Jmc Japan Marina Co., Ltd.

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

Messrs Bureau Veritas:

Dear Sirs:

Application for Changes to Existing EC Type Examination Certificate

We wish to modify the software of the products listed below, which are type–approved under Certificate No. 16005/A1 EC, and hereby apply for BV's permission for the execution of the modifications detailed in the test report attached.

These modifications are to be incorporated in response to users' request that the EUT should be fully remotely controllable as a blackbox type receiver and also to improve the user interfacing and the integrity of received NAVTEX messages.

- Currently type–approved software: NT–2000 (Version 1.2), DEBEG 2902 (Version 1.2)
- Modified software version: NT–2000 (Version 1.3), DEBEG 2902 (Version 1.3)
- Additional model for type–approval: ALDEN AE–2000 (Version 1.3)

The ALDEN AE–2000 is an OEM product to be distributed in the United States by the applicant's dealer *MORCOM International, Inc. (3656 Centerview Drive, Unit #1, Chantilly, VA 20151), and is identical to the above two models in hardware and software.

The attached test report lists the types of the tests that became necessary as the results of the modifications and were conducted at the applicant's office with a BV surveyor as the witness.

Yours faithfully,

Japan Marina Co. Ltd.

H. Yoshihara

Hideaki Yoshihara, President

Documents attached:
- Test Report #T2005005–2
- Manuals for NT–2000, DEBEG 2902 and AE–2000

* 3656 Centerview Drive, Unit #1, Chantilly, VA 20151, U. S. A.
Phone: 703–263–9305, FAX: 703–263–9308. URL: www.morcom.com

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Test Report for EU Type Approval of NAVTEX Receivers with Modified Software

1. Introduction

This set of documentation is to report to Bureau Veritas (BV) a series of additional tests conducted on the EUT (Model **NT–2000** NAVTEX receiver, currently type–approved under EC Type Examination Certificate No. **16005/A1 EC**) by Japan Marina Company Ltd. (JMC) with a BV surveyor acting as the witness.

The tests were necessitated by the modifications of the original software (version 1.2) to improve user interfacing and incorporate additional related functions, as summarized below. The modified software is Version 1.3, which was installed in the EUT for the testing.

No modifications in hardware and software other than those listed in this report are made to the original EUT.

2. Reasons for Software Modifications

JMC wishes to incorporate the modifications into the NAVTEX receivers Model **NT–2000** and its OEM model **DEBEG 2902**, both type–approved under the above Certificate, in response to requests from many users who need more easy–to–use man–machine interfacing and greater flexibility in its external interface functions for the development of INS applications in which the EUT is to be operated fully remotely as a blackbox type receiver. The attached *1manuals reflect the modifications.

3. Summary of Tests and Related Information

(1)	Date and Time of Tests:	10th April, 2007, 10:00 to 16:00 local time
(2)	Test Site:	JMC's Head Office (36–2–1001 Udagawa–cho, Shibuya–ku, Tokyo 150–0042)
(3)	Test Engineer:	Hisashi ICHIKAWA, Technical Manager, JMC
(4)	Ambient Conditions:	24° C, 37% RH
(5)	Equipment under Test:	**NT–2000** Version 1.3, Serial No. 05300295
(6)	Test Instruments:	
	· NAVTEX Simulator:	8502E (518 kHz) Serial No. 9401
	· NAVTEX Simulator:	8502E (490 kHz) Serial No. 9403
	· INS Device:	PC–LG15FWT JG, (NEC LaVie) Serial No. 45000011A, Windows–XP SP2
(7)	Applicable Test Standards:	IEC 61097–6 Ed. 2 (2005–12), IEC 61162–1 2nd Ed. (2000–7) ETS 300 065, ITU–R M.540–2
(8)	Test Results:	As stated on pages 2–7 and *2check sheets of this report

Tokyo, 16th April, 2007

Tests Conducted, and Compliance with Related Standards Checked, by:

H. Ichikawa

Hisashi ICHIKAWA, Technical Manager
Japan Marina Company Ltd.

Tests Witnessed on Behalf of Bureau Veritas by:

BUREAU VERITAS SURVEYOR AT YOKOHAMA PARIS 1828 INTERNATIONAL REGISTER

Masaharu NAKAJIMA, Surveyor

*1: Operation & Installation Manual: **UM–NT2000–12**, 2nd Ed. dated January, 2007
Operation and Installation: **UM2902–V3**, 3rd Ed. dated February, 2007
INSTRUCTION MANUAL: **UM–AE2000–2.0**, 2nd Ed. dated February, 2007

*2: NT–2000 Memory Storage, Printer Port & INS Port Mask Check Sheet, pages 8–16

4. Reasons and Description of Software Modifications – 1/6

User Interface: Procedure for Selection/Rejection of Transmitters and Message Types

Related Standard:

IEC 61097–6 Ed. 2, paragraph 4.6.1.1:

There shall be a display mode that clearly shows the user which transmitter coverage areas (B_1) and message types (B_2) are currently selected for each receiver.

It shall be possible to select transmitter coverage areas (B_1) and message types (B_2) independently for message storage to non–volatile memory, for message output to the INS port and for message output to the printer port.

Software Version 1.2	Software Version 1.3	Test Results	Compliance Status
The selection of transmitters and message types for message storage and message output to the I/O ports can be made with commands from an INS device through the RS–422 port.	A user interface (submenu) is added to the existing menu system in the EUT, thereby allowing the user to manually select transmitters and message types for message storage and output to the I/O ports without using an INS device to the RS–422 port. See paragraph 4.8.2, page 4–6 of the manual.	*Visually confirmed on EUT.*	*OK*
The storage and I/O port output settings of transmitters and message types can be checked with a command from an INS device through the RS–422 port.	A user interface (submenu) is added to the menu system in the EUT, thereby allowing the user to check which transmitters and message types are currently selected for message storage and output to the I/O ports. See paragraph 4.8.2, page 4–6 of the manual for details. An example given in paragraph 7.4.3, page 7–18 shows how the current settings of message storage and I/O port output look like to the user.	*Visually confirmed on EUT.*	*OK*
Only the messages that are set to the "SELECTED" status for display and storage can be output to the I/O ports. For example, messages that are set to the "REJECTED" status for storage cannot be displayed or output to the INS device or to the printer. *NOTE: The Models **NT–900** and **DEBEG 2900**, both EC–type approved by BV, use the same message handling procedure.*	Message types can be set to the "SELECTED" status independently for display, storage and output to the I/O ports. See paragraphs 4.8.2 and 7.4.2 of the manual for details. For example, message types that are not selected for display and storage, except for types A, B, D and L, can be output to the RS–232C and RS–422 ports.	*Visually confirmed on EUT.* *Pages 8–16 of check sheet*	*OK*

4. Reasons and Description of Software Modifications – 2/6

User Interface: How To Display Received Messages

Related Standards:

IEC 61097–6 Ed. 2, paragraph 4.3.6.2:

The EUT shall not store or print messages if the received character error rate > 33%.

ETS 300 065, paragraph 3.1.10.5:

When the received character error rate exceeds $33X10^{-2}$ for more than 5 seconds, the printing of the message shall be inhibited, the message shall be considered as not correctly received, and the message identification shall not be stored in memory.

IEC 61097–6 Ed. 2, paragraph 4.6.1.1:

New search and rescue (SAR) messages shall be displayed immediately that they are received and stored, and shall cause an alarm to be set. SAR messages shall be displayed until they are acknowledged by the cancellation of the alarm. The reception and storage of new messages other than SAR messages shall be clearly indicated to the user by a method declared by the manufacturer.

Software Version 1.2	Software Version 1.3	Test Results	Compliance Status
The EUT displays a currently receiving message line by line while calculating the CER, and will not store that message if the CER (character error rate) exceeds 33%. Such a message cannot be recalled onto screen by manual scrolling.	The EUT does not display a currently receiving message and, instead, blinks an indication "**RCVNG MSG**" in the upper status line and calculates the CER as it completes the reception. Then, the EUT displays the whole message at a time if the CER is less than 33%, and does not display the message if it exceeds 33%. This message display method is described in paragraph ④, page 1–2 of the manual.	*Visually confirmed on EUT.*	*OK*
A type–D (SAR info.) message that is currently displayed will be scrolled out of the screen when a new message is received subsequently.	An unacknowledged type–D message that is currently showing will remain fixed on screen even if a new message, except a new D message, is received subsequently. If another new type–D message is received in the meantime, the previous D message will be scrolled out, allowing the new one to be displayed. See paragraph ⑦ in Section 2, page2–9, and paragraph 3.7, page 3–4, of the manual for a summary description of this function.	*Visually confirmed on EUT.*	*OK*
When a new type–D message is received on the 2nd receiver while an unacknowledged D message is still showing on the 1st receiver screen, the aural alarm will be triggered, and a warning message prompt will be displayed at the screen's bottom.	When a new type–D message is received on the 2nd receiver while an unacknowledged D message is still showing on the 1st receiver screen, the EUT will switch to the 2nd receiver screen to show and fix that message until it is acknowledged.	*Visually confirmed on EUT.*	*OK*

4. Reasons and Description of Software Modifications – 3/6

User Interface: Alarm Activation Method for Type–D Message

Related Standards:

IEC 61097–6 Ed. 2, paragraphs 4.3.6.2:
The EUT shall not store or print messages if the received character error rate > 33%.

ETS 300 065, paragraph 3.1.10.5:

When the received character error rate exceeds $33X10^{-2}$ for more than 5 seconds, the printing of the message shall be inhibited, the message shall be considered as not correctly received, and the message identification shall not be stored in memory.

Software Version 1.2	Software Version 1.3	Test Results	Compliance Status
The EUT activates the alarm (aural and visual) as soon as it starts receiving a type–D message regardless of the message's CER. *NOTE: Considering that D messages are of greatest importance in all NAVTEX messages, requiring an immediate user action, the EUT handles D messages in the manner described above.* *The Models **NT–900** and **DEBEG 2900**, both EC–type approved by BV, use the same message handling procedure.*	When the EUT starts receiving a type–D message, it waits until the CER is computed while that message is being received, and then activates the alarm if the resultant CER is equal to, or less than, 33%. The EUT remains silent and does not store the message if the CER is in excess of 33%. *NOTE: This modification was incorporated to ensure the integrity of a type–D NAVTEX message for use in INS systems when the EUT is to be used as a blackbox type receiver.*	*Visually confirmed on EUT.*	*OK*

4. Reasons and Description of Software Modifications – 4/6

Alarm Sentence Formats

Related Standard:

IEC 61097–6 Ed. 2, paragraph 4.3.9.3:

When all the alarm conditions are acknowledged (but still active), the NAVTEX receiver shall stop the output of any audible alarm indication (whether by integral sounder or by relay contacts) but shall continue to repeat the ALR sentences once every 30 seconds

When the alarm condition has returned to "healthy," an ALR sentence with the status set to "V" shall be sent out at one–minute intervals.

When there are no active alarms, the NAVTEX receiver may send out a single ALR sentence with alarm number **006** and a status of "V" once every minute as an indication that all is well

Software Version 1.2	Software Version 1.3
The EUT outputs the following single sentence at 1–minute intervals via the RS–422 port after the active alarm condition is acknowledged. $CRALR,,006,V,A,NAVTEX:General failure*72 *NOTE: The above standard does not define exactly how to handle the alarm output via the INS port after it is acknowledged.*	The EUT outputs each of the following sentences once via the RS–422 port after the active alarm condition is acknowledged. $CRALR,,001,V,A, NAVTEX: Navigational warning *03 $CRALR,,002,V,A, NAVTEX: Meteorological warning *0F $CRALR,,003,V,A, NAVTEX: Search and rescue information*72 Within one minute after acknowledgement, the EUT will output the following sentences each at 1–minute intervals via the RS–422 port. $CRALR,,001,V,V, NAVTEX: Navigational warning *14 $CRALR,,002,V,V, NAVTEX: Meteorological warning *18 $CRALR,,003,V,V, NAVTEX: Search and rescue information*65 See paragraph 7.4.5, page 7–20 of the manual for details. *NOTE: The above modification was made to meet INS applications users' request that, when operating the EUT as a blackbox–type receiver, they require a separate output sentence for each alarm type instead of the single sentence that represents all the alarm types including non–NAVTEX related alarms with local alarm numbers 051 to 099 assigned.*

Test Results	Compliance Status
Visually confirmed	*OK*

4. Reasons and Description of Software Modifications – 5/6

Alarm Acknowledgement Procedure

Related Standards:

IEC 61097–6 Ed. 2, paragraph 4.3.9.2:

Alarm messages shall be IEC 61162–1 compliant "$––ALR" sentences and shall contain the local alarm numbers and alarm text shown in the following table:

Table 1 – Alarm conditions signaled using the ALR sentence formatter

Alarm number	Alarm text
001	"NAVTEX:Navigational warning"
002	"NAVTEX:Meteorological warning
003	"NAVTEX:Search and rescue information"
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006	"NAVTEX:General failure"

IEC 61162–1 Ed. 2, paragraph 6.3:

ACK – Acknowledge alarm

Acknowledge device alarm. This sentence is used to acknowledge an alarm condition reported by a device.

