

# **NON-CONTACT 3D DIGITIZER VIVID 700/VI-700**

INSTRUCTION MANUAL (HARDWARE)

**NOTE**

The VI-700 is model name for Europe and the VIVID 700 is model name for other countries.  
Please note that the VIVID 700 model name is intended only for reference with this manual.

























**MINOLTA**



## **SAFETY PRECAUTIONS**

- To ensure correct use of the VIVID 700, read the following points carefully and adhere to them. After you have read this manual, keep it in a safe place where it can be referred to anytime a question arises.

 <b>WARNING</b> (Failure to adhere to the following points may result in death or serious injury.)	
 Do not use the VIVID 700 in places where flammable or combustible gases (gasoline etc.) are present. Doing so may cause a fire.	 Do not disassemble or modify the VIVID 700. Doing so may cause a fire or electric shock.
 Always use the AC power cord supplied as a standard accessory with the VIVID 700, and connect it to an AC outlet (100-240 Vac, 50-60 Hz). Failure to do so may damage the VIVID 700, causing a fire or electric shock.	 Take special care not to allow liquid or metal objects to enter the VIVID 700. Doing so may cause a fire or electric shock. Should liquid or metal objects enter the VIVID 700, turn the power OFF immediately, disconnect the AC power cord from the AC outlet, and contact the nearest Minolta-authorized service facility.
 Do not bend, twist or pull the AC power cord excessively. In addition, do not place heavy items on the AC power cord, or damage or modify it in any way. Doing so may cause damage to the AC power cord, resulting in fire or electric shock.	 The VIVID 700 should not be operated if dirt or dust has entered through the vent holes. Doing so may result in a fire. For periodic inspection, contact the nearest Minolta-authorized service facility.
 If the VIVID 700 will not be used for a long time, disconnect the AC power cord from the AC outlet. Accumulated dirt or water on the prongs of the AC power cord's plug may cause a fire. If there is any dirt or water on the prongs of the AC power cord's plug, remove it.	 Do not put the battery in fire, short-circuit it, heat it or disassemble it. Doing so may cause explosion or heat generation, resulting in fire or injury.
 When disconnecting the AC power cord's plug, always hold the plug and pull it to remove it. Never pull the AC power cord itself. Doing so may damage the AC power cord, causing a fire or electric shock. In addition, do not insert or disconnect the AC power cord's plug with wet hands. Doing so may cause electric shock.	 Never stare into the laser emitting window. 
 The VIVID 700 should not be operated if it is damaged, or smoke or odd smells are detected. Doing so may result in a fire. In such situations, turn the power OFF immediately, disconnect the AC power cord from the AC outlet, and contact the nearest Minolta-authorized service facility.	 Do not place a lens, mirror or optical element in the passage of the laser beam. Doing so may converge the laser beam, resulting in damage to your eyes, burns or fire. To prevent the above accidents, make sure that a wall or similar which can block the laser beam is located behind the object. 
	 The battery must be disposed of in the proper way. Failure to do so may cause short-circuit, resulting in heat generation, explosion or combustion, thereby causing injury or fire. The disposal method of lithium batteries varies according to local government regulations. Dispose of the battery according to the instructions given by local government regulations or ask a specialized waste service company to dispose of it.

 <b>CAUTION</b> (Failing to adhere to the following points may result in injury or damage to the VIVID 700 or other property.)	
 Do not use batteries other than those specified by MINOLTA. Failure to do so may cause explosion of the batteries or leakage of electrolyte, resulting in fire, injury or air pollution.	 Before connecting the grounding terminal, make sure that the AC power cord is not connected to the AC outlet. Failure to do observe this may cause electric shock.
 When removing batteries from the VIVID 700, keep them in a safe place out of the reach of children. Take special care when disposing of the batteries. Should a child swallow a battery, consult a doctor immediately.	 Do not place the VIVID 700 on an unstable or sloping surface. Doing so may result in its dropping or overturning, causing injury. Take care not to drop the VIVID 700 when carrying it.
 Be sure to connect the grounding terminal of the VIVID 700 to the one provided on the AC outlet or the one provided in the installation site. Failure to do so may result in electric shock.	

## FOREWORD

The VIVID 700 (for non-Europe)/VI-700 (for Europe) is designed for non-contact acquisition of 3D image data of an object by emitting a laser beam to the object and acquiring its shading images.  
Please note that the VIVID 700 model name is intended only for reference with this manual.

## NOTES ON USE

- ⚠ This instrument should be used under the following environmental conditions:
  - Indoor use only
  - Maximum altitude: 2000m
  - Ambient temperature: 10 to 35°C
  - Humidity: Less than 85% RH (at 35°C) with no condensation
  - Allowable fluctuation of power supply voltage:  $\pm 10\%$  of nominal voltage
  - Installation category 2
  - Pollution degree 1
- ⚠ Do not use the VIVID 700 in direct sunlight or near sources of heat such as stoves. Doing so will cause the temperature of the VIVID 700 to rise considerably higher than room temperature and may result in malfunctions. Use the VIVID 700 in a well ventilated area and make sure that the ventilation holes of the VIVID 700 are not blocked.
- ⚠ Do not use the VIVID 700 in extremely dusty or humid areas. Doing so may result in malfunctions.
- ⚠ Do not subject the VIVID 700 to strong vibration or shocks. Doing so may result in malfunctions.
- ⚠ Do not disconnect cords and cables with the POWER switch of the VIVID 700 set to ON "I". Doing so may result in malfunctions.
- ⚠ This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
  - Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and receiver.
  - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  - Consult the dealer or an experienced radio/TV technician for help.
- ⚠ This Class B digital apparatus complies with Canadian ICES-003.  
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.
- ⚠ The VIVID 700 is a class II instrument specified in IEC Publication 825. Use it according to the instructions given in this manual.

## CARE AND STORAGE

- ⚠ The VIVID 700 should be stored in areas with temperatures of between -20 and +50°C. Do not store it in areas subject to high temperature or high humidity or where sudden changes in temperature or condensation are likely to occur. We recommend storing the VIVID 700 at a relatively constant temperature with a desiccant (silica gel etc.).
- ⚠ Do not leave the VIVID 700 inside a closed car or in the trunk of a car. Under direct sunlight, the increase in temperature can be extreme and may result in malfunctions.
  - 1 If the VIVID 700 needs cleaning, wipe with a soft dry cloth. Never use solvents such as thinner or benzene.
  - 1 In cases of malfunction, do not disassemble the VIVID 700 or attempt to repair it yourself. Contact the nearest Minolta-authorized service facility.

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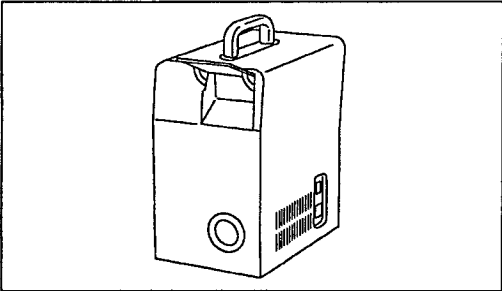
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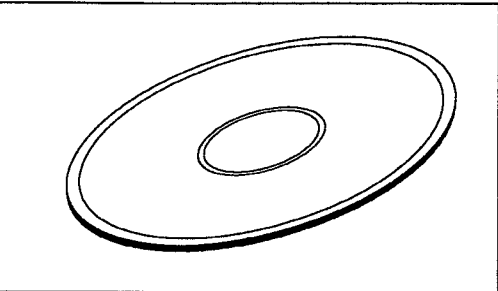
# STANDARD ACCESSORIES

Check that the following standard accessories are present.

