3.4.7 Original image

    This processing restores the image processing result to the original state and displays unprocessed raw data. Perform the following steps to restore the original image. (See Figure 3-19.)

    (1) Press the 6 **PRCS** key.

        The setting field of the **PROC** setting at the bottom line of the scan screen is video-inverted. Then the image processing mode starts.

    (2) Set ORG (Original image) using the cursor keys ▲ ▼. Original image will be performed.

    (3) To end the image processing mode, press the 6 **PRCS** key again.

        The normal display is shown as the item for the **PROC** "setting at the bottom of the screen and image processing mode is ended.

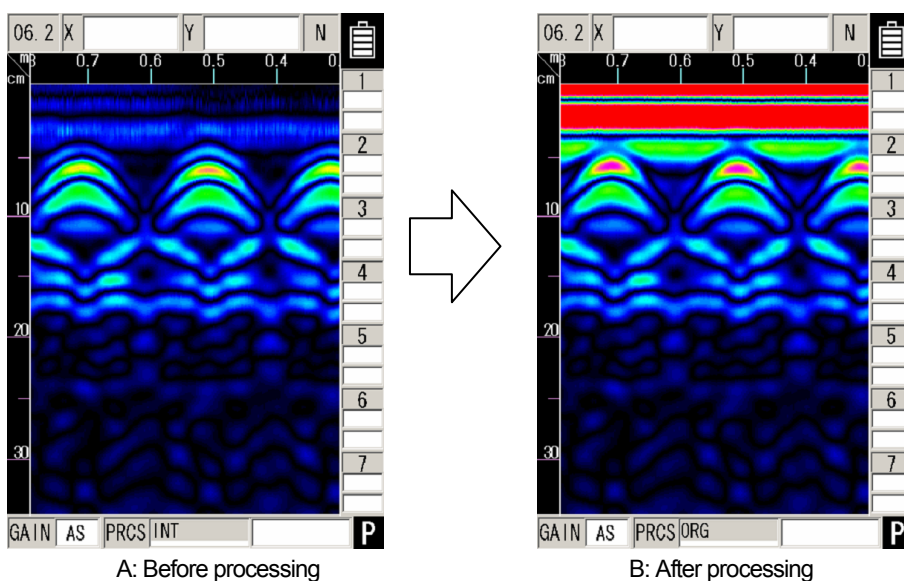A: Before processing   B: After processing

Figure 3-19 Original image

3.5 How to determine depths and sample scan data

The reflected waves shown in the scan example in Figure 3-20 are reflections of rebar. (↓ position)

The position of the object to be probed (e.g., reinforcing steel) in the traveling direction is determined as the peak of the reflected wave.

An approximate depth (covering depth) of the object to be probed (e.g., reinforcing steel) is determined as the center of the reflected wave.

Perform depth calibration (see Section 3.2.6 Depth) to reduce the error in the depth (covering depth) of the object being probed (such as rebar). Use the A-mode waveform from BA-mode (see Section 3.3.1 Mode switching) to determine the position of the object to be probed.

The position of the object to be probed (such as rebar) is shown by the peak on the right side of the A-mode waveform. Match the cursor to the peak position to determine the depth.
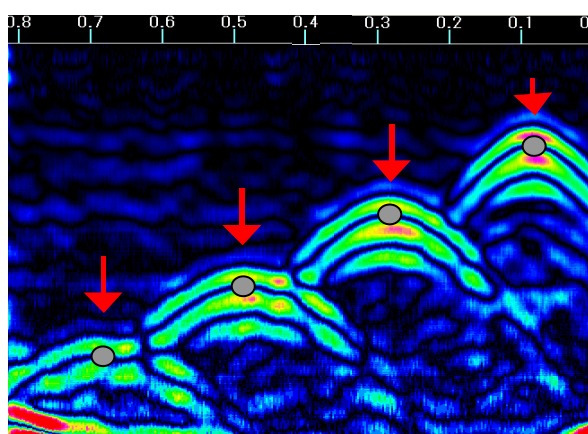
: Position of rebar shown among the reflected waves of the scan results (The ⬤ mark is not actually shown in the scan results.)
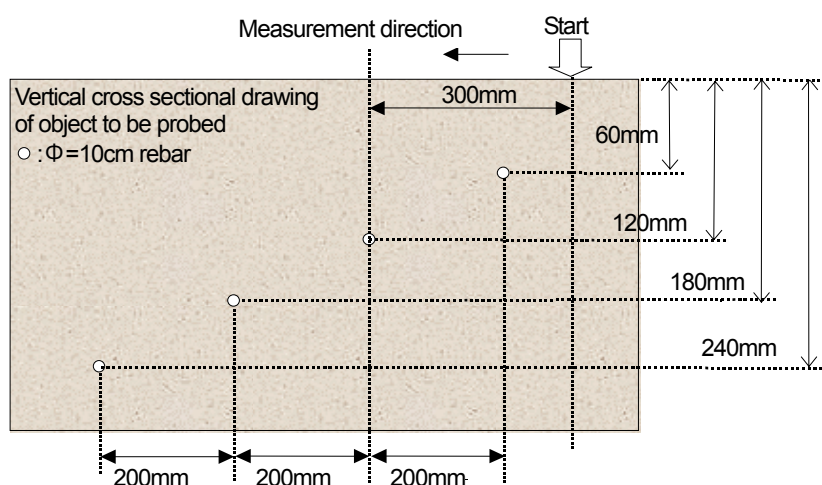

Figure 3-20 Scan example

3.6 External output methods

This product is equipped with functions for printing the screen to a special printer (option) and a function for saving scan data to a CF memory. The following explains how to use the functions:

3.6.1 Printer output

(1) Setting of an output destination

Press the ⌷4⌷ **SET** key on the scan screen, and set ⌷ printer (I) ⌷ to the **ouput** setting on the parameter setting screen.

