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Instruction Manual
For
MSG-2051
RS-232C Program

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Contents

1 GENERAL 11

1.1 SUMMARY 11
1.2 FEATURES 11
1.3 ATTACHMENT 11

2 SET UP 12

2.1 RECOMMENDABLE CONDITIONS 12
2.2 INTERFACE 12
2.3 INSTALLATION 13
2.4 DELETION OF PROGRAM 13

3 BASIC OPERATION METHOD 14

3.1 START 14
3.2 START DIALOG DISPLAY 15
3.3 SCREEN STRUCTURE 16
3.3.1 MSG-2051 RS-232C Program window 16
3.3.2 Environment window 20
3.3.3 Panel tab 21
3.3.3.1 PANEL INFORMATION tab 21
3.3.3.2 PANEL MODE tab 23
3.3.3.2.1 MODE 0 tab 25
3.3.3.2.2 MODE 1 tab 26
3.3.3.2.3 MODE 2 tab 27
3.3.3.2.4 MODE 3 tab 28
3.3.3.2.5 EDIT window 29
3.3.4 ROM DATA tab 31
3.3.5 NAVI DATA 1 tab 32
3.3.6 NAVI DATA 2 tab 33
3.3.7 NAVI DATA 3 tab 35

4 OPERATION 36

4.1 MENU OPERATION 36
4.2 OPERATION OF SHORT CUT BUTTONS 37
4.3 PANEL OPERATION 38
4.3.1 Panel tab operation 38
4.3.2 PANEL INFORMATION tab operation 38
4.3.3 PANEL MODE tab operation 38
4.3.3.1 Display tab operation 38
4.3.3.1.1 MODE 0 tab operation 39

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4.3.3.1.2 MODE 1 tab operation 40
4.3.3.1.3 MODE 2 tab operation 41
4.3.3.1.4 MODE 3 tab operation 42
4.3.3.2 MODULATION operation 43
4.3.3.2.1 C／A button operation 43
4.3.3.2.2 NAVI button operation 43
4.3.3.3 DOPP. Button operation 43
4.3.3.4 SYNC. PRESET operation 44
4.3.3.5 OUTPUT button operation 45
4.3.3.6 EDIT window operation 45
4.3.3.6.1 EDIT window display 45
4.3.3.6.2 Decision of EDIT window setting 46
4.3.3.6.2.1 Setting procedure 1 46
4.3.3.6.2.2 Setting procedure 2 47
4.3.3.6.2.3 Setting procedure 3 47
4.3.3.6.2.4 Setting procedure 4 48
4.3.3.6.3 Canceling the EDIT window setting to be inffective 48
4.3.3.6.4 SATELLITE NO. EDIT window operation 49
4.3.3.6.5 DOPPLER EDIT window operation 50
4.3.3.6.5.1 User setting 50
4.3.3.6.5.2 DEFAULT setting 50
4.3.3.6.6 LEVEL OUTPUT EDIT window operation 51
4.3.3.6.7 RTC SYNC. EDIT window operation 52
4.3.3.6.8 DATE EDIT window operation 53
4.3.3.6.8.1 User setting 53
4.3.3.6.8.2 PRESET setting 53
4.3.3.6.9 TIME EDIT window operation 54
4.3.3.6.9.1 User setting 54
4.3.3.6.9.2 PRESET setting 54
4.3.3.6.10 toe EDIT window operation 55
4.3.3.6.11 10MHz OUT EDIT window operation 56
4.3.3.6.12 10MHz IN EDIT window operation 57
4.3.3.6.13 LEVEL RANGE EDIT window operation 58
4.3.4 ROM DATA tab operation 59
4.3.4.1 LOAD button operation 59
4.3.4.2 SAVE button operation 59
4.3.4.3 ROM DATA Text Box operation 59
4.3.5 NAVI DATA 1 tab operation 59
4.3.6 NAVI DATA 2 tab operation 60
4.3.7 NAVI DATA 3 tab operation 61

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5 ENVIRONMENT SETTING 63
5.1 ENVIRONMENT SETTING 63
5.2 PORT SETTING CANCEL 63
5.3 RESETTING TO PORT NUMBER AT THE TIME OF INSTALLATION 63
6 ROM DATA 64
6.1 ROM DATA TEXT BOX DISPLAY 64
6.2 SAVE DATA 65
7 NAVI DATA 66
7.1 SATELLITE NUMBER ITEM 66
7.1.1 Display 66
7.1.2 Calculation method 66
7.1.3 Exemption 67
7.2 TOE ITEM 67
7.2.1 Display 67
7.2.2 Calculation method 67
7.2.3 Exemption 68
7.2.3.1 Effective range 68
7.2.3.2 Difference between ROM DATA Text Box and internal ROM data of MSG-2051 unit 69
7.3 TOA ITEM 69
7.3.1 Display 69
7.3.2 Calculation method 69
7.4 TOC ITEM 70
7.4.1 Display 70
7.4.2 Calculation method 70
7.5 IODE ITEM 70
7.5.1 Display 70
7.5.2 Calculation method 70
7.5.3 NAVI data change 71
7.6 IODC ITEM 72
7.6.1 Display 72
7.6.2 Calculation method 72
7.6.3 NAVI data change 73
7.7 △T LSF ITEM 74
7.7.1 Display 74
7.7.2 Calculation method 74
7.7.3 NAVI data change 74
7.8 WN T LSF ITEM 75
7.8.1 Display 75

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7.8.2 Calculation method 75
7.8.3 NAVI data change 75
7.9 DN LSF ITEM 76
7.9.1 Display 76
7.9.2 Calculation method 76
7.9.3 NAVI data change 76
8 NAVI DATA EDIT ITEM 77
8.1 NAVI DATA READOUT 77
8.1.1 PAGE ComboBox and ALMANAC, UTC, and OTHER ComboBox 77
8.1.2 DATA Text Box 77
8.1.3 EPHEMERIS Text Box and ALMANAC, UTC, and OTHER Text Box 78
8.1.3.1 SATELLITE NUMVER display 78
8.1.3.2 NAVI DATA display 78
8.1.3.3 PARITY Display 79
8.1.3.4 OTHER DISPLAY 79
8.2 NAVI DATA CHANGE 80
8.2.1 EPHAMERIS change 80
8.2.2 DATA Text Box change 80
8.2.3 PARITY display 80
8.2.4 Exception 81
8.3 PARITY DIFFERENCE 82
8.4 PARITY CALCULATION 83
8.4.1 PARITY calculation of WORD 3～WORD 9 83
8.4.2 PARITY calculation of WORD 10 84
8.5 SAVE DATA 84
9 TROUBLESHOOTING 85

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! Cautions on use

Observe the following cautions for preventing a fire, an electric shock, and other accidents or troubles.

1. Uses

1. Don't use the system for any use other than the original use of the product.

1.1 Users

1. Use this unit by persons each having electric knowledge after fully understanding the contents of this instruction manual and confirming the safety.
2. If a person having no electric knowledge uses this product, it may cause an accident resulting in injury or death. Use this unit under the supervision of a person having electric knowledge in such a case.

1.2 Input power supply

1. Use this unit within a range of the rated input power voltage.
2. For feeding the input power supply, use the attached power cord. In case of a product where the input power voltage is selectable or a product which can use 100V／200V system without switching them, the attached input cord cannot always be used depending upon the input power voltage. In such a case, use an appropriate power cord. For details, refer to the relevant page in the instruction manual.

2. Cover

1. Certain parts mounted inside this unit endanger the human body. Don't remove the external cover.

3. Installation

1. For mounting this unit, observe the [Cautions on installation] described in this manual.
2. Be sure to connect the unit to the ground to which the grounding work specified in Technical Standards for Electric Equipment and Facilities, category 3 at least has been implemented.
3. For feeding the input power supply from a power distribution board, perform the work by a qualified electric worker or under this supervision.

4. Relocation

1. Turn off the power switch and disconnect all wiring cables before relocating the unit.
2. Attached the instruction manual without fail when relocating the unit.

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5. Operation

1. Check if the input power supply, input power cable, and appearance are normal before using this unit. Disconnect the power plug from the plug socket or shut off the power supply without fail before checking the unit.
2. If a trouble or an abnormal symptom of the unit was detected, stop using the unit at once, disconnect the power plug from the plug socket and also, disconnect the input cable from the power distribution board. Don't use the unit until it is repaired completely.
3. Select the output cable, load cable, and other power current cables having a sufficient current capacity.
4. Don't disassemble nor modify the unit. If a modification is necessary, please contact your sales agent or our sales office.

6. Maintenance and check

1. For preventing an electric shock accident, disconnect the power plug from the plug socket or stop feeding the power supply before starting maintenance and check.
2. It is recommended for maintaining the performance and safety of the unit to execute periodical maintenance, check, and cleaning.

7. Adjustment and repair

1.An our service engineer will perform internal adjustment and repair of the unit. If adjustment or repair is necessary, please contact your sales agent or our sales office.

8. Unpacking and packaging

8.1 Unpacking

When the product has reached your site, check if its attachments are contained, without fail and the unit is free of being damaged during transportation.

If damage or deficiencies should have been found, please contact your sales agent or our sales office.

8.2 Packaging

1. For transporting the product, use the exclusive packaging materials (packaging materials at the time of import) without fail.
2. If packaging materials are necessary, please contact your sales agent or our sales office.
3. Disconnect the input power cord and connection cables in advance when packaging the product.

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9. Cautions on installation

Be sure to observe the following cautions when mounting this product.

1. Don't use the unit in a combustible atmosphere.

   Don't use the unit near alcohol, thinner or other combustibles or within their atmospheres, otherwise explosion or a fire may occur.

2. Don't use the unit at a hot place or a place subjected to the direct sunlight.

   Operating temperature range: 0℃～40℃

   Specified guaranteed temperature range: 15℃～35℃

   Storage temperature range: -20℃～60℃

3. Don't use the unit at a wet place.

   Don't put the unit at a wet place near a kettle, a humidifier, a city water tap, or the like.

   Operating humidity range: 20%～85% (No dew formation is allowable)

   Storage humidity range: 20%～90% (No dew formation is allowable)

   Dew formation may occur even in the operating humidity range. In such a case, don't use this unit until it is fully dried up.

4. Don't put the unit in a corrosive gas atmosphere.

   Don't mount the unit in a corrosive gas atmosphere or a place where sulfuric mist exists much, otherwise internal conductors of the unit may be corroded or a poor contact of connectors may occur to cause malfunction or troubles and resultantly cause a fire.

5. Don't put the unit at a dusty place.

   The attachment of dust particles may cause an electric shock accident or a fire.

6. Don't use the unit at a poor ventilated place.

   The heat may be accumulated to cause a fire.

   Keep a sufficient space around the unit.

7. Don't put any substance on this unit.

   Putting a heavy substance may cause a trouble.

8. Don't put the unit at a tilted place or a place subjected to vibrations.

   The unit may drop or it may be tilted to cause damage or injuries.

9. Don't use the unit at a place where a powerful magnetic field or an electric field exists nearby.

   An electric shock or a fire may occur due to malfunction.

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10. Cautions on relocation and transportation

Be careful with the following cautions when relocating this unit to its mounting place or when transporting this unit.

1. Turn off POWER switch.

If POWER switch remains turned on during relocation, an electric shock accident or a fire may occur.

2. Disconnect all cables.

If the unit is relocated without disconnecting cables, a disconnection or injuries due to tumbling over may occur.

3. Use the exclusive packaging materials without fail when transporting this product.

The unit may be damaged due to vibrations or a drop during transportation.
If the packaging materials are necessary, please contact your nearest sales agent or our sales office.

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Cautions

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1 General

1.1 Summary

This instruction manual covers MSG-2051 RS-232C Program Ver.1.00 exclusively applied to MSG-2051 unit.
This MSG-2051 RS-232C Program can execute the panel operation of MSG-2051 unit and change NAVI data.
By connecting a Windows computer to the rear panel of MSG-2051 unit by an RS-232C cable, data can be displayed or changed on the display in synchronization with MSG-2051 unit.

1.2 Features

1) MSG-2051 unit display and panel can be displayed.
2) Automatic update of Z counter can be synchronized with the real time.
3) NAVI data can be checked or set.
4) NAVI data of the internal ROM of MSG-2051 unit can be checked as a text.
5) Windows system time can be synchronized with RTC of MSG-2051 unit.
6) NAVI data of MSG-2051 unit can be changed by designating PAGE, FRAME, and WORD.
7) Display can be done in Japanese as well as in English.

1.3 Attachment

Article name	Quantity	Remarks
CD-ROM	1	Install package

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2 Set up

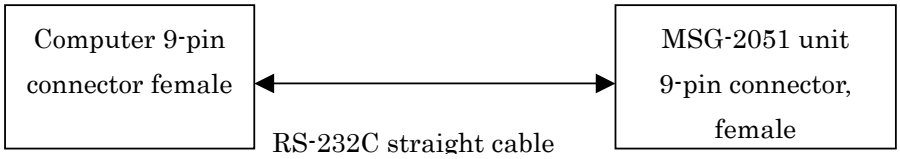
2.1 Recommendable conditions

MSG-2051 RS-232C Program requires an operation environment on Microsoft Windows. It is operated under the following OS conditions in a computer being provided with an applicable environment of Microsoft Windows.
The recommendable conditions necessary for operating MSG-2051 RS-232C Program are shown in the following table.

CPU	200MHz or over
Memory	128MB or over
CD-ROM drive	Necessary for installation
Free capacity of hard disc	100MB or over
Mouse	Shall applicable to Microsoft Windows
OS	Microsoft Windows 98 or over
Interface	At least one RS-232C port

2.2 Interface

An RS-232C straight cable is used for connecting MSG-2051 unit to the computer. (Conforms to the RS-232C straight cable being available on the market)



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2.3 Installation

Install MSG-2051 RS-232C Program Ver.1.00 into the computer according to the following procedure.

① Start operating the computer Windows.
② Set the CD-ROM disk of MSG-2051 RS-232C Program INSTALL DISC Ver.1.00 to the CD-ROM drive.
③ Start the disk from [My Computer] or [Explorer], and designate the drive to which the disk has been set.
④ By double-clicking the cursor after bringing it to [dotnetfx.exe] in the disc, the Microsoft .NET Framework install window is displayed.
⑤ Observe the instructions on the install window.
For details of the set-up of [Microsoft .NET Framework], refer to Microsoft home page (http://www.microsoft.com/) .
⑥ By double-clicking the cursor after bringing it to [Setup.exe] in the disc, the MSG-2051 RS-232C Program install window is displayed.
⑦ Observe the instructions on the install window.
⑧ After the program has been installed, a MSG-2051 RS-232C Program folder is added to the list of programs to complete the installation.

*** Caution**

When double-clicking [Setup.exe] without installing [dotnetfx.exe] in the disc, a dialog

[This setup requires the .NET Framework. Please install the. NET framework and run this setup again.]

is displayed and the installation is not executed.
Terminate [setup.exe] according to the instructions of the dialog.
Install [dotnetfx.exe] shown in step ④.

2.4 Deletion of program

For uninstalling the MSG-2051 RS-232C Program from the computer, observe the following procedure.

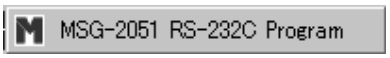
① Click [Deletion of program] of [Control] in [Start].
② An [Addition and deletion of program] window is displayed.
③ Select MSG-2051 RS-232C Program and click Deletion.
④ Observe the instructions of the dialog.
⑤ MSG-2051 RS-232C Program is deleted from the computer.

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3 Basic operation method

3.1 Start

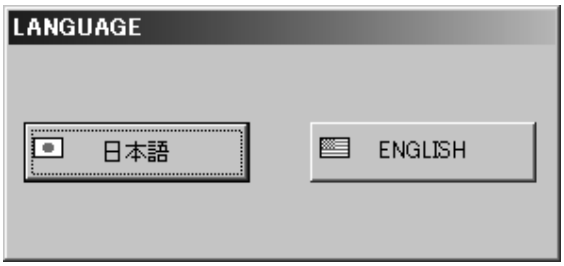
For starting MSG-2051 RS-232C Program, its installation must be completed in advance. If not installed, refer to 2.3 Install.

① Start operating Windows by turning on the computer power supply.
Click 

of [MSG-2051 RS-232C Program] of [Program] in [Start].

② A LANGUAGE form is displayed.

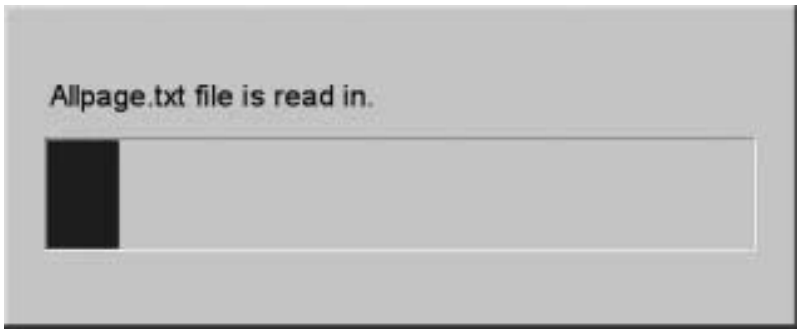
* Note
This is not displayed in the second start.



③ Click the language to be used.

* Note
A language can be selected even after starting the operation.

④ A standby form is displayed.



If the following dialog is displayed, refer to 3.2 Start dialog display.



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⑤ The standby form is closed and MSG-2051 RS-232C Program is started.



3.2 Start dialog display

When MSG-2051 RS-232C Program has been started, a dialog is displayed to show that AllPage.txt file of MSG-2051 RS-232C Program is broken or the file is not present.



NAVI data on June 03, 2005 shows a NAVI data which is stored in MSG-2051 RS-232C Program and has received an air on June 3, 2005.
When the program is connected under this condition, ROM DATA Text Box and WORD 1 and WORD 2 of EPHAMERIS & ALMANAC, UTC, and OTHER Text Box of NAVI DATA EDIT display NAVI data on June 3, 2005 are displayed.

For recovering the AllPage.txt file of MSG-2050 unit, observe the following procedure.

① Close MSG-2051 RS-232C Program, if it has been started.
② Set CD-ROM of MSG-2051 INSTALL DISK Ver.1.00 to the CD drive.
③ Start MSG-2051 RS-232C Program INSTALL DISK Ver.1.00 from [My Computer] or [Explorer], and designate a drive.
④ Copy AllPage.txt file and substitute MSG-2051 RS-232C Program install folder. (Default: ¥¥Program Files¥MEGURO ELECTRONICS CORPORATION¥MSG-2051 RS-232C PROGRAM) with it.
⑤ Observe the start procedure in 3.1.

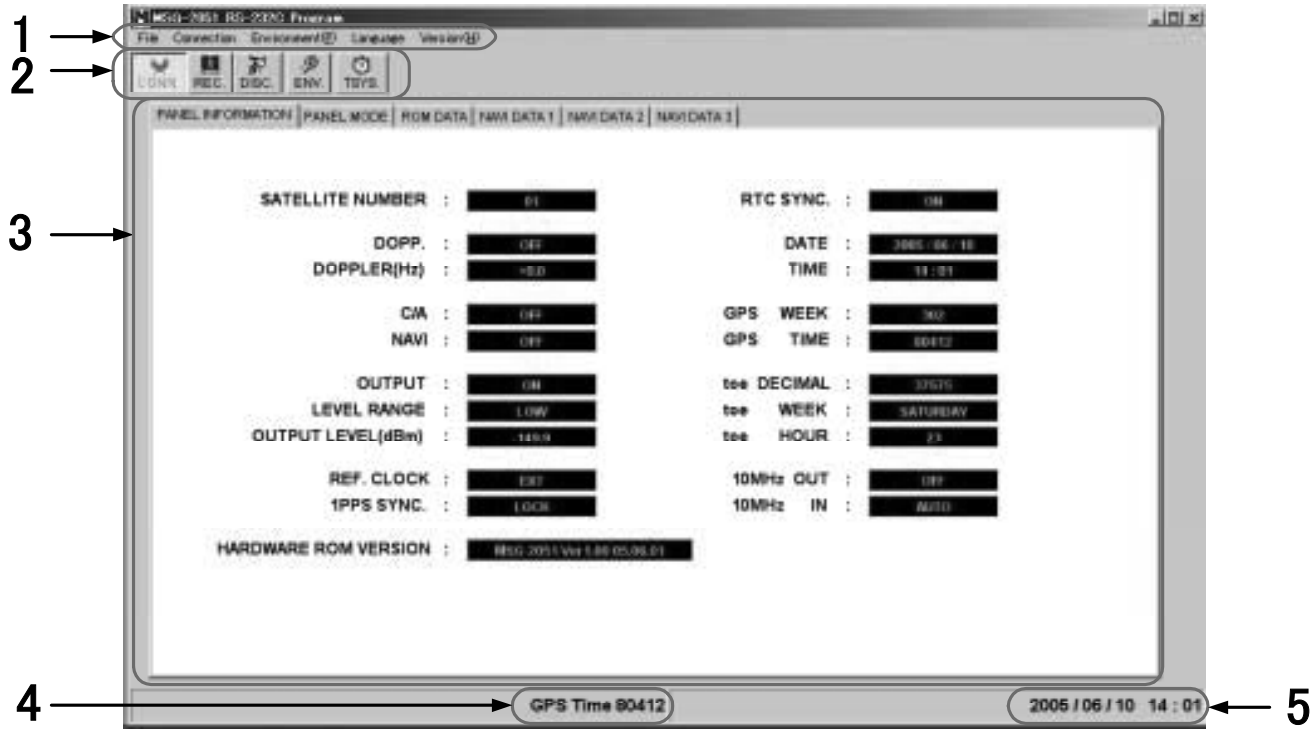
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3.3 Screen structure

This paragraph describes the basic screen structure of MSG-2051 RS-232C Program every window and tab.