$––ACK,xxx*hh<CR><LF>

└——— Local alarm number (identifier) [identification number of alarm source]

Software Version 1.2	Software Version 1.3
Sending any one of the following command sentences through the RS–422 port acknowledges the currently active condition, resetting all alarms (Navigational warning, Meteorological warning and Search–and–Rescue information). $INACK,001*53<CR><LF> $INACK,002*50<CR><LF> $INACK,003*51<CR><LF> *NOTE: The above checksum values apply when the INS device identifier is IN.*	Each active alarm can be acknowledged and reset separately using the appropriate command, like the following example command sentences below: $INACK,001*53<CR><LF> : Nav. warning $INACK,002*50<CR><LF> : Met. warning $INACK,003*51<CR><LF> : SAR information See paragraph 7.4.5, page 7–19 of the manual for details. For example, assuming that all alarms are active, if the user sends command $INACK,003*51 to acknowledge and reset the D–message alarm, the EUT will continue outputting the following sentences every 30 seconds to indicate that the rest of the alarms remain active and unacknowledged: $CRALR,,001,A,V,NAVTEX:Navigational warning*03 $CRALR,,002,A,V,NAVTEX:Meteorological warning*0F *NOTE: This modification was incorporated for INS applications users wishing to separately control the various alarm conditions when operating the EUT as a blackbox–type receiver.*
	Test Results: *Visually confirmed* — Compliance Status: *OK*

4. Reasons and Description of Software Modifications – 6/6

End–of–Message Processing Procedure

Related Standards::

IMO Resolution MSC/Circ. 112, paragraph 8 – Message format (ITU–R M.540–2, Annex 2, paragraph 3):

The format of all messages should be in strict accordance with figure 4. This defines the essential elements of the messages which influence the operation of the receiver. Great care is required to avoid errors of syntax in the groups ZCZC, $B_1B_2B_3B_4$, and NNNN as they will cause receivers to operate incorrectly, and may well result in the loss of a vital message.

Software Version 1.2	Software Version 1.3
Upon receiving the end–of–message indication NNNN at the end of a transmission, the EUT decides whether to display, and store, the message and whether to output the message to the I/O ports, depending on the calculated CER. Under actual operating conditions, there are stations sending only 2 Ns (NN) to indicate the end of transmission, or one or some of the received 4 Ns (NNNN) cannot be received or are received corrupted due to interference or unstable signal propagation. Even if the transmission ends with such an incorrectly formatted end–of–message indication, the EUT has some redundancy in its processing for the convenience of users, allowing the message to be stored and output to the I/O ports, unless the CER exceeds 33%. *NOTE: The Models **NT–900** and **DEBEG 2900**, both EC–type approved by BV, use the above processing procedure.*	Only when the end–of–message indication (NNNN) is received correctly, the EUT considers that the transmission has ended normally, and decides whether to display and store, and externally output, the message depending on the CER. If the EUT fails to receive the NNNN indication correctly, it considers that the current message transmission is still continuing with the rest of the message characters missing or mutilated, and terminates the receiving operation when the CER exceeds 33%. The EUT does not display, store, or output, such a message. However, if the EUT starts receiving the next transmission within a specified time slice, it considers that it is receiving the rest of the previous message, and decides whether to display and store, and output the two messages as a single message, depending on the CER of the two messages combined. *NOTE: This modification was incorporated to ensure the reliability of a received NAVTEX message for INS applications where the EUT is to be operated as a blackbox–type receiver.*

Test Results	Compliance Status
Visually confirmed	*OK*

5. NT-2000 Memory Storage, Printer Port & INS Port Mask Check Sheet

5.1.1 Factory default settings for 518kHz first receiver

B1	MASK Setting	MEMORY	PRINTER	INS PORT	B2	MASK Setting	MEMORY	PRINTER	INS PORT
A	1	1	1	1	A	1	1	1	1
B	1	1	1	1	B	1	1	1	1
C	1	1	1	1	C	1	1	1	1
D	1	1	1	1	D	1	1	1	1
E	1	1	1	1	E	1	1	1	1
F	1	1	1	1	F	1	1	1	1
G	1	1	1	1	G	0	0	0	0
H	1	1	1	1	H	1	1	1	1
I	1	1	1	1	I	0	0	0	0
J	1	1	1	1	J	1	1	1	1
K	1	1	1	1	K	1	1	1	1
L	1	1	1	1	L	1	1	1	1
M	1	1	1	1	M	0	0	0	0
N	1	1	1	1	N	0	0	0	0
O	1	1	1	1	O	0	0	0	0
P	1	1	1	1	P	0	0	0	0
Q	1	1	1	1	Q	0	0	0	0
R	1	1	1	1	R	0	0	0	0
S	1	1	1	1	S	0	0	0	0
T	1	1	1	1	T	0	0	0	0
U	1	1	1	1	U	0	0	0	0
V	1	1	1	1	V	1	1	1	1
W	1	1	1	1	W	0	0	0	0
X	1	1	1	1	X	0	0	0	0
Y	1	1	1	1	Y	0	0	0	0
Z	1	1	1	1	Z	1	1	1	1
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
Results	03FFFFFF	OK	ok	ok	Results	02200EBF	OK	ok	o/c

Test Date: 10th April, 2007

Tested by JMC : Hisashi ICHIKAWA H. Ichikawa

Witnessed by BV Surveyor : Masaharu NAKAJIMA M. Nakajima

5. NT-2000 Memory Storage, Printer Port & INS Port Mask Check Sheet

5.1.2 Factory default settings for 490kHz second receiver

B1	MASK Setting	MEMORY	PRINTER	INS PORT	B2	MASK Setting	MEMORY	PRINTER	INS PORT
A	1	1	1	1	A	1	1	1	1
B	1	1	1	1	B	1	1	1	1
C	1	1	1	1	C	1	1	1	1
D	1	1	1	1	D	1	1	1	1
E	1	1	1	1	E	1	1	1	1
F	1	1	1	1	F	1	1	1	1
G	1	1	1	1	G	0	0	0	0
H	1	1	1	1	H	1	1	1	1
I	1	1	1	1	I	0	0	0	0
J	1	1	1	1	J	1	1	1	1
K	1	1	1	1	K	1	1	1	1
L	1	1	1	1	L	1	1	1	1
M	1	1	1	1	M	0	0	0	0
N	1	1	1	1	N	0	0	0	0
O	1	1	1	1	O	0	0	0	0
P	1	1	1	1	P	0	0	0	0
Q	1	1	1	1	Q	0	0	0	0
R	1	1	1	1	R	0	0	0	0
S	1	1	1	1	S	0	0	0	0
T	1	1	1	1	T	0	0	0	0
U	1	1	1	1	U	0	0	0	0
V	1	1	1	1	V	1	1	1	1
W	1	1	1	1	W	0	0	0	0
X	1	1	1	1	X	0	0	0	0
Y	1	1	1	1	Y	0	0	0	0
Z	1	1	1	1	Z	1	1	1	1
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
Results	03FFFFFF	ok	ok	ok	Results	02200EBF	ok	ok	ok

Test Date: 10th April. 2007

Tested by JMC : Hisashi ICHIKAWA H. Ichikawa

Witnessed by BV Surveyor : Masaharu NAKAJIMA

5. NT-2000 Memory Storage, Printer Port & INS Port Mask Check Sheet

5.1.3. Factory default settings for 4209.5kHz second receiver

B1	MASK Setting	MEMORY	PRINTER	INS PORT	B2	MASK Setting	MEMORY	PRINTER	INS PORT
A	1	1	1	1	A	1	1	1	1
B	1	1	1	1	B	1	1	1	1
C	1	1	1	1	C	1	1	1	1
D	1	1	1	1	D	1	1	1	1
E	1	1	1	1	E	1	1	1	1
F	1	1	1	1	F	1	1	1	1
G	1	1	1	1	G	0	0	0	0
H	1	1	1	1	H	1	1	1	1
I	1	1	1	1	I	0	0	0	0
J	1	1	1	1	J	1	1	1	1
K	1	1	1	1	K	1	1	1	1
L	1	1	1	1	L	1	1	1	1
M	1	1	1	1	M	0	0	0	0
N	1	1	1	1	N	0	0	0	0
O	1	1	1	1	O	0	0	0	0
P	1	1	1	1	P	0	0	0	0
Q	1	1	1	1	Q	0	0	0	0
R	1	1	1	1	R	0	0	0	0
S	1	1	1	1	S	0	0	0	0
T	1	1	1	1	T	0	0	0	0
U	1	1	1	1	U	0	0	0	0
V	1	1	1	1	V	1	1	1	1
W	1	1	1	1	W	0	0	0	0
X	1	1	1	1	X	0	0	0	0
Y	1	1	1	1	Y	0	0	0	0
Z	1	1	1	1	Z	1	1	1	1
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
Results	03FFFFFF	OK	OK	OK	Results	02200EBF	OK	OK	OK

Test Date: 10th April, 2007

Tested by JMC : Hisashi ICHIKAWA H. Ichikawa

Witnessed by BV Surveyor : Masaharu NAKAJIMA M. Nakajima

5. NT-2000 Memory Storage, Printer Port & INS Port Mask Check Sheet

5.2.1 All station and Message type Enable setting for 518kHz first receiver

B1	MASK Setting	MEMORY	PRINTER	INS PORT	B2	MASK Setting	MEMORY	PRINTER	INS PORT
A	1	1	1	1	A	1	1	1	1
B	1	1	1	1	B	1	1	1	1
C	1	1	1	1	C	1	1	1	1
D	1	1	1	1	D	1	1	1	1
E	1	1	1	1	E	1	1	1	1
F	1	1	1	1	F	1	1	1	1
G	1	1	1	1	G	1	1	1	1
H	1	1	1	1	H	1	1	1	1
I	1	1	1	1	I	1	1	1	1
J	1	1	1	1	J	1	1	1	1
K	1	1	1	1	K	1	1	1	1
L	1	1	1	1	L	1	1	1	1
M	1	1	1	1	M	1	1	1	1
N	1	1	1	1	N	1	1	1	1
O	1	1	1	1	O	1	1	1	1
P	1	1	1	1	P	1	1	1	1
Q	1	1	1	1	Q	1	1	1	1
R	1	1	1	1	R	1	1	1	1
S	1	1	1	1	S	1	1	1	1
T	1	1	1	1	T	1	1	1	1
U	1	1	1	1	U	1	1	1	1
V	1	1	1	1	V	1	1	1	1
W	1	1	1	1	W	1	1	1	1
X	1	1	1	1	X	1	1	1	1
Y	1	1	1	1	Y	1	1	1	1
Z	1	1	1	1	Z	1	1	1	1
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
Results	03FFFFFF	OK	OK	OK	Results	03FFFFFF	OK	OK	OK

Test Date: 10th April, 2007

Tested by JMC : Hisashi ICHIKAWA H. Ichikawa

Witnessed by BV Surveyor : Masaharu NAKAJIMA M. Nakajima

5. NT-2000 Memory Storage, Printer Port & INS Port Mask Check Sheet

5.2.2 All station and Message type Enable setting for 490kHz second receiver

B1	MASK Setting	MEMORY	PRINTER	INS PORT	B2	MASK Setting	MEMORY	PRINTER	INS PORT
A	1	1	1	1	A	1	1	1	1
B	1	1	1	1	B	1	1	1	1
C	1	1	1	1	C	1	1	1	1
D	1	1	1	1	D	1	1	1	1
E	1	1	1	1	E	1	1	1	1
F	1	1	1	1	F	1	1	1	1
G	1	1	1	1	G	1	1	1	1
H	1	1	1	1	H	1	1	1	1
I	1	1	1	1	I	1	1	1	1
J	1	1	1	1	J	1	1	1	1
K	1	1	1	1	K	1	1	1	1
L	1	1	1	1	L	1	1	1	1
M	1	1	1	1	M	1	1	1	1
N	1	1	1	1	N	1	1	1	1
O	1	1	1	1	O	1	1	1	1
P	1	1	1	1	P	1	1	1	1
Q	1	1	1	1	Q	1	1	1	1
R	1	1	1	1	R	1	1	1	1
S	1	1	1	1	S	1	1	1	1
T	1	1	1	1	T	1	1	1	1
U	1	1	1	1	U	1	1	1	1
V	1	1	1	1	V	1	1	1	1
W	1	1	1	1	W	1	1	1	1
X	1	1	1	1	X	1	1	1	1
Y	1	1	1	1	Y	1	1	1	1
Z	1	1	1	1	Z	1	1	1	1
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
Results	03FFFFFF	ok	ok	ok	Results	03FFFFFF	ok	ok	ok

