

Operating Instructions

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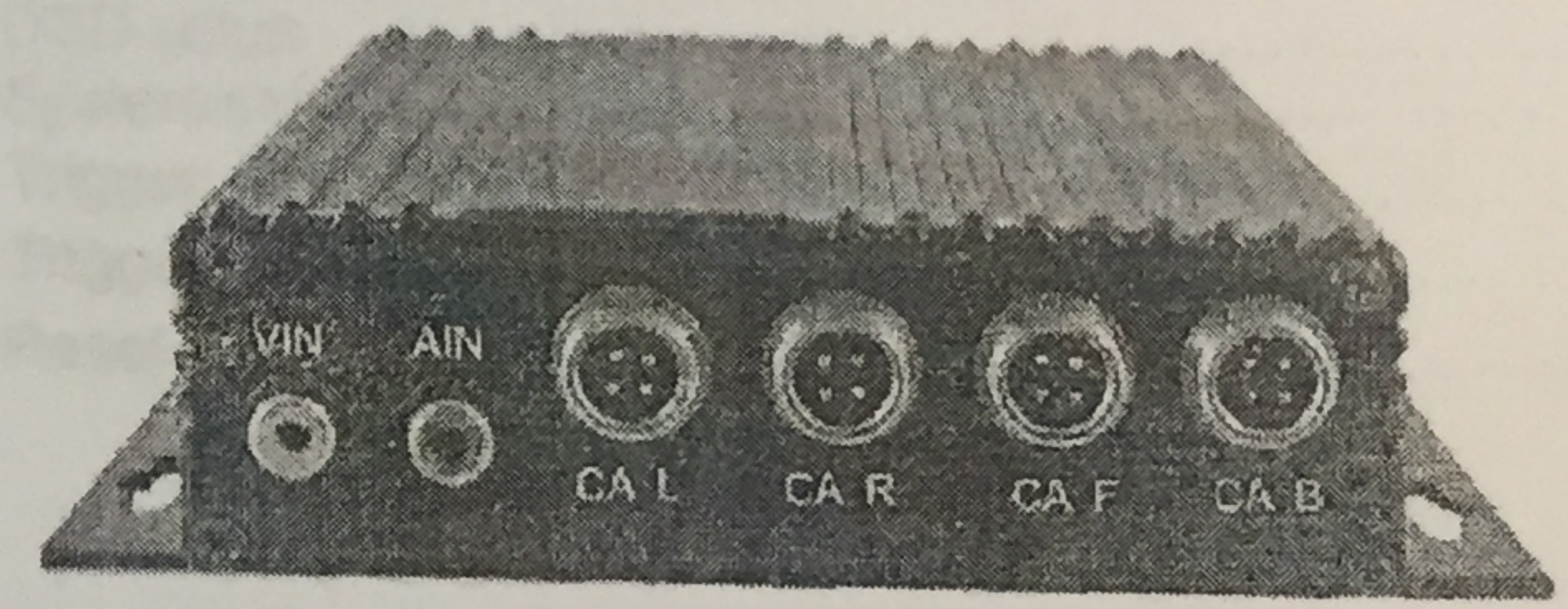


Image Processor-Multiplexer

Please read this manual thoroughly before operating the device, and keep it for future reference.

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1. Precautions

Storage and Keeping

1. Avoid high temperature and low temperature the storage temperature of this device is $-30\sim+80^{\circ}\text{C}$, and the operating temperature is $-20\sim+65^{\circ}\text{C}$. The humidity is RH90%.
2. Never make this device under affection of moisture, dust or oil smoke etc.
3. Avoid dropping or striking this device.
4. Avoid using this device in areas with excessive vibration or subject to severe impacts.
5. Never extrude or fractionize this device with sharp objects .
6. Do not place cables where they may be pinched or stepped on.

2. Produce Features

1. 1 AV input and 4 camera inputs; camera title can be set: (maximum 8 characters).
2. Single, dual, triple, quad image and PIP functions.
3. Boot-strap display can be set as single or split views.
4. Four trigger wires control auto switching between cameras.
5. With trigger wire for dual picture, the relative cameras can be combined optionally.
6. Priority of trigger wire can be set up.
7. Backup distance grid & left/right turning indicator arrow available.
8. Brightness, color, contrast and sharp of each camera can be separately set up.
9. Mirror/normal image for each camera can be separately selected.
10. Auto switch to blue screen when there is no video input.
11. Live video output: connected monitor can display synchronously.
12. REC video output, and picture can be single or split.
13. Auto scan available and image switching time from 1~30 seconds.
14. Operates from 12~32V.
15. Supports max. $4\times 300\text{mA}$ power output.

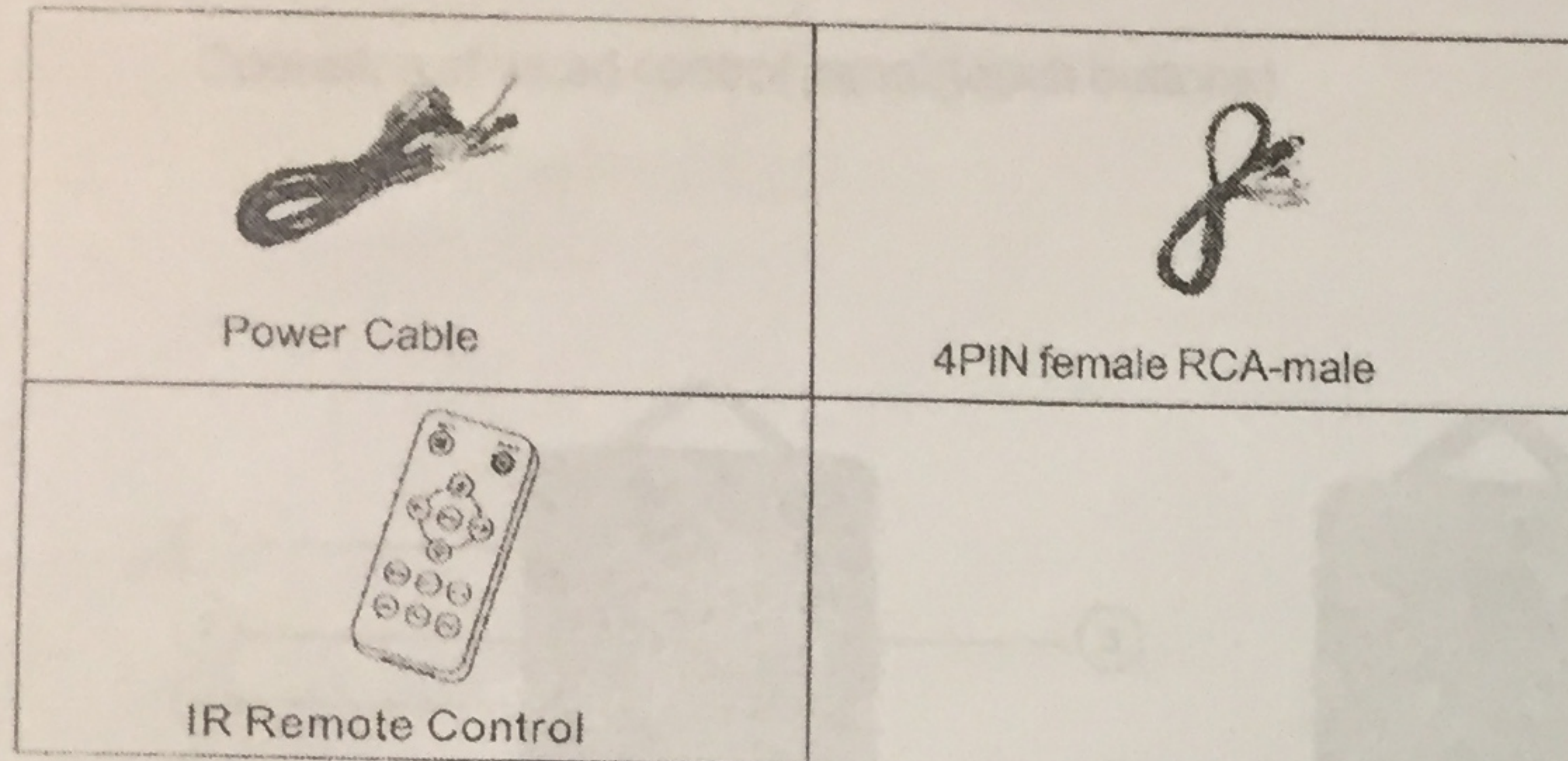
3. Technical Specifications

1. Operating Temperature: $-20^{\circ}\text{C}\sim+70^{\circ}\text{C}$
2. Storage Temperature: $-30^{\circ}\text{C}\sim+80^{\circ}\text{C}$
3. Power for cameras: max. $4\times 300\text{mA}$, 12V
4. Video inputs: 4 video inputs for cameras: peak value: 1Vp-p, impedance: 75 ohm.
1 AV input: peak value: 1Vp-p, impedance: 75 ohm.
5. Audio inputs: 4 audio inputs for cameras: peak value: 1Vp-p, impedance: 4.7K ohm.
1 AV input: peak value: 1Vp-p, impedance: 4.7K ohm.
6. Video outputs: 1 REC video output: peak value: 1Vp-p, impedance: 75 ohm.
1 LIVE video output: peak value: 1Vp-p, impedance: 75 ohm.
7. Audio output: 1 REC audio output: peak value: 1Vp-p, impedance: 4.7K ohm.

