DENSO

2D Code Handy Terminal

2D Code Handy Terminal

BHT-604Q

User's Manual

Preface

Thank you for using the BHT-604Q DENSO WAVE 2D Code Handy Terminal.

Please read this manual thoroughly prior to operation to ensure full use of the product's functionality, and store safely in a convenient location for quick reference even after reading.

Liability Limitations

- DENSO WAVE INCORPORATED does not assume any product liability (including damages for lost profits, interruption of operations, or the loss of business-related information) arising out of, or in connection with, the use of, or inability to use the BHT system software or related manuals.
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Customer Registration and Inquiries

Customer Registration

To allow us to provide our customers with comprehensive service and support, we request that all customers complete a Member Registration Form. Registered members will be offered the following privileges.

- The latest upgrade information
- Free exhibition and event information for new products
- Free Web-information service "QBdirect".

QBdirect Service Contents

Information search service (FAQ)	Offers detailed information on each product.
Download service	Offers downloads of repair modules for the latest BHT Series systems or software, and sample programs.
E-mail inquiries	Product related queries can be sent in by e-mail.

* Please note that these privileges may be subject to change without prior notice.

− How to Register

Access the URL below and follow the instructions provided.

http://www.qbdirect.net/

Inquiries

− Technical Inquiries (QBdirect)

- BHT product programming method
- Product setup method, usage
- Other technical questions

Inquires relating to the above can be made at our exclusive Web site for registered users (QBdirect). Access the link below to log on or register.

http://www.qbdirect.net/

About this Manual

- Due to improvements and so on, the content of this manual may be subject to change without prior notice.
- The reproduction or duplication of the whole or part of this manual is strictly prohibited without prior consent.
- Every attempt has been made to ensure that the content of this manual is thorough and up to date, however, we kindly ask that any questionable content, mistakes, or omissions be reported to DENSO WAVE.
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Manual Composition

This manual is made up of the following 9 chapters.

Chapter 1 Outline

Describes the BHT system and provides an overall outline of the BHT.

Chapter 2 BHT Preparation

Describes information required by the user and procedures that must be performed prior to commencing operation.

Chapter 3 Basic Operation

Describes basic operations performed by the operator and how to make basic changes to settings such as the beeper volume.

Chapter 4 System Operation

Describes how to initialize and update the system, start up a user program, and operate System Mode.

Chapter 5 Communication

Describes interfaces and communication specifications.

Chapter 6 Maintenance

Describes battery cartridge replacement and daily procedures for taking care of the BHT.

Chapter 7 Error Messages

Describes causes and countermeasures for error messages expected to occur during basic operation.

Chapter 8 Specifications

Describes specifications for hardware, readable barcodes, and interfaces.

Appendices-1 CU-600 Specifications (Option)

Describes the main specifications for the CU-600 Series (option).

Appendices-2 When File Transfer is Not Possible Using the Transfer Utility

Describes causes and countermeasures when unable to transfer files.

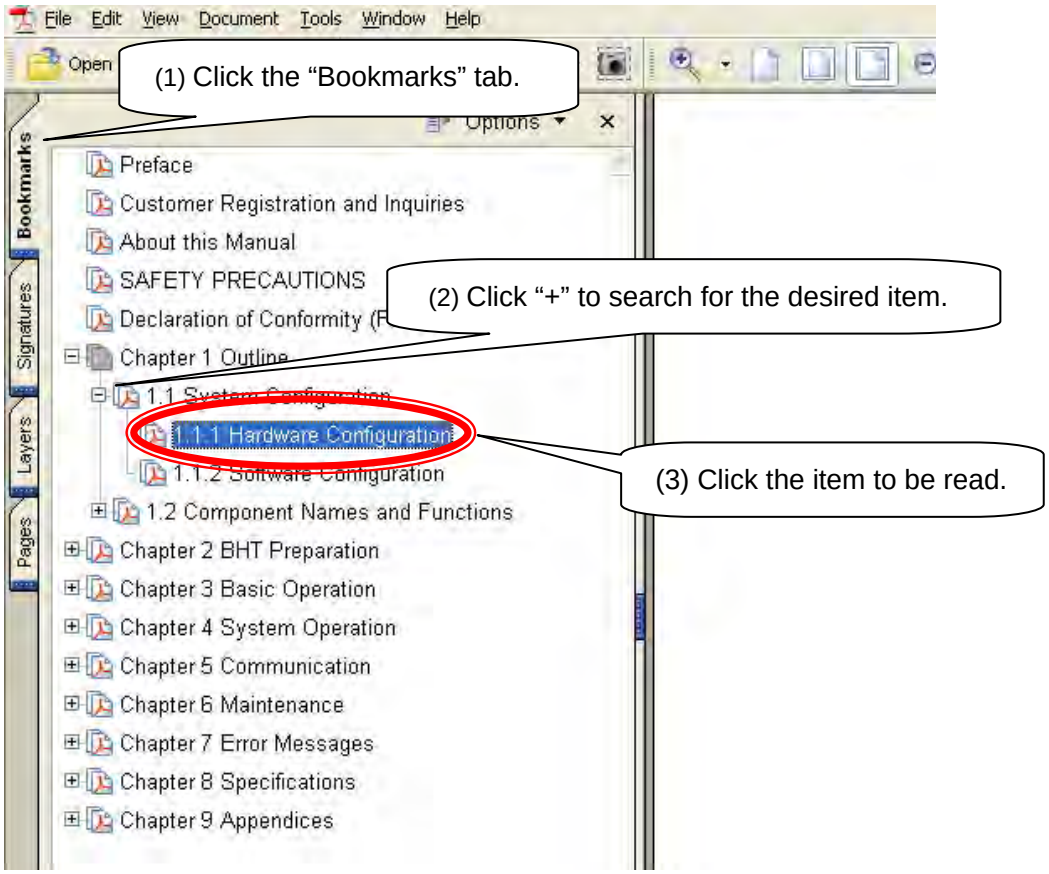
Viewing this Manual

− About the Bookmark

The PDF Bookmark function can be used to jump to the Contents page.

<Procedure>

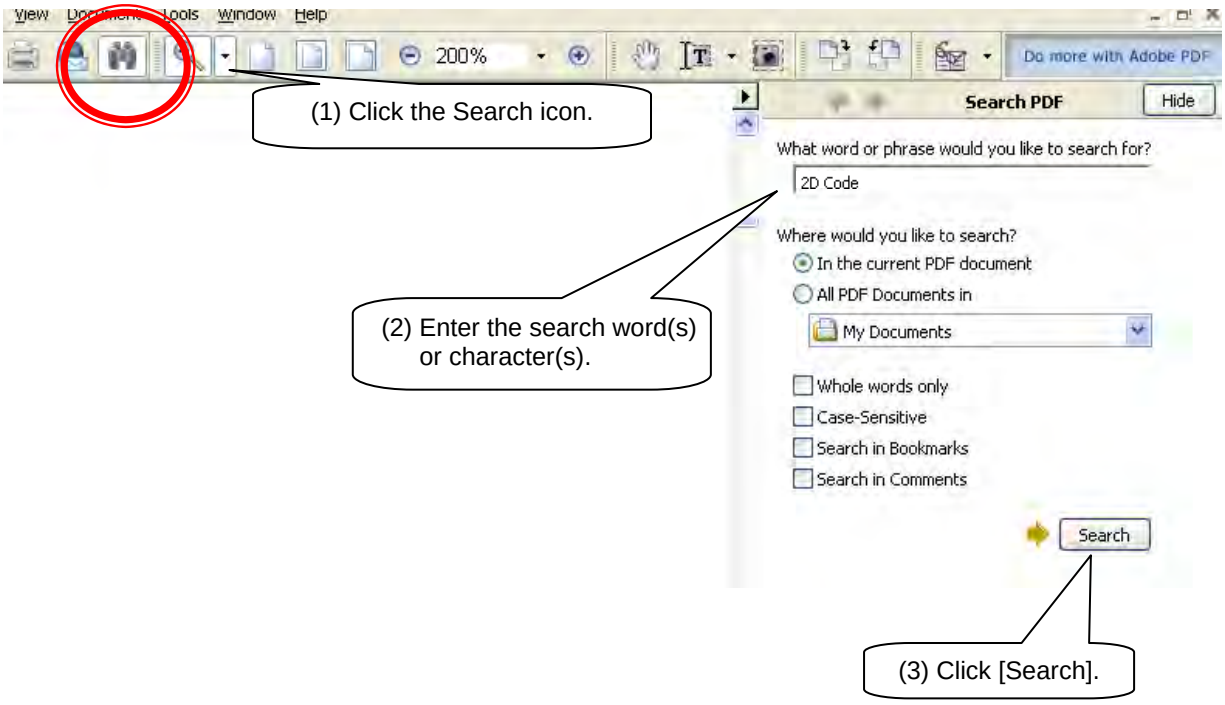
(1) Click the “Bookmark” tab.
(2) Click ⊞ to search for the desired item.
(3) Click the item to be read.



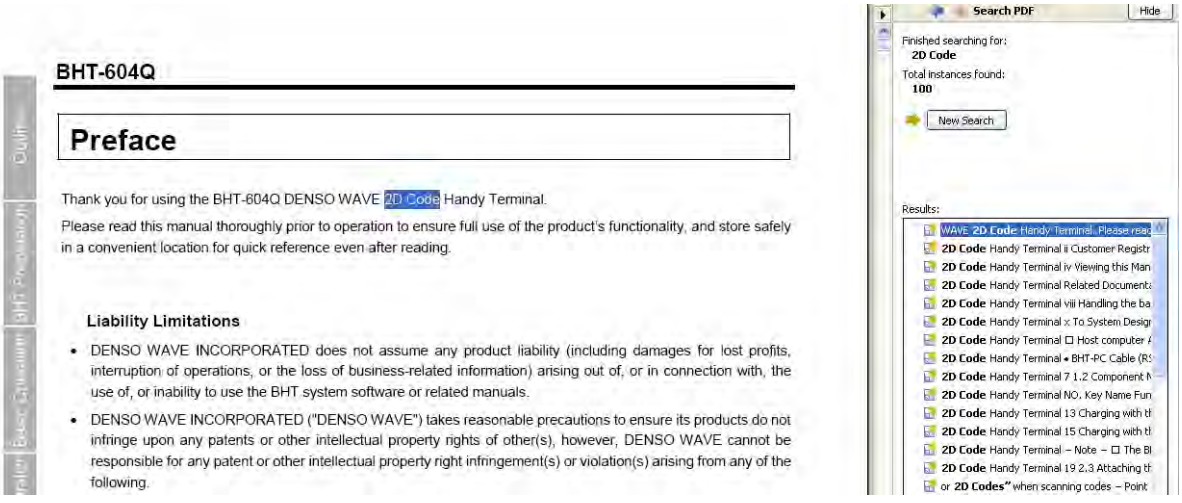
− Searching by Word

The PDF search function can be used to jump to the target page by entering words or characters related to the item being searched.

(1) Click the Search icon. (Or select “Edit” – “Search”.)
(2) Enter the word(s) or character(s) to be searched for.
(3) Click [Search].



<Search Results Example>



Related Documentation

- BHT-BASIC Programmer's Manual (BHT-600 Series)
  This is an instruction manual used to create handy terminal programs with BHT-BASIC.
  This manual can be found in the BHT-BASIC Compiler CD-ROM.
  This manual can also be downloaded from the DENSO WAVE member's Web site (QBdirect).
- BHT-BASIC 4.0 Transfer Utility User's Guide
  This is an instruction manual for software relating to data transfer between the computer and BHT-604 and comes bundled with the BHT-BASIC 4.0 Transfer Utility.
  This manual can also be downloaded from the DENSO WAVE member's Web site (QBdirect).

SAFETY PRECAUTIONS

Be sure to observe all these safety precautions.

- Please READ through this manual carefully. It will enable you to use the BHT and CU correctly.
- Always keep this manual nearby for speedy reference.

Strict observance of these warnings and cautions is a MUST for preventing accidents that could result in bodily injury and substantial property damage. Make sure you fully understand all definitions of these terms and symbols given below before you proceed to the text itself.

⚠ **WARNING**	Alerts you to those conditions that could cause serious bodily injury or death if the instructions are not followed correctly.
⚠ **CAUTION**	Alerts you to those conditions that could cause minor bodily injury or substantial property damage if the instructions are not followed correctly.

Meaning of Symbols

	A triangle (△) with a picture inside alerts you to a warning of danger. Here you see the warning for electrical shock.
	A diagonal line through a circle (⃠) warns you of something you should not do; it may or may not have a picture inside. Here you see a screwdriver inside the circle, meaning that you should not disassemble.
	A black circle (●) with a picture inside alerts you to something you MUST do. This example shows that you MUST unplug the power cord.

⚠ WARNING

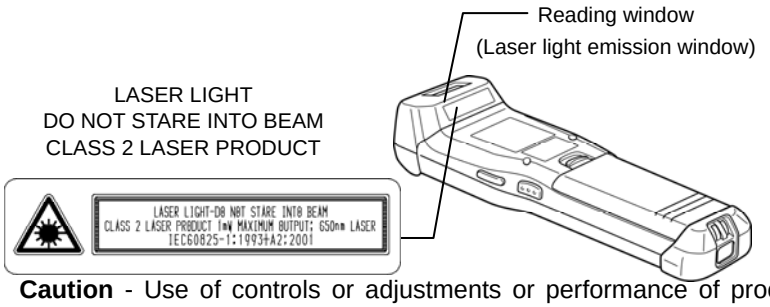
Handling the battery cartridge

- Never disassemble or heat the battery cartridge, nor put it into fire or water; doing so could cause battery-rupture or leakage of battery fluid, resulting in a fire or bodily injury.
- Do not carry or store the battery cartridge together with metallic ball-point pens, necklaces, coins, hairpins, etc.
  Doing so could short-circuit the terminal pins, causing the batteries to rupture or the battery fluid to leak, resulting in a fire or bodily injury.
- Never put the battery cartridge into a microwave oven or high-pressure container.
  Doing so could cause the batteries to break, generate heat, rupture or burn.
- Avoid dropping the battery cartridge or letting it undergo any shock or impact.
  Doing so could cause the batteries to break, generate heat, rupture or burn.
- Never charge the rechargeable battery cartridge where any inflammable gases may be emitted; doing so could cause fire.

- Only use the dedicated charger for charging the rechargeable battery cartridge.
  Using a different type of charger could cause battery-rupture or leakage of battery fluid and result in a fire, bodily injury, or serious damage to property.

Handling the BHT

- The BHT uses a laser light for indicating the scanning range. Though the intensity of the laser light is too low to inflict bodily injury.
  You must observe the following precautions when handling the BHT equipped with laser light:
  1) Never stare into the laser light.
  2) Never point the code reading window at someone's eyes.
  The BHT complies with IEC 60825-1:1993+A2:2001.
  In accordance with Clause 5, IEC 60825-1, the following information is provided to the user:



Caution - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure.

- Never put the BHT into a microwave oven or high-pressure container.
  Doing so could cause the BHT to break, generate heat, rupture or burn.

⚠ WARNING

Handling the CU

	• If smoke, abnormal odors or noises come from the CU, immediately unplug the AC adapter from the wall socket or CU and contact your nearest dealer. Failure to do so could cause fire or electrical shock. • If foreign material or water gets into the CU, immediately unplug the AC adapter from the wall socket or CU and contact your nearest dealer. Failure to do so could cause fire or electrical shock. • If you drop the CU so as to damage its housing, immediately unplug the AC adapter from the wall socket or CU and contact your nearest dealer. Failure to do so could cause fire or electrical shock.
	• Never use the CU for charging anything other than the specified battery cartridges. Doing so could cause heat, battery-rupture, or fire. • Never bring any metals into contact with the output terminals. Doing so could produce a large current through the CU, resulting in heat or fire, as well as damage to the CU. • Never use the CU on the line voltage other than the specified level. Doing so could cause the CU to break or burn.
	• Use the dedicated AC adapter only. Failure to do so could result in fire. • If the power cord of the AC adapter is damaged (e.g., exposed or broken lead wires), stop using it and contact your nearest dealer. Failure to do so could result in a fire or electrical shock.

⚠ CAUTION

To System Designers:

- When introducing BHTs in those systems that could affect human lives (e.g., medicines management system), develop applications carefully through redundancy and safety design which avoids the feasibility of affecting human lives even if a data error occurs.

Handling the battery cartridge

- Never charge a wet or damp rechargeable battery cartridge.
  Doing so could cause the batteries to break, generate heat, rupture or burn.

Handling the BHT

- If smoke, abnormal odors or noises come from the BHT, immediately turn off the power, pull out the battery cartridge, and contact your nearest dealer.
  Failure to do so could cause smoke or fire.
- If foreign material or water gets into the BHT, immediately turn off the power, pull out the battery cartridge, and contact your nearest dealer.
  Failure to do so could cause smoke or fire.
- If you drop the BHT so as to damage its housing, immediately turn off the power, pull out the battery cartridge, and contact your nearest dealer.
  Failure to do so could cause smoke or fire.
- Do not use batteries or power sources other than the specified ones; doing so could generate heat or cause malfunction.
- When using the hand strap or neck strap, exercise due care to avoid getting them caught in other objects or entangled in rotating machinery.
  Failure to do so could result in accident or injury.


Never dis-assemble

- Never disassemble or modify the BHT; doing so could result in an accident such as break or fire.

- Never put the BHT in places where there are excessively high temperatures, such as inside closed-up automobiles, or in places exposed to direct sunlight.
  Doing so could affect the housing or parts, resulting in a fire.
- Avoid using the BHT in extremely humid or dusty areas, or where there are drastic temperature changes.
  Moisture or dust will get into the BHT, resulting in malfunction, fire or electrical shock.
- In environments where static electricity can build into significant charges (e.g., if you wipe off the plastic plate with a dry cloth), do not operate the BHT. Doing so will result in malfunction or machine failure.
- When connecting or disconnecting the direct-connect interface cable to/from the BHT, do not plug or unplug it at an angle and do not pull the cable strongly. Doing so will result in a machine failure.
- Do not apply excessive force when inserting or removing the rechargeable battery cartridge. Doing so will result in damage.

- If the BHT has been stored in a hot (50°C to 60°C, 122°F to 140°F) and humid place, allow it to sit at room temperature and humidity for at least one day before use. Using the BHT with its inside being hot will fail to scan or result in a machine failure.

⚠ CAUTION

Handling the CU

	• Never disassemble or modify the CU; doing so could result in an accident such as fire or malfunction.
	• Never put the CU in places where there are excessively high temperatures, such as inside closed-up automobiles, or in places exposed to direct sunlight. Doing so could affect the housing or parts, resulting in a fire. • Avoid using the CU in extremely humid or dusty areas, or where there are drastic temperature changes. Moisture or dust will get into the CU, resulting in malfunction, fire or electrical shock. • Never cover or wrap up the CU or AC adapter in a cloth or blanket. Doing so could cause the unit to heat up inside, deforming its housing, resulting in a fire. Always use the CU and AC adapter in a well-ventilated area. • Do not place the CU anyplace where it may be subjected to oily smoke or steam, e.g., near a cooking range or humidifier. Doing so could result in a fire or electrical shock. • Keep the power cord away from any heating equipment. Failure to do so could melt the sheathing, resulting in a fire or electrical shock. • Do not insert or drop foreign materials such as metals or anything inflammable through the openings or vents into the CU. Doing so could result in a fire or electrical shock.
	• If you are not using the CU for a long time, be sure to unplug the AC adapter from the wall socket for safety. Failure to do so could result in a fire. • When caring for the CU, unplug the AC adapter from the wall socket for safety. Failure to do so could result in an electrical shock.

Chapter 1
Outline

This chapter describes the BHT system and provides an overall outline of the BHT.

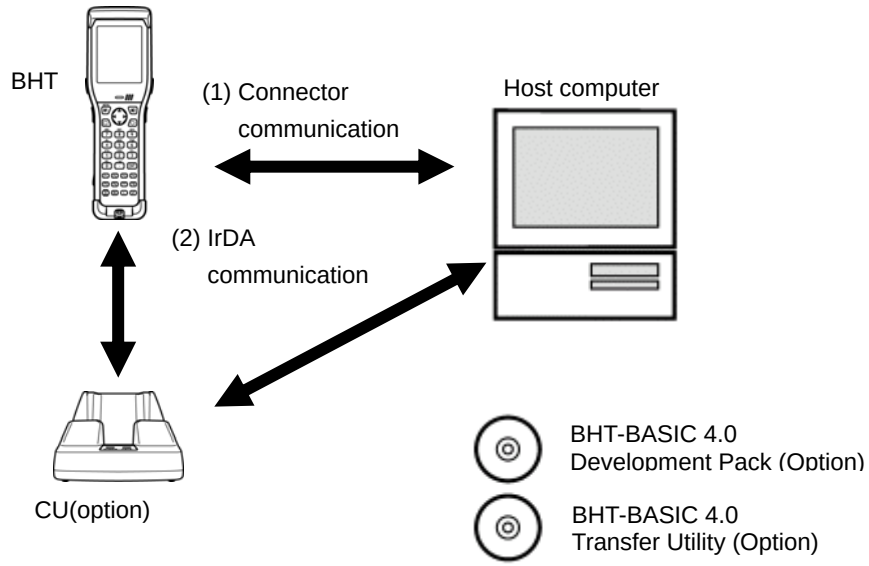
1.1 System Configuration

This section describes the hardware required for the barcode data collection system used by the BHT and the BHT software.

1.1.1 System Configuration

In addition to the BHT, the following hardware and software are required for the barcode data collection system used by the BHT.
Please note that certain components of the required hardware will differ depending on the type of communication used.

- Host computer
- CU-600 Series (option): Communication unit
- Connection cable (option): Used to connect the BHT and host computer.
- Software: BHT-BASIC 4.0 Development Pack (Option) and BHT-BASIC 4.0 Transfer Utility (Option)



● : Required for system configuration

	Host computer	BHT	CU	Wireless LAN access point	Software	Ref. Page
(1)Connector communication	●	●	—	—	●	Page 32
(2) IrDA communication	●	●	●	—	●	Page 33

◆ Host computer

Allows you to edit, manage and download user programs and data, as well as downloading system programs.

Models : PC/AT Compatible

Operating Systems and Optional Application Programs

Operating Systems (OS)	Windows 98	Windows NT 3.51/4.0	Windows 2000 Professional	Windows XP
BHT-BASIC4.0 Development Pack	–	–	√	√
BHT-BASIC4.0 Transfer Utility*	√	√	√	√

*This application does not activate any built-in IrDA interface port.

◆ CU-600 Series (Option)

Used for communication between the BHT and host computer.
Communication with the BHT is performed by IrDA communication, and communication with the host computer is performed with an RS-232C, Ethernet or USB interface.
The following three types of CU are available depending on the interface used to communicate with the host computer.

- CU-601: RS-232C interface
- CU-611: Ethernet
- CU-621: USB interface

◆ Connection Cable (Option or Commercially Available Product)

Used to connect the host computer and CU-600 Series.
Select a cable suited to the CU-600 Series interface being used.

Supported CU-600 Series Cables

- CU-601: RS-232C cable (Option)
- CU-611: Ethernet (10BASE-T) cable (commercially available product)
- CU-621: USB cable (Option)

Furthermore, by preparing the BHT connector interface and cable suited to each connection port, connection is also possible between the BHT and host computer, between the BHT and modem, and between BHT units.
Please note, however, that the BHT connector interfaces have not been designed for frequent cable insertion and removal and therefore use of the CU-600 Series is recommended.
* Refer to “Chapter 8 Specifications” for further details on BHT interfaces.

◆ BHT-BASIC 4.0 Development Pack (Option) and BHT-BASIC 4.0 Transfer Utility (Option)

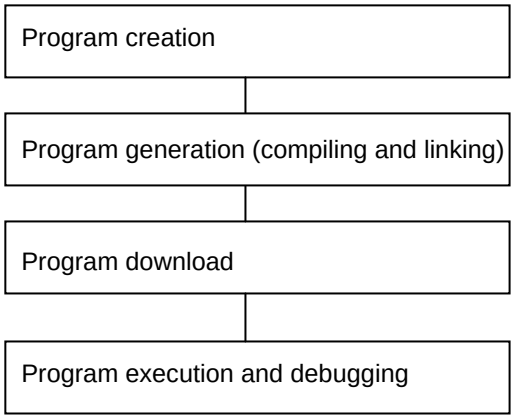
Refer to “Software Configuration” on the following page.

1.1.2 Software Configuration

This section describes the software used for BHT Series application development and application in addition to the software used at the BHT unit.
Please note that the above-mentioned software can be downloaded (Certain versions may be for trial use.) from the QBdirect service discussed at “Customer Registration” on page ii.

[1] Application Development Procedure

The procedure for BHT Series program development is as follows.



[2] Software Used for Application

◆ BHT-BASIC Programmer’s Manual for BHT-600 Series

This is an instruction manual used to create handy terminal programs with BHT-BASIC.

◆ BHT-BASIC4.0 Development Pack (option)

This is a package containing four software products required for BHT Series application development and accessories.
The BHT-BASIC 4.0 Development Pack contains the following products.

- BHT-BASIC 4.0 Compiler
  Compiles and links a source program written in BHT-BASIC 4.0 to create a user program executable on the BHT (*.PD4).

- BHT-BASIC 4.0 Simulator
  Performs an operation check for generated application programs (*.PD4) at the computer.

- BHT-BASIC 4.0 Remote Debugger
  Uses the BHT unit to debug generated application programs (*.PD4) at the computer.

- BHT-BASIC4.0 Transfer Utility
  Transfers files between the host computer and BHT at the host computer.
  YMODEM or BHT-Ir protocol is used for file transfer.
  BHT-BASIC 4.0 specification files such as application programs and data files are transferred using YMODEM protocol.

- BHT-PC Cable (RS-232C)

  This cable can be used to connect the BHT and computer using the BHT connector interface and computer RS-232C interface.

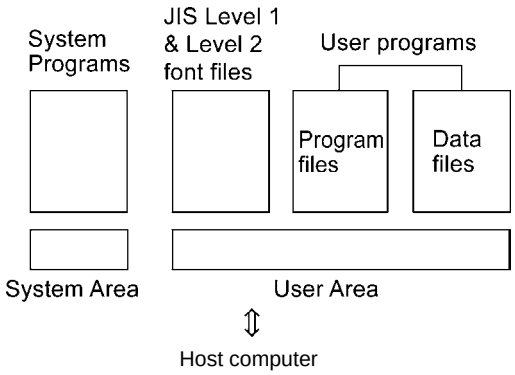
  (Note) The BHT connector interface has not been designed for frequent removal and insertion of the cable. The CU-600 Series should normally be used. Refer to “Chapter 5 Communication” - “5.1 Connector Communication (RS-232C Interface)” for details on the connector interface.

◆ BHT-BASIC4.0 Transfer Utility (Option)

This is the same BHT-BASIC 4.0 Transfer Utility that comes bundled with the BHT-BASIC 4.0 Development Pack.

[3] Software Used at the BHT Unit

The BHT unit FLASH memory has a system area and user area, with the system program stored in the system area and font files and user programs stored in the user area.
The BHT unit is shipped with the system program and font files stored in their respective areas.



Application programs (*.PD4) stored in the user area are run by the system program in order to use the BHT.
It is necessary to download application programs (*.PD4) and data files (product master files etc.) required to run application programs (*.PD4) to the BHT user area prior to use.

◆ System Program

- Driver

  Drivers is a set of programs that directly controls the BHT hardware. It can be called up by the BHT-BASIC Interpreter or System Mode.

- BHT-BASIC Interpreter

  This program interprets application program (*.PD4) command language and controls the BHT unit hardware via drivers.

- System Mode

  This program is used to operate files, make system environment settings, and perform various types of tests.

  Refer to “Chapter 4 System Operation“ - “4.4 System Mode“ for further details.

◆ Font File

These files are required to display JIS 1 and 2 standard Kanji characters at the BHT unit LCD display.
By using font files, the BHT unit is able to display 16 to 40 dot Kanji in application programs (*.PD4).

– Point – If you do not need to display Kanji characters, you may delete these JIS font files. After deletion, the memory area which was occupied by these files can be used as a user area. For the deleting procedure, refer to "Chapter 4 System Operation" - "4.1.4 Performing System Initialization"or "4.5.10 Deleting Font Files (DELETE FILE Menu)."

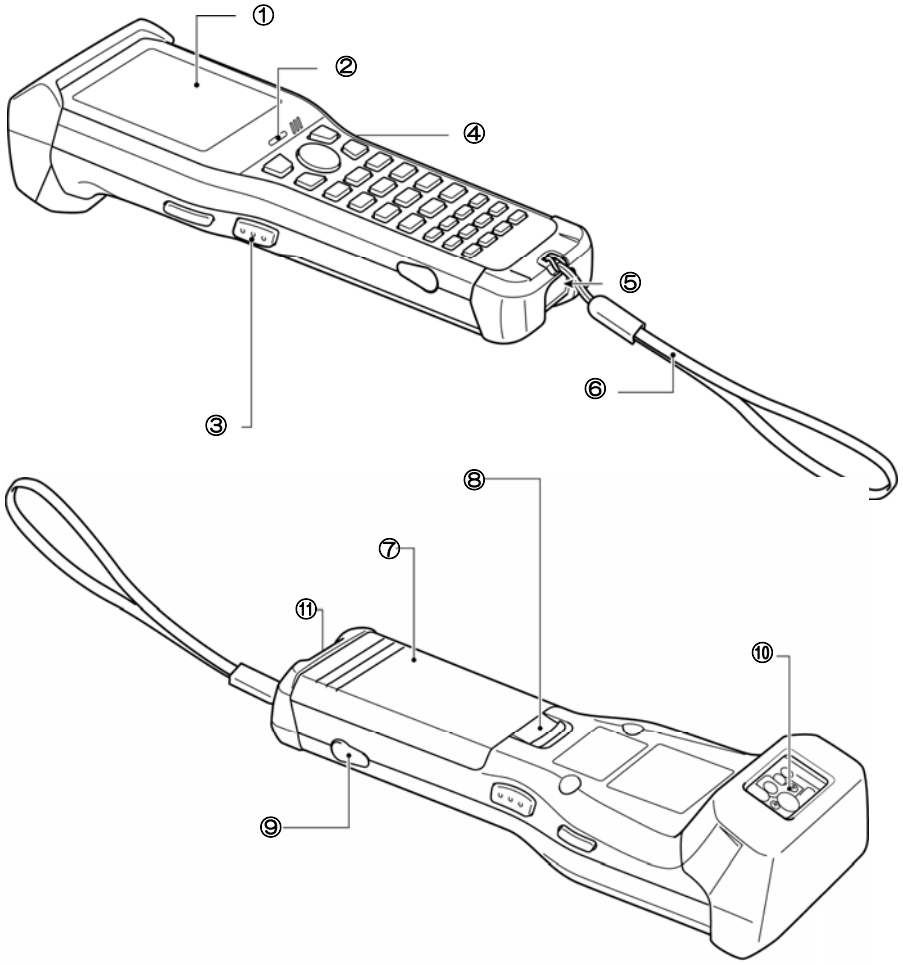
The names of the font file: FNTFSHG.FN4 (JIS Level 1 and 2 font, 16-dot to 40-dot)

◆ User Programs

Application programs and data files are downloaded to the BHT user area and are collectively known as user programs.
To download a BHT-BASIC 4.0 specification user program to the BHT unit, the BHT-BASIC 4.0 Transfer Utility is required.

1.2 Component Names and Functions

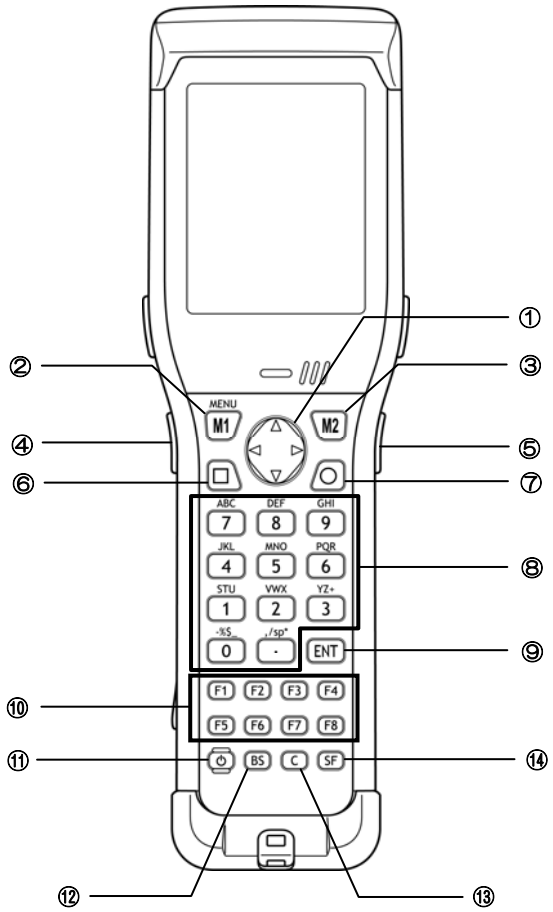
1.2.1 BHT Front/Rear



NO.	Name	Function and Description
(1)	LCD (Liquid crystal display)	Displays the characters and graphic patterns.
(2)	Indicator LED	Indicates the code read status. Illuminates in blue when the BHT has successfully read a code.
(3) (4)	Trigger switch (M3 and M4 Magic keys)	Press when reading a code. The SF and ENT key functions can be assigned to these magic keys by making settings at the SYSTEM MENU. Character strings can be assigned at user programs. * Refer to “Chapter 4 System Operation“ for details on how to operate the SYSTEM MENU.
(5)	IrDA interface port	Used to exchange data/programs with the communication unit CU-600 or other BHTs.
(6)	Hand strap	Wear this strap around your wrist to prevent you from dropping the BHT accidentally.
(7)	Battery cover	Remove this cover to replace the battery cartridge.
(8)	Battery cover lock	Use this to lock or unlock the battery cover.
(9)	Connector port	Inside this cover is the connect interface port.
(10)	Code reading window	Align the reading window with barcodes to perform code reading.
(11)	Charge terminal	Place on the CU to charge the BHT.

1.2.2 Keypad

The BHT key functions can be set at user programs.
The diagram below shows an example of settings for each key function.

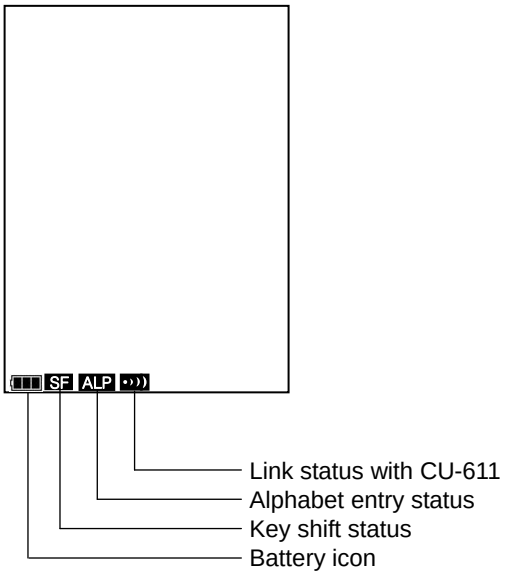


NO.	Key	Name	Function and Description
(1)		Cursor key	Used to move the cursor and select menus.
(2)	M1	Magic key[**M1**]	• Each of the **M3** and **M4** keys is assigned a trigger switch by default. • The **M5** key is assigned the **C** key by default. • Character strings can be assigned at user programs. • The **SF**, **ENT**, **Backlight**, **MENU** or **C** key functions can be assigned with SYSTEM MENU. • A character or character strings can also be assigned with the user programs. • Hold down the **M1** key to display the following setting screens when set to the default. - Beeper volume - Vibrator - LCD display brightness - Power save - Key backlight
(3)	M2	Magic key[**M2**]	
(4)		Magic key[**M3**]	
(5)		Magic key[**M4**]	
(6)		Magic key[**M5**]	
(7)		Magic key[**M6**]	
(8)		Numeric keys	Used to enter data.

NO.	Key	Name	Function and Description
(9)	ENT	Enter key	Press to finalize entered data or execute operations.
(10)	F1 - F8	Function key	Used to select functions.
(11)	⏻	Power key	Turns ON or OFF.
(12)	BS	Backspace key	Removes the last character that you entered.
(13)	C	Clear key	Cancels entry and returns the LCD display to the previous screen.
(14)	SF	Shift key	Used in combination with other keys such as the numerical keys for special input procedures.

1.2.3 BHT Screen

If the system display is set to ON at the system settings or in the user program, icons display at the bottom of the screen (default) indicating the key shift status, alphabet entry status, and status of the link with the CU-611.



	This is the battery icon. Indicates the current battery power level.
SF	(SF) Displays when the SF key is pressed and the keys are in the shift status.
ALP	When the **SF** and the **BS** keys are pressed while set to alphabet entry mode at the user program, the entry mode changes from “numeric entry” to “alphabet entry” and ALP displays. Alphabet entry is used when performing FTP settings. Refer to “Chapter 7.2.1 Numeric, Alphabet Entry of Programmer’s manual” for more information.
	displays when a link is established with the CU-611. When an attempt is made to perform communication with the CU-611 when no link has been established, the icon flashes. When there is no response from the CU-611, when waiting for the link with the CU-611 to be established, or when waiting for the link to be disengaged, the icon displays in the order → → → → .

Chapter 2
BHT Preparation

This chapter describes inserting and charging the battery cartridge, turning the BHT power ON and OFF, and use of the hand strap.

2.1 "BHT Preparation" Procedure

Follow the steps below to prepare the BHT for use.

2.2 Inserting and Charging the Battery Cartridge(Page 12)	First insert and charge the battery cartridge.
↓	
2.3 Wearing the Hand Strap (Page 19)	Wear the hand strap at your wrist to prevent the BHT from being dropped.
↓	
2.4 Initial Setup (Page 20)	Set the calendar clock when the power is turned ON for the first time.

2.2 Inserting and Charging the Battery Cartridge

The battery cartridge is not charged when purchased and should therefore be charged prior to use.
The chargers that can be use with the BHT are the communication units (CU-601, CU-611 and CU-621) and battery chargers (CH-201A, CH-651, CH-704 and CH-654).

* The CH-201A and CH-704 are chargers to separately charge the battery cartridge on its own, while the CH-651 and CH-654 are stationary models (same type as CU (communication unit)) for directly charging the battery cartridge placed in the BHT..

The charging time is approximately 3 hours.

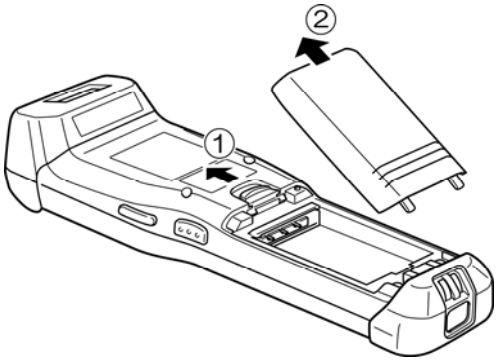
- The charging time is approximately 7 hours using the CU-621 with power supplied via the USB port.
- This time will be reduced for a battery cartridge with low discharge capacity.

Charging Precautions

- Do not touch the any terminals of BHT, battery, or charger by hand or stain them. Doing so could result in a contact failure or prevent charging.
- Never charge the battery near fire or in a high-temperature environment.
  High-temperatures may activate the charger's protective device, preventing charging, and lead to protective device damage, overheating, blowout or combustion.
- Terminate charging if not completed even after the specified time has elapsed.

