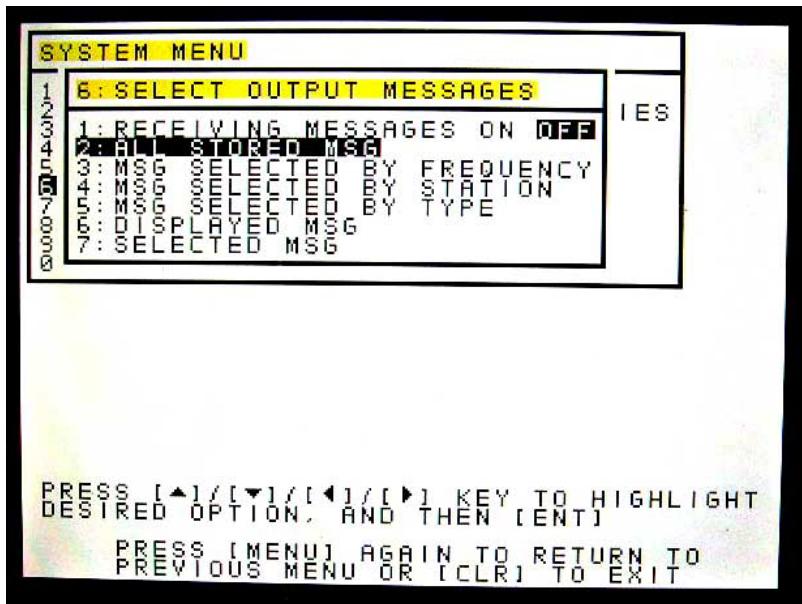


Figure 10 Menu Option for Outputting All Stored NAVTEX Messages
[as per MSC.148(77) Annex 10, paragraph 5.8.2]



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Figure 11 Menu Option for Outputting All Displayed NAVTEX Messages
[as per MSC.148(77) Annex 10, paragraph 5.8.4]

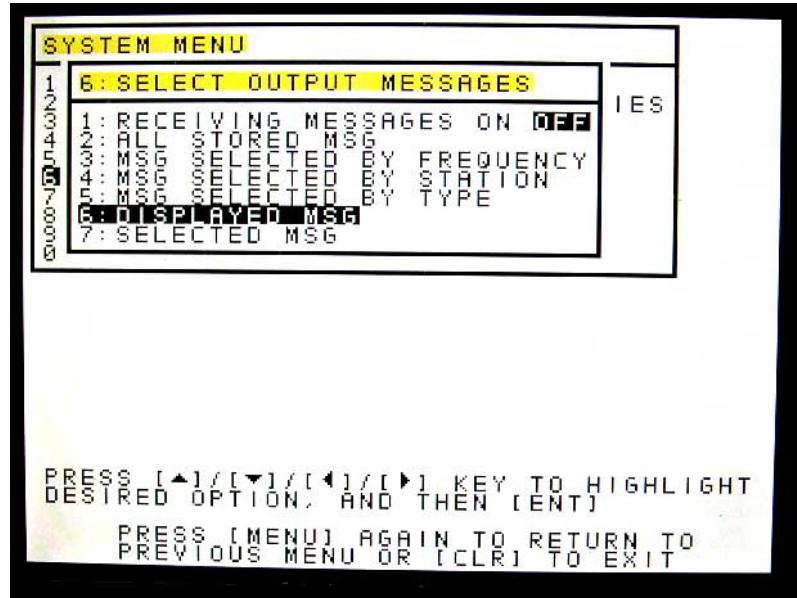
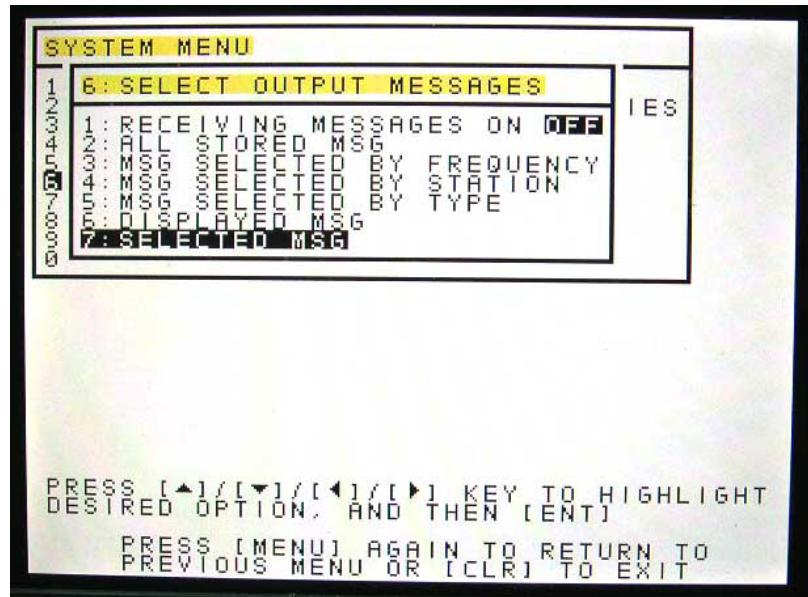


Figure 12 Menu Option for Outputting Selected NAVTEX Messages
[as per MSC.148(77) Annex 10, paragraph 5.8.5]



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Figure 13 Tagging Messages for Permanent Storage – Example
[as per MSC.148(77) Annex 10, paragraph 6.1.2]

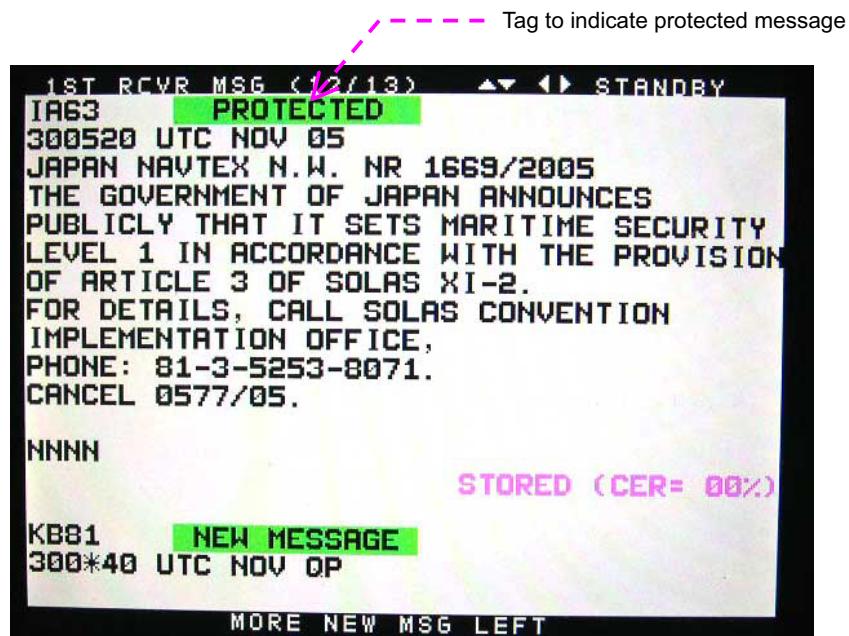
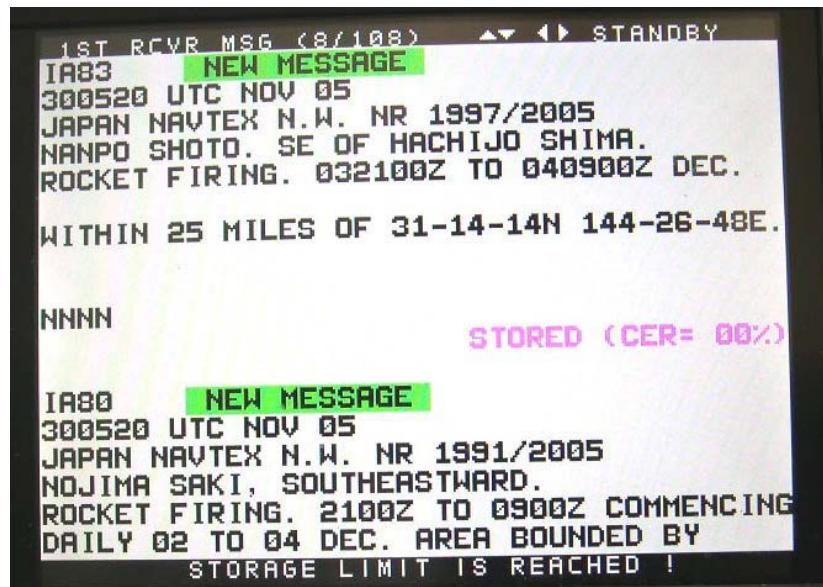


Figure 14 Caution for Storage of Protected Messages to Capacity – Example
[as per MSC.148(77) Annex 10, paragraph 6.1.2]



A pink dashed arrow points to the text "STORAGE LIMIT IS REACHED !", with the text "Caution for full capacity storage of protected messages" written next to it.