Special Notice

All specifications are subject to change without notice.

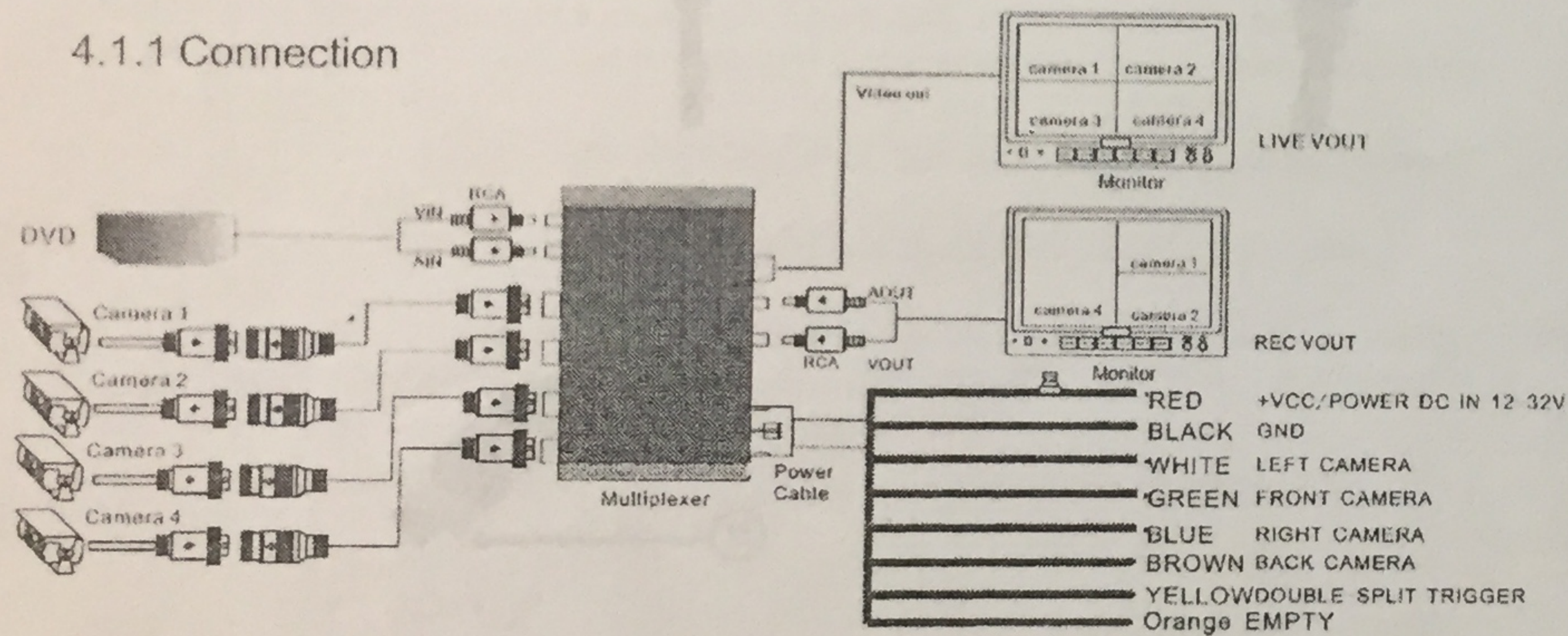
4. Accessories



Special Notice
Accessories may be different for different applications.

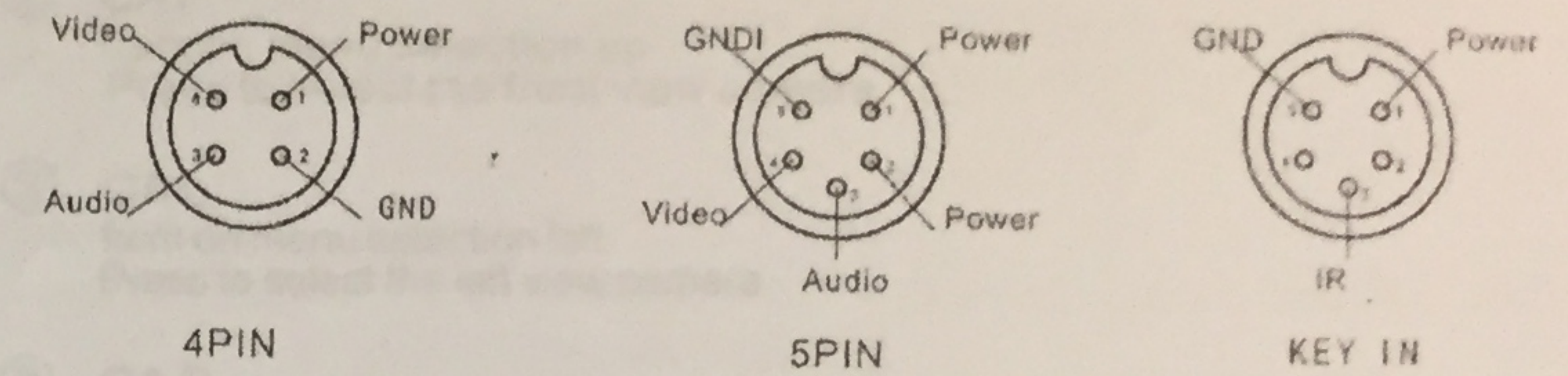
4.1 System connection

4.1.1 Connection

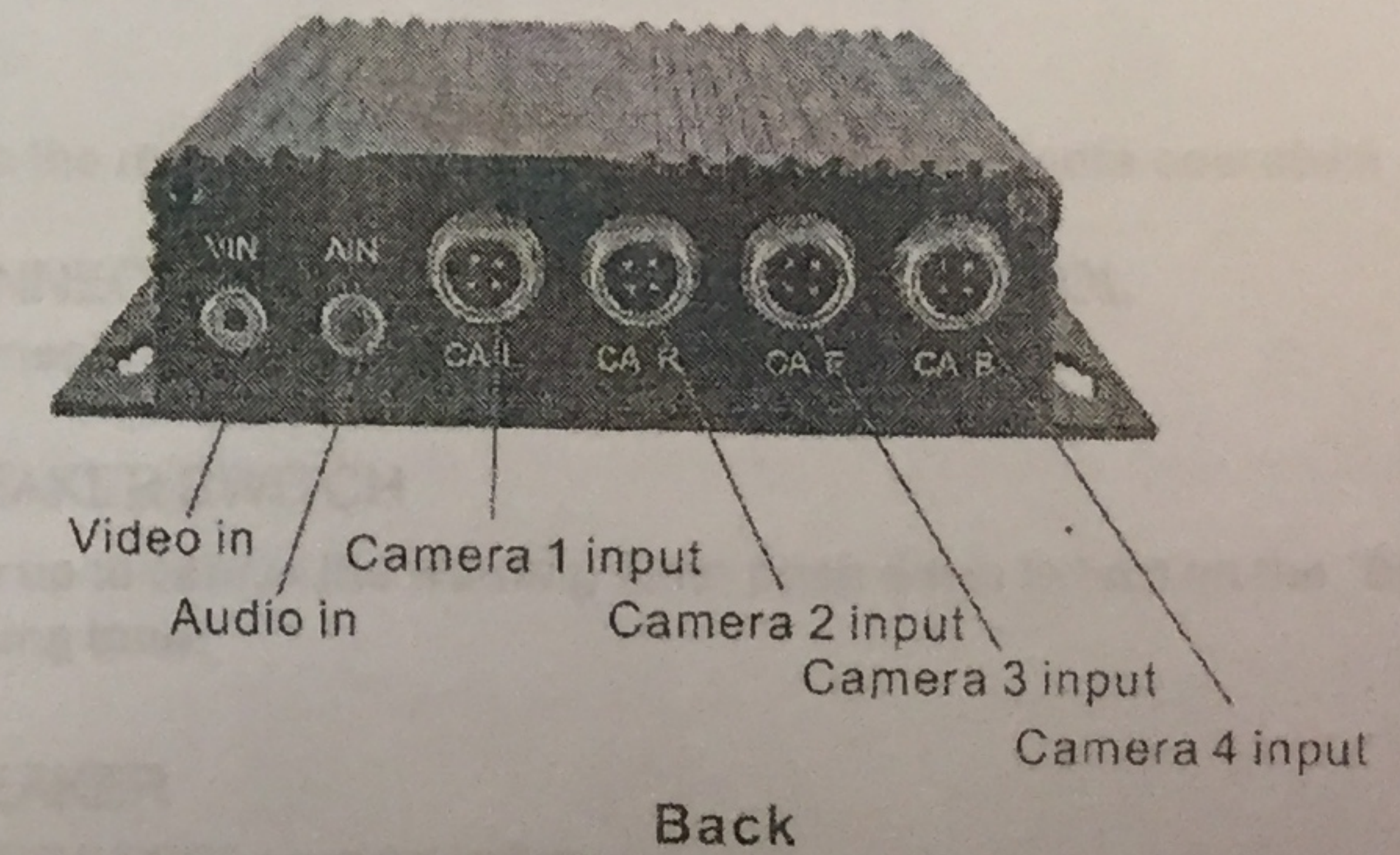
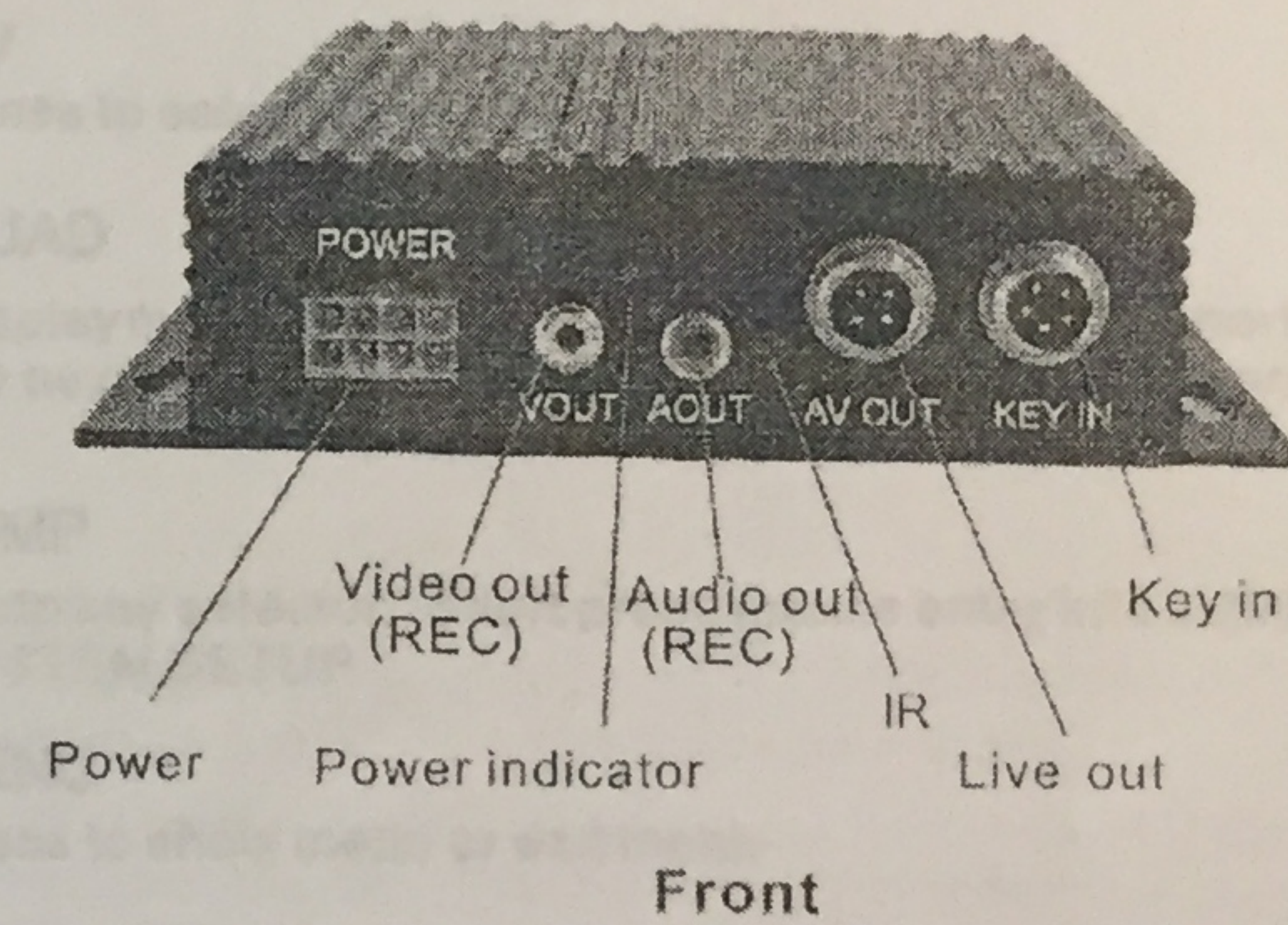


