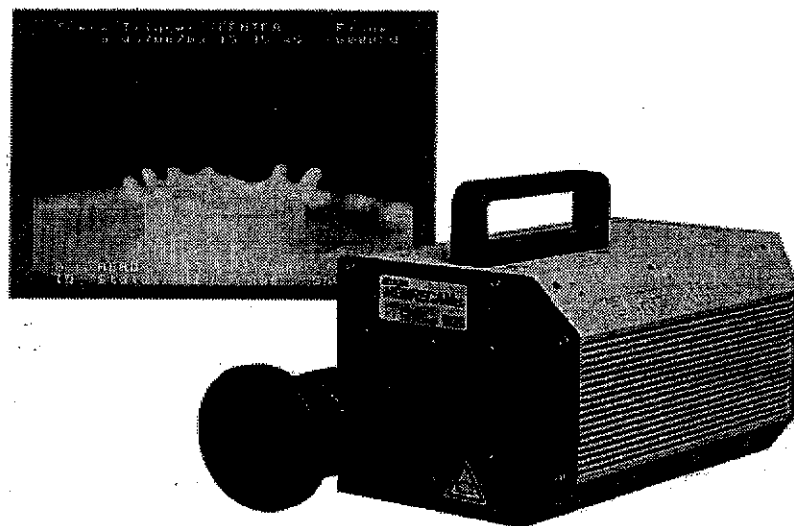


Operation Manual

82K005-W0A
Dec. 1998

Digital High Speed
MEMRECAM_{ci}

ST-569 -U, E



nac
IMAGE TECHNOLOGY

Trademarks

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MEMRECAM ci ST-569-U, E Operation Manual
(Ver2.03) Nov. 1998
Ref. No. 82K005-W0A

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(2K005)

READ BEFORE USE

SAFETY PRECAUTIONS

Be sure about the following safety precautions when using the system. They are indicated as symbols or warnings where maximum care must be taken in handling the system. When such symbols and warnings are found, read descriptions before attempting to subsequent operations. Unexpected abnormalities may occur depending on other using conditions and operating environment than described below. Therefore, consult and understand the descriptions on operation manual (or user's manual) of the device to be used before proceeding with the operations. Please ask any questions on the system of your nearest dealer directly.

DANGER

The DANGER indicates an imminently hazardous situation which, if the directions and descriptions of this warning sign is ignored, will result in death or serious injury.

WARNING

The WARNING indicates a potentially hazardous situation which, if the directions and descriptions of this warning sign is ignored, could result in death or serious injury.

CAUTION

The CAUTION indicates a potentially hazardous situation which, if the directions and descriptions of this warning sign is ignored, may result in minor or moderate injury. This warning sign is also placed where the system itself and the device connected the system would likely to be damaged.

PRECAUTIONS in OPERATING

SAFETY ALERT symbol



This is a safety alert symbol in industries. This symbol invites attention to the matter or operation harmful to the user or the other people. Be sure about the directions following the symbol when using the system.

GROUND TERMINAL symbol



This symbol indicates grounding terminals for protection. Be sure that these terminals are grounded, or it will be dangerous around this system especially its metallic portions. The grounding line on the plug must be connected to a grounding terminal when connect a 3P-2P plug to outlet. This grounding is also effective in reducing the noise occurring to the signal lines.

WARNING



Power must be OFF when connecting or disconnecting cables. Otherwise, it may cause electrical shock or damage to the system.

HIGH VOLTAGE WARNING symbol



This symbol is placed where no touching is permitted because of the presence of a dangerous voltage. Disconnect power cable from outlet before replacing such as a fuse. Do not open the cover. Do not operate the system with its cover open. Do not touch any part of the system with a wet hand. High voltage is used in some parts.

CONDENSATION

When hot moist air touches a cool surface of an object, water vapor condenses upon it. (You can recognize this phenomenon by dew on the surface of window glasses of a warm room in the winter, dew on the outside surface of a glass containing icy water in it, etc.) This phenomenon is termed condensation. Condensation can also generate on the MEMRECAM system when the environmental condition varies abruptly.

If the MEMRECAM is moved from a cold to a hot environment, condensation will be produced. Do not use the MEMRECAM with condensation. Otherwise, the head of drive and a DataCartridge may be damaged.

MEMRECAM troubles caused by condensation and its prevention

If a DataCartridge is installed while the head of drive or DataCartridge is wet by condensation, the head will adhere to the surface of the DataCartridge. Proceeding to operate the system in that status makes a Data Cartridge damaged and in the worst case makes the head of drive broken.

Causes and countermeasures of condensation

Condensation may occur in the following conditions.

- When the cold room containing the MEMRECAM and DataCartridge is warmed up by a heater.
- When the MEMRECAM and DataCartridge is moved from cold outside to warm inside.
- When the MEMRECAM and DataCartridge is placed in a cool damp room. If condensing may possibly occur on the MEMRECAM, turn on power to the MEMRECAM and warm it up fully before installing the DataCartridge.

ROTATING OBJECT ALERT symbol

This symbol is placed where a rotating object is present.
Please be sure not to touch the rotating object.



CAUTION Shutter Operation

The shutter knob in the front panel of MEMRECAM ci rotates at the high speed during recording. Be sure to place the protective cap over the shutter knob before starting rotation. Make the camera STOP mode and make sure that the shutter does not rotate to set the shutter speed.

Warning for Ni-Cd Battery



- Do not place MEMRECAM including the backup option such sites in high temperature as in a car under the blazing sun, around flame and in front of a heater. It may cause a battery leakage, reducing life and degrading performance of battery.
- Do not recharge a battery except for the specified method. It may cause a battery leakage, heating or explosion of battery.
- Do not immerse a battery into water or seawater. It may cause heating and rust of battery.
- Do not use the battery used for the backup option in other usage for backup. It may cause a battery leakage, heating or explosion of battery.

Unexpected abnormalities may occur depending on other using conditions and operating environment than described below. Therefore, consult and understand the descriptions on operation manual (or user's manual) of the device to be used before proceeding with the operations. Please ask any questions on the system of your nearest dealer directly.



OPERATING CONDITION

Use MEMRECAM ci under the following operating conditions.

(Refer to each operation manual of the optional products on the operations and storing conditions.)

1. Temperature and Humidity

- Use the system in the ambient temperature between 0 and 40 degree C, the humidity between 30 and 80 % without condensation.
- Do not store the system where the ambient temperature exceeding between -10 and 60 degree C, humidity exceeding 30 and 80% RH.

2. Ventilation

- Do not block or cover the air intake slits on the side panel and air outlet at the rear, to prevent the camera from overheating.

3. Ambient Environment

- Do not use the system in an environment where soot, corrosive gas, or strong magnetic fields are presented.
- Do not place the system in an environment exposed to direct sun light, rainfall, or salt water.
- Avoid using the system for a long time in a dusty environment.

4. Transportation

- For transportation, use of own container is strongly recommended.

MEMRECAM ci has been designed and produced to stand a strong vibration and a hard shock, and applied to using in a vehicle. Do not operate MEMRECAM ci while rotating the shutter.

The resistances against vibration and impact are increased, but no particular specification is specified. The performing a periodical inspection is recommended depending on you site conditions in operating the system.



PERIODIC REPLACEMENT PARTS

Internal Battery (for Clock and parameter backup)

Replacement of internal battery may be required every 5 years period.

The battery must be replaced at a qualified facility, please contact our Service Center for the battery replacement.

Memory backup battery (for option)

Replacement of internal battery for memory backup may be required every 1 year. The battery must be replaced at a qualified facility, please contact our Service Center for the replacement.



APPLICABLE STANDARDS

FCC Statements

This equipment complies with the requirements in Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference.

EMC Notice

Products with the CE Marking comply with the EMC Directive (89/336/EEC, 92/31/ECC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms:

EN55022, Class B-Radio Frequency Interference

EN50082-1-Electromagnetic Immunity

Cable Connection

Connection to this device must be made with shielded cables with metallic RFI/EMI connector hood and put 25mm or more length of EMC ferrite core on the both ends of cable to maintain compliance with EMC Directive.

Performance Degradation in the Immunity Test

NAC, Inc. specifies that in the MEMRECAci, the performance degradation implies only when a loss of sync in video image occurs due to external interfere.



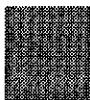
INTRODUCTION

The MEMRECAMci is a fully integrated, color, high speed, high resolution video camera with a built-in digital, solid-state memory.

The MEMRECAMci is ideal for observing those hard to see, instantaneous events.

Since the camera contains everything and controlled under a micro processor, routine work could be programmed for repeated operation. Remote control facility, software are available at option.

This Operation Manual describes the principle operation and essential functions of the MEMRECAMci for an optimum use. Please read through this manual to familiar to the camera.



WARRANTY

NAC warrants product of its manufacture to be free from defects in design, workmanship and material under normal and proper use and service for a period of twelve (12) months after the date of NAC's shipment or delivery.

NAC agrees to repair or replace at the place of manufacture, without charge, all parts of said products which are returned, for inspection, to NAC within the applicable warranty period, provided such inspection discloses that the defects are as above specified and provided also that the equipments has not been altered or repaired other than with authorization from NAC and by its procedures, subjected to misuse, improper maintenance, negligence, or accident, damaged by excessive current or otherwise, or had its serial number or any part thereof altered, defaced or removed.

Shipping expenses to and from NAC will be to the account of the customer. Consumer goods such as lamp, fuse, etc. considered by NAC are not applied to this warranty.

TABLE OF CONTENTS

READ BEFORE USE	1
OPERATING CONDITION	4
PERIODIC REPLACEMENT PARTS	5
APPLICABLE STANDARDS	5
INTRODUCTION	6
WARRANTY	7

1 INTRODUCTION

1 - 1	OUTLINE	1-2
1 - 2	COMPONENTS AND FUNCTIONS	1-3
1	FRONT PANEL	1-3
2	SIDE PANEL	1-4
3	REAR PANEL	1-5
4	REAR, OPERATION PANEL	1-6
5	REAR, LCD PANEL	1-9
6	REAR, CONNECTOR PANEL	1-10
7	POWER SWITCH AND DC INPUT CONNECTOR	1-11
8	VIDEO MONITOR DISPLAY	1-12
1 - 3	LENS AND HANDLE	1-13
1	INSTALLING LENS	1-13
2	HANDLE	1-13
1 - 4	OUTLINE DRAWING	1-14
1 - 5	AC POWER SYSTEM	1-15
	Connection to Camera	1-15

2 TYPICAL OPERATIONS

2 - 1	TYPICAL CABLE CONNECTION	2-2
2 - 2	TYPICAL PROCEDURE	2-3
1	POWER ON	2-3
2	START UP SEQUENCE	2-3
3	FIRST RECORDING	2-6
4	PLAYBACK RECORDED PICTURES	2-8
5	ABOUT PLAYBACK MODE	2-8
6	TURNING POWER OFF	2-10

3 CAMERA SETUP

3 - 1	SETTING THE SHUTTER	3-2
1	NO SHUTTERED RECORDING	3-2
2	SHUTTERED RECORDING	3-2
3	CHANGING SHUTTER SPEED	3-3
3 - 2	RECORDING SETUP MODE	3-4
1	STARTS RECORDING SETUP MODE	3-4
2	SCENE No.	3-6
3	TRIGGER	3-6
4	GAIN	3-6
5	WHITE BALANCE	3-7
6	BLACK BALANCE	3-7
7	ENHANCE	3-7
8	GAMMA	3-8
9	CHROMA	3-8
10	COMMENT	3-8
11	STROBE	3-9
12	SAVING SETUP PARAMETERS	3-10
3 - 3	GENERAL SETUP MODE	3-11
1	STARTS GENERAL SETUP MODE	3-11
2	TRIGGER	3-12
3	FRAME RATE	3-12
4	FRAME SIZE	3-13
5	COMMENT	3-13
6	GAIN, WHITE BALANCE, ENHANCE, GAMMA AND CHROMA	3-13
7	MEMORY SEGMENT	3-13
8	SYSTEM Settings	3-14
9	OTHER Settings	3-18
10	DRIVE SELECT	3-22
11	DataMagazine	3-22
12	SAVING SETUP PARAMETERS	3-22
3 - 4	OPTION	3-23
1	USING OPTIONS	3-23
3 - 5	EXTERNAL TRIGGER INPUT	3-25

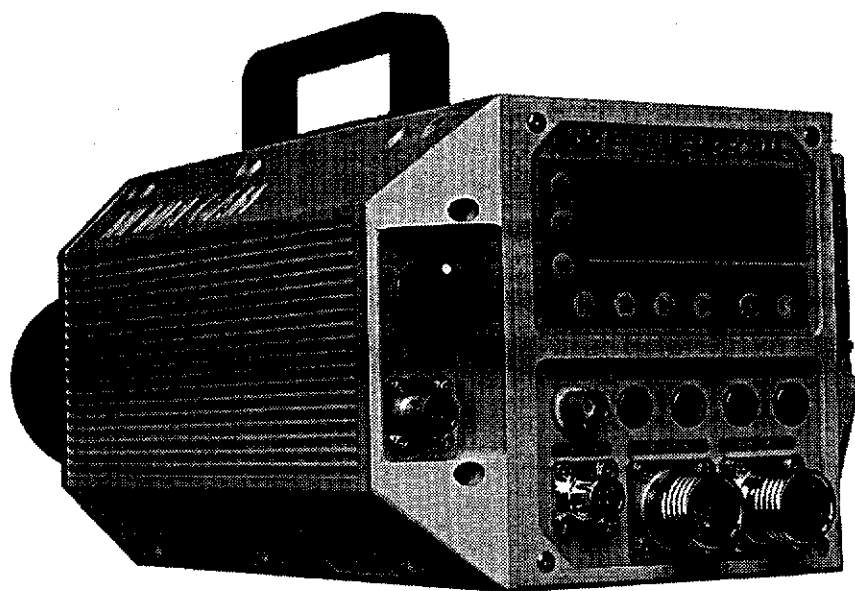
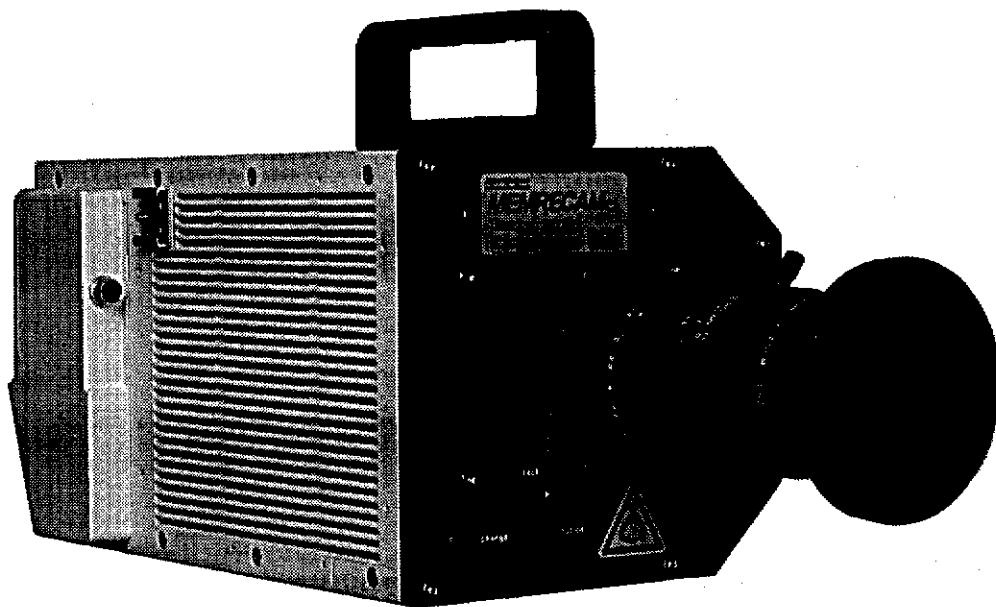
3 - 6	ACCESSING TO DataCartridge	3-27
1	SAVING IMAGE TO DATA MAGAZINE	3-29
2	LOADING IMAGE TO MEMRECAM	3-29
3	DELETING SCENE	3-30
4	RECORDING TECHNIQUE	
4 - 1	RECORDING TECHNIQUE	4-2
1	RECORDING INTO SOLID-STATE MEMORY	4-2
2	TRIGGER INPUT	4-3
4 - 2	COLOR BALANCE	4-5
1	WHITE BALANCE	4-5
2	PRINCIPLE OF AUTO WHITE BALANCE(AWB)	4-6
3	BLACK BALANCE	4-6
5	TROUBLESHOOTING	
5 - 1	IN CASE OF ABNORMAL OPERATIONS	5-2
1	THE SYSTEM DOES NOT STARTUP	5-2
2	A JOG PAD CAN NOT BE USED	5-2
3	DATA CARTRIDGE CAN NOT BE ACCESSED	5-2
4	EXTERNAL TRIGGER SIGNALS FROM MEMRECAM'S TRIG.IN CONNECTER CAN NOT BE RECEIVED	5-3
5 - 2	SYSTEM CRASH	5-4
1	COUNTERMEASURES TO SYSTEM CRASH	5-4
5 - 3	INQUIRY AND REPAIR AT MALFUNCTIONS	5-6
6	SPECIFICATIONS	