(continued on next page)

NT-2000 IMO Resolution Compliance Report – 18/19

Figure 15 Requiring User-Confirmation against Removal of Protected Tag – Example
[as per MSC.148(77) Annex 10, paragraph 6.1.2]

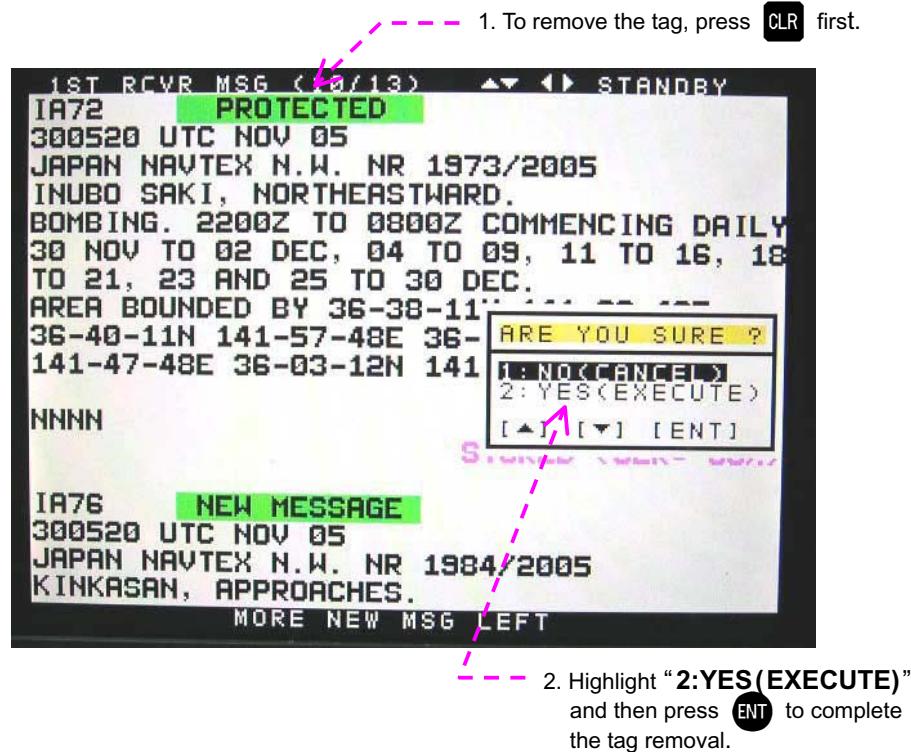
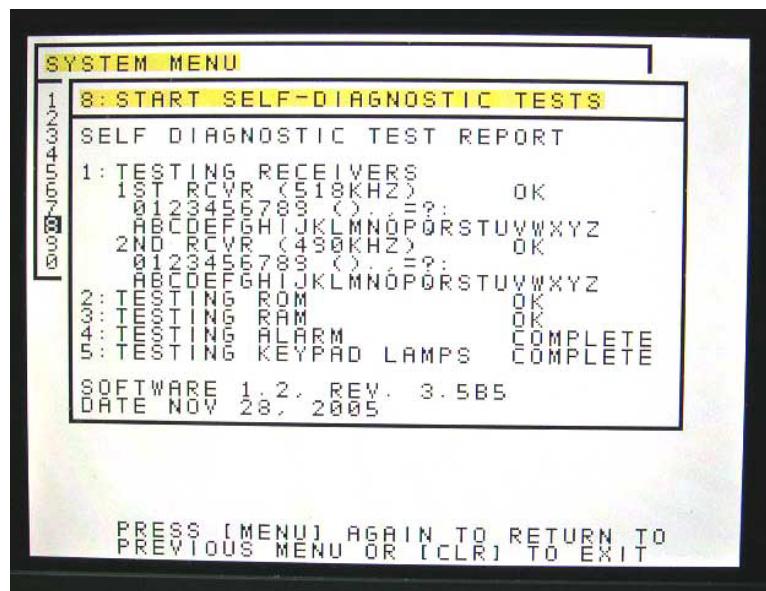


Figure 16 Report of Self-Diagnostic Tests – Example
[as per MSC.148(77) Annex 10, paragraph 8.1]



(continued on next page)

NT-2000 IMO Resolution Compliance Report – 19/19

Figure 17 Rear Panel Digital Interface Connectors [as per MSC.148(77) Annex 10, paragraphs 9.1 through 9.3]





Japan Marina Co., Ltd.

36-2-1001 UDAGAWA-CHO, SHIBUYA-KU, TOKYO 150-0042, JAPAN
PHONE: (03)3461-3606 FAX: (03)3496-2078

Declaration of Compliance with IMO Resolution A.694(17)

Date: January 23, 2009

To: The U.S. Federal Communications Commission

Dear Sirs:

This is to declare that the Model **AE-2000** NAVTEX Receiver manufactured by Japan Marina Co. Ltd. complies fully with all paragraphs of IMO Resolution A.694(17).

Yours faithfully,

Japan Marina Company Limited

A handwritten signature in blue ink, appearing to read "H. Ichikawa".

Hisashi Ichikawa, Director-Technical Manager



Japan Marina Co., Ltd.

36-2-1001 UDAGAWA-CHO, SHIBUYA-KU, TOKYO 150-0042, JAPAN
PHONE: (03)3461-3606 FAX: (03)3496-2078

Declaration of Conformity with Electromagnetic Compatibility

Date: January 23, 2009

To: The U.S. Federal Communications Commission

Dear Sirs:

This is to declare that the Model **AE-2000** NAVTEX Receiver manufactured by Japan Marina Co. Ltd. conforms fully to the following standards with regard to electromagnetic compatibility (EMC):

IEC 60945 (2002)

- Article 9.2 Conducted Emission (Frequency range: 10 kHz to 30 MHz)
- Article 9.3 Radiated Emission (Frequency range: 150 kHz to 2 GHz)
- Article 10.3 Immunity to Conducted Radio Frequency Disturbance
 - (Frequency range: 150 kHz to 80 MHz, test level 3 V_{rms})
 - (Spot frequencies: 2, 3, 4, 6.2, 8.2, 12.6, 16.5, 18.8, 22 and 25 MHz, test level 10 V_{rms})
- Article 10.4 Immunity to Radio Frequencies
 - (Frequency range: 80 MHz to 2 G MHz, test level: 10 V/m)
- Article 10.8 Immunity to Power Supply Failure
 - (3 breaks in power supply voltage of duration 60 seconds each)
- Article 10.9 Immunity to Electrostatic Discharge
 - Test level: 6 kV (contact discharge), 8 kV (aerial discharge)