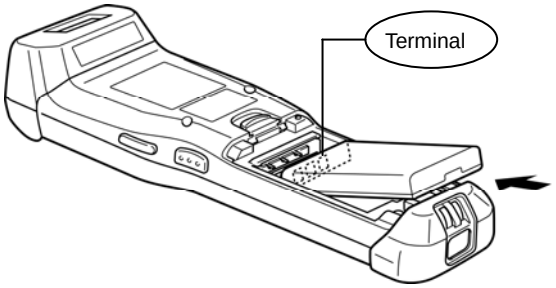
Charging with the communication unit (CU-601, CU-611 and CU-621) or battery charger (CH-651 and CH-654)

1. Slide the battery cover lock (1) in the direction indicated by the arrow and remove the battery cover (2).

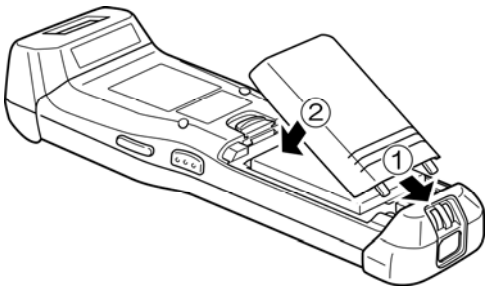


2. Check the battery cartridge terminals and indication on the BHT unit, and then insert the cartridge in the direction indicated by the arrow.

– Point – Do not use battery cartridges other than those specified by DENSO WAVE.

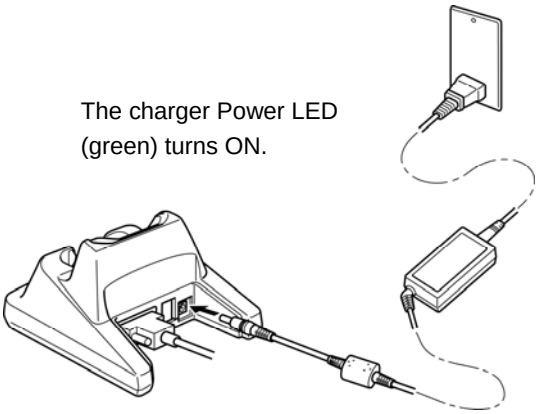


3. Insert the battery cover tab (1), and then close the battery cover (2) to lock the cover in position.



4. Connect the dedicated AC adapter to the DC input connector on the charger and plug the adapter into the wall socket.

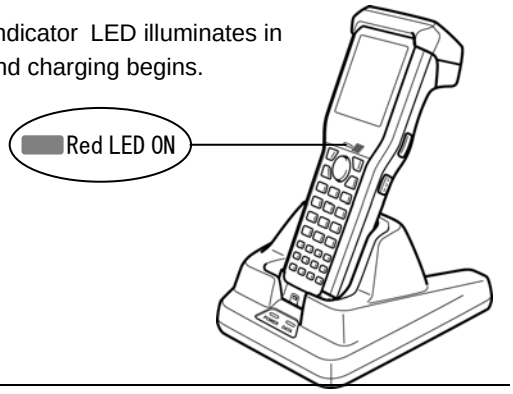
The charger Power LED (green) turns ON.



– Note – Power for the CU-621 can be obtained from a USB connection port (host computer or hub), however, charging is not possible while the host computer is in suspend mode. Charging is resumed when suspend mode is exited. This can be avoided using a dedicated AC adapter to supply power. Suspend mode is a power saving function used to temporarily put the computer on standby when not in use.

5. PLACE THE BHT ON THE CHARGER.

The indicator LED illuminates in red and charging begins.

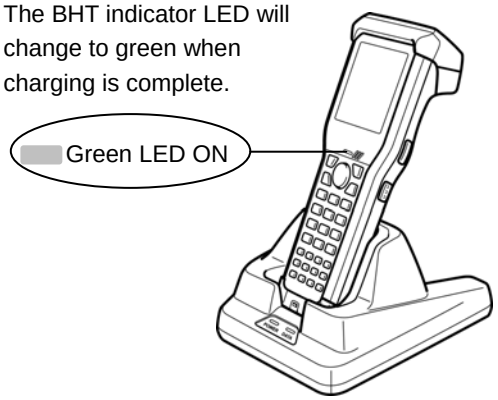


– Point – After placing the BHT on the charger when using the BHT for the first time or when left unused for long periods of time, do not remove from the charger for approximately 10 minutes.

– Note – The BHT is equipped with a back-up battery used to back-up the internal memory and calendar clock.
The internal back-up battery is charged first when charging is commenced.
Do not remove the BHT from the charger for at least 10 minutes when using the BHT for the first time or when using after long periods of time.

6. The BHT indicator LED will change to green when charging is complete.

The BHT indicator LED will change to green when charging is complete.

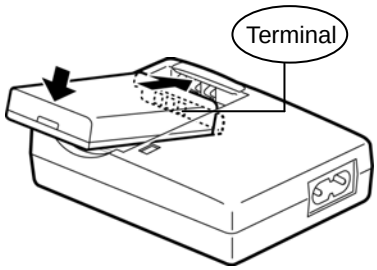


– Point –

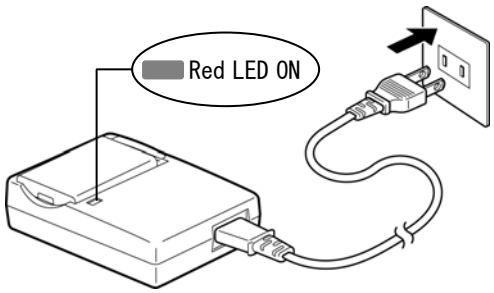
- The charge time is approximately 3 hours.
- The charge time is approximately 7 hours using the CU-621 with power supplied via the USB port.
- An only slightly discharged battery cartridge should take less time to become fully charged.
- Take proper steps if the BHT indicator LED is blinking in red.
  a. Detecting the abnormal temperature of the battery cartridge.
  Charge at the right temperature(0 to 40 degree). Avoid the direct sunlight or something hot.
  Stop the charging if under the proper environment.
  b. Bad electrical contact.
  Wipe any dirt from battery cartridge terminals with refer to “Chapter 6.3 Daily Maintenance”.
  c. Non-completion of the charge in the given time.
  Charge again using dedicated AC adapter if the charging was using USB port which is weak power supplying capability.
  d. Failure or life of battery cartridge.
  Replace the new battery cartridge.

Charging with the battery charger (CH-201A and CH-704)

1. Check the battery cartridge terminals and insert the cartridge.

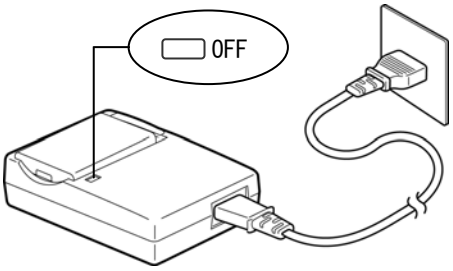


2. Connect the power cable to the CH-201A and connect the plug to a commercial AC power source (230 V AC).



The LED illuminates in red and charging begins.

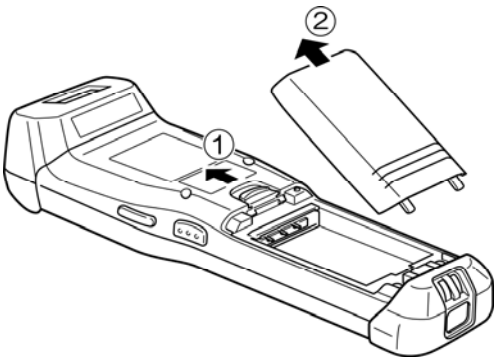
3. The LED will turn OFF when charging is complete.



– Point –

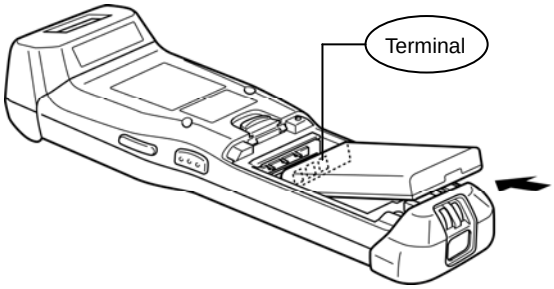
- The charge time is approximately 3 hours.
- An only slightly discharged battery cartridge should take this time to become fully charged.
- Take proper steps if the LED is blinking in red.
  a. Detecting the abnormal temperature of the battery cartridge.
  Charge at the right temperature(0 to 40 degree). Avoid the direct sunlight or something hot.
  Stop the charging if under the proper environment.
  b. Bad electrical contact.
  Wipe any dirt from battery cartridge terminals with refer to “Chapter 6.3 Daily Maintenance”.
  c. Failure or life of battery cartridge.
  Replace the new battery cartridge.

4. Slide the battery cover lock (1) in the direction indicated by the arrow and remove the battery cover (2).

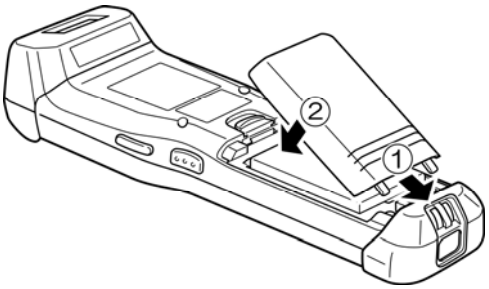


5. Check the battery cartridge terminals and indication on the BHT unit, and then insert the cartridge in the direction indicated by the arrow.

– Point – Do not use battery cartridges other than those specified by DENSO WAVE.



6. Insert the battery cover tab (1), and then close the battery cover (2). tThe battery cover is now locked in position.



⚠ WARNING

Mishandling of the charger may result in charger overheating, smoke generation, blowout or combustion. Please read the following items prior to use.

- Never disassemble or modify the battery cartridge.
- Never connect the battery cartridge (+) and (-) terminals with a metal object such as a piece of wire.
- Never carry or store the battery cartridge together with metallic necklaces, hairpins and so on.
- Never expose the battery cartridge to fire or apply heat.
- Never use or leave the battery cartridge in the vicinity of high-temperature locations (60° C or higher) such as a fire or stove.
- Never place the battery cartridge into or soak it in water or seawater.
- Never charge the battery cartridge in the vicinity of fire or under a scorching sun.
- Never hammer nails into the battery cartridge, hit it with a hammer, or trample on it.
- Never apply strong impact to or throw the battery cartridge.
- Never use significantly damaged or deformed battery cartridges.
- Never apply solder directly to the battery cartridge.
- If battery fluid leaked from the battery cartridge gets into the eyes or comes into contact with the skin, wash thoroughly with clean water such as tap water without rubbing, and obtain medical treatment immediately. Failure to do so will result in eye or skin injuries.

⚠ CAUTION Mishandling of the charger may result in charger overheating, smoke generation, blowout or combustion. Please read the following items prior to use.

- Terminate charging if not completed even after the specified time has elapsed.

– Note –

- The BHT is equipped with a back-up battery used to back-up the internal memory and calendar clock when the battery cartridge is removed or the battery voltage falls below the stipulated level. It is therefore necessary to charge the internal back-up battery when using the BHT for the first time or when left unused for long periods of time.
  The back-up battery is charged automatically when a fully-charged battery cartridge is inserted.
  To ensure that the back-up battery is fully charged, do not remove the battery cartridge for at least 10 minutes when using the BHT for the first time or when using after long periods of time.
- If you leave the BHT without a battery cartridge inserted for a long time, the memory contents will no longer be backed up so that the message "Contact your administrator. Note the error number. (XXXX)" or "Set the current date and time." may appear on the LCD.
- Refer to “Chapter 6 Maintenance” – “6.2 Using the BHT after Long Periods” for details of handling the BHT after long periods of time.
- Avoid storing the battery cartridge in high-temperature locations. The battery capacity may decrease.
- Do not touch the BHT, battery, or charger terminals by hand or stain them. Doing so may result in a BHT operation defect or battery cartridge charging failure. It is recommended that dirt on the battery cartridge terminals or BHT battery terminals be periodically wiped with a soft, dry cloth.

2.2.1 Battery Power Level Indicator

Confirming at the Power Level Icon

The battery power level can be confirmed with the battery icon( ) displayed at the bottom left of the LCD screen.
The battery power is indicated in four levels.
The battery power level indicator tells you when to charge the battery cartridge.

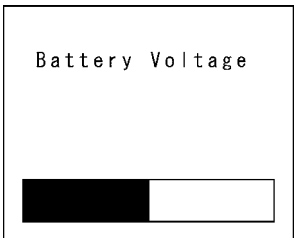
: Sufficient battery power remains.
: The battery power is partially depleted. Making early charge is recommended.
: The battery power is almost fully depleted. Charge immediately.
: The battery power is totally depleted.
Charge immediately or replace with a fully charged battery cartridge.

Confirming at the “Battery Voltage” Screen

The battery power level can also be confirmed at the “Battery Voltage” screen.
The "Battery Voltage" screen displays the battery power level in more detail than the battery icon ( ) that displays on the LCD screen.
Display the “Battery Voltage” screen using the following procedure.

1. Hold down the **SF** key and press the **ENT** key.

The “Battery Voltage” screen displays while the keys are pressed.



About the Battery Level

- The battery power level indicator does not accurately reflect the battery residual power and should only be used as a guideline.
- The battery power level will fluctuate due to BHT operation, and therefore disparities may occur between the actual battery voltage and the display indicator.
- Ensure to charge the battery as soon as possible before the battery power is depleted.

– Point –

- If the BHT is placed in the alphanumeric entry system in user programs, the combination of the **SF** and **ENT** keys cannot be used for displaying the battery voltage level. This is because in the alphanumeric entry system the **SF** key and **ENT** key are used for switching between the numeric and alphabet entry modes.

– TIP –

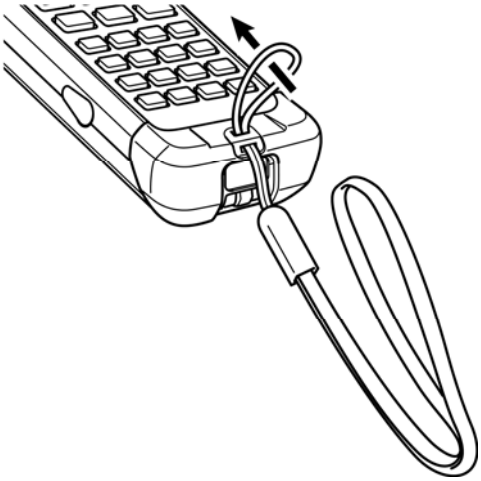
- In user programs, you may select the key to be used for displaying the battery voltage level (instead of the default: combination of **SF** and **ENT** keys).
- The displayed battery level shows the terminal voltage of the battery, not how much power is left.
- The actual voltage level varies depending upon the operation of the BHT, so the displayed level also may vary.

2.3 Wearing the Hand Strap

Wear the hand strap to prevent the BHT from being accidentally dropped during use.

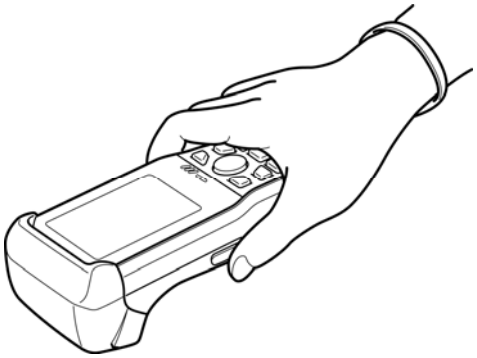
2.3.1 Attaching the Hand Strap

Attach the hand strap to the BHT as shown below.



2.3.2 Holding the BHT

Wear the hand strap to your wrist and hold the BHT as shown below.



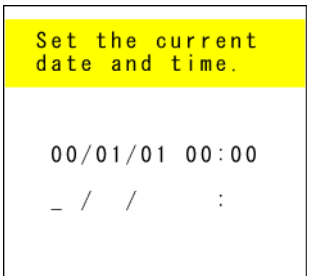
or

2.4 Initial Setup

Turn ON the power after inserting the fully charged battery cartridge into the BHT.
The date and time are not set at the time of purchase. You are required to set the date and time when turning ON the power for the first time.
Also follow the below procedure when resetting the date and time

1. Press the **Power** key (⏻) to turn ON the BHT.

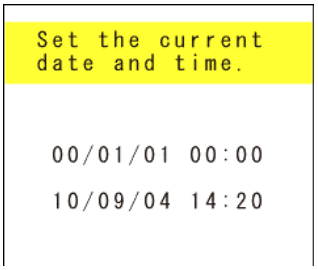
The screen right displays.



2. Enter the date and time using the numeric keys.

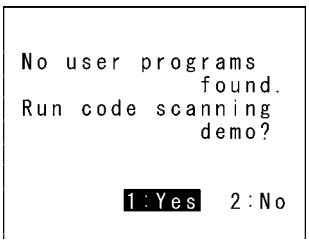
[Ex.] : September 4, 2010, 14:20

– Point – Enter the last two digits for the year, and enter the time in 24-hour clock format.



3. Press the **ENT** key to set the date and time.

The screen right displays when the date and time are set.



4. Press the numeric key **1** and the **ENT** key. Then, select [1:Yes].

A scanning demo commences.
The scanning demo is a program that allows codes to be read without a user program. Press the trigger switch to enable code reading.
Refer to "Chapter 3 Basic Operation" – “3.1 Reading Codes or 2D Codes” when reading codes

– Point – The power turns OFF by selecting [2:No].

2.5 Turning OFF the Power

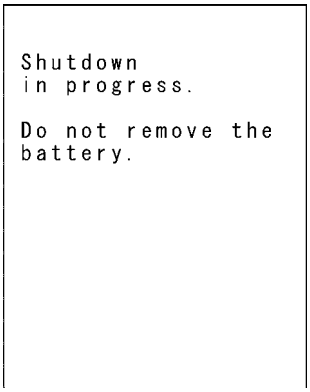
You can turn OFF the BHT in one of the following three methods.

Normal Power OFF	→	Press the **Power** key (⏻).
Turning the power OFF after data back-up	→	Hold down the **Power** key (⏻) for at least 3 seconds.
Auto power OFF	→	The power turns OFF itself when the BHT is not used for specified period of time set at the user program.

2.5.1 Normal Power OFF

1. Press the **Power** key (⏻).

The BHT turns OFF after the message on the screen given to the right displays.



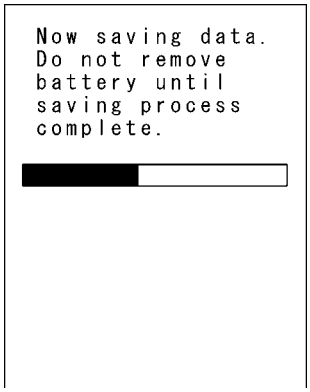
– Point – Do not remove the battery cartridge while the message on the right is displayed.

When the power is next turned ON, there are times when a message (2XXX) displays asking the user to contact the administrator.

2.5.2 Turning the Power OFF after Data Back-up

1. Hold down the **Power** key (⏻) for at least 3 seconds.

The message right displays and data back-up is commenced.
The power turns OFF itself when the back-up is complete.



– Point – Do not remove the battery cartridge while the message on the right is displayed.
The back-up process may take several tens of seconds depending on the amount of data.

2.5.3 Auto Power OFF

The power turns OFF itself when the BHT is not used for the specified period of time set at the user program.
This is set to 3 minutes at default when the BHT is shipped from the factory.
* Refer to “BHT-600 Programmer’s Manual” for details of auto power OFF.

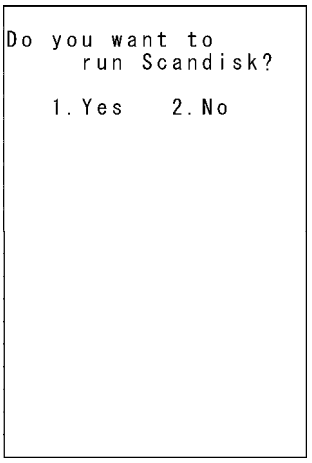
2.5.4 If the BHT Is Shut Down Abnormally

If the BHT is shut down abnormally* and is left without a battery cartridge or with a discharged battery cartridge inserted, then unsaved data may be lost.
(*"Normally shut down" refers to "2.5 Turning OFF the Power.")

1. The right message will appear when you insert a charged battery cartridge and turn the BHT on.

2. Press the **2** key while holding down the **SF** key.

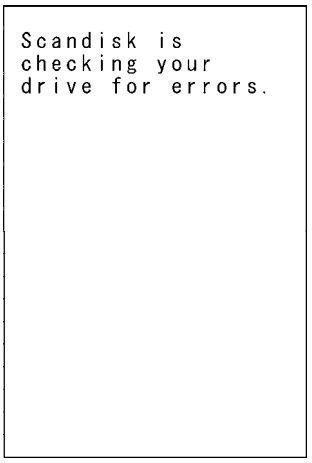
The screen right displays.



[1. Yes]: Run Scandisk and start the System.
[2. No]: Turn the BHT off.

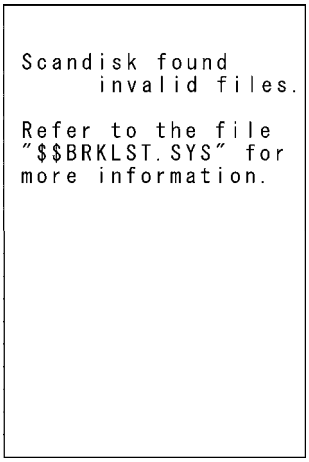
3. Choose [1. Yes] with the numerical keys and press the **ENT** key.

When Scandisk is in progress, the right message is displayed.



If Scandisk finds an invalid file(s), the right screen will appear.
(As long as an invalid file exits, the screen displays every time the BHT System is started up.)

(Refer to “About “$$BRKLST.SYS” on the following page.)

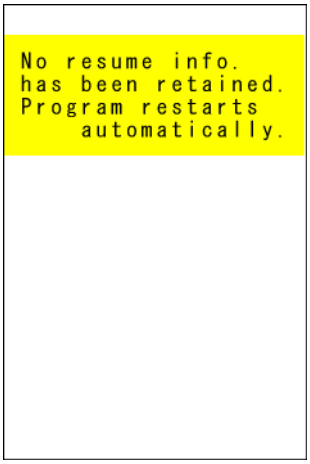


4. Press the **ENT** key to start up the BHT System.

Scandisk when the resume function is enabled

If Scandisk runs when the resume function is enabled, the screen given right may appear.

The BHT displays the screen for three seconds and then automatically runs the execution program from the beginning.
(The screen may also appear when the calendar clock built in the BHT stops, even without running Scandisk.)



– Point – The resume function is used to return the display to the status (screen) when the power was last turned OFF when the power is next turned ON.

Resume function settings are made at the “SET SYSTEM” menu. Refer to “Chapter 4 System Operation” – “4.5.5 System Environment Settings (SET SYSTEM Menu)” for further details.

About "$$BRKLST.SYS"

If Scandisk finds an invalid file(s), it will automatically create the "$$BRKLST.SYS" file.
To check the contents of the file, upload the file in System Mode to the host computer.
(Refer to "Chapter 4 System Operation" – "4.5.3 Uploading Files (UPLOAD MENU).")

Contents of the "$$BRKLST.SYS" file

Records	(1) File name	
	(2) Error factor	+ (Broken since the BHT has not been turned off normally) * (Broken due to any other causes)
	(3) Broken records	e.g. 01000-01200 (Data in records numbered 1000 to 1200 is lost)

[Ex.]

SAMPLE1.DAT + 01000-01050
SAMPLE1.DAT + 01200-01250
SAMPLE1.DAT + 01600-01650
} If more than one sequence of records is broken in a same file, they will be written into the subsequent records in the "$$BRKLST.SYS."

SAMPLE2.DAT * 00250-00275
SAMPLE3.DAT * 00100-00150
↑ ① ↑ ② ↑ ③

2.5.5 If Invalid Files Are Found

Even invalid files can be uploaded, so upload them to the host computer according to your needs.

- Delete those invalid files.
  (Refer to "Chapter 4 System Operation" – "4.5.9 Deleting Program/Data Files (DELETE FILE MENU).")
- Download valid files having the same names as invalid ones.
  (Refer to "Chapter 4 System Operation" – "4.5.2 Downloading Files (DOWNLOAD MENU).")

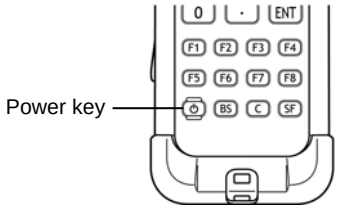
Chapter 3
Basic Operation

This chapter describes basic operations such as code reading, numerical data entry and item selection using the BHT, basic changes to settings, and BHT data transmission

3.1 Reading Barcodes or 2D Codes

Follow the procedure below to read codes.

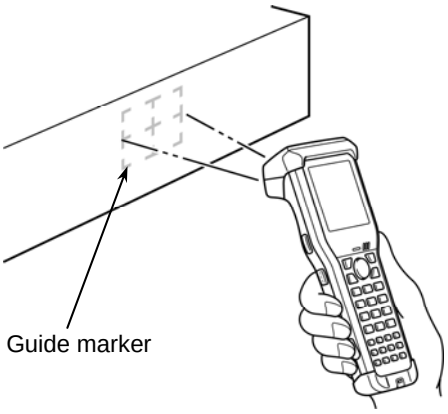
1. Turn the BHT power ON.



2. Press the trigger switch.

The BHT emits guide marker (laser light) and the light for reading

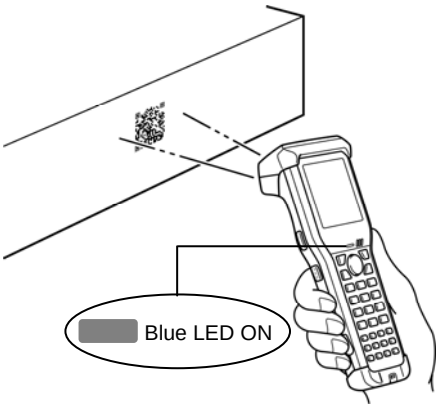
— **Point** — The trigger switch is assigned to magic keys **M3** and **M4** when shipped from the factory.



3. Hold the BHT close to the code to align the guide marker.

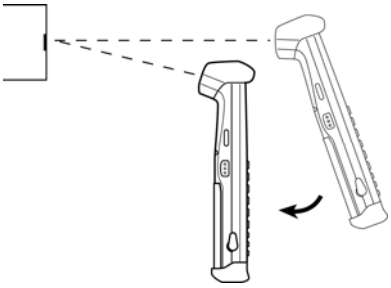
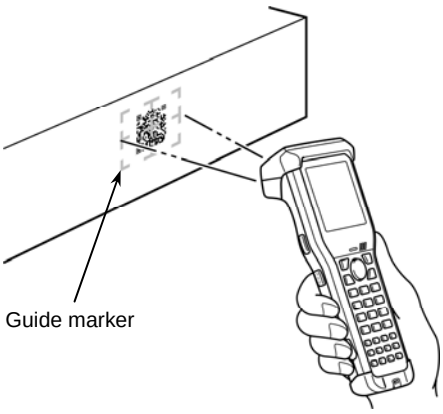
When the BHT has read the code successfully, the indicator LED will illuminate in blue.

— **Point** — The code reading method may differ depending on the application. Select the most appropriate in accordance with in the User's Manual.



— **Note** —
- If required, clean dirty labels before reading.
- It may not be possible to perform reading in direct sunlight.
- If the code is on a curved surface, flatten the label surface and read it again.
- If the code reading window is pulled away from the code, the readable code range will become narrower than that of the light emission.

When unable to successfully read barcodes or 2D codes…

Cause		Countermeasure
Specular reflection	When the light is focused on the printed surface of the code from directly above, the BHT may not read the code due to specular reflection.	Change the BHT reading angle and try again. 
Distance from code	The barcode may not be read if it is too close to or too far from the BHT reading window,	Move the BHT slowly toward or away from the code and try again. Use the display range of the guide marker as a guide. The valid reading range is approx. 6×4 cm if the reading distance is 11 cm. 
Code surface curvature	The code may not be read if surface is extremely curved.	Flatten the label surface and read it again.
Code surface dirt	The code may not be read if its surface is dirty.	Wipe the dirt from the code and try again.
Code reading window dirt	The code may not be read if the barcode reading window is dirty.	Blow any dust away with an airbrush, and then gently wipe the reading window with a cotton swab or similar soft object.
Direct sunlight, ambient light	Code reading may be adversely affected by direct sunlight or the brightness of the surrounding light.	Read the code away from direct sunlight. Adjust the brightness of the surrounding light when reading indoors.

3.2 Numeric Data Entry

Enter numeric data such as product volume with the numeric keys and Enter (ENT) key.
If numeric data is entered incorrectly, use the backspace key (BS) to delete the data and then reenter with the numeric keys.

When Entering “120”	Key Operation
Press numeric keys 1, 2, and 0 followed by the Enter key.	1 2 0 ENT

3.3 Task Selection

If a selection item “such as “1:XXX 2:XXX” with numeric values displays, enter the values with the numeric entry keys and then press the Enter key.

When Selecting Task 2:XXX	Key Operation
Press numeric key 2 followed by the Enter key.	2 ENT

If a YES/NO selection screen such as “1:YES 2:NO” displays, press numeric key [1] to select “YES”, and [2] to select “NO”.

When Selecting “1:YES”	Key Operation
Press numeric key 1 followed by the Enter key.	1 ENT

3.4 Changing the Default Settings

The buzzer volume, vibrator, LCD screen brightness, power save settings and key backlight can be changed at the MENU screen.

Item	Details	Setting
BUZZER VOLUME	Used to set the volume of the buzzer that notifies the user when code reading is complete. The volume can be adjusted in 4 levels: Hi, Lo, Mid and Mute.	Mute→Lo→Mid→Hi
VIBRATOR	Used to turn ON/OFF the vibrator that notifies the user when code reading is complete.	ON, OFF
BRIGHTNESS	Used to set the backlight brightness of the LCD screen. The brightness can be adjusted in 5 levels.	Levels 1 to 5
BRIGHTNESS(PS)	Used to set the backlight brightness of the LCD screen during power save mode. The brightness can be adjusted in 6 levels.	Levels 0 to 5
POWER SAVE	Used to set the time until the LCD screen backlight is dimmed when not in use in order to save power.	1-second units (max. 30 seconds)
KEY BACKLIGHT	Used to turn ON/OFF the keypad backlight.	ON, OFF

3.1.1 Procedure

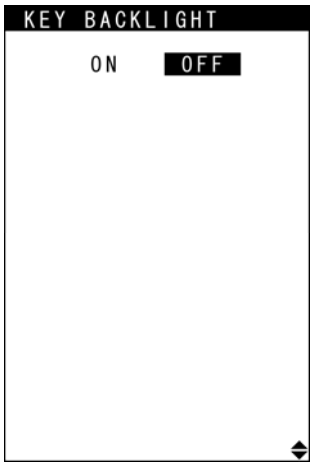
1. Hold down magic key **M1** for at least **1** second.

The MENU screen displays

2. Use the [▲] and [▼] cursor keys to select the item to be changed.

The selected item is highlighted.

With BUZZER VOLUME highlighted, press [▲] or with POWER SAVE highlighted, press [▼] to change to the next screen.



3. Use the [◄] and [►] cursor keys to select the setting.

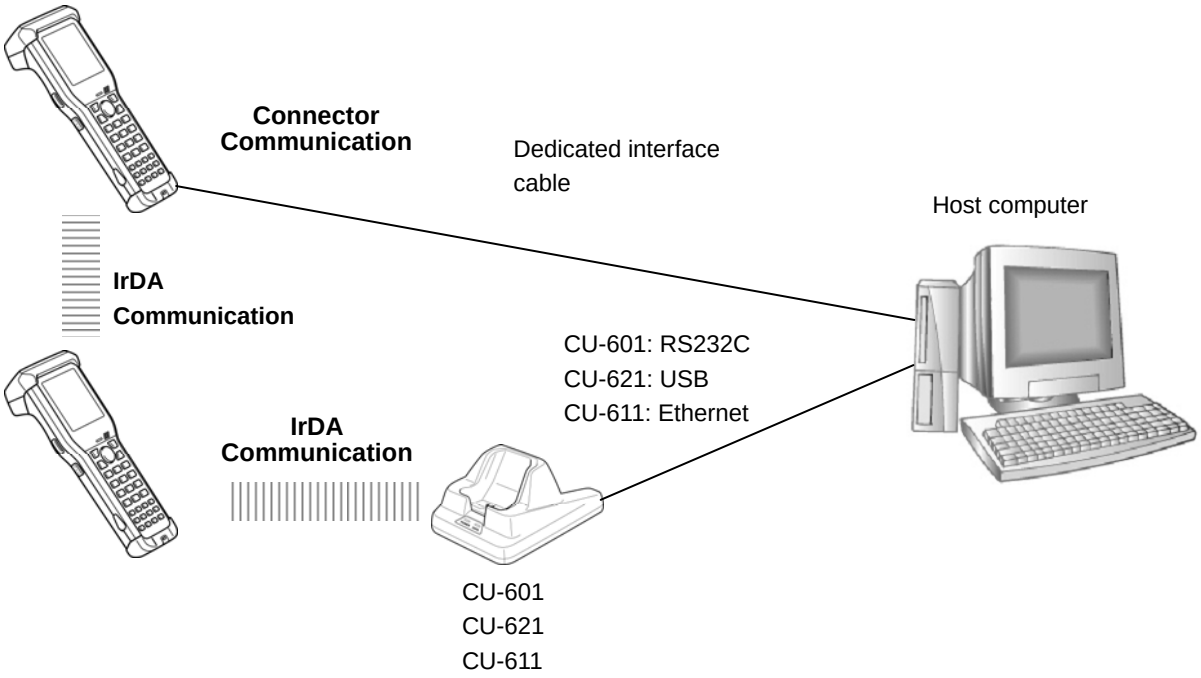
4. Press any of the following keys to exit the settings screen.

- M1 key long press
- Clear key
- Enter key

3.5 Transmitting Data

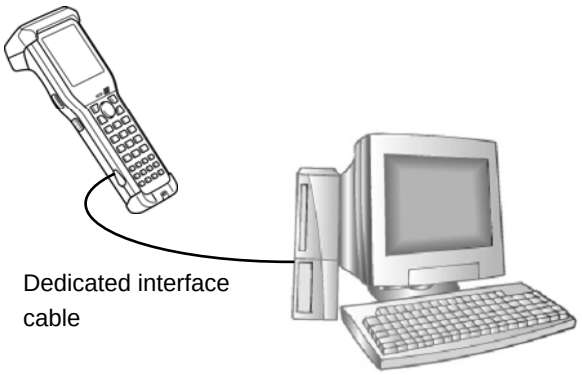
Data gathered by the BHT can be transmitted to the host computer by connector communication, IrDA communication and wireless communication.
The data transmission method and BHT setting method will differ depending on the system used, and therefore the system administrator should be contacted for details of operation.

Requests
Data gathered by the BHT should be promptly uploaded to the host computer.



3.5.1 Connector Communication

Connect the host computer and BHT with a dedicated interface cable (Option, Type: CBBHT-RS1000/3-9-02) and perform data communication.
The BHT-BASIC 4.0 Development Pack (Option) and BHT-BASIC 4.0 Transfer Utility (Option) software is required.



Requests

- Do not use a cable other than the dedicated interface cable.
- Avoid disconnecting and reconnecting the cable more than once a day. Disconnecting and reconnecting the cable too frequently will shorten the lifetime of the connector interface port. Use the communication unit (CU-601, CU-621 or CU-611) when it is necessary to perform frequent communication between the host computer and BHT.
- Avoid inserting the connector at an angle or pulling the cable strongly.

3.5.2 IrDA Communication

◆ WHEN PERFORMING DATA COMMUNICATION BETWEEN BHT UNITS

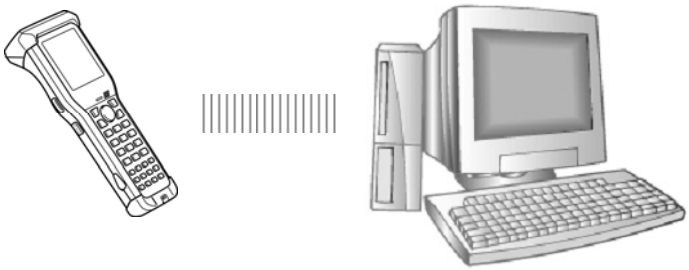
Point the BHT IrDA communication ports toward each other and perform communication.

Request

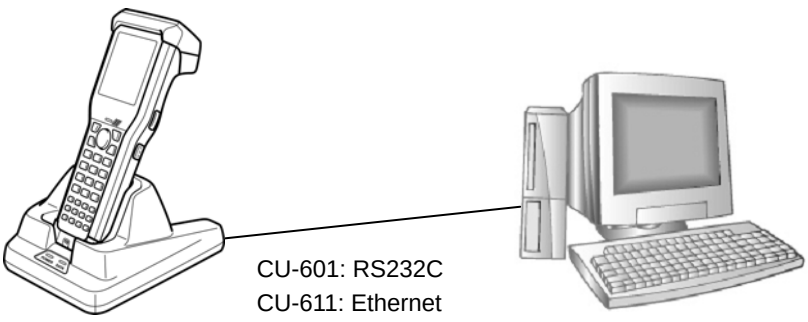
- Make sure that the light path between the BHT and any target stations is not obstructed.
- Perform communication within the effective IrDA emission range (15 cm).
- Do not operate remote control units for televisions and so forth in the vicinity of IrDA communication. This may result in communication failure.
- Perform communication in locations where the BHT units will not be exposed to light interference from sources such as intense ambient lighting (inverter-driven fluorescent lighting, in particular) or direct sunlight. This may result in communication failure.

◆ When performing data communication with the host computer

Data can be transmitted directly to the host computer if the computer is equipped with an IrDA communication port.



If the host computer is not equipped with an IrDA communication port, place the BHT on the communication unit (CU-601, CU-621 or CU-611) and transmit data.
In case of using the CU-601 or CU-621, the BHT-BASIC 4.0 Development Pack (Option) and BHT-BASIC 4.0 Transfer Utility (Option) software is required.
In case of using the CU-611, FTP communication environment is required.



CU-601: RS232C
CU-611: Ethernet
CU-621: USB

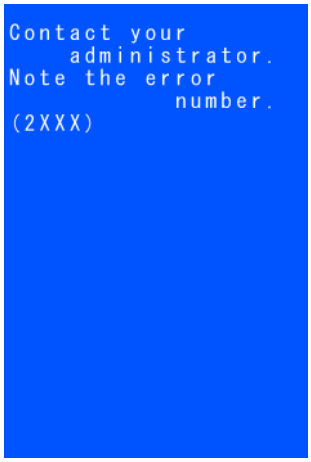
Chapter 4
System Operation

This chapter describes how to initialize and update the system, start up a user program, and operate System Mode.

4.1 Initializing the BHT System

By initializing the system, program files and data files downloaded to the BHT user area are deleted, and system settings are returned to the default status when shipped from the factory.
The system must be initialized when:

- Deleting all program files and data files downloaded to the BHT user area (Font files are also deleted by selecting the area subject to initialization.)
- The following message displays on the screen when the BHT is turned on.



- Point - By initializing the system, all files in the user area are deleted, and therefore all files that need to be backed up should be uploaded to the host computer and so on beforehand.
Refer to section “4.5.3 Uploading files (UPLOAD menu)” for details of uploading.

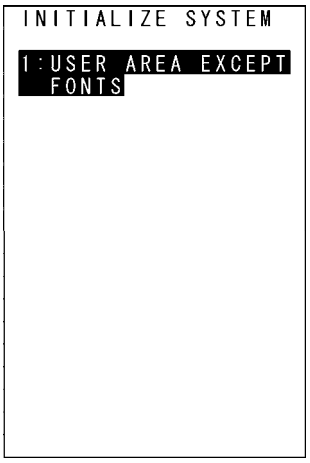
The initialization procedure is described on the following pages.
Perform operation in accordance with the procedure for each item.