Test Date: 10th April, 2007

Tested by JMC : Hisashi ICHIKAWA H. Ichikawa

Witnessed by BV Surveyor: Masaharu NAKAJIMA

5. NT-2000 Memory Storage, Printer Port & INS Port Mask Check Sheet

5.2.3. All station and Message type Enable setting for 4209.5kHz second receiver

B1	MASK Setting	MEMORY	PRINTER	INS PORT	B2	MASK Setting	MEMORY	PRINTER	INS PORT
A	1	1	1	1	A	1	1	1	1
B	1	1	1	1	B	1	1	1	1
C	1	1	1	1	C	1	1	1	1
D	1	1	1	1	D	1	1	1	1
E	1	1	1	1	E	1	1	1	1
F	1	1	1	1	F	1	1	1	1
G	1	1	1	1	G	1	1	1	1
H	1	1	1	1	H	1	1	1	1
I	1	1	1	1	I	1	1	1	1
J	1	1	1	1	J	1	1	1	1
K	1	1	1	1	K	1	1	1	1
L	1	1	1	1	L	1	1	1	1
M	1	1	1	1	M	1	1	1	1
N	1	1	1	1	N	1	1	1	1
O	1	1	1	1	O	1	1	1	1
P	1	1	1	1	P	1	1	1	1
Q	1	1	1	1	Q	1	1	1	1
R	1	1	1	1	R	1	1	1	1
S	1	1	1	1	S	1	1	1	1
T	1	1	1	1	T	1	1	1	1
U	1	1	1	1	U	1	1	1	1
V	1	1	1	1	V	1	1	1	1
W	1	1	1	1	W	1	1	1	1
X	1	1	1	1	X	1	1	1	1
Y	1	1	1	1	Y	1	1	1	1
Z	1	1	1	1	Z	1	1	1	1
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
Results	03FFFFFF	OK	OK	OK	Results	03FFFFFF	OK	OK	OK

Test Date: 10th April. 2007

Tested by JMC : Hisashi ICHIKAWA

Witnessed by BV Surveyor : Masaharu NAKAJIMA

5. NT-2000 Memory Storage, Printer Port & INS Port Mask Check Sheet

5.3.1. All Message type disable setting for 518kHz first receiver

B1	MASK Setting	MEMORY	PRINTER	INS PORT	B2	MASK Setting	MEMORY	PRINTER	INS PORT
A	1	1	1	1	A	0	1	1	1
B	1	1	1	1	B	0	1	1	1
C	1	1	1	1	C	0	0	0	0
D	1	1	1	1	D	0	1	1	1
E	1	1	1	1	E	0	0	0	0
F	1	1	1	1	F	0	0	0	0
G	1	1	1	1	G	0	0	0	0
H	1	1	1	1	H	0	0	0	0
I	1	1	1	1	I	0	0	0	0
J	1	1	1	1	J	0	0	0	0
K	1	1	1	1	K	0	0	0	0
L	1	1	1	1	L	0	1	1	1
M	1	1	1	1	M	0	0	0	0
N	1	1	1	1	N	0	0	0	0
O	1	1	1	1	O	0	0	0	0
P	1	1	1	1	P	0	0	0	0
Q	1	1	1	1	Q	0	0	0	0
R	1	1	1	1	R	0	0	0	0
S	1	1	1	1	S	0	0	0	0
T	1	1	1	1	T	0	0	0	0
U	1	1	1	1	U	0	0	0	0
V	1	1	1	1	V	0	0	0	0
W	1	1	1	1	W	0	0	0	0
X	1	1	1	1	X	0	0	0	0
Y	1	1	1	1	Y	0	0	0	0
Z	1	1	1	1	Z	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
Results	03FFFFFF	OK	OK	OK	Results	0000080B	OK	OK	OK

Test Date: 10th April, 2007

Tested by JMC : Hisashi ICHIKAWA H. Ichikawa

Witnessed by BV Surveyor : Masaharu NAKAJIMA

5. NT-2000 Memory Storage, Printer Port & INS Port Mask Check Sheet

5.3.2. All Message type disable setting for 490kHz second receiver

B1	MASK Setting	MEMORY	PRINTER	INS PORT	B2	MASK Setting	MEMORY	PRINTER	INS PORT
A	1	1	1	1	A	0	1	1	1
B	1	1	1	1	B	0	1	1	1
C	1	1	1	1	C	0	0	0	0
D	1	1	1	1	D	0	1	1	1
E	1	1	1	1	E	0	0	0	0
F	1	1	1	1	F	0	0	0	0
G	1	1	1	1	G	0	0	0	0
H	1	1	1	1	H	0	0	0	0
I	1	1	1	1	I	0	0	0	0
J	1	1	1	1	J	0	0	0	0
K	1	1	1	1	K	0	0	0	0
L	1	1	1	1	L	0	1	1	1
M	1	1	1	1	M	0	0	0	0
N	1	1	1	1	N	0	0	0	0
O	1	1	1	1	O	0	0	0	0
P	1	1	1	1	P	0	0	0	0
Q	1	1	1	1	Q	0	0	0	0
R	1	1	1	1	R	0	0	0	0
S	1	1	1	1	S	0	0	0	0
T	1	1	1	1	T	0	0	0	0
U	1	1	1	1	U	0	0	0	0
V	1	1	1	1	V	0	0	0	0
W	1	1	1	1	W	0	0	0	0
X	1	1	1	1	X	0	0	0	0
Y	1	1	1	1	Y	0	0	0	0
Z	1	1	1	1	Z	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
Results	03FFFFFF	OK	ok	ok	Results	0000080B	OK	OK	OK

Test Date: 10th April, 2007

Tested by JMC : Hisashi ICHIKAWA H. Ichikawa

Witnessed by BV Surveyor : Masaharu NAKAJIMA M. Nakajima

5. NT-2000 Memory Storage, Printer Port & INS Port Mask Check Sheet

5.3.3. All Message type disable setting for 4209.5kHz second receiver

B1	MASK Setting	MEMORY	PRINTER	INS PORT	B2	MASK Setting	MEMORY	PRINTER	INS PORT
A	1	1	1	1	A	0	1	1	1
B	1	1	1	1	B	0	1	1	1
C	1	1	1	1	C	0	0	0	0
D	1	1	1	1	D	0	1	1	1
E	1	1	1	1	E	0	0	0	0
F	1	1	1	1	F	0	0	0	0
G	1	1	1	1	G	0	0	0	0
H	1	1	1	1	H	0	0	0	0
I	1	1	1	1	I	0	0	0	0
J	1	1	1	1	J	0	0	0	0
K	1	1	1	1	K	0	0	0	0
L	1	1	1	1	L	0	1	1	1
M	1	1	1	1	M	0	0	0	0
N	1	1	1	1	N	0	0	0	0
O	1	1	1	1	O	0	0	0	0
P	1	1	1	1	P	0	0	0	0
Q	1	1	1	1	Q	0	0	0	0
R	1	1	1	1	R	0	0	0	0
S	1	1	1	1	S	0	0	0	0
T	1	1	1	1	T	0	0	0	0
U	1	1	1	1	U	0	0	0	0
V	1	1	1	1	V	0	0	0	0
W	1	1	1	1	W	0	0	0	0
X	1	1	1	1	X	0	0	0	0
Y	1	1	1	1	Y	0	0	0	0
Z	1	1	1	1	Z	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
–	0	0	0	0	–	0	0	0	0
Results	03FFFFFF	OK	OK	OK	Results	0000080B	OK	OK	OK

Test Date: 10th April, 2007

Tested by JMC : Hisashi ICHIKAWA H. Ichikawa

Witnessed by BV Surveyor : Masaharu NAKAJIMA

Environmental Tests Report
For
NAVTEX Receiver Model NT–2000 (DEBEG 2902)

Date: June 6, 2005

1. Introduction

This report is compiled from the results of the environmental tests conducted for the EUT (NAVTEX Receiver Model NT–2000, OEM Model DEBEG 2902, manufactured for Japan Marina Co. Ltd. by Nippon Alpha Electric Co. Ltd.) in accordance with the relevant IEC 60945 (2002) test specifications at the test facilities of the Yaita Factory of TOKIMEC Inc. during the period 18th to 24th May, 2005 by Mr. *[1]Minoru Isobe, Mr. *[2]Takao Hashimoto, and Mr. *[3]Hisashi Ichikawa under the instructions of Bureau Veritas, and also under the supervision of *[4]qualified engineers from TOKIMEC's Quality Assurance Department, and consists of the following sections:

- Test Results (Section 2)
- Dry heat test (Section 3, as per IEC 60945 paragraphs 8.2.2 and 7.1)
- Low temperature test (Section 4, as per IEC 60945 paragraphs 8.4.2.4 and 7.1)
- Damp heat test (Section 5, as per IEC 60945 paragraph 8.3.1.2)
- Vibration test (Section 6, as per IEC 60945 paragraph 8.7.2)
- Appendix (Section 7)
  - List of Equipment & Test instruments Used
  - TOKIMEC Qualified Quality Control Engineers

*[1]: Assembly line engineer, Nippon Alpha Electric Co. Ltd.
*[2]: Consultant engineer, Japan Marina Co. Ltd. (JMC)
*[3]: Technical manager, Japan Marina Co. Ltd. (JMC)
*[4]: Listed in paragraph 7.2 of this report.

2. Test Results

The results of the tests are summarized in Table 2–1 below. Details of each test are given in the sections listed in the **Test Details** column of the table.

Table 2-1 Environmental Test Results

EUT	Type of Test	Test Method (IEC 60945 – 2002) Paragraph #	Results		Test Details
			Normal Power	Extreme Power	
NT–2000 (DEBEG 2902) Serial Number: S-003	Dry heat	8.2.2 & 7.1	Passed	Passed	Section 3
	Low temperature	8.4.2.4	Passed		Section 4
	Damp heat	8.3.1.2 & 7.1	Passed	Passed	Section 5
	Vibration	8.7.2	Passed		Section 6

3. Dry Heat Test

The dry heat test of the EUT was conducted on 18th through 19th May 2005 by Mr. *[1]M. Isobe and Mr. *[2]T. Hashimoto in accordance with the method of test defined in paragraph 8.2.2. The temperature was program–controlled to vary automatically in the specified manner as illustrated in Figure 3–1 below. The actual control record is given in Figure 3–2.

18th May

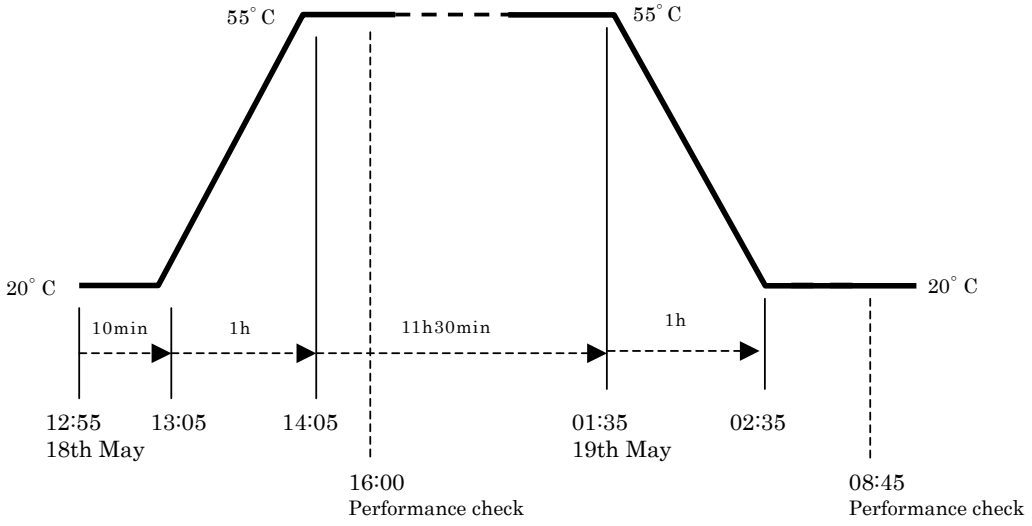
- 08:45 – 09:45: EUT (NT–2000/DEBEG 2902) performance checked
- 12:55 – 13:05: Chamber switched on and maintained at +20° C
- 13:05 – 14:05: Chamber temperature raised to +55° C
- 14:05: Chamber temperature maintained at +55° C (till 01:35 19th May)
- 16:00: Performance was checked visually and with calibrated simulators. No sign of external damage or malfunction was observed, as in photo Figure 3–3. The sensitivity measured met JMC's *[7]test standards at both 518 kHz and 490 kHz. These results were confirmed in the presence of Mr. *[4]Tomoaki Tsurubuchi.

19th May

- 01:35 – 02:35: Chamber temperature lowed to +20° C
- 02:35 – 08:45: Chamber maintained at +20° C
- 08:45: Performance was checked visually and with calibrated simulators. No sign of external damage or malfunction was observed. The sensitivity met JMC's *[7]test standards at both 518 kHz and 490 kHz. The DC input voltage was also changed from –15% to +30% of the nominal voltage (24 VDC) during the check, and no performance degradation was observed as in the photos in Figure 3–4. These results were confirmed in the presence of Mr. *[4]Tsurubuchi and Mr. *[4]Shigeru Nanbu.