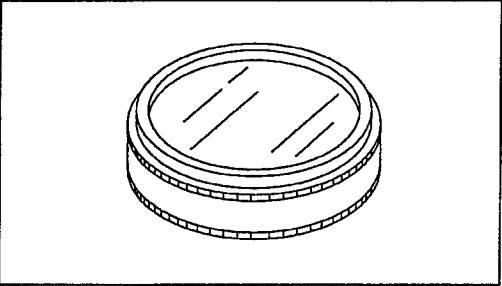
**VIVID 700 MAIN BODY**



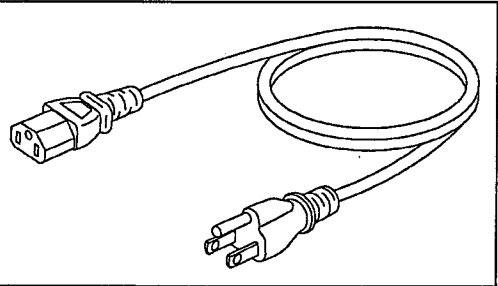
**UTILITY SOFTWARE VI-S1**



**WHITE BALANCE CAP VI-A10**

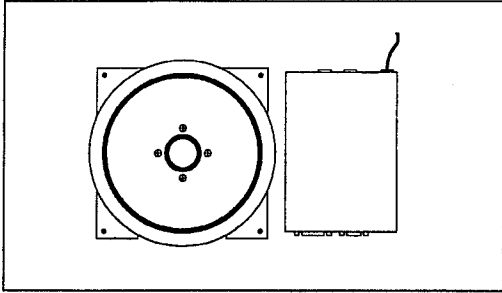


**AC POWER CORD**

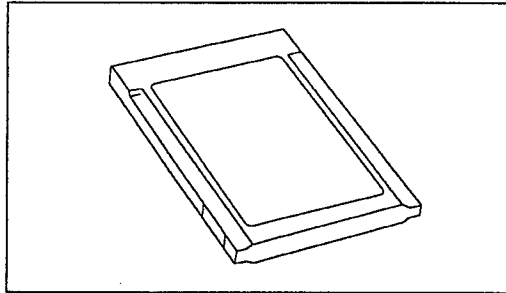


## OPTIONAL ACCESSORIES

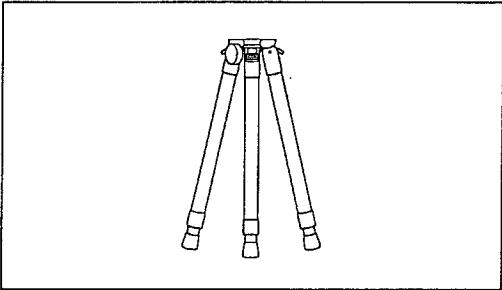
### ROTATING STAGE SET



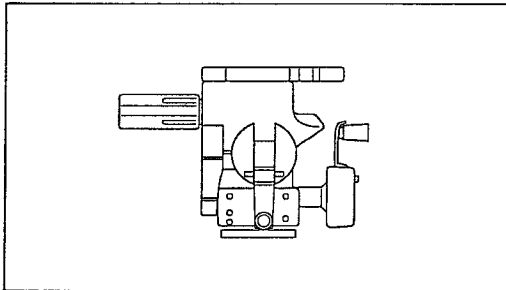
### MEMORY CARD VI-A11



### TRIPOD CS-A3

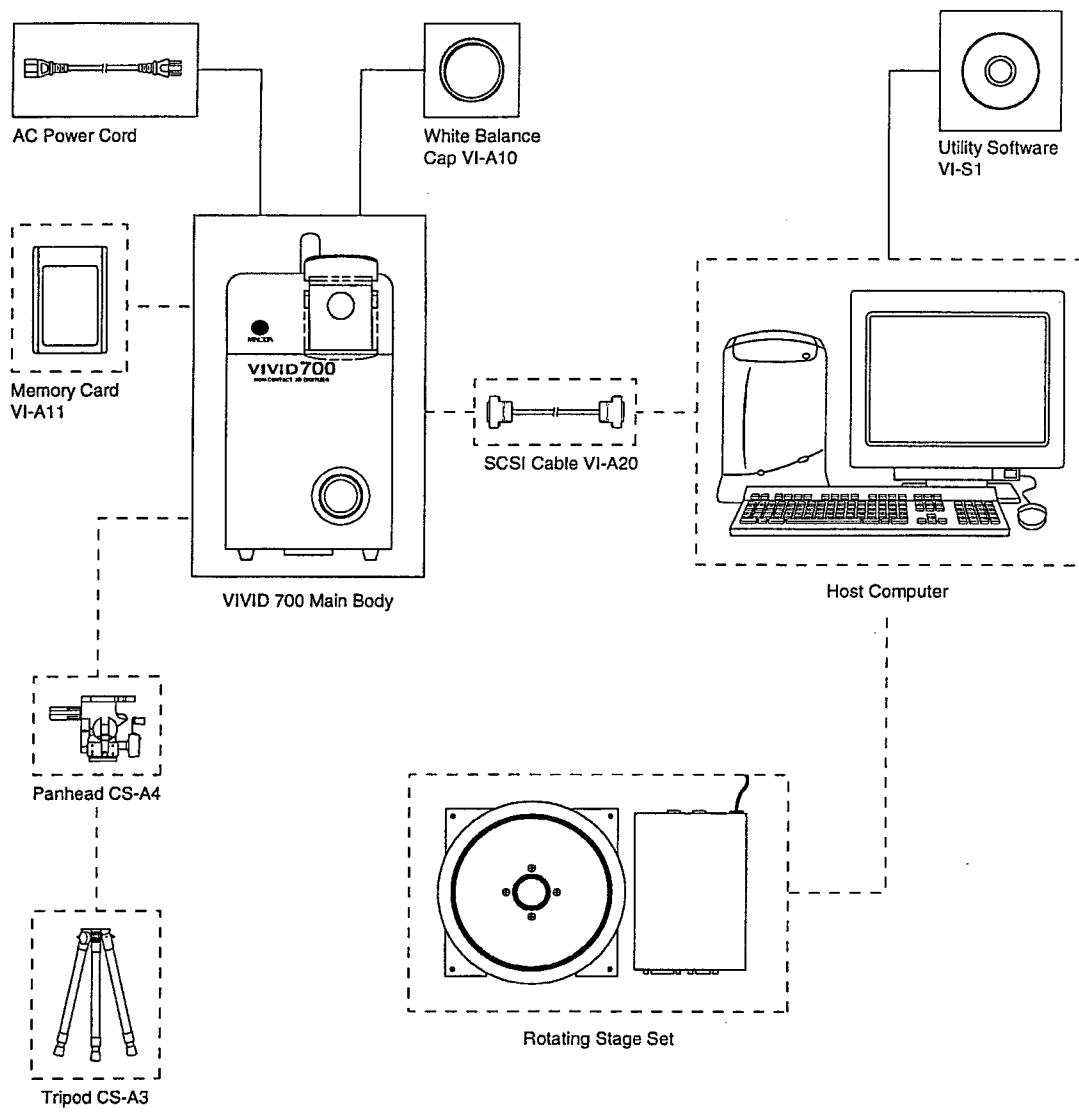


### PANHEAD CS-A4



SCSI Cable VI-A20 (Half-pitch, D-Sub, 50-pin male plug on both ends)  
Joint MM-A14 (for rotating stage)

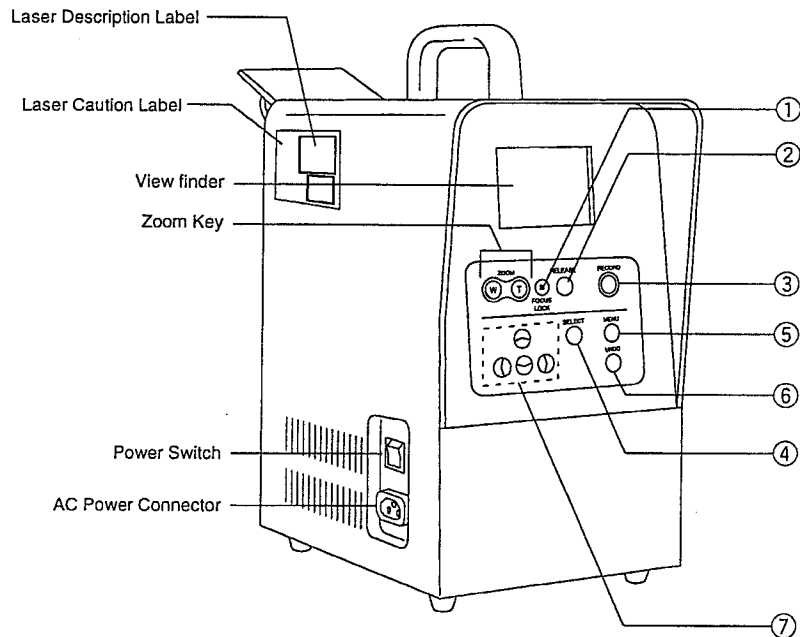
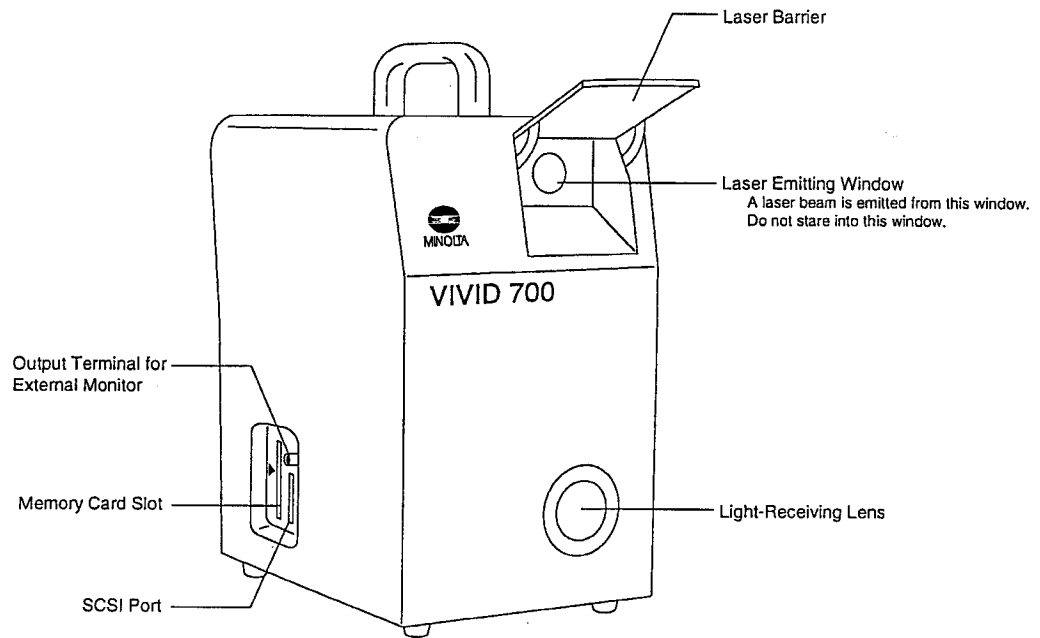
# SYSTEM CONFIGURATION



—— Standard accessory

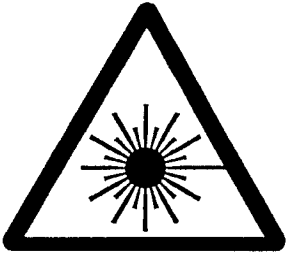

- - - Optional accessory  
 (A commercially available  
 computer can be used as  
 the host computer.)

## NAMES OF PARTS



- ① **FOCUS LOCK** key ..... Fixes the focus to acquire an image.
- ② **RELEASE** key ..... Acquires an image.
- ③ **RECORD** key ..... Saves the acquired image to the PC card.
- ④ **SELECT** key ..... Confirms selection of the items to be displayed on the viewfinder.
- ⑤ **MENU** key ..... Displays the MENU view on the viewfinder.
- ⑥ **UNDC** key ..... Cancels key operations.
- ⑦ **[<] [^] [v] [>]** key ..... Shifts an item displayed on the viewfinder.

# LASER DESCRIPTION AND CAUTION LABEL

	<p><b>CAUTION</b></p> <p>レーザ光 ビームをのぞきこまないこと LASER RADIATION DO NOT STARE INTO BEAM LASER STRAHLUNG NICHT IN DEN STRAHL SEHEN</p> <hr/> <p>MAX 25mW 685nm</p> <hr/> <p>クラス2 レーザ商品 CLASS 2 LASER PRODUCT Complied with IEC Publication 825, Amendment 1, 1990-08</p>
<p><b>AVOID EXPOSURE</b> Laser radiation is emitted from this aperture.</p>	<p><b>CAUTION</b></p> <p>LASER RADIATION DO NOT STARE INTO BEAM</p>  <hr/> <p>MAX 25mW 685nm CLASS 1 LASER PRODUCT</p>
<p>Complies with 21 CFR Chapter 1, Subchapter J. MINOLTA CO., LTD. 3-12, 2-Chome, Azuchi-Machi, Chuo-ku, Osaka 541 Japan manufactured</p>	
<p>SEPTEMBER 1997</p>	

## CONNECTING THE AC POWER CORD

### ⚠ WARNING

- ❶ Always use the AC power cord supplied as a standard accessory with the VIVID 700, and connect it to an AC outlet (100-240 V~, 50-60 Hz). Failure to do so may damage the VIVID 700, causing a fire or electric shock.
- ❷ Do not bend, twist or pull the AC power cord excessively. Do not place heavy items on the AC power cord, or damage or modify it in any way. Doing so may cause damage to the AC power cord, resulting in fire or electric shock.
- ❸ If the VIVID 700 will not be used for a long time, disconnect the AC power cord from the AC outlet. Accumulated dirt or water on the prongs of the AC power cord's plug may cause a fire. Any dirt or water on the prongs of the AC power cord's plug must be removed.
- ❹ When disconnecting the AC power cord's plug, always hold the plug and pull it to remove it. Never pull the AC power cord itself. Doing so may damage the AC power cord, causing a fire or electric shock. Do not insert or disconnect the AC power cord's plug with wet hands. Doing so may cause electric shock.

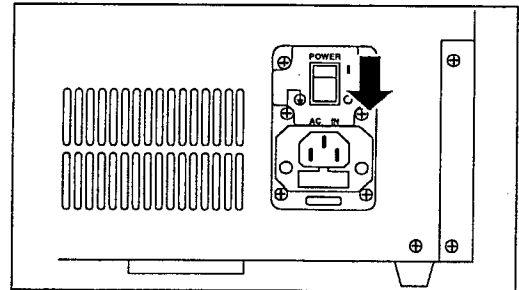
### ⚠ CAUTION

- ❶ Be sure to connect the grounding terminal of the VIVID 700 to the one provided on the AC outlet or the one provided in the installation site. Failure to do so may result in electric shock.
- ❷ Before connecting the grounding terminal, make sure that the AC power cord is not connected to the AC outlet. Failure to observe this may cause electric shock.

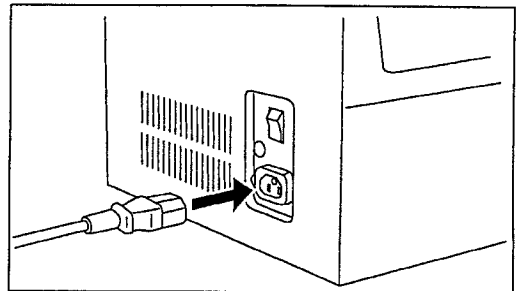
### Connecting Method

1. Set the POWER switch on the side panel of the VIVID 700 to the OFF "O".

- ⚠ If the AC power cord is connected to an AC outlet with the POWER switch set to ON "I", damage to the VIVID 700 or host computer may result.



2. Plug the AC power cord to the AC power connector (AC IN) on the side panel.
3. Plug the other end of the AC power cord to an AC outlet.