(2) Installation of the printer

Set up the printer so that the IrDA optical receiver faces the IrDA optical receiver on the front of this product at a distance of between 50 and 500 mm. Note that if there is an obstacle between this product and printer or the printer is not installed at an angle of ±15 degrees, the printer is unable to operate.

(3) Printing

Pressing the ⌷13⌷ **OUTPUT** key enables printing to the printer. Data in the range from 0 m (0 s) up to the currently displayed screen contents will be printed. During output to the printer, "Date, Data No." as well as the message "Under printing" will be displayed on the LCD screen.

Notes

- The printer has a software DIP switch which allows to select one of communication modes: **BHT-IR**, **Serial**, and **IrDA**. It is set to **Serial** at the factory shipment. Therefore change the setting from **Serial** to **IrDA** before starting to use. Otherwise the printer at the setting **Serial** does not work with the NJJ-105. For the procedure to change the setting, refer to the attached document **Note: Operation of Handy Search NJJ-105 Option Printer DPU-S445**. (The setting of DIP switch is kept after turning off the printer.)
- The printer DPU-S445 is a dedicated printer only to the NJJ-105. Don't use the printer for other products (NJJ-95 series). If this printer is applied to other products, the software DIP switch setting is changed, then after that the printer doesn't work for the NJJ-105. If this situation happened, change the DIP switch setting to **IrDA** in accordance with the document **Note: Operation of Handy Search NJJ-105 Option Printer DPU-S445**.

Notes

- The output to the printer supports only the black and white print with 16 gradation. Therefore the printed image is not matched with the image displayed on this product (128 colors, black and white of 16 gradation).
- The output to the printer prints out a simplified image. The printed image is generated by deducting the data periodically from the scan result. (Horizontally one line deduction per one line printing at the display rage settings of `D` (Deep), `N` (Normal), and `S` (Shallow) , and three line deduction per one line printing at the display range settings of `DW` (Deep Wide), `NW` (Normal Wide), and `SW` (Shallow Wide). Vertically one point deduction per one point printing.) The cursor and cursor markers located on the deducted data are moved and printed on the printed data. Therefore the printed position of the cursor and cursor markers may not be matched visually with the image display on the product. (where the printed coordinates are matched with the displayed coordinates.
- Use the recommended printer set (Refer Table 1-3).

Remarks

- For details on the printer, see the printer instruction manual.
- To stop the print out in the middle of printing, press the `13` **OUTPUT** key.
- The printing range is from 0 m (0 s) up to the currently displayed screen contents. To print all the scan data, scroll to the last scan screen using the cursor keys ◀ ▶, and then start printing.
- The direction of printed image data changes in accordance with the setting of the screen inversion function. For the printer to always output image data in the same direction, retain the same setting `normal` or `reverse` for the **disp.direction** setting. See Section 2.3.2 disp.direction.
- As the voltage of the printer's battery pack lowers, the printing speed decreases. Replace the battery pack as soon as a sign of a voltage drop is detected.
- When the message "Charge the printer's battery" is displayed on the screen, the voltage of the printer's battery pack has lowered. In this case, charge the battery pack or change to a fully charged battery pack according to the message, and press the `13` **OUTPUT** key again to start printing.
- If pressing the `13` **OUTPUT** key does not start printing and the message "Turn OFF/ON the printer" is displayed, the printer settings may have been initialized. (The system may take about 30 seconds to display this message after the `13` **OUTPUT** key is pressed.)
  In this case, turn OFF/ON the printer according to the message. The printer will be set again and get ready for printing. Press the `13` **OUTPUT** key again to start printing.
- When the message "No printing paper" is displayed on the screen, the printer has run out of paper. In this case, load a new roll of printing paper, and press the `13` **OUTPUT** key again to start printing.
- The data no. of the scan result is not changed by printing it.
- When setting a value ≧13 to the distance correction constant , scanning the distance longer than 10 m, and printing the scan result at the wide display range setting (`DW` :Deep Wide, `NW` :Normal Wide, `SW` :Shallow Wide), the printed result may show a part which is difficult to read.

3.6.2 Data saving in CF memory

Notes

- Power the product off always when inserting/removing the CF memory from the product.
- Make sure of the insertion direction before inserting the CF memory.
- **Operation of this product has been confirmed with CF TS512MCF80 manufactured by Transcend. This product may not operate with another CF memorys.**
- Make sure to initialize the CF memory using this product. **If this is performed using other equipment (NJJ-95 series,PC etc.) the CF may not be recognized.**
- Do not use a CF memory that was used with a NJJ-95 series.   **As the data format used by NJJ-95 series and NJJ-105 are different, this may cause an error.**

This product can save the scan result as data to a CF memory. There are two types of data save formats: binary format and text format.

(1)Binary format

a) Configuration

The data format in binary mode consists of the following two sections:

Header section (ASCII data) + data section (binary data)

The header section contains information incidental to the scan data (date, scan parameters, scan data size, etc.).

The data section contains data attributes and scan data.

b) Header section

The following shows a sample configuration of the header section and explains the items.

The control codes in the header section are as follows: [0x0D] = CR, [0x0A] = LF, and [0x1A] = EOF. Table 3-1 shows the header configuration.