*[7]: Error–free message reception for 0 to –4 dBμ RF input to antenna connector from each NAVTEX simulator

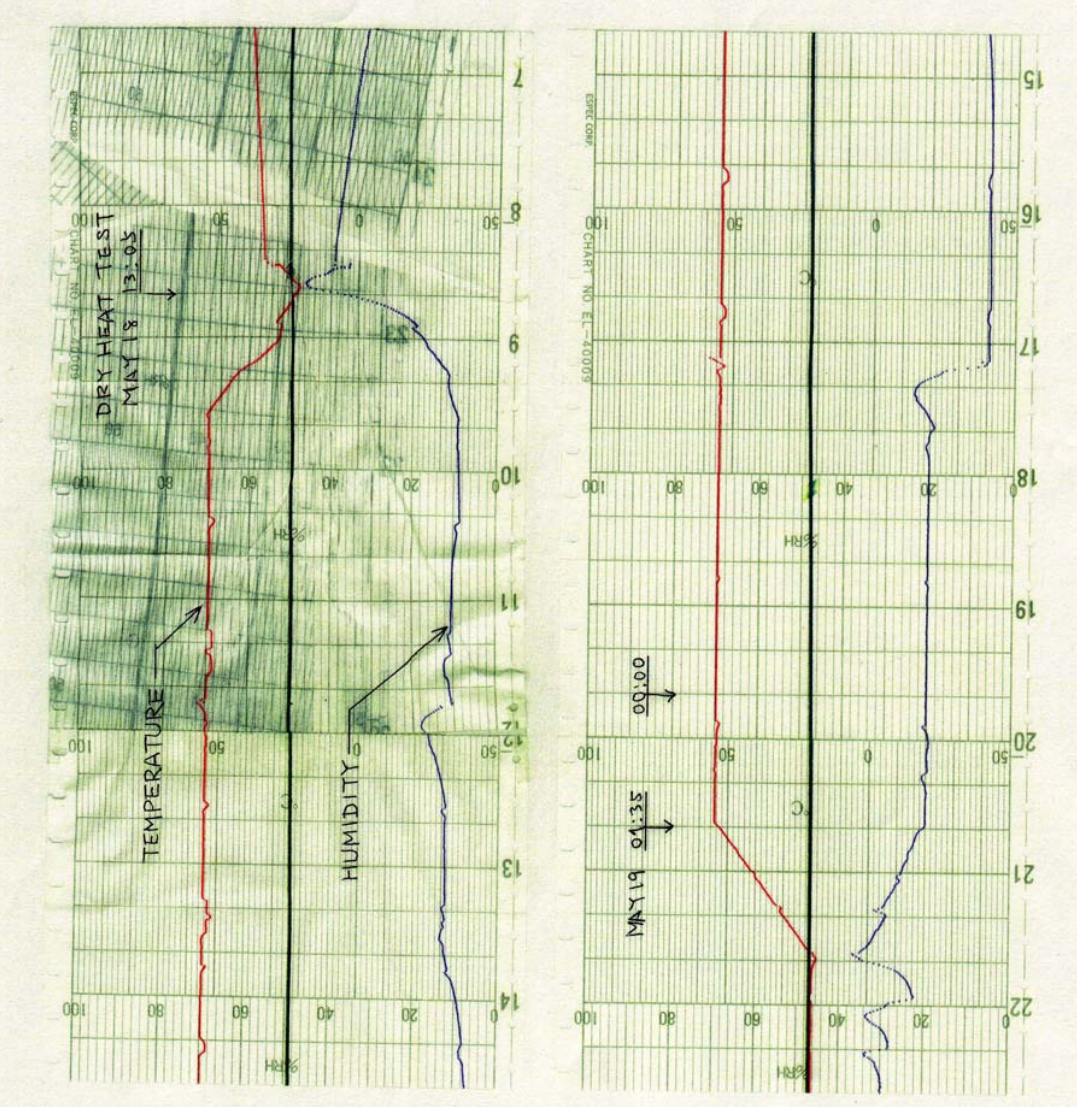
Figure 3-1 Chamber Temperature Control (Programmed) for Dry Heat Test



(*Continued on next page*)

3. Dry Heat Test (*continued – 2/3*)

Figure 3-2 Temperature Control Record for Dry Heat Test

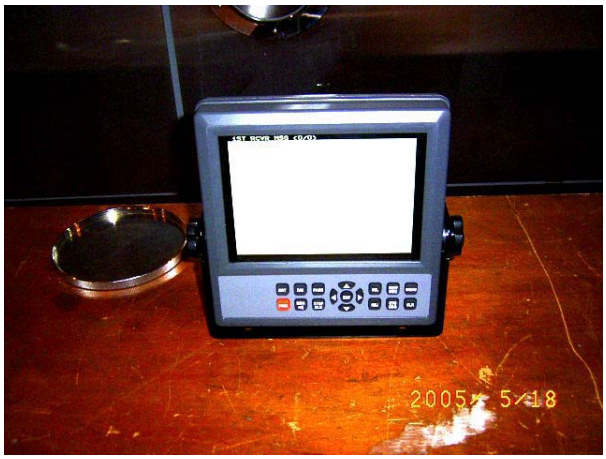


The red line represents the temperature control record from the start to the end of the dry heat test. The blue line shows the humidity record, and the thick black line in the center is the room temperature record outside the test chamber.

(*Continued on next page*)

3. Dry Heat Test (*continued – 3/3*)

Figure 3-3 EUT Performance Check at 16:00, May 18th during Dry Heat Test



The picture at right was taken inside the chamber with the test in progress. The receiver in use in the picture was the first receiver (518 kHz).

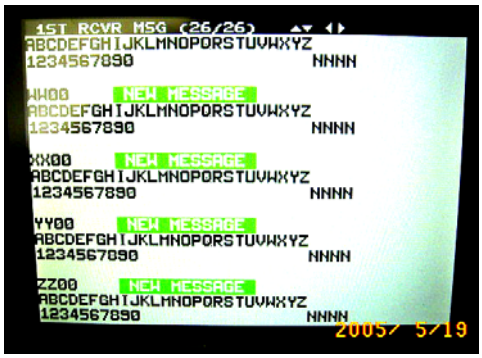
The NAVTEX simulators were plugged in from outside the chamber through a cable passage hole. Test parameters (RF signal level, message type, power supply voltage, etc.) were set from the test instruments located outside the chamber.

The EUT was then showing only one line on the message screen, but this was not a sign of trouble or of performance degradation. After completion of this check, it was learned from the EUT software design engineer that a wrong output from the simulator had been fed to the antenna connector so that only one line showed up on the screen. This problem was corrected for the rest of the test period.

A similar LCD screen was obtained when the EUT was switched to 490 kHz.

Figure **3-4** Performance Checks on Completion of Dry Heat Test, 19th May

1st Receiver Message Screen 08:45



2nd Receiver Message Screen 08:45

The above photos show normal EUT performance obtained on completion of the dry heat test at 08:45 on 19th May, 2005.

4. Low Temperature Test

4.1. Introduction

The low temperature test of the EUT was conducted twice, first on 19th through 20th May by Mr. *1M. Isobe and Mr. *2T. Hashimoto just after completion of the dry heat test, and then on 23rd through 24th May by Mr. *3H. Ichikawa and Mr. Hashimoto and partly in the presence of Mr. T. Kano from Bureau Veritas (BV) on 24th May, in accordance with the method of test defined in paragraph 8.4.2.4 of IEC 60945. The second test was carried out at the request of Mr. T. Kano, who wanted to see the rest results himself. The temperature was program–controlled to vary automatically in the specified manner, as illustrated in Figures 4–1 (first test) and 4–3 (second test). The actual temperature control record of the first test is given in Figure 4–2.

4.2. First Test Details

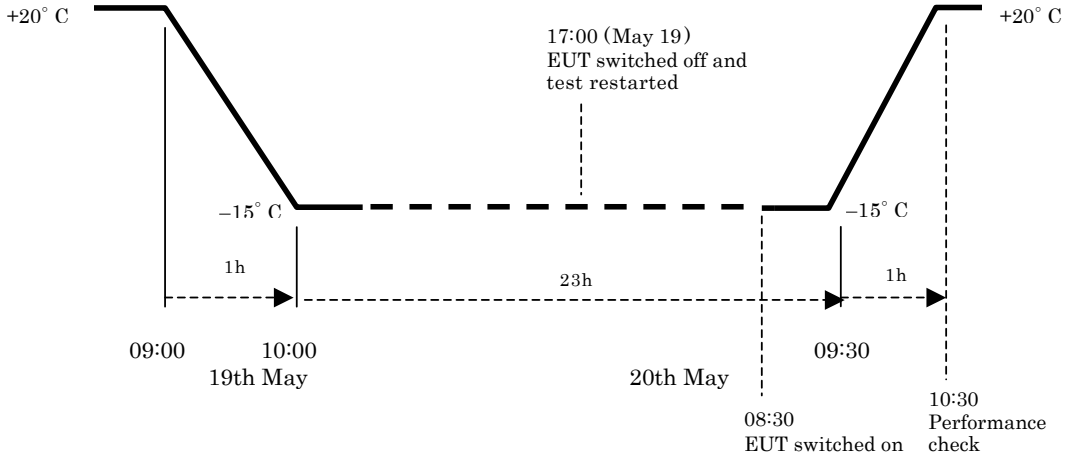
19th May

- 09:00 – 10:00: Chamber temperature lowed to –15° C
- 10:00 – 17:00: Chamber temperature maintained at –15° C
- 17:00: It was found by Mr. *4S. Nanbu that the EUT had been mistakenly switched on since the start of the test. The EUT was switched off, and the test was restarted.
- 17:00 – 09:00: Chamber temperature maintained at –15° C

20th May

- 08:30: EUT was switched on inside the test chamber, and started up correctly with no sign of malfunction on the LCD. This check was made in the presence of Mr. *4T. Tsurubuchi.
- 09:30 – 10:30: Chamber temperature raised to +20° C
- 10:30: EUT performance was checked visually and with calibrated simulators, and also by changing the DC input voltage from –15% to +30% of the nominal voltage (24V). No sign of external damage or malfunction was observed, except for a slightly decreased bright–ness due to the temperature characteristics of the fluorescent LCD backlight. The brightness returned to its normal level after the test The sensitivity met the *7test standards at both 518 and 490 kHz. Those checks were made in the presence of Mr. *4T. Tsurubuchi.

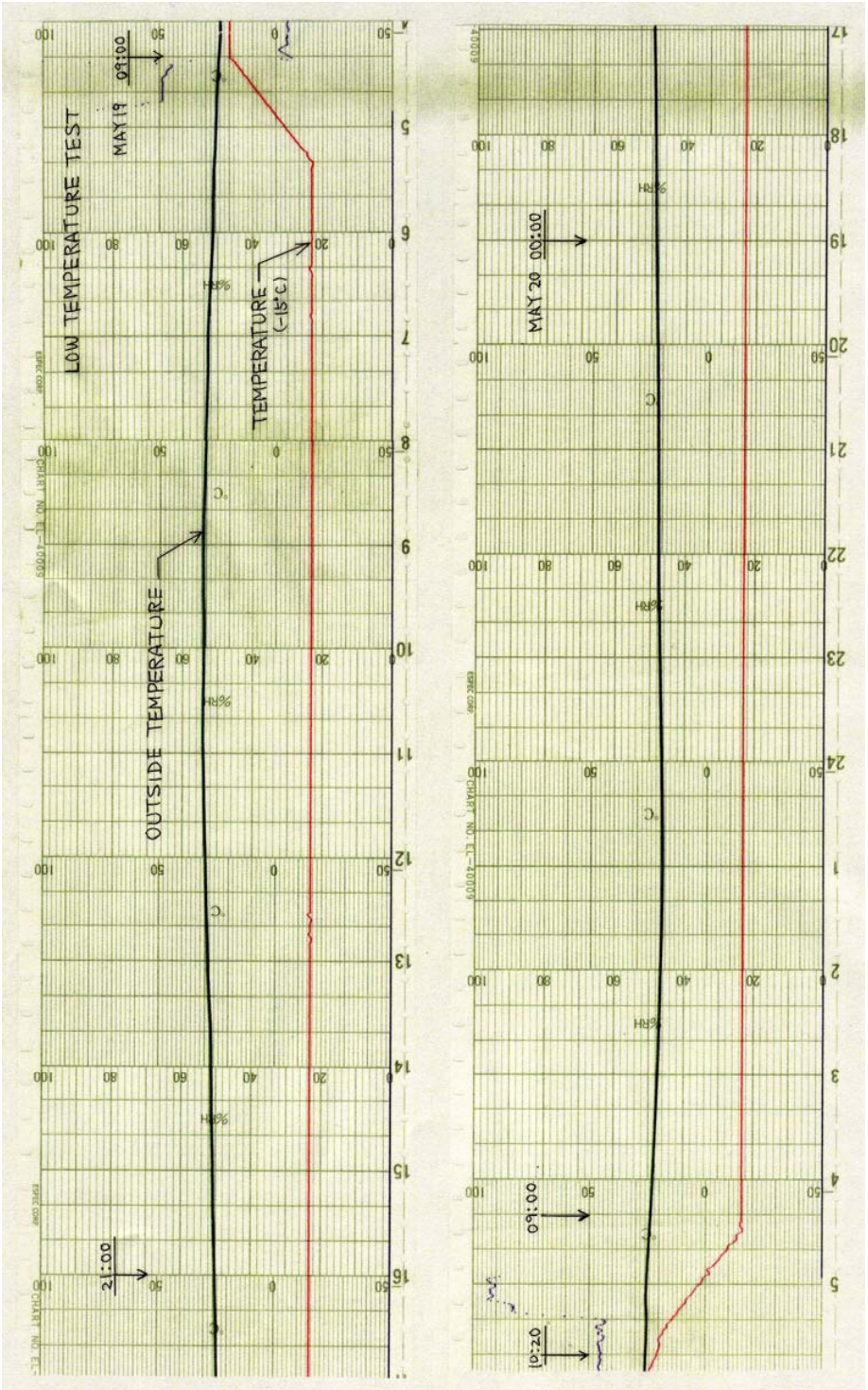
Figure 4-1 Chamber Temperature Control (Programmed) for Low Temperature Test – 1