SECTION

1

INTRODUCTION

1 - 1 OUTLINE

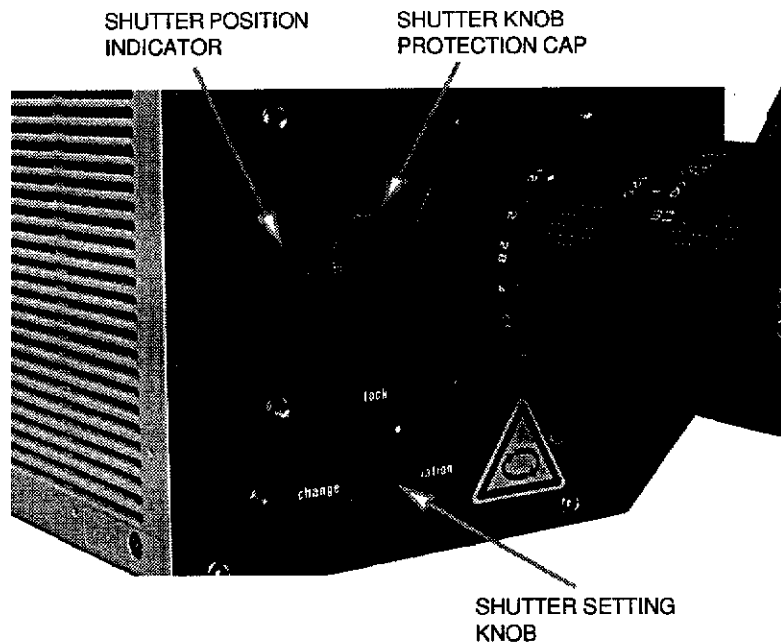


1 - 2 COMPONENTS AND FUNCTIONS

1

FRONT PANEL

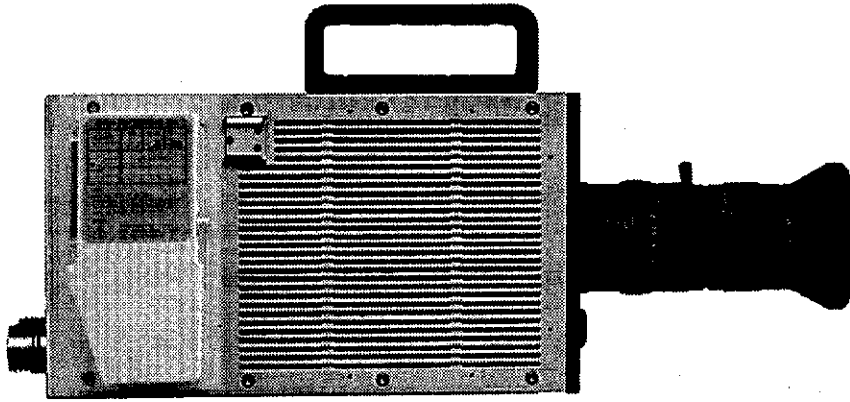
Shutter controls and lens mount are located.



2

SIDE PANEL

Viewfinder attachment and viewfinder output connector are located.



(with memory back up option)

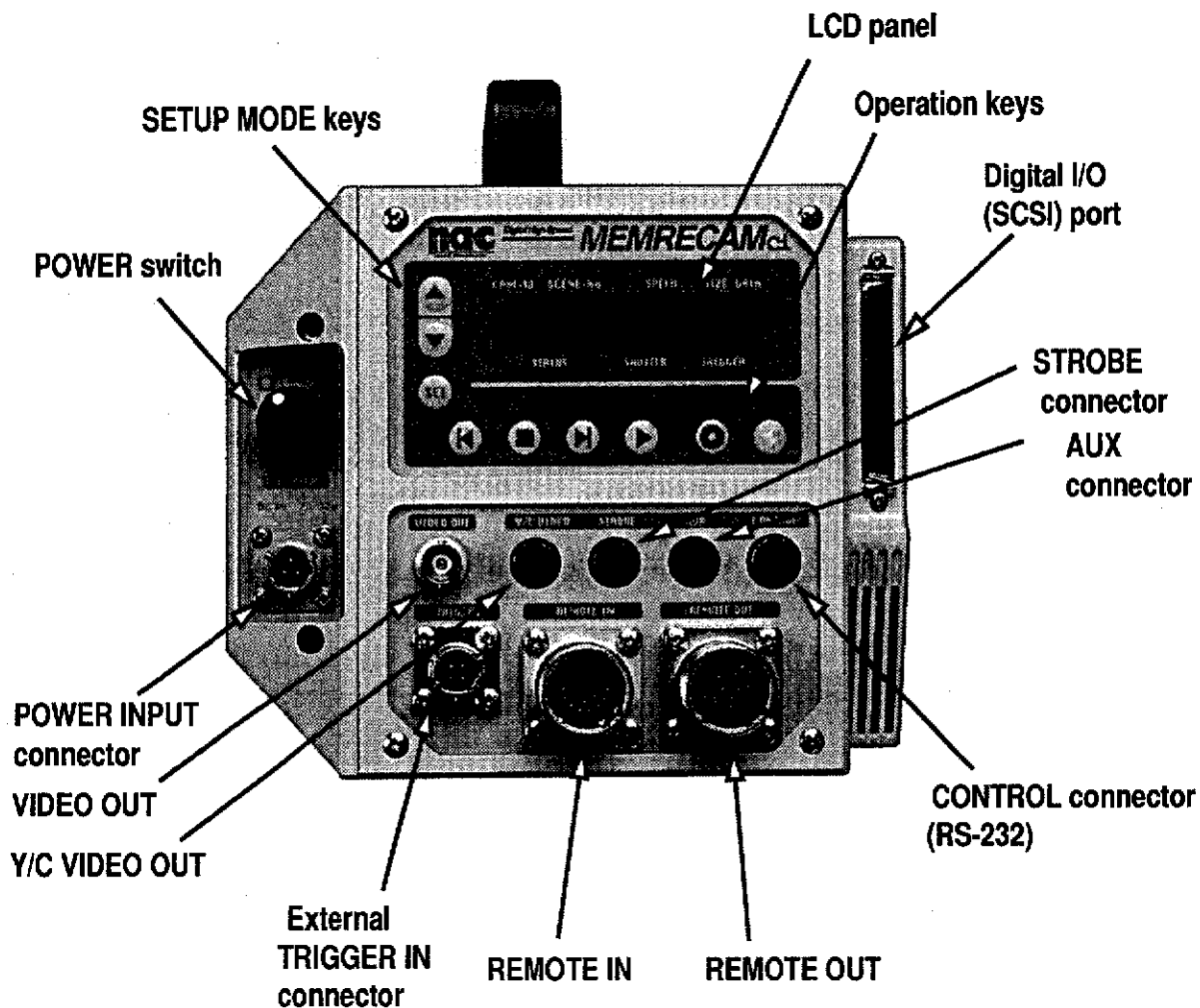


Side panel has lots of slit which used for air intake to cool inside the camera. Air outlet is provided at rear of camera just below the SCSI connector. Do not block or cover these slits.

3

REAR PANEL

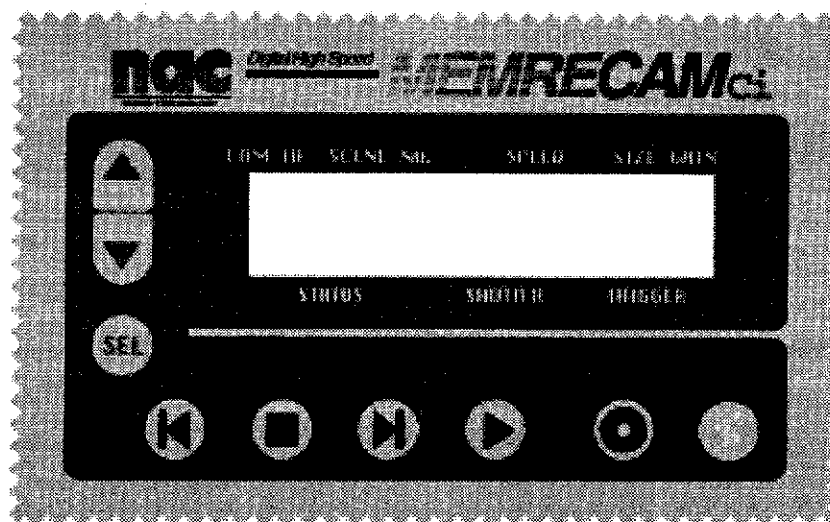
All controls (except shutter controls), indicators and connectors are located.



4

REAR, OPERATION PANEL

In the upper part of rear panel, operation panel are located including 9 keys and 7 LED indicators.



■ Setup Mode keys (keys used in the SETUP mode)

UP		Move to upper parameter or increase value.
DOWN		Move to lower parameter or decrease value.
SEL		Starts the SETUP mode. Select the parameter.

■ Record, Replay Operation Keys

REV STEP		Starts the REVERSE single frame feeding, or starts REWIND. During PLAY, it reduce the playback speed. Reducing the playback speed makes the speed negative (-), it becomes same function as to set the playback direction in reverse. (The playback speed can be changed by pressing the REV STEP or FWD STEP button during playback.)
STOP		During PLAY, it stops playback and display still image. If pressed during recording it stops recording.
FWD STEP		Starts the ForWorD single frame feeding, or starts Fast Feeding. During PLAY, it increase the playback speed. (This is the opposite function to the REV STEP button.)
PLAY		Starts PLAYback mode.
VIEW/ARM		Starts VIEW or ARM mode.
TRIGGER		Manual trigger is activated if pressed during ARM mode.

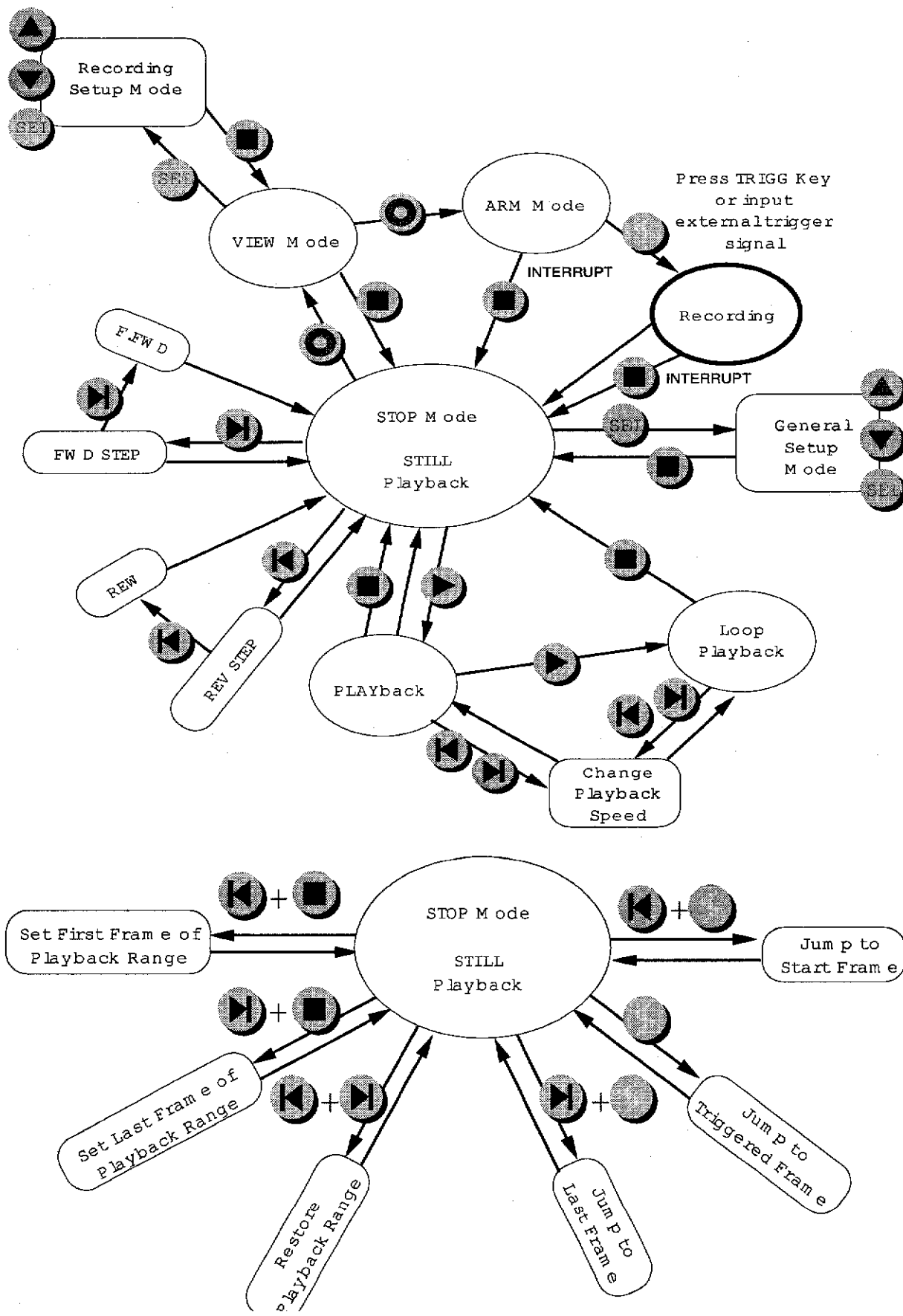
■ LED lamps

LED lamps are placed near the associated keys.

SEL LED	●	Lights during setup mode.
STOP LED	■	Lights during stop (still) mode.
PLAY LED	▶	Lights during playback.
LOOP LED	↺	Lights during loop playback.
VIEW LED	VIEW	Lights during VIEW mode.
ARM LED	ARM	Lights during ARM mode. Flashes from triggering to the end of recording.
TRIG LED	TRIG.	Flashes from triggering to the end of recording.

OPERATION SCHEMATIC

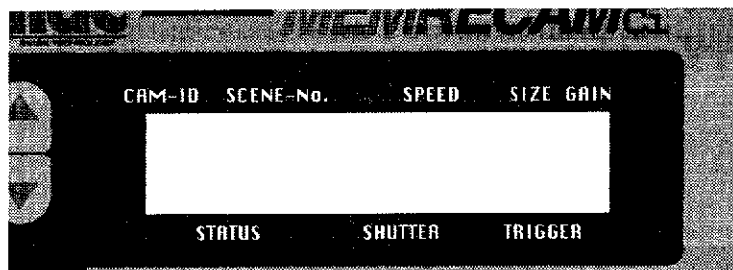
Operation Schematic Diagrams are shown as follows.



5

REAR, LCD PANEL

LCD panel of 16 characters 2 lines is located, to indicates the status of camera.



CAM-ID	Camera ID number (0 - 9, A - Z)
SCENE-No.	Recording scene number (0 - 65535)
SPEED	Recording rate (in pps: pictures per second)
SIZE	Frame size (1/4, 1/2 or 1/1)
GAIN	Camera sensitivity (0, 6, or 12)
STATUS	Status of camera
SHUTTER	Shutter parameters
TRIGGER	Trigger mode (start, center, or end)

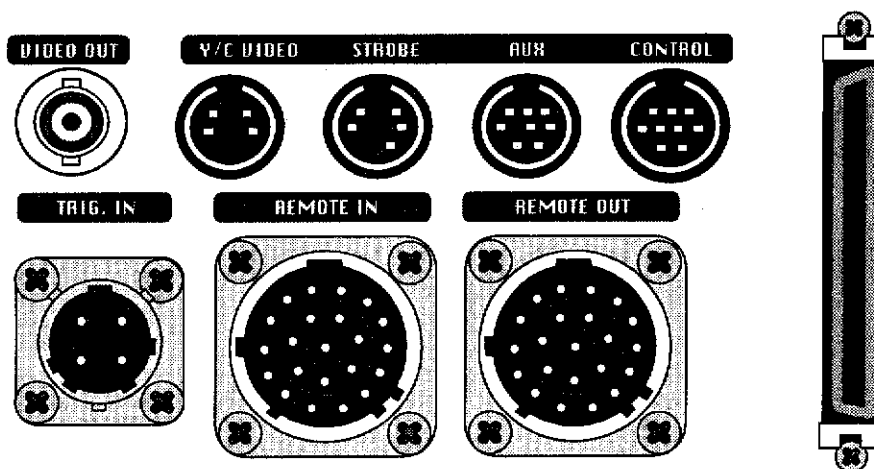
Contents of LCD panel varies depending on parameters set in the camera.

- In playback mode, recording parameters such as **SCENE-No.**, **SPEED**, **SIZE**, **GAIN**, **TRIGGER** are displayed, and for **CAM-ID** and **SHUTTER**, current status are displayed.
- In recording mode, all items show the current camera status set for recording.
- In the setup mode, menu is displayed. To select the item to change, use UP and DOWN key to bring the menu item on the LCD panel.

6

REAR, CONNECTOR PANEL

■ On the rear connector panel, 9 in/out connectors are located.



NAME	Part Number	
VIDEO OUT	(BNC)	VIDEO signal output
Y/C VIDEO		S-VIDEO signal output
STROBE	(TCS7658-01-201)	Strobe or an external device sync control signal output
AUX		Auxiliary connector for future use
CONTROL	(TCS7693-01-201)	Connector for external control Connect with a J-pad. (Concurrent use of the REMOTE IN/OUT connectors is not allowed when Remote control software is being used.)
TRIG. IN	(PT02H-8-4P)	Trigger signal input
REMOTE IN	(ACT90MC35PN)	For connecting to the Synchronous Unit
REMOTE OUT	(ACT90MC35SN)	For connecting to the Synchronous Unit
DIGITAL		I/O (176972-8-68P) SCSI port for connecting to the Data Cartridge

■ In the connectore panel area, 3 LED lamps are located.