Table 3-1 Header configuration (1/2)

Header	Contents
### NJJ-105　Measurement Data ###[0x0D][0x0A]	ID data of the scan result including the model name
Date : 2006/12/31[0x0D][0x0A]	Date
Time : 23:59[0x0D][0x0A]	Time
Data # : 999[0x0D][0x0A]	Data number:000 to 999
X Data Size : 3000[0x0D][0x0A]	Line number:1 to 6000
Y Data Size : 512[0x0D][0x0A]	Number of points per line:512(Constant)
X Scale : Distance[0x0D][0x0A]	Scan mode 　　Distance: Distance feed scan 　　Time　　 : Time feed scan
Y Scale : 06.2[0x0D][0x0A]	Correction constant for depth calibration: 02.0 to 20.0 or ns
X Scale Adjust : +5[0x0D][0x0A]	Correction constant for distance calibration:-20 to +20
Y Scale Range : 6ns[0x0D][0x0A]	Display range: 　　4ns: S(Shallow), 6ns : N(Normal), 8ns :D(Deep), 　　4nsW:SW(Shallow W), 6nsW: NW(Normal W), 　　8nsW: D W (Deep W)
Search PRCS : INT	Search processing 　　Int: Fixed surface wave 　　User: User surface wave
disp.color　　　　　　　　　 : Monochrome1[0x0D][0x0A]	Disp.color setting when the scan data is stored: 　　Colo1, Color2, Color3, Monochrome1, or Monochrome2
disp.direction　　　　　　 : normal[0x0D][0x0A]	Disp.direction setting when the scan data is stored: 　　normal or invert
disp.mode : BA[0x0D][0x0A]	Disp.mode setting when the scan data is stored: 　　B or BA
amplitude : offset[0x0D][0x0A]	Amplitude setting when the scan data is stored: 　　abs or offset
X unit : m[0x0D][0x0A]	X unit setting of XY.unit parameter when the scan data is stored: m, cm. or mm
Y unit : cm[0x0D][0x0A]	Y unit setting of XY.unit parameter when the scan data is stored: m, cm. or mm

Table 3-1 Header configuration (2/2)

Header	Contents
Gain : AS[0x0D][0x0A]	Gain (sensitivity) setting when the scan data is stored: -2S (-2, shallow), -1S (-1, shallow), AS (A, shallow), +1S (+1, shallow), +2S (+2, shallow), -2D (-2, deep), -1D (-1, deep), AD (A, deep), +1D (+1, deep), +2D (+2, deep).
PRCS : INT[0x0D][0x0A]	Proc (image processing) setting when the scan data is stored: INT: Fixed surface wave processing USER: User processing ORG: Original image SUB: Deduction processing MAN: Manual surface wave processing AVR: Average wave processing Peak_SUB: Peak deduction processing Peak_USER: Peak user processing Peak_AVR: Peak average processing
MarkX 1 : 3[0x0D][0x0A]	First cursor marker's X coordinate : scan line somethingth number
MarkY 1 : 14[0x0D][0x0A]	First cursor marker's Y coordinate : data somethingth number
⟨	⟨
MarkX n : 2997[0x0D][0x0A]	Nth (Max 7) cursor marker's X coordinate : scan line somethingth number
MarkY n : 508[0x0D][0x0A]	Nth (Mac 7) cursor marker's Y coordinate : data somethingth number
END[0x0D][0x0A]	Header end
[0x1A] [0x0D][0x0A]	EOF

c) Data section

Scan data is configured as a collection of 1-line data. One-line data is fixed to a length of 769 bytes as follows:

1 byte of header + 768 bytes of scan data = 769 bytes

The header represents line attributes in the following format:

A0-Bit7(MSB)	0
A0-Bit6	0
A0-Bit5	1: an antenna mark is place on this line, 0: not placed.
A0-Bit4	1: this line is specified as the surface wave; 0: not specified
A0-Bit3	0
A0-Bit2	0
A0-Bit1	0
A0-Bit0(LSB)	0

The fixed surface wave is output as the first line contains and the user surface wave is output as the second line. The scan result is output from the third line.

The header of the fixed surface wave is "FF" (1111 1111) and that of the user surface wave is "40"(0100 0000).

Details on 768 bytes of scan data:

Scan data per line includes 512 points, and 1-point data consists of 12 unsigned bits.

Two-point data is sent after being re-listed as 3 bytes, so a total of 512 points (= 768 bytes) are sent. Data is re-listed according to the rule shown below.

[0xABC]+[0xDEF]→[0xAD]+[0xBC]+[0xEF]

Following the fixed surface wave data, the single-line scan data explained above is output for each scanning line. The header of the fixed surface wave data is [0xFF]. Therefore, the length of the data section is variable:

(1 byte of header + 768 bytes of scan data) x (number of scanning lines +1)

(2) Text mode

    a) Configuration

        The data format of the text mode is the same as for the binary format.

        The difference from the binary format is that the text mode processes all data as ASCII data.

            Header section (ASCII data) + data section (ASCII data)

    b) Header section

        The configuration of the header section is the same as for the binary format.

    c) Data section

        The text mode converts one byte of data output by the binary format to two bytes of ASCII data (HEX) and outputs the converted data with [0x0D] and [0x0A] being added.

Remarks

- The size of data in binary format is smaller than that in text mode, thereby saving space of the CF memory.
- The saved data is A/D conversion data (original image data), but not the one after image processing such as surface wave processing has been performed.

(3)Saving data to CF memory

Procedure for saving data in CF memory:

a) Setting of an output destination

Press the ⊡4 **SET** key on the scan screen, and set `CF (text)` or `CF (binary)` to the **output** setting on the parameter setting screen.

b) Setting of a data number

An arbitrary number can be assigned to scanned data by setting the number for the `Data No.` setting on the parameter setting screen. The data number (Data No.) is incremented each time data is saved.

c) Saving of scan data

Press the ⊡13 **OUTPUT** key while a scan is stopped to save the scan result to a CF memory. The file name of saved data is determined as follows:

B1230450.001

Data No.

Scan time: The first 2 digits indicate hours; the last 2 digits   indicate minutes.

Scan date

Scan month month: A, B, and C stand for October, November, and December, respectively.