(*Continued on next page*)

4. Low Temperature Test (*continued –2/4*)

Figure 4-2 Temperature Control Record for First Low Temperature Test



(*Continued on next page*)

4. Low Temperature Test (*continued –4/4*)

4.3. Second Test Details

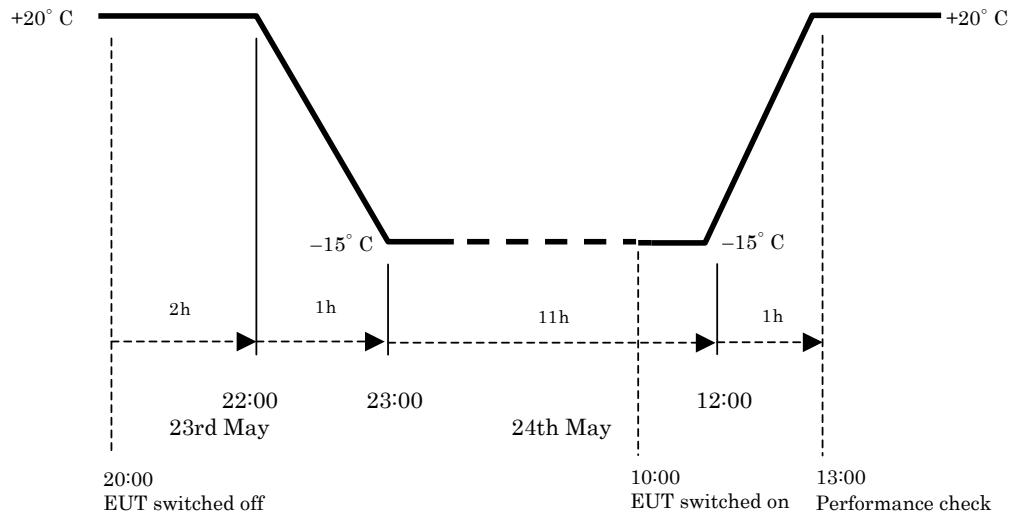
23rd May

- 20:00: EUT was switched off after confirmation of its correct performance.
- 22:00 – 23:00: Chamber temperature lowed to –15° C
- 23:00 – 10:00: Chamber temperature maintained at –15° C

24th May

- 10:00: EUT was switched on, and started up correctly with no sign of malfunction on the LCD. This was confirmed by Mr. T. Kano, BV.
- 12:00 – 13:00: Chamber temperature raised to +20° C
- 13:00: EUT performance was checked visually and with calibrated simulators, and also by changing the DC input voltage from –15% to +30% of the nominal voltage (24V). No sign of external damage or malfunction was observed, except for a slightly decreased screen brightness due to the low temperature characteristics of the fluorescent lamp used for the LCD backlighting. The brightness returned to its normal level after the test The sensitivity met the *[7]test standards at both 518 kHz and 490 kHz. These results were confirmed by Mr. Kano, BV.

Figure 4-3 Chamber Temperature Control (Programmed) for Low Temperature Test – 2



Photographing of the EUT to show the test in progress or test results was omitted due to:

(1) personal inspection and confirmation of proper startup inside the chamber (at 10:00) and performance checks (at 13:00) by Mr. Kano, BV. and

(2) the possibility of internal condensation that might damage the EUT's electronics before the temperature was restored to 20° C.

5. Damp Heat Test

The damp heat test of the EUT was conducted on 20th through 21st May, 2005 by Mr. *[1]M. Isobe, Mr. *[3]H. Ichikawa and Mr. *[2]T. Hashimoto, under the supervision of Mr. *[4]T. Tsurubuchi and Mr. *[4]S. Nanbu, in accordance with the method of test defined in paragraph 8.3.1.2 of IEC 60945. The temperature and humidity were program–controlled to vary automatically in the specified manner, as illustrated in Figures 5–1 and 5–2. The actual control record is given in Figure 5–6. After the chamber was shut off automatically at the conclusion of the humidity and temperature control cycle, the EUT was kept switched on in its operating condition until 16:21, 23rd May due to factory closure on 21st (Saturday) and 22nd (Sunday) May. Given below are the results of the damp heat test.

20th May to 21st May

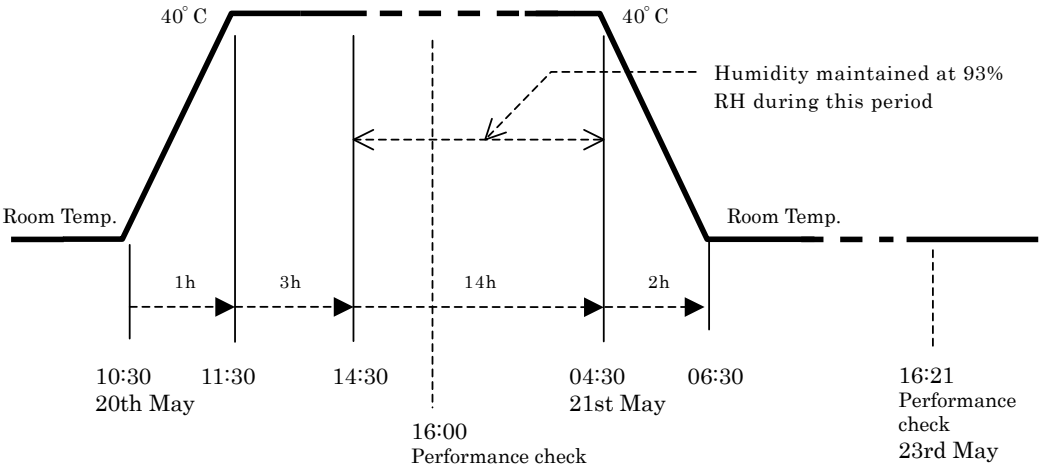
- 10:30 – 11:30: Chamber temperature raised to 40°C from room temperature
- 10:30 – 13:30: Chamber humidity raised to 93%
- 14:30 – 02:30: Temperature & humidity maintained as per IEC test specs.
- 16:00: EUT performance was checked visually (Figure 5–3) and with calibrated simulators. No sign of external damage or malfunction was observed. The receiver sensitivity was measured at both 518 kHz and 490 kHz in the presence of Mr. *[4]S. Nanbu and met JMC's *[7]test standards.
- 02:30 – 04:30: Chamber humidity lowered to room humidity (approx. 40%)
- 04:30 – 06:30: Chamber temperature lowered to room temperature

21st to 23rd May: EUT kept switched on (due to weekend/Sunday test facility closures)

23rd May

- 16:21: EUT performance was checked visually and with calibrated simulators, and also by changing the DC input voltage from –15% to +30% of the nominal voltage (24V). No sign of external damage or malfunction was observed (Figure 5–4). The sensitivity measured met JMC's *[7]test standards at both 518 kHz and 490 kHz. These results were checked in the presence of Mr. *[4]T. Tsurubuchi.

Figure 5-1 Chamber Temperature Control (Programmed) for Damp Heat Test



(*Continued on next page*)

5. Damp Heat Test (*continued – 2/3*)

Figure 5-2 Chamber Humidity Control (Programmed) for Damp Heat Test

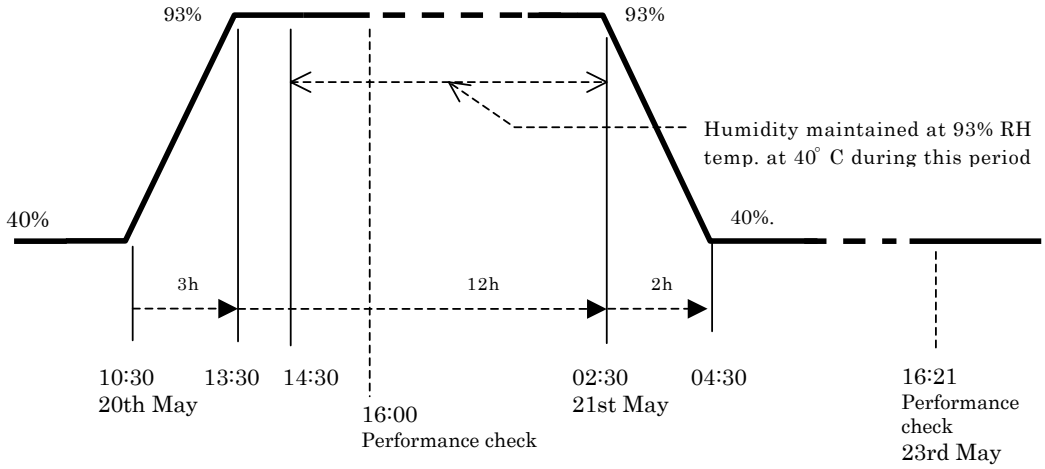
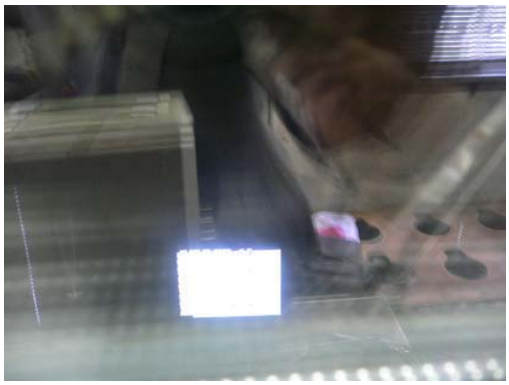


Figure 5-3 Checking EUT Performance during Damp Heat Test, 20th May

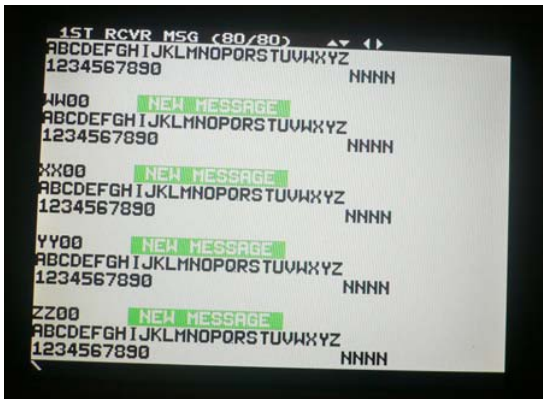
EUT Performance Visually Checked at 16:00 via Chamber's Observation Window



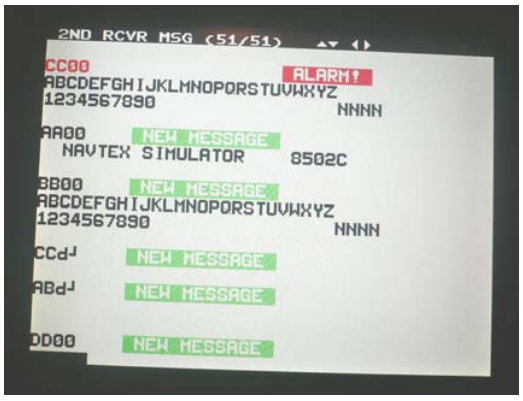
Setting Simulator Output Level for Receiver Sensitivity Checks at 15:58