Yours faithfully,

Japan Marina Company Limited

Hisashi Ichikawa, Director-Technical Manager

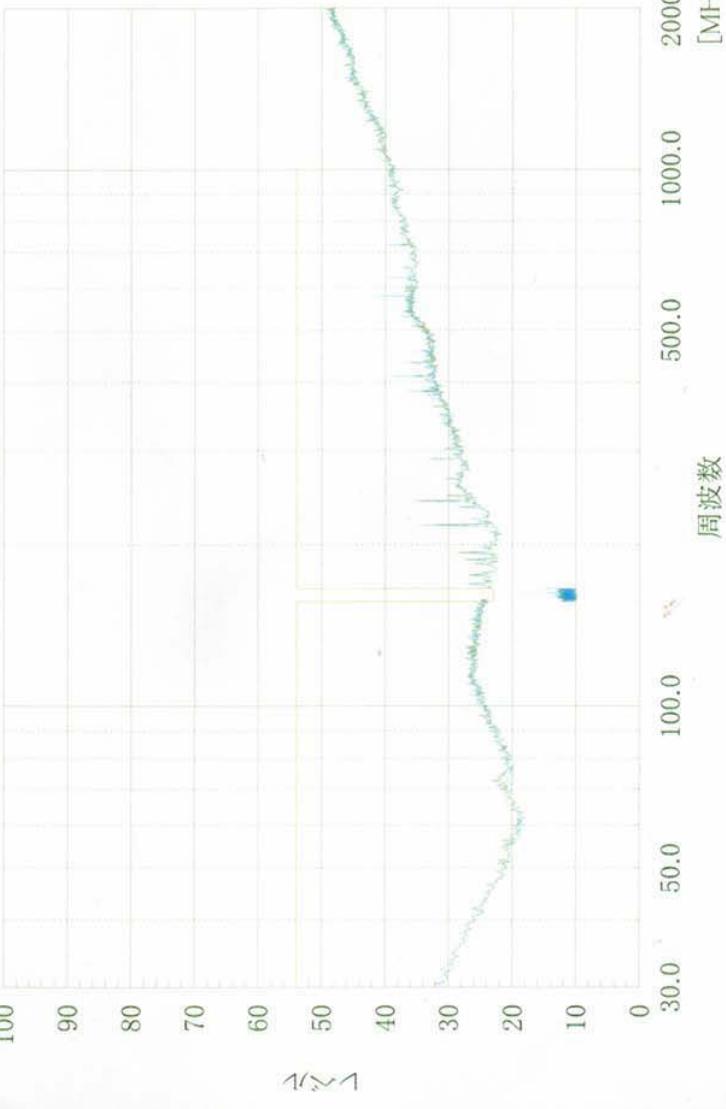
<<EMI測定>>

30 September,2005 15:22

モデル番号 : NT-2000
シリアル番号 : S-001
オペレータ : K. Ohusa
電源 : 24 VDC
温度、湿度 :
[dB(μV/m)]

限度値
備考1
備考2
備考3
備考4

: IEC68-2-48
: IEC 60945-2002
: Short LCD Harness/Plated Cabinet
:



〈〈EMI測定〉〉

30 September, 2005 15:04

モデル	NT-2000
シリアル番号	S-001
オペレータ	Ohusa
電源	24VDC
温度、湿度	[dB(μV/m)]

限備備備備

IEC68-2-48
IEC 60945-2002
Short LCD Harness/Plated Cabinet



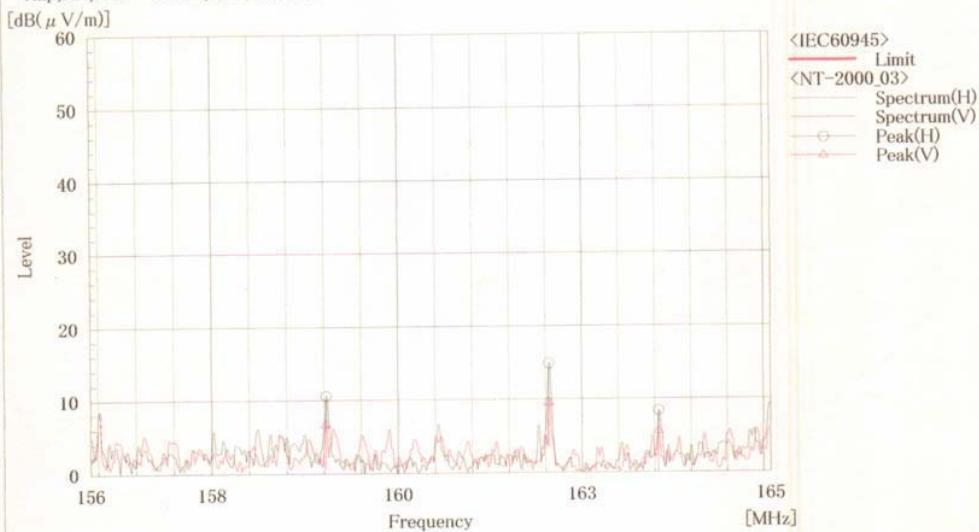
ANRITSU CS LTD.
EMC Center

<<Radiated Emissions>>

6 July,2005 18:35
NT-2000_03.dat

Model : NT-2000
Serial No. : S-005
Operator : Kosugi
Power : +24Vdc
Tmp,RH,Pres : 25°C, 64%, 994hPa

Standard : IEC60945 2002
Site : 2号暗室(1Range)
Remark1 : 測定3回目
Remark2 : PK DETECTOR
Remark3 :



Spectrum Selection

--- Horizontal Polarization ---

No.	Frequency	Reading	c. f.	Result	Limit	Margin
				PK		
	[MHz]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]
1	159.028	27.9	-17.3	10.6	30.0	19.4
2	162.046	32.3	-17.4	14.9	30.0	15.1
3	163.554	25.8	-17.4	8.4	30.0	21.6

--- Vertical Polarization ---

No.	Frequency	Reading	c. f.	Result	Limit	Margin
				PK		
	[MHz]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]
1	159.028	23.9	-17.3	6.6	30.0	23.4
2	162.046	26.9	-17.4	9.5	30.0	20.5
3	163.554	23.0	-17.4	5.6	30.0	24.4

MARINE DIVISION

17 bis Place des Reflets - La Défense 2
92400 Courbevoie - France
Tel. 33 1 42 91 52 91
Fax. 33 1 42 91 28 94
www.veristar.com



Certificate number: 16005/A0 EC

File number : RAD 4/28725/2

Annex A1 Item number : A.1/5.3

This certificate is not valid when presented without the full attached schedule composed of 7 sections

EC TYPE EXAMINATION CERTIFICATE

as per Module B of European Union Council Directive 96/98/EC on marine equipment
as last amended by Commission Directive 2002/75/EC of 2 September 2002

This certificate is issued to

Japan Marina Co., Ltd.

Tokyo - JAPAN

for the type of product

NAVTEX RECEIVER

NT-2000 / DEBEG 2902

Regulations and standards :

SOLAS 74, as amended, Regulations IV/7.1.4, X/3, IMO Resolution MSC.36(63)14.6.1.4(1994 HSC Code), MSC.97(73)14.7.1.4(2000 HSC Code), A.525(13), A.694(17), MSC.148(77), ITU-R M.540-2(06/90), ITU-R M.625-3(10/95), IEC 61097-6(1995), IEC 60945 (2002), IEC 61097-6(ed2)FDIS, IEC 61162-1, IEC 61162-2.

This certificate is issued under the French Maritime Authority to attest that BUREAU VERITAS did undertake the relevant type-examination procedures for the product identified above which was found to comply with the relevant requirements of the Council Directive 96/98/EC of 20 December 1996 as amended

This certificate is valid until : 22 Nov 2010



At Paris la Défense, on : 13 Dec 2005

For BUREAU VERITAS, Notified Body N°0062
By order of the Secretary

Approval office

Local office : BV KOBE
Surveyor : T. Kano



J. BENOIT



This certificate does not allow to issue the Declaration of Conformity and to affix the mark of conformity (wheelmark) to the products corresponding to this type. To this end, the production-control phase module (D, E or F) of Annex B of the Directive is to be complied with and controlled by a written inspection agreement with a notified body.

This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. BUREAU VERITAS S.A. is designated by the French Maritime Authority as a "notified body" under the terms of the French Regulations Division 140 Chapter 140-2. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine Division. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION :

Navtex receiver Type: NT-2000 / DEBEG 2902

The equipment comprises:

- radio receivers
- a signal processor
- a dedicated display device
- printer output port and a thermal printer (option)
- a non-volatile message memory
- connection to an integrated navigation system (INS).

1.1 Main Features:

1.1.1 Receiving Frequency:

518 kHz(first receiver), 490 kHz & 4209.5 kHz (second receiver)

1.1.2 Type of Reception:

FIB, (FEC) mode

1.1.3 Sensitivity:

Better than 1 μ V/ 50 ohm ant. input

1.1.4 Input Protection:

Capable of withstanding 30V rms of RF signal

1.1.5 Display screen:

8-inch color VGA TFT LCD, daylight-viewing

1.1.6 Navtex Messages:

40 characters per line, 18 lines per screen

1.1.7 Message Storage:

capacity: 200 messages of average length 500 characters

1.1.8 Message tagging/Protection:

Permanent storage in up to 25% of non-volatile memory (equivalent to approx. 50 messages)

1.1.9 External I/O Specifications:

- Printer interface: RS-232C
- IBS/INS: RS-422
- Additional I/O port: I/O DATA
- Approved sentences as per NMEA 0183/ IEC 61162-1

1.1.10 Power Requirements: 24VDC

1.1.11 Printer Specifications:

PR-900: Thermal moving head type, 42 characters/line

1.1.12 Active Antenna Specifications:

Type: 3-frequency active Whip antenna, 1.2 m, with preamplifier

1.1.13 Software version: 1.2

2. DOCUMENTS AND DRAWINGS :

2.1 - Technical Specification dated Sep. 2005.

