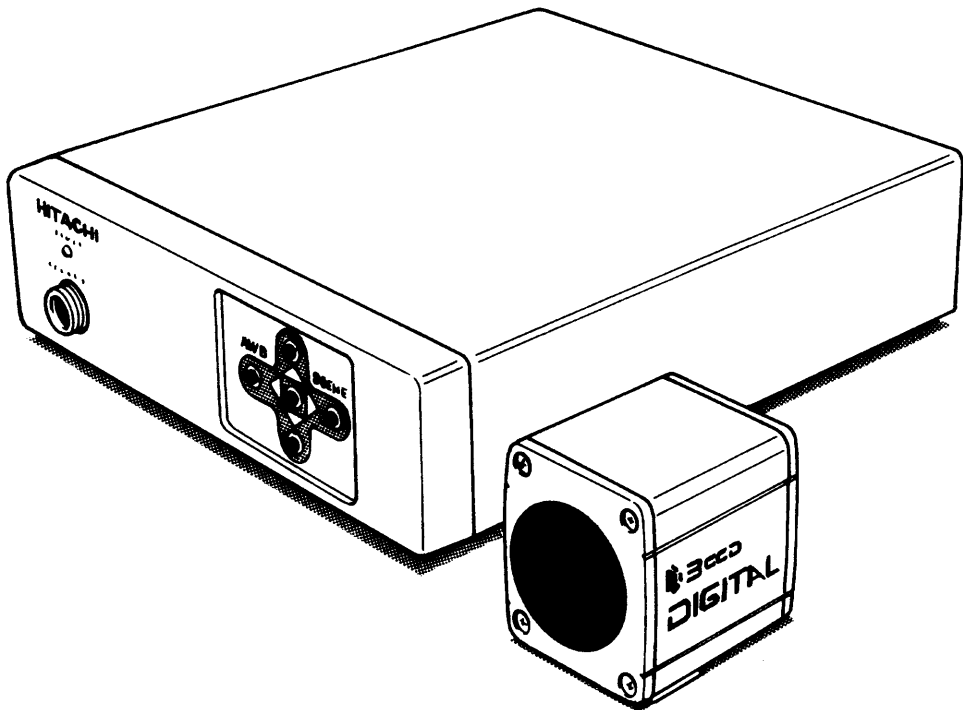*3-CCD Color Camera*

MODEL HV-D27／HV-D37

OPERATION MANUAL

Please read this operation manual carefully for proper operation, and keep it for future reference.

Note: The model and serial numbers of your product are important for you to keep for your convenience and protection.   These numbers appear on the nameplate located on the bottom of the product.   Please record these numbers in the spaces provided below, and retain this manual for future reference.

Model No._____   Serial No._____

Hitachi Denshi, Ltd.

Table of contents

L

Standard composition

Check when unpacking.

Camera, HV-D27 or HV-D37 ·· 1

Camera cable, 3m(10ft: C-301 KAJ) or 10m(33ft: C-102 KAJ)

or 20m(67ft: C-202KAJ) ·· 1

Power plug, RM12BPG-3S   (JMR0152*) ························· 1

Operation Manual ·· 1

Function labels for RC-C10 Remote Control Box ····················· 1

* Part code

Overview

The HV-D27 and HV-D37 from Hitachi are separate head and control unit type 3 element color camera respectively incorporating 1/2-inch and 1/3-inch 410 K pixel CCD image sensors.   The circuit from processor encoder is digitized and contained on a single chip to deliver top level picture quality and stability.

Proprietary digital processing technology borne of extensive experience in the design of broadcast and industrial color cameras provides a wealth of high performance functions in these industrial camera model The picture quality is further at a level unattainable with earlier analog camera designs.

Features

- Unitized signal processor

  The entire circuit from processor to encoder is organized into a single high density (0.5 μ m precision) LS chip that conserves both space and power.   Moreover, the 10 bit A/D converter and 13 bit signal process provide high signal to noise ratio and wide dynamic range.

- High resolution

  Horizontal resolution (luminance channel) is 800 TV lines with the HV-D27 and 750 TV lines with the HV-D37.

- Digital processing enables wide array of functions

  Desired hue and tint can be adjusted with 6-vector independently variable masking.   Even at wid dynamic range, auto-knee and dynamic chroma can provide superbly colored images.

  The versatile detail compensating functions allow optimum contour compensation to match the scene.

- Intelligent automatic level control (ALC)

  Digital light metering by ALC gating freely selectable for overall picture or 64 segments is combined with AGC and AES (auto electronic shutter) enable response over an extremely wide range of lighting conditions. The ALC response can also be set.

- Three application files

  Different setting data according to the application and scene can be stored in 3 application files.

- Bi-directional data communication

  The camera can be connected to a personal computer via RS-232C for two-way data communications to provide finely detailed camera control. An identification (ID) code can be assigned to each camera in a system and allow remotely controlling multiple cameras from a single computer.

- Scene files

  Three scene files can store different setting data according to application and scene conditions.

- Field on demand

  An external trigger signal can be used for image pickup at a desired timing to instantly obtain an image. The trigger and shutter can also adjust the pickup time.

Notes to users

Notes for safety

- Use this camera with a 12 VDC power supply.
- Observe that flammable objects, water or metal do not enter the camera interior. These may lead to failure or accident.
- Do not modify the camera or use the camera with external covers removed. These may cause failure, void any warranties and pose a safety hazard.
- Stop using the camera at the approach of an electrical storm (thunder audible). Protect the camera from rain if using it outdoors.
- In event the camera shows any abnormality, switch off the camera and disconnect the power cord. Contact a Hitachi Denshi service representative.

Operating considerations

- Power supply

  Check that the supplied voltage is between 10.5 and 17 VDC. Inadequate voltage can affect color fidelity and cause noise, while voltage over 17 V can damage the camera.

- Connectors

  Confirm the power is off before connecting or disconnecting a signal cable. Grasp connectors by the body, not the attached wires.

2

● Lens

The correct lens is important for deriving optimum performance from the camera.   Consult a Hitachi Dens

dealer for a selection of fine lenses according to the application.

● Installation and storage sites

The following types of environment can impair performance, lead to damage, pose safety hazards ar

shorten the useful life of the camera.   Select the sites for installing the storing the camera carefully.

- Direct sunlight, rain or snow
- Flammable or corrosive gasses
- Very hot or cold (beyond 0 to 40 ℃ operating, -20 to 60 ℃ storage)
- Humid or dusty
- Exposed to vibration or shock
- Strong electrical or magnetic fields
- Exceptionally strong light

Continuous operation

In situations where the camera is used continuously for long periods of time, the ambient temperature shou

be kept below 40 ℃ in order to avoid accelerated deterioration of internal parts and to derive maximu

long-term reliability.

Cleaning

● A photographers blower or lens brush can be used for clearing dust from the lens and optical filters.

● Wipe dust from the case with a soft dry cloth.   If soiling is severe, moisten the cloth with a solution of neutr

detergent.   Afterwards, wipe the cover with a dry cloth.

● Do not use petroleum distillates, alcohol or spray type cleaners.

Transportation

Remove the lens (install lens mount cap) and other attachments.   Pack the camera carefully in its original

equivalent container.   Use ample cushioning to protect the camera from physical shock.

CCD properties

The following phenomena are inherent to a charge coupled device imaging element and do not indica

malfunction.

1) Smear and blooming

Vertical bands are visible when a strong light enters the scene.   Adjust the camera aiming directi

carefully to avoid strong direct or reflected light.

2) Fixed pattern noise

High ambient temperature can cause fixed pattern noise to appear throughout the scene.

3) Moire

Interaction between patterns can produce an additional "phantom" pattern to appear. The CCD picture elements (pixels) are arranged in a pattern, which can interact with a pattern in the scene (e.g., a performer wearing a finely striped necktie) to result in a Moire pattern. The effect should be considered when selecting costumes, props and other scene elements.

4) Ghosting

Strong direct or reflected light near an object of interest can cause ghosting of the object to appear in the picture. The effect is more obtrusive with certain iris settings and lens types. Select the scene layout and camera pointing direction carefully in order to avoid this effect.

SETUP button
Press this button to display the camera setup menu. The four switches U, D, L and R provide different functions depending on whether the menu is displayed (MENU mode) or not (DERECT mode).
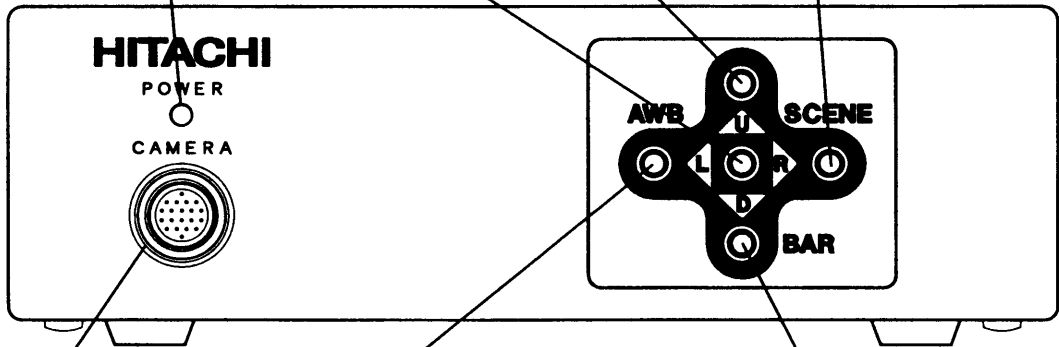
U button
DERECT mode: Not available.
MENU MODE:
Pressing this button moves the cursor up.

SCENE/R button
DIRECT mode:
Selects the scene file. Press once to show the present file name for 1 second. During the display, press again to change the scene file.
MENU mode:
In this mode, it is allowed to change functional data or carry out each function.

Pilot lamp

HITACHI
POWER
CAMERA
AWB U SCENE
L R
D
BAR

CAMERA connector

AWB/L button
DIRECT mode:
Holding down this button for more than two seconds carries out auto white balance(AWB).
MENU mode:
In this mode, it is allowed to change functional data or carry out each function.

BAR/D button
DIRECT mode:
Press this button to turn on/off a color bar signal.
MENU mode:
Press this button to move the cursor down.

12V IN connector

REMOTE connector
Used for connection with the remote control box RC-C10 or personal computer.

GL IN connector
Receives a black burst signal or composite is video signal where this equipment operated with external synchronization.

VIDEO conector
Outputs a composite video signal (1Vp-p/75 hms) .

DC IN
+12V
REMOTE GL S-VIDEO VIDEO
MULTI TRIG
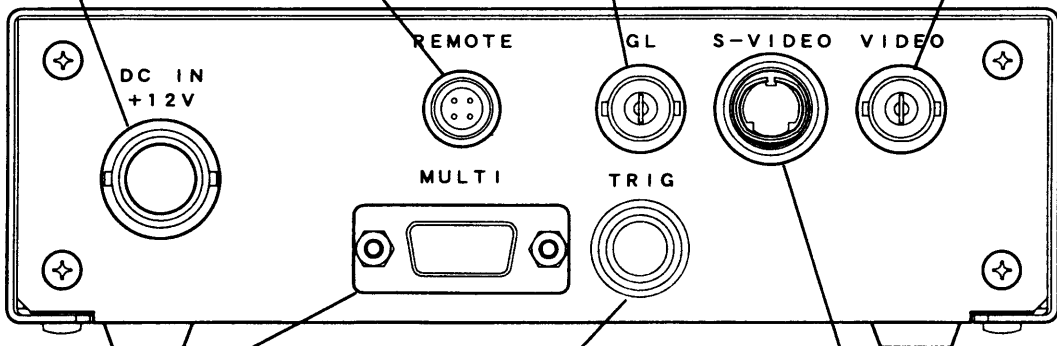
MULTI connector
Delivers an R/G/B, Y/R-Y/B-Y or Y/C output signal and a sync signal.

TRIG connector
External trigger signal input for field on demand mode operation. Or, an HD/VD signal is input where this equipment is operated with xeternal HD/VD synchronization.

Y/C connector
Output an Y/C signal. (S terminal)

LENS
CAUTION:
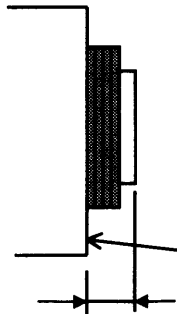
> Observe the dimensions of the lens mounting selection
> as illustrated atthe left.
> if the dimensions are not observed, do not use such a
> lens,because the lens and the camera will be damaged.

Flang sorface of lens

T : 3. 8 mm or less （H V − D 2 7 ）
   : 4. 3 mm or less （H V − D 3 7 ）

Selection of lens

Camera performance depends greatly on the choice of lens.   Note the following points when choosing the lens.

Image ghosting can occur if the lens is not matched to the CCD.   Choose 1/2-inch for the HV-D27 and 1/3-inch for the HV-D37.