### ⚠ CAUTION

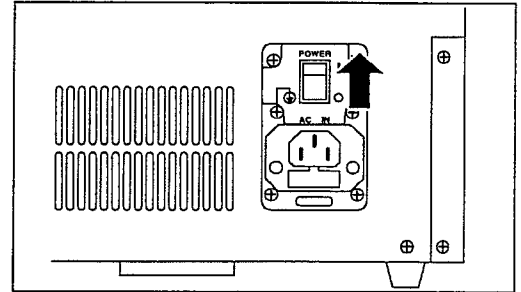
- ⚠ Be sure to connect the grounding terminal of the VIVID 700 to the one provided on the AC outlet or the one provided in the installation site. Failure to do so may result in electric shock.
- ⚠ Before connecting the grounding terminal, make sure that the AC power cord is not connected to the AC outlet. Failure to observe this may cause electric shock.

## TURNING POWER ON/OFF

### Turning Power ON

1. Set the POWER switch to ON "I".

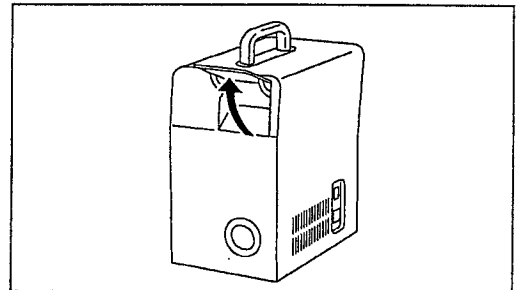
- ◆ The power will be supplied to the VIVID 700 and the initial setup is performed. After approximately 10 seconds, "PLEASE OPEN LASER BARRIER AND PRESS ANY KEY" will be displayed on the viewfinder.



2. Open the laser barrier.

3. Press any key.

- ◆ The VIVID 700 is now ready for operation.

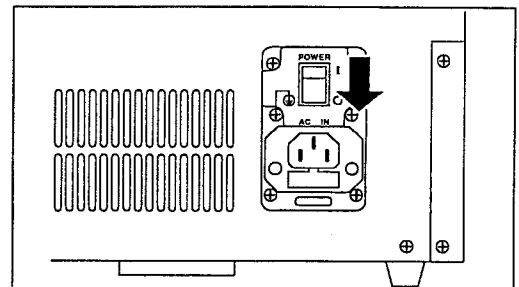


⚠ When turning the power ON after it has been turned OFF, wait at least 5 seconds before turning the power ON. Failure to do so may result in malfunction.

### Turning Power OFF

1. Set the POWER switch to OFF "O".

- ◆ The power will be turned off.



## CONNECTING THE VIVID 700 TO A HOST COMPUTER

To operate the VIVID 700 from a host computer using the utility software VI-SI, the VIVID 700 must be connected to the host computer with an optional SCSI cable (VI-A20).

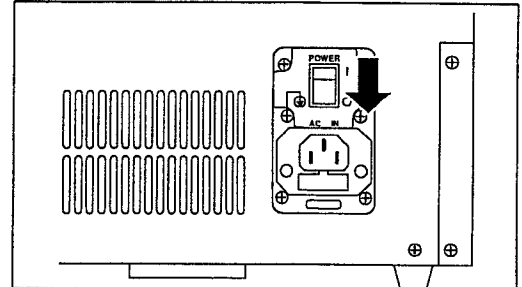
### ⚠ CAUTION

- The host computer must be operated correctly and safely according to its instruction manual.
- The optional SCSI cable (VI-A20) has a 50-pin male plug (half-pitch, D-Sub) on both its ends.
- Before turning the host computer ON, make sure that the VIVID 700 is turned ON and ready for operation.

### Connecting Method

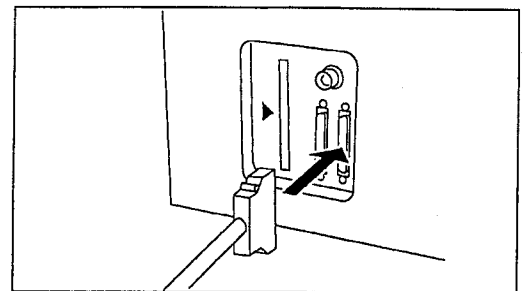
1. Set the POWER switch of both VIVID 700 and host computer to OFF "O".

⚠ If the VIVID 700 is connected to the host computer with the POWER switch set to ON "I", damage to the VIVID 700 or host computer may result.



2. Plug the SCSI cable to a SCSI port of the VIVID 700.
3. Plug the other end of the SCSI cable to the SCSI connector of the host computer.

◆ The VIVID 700 is now connected to the host computer.



## Setting the SCSI ID No.

In order for the host computer to recognize that the VIVID 700 is connected to the host computer via the SCSI interface, a SCSI ID No. (1 to 6) must be set for the VIVID 700.

● SCSI ID No. 5 has been set as the default setting before shipment.

△ If other devices are connected to the host computer via the SCSI interface, make sure that the SCSI ID No. of the VIVID 700 differs from those set for the devices.

### Setting Method

1. Press the **MENU** key.

◆ The MENU view will appear on the viewfinder.

2. Press the [^] and [v] keys to locate the cursor to "CAMERA SETTINGS".

3. Press the **SELECT** key.

◆ The CAMERA SETTINGS view will appear on the viewfinder.

4. Press the [^] and [v] keys to locate the cursor to "SCSI ID".

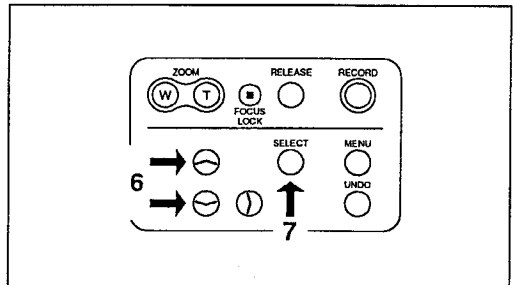
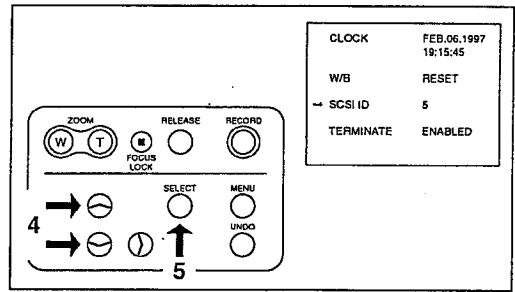
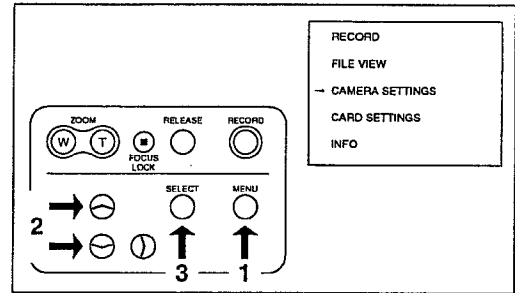
5. Press the **SELECT** key.

◆ The currently selected SCSI ID No. will blink.

6. Press the [^] and [v] keys to select the desired SCSI ID No.

7. Press the **SELECT** key.

◆ Setting is now complete.



## Setting the Terminator

The VIVID 700 has a built-in SCSI terminator. The terminator is needed if the VIVID 700 is the last device of those connected in series to the SCSI interface (i.e., if only one of the SCSI ports on the VIVID 700 is used). "ENABLED" or "DISABLED" must be selected for the built-in terminator according to how the VIVID 700 is connected to the SCSI interface. (If the VIVID 700 is not the last device of those connected in series to the SCSI interface or if it is not connected via the SCSI interface, the terminator is not needed. However, "DISABLED" still needs to be selected.)

● "ENABLED" has been selected as the default setting before shipment.

△ If the terminator is not set correctly, the VIVID 700 or devices connected to the SCSI interface may malfunction.

### Setting Method

1. Press the **MENU** key.

◆ The MENU view will appear on the viewfinder.

2. Press the [^] and [v] keys to locate the cursor to "CAMERA SETTINGS".

3. Press the **SELECT** key.

◆ The CAMERA SETTINGS view will appear on the viewfinder.

4. Press the [^] and [v] keys to locate the cursor to "TERMINATE".

5. Press the **SELECT** key.

◆ The currently selected option (ENABLED or DISABLED) will blink.

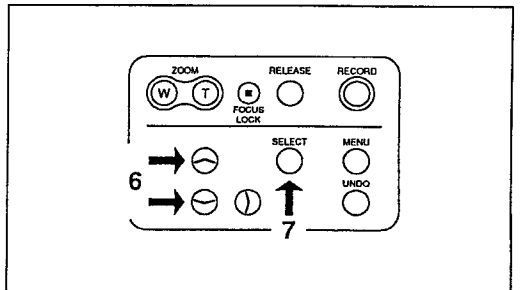
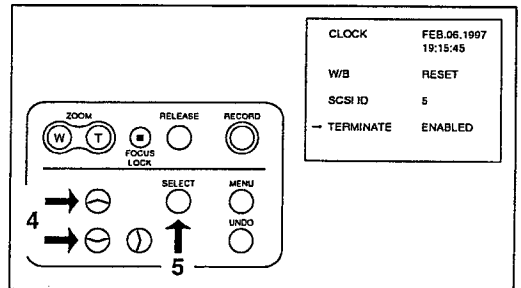
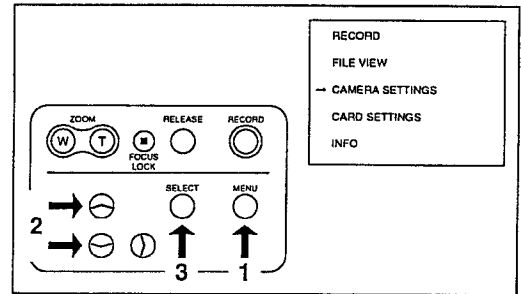
6. Press the [^] and [v] keys to select "ENABLED" or "DISABLED".

● **ENABLED:** Select this option if the terminator is to be used.

● **DISABLED:** Select this option if the terminator is not to be used.

7. Press the **SELECT** key.

◆ Setting is now complete.



## ROTARY STAGE SET (OPTION)

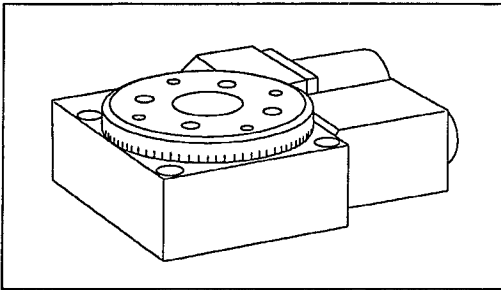
### **⚠ WARNING**

❶ The rotary stage set must be operated correctly and safely according to its instruction manual. Failure to do so may result in fire or electric shock.

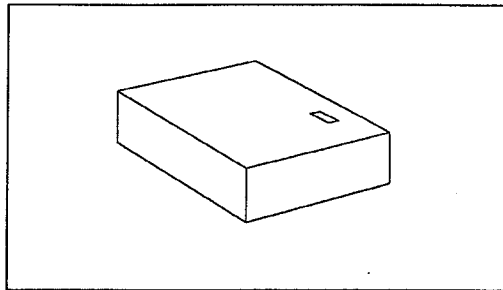
The rotary stage set is used to rotate the object at certain angles accurately and facilitate acquisition of images and integration of multi-view data.