2.2 - Drawing and bill of material ref. BV: DT3/05/02495/KER/NF & 3051212/1.

2.3 - Operation & Installation Manual.
Ref. UM-NT2000-07 - 1st Ed. dated Oct. 2005.

2.4 - Manual (s) for installation, use and maintenance to be stamped by a Society's Surveyor. To be available in one of the IMO languages, in addition to ship's flag language.

2.5 - Before changes can be implemented, new drawings must be provided to Bureau Veritas for review and acceptance. The new drawing list will be stamped and endorsed accordingly.

3. TEST REPORTS :

- 3.1 - JMC Test report N° T2005005 dated Oct. 2005 (tests witnessed by a Society Surveyor).
- 3.2 - Tokimec test report N° BV-NT2000-TA-01 dated 06/Jun./2005.
- 3.3 - Research Institute of Marine engineering Test report N° 05-113(E) dated 10/Jun./2005.
- 3.4 - KENTA Test reports N° 203869 & 203873 dated October 2005.
- 3.5 - Reviewed for validation by the Society.
- 3.6 - The equipment has been tested in accordance with:
 - IEC 61097-6 Ed2 (FDIS),
 - IMO resolutions MSC.148(77) and A513(13).

4. APPLICATION / LIMITATION :

As per requirements of Regulations stated on front page of this certificate.

5. PRODUCTION SURVEY REQUIREMENTS :

5.1 - The Manufacturer shall have a quality control system audited by a competent authority to ensure continuous compliance with the type approval conditions.

5.2 - Each Navtex Receiver intended to be fitted onboard a ship registered to a national register adhering to the directive shall be delivered with a Declaration of Conformity, which shall be signed by the manufacturer.

5.3 - Each equipment is to be supplied with Manual (s) for installation, use & maintenance (cf. §2 above).

6. MARKING OF PRODUCT :

- 6.1 - Maker's name or trade mark,
- Serial number of the units,
- Equipment type number or model identification under which it was type-tested,
- Minimum safe distance at which the equipment may be mounted from a standard and a steering magnetic compass,
- ☒ conformity mark and number of the Notified Body undertaking surveillance module (where BV, 0062),
- Last two digits of year mark affixed.

6.2 - Markings as detailed in article 11 of the Directive, must not be applied until the relevant modules 'D', 'E' or 'F' certificate has been issued to the manufacturing works by the notified body.

6.3 - Alternatively, the marking may be presented on a display at equipment start- up.

6.4 - The title and version of each software element included in the installed software system shall be either marked or displayed on command on the equipment.

6.5 - When the marking and the title and version of the software are displayed only on the display, such information shall also be included in the equipment manual.

7. OTHERS :

This approval is given on the understanding that the Society reserves the right to require check tests to be carried out on the Navtex Receiver at any time, and that **Japan Marina Co., Ltd, Tokyo - Japan**, will accept the responsibility for informing shipbuilders or their sub-contractors of the proper methods of use and general maintenance of the Navtex Receiver and of the conditions of this approval.

*** END OF CERTIFICATE ***

MARINE DIVISION

17 bis Place des Reflets - La Défense 2
92400 Courbevoie - France
Tel. 33 1 42 91 52 91
Fax. 33 1 42 91 28 94
www.veristar.com



Certificate number: 16005/A2 EC

File number : RAD 4/28725/2

Annex A1 Item number : A.1/5.3

This certificate is not valid when presented without the
full attached schedule composed of 7 sections

EC TYPE EXAMINATION CERTIFICATE

as per Module B of European Union Council Directive 96/98/EC on marine equipment
as last amended by Commission Directive 2002/75/EC of 2 September 2002

This certificate is issued to

Japan Marina Co., Ltd.

Tokyo - JAPAN

for the type of product

NAVTEX RECEIVER

Navtex receiver Type: NT-2000 / DEBEG 2902 / ALDEN AE-2000

Regulations and standards :

SOLAS 74, as amended, Regulations IV/7.1.4, X/3, IMO Resolution MSC.36(63)14.6.1.4(1994 HSC Code), MSC.97(73)14.7.1.4(2000 HSC Code), A.525(13), A.694(17), MSC.148(77), ITU-R M.540-2(06/90), ITU-R M.625-3(10/95), IEC 61097-6(1995), IEC 60945 (2002), IEC 61097-6(ed2-2005), IEC 61162-1, IEC 61162-2.

This certificate is issued under the French Maritime Authority to attest that BUREAU VERITAS did undertake the relevant type-examination procedures for the product identified above which was found to comply with the relevant requirements of the Council Directive 96/98/EC of 20 December 1996 as amended

This certificate is valid until : 22 Nov 2010



At Paris la Défense, on : 22 Jun 2007

For BUREAU VERITAS, Notified Body N°0062
By order of the Secretary

Approval office

Local office : BV KOBE
Surveyor : M. Kakimoto

L. COURREGELONGUE



This certificate does not allow to issue the Declaration of Conformity and to affix the mark of conformity (wheelmark) to the products corresponding to this type. To this end, the production-control phase module (D, E or F) of Annex B of the Directive is to be complied with and controlled by a written inspection agreement with a notified body.

This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. BUREAU VERITAS S.A. is designated by the French Maritime Authority as a "notified body" under the terms of the French Regulations Division 140 Chapter 140-2. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine Division. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION :

Navtex receiver Type: NT-2000 / DEBEG 2902 / ALDEN AE-2000

The equipment comprises:

- *radio receivers*
- *a signal processor*
- *a dedicated display device*
- *printer output port and a thermal printer (option)*
- *a non-volatile message memory*
- *connection to an integrated navigation system (INS).*

1.1 Main Features:

1.1.1 Receiving Frequency:

518 kHz(first receiver), 490 kHz & 4209.5 kHz (second receiver)

1.1.2 Type of Reception:

FIB, (FEC) mode

1.1.3 Sensitivity:

Better than 1 μ V/ 50 ohm ant. input

1.1.4 Input Protection:

Capable of withstanding 30V rms of RF signal

1.1.5 Display screen:

8-inch color VGA TFT LCD, daylight-viewing

1.1.6 Navtex Messages:

40 characters per line, 18 lines per screen

1.1.7 Message Storage:

capacity: 200 messages of average length 500 characters

1.1.8 Message tagging/Protection:

Permanent storage in up to 25% of non-volatile memory (equivalent to approx. 50 messages)

1.1.9 External I/O Specifications:

- Printer interface: RS-232C
- IBS/INS: RS-422
- Additional I/O port: I/O DATA
- Approved sentences as per NMEA 0183/ IEC 61162-1

1.1.10 Power Requirements: 24VDC

1.1.11 Printer Specifications:

PR-900 and DEBEG 9529: Thermal moving head type, 40 characters/line

1.1.12 Active Antenna Specifications:

Type: 3-frequency active Whip antenna, 1.2 m, with preamplifier

1.1.13 Software version: 1.3

2. DOCUMENTS AND DRAWINGS :

- 2.1 - Technical Specification dated Sep. 2005.
 2.2 - Drawing and bill of material ref. BV: DT3/05/02495/KER/NF & 3051212/1.
 2.3 - Operation & Installation Manual:
 UM-NT2000-12 - 2nd Ed. dated Jan. 2007
 2.4 - DEBEG 2902 Operation & Installation Manual:
 UM2902-V3, 3rd Ed. dated Feb. 2007
 2.5 - AE-2000 Instruction Manual:
 UM-AE2000-2.0, 2nd Ed. dated Feb. 2007
 2.6 - Manual (s) for installation, use and maintenance to be stamped by a Society's Surveyor. To be available in one of the IMO languages, in addition to ship's flag language.
 2.7 - Before changes can be implemented, new drawings must be provided to Bureau Veritas for review and acceptance. The new drawing list will be stamped and endorsed accordingly.