Figure 5-4 Performance Checks after Completion of Damp Heat Test 23rd May

1st Receiver Message Screen 16:21

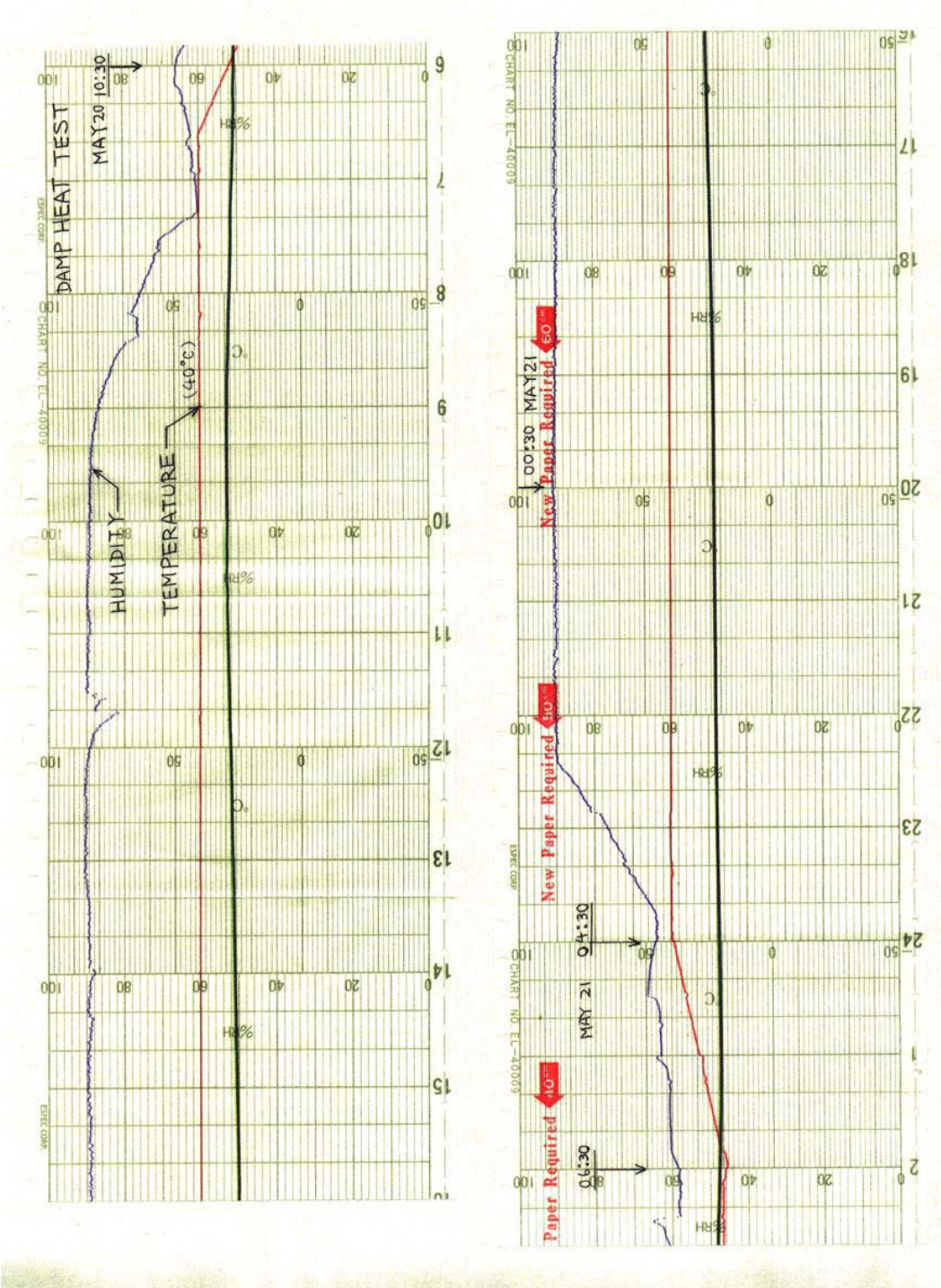


2nd Receiver Message Screen 16:23



5. Damp Heat Test (*continued – 3/3*)

Figure 5-5 Temperature and Humidity Control Record for Damp Heat Test



6. Vibration Tests

6.1. Introduction

The vibration tests of the EUT were conducted on 24th May, 2005 by Mr. H. Ichikawa and Mr. T. Hashimoto, under the supervision of Mr. *4T. Tsurubuchi and Mr. *4Tomokazu Ishii and in the presence of Mr. T. Kano, BV, in accordance with the method of test defined in paragraph 8.7.2 of IEC 60945.

For description of the test procedure, the vibration axes are defined as follows:

- Axis X: Vibration in lengthwise direction of EUT cabinet and mounting bracket in horizontal plane (Figure 6–7)
- Axis Y: Vibration perpendicular to axis X in horizontal plane (Figure 6–8)
- Axis Z: Vibration vertical to slip table in vertical plane (Figure 6–9)

6.2. Vibration Test – Axis X (Figures 6–1 and 6–2)

- 10:20: Sweep started and resonance detected at approx. 54 Hz with approx. 11.8G of acceleration.
- 11:45 – 13:45: Continuous vibration at resonant frequency (54 Hz/11.8G).
- 12:50: Performance checked. No sign of external damage was observed, and the sensitivity measured with the test in progress met JMC's *7test standards at both 518 kHz and 490 kHz. These results were checked in the presence of Mr. T. Kano, BV.
- 13:46: Test completed. The sensitivity was checked again (Figure 6–10), and met the standard. The result was also confirmed by Mr. Kano.

6.3. Vibration Test – Axis Y (Figures 6–3 and 6–4)

- 14:05: Sweep started, and resonance detected at approx. 56.5 Hz with approx. 5G of acceleration.
- 14:10–16:10: Continuous vibration at resonant frequency (56.5 Hz/5G)
- 15:40: Performance checked with the test in progress (Figure 6–11). No sign of external damage was observed, and the sensitivity met JMC's *7test standards at both 518 kHz and 490 kHz. These results were confirmed in the presence of Mr. T. Kano, BV.
- 16:10: Test completed. The sensitivity was checked again, and met the standard. The result was also confirmed by Mr. Kano.

6.4. Vibration Test – Axis Z (Figures 6–5 and 6–6)

- 16:38: Sweep started, and no resonance detected up to 100 Hz.
- 16:50–18:50: Test continued at 30 Hz with acceleration of 0.7 m/s^2.
- 17:50: Performance checked with the test in progress (Figure 6–12). No sign of external damage was observed, and the sensitivity met JMC's test standards at both 518 kHz and 490 kHz. These results were checked in the presence of Mr. T. Kano, BV.
- 18:34: Performance checked with the test in progress (Figure 6–12). The results were the same as above.
- 18:50: Test completed. EUT was checked by Mr. *8K. Kato and its normal performance was confirmed by Mr. Kano.

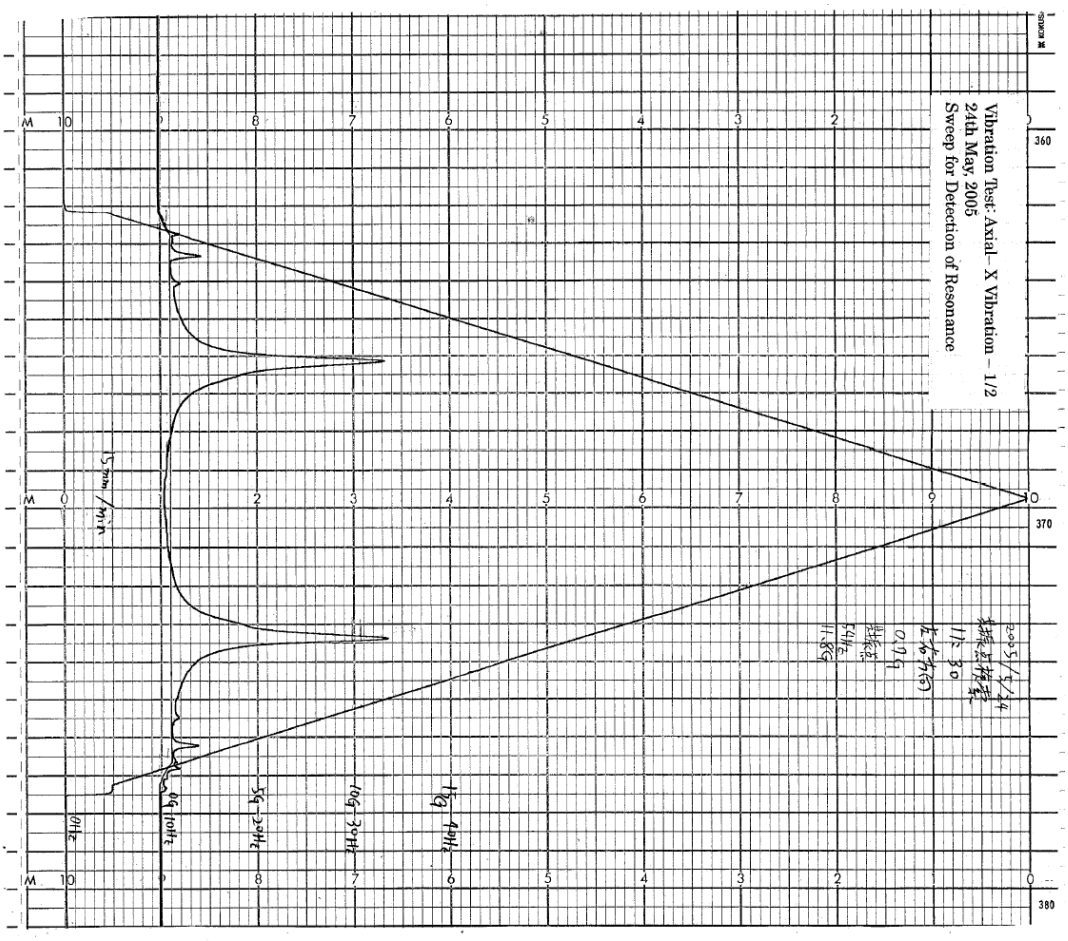
*8: Factory Manager, Nippon Alpha Electric Co. Ltd.

(*Continued on next page*)

6. Vibration Test (*continued – 2/10*)

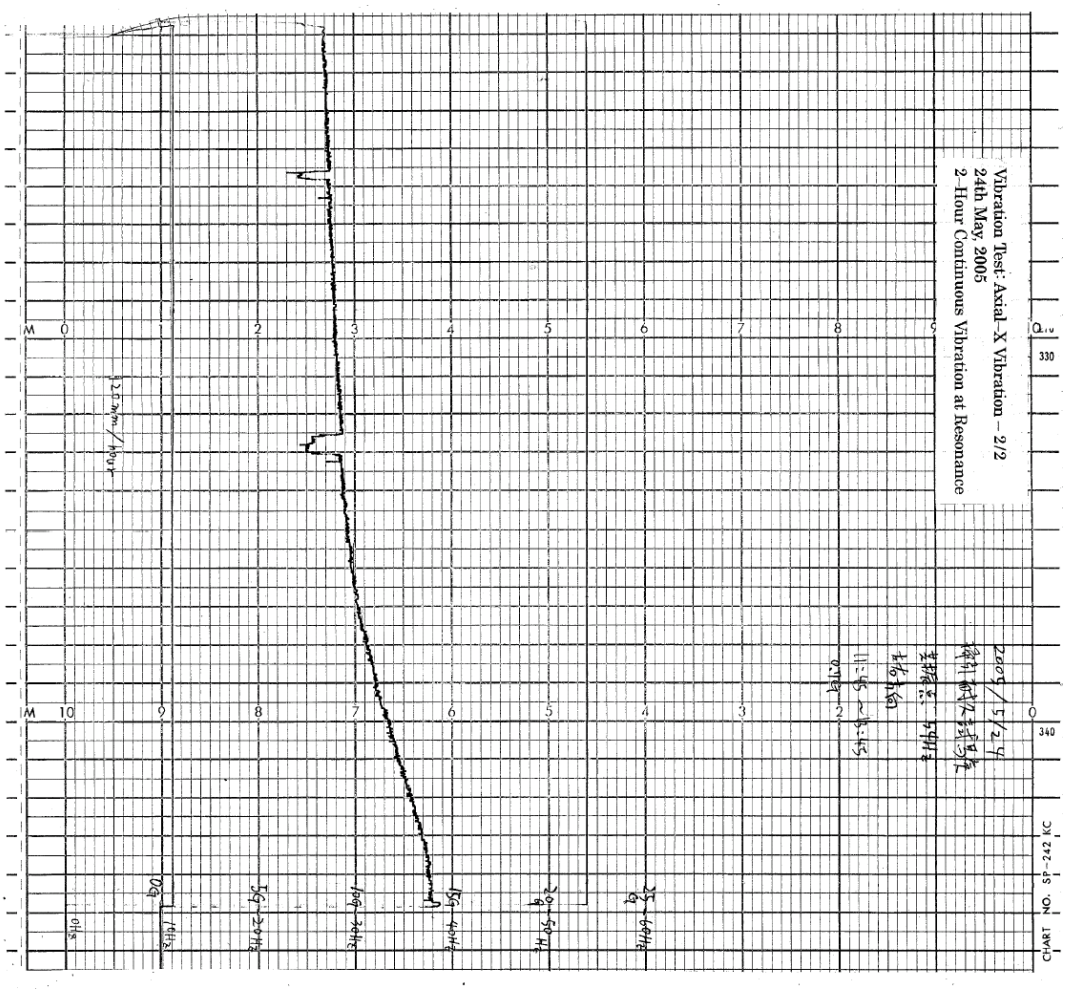
Figure 6-1 Detection of Resonance during Axial–X Vibration

The figure below shows that the EUT became resonant at approx. 54 Hz with an acceleration of approx. 11.8G.