### Contents

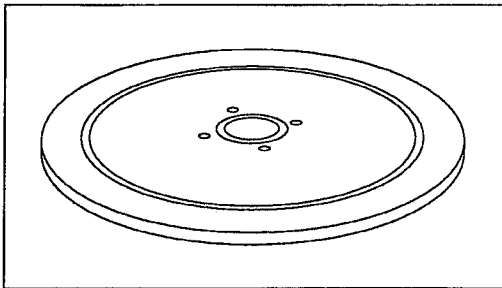
#### ROTARY STAGE



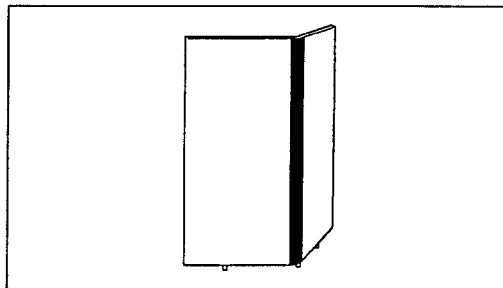
#### REMOTE CONTROLLER



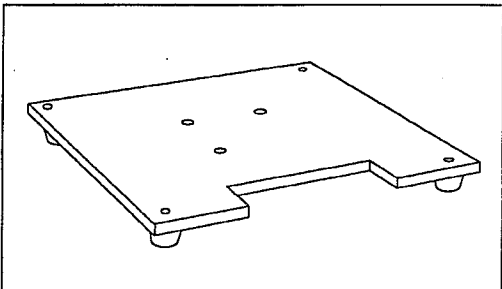
#### ROTARY TABLE MM-A10



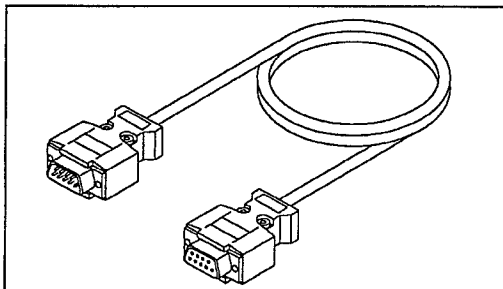
#### CALIBRATION CHART MM-A11



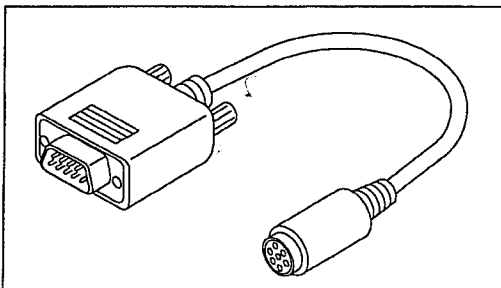
#### BASE MM-A13



#### BS-232C CABLE IF-A12



#### CONNECTOR CONVERTING CABLE MM-A12



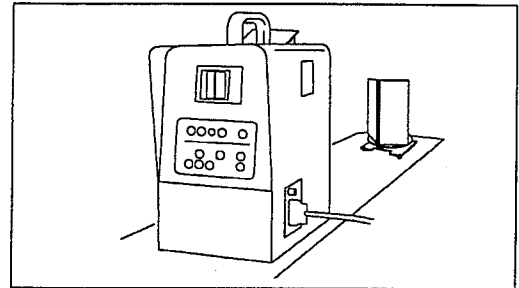
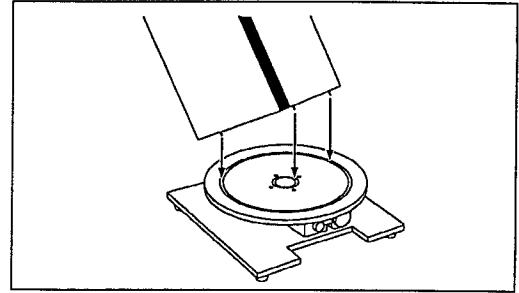
#### MOTOR JOINT

## Mounting the Calibration Chart

The calibration chart supplied with the rotary stage set can be installed on the rotation axis of the rotary stage. By placing the calibration chart on the rotation axis and acquiring its image, the distance from the VIVID 700 to the rotation axis can be calculated. The utility software VI-S1 enables the VIVID 700 to use the calculated distance data and automatically perform registration of multiple image data acquired while the rotary stage is rotated by certain angles, to create 3D image easily.

### Mounting Method

1. Mount the rotary table MM-A10 on the rotary stage.
2. Position the calibration chart so that its front edge (marked with a black line) faces the VIVID 700, then place it on the rotary table. Make sure that it is fitted into the three slots provided on the rotary table.



## MEMORY CARD (OPTION)

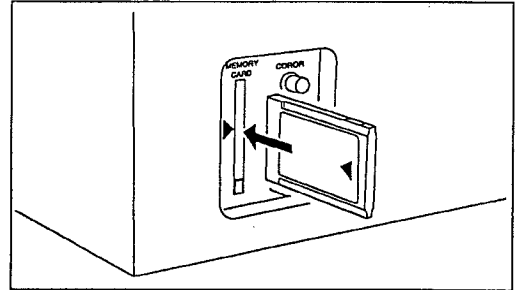
The memory card (VI-A11) is a PC card (ATA type II) and is used to save the acquired image data (3D data, color images).

- For a description of data file management (saving, loading, selecting etc.), refer to pages 24 to 29.

### Inserting the Memory Card

1. Position the memory card so that the “▶” mark on the memory card is aligned with that of the memory card slot, then insert the memory card into the slot.

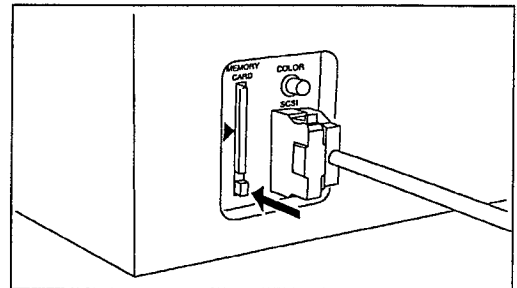
- Make sure that the memory card is inserted into the slot until the eject button pops out.
- ⚠ Make sure that the memory card is correctly oriented. Failure to do so may cause damage to the memory card.



### Ejecting the Memory Card

1. Press the eject button. The memory card will be ejected from the slot.

- ⚠ Never attempt to eject the memory card during data loading or saving.



## CONNECTING AN EXTERNAL MONITOR

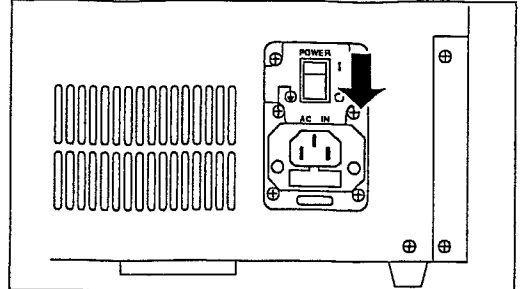
To connect an external monitor to the VIVID 700, use a suitable co-axial cable (the cable must have a BNC terminal (75Ω) on the end which is to be connected to the VIVID 700).

- Only the NTSC type monitor can be used (PAL and other types cannot be used).

### Connecting Method

1. Set the POWER switch of both VIVID 700 and external monitor to OFF "O".

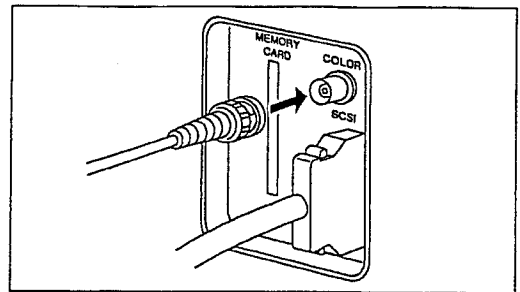
⚠ If the VIVID 700 is connected to the monitor with the POWER switch set to ON "I", damage to the VIVID 700 or monitor may result.



2. Connect the BNC plug of the co-axial cable to the output terminal for external monitor (COLOR) of the VIVID 700.

3. Connect the other end of the cable to the VIDEO terminal of the external monitor.

- ◆ The VIVID 700 is now connected to the external monitor.
- Set the POWER switch of the VIVID 700 to ON "I". The same views and images currently displayed on the viewfinder will appear on the external monitor.



# ACQUIRING AN IMAGE

## MENU key

The MENU key is used to display the MENU view, which is the fundamental view for operations. If you get lost during operations becoming unsure of which view is currently displayed, press the MENU key to return to the MENU view. (From certain views, the MENU view may not be resumed.)

### ⚠ WARNING

- ⚠ Do not stare into the laser emitting window.
- ⚠ Do not place a lens, mirror or optical element in the passage of the laser beam. Doing so may converge the laser beam, resulting in damage to your eyes, burns or fire. To prevent the above accidents, make sure that a wall or similar which can block the laser beam is located behind the object.

## Operating Method

1. Press the MENU key.

- ◆ The MENU view will appear on the viewfinder.

2. Press the [^] and [v] keys to locate the cursor to "RECORD".

3. Press the SELECT key.

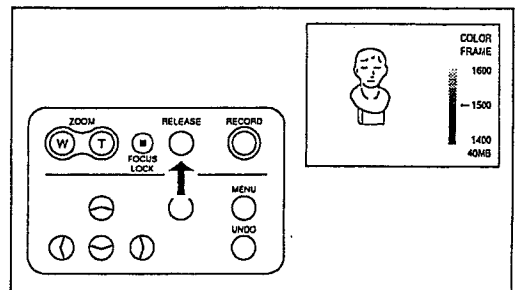
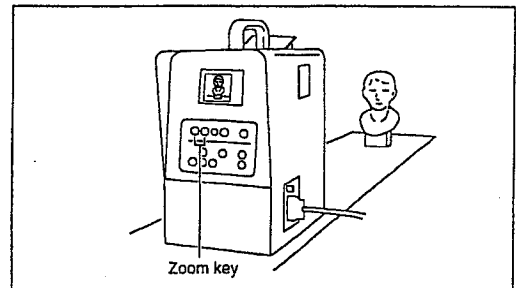
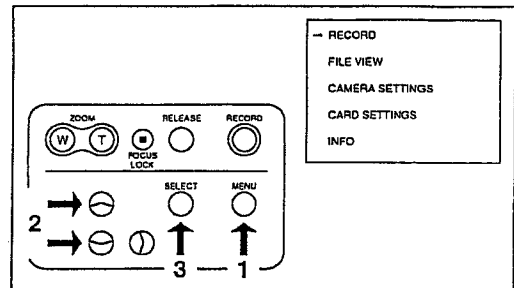
- ◆ The currently captured color image will appear on the viewfinder.

4. To display the object's image in the center of the viewfinder, change the position of the object and press the ZOOM key to fix the field of view.

- During zooming, "I", which indicates the focus frame, will be displayed. The VIVID 700 adjusts focus automatically within this range (auto-focus).

5. Press the RELEASE key.

- ◆ The VIVID 700 will perform auto-focus, and cause the laser beam to scan the object surface to capture the image of the object. The image input data (range image data) will be displayed on the viewfinder. (For a detailed description, refer to [Observing a Range Image] on page 19.)
- With certain objects, "AF ERROR" will be displayed, indicating that auto-focus cannot be performed. In this case, press any key to clear the error view, then set focus lock (see page 20).



## OBJECTS WHOSE CORRECT IMAGES ARE DIFFICULT TO ACQUIRE

- Glass etc. which transmits light
- Mirrors etc. which causes mirror reflection
- Electric bulbs etc. which themselves illuminate
- Black or blue cloth material which has a low reflectance for red and similar colors

Correct images can be acquired from the above objects by increasing the laser intensity. (For a description of adjustment of the laser intensity, refer to "Adjusting the Laser Intensity Manually" on page 21.)