1. VCC (red wire)
Connecting to the anode of power
2. GND (black wire)
Connecting to the cathode of power
3. CAMERA L TRIGGER (white wire)
Left-turn trigger wire, connecting to the positive wire of left-turn light
4. CAMERA F TRIGGER (green wire)
Front trigger wire, connecting to the positive wire of brake
5. CAMERA R TRIGGER (blue wire)
Right-turn trigger wire, connecting to the positive wire of right-turn light
6. CAMERA B TRIGGER (brown wire)
Back-up trigger wire, connecting to the positive wire of back-up light
7. SPLIT (yellow wire)
Trigger wire for dual picture, connecting to the positive wire of gate control
8. EMPTY (orange wire)

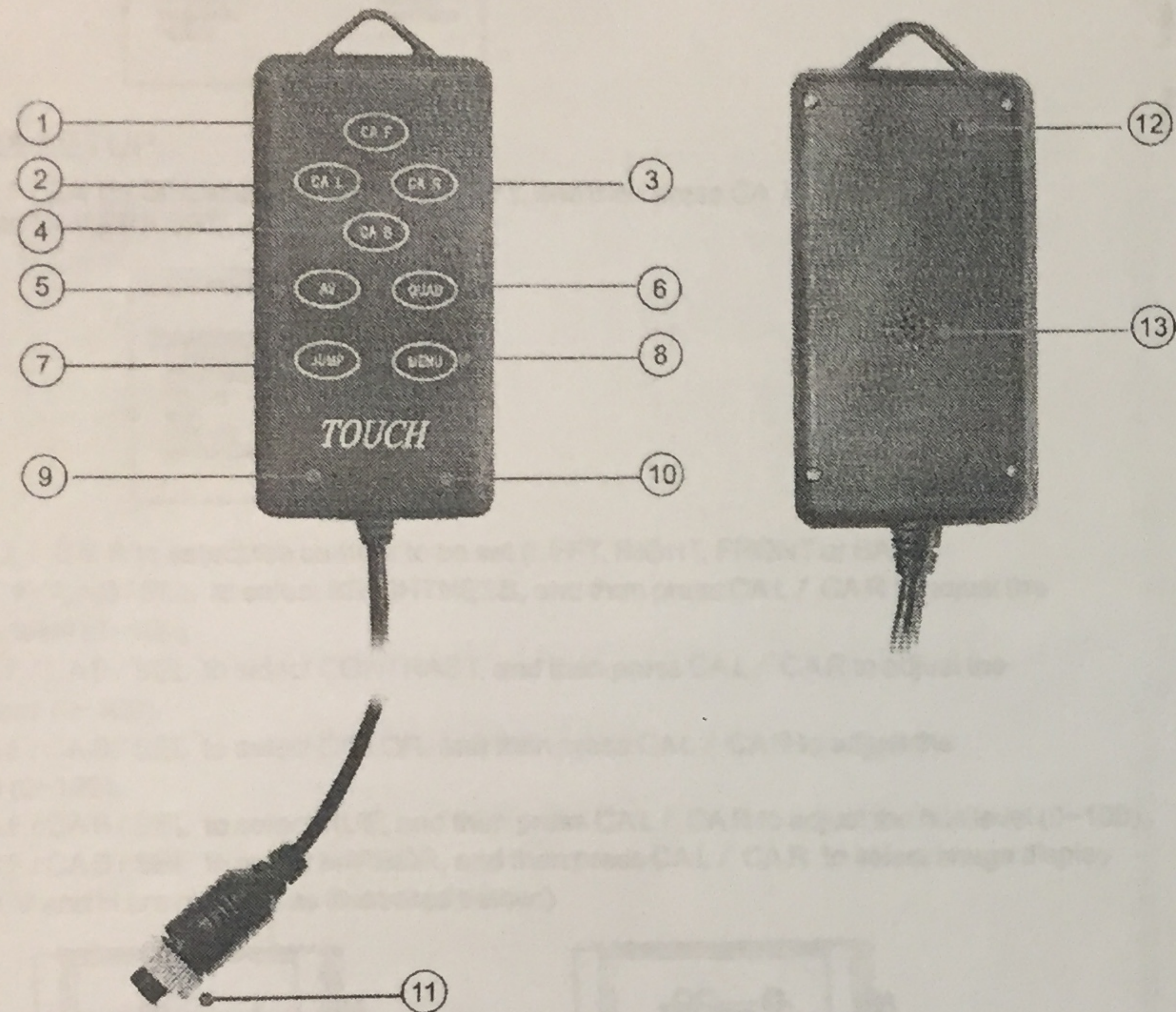
4.2 Camera pin-out definition



5. Parts Identification



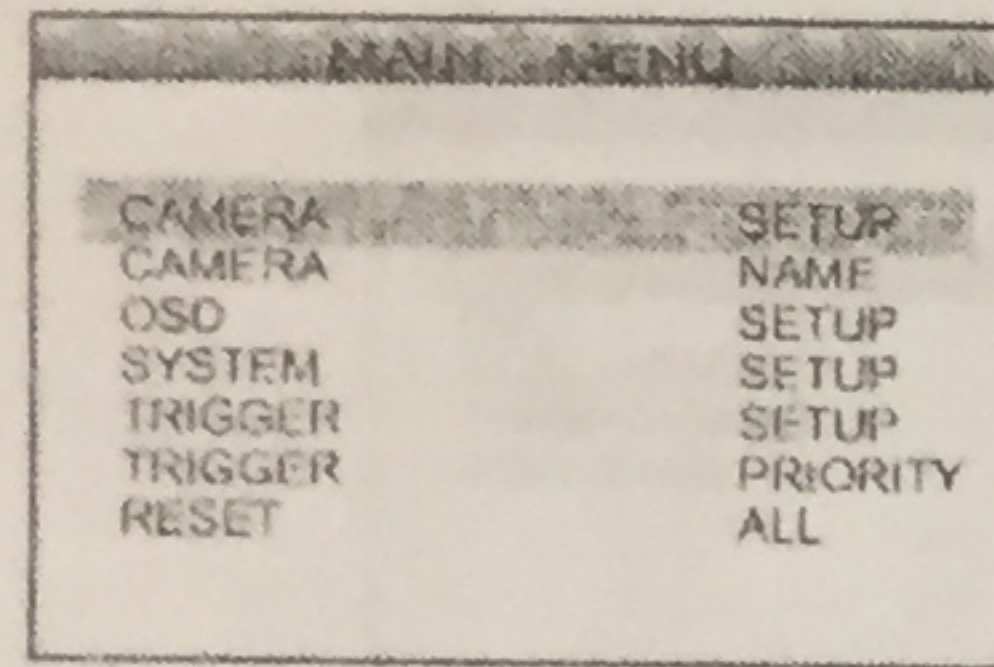
Operation of wired control panel(touch buttons)