When the exit pupil is short, colors at the upper and lower parts of the screen become uneven.

The camera does not include flangeback adjustment.   Depending on the type, focus might be imperfect at the telephoto and wide angle extremes of a zoom lens.

Color monitor

Personal computer

RC-C10
Remote box

AP-60A
AC adaptor

VBS

Y/C

R

G

B

SYNC

HD/VD
TRIG

RS-232C

RS-232C Level
converter
JU-C20

TRIG

REMOTE

DC IN

D-sub 9pin

Y/C

VBS

CCU

HV-D27/D37

Camera cable

CK-301KAJ(3m)
CK-102KAJ(10m)
CK-202KAJ(20m)

Head

Lens

Graphic stand

Microscope
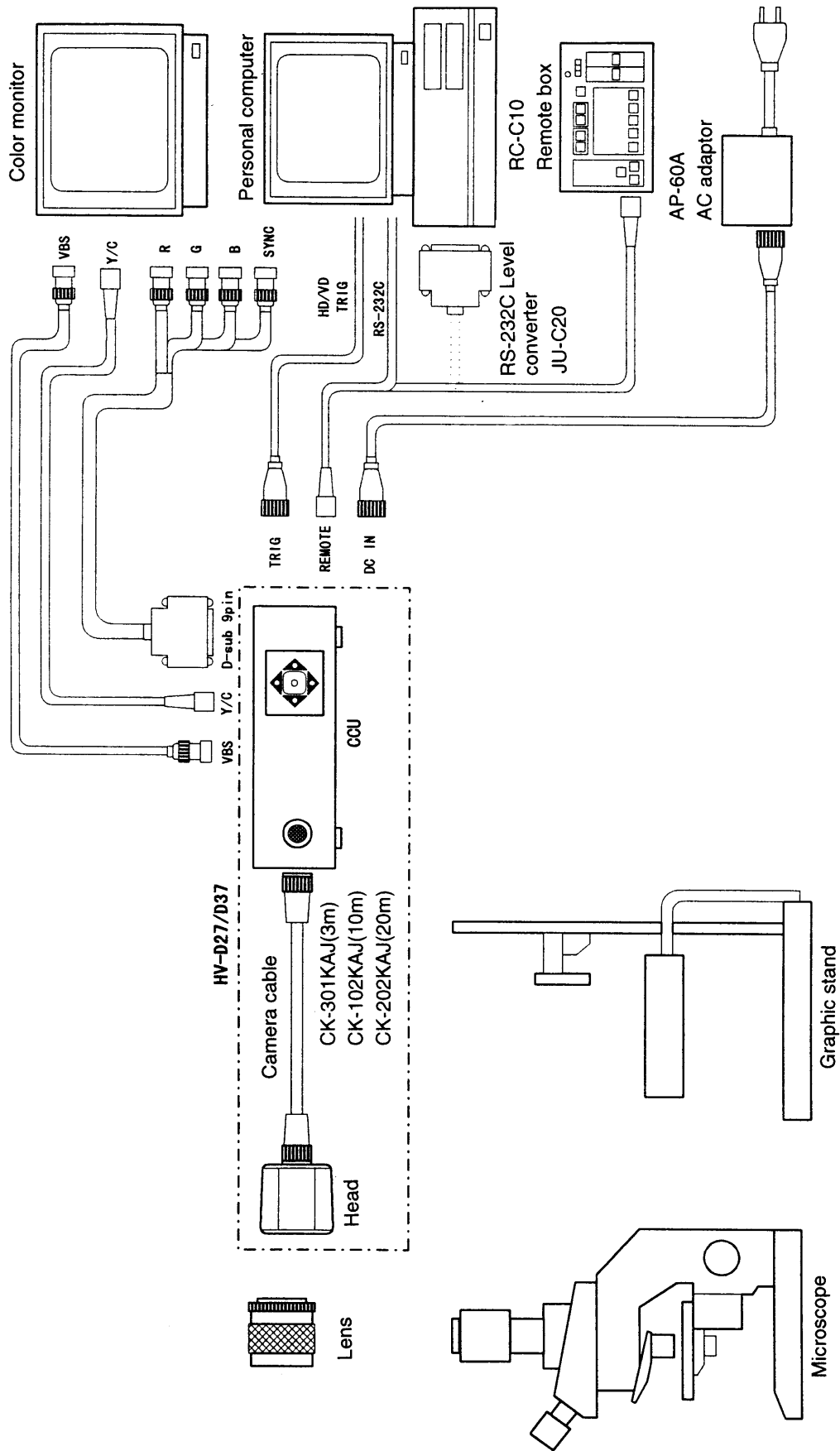
1. Menu Structure

For settings in the camera, the MAIN and SPECIAL menus are available.

1-1 MAIN Menu Structure

Press the SEUTP button and MAIN MENU appears on the screen to indicate the main menu mode. Again press the SETUP button to extinguish the menu and enter the direct mode. There are a main function setup menu and three sub-menus, which are arranged hierarchically as shown below. On the MAIN menu, bring the cursor to SUB MENU 1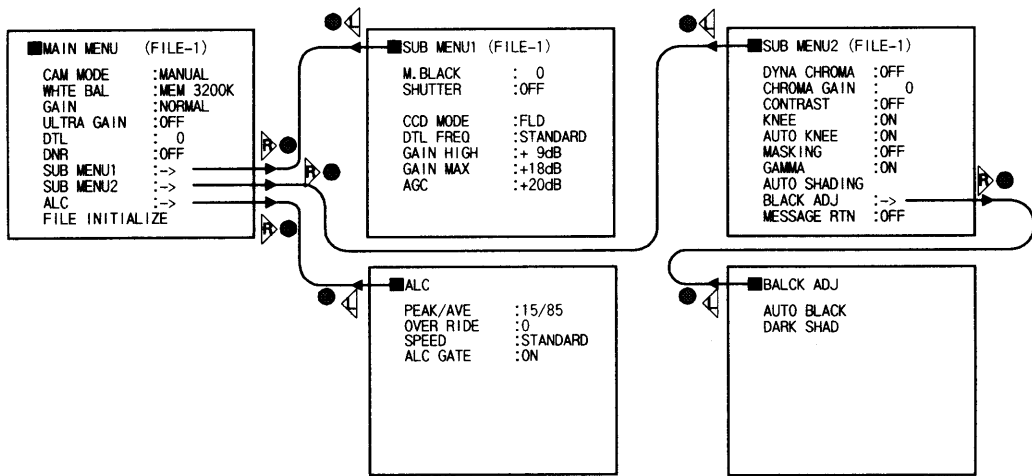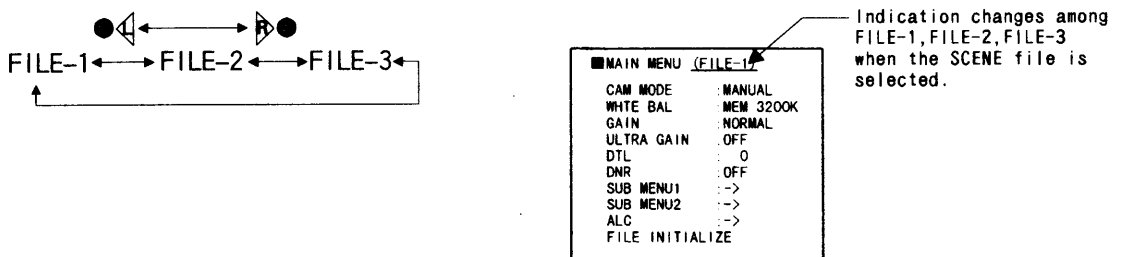, SUB MENU 2 or ALC and press the R button, and the desired subsidiary menu will come up. To return to the MAIN menu from the SUB menu 1, SUB menu 2 or ALC, bring the cursor to the top line (title line of SUB MENU 1, SUB MENU 2or ALC) and press the L button.

On each menu screen, bring the cursor to any desired item using the U or D button. For mode change/data setting, use the L or R button.

```
■MAIN MENU   (FILE-1)            ■SUB MENU1 (FILE-1)           ■SUB MENU2 (FILE-1)

 CAM MODE     :MANUAL             M.BLACK      :  0             DYNA CHROMA  :OFF
 WHTE BAL     :MEM 3200K          SHUTTER      :OFF             CHROMA GAIN  :   0
 GAIN         :NORMAL                                          CONTRAST     :OFF
 ULTRA GAIN   :OFF                CCD MODE     :FLD             KNEE         :ON
 DTL          :  0                DTL FREQ     :STANDARD        AUTO KNEE    :ON
 DNR          :OFF                GAIN HIGH    :+ 9dB           MASKING      :OFF
 SUB MENU1    :->                 GAIN MAX     :+18dB           GAMMA        :ON
 SUB MENU2    :->                 AGC          :+20dB           AUTO SHADING
 ALC          :->                                              BLACK ADJ    :->
 FILE INITIALIZE                                               MESSAGE RTN  :OFF


                                 ■ALC                          ■BALCK ADJ

                                  PEAK/AVE     :15/85           AUTO BLACK
                                  OVER RIDE    :0               DARK SHAD
                                  SPEED        :STANDARD
                                  ALC GATE     :ON
```

At the first line of the main menu, press the R and L buttons to select the SCENE file. The indication changes to show the selected file.
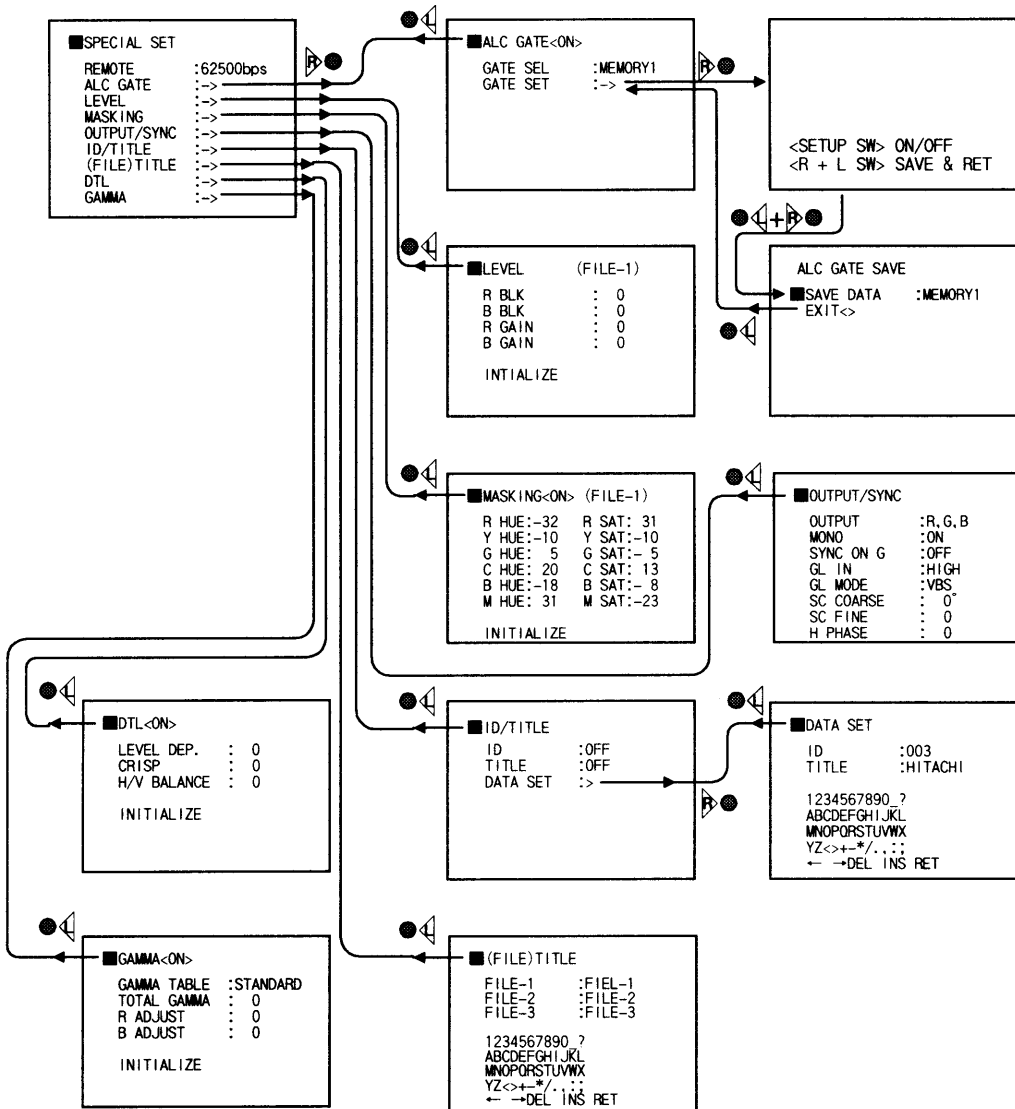
```
FILE-1 ←→ FILE-2 ←→ FILE-3
```

```
■MAIN MENU  (FILE-1)

 CAM MODE     :MANUAL
 WHTE BAL     :MEM 3200K
 GAIN         :NORMAL
 ULTRA GAIN   :OFF
 DTL          :  0
 DNR          :OFF
 SUB MENU1    :->
 SUB MENU2    :->
 ALC          :->
 FILE INITIALIZE
```

Indication changes among FILE-1, FILE-2, FILE-3 when the SCENE file is selected.