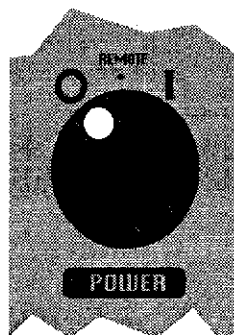
CONTROL LED	Indicates usage of CONTROL connector
TRIG. IN LED	Flashes in green when trigger signal is acceptable
REMOTE IN LED	Indicates usage of REMOTE connector

7

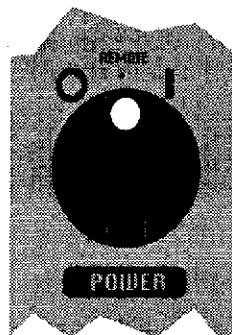
POWER SWITCH AND DC INPUT CONNECTOR



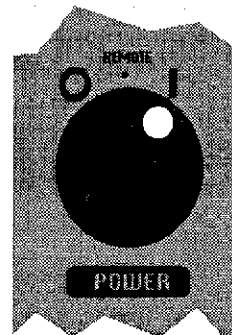
■ POWER switch has three positions as follows:



POWER OFF

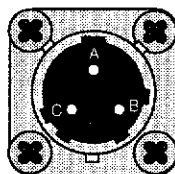


**Power REMOTE CTL
(with Synchronous unit)**



POWER ON

■ Power input to the camera is DC 20 to 32 V.

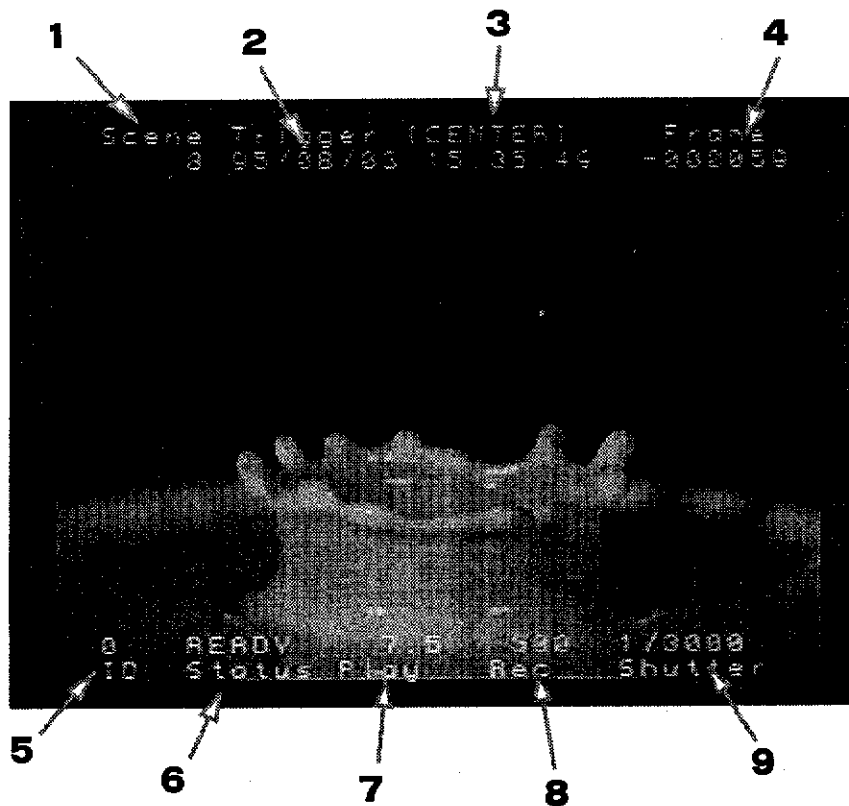


Pin No.	Assign	Description
A	DC IN	DC 20 - 32 V input
B	F. GND	Frame Ground
C	DC RTN	DC Ground

8

VIDEO MONITOR DISPLAY

In the monitor (connected to VIDEO OUT) or on the viewfinder (both optional) video display from the camera is seen as following, except setup mode. Camera parameters seen in upper and lower part of the display depends on the camera mode.



- | | |
|-------------------|--|
| 1 Scene | Scene number for recorded picture. Counts up by 1 at every recording. |
| 2 Trigger | Triggering time is displayed. |
| 3 [CENTER] | Trigger mode at the recording is displayed. |
| 4 Frame | [in playback] Current frame number is displayed.
[in ARM mode] Remaining number of frames is displayed. |
| 5 ID | ID number of the camera is displayed. |
| 6 Status | Current status of the camera is displayed. |
| 7 Play | [in playback] Playback speed is displayed. |
| 8 Rec | Recording rate is displayed. |
| 9 Shutter | Shutter parameters such as shutter speed are displayed. |

1 - 3 LENS AND HANDLE

1 INSTALLING LENS

The MEMRECAMci has a C-mount lens adapter. Provide a C-mount lens. Attach the C-mount thread of the lens to the C-mount adapter of the cameras and screwing the lens clockwise until it stops.

CAUTION: The distance from lens seating plane and the end of lens must be less than 9 mm, otherwise internal optics in the camera may be damaged.



Installing a G-resistant lens

When install a G-resistant lens to MEMRECAM ci, secure fasten the mounting screw for G-resistant holder on the front panel or the mounting screw on the upper and bottom panels with a G-resistant holder.

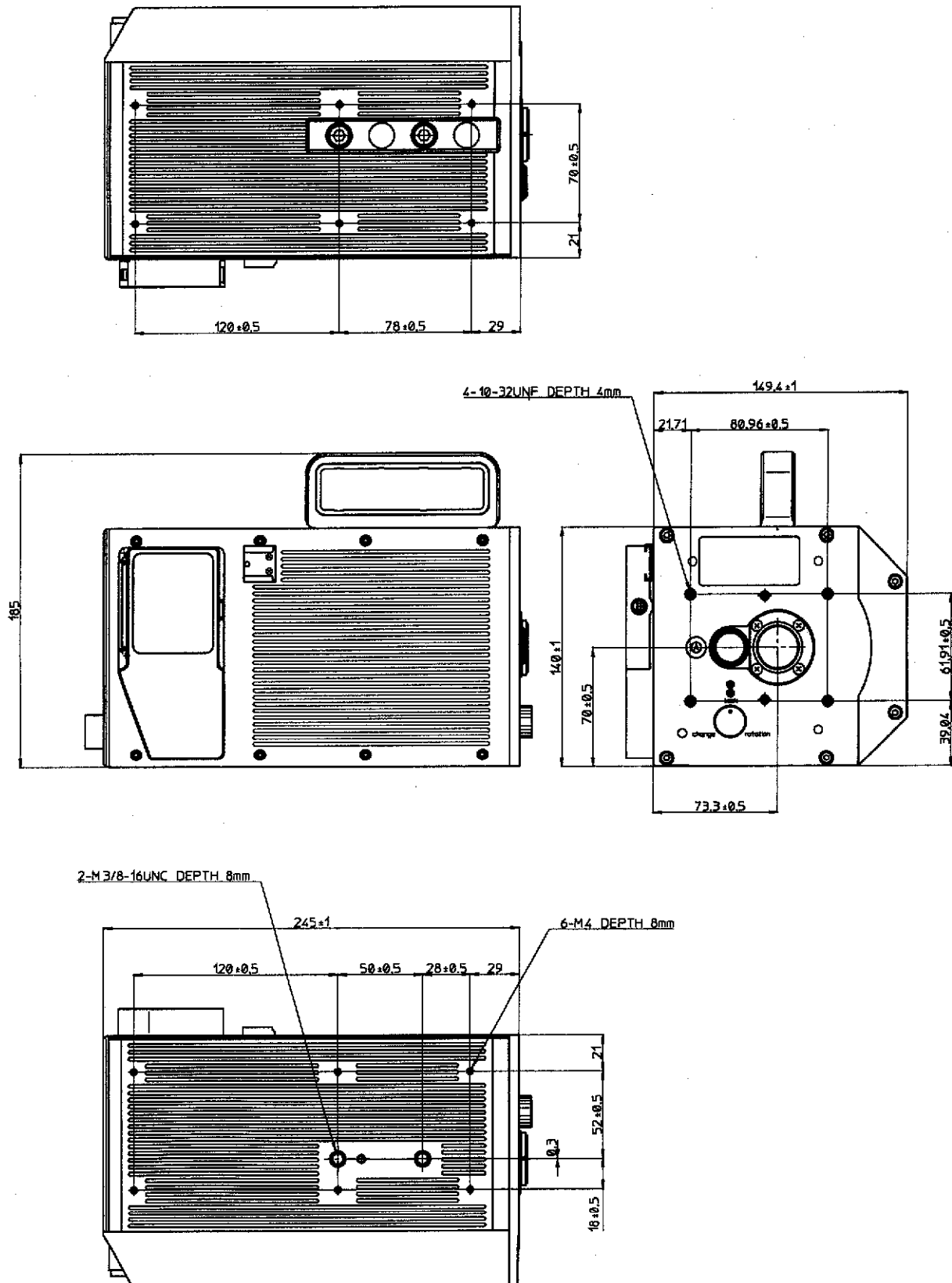


The attached lens can not be used in high-G condition. It may cause an internal damage to MEMRECAM ci.

2 HANDLE

The MEMRECAMci is equipped with a handle to carry the camera body for a short distance. If a heavy lens has installed on the camera, do not carry the camera only hold by the handle. The handle may be removed, if necessary, by removing two Hex socket cap screws (3/8-16UNC) using Hex driver (8mm width).

1 - 4 OUTLINE DRAWING



1 - 5 AC POWER SYSTEM



The AC power system is exclusive for MEMRECAM series. Do not use it for other devices.



WARNING Do not open the cover because there is some presence of dangerous high voltage in the system.

Be sure that the AC plug ground terminal is grounded, or electric shock hazards may be received of metallic portions or other parts of the system.

Connection to Camera

For the connecting method to a MEMRECAM camera, refer to the diagram of the section 2-1.

1. Connect the DC cable to the POWER connector (DC IN 20-32V) on the MEMRECAM.
2. Connect the power cable of the unit to the AC outlet (90-240V AC).

SECTION

2

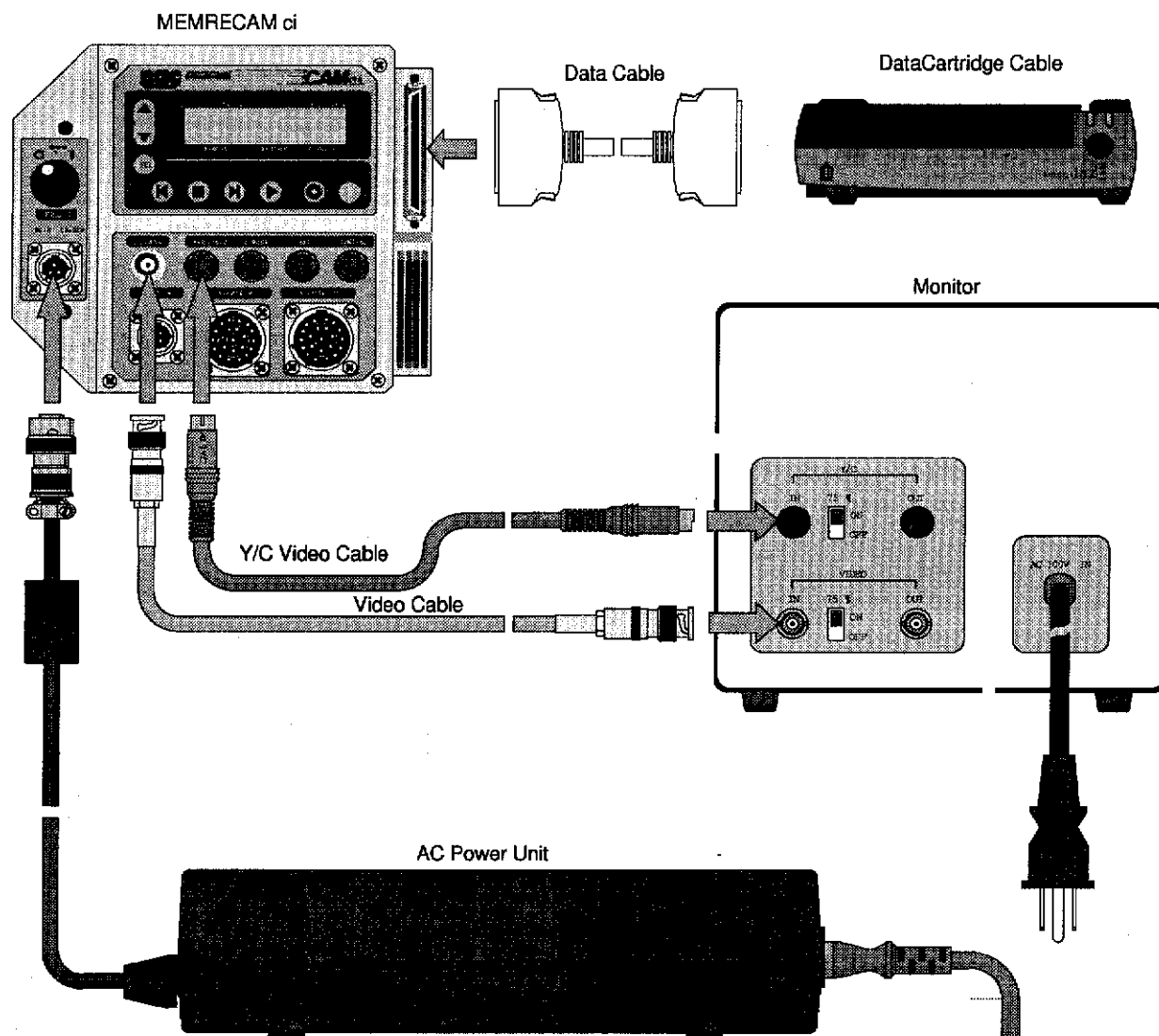
TYPICAL OPERATIONS

This section explains the simple typical operation pass from connecting cables , recording until playback, for the user who touches the system at the first time.

2 - 1 TYPICAL CABLE CONNECTION

Before applying the power to the camera, make sure that the POWER switch is set to OFF position, and connect cables as shown in following example.

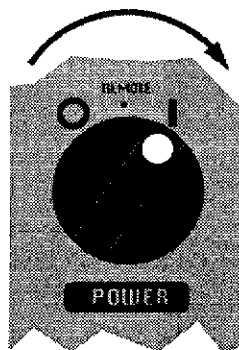
Equipment shown below may be different depending on what you purchased.



2 - 2 TYPICAL PROCEDURE

1 POWER ON

Turn the Monitor power switch on, then turn the MEMECAMci POWER switch on.



Power ON

2 START UP SEQUENCE

When the MEMECAMci is powered on, the camera get into start up sequence which perform self diagnostics with beep sound. The start up sequence finishes within about 30 seconds, and operation to the camera will be enabled.

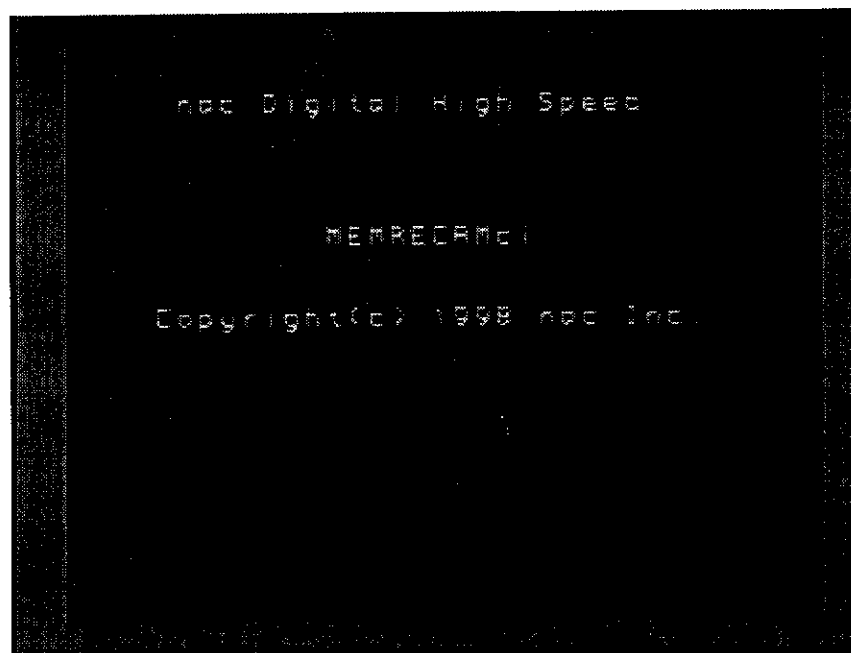
If the camera is used at the first time, the camera parameter have set at the factory defaults, as follows:

Recording Rate :	500 pps
Frame Size:	1/1
Trigger mode:	CENTER
Shutter:	LOCK
Segment size	ALL

NOTE : A changed camera parameter will be stored at power OFF or at completion of recording.
To change parameters, refer to Section 3.