- ① **CAF**
Item on menu selection up
Press to select the front view camera
- ② **CAL**
Item on menu selection left
Press to select the left view camera
- ③ **CAR**
Item on menu selection right
Press to select the right view camera
- ④ **CAB**
Item on menu selection down
Press to select the back view camera
- ⑤ **AV**
Press to select or exit AV
- ⑥ **QUAD**
Displaymode (dual, triple, quad, PIP) selection. Short press to compile the next character when changing the name of camera
- ⑦ **JUMP**
Jump key selector. Short press makes entry into JUMP KEY setup in SYSTEM SETUP
- ⑧ **MENU**
Press to show menu or exit menu
- ⑨ **AUTO LIGHT CONTROL**
Backlighting indicator lights up when it is getting dark.
- ⑩ **IR**
Align the remote control with this position for remote operation
- ⑪ **CONNECTOR OF TOUCH-BUTTON CONTROL**
Connects to the 5PIN port "KEY IN" on the device
- ⑫ **SPEAKER SWITCH**
Push up to cancel the warning tone; push down to turn on the "BEEP BEEP" warning tone.
- ⑬ **SPEAKER**
" BEEP BEEP" sound window

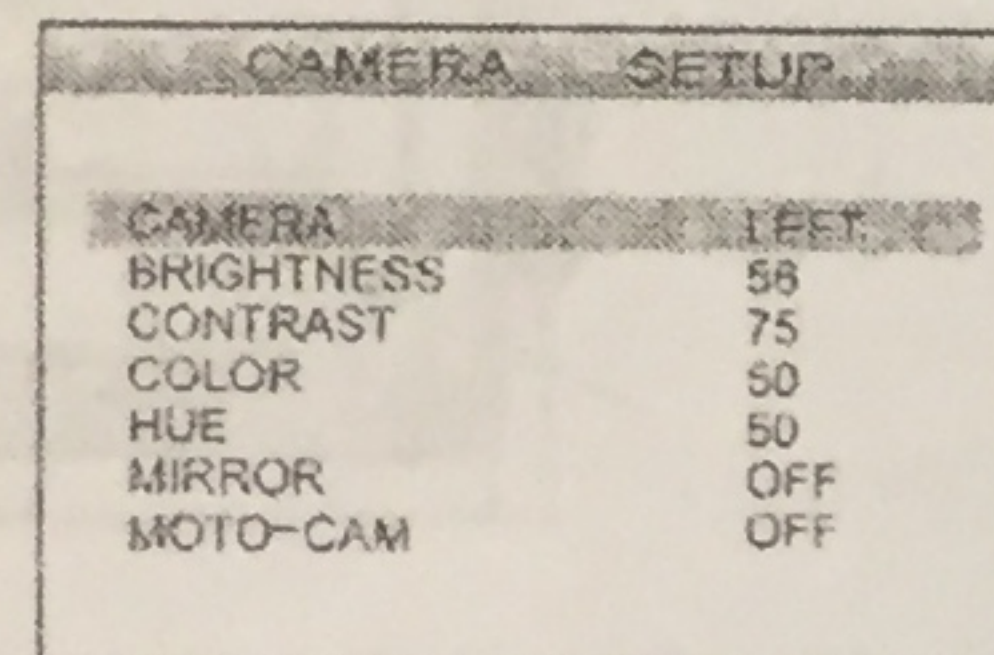
7. Menu

Press MENU to display the master menu:

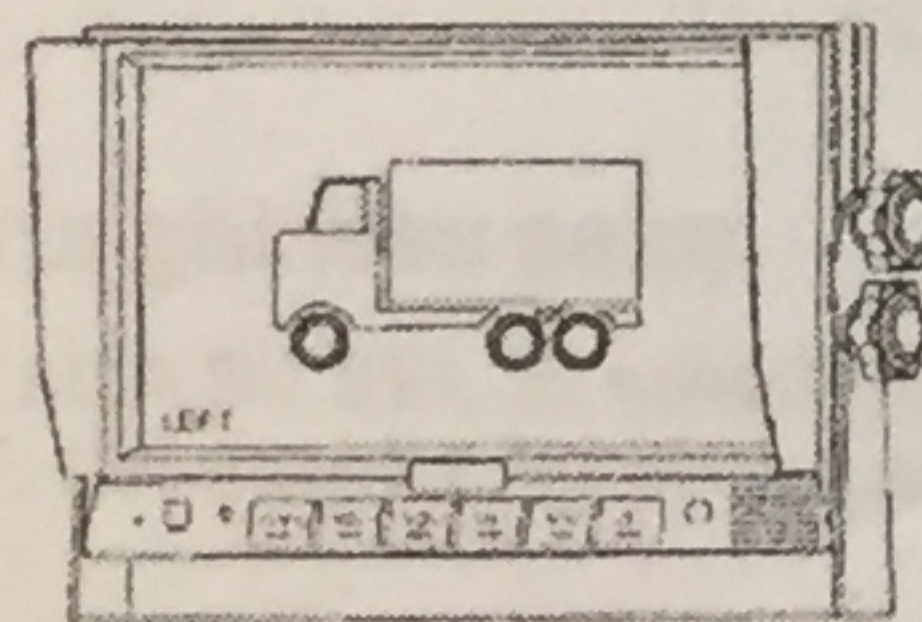


7.1 CAMERA SETUP

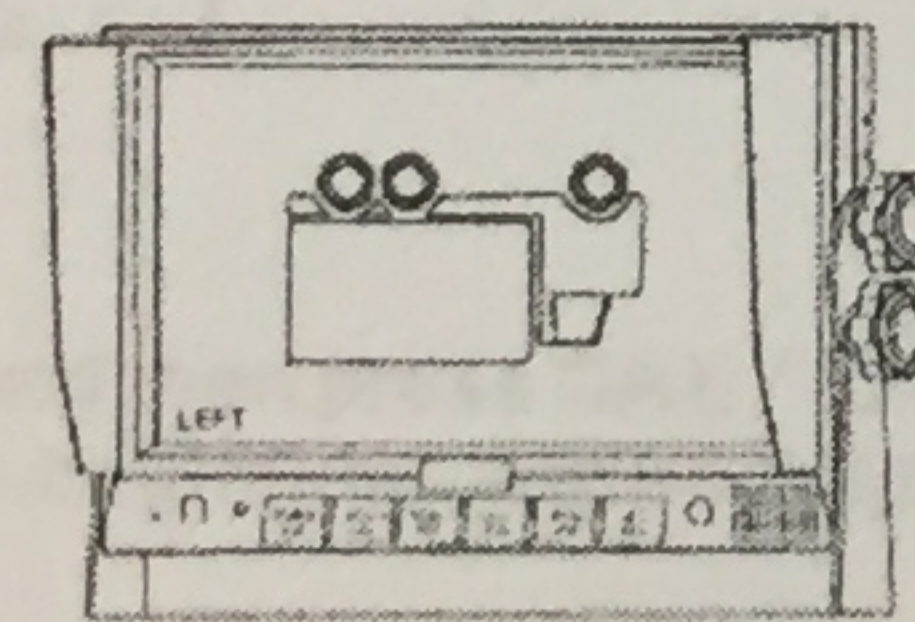
- ① Press CA F / CA B / SEL to select CAMERA LEFT, and then press CA L / CA R to enter into CAMERA SETUP:



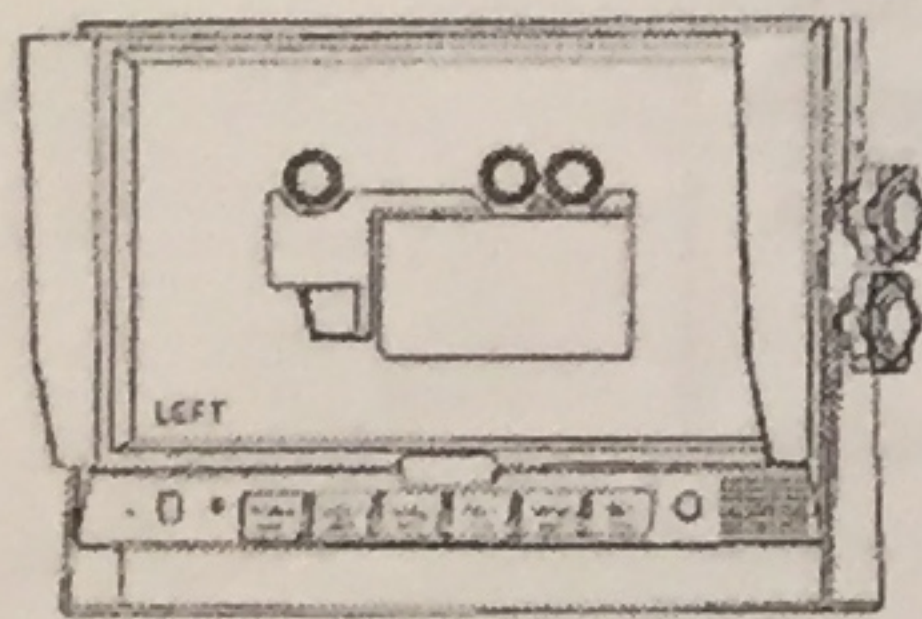
- ② Press CA L / CA R to select the camera to be set (LEFT, RIGHT, FRONT or BACK)
 ③ Press CA F / CAB / SEL to select BRIGHTNESS, and then press CAL / CAR to adjust the brightness level (0~100).
 ④ Press CA F / CAB / SEL to select CONTRAST, and then press CAL / CAR to adjust the contrast level (0~100).
 ⑤ Press CA F / CAB / SEL to select COLOR, and then press CAL / CAR to adjust the color level (0~100).
 ⑥ Press CA F / CAB / SEL to select HUE, and then press CAL / CAR to adjust the hue level (0~100).
 ⑦ Press CA F / CAB / SEL to select MIRROR, and then press CAL / CAR to select image display (OFF, H-V, V and H are optional as illustrated below:)



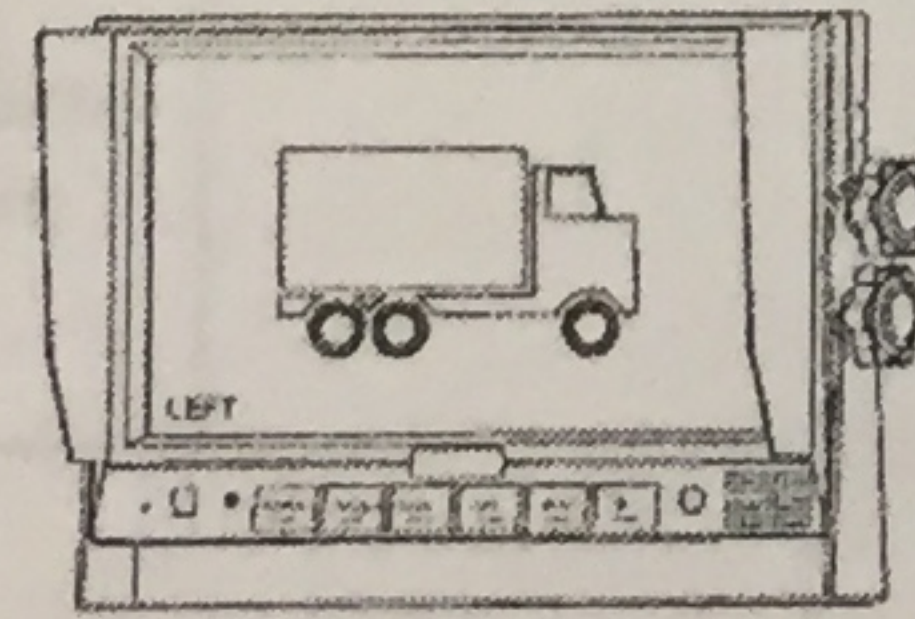
OFF



H-V



V

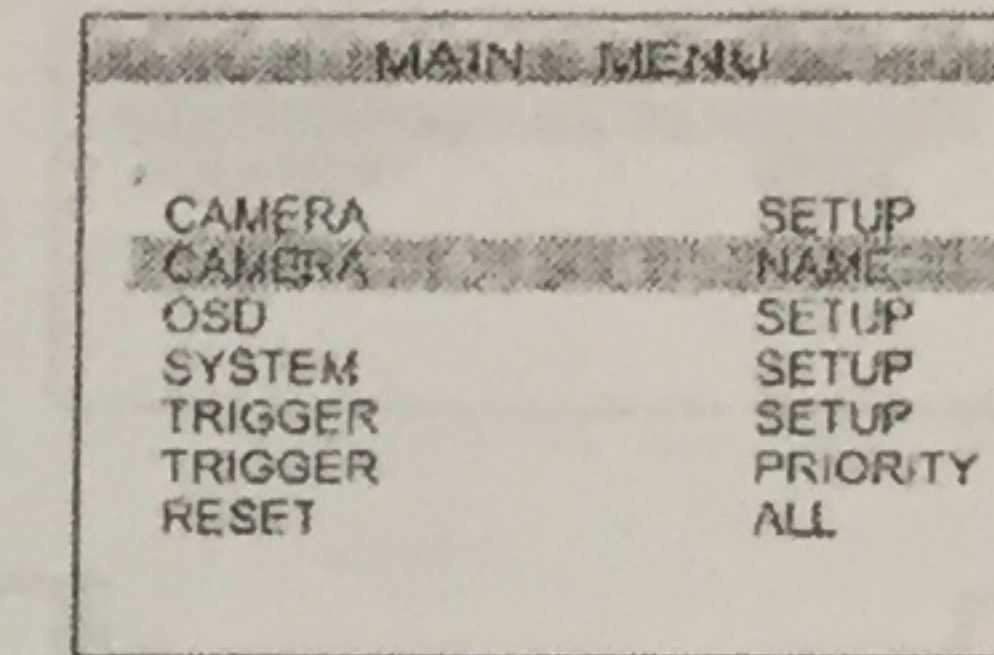


H

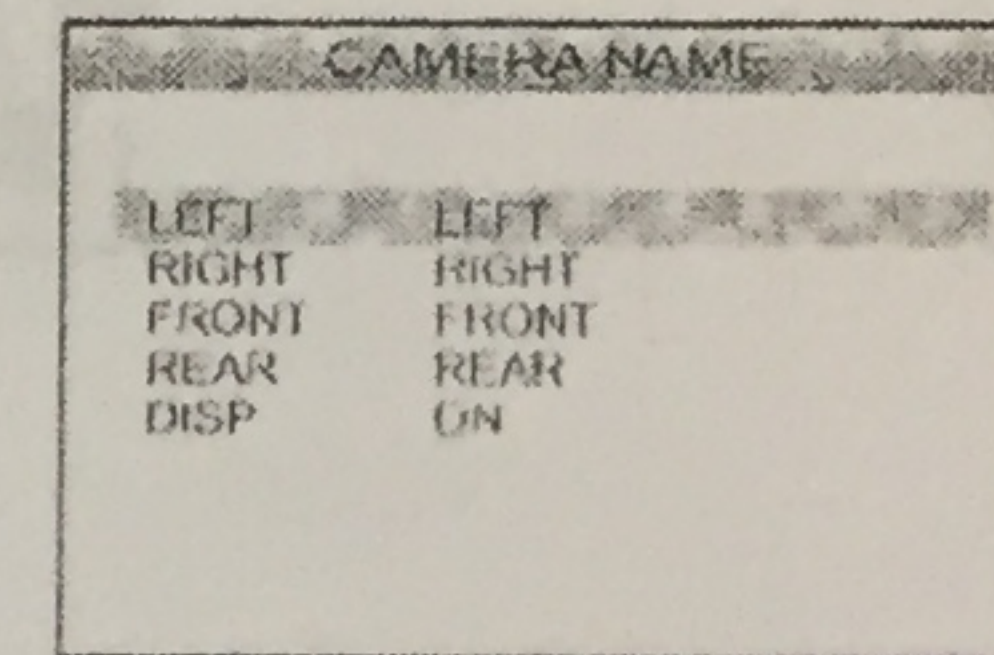
- ⑧ Press CA F / CAB / SEL to select MOTO-CAM, and then press CAL / CAR to select ON or OFF. When it is ON, the motorized lens cover is open all the time; otherwise, the lens cover only opens when reversing trigger wire is activated.

7.2 CAMERA NAMING

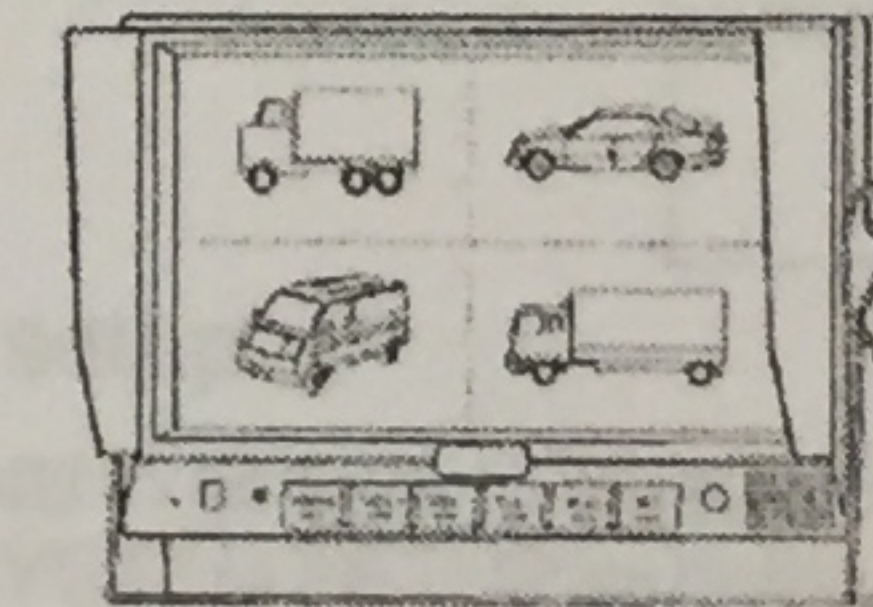
Press MENU to go back to master menu, and then press CA F / CAB / SEL to select CAMERA NAME.