Refer to Page 24 for a detailed description of the SCENE file.

To select the SPECIAL SET mode, press the SETUP button for 2 seconds while holding down the button. Thus, the SPECIAL SET menu can be displayed. To return to the DIRECT mode, press the SETUP button again. The SPECIAL SET menu indicates a list of items, and each special item subsidiary menus are available. These menus are arranged hierarchically as shown below. On the SPECIAL SET menu, most items have '->' mark at the right side. For these items, press the R button and the relevant item setup menu will come up. To return to the SPECIAL SET menu, bring the cursor to the top line (title line of each subsidiary menu) and press the L button.

On each menu screen, bring the cursor to any desired item using the U or D button. For mode change/data setting, use the L or R button.
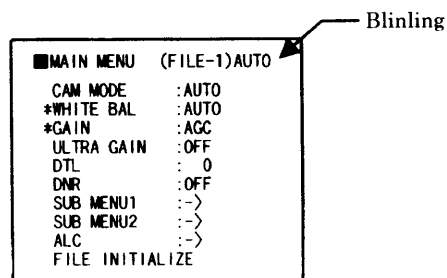


```
■SPECIAL SET

   REMOTE      :62500bps
   ALC GATE    :->
   LEVEL       :->
   MASKING     :->
   OUTPUT/SYNC :->
   ID/TITLE    :->
   (FILE)TITLE :->
   DTL         :->
   GAMMA       :->
```

```
■ALC GATE<ON>

   GATE SEL    :MEMORY1
   GATE SET    :->
```

```
   <SETUP SW> ON/OFF
   <R + L SW> SAVE & RET
```

```
   ALC GATE SAVE

■SAVE DATA    :MEMORY1
 EXIT<>
```

```
■LEVEL       (FILE-1)

   R BLK       : 0
   B BLK       : 0
   R GAIN      : 0
   B GAIN      : 0

   INTIALIZE
```

```
■MASKING<ON>  (FILE-1)

   R HUE:-32   R SAT: 31
   Y HUE:-10   Y SAT:-10
   G HUE:  5   G SAT:- 5
   C HUE: 20   C SAT: 13
   B HUE:-18   B SAT:  8
   M HUE: 31   M SAT:-23

   INITIALIZE
```

```
■OUTPUT/SYNC

   OUTPUT      :R,G,B
   MONO        :ON
   SYNC ON G   :OFF
   GL IN       :HIGH
   GL MODE     :VBS
   SC COARSE   :  0°
   SC FINE     :  0
   H PHASE     :  0
```

```
■DTL<ON>

   LEVEL DEP.  : 0
   CRISP       : 0
   H/V BALANCE : 0

   INITIALIZE
```

```
■ID/TITLE

   ID          :OFF
   TITLE       :OFF
   DATA SET    :>
```

```
■DATA SET

   ID          :003
   TITLE       :HITACHI

   1234567890_?
   ABCDEFGHIJKL
   MNOPQRSTUVWX
   YZ<>+-*/.:;
   ←  →DEL INS RET
```

```
■GAMMA<ON>

   GAMMA TABLE :STANDARD
   TOTAL GAMMA : 0
   R ADJUST    : 0
   B ADJUST    : 0

   INITIALIZE
```

```
■(FILE)TITLE

   FILE-1      :FIEL-1
   FILE-2      :FILE-2
   FILE-3      :FILE-3

   1234567890_?
   ABCDEFGHIJKL
   MNOPQRSTUVWX
   YZ<>+-*/.:;
   ←  →DEL INS RET
```
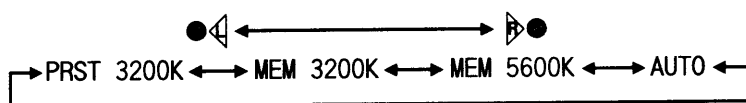
2. MAIN MENU

1) CAM MODE : Camera mode

- **MANUAL :** In this mode, you can set up most functions. Use the MANUAL mode for detail settings.
- **AUTO   :** The video level and white balance are adjusted automatically. Without having to make detail settings, you can display images under standard conditions.

  On the Main menu, some function items have the asterisk (*) mark. In the AUTO mode, the default settings shown below are given and the cursor skips over these items. When the AUTO mode is selected, 'AUTO' blinks at the upper right corner of each screen.

Menu	Function and Mode	
MAIN MENU	WHITE BAL	: AUTO
	GAIN	: AGC
SUB MENU 1	SHUTTER	: AES
	CCD MODE	: FLD
	GAIN HIGH	: Not settable
	GAIN MAX	: Not settable
SUB MENU 2	KNEE	: ON
	AUTO KNEE	: ON
	GAMMA	: ON
LEVEL	R BLK	: Not effective
	B BLK	: Not effective
	R GAIN	: Not effective
	B GAIN	: Not effective

Blinling

```
■MAIN MENU   (FILE-1)AUTO
  CAM MODE      :AUTO
 *WHITE BAL     :AUTO
 *GAIN          :AGC
  ULTRA GAIN    :OFF
  DTL           :  0
  DNR           :OFF
  SUB MENU1     :->
  SUB MENU2     :->
  ALC           :->
  FILE  INITIALIZE
```

2) WHITE BAL : White balance mode

```
       ●◁ ◀——————————▶ ▷●
→PRST 3200K ◀——▶ MEM  3200K ◀——▶ MEM  5600K ◀——▶ AUTO ◀┐
└──────────────────────────────────────────────────────┘
```

- **PRST 3200K :** The white balance condition is optimized at a color temperature of 3200K.
- **MEM 3200K :** White balance is automatically adjusted by the direct mode AWB button.

  Use in the color temperature range from halogen to fluorescent lighting.
- **MEM5600K :** White balance is automatically adjusted by the direct mode AWB button.

  Use in the high color temperature range from xenon to mercury lighting.
- **AUTO :** The white balance condition is set through realtime auto white balancing (automatic tracking).

Note: If selecting MEM 3200K and MEM 5600K, set to the direct mode (extinguish the menu) and press the AWB button for auto white balance adjustment.

In the Auto CAM mode, white balance is fixed at AUTO.

3) GAIN : Gain mode

```
        ●◁◀─────────────────────▶▷●
   ┌─▶ NORMAL ◀──▶ HIGH ◀──▶MAX ◀──▶ AGC ◀─┐
   └──────────────────────────────────────┘
```
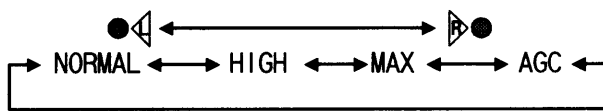
- **NORMAL :** The gain level is set to 0 dB.
- **HIGH :**　The gain level is set to a value specified at GAIN HIGH on the SUB menu 1.
- **MAX :**　　The gain level is set to a value specified at GAIN MAX on the SUB menu 1.
- **AGC :**　　An increase in gain is controlled automatically.　The upper limit of gain to increased corresponds to a value specified at AGC on the SUB menu 2.
　　　　　　In the Auto CAM mode, gain is fixed at AGC.

4) ULTRA GAIN : ULTRA GAIN ON/OFF

The on setting increases the sensitivity about 12 dB (but there is some loss of resolution).

5) DTL : DTL level setup

```
        ●◁◀─────────────────▶▷●
   OFF ◀──▶ -128 ◀──▶ 0 ◀──▶ 127
```
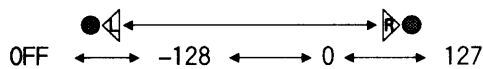
The DTL level can be set to OFF or in a range of -128 to 127.　The degree of contour correcti increases in the positive value setting, and it decreases in the negative value setting.　For zero setting, hold down both the L and R buttons for approx. two seconds.　However, if setting is OFF is not set over if the buttons are pressed.

6) DNR : Digital noise reduction mode

```
        ●◁◀──────▶▷●
   ┌─▶OFF ◀──▶ MODE1 ◀──▶ MODE2 ◀─┐
   └──────────────────────────────┘
```
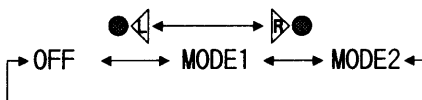
OFF, MODE 1 or MODE 2 is selectable.　In MODE 2, noise becomes lower than that in MODE 1 b a feel of image resolution becomes lower slightly.

7) SUB MENU 1 : The SUB menu 1 is brought up.

8) SUB MENU 2 : The SUB menu 2 is brought up.

9) ALC : The ALC is brought up.

10) FILE INITIALIZE : Returns main menu items of scene file to factory settings.
Simultaneously press the L and R buttons for about 2 seconds to initialize the selected applicati file.　The Special menu items are not initialized.
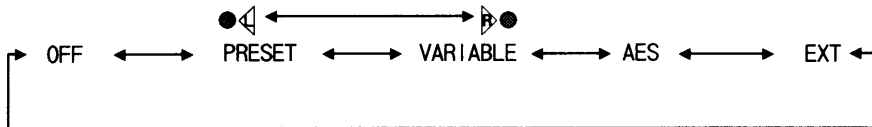
11

3. SUB MENU 1

1） **M BLACK** : Master black level setting

The master black level can be set in a range of -128 to 127. Pressing the R button increases a set value to make the black level higher, and pressing the L button decreases a set value to make the black level lower. For zero (0) setting, hold down both the L and R buttons for approx. two seconds.
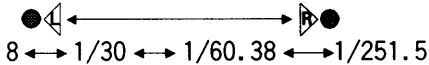
2） **SHUTTER** : Electronic shutter mode

When the shutter speed is Variable, operation is at the speed selected by the Variable setting (see below). In the Auto CAM mode, the shutter is set to AES.

```
              ●◁◀─────────▶▷●
  ┌─▶ OFF ◀──▶ PRESET ◀──▶ VARIABLE ◀──▶ AES ◀──▶ EXT ◀─┐
  │                                                       │
  └───────────────────────────────────────────────────────┘
```

(Note) In the AES mode, FLD operation is performed even if 'CCD MODE:FRM' is specified.

3） **VARIABLE** : Variable electronic shutter speed setting

```
●◁◀────────▶▷●
8 ◀─▶ 1/30 ◀─▶ 1/60.38 ◀─▶ 1/251.5
```

・8~1/30 （1/25 : PAL） : Long-time store mode

The camera delivers intermittent video signal output. So, to view continuous images, it is required to use the video memory. A clear image can be attained even if the subject is illuminated with a faint light source. As the store time increases, the degree of after-image becomes higher.

(Note) With an increase in store time, the degree of characteristic pattern noise, white scratch, etc. of the CCD image sensor will become higher.

・1/60.38 (1/50.31: PAL)~1/251.5 (1/253.8: PAL) : Lock scan mode

When an image of a subject display screen having a different scan frequency is taken, a bright or dark horizontal bar appears to roll up or down the screen.

When the shutter speed is Variable, operation is at the speed selected by the Variable setting (see below). In the Auto CAM mode, the shutter is set to AES.

The shutter speed can be adjusted to where the horizontal bars are minimized in the display.