## OPERATION WHICH ERASE ACQUIRED IMAGE DATA

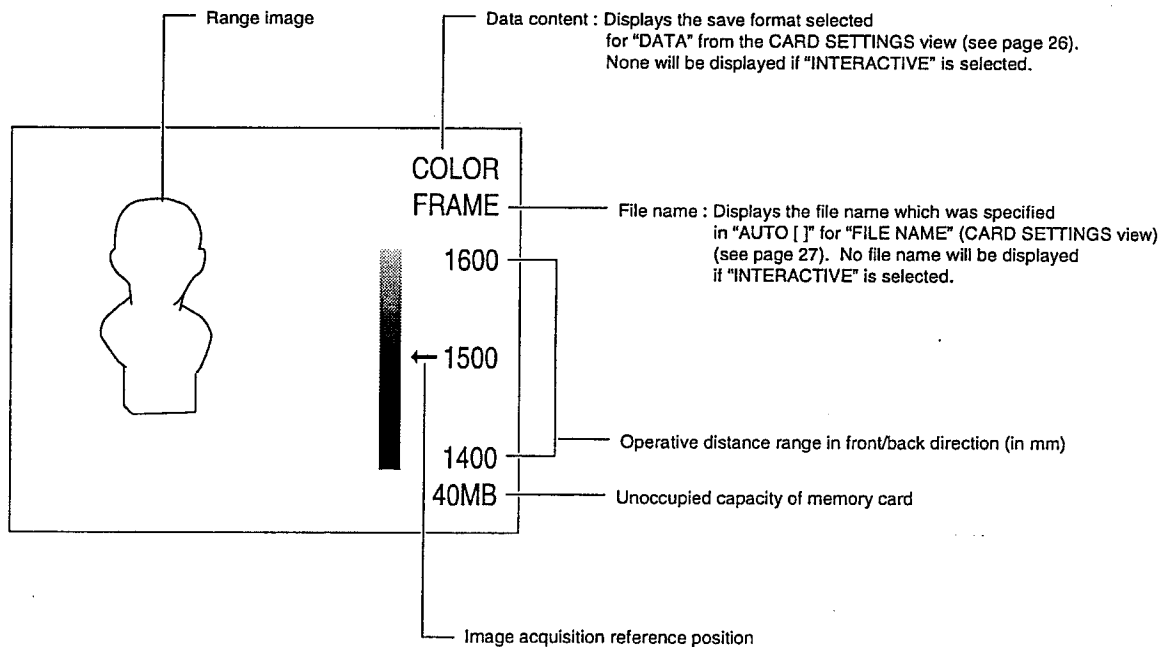
Acquired image data will be erased if any of the following operations are performed, so make sure that the data is saved in advance. (See page 26.)

- When the **ZOOM** key (W or T) is pressed
- When the **MENU** key is pressed
- When the **SELECT** key is pressed twice after the **UNDO** key is pressed
- When the **POWER** switch is set to OFF

## ACQUIRING ANOTHER IMAGE

To acquire another image after an image has been acquired, press the **ZOOM** key then repeat steps 4 and 5 on page 18 (ACQUIRING AN IMAGE).

## Observing a Range Image



## Displaying Color Images

Pressing the **[>]** or **[<]** key after a range image has been acquired will display the color image of the object. To switch back to the range image, press the **[>]** or **[<]** key again.

## Setting Focus Lock

With certain objects, "AF ERROR" will be displayed, disabling auto-focus. In this case, press any key to clear the error view, then set focus lock as described below.

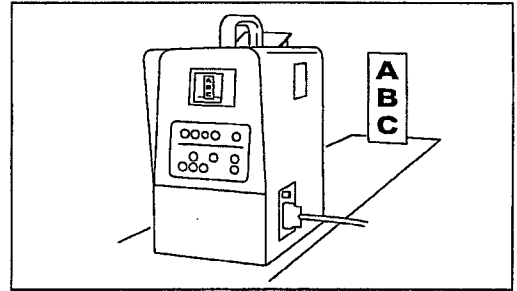
### OBJECTS WHICH MAKE AUTO-FOCUS DIFFICULT

- White wall etc. whose contrast is low
- Objects with repetitive patterns (stripes etc.)

### Operating Method

1. Place any item, which can be easily focused, in the approximate position in which the actual object is to be placed.

Example) Affix a paper on which high-contrast patterns, such as characters are written, to the object.

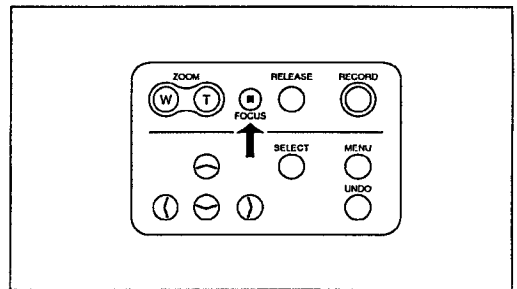


2. Press the **FOCUS LOCK** key.

◆ The focus will be fixed when the item is focused

3. Set the object in place and press the **RELEASE** key.

◆ The image of the object will be acquired.



# Adjusting the Laser Intensity Manually and Shifting the Operative Distance Range

## ADJUSTING THE LASER INTENSITY MANUALLY

The laser intensity can be adjusted manually in 9 steps.

To acquire images of black cloth etc. which has low reflectance, increase the laser intensity.

## SHIFTING THE OPERATIVE DISTANCE RANGE

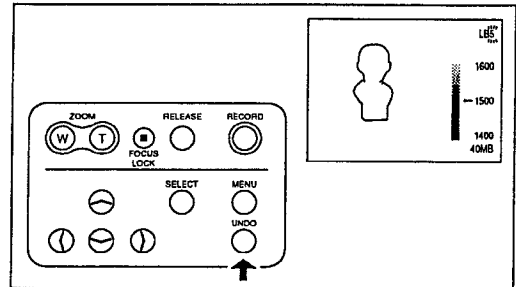
If the entire object is not completely within the operative distance range and a part of the front or back of the acquired image is missing, shift the image acquisition reference position back or forth (i.e., up or down on the viewfinder) as described below, then acquire the image.

If the entire object is still not completely within the operative distance range, the back/front distance of the object is too long. In this case, press the **ZOOM** key (W) or place the object away from the VIVID 700 (or place the VIVID 700 away from the object), then acquire the image again. In this case, the resolution of the image will drop.

### Operating Method

1. After an image is acquired, press the **UNDO** key.

- ◆ The currently set laser beam intensity indicated by "LD" will blink.

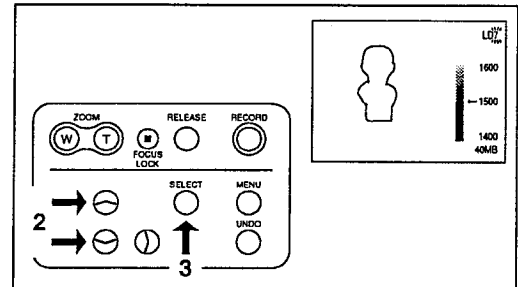


2. Press the [^] and [v] keys to set the desired laser beam intensity.

- The laser beam intensity can be set to 1 to 9. The larger the value is, the higher the laser beam intensity.

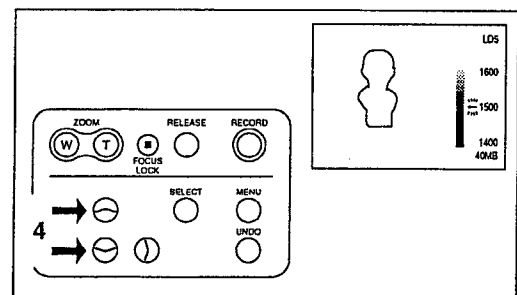
3. Press the **SELECT** key.

- ◆ "→" indicating the current scale will blink.



4. Press the [^] and [v] keys to shift the "→" up and down to the desired scale.

- If the acquired image lacks a front part of the object, shift the "→" down.
- If the acquired image lacks a back part of the object, shift the "→" up.
- Pressing the **UNDO** key once will cause the currently set laser beam intensity to blink, indicating that you can adjust the laser beam intensity.
- Pressing the **UNDO** key twice will return to the previous state, i.e. the view displayed immediately after the image was acquired.

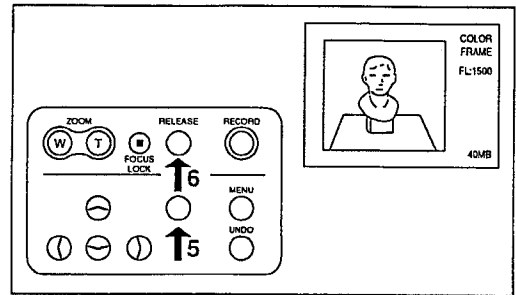


5. Press the **SELECT** key.

- ◆ The currently acquired color image and image acquisition reference position (indicated by "FL:") will be displayed on the viewfinder.

6. Press the **RELEASE** key.

- ◆ Acquisition of the image is now complete.

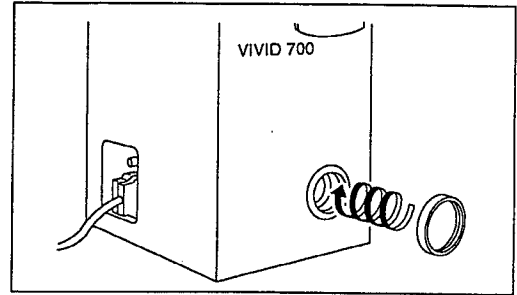


# White Balance

The color of an object varies slightly depending on the type of the light source. Thus, if you want to merge the image input data (3D image) with the color image data (see page 24), the color image data must be accurate. To acquire accurate color image data, adjust the white balance as described below under the light source to be used. The white balance has been adjusted under fluorescent light before shipment.

## Operating Method

1. Set the light source so that the lighting condition is the same as that under which image acquisition is to be performed.
2. Attach the white balance cap to the VIVID 700 as illustrated.



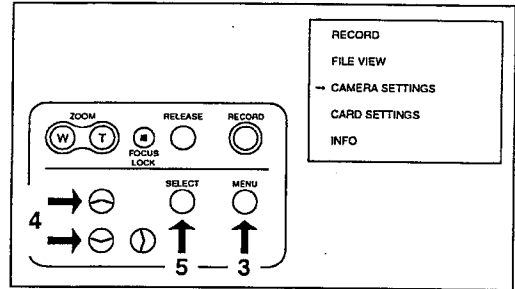
3. Press the **MENU** key.

- ◆ The MENU view will appear on the viewfinder.

4. Press the [^] and [v] keys to locate the cursor to "CAMERA SETTINGS".

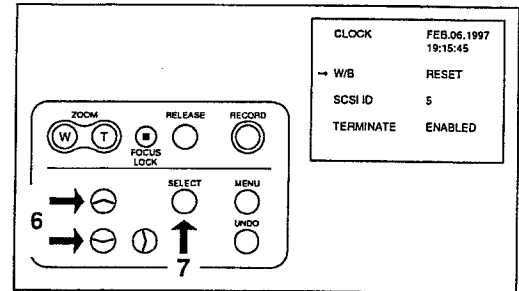
5. Press the **SELECT** key.

- ◆ The CAMERA SETTINGS view will appear on the viewfinder.



6. Press the [^] and [v] keys to locate the cursor to "W/B".

7. Press the **SELECT** key.

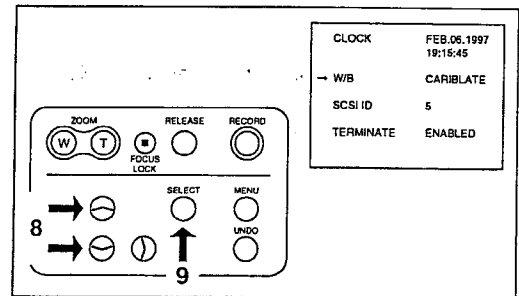


8. Press the [^] and [v] keys to locate the cursor to "CALIBRATE".

- If "RESET" is selected, the default calibration (calibrating under fluorescent light) will be selected.

9. Press the **SELECT** key.

- ◆ "CALIBRATING" will blink, indicating adjustment of the white balance is now in progress.
- ◆ When adjustment of the white balance is complete, the CAMERA SETTINGS view will re-appear.