3.3.1 MSG-2051 RS-232C Program window

The following screen shows the MSG-2051 RS-232C Program window.



1 Menu bar

A menu of items being executable by the application.

2 Short cut button

A short cut button of menu bar.

3 Panel tab

Displays MSG-2051 unit panel or NAVI data setting.

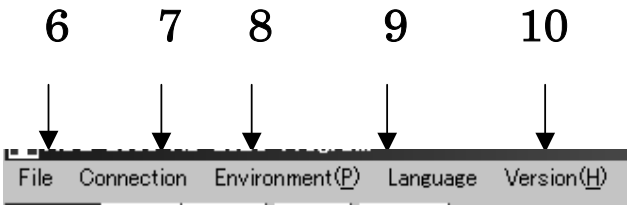
4 GPS TIME

Indicates GPS TIME of RTC being connected to MSG-2051 unit.

5 RTC synchronous time

Indicates the DATE and TIME of RTC being connected to MSG-2051 unit.

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6 File button

Indicates ROM DATA SAVE button, NAVI DATA SAVE button, and END button.

7 Connection button

Indicates the connection to or disconnection from MSG-2051 unit.

8 Environment button

Indicates the environment window of MSG-2051 RS-232C Program.

9 Language button

Selects the language being displayed by MSG-2051 RS-232C Program.

10 Version button

Indicates the version of MSG-2051 RS-232C Program.



11 ROM DATA SAVE button

Indicates the save dialog of ROM data Text Box of ROM data tab.

12 NAVI DATA SAVE button

Indicates the dialog which saves EPHEMERIS, ALMANAC, UTC, and OTHER of NAVI data tab.

13 End button

Terminates MSG-2051 RS-232C Program.

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14 Connection button

Connects the program to MSG-2051 unit.

The button cannot be clicked during connection and it can be clicked during disconnection.

15 Disconnection button

Disconnects the program from MSG-2051 unit.

The button can be clicked during connection and it cannot be clicked during disconnection.



16 Japanese button

Selects Japanese as the display language of MSG-2051 RS-232C Program.

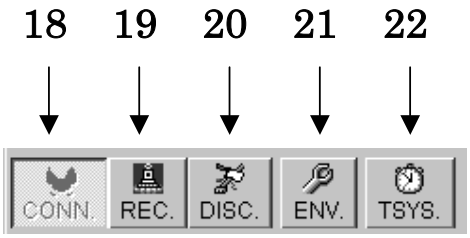
This button cannot be clicked during the selection of Japanese and it can be clicked during the selection of English.

17 English button

Selects English as the display language of MSG-2051 RS-232C Program.

This button can be clicked during the selection of Japanese and it cannot be clicked during the selection of English.

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18 Connection button

Connects the program to MSG-2051 unit.

The button cannot be clicked during connection and it can be clicked during disconnection.

19 Reconnection button

This button acquires data of the MSG-2051 unit again

during connection.

The button can be clicked during connection, but it cannot be clicked during disconnection.

20 Disconnection button

Disconnects the program from MSG-2051 unit.

The button can be clicked during connection and it cannot be clicked during disconnection.

21 Environment button

This button indicates an environmental window of MSG-2051 RS-232C Program.

22 Time synchronizing button

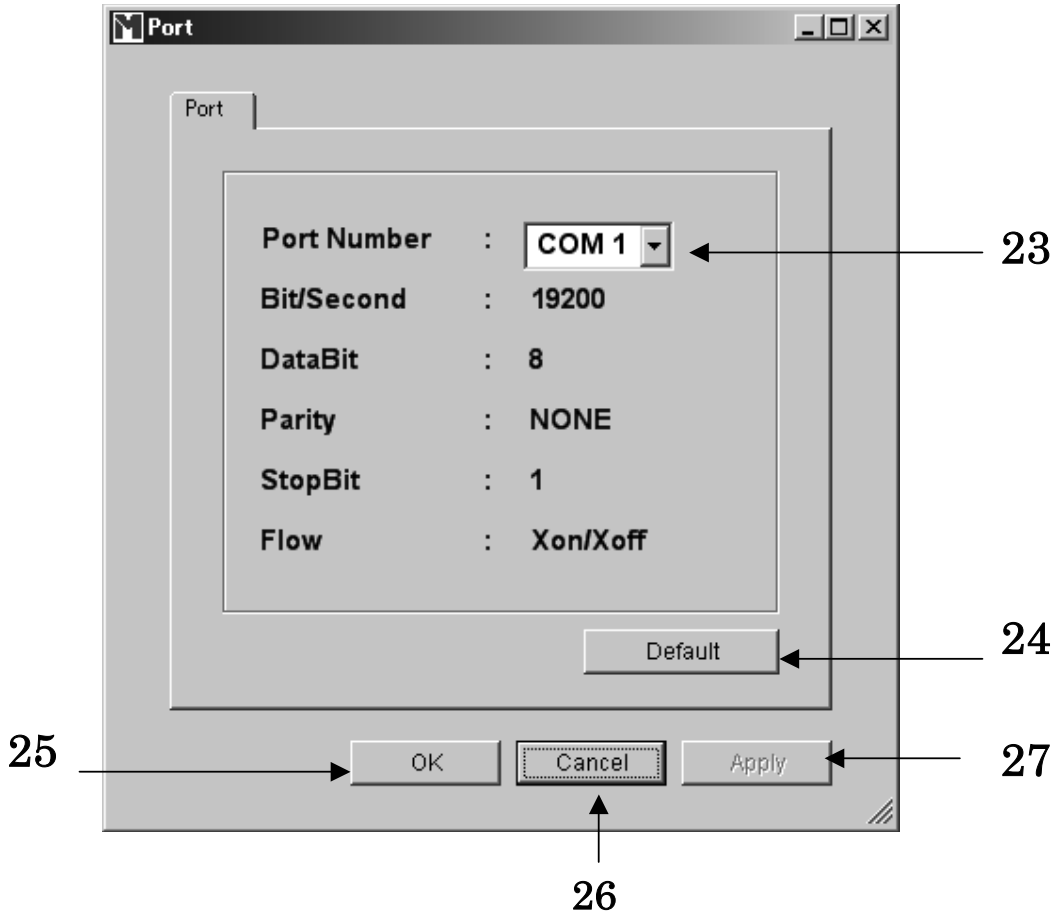
This button synchronizes the system time of computer with the DATE and TIME of RTC of MSG-2051 unit.

The button can be clicked during connection and it cannot be clicked during disconnection.

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3.3.2 Environment window

This window is used to set the computer environment.



23 Port Number ComboBox

Selects the RS-232C port of computer.

24 Default button

Sets the environment of MSG-2051 RS-232C Program to be default.

25 OK button

Makes the setting of environment window effective

26 Cancel button

Makes the setting of environment window ineffective.

27 Apply button

Makes the setting of environment window effective.

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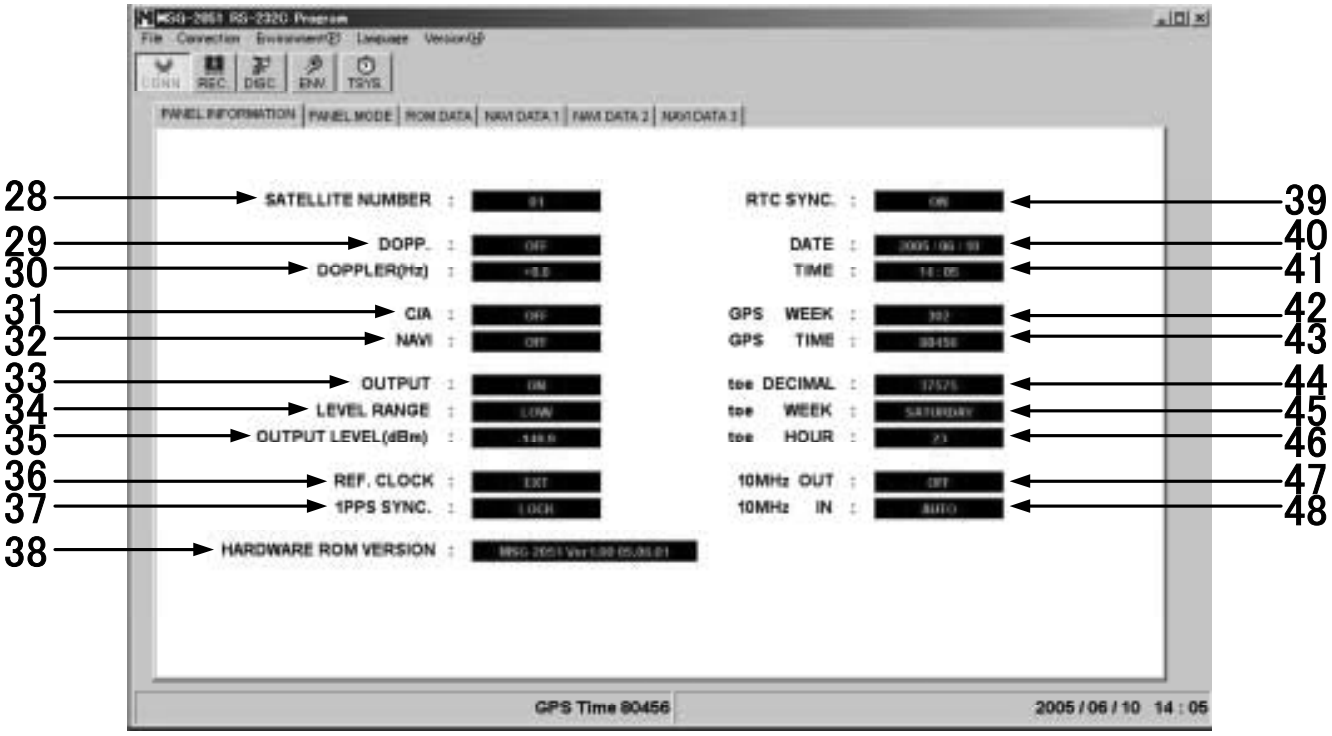
3.3.3 Panel tab

Switches the panel display of MSG-2051 RS-232C Program.



3.3.3.1 PANEL INFORMATION tab

Displays the MSG-2051 unit panel and hardware ROM version.



28 SATELLITE NUMBER label

Indicates SATELLITE NO. of modulation channel being connected to MSG-2051 unit from 01 to 37.

29 DOPP. label

Indicates the Doppler frequency being connected to MSG-2051 unit by ON／OFF.

30 DOPPLER (Hz) label

Indicates the Doppler frequency being connected to MSG-2051 unit from ＋10000.0 ～ －10000.0.

31 C／A label

Indicates the MODULATION C／A being connected to MSG-2051 unit by ON／OFF.

32 NAVI label

Indicates the MODULATION NAVI being connected to MSG-2051 unit by ON／OFF.

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33 OUTPUT label

Indicates the output being connected to MSG-2051 unit by ON／OFF.

34 LEVEL RANGE label

Indicates the level being connected to MSG-2051 unit by HIGH／LOW.

35 OUTPUT LEVEL (dBm) label

Indicates the output level being connected to MSG-2051 unit from －149.9 to －60.0.

36 REF CLOCK label

Indicates the REF CLOCK being connected to MSG-2051 unit by INT/EXT.

37 1PPS SYNC. label

Indicates 1PPS SYNC. being connected to MSG-2051 unit by LOCK/UNLOCK.

38 HARDWARE ROM VERSION label

Indicates the version of the internal ROM being connected to MSG-2051 unit.

39 RTC SYNC. label

Indicates the ON／OFF of RTC being connected to MSG-2051 unit.

40 DATE label

Indicates the DATE of RTC being connected to MSG-2051 unit.

41 TIME label

Indicates the TIME of RTC being connected to MSG-2051 unit.

42 GPS WEEK label

Indicates the GPS WEEK being connected to MSG-2051 unit by decimal number.

43 GPS TIME label

Indicates the GPS TIME being connected to MSG-2051 unit by decimal number.

44 toe DECIMAL label

Indicates the effective limit of the EPHEMERIS being connected to MSG-2051 unit by decimal number.

45 toe WEEK label

Indicates the effective limit of the EPHEMERIS being connected to MSG-2051 unit by week.

46 toe HOUR label

Indicates the effective limit of the EPHEMERIS being connected to MSG-2051 unit by TIME.

47 10MHz OUT label

Indicates the 10MHz OUT being connected to MSG-2051 unit by ON／OFF.

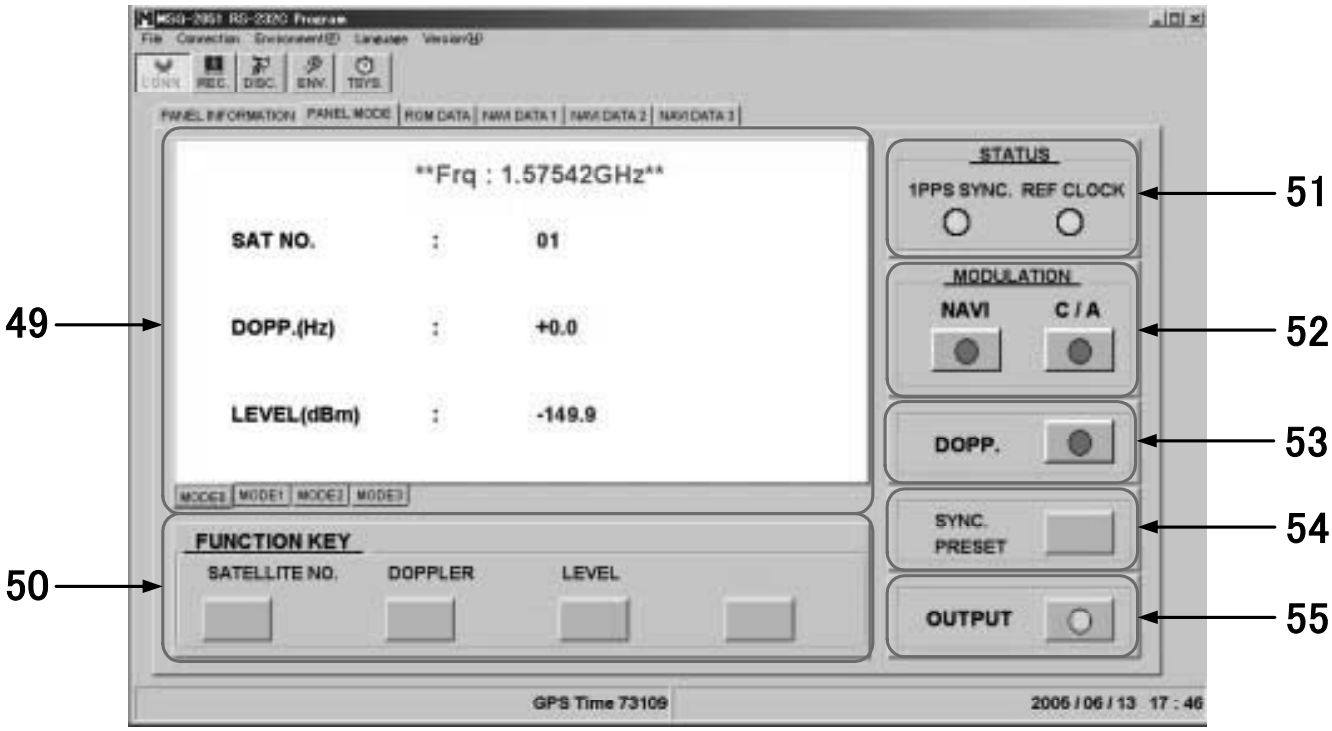
48 10MHz IN label

Indicates the 10MHz IN being connected to MSG-2051 unit by AUTO／INT／EXT.

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3.3.3.2 PANEL MODE tab

Indicates the MSG-2051 unit panel.



49 Display tab

Indicates the display of MSG-2051 unit.

50 FUNCTION KEY items

Items of the buttons indicating the EDIT window.

51 STATUS items

Indicates the STATUS of MSG-2051 unit.

1PPS SYNC lamp indicates LOCK/UNLOCK of the 1PPS SYNC. being connected to MSG-2051 unit by colors.

When the lamp is light blue, 1PPS SYNC. is locked.

When the lamp is gray, 1PPS SYNC. is unlocked.

REF CLOCK lamp indicates EXT/INT of REF clock being connected to MSG-2051 unit by colors.

When the lamp is light blue, REF CLOCK is se to EXT.

When the lamp is gray, REF CLOCK is set to INT.

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52 MODULATION items

C／A button indicates.

ON／OFF of the C/A being connected to MSG-2051 unit by the center color.

When the button is green at the center, C／A is turned on.

When the button is gray at the center, C／A is turned off.

NAVI button indicates ON/OFF of the NAVI being connected to MSG-2051 unit by the center color.

When the button is green at the center, NAVI is turned on.

When the button is gray at the center, NAVI is turned off.

53 DOPP. button

DOPP. button indicates ON/OFF of the Doppler being connected to MSG-2051 unit by the center color.

When the button is green at the center, Doppler is turned on.

When the button is gray at the center, Doppler is turned off.

54 SYNC. PRESET button

This button is used for synchronizing an external signal (1PPS, etc.) with C/A (gold) code epoch timing in MSG-2051 unit.

55 OUTPUT button

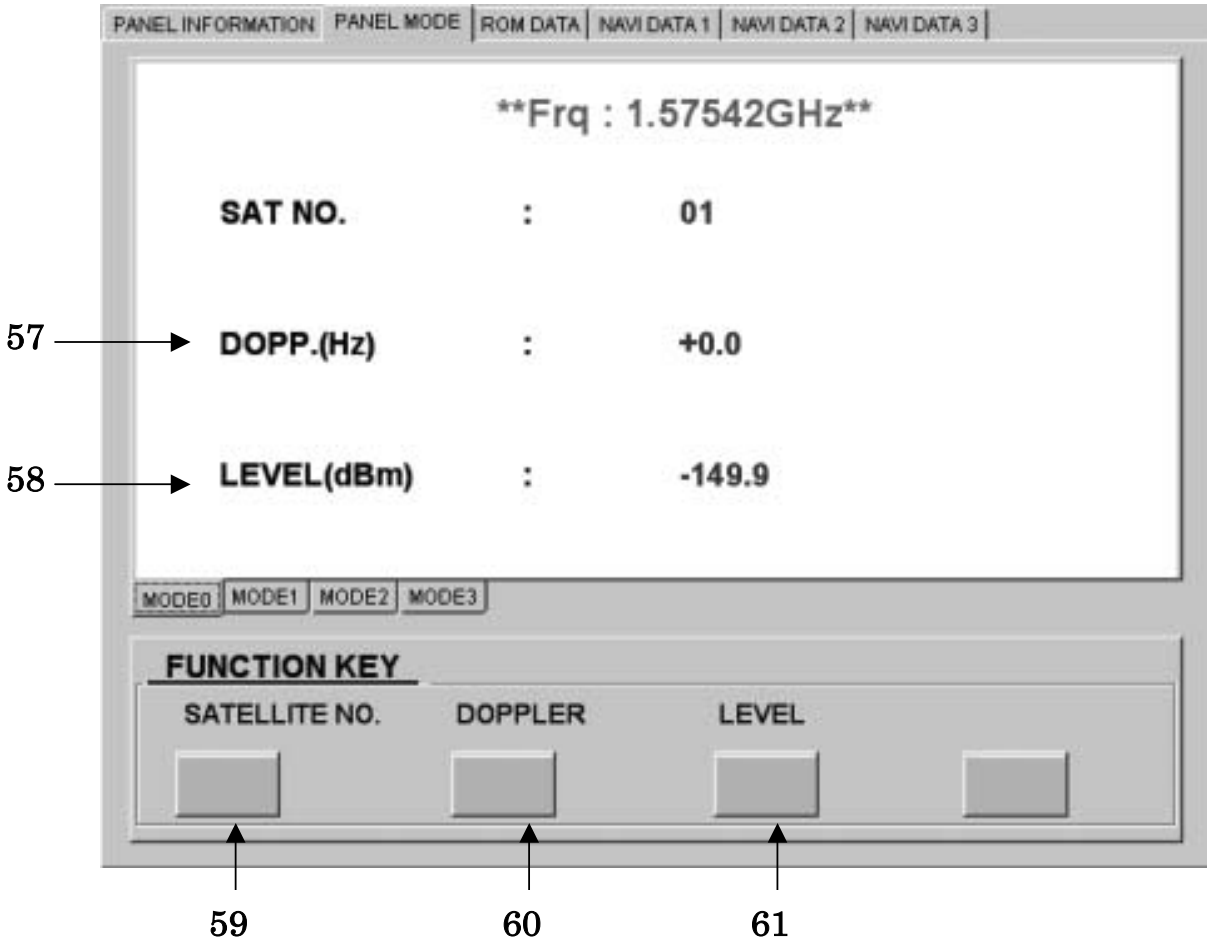
OUTPUT button indicates ON/OFF of the output being connected to MSG-2051 unit by the center color.

When the button is green at the center, the output is turned on.

When the button is gray at the center, the output is turned off.