3. TEST REPORTS :

- 3.1 - JMC Test report N° T2005005 dated Oct. 2005 and N° T2005005-2 dated April, 2007
 (tests witnessed by a Society Surveyor).
 3.2 - Tokimec test report N° BV-NT2000-TA-01 dated 06/Jun./2005.
 3.3 - Research Institute of Marine engineering Test report N° 05-113(E) dated 10/Jun./2005.
 3.4 - KENTA Test reports N° 203869 & 203873 dated October 2005.
 3.5 - Reviewed for validation by the Society.
 3.6 - The equipment has been tested in accordance with:
 - IEC 61097-6 Ed2 (2005),
 - IMO resolutions MSC.148(77) and A513(13).

4. APPLICATION / LIMITATION :

As per requirements of Regulations stated on front page of this certificate.

5. PRODUCTION SURVEY REQUIREMENTS :

- 5.1 - The Manufacturer shall have a quality control system audited by a competent authority to ensure continuous compliance with the type approval conditions.
 5.2 - Each Navtex Receiver intended to be fitted onboard a ship registered to a national register adhering to the directive shall be delivered with a Declaration of Conformity, which shall be signed by the manufacturer.
 5.3 - Each equipment is to be supplied with Manual (s) for installation, use & maintenance (cf. §2 above).

6. MARKING OF PRODUCT :

- 6.1 - Maker's name or trade mark,
 - Serial number of the units,
 - Equipment type number or model identification under which it was type-tested,
 - Minimum safe distance at which the equipment may be mounted from a standard and a steering magnetic compass,
 -  conformity mark and number of the Notified Body undertaking surveillance module (where BV, 0062),
 - Last two digits of year mark affixed.
 6.2 - Markings as detailed in article 11 of the Directive, must not be applied until the relevant modules 'D', 'E' or 'F' certificate has been issued to the manufacturing works by the notified body.
 6.3 - Alternatively, the marking may be presented on a display at equipment start- up.
 6.4 - The title and version of each software element included in the installed software system shall be either marked or displayed on command on the equipment.
 6.5 - When the marking and the title and version of the software are displayed only on the display, such information shall also be included in the equipment manual.

7. OTHERS :

- 7.1 - This approval is given on the understanding that the Society reserves the right to require check tests to be carried out on the Navtex Receiver at any time, and that **Japan Marina Co., Ltd, Tokyo - Japan**, will accept the responsibility for informing shipbuilders or their sub-contractors of the proper methods of use and general maintenance of the Navtex Receiver and of the conditions of this approval.

7.2 - This certificate supersedes the Type Approval Certificate N° 16005/A1 EC issued on 06/10/2006 by the Society.

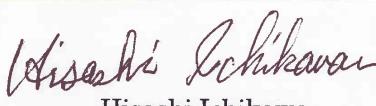
*** END OF CERTIFICATE ***

IEC 61097-6 2nd Edition/FDIS Compliance Report

for
Model NT-2000/DEBEG 2902
Dual Channel NAVTEX Receiver

Date: 17th October, 2005

This report is based on the compliance checks of the above EUT conducted at the office of the manufacturer Japan Marina Co. Ltd. (JMC) Tokyo, by JMC technical manager H. Ichikawa under the supervision of Mr. M. Nakajima, surveyor of Bureau Veritas Yokohama (BV) on the dates of 4th, 5th, 11th and 17th October, 2005.

Compliance Checked by	Compliance Checks Supervised by:
 Hisashi Ichikawa, Technical Manager, JMC	 Masaharu Nakajima, Surveyor, BV 



Japan Marina Co., Ltd.

36-2-1001 UDAGAWA-CHO, SHIBUYA-KU, TOKYO 150-0042, JAPAN
PHONE: (03)3461-3606 FAX: (03)3496-2078

sales@japan-marina.co.jp
www.japan-marina.co.jp

Conformance Tests of NAVTEX Receiver Equipment

1. Equipment under test : NAVTEX Receiver NT-2000 S/No. 0510002 & S003 Software version V1.2 REV3.3
 Manufacturer : JAPAN MARINA CO., LTD.
2. Normative references
 IEC 61097-6 ed. 2 FDIS, IEC60945 2002, IEC61162-1, IEC61162-2,
 IMO Resolution MSC. 148(77) 2003
3. Test Results

Section	Requirements	Test results and comments		
		Compliance	Comment	
4	Performance Requirement	/	/	/
4.1 a)	An integrated printing device		N/A	
4.1 b)	A dedicated display, printer output port and non-volatile message memory.	Yes		8 inch color TFT LCD
4.1 c)	A connection to an integrated navigation system (INS) and Non-Volatile memory.		N/A	
4.2	General characteristic	/	/	/
4.3	Specific characteristics	/	/	/
4.3.1	B₁ and B₂ characteristic	Yes		
4.3.1.a)	EUT shall be capable of automatically rejecting unwanted information using character B ₁ .	Yes		1 st receiver rejection OK. 2 nd receiver rejection OK.
4.3.1.b)	EUT shall be capable of disabling print-out, transmission to INS port or display of selected types of messages using character B ₂ with the exception of messages with B ₂ characters A, B, D and L	Yes		1 st receiver rejection OK 2 nd receiver rejection OK Printer port rejection OK INS port rejection OK
4.3.1 c)	If any facility is rejected (transmitter coverage area) or disabled (type of message) the extent of any such limitation shall be clearly indicated to the user.	Yes		[SEL] and [REJ] keys are used to display rejected stations and types of message.
4.3.2	B ₃ and B ₄ characters	Yes		
4.3.3	Preamble	Yes		
4.3.4	Repetition of Printing/display	Yes		
4.3.5	Mandatory printing/display	Yes		Number 00 messages are always displayed if B ₁ is selected.
4.3.6	Reception of messages with character errors	/	/	/
4.3.6.1	Messages with character error rate of >4 % and \leq 33%	Yes		Displayed with CER value and messages are stored
4.3.6.2	Messages with character error rate > 33%	Yes		Messages are not stored.

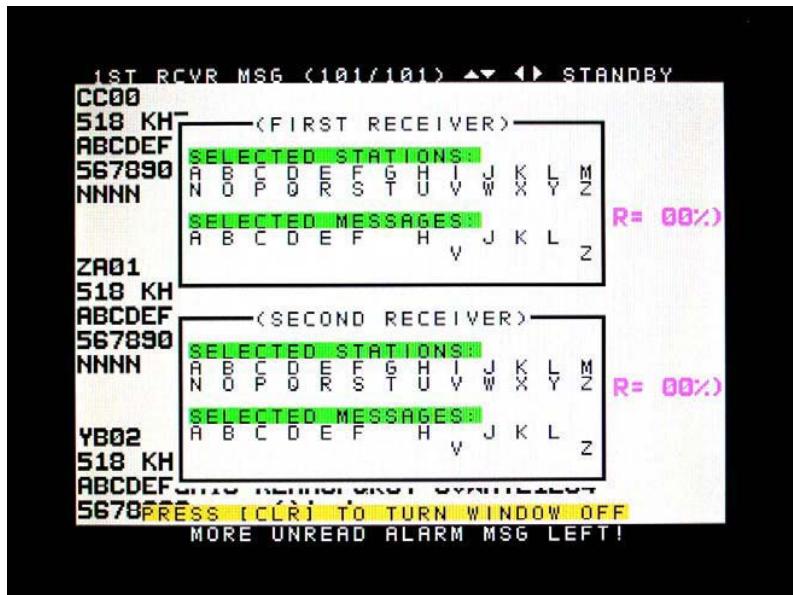
Section	Requirements	Test results and comments		
		Compliance	Comment	
4.3.7	Controls and indicators	Yes		
4.3.8	Programmable control memories	Yes		Defaults settings; all station and message type A, B, C, D, E, F, H, J, K, L, V, Z are selected.
4.3.9	Alarms			
4.3.9.1	Generation of alarms	Yes		
4.3.9.2	Using the ALR formatter	Yes		
4.3.9.3	Repetition of alarm conditions	Yes		
4.3.10	Test facilities	Yes		1 st and 2 nd receivers are tested at the same time. 45 characters are displayed for self-test display.
4.4	Interfaces	Yes		
4.5	Receiver	Yes		
4.5.1	Number of receivers	Yes		Dual channel receiver
4.5.2	Receive frequencies	Yes		490kHz, 518kHz and 4209.5kHz
4.5.3	Sensitivity			Refer to receiver test report
4.6	Display			
4.6.1	General	Yes		
4.6.1.1	User interface	Yes		
4.6.1.2	Number of characters displayed per line	Yes		40 characters per line
4.6.1.3	Number of line displayed	Yes		18 lines for received message text
4.6.1.4a)	An indication of newly received selected messages shall be immediately displayed until acknowledged or until 24 h after receipt.	Yes		
4.6.1.4b)	Newly received selected message shall also be capable of being displayed	Yes		
4.6.1.4c)	Stored messages shall be capable of being displayed and searchable by location (station) designators and type of message designators.	Yes		
4.6.1.5	Visibility of display	Yes		
4.6.1.6	Automatic line feed	Yes		Automatic line feed character is shown by “↓”
4.6.1.7	End of message display	Yes		
4.6.1.8	Corrupt characters	Yes		Corrupt character is shown by “*”.
4.6.1.9	Printer interface message selection requirement	Yes		
4.6.1.9 a)	All messages as they are received	Yes		
4.6.1.9 b)	All messages stored in the message memory	Yes		