Save format: T stands for text format; B stands for binary format.

d) Confirmation of data saved

Press the ⊡12 **CF** key. The screen will be switched to the CF control screen shown in Figure 3-21. You can check whether data has been saved in this creen. On the CF control screen, you can also display the thumbnail images of saved data, read/delete data, and initialize the CF memory. For details, see Section 3.7 CF Control Screen.
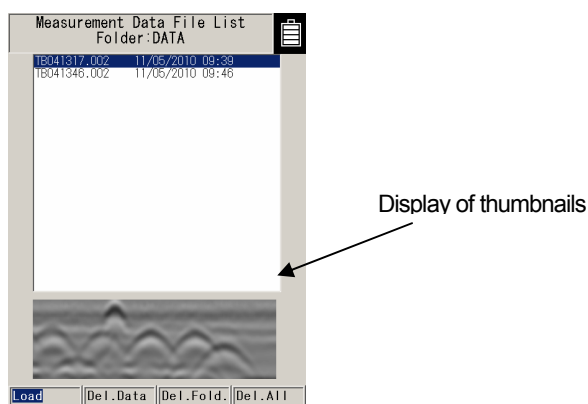

Measurement Data File List
Folder:DATA

TB041317.002   11/05/2010 09:39
TB041346.002   11/05/2010 09:46

Load Del.Data Del.Fold. Del.All

Display of thumbnails

Figure 3-21   CF Control Screen

Notes

- **When saving the scan result into the CF memory with the remained memory less than 2 MB, this product displays the error "Insufficient CF memory volume" and stops the data saving. When the error appears, delete unnecessary data in the memory and perform the data saving again. Or change the memory to an other memory with enough volume and perform the data saving.**
- **When using the CF memory with the remained memory more than 2 MB, and when saving the scan result which volume is larger than the available memory of the CF memory, this product displays the error "Writing Error" and stops the data saving. But the data file is created in spite of stopping the data saving. Delete the file created after the error appears. (You cannot recall and display the scan result in the file created after the error appears.)**
- **This product saves the depth correction constant used at scanning. Even when changing the depth correction constant after completing the scan, the saved depth correction constant is the setting used at scanning. (When overwriting and re-saving the recalled scan result to the CF memory, the depth correction constant used at scanning is saved.**

3.7 CF Control Screen

When not scanning, when the [12] **CF** key is pushed, the screen is switched to the CF control screen. Once at the CF control screen, thumbnail image display can be viewed. Also, data storage, data erasure, and initialization for the CF memory can be executed.

To return to the measurement screen, press the [12] **CF** key.

All of the functions of the CF control screen are shown below.

Notes

- **The maximum number of files displayed on the CF control screen is 8000. When the files beyond 8000 each are stored into the CF memory, some files are not displayed on the screen. (In this case, an error message "The number of files exceeds 8000. There are some files which cannot be displayed on the screen." appears.**
- **When the large volume of files is stored in the CF memory, the switch to the CF control screen takes time. (The scan screen is displayed during switching to the CF control screen.)**
For example, when 8000 each of files are stored in the CF memory, it takes 5 seconds to switch the mode to the CF control screen. (case of CF memory: Transcend TS1GCH80)

3.7.1 Displaying the thumbnail images of saved data

When a file is selected at the CF control screen using the ▲▼ cursor keys, scan results can easily be displayed on the display area. (See Figure 3-22.)

The thumbnail display enables an easy check on saved image data.

When Monochrome1 or Monochrome2 is set to the **disp.color** setting on the setting screen, the thumbnail image display will also be monochrome.
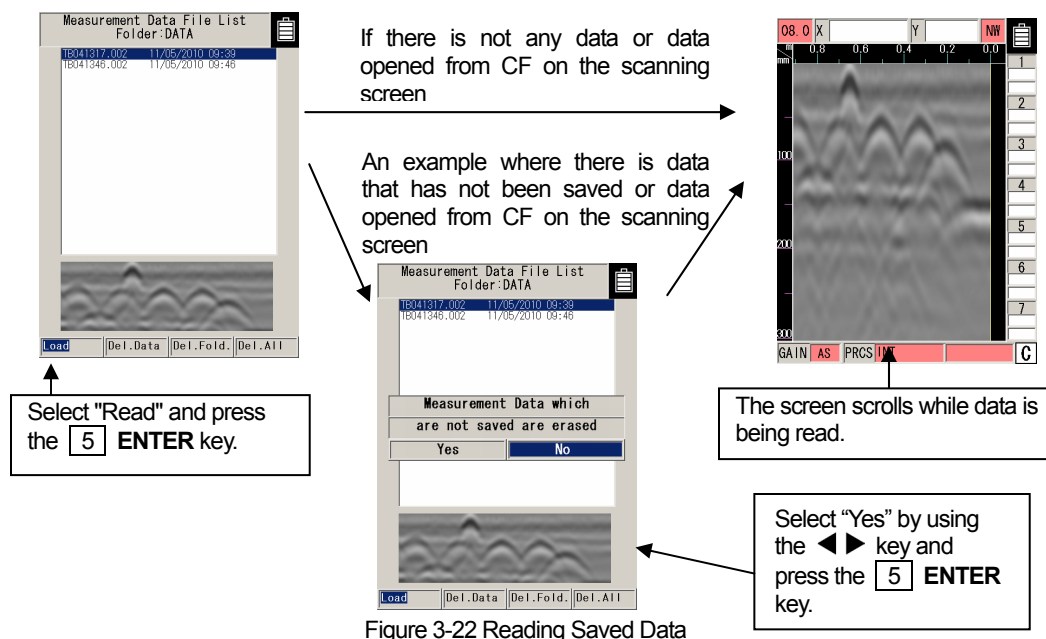
Notes

- The thumbnail displays a part of the selected file (Distance direction; around 0.5 m, depth direction: around half of the display range). The image processing selected at the image processing setting is applied to the thumbnail image

3.7.2 Reading saved data

To read the data that has been saved, select the file to be read by using the ▲▼ cursor keys on the CF control screen, select **Load** using the ◀▶ keys and press the 5 **ENTER** key.

The screen changes to the scan screen, the screen is scrolled, and the selected data is opened. The data read is finished when the screen stops scrolling.