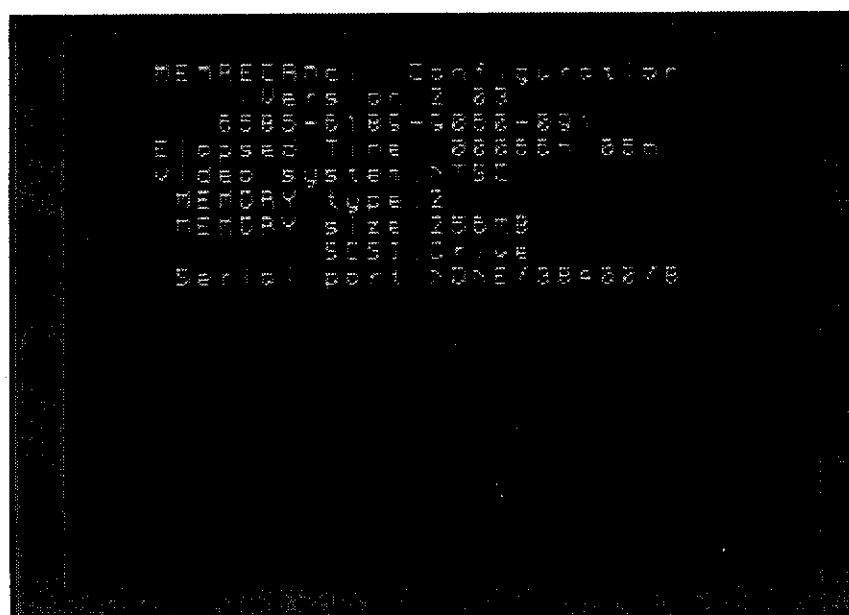
■ Startup screen Display 1

The title MEMRECAM ci will be displayed as follows.

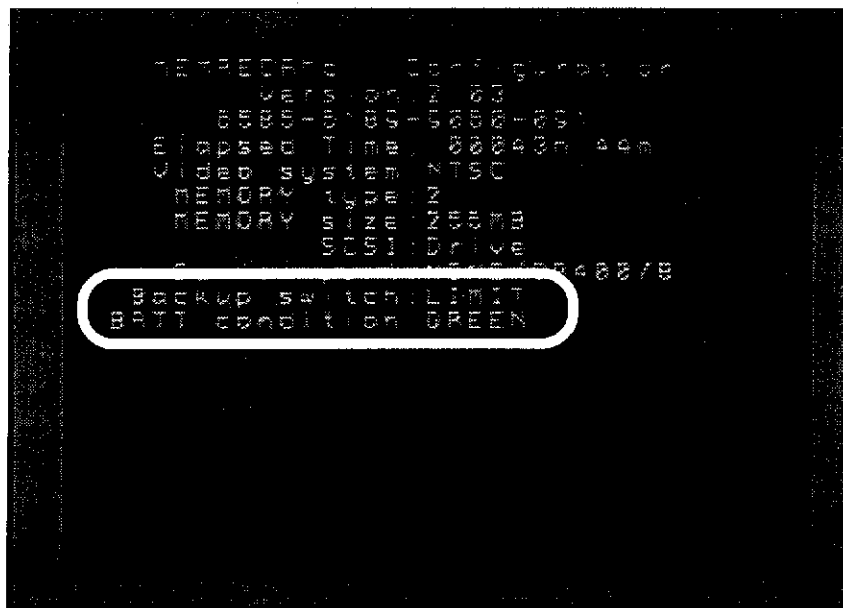


■ Startup screen Display 2

Next the version of stored software, the serial number of built-in software for MEMRECAM, the current system configuration and so on will be displayed as follows (during the startup sequences), then a test recorded picture will be shown in still mode.



When the memory backup function (option) is built in the system, the following screen will be displayed.



■ Startup screen in still mode display

A test recorded picture will be displayed (during the startup sequences).

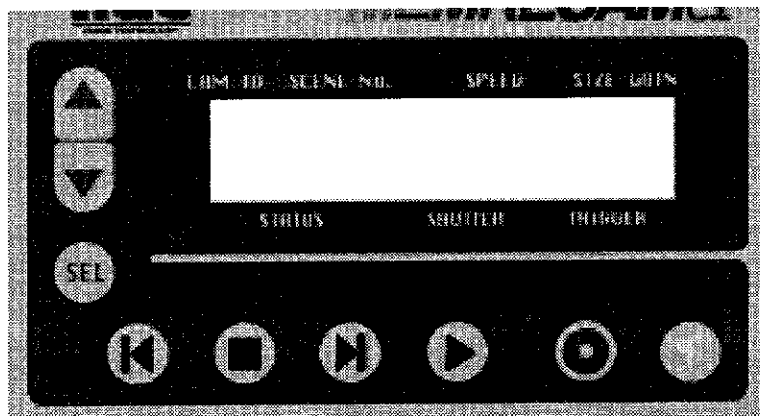


The recorded picture will be displayed when it has been maintained by the memory backup function (option) as it was recorded.


3

FIRST RECORDING

When the start up sequence is completed, the camera get into Still mode automatically. A picture displaying at this moment is of test recorded picture during the start up sequence. Let's **START RECORDING**, by operating keys on the operation panel.




■ Set the camera into **VIEW** mode.

First, press the **VIEW/ARM** key , and release. This makes the camera generate acknowledge sound, and change into **VIEW** mode. The **VIEW** LED comes on.




■ Setting the camera into ARM mode

Pressing the **VIEW/ARM** key  again makes the camera generate acknowledge sound and change the VIEW mode into ARM mode. At this time, the VIEW LED goes off and the ARM LED goes on.

As changing into the ARM mode makes the picture memory updated by camera input, the last recorded picture should be erased.

In the ARM mode, picture data can be recorded as well as picture signal from the image sensor is displayed on a video monitor. MEMRECAM ci is in wait for inputting trigger signals while updating the picture data of the picture memory. The value of frame counter shows in this case number of remained frame to be recorded.

■ Trigger input and completion of recording

Next, press the **TRIGGER** key . An acknowledge sound is generated, and the frame counter on the upper right of the monitor starts counting, after about 2.1 seconds the recording is completed (recording speed is 500 pps, Center trigger and memory available is 256 MB).

4

PLAYBACK RECORDED PICTURES

After recording is completed, MEMRECAM ci playbacks trigger frame pictures in still mode. Trigger frame is a frame at just a trigger signal is input. In this case, as the recording is in the center trigger setting, the picture at the middle time of whole recording is played back in still mode.

■ Playback just after recording




Pressing the PLAY key  makes the camera generate acknowledge sound and allows playing back until the last frame then displaying the last frame picture in still mode.

5

ABOUT PLAYBACK MODE

Various playback is done by operation keys in the rear operation panel. Refer to Section 1-2, 4 for functions on each operation key.



■ Loop playback

Press the PLAY key , again during playback to get into loop playback. The loop LED  comes on to indicate that the playback is in loop mode. When STOP key  is pressed, loop playback is stopped and get into STILL mode.



■ Jumping to the triggered frame

In STILL mode, pressing of TRIGGER key  jumps the display frame to the triggered frame.

■ Jumping to the first frame





In STILL mode, simultaneous pressing of TRIGGER key  and REV STEP key  jumps the display frame to the first frame.

■ Jumping to the last frame

In STILL mode, simultaneous pressing of TRIGGER key  and FWD STEP key  jumps the display frame to the last frame.

■ Setting a range for loop playback

A range for loop playback can be set.

Bring the first frame of a range on the monitor, and press STOP key  and REV STEP key  at the same time. Then, bring the last frame of a range on the monitor, and press STOP key  and FWD STEP key  at the same time. On the monitor, "FRAME" item is changed to "[FRAME]" to indicate that the playback range has set ("FRAME" character is enclosed with []).

■ Restore the range

In STILL mode, press the REV STEP key  and FWD STEP key  at the same time to cancel the display range.

6

TURNING POWER OFF



CAUTION: All picture data recorded in a camera should be lost at turning power off. If important picture data remains, save the data in a DataCartridge before proceed to turn power off. Checking the data before turning power off is recommended.

(When the memory backup option is effective, it is helpful to save data such as in this case, or accidentally lost camera DC power)

Power off can be attempted from any mode, however, it is recommended to turn off power from STOP mode.

To turn off power, set the POWER switch to off position, and camera will automatically shut off after a couple of seconds.

SECTION

3

CAMERA SETUP

This section explains in details camera parameter setting for recording and playback.

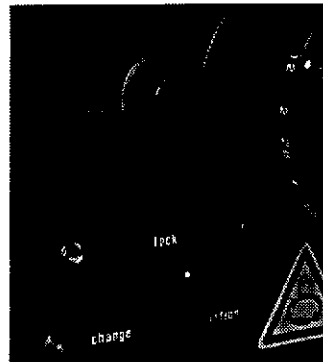
3 - 1 SETTING THE SHUTTER



PRECAUTION FOR SHUTTER OPERATION

The Shutter Knob on front panel rotates at high speed during shuttered recording. For a safety reason, be sure to place the cap over the Shutter Knob. Before attempt to place or remove the cap, wait for a while until shutter rotation is stopped, and set the Shutter Setting Knob to "lock" position.

It may be needed to remove the lens if lens interfere to the cap position.

**1**

NO SHUTTERED RECORDING

When the shutter is not used for recording, satisfy following two conditions:

1. Shutter Setting Knob has set to "lock" position.
2. Shutter Position has set to "A" position

2

SHUTTERED RECORDING

When the shutter is used for recording, set the Shutter Setting Knob to "rotation" position. The shutter is operated only when the camera is in VIEW or ARM mode.

3

CHANGING SHUTTER SPEED

To change the shutter speed, perform followings:

1. Set the Shutter Setting Knob to "change" position.
2. While pulling the Shutter Knob toward you, turn it until desired indicator "A, B, or C" is set in the window.

Refer to table (on front panel) below to obtain desired shutter speed from the combinations of the indicator and recording rate.

Digital High Speed

MEMRECAM_{ci}

Shutter	500	1000	2000
A	1/1500	1/3000	1/6000
	LOCK / OPEN		
B	1/3000	1/6000	1/12000
C	1/6000	1/12000	1/24000

nac
IMAGE TECHNOLOGY

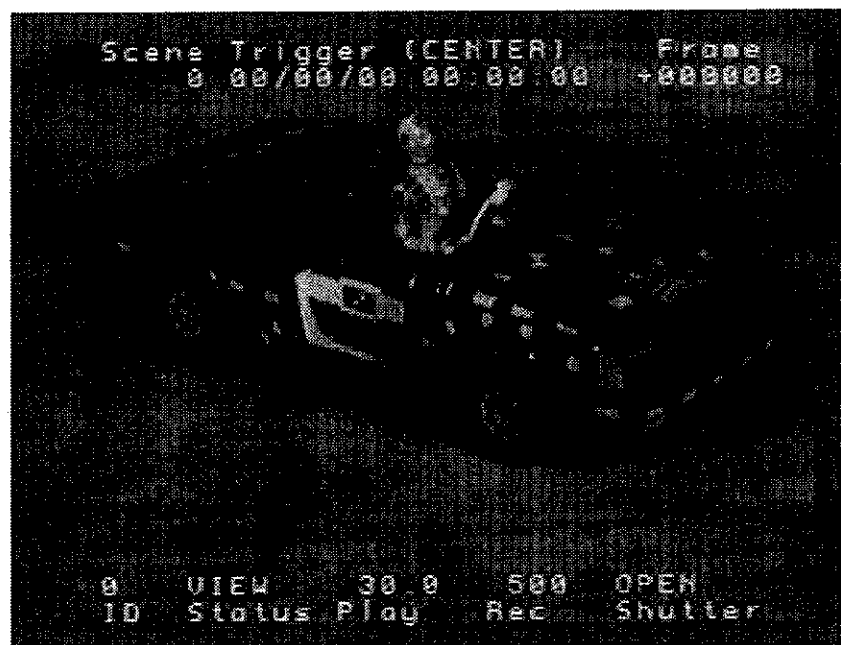
3 - 2 RECORDING SETUP MODE

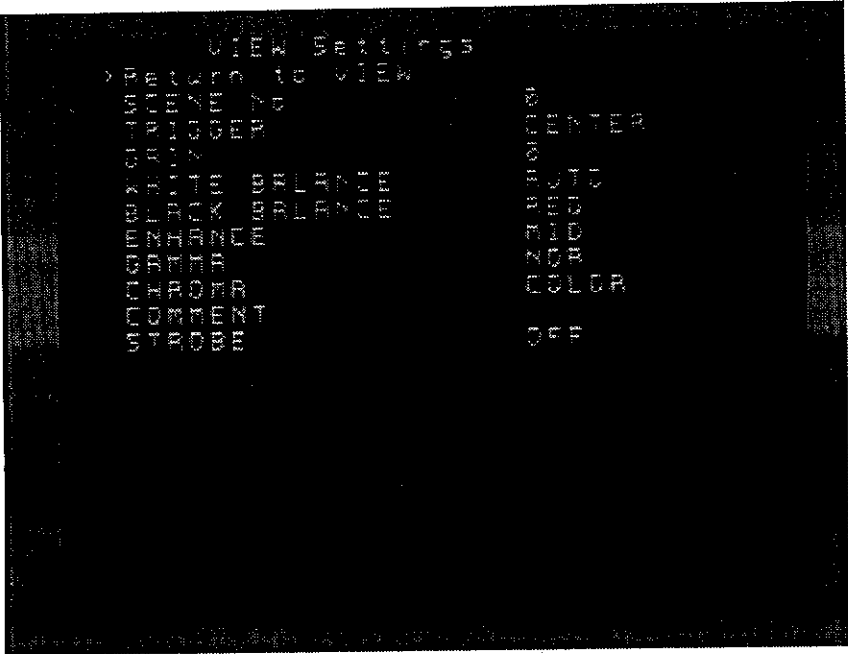
In recording setup mode, recording parameters will be set. Setting is performed in VIEW mode, while viewing set parameters on the monitor.

Setting of the shutter is done at front panel, and setting of recording rate, frame size is done in general setup mode.

1 STARTS RECORDING SETUP MODE

From the STILL mode, pressing of the **VIEW/ARM** key  turns the camera into VIEW mode. In this mode, live image is seen on the monitor.





In the upper part of the monitor, setting parameters and current mode are shown.



Selection among sub menu item is done by the same manner.

Exiting from the recording setup mode is done by either :



五十年

2

SCENE No.

SCENE number is increase by 1 at every trigger signal input. At this stage set an initial number.

SCENE No.

>0

3

TRIGGER

Select a trigger mode among; START, CENTER, or END. Details will be explained in Section 4-1.

TRIGGER

START

A trigger point(frame) will be at the start of memory.

> CENTER

A trigger point(frame) will be at the center of memory.

END

A trigger point(frame) will be at the end of memory.

4

GAIN

Set a gain of the camera. Unit is in dB.

GAIN

> 0

6

12

5 WHITE BALANCE

Perform the white balance adjustment for color recording.
Explanation on white balance is given in Section 4-2.

WHITE BALANCE

> AUTO TRACKING	Auto tracking mode
3100	3100K fixed
5000	5000K fixed
9000	9000K fixed
REG	Register mode
SET REG	Current white balance date is written in register

6 BLACK BALANCE

Perform the black balance adjustment for color recording.

BLACK BALANCE

> REG	Retain previous black balance
SET REG	Set new black balance. Shield the lens iris.

7 ENHANCE

Select the edge enhancement level for a better view.

ENHANCE

OFF
LOW
> MID (Default)
HIGH

8

GAMMA

Select the gamma level for a better view.

```
GAMMA
  OFF
  LOW
> NOR (Default)
```

9

CHROMA

Switch the color and monochrome.

```
CHROMA
> COLOR (Default)
  MONO
```

10

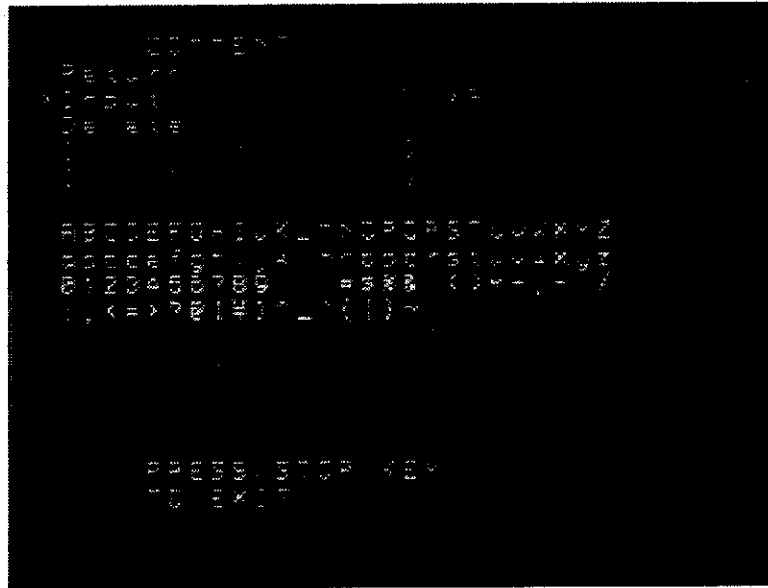
COMMENT

Enter a comment for the recorded scene up to 30 alphanumeric characters. The comment set once is used for recording until it is updated (the comment of the recorded scene can not be changed). Setting the comment display on allows displaying the comment on the specified position during playback (refer to "DISPLAY STYLE" of the section 3-3 "9 OTHER SETTINGS").