■Selecting the Memory Area to be Initialized
↓
■Selecting the Message Version (English or Japanese)
↓
■Confirming the Memory Area to be Selected for Initialization
↓
■Performing System Initialization

4.1.1 Selecting the Memory Area to be Initialized

1. Press the **Power** key (⏻) while holding down the **SF**, **M1** and **0** keys together.

The screen displays as shown on the right.



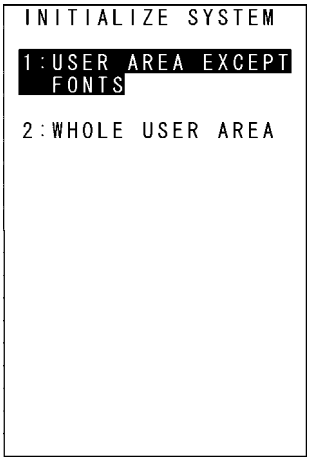
2. Select the memory area to be initialized.

(1) To exempt font files from deletion:

Ensure that "1:USER AREA EXCEPT FONTS" is selected and press the **ENT** key.
The screen changes to the "4.1.3 Confirming The Memory Area Selected for Initialization".

(2) To delete font files:

Press the **2** key while holding down the **SF** key.
The screen displays as shown on the right.
Next, press the **2** key, select "2:WHOLE USER AREA", and press the **ENT** key.
The screen changes to the "4.1.2 Selecting the Message Version (English or Japanese)".



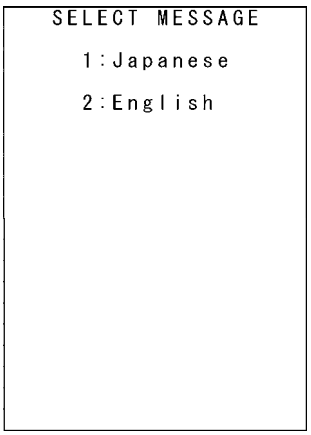
"1: USER AREA EXCEPT FONTS"
The user area is initialized without deleting file fonts.
"2: WHOLE USER AREA"
The entire user area is initialized and therefore file fonts are also deleted.

- Point - If a "Contact the administrator. (2XXX)" message displays when the BHT power is ON, select "2: WHOLE USER AREA".

4.1.2 Selecting the Message Version (English or Japanese)

1. When the screen displays as shown on the right, select the message display language with the numerical keys.

"1: Japanese" Changes the message language to Japanese.
"2: English" Changes the message language to English.



2. Press the **ENT** key.

The screen changes to the "4.1.3 Confirming the Memory Area Selected for Initialization".

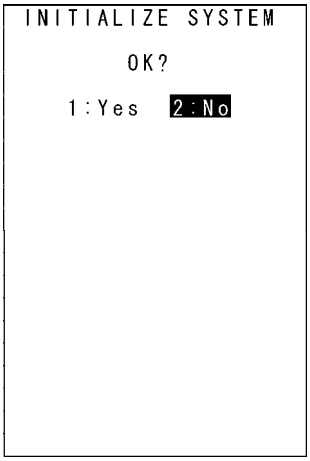
4.1.3 Confirming the Memory Area Selected for Initialization

(1) To exempt font files from deletion:

When the screen displays as shown on the right, select the item and press the **ENT** key.

Press the **C** key to return to the screen to select the area for initialization.

"1: Yes":
The system will be initialized without deleting font files.
"2: No":
Cancels system initialization and turns the BHT power OFF.

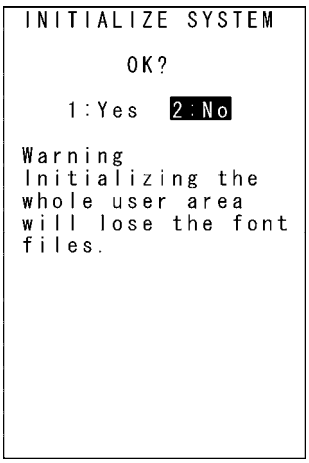


(2) To delete font files:

When the screen displays as shown on the right, select the item and press the **ENT** key.

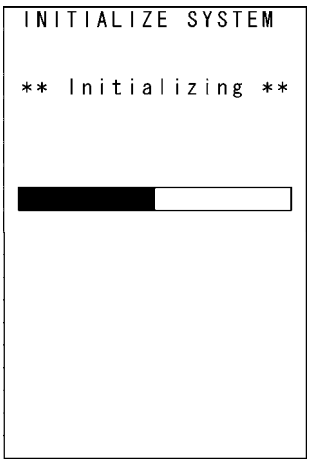
Press the **C** key to return to the screen to select the area for initialization.

"1: Yes":
The system will be initialized, and all files in the user area, including font files, will be deleted.
"2: No":
Cancels system initialization and turns the BHT power OFF.

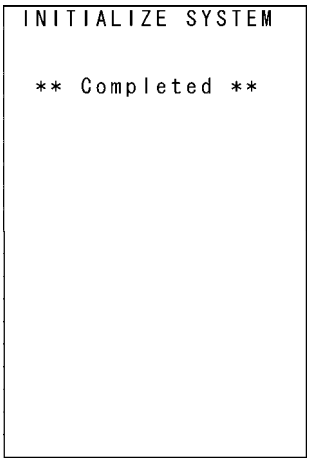


4.1.4 Performing System Initialization

1. The screen displays as shown on the right during system initialization.



2. Upon completion of system initialization, the BHT displays the screen on the right for a second and then turns OFF automatically.



- Point -

- Never turn OFF the BHT power during system initialization. Turning the power OFF too early will interrupt the process, requiring initialization to be performed again.
- If a “Contact your administrator. Note the error number. (XXXX)” message displays even although initialization has been completed, initialize the BHT again.
- Following initialization, all programs and data files stored in the target memory area will be lost. Download them again if necessary. (Refer to section “4.5.2 Downloading Files (DOWNLOAD Menu)” for details of downloading.)
- Always set the calendar clock following initialization. (Refer to “Chapter 2 BHT Preparation” – “2.4 Initial Setup”.)
- Initialization will restore the display contrast level, communication conditions and other settings to their default values when shipped from the factory, and therefore they should be edited if necessary.

4.2 Updating the System

4.2.1 Updating the BHT System

The BHT System Update procedure is as follows.

BHT System Update File Download
↓
Bht System Update

◆ BHT System Update File Download

Refer to sections “4.5.2 Downloading Files (DOWNLOAD menu)” and “4.5.8 Downloading/Uploading Files by FTP (FTP MENU)”, and Download the BHT system update file to the BHT.

- Note - The BHT system update file can be downloaded from the following Web site.

http://www.qbdirect.net/

◆ BHT SYSTEM UPDATE

Refer to section “4.5.14 Updating the System (MODIFY MENU)” and update the BHT system.

- Important - In order to prevent the battery running low during the system update process, perform the system update with the battery sufficiently charged, or with the BHT placed in the CU-600 Series. If the BHT power turns OFF due to a low battery and so on during the system update, the system update will continue when the power is next turned ON. Furthermore, during system update, the power will not turn OFF even if the **Power** key (⏻) is pressed. Wait until the system update process is complete before operating the BHT.

4.2.2 CU-611 System Update

The CU-611 System Update procedure is as follows.

CU-611 System Update File Download
↓
CU-611 System Update

◆ CU-611 System Update File Download

Refer to sections “4.5.2 Downloading Files (DOWNLOAD Menu)” and “4.5.8 Downloading/Uploading Files by FTP (FTP MENU)”, and Download the CU-611 System update file to the BHT.
Download the CU-611 System update file as a data file with field length of 64 bytes.

- Important - If the Transfer Utility is used to Download in BHT protocol, select the “perform binary file transfer (F)” check box at the Transfer Utility Options screen and then download.

- Note - The CU-611 system update file can be downloaded from the following Web site.
http://www.denso-wave.com/

◆ CU-611 System Update

Refer to section “4.5.14 Updating the System (MODIFY MENU)” and update the CU-611 System.
The CU-611 LED flashes during CU-611 system update.

- Important - Never remove the BHT from the CU-611 or turn the BHT power OFF during the system update process.
If the BHT is removed from the CU-611 or the BHT power turned OFF during system update, a system update error will occur, and the CU-611 will wait for the update to be retried.
In such a case, either perform the CU-611 system update again, or reboot the CU-611.

- Point - If the CU-611 power is turned OFF during the system update, when the power is next turned ON, either the system prior to updating or system after updating will run.
The system running can be verified at the CU-611 System Information display.
(Refer to section “4.5.7 System Information (SYSTEM INFORMATION Menu)” for details.)

4.3 Executing User Programs

User programs (application programs) can be executed using the following methods.
Select the most appropriate method to meet the objective.

4.3.1 Executing from the SYSTEM MENU “EXECUTE PROGRAM”

Select the program to be executed at the SYSTEM MENU “EXECUTE PROGRAM” menu.
In such a case, the selected program will always be executed from the start.
Refer to section “4.5.1 Executing User Programs (EXECUTE PROGRAM Menu)” for details.

4.3.2 Automatically Executing the Program Set at the SYSTEM MENU when Turning the Power ON

Select the program to be executed at the SYSTEM MENU “EXECUTE PROGRAM” menu, and then turn the BHT power OFF. The selected program will executed automatically the next time the BHT power is turned ON.
If the resume function has been set, the BHT will resume from the position in the program that was stopped when the BHT power was last turned OFF.
Refer to section “4.5.5 System Environment Settings (SET SYSTEM Menu)” for details.

4.3.3 Executing the First Registered Program by Turning the Power ON (BHT System Directory Management Program Function)

If no program has been selected at the SYSTEM MENU “EXECUTE PROGRAM” menu and the BHT power is turned ON, control will switch to the directory management program, and the first of the programs (.PD4) registered in the BHT will executed.
If the resume function has been set, the BHT will resume from the position in the program that was stopped when the BHT power was last turned OFF.

If downloading multiple programs after system initialization, programs are registered in the system in the order in which they are downloaded, and therefore ensure that the program to be executed is the first program downloaded.

If a program is later downloaded for purpose of upgrading the version, use the same program name. The order in which programs are registered in the system will not change, and therefore the same program will be executed even after upgrading the version. (*)

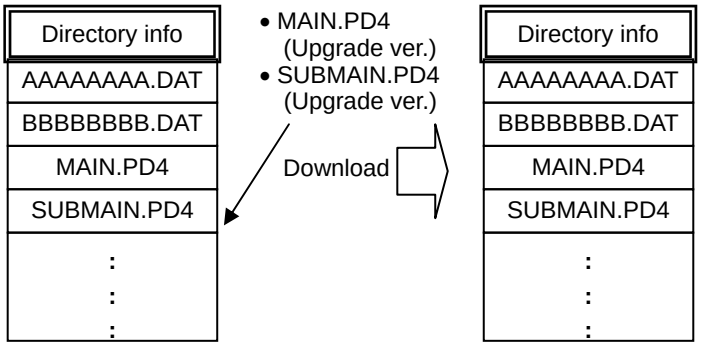
* The system directory management program also manages files with other extensions simultaneously. If the top file from the first registered program is deleted and a new program is downloaded, the new program will be registered in the position vacated by the deleted file and therefore caution is advised. It is recommended that the program to be execute after turning on the BHT power is first downloaded following system initialization.

Several directory management program examples are given below.
The names of the files used in these examples are as follows.

MAIN.PD4	:	Program to be executed by pressing the **Power** key (⏻) only
SUBMAIN.PD4	:	Program chained from MAIN.PD4 using the BHT-BASIC CHAIN statement
USER.PD4	:	New program
AAAAAAAA.DAT	:	Data file 1 used at the user program
BBBBBBBB.DAT	:	Data file 2 used at the user program

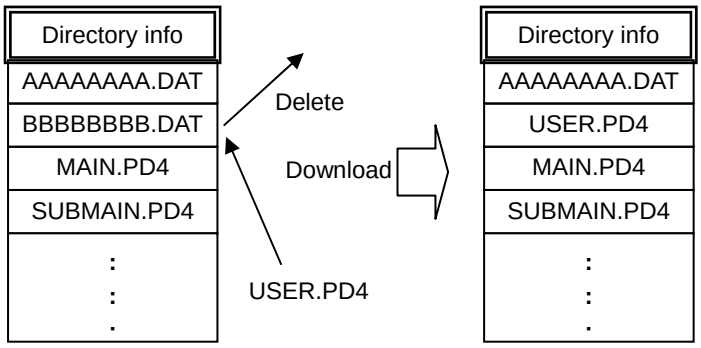
◆ (Example 1) When downloading the MAIN.PD4 and SUBMAIN.PD4 upgrade version

In the above case, the registration order does not change and therefore MAIN.PD4 starts up by pressing the **Power** key (⏻).



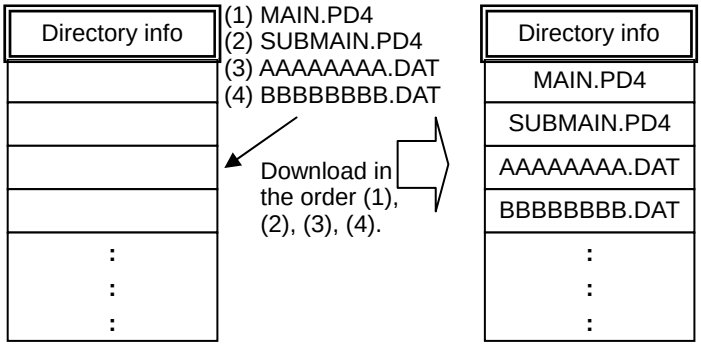
◆ (Example 2) When newly downloading USER.PD4 after deleting BBBBBBBB.DAT

In the above case, USER.PD4 is registered after BBBBBBBB.DAT, and therefore USER.PD4 will be the first registered program. Press the **Power** key (⏻) to start up USER.PD4.



◆ (Example 3) Recommended download method

After system initialization, first download the program to be executed simply by pressing the **Power** key (⏻). In this case, this program is always registered at the beginning of the system directory management unless the program has been deleted and another file downloaded.



<Status following system initialization>

4.3.4 Executing by Wake-up

By specifying the wake-up time at the user program, the BHT can be started up at the wake-up time and a program executed.

If an auto-start execution program has been selected at the system Mode “4.5.5 [1] Setting the auto-start execution program”, the selected program will be executed.

If no auto-start execution program has been selected, the first registered program from among the programs (.PD4) registered in the BHT will be executed.

Refer to the “BHT-BASIC Programmer’s Manual” for details.

4.3.5 Executing by Remote Wake-up

If remote wake-up is enabled, the BHT can be started up by receiving a control command from the host computer. If a fixed file called “BHTRMT.PD4” exists in the BHT at this time, BHTRMT.PD4 will be executed.

In other words, it is possible to execute the desired program by chaining from BHTRMT.PD4 using a BHT-BASIC CHAIN statement.

Refer to “4.5.12 Setting the Remote Wake-up (SET REMOTE WAKEUP Menu)” and the “BHT-BASIC Programmer’s Manual” for details.

4.4 System Mode

By starting up the BHT in system Mode and selecting each menu, the following operations can be performed individually.

- Executing user programs
- File download/upload
- System environment setting
- BHT operation test
- System information display
- Downloading/uploading files by FTP
- File deletion
- Font file deletion
- System settings parameter file download/upload
- Remote wake-up setting
- System message file download/upload
- System update

Refer to each item at the “4.5 SYSTEM MENU” for details of the above operations.

4.4.1 Starting Up System Mode

Use the following procedure to start up System Mode.

1. Press the **Power** key (⏻) while holding down the **SF** and **1** keys.

System Mode starts up and the SYSTEM MENU (screen on right) displays.

Select and display each menu from the SYSTEM MENU and perform each operation.

Hold down the **SF** key and press the appropriate numerical key to display items not displayed at the SYSTEM MENU.
Refer to “4.4.3 SYSTEM MENU Configuration” for details.

4.4.2 System Mode Basic Operation

Menu selection and Display

Use the following procedure to select and display each menu.

1. Press the numerical key corresponding to the menu to be selected.
Alternatively, press the cursor keys ([▲] [▼]) to select the menu.

The selected menu item will be highlighted. "EXECUTE PROGRAM" will be highlighted when System Mode is started up.

2. Press the **ENT** key.

The selected item is set and the next screen displays.
Press the **C** key to return to the previous screen.
The selected item will be highlighted when returning to the previous screen.

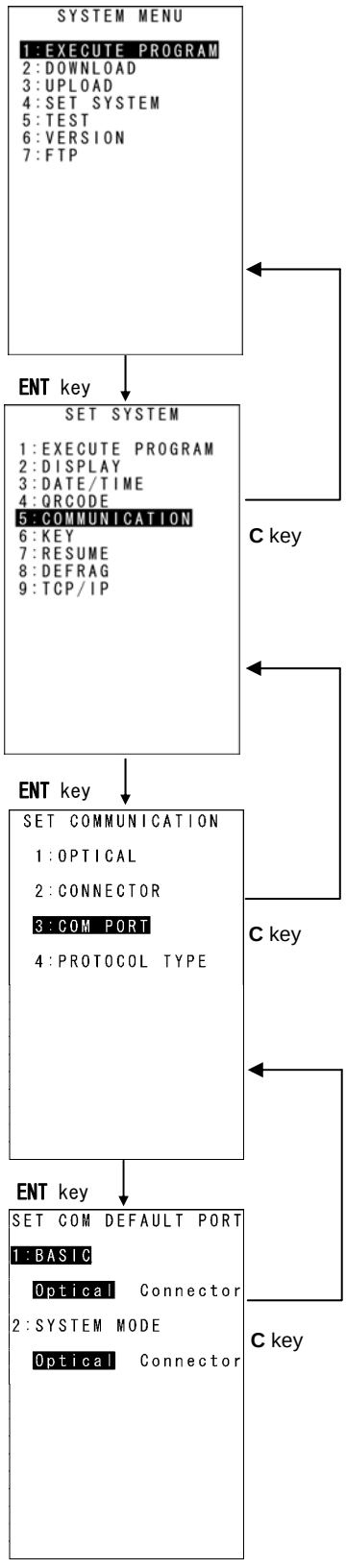
3. Repeat the above operation to display the target menu.

◆ **Operation example**

Select [4: SET SYSTEM] with the [4] or [▲]/[▼] keys.

Select [5:COMMUNICATION] with the [5] or [▲]/[▼] keys.

Select [3:COM PORT] with the [3] or [▲]/[▼] keys.



Setting Value Selection

Use the following procedure to select setting values.

1. Press the numerical key corresponding to the item to be selected. Alternatively, press the cursor keys ([▲] [▼]) to select the item.

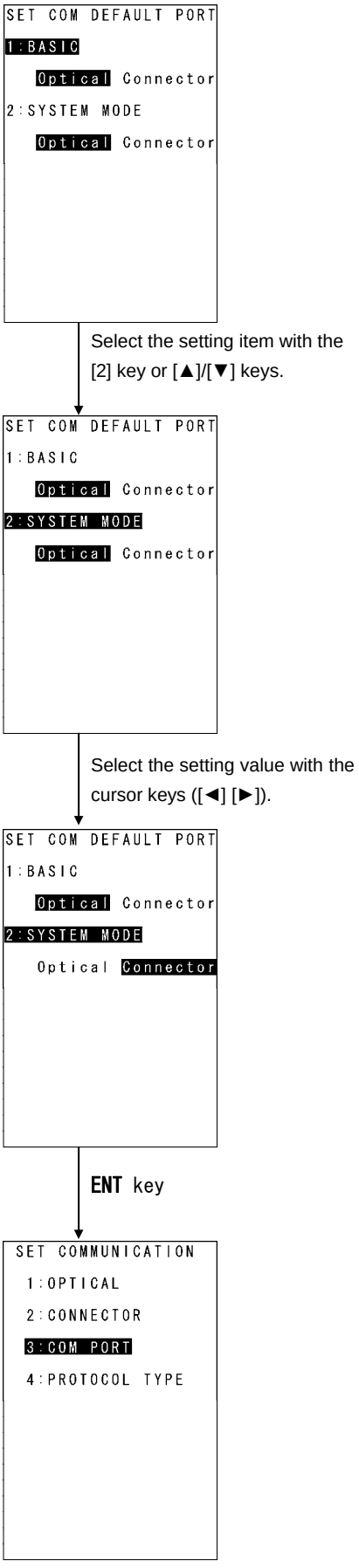
The selected item will be highlighted.

2. Select the setting value with the cursor keys ([◄] [►]).

3. Press the **ENT** key.

The selected setting value will be set.

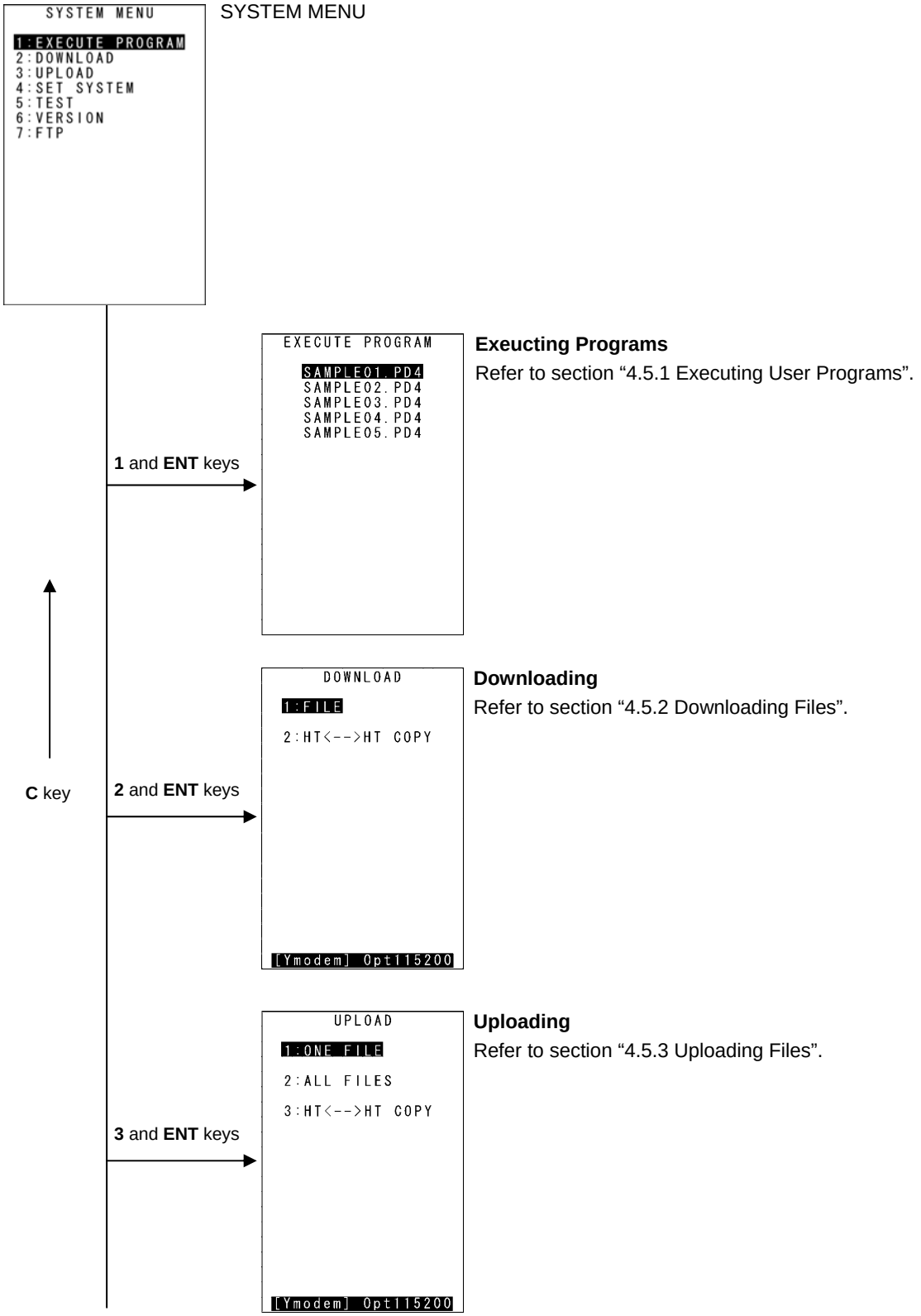
◆ Operation example

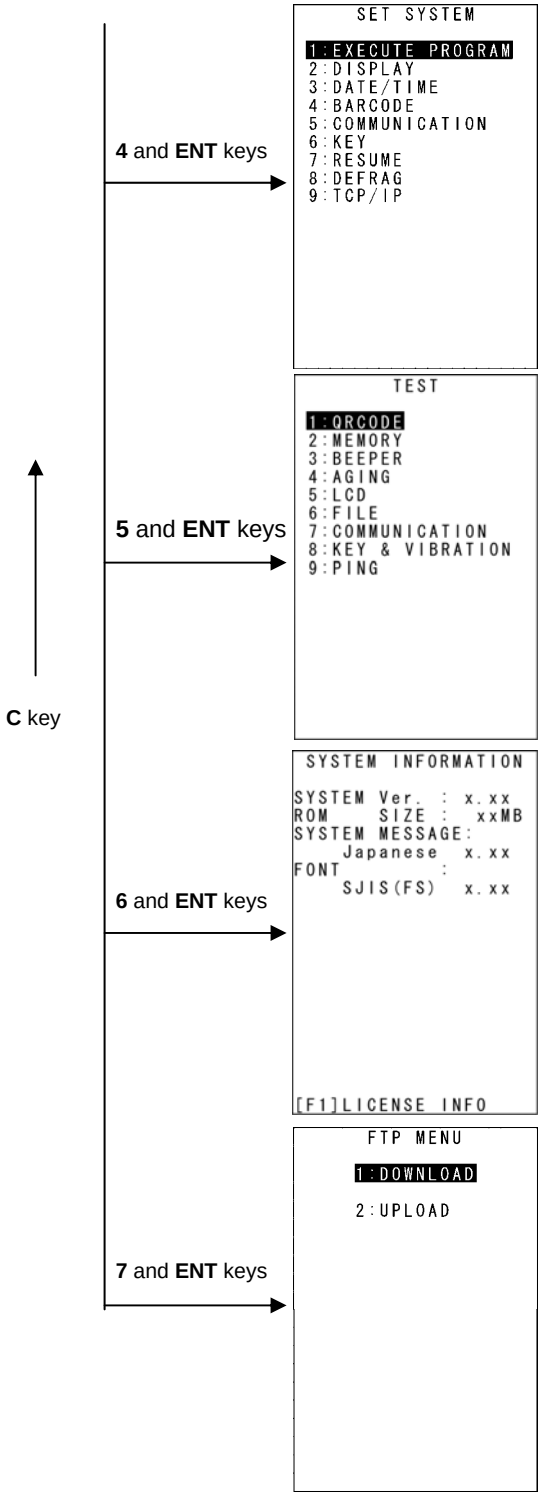


4.4.3 SYSTEM MENU Configuration

Menu Configuration for Items Displayed at the SYSTEM MENU screen

Select the item with the numerical keys or cursor keys ([▲] [▼]) and press the **ENT** key.





System Environment Setting

Refer to section “4.5.5 System Environment Setting”.

Testing

Refer to section “4.5.6 BHT Operation Test”.

System Information Display

Refer to section “4.5.7 System Information”.

Downloading/Uploading by FTP

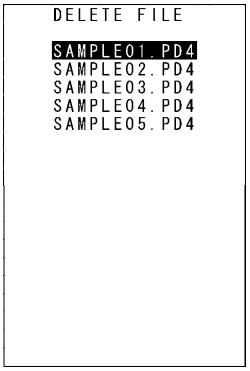
Refer to section “4.5.8 Downloading/Uploading Files by FTP”.

Menu Configuration for Items Not Displayed at the SYSTEM MENU Screen

Press the corresponding numerical key while holding down the **SF** key.

SYSTEM MENU

0 with **SF** held down

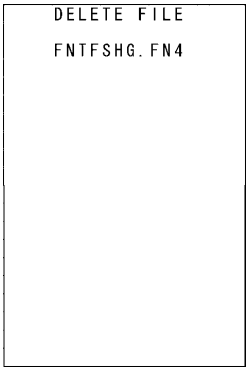


Deleting Program/Data Files

Refer to section “4.5.9 Deleting Program/Data Files”.

C key

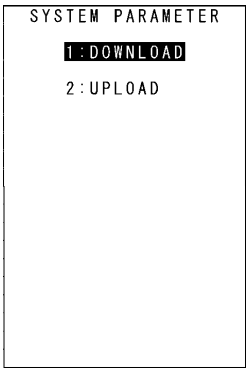
2 with **SF** held down



Deleting Font Files

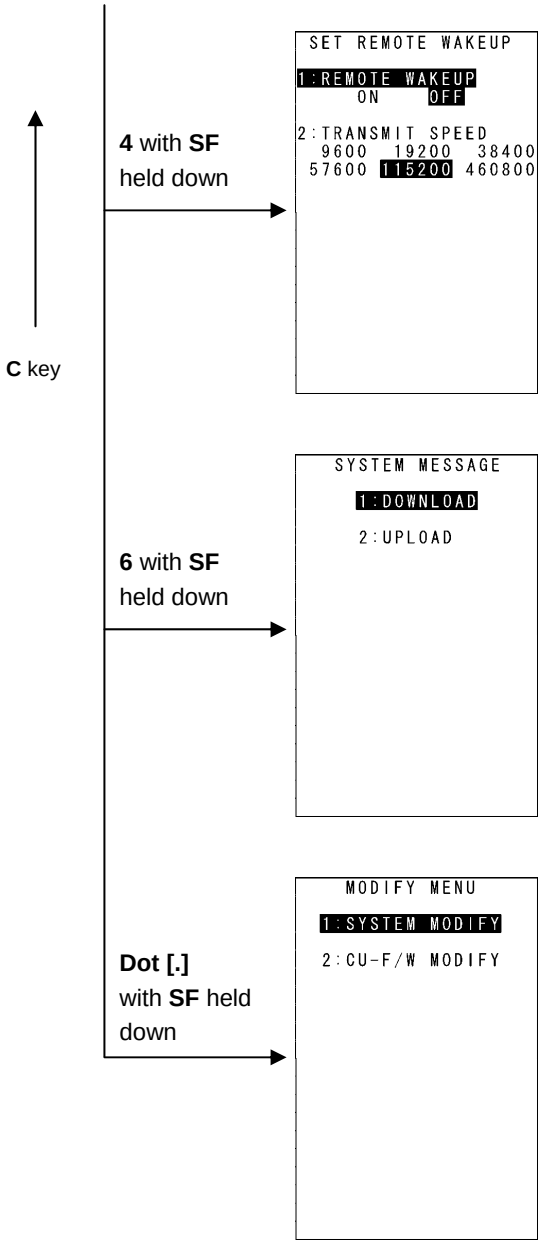
Refer to section “4.5.10 Deleting Font Files”.

3 with **SF** held down



Downloading/Uploading the BHT System Parameter File

Refer to section “4.5.11 Downloading/Uploading the BHT System Parameter File”.



Setting Remote Wake-up
Refer to section “4.5.12 Setting Remote Wake-up”.

Downloading/Uploading the System Message File
Refer to section “4.5.13 Downloading/Uploading System the Message File”.

Updating the System
Refer to section “4.5.14 Updating the System”.

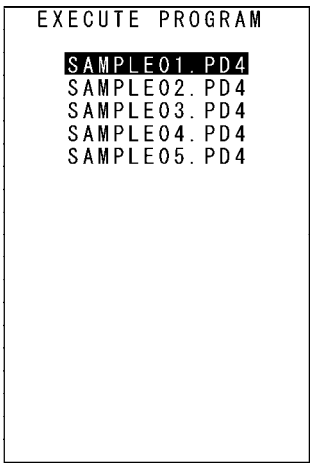
4.5 SYSTEM MENU

4.5.1 Executing User Programs (EXECUTE PROGRAM Menu)

Individually select and execute user programs downloaded to the BHT.
Use the following procedure to execute user programs.

1. Select “1: EXECUTE PROGRAM” at the SYSTEM MENU and then press the **ENT** key.

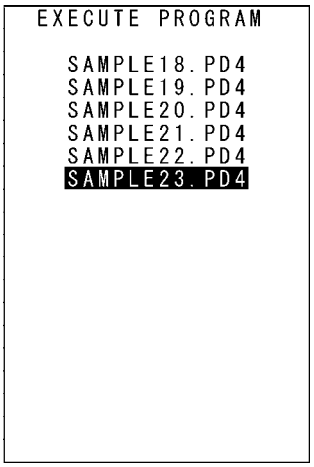
The screen displays as shown on the right.
Press the **C** key to return to the SYSTEM MENU.



2. Use the cursor keys ([▲] [▼]) to select the target program.

The selected program will be highlighted.
Use the [▼] key to scroll down when more than 18 programs have been downloaded to the user area.

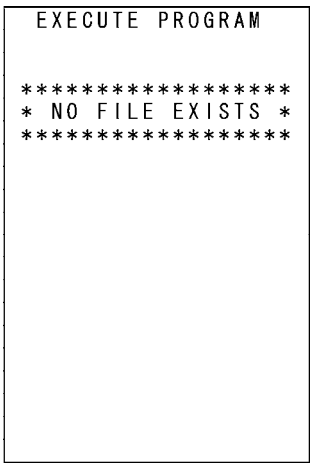
The screen on the right shows an example in which 23 programs have been downloaded.



3. When the target program is highlighted, press the **ENT** key.

The selected program will be executed.

The screen displays as shown on the right when no program files exist in the user area.
Press the **C** key to return to the SYSTEM MENU.



4.5.2 Downloading Files (DOWNLOAD Menu)

Download files to the BHT user area from other devices such as the host computer

- Point -

- If a file with the same name as one already used in the user area of the target memory in the BHT is downloaded, the newly downloaded file replaces the old one.
- If an auto-start execution program has not been specified (See 4.5.5 [1] Setting the auto-start execution program), the directory management program will execute the first managed program from among the programs (.PD4) downloaded to the BHT when the BHT power is turned ON. (Program displayed at the top of the "EXECUTE PROGRAM" menu) Take this into account when determining the file download order.
  Refer to "4.3 Executing User Programs" for details.

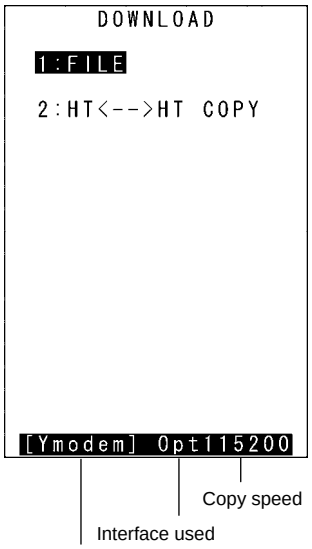
Use the following procedure to download files.

1. Select "2: DOWNLOAD" at the SYSTEM MENU and then press the **ENT** key.

The screen displays as shown on the right.

"1: FILE":
Select to download a specific file.
"2: HT<-->HT COPY":
Select to download a file from another BHT.
Refer to "4.5.4 Copying Files between 2 BHT Units" for details.

Press the **C** key to return to the SYSTEM MENU.



The current communication settings display at the bottom of the screen.

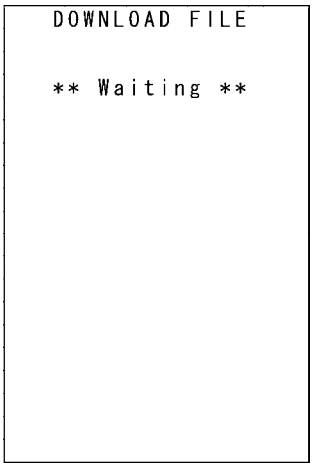
Communication protocol type	Ymodem BHT-Ir BHTp	Ymodem protocol BHT-Ir protocol BHT protocol
Interface used	Opt Con	Infrared interface Connector interface
Copy speed	300 to 460800	Transmission speed corresponding to each protocol

Refer to "4.5.5 System Environment Settings (SET SYSTEM Menu)" for details of communication environment settings.

2. Select either “1: FILE” or “2: HT<-->HT COPY” and press the **ENT** key.

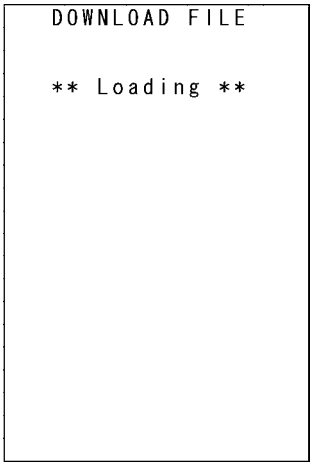
The screen displays as shown on the right indicating that the BHT is waiting for the file to be downloaded.

The screen displays as shown on the right only when “1: FILE” is selected. If “2: HT<-->HT COPY” is selected, “HT<-->HT” displays in the center of the second row of the screen.



3. By executing the BHT-BASIC 4.0 Transfer Utility or similar program, the screen displays as shown on the right and file downloading is commenced.

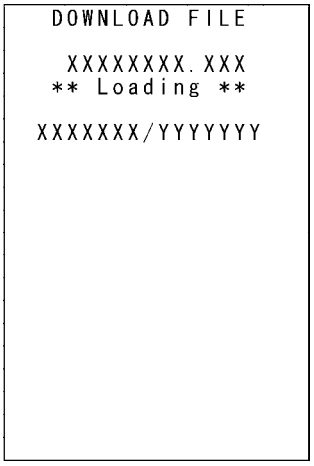
(Refer to the “BHT-BASIC4.0 Transfer Utility User’s Guide.”)



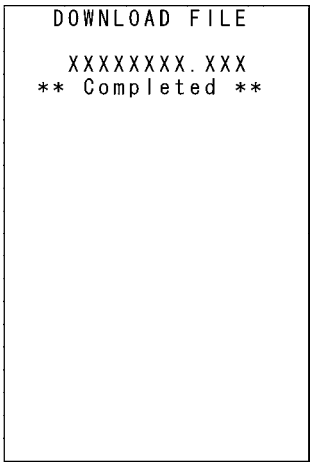
4. The screen displays as shown on the right during downloading.

The screen displays as shown on the right indicating the file name and the number of received records/the total number of records.
(When using the Ymodem protocol, the received file size/the total file size (units: KB) displays.)

Press the **C** key to abort the download process and return to the DOWNLOAD menu.



5. When downloading is complete, the beeper sounds once and the screen displays as shown on the right.

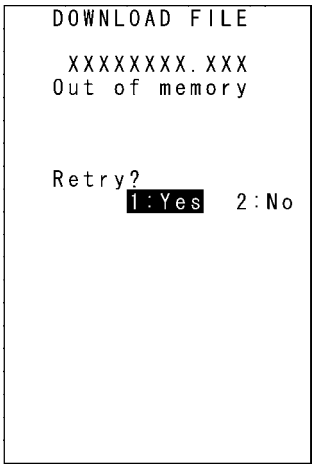


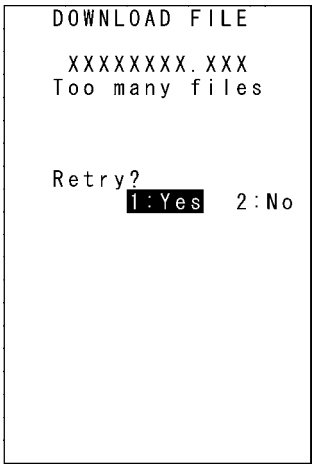
When the number of received records equals the total number of records, downloading is complete.
(When using the Ymodem protocol, the received file size equals the total file size.)