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3.3.3.2.1 MODE 0 tab



56 SAT NO. label

Indicates SATELLITE NO. of the modulation channel being connected to MSG-2051 unit by 01 ～ 37.

57 DOPP. (Hz) label

Indicates the DOPPLER frequency being connected to MSG-2051 unit by ＋10000.0 ～ －10000.0.

58 LEVEL (dBm) label

Indicates the output level being connected to MSG-2051 unit by －149.9 ～ －60.0.

59 SATELLITE NO. button

Indicates SATELLITE NO. EDIT window.

60 DOPPLER button

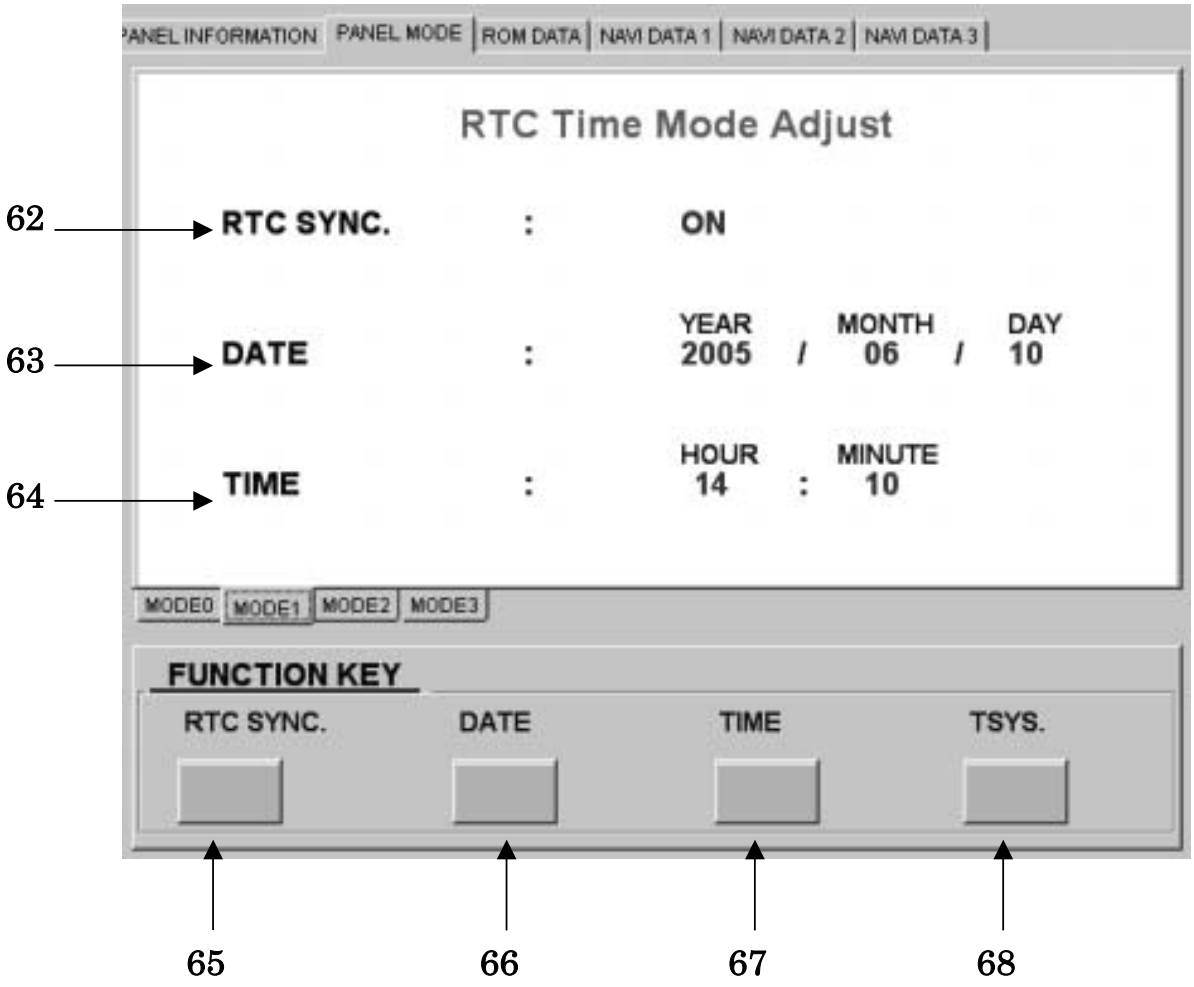
Indicates DOPPLER EDIT window.

61 LEVEL button

Indicates LEVEL EDIT window.

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3.3.3.2.2 MODE 1 tab



62 RTC SYNC. label

Indicates RTC being connected to MSG-2051 unit by ON／OFF.

63 DATE label

Indicates the date of RTC being connected to MSG-2051 unit.

64 TIME label

Indicates the time of RTC being connected to MSG-2051 unit.

65 RTC SYNC. button

Indicates RTC SYNC. EDIT window.

66 DATE button

Indicates DATE EDIT window.

67 TIME button

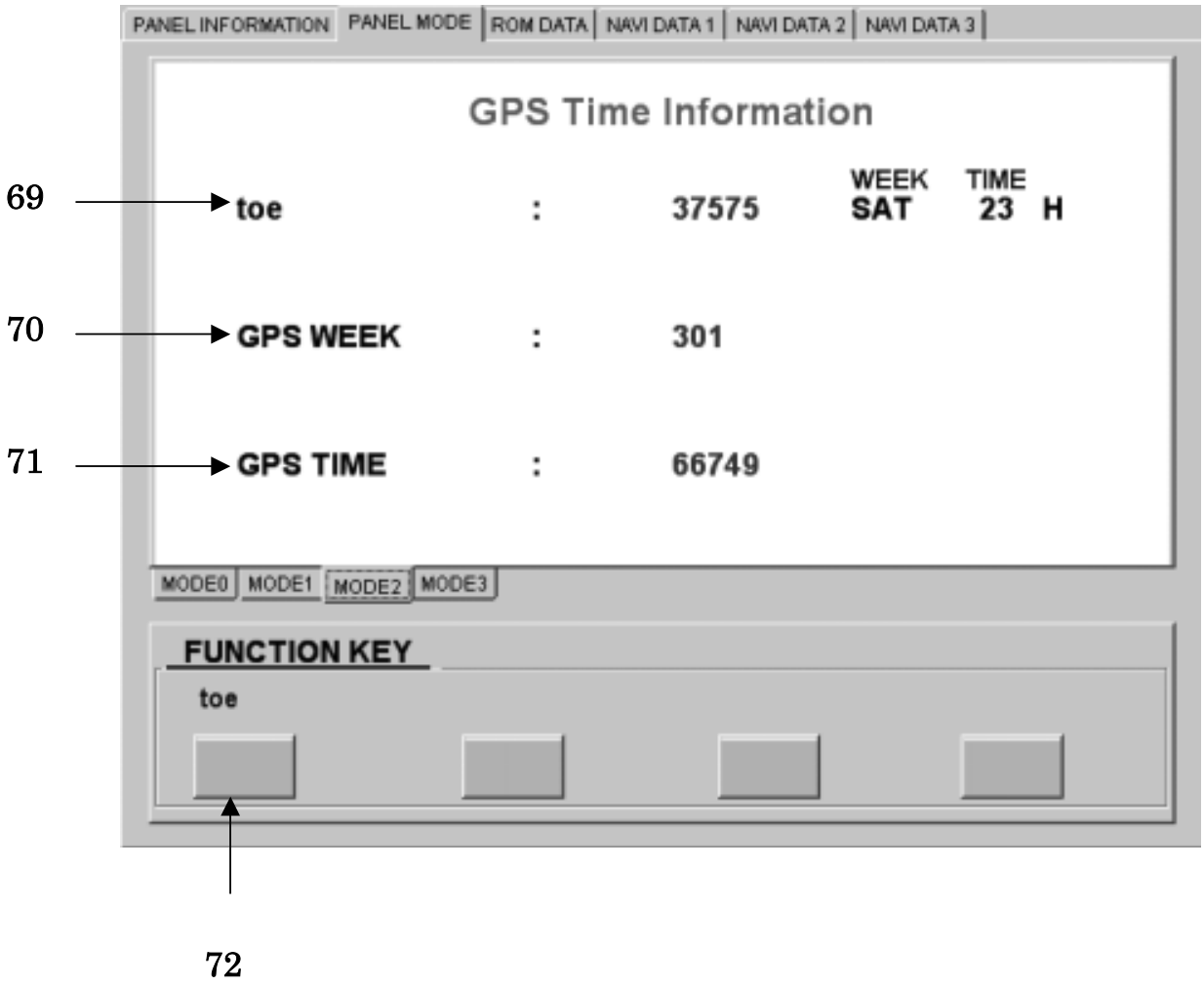
Indicates TIME EDIT window.

68 Time synchronizing button

Synchronizes the computer system time with the date and time of RTC of MSG-2051 unit.

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3.3.3.2.3 MODE 2 tab



69 toe label

Indicates the effective period of the EPHEMERIS which is set to NAVI data being connected to MSG-2051 unit by a decimal number, WEEK, and TIME.

70 GPS WEEK label

Indicates GPS WEEK being connected to MSG-2051 unit by a decimal number.

71 GPS TIME label

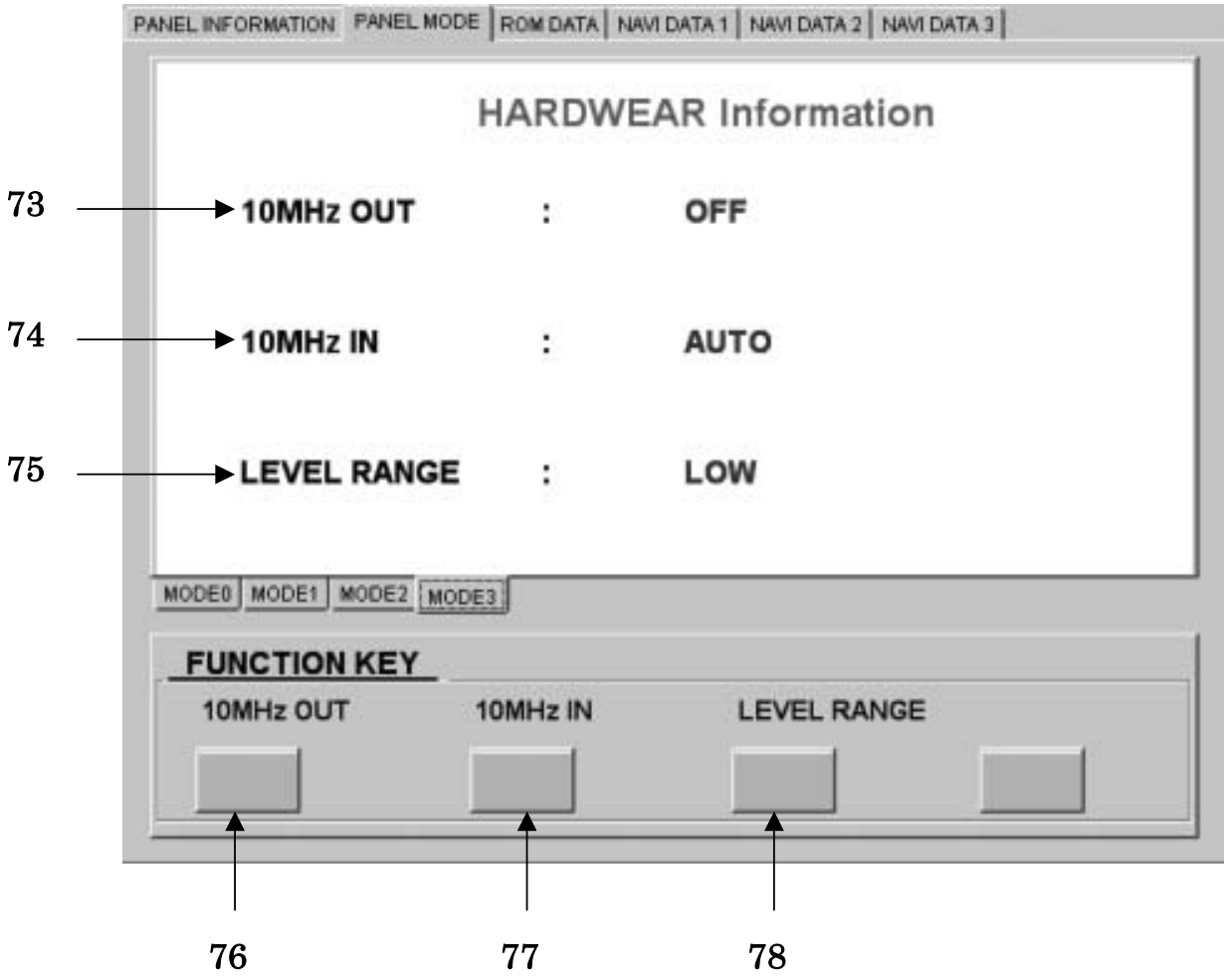
Indicates GPS TIME being connected to MSG-2051 unit by a decimal number.

72 toe button

Indicates the toe EDIT window.

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3.3.3.2.4 MODE 3 tab



73 10MHz OUT label

Indicates 10MHz OUT being connected to MSG-2051 unit by ON／FF

74 10MHz IN label

Indicates 10MHz IN being connected to MSG-2051 unit by AUTO／NT／XT.

75 LEVEL RANGE label

Indicates the level being connected to MSG-2051 unit by HIGH/LOW.

76 10MHz OUT button

Indicates 10MHz OUT EDIT window.

77 10MHz IN button

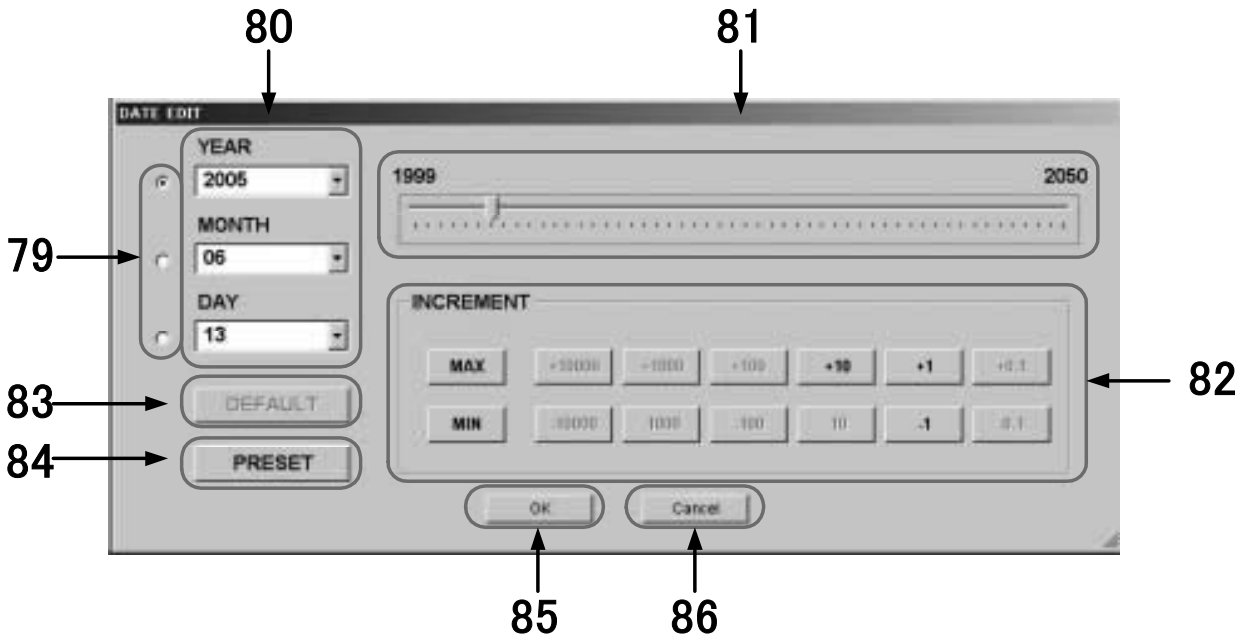
Indicates 10MH IN EDIT window.

78 LEVEL RANGE button

Indicates LELEL RANGE EDIT window.

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3.3.3.2.5 EDIT window



79 Item selection ratio button

Indicates by means of check that the selection track bar and INCREMENT item are employable.

Check mark indicates that the track bar and INCREMENT item are used.

No check mark indicates that neither track bar nor INCREMENT item is used.

80 Selection ComboBox

Selects the values of the settable items being connected to MSG-2051 unit.

81 Selection track bar

Indicates the selection range of the values of selection ComboBox.

82 INCREMENT item

Increases the selection ComboBox value selected by the item selection radio button.

83 DEFAULT button

Sets the selection ComboBox to default.

84 PRESET button

Executes the function being set by MSG-2051 RS-232C Program.

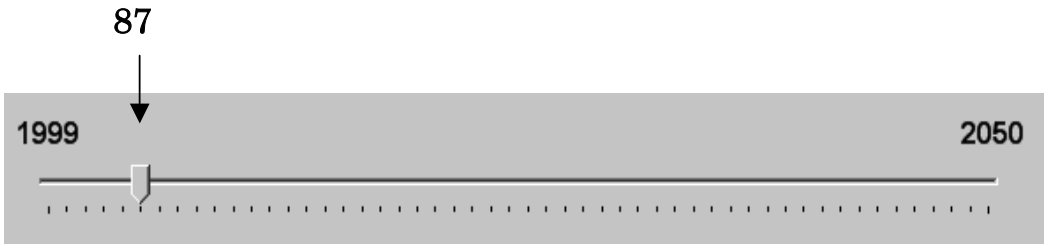
85 OK button

Decides the selected value of selection ComboBox.

86 Cancel button

Cancels the selected value of selection ComboBox.

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87 Track bar pointer

Indicates the selection range of the selection ComboBox within a range of the track bar.



88 MAX button

Sets the selection range value of the selection ComboBox to the maximum value.

89 MIN button

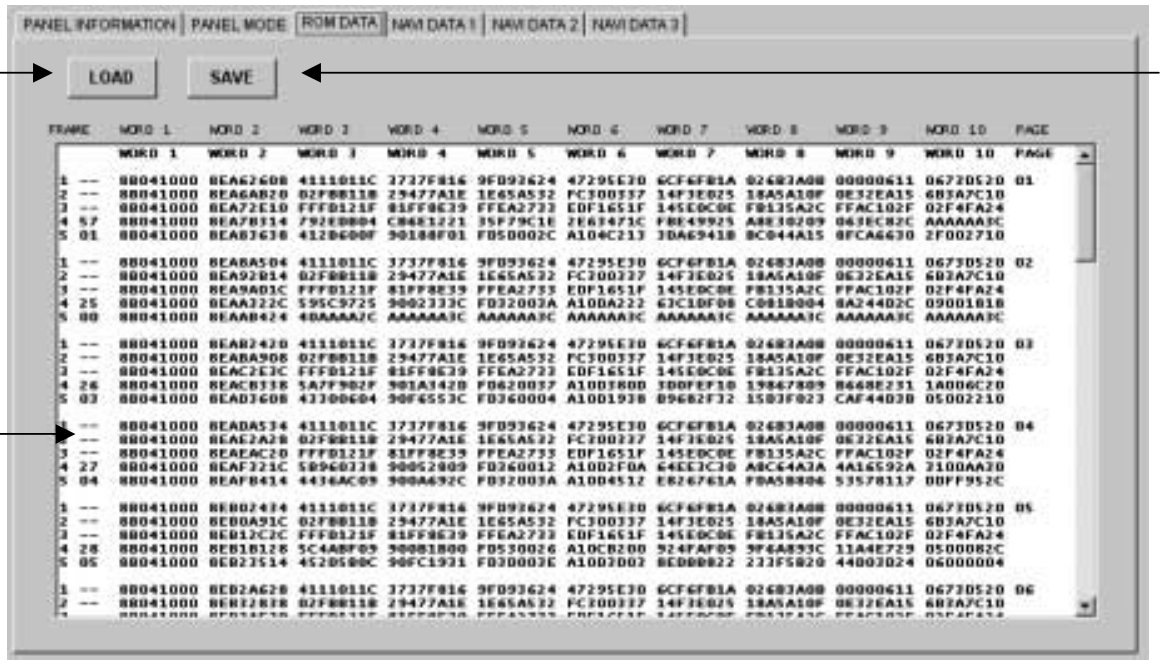
Sets the selection range value of the selection ComboBox to the minimum value.

90 INCREMENT button

Increases the selection range value of the selection ComboBox according to the button value.

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3.3.4 ROM DATA tab



91 LOAD button

Indicates NAVI data to ROM DATA Text Box.

92 SAVE button

Indicates a dialog in which ROM DATA Text Box is stored.