If there is data that has not been saved or data read from the CF memory on the scan screen prior to switching to the CF control screen, a message "Data that has not been saved will be erased – Yes/No" is displayed. Select Yes using the ◀▶ keys and press the 5 **ENTER** key to open the file. When No is selected and the 5 **ENTER** key is pressed, operation returns to the CF control screen. (See Figure 3-22.)

If there is not any data or data opened from CF on the scanning screen

An example where there is data that has not been saved or data opened from CF on the scanning screen

Select "Read" and press the 5 **ENTER** key.

Measurement Data which are not saved are erased

The screen scrolls while data is being read.

Select "Yes" by using the ◀▶ key and press the 5 **ENTER** key.

Figure 3-22 Reading Saved Data

In the display of scan data read from the CF memory, the settings of the scan data are displayed using red background color. The current settings of the product (settings not stored and read from the scan data) are displayed using white background color.

You can change the read settings. Whereas the settings of red background color returns to the current setting of the product before reading the data by starting a new scan, and the settings of white background color are kept after starting a new scan.

The settings of **X-axis** (scan method) and **dist adj** (distance compensation) which are displayed using red background color and white string color cannot be changed for the read data. (Even when pressing **default** YES, the settings are not changed.)

Table 3-2 shows the settings after reading the data and Figure 3-23 shows the scan screen and setting screen after reading the data.

Table 3-2 Settings after reading the data

Item	Settings after reading the data	Back-ground Color	Change	Setting for Quick Display
Gain	Read Setting	Red	Avaiable	Product setting　before reading
Proc	Read Setting	Red	Avaiable	Product setting　before reading
Disp.color	Read Setting	Red	Avaiable	Product setting　before reading
Disp.direction	Read Setting	Red	Avaiable	Product setting　before reading
disp.mode	Read Setting	Red	Avaiable	Product setting　before reading
Amplitude	Read Setting	Red	Avaiable	Product setting　before reading
X-axis	Read Setting	Red	Not	Product setting　before reading
Depth	Read Setting	Red	Avaiable	Product setting　before reading
Date/time	Product Setting	White	Not	Product setting　kept
data No.	Read Setting	Red	Avaialble	Product setting　before reading
Folder	Product Setting	White	Available	Product setting　kept
dist.adj.	Read Setting	Red	Not	Product setting　before reading
output	Product Setting	White	Available	Product setting　kept
disp.range	Read Setting	Red	Avaialble	Product setting　before reading
XY.unit	Read Setting	Red	Available	Product setting　before reading
Character Mode	Product Setting	White	Available	Product setting　kept
SearcPRCS	Product Setting	Red	Avaialble	Product setting　before reading
Scroll.speed	Product Setting	White	Available	Product setting　kept
Default	Product Setting	White	Available	Product setting　kept
Disp.color.setting	Product Setting	White	Available	Product setting　kept
Disp.direction.seting	Product Setting	White	Available	Product setting　kept
Disp.mode.setting	Product Setting	White	Available	Product setting　kept
Amplitude.setting	Product Setting	White	Available	Product setting　kept
X-axis.setting	Product Setting	White	Available	Product setting　kept
Depth.setting	Product Setting	White	Available	Product setting　kept
Output.setting	Product Setting	White	Available	Product setting　kept
Disp.range.setting	Product Setting	White	Available	Product setting　kept
Gain.setting	Product Setting	White	Available	Product setting　kept
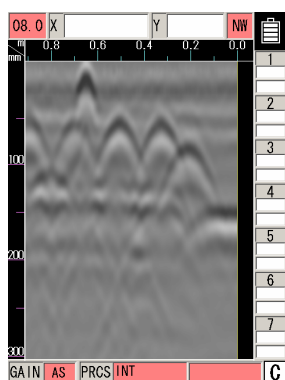
disp.color	Monochrome1
disp.direction	normal
disp.mode	B
amplitude	offset
X-axis	distance
depth	08.0 [+0] [----]
date/time	12/28/2010 15:22
data No.	001
Folder	DATA
dist adj.	+ 0 [0.0000m]
output	CF[bin]
disp.range	N
XY.unit	X: m / Y:cm
Character Mode	English
Search PRCS	Int
Scroll.speed	Step up
default	NO

Scan Screen   Parameter Setting Screen

Figure 3-23 Scan screen and Parameter setting screen after reading data

3.7.3 Deleting a saved data

Select the file to be deleted on the CF control screen using the cursor keys ▲▼, select **Del.Data** using the cursor keys ◀▶, and press the ⑤ **ENTER** key.

When the message "Delete? Yes/No" is displayed, select Yes using the cursor keys ◀▶, and press the ⑤ **ENTER** key. (See Figure 3-24.)

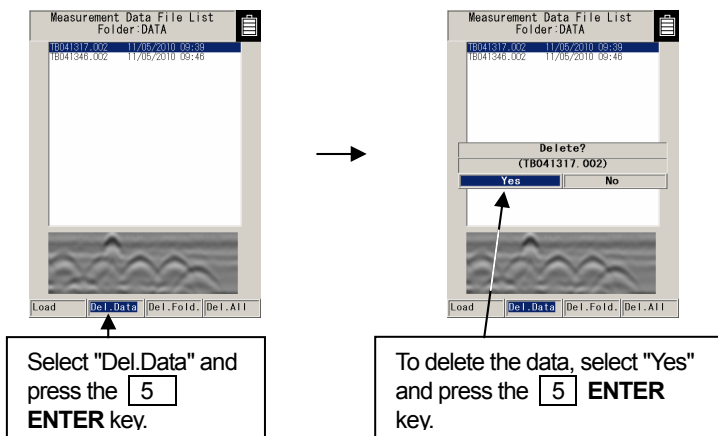(To cancel the deletion, select No and press the ⑤ **ENTER** key.)