Input method of comment:

1. Point the cursor on line of the Input and press the SEL key.

Characters available to input will be displayed as follows.



2. Select a character to be input from the list using the UP/DOWN keys and press the SEL key.

Selected one character is entered.

Repeat the step for all characters to be input to specify a character string (comment).

3. Press the STOP button to end inputting the character string.

Return to the previous menu screen.

Deleting method of comment:

1. Point the cursor on the line of the string using the UP/DOWN keys and press the PLAY key to move the position of character to right then press the SEL key.
2. Next, point the cursor on line of the Delete and press the SEL key.
Selecting the Return allows returning the previous menu screen.

11

STROBE

Set the strobe control.

```
STROBE
> OFF (Default)
ON
```

12**SAVING SETUP PARAMETERS**

The mode setting for MEMRECAM ci in the recording setup mode or in the general setup mode is saved in the internal parameter memory of MEMRECAM ci after completion of recording or power off sequence. Next turning power on allows loading the parameters set into MEMRECAM ci and proceeding with operations.

Only the setting ALERT DISPLAY OFF in the general setup mode is switched back to ON as default at turning power on next time.




3 - 3 GENERAL SETUP MODE

In the general setup mode, various camera parameter will be set. Also, connection parameters for external equipment including the DataCartridge, in addition to recording rate and frame size are set.

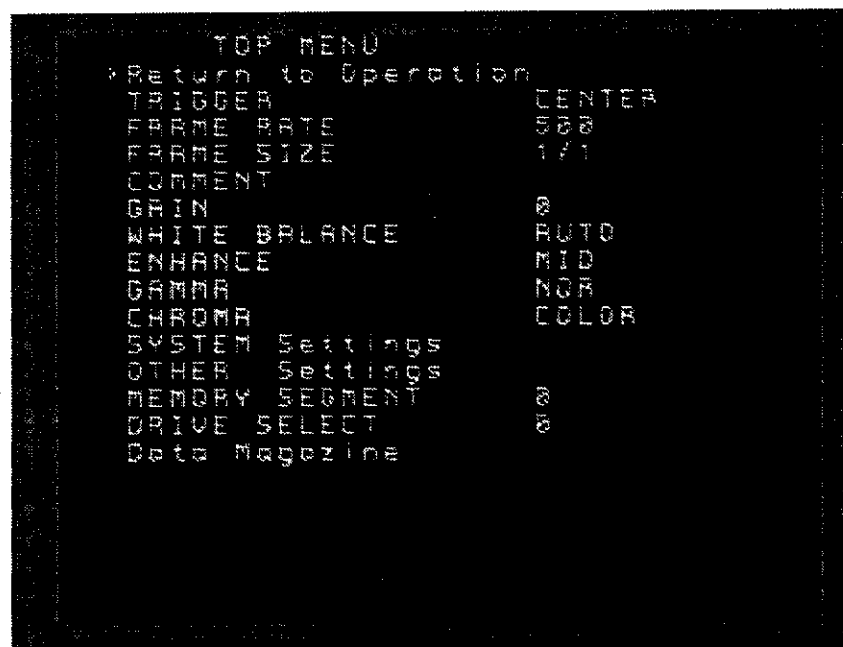
1 STARTS GENERAL SETUP MODE

From the STILL mode, pressing of SEL key  start the general setup mode.

In the upper part of the monitor, current parameters and mode are displayed.


To select a parameter to be changed, use UP/DOWN keys  , and change of its contents is done in sub menu which are shown by SEL key .

Selection among sub menu item is done by the same manner.



Exiting from the general setup mode is done by either :

Press STOP key ,  or

Select (bring the block cursor over) "Return to Operation" item in the menu, and press SEL key .

The parameters and items shown on this menu are categorized those functions in colors ordinarily.

- Red Parameters for recording
 Used for the next recording.
- Blue Parameters for playback
 Used for the current playback.

Parameters on picture quality for picture display are used for the next recording.

- Yellow Parameters not related to recording and playback.
 Others such as wrong operations are also shown yellow.
- White Sub menus other than parameters
 They are items for control of menu.

2

TRIGGER

Select the Trigger mode which set the trigger frame among three point. Details will be explained in Section 4-1.

TRIGGER

- START Set the trigger point at the start of memory.
- > CENTER Set the trigger point at the center of memory.
- END Set the trigger point at the end of memory.

3

FRAME RATE

Select the recording Frame Rate among five alternatives.
Unit is pps : Pictures Per Second.

FRAME RATE

- 100
- 250
- > 500
- 1000
- 2000

4 FRAME SIZE

Select the recording Frame Size, although a limitations depending on Frame Rate.

FRAME SIZE

1/4	Selectable at any frame rate.
1/2	Selectable at frame rate less than 1000 pps.
> 1/1	Selectable at frame rate less than 500 pps.

5 COMMENT

Set for recording. Refer to the sub menus for recording of "3-2 RECORDING SETUP MODE".

6 GAIN, WHITE BALANCE, ENHANCE, GAMMA AND CHROMA

For details on settings, refer to the sub menus for recording of "3-2 RECORDING SETUP MODE". Set the recorded scene for its playback. (Settings for recording are performed in the recording setup mode and displayed on a monitor in red characters.) Settings for playback are displayed on a monitor in blue characters.

7 MEMORY SEGMENT

The picture memory can be segmented for recording and playback pictures. The memory segment numbered of currently segmented memory is displayed. Pointing the cursor allows displaying the corresponding picture in still mode.

MEMORY SEGMENT

```

0 / 1      ( 1 2 8 M )
> 0 : 0 0 0 0 0 9 7 / 0 9 / 2 5 1 8 : 5 5 : 5 5 : 1 7
    1 : * * * * * / * * / * * * * : * * : * * : * *
```

Memory segment numbers, scene numbers and "****", which memory segment no picture is recorded at the recording time and date, are displayed.

8

SYSTEM Settings

Set the items related to the system such as date and time. In the INFORMATION menu, the temperature of image sensor, the input power voltage and so on are shown.

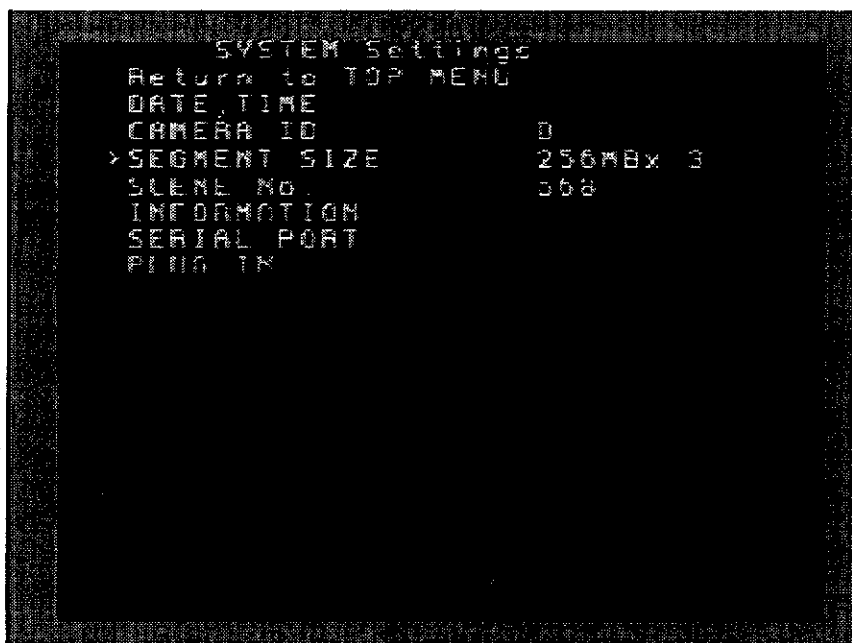
```
> Return to TOP MENU
DATE TIME
CAMERA ID 0
SEGMENT SIZE
SCENE No. 0
INFORMATION
SERIAL PORT
PLUG IN
```

■ Memory segment

Memory can be segmented for recording, playback and storage of data.

Method of memory segmentation

1. Select the SYSTEM Settings from the TOP MENU.
2. Select the SEGMENT SIZE from the SYSTEM Settings.



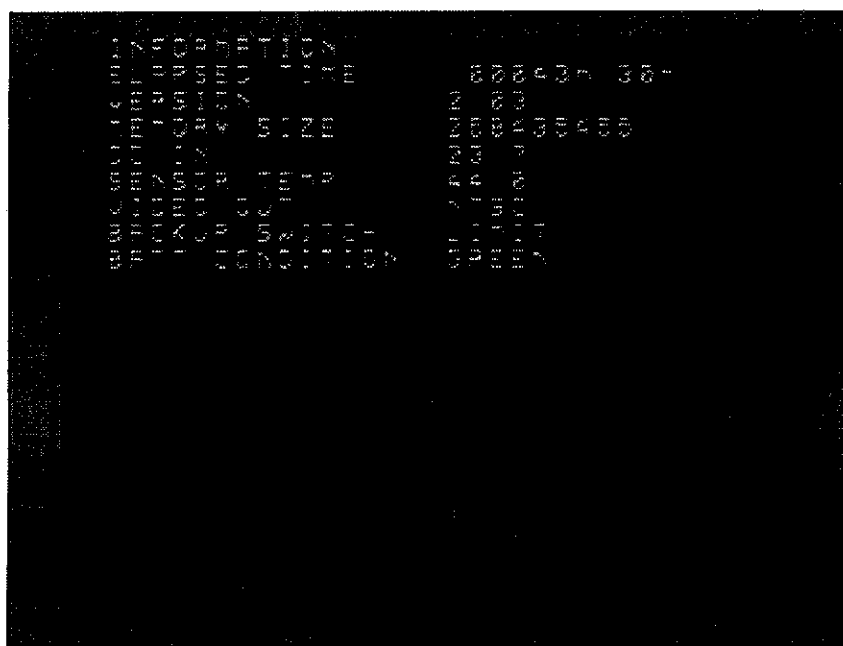
3. Select one segment size among three types. (In case of standard 256 MB memory)

64 MB	×	4	4 segments for every 64 MB
128 MB	×	2	2 segments for every 128 MB
ALL			1 segment for 256 MB

Segment size in case 768 MB memory is as follows.

64 MB	×	12	12 segments for every 64 MB
128 MB	×	6	6 segments for every 128 MB
256 MB	×	3	3 segments for every 256 MB
ALL			1 segment

- The INFORMATION tells you followings:



The displaying contents are as follows.

ELAPSED TIME	Elapsed time is displayed.
VERSION	Version of the system software is displayed.
MEMORY SIZE	Memory size is displayed in unit of byte.
DC IN	Current DC input voltage is displayed. The unit is V.
SENSOR TEMP	Current temperature of Image Sensor is displayed (in Celsius).
VIDEO OUT	Type of video output signal is displayed.
BACKUP SWITCH	Status of memory backup switch (option) is displayed.
BATT. CONDITION	Status of memory backup battery (option) is displayed.

By pressing the SEL key  , menu returns to previous "System Setting" menu.

■ SERIAL PORT

Set the serial port on the system (the followings are factory-shipped values : Default).

```
SERIAL PORT
> PROTOCOL  NONE
    BAUD RATE 38400
    DATA BIT 8
    STOP BIT 1
    PARITY BIT NONE
```

• PROTOCOL

CONTROL For remote control with the CONTROL connector on the panel
A J-pad can not be used.

REMOTE For connection with a synchronous unit (multi-cameras control) with the
REMOTE connector
(A J-pad can be used.)

NONE For no remote control (as default) (A J-pad can be used.)

NOTE: When MEMRECAM ci is used stand alone in the setting of REMOTE
for multi-cameras connecting with a synchronous unit, trigger
signal is not accepted at the TRIG. IN connector.

• BAUD RATE

2400

9800

19200

38400 Default for remote control and connection with a synchronous unit
(Default)

• DATA BIT

8 Default for remote control and connection with a synchronous unit
(Default)

7

• STOP BIT

1 Default for remote control and connection with a synchronous unit
(Default)

2

• PARITY BIT

NONE Default for remote control and connection with a synchronous unit
(Default)

ODD

EVEN

■ PLUG IN

Set an additional function (option) to the system software

MemrecamCi J-Pad Command List

1. Conditions

- Available operations/functions are limited as similar as J-Pad operation by commands provided by this manual.
- MemrecamCi may need to modify in order to communicate by the commands properly.
- The parameters of MemrecamCi must be set up in the same conditions as use with J-Pad.
- When you make command sequence, pay attention that mode switching timing, order of set up menu will change according to type, version, set up and status of MemrecamCi.

2. General

- The commands are used for remote control of MemrecamCi via RS-232C.
- The commands correspond to each button key of rear control panel of MemrecamCi.
- Mode or error code will be returned as status.

3. Interface

- asynchronous serial 9600 baud
- 1 stop bit
- 8 bits data
- non parity
- no flow control
- RS-232-C

4. Communication Sequence at an external device

- Command code: The commands are ASCII codes and do not have subtracted figures (except DELAY command). The commands must not include control characters (DEL, TAB, SPACE, LF, etc.). The command is terminated and executed by CR code.
 - Status code: The statuses are ASCII codes and do not have subtracted figures. The status is completed by CRLF code.
 - Handshake: Handshake processing for control is conducted by sending the command and receiving the status. You can send the command anytime after receiving the first status. If you send next command before receiving the first status, a part of command code may be missed and the MemrecamCi may not work properly. The status will be returned within maxT after sending the command. If the status is not returned within maxT, you should assume communication is failed.
(maxT: 5 sec. Refer to control sequence.)
-

- Initial Procedure 1

There is a case that MemrecamCi send trash data or a characters which are different from the status when turning on the power of MemrecamCi. The command is ignored and the status is not returned from power on till "READY" (status of PSTOP). In this case, repeat status confirmation by NOP every 5-10 sec until the valid status is returned.

- Initial Procedure 2 - - - - Checking the command system

If the status response is ERR1, command system is shortening DRP connection command.

If the status response is ERR1, command system is DRP connection command.

- Connection Check Response Procedure

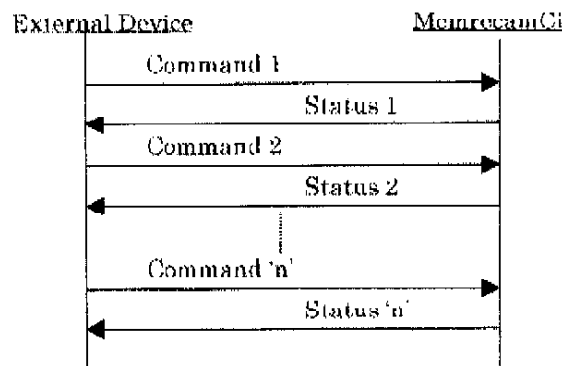
Check Memrecam mode and if it is necessary as an external device, display it.

If response is error when checking the Memrecam mode, recheck the Memrecam mode.

- Sending the command

Memrecam operation by the command from an external device is determined according to current mode.

- Command Transfer Procedure



5. Commands

STOP	Turn to PSTOP Condition when Ci is PLAY, VIEW, ARM, REC, PEDIT or VEDIT Condition. Turn to PEDIT Condition when Ci is DMENU or DNONE Condition. Turn to DMENU Condition when Ci is DDEL, DLOAD or DSAVE.
VIEW	Turn to VIEW Condition when Ci is PSTOP Condition.
ARM	Turn to ARM Condition when Ci is VIEW Condition.
TRIG	Turn to REC Condition when Ci is ARM Condition.
PLAY	Turn to PLAY Condition when Ci is PSTOP Condition. Turn to LOOP Condition when Ci is PLAY Condition.
FSTEP	Advance one Frame Forward when Ci is PSTOP Condition.

	Increase Playback Speed when Ci is PLAY Condition.
BSTEP	Advance one Frame Backward when Ci is PSTOP Condition.
	Decrease Playback Speed when Ci is PLAY Condition.
FF	Begin Playback Forward and increase Playback Speed Command by Command, when Ci is PSTOP Condition.
REWIND	Begin Playback Backward and increase Playback Speed Command by Command, when Ci is PSTOP Condition.
FSTART	Jump to First Frame to be displayed when Ci is PSTOP Condition.
FEND	Jump to End Frame to be displayed when Ci is PSTOP Condition.
FTRIG	Jump to Trigger Point Frame to be displayed when Ci is PSTOP Condition.
PBEG	Set Current Frame for Start Frame of Playback Range.
PEND	Set Current Frame for End Frame of Playback Range.
PCLR	Reset Playback Range when Ci is PSTOP Condition.
SEL	Turn to Menu Mode when Ci is PSTOP or VIEW Condition. Select a Menu Item when Ci is Menu Mode.
UP	Move up Menu Item or increase Value when Ci is Menu Mode.
DOWN	Move down Menu Item or decrease Value when Ci is Menu Mode.
NOP	No operation but return Status when Ci is any Condition.
DELAY nan	Set Delay Time for Status return. Valid Number is from 10 to 2000, and be truncated less than 10.
ECHO ON	Enable Echo back Prompt and Send Command String.
ECHO OFF	Disable Echo back.