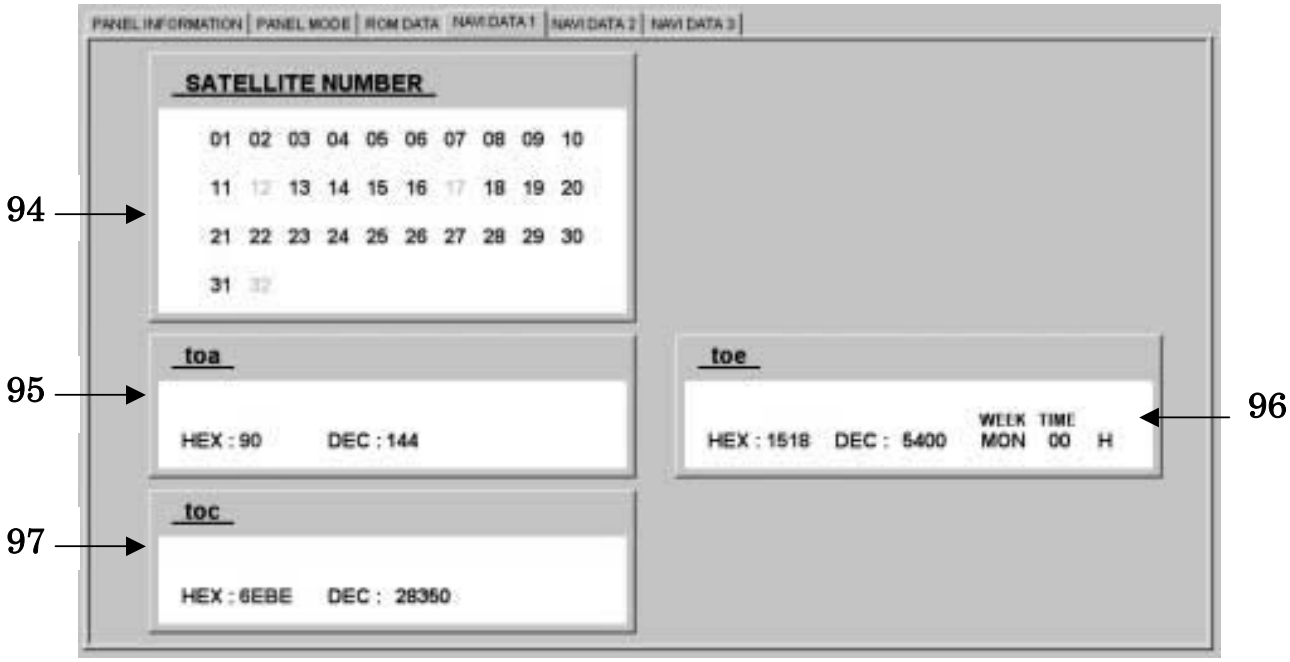
93 ROM DATA Text Box

Indicates NAVI data of the internal ROM of MSG-2051 unit.

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3.3.5 NAVI DATA 1 tab

Indicates NAVI data when MSG-2051 RS-232C Program is connected to MSG-2051 unit.



94 SATELLITE NUMBER item

Indicates SV-ID numbers 01～32 being set to ALMANAC data of NAVI data being connected to MSG-2051 unit.

95 toa item

Indicates the effective period of ALMANAC being set to ALMANAC data of NAVI data being connected to MSG-2051 unit.

96 toe item

Indicates the effective period of EPHEMERIS being set to EPHEMERIS data of NAVI data being connected to MSG-2051 unit.

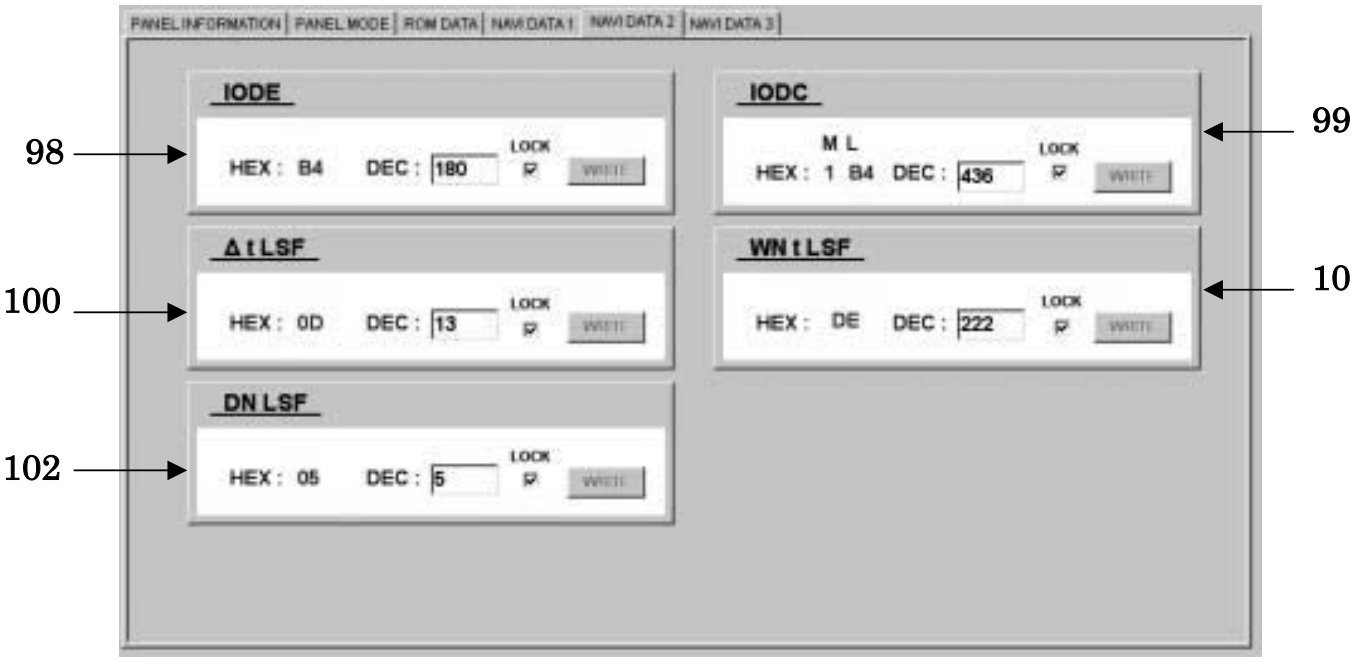
97 toc item

Indicates the effective time of the time correction being set to EPHEMERIS data of NAVI data being connected to MSG-2051 unit.

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3.3.6 NAVI DATA 2 tab

Indicates NAVI data when MSG-2051 RS-232C Program is connected to MSG-2051 unit.



98 IODE item

Indicates the update time of the orbit forecast data being set to EPHEMERIS data of NAVI data being connected to MSG-2051 unit.

99 IODC item

Indicates the update time of the time correction being set to EPHEMERIS data of NAVI data being connected to MSG-2051 unit.

100 Δt LSF item

Indicates the leap year after update being set to UTC data of NAVI data being connected to MSG-2051 unit.

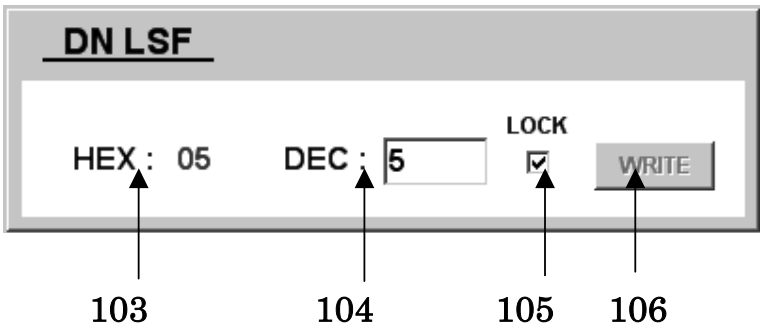
101 WN t LSF item

Indicates the update week of the leap second being set to UTC data of NAVI data being connected to MSG-2051 unit.

102 DN LSF item

Indicates the leap second update day being set to UTC data of NAVI data being connected to MSG-2051 unit.

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103 HEX label

Indicates a NAVI data item value in hexadecimal notation.

104 DEC label

Indicates a hexadecimal value of an NAVI data item in decimal notation.

105 LOCK Check Box

Prevents a change when an NAVI data item is changeable.

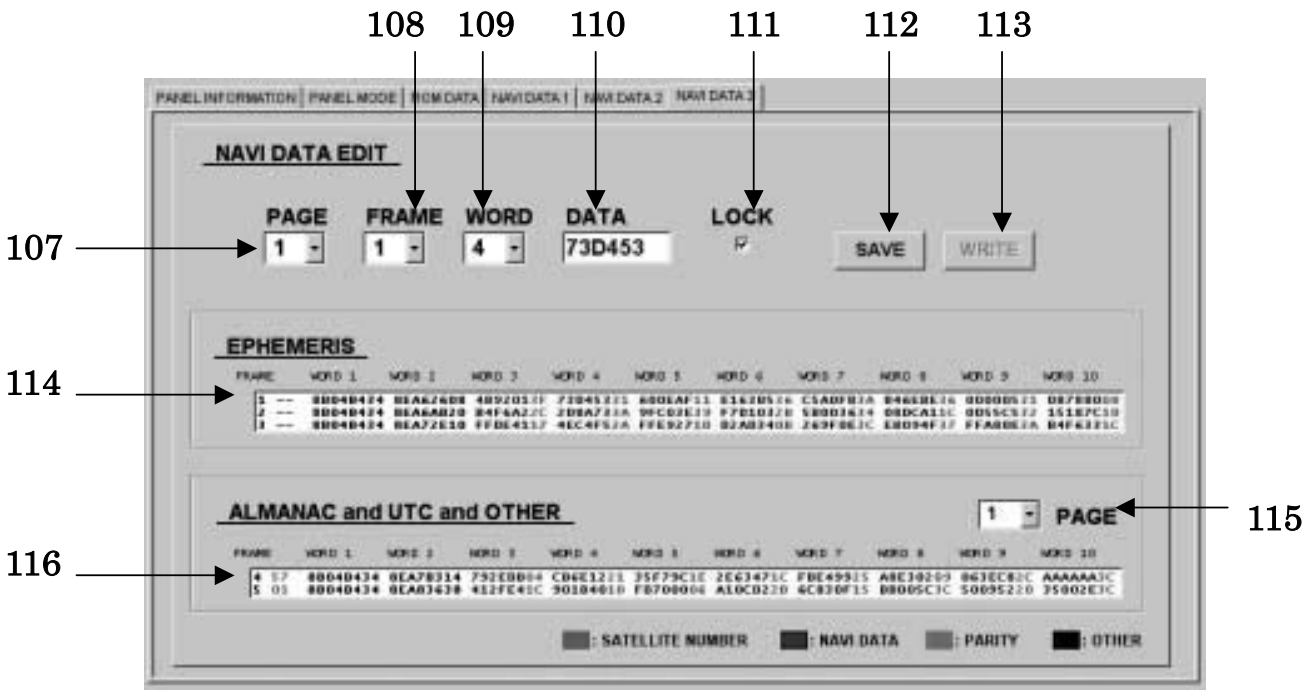
106 WRITE button

Changes a NAVI data item, if changeable.

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3.3.7 NAVI DATA 3 tab

Indicates NAVI data when MSG-2051 RS-232C Program is connected to MSG-2051 unit.



107 PAGE ComboBox

Selects a NAVI data PAGE.

108 FRAME ComboBox

Selects NAVI data FRAME.

109 WORD ComboBox

Selects a NAVI data WORD.

110 DATA Text Box

Indicates or changes NAVI data designated by PAGE ComboBox, FRAME ComboBox, or WORD ComboBox.

111 LOCK Check Box

Prevents a change of NAVI data.

112 SAVE button

Indicates a storage dialog for saving the contents of the Text Boxes of "EPHEMERIS" and "ALMANAC, UTC, and OTHER" being connected to MSG-2051 unit.

113 WRITE button

Changes NAVI data of MSG-2051 unit.

114 EPHEMERIS Text Box

Indicates EPHEMERIS data of NAVI data of MSG-2051 unit.

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115 ALMANAC and UTC and OTHER ComboBox

Selects the ALMANAC, UTC, and OTHER Text Box of NAVI data by page No.

116 ALMANAC, UTC, and OTHER Text Box

Indicates NAVI data of the ALMANAC, UTC, and OTHER Text Box of NAVI data of MSG-2051 unit.

4 Operation

4.1 Menu operation



○ File buttons

├ROM DATA SAVE button

│ By clicking this button, a save dialog of ROM DATA Text Box is indicated.

│

├NAVI DATA SAVE button

│ By clicking this button, the ALMANAC, UTC, and OTHER Text Box.

│

└End button

By clicking this button, MSG-2051 RS-232C Program is terminated.



○ Connection button

├Connection button

│ By clicking this button, the program is connected to MSG-2051 unit.

└Disconnection button

By clicking this button, the program is disconnected from MSG-2051unit.

○ Environment button

By clicking this button, an environment window is displayed.



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○ Language buttons

├Japanese button

│ By clicking this button, the display is done in Japanese.

│

└English button

By clicking this button, the display is done in English.

○ Version button

By clicking this button, a dialog is displayed to indicate version.

4.2 Operation of short cut buttons



○ Connection button

By clicking this button, the program is connected to MSG-2051 unit.

○ Reconnection button

By clicking this button, data of MSG-2051 unit are acquired again under the connected condition to MSG-2051 unit.

○ Disconnection button

By clicking this button, the program is disconnected from MSG-2051 unit.

○ Environment button

By clicking this button, an environment window is displayed.

○ Time synchronizing button

By clicking this button, a standby form is displayed and the computer system time is synchronized with the date and time of MSG-2051 unit simultaneously when the standby form of the computer system time becomes 0 second.

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4.3 Panel operation

4.3.1 Panel tab operation



① Click the panel tab of MSG-2051 RS-232C Program.
② Panel display is updated.

4.3.2 PANEL INFORMATION tab operation

No operation is done.

4.3.3 PANEL MODE tab operation

This panel is used to control the setting of MSG-2051 unit panel.

4.3.3.1 Display tab operation

① Click PANEL MODE tab on the MSG-2051 RS-232C Program window panel, and the panel is updated.
② Click the display tab.

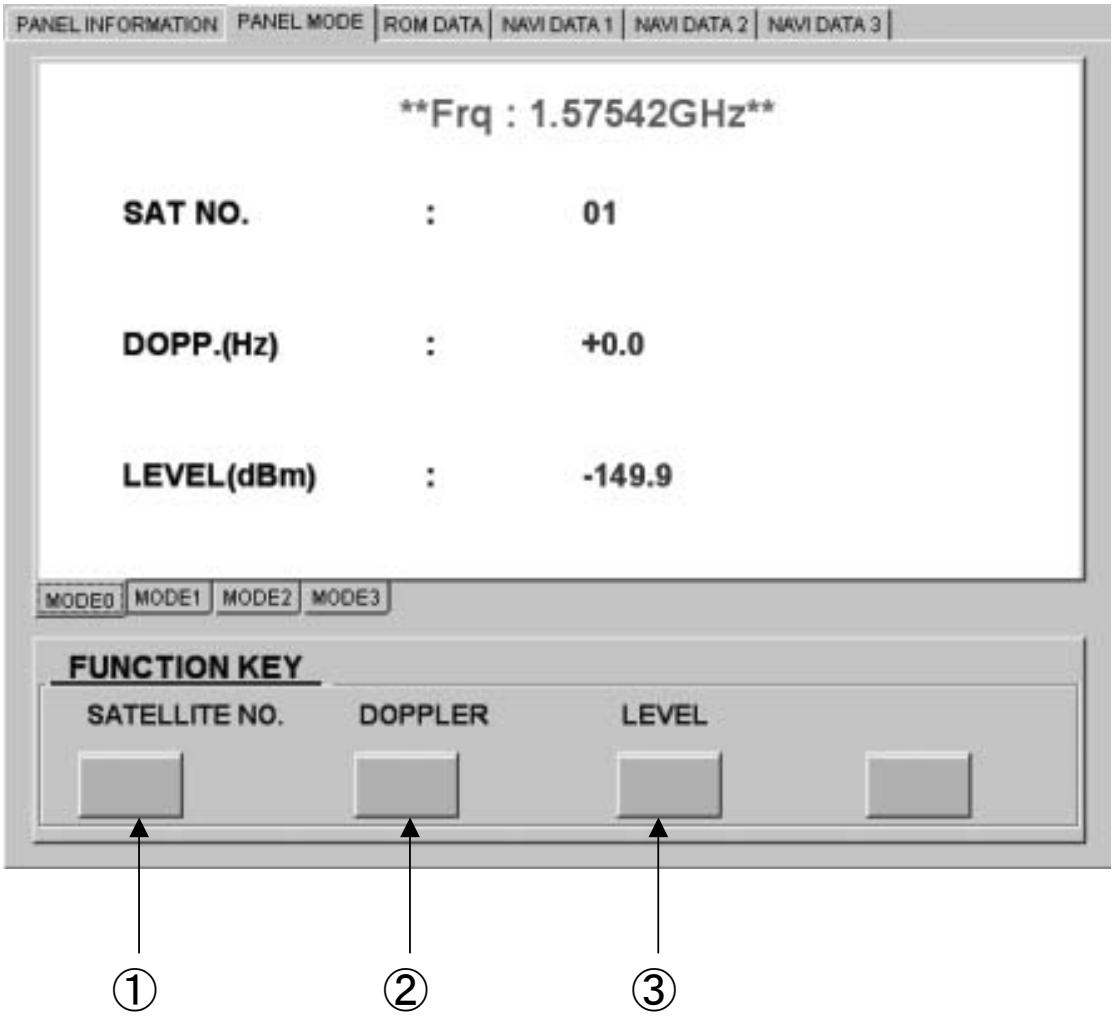


③ Display and FUNCTION key item label are updated, and the DISPLAY of MSG-2051 unit is updated to the display of the display tab mode.



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4.3.3.1.1 MODE 0 tab operation



① SATELLITE NO. button

By clicking the button, the SATELLITE NO. EDIT window is displayed.

② DOPPLER button

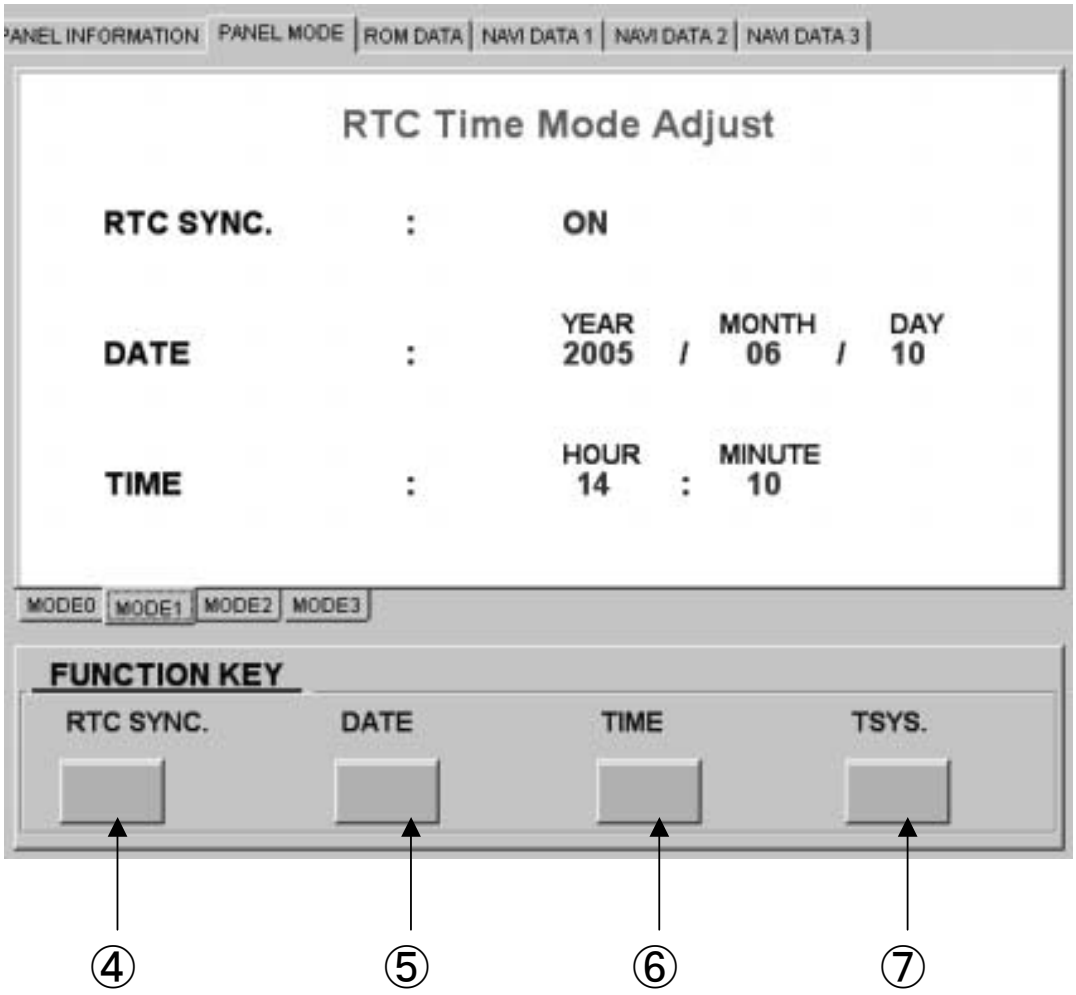
By clicking the button, the DOPPLER EDIT window is displayed.

③ LEVEL button

By clicking the button, the LEVEL OUTPUT EDIT window is displayed.

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4.3.3.1.2 MODE 1 tab operation



④ RTC SYNC. button

By clicking the button, the RTC SYNC. EDIT window is displayed.

⑤ DATE button

By clicking the button, the DATE EDIT window is displayed.