Select "Del.Data" and press the ⑤ **ENTER** key.

To delete the data, select "Yes" and press the ⑤ **ENTER** key.

Figure 3-24 Deleting Saved Data

3.7.4 Deleting all saved data under the selected folder

You can delete all saved data within the specified folder by using the **Del.Fold.** operation. This operation deletes all data of only the folder specified by the **folder** setting in the parameter setting screen. (This operation does not delete any files under folders not specified by the **folder** setting.)

To delete all data under a selected folder, select **Del.Fold.** on the CF control screen using the cursor keys ◀▶, and press the ⑤ **ENTER** key. The message "Delete? (Folder:xxxxx) Yes/No" is displayed. Select Yes using the cursor keys ◀▶, and press the ⑤ **ENTER** key. (To cancel the Del.Fold., select No and press the ⑤ **ENTER** key.)

The message "Deleting!" is displayed and the Del.Fold. is started. After the message disappears, all data files under the specified folder are deleted. (See Figure 3-25.)

Notes

- **Never remove/insert the CF memory or turn off the power switch while initializing is in progress. Doing so may cause a malfunction.**
- **If the ⑫ CF key is pressed without a CF memory being inserted, the message "No CF memory" will be displayed. In this case, press the ⑤ ENTER key to close the screen, turn off the power, and then insert the CF memory.**
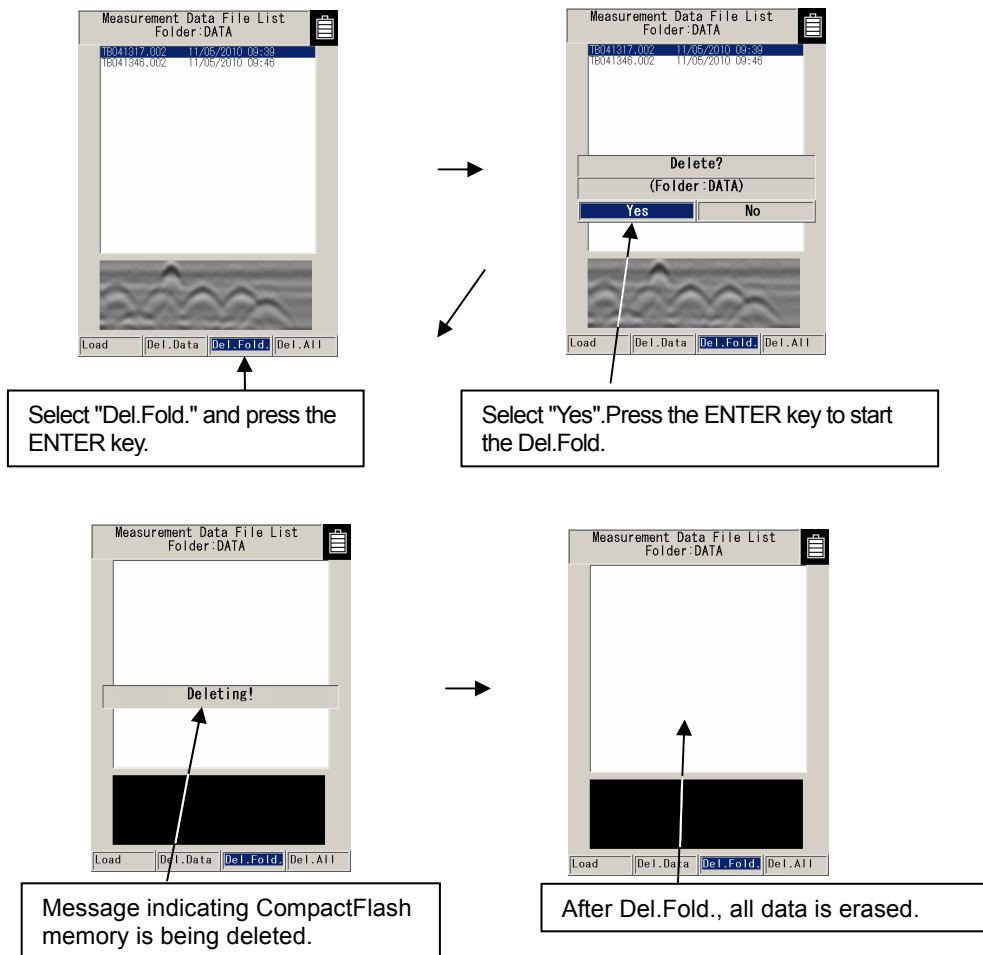- **Del.Fold. operation deletes all data files within the specified folder.**
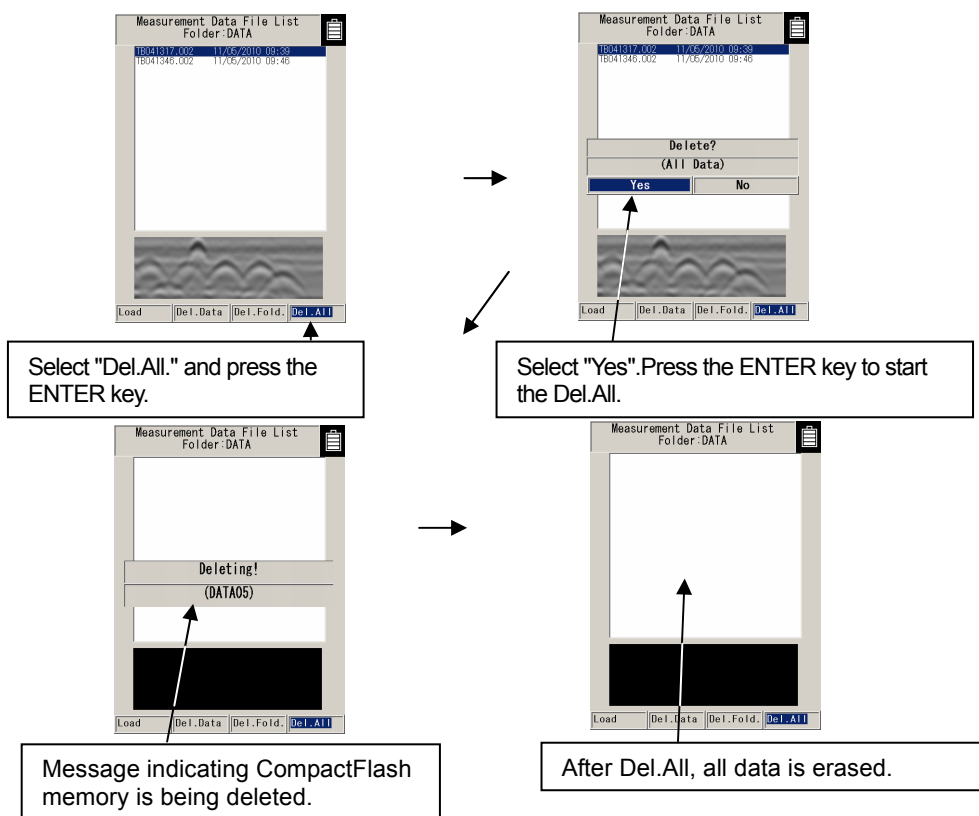
Measurement Data File List
Folder:DATA