(Note) If the display screen scanning frequency is less than 60Hz (50Hz PAL), the rolling horizontal bars cannot be stopped. Not settable in the Auto CAM mode.
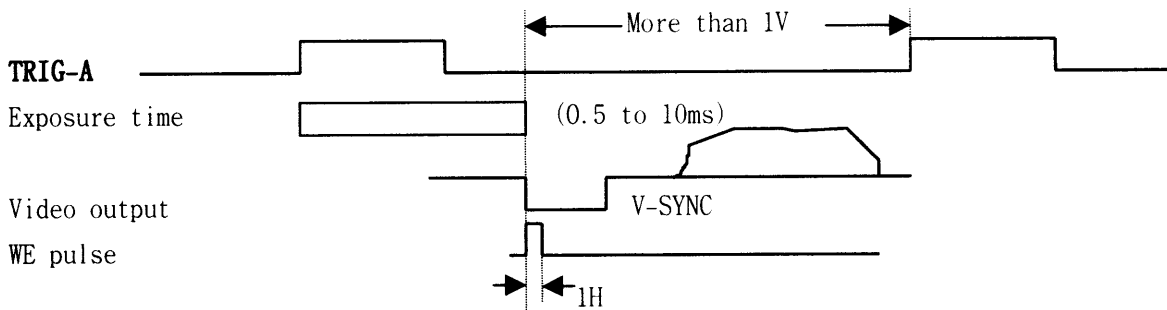
4) EXT : FIELD-ON-DEMAND FANCTION

Frame-on-demand refer to a function for picking up rapidly moving objects by applying a trigger pulse input a desired timing to provide a desired or a fixed exposure time. The function is effective since the object is alwa taken at the same position in the picture.
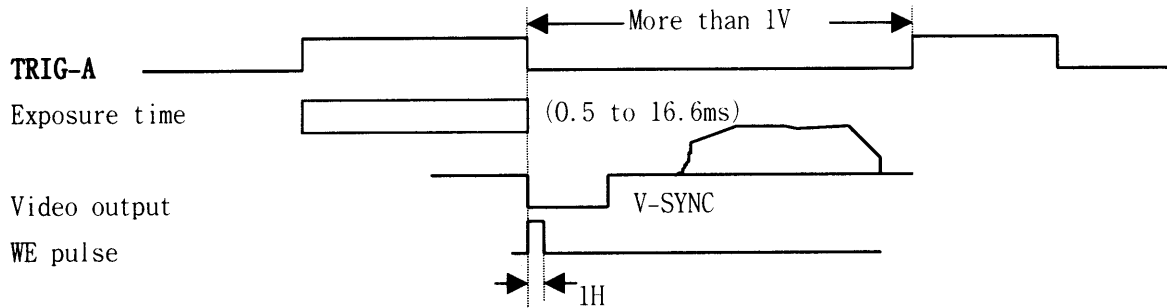
· FIX : Fixed

When a single trigger pulse (TRIG-A) is applied, exposure starts at the pulse rising edge. The expos time is fixed (1/100(NTSC) ,1/60(PAL) to 1/2000) and set by the L or R button.

The video output is obtained immediately after exposure ends.

```
                              ←——— More than 1V ———→
TRIG-A    ____┌──┐_____┌──┐___┌─
Exposure time  ┌────────┐   (0.5 to 10ms)
Video output                        ___/‾‾‾‾‾\___   V-SYNC
WE pulse         ┌┐
              →| |←1H
```

· SHORT : When a single trigger pulse (TRIG-A) is applied, exposure starts at the pulse rising ed and ends at the falling edge. One filed of the picture is obtained immediately at vertical reset. The pu width determines the exposure time.

```
                              ←——— More than 1V ———→
TRIG-A    ____┌──┐_____┌──┐___┌─
Exposure time  ┌────────┐   (0.5 to 16.6ms)
Video output                        ___/‾‾‾‾‾\___   V-SYNC
WE pulse         ┌┐
              →| |←1H
```

LONG : When a single trigger pulse (TRIG-A) is applied, exposure starts at the pulse rising edge ends at the falling edge. At the FRM CCD mode setting, one frame of the picture is obtained immedia at vertical sync reset. The pulse width determines the exposure time.

At the FLD CCD mode setting, operation is the same as the Short mode.
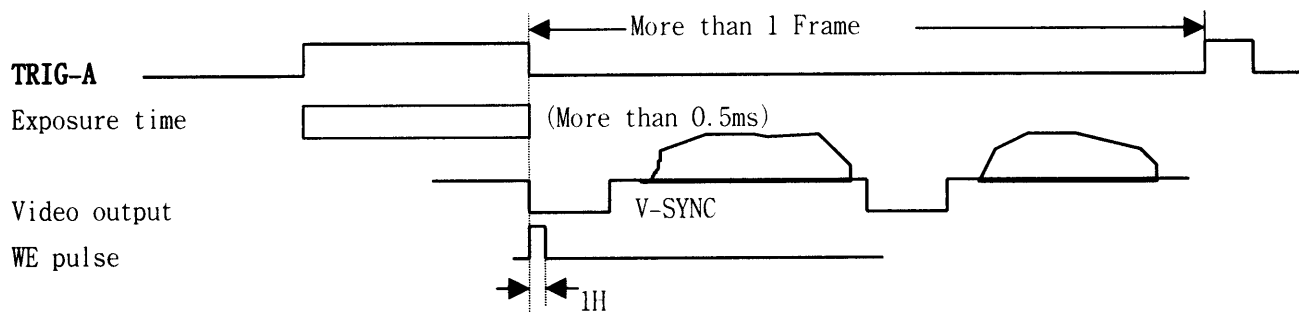
```
                              ←——— More than 1 Frame ———→
TRIG-A    ____┌──┐_____┌─┐__┌─
Exposure time  ┌────────┐   (More than 0.5ms)
Video output              ___/‾‾‾‾‾\___   V-SYNC   _/‾‾‾‾‾\_
WE pulse         ┌┐
              →| |←1H
              (CCD MODE = FRM )
```

(Note) Wite an increase in store time , the degree of characterristic pattern noise , white scratch , etc.

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5) **CCD MODE** : CCD store mode changeover

　　　・ **FLD** : The field store mode operation is performed (for ordinary purpose of application).

　　　・ **FRM** : Frame store mode operation is performed. The vertical resolution can be increased but the degree of after-image becomes slightly higher. It is therefore recommended to use the FRM function when taking a still image.

　　　　　　(Note) When the shutter mode is AES, even if set to frame, the camera operates in the field mode. In the Auto CAM mode, The CCD mode is set to FLD.

6) **DTL FREQ** : DTL amplifying frequency changeover.

```
        ●◁←————→▷●
    ┌→LOW ←——→ STANDARD ←——→ HIGH←┐
    └──────────────────────────────┘
```

　　・ **LOW** : The lower band frequency is amplified.

　　・ **STANDARD** : The standard amplification is performed.

　　・ **HIGH** : The high band frequency is amplified. Finer contour correction is carried out.

7) **GAIN HIGH** : Gain setting in GAIN HIGH mode (At the time of AGC:OFF mode)

```
    ●◁←————→▷●
    +1DB ←——→ +10DB
```
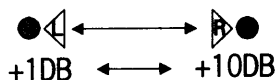
　　The gain level can be set in a range of +1 to +10 dB.

　　Cannot be set in the Auto CAM MODE.

8) **GAIN MAX** : Gain setting in GAIN MAX mode (At the time of AGC:OFF mode)

　　The gain level can be set in a range of +11 to +20 dB.

　　Cannot be set in the Auto CAM MODE.

9) **AGC** : Upper gain limit setting in AGC mode (At the time of AGC:ON mode)

　　The upper limit of gain increase in AGC operation can be set in a range of +6 to +20 dB.

4 .SUB MENU 2

1) **DYNA CHROMA :** Dynamic chroma ON/OFF

With knee on, setting the dynamic chroma on improves coloration in bright portions of the scene.

2) **CHROMA GAIN :** Level setting in chroma signal

The chroma signal level can be set in the range of -128 to +127. Respectively press the R button increase and the L button to decrease the chroma signal level. Set the level to 0 by simultaneou: pressing both L and R buttons for about 2 seconds.

3) **CONTRAST :** Contrast OFF/NORMAL/HIGH

Contrast can be set in two steps of Normal and High.

HIGH enhances the contrast more than NORMAL.

4) **KNEE :** KNEE ON/OFF

The on setting provides natural gradation in bright portions.

Knee is fixed to on in the Auto CAM mode.

5) **AUTO KNEE :** AUTO KNEE ON/OFF

At the on setting, gradation in bright components is automatically optimized even with scene change

6) **MASKING :** Masking ON/OFF

At the on setting, the overall screen gradation is set by the Special Set Masking menu.

Standard setting is on.

7) **GAMMA :** Gamma ON/OFF

Gamma on/off setting. In the Auto CAM mode, gamma is fixed at on.

8) **AUTO SHADING :** Automatic shading correction is carried out.

Pressing the R button performs automatic shading correction. For details, refer to 'How to Atta Better Images' (p. 28).

9) BLACK ADJ : The BLACK ADJ menu is brought up.

10) MESSAGE RTN : Message display ON/OFF
   · ON : A message indicating the result of AWB/ABB execution in the DIRECT mode is displayed.
   · OFF : A message indicating the result of AWB/ABB execution in the DIRECT mode is not displayed.

5 . ALC

1) Peak/AVE: Sets ALC detect signal peak/average ratio. Can be set in 4 steps of 50/50, 25/75, 15/85 and 0/100. When the average data percentage is large, the background is easier to see if the scene has bright components. Conversely, a larger peak data percentage makes bright objects such as clouds easier to distinguish.

2) Over ride: ALC setting
Setting range is from -128 to 127. Press the R button to increase and the L button to decrease the level. Set to 0 by simultaneously pressing R and L buttons for about 2 seconds.

3) Speed: ALC operating speed
The ALC operation can be set for Slow, Standard or Fast.

2) ALC Gate: ALC gate on/off

On : The selected area video signal is detected for controlling AGC and AES. In the menu mode, the light sensing area is overlapped on the video signal and visible. Sensing area setting is described on page . When the cursor is shifted to another item, the window is not visible. In the direct mode, the window is not shown, but ALC operates from the ALC gate.

```
ALC

PEAK/AVE    :15/85
OVER RIDE   :  0
SPEED       :STANDARD
■ALC GATE   :ON
```
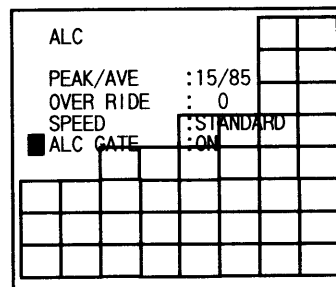
Off: The full screen video signal is detected for control. The window is not displayed.

6. BLACK ADJ

1) Auto black: Automatic black balance adjustment

Press the R button to activate automatic adjustment. See page 26.

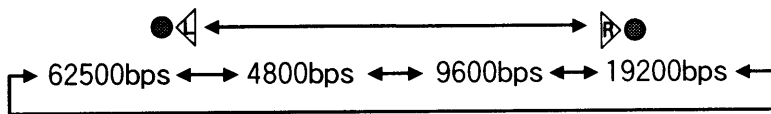2) Dark Shad: Automatic dark shading adjustment

Press the R button to activate automatic adjustment. See page 26.

7. SPECIAL SET

1) REMOTE : Remote control baud rate setting

For baud rate setting, use the L and R buttons.

(Note) When setting a baud rate, do not connect the communication cable with the REMOTE termin

$$\text{62500bps} \longleftrightarrow \text{4800bps} \longleftrightarrow \text{9600bps} \longleftrightarrow \text{19200bps}$$

- 62500bps : Select this baud rate when using the RC-C10 remote control box. In this case, be su
  to also set the RC-C10 baud rate to 65200 bps. Refer to the RC-C10 operati
  instructions.
- 19200bps, 9600bps, 4800bps : Select any one of these baud rates when controlling the camera fr
  a personal computer through RS-232C interfacing. For detai
  refer to 'Function Selection by Internal Switch Setting'. Contact
  for details of the control procedure using a personal comput
  Technical documents including protocol data will be supplied.

2) LENS : Change to LENS menu.

3) IRIS GATE : Change to IRIS GATE menu.

4) WHITE GATE : Change to WHITE GATE menu.

5) LEVEL : Change to LEVEL menu.

6) MASKING : Change to Masking menu.

7) OUTPUT/SYNC : Change to OUTPUT/SYNC menu.

8) ID/TITLE : Change to ID/TITLE menu.

9) DTL : Change to DTL menu.

8. ALC GATE

Menu for setting light sensing areas used for ALC data.

1) Gate sel: Select sensor area arrangement pattern.

Preset 1 - preset 5: 5 fixed arrangement patterns.

Memory 1 and memory 2: Arrangement patterns from Gate Set.

2) Gate set: Changes to ALC gate pattern setting screen.

Desired of 64 areas can be set.

ALC gate pattern setting

1) Shift the cursor with the L, R, U and D buttons to designate the light sensing areas.

2) Press the Setup button to select or deselect an area. Selected areas are outlined in the display.

3) Simultaneously press the L and R buttons for about 2 seconds to produce the ALC Gate Save menu. Select the memory for saving the changed data.

· Memory 1: Save pattern in memory 1.

· Memory 2: Save pattern in memory 2.

· Cancel: Exit without saving data.

4) To exit the menu at the end of setting, position the cursor at Exit and press the L or R button.
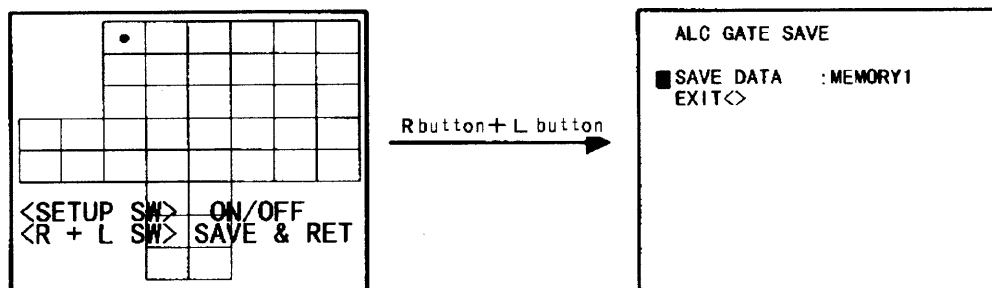
Note: Select at least 20 areas for a stable image.