⑥ TIME button

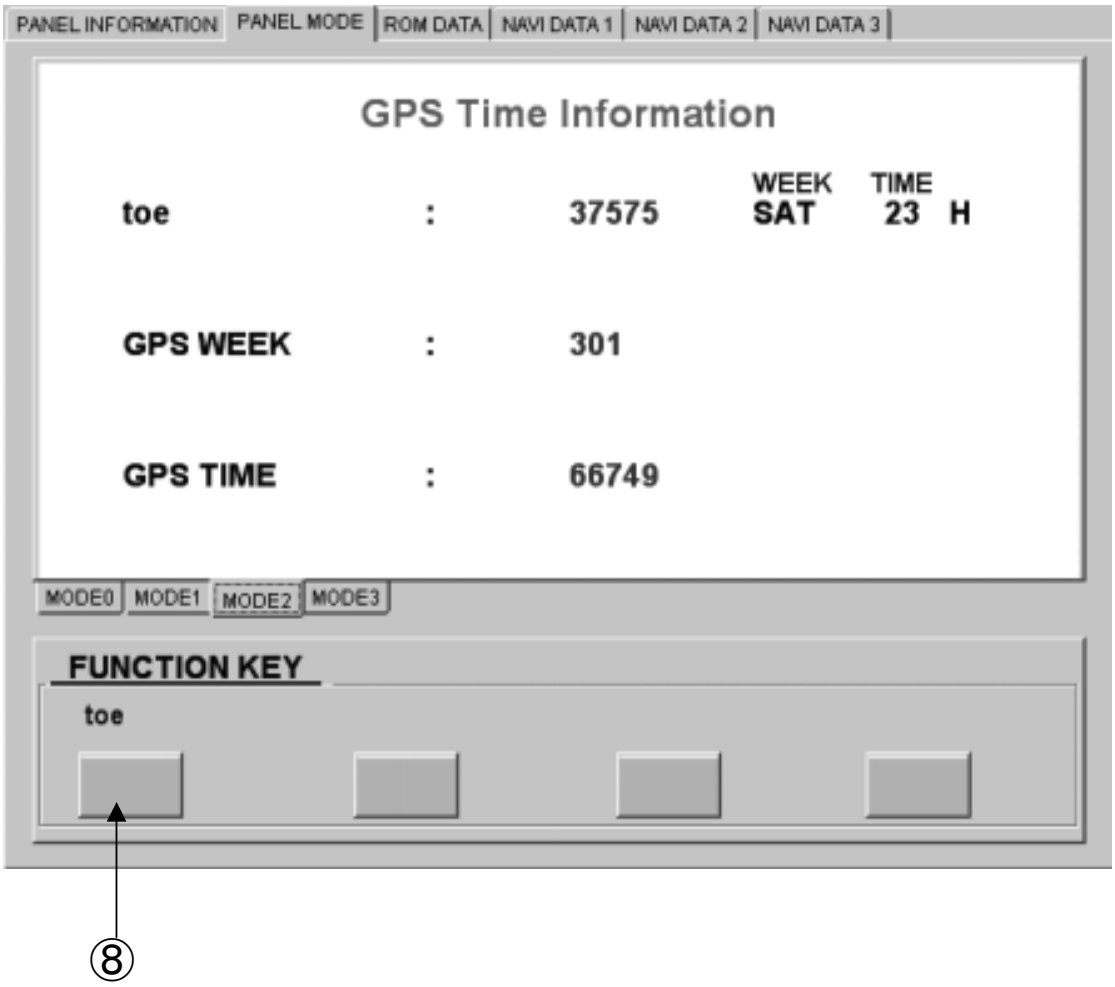
By clicking the button, the TIME EDIT window is displayed.

⑦ Time synchronizing button

By clicking this button, a standby form is displayed and the computer system time is synchronized with the DATE and TIME of MSG-2051 unit simultaneously when the standby form of the computer system time becomes 0 second.

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4.3.3.1.3 MODE 2 tab operation

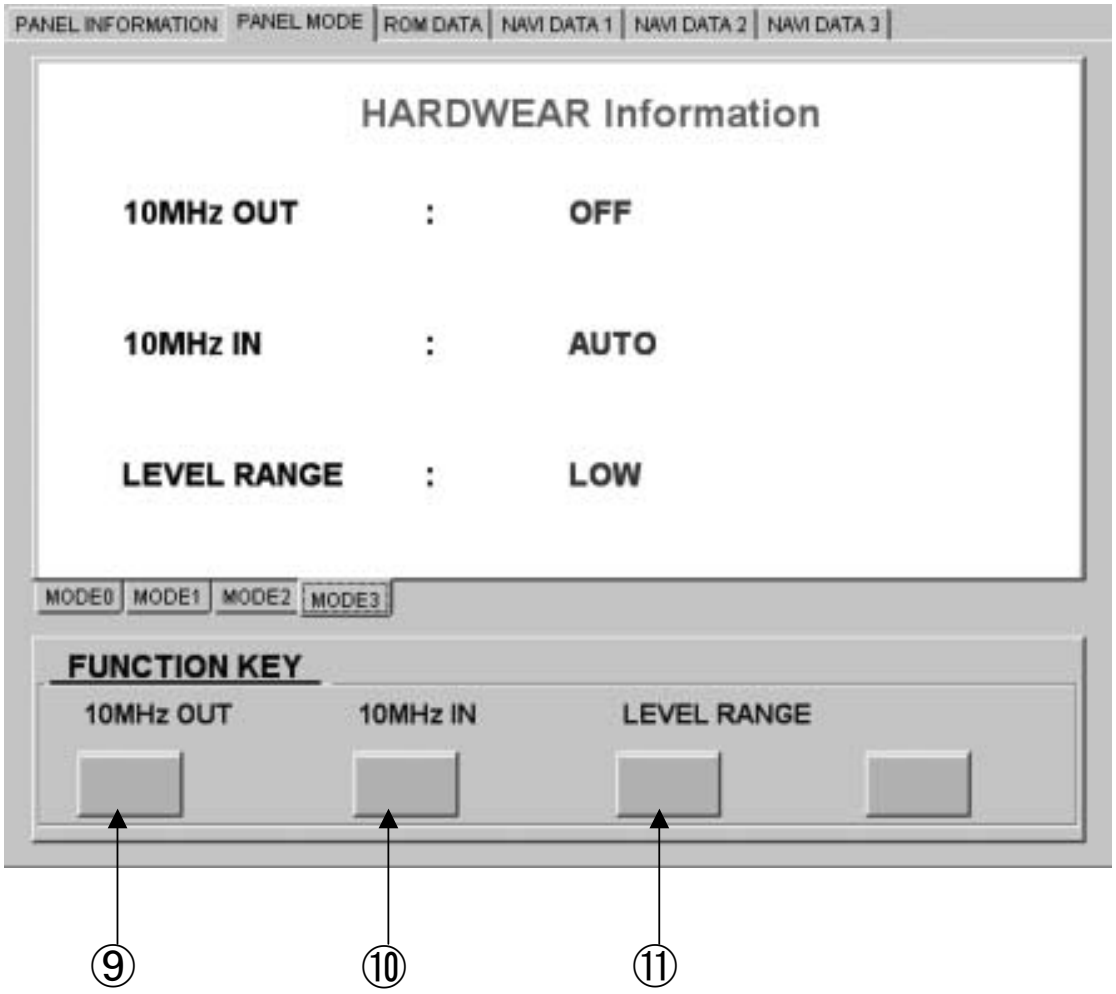


⑧ toe button

By clicking the button, the toe EDIT window is displayed.

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4.3.3.1.4 MODE 3 tab operation



⑨ 10MHz OUT button

By clicking the button, the 10MHz OUT EDIT window is displayed.

⑩ 10MHz IN button

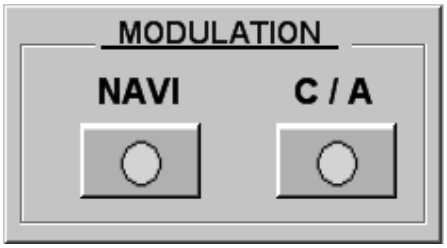
By clicking the button, the 10MHz IN EDIT window is displayed.

⑪ LEVEL RANGE button

By clicking the button, the LEVEL RANGE EDIT window is displayed.

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4.3.3.2 MODULATION operation



4.3.3.2.1 C／A button operation

C／A is turned on or off, each time the button is clicked.

① Click the button.

② The center color of the button changes simultaneously when clicking the button, and C/A button of MSG-2051 unit turns on or off.

* Note:

If C／A button is turned off when both C/A button and NAVI button are turned on, NAVI button is also turned off at the same time.

4.3.3.2.2 NAVI button operation

NAVI is turned on or off each time the button is clicked.

① Click the button.

② The center color of the button changes simultaneously when clicking the button, and NAVI button of MSG-2051 unit turns on or off.

* Note:

NAVI button becomes effective when C/A button is turned on.

4.3.3.3 DOPP. Button operation

DOPP. is turned on or off each time the button is clicked.



① Click the button.

② The center color of the button changes simultaneously when clicking the button, and DOPP. button of MSG-2051 unit turns on or off.

* Note:

If DOPP. button is turned on when the Doppler frequency is selected to be other than +0.0Hz, 1PPS SYNC. of STATUS may indicate UNLOCK.

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4.3.3.4 SYNC. PRESET operation



By clicking this button, an external signal (1PPS, etc.) is synchronized with C/A (gold) code epoch timing of MSG-2051 unit.

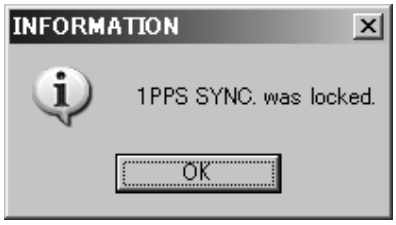
① Click the button.

② A standby form is displayed at once.

③ A dialog is displayed when synchronization ends or failed.

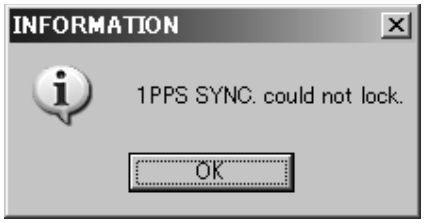
④ When synchronization ends, "1PPS SYNC." LED of "STATUS" lights on the front panel.

An external reference signal is used to select the external SYNC. mode.



⑤ If synchronization failed, the following requirements are not satisfied.

- No SYNC. signal (1PPS, etc.) is input from an external unit to the "SYNC. IN" BNC connector on the ear panel.
- A 10MHz reference signal (1PPS, etc.) is input from an external unit to the "10MHz IN" BNC connector on the rear panel.
- External reference clock is not selected.



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4.3.3.5 OUTPUT button operation



OUTPUT is turned on or off each time the button is clicked.

① Click the button.

② The center color of the button changes simultaneously when clicking the button, and OUTPUT of MSG-2051 unit turns on or off.

4.3.3.6 EDIT window operation

4.3.3.6.1 EDIT window display

① Click PANEL MODE of the panel tab.



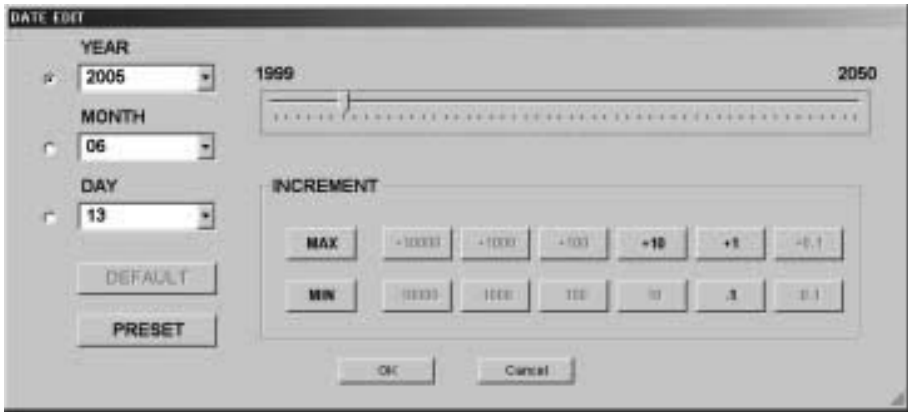
② Click the display tab of MODE of the display where a desired setting item is present.



③ Click a desired FUNCTION key button to be set out of the FUNCTION KEY items.



④ A desired EDIT window to be set is displayed.

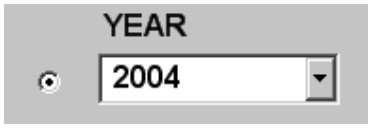


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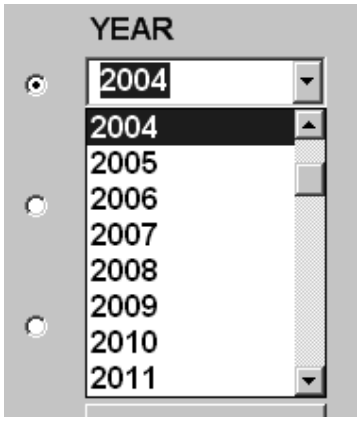
4.3.3.6.2 Decision of EDIT window setting

4.3.3.6.2.1 Setting procedure 1

① Click the item selection radio button of the selection ComboBox to be set.



② A selection range is displayed simultaneously when clicking the inverted triangle of the selection ComboBox.



③ A value to be set is displayed on the selection ComboBox. by clicking the value to be set, and the track bar pointer of the track bar indicates the clicked value.

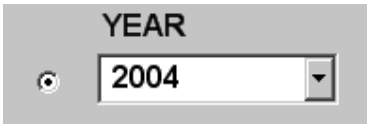


④ By clicking OK button, the setting of the selection ComboBox of EDIT window is reflected on MSG-2051 unit and the EDIT window is closed.

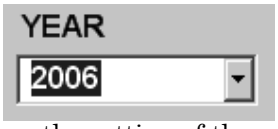
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4.3.3.6.2.2 Setting procedure 2

① Click the item selection radio button of the selection ComboBox to be set.



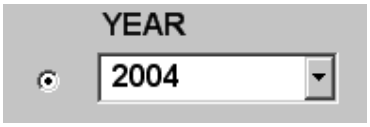
② Shift the mouse while clicking the track bar of the selection track bar so that the selection ComboBox value meets the value to be set.



③ By clicking OK button, the setting of the selection ComboBox of EDIT window is reflected on MSG-2051 unit and the EDIT window is closed.

4.3.3.6.2.3 Setting procedure 3

① Click the item selection radio button of the selection ComboBox to be set.



② Click an INCREMENT item selection button so that the selection ComboBox meets the value to be set.



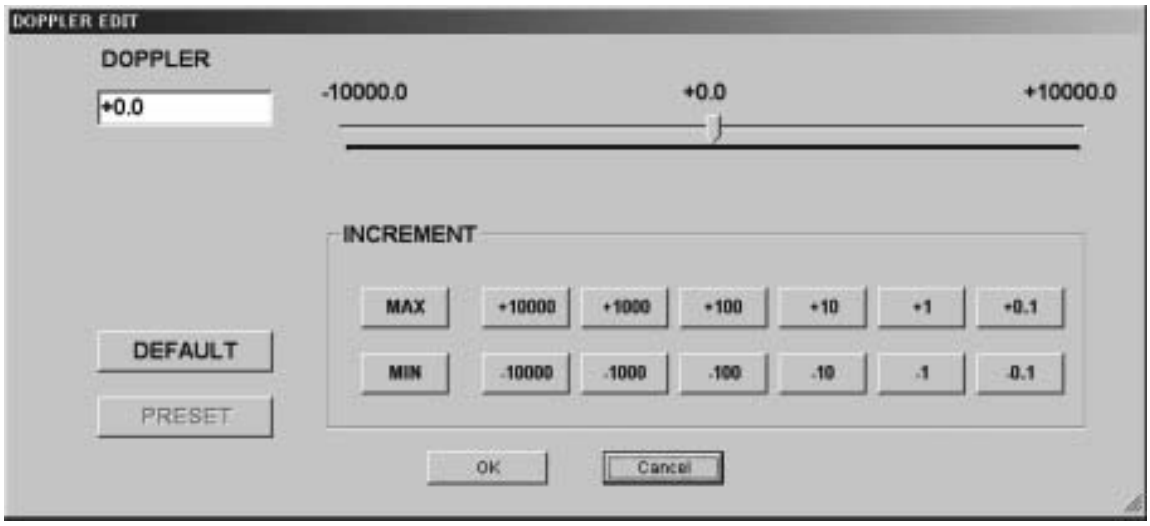
③ By clicking OK button, the setting of the selection ComboBox of EDIT window is reflected on MSG-2051 unit and the EDIT window is closed.

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4.3.3.6.2.4 Setting procedure 4

* Note:

This procedure applies to DOPPLER EDIT window setting only. It does not apply to any other setting item.



① Input a frequency to be set from the keyboard to the DOPPLER Text Box.

② Press ENTER key.

③ The track bar indicates the value to be set in the DOPPLER Text Box.

④ By clicking OK button, the setting of the selection ComboBox of EDIT window is reflected on MSG-2051 unit and the EDIT window is closed.

* Note:

- Press ENTER key without fail when the input has been done from the keyboard to the DOPPLER Text Box, otherwise the setting is not reflected.
- If ENTER key is clicked after inputting a value other than the setting range to the DIOPPLER Text Box, an alarm dialog is displayed.

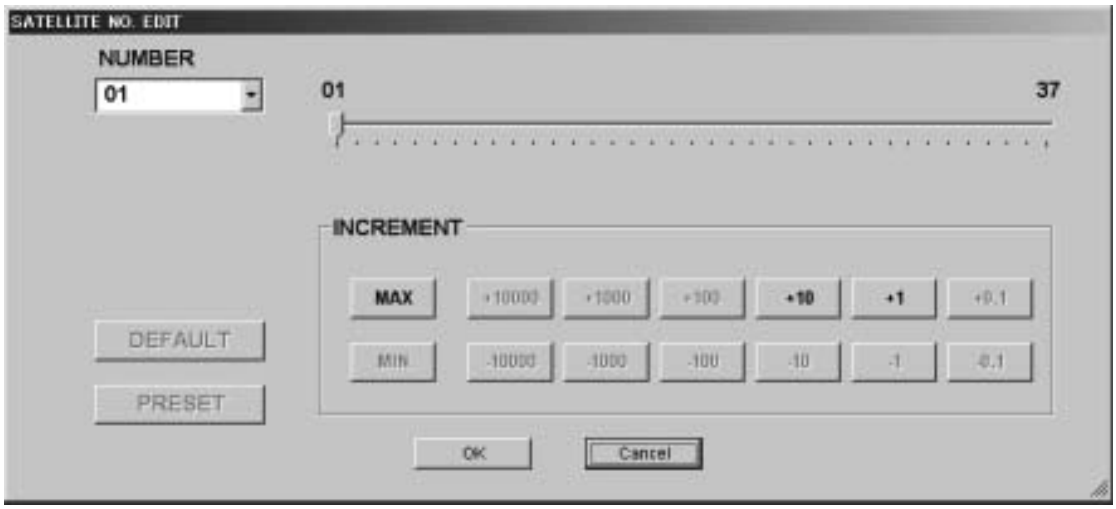
4.3.3.6.3 Canceling the EDIT window setting to be inffective

① EDIT window is closed simultaneously when clicking Cancel button.

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4.3.3.6.4 SATELLITE NO. EDIT window operation

This operation is done to change SATELLITE NO. of the modulation channel during the connection to MSG-2051 unit.



① Select an optional SATELLITE NO. in the NUMBER ComboBox, track bar, or INCREMENT item.

② By clicking OK button, the setting of SATELLITE NO. is decided.

③ SATELLITE EDIT window is closed simultaneously when clicking the button.

Setting range : 01 ～ 37

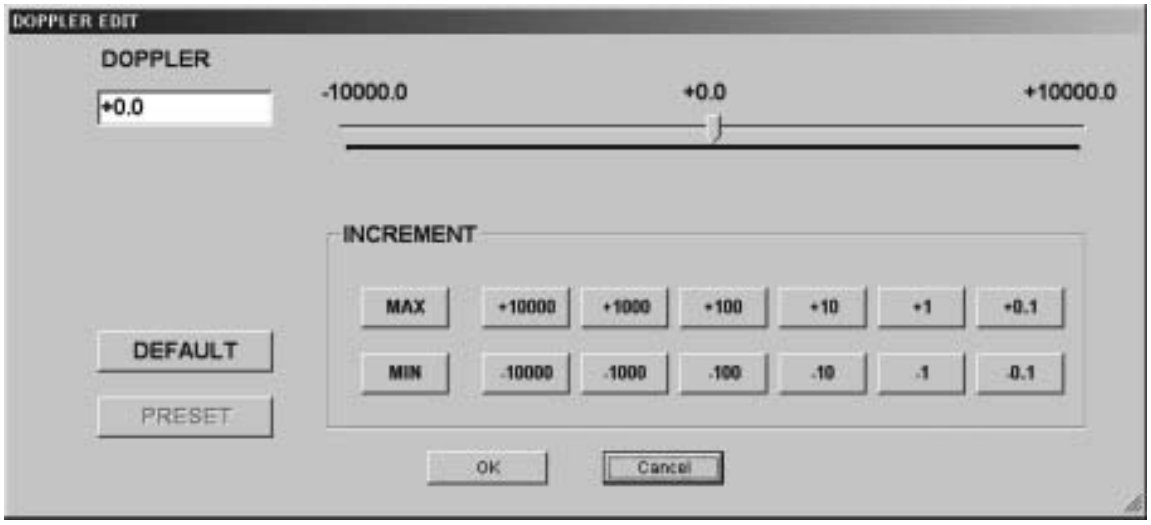
DEFAULT button : No function is provided

PRESET button : No function is provided

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4.3.3.6.5 DOPPLER EDIT window operation

This operation is done to change the DOPPLER frequency during the connection to MSG-2051 unit.