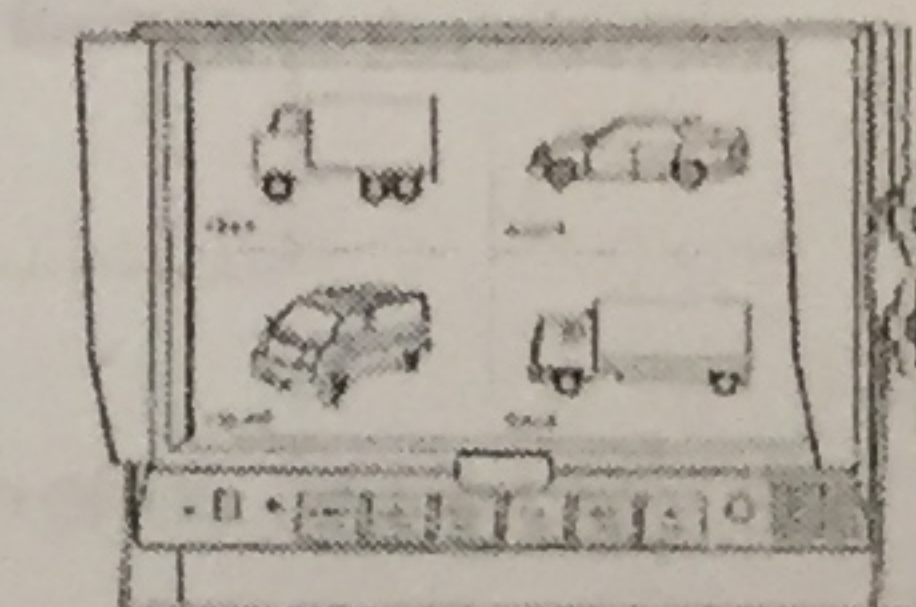
- ① press CAL / CAR to enter CAMERA NAME:



- ② Press CA F / CAB / SEL to select LEFT, RIGHT, FRONT or BACK (default name of each camera is also "LEFT", "RIGHT", "FRONT" and "BACK"). If you want to rename cameras, the letters can be revised by pressing CAL / CAR. Pressing CH- is to select the next letter in one word. There are totally 62 characters available.
 ③ Press CA F / CAB / SEL to select DISP, and then press CAL / CAR to select ON or OFF (default is ON.) When it is ON, title of each camera is displayed; otherwise, it is not.



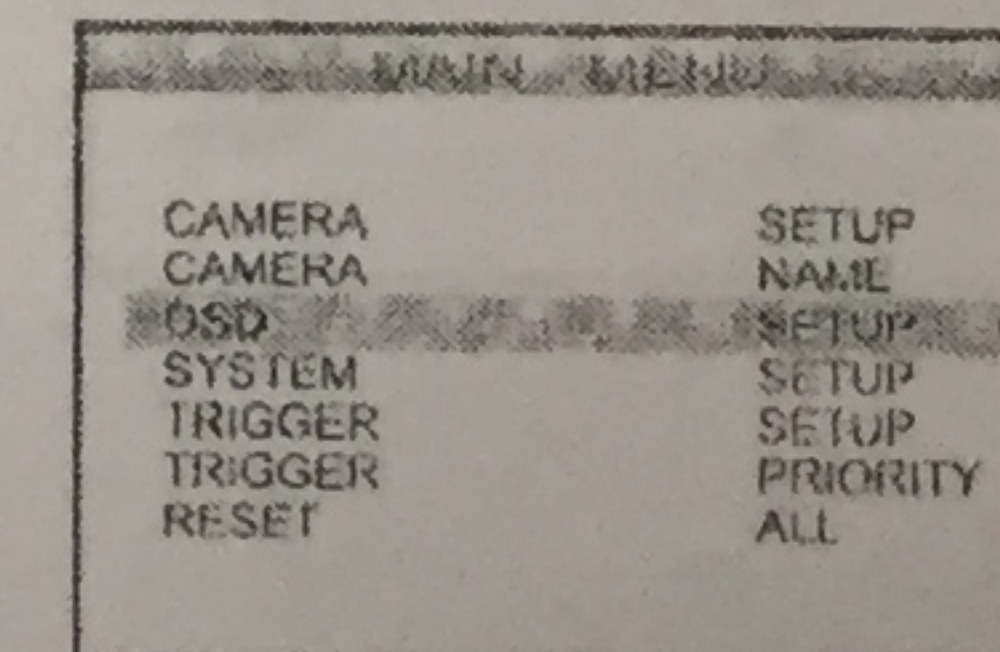
OFF



ON

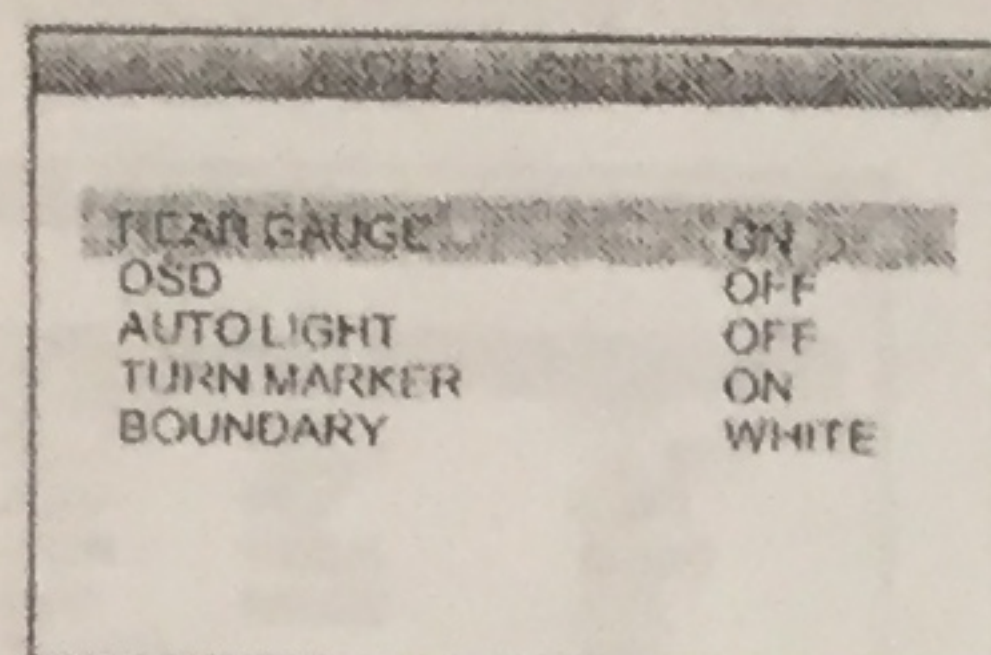
7.3 OSD SETUP

Press MENU to go back to master menu, and then press CA F / CAB / SEL to select OSD SETUP.