6. Vibration Test (*continued – 3/10*)

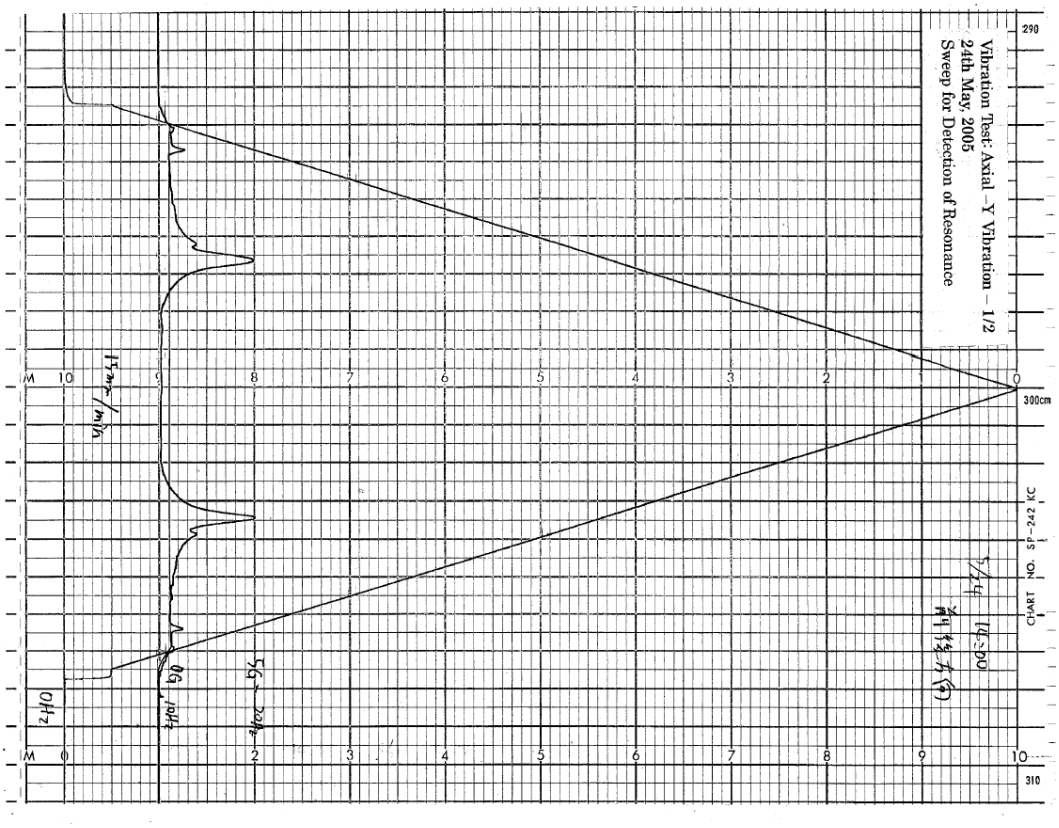
Figure 6-2 2–Hour Continuous Axial–X Vibration at Resonance



6. Vibration Test (*continued – 4/10*)

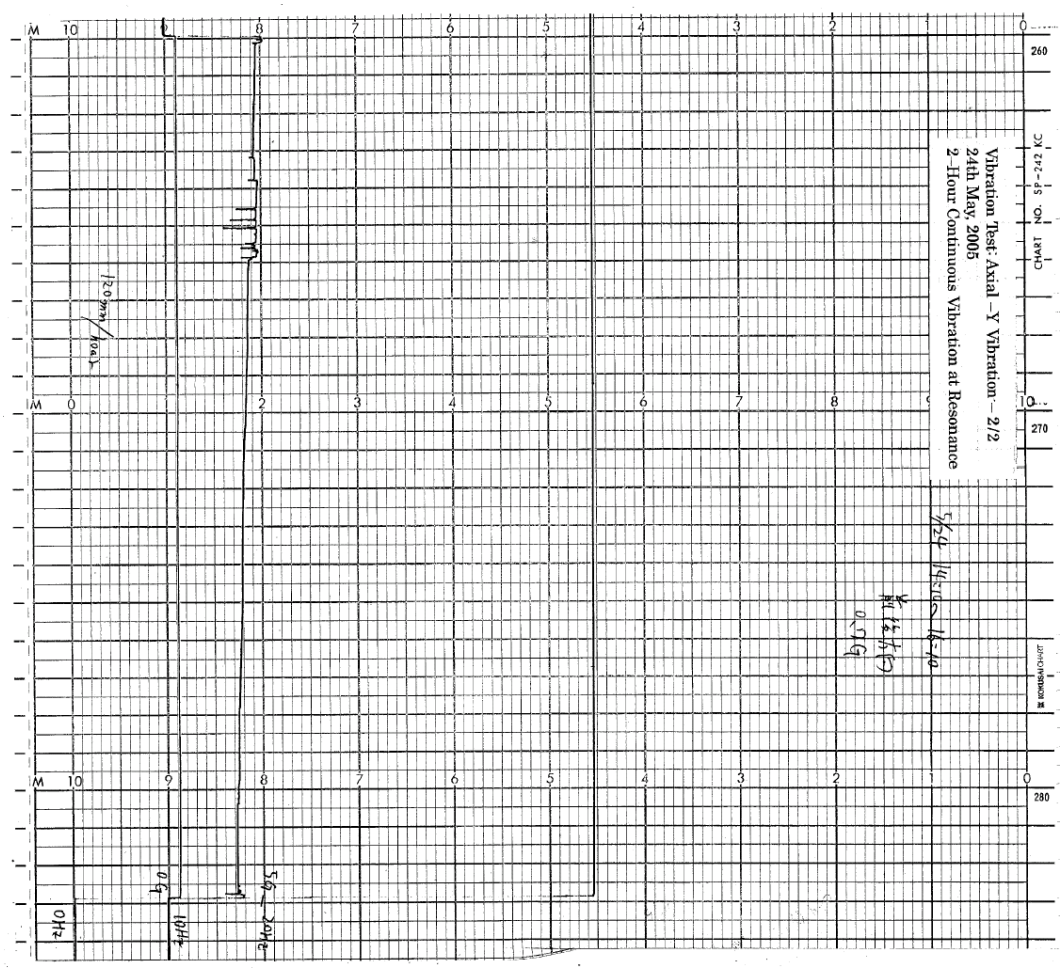
Figure 6-3 Detection of Resonance during Axial–Y Vibration

The figure below shows that the EUT became resonant at approx. 56.5 Hz Hz with an acceleration of approx. 5G.



6. Vibration Test (*continued – 5/10*)

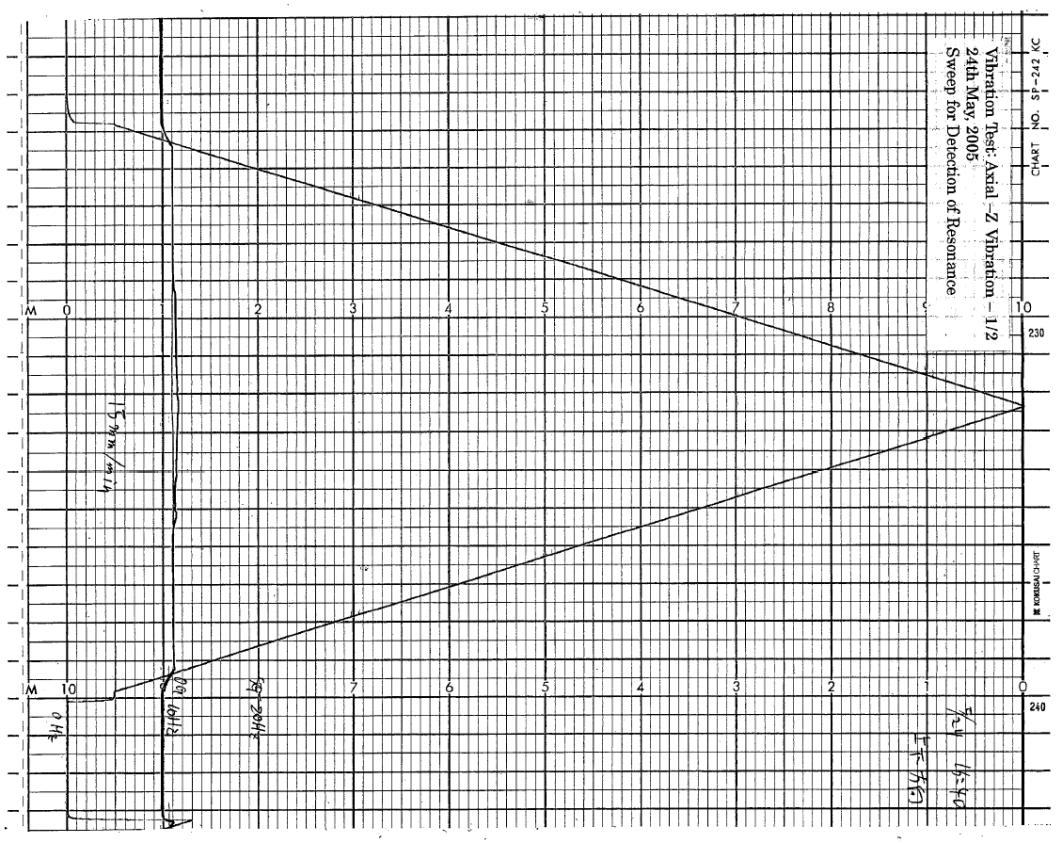
Figure 6-4 2–Hour Continuous Axial–Y Vibration at Resonance



6. Vibration Test (*continued – 6/10*)

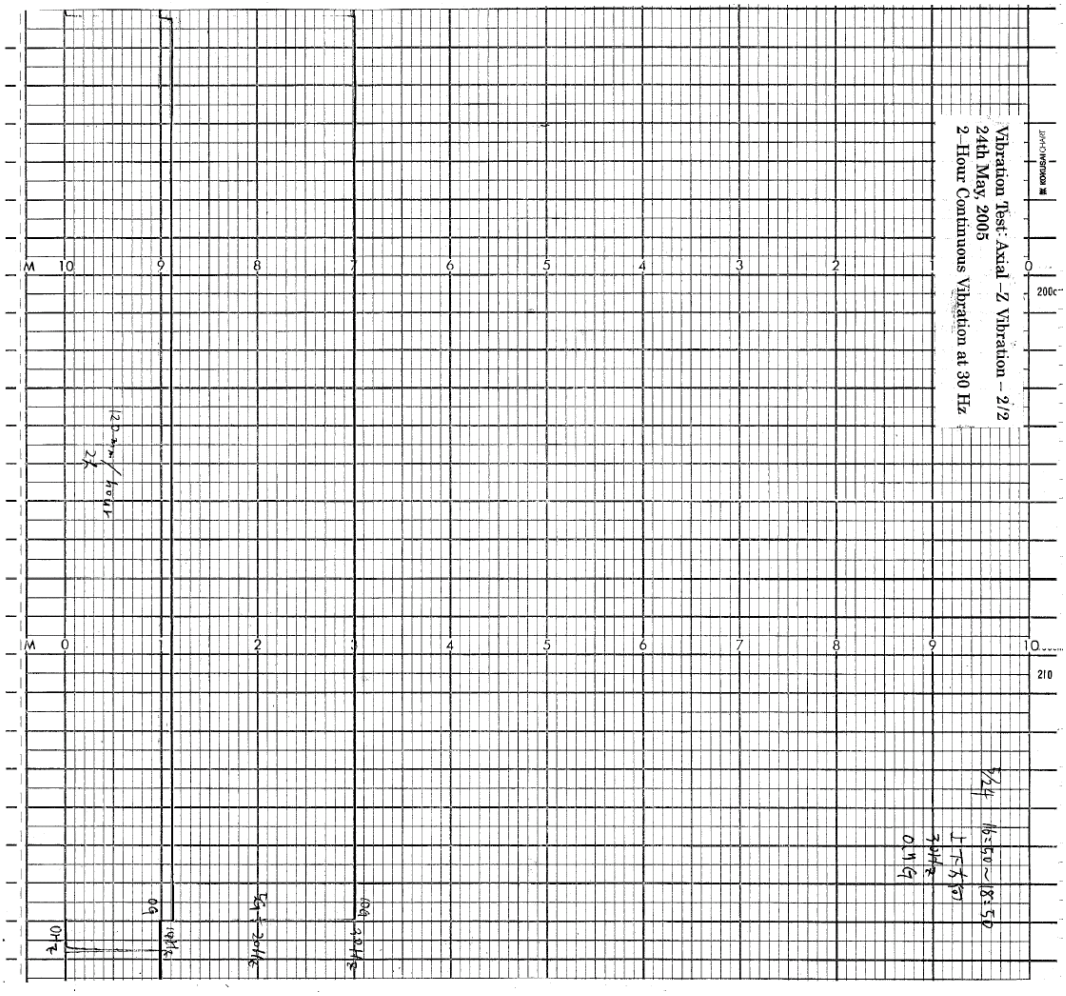
Figure 6-5 Detection of Resonance during Axial–Z Vibration

The figure below shows that the EUT did not become resonant throughout the test frequency range.