# DATA FILE MANAGEMENT

The acquired image data can be saved in an optional memory card VI-A11. Once the data is saved, it can be loaded to the VIVID 700 or to the host computer using the utility software VI-S1.

## Selecting the Data to be Saved

The acquired image data can be saved in the following save formats.

**COLOR&RANGE:** Saves both the 3D data and color image data.

**RANGE:** Saves the 3D data only. (Select this format if it is not necessary to save the color image data. Selecting this format reduces the data size.)

**INTERACTIVE:** Asks you to select "COLOR&RANGE" or "RANGE" each time you attempt to save the data. (A view asking you select "COLOR&RANGE" or "RANGE" will appear each time you attempt to save the data.)

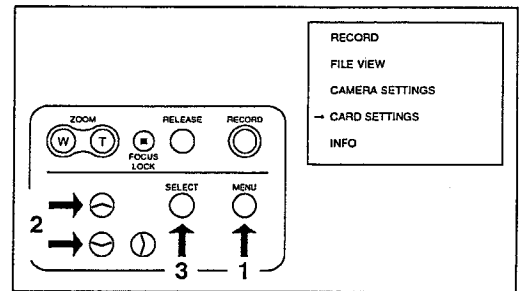
## Operating Procedure

1. Press the **MENU** key.

◆ The MENU view will appear on the viewfinder.

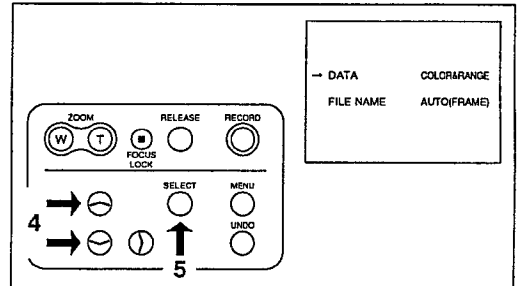
2. Press the [^] and [v] keys to locate the cursor to "CARD SETTINGS".

3. Press the **SELECT** key.



4. Press the [^] and [v] keys to locate the cursor to "DATA".

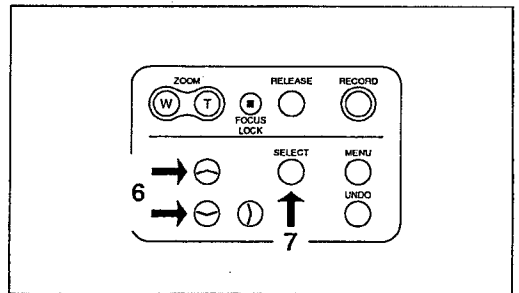
5. Press the **SELECT** key.



6. Press the [^] and [v] keys to select the desired save format.

7. Press the **SELECT** key.

◆ Selection of the data to be saved is now complete.



## Selecting the File Name Input Method

The data file name can be specified in the following methods.

**AUTO [ ]:** Adds a number (001 to 999) to the characters (up to 5 characters) entered in [ ] automatically and saves the data.

**INTERACTIVE:** Asks you to enter a file name each time you attempt to save the data. (A view asking you enter a file name will appear each time you attempt to save the data.)

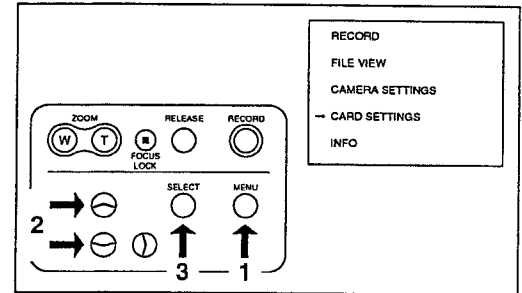
### Operating Method

1. Press the **MENU** key.

◆ The MENU view will appear on the viewfinder.

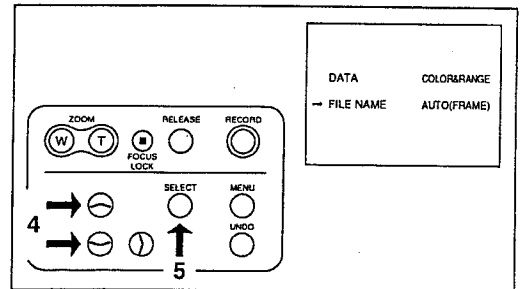
2. Press the [^] and [v] keys to locate the cursor to **"CARD SETTINGS"**.

3. Press the **SELECT** key.



4. Press the [^] and [v] keys to locate the cursor to **"FILE NAME"**.

5. Press the **SELECT** key.

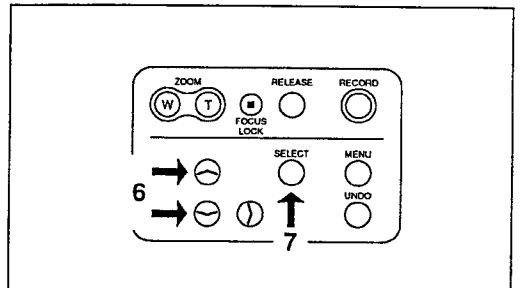


6. Press the [^] and [v] keys to select the desired file name input method.

- If "AUTO [ ]" is selected, use the [<] and [>] keys to select the desired character position, then use the [^] and [v] keys to select and enter the desired character. Up to 5 characters can be entered in [ ].

7. Press the **SELECT** key.

◆ Selection of the file name input method is now complete.

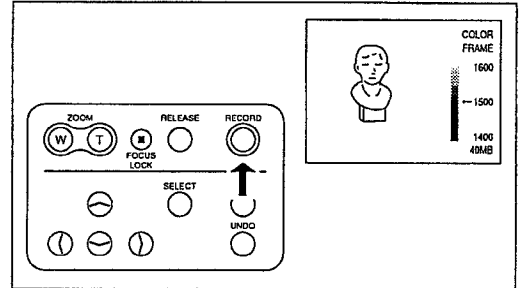


## Saving the File

The data can be saved as described below.

### Operating Method

1. Acquire necessary images.
2. Press the **RECORD** key.
  - ◆ If "INTERACTIVE" is selected in [Selecting the Data to be Saved] (page 24), a view asking you select "COLOR&RANGE" or "RANGE" will appear. Use the [^] or [v] key to select "COLOR&RANGE" or "RANGE", then press the **SELECT** key.
  - ◆ If "INTERACTIVE" is selected in [Selecting the File Name Input Method] (page 25), a view asking you enter a file name will appear. Enter the desired file name and press the **SELECT** key.
    - [<], [>] keys: Used to switch the character position.
    - [^], [v] keys: Used to select a character.
  - ◆ The data is now saved.



## Loading a File

The desired saved image data can be loaded as described below.

### Operating Method

1. Press the **MENU** key.

◆ The MENU view will appear on the viewfinder.

2. Press the [^] and [v] keys to locate the cursor to "FILE VIEW".

3. Press the **SELECT** key.

◆ The FILE LIST view will appear.

4. Press the [^] and [v] keys to locate the cursor to the file name to be loaded.

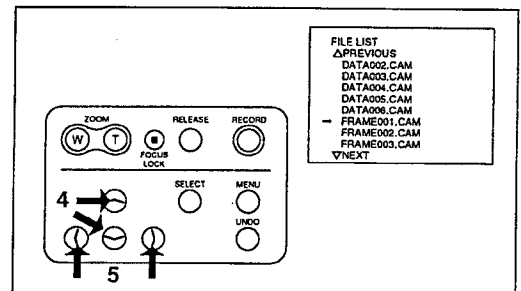
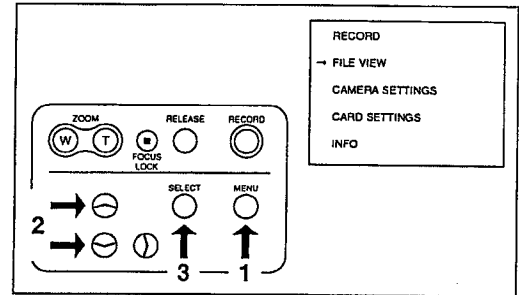
5. Press the [>] and [<] key.

● Each time the [>] key is pressed, the view will switch as follows.

Color image view → Range image view → File information view

● Each time the [<] key is pressed, the view will switch as follows.

File information view → Range image view → Color im-



# Changing a File Name

The file name of the desired image data can be changed as described below.

## Operating Method

1. Press the **MENU** key.

◆ The MENU view will appear on the viewfinder.

2. Press the [^] and [v] keys to locate the cursor to "FILE VIEW".

3. Press the **SELECT** key.

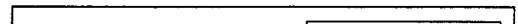
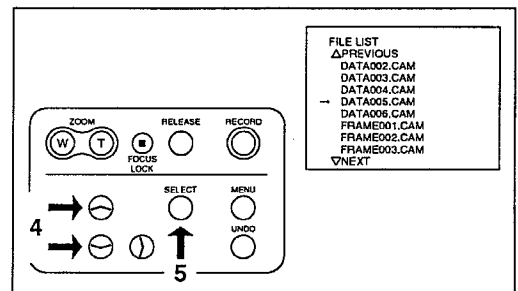
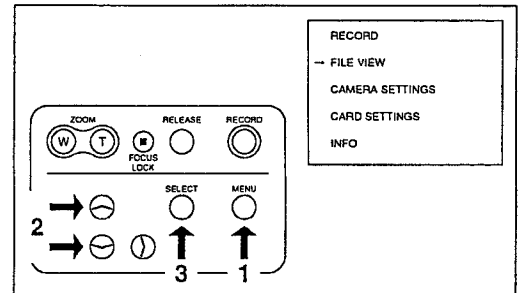
◆ The FILE LIST view will appear.

4. Press the [^] and [v] keys to locate the cursor to the file name to be changed.

5. Press the **SELECT** key.

◆ The file editing view will appear.

6. Press the [^] and [v] keys to locate the cursor to "CHANGE FILE



## Deleting a File

The desired data file can be deleted as described below.

### Operating Method

1. Press the **MENU** key.

◆ The MENU view will appear on the viewfinder.

2. Press the [^] and [v] keys to locate the cursor to "FILE VIEW".

3. Press the **SELECT** key.

◆ The FILE LIST view will appear.

4. Press the [^] and [v] keys to locate the cursor to the file to be deleted.

5. Press the **SELECT** key.

◆ The file editing view will appear.

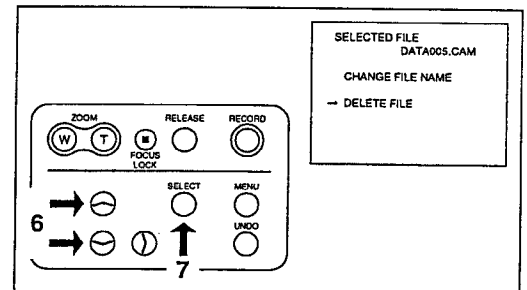
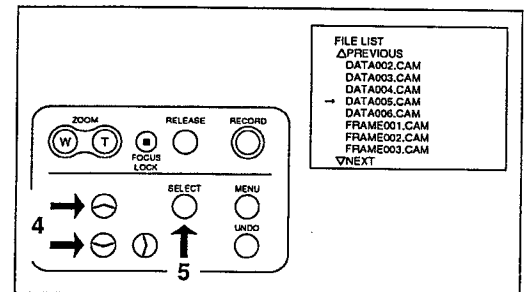
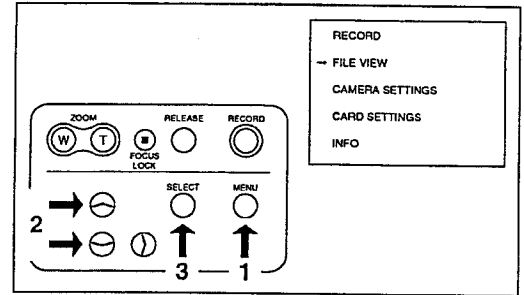
6. Press the [^] and [v] keys to locate the cursor to "DELETE FILE".