6. Status Response

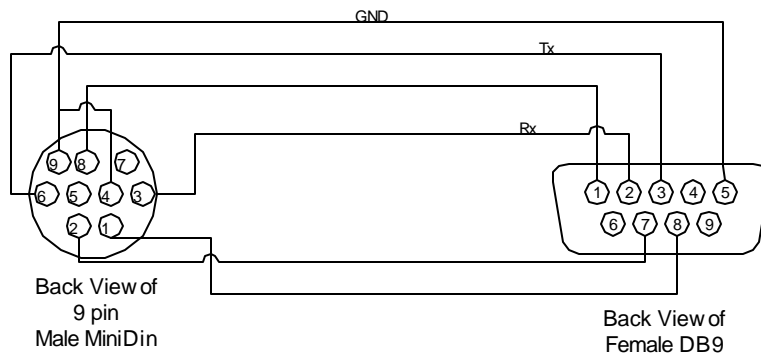
INIT	Initializing now.
PSTOP	STOP Condition.
PLAY	Playback Condition. When Playback finished, turn to PSTOP Condition automatically. Advance one Frame Condition. When Advance finished, turn to PSTOP Condition automatically. Loop Playback Condition.
VIEW	View Finder Mode.
ARM	Wait for Recording Trigger. When Trigger in, turn to REC Condition automatically.
REC	Recording Condition. When Recording finished, turn to PSTOP Condition automatically.
PEDIT	Setting Playback Parameters Mode.
VEDIT	Setting Recording Parameters at View Finder Mode.

DMENU	Data Magazine Menu Mode.
DNONE	Data Magazine is not connected.
DLOAD	Loading Image Data from Data Magazine now. When Loading finished, turn to DMENU Condition automatically.
DSAVE	Saving Image Data to Data Magazine now. When Saving finished, turn to DMENU Condition automatically.
DDEL	Be confirming to delete Data Magazine Data now.
DERR	Data Magazine access error.
WAIT	Be processing anything now. When Processing finished, turn to one Condition as above automatically.
ERRO	Invalid Command Operation.
ERR1	Invalid Command (unknown Command).
ERR2	Error by anything else.

7. Precautions for Command Sequence

- There is a case that the mode changes at the MemrecamCi automatically, as INIT, PLAY, ARM, REC, DLOAD, DSAVE, WAIT. If you send the command in this case, it may be error mode ERRO. In such a mode error, send NOP command and confirm the changes of Memrecam modes. (If response is not returned within maxT, you should assume that communication is failed.) While mode are changing, WAIT mode may be returned (for instance, in case of long processing such as to complete the recording). While mode are changing, completion time for disk access is as follows.
 - Time of WAIT mode to enter to DMENU is approx. 10 sec.
 - Time of WAIT mode to exit from DMENU is approx. 10 sec.
 - Time from entering to DLOAD to completion of loading (DMENU) is max. 180 sec.
 - Time from entering to DSAVE to completion of saving (DMENU) is max. 180 sec.
 If DELAY parameter is less than 10msec, a previous mode just before mode change or WAIT response may be returned. Set DELAY parameter at around 200msec normally. (In only the case of PSTEP and BSTEP, we suggest to set DELAY parameter at around 100msec for smooth operation.)
- Memrecam has a LED loop playback indicator but there is no status corresponding to this (PLAY only). When you send PLAY command in PSTOP mode, Memrecam enter to playback, and when you send PLAY command in PLAY mode, Memrecam enters to loop playback.

Memrecam Ci Serial Cable

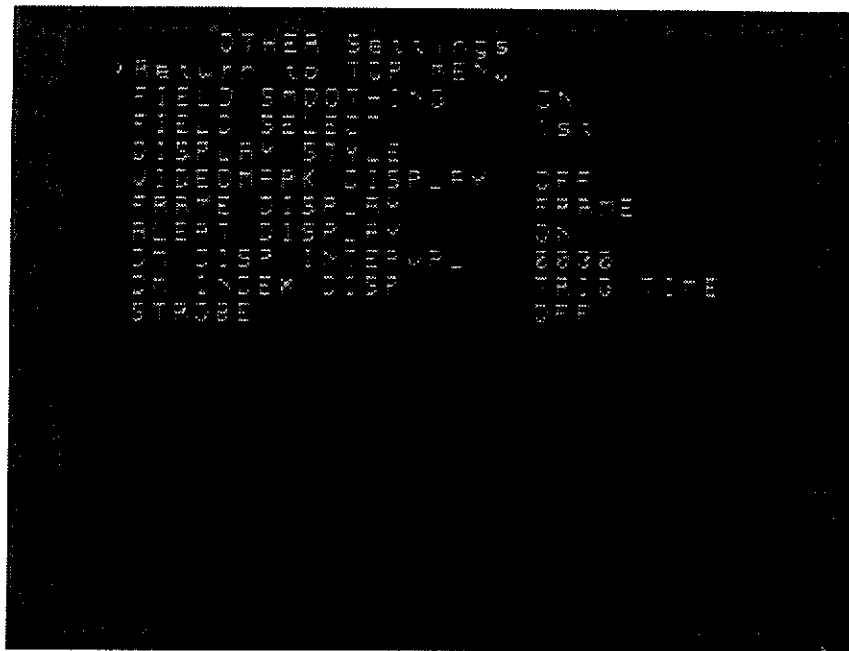


9 Pin Mini Din	DB 9
1 - CTS	- 8
2 - RTS	- 7
3 - RX	- 2
4 - GND	- 5
5 - N/C	
6 - TX	- 3
7 - N/C	
8 - DCD	- 1
9 - GND	- 5
Frm Gnd - Shield - Frm Gnd	

2

OTHER Settings

Another remaining parameter can be set, however in normal situations, default setting will be used. (The followings are factory-shipped values : Default.)



■ FIELD SMOOTHING

Select the field smoothing functions ON or OFF.



■ FIELD SELECT

Select the field to be revised in playback.



■ DISPLAY STYLE

Customize the setting of screen character display for every item.

```

DISPLAY STYLE
Return to OTHER
DISPLAY          ON
CUSTOM SET
FACTORY SET
  
```

Displaying items can be set in the CUSTOM SET for recording and playback are as follows.

Scene, Trigger Date, Trigger Time, Trigger Pos, Frame Count, Status, DRP ID, Play Rate, Rec Rate, Comment and Shutter
(The Comment is set not displayed at factory setting.)

The following menus are displayed and can be set for each item.

DISPLAY	Set the item to be whether displayed or not.
ON	Display.
w/o PLAY	Not display during playback in constant rate.
OFF	Not display.
X POSITION	Set the display position from the left edge of screen in numbers of character.
Y POSITION	Set the display position from the upper edge of screen in numbers of line.
DATA POS	Set the data to be displayed on which side of item's title.
NO TITLE	Not display title.
UPPER	Display item on the upper side of title.
LOWER	Display item on the lower side of title.
RIGHT	Display item on the right side of title.

* When the position of character display is set to out of displaying range and to be overlapped other character strings, the characters can not be displayed correctly. So the setting title to be displayed within displaying range and not to be overlapped other character strings is necessary.

■ TIMING VIDEO MARK

Set the video mark display function ON/OFF at the VIDEOMARK DISPLAY in the OTHER Settings of the TOP MENU.

Set the timing video mark to get a recording information of picture with such as analysis software.

Recording information to be displayed

1. Scene number
2. Camera ID for MEMRECAM
3. Recording rate
4. Frame timing
 - Trigger frame
 - Mark start frame
 - Mark end frame

Mark start frame and mark end frame are to be set only on the remote control software.

■ FRAME DISPLAY

Select a unit of Frame Counter or no display.

FRAME DISPLAY

- > FRAME Displays triggered (time:0) frame number.
- TIME Displays elapsed time from trigger input.
- % Displays current playback location in % of memory capacity.

■ ALERT DISPLAY

Select whether the Alert message on power voltage and sensor temperature is displayed or not.

ALERT DISPLAY

- OFF
- > ON

■ DM DISP INTERVAL

Select the picture update interval on the monitor during data transfer to the DataCartridge.

- > 0030 Display picture updates at every 30 frames.

■ DM INDEX DISP

Select the display mode of index.

- SAVE TIME Displays the date of data saved into the Data Cartridge.
- > TRIG. TIME Displays the time of trigger input.
- FRAME RANGE Displays the frame range saved into the Data Cartridge.

■ STROBE Control

Set the strobe control function ON or OFF.

STROBE

> OFF

Does not control the Strobe flush.

ON

Strobe flushes automatically in VIEW or ARM mode.

10

DRIVE SELECT

Set in advance the SCSI ID of the drive to be connected to the SCSI connector. Set always to 0 in case of using a DataMagazine. Set in general to 0 in case of using an external Jaz drive (refer to the operation manual of external Jaz drive).

11

DataMagazine

Menu for accessing to a DataCartridge. For details on the operations, refer to "3-6 ACCESSING TO DataCartridge".

12

SAVING SETUP PARAMETERS

The mode setting for MEMRECAM ci in the recording setup mode or in the general setup mode is saved in the internal parameter memory of MEMRECAM ci after completion of recording or power off sequence. Next turning power on allows loading the parameters set into MEMRECAM ci and proceeding with operations.

Only the setting ALERT DISPLAY OFF in the general setup mode is switched back to ON as default at turning power on next time.

3 - 4 OPTION

1 USING OPTIONS

■ Memory backup 4H0906

Using the memory backup function built-in MEMRECAM allows saving the recorded pictures even if an expected shutdown the power.

* Factory-shipped option

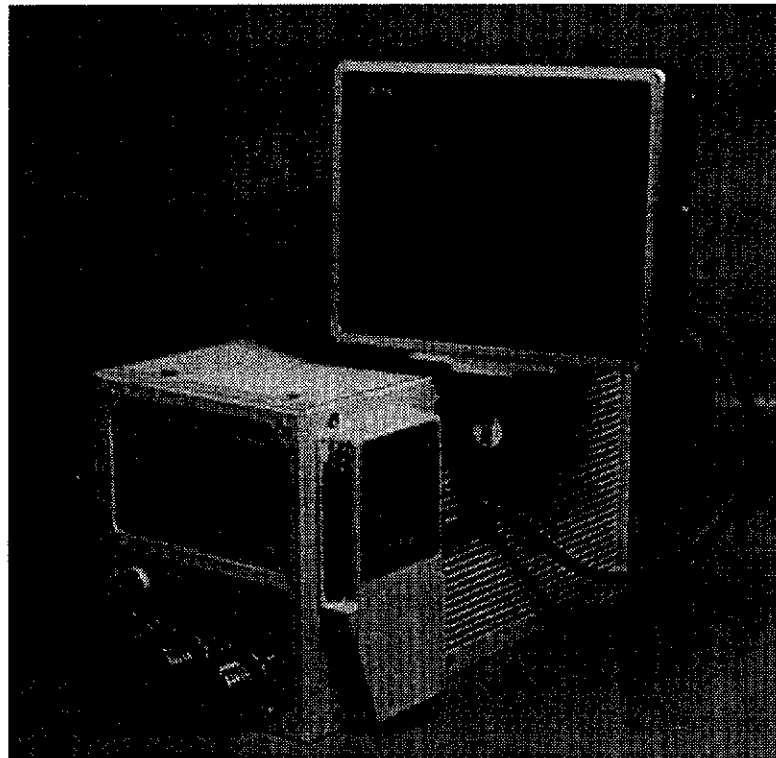
■ Color LCD viewfinder 4H0622(only for inside Japan)

Using the color LCD viewfinder with a 5.5" adjustable LCD module sized back-light allows same displaying screens and characters as video output.

Specification is as follows.

Power consumption	10W or less
Size	120 mm (height) × 145 mm (width) × 40 mm (depth)
Weight	approximately 850g

* Using Monochrome viewfinder (V603) is not allowed.



■ J-pad 4H0620

In connecting a synchronous unit, a J-pad can be used.
Refer to the setting of the PROTOCOL on "SERIAL PORT" in "8 SYSTEM SETTINGS" of "3-3 GENERAL SETUP MODE".

■ External Jaz drive for MEMRECAM ci 4H0628-2(only for inside Japan)

External Jaz drive for using a DataCartridge. For details on connecting and operating methods, refer to "3-6 ACCESSING TO DataCartridge" and the operation manual of external Jaz drive for MEMRECAM ci.

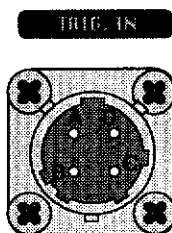
■ External Jaz drive kit MEMRECAM ci 4H0628-5(only for outside Japan)

External Jaz drive for using a DataCartridge. For details on connecting and operating methods, refer to "3-6 ACCESSING TO DataCartridge" and the operation manual of external Jaz drive for MEMRECAM ci.

*Contents, names and model number for these options will be changed by update or improve products. Please contact our dealer for detail.

3 - 5 EXTERNAL TRIGGER INPUT

When a trigger signal is applied externally, use TRIG. IN connector.



Connector

Receptacle: FPT02H-8-4P

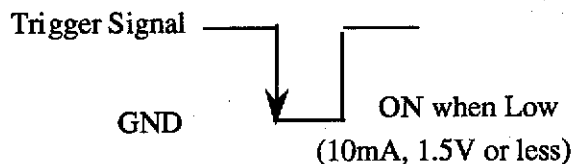
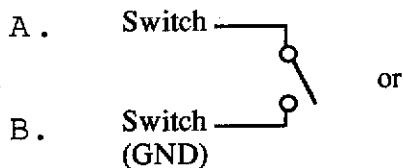
Plug : PT06E-8-4S(SR)

■ For an input of a MAKE contact or TTL signal

Use pins A and B.

When an instant makes contact or TTL signal changed from Hi to Lo level, trigger become active.

Pin Number

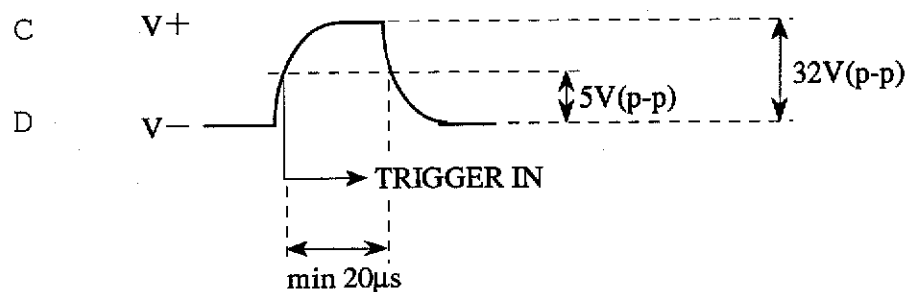


■ For an input of photo-isolate

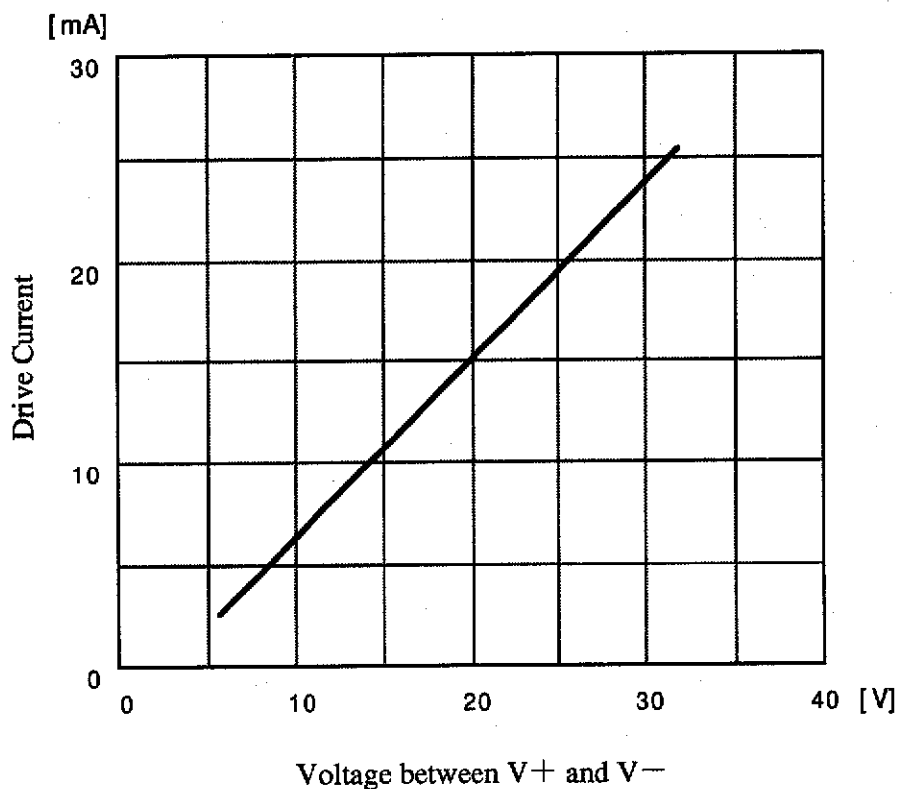
Use pins C and D.

Input impedance across pins C and D is about 1500 ohms. Trigger become active when voltage across pins C and D is 5 to 32 V.