6. Vibration Test (*continued – 7/10*)

Figure 6-6 2–Hour Continuous Axial–Z Vibration at 30 Hz



6. Vibration Test (*continued – 8/10*)

Figure 6-7 EUT in Axis–X Vibration Test, 24th May, 10:26

Figure 6-8 EUT in Axis–Y Vibration Test, 24th May, 13:50

(*Continued on next page*)

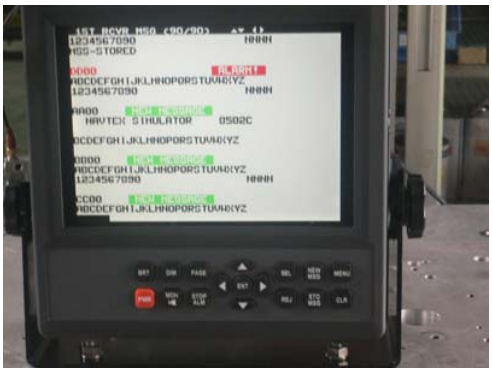
6. Vibration Test (*continued – 9/10*)

Figure 6-9 EUT in Axis–Z Vibration Test, 24th May, 16:53

Figure 6-10 Performance Checks after Completion of Axis–X Test

2nd Receiver Message Screen 13:46

1st Receiver Message Screen 13:48



(*Continued on next page*)

6. Vibration Test (*continued – 10/10*)

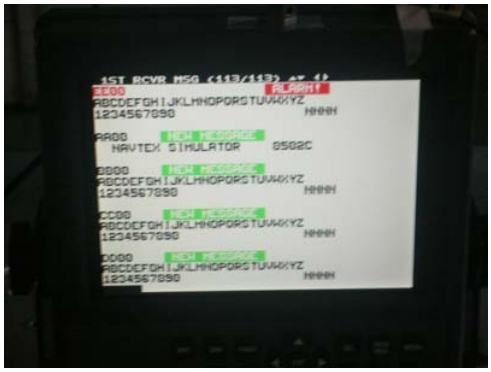
Figure 6-11 Performance Checks during and after Axis–Y Vibration Test

2nd Receiver Message Screen 15:40
(Test in Progress)

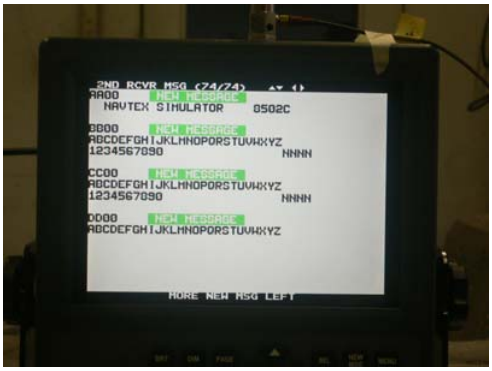
1st Receiver Message Screen 16:05
(Test Just Completed)

Figure 6-12 Performance Check at 18:34 with Axis–Z Vibration Test in Progress

1st Receiver Message Screen 17:50
(Test in Progress)



2nd Receiver Message Screen 18:34
(Test in Progress, 15 min. before Completion)



7. Appendix

7.1. List of Test Equipment and Instruments Used

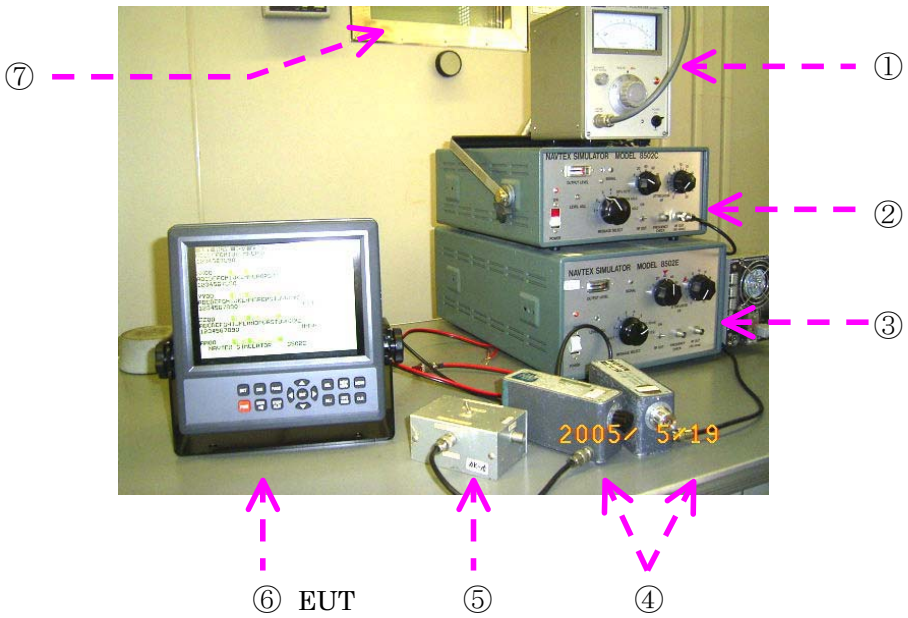
The test equipment and instruments used are listed below. Figure 3–1 shows the test configuration for performance checks of the EUT before and after each test.

Table 7-1 Test Equipment and Instruments Used

Name & Manufacturer	Serial Number or Control Number	Last Calibrated or Checked
*5Constant Temperature/Humidity Chamber FK–14229 ⑦		April 8, 2005
*6NAVTEX Simulator (518 kHz) 8502C ②	9301	May 18, 2005 (On–site calibration)
*6NAVTEX Simulator (490 kHz) 8502E ③	9404	May 18, 2005 (On–site calibration)
*6Electronic Voltmeter ML69B (Anritsu Corp.) ①	M34882	July 6, 2004
*6Attenuators ④ (Hewlett–Packard)	AK–6 (1dB) AK–7(10 dB)	May 18, 2005 (On–site calibration)
*6Input Impedance Selector ⑤ ((50Ω coax or 10Ω+150pF long wire)		May 18, 2005 (On–site check)
*5Vibration Test System EVH–20 (Saginomiya Seisakusho)	MKTV–44	Dec. 27, 2004

*5: Controlled and maintained by TOKIMEC Inc.
*6: Controlled and maintained by Nippon Alpha Electric Co. Ltd.

Figure 7-1 EUT & Configuration for Performance Checks



7.2. TOKIMEC Qualified Quality Control Engineers

Listed below are the TOKIMEC's Quality Assurance Department engineers who participated in the environmental tests of the EUT, supervising the test procedures, and/or operating the TOKIMEC– controlled test systems.

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Test Report No.05-113(E)
Issued on June 10, 2005

TEST REPORT

ON

TEST FOR COMPASS SAFE DISTANCE

Reference Number: No.71054

Name of Specimen: NAVTEX Receiver and Mounting Bracket
Model NT-2000(DEBEG 2902)

Name and Address of Applicant: Japan Marina Co., Ltd.
36-2-1001 Udagawacho, Shibuya-ku,
Tokyo 150-0042

This test report describes the results of the above test.
Cover 1 sheet, Text 4 sheets and attachment 1 sheet (Total 6 sheets) are included.

Tested and Reported by
M. Fujiyoshi
Masatoshi Fujiyoshi
Chief Researcher
Containers & Electric Devices Division

Approved by
Tsuneo Itagaki
Tsuneo Itagaki
Vice Director
Research and Development

JAPAN SHIP MACHINERY QUALITY CONTROL ASSOCIATION
RESEARCH INSTITUTE OF MARINE ENGINEERING
1-5-12 Fujimicho, Higashimurayama, Tokyo 189-0024 Japan
Tel: 81-42-394-3611 Fax: 81-42-394-1119

1 . Date of testing : June 3, 2005

2 . Specimen

2.1 Name of specimen : NAVTEX Receiver and Mounting Bracket

2.2 Model of product : Model NT-2000(DEBEG 2902)

2.3 Construction and dimensions: The details are shown in Photo 1 and attached drawing.

2.4 Name of manufacturer : Japan Marina Co., Ltd.

3 . Test contents

3.1 Test items

Compass safe distance

3.2 Test standard

This test is carried out in accordance with "IEC 60945 –2002: Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results (paragraph 4.5.3 and 11.2)".

3.3 Test method

① Each unit of the EUT shall be tested in the position and attitude relative to the compass or magnetometer at which the error produced at the compass would be a maximum, provided the item can be fitted in this way.

② The compass safe distance of any unit of the EUT is defined as the distance between the nearest point of the item and the centre of the compass or magnetometer at which it will not produce a deviation in the standard compass of more than 5.4° /H where H is the horizontal component of the magnetic flux density in μ T (microtesla), and 1 μ T is equivalent to 0.01 Oe (oersted).

③ For the steering compass, the standby steering compass and the emergency compass, the permitted deviation is 18° /H, H being defined as above.

④ Each unit of the EUT shall be tested:

a) in the magnetic condition in which it is received.

b) after magnetization in a d.c. field of $10^3/4\pi$ A/m, with a superimposed stabilizing field of $18\times10^3/4\pi$ A/m r.m.s. at 50 Hz (1 A/m = $4\pi\times10^{-3}$ Oe). If, however, damage to the EUT might result, the stabilizing field should be omitted. The direction of the field is that in which, as estimated by inspection or from drawings, the resultant magnetization will be greatest (for example the long axis of a ferromagnetic box).

c) in the energized condition, if the unit is capable of being energized electrically.

In each of the above tests the unit shall be rotated to determine the direction in which it produces the maximum deviation.

4 . Test apparatus

4.1 Gauss meter	MM-123	MTI
4.2 Magnetization equipment		Yokogawa Denshikiki

5 . Test results

Table 1 shows the test results.

Photo 2 shows the appearance of the magnetized.

Photo 3 shows the appearance of the test.

Table 1 Test results of the compass safe distance

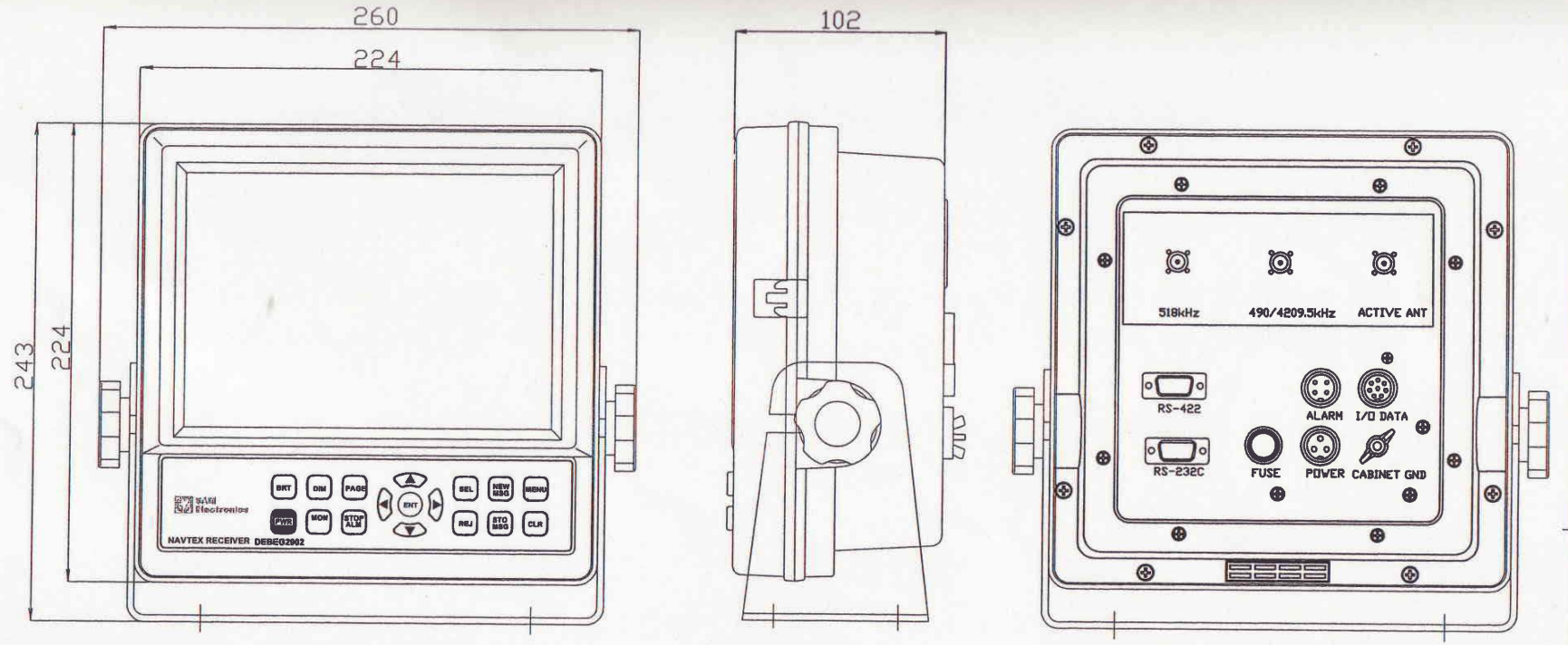
Unit : (cm)

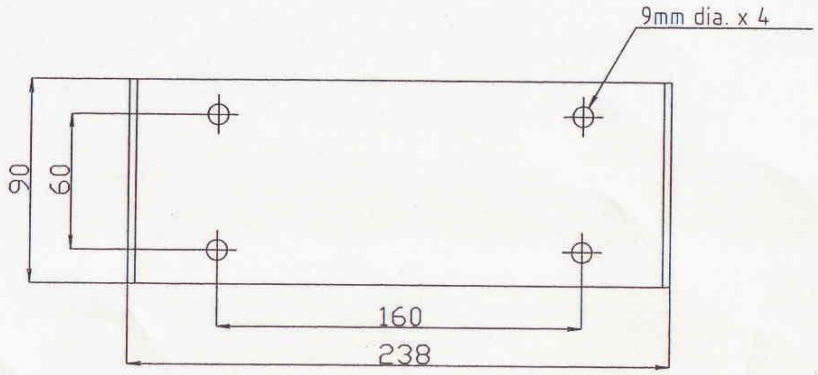
Specimen		Compass safe distance	
		Standard compass	Steering compass Standby steering compass Emergency compass
NAVTEX Receiver with Mounting Bracket	Energized condition	80	45
	Not energized condition	70	45
NAVTEX Receiver only	Energized condition	60	40
	Not energized condition	60	40

Photo 1 Appearance of the specimen

Photo 2 The magnetized in the magnetic field

Photo 3 Compass safe distance





UNIT: mm

JAPAN MARINA CO. LTD

NT-2000-8 DRAWING