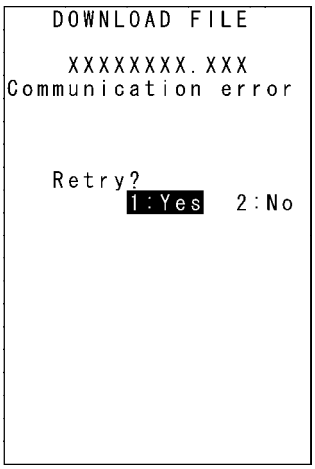
Press the **C** key to return to the DOWNLOAD menu.
With this screen is displayed on the BHT, downloading another new file from the host computer allows the BHT to begin receiving.
(Refer to the "BHT-BASIC 4.0 Transfer Utility User's Guide.")

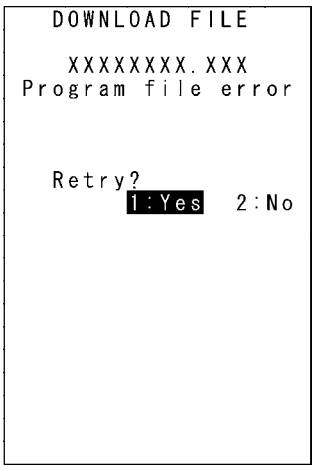
If "2: HT<-->HT COPY" is selected, repeat the above operation until all files are downloaded.

If an error message (screen below) displays during downloading, refer to "Chapter 7 Error Messages".







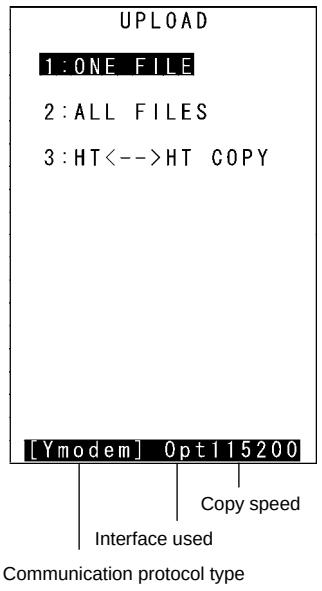


4.5.3 Uploading Files (UPLOAD Menu)

Upload files stored in the BHT user area to another device.
Use the following procedure to upload files.

1. Select "3: UPLOAD" at the SYSTEM MENU and then press the **ENT** key.

The screen displays as shown on the right.



"1: ONE FILE":
Select to upload a specific file.
"2: ALL FILES":
Select to upload all files, excluding font files.
"3: HT<-->HT COPY":
Select to upload a file to another BHT.
Refer to "4.5.4 Copying Files between 2 BHT Units" for details.

Press the **C** key to return to the SYSTEM MENU.

The current communication settings display at the bottom of the screen.

Communication protocol type	Ymodem BHT-Ir BHTp	Ymodem protocol BHT-Ir protocol BHT protocol
Interface used	Opt Con	Infrared interface Connector interface
Copy speed	300 to 460800	Transmission speed corresponding to each protocol

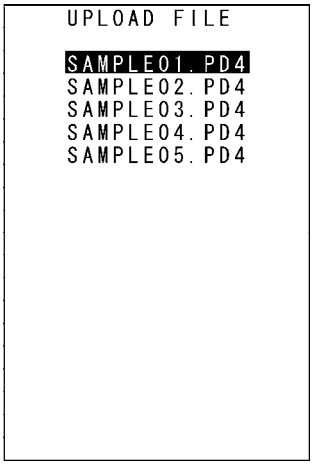
Refer to "4.5.5 System Environment Settings (SET SYSTEM Menu)" for details of communication environment settings.

- Point - If BHT protocol or BHT-Ir protocol is selected for the communication protocol, BHT-BASIC 4.0* specification files will not display at the file selection screen, and therefore cannot be downloaded.

(*Applications with extension ".PD4", extension libraries with extension ".FN4", and data files that have any of the following structures: the number of fields is 17 or more, the total of the number of fields and each field length is 255 or more, and the number of records is 32768 or more)

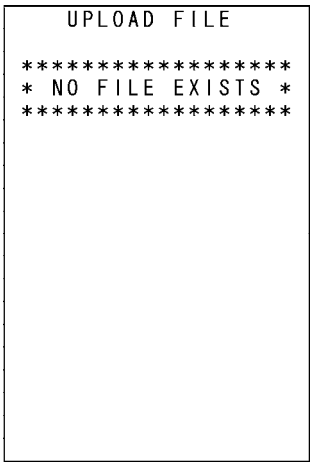
2. Select “1: FILE”, “2: ALL FILES” or “3: HT<-->HT COPY” and press the **ENT** key.

When “1: FILE” is selected:
The screen displays as shown on the right. Select the file to be uploaded and press the **ENT** key.
Next, proceed to step 3.

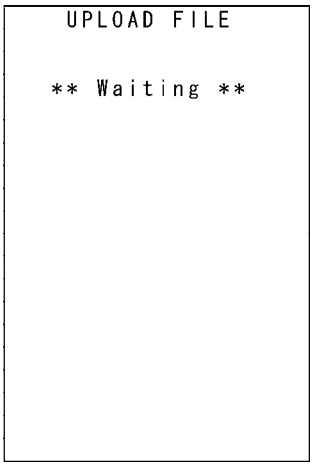


When “2: ALL FILES” or “3:HT<-->HT COPY” is selected:
Proceed to step 3.

The screen displays as shown on the right If no files that can be uploaded exist in the user area.
Press the **C** key to return to the UPLOAD menu.



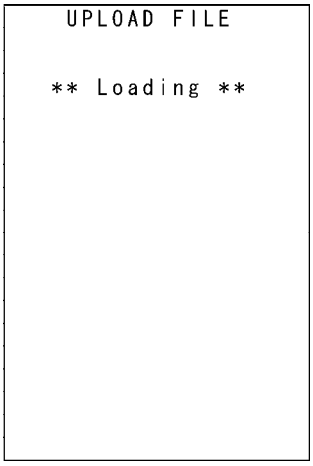
3. The screen displays as shown on the right indicating that the BHT is waiting for the file to be uploaded.



The screen displays as shown on the right only when “1: FILE” is selected.
If “2:ALL FILES” is selected, “ALL” displays in the center of the second row of the screen.
If “3: HT<-->HT COPY” is selected, “HT<-->HT” displays in the center of the second row of the screen

4. By executing the BHT-BASIC 4.0 Transfer Utility or similar program, the screen displays as shown on the right and file uploading is commenced.

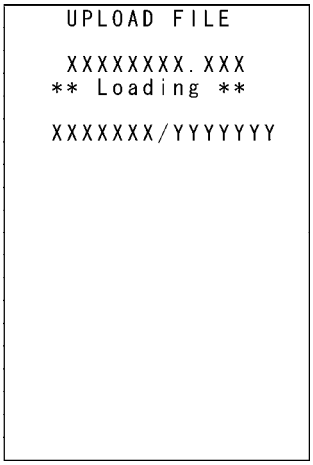
(Refer to the “BHT-BASIC4.0 Transfer Utility User’s Guide.”)



5. The screen screen displays as shown on the right during uploading.

The screen screen displays as shown on the right indicating the file name and the number of sent records/the total number of records.
(When using the Ymodem protocol, the sent file size/the total file size (units: KB) displays.)

Press the **C** key to abort the download process and return to the UPLOAD menu.

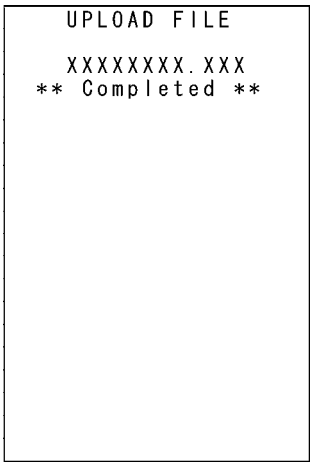


6. When uploading is complete, the beeper sounds once and the screen screen displays as shown on the right.

When the number of sent records equals the total number of records, downloading is complete.
(When using the Ymodem protocol, the sent file size equals the total file size.)

Press the **C** key to return to the UPLOAD menu.

If “2: ALL FILES” or “3: HT<-->HT COPY” is selected, repeat the above operation until all files are uploaded.



If an error message displays during uploading, refer to “Chapter 7 Error Messages”.

4.5.4 Copying Files between 2 BHT Units

Copy “all files (excluding font files)”, “setting data”, and the “date and time” stored in the BHT user area to another BHT.
Use the following procedure to copy files between 2 BHT units.

1. Set the same interface at both BHT units.

An infrared communication (Optical) interface and connector communication (Connector) interface are available.
The default interface is set to infrared communication (Optical).

Changing the Interface
Select “4: SET SYSTEM” → “5: COMMUNICATION” → “3: COM PORT” from the SYSTEM MENU, and change at the [2: SYSTEM MODE] “INTEFACE USED” item.

2. Set “COMMUNICATION PROTOCOL OPTION” → “FIELD SPACE” (space at the end of the field) to “Ignore” at both BHT units.

The default setting is “Ignore”.
Refer to “4.5.5 System Environment Settings (SET SYSTEM Menu)” when changing the interface.

3. When using infrared communication, ensure that the BHT infrared communication ports are facing one another.

- When using the connector interface, open the BHT connector covers and connect both BHT units using a cable with JC-25-P-3 (ϕ2.5mm stereo mini-plug).
  (Refer to “Chapter 8 Specifications” for cable details.)

4. Select “2: DOWNLOAD” → “2: HT<-->HT COPY” at the SYSTEM MENU of the BHT that is downloading to await downloading.

Refer to “4.5.2 Downloading Files (DOWNLOAD Menu)” for details.
When copying only the system parameter file, use the SYSTEM PARAMETER transfer menu. Refer to “4.5.11 Downloading/Uploading the BHT System Parameter File (SYSTEM PARAMETER Menu)” for details.

5. Select “3: UPLOAD” → “3: HT<-->HT COPY” at the SYSTEM MENU of the BHT that is uploading to await uploading.

Refer to the “4.5.3 Uploading Files (UPLOAD Menu)” for details.
When copying only the system parameter file, use the SYSTEM PARAMETER transfer menu. Refer to “4.5.11 Downloading/Uploading the BHT System Parameter File (SYSTEM PARAMETER Menu)” for details.

6. Preparation at both BHT units is now complete and file copying will be commenced.

- Note - The following setting data is copied when copying between BHT units.

LCD contrast level
Beeper volume
Switching between beeper and vibrator
Program to be executed automatically when the BHT is turned ON
Message version (English or Japanese)

Backlight brightness of the LCD display
Backlight brightness of the LCD display during power save mode
Key backlight
Display font size
System status display

Date
Time
Setting of black-and-white inverted label reading function (enable/disable)
Decode level
Minimum number of digits to be read for ITF

Minimum number of digits to be read for codabar (NW-7)
Interface port to be used in user programs
Interface port to be used in System Mode
Communication parameters for the infrared interface
Communication parameters for the direct-connect interface

Communication protocol options for the infrared interface
Communication protocol options for the direct-connect interface
Communication protocol type
Shift key function definition
M1 key function definition

M2 key function definition
M3 key function definition
M4 key function definition
M5 key function definition
M6 key function definition

Resume function
Remote wake-up setting (enable/disable)
Transmission speed for remote wake-up
Remote wake-up history
YMODEM option

IP address of FTP server
User name of FTP server
Password of FTP server
Default directory for FTP server
FTP option, Line delimiters (CR/LF)

FTP option, Handling of line delimiters
FTP option, Handling of trailing spaces in data fields
FTP option, Upload mode
FTP option, Verbose mode
IP address of host computer for ping-test
Data size of echo request
Echo request intervals
Timeout period for echo request
No. of echo requests to be sent
Echo Request send timing
TCP/IP operation device
TCP/IP link layer
Transmission speed between BHT and CU
No. of retries for link establishment command to be sent
Link establishment command intervals
No. of retries for link release command to be sent
Link release command intervals
Link release period
Service Set ID (SSID) (Not possible to copy correctly if there is a space at the end.)

4.5.5 System Environment Settings (SET SYSTEM Menu)

Use the following procedure to set the system environment.

1. Select “4: SET SYSTEM” at the SYSTEM MENU and then press the **ENT** key.

The SET SYSTEM menu screen screen displays as shown on the right.

“1: EXECUTE PROGRAM”:
Sets the auto-start execution program to be executed when the power is turned ON.

“2: DISPLAY”:
Sets the message version (English or Japanese).

“3: DATE/TIME”:
Sets the calendar clock (date and time).

“4: QRCODE”:
Sets the code reading conditions (black/white inverted label rading function, inverted 2D code reading function, decode label, added option data for the 2D codes, minimum number of read digits for read codes (ITF, Codabar), light and sensor off time).

“5: COMMUNICATION”:
Sets the communication environment (interface port and communication parameters).

“6: KEY”:
Defines the functions of the shift key and magic keys.

“7: RESUME”:
Sets the resume function.

“8: DEFRAG”:
Defragments the drive.

“9: TCP/IP”:
Displays the setting menu for TCP/IP, FTP and DHCP.

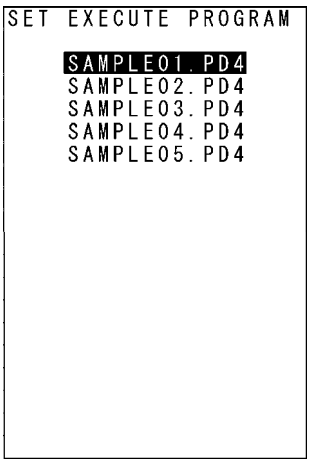
Refer to the following section for details of the above items.
Press the **C** key to return to the SYSTEM MENU.

[1] Setting the auto-start execution program

Use the following procedure to set the auto-start execution program.

1. Select “1: EXECUTE PROGRAM” at the SET SYSTEM menu and then press the **ENT** key.

The SET EXECUTE PROGRAM menu screen screen displays as shown on the right.
The highlighted program will be the program currently set as the auto-start execution program.



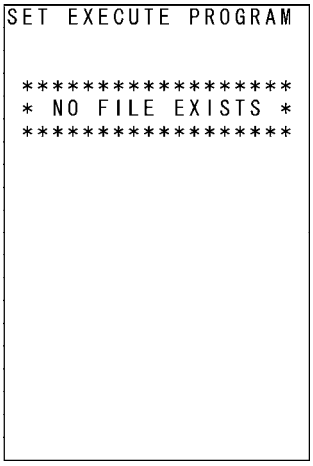
2. Use the cursor keys ([▲] [▼]) to highlight the target program.

3. Press the **ENT** key.

The selected program will be set as the auto-start execution program.

Press the **C** key to return to the SET SYSTEM menu.

The screen screen displays as shown on the right if no programs have been downloaded.



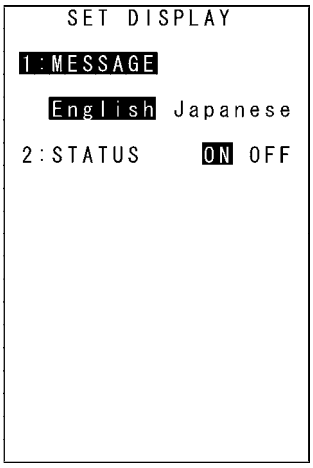
Press the **C** key to return to the SET SYSTEM menu.

[2] Setting the message version, system status indication and screen display compatible mode

Use the following procedure to set the display language, system status indication and screen display compatible mode.

1. Select "2: DISPLAY" at the SET SYSTEM menu and then press the **ENT** key.

The SET DISPLAY menu screen displays as shown on the right.
The highlighted settings will be the current settings.



2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to highlight "1: MESSAGE" or "2: STATUS".

3. Highlight the target setting with the cursor keys ([◄] [►]) and press the **ENT** key.

Press the **C** key to return to the SET SYSTEM menu.

"1: MESSAGE":

Sets whether messages displayed at the screen are displayed in English or Japanese.
The default is the message version selected at the system initializing process.
The English and Japanese display changes at the following messages.

- System error messages
- Indications relating to the LCD contrast
- Beeper volume
- Beeper & vibrator switching
- Battery voltage level screens

"2: STATUS":

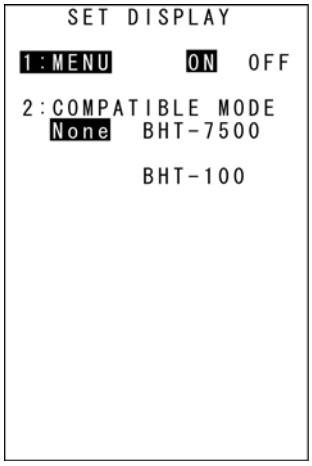
Sets whether to display or hide the system status displayed at the bottom of the screen.
Refer to "System Status Indication" on the following page for details of the system status indication.

- "ON": The system status is displayed.
- "OFF": The system status is hidden.

- Note - The system status indication can be turned ON or OFF using the OUT statement in user programs. Refer to the "BHT-BASIC Programmer's Manual."

4. Simultaneously press the **SF** key and "1: MESSAGE" at the SET DISPLAY menu.

The SET DISPLAY menu screen displays as shown on the right.
The highlighted settings will be the current settings.



5. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to highlight "1: MENU" or " 2: COMPATIBLE MODE".

6. Highlight the target setting with the cursor keys ([◄] [►]) and press the **ENT** key.

Press the **C** key to return to the SET SYSTEM menu.

"1: MENU":

Sets whether to permit or prohibit menu screens (beeper volume, vibrator, screen brightness, power saving, key backlight settings) being started up while applications are running.

- "ON": Permits menu screen display.
- "OFF": Prohibits menu screen display.

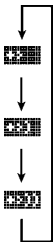
"2: COMPATIBLE MODE":

Sets compatible mode for screen display between the BHT-100 and BHT-7500.
This allows BHT-100 Series and BHT-7500 Series application programs to be used at the BHT-604Q without changing or correcting the font size.

				BHT-7500	BHT-100	BHT-604Q		
						BHT-7500 Mode	BHT-100 Mode	Normal Mode
Font size	Standard font	Screen mode	ANK mode	26 x 20 char. (6 x 8 dots)	16 x 25 char. (12 x 12 dots)	26 x 26 char. (9 x 12 dots)	20 x 26 char. (12 x 12 dots)	20 x 20 char. (12 x 16 dots)
	Small font			26 x 26 char. (6 x 6 dots)	16 x 25 char. (12 x 12 dots)	26 x 26 char. (9 x 12 dots)	20 x 26 char. (12 x 12 dots)	20 x 20 char. (12 x 16 dots)
	Standard font		Kanji mode	10 x 10 char. (16 x 16dots)	12 x 19 char. (16 x 16 dots)	10 x 13 char. (24 x 24 dots)	15 x 20 char. (16 x 16 dots)	8 x 10 char. (30 x 30 dots)
	Small font			13 x 13 char. (12 x 12 dots)	16 x 25 char. (12 x 12 dots)	13 x 17 char. (18 x 18 dots)	20 x 26 char. (12 x 12 dots)	10 x 13 char. (24 x 24 dots)

◆ System Status Indication

Turning ON the system status indication displays the following icons at the bottom of the screen.

Indication	Icon	Description
Key Shift status		Displays when the keys on the keypad are in shift mode.
Alphabet entry mode		Displays when the BHT is set to alphabet entry mode. (If the alphanumeric entry system has been selected in user programs, pressing the **SF** and the **BS** key switches from the numeric entry mode to alphabet entry mode.)
Communication link with the CU-611	 	Displays when a communication link is established with the CU-611. Flashes when the BHT tries to communicate with a CU-611 that has not been linked with the BHT. Displays cyclically when the BHT receives no response from the CU-611, or when it is waiting for the link to be established with or severed from the CU-611.

[3] Setting the calendar clock

When resetting the date and time, refer to “Chapter 2 BHT Preparation” · “2.4 Initial Setup.”
Select “3: DATE/TIME” at the SET SYSTEM menu and press the **ENT** key to display the SET DATE/TIME menu screen on the right.

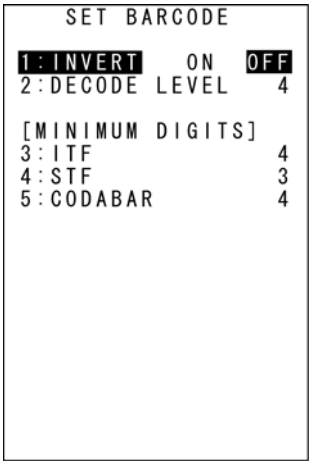
```
SET DATE/TIME

00/01/01 00:00
_ /  /     :
```

[4] Setting the code reading conditions

Use the following procedure to set the code reading conditions.

1. Select "4: QRCODE" at the SET SYSTEM menu and then press the **ENT** key.



The SET QRCODE menu screen displays as shown on the right.
The highlighted display and displayed values will be the current settings.

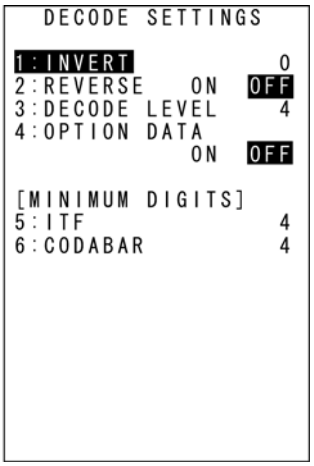
1: DECODE SETTINGS:
The DECODE SETTINGS screen displays
2: DEVICE SETTINGS:
The DEVICE SETTINGS screen displays

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to highlight the item to be set and press the **ENT** key.

Press the **C** key to return to the SET SYSTEM menu.

◆ "1: DECODE SETTINGS": Code reading conditions and minimum number of digits for the code to be read

1. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4] [5] [6]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]) and press the **ENT** key.



Press the **C** key to return to the SET CODE SCANNING CONDITIONS menu.

◆ "1: INVERT": Black/white inverted label reading function

Inverted 2D codes and barcodes can be read.

"0": Disables black/white inverted label reading.
"1": Enables black/white inverted label reading.
"2": Enables black/white inverted label auto-detect reading.

- Point - Auto-detect reading may take longer than ordinary reading of black/white inverted labels or non-inverted labels.

"2: REVERSE": Inverted 2D code reading function

Setting inverted 2D code reading to ON enables 2D code reading from the reverse side.
Reading times for 2D codes may be longer in such cases.

“3: DECODE LEVEL”

Set the decode level (code reading tolerance level).
Press [◀] to decrease the setting value and [▶] to increase the setting value.

Decode level entry range: 1 - 9 (default: 4)

Setting a lower value improves the reading rate but increases the risk of incorrectly reading poor quality codes (split or dirty codes). Conversely, setting a higher value reduces the reading rate but decreases the risk of such errors.

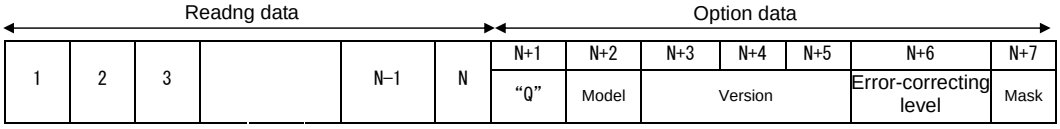
“4: OPTION DATA”

If set to ON when 2D codes are read, option data for the 2D codes such as the model and the error-correcting level are added to the end of the reading data.

- Point - These settings are enabled even when system mode reading tests are not being carried out. Do not change these settings unless necessary.

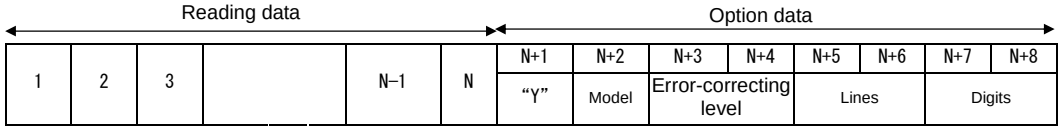
■Option data formats

・QR code



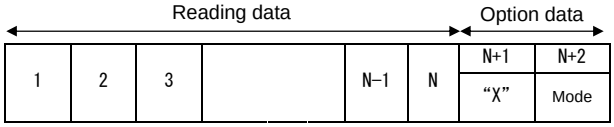
(Ex.) When read code is “QR code, Model 2, Version 5, Error-correcting level M, Mask number 6” (Reading data)... Q2v05M6

・PDF417



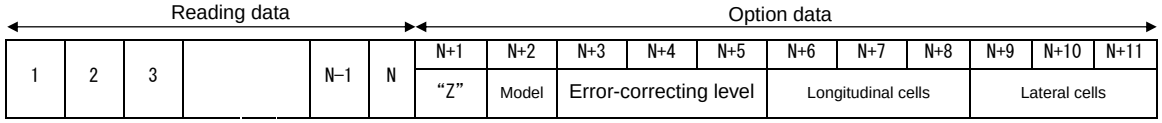
(Ex.) When read code is “PDF417 code, Error-correcting level 4, Lines: 12, Digits: 2” (Reading data)... Y1041202

・Maxi Code



(Ex.) When read code is “Maxi code, Mode 4” (Reading data)... X4

・Data Matrix



(Ex.) When read code is “data matrix, Error-correcting level ECC200, Longitudinal cells: 10, Lateral cells: 10”...z0200010010

"5: ITF": **Minimum number of digits to be read for ITF**

"6: CODABAR": Minimum number of digits to be read for Codabar

Set minimum number of digits for the Code to be read.

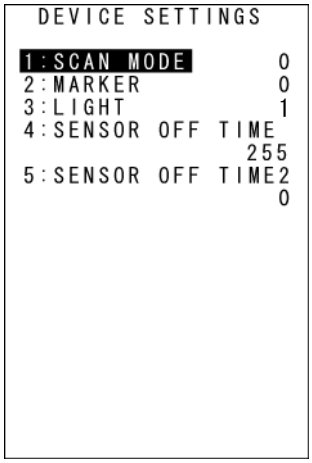
Press [◀] to decrease the setting value and [▶] to increase the setting value.

ITF entry range:	2 - 20	(default: 4)
Codabar entry range:	3 - 20	(default: 4)

Setting a small number of digits increases the frequency of missing digits when reading or incorrectly reading depending on how codes are read or the quality of codes.

On the other hand, setting a large number will decrease the possibility of such errors.

◆ "2:DEVICE SETTINGS": Device settings during reading



1. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4] [5]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]) and press the **ENT** key.

Press the **C** key to return to the SET CODE SCANNING CONDITIONS menu.

"1: SCAN MODE"

Set the scan mode.

"0": Normal mode

Codes within the field of view can be read.

Refer to "Chapter 8 Specifications" regarding the size of the field of view.

"1": Point scan mode

Codes above the cross at the center of the marker can be read. Reading will be unsuccessful if there is no code above the cross or the marker cannot be detected due to external light. This kind of reading is only enabled if marker illumination is enabled.

"2: MARKER"

Set whether the guide marker illuminates or not when the trigger switch is pressed.

"0":	Operated by trigger switch
"1":	Locked ON (Illuminates)
"2":	Locked OFF (Doesn't illuminate)

- Point - When the marker is locked on, more power is used and operating times are shorter compared to other modes. Do not change these settings unless necessary.

“3: LIGHT”

Set whether the INDICATOR LED light illuminates or not when the trigger switch is depressed.

“0”: Illuminates
“1”: Illuminates
“2”: OFF

“4: SENSOR OFF TIME”

Set the sensor off time
Press [◀] to decrease the setting value and [▶] to increase the setting value.

OFF time setting range: 0～255 Default value : 255

“5: SENSOR OFF TIME 2”

Set the time from close to sensor off
Press [◀] to decrease the setting value and [▶] to increase the setting value.

OFF time setting range: 0～255 Default value : 0

[5] Setting the communication environment

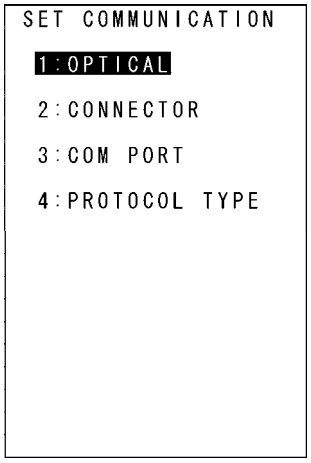
The communication environment settings following system initialization are follows.
Do not change these settings unless necessary.

Item		Default	
Interface used		Optical (infrared interface port)	
Communication protocol type		Ymodem protocol	
Infrared interface port			
TRANSMIT SPEED	Baud rate	115200 Bps	
PROTOCOL	Protocol options	SERIAL No.:	ON (Adds serial numbers to data blocks.)
		H. PARITY:	ON (Adds horizontal parity.)
		LINKUP TIME:	30 seconds
		FIELD SPACE:	ignore (Trim)
Connector interface port			
TRANSMIT SPEED	Baud rate	115200 Bps	
PARITY BIT	(Vertical parity)	None	
DATA BIT	(Character length)	8 bits	
STOP BIT	(Stop bit length)	1 Bit	
PROTOCOL	(Protocol options)	SERIAL No.:	ON (Adds serial numbers to data blocks.)
		H. PARITY:	ON (Adds horizontal parity.)
		LINKUP TIME:	30 seconds
		FIELD SPACE:	ignore (Trim)

Use the following procedure if necessary to change the communication environment settings.

1. Select “5: COMMUNICATION” at the SET SYSTEM menu and then press the **ENT** key.

The SET COMMUNICATION menu screen displays as shown on the right.



2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4]) to highlight the item to be set and press the **ENT** key.

“1: OPTICAL”:
Changes the infrared communication parameters.

“2: CONNECTOR”:
Changes the connector communication parameters.

“3: COM PORT”:
Changes the communication port setting.

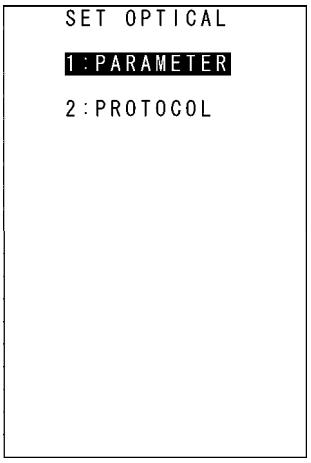
“4: PROTOCOL TYPE”:
Change the communication protocol type setting

Refer to the following section for details of the above items.
Press the **C** key to return to the SET SYSTEM menu.

◆ “1: OPTICAL”:infrared communication parameters

1. Select “1: OPTICAL” at the SET COMMUNICATION menu and then press the **ENT** key.

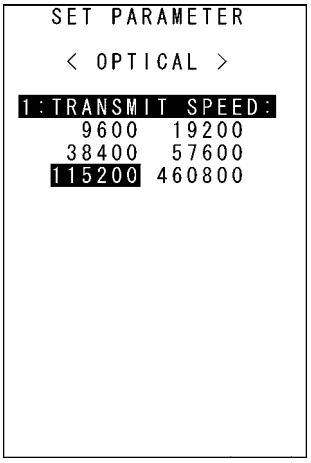
The SET OPTICAL menu screen displays as shown on the right.



2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to highlight “1: PARAMETER” or “2: PROTOCOL”, and then press the **ENT** key.

Press the **C** key to return to the SET SYSTEM menu.

“1: PARAMETER”: setting the communication parameters
Select “1: PARAMETER” to display the screen shown on the right.

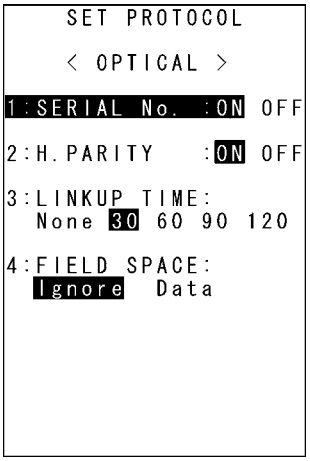


The highlighted settings will be the current settings.

“1: TRANSMIT SPEED”: Setting the transmission speed
To change the setting, highlight the transmission speed with the cursor keys ([◄] [►]) and press the **ENT** key.
Press the **C** key to return to the SET OPTICAL menu.

“2: PROTOCOL”: Communication protocol options setting screen

Select “2: PROTOCOL” to display the screen shown on the right
The highlighted settings will be the current settings.



“1: SERIAL No.”:
Selects whether or not to add serial numbers to data blocks.

“2: H.PARITY”:
Selects whether or not to add horizontal parity.

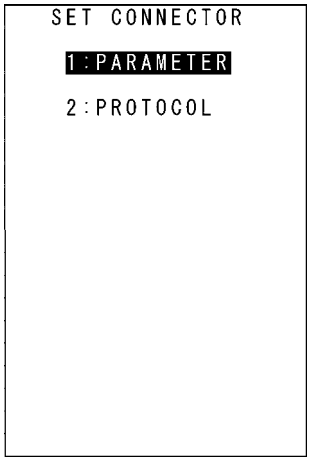
“3: LINKUP TIME”:
Selects the timeout length (in seconds) to be applied when a link is to be established.

“4: FIELD SPACE”:
Specifies handling for trailing spaces in fields.
To trim trailing spaces in fields, select “ignore”, and to retain them as data, select “data”.

To change the setting, use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]), and then press the **ENT** key.
Press the **C** key to return to the SET OPTICAL menu.

- Point - Selecting the BHT-IR or YMODEM protocol ignores the serial number and horizontal parity settings.

◆ "2: CONNECTOR": Connector communication environment settings



1. Select "2: CONNECTOR" at the SET COMMUNICATION menu and then press the **ENT** key.

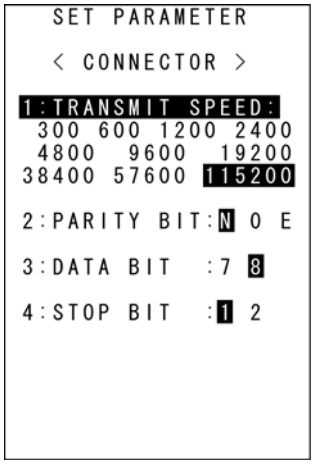
The SET CONNECTOR menu screen displays as shown on the right.

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to highlight "1: PARAMETER" or "2: PROTOCOL", and then press the **ENT** key.

Press the **C** key to return to the SET SYSTEM menu.

"1: PARAMETER": Setting the communication parameters

Select "1: PARAMETER" to display the screen shown on the right.
The highlighted settings will be the current settings.



"1: TRANSMIT SPEED": Sets the transmission speed.
"2: PARITY BIT": Sets the vertical parity: none, odd, or even.
"3: DATA BIT": Sets the character length.
"4: STOP BIT": Sets the stop bit length.

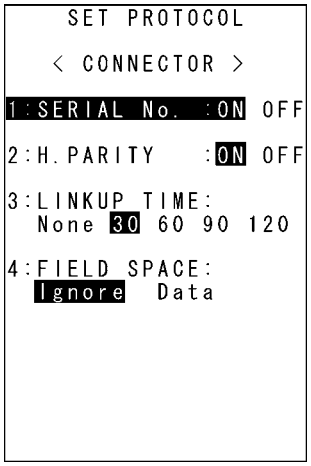
To change the setting, use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]), and then press the **ENT** key.
Press the **C** key to return to the SET CONNECTOR menu.

- Point -

- Selecting the BHT-Ir protocol ignores the vertical parity, character length, and stop bit length settings.
- Selecting YMODEM requires the vertical parity, character length, and stop bit length to be set to N, 8 and 1, respectively.

“2: PROTOCOL”: Communication protocol options setting screen

Select “2: PROTOCOL” to display the screen shown on the right
The highlighted settings will be the current settings.



“1: SERIAL No.”:
Selects whether or not to add serial numbers to data blocks.

“2: H.PARITY”:
Selects whether or not to add horizontal parity.

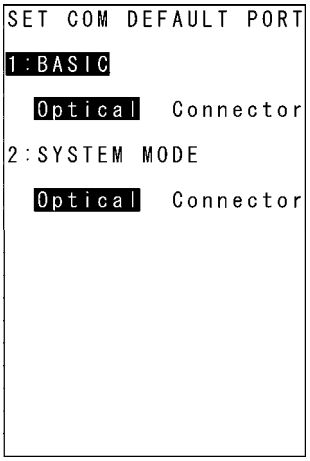
“3: LINKUP TIME”:
Selects the timeout length (in seconds) to be applied when a link is to be established.

“4: FIELD SPACE”:
Specifies the handling for trailing spaces in fields.
To trim trailing spaces in fields, select “Ignore”, and to retain them as data, select “Data”.

To change the setting, use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]), and then press the **ENT** key.
Press the **C** key to return to the SET CONNECTOR menu.

- Point - Selecting the BHT-IR or YMODEM protocol ignores the serial number and horizontal parity settings.

◆ "3: COM PORT": Setting the interface port



1. Select "3: COM PORT" at the SET COMMUNICATION menu and then press the **ENT** key.

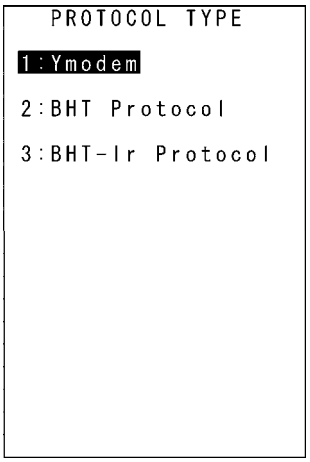
The SET COM DEFAULT PORT menu screen displays as shown on the right.
The highlighted settings will be the current settings.

"1: BASIC"
Selects the infrared communication (Optical) or connector Communication (Connector) interface port to be used for user programs written in BHT-BASIC (OPEN "COM:").
"Optical": Uses infrared communication.
"Connector": Uses connector communication.

"2: SYSTEM MODE"
Selects the infrared communication (Optical) or connector communication (Connector) interface port to be used for downloading or uploading files in System Mode.
"Optical": Uses infrared communication.
"Connector": Uses connector communication.

To change the setting, use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]), and then press the **ENT** key.
Press the **C** key to return to the SET CONNECTOR menu.

◆ "4: PROTOCOL TYPE": Setting the communication protocol type



1. Select "4: PROTOCOL TYPE" at the SET COMMUNICATION menu and then press the **ENT** key.

The PROTOCOL TYPE menu screen displays as shown on the right.
The highlighted settings will be the current settings.

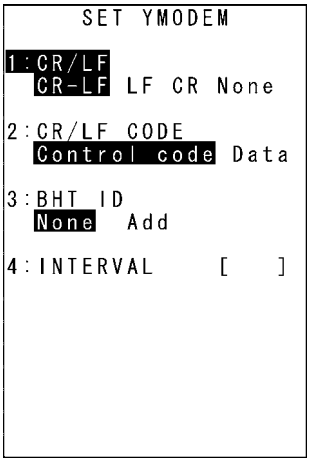
"1: Ymodem":
Selects Ymodem when uploading downloading in System Mode or for the execution of the XFILE statement in BHT-BASIC.

"2: BHT Protocol":
Selects the BHT-protocol when uploading downloading in System Mode or for the execution of the XFILE statement in BHT-BASIC.

"3: BHT-IR Protocol":
Selects the BHT-IR protocol when uploading downloading in System Mode or for the execution of the XFILE statement in BHT-BASIC.

To make changes, use the cursor Keys ([▲] [▼]) or numerical keys ([1] [2] [3]) to highlight the setting item, and then press the **ENT** key.

To use the BHT-BASIC 4.0 Transfer Utility, select Ymodem or BHT-Ir protocol.
Press the **C** key to return to the SET COMMUNICATION menu.



Select “1: Ymodem” at the PROTOCOL TYPE menu to display the screen on the right.
The highlighted settings will be the current settings.

“1: CR/LF”:
Specifies line delimiters.

“2: CR/LF CODE”:
Specifies handling for line delimiters in records when data files are downloaded.
“Control code”:
Does not handle line-break codes as data.
(handles as record delimiters.)
“Data”:
Handles line-break codes as data.