9. LEVEL

This menu screen allows you to set up a black level and gain of R/B video signal.

1) R BLK : R black level setting

The allowable setting range is -128 to 127.

Pressing the R button increases a numeric value to make the R video signal black level higher. Pressing the L button decreases a numeric value to lower the R video signal black level. For 0 (zero) setting, hold down both the L and R buttons for approx. two seconds.

2) B BLK : B black level setting

The allowable setting range is -128 to 127.

Pressing the R button increases a numeric value to make the B video signal black level higher. Pressing the L button decreases a numeric value to lower the B video signal black level. For 0 (zero) setting, hold down both the L and R buttons for approx. two seconds.

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3) R GAIN : R gain level setting

The allowable setting range is -128 to 127.

Pressing the R button increases a numeric value to make the R video signal gain higher. Pressi
the L button decreases a numeric value to lower the R video signal gain. For 0 (zero) setting, ho
down both the L and R buttons for approx. two seconds.

4) B GAIN : B gain level setting

The allowable setting range is -128 to 127.

Pressing the R button increases a numeric value to make the B video signal gain higher. Pressi
the L button decreases a numeric value to lower the B video signal gain. For 0 (zero) setting, ho
down both the L and R buttons for approx. two seconds.

(Note) CAM MODE :　In case of AUTO, numeric values of R BLK, B BLK, R GAIN and B GAI
become ineffective.

WHITE BAL :　In case of AUTO, numeric values of R GAIN and B GAIN become ineffective.

5) INITIALIZE

Red and blue gain settings are initialized for each application. Simultaneously press the L and
buttons for about 2 seconds to return the selected files to the factory settings. See Page 24 for t
factory settings of each application file.

10. MASKING

Menu for setting the masking.

1) R HUE:　Change red color phase

2) Y HUE:　Change yellow color phase

3) G HUE:　Change green color phase

4) C HUE:　Change cyan color phase

5) B HUE:　Change blue color phase

6) M HUE:　Change magenta color phase
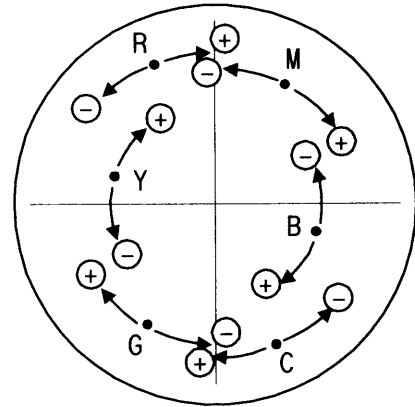
The above items can be set in the range of -32 to +31. Respectively
press the R button to increase and the L button to decrease the vector
color hue as indicated in the figure. Each item can be set to 0 by
simultaneously pressing the L and R buttons for about 2 seconds.

7) R SAT:　Increase red color level

8) Y SAT:　Increase yellow color level

9) G SAT:　Increase green color level

10) C SAT:　Increase cyan color level

11) B SAT:　Increase blue color level

12) M SAT:　Increase magenta color level

The above items can be set in the range of -32 to +31. Respectively press the R button to increase a
the L button to decrease the color level. Each item can be set to 0 by simultaneously pressing the
and R buttons for about 2 seconds.

13) INITIALIZE: Mask settings are initialized to factory values for each application file. Simultaneously press the L and R buttons for about 2 seconds to return the selected files to the factory settings. See Page 25 for the factory settings of each application file.

11. OUTPUT/SYNC

On this menu screen, you can make signal changeover for output to the D-SUB connector and phase adjustment for external synchronization.

1) OUTPUT : Output mode changeover

R, G, B ⟷ Y, R–Y, B–Y ⟷ Y/C
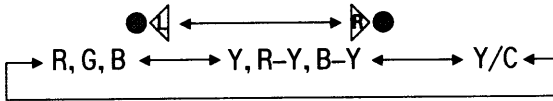
- · R, G, B : The R, G and B video signals are output to the D-SUB connector.
- · Y, R-Y, B-Y : The Y, R-Y and B-Y signals are output to the D-SUB connector.
- · Y/C : The Y/C signal is output to the D-SUB connector. It can be delivered simultaneously with the Y/C signal output from the Y/C connector (S terminal).

2) MONO : Monochrome (black and white) ON/OFF for the video output signal from the VIDEO connector

Set to ON for monochrome. Setting ineffective during color bar.

3) SYNC ON G : G video signal synchronization ON/OFF (In the R/G/B mode only)

When output is RGB with Sync on and G on, Sync is added to the G video signal.

4) GL IN : Impedance changeover of input to the GL IN connector.
- · HIGH : The high impedance level is provided.
- · 75 Ω : An impedance of 75 ohms is provided.

(Note) When power to the camera is turned off, the high impedance level is provided. So, do not use this function in a system where power is turned off for the camera unit only.

5) GL MODE :
- · VBS : The VBS signal or BBS (black burst) signal is input as an external synchronizing signal.
- · HD/VD : The HD/VD signal is input as an external synchronizing signal.

(Note) During external sync with HD and VD signals, be sure to use either RGB or Y, B-Y, R-Y output signals. Although VBS and Y/C output signals are also produced, these cannot be used as normal output signals.

6) **SC.COARSE** : Coarse adjustment of subcarrier phase
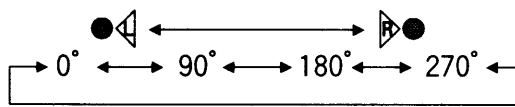
Using the L or R button, select one of the following phases; 0°, 90°, 180° and 270°.

7) **SC.FINE** : Fine adjustment of subcarrier phase

The allowable setting range is -128 to 127.

There is no direct relationship between a numeric value and a degree of phase. If the relevant ran

is exceeded, the SC COARSE setting is updated automatically to permit continuous adjustment.

8) **H.PHASE** : Adjustment of horizontal synchronization phase

The allowable setting range is -128 to 127.

12. ID/TITLE

ID and title display position and data setting menu.

1) **ID** : ID display position setting

Once an ID is assigned, it becomes possible to control a particular camera unit remotely from

personal computer according to its ID. That is, multiple camera units can be remote-controll

individually from one personal computer.

At this function item, specify whether the ID is displayed on

screen or not. In case that the ID is displayed on screen,

specify its display position also.

· **OFF** : Not displayed.

· **TOP** : Displayed at the upper right corner of screen.

· **BOTTOM** : Displayed at the lower right corner of screen.
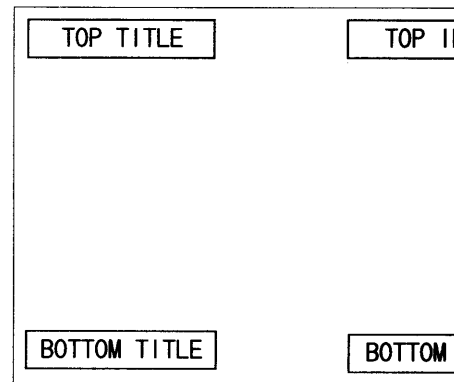
ID/TITLE Display Position

2) At this function item, specify whether the TITLE is displayed

on screen or not. In case that the TITLE is displayed on

screen, specify its display position also.

· **OFF** : Not displayed.

· **TOP** : Displayed at the upper left corner of screen.

· **BOTTOM** : Displayed at the lower left corner of screen.

3) **DATA SET** : The DATA SET screen comes up.

ID : Enter an ID code consisting of three characters.

Alphanumeric upper-case characters and a space character are permitted.

TITLE : Enter a TITLE consisting of up to 12 characters. ⊔

Alphanumeric upper-case characters, special symbols and a space character are permitted.

(Note) The symbol " ⊔ " in the data represents a space character. On the actual screen, a spa

character is given as a blank in an ID code or TITLE.

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① With the cursor located at DATA SET, press the D button. The cursor moves to the ID data set position an the first character flashes.

② Using the L, R, U and D buttons, select an input character.

③ Press the SET UP button, and the selected character will be entered. (The cursor will then move to the next character position.)

④ In the same manner, repeat the above steps ② and ③ to enter an ID code and TITLE.

⑤ On completion of character input, bring the cursor to RET using the L, R, U or D button. Then, press the SET UP button.

The cursor is returned to DATA SET.

⑥ To quit the SPECIAL SET mode, press the SET UP button.

← : Flashing shifts one character toward the left.

→ : Flashing shifts one character toward the right.

DEL : Flashing character is deleted, and the subsequent character string is shifted left.

INS : A space is inserted at the flashing character position, and the subsequent character string is shifted right.

RET : The cursor is returned to DATA SET.

13. (FILE) TITLE

Menu for setting the scene file name.

1) File-1: Set File-1 title.

2) File-2: Set File-2 title.

3) File-3: Set File-3 title.

Setting procedure

1) Select input characters with the L, R, U and D buttons.

2) Press the Setup button to decide a character. The cursor shifts to the next character position.

3) In the same manner, set the titles for Files 2 and 3.

4) After completing character input, shift the cursor to RET with the L, R, U and D buttons, and press Setup. The cursor shifts to (File) Title.

5) Press the Setup button to exit the Special set mode.

←: Move 1 character toward left. The selected character flashes.

→: Move 1 character toward right. The selected character flashes.

DEL: Delete flashing character and close vacated space.

INS: Insert a space at the flashing character position and shift subsequent characters toward the right.

RET: Shift cursor to (File) Title.

14. DTL

Menu for setting detail parameters

1) LEVEL DEP : Dependent level setting

Detail amount, and noise, can be reduced in scene dark components.

Setting range is -128 to +127. Press the R button to increase the value, reduce the detail amount

and expand the video signal level range.   Press L button to decrease the value and reduce the ran

Set to 0 by simultaneously pressing the L and R buttons for about 2 seconds.

2) **CRISP** : Crispness level setting

Reduces noise when DTL setting is in the range of -128 to 127.   However, at high settings, some l

of sharpness occurs in detailed scene components.   Setting range is -128 to +127.   Press the

button to increase the value and the detail noise.   Press the L button to decrease the value a

reduce detail noise.   Set to 0 by simultaneously pressing the L and R buttons for about 2 seconds.

3) **H/V BALANCE** : Balance setting for horizontal and vertical detail amount

Setting range is -128 to +127.   Press the R button to increase the value and reduce the H D

amount.   Press the L button to decrease the value and reduce the V DTL amount.   Set to 0

simultaneously pressing the L and R buttons for about 2 seconds.

4) **INITIALIZE** : Return each item to factory settings by simultaneously pressing the L and R buttons

about 2 seconds.

15.GAMMA

Menu for setting the gamma parameters.

1)   Gamma table: Select gamma rising slope.

Standard: Standard setting.

Low: Reduce gradation in dark component.

High: Raise gradation in dark component.

2)   Total gamma: Gamma correction can be adjusted from standard in the range of -64 to 63.   Press R

increase and L to decrease the gamma correction amount.   Set to 0 by simultaneously pressing R and L

about 2 seconds.

3)   R Adjust: Red gamma can be fine adjusted in the range of -64 to 63.   Press R to increase and L

decrease the red gamma correction amount.   Set to 0 by simultaneously pressing R and L for about 2 secon

4)   B Adjust: Blue gamma can be fine adjusted in the range of -64 to 63.   Press R to increase and L

decrease the red gamma correction amount.   Set to 0 by simultaneously pressing R and L for about 2 secon

5)   INITIALIZE: Set to factory setting simultaneously pressing R and L for about 2 seconds.

Scene files (FILE-1,FILE-2,FILE-3)

The camera setting data can be saved to 3 scene files.   This function enables storing the optimum settings for 3 sets of special but recurring scene conditions for later recall when setting up the camera.

1.   Items stored in scene files

The following items can be stored in each scene file.   The data shown are those entered at the factory.

Menu item	Setting data
MAIN MENU	
WHITE BAL	MEM 3200K
GAIN	NORMAL
DTL	0
DNR	OFF
SUB MENU 1	
M. BLACK	0
SHUTTER	OFF
DTL FREQ	STANDARD
SUB MENU 2	
DYNA CHROMA	ON
CHROMA GAIN	0
AUTO KNEE	ON
MASKING	ON

Menu item	Setting data	
LEVEL		
	HV-D27	HV-D37
R GAIN	0	0
B GAIN	0	0
MASKING		
	HV-D27	HV-D37
R HUE	-2	-1
Y HUE	3	-1
G HUE	4	10
C HUE	0	-2
B HUE	-3	-5
M HUE	-7	-9
R SAT	8	15
Y SAT	8	19
G SAT	6	13
C SAT	1	-3
B SAT	0	3
M SAT	11	13

2. Common file settings

The settings of these items apply to all files. They cannot be set differently for each file. The tab[le]
indicates the factory settings.