7. Press the **SELECT** key.

◆ The selected file name will blink.

8. Press the **SELECT** key.

◆ The file will be deleted, and the view will return to the previous one (FILE LIST view, color image view, range image view or file information view).



## SETTING THE DATE AND TIME

The date and time can be set. Once the date and time are set, when image data is saved the date and time on which the image was acquired will also be saved. If the current date and time are incorrect, correct them as described below. Japan local date and time have been set before shipment.

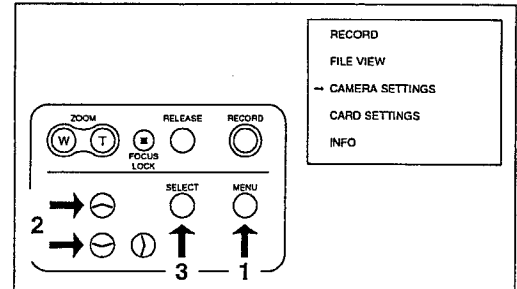
### Operating Method

1. Press the **MENU** key.

◆ The MENU view will appear on the viewfinder.

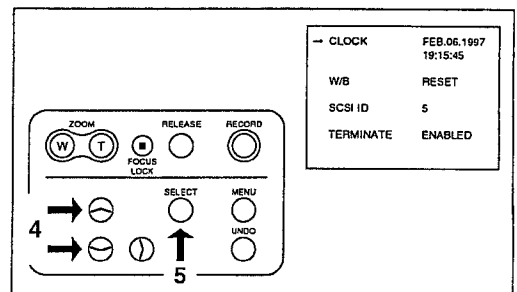
2. Press the [ $\wedge$ ] and [ $\vee$ ] keys to locate the cursor to "**CAMERA SETTINGS**".

3. Press the **SELECT** key.



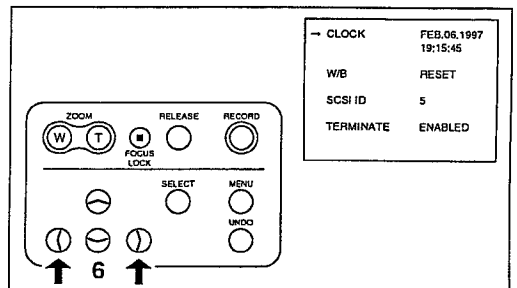
4. Press the [ $\wedge$ ] and [ $\vee$ ] keys to locate the cursor to "**CLOCK**".

5. Press the **SELECT** key.



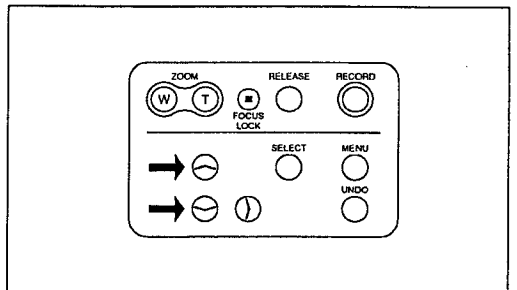
6. Press the [ $<$ ] and [ $>$ ] keys to select the date/time item to be set (or changed).

- Each time the [ $>$ ] key is pressed, the item will switch as follows.  
Month → Day → Year → Hour → Minute → Second
- Each time the [ $<$ ] key is pressed, the item will switch in the opposite order.
- To cancel the setting operation and return to the previous state, press the **UNDO** key.



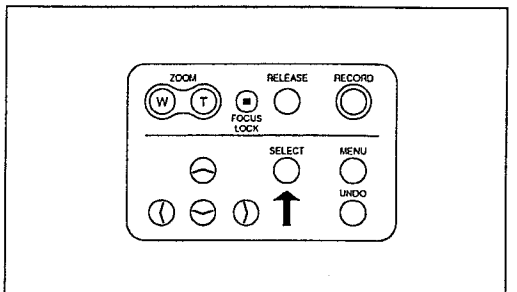
7. Press the [ $\wedge$ ] and [ $\vee$ ] keys to set (or change) the date/time item.

8. Repeat steps 6 and 7 until all the desired date/time items are set (changed).



9. Press the **SELECT** key.

◆ The date/time is now set (or changed).



## DISPLAYING THE STATUS INFORMATION

The model name, version, total capacity and unoccupied capacity of the memory card can be displayed.

CAMERA  
MODEL : Model name  
VERSION : Version  
PC CARD  
TOTAL SPACE : Total capacity of the memory card  
FREE SPACE : Unoccupied capacity of the memory card

### Operating Method

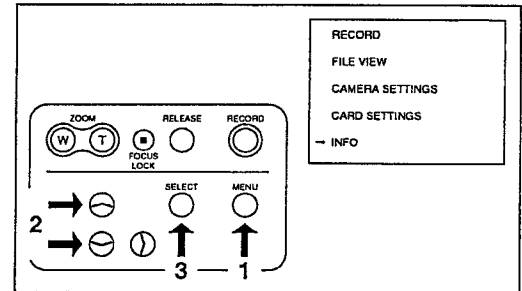
1. Press the **MENU** key.

◆ The MENU view will appear on the viewfinder.

2. Press the [^] and [v] keys to locate the cursor to "INFO".

3. Press the **SELECT** key.

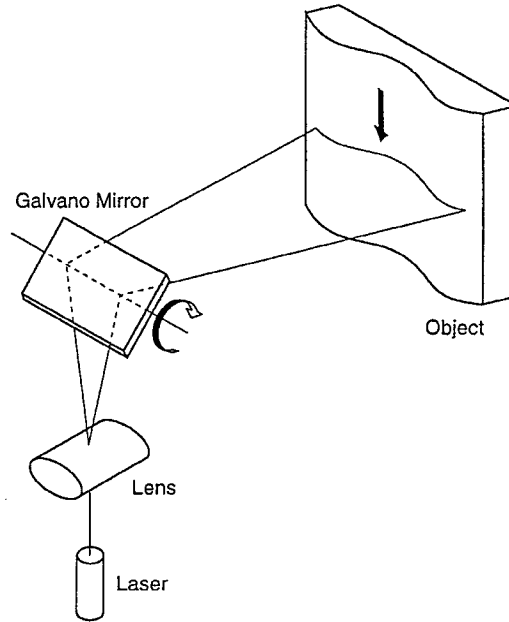
◆ The status information will be displayed as shown below.



CAMERA		Model name
MODEL	700	Version
VERSION	1.08	Total capacity of the memory card
PC CARD		Unoccupied capacity of the memory card
TOTAL SPACE	40MB	
FREE SPACE	36MB	

## MEASURING PRINCIPLE

The VIVID 700 uses the light-stripe method to emit a horizontal stripe light through a cylindrical lens to the object. The reflected light from the object is received by the CCD, and then converted by triangulation into distance information. This process is repeated by scanning the stripe light vertically on the object surface using a galvano mirror, to obtain a 3D image data of the object.



## High-Speed Image Processing Circuit

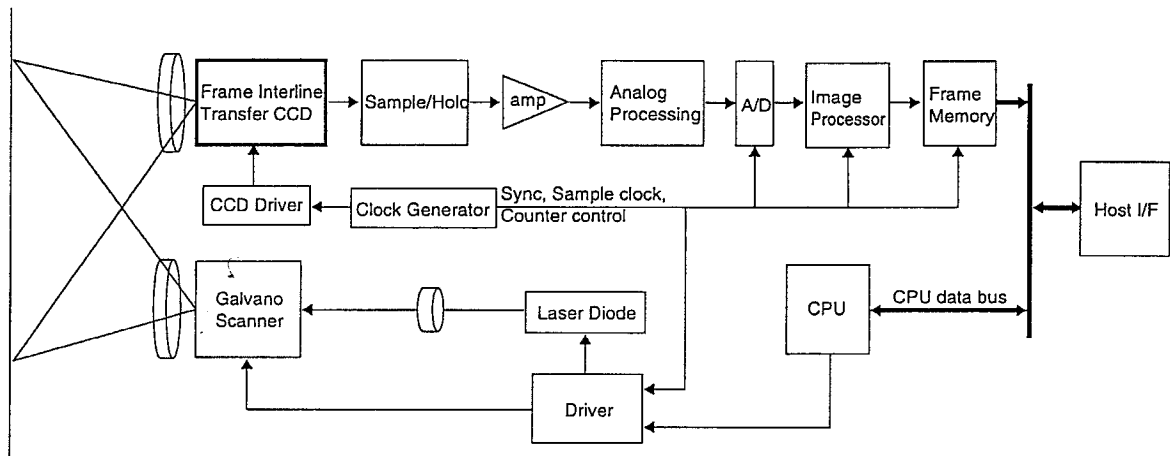
The VIVID 700 uses a CCD which can be operated in 2 modes (charge output and charge drain modes), to enable high-speed acquisition of range images.

After 1-frame CCD exposure, among the signal charges transferred to the memory, only those of the reflected light from the object surface are extracted by block readout while the other signal charges are drained at once.

The stripe light is scanned on the CCD image plane at one horizontal line per frame and the CCD is driven so that the block readout start position is shifted one line per frame, to acquire a total of approximately 250 frames of the image.

(CCD driving rate: 14.3 MHz, block readout: 38 lines, data acquisition speed: 0.6 seconds)

The output signal from the CCD is then sent to the analog processing portion, where it is amplified and subjected to waveform processing. It is then converted into a digital signal (i.e., image data) and saved in the frame memory.



## ERROR MESSAGES

The following error messages appear if incorrect operation is performed or an abnormality occurs with the VIVID 700. If an error message appears, take the appropriate corrective actions as shown in the table below. If the same error continues to occur, contact the nearest Minolta-authorized service facility.

Error Message	Description	Action
AF ERROR LASER BARRIER MAY BE CLOSED PRESS ANY KEY	Auto-focus failed. Press any key.	Open the laser barrier.
		In the case of an object for which is difficult to acquire correct images, set the focus lock.
BATTERY IS ALMOST EXHAUSTED	The voltage of the built-in backup battery has dropped.	Contact the nearest Minolta-authorized service facility.
CAUTION LASER SCANNER IS OUT OF ORDER PLEASE TURN OFF	The laser beam is not emitted properly. Turn off the power immediately.	Highly dangerous! Turn off the power immediately, and contact the nearest Minolta-authorized service facility.
COVER IS REMOVED PLEASE TURN OFF AND REPLACE IT	The cover is removed. Turn off the power immediately.	Highly dangerous! Turn off the power immediately, and contact the nearest Minolta-authorized service facility.
OUT OF DISTANCE RANGE PRESS ANY KEY	The object is not located within the specified object distance range. Press any key.	Place the object in a position 0.6 m to 2.5 m away from the VIVID 700.
INVALID FORMAT PLEASE INSERT ANOTHER PC CARD OR PRESS ANY KEY	The memory card has not been initialized. Insert another memory card or press any key.	Insert an initialized memory card into the slot or initialize the current memory card. (It is not possible to initialize a memory card using the VIVID 700.)
		Press any key to exit file management.
NO FREE SPACE PLEASE INSERT ANOTHER PC CARD OR PRESS ANY KEY	There is no sufficient unoccupied capacity on the memory card. Press any key.	Insert a memory card which has sufficient unoccupied capacity or delete some files from the current memory card. Insert a memory card which has sufficient unoccupied capacity.
		Press any key to exit file management.
NO PC CARD PLEASE INSERT A PC CARD OR PRESS ANY KEY	No memory card is inserted. Insert another memory card or press any key.	Insert a memory card into the slot.
		Press any key to exit file management.
PC CARD IS EJECTED PRESS ANY KEY	The memory card has been ejected.	Insert the memory card.
PC CARD IS EJECTED RECORDING IS CANCELED PRESS ANY KEY	The memory card has been ejected. Press any key.	Insert the memory card.
SCSI ERROR PRESS ANY KEY	A SCSI communication error has occurred. Press any key.	Connect the SCSI cable properly.
		Make the correct terminator setting.
SYSTEM ERROR PLEASE TURN OFF	A system error has occurred.	Turn OFF the power, then turn it ON again.
UNKNOWN PC CARD PLEASE INSERT ANOTHER PC CARD OR PRESS ANY KEY	The currently inserted memory card is not suitable for the VIVID 700. Insert another memory card or press any key.	Insert a suitable memory card into the slot.
		Press any key to exit file management.