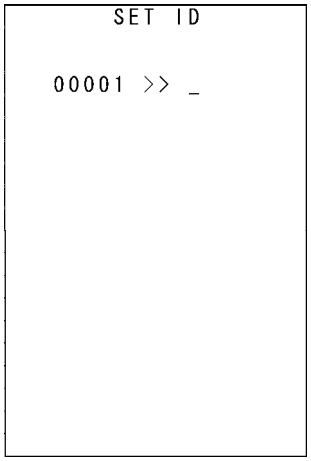
“3: BHT ID”:
Specifies whether or not to add the BHT ID number to packets when performing YMODEM transfer.
“None” should normally be selected. To add the BHT ID number to the transfer tool, select “Add”. (This setting is not supported. Changing this setting has no result.)

“4: INTERVAL”:
Specifies the retry interval within a range of 1 to 255 in units of 100 ms.

To change the setting, use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]), and then press the **ENT** key.
For “4: INTERVAL”, press the **ENT** key to change to entry mode.
The cursor displays, allowing the previous setting to be deleted by pressing the **BS** key.
Enter a new setting values with the numerical keys and press the **ENT** key.

Press the **C** key to return to the SET COMMUNICATION menu.

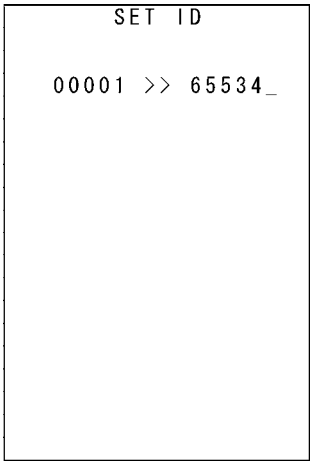
Select “3: BHT-IR protocol” at the PROTOCOL TYPE menu to display the screen on the right.



Enter the ID number of the BHT using the numerical keys and then press the **ENT** key.
If there is no need to edit the current setting, press the **ENT** key only.

- Point - ID numbers should consist of a five-digit decimal character string. The entry range is from 00001 To 65534. If the entry value is less than five digits, the **ENT** key will be invalid.

If an incorrect entry is made, press the **BS** key to delete it and then enter the correct data.
Press the **C** key to return to the SET COMMUNICATION menu.

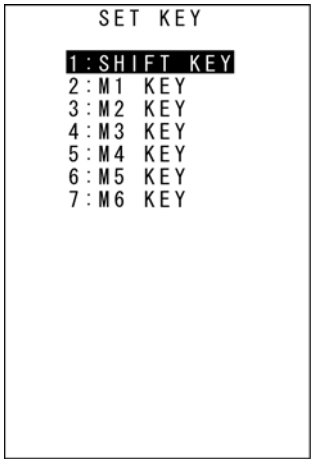


[6] Defining the functions of the Shift key and Magic keys

Use the following procedure to change the key settings.

1. Select “6: KEY” at the SET SYSTEM menu and then press the **ENT** key.

The SET KEY menu screen displays as shown on the right.



2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4] [5] [6] [7]) to highlight the item to be set, and then press the **ENT** key.

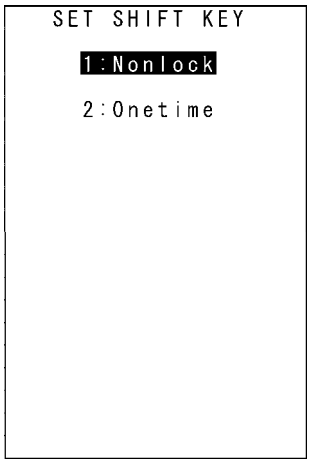
“1: SHIFT KEY”: Displays the **SF** key definition screen.
“2: M1 KEY”: Displays the **M1** key definition screen.
“3: M2 KEY”: Displays the **M2** key definition screen.
“4: M3 KEY”: Displays the **M3** (left-hand trigger switch) key definition screen.
“5: M4 KEY”: Displays the **M4** (right-hand trigger switch) key definition screen.
“6: M5 KEY”: Displays the **M5** key ( ) definition screen.
“7: M6 KEY”: Displays the **M6** key ( ) definition screen.

Refer to the following section for details of the above items.
Press the **C** key to return to the SET COMMUNICATION menu.

◆ “1:SHIFT KEY”: Defining the Shift key function

1. Select “1: SHIFT KEY” at the SET KEY menu and then press the **ENT** key.

The SET SHIFT KEY menu screen displays as shown on the right.
The highlighted settings will be the current settings.



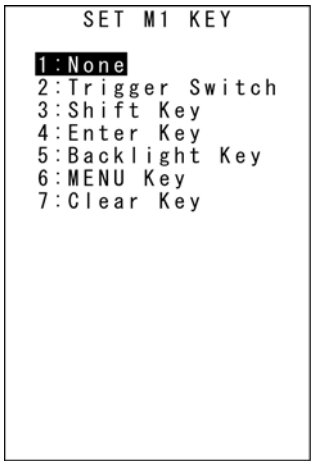
“1: Nonlock”: Shifts the keypad only when the **SF** key is held down.
“2: Onetime”: Shifts only the key pressed immediately after the **SF** key is pressed. (The following keys will not be shifted.)

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to highlight the item to be set, and then press the **ENT** key.

The selected item will be set and the screen will return to the SET KEY menu.

◆ "2: M1 KEY" - "7: M6 KEY": Defining the Mx key functions

1. Select "2: M1 KEY" to "7: M6 KEY" at the SET KEY menu and then press the **ENT** key.



The SET Mx KEY menu screen displays as shown on the right.
(In the example on the right, "2: M1 KEY" has been selected.)
The highlighted settings will be the current settings.

"1: None":
Key entry will be ignored.
"2: Trigger switch":
Sets the magic key as the trigger switch.
"3: Shift key":
Sets the magic key as the **SF** key.
"4: Enter key":
Sets the magic key as the **ENT** key.
"5: Backlight key":
Sets the magic key as the backlight function ON/OFF key.
"6: MENU Key":
Sets the magic key as a key used to start up the "Beeper/Vibrator/backlight Adjustment Screen".
"7: Clear key":
Sets the magic key as the **C** key.

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4] [5] [6] [7]) to highlight the item to be set, and then press the **ENT** key.

The selected item will be set and the screen will return to the SET KEY menu.

◆ Magic keys (M1 to M6)

Magic keys (**M1** to **M6**) can be set to function as the trigger switch, **SF** key, **ENT** key, backlight function ON/OFF key, **MENU** key or **C** key.
If the **M1** key is defined as the backlight function ON/OFF key, pressing the **M1** key enables or disables the backlight function.
In user programs, data strings can be also assigned to these Magic keys.
Magic keys **M3** and **M4** are set as the trigger switch by default.

- Point - The backlight function ON/OFF key can be assigned only to one of the magic keys from **M1** to **M6**. The key defined more recently will act as the backlight function ON/OFF key and the previously defined key will be ignored.

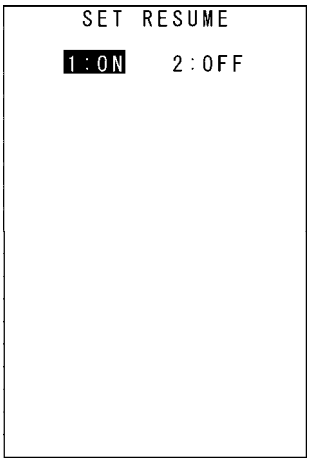
If, for example, the **M1** and **M2** keys are defined as the backlight function ON/OFF key in this order, the **M2** key will function as the backlight function ON/OFF key and the **M1** key entry will be ignored.
On the other hand, if the **M2** and **M1** keys are defined as the backlight function ON/OFF key in this order, the **M1** key will function as the backlight function ON/OFF key and the **M2** key entry will be ignored.

[7] Setting the resume function

Use the following procedure to set the resume function.

1. Select "7: RESUME" at the SET SYSTEM menu and then press the **ENT** key.

The SET RESUME menu screen displays as shown on the right.
The highlighted settings will be the current settings.



2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to change the setting and press the **ENT** key.

Press the **C** key to return to the SET SYSTEM menu.

"1: ON": Enables the resume function.
"2: OFF": Disables the resume function.

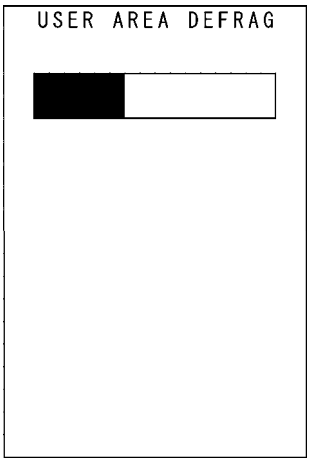
- Note - The resume function is used to return the BHT status (screen) when the power is turned ON to the status at the point the power was turned OFF.

[8] Defragmenting the drive

Use the following procedure to defragment the drive.

1. Select "8: DEFRAG" at the SET SYSTEM menu and then press the **ENT** key.

The screen displays as shown on the right and the defragmentation process is performed for the entire user area.
The screen returns to the SYSTEM MENU when defragmentation is complete.



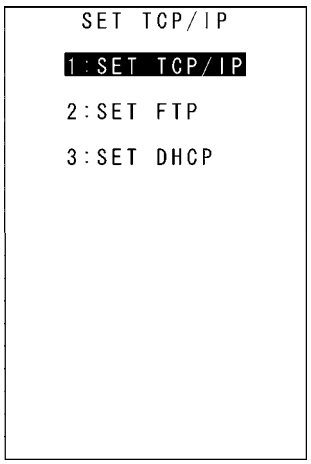
Defragmentation reorganizes the user area in order to increase the amount of available space.
If defragmented, the BHT may download files more efficiently than before performing defragmentation.

[9] Setting the TCP/IP, FTP and DHCP

Use the following procedure to change the TCP/IP, FTP and DHCP settings.

1. Select “9: TCP/IP” at the SET SYSTEM menu and then press the **ENT** key.

The SET TCP/IP menu screen displays as shown on the right.



2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3]) to highlight the item to be set, and then press the **ENT** key.

“1: SET TCP/IP”: Changes the TCP/IP setting.
“2: SET FTP”: Changes the FTP setting.
“3: SET DHCP”: Changes the DHCP setting.

Refer to the following section for details of the above items.
Press the **C** key to return to the SET SYSTEM menu.

◆ “1: SET TCP/IP”: Setting the TCP/IP

1. Select “1: SET TCP/IP” at the SET TCP/IP menu and then press the **ENT** key.

The SET TCP/IP menu screen displays as shown on the right.

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to highlight the item to be set, and then press the **ENT** key.

Press the **C** key to return to the SET TCP/IP menu.

“1: DEVICE”: Setting the TCP/IP device

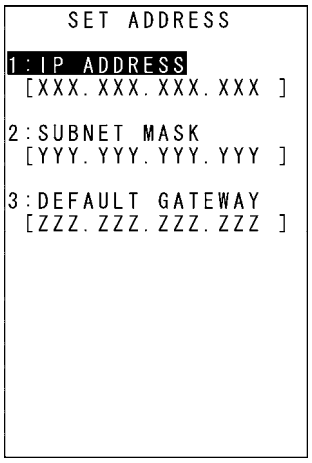
Select “1: DEVICE” at the SET TCP/IP menu to display the screen on the right where the current settings are displayed.

“1: TCP/IP DEVICE”: TCP/IP communication device
“2: LINK LAYER”: Link layer

Press the **C** key to return to the SET TCP/IP menu.

"2: IP ADDRESS": Setting the IP address

Select "2: IP ADDRESS" at the SET TCP/IP menu to display the screen on the right where the current settings are displayed.



To change the setting:

(1) Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3]) to highlight the item to be set and press the **ENT** key.

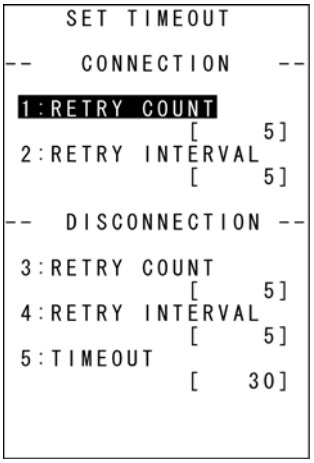
(2) The mode changes to entry mode and the cursor displays, allowing the setting to be entered with the numerical keys and dot key.
To delete a single character, press the **BS** key. To delete the entire entry, press the **C** key.

(3) Enter the desired value and then press the **ENT** key

If the IP address, subnet mask and default gateway are all set to [0.0.0.0], DHCP is enabled.
Press the **C** key to return to the SET TCP/IP menu.

"3: TIMEOUT": Setting the timeout (only when COM1 selected)

Select "3: TIMEOUT" at the SET TCP/IP menu to display the screen on the right where the current settings are displayed.



To change the setting:

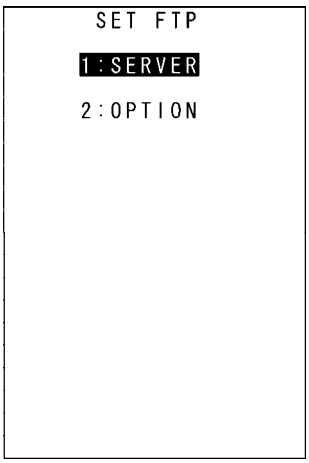
(1) Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4] [5]) to highlight the item to be set and press the **ENT** key.

(2) The mode changes to entry mode and the cursor displays, allowing the setting to be entered with the numerical keys and dot key.
To delete a single character, press the **BS** key. To delete the entire entry, press the **C** key.

(3) Enter the desired value, and then press the **ENT** key.

Press the **C** key to return to the SET TCP/IP menu.

◆ Setting the FTP



1. Select “2: SET FTP” at the SET TCP/IP menu and then press the **ENT** key.

The SET FTP menu screen displays as shown on the right.

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to highlight the item to be set, and then press the **ENT** key.

Press the **C** key to return to the SET TCP/IP menu.

“1: SERVER”: Setting the FTP server connection environment

Select “1: SERVER” at the SET FTP menu to display the screen on the right where the current settings are displayed.

“1: SERVER IP”:
Sets the IP address for the FTP server.
“2: USER ID”:
Sets the user name.
“3: PASSWORD”:
Sets the password.
“4: DEFAULT DIR”:
Specifies an initial directory through which the FTP server will search for files for transfer first when the FTP client establishes a connection to the server.

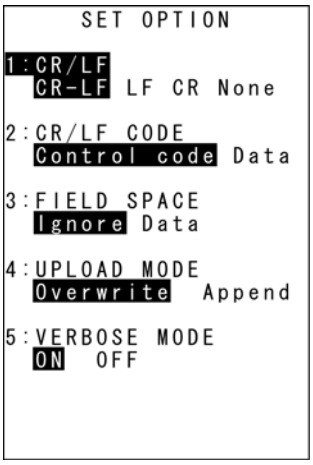
To change the setting:

(1) Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4]) to highlight the item to be set and press the **ENT** key.
(2) The mode changes to entry mode and the cursor displays, allowing the setting to be entered with the numerical keys and dot key.
Press the **SF** and the **BS** key to change the entry mode (numeric entry (with no guidance display) and alphabet entry).
To delete a single character, press the **BS** key. To delete the entire entry, press the **C** key.
(3) Enter the desired value, and then press the **ENT** key.

Press the **C** key to return to the SET FTP menu.

"2: OPTION": Setting the FTP options

Select "2: OPTION" at the SET FTP menu to display the screen on the right where the current settings are displayed.



"1: CR/LF":
Specifies line delimiters that should match ones used in the server OPERATING SYSTEMS (OS).

"2: CR/LF CODE":
Specifies handling for line delimiters in records when data files are downloaded.
"Control code": Does not handle line-break codes as data. (handles as record delimiters.)
"Data": Handles line-break codes as data.

"3: FIELD SPACE":
Specifies the treatment of trailing spaces in fields.
"Ignore": Trims trailing spaces in fields.
"Data": Retains trailing spaces as data.

"4: UPLOAD MODE":
Specifies the treatment of trailing spaces in fields.
"Overwrite": Uploaded files will be written over the existing files
"Append": Uploaded files will be appended to the existing files.

"5: VERBOSE MODE":
Specifies the command response display when using FTP.
"ON": Displays a message to the response (number) from the FTP server when the BHT (FTP client) outputs a message.
"OFF": Displays only messages output by the BHT (FTP client).

Refer to "FTP Download/Upload Messages" at section "4.5.8 Downloading/Uploading Files by FTP (FTP MENU)" for messages output by the BHT (FTP client).
Refer to "Response messages from the FTP Server" at section "4.5.8 Downloading/Uploading Files by FTP (FTP MENU)" for messages to responses (numbers) from the FTP server.

To change the setting:
(1) Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4] [5]) to highlight the item to be set and press the **ENT** key.
(2) Use the cursor keys ([◄] [►]) to highlight each setting value.
(3) Press the **ENT** key.

Press the **C** key to return to the SET FTP menu.

◆ Setting the DHCP

1. Select “3: SET DHCP” at the SET TCP/IP menu and then press the **ENT** key.

The SET DHCP screen displays as shown on the right.
Press the **C** key to return to the SET TCP/IP menu.

```
SET DHCP

1:TIMEOUT   [XXXXX]
```

Press the dot key while holding down the **SF** key at the SET DHCP menu to display the NETWORK (DHCP) screen (acquisition check screen for IP address at DHCP).
Press the **C** key at the NETWORK (DHCP) screen to return to the SET DHCP screen.

[C]key ⇑ ⇓ [**SF**]+[.]key

- Point - If the acquired IP configuration is displayed when the IP address, subnet mask or default gateway is set to a value other than “0.0.0.0”, the DHCP does not display on the screen shown on the right.

```
   NETWORK(DHCP)

IP ADDRESS
   XXX.XXX.XXX.XXX

SUBNET MASK
   YYY.YYY.YYY.YYY

DEFAULT GATEWAY
   ZZZ.ZZZ.ZZZ.ZZZ
```

“1: TIMEOUT”:
Sets the timeout for acquiring the IP configuration from the DHCP Server. The entry range is from 00001 to 32767 seconds.

- Point - Up to 32767 seconds can be entered, but in actual operation, a maximum of 190 seconds is available since the number of retries and retry intervals are determined by the system.

To set the DHCP:

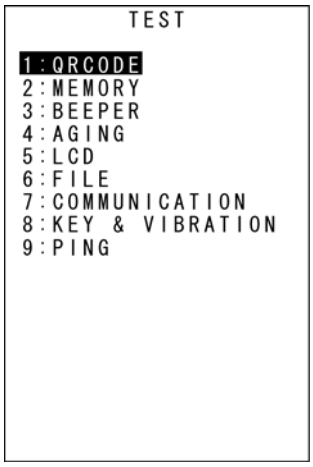
(1) Press the **ENT** key.
(2) The mode changes to entry mode and the cursor displays, allowing the setting to be entered with the numerical keys.
To delete a single character, press the **BS** key. To delete the entire entry, press the **C** key.
(3) Enter the desired value, and then press the **ENT** key.

Press the **C** key to return to the SET FTP menu.

4.5.6 BHT Operation Test (TEST Menu)

Use the following procedure to perform a BHT operation test.

1. Select “5: TEST” at the SYSTEM MENU and then press the **ENT** key.



The TEST menu screen displays as shown on the right.

“1: QRCODE”:
Selects the QRcode reading test.

“2: MEMORY”:
Selects the RAM read/write test.

“3: BEEPER”:
Selects the beeper scale test.

“4: AGING”:
Selects the aging test.

“5: LCD”:
Selects the LCD and indicator indicator LED tests.

“6: FILE”:
Selects the file checksum test.

“7: COMMUNICATION”:
Selects the communication test.

“8: KEY & VIBRATION”:
Selects the key entry, beeper and vibrator tests.

“9: PING”:
Selects the PING test.

Refer to the following section for details of the above items.
Press the **C** key to return to the SYSTEM MENU.

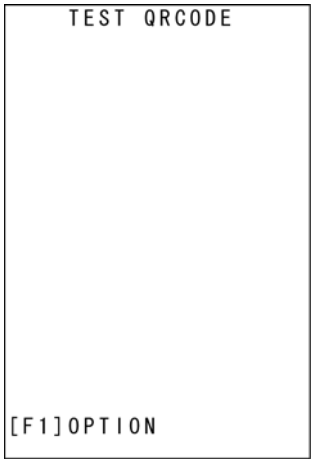
- Point - Contact your nearest dealer If an error occurs during any of the above tests.

[1] QR code reading test

Use the following procedure to perform a QR code reading test.

1. Select “1: QRCODE” at the TEST menu and then press the **ENT** key.

The screen displays as shown on the right.

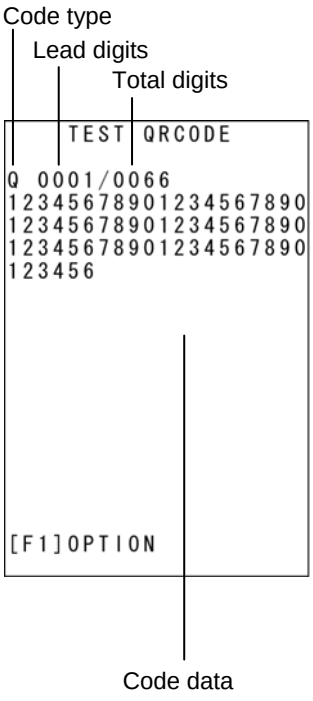


2. Read a barcode or 2D code with the BHT.

Upon completion of barcode or 2D code reading, the BHT beeps once, and the indicator LED turns blue.

3. The read 2D code or barcode type, lead digits, total number of digits, and code data display on the screen. Ensure that the code data and screen display match.

Press the **C** key to return to the TEST menu.



Code Type and Corresponding Characters Displayed on the Screen

Code type	ID characters
QR Code	Q
QR Code (Codes concatenated with unedited modes)	S
PDF417	Y
Maxicode	X
Data matrix	Z
EAN-13 (JAN-13)UPC-A	A
EAN-13（JAN-13), UPC-A COMPOSITE	A
EAN-8（JAN-8）	B
EAN-8（JAN-8）COMPOSITE	B
UPC-E	C
UPC-E COMPOSITE	C
Interleaved 2of5 (ITF) *	I
Codabar（NW-7）	N
Code 39	M
Code 93	L
Code 128	K
GS1-128 (EAN-128)	W
GS1-128 (EAN-128) COMPOSITE	W
RSS (GS1 DataBar)	R
RSS (GS1 DataBar) COMPOSITE	R

*with ITF, a code with 4 or more digits is read.

- Point - QR Code has a function where data is coded after being split into a maximum of 16 segments and the segmented codes are read. Codes segmented using this function are called concatenated codes.

When reading concatenated codes, the beeper works differently than with normal reading.

The beeper sounds twice when the first code of the concatenated code is read, and the system enters the concatenated code reading mode. When subsequent concatenated codes are raed, the beeper sounds once. After the final code has been read, the beeper sounds three times and reading is complete.

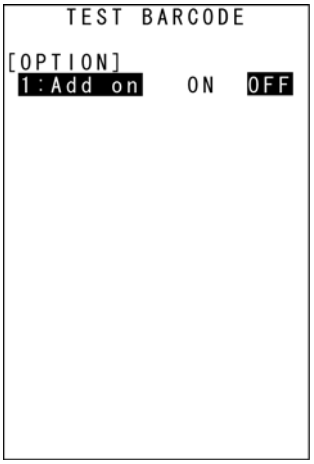
The reading data screen display will not be shown until after concatenated code reading is complete.

If QR codes other than concatenated codes are read during concatenated code reading those codes are displayed, the concatenated code reading mode is cancelled and the read concatenated codes are discarded. This also happens if the trigger switch is released or the interval between reading of concatenated codes is over 5 seconds.

The order for reading concatenated codes is arbitrary. The same concatenated codes will not be read it again.

- Point - Option data is displayed at the end of the QR Code data when OPTION DATA is set to ON at the set code reading conditions screen of the SET SYSTEM menu. (Refer to “4.5.5 [4] Setting the code reading conditions”)

◆ Setting the QRcode Reading Test Options

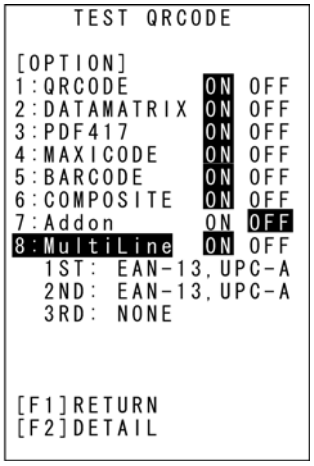


When performing the QR code reading test, press the **F1** key to display the screen on the right, allowing QR code reading test options to be set.
The highlighted settings will be the current settings.

To change the setting, use the cursor keys ([▲] [▼]) or numerical keys ([1][2][3][4][5][6][7][8]) to highlight the item to be set and highlight the setting value using the cursor keys ([◄] [►]).

Press the [F1] key or the [**ENT**] key to return to the code reading test.

"1: QRCODE":
Enable/disable QR code.
"2: DATAMATRIX":
Enable/disable DATAMATRIX.
"3: PDF417":
Enable/disable PDF417.
"4: MAXICODE":
Enable/disable MAXICODE.
"5: BARCODE":
Enable/disable BARCODE.
"6: COMPOSITE":
Enable/disable Composite.
"7: Add-on":
Enable/disable Add-on.
It is not possible to enable both Add-on and Multiline.
"8: Multiline":
Enable/disable Multiline.
When Multiline is enabled, the screen displays as shown on the right and the reading code can be set for the Multiline code.



To change the setting, use the cursor keys ([▲] [▼]) to highlight 1ST, 2ND, or 3RD and change the barcode using the cursor keys ([◄] [►]).

1ST: Set the first line of the barcode to be read.
2ND: Set the second line of the barcode to be read.
3RD: Set the third line of the barcode to be read.

Note: Multiline is limited to 3 lines, and is compatible with 9 types of reading code.
(Common product codes (4 types), ITF, codabar, Code39, Code93, and Code128)

Press the [F1] key or the [**ENT**] key to return to the code reading test.

If you press the [F2] key at the code reading test option setting screen, the screen displays as shown on the right and detailed settings can be specified for the code reading test.

To change the setting, use the cursor keys ([▲] [▼]) or numerical keys ([1][2]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]), and then press the **ENT** key.

Press the [C] key to return to the option setting screen for the code reading test.

◆ "1:CODE SETTINGS": Detailed settings for the code reading test

If you select "1: CODE SETTINGS", the screen displays as shown on the right.
Set code reading to enable (ON) or disable (OFF).

"1: QRCODE": Selecting enable/disable QRCODE reading and availability of the concatenation function

"1: QR MODEL1":
Enable/disable QR code Model 1.

"2: QR MODEL2":
Enable/disable QR code Model 2.

"3: Micro QR":
Enable/disable Micro QR.

"4: STR APPEND":
Select the availability of the QR code concatenation function.

For QR Codes, there is a function where data is coded after being split into a maximum of 16 segments and original data is restored when the codes are read. These segmented codes are called concatenated codes.

The following 3 modes can be selected when reading concatenated codes.

"EDIT": Edit mode
The data is stored in memory when all segmented codes have been read.
A reading error occurs if the volume of data exceeds 8 kb. The beeper sounds at 500 ms intervals, and all read data is discarded.

"BATCH": Batch edit mode

The data is stored in memory when all segmented codes within the reading field of view have been read.

"NONE": Unedited mode

The data is stored in memory each time a segmented code is read.

In edit mode, when the first code of the concatenated code is read the beeper sounds twice and the system enters concatenated code reading status.

When subsequent concatenated codes are read the beeper sounds once. After the final code has been read, the beeper sounds three times and reading is complete.

To change the setting, use the cursor keys ([▲] [▼]) or numerical keys ([1][2][3][4]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]), and then press the **ENT** key.

Press the [C] key to return to the detailed settings screen for the code reading test.

- Point -

- If QR codes other than concatenated codes are read during concatenated code reading then concatenated code reading ends, the read concatenated codes are discarded, and the data for the last QR codes read is saved.
- When the illuminating indicator LED is set to OFF in trigger switch operation (Auto-off mode, Momentary mode, and alternate) or when the reading of the next concatenated code is not completed within approx. 3 seconds in modes other than Auto-off mode, the data read so far is cleared and concatenated code reading ends.
- When other concatenated codes are read before a concatenated code has been read completely, the data read so far is cleared and reading begins on the new code.

"2: DATAMATRIX": Selecting enable/disable DATAMATRIX reading

"1: SQUARE":

Enable/disable SQUARE DATAMATRIX.

"2: RECTANGULAR":

Enable/disable RECTANGULAR DATAMATRIX.

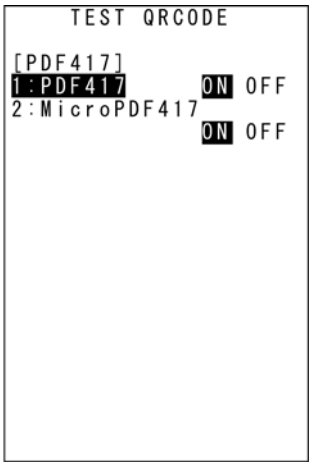
To change the setting, use the cursor keys ([▲] [▼]) or numerical keys ([1][2]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]), and then press the **ENT** key.

Press the [C] key to return to the detailed settings screen for the code reading test.

“3: PDF417”: Selecting enable/disable PDF417 reading

“1: PDF417”:
Enable/disable PDF417.

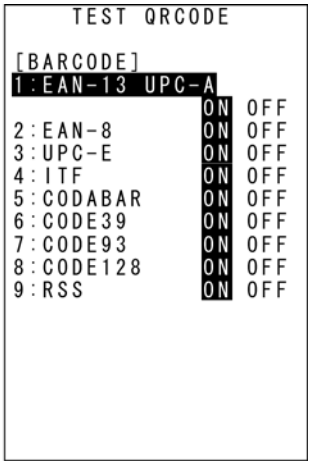
“2: Micropdf417”:
Enable/disable Micropdf417.



To change the setting, use the cursor keys ([▲] [▼]) or numerical keys ([1][2]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]), and then press the **ENT** key.

Press the [C] key to return to the detailed settings screen for the code reading test.

“5: BARCODE”: Selecting enable/disable BARCODE reading



“1: EAN-13/UPC-A”:
Enable/disable EAN-13/UPC-A.

“2: EAN-8”:
Enable/disable EAN-8.

“3: UPC-E”:
Enable/disable UPC-E.

“4: ITF”:
Enable/disable ITF.

“5: CODABAR”:
Enable/disable CODABAR.

“6: CODE39”:
Enable/disable CODE39.

“7: CODE93”:
Enable/disable CODE93.

“8: CODE128”:
Enable/disable CODE128.

“9: RSS”:
Enable/disable RSS.

To change the setting, use the cursor keys ([▲] [▼]) or numerical keys ([1][2][3][4][5][6][7][8][9]) to highlight the item to be set, highlight the setting value using the cursor keys ([◄] [►]), and then press the **ENT** key.

Press the [C] key to return to the detailed settings screen for the code reading test.

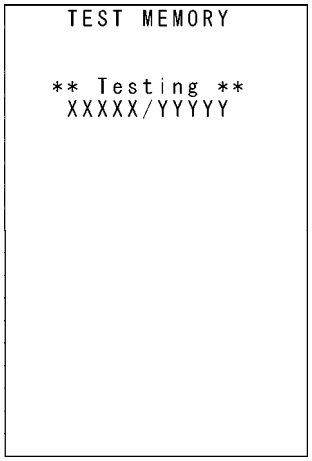
- Note - There are no setting items related to “4: MAXICODE” or “6: COMPOSITE”.

[2] Memory test

Use the following procedure to perform a memory test.

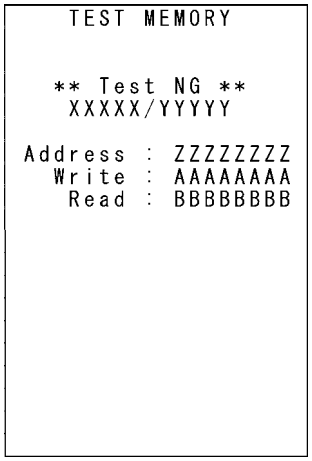
1. Select “2: MEMORY” at the TEST menu and then press the **ENT** key.

The screen displays as shown on the right, and the BHT reads and writes data to and from all areas of the RAM and performs an address check.



“XXXXX”: Tested RAM capacity (unit: kilobytes)
“YYYYY”: Total RAM capacity (unit: kilobytes)

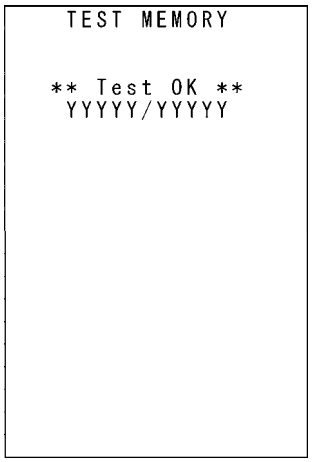
If any error is detected, the BHT beeps three times, displays a message similar to that shown on the right, and aborts the test.



“ZZZZZZZZ”: Address where the error occurred
“AAAAAAAA”: Data to write
“BBBBBBBB”: Data read out the RAM

Press the **C** key to return to the TEST menu.

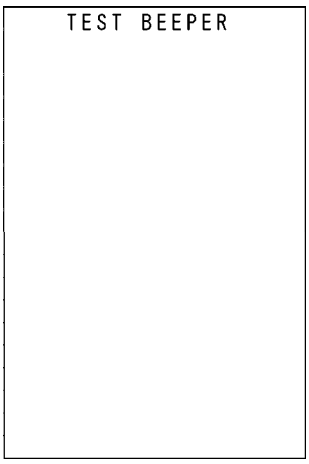
Upon normal completion of the RAM test, the BHT beeps once, displays a message similar to that shown on the right, and returns to the TEST menu.



[3] Beeper scale test

Use the following procedure to perform a beeper scale test

1. Select “3: BEEPER” at the TEST menu and then press the **ENT** key.



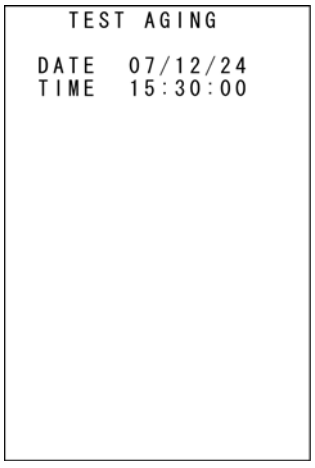
The screen displays as shown on the right, and the beeper sounds at the three octaves listed below.
Upon completion of this test, the BHT automatically returns to the TEST menu.

To stop the beeper scale test while in progress, turn the BHT OFF.

Scale	Frequency (Hz)			
do	523	1046	2093	4186
re	587	1174	2349	-
mi	659	1318	2637	-
fa	698	1396	2793	-
sol	783	1567	3135	-
la	880	1760	3520	-
ti	987	1975	3951	-

[4] Aging test

Use the following procedure to perform an aging test.



1. Select “4: AGING” at the TEST menu and then press the **ENT** key.

The aging test begins and the current date and time display on the screen. (This test is intended for personnel responsible for checking the BHT at the factory.)

- Point - The Auto OFF function is disabled during the aging test. To abort the test, press the **C** key to return to the TEST menu, or turn the BHT power OFF.

[5] LCD and indicator LED tests

Use the following procedure to perform an LCD and indicator LED test.

1. Select “5: LCD” at the TEST menu and then press the **ENT** key.

The TEST BEEPER screen displays as shown on the right.
The indicator LED is OFF at this time.

Press the **C** key to return to the TEST menu.

2. Press the **ENT** key.

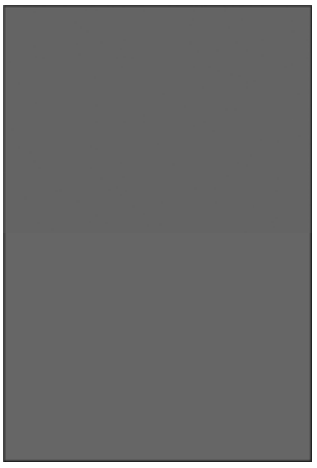
The entire screen turns black and the indicator LED illuminates in green.

Press the **BS** key to return to the previous screen.
Press the **C** key to return to the TEST menu.

3. Press the **ENT** key.

The entire screen turns gray.

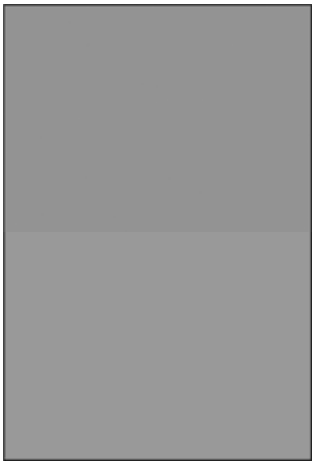
Press the **BS** key to return to the previous screen.
Press the **C** key to return to the TEST menu.



4. Press the **ENT** key.

The entire screen turns a lighter shade of gray.

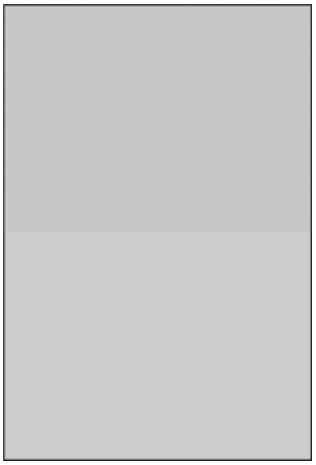
Press the **BS** key to return to the previous screen.
Press the **C** key to return to the TEST menu.



5. Press the **ENT** key.

The entire screen turns an even lighter shade of gray.

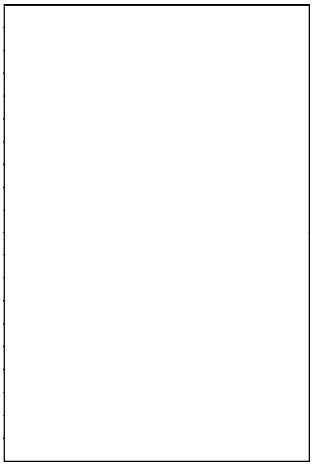
Press the **BS** key to return to the previous screen.
Press the **C** key to return to the TEST menu.



6. Press the **ENT** key.

The entire screen turns white.

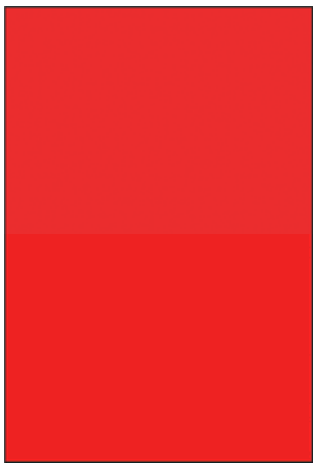
Press the **BS** key to return to the previous screen.
Press the **C** key to return to the TEST menu.



7. Press the **ENT** key.

The entire screen turns red, and at the same time, the indicator LED turns red.

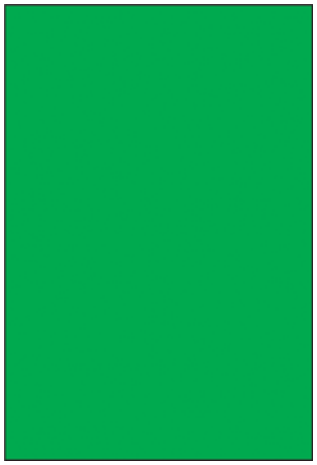
Press the **BS** key to return to the previous screen.
Press the **C** key to return to the TEST menu.



8. Press the **ENT** key.

The entire screen turns green, and at the same time, the indicator LED turns green.