Menu item	Setting data
MAIN MENU	
CAM MODE	MANUAL
ULTRA GAIN	OFF
SUB MENU 1	
VARIABLE	NTSC:1/60.38
	PAL :1/50.31
PRESET SHT	NTSC:1/100
	PAL :1/60
PRESET TRIG	NTSC:1/100
	PAL:1/60
CCD MODE	FLD
GAIN HIGH	+9dB
GAIN MAX	+18dB
AGC	+20dB
SUB MENU 2	
CONTRAST	OFF
KNEE	ON
GAMMA	ON
AUTO SHADING	Adjusmemt data
MESSAGE RTN	ON
ALC	
PEAK/AVE	15/85
OVER RIDE	0
SPEED	0
ALC GATE	OFF

Menu item	Setting data
BLACK ADJ	
AUTO BLACK	Adjusmemt data
DARK SHAD	Adjusmemt data
SEPECIAL SET	
REMOTE	62500bps
ALC GATE	
GATE SEL	MEMORY1
(MEMORY1 DATA)	6×6
(MEMORY2 DATA)	6×6
LEVEL	
R BLK	0
B BLK	0
OUTPUT/SYNC	
OUTPUT	R, G, B
MONO	OFF
SYNC ON G	OFF
GL IN	75Ω
GL MODE	VBS
SC COARSE	0°
SC FINE	0
H PHASE	0

Menu item	Setting data
ID/TITLE	
ID	OFF
TITLE	OFF
ID DATA	(Blank)
TITLE DATA	(Blank)
(FILE)TITLE	
FILE-1	FILE-1
FILE-2	FILE-2
FILE-3	FILE-3
DTL	
LEVEL DEP.	0
CRISP	0
H/V BALANCE	0
GAMMA	
GAMMA TABLE	STANDARD
TOTAL GAMMA	0
R ADJUST	0
B ADJUST	0

How to Attain Better Images

Black Balance Adjustment

Adjust black balance to provide proper color tone at a dark part of video image.   In the following cases, be sure to carry out black balance adjustment.

● When using the camera first after purchasing it.

● When using the camera after it has been unused for a long time.

● When changing the camera cable length

● When the camera operating environment is changed (e.g., when the ambient temperature varies significantly).

Under normal condition, it is not required to make black balance adjustment at power-on.

1. At the BLK ADJ item of Sub menu 2, position the cursor to Auto Black and press the R button to activate automatic black balance adjustment.

(Notes)   1) In combinational use with the manual iris lens or microscope, a full-black screen image is provided from the CCD image sensor during adjustment.   When picturing after adjustment, a white screen image appears momentarily.   This phenomenon is not a symptom of trouble, however.

2) Do not attempt auto black balance adjustment while taking an image of subject having extremely high luminance such as the sun.   This may deteriorate black balance accuracy.

2.   If black balance adjustment cannot be made, any one of the following messages will appear.   Take a proper procedure according to the error message, and then try black balance adjustment again.

Error message	Procedure
AUTO BLACK : BAR	· Turn off the color bar.
AUTO BLACK : NG	· Carry out ABB again. If this message appears in repeated attempts, it is necessary to inspect the inside of the camera. In this case, notify your local Hitachi Denshi sales agent or Hitachi Denshi service office

Dark shading compensation

When the camera cable length is changed, horizontal color shading can occur in the image.   The shading can be compensated as follows.

1.   Close the lens iris.

2.   In the menu mode, position the cursor at Dark Shad and press R to activate automatic shading adjustment.

3.   In the menu mode, position the cursor at Auto Black and press R to activate automatic black balance adjustment.

4.   Repeat steps 2 and 3 several times.

Note: Be sure to compensate for dark shading when changing the camera cable.

White Balance Adjustment

Carry out white balance adjustment when the illumination condition (color temperature) is changed.

1. In the MENU mode, set up WHITE BAL: MEM 3200K or MEM 5600K.
2. Turn off the MENU screen to select the DIRECT mode.
3. Provide a proper aperture value of lens using the auto iris function or manually.
4. Put an white object in the subject image, and zoom it up.
5. Hold the AWB button pressed for about 2 seconds for automatic white balance adjustment. Wit MESSAGE RTN:ON, AUTO WHITE appears. At the end of successful adjustment AUTO WHITE:O appears.
6. If white balance adjustment cannot be made, any of the following messages will appear. Take a prop procedure according to the error message, and then try white balance adjustment again.

Error message	Procedure
AUTO WHITE : NG CHANGE TO CAM TRY AGAIN	· Turn off the color bar.
AUTO WHITE : NG CHANGE TO MEMORY MODE TRY AGAIN	· Set up WHITE BAL:MEM 3200K or MEM 5600K.
AUTO WHITE : NG LOW LIGHT TRY AGAIN	· White balance cannot be made due to insufficient illumination. · Increase the intensity of illumination, turn lens iris toward ope direction, or increase the gain to provide a proper video level. · Press the AWB switch again.
AUTO WHITE : NG HIGH LIGHT TRY AGAIN	· White balance cannot be made due to excess illumination. · Increase the intensity of illumination, turn lens iris towa closed direction, or increase the gain to provide a proper vid level. · Press the AWB switch again.
AUTO WHITE : NG C.TEMP HIGH TRY AGAIN	· The color temperature is too high, making it impossible to reach t optimum value in adjustment. (If there is no problem in practic application, use the camera under the current condition.) · Add a filter to the lens or illumination to decrease the col temperature.
AUTO WHITE : NG C.TEMP LOW TRY AGAIN	· The color temperature is too low, making it impossible to reach t optimum value. (If there is no problem in practical application, u the camera under the current condition.) · Add a filter to the lens or illumination to increase the col temperature.
AUTO WHITE : NG C. TEMP HIGH CHANGE TO MEM 5600K TRY AGAIN	· Color temperature too high for optimum adjustment. · Set WHITE BAL to MEM 5600 K mode.
AUTO WHITE : NG C. TEMP LOW CHANGE TO MEM 3200K TRY AGAIN	· Color temperature too low for optimum adjustment. · Set WHITE BAL to MEM 3200 K mode.

Realtime Auto White

The camera detects a white part in the image by itself, and its internal microcomputer automatically adjusts white balance in realtime. Use this function in case that the color temperature varies with time (e.g., from morning to day to night).

1. In the MENU mode, set up WHITE BAL:AUTO.

(Note) If the color temperature of the scene being taken is changed abruptly (when the camera is oriented from indoor side to outdoor side), the image may become bluish or reddish momentarily. This phenomenon is not a symptom of trouble, however. Immediately after it, the optimum white balance condition is set.

Where the camera is mounted fixedly and the orientation and image-taking range of the camera remain unchanged. it is advisable to use the white gate function in combination for attaining higher accuracy in white balance.

1. In the MENU mode, set up WHITE GATE:ON.

2. Using the WHITE GATE menu in the MENU mode, bring the display window to a monochrome part (white or gray part) in the image.

For details of the WHITE GATE function, refer to p. 18. Be sure to set the WHITE GATE window to a white or gray part in the image. Do not set it to a colored part.

Auto Shading Correction

Color shading may occur in the vertical direction on screen due to any characteristic of lens. This camera is equipped with a function for correcting color shading automatically.

1. Provide a proper aperture value of lens using the auto iris function or manually.

2. Take an white image fully on screen. At this step, take care so that uneven brightness will not occur in the vertical direction.

3. In the DIRECT mode, press the AWB button. White balance is adjusted automatically.

4. In the MENU mode, carry out AUTO SHADING. Thus, color shading in the image is corrected automatically.

Note: Be sure to adjust auto shading when using the camera for the first time or after exchanging the lens.

A L C

In combination of GAIN:AGC, SHUTTER:AES, the following ALC (auto level control) can be performed.

AES range
(equivalent to aperture)

AGC range

+6dB~
+20dB

0d
B

OPEN
LIMIT

28
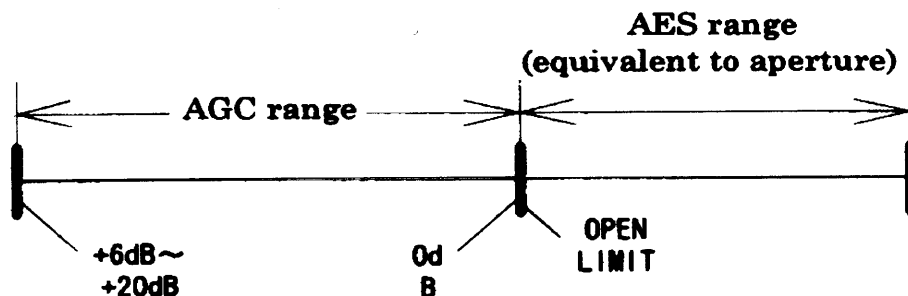
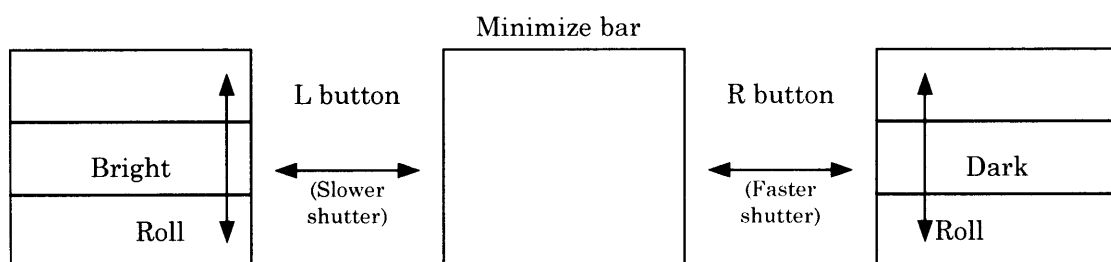# Lock scan mode shutter speed setting

① Press the Setup button and open the main menu, then open Sub menu 1. Set the cursor
   SHUTTER by pressing D, select the VARIABLE position with the L-R buttons, again press D to sh
   to the variable items.

② Press the L and R buttons to set the shutter speed in the range indicated below. Set the desired shutt
   speed.

$$\bullet\lhd \longleftrightarrow \rhd\bullet$$

1/60.38	~	1/251.5
(1/50.31:PAL)		(1/253.8:PAL)
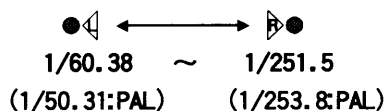
When picking up e.g., a computer screen having a different scanning frequency, bright or dark horizontal ba
roll vertically across the screen (see figure). The shutter speed can be adjusted to minimize this effect
most cases.

Minimize bar

Bright	L button		R button	Dark
Roll	(Slower shutter)		(Faster shutter)	Roll

Notes

1. Each pressing of the L or R button changes the shutter speed by 1 H. Hold the button depressed f
   continuous change.

2. If the display scanning frequency is below 60 Hz, the rolling horizontal bar cannot be stopped.

3. Raising the shutter speed improves resolution of moving objects, but loses sensitivity to the exte
   auxiliary lighting may be needed for outdoor scenes. Also, vertical smear increases with higher shutt
   speeds due to the physical properties of CCD cameras.
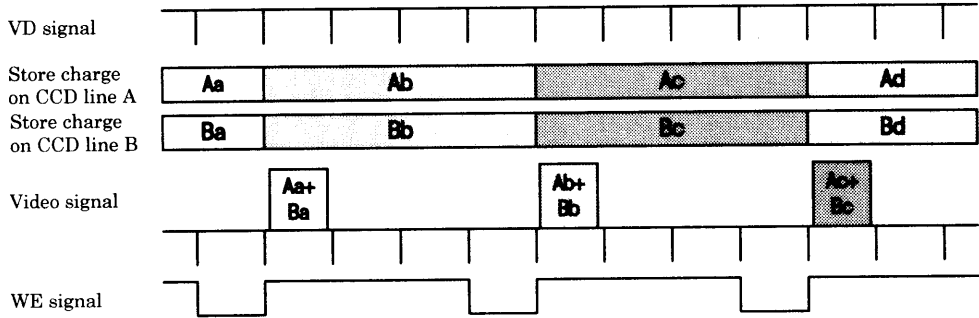
Long-Time Store Mode

In case that illumination on the subject is insufficient, just increasing the gain of the camera may cause an increase in noise, resulting in an unclear image. In such a situation, it is advisable to select the long-time store mode using the external memory. Thereby, the image can be brighter and clearer according to the stored amount of image. This camera is provided with two kinds of image store functions (CCD MODE:FLD/FRM in SUB MENU 1). When one of these image store functions is used, video signal output is delivered from the camera with the timing shown below.