4.3.3.6.5.1 User setting

① Select an optional DOPPLER frequency in the DOPPLER Text Box, track bar, or INCREMENT item.
② By clicking OK button, the setting of DOPPLER frequency is decided.
③ DOPPLER EDIT window is closed simultaneously when clicking the button.

4.3.3.6.5.2 DEFAULT setting

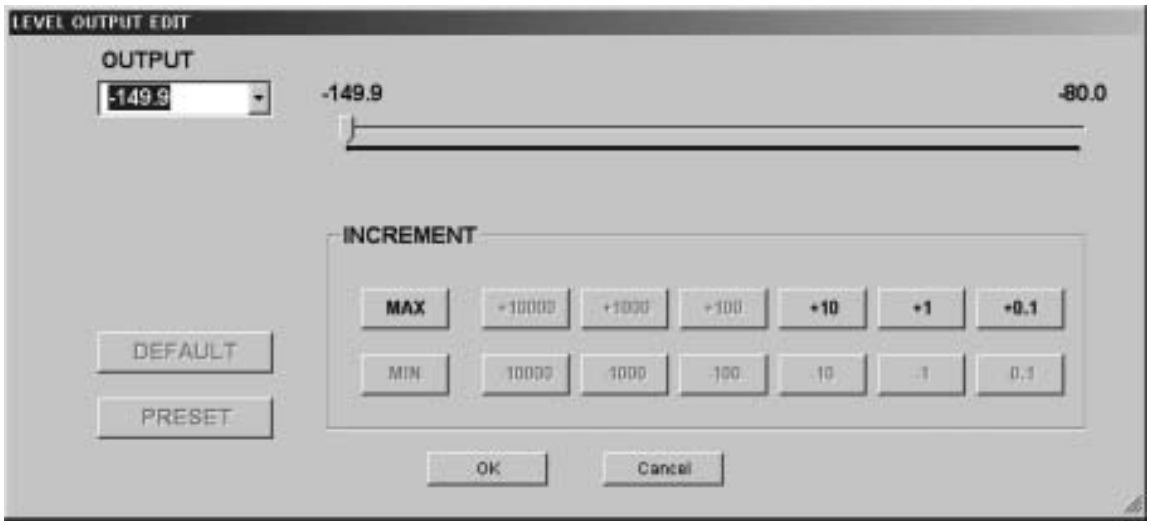
Set the DOPPLER Text Box value to ＋0.0.
① Click DEFAULT button.
② DOPPLER Text Box and track bar pointer indicate ＋0.0.

Setting range : ＋10000.0 ～ －10000.0
DEFAULT button : ＋0.0
PRESET button : No function is provided

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4.3.3.6.6 LEVEL OUTPUT EDIT window operation

This operation is done to change the output level during the connection to MSG-2051 unit.



① Select an optional output level in the OUTPUT ComboBox, track bar, or INCREMENT item.

② By clicking OK button, the setting of the output level is decided.

③ LEVEL OUTPUT EDIT window is closed simultaneously when clicking the button.

Setting range : LEVEL RANGE
HIGH: －129.9 ～ －60.0
LOW : －149.9 ～ －80.0

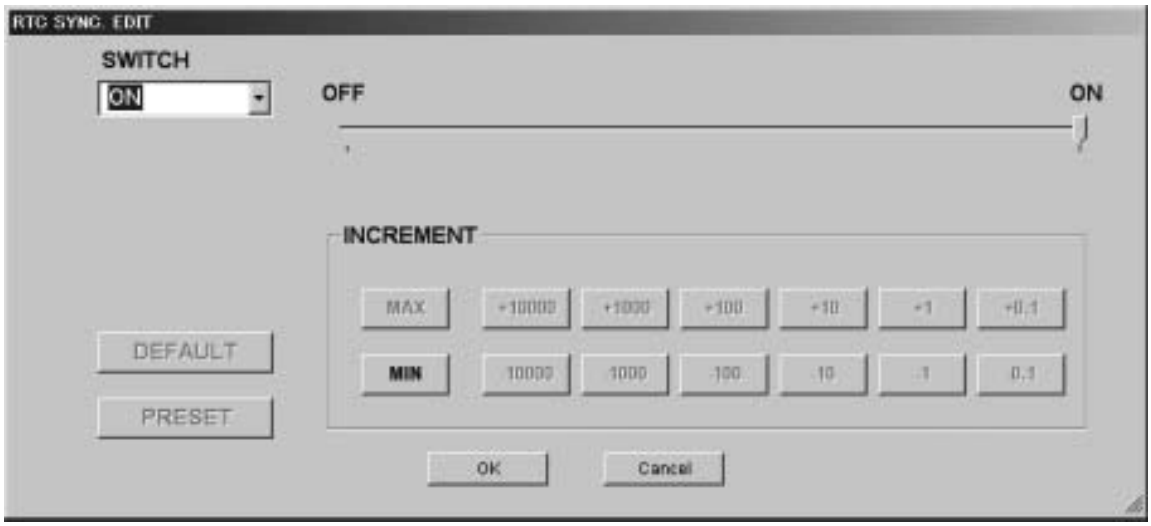
DEFAULT button : No function is provided

PRESET button : No function is provided

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4.3.3.6.7 RTC SYNC. EDIT window operation

RTC SYNC. is changed during the connection to MSG-2051 unit.



① Select RTC SYNC. in the SWITCH ComboBox, track bar, or INCREMENT item.

② By clicking OK button, the setting of RTC SYNC. is decided.

③ RTC SYNC. EDIT window is closed simultaneously when clicking the button.

Setting range : ON／OFF

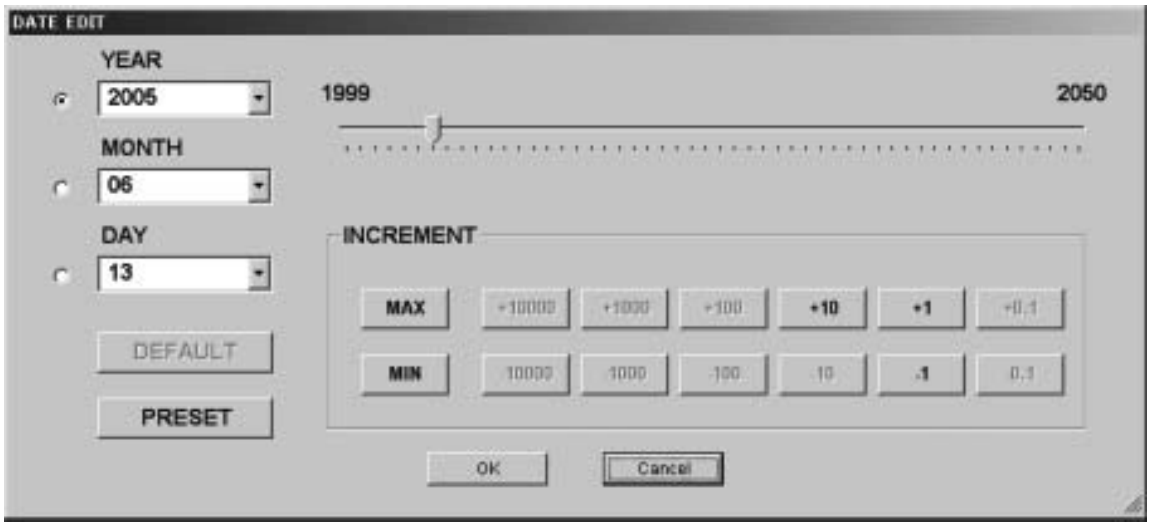
DEFAULT button : No function is provided

PRESET button : No function is provided

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4.3.3.6.8 DATE EDIT window operation

This operation is done to change the date during the connection to MSG-2051 unit.



4.3.3.6.8.1 User setting

① Select an optional YEAR in the YEAR ComboBox, track bar, or INCREMENT item.
② Select an optional MONTH in the MONTH ComboBox, track bar, or INCREMENT item.
③ Select an optional DAY in the DAY ComboBox, track bar, or INCREMENT item.
④ By clicking OK button, the setting of the YEAR, MONTH, and DAY is decided.
⑤ DATE EDIT window is closed simultaneously when clicking the button.

4.3.3.6.8.2 PRESET setting

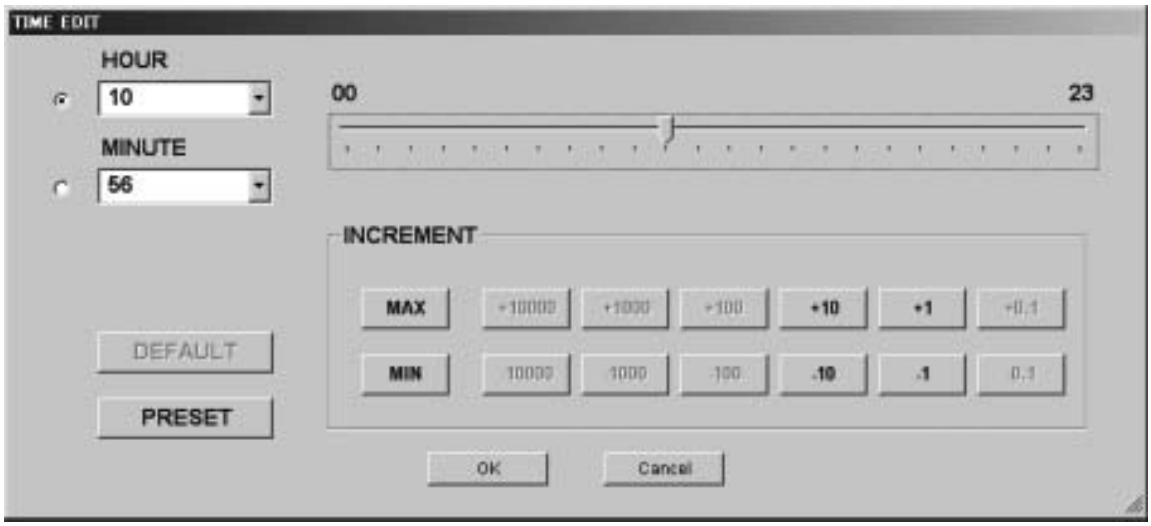
① Click PRESET button.
② The computer system time is set to the RTC DATE of MSG-2051 unit simultaneously when clicking PRESET button.
③ DATE EDIT window is closed.

Setting range	:	YEAR	1999 ～ 2050
		MONTH	01 ～ 12
		DAY	01 ～ 31
DEFAULT button	:	No function is provided	
PRESET button	:	DATE synchronization	

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4.3.3.6.9 TIME EDIT window operation

This operation is done to change the time during the connection to MSG-2051 unit.



4.3.3.6.9.1 User setting

① Select an optional HOUR in the HOUR ComboBox, track bar, or INCREMENT item.
② Select an optional MINUTE in the MINUTE ComboBox, track bar, or INCREMENT item.
③ By clicking OK button, the setting of the HOUR and MINUTE is decided.
④ TIME EDIT window is closed simultaneously when clicking the button.

4.3.3.6.9.2 PRESET setting

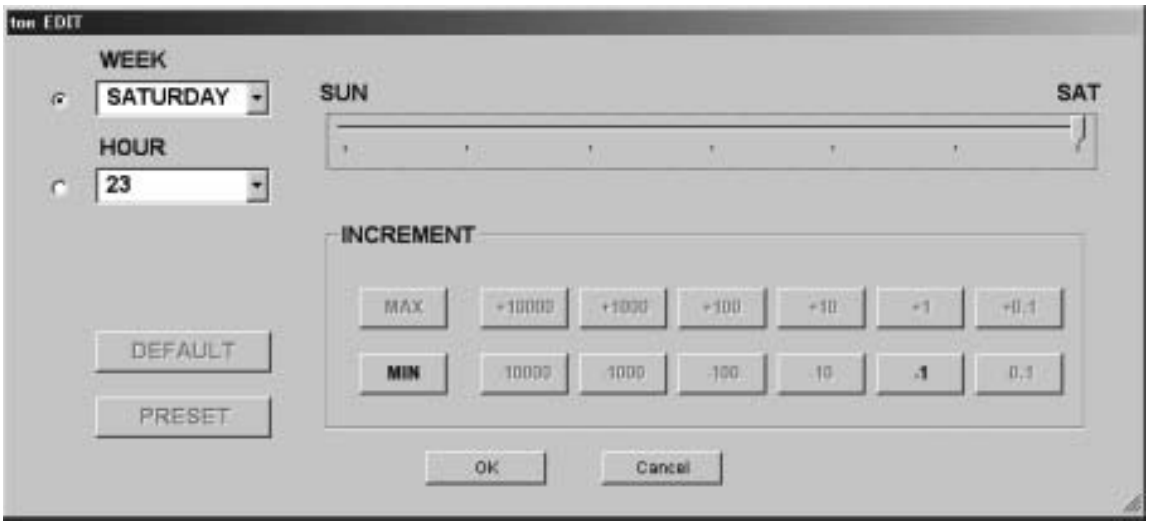
① Click PRESET button.
② A standby form is displayed.
③ The computer system time is set to TIME of MSG-2051 unit simultaneously when the standby form is displayed and the second is displayed to be 0.
④ The standby form and TIME EDIT window are closed.

Setting range : HOUR 00 ～ 23
MINUTE 00 ～ 59
DEFAULT button : No function is provided
PRESET button : Time synchronization

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4.3.3.6.10 toe EDIT window operation

This operation is done to change toe during the connection to MSG-2051 unit.



① Select an optional WEEK in the WEEK ComboBox, track bar, or INCREMENT item.

② Select an optional TIME in the HOUR ComboBox, track bar, or INCREMENT item.

③ By clicking OK button, the setting of the WEEK and TIME is decided.

④ The toe EDIT window is closed simultaneously when clicking the button.

Setting range	: WEEK	SUNDAY ～ SATURDAY
	HOUR	00 ～ 23
DEFAULT button	: No function is provided	
PRESET button	: No function is provided	

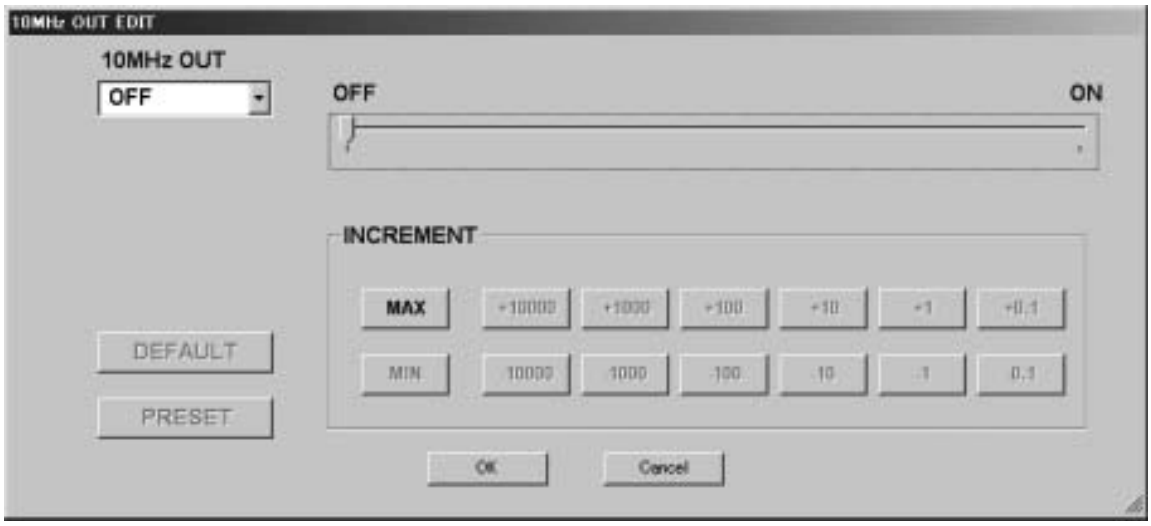
* Note:

If OK button is clicked when toe is changed by NAVI DATA EDIT or other RS232C communication software, the label of the toe item of NAVI DATA 1 is changed simultaneously when clicking OK button.

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4.3.3.6.11 10MHz OUT EDIT window operation

This operation is done to change 10MHz OUT during the connection to MSG-2051 unit.



① Select an optional 10MHz OUT by 10MHz OUT ComboBox, track bar, or INCREMENT item.

② By clicking OK button, the setting of the 10MHz OUT is decided.

③ The 10MHz OUT EDIT window is closed simultaneously when clicking the button.

Setting range : ON／OFF

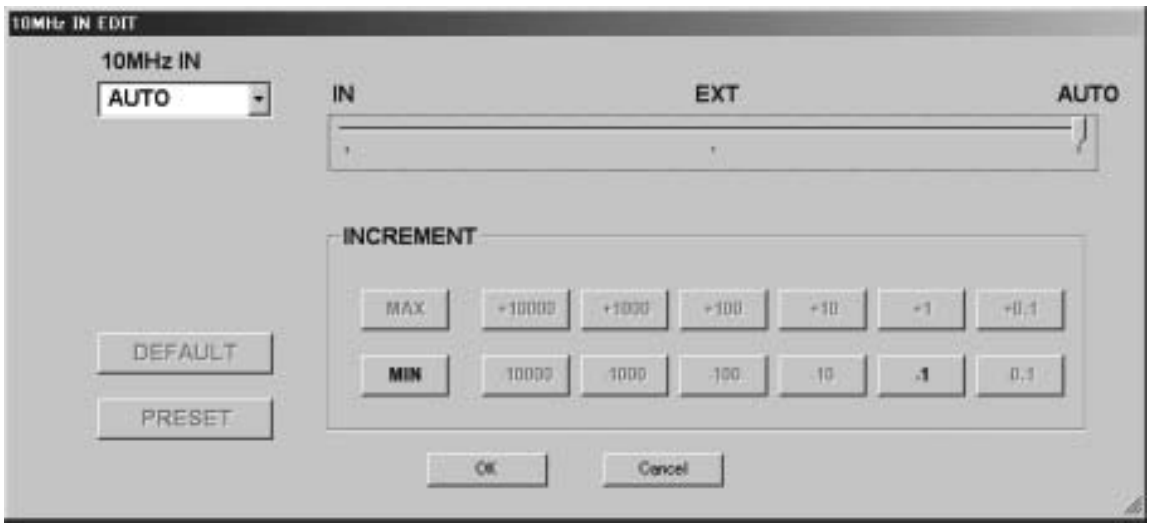
DEFAULT button : No function is provided

PRESET button : No function is provided

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4.3.3.6.12 10MHz IN EDIT window operation

This operation is done to change 10MHz IN during the connection to MSG-2051 unit.



① Select an optional 10MHz IN by 10MHz IN ComboBox, track bar, or INCREMENT item.

② By clicking OK button, the setting of the 10MHz IN is decided.

③ The 10MHz IN EDIT window is closed simultaneously when clicking the button.

Setting range : AUTO/INT/EXT

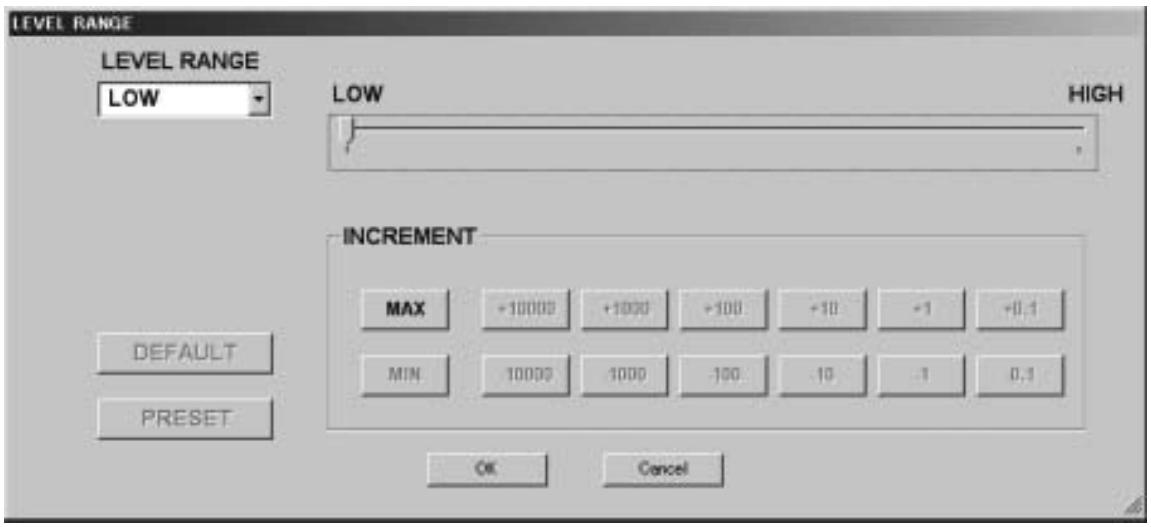
DEFAULT button : No function is provided

PRESET button : No function is provided

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4.3.3.6.13 LEVEL RANGE EDIT window operation

This operation is done to change the level range during the connection to MSG-2051 unit.



① Select an optional LEVEL RANGE by LEVEL RANGE ComboBox, track bar, or INCREMENT item.

② By clicking OK button, the setting of LEVEL RANGE is decided.