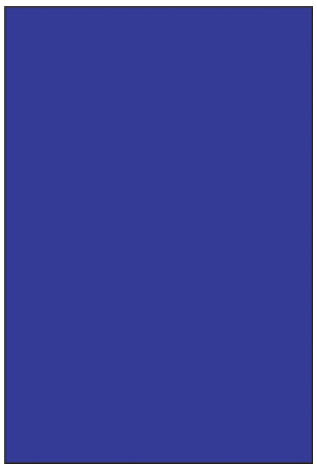
Press the **BS** key to return to the previous screen.
Press the **C** key to return to the TEST menu.



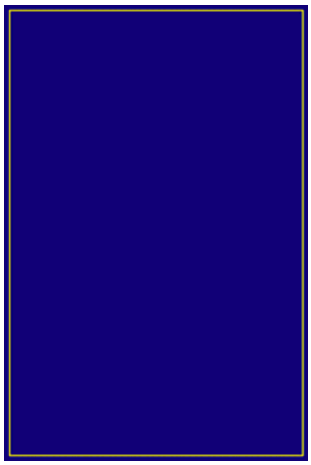
9. Press the **ENT** key.

The entire screen turns blue, and at the same time, the indicator LED turns blue.

Press the **BS** key to return to the previous screen.
Press the **C** key to return to the TEST menu.



10. Press the **ENT** key.



A 1-dot thick frame displays around the screen.

Press the **BS** key to return to the previous screen.
Press the **C** key to return to the TEST menu.

11. Press the **ENT** key.

The beeper sounds once, and the display returns to the TEST menu.

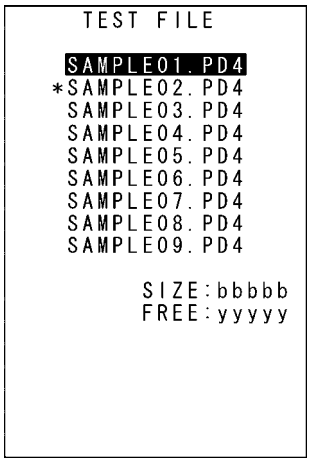
[6] File test

Use the following procedure to perform a file test.

1. Select “6: FILE” at the TEST menu and then press the **ENT** key.

The screen displays as shown on the right, and If any of the files stored in the memory is defective, an asterisk (*) or plus sign (+) is prefixed to the name of the defective file (s).

Refer to “About ‘$$BRKLST.SYS’” in “2.5.4 If the BHT is shut DOWN Abnormally” for details on the asterisk (*) and plus sign (+).



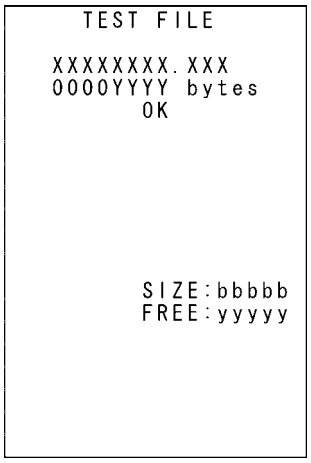
“SIZE: bbbbb”: Used memory size
“FREE: yyyyy”: available memory size

2. Use the cursor keys ([▲] [▼]) to highlight a file.

If there are more than ten files, the screen can be scrolled.

3. Press the **ENT** key.

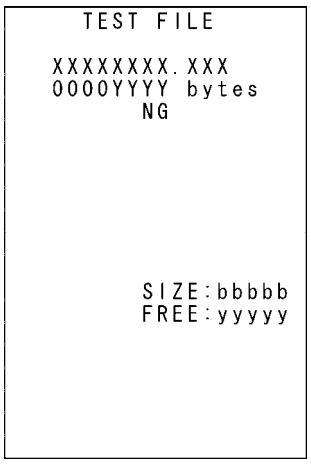
The file name, file size, and test result (OK or NG) display as shown on the right.



File Test Result

“OK”: No abnormalities
“NG”: Abnormalities exist

Press the **C** key to return to the TEST menu.



- Point -

- If a defective file is found, delete it or overwrite it with a file with the same name.
- Even defective files can be uploaded at the UPLOAD menu. It is therefore recommended that important files be uploaded before being deleted.

[7] Communication test

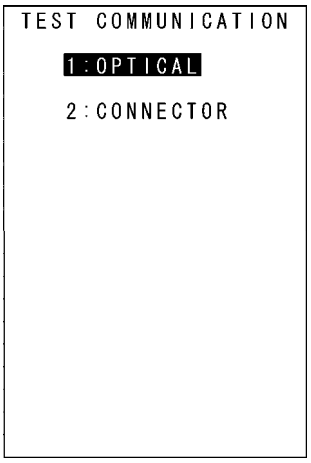
Use the following procedure to perform a communication test.

1. Select “7: COMMUNICATION” at the TEST menu and then press the **ENT** key.

The TEST BEEPER screen displays as shown on the right.

“1: OPTICAL”: Performs an infrared communication test.
“2: CONNECTOR”: Performs a connector communication test.

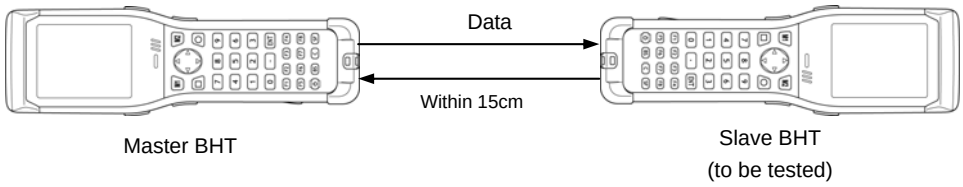
Refer to the following section for details of the above items.
Press the **C** key to return to the TEST menu.



◆ Infrared communication Test

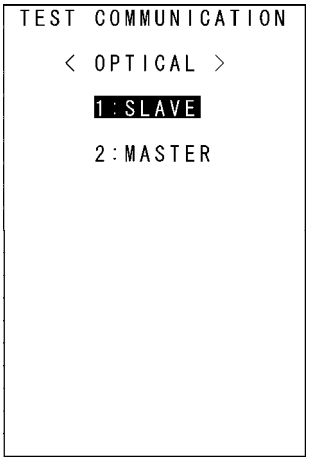
1. Arrange two BHTs, one as a master station and the other as a slave station (to be tested) with their IrDA interface ports facing each other as illustrated below.

This test involves transmitting data from the test BHT and the master BHT returning the data to the test BHT.



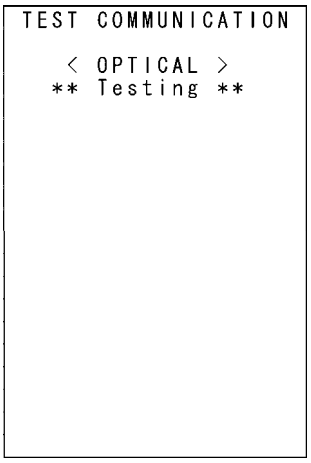
2. Select “1: OPTICAL” at the TEST COMMUNICATION menu and then press the **ENT** key.

The TEST COMMUNICATION screen displays as shown on the right.

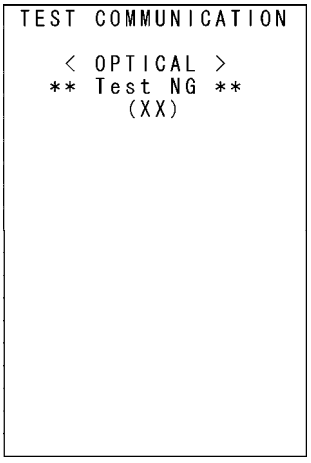


3. At the slave BHT to be tested, select “1: SLAVE”, and at the master BHT, select “2: MASTER”. Then press the **ENT** key.

The screen displays as shown on the right during the test, and an infrared communication test is performed.



If an error occurs, the tested slave BHT beeps three times and displays the screen on the right.



The meanings of the error codes in parentheses are as follows.

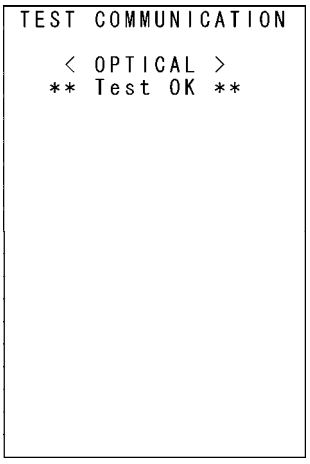
(X X)

- 1: The received data is different from the sent data.
- 2: A timeout has occurred during standby for data reception.

- 1: 9600 bps
- 2: 115200 bps
- 3: 460800 bps

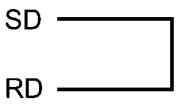
Press the **C** key to return to the TEST COMMUNICATION menu.
The master BHT automatically returns to the TEST COMMUNICATION menu 10 seconds after the occurrence of an error.

Upon normal completion of the test, the tested slave BHT beeps once and displays the screen on the right.
Press the **C** key to return to the TEST COMMUNICATION menu.
The master BHT automatically returns to the TEST COMMUNICATION menu.



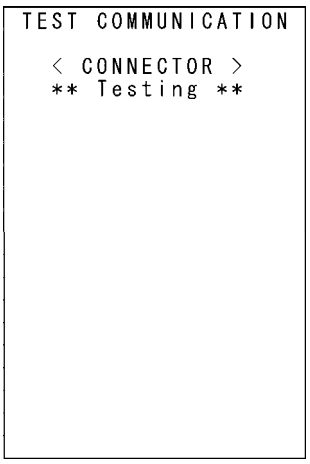
◆ Connector communication Test

1. Wire the cable with JC-25-P-3 (ϕ2.5mm stereo mini-plug) as shown below and connect to the BHT connector communication port.

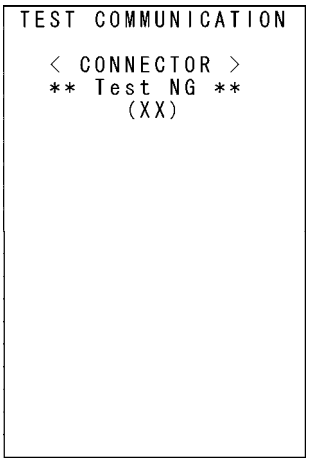


2. Select “2: CONNECTOR” at the TEST COMMUNICATION menu and then press the **ENT** key.

The TEST COMMUNICATION screen displays as shown on the right.



If an error occurs, the BHT beeps three times and displays the screen on the right.



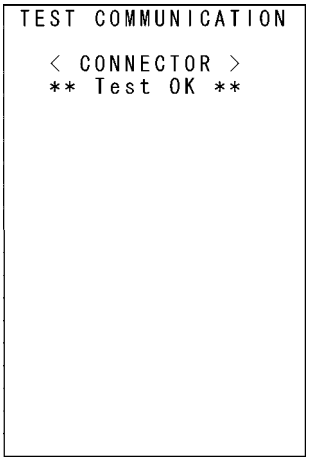
The meanings of the error codes in parentheses are as follows.

(XX)
- 1: 300 bps
- 2: 115200 bps

1: The received data is different from the sent data.
2: A timeout has occurred during standby for data reception.

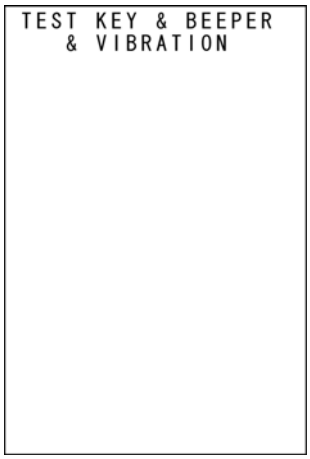
Press the **C** key to return to the TEST COMMUNICATION menu.

Upon normal completion of the test, the BHT beeps once and displays the screen on the right.
Press the **C** key to return to the TEST COMMUNICATION menu.



[8] Key-entry, beeper and vibrator test

Use the following procedure to perform a key entry, beeper and vibrator test.



1. Select "8: KEY & VIBRATION" at the TEST menu and then press the **ENT** key.

The screen displays as shown on the right, and the BHT waits for key entry.

2. Press the **ENT** key.

Pressing individual keys displays the identifier letters in the positions pre-assigned to those keys on the LCD as well as sounding the beeper or activating the vibrator. (As long as the individual key is held down, the BHT continues to beep or vibrate.)

3. Press the same key again.

The displayed characters disappear.

4. Repeat the above operation to display all keys on the screen.

Upon completion of the test, the BHT automatically returns to the TEST menu.
Turn OFF the power to abort the test during testing.

The table below shows the relationship between the keys, the identifier letters to be displayed on the screen, and the frequencies (Hz) of the beeper.

Key	Letter		Beeper (Hz)	Key	Letter		Beeper (Hz)
M1	'P'	RA1	220	F1	'A'	SO4	1567
M2	'Q'	SI1	246	F2	'B'	RA4	1760
TRG1(M3)	'R'	VIB	VIBRATOR	F3	'C'	SI4	1975
TRG2(M4)	'S'	VIB	VIBRATOR	F4	'D'	DO5	2093
□ (M5)	'T'	DO2	261	F5	'E'	RE5	2349
○ (M6)	'U'	RE2	293	F6	'F'	MI5	2637
▲	'I'	MI2	329	F7	'G'	FA5	2793
▼	'J'	FA2	349	F8	'H'	SO5	3135
◀	'K'	SO2	391	BS	'M'	RA5	3520
▶	'L'	RA2	440	C	'N'	SI5	3951
7	'7'	SI2	493	SF	'O'	DO6	4186
8	'8'	DO3	523				
9	'9'	RE3	583				
4	'4'	MI3	659				
5	'5'	FA3	698				
6	'6'	SO3	783				
1	'1'	RA3	880				
2	'2'	SI3	987				
3	'3'	DO4	1046				
0	'0'	RE4	1174				
.	'. '	MI4	1318				
ENT	'='	FA4	1396				

[9] PING test

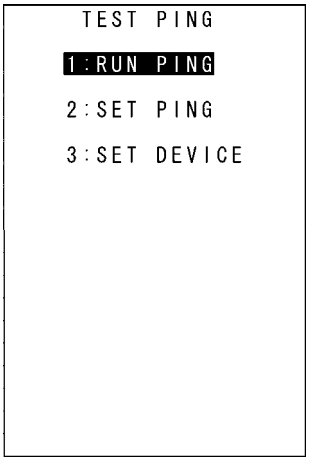
Use the following procedure to run the PING test.

1. Select “9: PING” at the TEST menu and then press the **ENT** key.

The TEST PING screen displays as shown on the right.

“1: RUN PING”: Runs the PING test.
“2: SET PING”: Displays the PING parameter setting screen.
“3: SET DEVICE”: Displays the PING device setting screen.

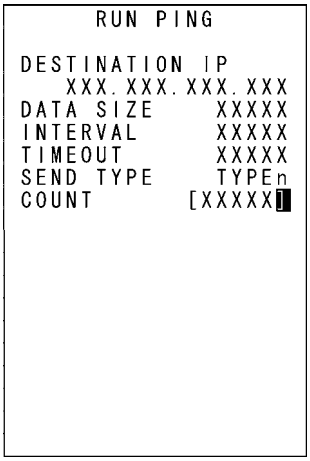
Refer to the following section for details of the above items.
Press the **C** key to return to the TEST menu.



◆ “1: RUN PING” (PING Test Screen)

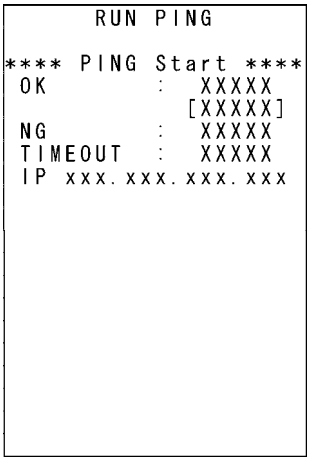
1. Select “1: RUN PING” at the TEST PING menu and then press the **ENT** key.

The current setting values display, and the BHT waits for the transmission count to be entered.
To change the number of echo requests displayed, enter the desired value using the numerical keys.
To delete a single character, press the **BS** key.
Press the **C** key to delete all entries made.

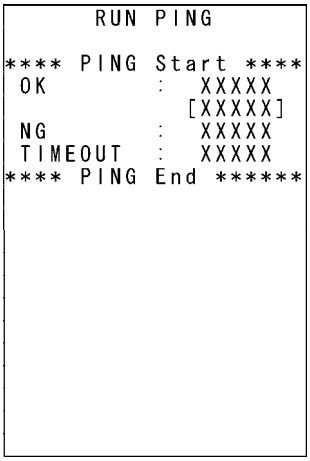


2. Press the **ENT** key.

When the PING test starts running, the message shown displays as shown on the right.
Press the **C** key to abort the PING test.



Upon completion of the PING test, the screen displays as shown on the right.



The PING result may include the following:

OK: Displays the number of echo replies.
[XXXXX]: Echo reply time in milliseconds
NG: Displays the number of errors found during the PING test.
TIMEOUT: Displays the number of timeouts (for echo replies) that took place during the PING test.
IP: Displays the BHT IP address during the PING test only.

Messages displayed during PING test (displayed in center of screen)

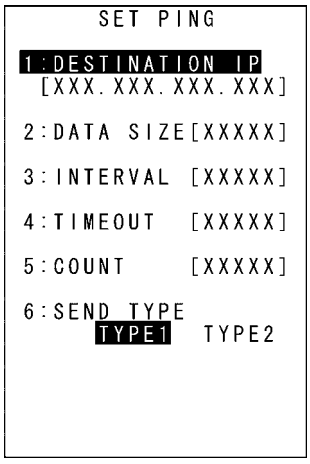
Waiting:	Setting up the PING test.
Opening device:	Opening devices.
Routing TCP/IP:	Connecting to the TCP/IP communication pathway.
PING start:	Starting the PING test.
Device error:	Faiindicator LED to open a device.
TCP/IP error:	Failed to connect to the TCP/IP communication pathway.

PING termination messages (displayed at bottom of screen)

PING end:	The PING test has ended normally.
PING aborted:	The PING test has been aborted.
PING error:	An error has occurred during the PING test.

◆ "2: SET PING" (PING Options Setting Screen)

1. Select "2: SET PING" at the TEST PING menu and then press the **ENT** key.



The current settings are displayed.

[1: DESTINATION IP]:
Specifies the IP address of the host computer to be pinged.
[2:DATA SIZE]:
Specifies the data size of the echo request.
[3:INTERVAL]:
Specifies the echo request interval (in units of 100 ms).
[4:TIMEOUT]:
Specifies the timeout period (in units of 100 ms) for the echo request.
[5:COUNT]:
Specifies the number of echo requests to be sent.
[6:SEND TYPE]:
Selects the echo request send timing (TYPE 1 or TYPE 2).
(Refer to "PING Echo Request Transmission Timing (SEND TYPE)" on the following page for details.)

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2] [3] [4] [5] [6]) to highlight the item to be set, and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.
Use the cursor keys ([◄] [►]) to highlight the "6: SEND TYPE" setting.

3. Enter the setting values with the numerical keys and dot key.

Use the cursor keys ([◄] [►]) to select "6: SEND TYPE" setting.
To delete a single character, press the **BS** key.
Press the **C** key to delete all entries made.

4. Enter the setting values and then press the **ENT** key.

Press the **C** key to return to the TEST PING menu.

Entry Range for DATA SIZE, INTERVAL, TIMEOUT, and COUNT

Item	Allowable Entry range	Default
DATA SIZE	4 to 1472	56
INTERVAL	0 to 65535	10
TIMEOUT	0 to 65535	10
COUNT	0* to 65535	4

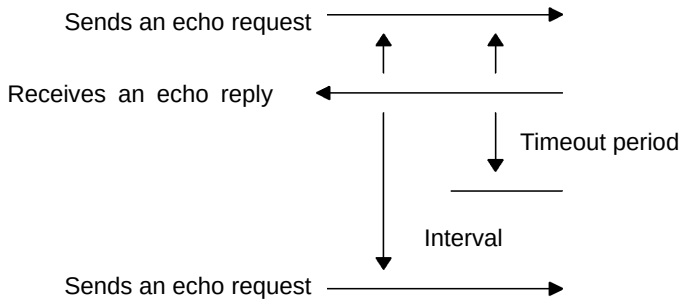
◆Specifying zero (0) will set the number of echo requests to "infinite," meaning that echo requests will be sent continuously until the PING test is aborted.
If a value outside the allowable entry range listed above is specified, the nearest value within the range will automatically be applied.

PING Echo Request Transmission Timing (SEND TYPE)

Two types of echo request send timings are available: TYPE 1 And TYPE 2.

☐TYPE1

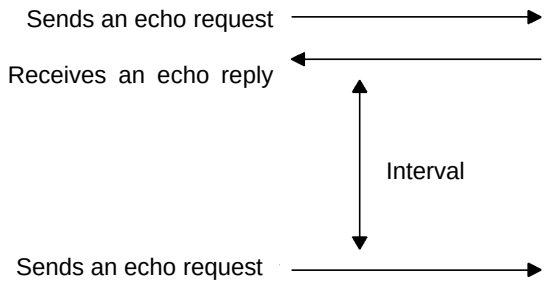
After sending an echo request, PING waits for the period specified at INTERVAL and then sends an echo request again. For TYPE 1, the relationship between the INTERVAL and TIMEOUT should be "INTERVAL ≥ TIMEOUT."



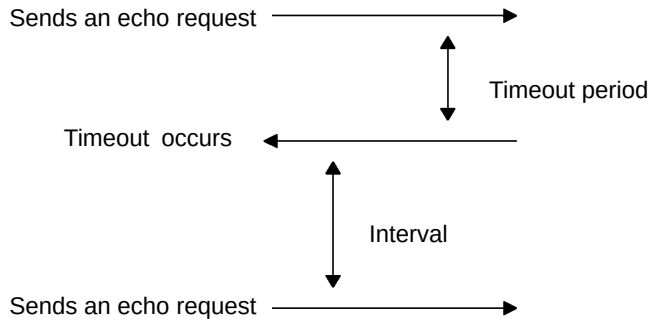
☐TYPE2

After sending an echo request, PING waits for an echo reply to be received or for a timeout to occur. Following that, PING waits for the period specified at INTERVAL and then sends the next PING echo request. For TYPE 2, no relationship between the INTERVAL and TIMEOUT is required.

If PING receives an echo reply:



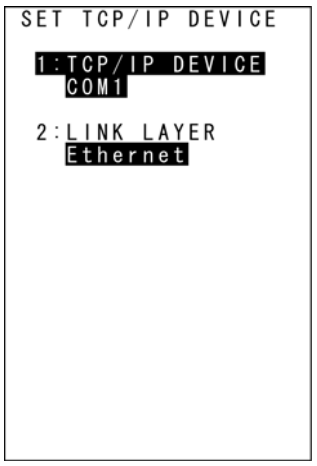
If a timeout occurs:



◆ "3: SET DEVICE" (PING Device Setting Screen)

1. Select "3: SET DEVICE" at the TEST PING menu and then press the **ENT** key.

The TCP/IP communication device, link layer, and transmission speed display.
Press the **C** key to return to the TEST PING menu.



4.5.7 System Information (SYSTEM INFORMATION Menu)

[1] Displaying the BHT system information

Use the following procedure to display the BHT system information.

1. Select “6: VERSION” at the SYSTEM MENU and then press the **ENT** key.

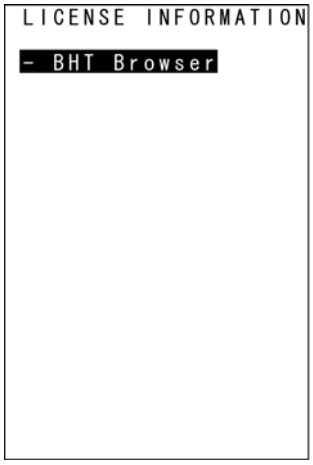
The SYSTEM INFORMATION screen displays as shown on the right.

[SYSTEM Ver.]:	System program version
[ROM SIZE]:	ROM size
[SYSTEM MESSAGE]:	System message version
[FONT]:	Loaded font type and version

Press the **C** key to return to the SYSTEM MENU.

◆ License List

Press the **F1** key at the LICENCE INFORMATION screen to display a license list as shown on the right.
The license list displays the names of functions for which licenses are required.



[1] ”*” symbol: Indicates that a license has been registered.
[2] ”-” symbol: Indicates that no license has been registered.

* Even if functions for which licenses are required are loaded in the system, these functions do not display in the list if they have never been run.

Press the **F1** key or press the **C** key to return to the SYSTEM INFORMATION screen.

[1] Functions for which licenses have been registered (*)

1. Use the cursor keys ([▲] [▼]) to highlight the name of a function that has been registered, and then press the **ENT** key to display a screen similar to that shown on the right containing the license registration details.

[PRODUCT ID]: Product ID
[PRODUCT NAME]: Product name
[PRODUCT KEY]: Product key

2. Press the **C** key to return to the LICENSE INFORMATION screen.

[2] functions for which licenses have not been registered (–)

1. Use the cursor keys ([▲] [▼]) to highlight the name of a function that has not been registered, and then press the **ENT** key to display the license registration screen shown on the right.

[PRODUCT ID]: Product ID
[PRODUCT NAME]: Product name
[PRODUCT KEY]: Product key

2. Press the **ENT** key to display the cursor, allowing the product key to be entered.

Enter the product key for the product ID, and then press the **ENT** key.
If "** Authorized **" displays, license registration is complete.
If "*** Key NG ***" displays, the entered product key is incorrect.
Reenter the correct product key.
*The product key can be acquired when purchasing the product.

3. Press the **C** key to return to the LICENSE INFORMATION screen.

[2] CU-611 System Information Display

Use the following procedure to display CU-611 System information.

1. Place the BHT on the CU-611.

2. Select “6: VERSION” at the SYSTEM MENU and then press the **ENT** key.

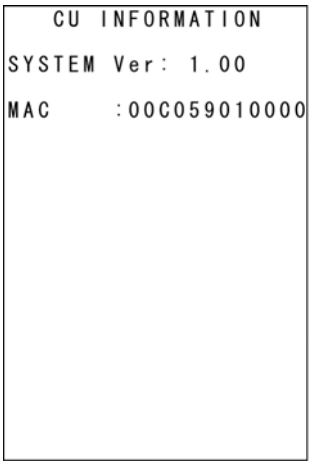
The SYSTEM INFORMATION screen displays as shown on the right.

3. Press the **M2** key.

The CU INFORMATION screen displays.

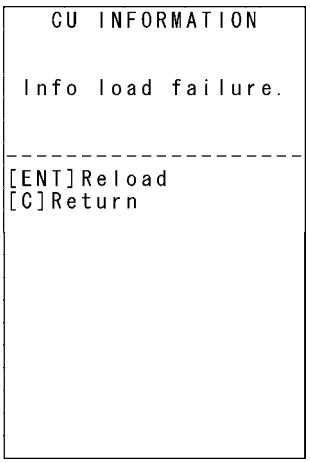
[SYSTEM Ver.]: System program information
[MAC ADDRESS]: MAC address

Press the **M1** key to return to the SYSTEM INFORMATION screen.



If the **M2** key is pressed when the BHT is not on the CU-611, the screen displays as shown on the right.

Press the **C** key to return to the SYSTEM INFORMATION screen.



4.5.8 Downloading/Uploading Files by FTP (FTP MENU)

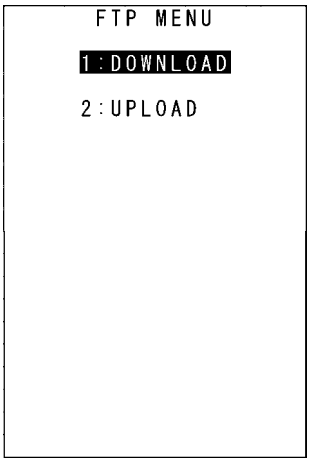
Use the following procedure to download and upload files by FTP.

1. Select “7: FTP” at the SYSTEM MENU and then press the **ENT** key.

The FTP MENU screen displays as shown on the right.

“1: DOWNLOAD”: Downloads a file by FTP.
“2: UPLOAD”: Uploads a file(s) by FTP.

Refer to the following section for details of the above items.
Press the **C** key to return to the SYSTEM MENU.



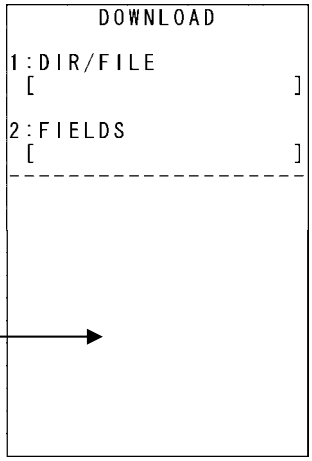
[1] Downloading by FTP

1. Select “1: DOWNLOAD” at the FTP MENU and then press the **ENT** key.

The screen displays as shown on the right.

[1: DIR/FILE]: Specifies the directory and/or file name.
[2: FIELDS]: Specifies field information for data files.

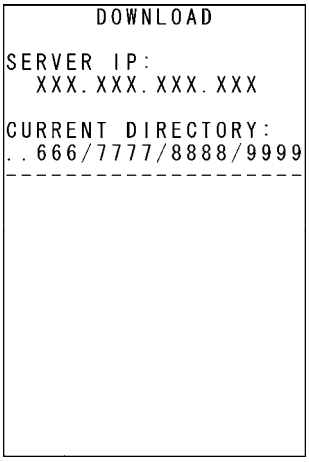
A message indicating the status displays at the bottom of the screen.



Press the **M2** key to display the screen on the right.

[SERVER IP]: Set IP address
[CURRENT DIRECTORY]: Acquired current directory

Press the **M1** key to return to the previous screen.



2. Use the cursor keys ([▲] [▼]) to highlight the item to be set, and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

3. Enter a setting value with the numerical keys and dot key.

Press the **SF** and the **BS** key to change the entry mode (numerical entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS** key.
Press the **C** key to delete all entries made.

4. Enter a setting value and press the **ENT** key.

Press the **C** key to return to the FTP MENU screen.

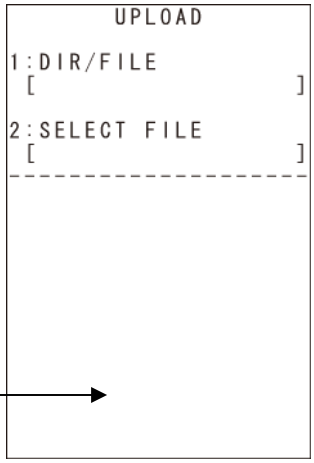
DIR/FILE entry box: The FTP client will interpret a character string entered into this box as a directory name at first, and will therefore send a Change Directory request to the FTP server. If the specified directory exists in the FTP server, the server will change a directory from the default to the specified one; if not, the FTP client will interpret the entered character string as a file name and send a Download request to the server.

FIELDS entry box: It is only necessary to enter field information in this box when downloading a data file. Before starting downloading, enter field information using the numerical keys and dot key. Pressing the dot key will enter a comma (,). No entry is required to download program files.

[2] Uploading by FTP

1. Select “2: UPLOAD” at the FTP MENU and then press the **ENT** key.

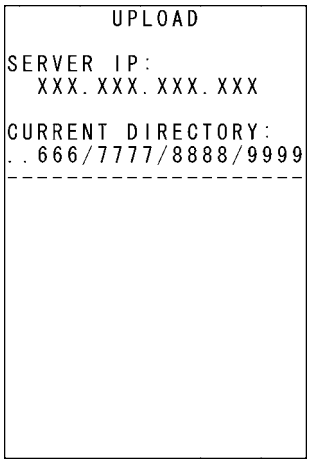
The screen displays as shown on the right If upload files exist.



[1: DIR/FILE]:
Entry Box for the directory and/or file name
[2: SELECT FILE]:
File name currently selected (Nothing is displayed at the FTP client initial status.)

A message indicating the status displays at the bottom of the screen. →

Press the **M2** key to display the screen on the right.



[SERVER IP]: Set IP address
[CURRENT DIRECTORY]: Acquired current directory

Press the **M1** key to return to the previous screen.

2. Use the cursor keys ([▲] [▼]) to highlight the item to be set, and then press the **ENT** key.

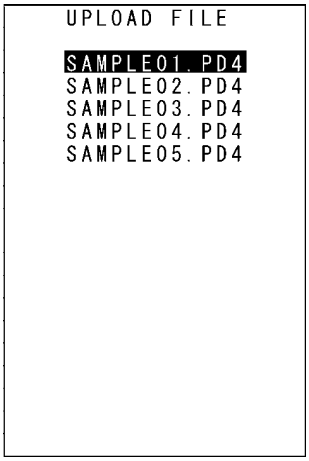
◆ When “1: DIR/FILE” is Selected

The mode changes to entry mode and the cursor displays, allowing directory and file names to be entered using the numerical keys and dot key.

Press the **SF** and the **BS** key to change the entry mode (numeric entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS** key.
Press the **C** key to delete all entries made.

◆ When “2: SELECT FILE” is Selected

The screen displays as shown on the right.
Use the cursor Keys ([▲] [▼]) to highlight the upload file and then press the **ENT** key.
Return to the previous screen to display the selected file name in [2: FIELDS]



3. Enter the directory and file name, or select a file, and then press the **ENT** key.

Press the **C** key to return to the FTP MENU screen.

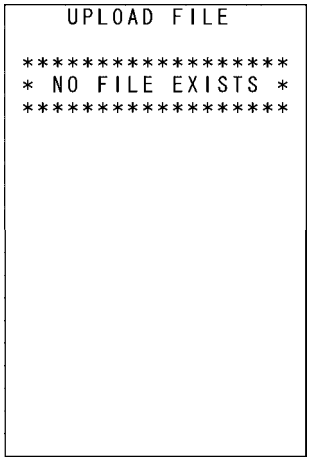
DIR/FILE entry box: The FTP client will interpret a character string entered into this box as a directory name at first, and will therefore send a Change Directory request to the FTP server. If the specified directory exists in the FTP server, the server will change a directory from the default to the specified one; if not, the FTP client will interpret the entered character string as a file name and send a Download request to the server.
If the SELECT FILE entry box file name differs from the file name specified in the DIR/FILE entry box, the FTP client will upload with the file name specified in the DIR/FILE entry box.

If the **ENT** key is pressed without entering a character string in the DIR/FILE entry box, the FTP client will upload to the server with the SELECT FILE entry box file name.

SELECT FILE entry box: For uploading, it is necessary to select a file to be uploaded to display the name in this entry box beforehand. Without a file name in this entry box, uploading will result in an error.
If the attributes (e.g., PD4, FN4, EX4, PD3, FN3, EX3, and data file extensions) of the selected file are different from those specified in the DIR/FILE entry Box, an error will result.

If No Upload Files Exist

If no file exists in the BHT when Uploading by FTP is selected, the message shown displays as shown on the right.



Press the **C** key to return to the FTP MENU screen.

FTP Download/Upload Messages

When the BHT is uploading or downloading files by FTP, the following messages will appear at the bottom of the screen:

Aborted.	:	Uploading or downloading has been interrupted.
Connection error	:	The communication pathway is disconnected.
Device error	:	Failed to open a device.
Downloading	:	Downloading starts.
Download failed	:	Downloading has ended abnormally.
Download finished	:	Downloading has ended normally.
File broken!	:	The file being uploaded is corrupt.
File not found!	:	No file is found when downloading.
File not selected	:	No file has been selected.
File type mismatch!	:	When uploading, the attributes of the file selected in the SELECT FILE entry box are different from those in the DIR/FILE entry box.
FTP error	:	An error has occurred during execution of an FTP command.
FTP opened	:	Connection has been established by FTP.
Illegal text format!	:	The format of the received text is illegal.
Opening device	:	Opening a device.
Out of memory!	:	The memory is insufficient for storing files to be downloaded.
Out of range!	:	The specified parameter(s) is out of the allowable range.
Parameter error!	:	When downloading, the record length and/or field length specified in the FIELDS entry box exceed 255.
Program file error!	:	The received program file is illegal.
Routing TCP/IP	:	Connecting to the TCP/IP communications pathway.
Syntax error!	:	A syntax error has occurred.
TCP/IP error	:	Failed to connect to the TCP/IP communication pathway.
TCP socket error	:	An error occurred in the TCP layer during execution of an FTP command.
Too many files!	:	The current download will exceed the allowable number of files in the memory.
Uploading	:	Uploading starts.
Upload failed	:	Uploading has ended abnormally.
Upload finished	:	Uploading has ended normally.

Response Messages from the FTP server

The messages that FTP servers send during and after FTP operations vary, but servers all use the same reply codes as listed below.

110 : Restart marker reply
120 : Service ready in approx. nnn minutes.
125 : Data connection has been established. Start transferring.
150 : File status okay: establishing data connection.
200 : Command okay
202 : No response to this command. Not required at this site.
211 : System status, or system help reply
212 : Directory status
213 : File status
214 : Help message
215 : NAME system type
220 : Service ready for new users.
221 : Service closing control connection.
225 : Data connection established: No transfer in progress.
226 : Closing data connection.
227 : Entering Passive Mode.
230 : User Logged in. Proceed.
250 : Requested file process completed normally.
257 : “PATHNAME” created.
331 : User name okay. Password required.
332 : Login account required.
350 : Requested file process awaiting further information.
421 : Service not available. Closing control connection.
425 : Unable to establish data connection.
426 : Connection closed: transfer aborted.
450 : Requested file action not taken.
451 : Requested action aborted: processing local error.
452 : Requested action not taken.
500 : Syntax error; command not recognized.
501 : Syntax error in parameters or arguments.
502 : Command not supported.
503 : Incorrect command sequence
504 : Command parameter not supported.
530 : Not logged in.
532 : File storage account required.
550 : Requested action not taken.
551 : Requested action aborted: page type unknown.
552 : Requested file processing aborted.
553 : Requested action not taken.

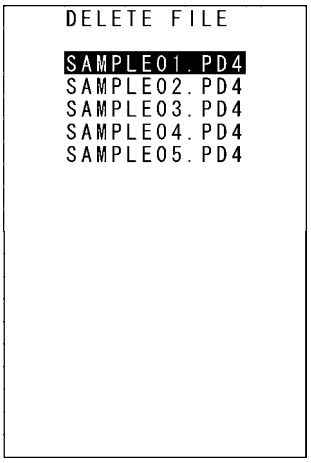
4.5.9 Deleting Program/Data Files (DELETE FILE Menu)

Delete program files or data files stored in the FLASH ROM.

Use the following procedure to delete files.

1. Press the **0** key while holding down the **SF** key at the SYSTEM MENU.

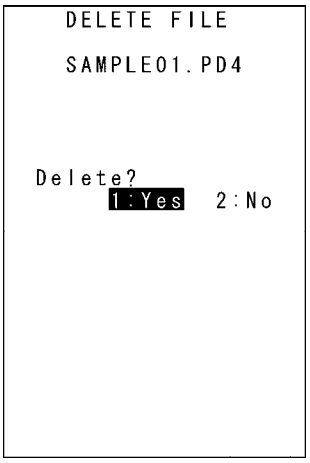
The DELETE FILE menu screen displays as shown on the right.
Press the **C** key to return to the SYSTEM MENU.



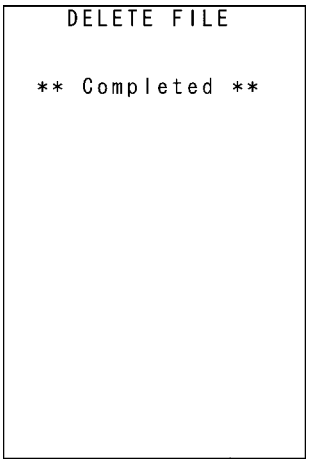
2. Use the cursor keys ([▲] [▼]) to highlight the program to be deleted.

3. Press the **ENT** key.

The screen displays as shown on the right.