Since the degree of after-image increases for a moving subject because of image storing, it is recommended to use the image store function when taking a still picture or scene.

Field store mode

Even field ── CCD line A
odd field ┈┈┈ CCD line B
Even field ── CCD line A
　　　　　　　CCD line B
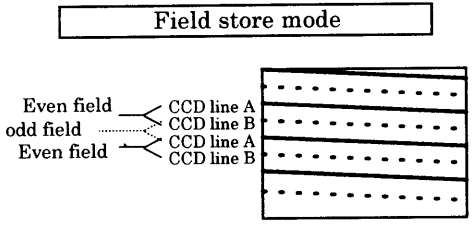
In the field store mode, both the CCD lines A and B are read out simultaneously. After completion of storing, video signal output is made on the next field. Immediately before the field on which video signal output is made, the WE signal is delivered from the MULTI connector equipped on the rear panel.
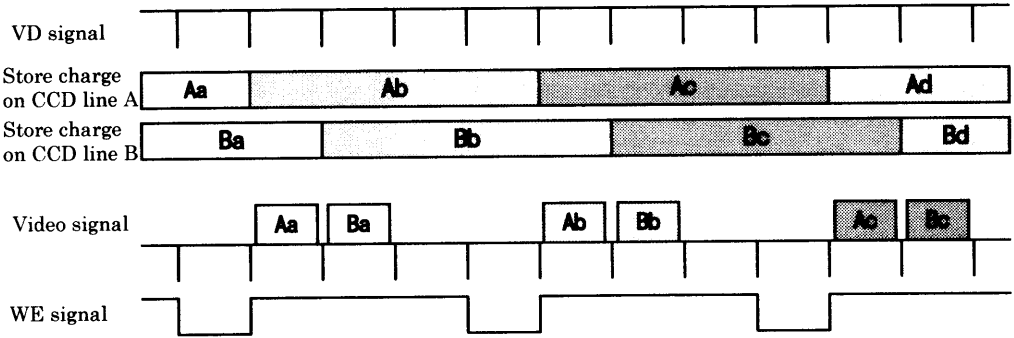
Store time: 1/15 s (Example)

VD signal

Store charge on CCD line A: Aa　Ab　Ac　Ad

Store charge on CCD line B: Ba　Bb　Bc　Bd

Video signal: Aa+Ba　Ab+Bb　Ac+Bc

WE signal

Frame store mode

Even field ── CCD line A
Odd field ┈┈┈ CCD line B
Even field ─╱ CCD line A
Odd field ┈╱ CCD line B
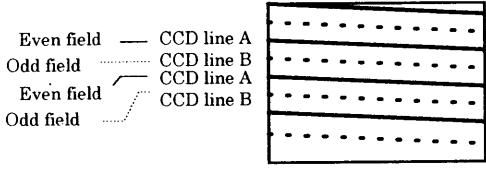
In the frame store mode, each of the CCD lines A and B is read out individually. Therefore, the vertical resolution is superior. After completion storing, video signal output is made between two fields. Immediately before the field on which video signal output is made, the WE signal is delivered from the MULTI connector equipped on the rear panel.

Store time: 1/15 s (Example)

VD signal

Store charge on CCD line A: Aa　Ab　Ac　Ad

Store charge on CCD line B: Ba　Bb　Bc　Bd

Video signal: Aa　Ba　Ab　Bb　Ac　Bc

WE signal

RC-C10 Remote Control Box

The RC-C10 enables operation of all camera menu items by remote control.   Before connecting the remote control box, check the camera settings as follows.

(1) SW701 : Camera internal switch SW701 should be set to RC-C10 (factory setting).

See Page 34 for internal switch setting details.

(2) Baud rate : Open the Special set menu and set the baud rate to 62500 bps (factory setting).
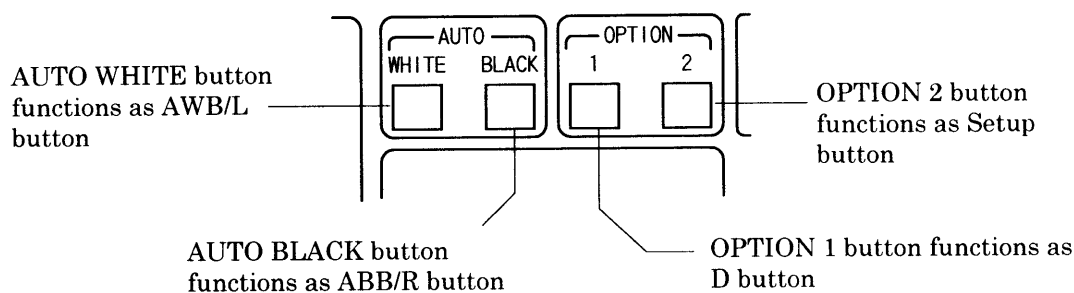
Operation

(1) Direct control

The following items can be controlled directly from the RC-C10 buttons.   Refer to the RC-C10 operating instructions.

· BAR/CAM	· R GAIN
· WHITE BAL	· B GAIN
· GAIN	· R BLK
· DTL	· B BLK
· IRIS MODE	· H PHASE
· IRIS	· SC COARSE
· M.BLK	· SC FINE

*Use Auto fixed for the HV-D27 and HV-D37.

(2) Menu control

Items not mentioned in the above list are controlled by menu settings.   The control box Option 1, Option 2 Auto White and Auto Black buttons are assigned to menu operating buttons.   When AUTO WHITE and AUTO BLK are not indicated in the menu, the functions are conducted directly from the control box button.

AUTO WHITE button functions as AWB/L button

AUTO BLACK button functions as ABB/R button

OPTION 2 button functions as Setup button

OPTION 1 button functions as D button

Refer to menu operation.

Note: Hold OPTION 1 depressed and press OPTION 2 for 2 seconds to produce the Special Set menu, t SPECIAL SET menu appears on the screen.

The accessory labels can be affixed to the controller buttons if required.

AWB SCENE /L /R

D SETUP

(3) Setting data storage

Data (menu and direct control items) set by remote control from the RC-C10 are not automatically save When setting data need to be stored, press the SET button (of the RC-C10).

Note: Use care since settings are lost if the application file is changed or power switched off witho
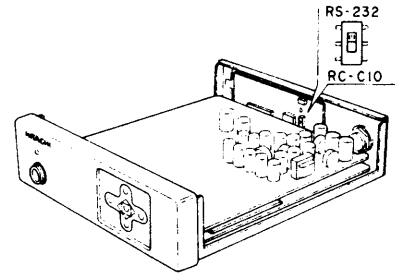
Function Selection by Internal Switch Setting

SW701

For connection with the remote control box RC-C10, set SW701 to the RC-C10 position.

For connection with the personal computer, set SW405 to the RS-232C position.

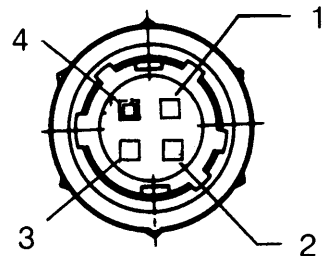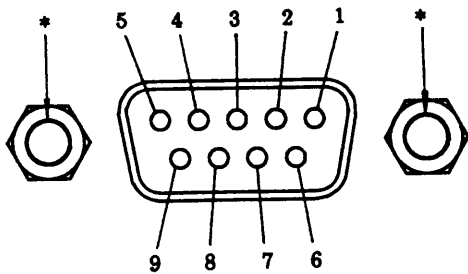At shipment from factory, SW405 is set at the RC-C10 position.

Connectors

MULTI connector (SDEB-9S)

Pin No.	Signal designation
1	GND
2	WE
3	R/R-Y/C output
4	G/Y output
5	B/B-Y output
6	VBS output
7	SYNC output
8	HD output
9	VD output

REMOTE connector (HR10A-7R-4S)

Pin No.	Signal designation
1	+12V output
2	RXD/SD input
3	TXD/SD output
4	GND

* Use M2.6 plug retaining screws.

TRIG connector (HR10A-10R-12PB)

Pin No.	Signal designation
1	GND
2	
3	
4	
5	GND
6	HD input
7	VD/TRIG input
8	
9	
10	GND
11	
12	GND
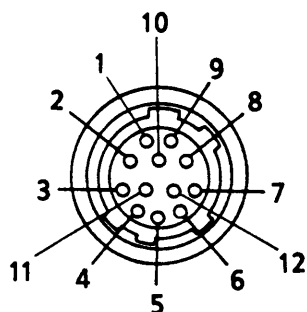
Y/C connector (TCS-7547-01-401)

Pin No.	Signal designation
1	Y GND
2	C GND
3	Y output
4	C output
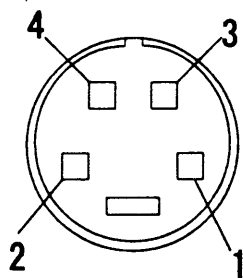
12V-IN connector (RM12BRD-3PH)

Pin No.	Signal designation
1	+12V input
2	GND
3	NC
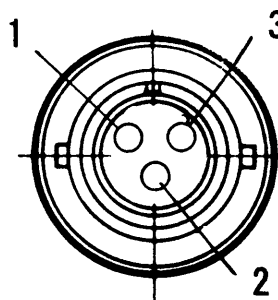
(16) Color bar   SMPTE   PAL   FULL

(17) Power supply voltage   12V rated

Stable operation is ensured with DC power supply 10.5 to 17 V

No ripple and noise shall occur

(18) Power consumption   Approx.10.5W

(19) Dimensions   Camera head   : 38.5 (W)×46 (H)×42 (D)mm

Caamera control unit   : 150 (W)×45 (H)×170 (D)mm

(20) Mass   Camera head   : Approx.90 g   (excluding lens)

Camera control unit : Approx.930 g (excluding camera cable)

(21) Ambient temperature(operating)   0   to   45℃

(22)Ambient temperature (storage)   -20 to   60℃

(Camera cable = 3 m)

Input/Output Signals

1. Input signal

   (1)   Genlock input

             ·VBS 1.0 Vp-p $\pm$ 3 dB or black burst, 75 Ω or high impedance (BNC)

                  (Sync 0.3 $\pm$ 0.1 Vp-p, burst 0.3 $\pm$ 0.1 Vp-p)

             ·HD/VD TTL level (TRIG connector)

   (2)   Serial data (4 pin connector)

             ·1.5 Vp-p $\pm$ 3 dB, high impedance (in connection with RC-C10)

             ·RS-232C level (in connection with personal computer)

     (Note)   Set internal switch according to connected equipment.

   (3)   Trigger input TTL level(L:0 to 0.4 VDC   H:3.4 to 5.0 VDC)

2. Output signal ratings

   (1) Composite video (BNC, D-sub connector)

             VBS 1.0 Vp-p, 75 Ω

   (2) Y/C (D-sub, Y/C connectors)

             Y : 1.0 Vp-p, 75 Ω

             C : 0.28 Vp-p (burst), 75 Ω (NTSC),

                   0.3 Vp-p (burst), 75 Ω (PAL)

   (3) Component (D-sub connector)

             Y : 1.0 Vp-p, 75 Ω

             R-Y: 0.7 Vp-p, 75 Ω

             B-Y: 0.7 Vp-p, 75 Ω

   (4) RGB (D-sub connector)

             R : 0.7 Vp-p, 75 Ω

             G : 0.7 Vp-p, 75 Ω

             B : 0.7 Vp-p, 75 Ω

     (Note)   Menu settings select the D-sub connector output for Y/C, component or RGB.

   (5) Sync (D-sub connector)

             HD : 2 Vp-p, 75 Ω

             VD : 2 Vp-p, 75 Ω

             SYNC: 2 Vp-p, 75 Ω

   (6) Serial data (4 pin connector)

             ·1.5 Vp-p/ Low (in connection with RC-C10)

             ·RS-232C level (in connection personal computer)

     (Note)   Set internal switch according to connected equipment.

Major accessories

AC adaptor, AP-60A

Camera control box, RC-C10

Junction Unit, JU-Z2

Camerd cable C-301KAJ (3m)

   C-102KAJ (10m)

                C-202KAJ (20m)

Cable length setting (for serviceman information)

When it is needed to change the cable length,contact your local Hitachi Denshi sales representative.

Note the following points when replacing the camera cable.