Section	Requirements	Test results and comments		
		Compliance	Comment	
4.6.1.9 c)	All messages received on specified frequencies, from specified locations or having specified message designators	Yes		
4.6.1.9 d)	All message currently displayed; and	Yes		
4.6.1.9 e)	Individual messages selected from those appearing on the display	Yes		
4.7	Integral Printer		N/A	
4.8	NAVTEX message selection requirement			
4.8.1.1	Number of messages	Yes		200 messages can be stored into non-volatile memory.
4.8.1.2	Message tagging	Yes		Maximum 50 message can be protected.
4.8.1.3	Automatic erasure	Yes		Erasure after 60 hours from message received.
4.8.2	Equipment with integral printer		N/A	
4.8.2.1	Numbers of messages		N/A	
4.8.2.2	Automatic erasure		N/A	
4.9	Power supplies	Yes		24V DC (11V – 36 VDC)
4.10	Source of UTC		N/A	EUT does not handle UTC time.
5.	Test conditions	Yes		Refer par. 11 of page 10/10
6.	Environmental tests required			Refer to environmental test report.
7.1	INS input electrical tests	Yes		
7.2	INS input performance tests	Yes		
7.3	INS output electrical tests	Yes		
7.4	INS output performance tests	Yes		
7.5	Printer output electrical tests		N/A	
7.6	Printer output performance tests		N/A	
8	General and signal processing tests			
8.1	Exclusion of stations	Yes		
8.2	Exclusion of message category	Yes		
8.3	Receiver test facility	Yes		Test results contains 44 characters
8.4	Search and rescue (SAR) alarm provision and reset	Yes		Alarm can be reset by manually and INS port ACK sentence. Audible alarm level is 80dBA* ¹ .
8.5	Additional alarms	Yes		A, B and L
9	Receiver tests (9.1.1 - 9.7.2 9.)			Refer to receiver performance test report.
10	Printer tests		N/A	
10.1	Basic requirement		N/A	
10.2	Paper roll end alarm and storage ...		N/A	
10.3	Automatic line feed indication and paper feed		N/A	

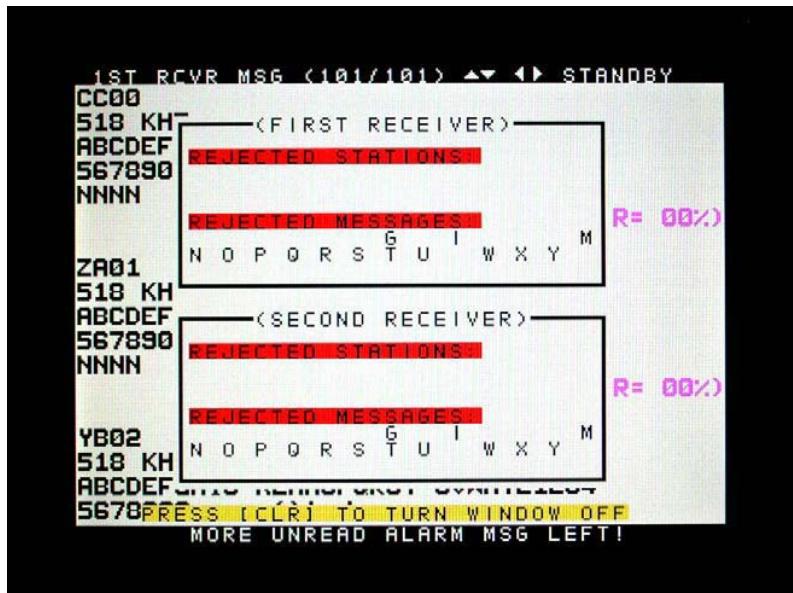
Section	Requirements	Test results and comments		
		Compliance	Comment	
10.4	Mutilated character indication		N/A	
10.5	Tests of technical characteristic (ITU-R Recommendation M.540)		N/A	
10.5.1	B1/B2 characters selection (in 8.1 and 8.2)		N/A	
10.5.2	Printer activation/error-free preamble B ₁ B ₂ B ₃ B ₄		N/A	
10.5.3	Non-repetitive printing of message		N/A	
10.5.4	Message with B ₃ B ₄ = 00		N/A	
11	Memory tests			
11.1	Internal storage, message tagging and erasure of oldest message identifications	Yes		200 messages ID and 50 tagged messages
11.2	Erasure of message identifications / storage time	Yes		60 hours
11.3	Storage of message identifications		N/A	
11.4	Reception of messages with character errors	Yes *		* Stored messages are replaced with lower CER messages.
11.5	Unsatisfactory reception	Yes		
11.6	Power-off check	Yes		Stored messages and user settings are retained for 6 hours power-off.
11.7	Brown-out test	Yes		24V -> 9.6V -> 19.2V
11.8	UTC handling check		N/A	UTC is not used to check message aging.
12	Miscellaneous tests			
12.1	Spurious emissions			Refer to receiver test report.
12.2	Equipment manuals – checks of the manufacturers manual	Yes		
12.3	Marking and identification	Yes		

ANNEX. A

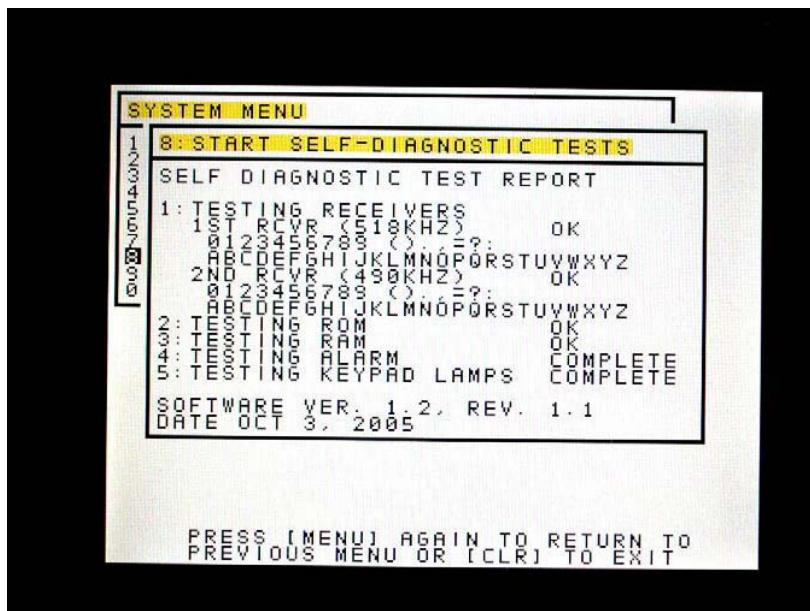
1. Status display for selected station ID and Message types.