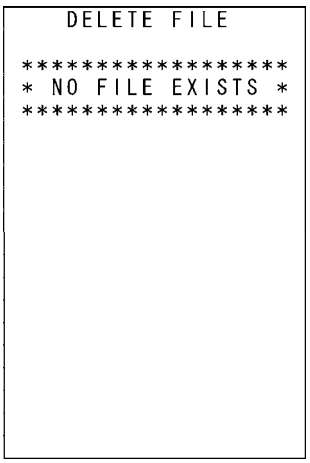


To delete files:
Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: Yes] and then press the **ENT** key.
The selected file is deleted and the screen displays as shown on the right.
Press the **C** key to return to the DELETE FILE menu.



To cancel:
Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: No] and then press the **ENT** key.
The screen returns to the DELETE FILE menu.

The screen displays as shown on the right if no files exist.
Press the **C** key to return to the SYSTEM MENU.



4.5.10 Deleting Font Files (DELETE FILE Menu)

Delete font files stored in the FLASH ROM.
If there is insufficient user area, by deleting font files, a user area equal to the size of the deleted font files can be secured.

Not displaying Japanese fonts at the user program:
All font files can be deleted.

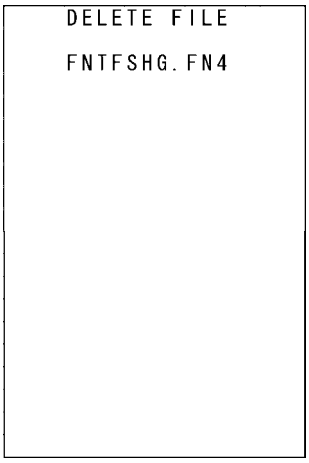
Using only 16 dots or 12 dots at the user program:
Font files that are not used can be deleted.

When deleting font files, upload the font files to the host computer an so on to ensure that they are backed up.
Refer to section “4.5.3 Uploading Files (UPLOAD menu)” for details of uploading.

Use the following procedure to delete font files.

1. Press the **2** key while holding down the **SF** key at the SYSTEM MENU.

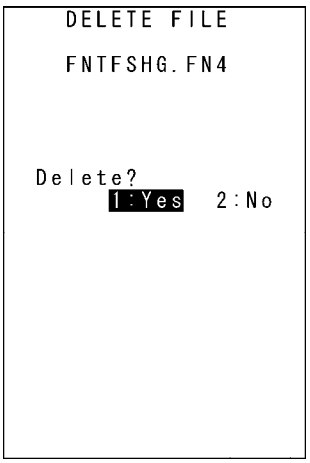
The DELETE FILE menu screen displays as shown on the right.
Press the **C** key to return to the SYSTEM MENU.



2. Use the cursor keys ([▲] [▼]) to highlight the font file to be deleted.

3. Press the **ENT** key.

The screen displays as shown on the right.

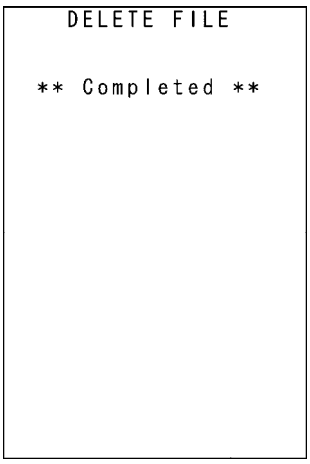


To delete font files:

Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: Yes] and then press the **ENT** key.

The selected file is deleted and the screen displays as shown on the right.

Press the **C** key to return to the DELETE FILE menu.



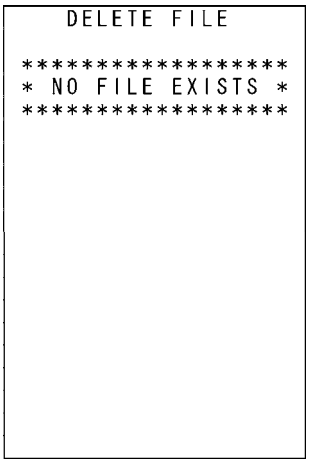
To cancel:

Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: No] and then press the **ENT** key.

The screen returns to the DELETE FILE menu.

The screen displays as shown on the right if no files exist.

Press the **C** key to return to the SYSTEM MENU.



4.5.11 Downloading/Uploading the BHT System Parameter File (SYSTEM PARAMETER Menu)

The system parameter file (file name: "_BHT.SYS") is a file containing settings such as values, LCD contrast and beeper volume set at section "4.5.5 Setting environment Settings".
The same settings can be set at another BHT by copying the system parameter file to that BHT.

Copying the System Parameter File

(1) Upload the system parameter file to the host computer and so on.
(2) Download the uploaded system parameter file at another BHT.

- Supplement - The system parameter file can also be copied directly between two BHT units by opening their respective UPLOAD and DOWNLOAD menus.
Refer to section "4.5.4 Copying Files between 2 BHT Units" for details of the copy method.

◆ Uploading the System Parameter File

Create a system parameter file based on the current setting values and upload it to the host computer and so on. After uploading, delete the created system parameter file.

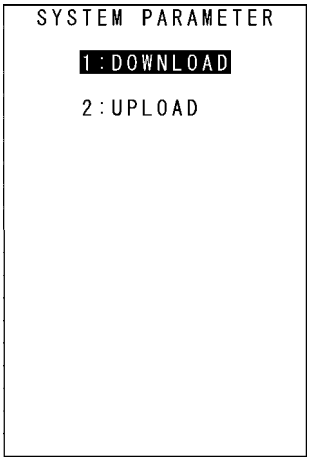
◆ Downloading the System Parameter File

Receive the system parameter file from the host computer and so on to which it was backed up, and after setting the stored values, delete the received system parameter file.

The communication parameters, communication protocol, and interface set at "[5] Setting the communication environment" in section "4.5.5 System Environment Settings" are used when uploading and downloading.
Use the following procedure to download and upload the system parameter file.

1. Press the **3** key while holding down the **SF** key at the SYSTEM MENU.

The SYSTEM PARAMETER menu screen displays as shown on the right.



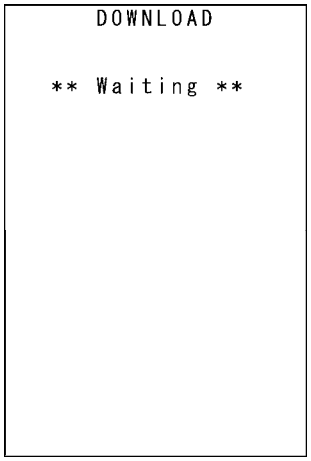
[1: Download]:
Downloads the BHT system parameter file to the BHT user area.
[2: UPLOAD]:
Uploads the BHT system parameter file stored in the BHT.

Refer to the following section for details of the above items.
Press the **C** key to return to the SYSTEM MENU.

[1] Downloading the BHT system parameter file

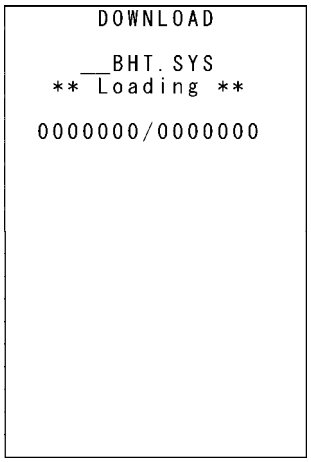
1. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: DOWNLOAD] and then press the **ENT** key.

The screen displays as shown on the right indicating that the BHT is waiting for the system parameter file to be downloaded.



2. While the download is in progress, the screen displays as shown on the right indicating the file name and the number of received records/the total number of records.

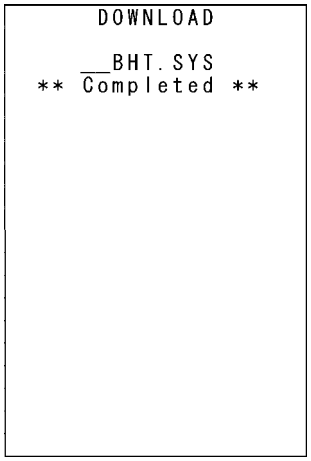
Press the **C** key to abort the download and return to the SYSTEM PARAMETER menu.



3. Upon completion of downloading, the BHT displays the screen shown on the right and beeps once.

Press the **C** key to return to the SYSTEM PARAMETER menu.

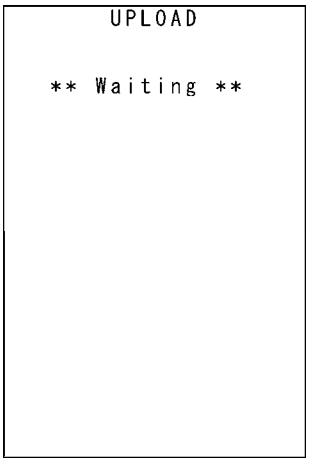
The beeper sounds three times if an error occurs during downloading, and an error screen displays.
Refer to “Chapter 7 Error Messages” - “7.2 System Mode Errors” and remedy the error.



[2] Uploading the BHT system parameter file

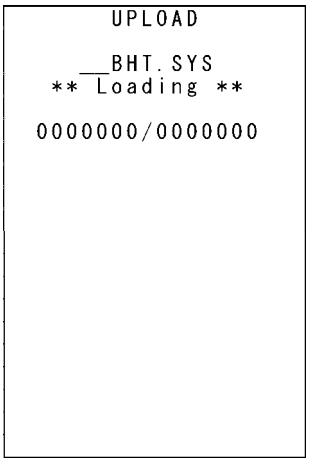
1. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: UPLOAD] and then press the **ENT** key.

The screen displays as shown on the right indicating that the BHT is waiting for the system parameter file to be uploaded.



2. While the upload is in progress, the screen displays as shown on the right indicating the file name and the number of sent records/the total number of records.

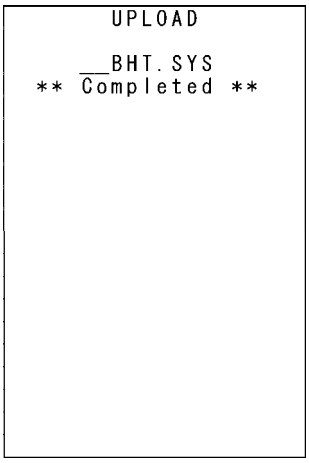
Press the **C** key to abort the upload and return to the SYSTEM PARAMETER menu.



3. Upon completion of uploading, the BHT displays the screen shown on the right and beeps once.

Press the **C** key to return to the SYSTEM PARAMETER menu.

The beeper sounds three times if an error occurs during uploading, and an error screen displays.
Refer to “Chapter 7 Error Messages” - “7.2 System Mode Errors” and remedy the error.

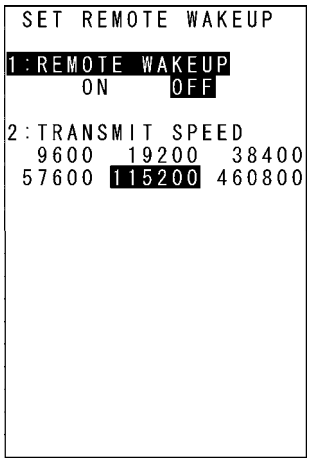


4.5.12 Setting the Remote Wake-up (SET REMOTE WAKEUP Menu)

Use the following procedure to perform remote wake-up settings.

1. Press the **4** key while holding down the **SF** key at the SYSTEM MENU.

The SET REMOTE WAKEUP menu displays as shown on the right.



[1: REMOTE WAKEUP]:
Enables or disables remote wake-up.
[2:TRANSMIT SPEED]:
Sets the transmission speed for remote wake-up.

Press the **C** key to return to the SYSTEM MENU.

2. Use the cursor keys ([▲] [▼]) or numerical keys ([1] [2]) to highlight the item to be set.

3. Highlight the settings with the cursor keys ([◄] [►]) and press the **ENT** key.

Press the **C** key to return to the SYSTEM MENU.

4.5.13 Downloading/Uploading the System Message File (SYSTEM MESSAGE Menu)

The system message file is a file (file name: "_B60MSG.FN4") used by the system to display messages such as "shutdown in progress. Do not remove the battery." or "Charge the battery!".

Downloading/Uploading the System Message File

(1) Upload the system message file to the host computer and so on.
(2) Download the uploaded system message file at another BHT.

◆ Uploading the System Message File

Create a system message file based on the current system message settings and upload it to the host computer and so on. After uploading, delete the created system message file.

◆ Downloading the system message file

Receive the system message file from the host computer and so on to which it was backed up, and after setting the stored system messages, delete the received system message file.

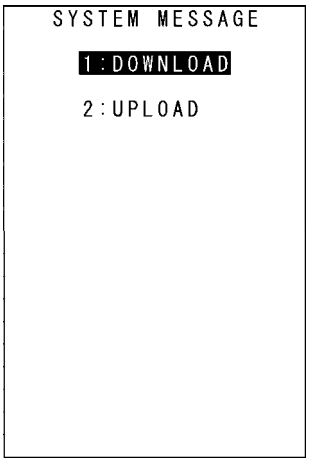
The communication parameters, communication protocol, and interface set at "[5] Setting the communication environment" in section "4.5.5 System Environment Settings" are used when uploading and downloading.

- Supplement - System messages are normally set when the BHT is shipped from the factory, and therefore operation at this menu is unnecessary.

Use the following procedure to download and upload the system message file.

1. Press the **6** key while holding down the **SF** key at the SYSTEM MENU.

The SYSTEM MESSAGE menu displays as shown on the right.



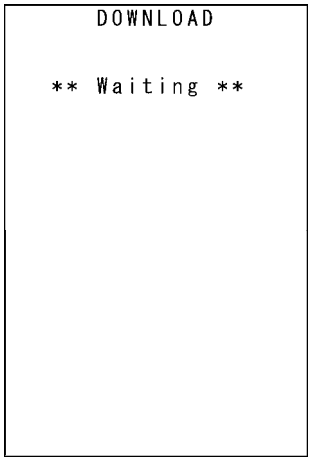
[1: Download]:
Downloads the system message file.
[2: UPLOAD]:
Uploads the system message file.

Refer to the following section for details of the above items.
Press the **C** key to return to the SYSTEM MENU.

[1] Downloading the system message file

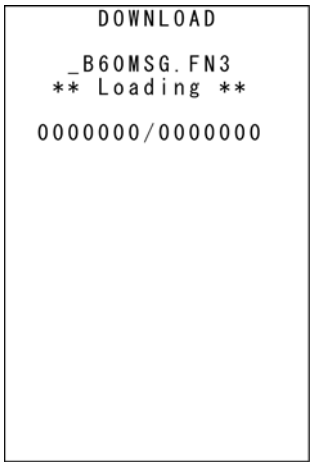
1. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: DOWNLOAD] and then press the **ENT** key.

The screen displays as shown on the right indicating that the BHT is waiting for the system message file to be downloaded.



2. While the download is in progress, the screen displays as shown on the right indicating the file name and the number of received records/the total number of records.

Press the **C** key to abort the download and return to the SYSTEM MESSAGE menu.



3. Upon completion of downloading, the BHT displays the screen shown on the right and beeps once.

Press the **C** key to return to the SYSTEM PARAMETER menu.

The beeper sounds three times if an error occurs during downloading, and an error screen displays.
Refer to “Chapter 7 Error Messages” - “7.2 System Mode Errors” and remedy the error.

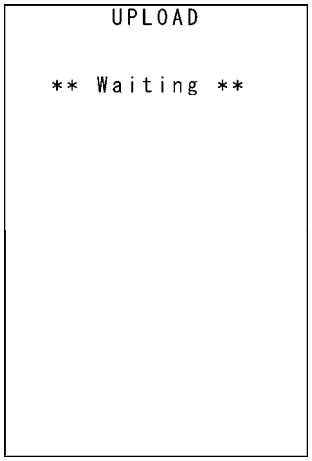
- Point - When downloading the system message file, the BHT creates a temporary file named “_B60MSG.FN3” in the user area. An error will therefore occur if there is insufficient space in the user area to create the temporary file.

The created temporary file will automatically be deleted after downloading is complete.

[2] Uploading the system message file

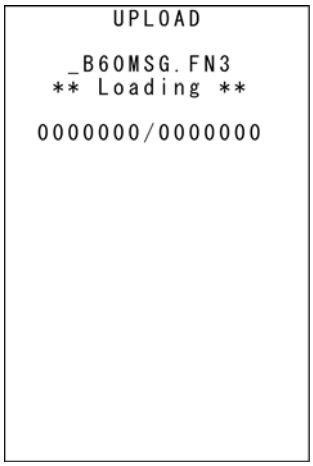
1. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: UPLOAD] and then press the **ENT** key.

The screen displays as shown on the right indicating that the BHT is waiting for the system message file to be uploaded.



2. While the upload is in progress, the screen displays as shown on the right indicating the file name and the number of sent records/the total number of records.

Press the **C** key to abort the upload and return to the SYSTEM MESSAGE menu.



3. Upon completion of uploading, the BHT displays the screen shown on the right and beeps once.

Press the **C** key to return to the SYSTEM PARAMETER menu.

The beeper sounds three times if an error occurs during uploading, and an error screen displays.
Refer to “Chapter 7 Error Messages” - “7.2 System Mode Errors” and remedy the error.

- Point - When uploading the system message file, the BHT creates a temporary file named “_B60MSG.FN3” in the user area. An error will therefore occur if there is insufficient space in the user area to create the temporary file.

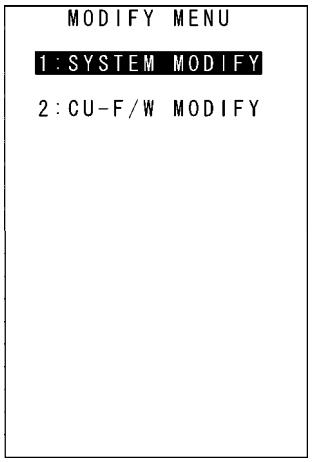
The created temporary file will automatically be deleted after uploading is complete.

4.5.14 Updating the System (MODIFY MENU)

Use the following procedure to update the system.

1. Press the dot key while holding down the **SF** key at the SYSTEM MENU.

The MODIFY MENU screen displays as shown on the right.



[1: SYSTEM MODIFY]: Updates the BHT system.
[2: CU-F/W MODIFY]: Updates the CU-611 system.

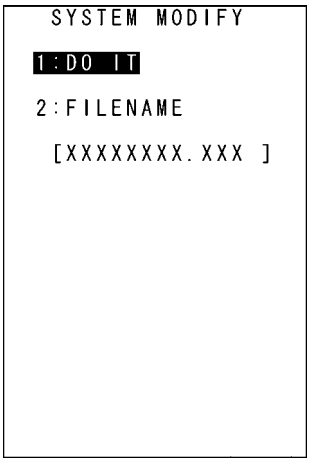
Refer to the following section for details of the above items.
Press the **C** key to return to the SYSTEM MENU.

[1] Updating the BHT system

Update the BHT system after downloading the BHT system update file.
(Refer to section “4.2.1 Updating the BHT System” for details.)

1. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: SYSTEM MODIFY] and then press the **ENT** key.

The screen displays as shown on the right.
If the downloaded BHT update file name differs from this file name, specify the correct file name using the procedure on the following page.

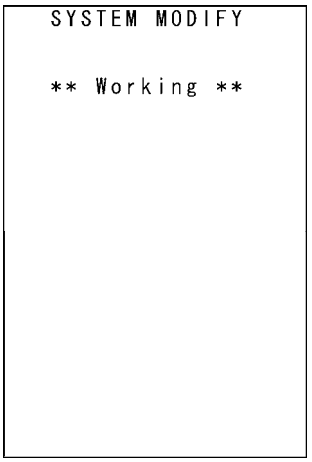


[1: DO IT]:
Updates the BHT system.
[2: FILENAME]:
Displays the filename to be used for updating the BHT system.

Press the **C** key to return to the SYSTEM PARAMETER menu.

2. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: DO IT] and then press the **ENT** key.

The screen shown displays as shown on the right and the BHT system is updated.
Upon completion of the update, the BHT power turns OFF automatically.



◆ When the Displayed File Name Differs from the BHT System Update File

If the name of the file displayed at [2: FILENAME] differs from the name of the BHT system update file to be used for updating the system, enter the correct file name.

1. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: FILENAME] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

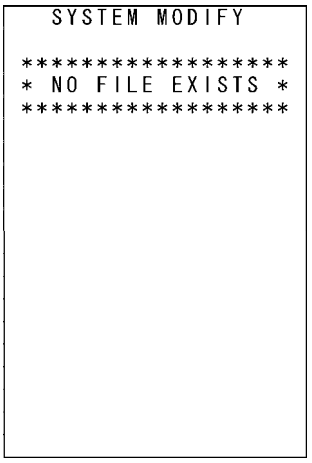
2. Use the numerical keys and dot key to enter the correct file name.

Press the **SF** and the **BS** key to change the entry mode (numeric entry (no guidance display) and alphabet entry).
To delete a single character, press the **BS** key.
Press the **C** key to delete all entries made.

3. Press the **ENT** key to set the entered file name.

◆ If the System Update File Does not Exist when Updating the BHT System

The screen displays as shown on the right If the system update file does not exist when updating the BHT system.
Download the BHT system update file and update the BHT system again.
Press the **C** key to return to the MODIFY MENU.



[2] Updating the CU-611 System

Update the CU-611 System after downloading the CU-611 system update file.
(Refer to section "4.2.2 CU-611 System Update" for details.)

1. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: CU-F/W MODIFY] and then press the **ENT** key

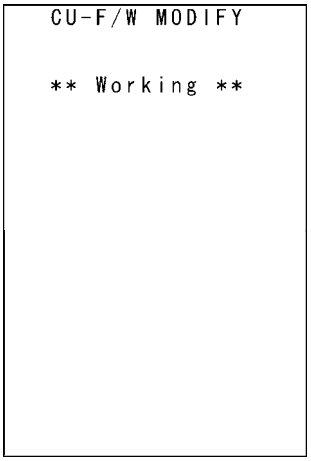
CU-611the MODIFY MENU screen displays as shown on the right.

[1: DO IT]:
Updates the CU-611 system.
[2: FILENAME]:
Displays the filename to be used for updating the CU-611 system.

Press the **C** key to return to the SYSTEM PARAMETER menu.

2. Use the cursor keys ([▲] [▼]) or numerical key ([1]) to highlight [1: DO IT] and then press the **ENT** key.

The screen shown displays as shown on the right and the CU-611 system is updated.
The screen displays as shown on the right upon completion of the update.



Press the **C** key to return to the CU-F/W MODIFY menu.

◆ When the Displayed File Name Differs from the CU-611 System Update File

If the name of the file displayed at [2: FILENAME] differs from the name of the CU-611 system update file to be used for updating the system, enter the correct file name.

1. Use the cursor keys ([▲] [▼]) or numerical key ([2]) to highlight [2: FILENAME] and then press the **ENT** key.

The mode changes to entry mode and the cursor displays.

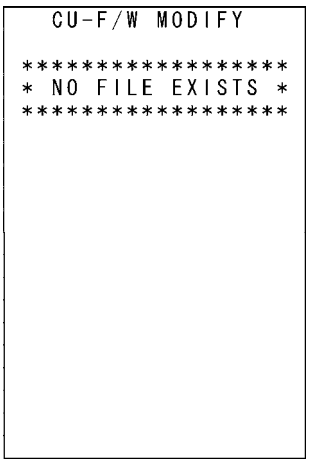
2. Use the numerical keys and dot key to enter the correct file name.

Press the **SF** and the **BS** key to change the entry mode (numeric entry (with no guidance display) and alphabet entry).
To delete a single character, press the **BS** key.
Press the **C** key to delete all entries made.

3. Press the **ENT** key to set the entered file name.

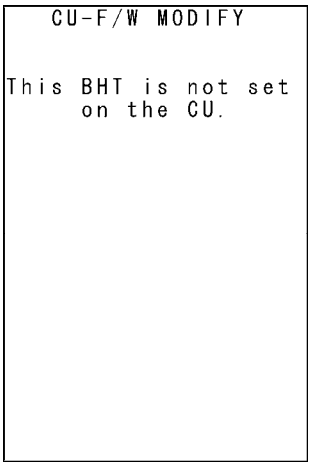
◆ If the System Update File Does not Exist when Updating the CU-611 System

The screen displays as shown on the right if the system update file does not exist when updating the CU-611 system.
Download the CU-611 system update file and update the CU-611 system again.
Press the **C** key to return to the CU-F/W MODIFY menu.



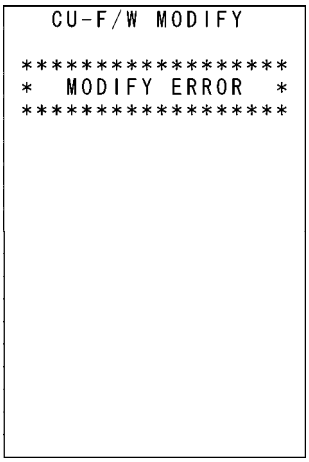
◆ If the BHT Has not been Set on the CU-611 when Updating the CU-611 System

The screen displays as shown on the right if the BHT has not been set on the CU-611 when updating the CU-611 system.
Set the BHT on the CU-611 and try again.
Press the **C** key to return to the CU-F/W MODIFY menu.



◆ If the CU-611 System Update Fails

The screen displays as shown on the right if the CU-611 system update fails.
Ensure that the BHT has been set properly on the CU-611 and then try again.
Press the **C** key to return to the CU-F/W MODIFY menu.



Chapter 5
Communication

This chapter describes technical information relating to the connector communication (RS-232C interface), IrDA communication, and wireless communication functions with which the BHT is equipped.

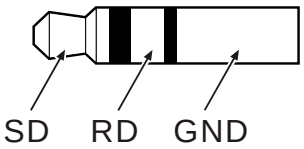
5.1 Connector Interface(RS-232C Interface)

The BHT-604Q is equipped with a connector interface used to communicate with other devices.

5.1.1 Interface Connector and Pin Assignment

Connector interface : JC-25-J-3A (ø2.5 mm stereo mini jack)

Connector pin: JC-25-P3 (ø2.5 mm stereo mini plug)



Signal Name	Function	Signal Input/Output BHT External device
SD	Send data	→
RD	Receive data	←
SG	Signal ground	—

Signal Voltage Input/Output Level

Signal	Input Voltage Threshold (RD)	Output Voltage Threshold (SD)
0	3V min.	5V min.
1	-3V max	-5V max.

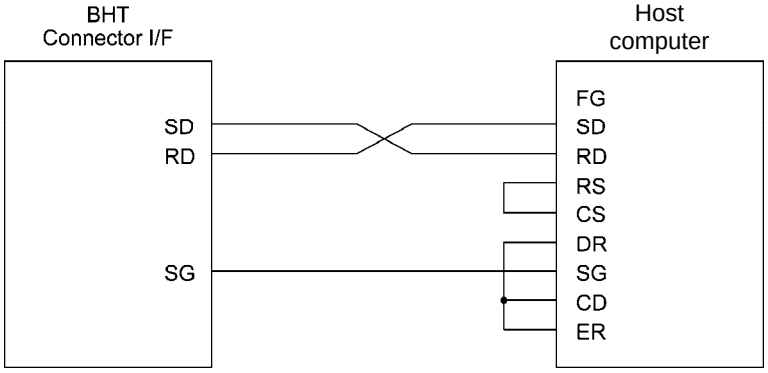
– Note –

- The BHT connector port is not designed for frequent cable insertion and removal. Repeatedly inserting and removing the cable more than once a day will result in a shortening of the connector port lifetime, and therefore IrDA communication (CU-600 Series, IrDA device etc.) should normally be used.
- Allow the specified signals only to enter the connector interface port. Entry of other signals will result in a failure or malfunction of the BHT.

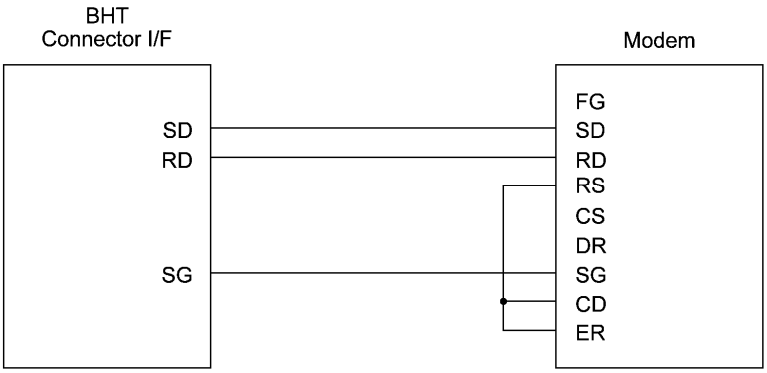
5.1.2 Interface Cable Connection

Connect the BHT directly to a host computer, a modem, or a printer with a connector interface cable as illustrated below.

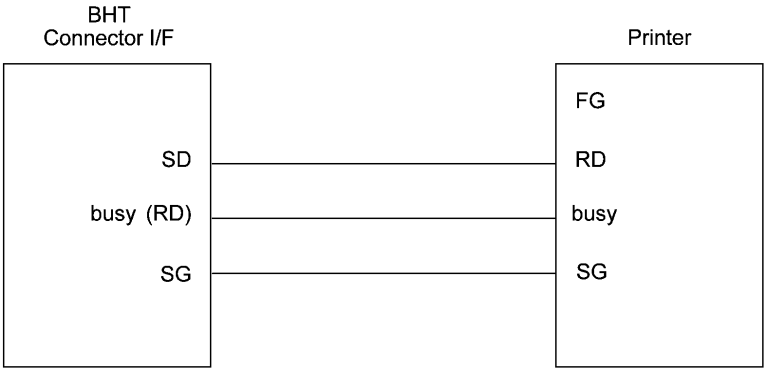
[Ex.1] Cable Connection between BHT and Host computer



[Ex.2] Cable Connection between BHT and Modem



[Ex.3] Cable Connection between BHT and Printer



5.2 IrDA Communication

The BHT has a built-in IrDA communication device that enables wireless transfer of programs and data both between the BHT and the host computer and between BHTs without the need for a cable.
IrDA communication offers the following benefits over other forms of communication.

- Communication without the need for a cable
- High communication speed
- Freedom from regulations and licenses that differ from country to country when using wireless devices

Communication is performed by arranging the BHT and other IrDA-compliant devices with their IrDA (infrared) interface ports facing one another. The communication distance and angle and so on will differ depending on the devices used. Refer to the instructions given in the manuals provided with such equipment.

– Point – When communication is not possible, move the respective devices closer together or change the angle of the IrDA interface ports and try again.

5.2.1 IrDA Communication Port Transmission Speed

Communicating Device	Transmission Speed
BHT-600 Series	9.6、19.2、38.4、57.6、115.2、460.8kbps，4Mbps
CU-601	9.6、19.2、38.4、57.6、115.2kbps
CU-621	115.2、460.8kbps
CU-611	4Mbps

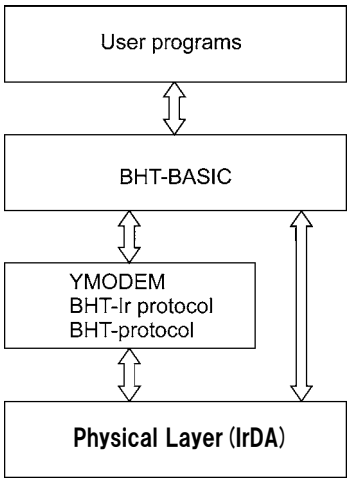
5.2.2 BHT Hardware (Physical Layer) and Communication Protocols

◆ BHT Hardware (Physical Layer) (Except Baud Rate: 460.8 kbps)

The BHT complies with IrDA Ver1.3 Low Power physical layer compliant by IrDA (Infrared Data Association). The maximum transmission distance is 0.15 m.

◆ BHT Communication Protocols (Max. Baud Rate: 115.2 kbps)

The BHT supports Ymodem, BHT-Ir protocol, and BHT protocol.



5.3 Basic Communication Specifications and Parameters

5.3.1 Basic Communication Specifications

The table below lists communication specifications when the BHT exchanges data with the host computer using the IrDA interface or connector interface.

	IrDA Interface	Connector Interface
Synchronization	Start-stop	
Transmission speed	9600, 19200, 38400, 57600, 115200, 460800(Note1) or 4M(Note2) bps	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
Transmission code	ASCII 8-bit code	ASCII 7-bit or 8-bit code
Transmission bit order	LSB (Least significant bit) first	
Vertical parity	None	Even, odd, or none

Note1: 460800 bps is only possible when communicating from one BHT-604Q unit to another or with the CU-621.

Note2: 4 Mbps is only possible for communication with the dedicated CU-611 unit.

◆ Synchronization

For accurate data transaction, it is necessary to synchronize transmission between the sender and receiver. To achieve this, the bit order and position, character length, and beginning and end of the character to be transmitted must be defined beforehand.

Start-stop synchronization is an asynchronous system that synchronizes each character as a unit; that is, it externally adds start and stop bits to the leading and trailing bit positions of the character to be transmitted, respectively. Data sampling is commenced upon receiving the start bit, and when the stop bit is received, sampling is completed and communication ceased. The number of stop bits can be selected (1 or 2 bits).

◆ Transmission speed

This is the maximum number of bits that can be transmitted per second, and is expressed in bps (bits per second).

◆ IrDA Interface Communication Range

The maximum effective range of the IrDA interface is 15 cm, with the IR beam within 10° angle of divergence.

To communicate via the CU-600, put the BHT on the CU-600.

◆ IrDA Interface Transmission/Receipt Switching Time

The IrDA interface must satisfy the following conditions for transmission and receipt switching.

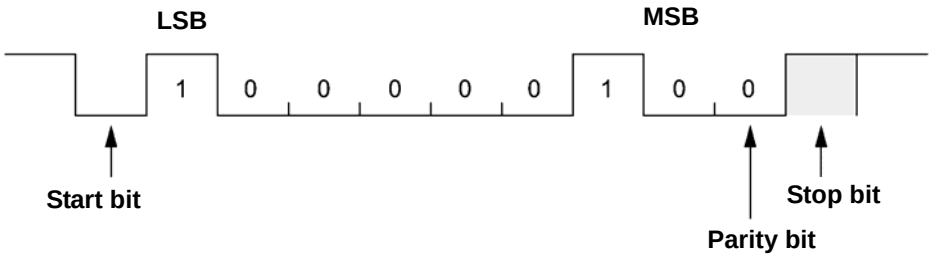
(1) The IrDA interface must be ready to receive within 10 ms following the completion of transmission.

(2) The IrDA interface must commence transmission after waiting at least 10 ms following the completion of receipt.

◆ Transmission code and Transmission bit order

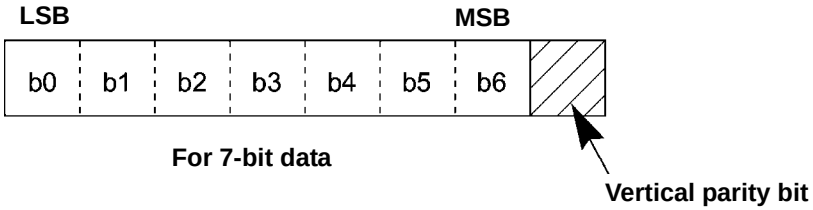
- All characters should be coded to 7 or 8-bit code for data transmission.
- The standard code at the BHT is ASCII 7-bit or 8-bit code.
- The transmission bit order is LSB (Least significant bit) first.

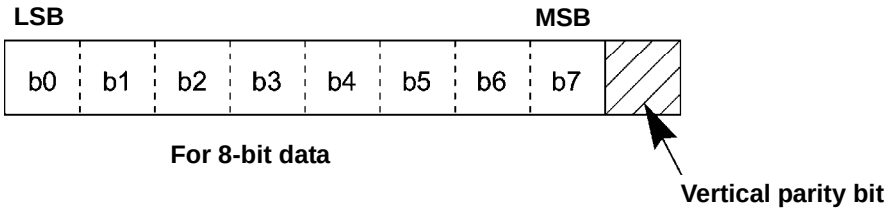
The example below is for the transmission of an ASCII 8-bit code A (41h or 01000001b, b: binary) with even vertical parity and a single bit each for the start and stop bits.



◆ Vertical parity

A vertical parity bit is a redundant bit that is added to every character transmitted in order to check that data has been transmitted accurately. The parity bit should be set to either “1” or “0” depending upon the parity parameter setting to make the number of set bits in the character even or odd. The receiver counts the number of set bits in the transmitted character code to make sure that it has the specified number (even or odd) of set bits.
The vertical parity bit is positioned immediately after the MSB (Most significant bit) as shown below.





5.3.2 Communications Parameters

In System Mode and user programs written in BHT-BASIC, you can set the communications parameters listed below.

Port	IrDA Interface	Connector Interface
Transmission speed	9600, 19200, 38400, 57600, 115200, 460800(Note1) or 4M(Note2) bps	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200 bps
Character length	8 bits	7 or 8 bits
Vertical parity	None	Even, odd, or none
Stop bit length	1 bit	1 or 2 bits

Note1: 460800 bps is only possible when communicating from one BHT-604Q unit to another or with the CU-621.

Note2: 4 Mbps is only possible for communication with the dedicated CU-611 unit.

◆ System Mode

Refer to “Chapter 4 System Operation” – “4.4.3 SYSTEM MENU Configuration.”

◆ BHT-BASIC

To set the transmission speed, character length, vertical parity, and stop bit length (For the IrDA interface, set the transmission speed only), use the OPEN “COM:” statement in BHT-BASIC.

OPEN “COM: ... ”	Opens the interface port selected in System Mode.
OPEN “COM1: ...”	Opens the IrDA interface port for data transmission, irrespective of the setting in System Mode.
OPEN “COM2: ... ”	Opens the direct-connect interface port for data transmission, irrespective of the setting in System Mode.

Note that it is impossible to open both the IrDA and connector interface ports concurrently.
Through the interface port opened by the OPEN ”COM:” statement, the *XFILE* statement transmits a designated file.

Chapter 6
Maintenance

This chapter describes battery cartridge and daily procedures for taking care of the BHT and CU/CH.

6.1 Replacing the Battery Cartridge

6.1.1 Battery Cartridge Service Life

The battery cartridge is a consumable part and should be replaced after being charged approximately 300 times.

The performance of the battery cartridge's lithium-ion battery will deteriorate gradually with repeated charging, even during normal use. When the battery operation time becomes shorter even after charging for the specified length of time, replace the battery with a new one.

6.1.2 Battery Cartridge Replacement Method

1. Press the **power** key (⏻) to turn OFF the BHT power.

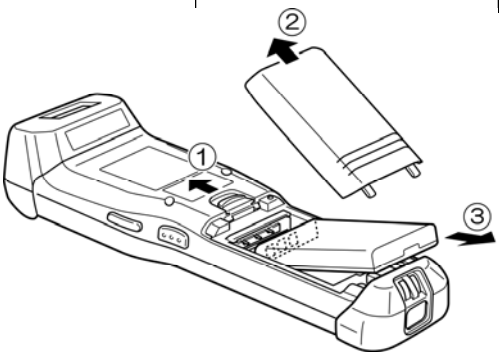
The screen displays as shown on the right.

```
Shutdown
in progress.

Do not remove the
battery.
```

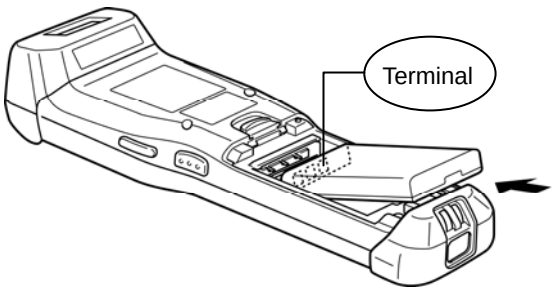
– Point – Do not remove the battery cartridge until the power turns OFF itself and the message on the screen given to the right is cleared.