(1)   Set CCU internal switches SW201 and SW202 according to the cable length.   Remove the CCU cover and set the switches as indicated.
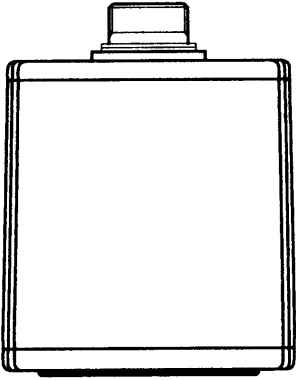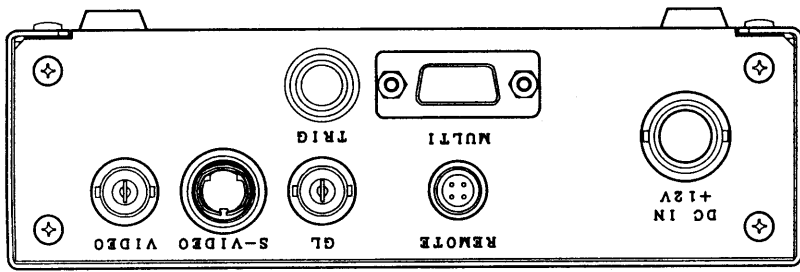
REARSIDE

SW201

SW202

Cable length = 3 m   Cable length = 1 0 m   Cable length = 2 0 m
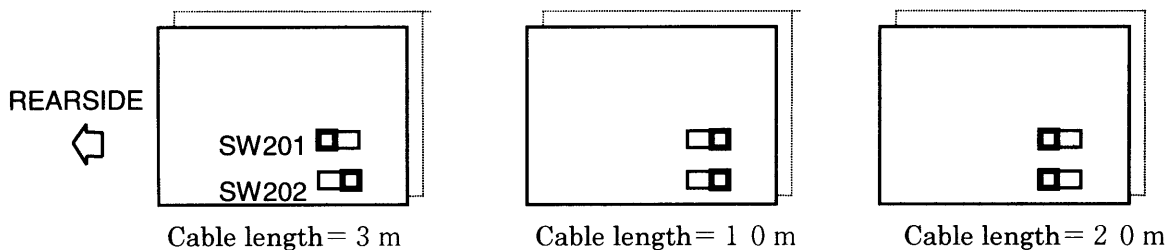
CAUTION:

1)Be sure to switch off the power supply connected to the camera before removing the cover for settir the switches. Also switch off the power supply before reinstalling the cover.

2)   Use care not to disturb other controls and switches.

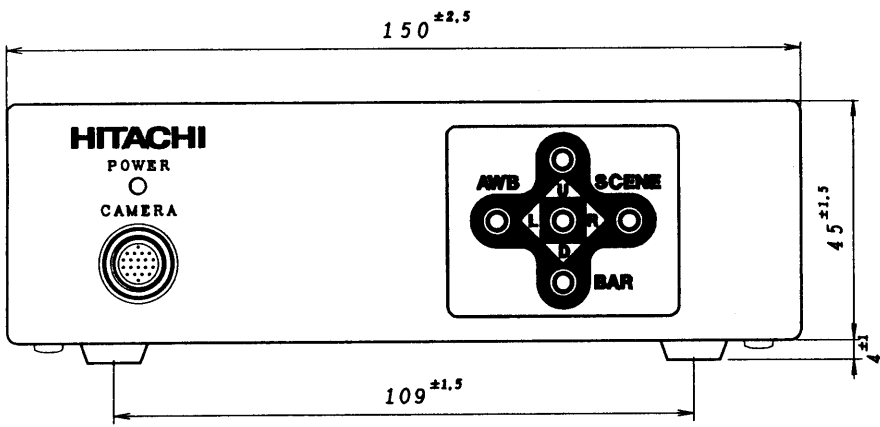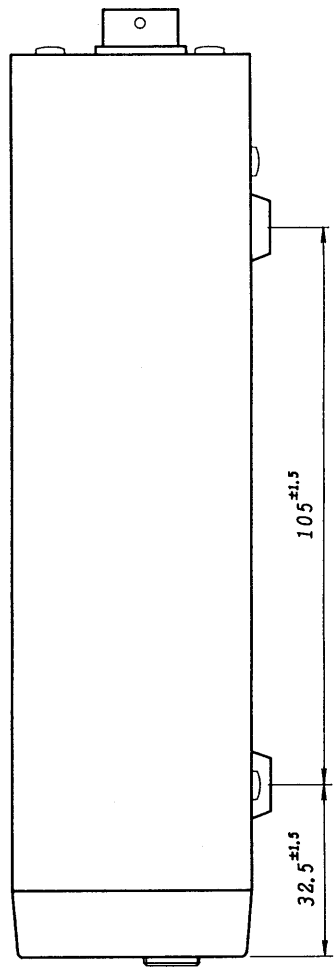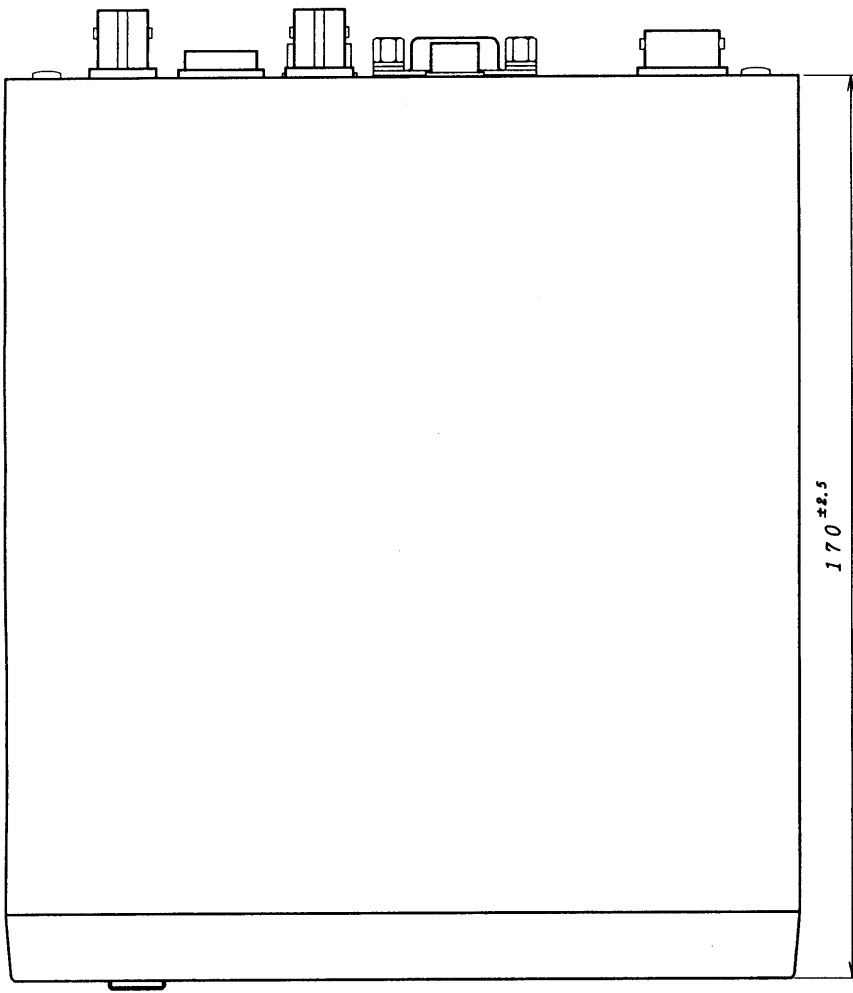(2)   Adjust auto black balance and dark shading as described on page 26.

HV-D37 HEAD

· MASS : APPROX. 90 g
· COLOR : GRAY
· UNIT : mm

2−M3 (DEPTH : 3)

U1 (DEPTH : 4.3)

(8)

41.5 ±1

15 ±0.5

23 ±0.5

46 ±1

29.5 ±0.5

38.5 ±1

3CCD DIGITAL

VIDEO   S-VIDEO   GL   TRIG

REMOTE   MULTI   DC IN +12V

$170^{\pm2.5}$

$105^{\pm1.5}$

$32.5^{\pm1.5}$

$150^{\pm2.5}$

HITACHI

POWER

CAMERA

AWB   SCENE

BAR

$45^{\pm1.5}$

$109^{\pm1.5}$
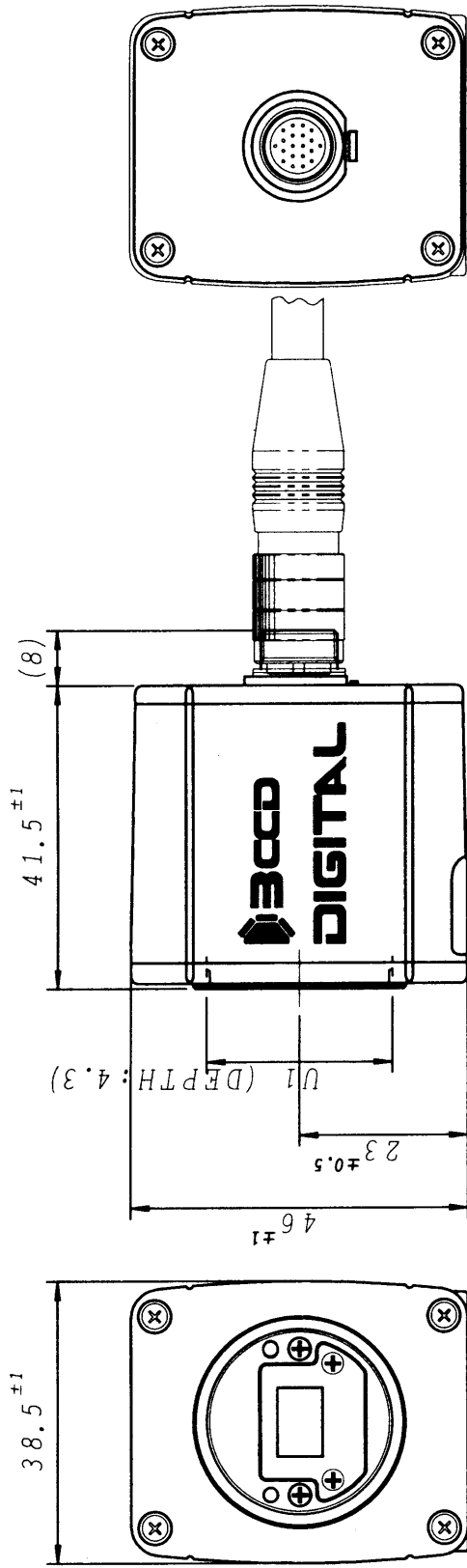
HITACHI DENSHI, LTD.

1, kanda izumi-cho chiyoda-ku, tokyo 101-0024, japan
phone : (03) 5821-5311, fax : (03) 5821-5394

HITACHI DENSHI AMERICA, LTD.*
Headquarters and New York Office

150 crossways park drive, woodbury, new york 11797, u. s. a.
phone : (516) 921-0993, fax : 516-496-3718, telex : 510-221-1899
Chicago Office

250 east devon ave., suite 115 itasca, illinois 60143, u. s. a.
phone : (630) 250-8050 fax : 630-250-8054
Los Angeles Office

371 van ness way, suite 120 torrance, ca. 90501, u. s. a.
phone : (310) 328-6116, fax : 310-328-6252
Dallas Office

2100 west n. w. highway suite 1145 grapevine, texas 76051, u. s. a.
phone : (817) 488-4528, fax : (817) 488-4714
Atlanta Office

3039 amwiler road, suite 118 atlanta, georgia 30360, u. s. a.
phone : (770) 242-3636, fax : 770-263-8838

HITACHI DENSHI, LTD. (CANADA)*
Head Office

1 serect avenue unit#14 scarborough, ontario m1v 5j3, canada.
phone : (416) 299-5900, fax : (416) 299-0450, telex : 652-5324
Eastern Office

8100 h trans canadienne, st laurent, quebec, h4s 1m5, canada
phone : (514) 332-6687, fax : (514) 335-1664, telex : 582-4768
Ottawa Office

9 antares drive, nepean, ontario, k2e 7v5, canada
phone : (613) 727-3930, fax : (613) 727-3955

HITACHI DENSHI (EUROPA) GmbH*
Head Office

wesikircher strabe 88, d-63110 rodgau, germany
phone : (6106) 6992-0, fax : (6106) 1690-6, telex : 417-849

HITACHI DENSHI (U. K.) LTD.*
Head Office

14 garrick industrial centre, irving way, hendon, london, nw96 aq,
united kingdom
phone : (181) 202-4311, fax : 181-202-2451
Leeds Office

brookfield house, selby road, garforth, leeds ls25 1nb united kingdom
phone : 113-287-4400, fax : 113-287-4260

HITACHI DENSHI, LTD. BEIJING OFFICE

100004 beijing fortune building
5, dong san huan bei-lu, chan yang district, beijing, china
phone : 6590-8755/8756 fax : 6590-8757
Beijing Service Center

b19, bei san huan middle road beijing china
phone : 204-3901 fax : 204-3902

HITACHI DENSHI, LTD. SINGAPORE BRANCH

10 anson road #20-15 international plaza singapore 079903
phone : 65-223-0030, fax : 65-223-0206

* subsidiaries of hitachi denshi, ltd.