Pin Number



Voltage vs Current when pins C and D are used




3 - 6 ACCESSING TO DataCartridge

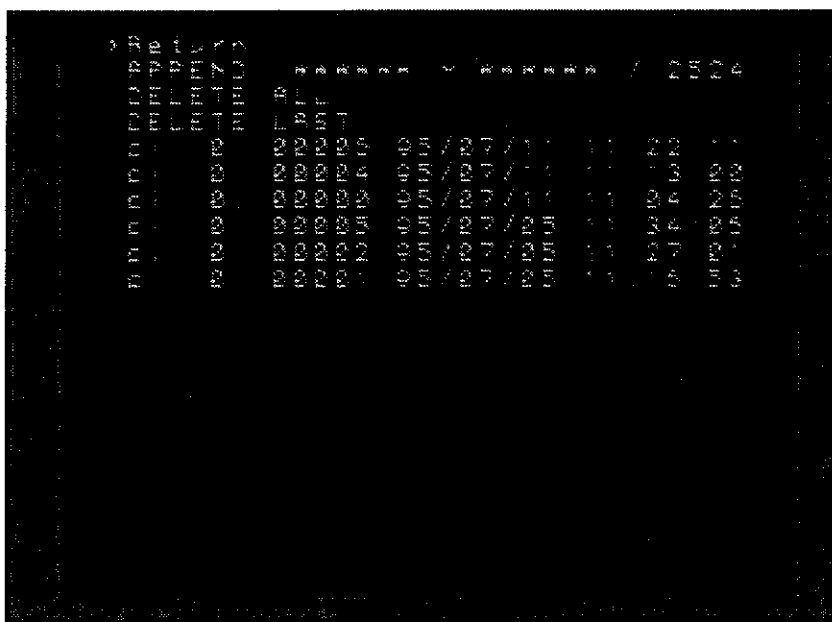
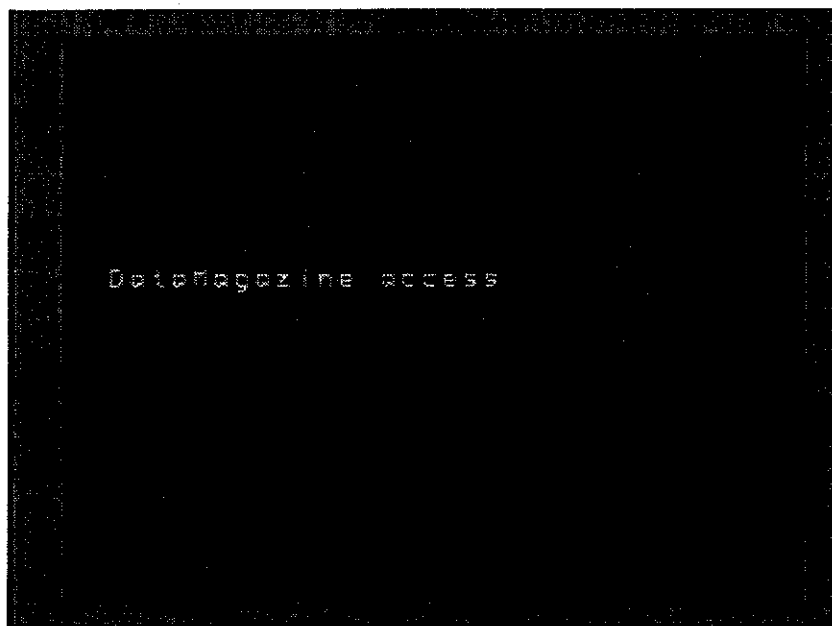
■ Selecting the SCSI ID for a secondary storage device for data retaining

Set in advance the SCSI ID of the drive to be connected to the SCSI connector.
Select the SCSI ID (0 to 6) for the SCSI drive in the DRIVE SELECT of the TOP MENU. Set in general to 0 in case of using an external Jaz drive for MEMRECAM ci (refer to the operation manual of external Jaz drive). Set to 0 in case of using a DataMagazine DM-344.



DataCartridge and DataMagazine are hard disks having a large capacity.
Avoid vibration and shock particularly during accessing.

After connect a DataCartridge with an exclusive cable, selecting the DataMagazine from the TOP MENU of the GENERAL SETUP MENU and pressing the SEL key  start accessing to the connected DataCartridge and allows displaying the following screen.



1

SAVING IMAGE TO DATA Cartridge

NOTE: If playback range has set, only the data in range is saved.
Playback range can be confirmed by performing loop playback.



Select APPEND by using UP/DOWN keys   , and press SEL key  , so that image data in the camera is saved into the DataCartridge.




2

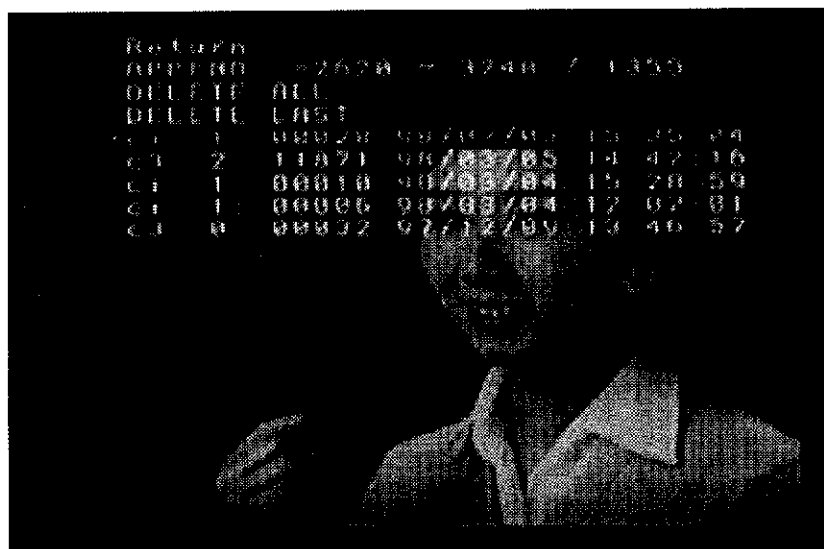
LOADING IMAGE TO MEMRECAM

By loading image data into the MEMRECAM from the Data Magazine, it can be replayed using playback facility of the MEMRECAM.

CAUTION: When the scene is loaded from the Data Cartridge to the MEMRECAM, existing data in the MEMRECAM will be erased. If existing data in the MEMRECAM is needed, save it in the Data Cartridge in advance.



Select a scene from a list on the monitor by using UP/DOWN keys   , and the first frame of the scene is brought on the monitor. If you agree, press SEL key  , so that scene in the Data Cartridge is loaded into the camera.




3

DELETING SCENE

CAUTION: Once the deleting is executed, it can not be restored.



■ DELETING ALL SCENES

Select DELETE ALL item in the menu, and press SEL key , and following message is displayed:

Are you sure ?

> NO


Cancel deleting.

YES

Execute deleting.

Select "Yes" and press SEL key  to execute deleting all scenes.

■ DELETING LAST SCENE

Select DELETE LAST item in the menu, and press SEL key , and following message is displayed:

Are you sure ?

NO

Cancel deleting.

> YES

Execute deleting.

Select "Yes" and press SEL key  to execute deleting last scene.

SECTION

4

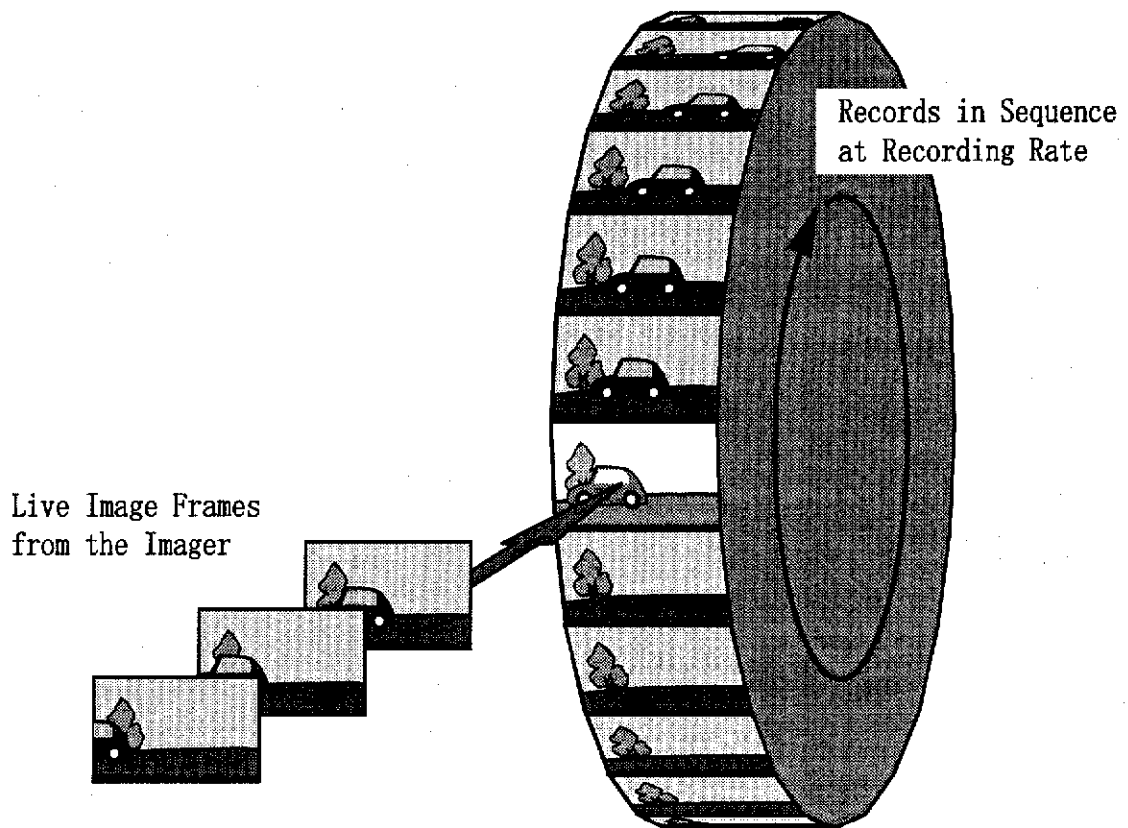
RECORDING TECHNIQUE

Principle operations of the MEMRECAMci such as recording technique and color balance methods will be explained.

4 - 1 RECORDING TECHNIQUE

1 RECORDING INTO SOLID-STATE MEMORY

The recording part of the MEMRECAMci is of solid-state memory and is configured as a ring buffer. The ring buffer, in an idea, illustrated as below, the first recording frame and the last one is connected to form loop memory. The ring buffer is well suited hardware for high speed camera like the MEMRECAMci.



Writing image data into the ring buffer is started when the camera is in ARM mode. During ARM mode, images from the image sensor at speed you selected are coming into the input port of the ring memory and are recorded sequentially. The ARM mode retains this sequential recording so that images in the ring buffer are always updated until the trigger is coming.

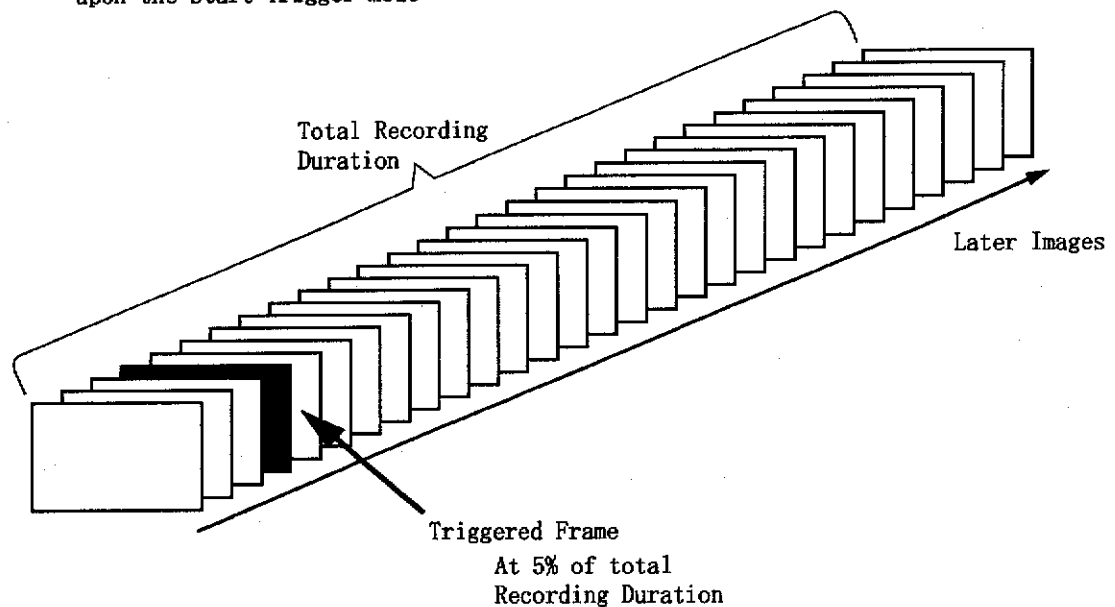
2 TRIGGER INPUT

The MEMRECAMci has three triggering mode; START, CENTER, and END, and are effective only during ARM mode. As in ARM mode, recording images are continuing, trigger signal input determines when and how the recording is stopped.

■ Start Triggered Recording

Place the triggered time stamp at the start of entire recording duration (capacity). Assuming that writing image data into the ring buffer become effective (not overwritten) upon trigger and is stopped at the end of memory. In the ring buffer, image data set from trigger instant to the end of memory is stored.

Image Data in the Ring Buffer
upon the Start Trigger Mode

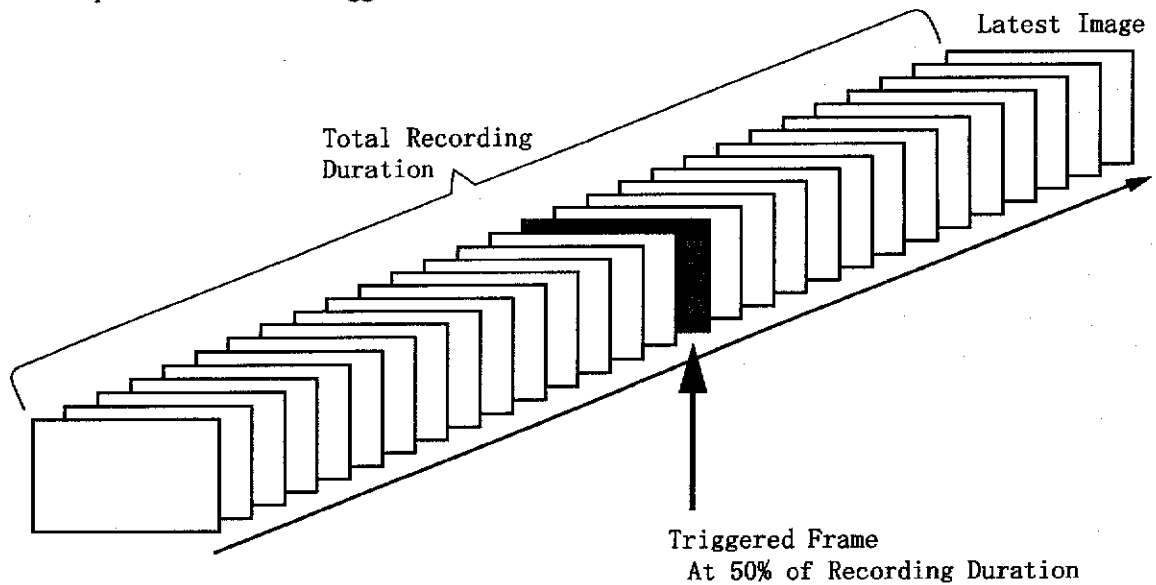


We think that images around a time of triggering are valuable, the MEMRECAMci holds 5% offset, before the trigger in START trigger mode, and after the trigger in END trigger, where the images are recorded.

■ Center triggered recording

Place the triggered time stamp at the center of entire recording duration (capacity). Assuming that writing image data into the ring buffer is stopped when ring is half rotated. In the ring buffer, image data set half before and half after the trigger are stored.

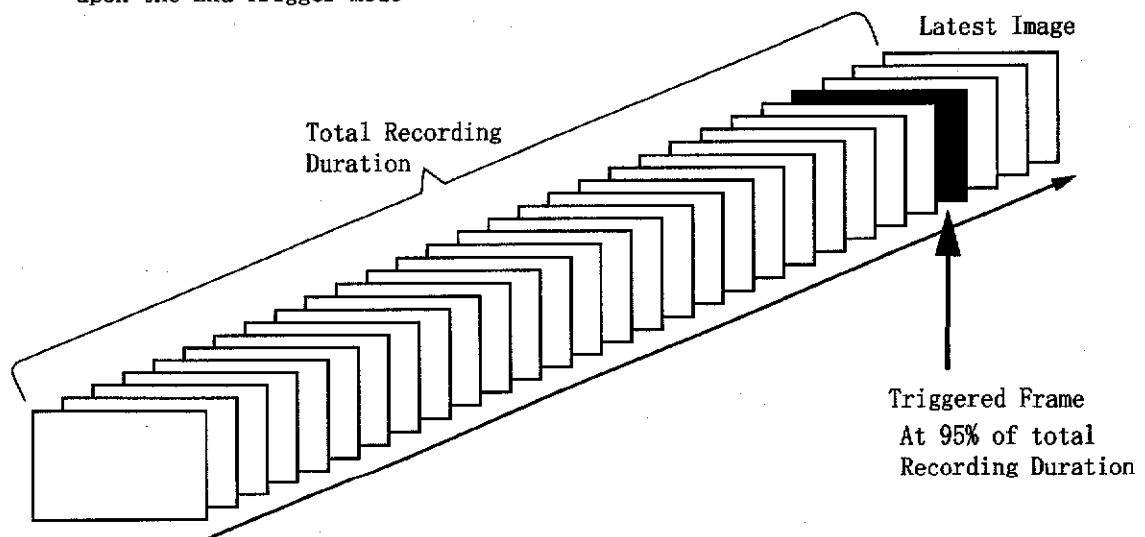
Image Data in the Ring Buffer
upon the Center Trigger Mode



■ End triggered recording

Place the triggered time stamp at the end of entire recording duration (capacity). Assuming that writing image data into the ring buffer is stopped upon input of the trigger. In the ring buffer, image data set up to trigger instant is stored.