TB041317.002   11/05/2010 09:39
TB041346.002   11/05/2010 09:46

Load   Del.Data Del.Fold. Del.All

Select "Del.Fold." and press the ENTER key.

Measurement Data File List
Folder:DATA

TB041317.002   11/05/2010 09:39
TB041346.002   11/05/2010 09:46

Delete?
(Folder:DATA)
Yes   No

Load   Del.Data Del.Fold. Del.All

Select "Yes".Press the ENTER key to start the Del.Fold.

Measurement Data File List
Folder:DATA

Deleting!

Load   Del.Data Del.Fold. Del.All

Message indicating CompactFlash memory is being deleted.

Measurement Data File List
Folder:DATA

Load   Del.Data Del.Fold. Del.All

After Del.Fold., all data is erased.

Figure 3-25 Deleting all saved data under the selected folder

3.7.5 Deleting all saved data in the CF memory

You can delete all saved data in the CF memory by using the **Del.All** operation. This operation deletes all data saved in all folders of **Data** to **DATA10**.

To delete all data, select **Del.All** on the CF control screen using the cursor keys ◀ ▶, and press the ⬚5⬚ **ENTER** key. The message "Delete? (All Data) Yes/No" is displayed. Select ⬚Yes⬚ using the cursor keys ◀ ▶, and press the ⬚5⬚ **ENTER** key. (To cancel this operation, select ⬚No⬚ and press the ⬚5⬚ **ENTER** key.)

The message "Deleting!" is displayed and the Del.All is started. After the message disappears, all data files in the CF memory are deleted. (See Figure 3-26.)

Notes

- **Never remove/insert the CF memory or turn off the power switch while initializing is in progress. Doing so may cause a malfunction.**
- **If the CF key is pressed without a CF memory being inserted, the message "No CF memory" will be displayed. In this case, press the**
  ⬚5⬚ **ENTER key to close the screen, turn off the power, and then insert the CF memory.**
- **Del.Fol. operation deletes all data files within the specified folder.**

Measurement Data File List Folder:DATA	Measurement Data File List Folder:DATA

Select "Del.All." and press the ENTER key.

Select "Yes".Press the ENTER key to start the Del.All.

Message indicating CompactFlash memory is being deleted.

After Del.All, all data is erased.

Figure 3-26 Method to delete all data in CF memory

3.8 Power-off Procedure

When scanning is finished, set the ⎡16⎤ power switch to OFF .

Notes

- All scan data that is not saved in the CF memory is deleted when the power is turned off.

3.9 Clearing up this product and accessories

Turn off the power, disconnect all cables this product, and put them together with this product into the provided storage box.

Remarks

- If this product is not to be used for a long time, dismount the battery pack when storing this product.

3.10 About the battery pack and charger

<table>
<tr><td colspan="2" align="center">⚠ WARNING</td></tr>
<tr><td>🚫</td><td>Do not short-circuit the terminals of the battery charger or battery pack.
Doing so could cause fire, explosion, or breakdown.</td></tr>
<tr><td>🚫</td><td>Do not disassemble, modify, heat, or throw the battery pack on fire.
Doing so could cause fire, explosion, or breakdown.</td></tr>
<tr><td>🚫</td><td>Do not use any charger other than the dedicated battery charger to charge the battery pack.
Doing so could cause fire, electric shock, or breakdown.</td></tr>
<tr><td>🚫</td><td>Do not connect/disconnect the plug while your hands are wet.
Doing so could cause an electric shock.</td></tr>
<tr><td>❗</td><td>Stop using this product immediately when a possible malfunction is detected, and follow only the detailed procedure in this instruction manual. If it cannot be restored to normal operation, contact our nearest branch office （See Section 9), sales outlet, or service station. Use of this product in abnormal state could cause fire or breakdown.</td></tr>
<tr><td>🔌</td><td>Should this product emit an abnormal sound, odor, or smoke, immediately turn off the power switch, remove the battery pack, disconnect the power plug from the socket outlet, and contact our nearest branch office (See Section 9), sales outlet, or service station.
Use of this product in abnormal state could cause fire, electric shock, or breakdown.</td></tr>
</table>

<table>
<tr><td colspan="2" align="center">⚠ CAUTION</td></tr>
<tr><td>🚫</td><td>Do not use any battery pack other than the BP-3007 SERIES.
Doing so may cause fire, electric shock, or breakdown.</td></tr>
</table>

3.10.1 Battery pack BP-3007 series

The battery pack BP-3007 series is used only for the HandySearch and contains a rechargeable lithium ion battery. When the battery pack is fully charged, you can operate this product for about 1.5 hours.