2. Slide the battery lock (1) in the direction indicated by the arrow and remove the battery cover (2), and then remove the battery cartridge (3).



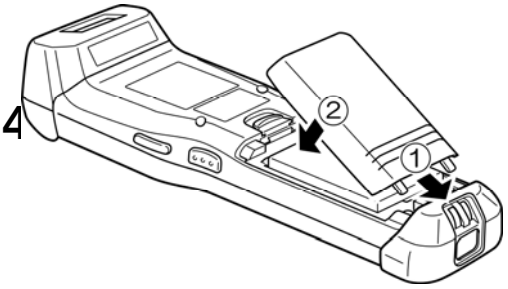
3. Insert a new battery cartridge in the direction shown by the arrow. Make sure that the battery cartridge is in the right orientation.

(Refer to "Chapter 2 BHT Preparation" – "2.2 Loading and Charging the Battery Cartridge".)



– Point – Do not use battery cartridges other than those specified by DENSO WAVE.

4 nsert the battery cover tab (1), and then close the battery cover (2) to lock the cover in position.



Battery Cartridge Recycling Request

- This product uses a lithium-ion battery that contains scarce, recyclable resources. We kindly ask for your cooperation in recycling to make sure reuse of these resources.

The crossed-out wheeled bin is applicable for EU member status only.

- Used battery cartridges must not be disposed of as combustibles.
- Contact your nearest rechargeable battery recycling centre or local sales office for information on disposal procedures.
- When disposing of used battery cartridges at your nearest recycle centre, cover the terminals with vinyl tape to insulate and protect from overheating or fire due to a short-circuit.
- Never disassemble battery cartridges.

– Note –

- Replace the battery cartridge promptly.
- Always turn the BHT power OFF before replacing the battery cartridge. Replace the depleted battery cartridge with a new one within three minutes to avoid data loss. Following replacement, turn ON the BHT power and check operation.
- The battery cartridge is charged using either a CU-601/611/621 communication unit (option) or CH-651/654/201A/704 battery charger (option). Refer to the respective User's Manual provided with each device for details of the charging method for the CH-651/654/201A/704.
- If a "Battery voltage has lowered." or "Replace or recharge the battery cartridge." message displays when impact is applied to the BHT, reboot the BHT and check the battery voltage level. The battery may not actually be depleted.

⚠ WARNING

Mishandling may result in battery cartridge overheating, smoke generation, blowout or combustion. Please read the following items prior to use.

- Never charge the battery cartridge in the vicinity of fire or under a scorching sun.
- Always use a dedicated charger to charge the battery cartridge.

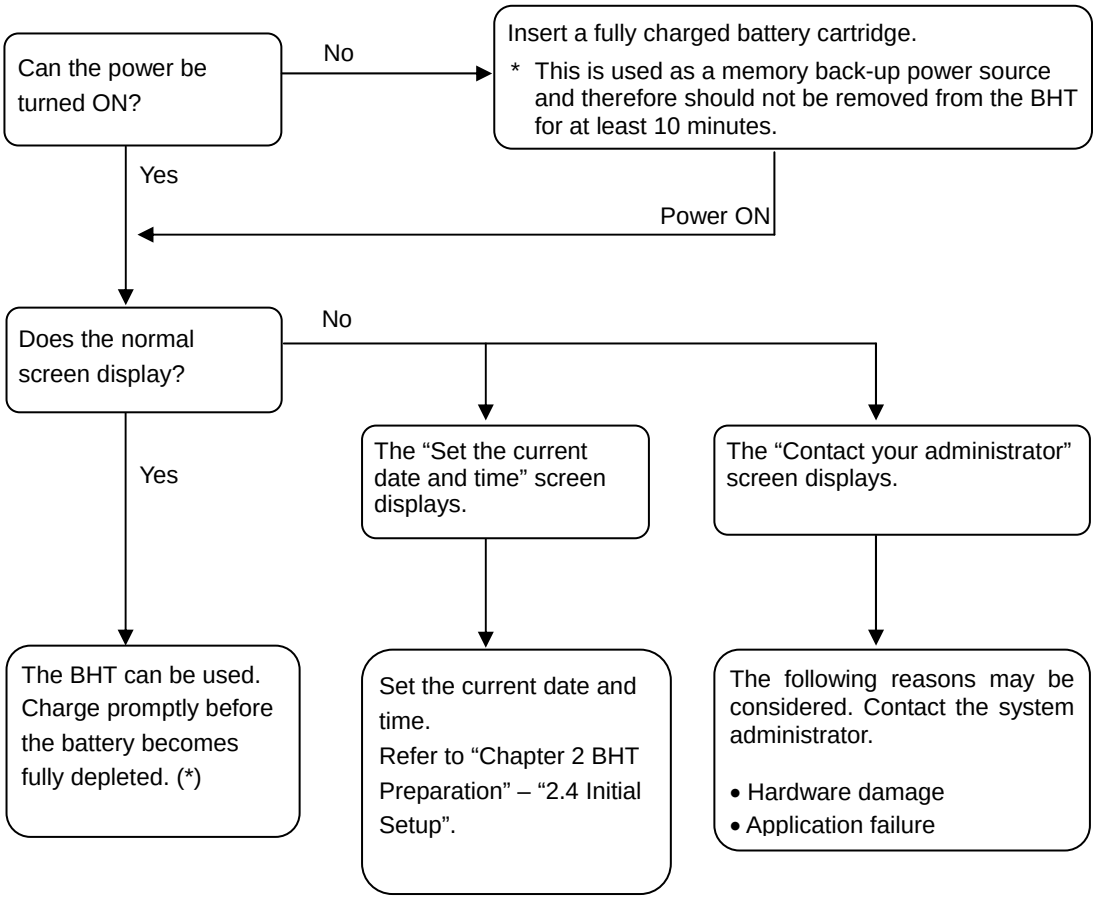
⚠ CAUTION

Mishandling may result in battery cartridge overheating, smoke generation, blowout or combustion. Please read the following item prior to use.

- Terminate charging if not completed even after the specified time has elapsed.

6.2 Using the BHT after Long Periods

Data stored in the BHT may be lost and the calendar clock may stop if the BHT is left unused for long periods of time. Take appropriate measures in accoRDance with the procedure below.



– Point – *: Files may become corrupt if left for a long period of time without replacing the battery cartridge.

6.3 Daily Maintenance

6.3.1 Proper Care of the BHT

Wipe any dirt from the BHT housing, charge terminals, and BHT or battery cartridge terminals with a dry, soft cloth.
Make sure to turn OFF the BHT before cleaning.

- Note -

- Never use substances such as benzene or alcohol, as this may cause the housing to be marred or paint to peel off.
- Never rub or strike the LCD screen with anything hard, as this may result in scratches on the screen or breakage.
- When cleaning the keypad, do not scrub the surface too hard or pull on the keys, as this may break the keys.
- If excessively dirty, wipe with a soft cloth that has been soaked in soapy water (always use neutral detergent) and wrung out thoroughly.

Any dirt or dust adhering to the red clear plate of the barcode reading window will adversely affect reading performance.
When using in dusty areas, perform periodic inspections to check whether any dust has accumulated on the clear plate of the barcode reading window, and if so, clean the plate as described below.

- First blow the dust away with an airbrush, and then gently wipe the plate with a cotton swab or similar soft object.
- If sand or hard particles have accumulated, rubbing the plate will result in scratches. Blow the particles away with an airbrush or wipe with a soft brush.

6.3.2 Proper Care of the CU/CH

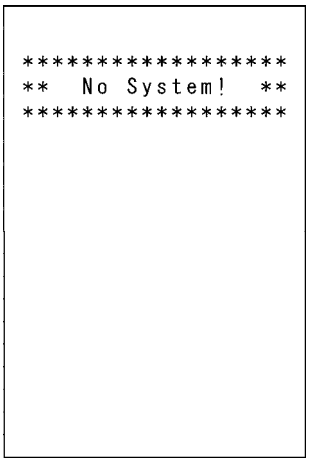
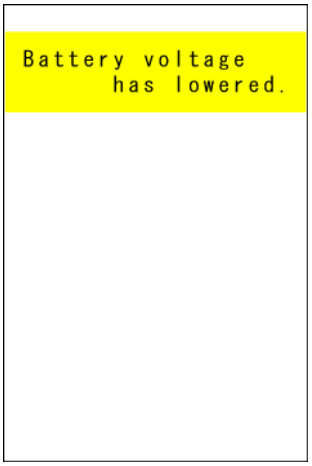
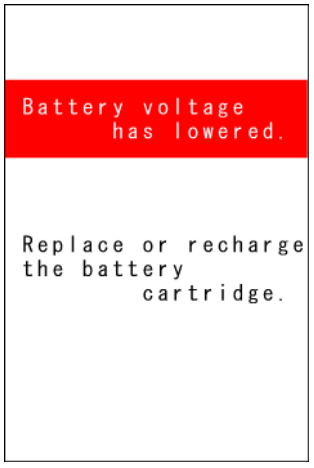
Wipe any dirt from the housing or charge terminals with a dry, soft cloth.
In the interests of safety, unplug the AC adapter from the socket when cleaning the CU or CH.

Chapter 7
Error Messages

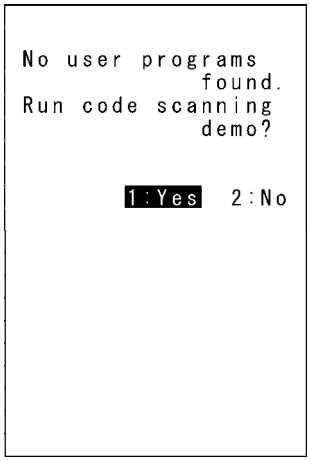
This chapter describes causes and countermeasures for error messages that display during BHT use.
About error messages during executing application program, refer to “Appendix A Error Codes and Error Messages of Programmer’s manual”.

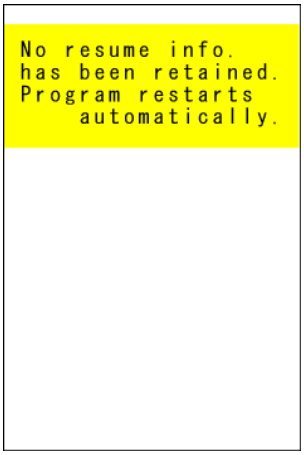
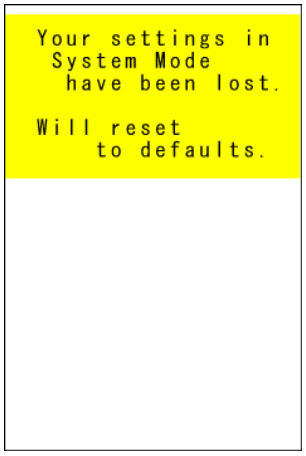
7.1 System Errors

The error messages that display on the screen and the causes and countermeasures to be taken if an error occurs when the power is turned ON or while running a program are shown below.

Message	BHT Response	Cause	Countermeasure
	If this error occurs, the BHT beeps five times and then turns itself off.	A System Program error has occurred.	Contact your system administrator.
	If low battery is detected, the BHT beeps three times. After that, it will resume previous regular operation.	The battery output level has dropped below a specified lower limit.	Replace or recharge the battery cartridge.
	If this error occurs, the BHT beeps five times and then turns itself off. Depending upon the battery level, the beeper may not sound five times.	The battery output level has lowered so that the BHT no longer operates.	Replace or recharge the battery cartridge.

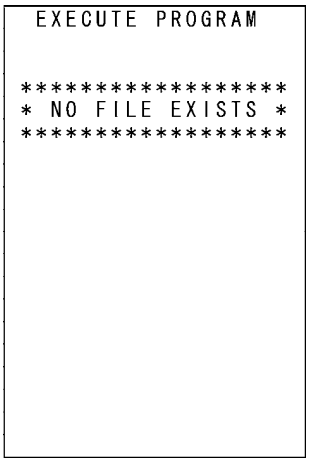
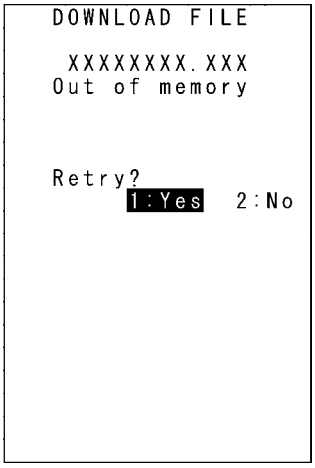
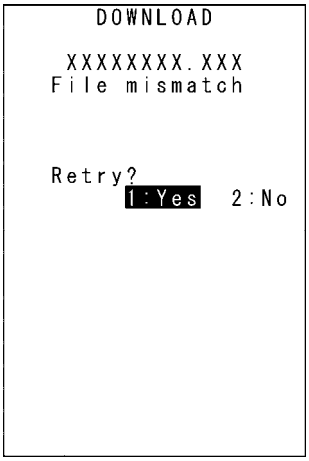
Message	BHT Response	Cause	Countermeasure
	The date and time settings screen displays, awaiting entry.	The calendar clock integrated in the BHT has stopped because: - the battery cartridge had been removed for a long time. - the battery cartridge had not been recharged for a long time.	Set the current date and time.(Refer to “Chapter 2 BHT Preparation” – “2.4 Initial Setup”)
	The message continues to display.	After shut down abnormally, the BHT has been left without the battery cartridge loaded, or with discharged battery cartridge loaded, so unsaved data was lost.	Contact your system administrator.
	If this error occurs, the BHT beeps five times.	During execution of System Program, the System Program has attempted to write onto the write-protected area of the memory. (xxxxxxxx: Error address)	Unload and reload the battery cartridge, then turn the BHT on. If this error occurs frequently, make a note of the displayed message and codes and contact your system administrator. Contact your system administrator.

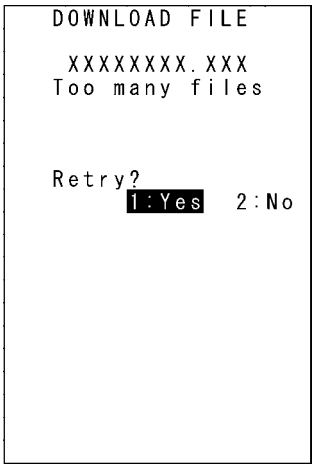
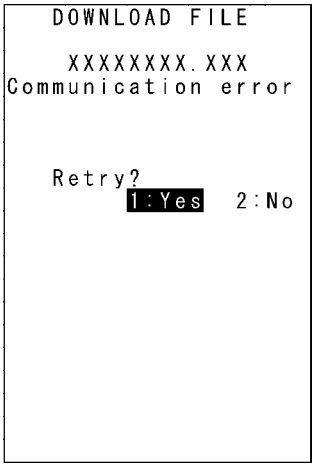
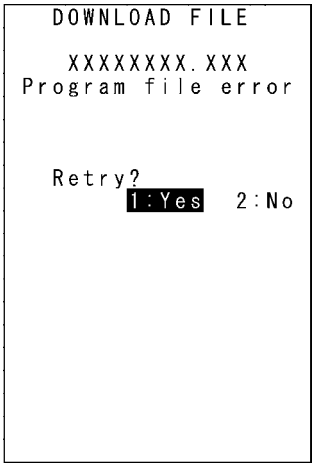
Message	BHT Response	Cause	Countermeasure
	If this error occurs, the BHT beeps five times.	During execution of System Program, the System Program has received an invalid command code. (xxxxxxxx: Error address)	Unload and reload the battery cartridge, then turn the BHT on. If this error occurs frequently, make a note of the displayed message and codes and contact your system administrator. Contact your system administrator.
	The message continues to display.	When the BHT is turned on, no user programs are found.	Contact your system administrator. You can run the code scanning demo without user programs. Pressing “1:Yes” runs the code scanning demo. Press the trigger switch to start the code scanning demo. Selecting “2:No” turns the power off.
	If this error occurs, the BHT beeps five times and then turns itself off.	Any of the hardware error, memory error and execution program error has occurred. (XXXX: Error code)	Turn the BHT on again. If this error occurs frequently, make a note of the displayed code and contact your system administrator.

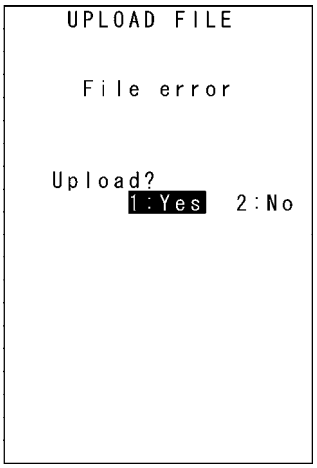
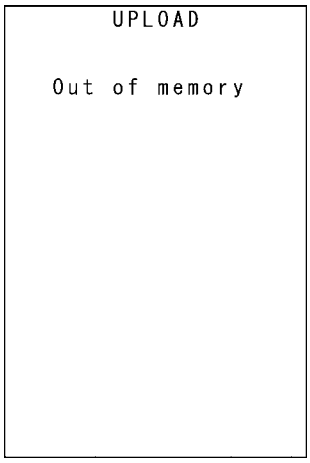
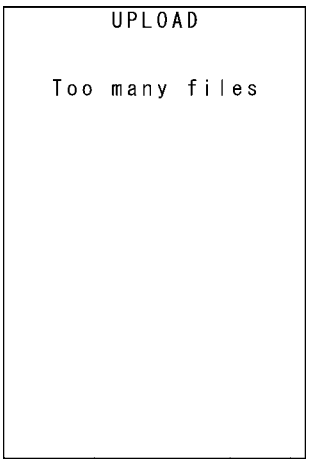
Message	BHT Response	Cause	Countermeasure
	The BHT displays this error message and automatically runs the execution program from the point of start-up.	Operation was terminated without turning OFF the power normally with the resume function set, and therefore resume info has been lost.	If this error occurs frequently, make a note of the displayed code and contact your system administrator.
	After displaying this error message, the BHT may start a user program other than the preset auto-start execution program or display the message “No execution program loaded.”	Your settings made in System Mode contain an error.	Contact your system administrator. (If this error occurs, the System Mode settings revert to the factory defaults.)
	If this error occurs, the BHT beeps five times.	An error has occurred during execution of System Program.	Unload and reload the battery cartridge, then turn the BHT on. If this error occurs frequently, contact your system administrator.

7.2 System Mode Errors

When error messages display while running System Mode, refer to the following table and take appropriate measures.

Message	Cause	Countermeasure
	You attempted to execute a user program in the EXECUTE PROGRAM menu, but no user program files had been stored in the memory.	Press the **C** key to return to the SYSTEM MENU, then download user programs.
	The memory is insufficient for storing files to be downloaded.	Press the **2** key to return to the SYSTEM MENU, then delete unnecessary files in the memory or decrease the size of the file to be downloaded.
	In the SYSTEM PARAMETER transfer menu, you attempted to download a file other than the BHT system parameter file. Or in the SYSTEM MESSAGE transfer menu, you attempted to download a file other than the system message file.	Check the file you attempted to download and then download the file in the appropriate menu (DOWNLOAD menu, SYSTEM PARAMETER transfer menu, or SYSTEM MESSAGE transfer menu).

Message	Cause	Countermeasure
	The current download will exceed the maximum allowable number of files (420 files) in the memory.	Press the **2** key to return to the SYSTEM MENU, then delete unnecessary files in the memory (or decrease the number of files to be downloaded if you attempted to download more than one file in the DOWNLOAD menu.)
	Downloading has failed. Uploading has failed.	To retry downloading/uploading, press the **1** key. To return to the SYSTEM MENU, press the **2** key. Check the interface port, communications parameters, and communications protocol in the SET SYSTEM menu or perform the communications test in the TEST menu.
	You attempted to download an invalid program file.	Check whether the program file you attempted to download is available to the BHT-600 model. If it is not available, download the appropriate program.

Message	Cause	Countermeasure
	The file you attempted to upload is damaged.	To upload the damaged file as is, press the **1** key.
	The memory is insufficient for setting up the BHT system parameter file or system message file to be uploaded.	Press the **C** key to return to the SYSTEM MENU and delete unnecessary files.
	The memory has already contained 420 files, so the BHT system parameter file or system message file cannot be set up.	Press the **C** key to return to the SYSTEM MENU and delete unnecessary files.

Chapter 8
Specifications

This chapter describes the BHT-604Q specifications.

8.1 BHT-604Q Specifications

8.1.1 Hardware Specifications

Power supply (main power):	Rechargeable lithium-ion battery cartridge (3.7 V DC)
Dimensions (W) x (L) x (H):	63 x 209 x 46 mm
Weight:	Approx. 270 g (including battery cartridge)
Ambient operating temperature	-5 to 50°C
Ambient operating humidity:	20 to 80% (with no dew condensation)
Ambient operating brightness:	20 to 10000 Lx Depth of field: 105mm, QR Code Ver.5 (37cells x 37 cells), Error-correcting level: M, Cell pitch 0.5mm, PCS value: 0.9 min., White reflection intensity: 85% min 500 to 3,000 Lx. Other conditions Refer to “8.1.2 Supported Code Types” for details
Controller:	CPU: 32-bit RISC Flash memory: 16MB
Keypad:	Magic keys: 6 Function keys: 16 Numerical keys etc.: 12
Display:	Type: Dot-matrix, TFT liquid crystal display (LCD) with backlight Formation: 240 dots wide by 320 dots high Display characters: (The following is an example)

Font size		Chars x Lines	Dots (W x H)
40-dot font	Full-width	6 x 8	40 x 40
	Half-width	12 x 8	20 x 40
30-dot font	Full-width	8 x 10	30 x 30
	Half-width	16 x 10	15 x 30
24-dot font	Full-width	10 x 13	24 x 24
	Half-width	20 x 13	12 x 24
16-dot font	Full-width	15 x 20	16 x 16
	Half-width	30 x 20	8 x 16

Calendar clock:	Year, month, day, hour, minute, and second Year: 2 digits Auto leap year correction up until 2099
Indicator LED:	Colors: Red, green and blue

(Note) Some of the pixels on the LCD may not illuminate or stay permanently illuminated. Furthermore, there may also be inconsistencies in color and brightness. None of these aspects represent an LCD defect.

Moreover, there will also be individual differences in visual quality in screens containing the above defects.

8.1.2 Supported Code Types

Reading Reference Position (See "8.1.3 Reading Performance") values.

QR code (Model 1, Model 2), Micro QR code

Code size	Cell pitch
QR code	
Max 109 cells × 119 cells（360° Skew）	0.25 mm
Max 81 cells × 81 cells（360° Skew） 117 cells × 117 cells	0.33 mm
Micro QR code	
Max 17 cells × 17 cells（360° Skew）	0.25 mm

PDF417

Digits/lines	Module dimensions
1 to 9 digits, 3 to 41 lines *1	0.25 mm min

*1 Does not include start/stop codes and left/right indicator

Micro PDF417

Digits/lines	Module dimensions
1 to 4 digits, 4 to 44 lines *2	0.25 mm min

*2 Does not include left, middle, and right Row address pattern

MaxiCode

Module size	Module pitch
30 (29) modules × 33 modules	0.88 mm

Data Matrix

Code size	Cell pitch
Max 96 cells × 96 cells（360° skew）	0.25 mm
Max 88 cells × 88 cells（360° skew） 120 cells × 120 cells	0.33 mm

COMPOSITE

Read digits	Module dimensions
RSS, EAN128, Universal product codes, PDF417, Micro PDF, all codes within limits	0.25 mm min

Barcodes

Supported Barcode Types	Bar Dimensions	Scan Magnification
Universal product codes		
EAN-13 (JAN-13)	0.26 to 0.50 mm	0.8 to 1.5 times
EAN-8 (JAN-8)	0.26 to 0.66 mm	0.8 to 2.0 times
UPC-A	0.26 to 0.50 mm	0.8 to 1.5 times
UPC-E	0.26 to 0.66 mm	0.8 to 2.0 times
Interleaved 2of5 (ITF)	Min. 0.15 mm	2 to 46 digits*
Codabar (NW-7)		3 to 30 digits
Code 39		1 to 24 digits
Code 128（EAN-128）		1 to 19 digits
RSS-14 (GS1 DataBar)		14 digits

* Even number digits only

Note: These specification values all apply to ambient illuminance of 500 to 3,000 Lx. (xenon lamp light source)

Multiline codes

Multiline reading can be performed up to a maximum of 3 lines at a time in the specified order on the following codes: Universal product codes, Interleaved 2of5 (ITF), Codabar (NW-7), Code 39, Code93, Code 128 (EAN-128).
This can only be specified with application programs. Refer to BHT-BASIC Programming Manual (BHT Series).

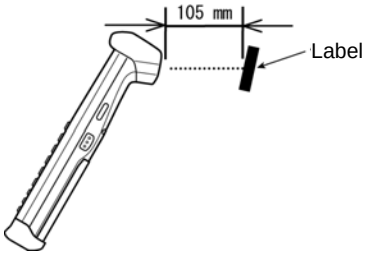
Required Optical Properties

White bars: Reflection intensity of 45% or higher
Black bars: Reflection intensity of 25% or lower
PCS value of 0.45 or higher

The reflection intensity is regulated with a light source with spectral peak of 650 nm and spectrum range of 610 to 700 nm.

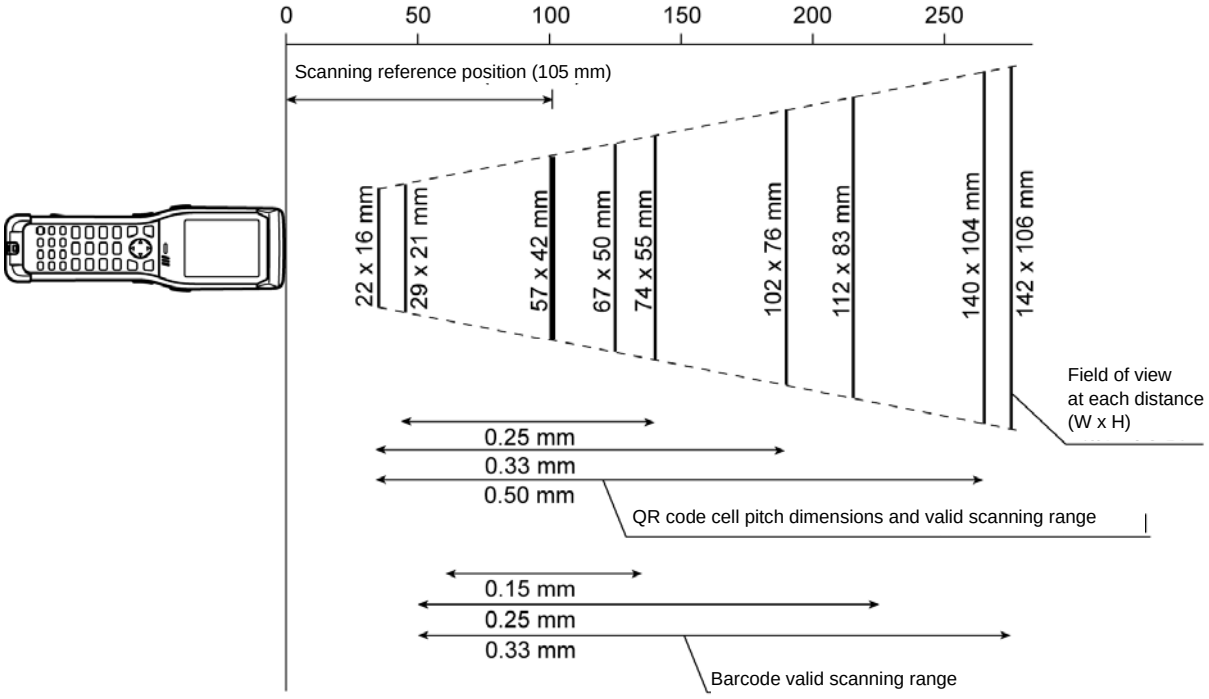
8.1.3 Reading Performance

Reading Reference Position



As illustrated at left, align the reading window with the center of the label (code) to be scanned.

Reading Performance



QR code cell pitch dimensions	Valid reading distance
0.25 mm	45 to 140 mm *1
0.33 mm	35 to 190 mm *1
0.50 mm	35 to 265 mm *2

PCS value: 0.9 min., White reflection intensity: 85% min

*1 Under the following conditions:
QR code model 2 Ver.5 (37 cells × 37 cells)
Error-correcting level: M,
Black & white label

*2 Under the following conditions:
QR code model 2 Ver.5 (29 cells × 29 cells)
Error-correcting level: M, Black & white label

Barcode module dimensions	Valid reading distance
0.15 mm	60 to 125 mm *3
0.25 mm	50 to 215 mm *4
0.33 mm	50 to 275 mm *5

PCS value: 0.9 min., White reflection intensity: 85% min

*3 Under the following conditions:
Codabar 10 digits NarrowBar, NarrowSpace
0.15mm

*4 Under the following conditions:
Codabar 10 digits NarrowBar, NarrowSpace
0.25mm

*5 Under the following conditions:
EAN-8 Module dimensions 0.33mm

The BHT-604BQ may fail to read codes due to specular reflection depending upon the position of the light source, readng angle of the reading window, and other conditions.

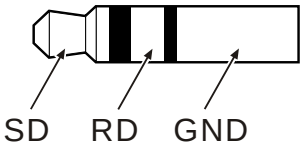
8.1.4 Interface Specifications

IrDA Interface

Specification: IrDA Ver1.3 Low Power physical layer compliant
(Except transmission speed: 460,800 bps)
Input signals: RD
Output signals: SD
Transmission speed: 9,600 / 19,200 / 38,400 / 57,600 / 115,200 / 460,800 /4M bps
Note: 460,800 bps is only possible when communicating from one BHT-600 unit to another or with the CU-621. 4 Mbps is only possible for communication with the dedicated CU-611 unit. The maximum transmission speed in all other cases is 115,200 bps.

Connector Interface

Synchronization: Start-stop
Transmission speed: Max. 115,200 bps
Signal level: Conforms to the RS-232C interface
Pin assignment: As shown below.



Pin No.	Signal Name	Function	Signal Input/Output BHT External device
1	SG（GND）	Signal ground	—
2	SD	Send data	→
3	RD	Receive data	←

Chapter 9
Appendices

This chapter describes the CU-600 Series (option) specifications, and describes causes and countermeasures when unable to transfer files.

9.1 CU-600 SPECIFICATIONS

9.1.1 Hardware Specifications

	CU-601	CU-611	CU-621
Power supply:	100/230 V AC (Using dedicated AC adapter)	100/230 V AC (Using dedicated AC adapter)	Powered from the USB interface *
Max. power consumption:	6.5 VA	7 VA	5V 500 mA
Dimensions (W) x (L) x (H):	110 x 134 x 81.7 mm		
Weight:	105 g	110 g	100 g
Ambient operating temperature:	0 to 40°C		
Ambient operating humidity:	20 to 80% (with no dew condensation)		

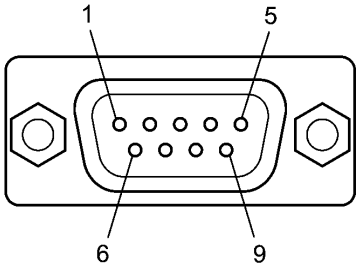
*The CU-621 can be powered also from the AC adapter.

9.1.2 Charging Requirements (CU-601/611/621)

Charge current: Approx. 950 mA (approx. 400 mA *)
Charging time: Approx. 3 hours (approx. 7 hours *)
(*When the CU-621 is powered from the USB host (computer) or USB hub)

9.1.3 Interface Specifications

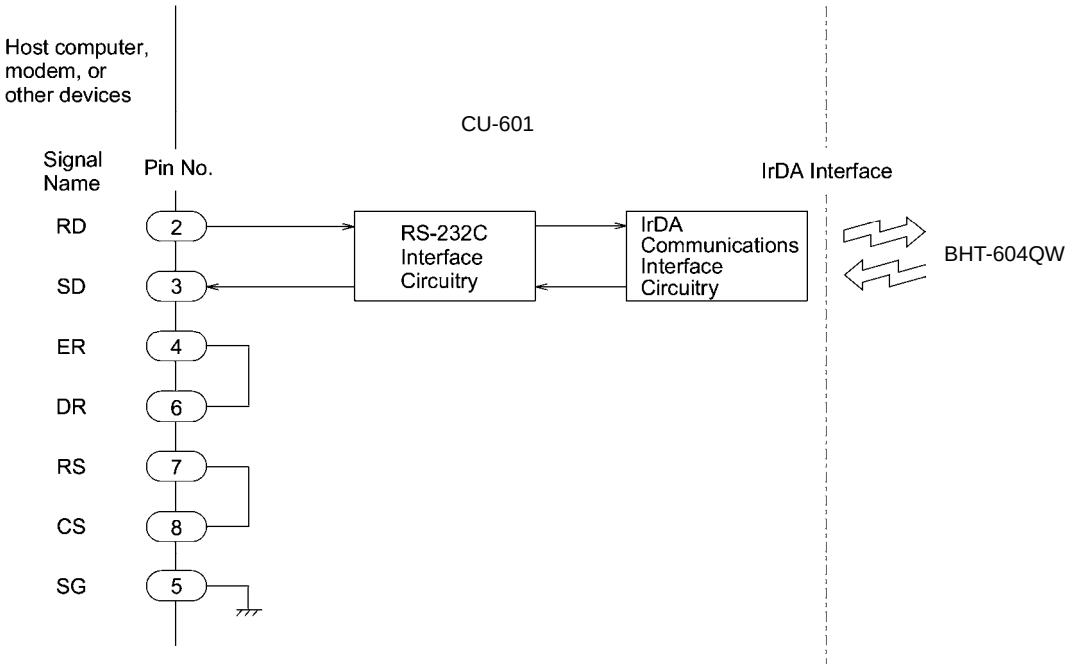
CU-601



The CU-601 RS-232C interface connector uses Dsub-9P.

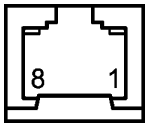
Pin. No.	Signal Name	Function	Signal Direction CU-601 ↔ External Device
2	RD	Receipt data	←
3	SD	Transmission data	→
4	ER	Data terminal ready	→
5	SG	Signal ground	—
6	DR	Data set ready	—
7	RS	Transmission request	—
8	CS	Transmission ready	—

- Ref - The CU-601 internal wiring is shown below.



CU-611

The CU-611 has an IEEE802.3-compliant Ethernet interface port (10Base-T).



Ethernet Interface Port (RJ45 jack) on the CU-611

Pin No.	Signal	Functions
1	TD+	Send data
2	TD-	Send data
3	RD+	Receive data
4	N.C.	No connection
5	N.C.	No connection
6	RD-	Receive data
7	N.C.	No connection
8	N.C.	No connection

CU-621

The USB interface on the CU-621 is USB1.1 (Full-speed) compliant, with a Type Mini-B receptacle.

9.2 When File Transfer is Not Possible Using the Transfer Utility

This section describes the causes and remedies when file transfer is not possible using the Transfer Utility.

Error No.	Cause Details	Remedy
2	Illegal field information specification option when transmitting data file.	Set a correct value for the field information option.
	The name of the file being downloaded is a long file name.	Long file names are not supported. Change to an 8.3 format file name.
	Illegal characters have been used in the file name.	Change the file name. Refer to QBdirect (page 171, Note 1) for details of characters that can be used in file names.
3 6 8	BHT-Ir/BHT protocol was used for transfer for a BHT-BASIC 4.0 format data file.	Use Ymodem protocol or restrict data files to BHT-BASIC 3.6 format.
51 52	Power is not being supplied to the CU.	Supply power with an AC adapter or via a USB bus when using a CU with USB connection.
	Defect or abnormality with the cable between the PC and CU.	Use a properly functioning RS-232C cross-cable.
	The DIP switch on the reverse side of the CU have been set incorrectly.	Set the correct transmission speed with the DIP switch on the reverse side of the CU.
	Defect or abnormality with the USB cable between the PC and CU.	Use a properly functioning USB cable.
	Unstable signal wire due to such reasons as a USB cable extension.	Connect directly to a PC USB port or self-powered hub. Connection may not be possible depending on the hub model, and if operation is unstable, connect directly to a PC USB port.
	The CU can be removed. (The device remains stopped.)	Disconnect the device and then reconnect.
	The CU is not recognized by the PC. There is a ! mark at the Device Manager or the device is unknown.	Disconnect the device and then reconnect. If the problem is still not resolved, uninstall the driver and then reinstall.
	The power supply is insufficient.	The USB power supply performance may be insufficient depending on the PC model. Furthermore, if another USB device consuming power exceeding the maximum standard (500mA or more) is connected to the adjacent port, insufficient current may be supplied. Use an AC adapter to supply power directly.
	Defect or abnormality with the cable between the PC and BHT.	Use a properly functioning RS-232C cross-cable.
	The BHT communication interface specification is illegal.	Specify IrDA(Optical) if connected to the PC via the CU, and Connector if connected via the interface connector. Refer to QBdirect (page 171, Note 1) for details of the setting method.

Error No.	Cause Details	Remedy
51 52	The Transfer Utility “Communication port” option specification is illegal.	Specify the communication port to which the BHT is connected for the “Communication port” option.
	The transmission speed at the BHT and PC does not match.	Ensure that the transmission speed at the BHT and PC matches. Please be aware that the default transmission speed differs depending on the BHT used.
	The protocol specified at the BHT and PC does not match.	Ensure that the protocol matches. Please be aware that the default protocol differs depending on the BHT used.
	The PC communication port setting is illegal.	Enable “Use FIFO buffer. (16550 interchangeable UART required.) (U)” setting for the communication port used.
	Hardware malfunction	Please contact your dealer.
53	The protocol specified at the BHT and PC does not match.	Ensure that the protocol matches. Please be aware that the default protocol differs depending on the BHT used.
55	The protocol specified at the BHT and PC does not match.	Ensure that the protocol matches. Please be aware that the default protocol differs depending on the BHT used.
	An attempt was made to download a file with field width differing from that of the data file already existing in the BHT.	It is not possible to download a file with the same name but different field width from the file already existing in the BHT. Either delete the existing data file in the BHT, or specify the same field format as the existing data file.
55 71	Illegal characters have been used in the file name.	Change the file name. Refer to QBdirect (page 171, Note 1) for details of characters that can be used in file names.
75	The USB-COM port drive has been incorrectly installed.	Reinstall the USB-COM port driver.
91	Illegal field information specification option when transmitting data file.	Set a correct value for the field information option.
91	An attempt was made to download a file with field width differing from that of the data file already existing in the BHT.	It is not possible to download a file with the same name but different field width from the file already existing in the BHT. Either delete the existing data file in the BHT, or specify the same field format as the existing data file.
	The size of the file being downloaded exceeds the size of the available space in the BHT user area.	Reduce the file size or delete any unwanted files in the BHT.
	Illegal characters have been used in the file name.	Change the file name. Refer to QBdirect (page 171, Note 1) for details of characters that can be used in file names.
Other	BHT-Ir/BHT protocol was used for transfer for a BHT-BASIC 4.0 format program file (*.PD4).	Use Ymodem protocol or convert program files to “*.PD3”.

Error No.	Cause Details	Remedy
Other	An attempt was made to download a BHT-BASIC 3.6 format program file (*.PD3).	Use BHT-BASIC 4.0 format program files (*.PD4).

Note 1: "Customer Registration" is required to use QBdirect (free of charge).
When using for the first time, complete "Customer Registration" and then refer to the following procedure to use QBdirect.
Refer to "Customer Registration" on page ii.

(1) Click the QBdirect URL below.
(2) Enter your user ID and password to log in.
(3) Search what you need to enter keyword to the textbox.

http://www.qbdirect.net/

2D Code Handy Terminal

BHT-604Q

User's Manual

First Edition Oct. 2008
Second Edition Mar. 2010

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