Image Data in the Ring Buffer
upon the End Trigger Mode



4 - 2 COLOR BALANCE

WHITE BALANCE

The WHITE BALANCE menu (in both recording setup and general setup mode) is to adjust white balance in the following 6 variations (selectable).

■ AUTO TRACKING

In this mode, white balance is maintained appropriately by determining color temperature relatively from video signal, in the range of 3000 K (Kelvin) and 9000 K. However, if a hue over the entire frame area is uniform (almost red color only for example), white balance falls poor result. To maintain better balance tracking, larger white area should be presented in the field of view.

■ 3100

Select this mode, if color temperature of lighting is 3100 K, such as tungsten lamp.

■ 5000

Select this mode, if color temperature of lighting is 5000 K. Daylight, strobe light and Metal-Halide lamp illumination will match this mode.

■ 9000

Select this mode, if color temperature of lighting is 9000 K.

■ REG

Select this mode, if white balance data is used which has set in the SET REG function.

■ SET REG

Select this mode, if better white balance is needed, or when decision of color temperature may suffer during recording.

When the mode is selected, internally, the auto tracking function become active. Then, visually confirm the white balance on the monitor and if you satisfied, press SEL key, and the white balance data at the moment is set in the register. Lastly, select REG mode to use this registered white balance data.

2**PRINCIPLE OF AUTO WHITE BALANCE(AWB)**

An auto tracking function of the AWB in the MEMRECAMci employs a relative color detection technique while video signal from the image sensor is being image processing. With this technique, it is necessary to extract no-color data from video signal, to obtain accurate white balance. Therefore, an assumption that "when whole picture area is integrated (mix various colors), it become no-color" is made, and error between no-color and detected color is being corrected to obtain white balance. Although, it may introduce poor result if a specific color occupies large area in the image, the MEMRECAMci overcome this problem by improving control algorithm to obtain white balance information sufficient enough in practical use.

3**BLACK BALANCE**

If the MEMRECAMci is being used in excessive temperature environment, it may produce a small drift in setup level of illuminance signal and hue. In practical use, amount of the drift may not be a problem, however, if more accurate black balancing is required, set the black balance again by the following procedure.

■**SETTING BLACK BALANCE**

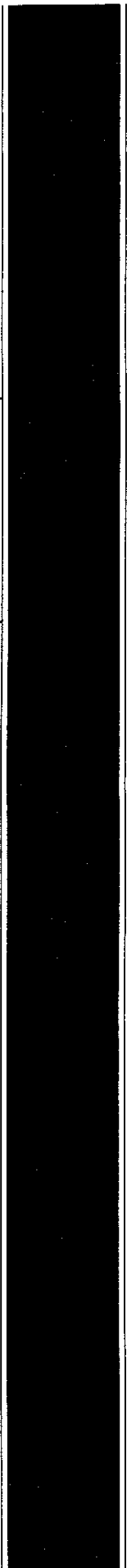
In the recording setup mode, from the View Setting, select "BLACK BALANCE". Close the lens iris or cap the lens, and press SEL key and release. Hold this shielded condition for 5 seconds. Black balance will be set and the data is stored.

The MEMRECAMci provides separate black balance data for each recording rates (500pps and higher) and frame size. Only the black balance for current setting is changed, and data for other setting are retained as they are.

SECTION

5

TROUBLESHOOTING



5 - 1 IN CASE OF ABNORMAL OPERATIONS

Examples of abnormal operations and their explained descriptions are shown below. Even if you operate the system according to the descriptions still the system does not operate normally, refer to "5-3 INQUIRY AND REPAIR AT MALFUNCTIONS" and please inquire us of further information.

1

THE SYSTEM DOES NOT STARTUP

Restore all settings to the factory-shipped settings and reconfirm whether the system starts up.

Operating procedures: Hold the STOP key press until the version will be displayed on the startup screen at the system begins starting up. If the system still does not startup, repair is necessary.

2

A J-PAD CAN NOT BE USED

Check whether the PROTOCOL of the SERIAL for the SYSTEM Settings in the TOP MENU is set to NONE or REMOTE.

Check whether the LED on the J-pad lights sequential when the jog pad is connected or MEMRECAM starts up.

If you can not find any incorrectness in the above, a J-pad or MEMRECAM may be in fault.

3

DATA CARTRIDGE CAN NOT BE ACCESSED

Check whether the SCSI ID number set on the DRIVE SELECT of the TOP MENU corresponds to the SCSI ID number for the connected Jaz drive.

Check whether the SCSI cable is connected correctly.

Check whether the Jaz media has been initialized with MEMRECAM Media Initialization Software.

If the accessing to DataCartridge is not allowed, or if some unordinary characters are displayed on the monitor, write down and ask us them.

One of MEMRECAM, Jaz drive, Jaz media and SCSI cable may have a malfunction.

EXTERNAL TRIGGER SIGNALS FROM MEMRECAM'S TRIG.IN CONNECTOR CAN NOT BE RECEIVED

- When multi-cameras are operated connecting to a synchronous unit, connecting to the TRIG. IN connector on synchronous unit allows receiving external trigger signals. External trigger signals can not be received through the TRIG. IN connector on MEMRECAM.
- When a MEMRECAM is operated stand alone, check whether the PROTOCOL of the SERIAL for the SYSTEM Settings in the TOP MENU is set to NONE or CONTROL. If the setting is set to REMOTE (for connecting with a synchronous unit), external trigger signals can not be received through the TRIG. IN connector on MEMRECAM.

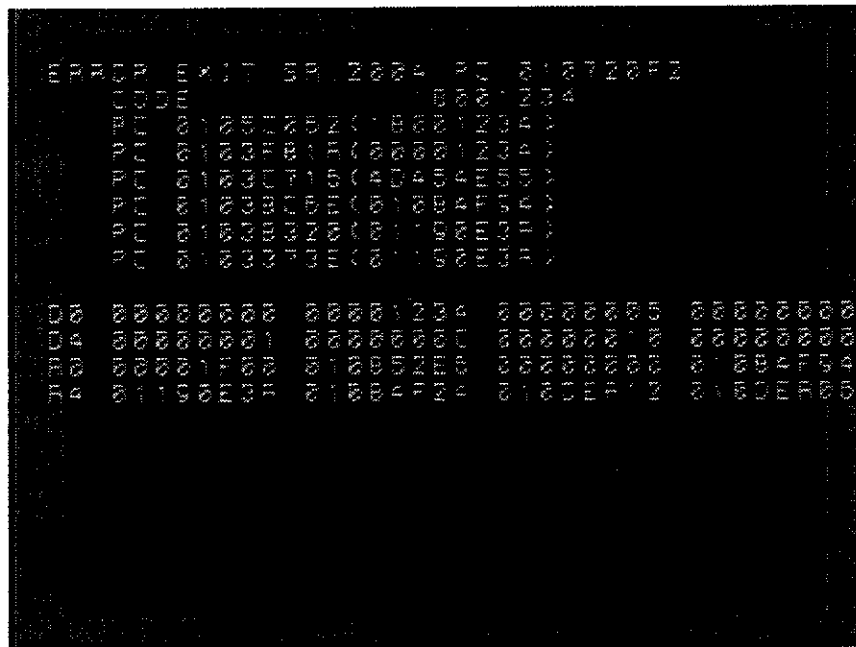
5 - 2 SYSTEM CRASH

Hanging-up the system with the following display is considered as a system crash. A lot of alphanumeric character strings follow such as XLOG and EXIT is displayed on the screen, the built-in software will detect a malfunction and stop operations. It may be caused by failure occurring in the equipment.

1 COUNTERMEASURES TO SYSTEM CRASH

Please make a record (writing down or taking a picture) all characters displayed on the monitor screen (related with your trouble).

Let us now try to avoid loss of picture in memory when recording has been already completed.



■ In case function of memory backup option is effective

Turn power off and after several seconds turn power on again. The system will be recovered to the status right after recording.

Save the picture in such as DataCartridge as soon as you can.

If the system does not startup normally, unfortunately the picture will be lost.

■ In case function of memory backup option is not applied

Restarting the system, keeping power on, can avoid loss of pictures in memory. Press the UP, STOP and TRIG buttons on the panel simultaneously and then release only the UP button. Pressing the STOP and TRIG buttons is kept until buzzer sounds (for several seconds). Startup the system ordinarily, the picture can be played back as it was recorded when it is left in memory. Save the picture in such as DataCartridge as soon as you can.

If the system does not startup normally, unfortunately the picture will be lost.

■ In case a system crash occurs

Refer to "5-3 INQUIRY AND REPAIR AT MALFUNCTIONS" and please inquire us of further information.

5 - 3 INQUIRY AND REPAIR AT MALFUNCTIONS

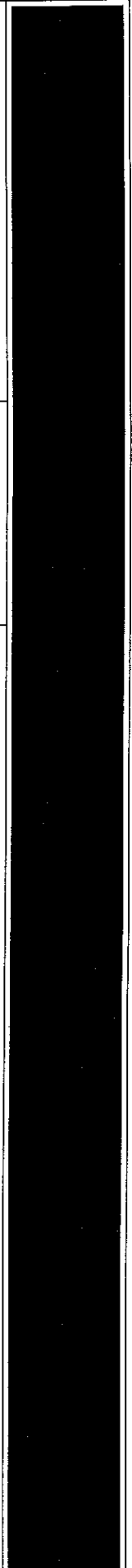
■ If a system crash occurs or the system does not operate normally, please inform us the following items.

- Record of the displayed characters on the monitor screen in case of system crash
- Record of any malfunction displayed on the monitor screen in other cases
- Status of LED lamp on the panel
- Model and serial number on the nameplate of MEMRECAM
- Details and frequency of the malfunction and the operation just before encountered malfunction
- System configuration
 - J-pad
 - Color LCD viewfinder
 - Synchronous unit (serial number, number of MEMRECAMS and model name)
 - Synchronous unit 4-channel distributor (number of units)
 - Remote control software (version, OS to be used on PC and model of PC)
 - DataCartridge
 - DM-344 (serial number)
 - Power supply (AC or DC)
 - Others (descriptions)

SECTION

6

SPECIFICATIONS



1. IMAGER PART

- 1) Imager : 1/2 inch, Single Chip, Color CMD
- 2) Recording Speeds : 100,250,500,1000,2000 pps
- 3) Sensing Areas :

Frame Size	Pixels (HxV)	Area Size (HxV)
1/1(at 500pps)	572 x 434	5.606 x 4.253 mm
1/2(at 1000pps)	400 x 282	3.920 x 2.764 mm
1/4(at 2000pps)	252 x 188	2.470 x 1.842 mm

Note : Number of pixels in Playback are different from above.

- 4) Spectral Response : 400 - 650 nm
- 5) Sensitivity : 24000 lx (at F/4, gain: 0dB, 500 pps)
- 6) Signal to Noise Ratio : 46 dB and more (at Y ch, 500 pps, gamma: off, Enhance: off)
- 7) Shutter
- | | | |
|---------------|---|--------------------------|
| Electrical | : | 1/picture rate |
| Mechanical | | |
| 100 - 500 pps | : | 1/1500, 1/3000, 1/6000 |
| 1000 pps | : | 1/3000, 1/6000, 1/12000 |
| 2000 pps | : | 1/6000, 1/12000, 1/24000 |
- 8) Lens Mount : "C" Mount standard
Maximam mount depth is 9mm

2. RECORDER PART

1) Recording Time

Recording time (in second) depends on memory capacity, recording rate, and frame size as follows(No memory segment):

Model	Recording	Frame Size		
	Speed(pps)	1/1	1/2	1/4
ci - 4 (256 MB) (Standard)	100	21.5	48.3	116
	250	8.6	19.3	46.7
	500	4.3	9.6	23.3
	1000	-	4.7	11.6
	2000	-	-	5.6
ci - 4 (768 MB)	100	64.8	145	350
	250	25.9	58.0	140
	500	12.9	29.0	70.1
	1000	-	14.2	35.0
	2000	-	-	16.9

When the memory segmentation is used, recording time in case the segment size is 128MB will be about half as long as in case of 256MB, and in case of 64MB will be one forth as long as in case of 256MB. Selecting a segment to record pictures allows storing respective recording scenes as same numbers of segments into memory. Recording time may be changed subject to improvement of the system functions immediately.

2) Video Monitoring During Recording

- VIEW mode Color live camera images are shown at 30 pps(NTSC), 25pps(PAL) but image are not written into the memory.
- ARM mode Color live camera images being written into the memory are shown at 30 pps (NTSC), 25pps (PAL).

3) Recording Trigger Modes

START Trigger	Trigger point will be a frame 5% (of whole capacity) after the first frame of memory.
CENTER Trigger	Trigger point will be a center of the memory
END Trigger	Trigger point will be a frame 5% (of whole capacity) before the end frame of memory.

- 4) Recording Data Camera ID, Scene number, Trigger data & time, Shutter speed, Video process data, COMMENT

3. VIDEO PROCESSOR

1) Settings

Gain	0, +6, +12 dB
White Balance	3100, 5000, 9000 K, Auto tracking, Register
Black Balance	Register
Gamma	3 levels
Enhance	4 levels (Horizontal, Vertical)
Chroma	On/Off (Monochrome display)

- 2) Display graduation Y, R-Y, B-Y, 8 bit each

4. PLAYBACK

- 1) Video System NTSC or PAL
- 2) Output Signal Video 1.0 Vp-p, 75 ohms, BNC, one output
S-VIDEO, S terminal, one output
B/W 1.0Vp-p (for Viewfinder)
- 3) Playback Speeds 1 to 30 pps (for NTSC model), 1 to 25 pps (for PAL model),
single-frame advance, 2 to 32 times fast, in each direction of
forward and backward
- 4) Playback Modes Single, Loop
- 5) Loop Setting Set manually a Start and End frame
- 6) Frame Jump Trigger frame, start frame, and end frame

5. SYSTEM CONTROL

1) System Settings

Date	Year, Month, and Date
Time	Hour, and minute
Camera ID	0 to 9 or A to Z
Scene Number	0 to 65535 (increments by 1 at every trigger input)
Serial Port	NONE, CONTROL, REMOTE
Memory Segment Size	64MB/128MB/(256MB)ALL

2) Other Settings

Display settings of screen characters

Setting for all items	Display only setting parameters for display or not display all items
Setting for each item	Display constantly, not display only during playback or not display
Setting for display position	In vertical direction and in horizontal direction
Setting parameters for display	Camera ID, scene number, trigger mode, recording rate, trigger date and time, shutter speed, camera status, playback speed and frame number
Displaying unit of frame	Frame number, elapsed time (from trigger input) or memory in %
Playback field update	1st field or 2nd field
Field smoothing	On or off
Timing mark	Display or not display

3) Display Data

Camera Information	Camera ID, Camera mode
Recording Information	Scene number, Trigger date & time, trigger mode, recording rate, frame size, comment, shutter speed
Playback Information	Frame number, playback speed
System Information	Power voltage, imager temperature, elapsed operating time, recording memory capacity, system version, software serial number, software version
Warning Display	At low power voltage, when temperature of imager becomes excessive high, at exhaustion of battery for timer and on UNLIMIT of memory backup option switch position

4) Setting Parameter Storage

Store Timing	Store latest parameter at power off
Store Parameters	
Recording	Recording rate, frame size, recording trigger, video process, gain, white balance, black balance, gamma, enhance, chroma
System	Camera ID, scene number, serial port
Others	Character display, unit of frame number, playback field, field smoothing
Clock Function	Date, time, elapsed time of operation
Reset function	Operation of buttons at startup restores all parameters to the factory-shipped values.

5) Selection of Control Module

Selects module function for an external control.

Following application specific module can be added by option.

Auto Sequencer Function	Within camera, routine operation procedures can be registered. Using this function, auto saving to Data Cartridge, can be performed.
VCR dubbing control	Controls VCR (AG-7350) directly through the CONTROL terminal as well as function of auto sequence. (Cable is optionally available.)

6. POWER INPUT

- | | |
|-------------------------|--|
| 1) Power Input | DC 20 - 32V, 2.8 - 1.8 A |
| 2) Power Switch | Rotary switch (OFF, REMOTE, ON) |
| 3) Remote Power Control | Controllable via REMOTE IN when power switch is in REMOTE position |
| 4) Power Off Delay Time | |
| POWER switch | 1 second, approx. |
| Remote Control | 4 seconds, approx. |

7. ENVIRONMENT

- | | |
|--------------|---|
| 1) Operation | 0 - 40 degree C, 30 - 80 %RH, no condensation |
| 2) Storage | -10 - 60 degree C, 20 - 80 %RH, no condensation |

8. DIMENSIONS

- | | |
|-------------------------|---|
| 1) Size | 148 (W) x 140 (H) x 245 (D) mm, approx. |
| 2) Weight | approx. 5 kg, without handle, lens or options |
| 3) Tripod Mounting Hole | 3/8-16 UNC |