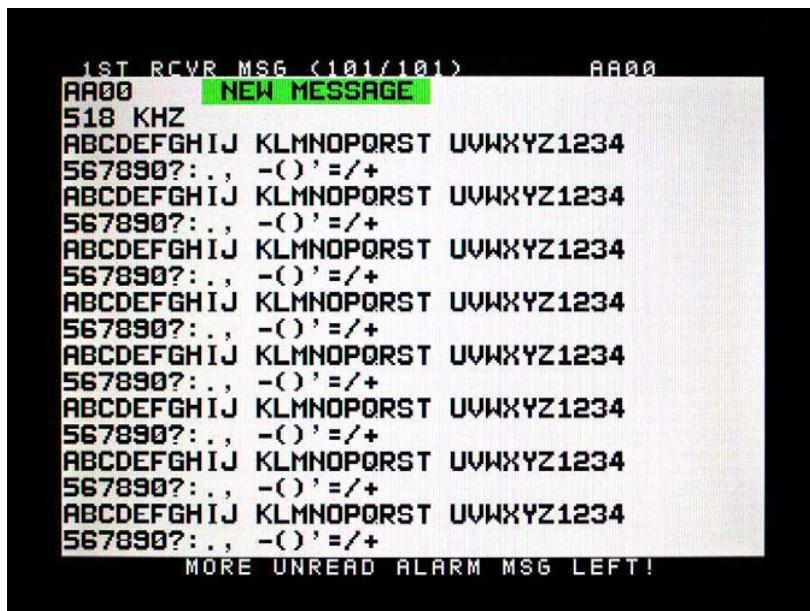
2. Status display for rejected station ID and Message Types



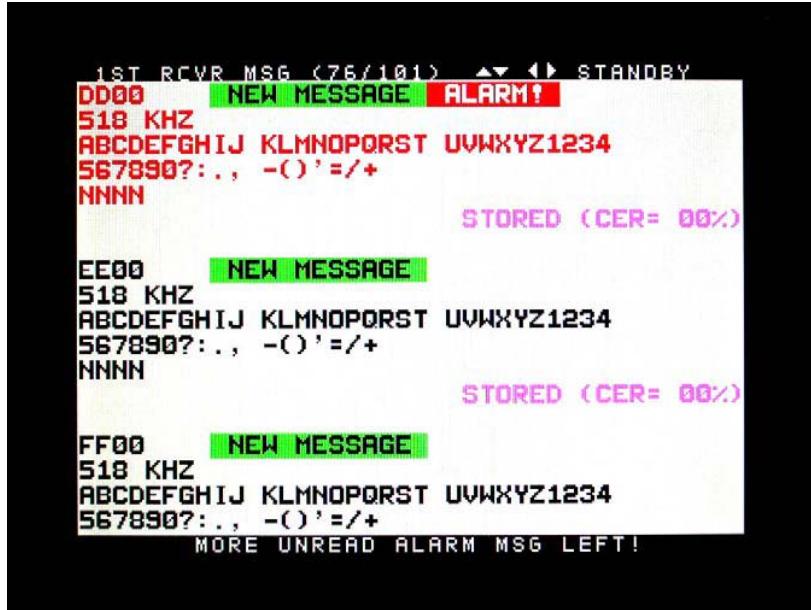
4. Self-diagnostic test results



5. STS message display on NT-2000 screen.



6. Search and rescue message receiving sample screen data



7. Printer port (RS-232C) output data sample

a) First receiver 518kHz receiving data of printer output

AA00

518 KHZ

ABCDEGHIJ KLMNOPQRST UVWXYZ1234

567890?.., -()'=/+

ABCDEGHIJ KLMNOPQRST UVWXYZ1234

567890?.., -()'=/+
MORE UNREAD ALARM MSG LEFT!

NNNN

STORED (CER= 00%)

b) Second receiver 490kHz receiving sample of printer output

AA00
 490 KHZ
 ABCDEFGHIJ KLMNOPQRST UVWXYZ1234
 567890?.., -0'=/+
 NNNN

STORED (CER= 00%)

8. INS port message sample

a) Typical STS message output of NRX sentence sample

First receiver 518kHz receiving message output to IEC61162 (RS-422) port

\$CRNRX,023,001,01,AA00,2,,,608,0,A,518 KHZ ^0D^0A*65
 \$CRNRX,023,002,01,,,,,,ABCDEFGHIJ KLMNOPQRST UVWXYZ1234^0D^0A*61
 \$CRNRX,023,003,01,,,,,,567890?..^2C -0'=/+ ^0D^0A*4C
 \$CRNRX,023,004,01,,,,,,ABCDEFGHIJ KLMNOPQRST UVWXYZ1234^0D^0A*67
 \$CRNRX,023,005,01,,,,,,567890?..^2C -0'=/+ ^0D^0A*4A
 \$CRNRX,023,006,01,,,,,,ABCDEFGHIJ KLMNOPQRST UVWXYZ1234^0D^0A*65
 \$CRNRX,023,007,01,,,,,,567890?..^2C -0'=/+ ^0D^0A*48
 \$CRNRX,023,008,01,,,,,,ABCDEFGHIJ KLMNOPQRST UVWXYZ1234^0D^0A*6B
 \$CRNRX,023,009,01,,,,,,567890?..^2C -0'=/+ ^0D^0A*46
 \$CRNRX,023,010,01,,,,,,ABCDEFGHIJ KLMNOPQRST UVWXYZ1234^0D^0A*62
 \$CRNRX,023,011,01,,,,,,567890?..^2C -0'=/+ ^0D^0A*4F
 \$CRNRX,023,012,01,,,,,,ABCDEFGHIJ KLMNOPQRST UVWXYZ1234^0D^0A*60
 \$CRNRX,023,013,01,,,,,,567890?..^2C -0'=/+ ^0D^0A*4D
 \$CRNRX,023,014,01,,,,,,ABCDEFGHIJ KLMNOPQRST UVWXYZ1234^0D^0A*66
 \$CRNRX,023,015,01,,,,,,567890?..^2C -0'=/+ ^0D^0A*4B
 \$CRNRX,023,016,01,,,,,,ABCDEFGHIJ KLMNOPQRST UVWXYZ1234^0D^0A*64
 \$CRNRX,023,017,01,,,,,,567890?..^2C -0'=/+ ^0D^0A*49
 \$CRNRX,023,018,01,,,,,,ABCDEFGHIJ KLMNOPQRST UVWXYZ1234^0D^0A*6A
 \$CRNRX,023,019,01,,,,,,567890?..^2C -0'=/+ ^0D^0A*47
 \$CRNRX,023,020,01,,,,,,ABCDEFGHIJ KLMNOPQRST UVWXYZ1234^0D^0A*61
 \$CRNRX,023,021,01,,,,,,567890?..^2C -0'=/+ ^0D^0A*4C
 \$CRNRX,023,022,01,,,,,,NNNN^0D^0A*7C
 \$CRNRX,023,023,01,,,,,,

STORED (CER= 00%)^0D^0A*0B

Second receiver 490kHz receiving message output to IEC61162 (RS-422) port

```

$CRNRX,023,001,00,AA00,1,,,608,0,A,490 KHZ ^0D^0A*66
$CRNRX,023,002,00,,,,,,,ABCDEFHIJ KLMNOPQRST UVWXYZ1234^0D^0A*60
$CRNRX,023,003,00,,,,,,,567890?:^2C -0'=/+ ^0D^0A*4D
$CRNRX,023,004,00,,,,,,,ABCDEFHIJ KLMNOPQRST UVWXYZ1234^0D^0A*66
$CRNRX,023,005,00,,,,,,,567890?:^2C -0'=/+ ^0D^0A*4B
$CRNRX,023,006,00,,,,,,,ABCDEFHIJ KLMNOPQRST UVWXYZ1234^0D^0A*64
$CRNRX,023,007,00,,,,,,,567890?:^2C -0'=/+ ^0D^0A*49
$CRNRX,023,008,00,,,,,,,ABCDEFHIJ KLMNOPQRST UVWXYZ1234^0D^0A*6A
$CRNRX,023,009,00,,,,,,,567890?:^2C -0'=/+ ^0D^0A*47
$CRNRX,023,010,00,,,,,,,ABCDEFHIJ KLMNOPQRST UVWXYZ1234^0D^0A*63
$CRNRX,023,011,00,,,,,,,567890?:^2C -0'=/+ ^0D^0A*4E
$CRNRX,023,012,00,,,,,,,ABCDEFHIJ KLMNOPQRST UVWXYZ1234^0D^0A*61
$CRNRX,023,013,00,,,,,,,567890?:^2C -0'=/+ ^0D^0A*4C
$CRNRX,023,014,00,,,,,,,ABCDEFHIJ KLMNOPQRST UVWXYZ1234^0D^0A*67
$CRNRX,023,015,00,,,,,,,567890?:^2C -0'=/+ ^0D^0A*4A
$CRNRX,023,016,00,,,,,,,ABCDEFHIJ KLMNOPQRST UVWXYZ1234^0D^0A*65
$CRNRX,023,017,00,,,,,,,567890?:^2C -0'=/+ ^0D^0A*48
$CRNRX,023,018,00,,,,,,,ABCDEFHIJ KLMNOPQRST UVWXYZ1234^0D^0A*6B
$CRNRX,023,019,00,,,,,,,567890?:^2C -0'=/+ ^0D^0A*46
$CRNRX,023,020,00,,,,,,,ABCDEFHIJ KLMNOPQRST UVWXYZ1234^0D^0A*60
$CRNRX,023,021,00,,,,,,,567890?:^2C -0'=/+ ^0D^0A*4D
$CRNRX,023,022,00,,,,,,,NNNN^0D^0A*7D
$CRNRX,023,023,00,,,,,,,STORED (CER= 00%)^0D^0A*0A