(1) Mounting/dismounting the battery pack

See Section 3.1 Scan preparation for how to mount/remove the battery pack.

(2) Battery pack remaining capacity

The battery availability indicator is displayed at the upper right of the LCD screen of this product.

When the battery availability indicator shows the "0" state (see Figure 3-27) and the buzzer sounds, set the ⎸16⎸ power switch to OFF and replace the battery pack.

Fully charged state   Availability "0" state

Figure 3-27 Battery pack capacity indicator
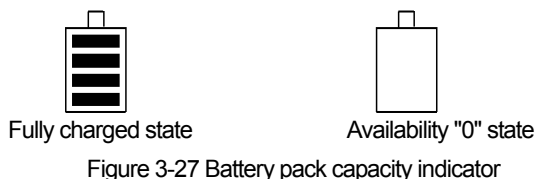
(3) Usage of the charging check mark

Use the green charging check mark (see Figure 3-28 A) to check if the battery pack has been used after being charged.

· The mark turns green when the battery pack is removed from the dedicated battery charger.

· This mark can also be switched by hand.

Remarks

- The battery pack is charged just enough for this product's test operation before it is shipped. The battery pack needs to be charged when used for long operation.
- The battery pack should be charged immediately before being used.
- Keep the battery pack in as cool a location as possible to make it last longer and it is recommended to charge the battery in an area with a temperature between +10 and +30 °C.
- The battery pack's operating time is shortened in a cold region.
- The battery pack does not need to be discharged or used up before it is charged.
- It is considered that the battery pack has reached its service life when the operating time sharply decreases. Change to a new battery pack.
- When using the battery pack, be careful that any foreign matters like dust or sand do not get into the terminals (see Figure 3-28 B). If foreign matters have got into the terminals, remove them completely with soft, pointed sticks, and repeat mounting/dismounting it on/from the battery charger several times.

B Terminals
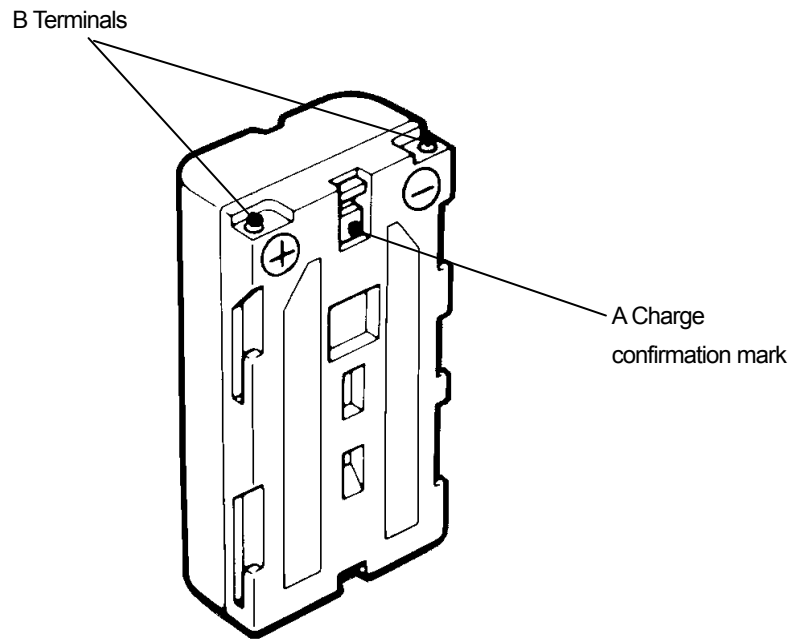
A Charge
confirmation mark

Figure 3-28 Battery Pack

3.10.2 Charging Device BC-3008 series

      The battery charger BC-3008-series is exclusively used with the battery pack BP-3007-series.

      When the battery pack is in the availability "0" state, charging will take about 2.5 hours.

(1) Procedure for using the charger

    a) Mount the battery in the charger (see Figure 3-24-(1))

      While pushing the battery pack against the charger, slide it in the direction indicated by the arrow. Mounting of the battery pack is completed when it is pushed in until the shutter of the charger is hidden.

    b) Connect the AC cord to the charger

      Connect the AC cable to the charger, and connect the AC cable plug to the socket outlet. (See Figure 3-29-(2).) The CHARGE lamp (orange) on the charger will light indicating the start of charging.

    c) Completion of charging

      When the CHARGE lamp goes off, the battery pack has been charged enough for practical use. The battery pack will be fully charged if it is charged for another hour continuously after the lamp goes off.

    d) Removing the battery

      When charging is finished, remove the battery pack sliding it in the opposite direction from the mounting, and disconnect the AC cable plug from the socket outlet.

Notes

- Thoroughly read the charger instruction manual to use the battery charger correctly and safely.
- Charge the battery pack in a place where the ambient temperature is 0 to 35 and the humidity is 45 to 90%.
- After using the battery charger, be sure to disconnect it from the socket outlet. Dismount the battery pack from the charger within 24 hours after it has been charged.

Remarks

- Store the battery pack in a cool location to ensure the longevity of the battery. It is recommended to charge the battery in an area with a temperature between +10 and +30 °C.
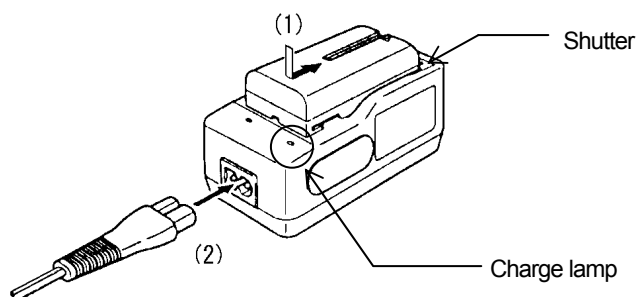

Figure 3-29 Battery Charger