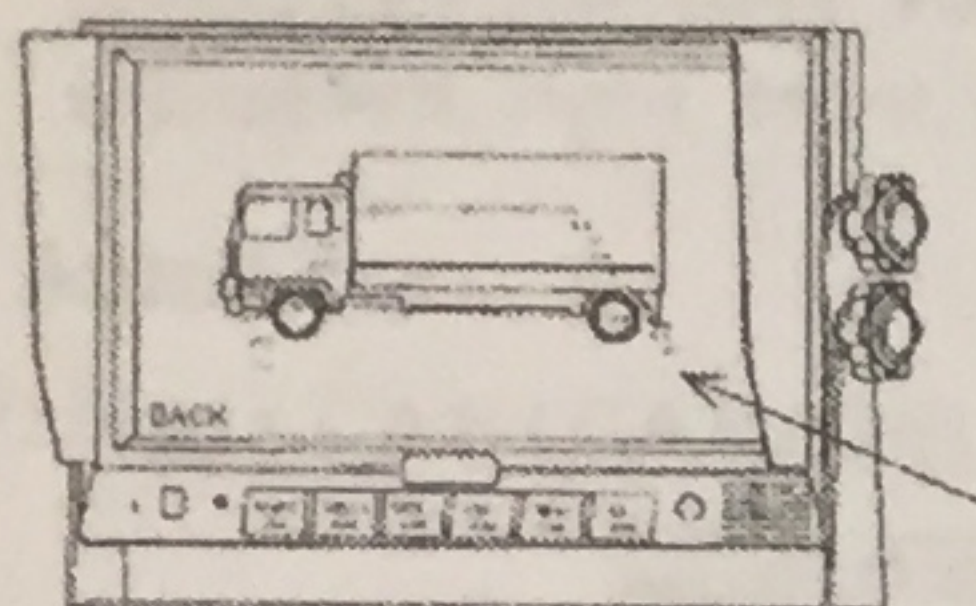


7.3.1 Camera title

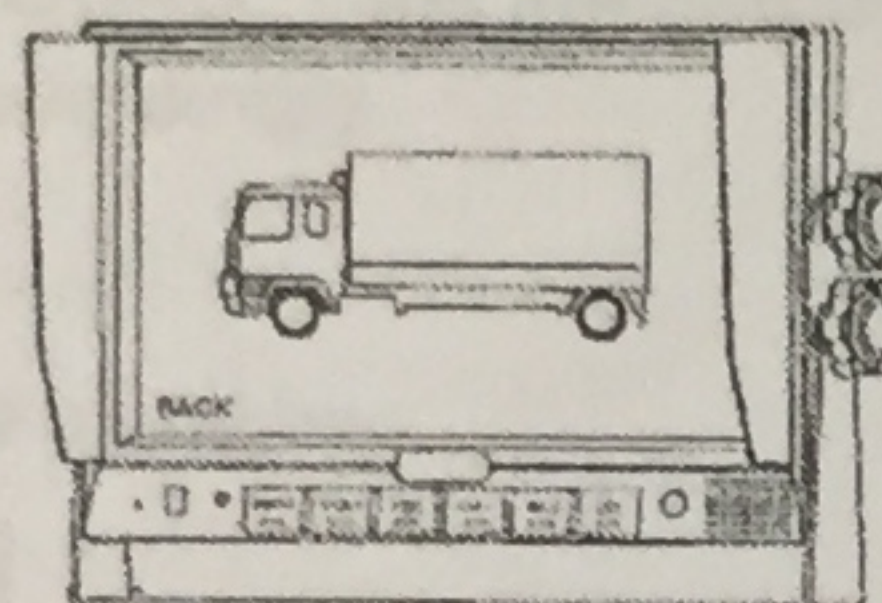
① Press CAL / CAR to enter OSD SETUP.:



② Press CAF / CAB / SEL to select REAR GAUGE, and then press CAL / CAR to select ON or OFF. When it is ON, there is distance grid displayed; otherwise there is not.



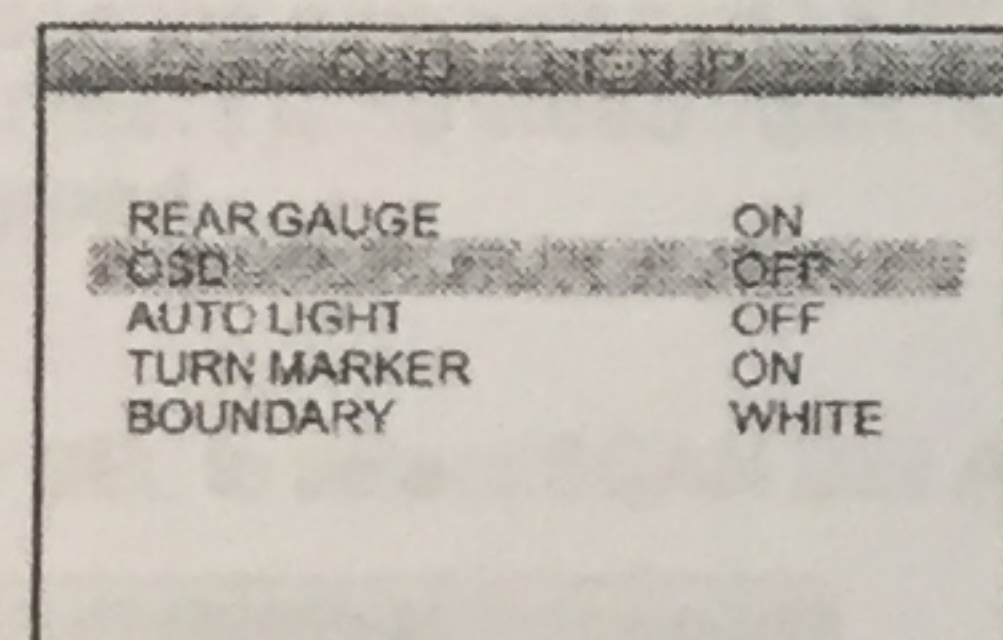
ON



OFF

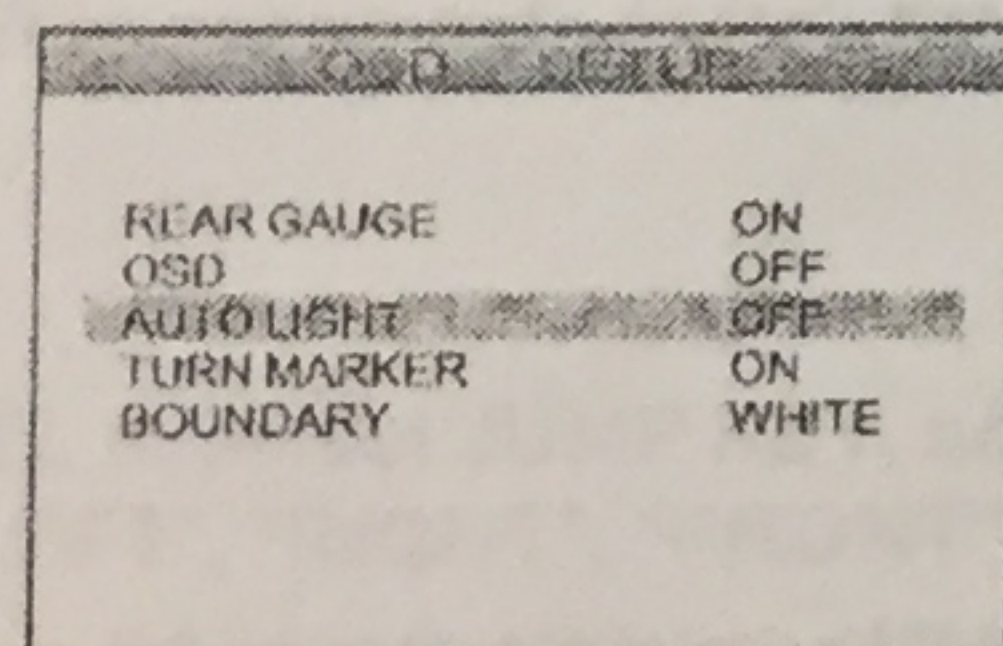
7.3.2 OSD lock

Press CAF / CAB / SEL to select OSD, and then press CAL / CAR to select ON or OFF. ON stands for lock.



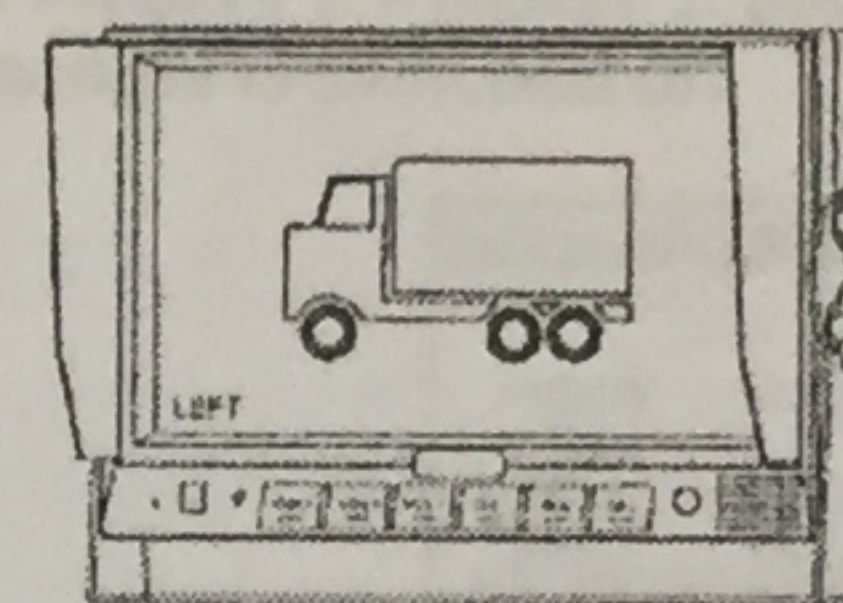
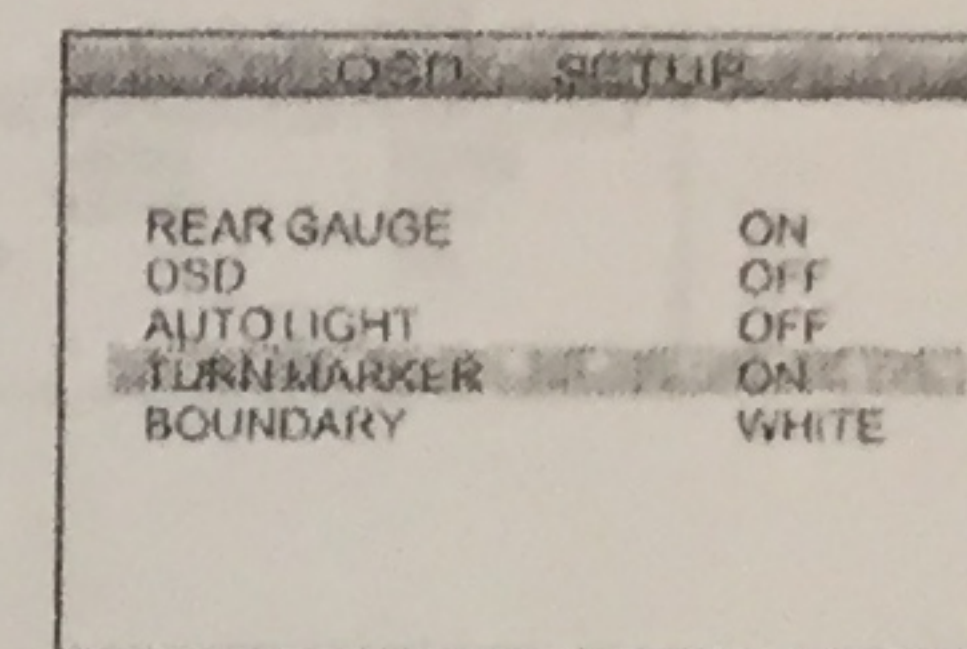
7.3.3 Auto brightness setup

Press CAF / CAB / SEL to select AUTO LIGHT, and then press CAL / CAR to select ON or OFF. ON stands for auto control of screen brightness and backlighting of buttons.