```

b) Sample output data to INS port with 6 error characters “*”.

```

$CRNRX,006,001,00,ZA01,2,,,179,6,A,-- TEST MESSAGE ERR 6/163=3.6^0D^0A*18
$CRNRX,006,002,00,,,,,,,123456^2A890ABCDEFHIJKLNO^2AQRSTU^0D^0A*5F
$CRNRX,006,003,00,,,,,,,1234567890ABCD^2AFGHIJKLMNOP^2ARSTU^0D^0A*2D
$CRNRX,006,004,00,,,,,,,1234567^2A90ABCDEFHIJKL^2ANOPQRSTU^0D^0A*4B
$CRNRX,006,005,00,,,,,,,NNNN^0D^0A*7F
$CRNRX,006,006,00,,,,,,,STORED (CER= 04%)^0D^0A*0E

```

Same message displayed sample on EUT screen or print out sample via RS-232C port

```

ZA01
-- TEST MESSAGE ERR 6/163=3.6
123456*890ABCDEFHIJKLNO*QRSTU
1234567890ABCD*FGHIJKLMNOP*RSTU
1234567*90ABCDEFHIJKL*NOPQRSTU
NNNN
STORED (CER= 04%)

```

d) ALR output data sample when receiving “A”, “B”, and “D” message

```

$CRALR,,001,A,V,NAVTEX:Navigational warning*03
$CRALR,,002,A,V,NAVTEX:Meteorological warning*0F
$CRALR,,003,A,V,NAVTEX:Search and rescue information*72
$CRALR,,006,V,A,NAVTEX:General failure -*72

```

e) NRM mask report message sample for response “\$INCRQ,NRM*3A” sentence

\$CRNRM,1,1,03FFFFFF,02200EBF*32
 \$CRNRM,2,1,03FFFFFF,02200EBF*31
 \$CRNRM,3,1,03FFFFFF,02200EBF*30
 \$CRNRM,1,2,03FFFFFF,02200EBF*31
 \$CRNRM,2,2,03FFFFFF,02200EBF*32
 \$CRNRM,3,2,03FFFFFF,02200EBF*33
 \$CRNRM,1,3,00010003,00010003*42
 \$CRNRM,2,3,00000000,00000000*41
 \$CRNRM,3,3,00000000,00000000*40

f) ACK sentence sample of alarm acknowledge control

\$INACK,001*53<CR><LF>
 \$INACK,002*50<CR><LF>
 \$INACK,003*51<CR><LF>

g) EUT report sentence sample for acknowledged Search and Rescue ALR sentence

\$CRALR,,003,A,A,NAVTEX:Search and rescue information*65

9. Erasure of message identifications/storage time

Test protocol

1. 2005 10/1 (SAT) 22:50 ZA01, YB02, XC03 message applied to EUT
2. 2005 10/4 (TUE) 9:50 59 hours passed (24h + 24h + 11h)
 Same message applied to EUT
 Messages are not receiving.
3. 20004 10/4(TUE) 12:50 61 hours passed (24h+24h +11h +2h)
 Same messages applied to EUT
 All messages are displayed on screen and IDs are stored.

10. Test equipment used.

*¹ Refer par. 8.4

LION Sound level Meter : NA-20 S/No. 66984312
 Level 27 – 130dB
 Frequency Range 31.5Hz –8000 Hz

518kHz NAVTEX Simulator : NAVTEX SIMULATOR MODEL 3502E S/No. 9401
 Frequency 517.915KHz / 518.085kHz

490kHz NAVTEX Simulator : NAVTEX SIMULATOR MODEL 3502E S/No. 94003
 Frequency 489.915kHz / 490.085kHz

11. Test Environment Condition

4 th Oct. 2005	Temperature 25.0 °C / Humidity 60%
5 th Oct. 2005	Temperature 25.8 °C / Humidity 65%
11 th Oct. 2005	Temperature 25.5 °C / Humidity 50%
17 th Oct. 2005	Temperature 27.0 °C / Humidity 54%

Compliance Checks – Manufacturer's Documentation – 1/2

Sections, paragraph numbers and front cover referred to in the list's "Supporting Information" column are those used in the NT-2000 user's manual (Operating Instructions for Model NT-2000/DEBEG 2902, UM-NT2000-7) filed with this documentation set.

IEC 61097-6 Ed. 2 FDIS, Annex D	Compliance Status	Supporting Information
nominal supply voltage and frequency	Yes	24 VDC; see paragraph (23) of section 9.
minimum and maximum supply voltage	Yes	11V (min) to 36V (max); see paragraph (23) of section 9.
how the reception and storage of new messages other than SAR messages are indicated to the user	Yes	See paragraph 1.2, and also paragraph (15) of section 9.
the memory capacity of the unit in terms of the number of 500 character long messages	Yes	200 messages; see paragraphs (16) of section 2, 3.8.1 and (18) of section 9.
whether the unit is IEC 60945 "protected" or "exposed" category	Yes	Protected; see front cover and paragraph (1) of section 9.
a list of available alarms	Yes	See section 10.
the receiver frequencies on which the unit operates	Yes	490, 518 and 4209.5 kHz; see paragraph 1.1 ① of section 1, paragraphs (2) and (9) of section 9.
a list of user settings that are non-volatile	Yes	See section 12.
whether the unit uses a source of time for handling message ageing	Yes	EUT does not use UTC to check message ageing. Time source is derived from CPU clock (24.00 MHz). See paragraphs (11) and (17) of section 9.
operating temperature range	Yes	-15 to 55° C; see paragraph (26) of section 9.
storage temperature range	Yes	-25 to 70° C; see paragraph (26) of section 9.
INS port serial interface electrical and protocol standards and settings	Yes	RS-422 with inputs optically isolated from cabinet ground. Protocol: IEC 61162-1. Port parameters are set via menu. See paragraph 4.11
printer port serial interface electrical and protocol standards and settings	Yes	RS-232C, asynchronous, ASCII characters. No hand-shaking. Port parameters are set via menu. See paragraph 4.11.
provide an overview of the NAVTEX system	Yes	See section 8.
manufacturer recommendations, if any, on periodic functional testing and maintenance	Yes	See section 6.
warranty information	Yes	See second sheet "WARRANTY" of manual.
a recommendation for mounting the unit	Yes	See paragraph 7.1.
information relating to the shipment of the unit	Yes	See section 13.
information relating to the disposal of the unit at the end of its operational life	Yes	See page iii of manual.
a list of languages supported by the user interface	Yes	English (menus, status and prompt indications)

Compliance Checks – Manufacturer's Documentation – 2/2

IEC 61097–6 Ed. 2 FDIS, Paragraph 12.2	Compliance Status	Supporting Information
● approved sentences against IEC 61162–1 and/or IEC 61162–2 and the requirements of Annex C of this standard	Yes	See paragraph 7.4.
● proprietary sentences (if any) against IEC 61162–1 and 61162–2	Yes	See paragraph 7.4.4
● transmission intervals and baud rates against IEC 61162–1 and 61162–2	Yes	Transmission is continuous for NAVTEX message outputs requested by externally fed commands via RS–422 port. See paragraph 4.11.4 for selectable baud rates. To comply with IEC 61162–1, baud rate should be fixed at 4800 baud.
● load on the line of inputs	Yes	Brief sepc. are given in paragraph (7) NOTE (3) for RS–422. See also specs. sheets of MAX 3490 attached.
● electrical isolation of input circuits	Yes	Input lines to RS–422 interface is isolated from cabinet ground by opto–isolators. See paragraph (7) NOTE (3), and also CPU board schematic.
Clearly identified interface connections, including A and B signal lines for IEC 61162 interfaces.	Yes	See Figures 7–12, 7–13 and 7–14 in paragraph 7.3.2.
Information on correct siting of antennas	Yes	See paragraph 7.2.