③ The LEVEL RANGE EDIT window is closed simultaneously when clicking the button.

Setting range : HIGH／LOW

DEFAULT button : No function is provided

PRESET button : No function is provided

* Note:

- By setting LEVEL RANGE to LOW when the level is set to －60.0 ～ －79.9dBm, －80.0dBm is set.
- By setting LEVEL RANGE to HIGH when the level is set to －130.0 ～ －149.9dBm, －129.9dBm is set.

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4.3.4 ROM DATA tab operation

4.3.4.1 LOAD button operation

① Click LOAD button.
② A NAVI data is displayed on the ROM DATA Text Box simultaneously when clicking the LOAD button.

4.3.4.2 SAVE button operation

① Click SAVE button.
② A SAVE dialog is displayed simultaneously when clicking SAVE button.
③ Input an optional folder and a save file name, and click SAVE.
④ The dialog is closed simultaneously when clicking Save to complete save operation.

4.3.4.3 ROM DATA Text Box operation

Use this box freely. This operation is not synchronized with NAVI data of MSG-2051 unit.

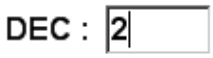
4.3.5 NAVI DATA 1 tab operation

No operation is done.

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4.3.6 NAVI DATA 2 tab operation

① Input an optional decimal number to the DEC Text Box of the NAVI data item to be changed.



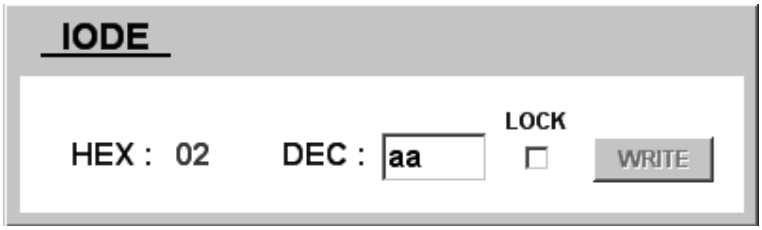
② Simultaneously when clicking the LOCK Check Box of NAVI data item to be changed, the LOCK Check Box is released from being checked and the buttons other than the WRITE button of the item to be changed becomes non-operable.



* Note:

Simultaneously when clicking the LOCK Check Box, GPS TIME and RTC synchronizing time of the status bar stop.

If a dialog [Input a numeric value up to f (setting range)] is displayed when clicking the LOCK Check Box, a value out of the setting range of the item to be changed or characters are input.



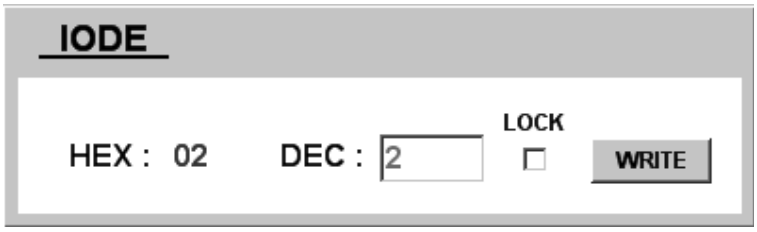


The dialog is closed by clicking OK button of the dialog.

③ Click the WRITE button of the NAVI data item to be changed.



④ By clicking the button, a dialog indicates [NAVI data item name to be changed has been input], and the HEX label of the NAVI data item to be changed indicates the DEC Text Box value in hexadecimal notation.





⑤ By clicking the OK button of the dialog, the dialog is closed at once, and the GPS TIME and RTC synchronous time of the status bar are started.

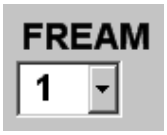
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4.3.7 NAVI DATA 3 tab operation

① Select an optional PAGE by the PAGE ComboBox.



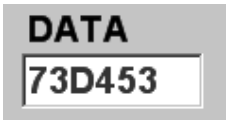
② Select an optional FRAME by the FRAME ComboBox.



③ Select an optional WORD by the WORD ComboBox.

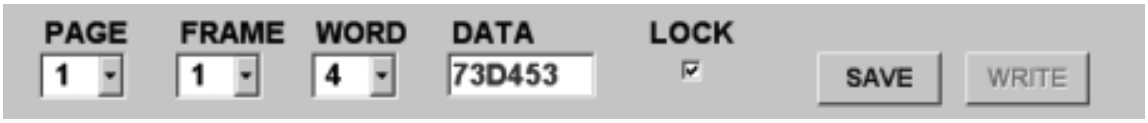


④ Input an optional NAVI data to the DATA Text Box by 3 bytes (6 characters).



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⑤ By clicking the check of LOCK Check Box, the input of PAGE ComboBox, FRAME ComboBox, WORD ComboBox, and DATA ComboBox becomes impossible, while WRITE button can be clicked.



If a dialog [Input 3 bytes of either numeric value 0 ～ 9 or alphabetic characters A ～ F] is displayed when clicking LOCH Check Box, 3 bytes are not input to DATA Text Box, or characters other than numeric values 0 ～ 9 or alphabetic characters A ～ F are input.
Input 3 bytes of numeric values 0 ～ 9 or alphabetic characters A ～ F.





If a dialog [Mask data] is displayed when clicking the LOCK Check Box, NAVI data cannot be changed.





⑥ By clicking WEITE button, optional NAVI data can be set to MSG-2051 unit, parity is calculated up to WORD 10 from optional NAVI data, and 3-byte NAVI data of WORD 10 in MSG-2051 unit are changed.

⑦ Now, PAGE ComboBox, FRAME ComboBox, WORD ComboBox, and DATA ComboBox can be input, while WRITE button cannot be clicked.

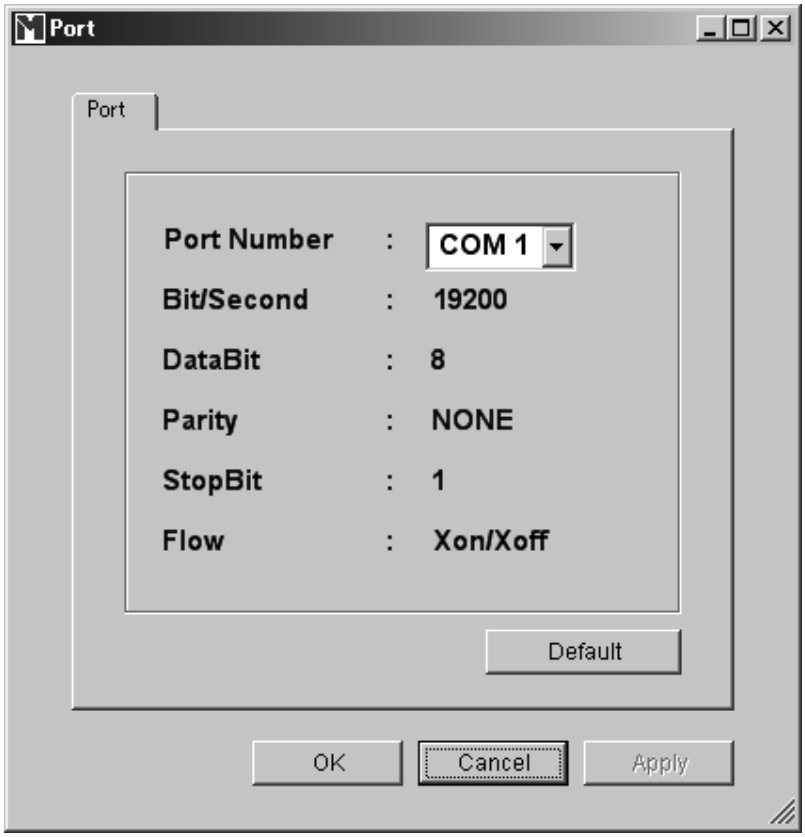
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5 Environment setting

Set the port number to which the RS-232C cable of computer has been connected. Port No. cannot be changed during the connection to MSG-2051 unit.

5.1 Environment setting

① An environment window is displayed by clicking Environment button.



② Select a port number of the RS-232C cable being connected to the computer by the Port Number ComboBox.

③ By clicking OK key, the Port Number selected by the ComboBox is set and the environment window is closed at the same time.

5.2 Port setting cancel

① By clicking Cancel button, the setting is canceled and the environment window is closed.

5.3 Resetting to port number at the time of installation

① By clicking Default button, Port Number ComboBox indicates COM 1.

② By clicking OK key, the port number selected by the Port Number ComboBox is set and the environment window is closed at the same time.

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6 ROM data

Internal ROM data under the initial condition of MSG-2051 unit or air data on June 2, 2005 are displayed in the ROM DATA Text Box.

* Note:
This data does not reflect any contents changed by MSG-2051 RS-232C Program or command [PSW].

6.1 ROM DATA Text Box display

The following table shows a part of ROM DATA Text Box.
Each part will be described below.

FRAME	SV-ID	NAVI data WORD 1 WORD 2 WORD 3 ・・・ WORD 10	PAGE
1	--	8B04B434 8EA62608 4B52011B ・・・ 08788008	1
2	--	8B04B434 8EA6AB20 B4F6A22C ・・・ 6EBE7C2C	
3	--	8B04B434 8EA72E10 FFDE4117 ・・・ B4F6331C	
4	57	8B04B434 8EA7B314 792EDB04 ・・・ AAAAAA3C	
5	01	8B04B434 8EA83638 412FE41C ・・・ 35002E3C	
1	--	8B04B434 8EA62608 4B52011B ・・・ 08788008	2
2	--	8B04B434 8EA6AB20 B4F6A22C ・・・ 6EBE7C2C	

○ PAGE (Page number)
Indicates NAVI data of PAGE 01 ～ 25 (1500-bit length) being displayed at present.

○ FRAME (Frame number)
Indicates the number line as FRAME numbers 1 ~ 5 (300-bit length).

○ WORD (Word number)
Each WORD is represented by the following format (30-bit length).
It is represented by a NAVI data of PAGE 1, FRAME 1, and WORD 1 as an example.

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	NAVI data			PARITY
Bytes	1	2	3	4
NAVI data	8B	04	B4	34
No of bits	8bits	8bits	8bits	6bits

PARITY is represented by LSB 6 bites, and 0 is inserted to MSB 2 bits (bit 1, bit 2) of the PARITY.

- SV-ID (satellite number)

  This number indicates SV-ID of the ALMANAC. If SV-ID number is 0, a blank data is inserted.

- NAVI data

  NAVI data obtained from the satellite for 12.5 minutes from 01:43 hours to 01:56 hours on June 3, 2005 are saved into ROM.

  Check NAVI data as shown below.

  Example)

PAGE No.	–	FRAME No.	–	WORD No.	=	NAVI data
1	–	3	–	1	=	8B04B434
1	–	5	–	10	=	35002E3C
18	–	4	–	9	=	0DDE0532

6.2 SAVE data

A file is output in text format which is the same as in the display in 6.1 ROM DATA Text Box.

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7 NAVI data

By connecting MSG-2051 RS-232 Program to MSG-2051 unit, NAVI data are displayed by loading them other than NAVI data WORD 1 and 2.
These data are displayed in decimal notation, hexadecimal notation, or other notations. In the other notations, NAVI data are calculated according to ICD-GPS-200 standard. Refer to ICD-GPS-200 standard.

The following units are displayed.

The hexadecimal unit is displayed with affixed H.
The decimal unit is displayed without any affixed character.
A PAGE is displayed with affixed P.
A FRAME is displayed with affixed F.
A WORD is displayed with affixed W.

7.1 SATELLITE NUMBER item

3W NAVI data other than all PAGE EPHEMERIS data of MSG-2051 unit are calculated to display SV-ID numbers.

7.1.1 Display

By connecting the program to MSG-2051 unit, 3W of ALMANAC data of all pages are loaded. One byte of these input data is calculated to light blue. If SV-ID number of ALMANAC data is less than 0 or more than 33, no display is done.

7.1.2 Calculation method

Let's use 2P4F3W of ROM DATA Text Box as an example.
NAVI data: 5962860F H

① Convert 1 byte of NAVI data into a decimal number.
59 H → 89
② Subtract 64 from the value obtained by converting into a decimal number.
89 − 64 = 25
③ Satellite number becomes 25.
④ From the above calculation method, SV-ID number 25 of SATELLITE NUMBER item is displayed by lighting it blue.

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7.1.3 Exemption

If an SV-ID number overlaps with ALMANAC data, it remains lit blue.

7.2 Toe item

This item is displayed by referring to 1P2F10W of EPHEMERIS data of MSG-2051 unit.

7.2.1 Display

By connecting the program to MSG-2051 unit, 1P2F10W is loaded to NAVI data, and bytes 2 and 3 of input data are displayed.

7.2.2 Calculation method

Let's use 1P2F10W of ROW DATA Text Box as an example.
NAVI data : 6EBE7C2C H

① Convert 1 and 2 bytes of NAVI data into a decimal number. 6EBE H → 28350

② Multiply the value obtained by converting into the decimal number by 16.
28350 × 16 = 453600

③ Divide the multiplied value by the day's total seconds (60 seconds*60 minutes*24 hours).
453600 ÷ 86400 = 5.083 …
From the integer part of the answer, the toe item WEEK is displayed as FRIDAY according to the following table.
The decimal part is omitted.

Integer part	WEEK
0	SUNDAY
1	MONDAY
2	TUESDAY
3	WEDNESDAY
4	THURSDAY
5	FRIDAY
6	SATURDAY
7 ～	SATURDAY

④ Calculate the value at 0 hour on the weekday of the integer part by multiplying the integer part by the day's total seconds (60 seconds*60 minutes*24 hours).
5 × 86400 = 432000 (FRIDAY 00 HOUR)

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⑤ Subtract the value at 0 hour on the weekday from the value obtained by converting into the decimal number in step ②.

453600 – 432000 = 21600

⑥ Divide the value obtained in step ⑤ by one hour's seconds (60 minutes × 60 seconds).

The decimal part is omitted.

21600 ÷ 3600 = 6

⑦ From the above calculation method, toe decimal is displayed as 6 hours. (FRIDAY 06 HOUR)

7.2.3 Exemption

7.2.3.1 Effective range

The calculation method in 7.2.2 is used normally. When NAVI data of 1P2F10W are changed by using NAVI DATA EDIT or RS-232C communication software and the MSG-2051 RS-232C Program is connected, the WEEK display and TIME display correspond to each other as shown below.

Toe (decimal number)	Toe (hexadecimal number)	WEEK	TIME (HOUR)
0 ～ 224	0000 H ～ 00E0 H	SUNDAY	00
225 ～ 37779	00E1 H ～ 9393 H	SUNDAY ～ SATURDAY	00 ～ 23
37800 ～ 65536	9394 H ～ FFFF H	SATURDAY	23

* Remarks:

One HOUR is 225 in decimal notation of toe.

The weekday change of WEEK is 5400 in decimal notation of toe. Use the above values as a reference for change.

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7.2.3.2 Difference between ROM DATA Text Box and internal ROM data of MSG-2051 unit

NAVI data of ROM DATA Text Box and NAVI data of toe (effective period of ephemeris) of MSG-2051 RS-232C Program under the reset condition differ from each other. This processing is provided for matching NAVI data when the user changed ephemeris data of internal ROM data of MSG-2051 unit and received them by the receiver.
The 1P2F10W toe of ROM DATA Text Box is raw NAVI data when obtaining these data from the satellite.
The 1P2F10W toe of internal ROM data of MSG-2051 unit is set to the maximum effective value to enable the user to match NAVI data by changing ephemeris data.

*** Important**
Default setting of MSG-2051 unit is 37575 in decimal notation and 9207 in hexadecimal notation. The effective period is Saturday 23 hours.
However, this does not mean that toe (effective period of ephemeris) cannot be changed.

7.3 Toa item

The toa item is displayed by referring to almanac data (24P5F4W and 25P5F3W of MSG-2051 unit.

7.3.1 Display

When the program is connected to MSG-2051 unit, 1 byte of 24P5F4W and 2 bytes of 25P5F3W of NAVI data are loaded and displayed.
In this case, 1 byte of 24P5F4W and 2 bytes of 25P5F3W of NAVI data may be different from each other. If different, 2 bytes of 25P5F3W are displayed.

7.3.2 Calculation method

Let's use 25P5F3W of ROM data Text Box as an example.

NAVI data : 73902D2C H

① Convert 2 bytes of NAVI data into a decimal number.

90 H → 144

② From the above calculation method, HEX of toe item is displayed as 90 and DEC is displayed as 144.

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7.4 toc item

The toc item is displayed by referring to the ALMANAC data 1P2F10W NAVI data of MSG-2051 unit.

7.4.1 Display

When the program is connected to MSG-2051 unit, 1 byte and 2 bytes of 1P2F10W of NAVI data are input and displayed, and 1 byte and 2 bytes of the input data are displayed.

7.4.2 Calculation method

Let's use 1P2F10W of ROM DATA Text Box as an example.

NAVI data :6EBE7C2C H

① Convert 1 byte and 2 bytes of NAVI data into a decimal number.

6EBE H → 28350

② From the above calculation method, HEX of toc item is displayed as 6EBE and DEC is displayed as 28350.

7.5 IODE item

This item is displayed by referring to 1P2F3W and 1P3F10W of EPHEMERIS data of MSG-2051 unit.

7.5.1 Display

When the program is connected to MSG-2051 unit, 1P2F3W and 1P3F10W of NAVI data are loaded and 1 byte of the loaded data is displayed.
In this case, 1 byte of 1P2F3W and 1P3F10W of NAVI data may be different from each other. If different, 1 byte of 1P3F10W is displayed as IODE item display.

7.5.2 Calculation method

Let's use 1P2F3W of ROM DATA Text Box as an example.

NAVI data :B4F6A22C H

① Convert 1 byte of NAVI data into a decimal number.

B4 H → 180

② From the above calculation method, HEX of IODE item is displayed as B4 and DEC is displayed as 180.

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7.5.3 NAVI data change

Let's change 1P2F3W of ROM DATA Text Box as an example.
As a result of this change, 1P3F10W of NAVI data is also changed.

NAVI data : 1P2F3W — B4F6A22C H
NAVI data : 1P3F10W — B4F6331C H

Rewrite data 255

① Convert the rewrite data from the decimal number to the hexadecimal number.
255 → FF H
② Change 1 byte of 1P2F3W to FF H.
B4F6A22C H → FFA6AB3E H
③ Change 1 byte of 1P3F10W to FF H.
B4F6331C H → FFF63310 H
④ From the above calculation method, HEX of IODE item is displayed as FF and DEC is displayed as 255.

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7.6 IODC item

This item is displayed by referring to 1P1F3W and 1P1F8W of EPHEMERIS data of MSG-2051 unit.

7.6.1 Display

When the program is connected to MSG-2051 unit, 1P1F3W and 1P1F8W of NAVI data are loaded, and 24 bits of loaded data 1P1F3W are displayed at MSB, while 1 byte of 1P1F8W are displayed at LSB.

7.6.2 Calculation method

Let's use 1P1F8W and 1P2F3W of ROM DATA Text Box as an example.

NAVI data : 1P1F3W — 4B52011B H

NAVI data : 1P1F8W — B46EBE36 H

① Set 23 bits and 24 bits of NAVI data of 1P1F3W as MSB.

MSB : 1 H

② Set 1 byte of NAVI data of 1P1F8W as LSB.

LSB : B4 H

③ Connect MSB and LSB to each other.

MSB LSB

1 H & B4 H = 1B4 H

④ Covert the connected value of MSB and LSB into a decimal number.

1B4 H → 436

⑤ From the above calculation method, MSB of HEX of IODC item is displayed as 1, LSB is displayed as B4, and DEC is displayed as 436.

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7.6.3 NAVI data change

Let's change 1P1F3W and 1P1F8W of the ROM DATA Text Box, as an example.

NAVI data : 1P1F3W — 4B52011B H

NAVI data : 1P1F8W — B46EBE36 H

Rewrite data 1023

① Convert rewrite data into a hexadecimal number.

1023 → 3FF H

② Set the first character of the converted hexadecimal value as MSB, and set the second value as LSB.

MSB = 3 H

LSB = FF H

③ Change 23 bits and 24 bits of 1P1F3W to MSB.

4B52011B H → 4B52033E H

④ Change 1 byte of 1P1F8W to LSB.

026B3A0B H → FF6EBE2C H

⑤ From the above calculation method, 3 is displayed as MSB of HEX of IODC item, FF is displayed as LSB, and 1023 is displayed as DEC.

* Note:

1P1F3W of ephemeris data can be changed by IODC item of MSG-2051 RS-232C Program only. It cannot be changed by NAVI DATA EDIT or other RS-232C communication softwar

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7.7 △t LSF item

This is displayed by referring to 18P4F9W and 18P4F10W of ALMANAC data of MSG-2051 unit.

7.7.1 Display

By connecting the program to MSG-2051 unit, 18P4F9W and 18P4F10W of NAVI data are loaded, and 1 byte of the loaded data is displayed.
In this case, 1 byte of 18P4F9W and 1 byte of 18P4F10W of NAVI data may be different from each other. If different, 18P4F10W is displayed.

7.7.2 Calculation method

Let's use 18P4F9W of ROM DATA Text Box as an example.

NAVI data : 0DDE0532 H

① Convert 1 byte of NAVI data into a decimal number.
0D H → 13
② From the above calculation method, HEX of Δt LSF item is displayed as 0D and DEC is displayed as 13.

7.7.3 NAVI data change

Let's change 18P4F9W of ROM data Text Box as an example.