## BUILT-IN BACKUP BATTERY

The clock function (see page 30 for how to set the date and time) is operated by the built-in backup lithium battery (button type). The service life of the battery is approximately 8 years. If the POWER switch is set to ON when the battery voltage is low, "BATTERY IS ALMOST EXHAUSTED" error message will appear. In this case, contact the nearest Minolta-authorized service facility.

⚠ Do not replace the backup with a new one by yourself. Doing so may damage the VIVID 700.

When disposing of the VIVID 700, remove the backup battery as described below and dispose it of in the proper way.

⚠ The backup battery must be disposed of in the proper way. Failure to do so may cause short-circuit, resulting in heat generation or explosion, thereby causing injury or fire.

### Disposing Of the Backup Battery

When you dispose of the VIVID 700, remove the backup battery as described below and dispose it of in the proper way.

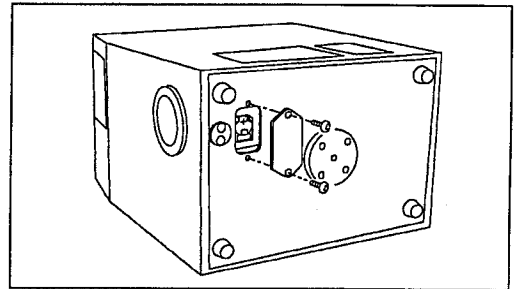
#### ⚠ WARNING

- ⊘ Do not put the battery in fire, short-circuit it, heat it or disassemble it. Doing so may cause explosion or heat generation, resulting in fire or injury.
- ❗ The battery must be disposed of in the proper way. Failure to do so may cause short-circuit, resulting in heat generation or explosion, thereby causing injury, burns or fire. The disposal method varies according to local government regulations. Dispose of the backup battery according to the instructions given by local government regulations or ask a specialized waste service company to dispose of it.

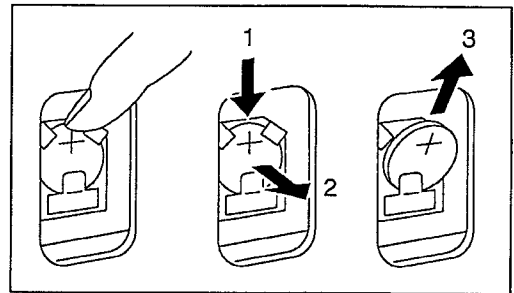
#### ⚠ CAUTION

- ❗ When removing the battery from the VIVID 700, keep it in a safe place out of the reach of children. Take special care when disposing of the batteries. Should a child swallow a battery, consult a doctor immediately.

1. Tilt the VIVID 700 slowly and put it on its side as illustrated so that the base of the VIVID 700 faces toward you.
2. Remove the screws with a screw driver and remove the battery chamber cover.

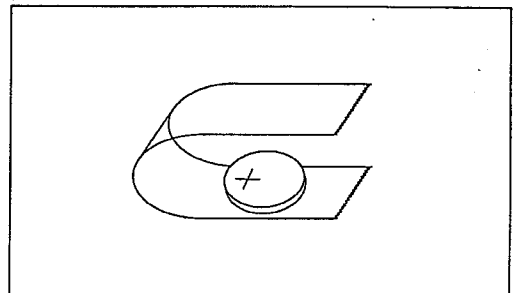


3. By pushing the battery downward, pull it toward you.



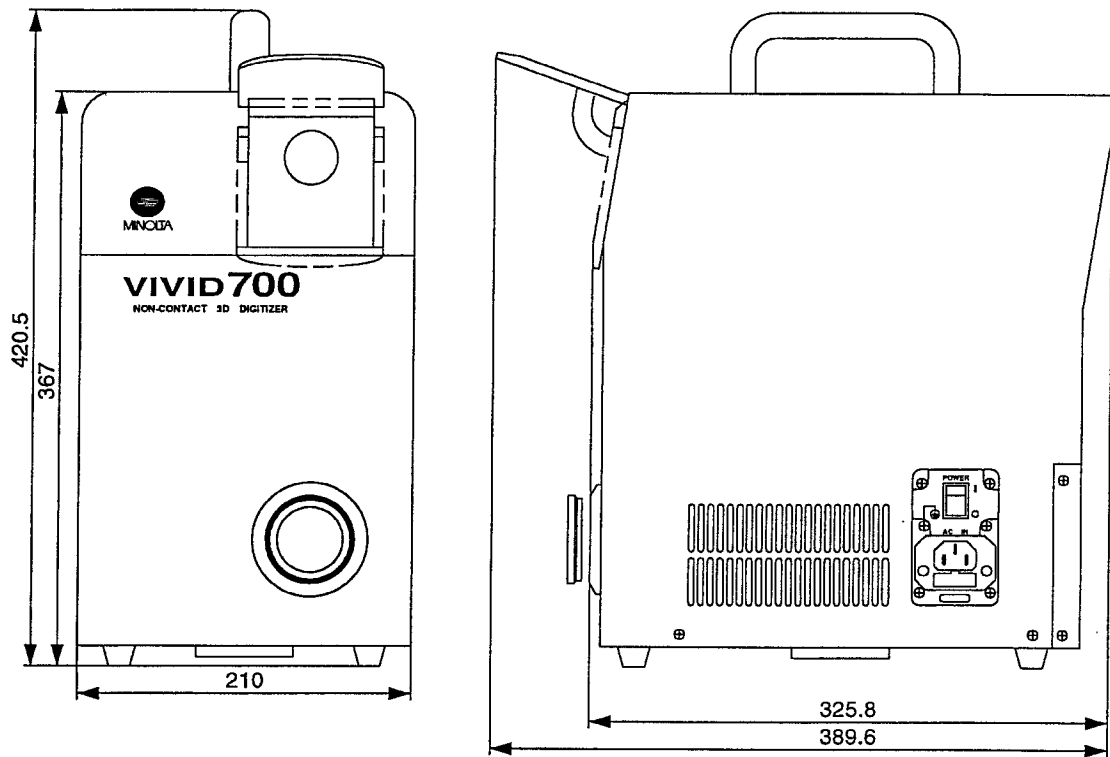
4. Isolate the (+) terminal from the (-) terminal as illustrated using a piece of cellophane tape.

⚠ The disposal method varies according to local government regulations. Dispose of the backup battery according to the instructions given by local government regulations or ask a specialized waste service company to dispose of it.



# DIMENSION DIAGRAM

(Unit: mm)



## SPECIFICATIONS

Model Name	VIVID 700
Light-Receiving Lens	f = 9 to 46 mm, 8-step variable, x5 zoom
AF	TTL pupil division AF method
Laser Power	$\lambda = 685 \text{ nm}$ , Max. 25 mW (Class II or equivalent, controlled and emitted by the internal control circuit and optics)
Beam Spread Angle ( $2\sigma$ )	Horizontal : $21^\circ$ Vertical : $0.1^\circ$
Laser Scanning Method	Galvano mirror
Object Distance Range	0.6 to 2.5 m
Field of View (each side of field of view xy)	70 to 1100 mm
Operative Distance Range ( $\Delta z$ )	Equivalent to each side of the field of view (when image input distance is 1.5 m)
Scanning Time	0.6 sec.
Image Data Transfer Time to Host Computer	2.0 sec. or less
Ambient Lighting Condition	500 lx or less
Imaging Device	3D data : 1/2-inch frame transfer CCD (380,000 picture elements) Color data : 1/2-inch color CCD (380,000 picture elements)
Output Data Points	3D data : $200 \times 200$ Color data : $400 \times 400$
Save/Output Format	3D data : Original format (converted to 3D data by the utility software VI-S1) Color data : RGB 24-bit raster scan data
Memory Media	ATA PC card Type I or Type II
Memory Capacity	1.1 MB/card (in total of 3D data and color data) (Up to 36 image data can be saved when an optional PC card VI-A11 is used)
Viewfinder	4-inch TFT color LCD finder
Output Interface	SCSI II, color monitor NTSC terminal
Power	100 to 240 V~ (50 to 60 Hz), 0.4 A (rated 100 V~)
Dimensions	210 (W) $\times$ 367 (H) $\times$ 326 (D) mm
Weight	9 kg
Operating Temperature Range	10 to $35^\circ\text{C}$ (85% RH or less, no condensation)
Storage Temperature Range	$-20$ to $50^\circ\text{C}$ (85% RH or less, no condensation)

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## Through The Years & Around The World: A CED Sponsored Learning Fair Providing Age-Specific & Culturally Competent Care at St. Joseph's



*Enhancing Jobs & Advancing Education*

At St. Joseph's we care for patients of all ages (from neonates to geriatrics) and many different cultures. With this comes the need for all direct care providers to be knowledgeable and skillful (or as JCAHO would say...competent) about differences in the care of patients of varying ages & cultures. How do we assess a 3 year-old differently from a 12 year-old? How do we insert a peripheral IV in an 85 year-old compared to a 35 year-old? How best to teach a 10-year old about their asthma medication? How to communicate effectively with a patient or colleague from another country?

**Directions:** Review each station with content related to your job at St. Joseph's. Note that you might not provide care to all ages of patients. Complete the educational activity (fishbowl question, post-test, etc.) then have the educator at the station sign the checklist. Have fun learning about the great ways we care for patients at St. Joseph's.

TOPIC	DATE COMPLETED	INSTRUCTOR SIGNATURE
<b>GROWTH &amp; DEVELOPMENT</b>		
Erickson's Developmental Tasks; Developmental Stages		
<b>AGE-SPECIFIC COMMUNITY RESOURCES FOR DISCHARGE PREPARATION &amp; TEACHING</b>		
Culturally Competent & Age-specific Patient Education Identifying Community Resources, Identification & Reporting of Abuse: elder, child, domestic violence		
<b>INFANT, TODDLER, PRE-SCHOOL, SCHOOL AGE &amp; ADOLESCENT</b>		
Assessing Age-specific Clinical Data, Performing Age-specific Treatments, Age-appropriate Communication/interactive Skills, Involvement of Family &/or Significant Other In Plan of Care		
<b>ADULT</b>		
Assessing Age-specific Clinical Data, Performing Age-specific Treatments, Age-appropriate Communication/interactive Skills, Involvement of Family &/or Significant Other In Plan of Care		
<b>GERIATRIC</b>		
Assessing Age-specific Clinical Data, Performing Age-specific Treatments, Age-appropriate Communication/interactive Skills, Involvement of Family &/or Significant Other In Plan of Care, Aging Sensitivity, Spirituality of Aging		
<b>PHARMACY SERVICES</b>		
Drug Therapy in the Elderly; Pediatric Medication Administration		
<b>CULTURALLY COMPETENT CARE</b>		
Definitions of Culturally Competent Care, Dimensions of Culture, Behavioral Health Cultural Competence PI Team, Working With An Interpreter, Pastoral Care Resources		

Once you have completed all stations, share 1 example of how you have recently provided age-specific & culturally competent care on the easels by the stage & participate in the free raffle!

**Learner Signature:** \_\_\_\_\_ **Job Title** \_\_\_\_\_ **Date:** \_\_\_\_\_

**PLEASE GIVE THIS RECORD TO YOUR SUPERVISOR.**      **Department** \_\_\_\_\_