NAVI data : 18P4F9W — 0DDE0532 H
NAVI data : 18P4F10W — 0DAAAA24 H

Rewrite data 255

① Convert rewrite data into a hexadecimal number.
255 → FF H
② Change 1 byte of NAVI data of 18P4F9W to FF H.
0DDE0532 H → FFDE0511 H
③ Change 1 byte of NAVI data of 18P4F10W to FF H.
0DAAAA24 H → FFAAAA38 H
④ From the above calculation method, HEX of Δt LSF item is displayed as FF and DEC is displayed as 255.

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7.8 WN t LSF item

This is displayed by referring to 18P4F9W of ALMANAC data of MSG-2051 unit.

7.8.1 Display

By connecting the program to MSG-2051 unit, 18P4F9 NAVI data are loaded, and 2 bytes of the loaded data are displayed.

7.8.2 Calculation method

Let's use 18P4F9W of ROM DATA Text Box as an example.

NAVI data :0DDE0532 H

① Convert 2 bytes of NAVI data into a decimal number.

DE H → 222

② From the above calculation method, HEX of WN t LSF item is displayed as DE and DEC is displayed as 222.

7.8.3 NAVI data change

Let's change 18P4F9W of ROM DATA Text Box as an example.

NAVI data :0DDE0532 H

Rewrite data 255

① Convert rewrite data into a hexadecimal number.

255 → FF H

② Change 2 bytes of NAVI data of 18P4F9W to FF H.

0DDE0524 H → 0DFF050D H

③ From the above calculation method, HEX of WN t LSF item is displayed as FF and DEC is displayed as 255.

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7.9 DN LSF item

This is displayed by referring to 18P4F9W of almanac data of MSG-2051 unit.

7.9.1 Display

By connecting the program to MSG-2051 unit, 18P4F9 NAVI data are loaded, and 3 bytes of the loaded data are displayed.

7.9.2 Calculation method

Let's use 18P4F9W of ROM DATA Text Box as an example.

NAVI data :0DDE0532 H

① Convert 3 bytes of NAVI data into a decimal number.

05 H → 5

② From the above calculation method, HEX of DN LSF item is displayed as 05 and DEC is displayed as 5.

7.9.3 NAVI data change

Let's change 18P4F9W of ROM DATA Text Box as an example.

NAVI data :0DDE0532 H

Rewrite data 255

① Convert rewrite data into a hexadecimal number.

255 → FF H

② Change 3 bytes of NAVI data of 18P4F9W to FF H.

0DDE0532 H → 0DDEFF20 H

③ From the above calculation method, HEX of DN LSF item is displayed as FF and DEC is displayed as 255.

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8 NAVI DATA EDIT item

8.1 NAVI data readout

Read out NAVI data except for 1 and 2 WORD simultaneously when the program is connected to MSG-2051 unit.
Data being displayed in the EPHEMERIS, ALMANAC, UTC, and OTHER Text Box show NAVI data when the MSG-2051 unit is connected.

NAVI data differ according to whether RTC is turned on or off. When RTC is tuned on, the displayed NAVI data reflect the internal clock.
When RTC is turned off, on the other hand, the displayed NAVI data are repeated over a range of 12.5 minutes from 0143 hours to 0156 hours on June 03, 2005 of the internal ROM of the MSG-2051 unit.

8.1.1 PAGE ComboBox and ALMANAC, UTC, and OTHER ComboBox

When PAGE ComboBox is selected, the ALMANAC PAGE ComboBox is also selected at the same time.
Since the PAGE ComboBox becomes non-selectable under the disconnected condition, it can be selected by the ALMANAC, UTC, and OTHER ComboBox. The PAGE ComboBox can be selected by the ALMANAC, UTC, and OTHER ComboBox under the connected condition.

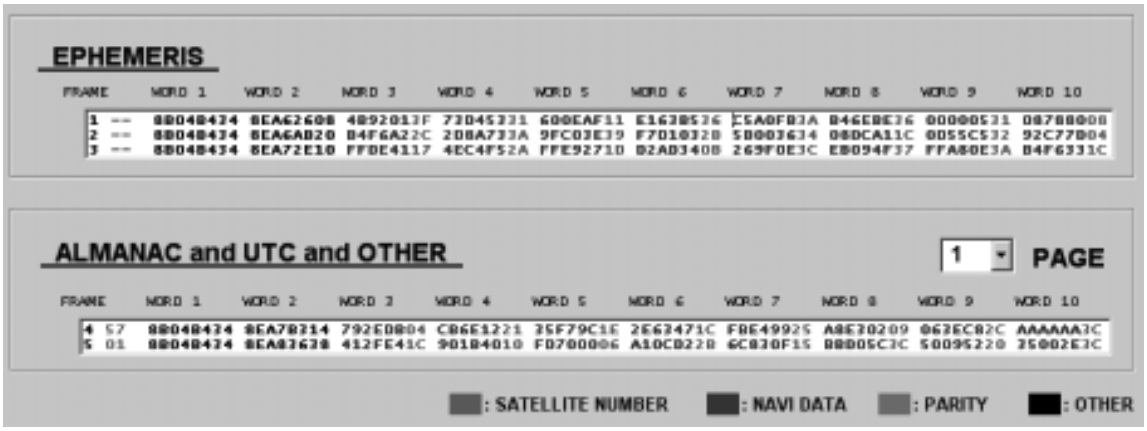
8.1.2 DATA Text Box

NAVI data are displayed blue in DATA Text Box.
By inputting data into the DATA Text Box from the keyboard, the NAVI data turn black for the purpose of preventing an input failure.
The DATA ComboBox displays NAVI data blue when selecting them by PAGE ComboBox, FRAME ComboBox, or PAGE ComboBox.

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8.1.3 EPHEMERIS Text Box and ALMANAC, UTC, and OTHER Text Box

Data of these Text Boxes are separated from each other by colors for easy monitoring when checking data.



8.1.3.1 SATELLITE NUMVER display

Light blue indicates SV-ID number every FRAME of ALMANAC data, UTC, and OTHER. No SV-ID number is assigned to EPHEMERIS data. For the calculation method of SV-ID number, refer to 7.1.2 Calculation method. SV-ID numbers are displayed from 00 to 99.



If SV-ID number is less than -1, it is displayed as [—*].
If it exceeds 100, it is displayed as [+*].



8.1.3.2 NAVI DATA display

Blue shows NAVI data when MSG-2051 unit is connected. It is displayed by 6 characters (3 bytes) consisting of 0～9 and A～F.
Refer to 6.1 Word numbers in ROM DATA Text Box display



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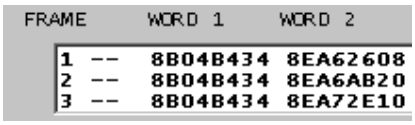
8.1.3.3 PARITY Display

Purple shows the PARITY of NAVI data words. PARITY is calculated by MSG-2051 RS-232C Program. For the calculation method, refer to 8.4 PARITY calculation.

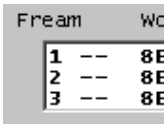


8.1.3.4 OTHER DISPLAY

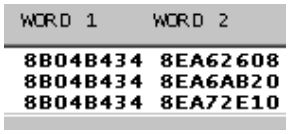
Black displays FRAME numbers and AllPage.txt or NAVI data on June 03, 2005 when MSG-2051 RS-232C Program has been started.



Black characters at the left end show FRAME numbers. Refer to 6.1 FRAME numbers in ROM DATA Text Box display.



WORD 1 and WORD 2 indicate AllPage.txt or NAVI data on June 03, 2005.



Since WORD 1 comprises telemetry data (time synchronizing data), it cannot be changed. WORD 2 cannot be displayed completely, since RTC of MSG-2051 unit changes every 6 seconds WORD 1 and WORD 2 indicate AllPage.txt or NAVI data on June 03, 2005.

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8.2 NAVI data change

8.2.1 EPHAMERIS change

The EPHEMERIS Text Box is common to No.1 ～ 3 of all pages and frames.
If WORD 4 on PAGE 3 and FRAME 1 is changed, WORD 4 of FRAME 1 is changed on all pages.

8.2.2 DATA Text Box change

When NAVI data are changed by NAVI DATA EDIT, the changed NAVI data are displayed in DATA Text Box.
Also, this change is reflected on the SATELLITE NUMBER items, toe items, toa items, toc items, IODE items, IODC items, △t LSF items, WN t LSF items, and DN LSF items on the NAVI data 2 panel at the same time.

8.2.3 PARITY display

When NAVI data are changed, parity (blue) of EPHEMERIS Text Box and ALMANAC, UTC, and OTHER Text Box is also changed at the same time.
This is because that the changed NAVI data are parity-calculated and displayed.
If an optional NAVI data is changed in WORD 10, 3 MSB bytes are changed, since the PARITY calculation of WORD 10 is exceptional. Refer to 8.4 PARITY calculation.
If WORD 3 has been changed, for example, PARITY of WORD 3 is reflected on the PARITY of WORD 4. This change is also reflected on PARITY on WORD 5 successively and finally reflected on the PARITY of WORD 10. At this time, 3 MSB bytes of WORD 10 are changed. As a result of the change of WORD 10, NAVI data of MSG-2051 unit are changed automatically.

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8.2.4 Exception

When NAVI data have been changed, other NAVI data are also changed exceptionally when the changed NAVI data comprise NAVI data panel items.
Assume that NAVI data (1P2F3W) comprising IODE has been changed, for example, and NAVI data (1P3F10W) as IODE is also changed concurrently.
When NAVI data (1P3F10W) as IODE has been changed, NAVI data (1P2F3W) comprising IODE items is also changed in the same way. NAVI data of the items that have been set by NAVI DATA are changed as described above.
The following table shows the correspondence when NAVI data have been changed.

NAVI data items	Data	PAGE	FRAME	WORD	ROM DATA	Bytes	Bits	Hexadecimal numbers	Decimal numbers
SATELLITE NUMBER	ALMANAC	–	–	3	–	1	1 ～ 8	–	–
toc	EPHEMERIS	1	1	8	B46EBE36	2,3	9 ～ 24	6EBE	28350
toa	ALMANAC	24	5	4	900EA939	1	1 ～ 8	90	144
	ALMANAC	25	5	3	73902D2C	2	9 ～ 16	90	144
toe	EPHEMERIS	1	2	10	92C77D04	1,2	1 ～ 16	92C7	37575
IODE	EPHEMERIS	1	2	3	B4F6A22C	1	1 ～ 8	B4	180
	EPHEMERIS	1	3	10	B4F6331C	1	1 ～ 8	B4	180
* IODC	EPHEMERIS	1	1	3	4B52011B	** 3	23,24	1	436
	EPHEMERIS	1	1	8	B46EBE36	1	1 ～ 8	B4	
Δ t LSF	UTC	18	4	9	0DDE0532	1	1 ～ 8	0D	13
	UTC	18	4	10	0DAAAA24	1	1 ～ 8	0D	13
WN t LSF	UTC	18	4	9	0DDE0532	2	9 ～ 16	DE	222
DN LSF	UTC	18	4	9	0DDE0532	3	17 ～ 24	05	5

* NAVI data cannot be changed by NAVI DATA EDIT. Change them by IODE items.

** This is applicable to 3 bytes LSB only.

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8.3 PARITY difference

The PARITY of NAVI data of ROM DATA Text Box and the PARITY of NAVI data of NAVI DATA EDIT are different from each other when RTC is turned off under the reset condition of MSG-2051 unit and the MSG-2051 unit is connected by MSG-2051 RS-232C Program.
They must be the same primarily.

NAVI data of ROM DATA Text Box has the format of NAVI data obtained by converting NAVI data of $1BM which were received by GPS receiver on June 03, 2005 from the air in our company. PARITY calculation is done by the $1BM format of the GPS receiver.
The WORD to be calculated and its last WORD are necessary for PARITY calculation. Refer to 8.4 PARITY calculation.
PARITY calculation is done in the sequence of WORD received in $1BM format by the GPS receiver.
In case of the PARITY calculation of $1BM format, the calculated WORD comprises bits 29 and 30 of the last WORD.

In NAVI DATA EDIT of MSG-2051 RS-232C Program, PARITY calculation is done by the WORD every connected FRAME.

The PARITY difference occurs according to whether the WORD is calculated in $1BM format after receiving NAVI data by the GPS receiver or PARITY calculation is done by the WORD every FRAME.

These calculation methods may be said to be correct.

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8.4 PARITY calculation

For PARITY calculation, a NAVI data and a NAVI data before 1 WORD of the former NAVI data are used.
Refer to ICD-GPS-200 standard.

D1～ D30	:	Data being transmitted from satellite D24 ～ D30 show parity bits
d1～ d24	:	NAVI data
D_29, D_30	:	Last 2 bits of the last WORD, or, D29 and D30 become D_29 and D_30 of the next WORD.
^	:	XOR (Exclusive-OR)
D25', D26'	:	Figure adjusting bits. 0 is used.

8.4.1 PARITY calculation of WORD 3～WORD 9

Calculation is done in the following sequence.

```
D1  = d1
D2  = d2
      .
      .
D23 = d23
D24 = d24

D25 = D29 ^ D1 ^ D2 ^ D3 ^ D5 ^ D6 ^ D10 ^ D11 ^ D12 ^ D13 ^ D14 ^ D17 ^ D18 ^ D20 ^ D23
D26 = D30 ^ D2 ^ D3 ^ D4 ^ D6 ^ D7 ^ D11 ^ D12 ^ D13 ^ D14 ^ D15 ^ D18 ^ D19 ^ D21 ^ D24
D27 = D29 ^ D1 ^ D3 ^ D4 ^ D5 ^ D7 ^ D8 ^ D12 ^ D13 ^ D14 ^ D15 ^ D16 ^ D19 ^ D20 ^ D22
D28 = D30 ^ D2 ^ D4 ^ D5 ^ D6 ^ D8 ^ D9 ^ D13 ^ D14 ^ D15 ^ D16 ^ D17 ^ D20 ^ D21 ^ D23
D29 = D30 ^ D1 ^ D3 ^ D5 ^ D6 ^ D7 ^ D9 ^ D10 ^ D14 ^ D15 ^ D16 ^ D17 ^ D18 ^ D21 ^ D22 ^ D24
D30 = D29 ^ D3 ^ D5 ^ D6 ^ D8 ^ D9 ^ D10 ^ D11 ^ D13 ^ D15 ^ D19 ^ D22 ^ D23 ^ D24
```

After the above calculation, D25' is inserted to D25 and D26' is inserted to D26 for adjusting the figure to 32 bits.

The total of the inserted bits becomes NAVI data (32 bits) = D1, D2, D3, D4, …, D20, D21, D22, D23, D24, D25', D26', D25, D26, D27, D28, D29, D30.

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8.4.2 PARITY calculation of WORD 10

Calculation is done in the following sequence.

D1 = d1

D2 = d2

.

.

D23 = d23

D24 = d24

D29 = 0

D30 = 0

D24' = D30 ^ D1 ^ D3 ^ D5 ^ D6 ^ D7 ^ D9 ^ D10 ^ D14 ^ D15 ^ D16 ^ D17 ^ D18 ^ D21 ^ D22

D24' =0 if the calculation result from D30 to D22 is 0.

D24' =1 if the calculation result from D30 to D22 is 1.

D23' = D29 ^ D3 ^ D5 ^ D6 ^ D8 ^ D9 ^ D10 ^ D11 ^ D13 ^ D15 ^ D19 ^ D22 ^ D24'

D23' =0 if the calculation result from D29 to D24 is 0.

D23' =1 if the calculation result from D29 to D24 is 1.

D25 = D29 ^ D1 ^ D2 ^ D3 ^ D5 ^ D6 ^ D10 ^ D11 ^ D12 ^ D13 ^ D14 ^ D17 ^ D18 ^ D20 ^ D23'

D26 = D30 ^ D2 ^ D3 ^ D4 ^ D6 ^ D7 ^ D11 ^ D12 ^ D13 ^ D14 ^ D15 ^ D18 ^ D19 ^ D21 ^ D24'

D27 = D29 ^ D1 ^ D3 ^ D4 ^ D5 ^ D7 ^ D8 ^ D12 ^ D13 ^ D14 ^ D15 ^ D16 ^ D19 ^ D20 ^ D22

D28 = D30 ^ D2 ^ D4 ^ D5 ^ D6 ^ D8 ^ D9 ^ D13 ^ D14 ^ D15 ^ D16 ^ D17 ^ D20 ^ D21 ^ D23'

D29 = D30 ^ D1 ^ D3 ^ D5 ^ D6 ^ D7 ^ D9 ^ D10 ^ D14 ^ D15 ^ D16 ^ D17 ^ D18 ^ D21 ^ D22 ^ D24'

After the above calculation, D25' is inserted to D25 and D26' is inserted to D26 for adjusting the figure to 32 bits.
The total of the inserted bits becomes.
NAVI data (32 bits) = D1, D2, D3, D4, …, D20, D21, D22, D23', D24', D25', D26', D25, D26, D27, D28, D29, D30.

* Note
LSB of 4-byte parity is displayed as yyyyyyy0 H, yyyyyyy4 H, yyyyyyy8 H, and yyyyyyyC H at all times, where y represents NAVI data.

8.5 SAVE data

A file is output in the text format. This format is the same as in 6.1 ROM DATA Text Box display.

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9 Troubleshooting

○ Installation

• MSG-2051 RS-232C Program cannot be installed.

Cause	[dotnetfx.exe] is not installed yet.
Remedial measure	Install [dotnetfx.exe] referring to 2.3 Installation.

○ Start

• When MSG-2051 RS-232C Program is started, a message [Allpage.text] is broken and it cannot be found. NAVI data on June 03, 2005 are displayed] is displayed.

Cause	AllPage.txt file is broken or it is not found.
Remedial measure	Refer to 3.2 Start dialog display.

○ Connections

• When clicking the connection button, a dialog [Communication was disconnected] is displayed.

Cause 1	Cable is not connected.
Remedial measure	Connect RS-232C straight cable securely.

Cause 2	MSG-2051 unit power supply is not turned on.
Remedial measure	Turn on MSG-2051 unit power supply.

Cause 3	Connection port is in error.
Remedial measure	Check or set the connection port, referring to 5 Environment setting.

Cause 4	The other RS-232C communication software is started.
Remedial measure	Terminate the other RS-232C communication software.

Cause 5	RS-232C cable is connected to a model other than MSG-2051 unit.
Remedial measure	Connect RS-232C cable to MSG-2051 unit securely.

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- When clicking the connection button, a dialog [Communication was disconnected] is displayed in the course of intermediate display.

Cause 1	Cable is not connected.
Remedial measure	Connect RS-232C straight cable securely.

Cause 2	If USB-RS-232 conversion cable is connected, an error occurs.
Remedial measure	Use an RS-232C straight cable or an USB-RS-232C cable free of an error.

○ Operation

- A dialog [Communication was disconnected] is displayed halfway in the course of normal operation with MSG-2051 RS-232C Program, and the operation cannot be done any more.

Cause 1	MSG-2051 unit has been initialized.
Remedial measure	Connect MSG-2051 RS-232C Program again.

Cause 2	Cable is not connected.
Remedial measure	Connect RS-232C straight cable securely.

Cause 3	10MHz IN is set to EXT.
Remedial measure	Set 10MHz IN to AUTO or INT, or initialize MSG-2051 unit.

- The unit is not turned on when clicking NAVI button.

Cause	C／A of MODULATION is not turned on.
Remedial measure	Turn on C/A of MODULATION.

- When the time synchronizing button is turned on, the time is not correct.

Cause	Computer system time is not correct.
Remedial measure	Set the computer system time correctly.

- No button can be pressed irrespective of the place in the window.

Cause	A dialog is displayed in the standby form to have caused main form clicking.
Remedial measure	Click the bar of the M icon only in the task bar. A dialog is displayed. By clicking the OK button of the dialog, the unit is transferred to normal operation.

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○ NAVI DATA

- When changing DATA in NAVI DATA 3, the display of data Text Box remains unchanged.

Cause	WN (week number) is going to be changed.
Remedial measure	WN (week number) cannot be changed.

- Purple of EPHEMERIS Text Box and ALMANAC, UTC, and OTHER Text Box changes each time data Text Box is changed in NAVI DATA 3.

Cause	PARITY is being calculated.
Remedial measure	Refer to 8.1 NAVI data.

- 3 bytes of WORD 10 change each time data are changed in NAVI DATA 3.

Cause	An exception of PARITY calculation in WORD 10.
Remedial measure	Refer to 8.4 PARITY calculation.

- By what means toe can be changed by NAVI DATA 1?

Cause	Two methods are available. Refer to remedial measures.
Remedial measure 1	toe button is provided in function keys of display MODE 2 of panel mode. Refer to 4.3.3.5.10 toe EDIT window.
Remedial measure 2	Change 1 and 2 bytes of PAGE 1, FRAME 2, WORD 10 by NAVI DATA EDIT of NAVI DATA 3.

- By what means toe can be changed by NAVI DATA 1?

Cause	Refer to the remedial measure.
Remedial measure	Change 1 byte of PAGE 24, FRAME 5, WORD 4 by NAVI DATA EDIT of NAVI DATA 3 or change 2 byte of PAGE 25, FRAME 5, WORD 3.

- By what means toc can be changed by NAVI DATA 1?

Cause	Refer to the remedial measure.
Remedial measure	Change 2, 3 byte of 1 PAGE 1, FRAME 1, WORD 8 by NAVI DATA EDIT of NAVI DATA 3.

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