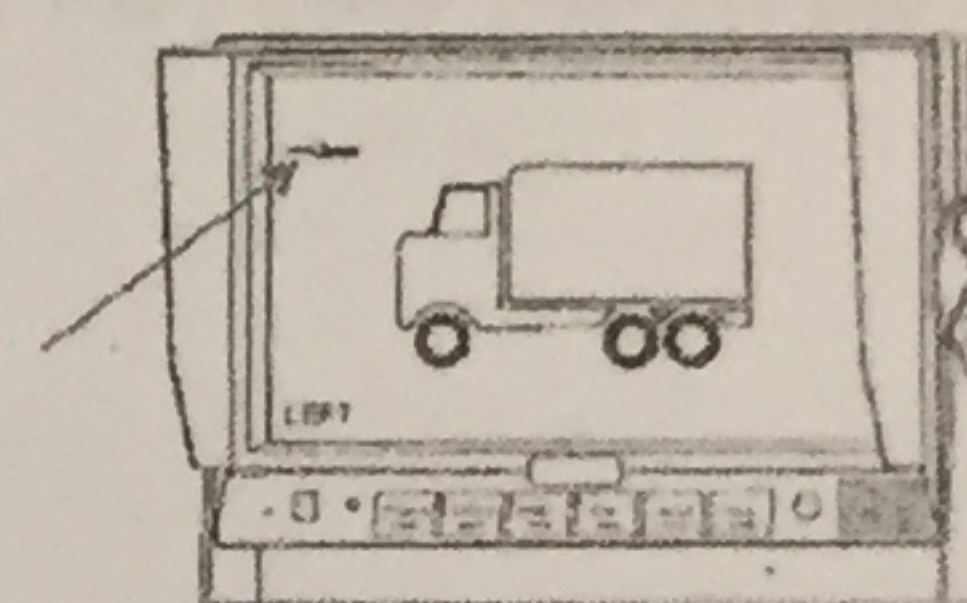


7.3.4 Arrow setup

Press CAF / CAB / SEL to select TURN MARKER, and then press CAL / CAR to select ON or OFF. ON is applied when the monitor is for reversing, while OFF is applied for regular security.



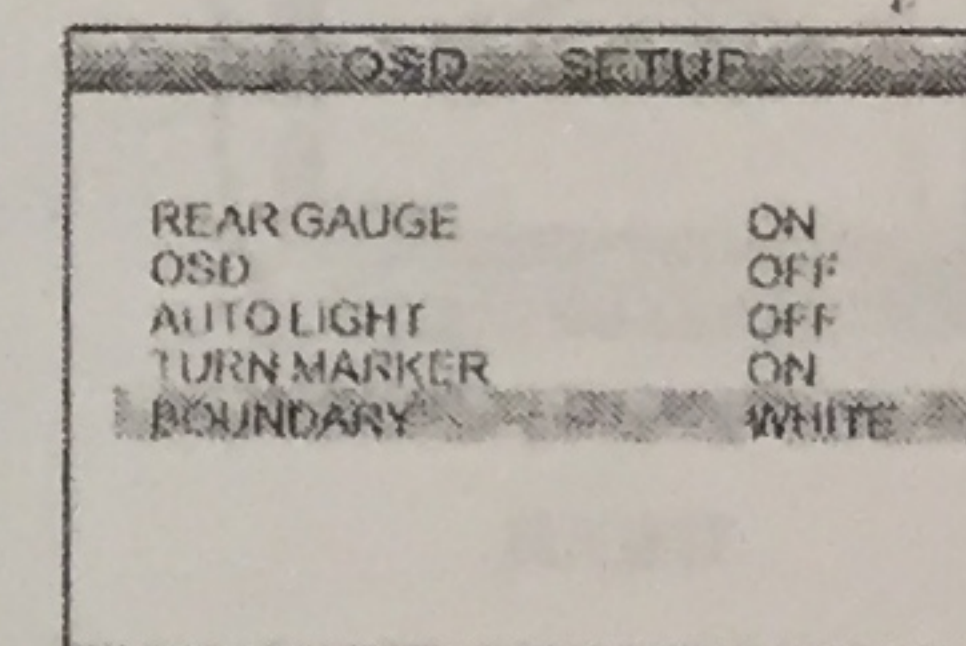
OFF



ON

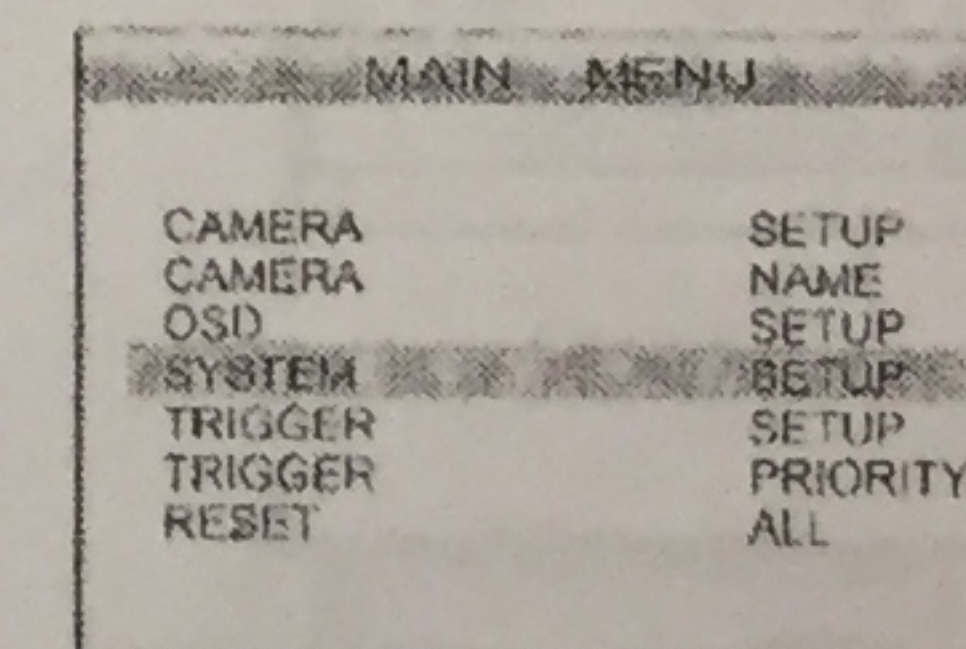
7.3.5 Boundary color

Press CAF / CAB / SEL to select BOUNDARY, and then press CAL / CAR to select color of the boundary. WHITE, BLACK and GRAY are available.



7.4 System setup

Press MENU to go back to master menu, and then press CAF / CAB / SEL to select SYSTEM SETUP as below:



7.4.1 Record video output

① Press CAL / CAR to enter SYSTEM SETUP:

SYSTEM SETUP		
REC-V	OUT	QUAD
SCAN	DELAY	OFF
JUMP	KEY	01_SEC
P-ON	MODE	LEFT
DVD	IMAGE	QUAD
SYSTEM		STA
		PAL

② Press CAF / CAB / SEL to select REC-V OUT, and then press CAL / CAR to select LEFT, RIGHT, FRONT, BACK or QUAD. Thus the output image will be left, right, front, back or quad accordingly.

7.4.2 Auto Scan

① Press CAF / CAB / SEL to select SCAN as below:

SYSTEM SETUP		
REC-V	OUT	QUAD
SCAN	DELAY	OFF
JUMP	KEY	01_SEC
P-ON	MODE	LEFT
DVD	IMAGE	QUAD
SYSTEM		STA
		PAL

② Press CAL / CAR to select ON or OFF. When it is ON, cameras will be auto switched in the sequence of LEFT, RIGHT, FRONT, BACK, QUAD, LEFT, RIGHT... If there is no video input in any channel, the channel will be automatically skipped.

7.4.3 Auto switch time

① Press CAF / CAB / SEL to select SCAN DELAY:

SYSTEM SETUP		
REC-V	OUT	QUAD
SCAN	DELAY	01_SEC
JUMP	KEY	LEFT
P-ON	MODE	QUAD
DVD	IMAGE	STA
SYSTEM		PAL

② Press CAL / CAR to set up auto switch time (1~60 seconds).

7.4.4 Jump key

Press CAF / CAB / SEL to select JUMP KEY, and then press CAL / CAR to set up display mode from "LEFT", "RIGHT", "FRONT", "BACK", "QUAD", "L'R", "F'B", "L+R'F" and "B+L'R". In this case, when monitor is out of "MENU", pressing SEL will switch directly to the JUMP KEY image.

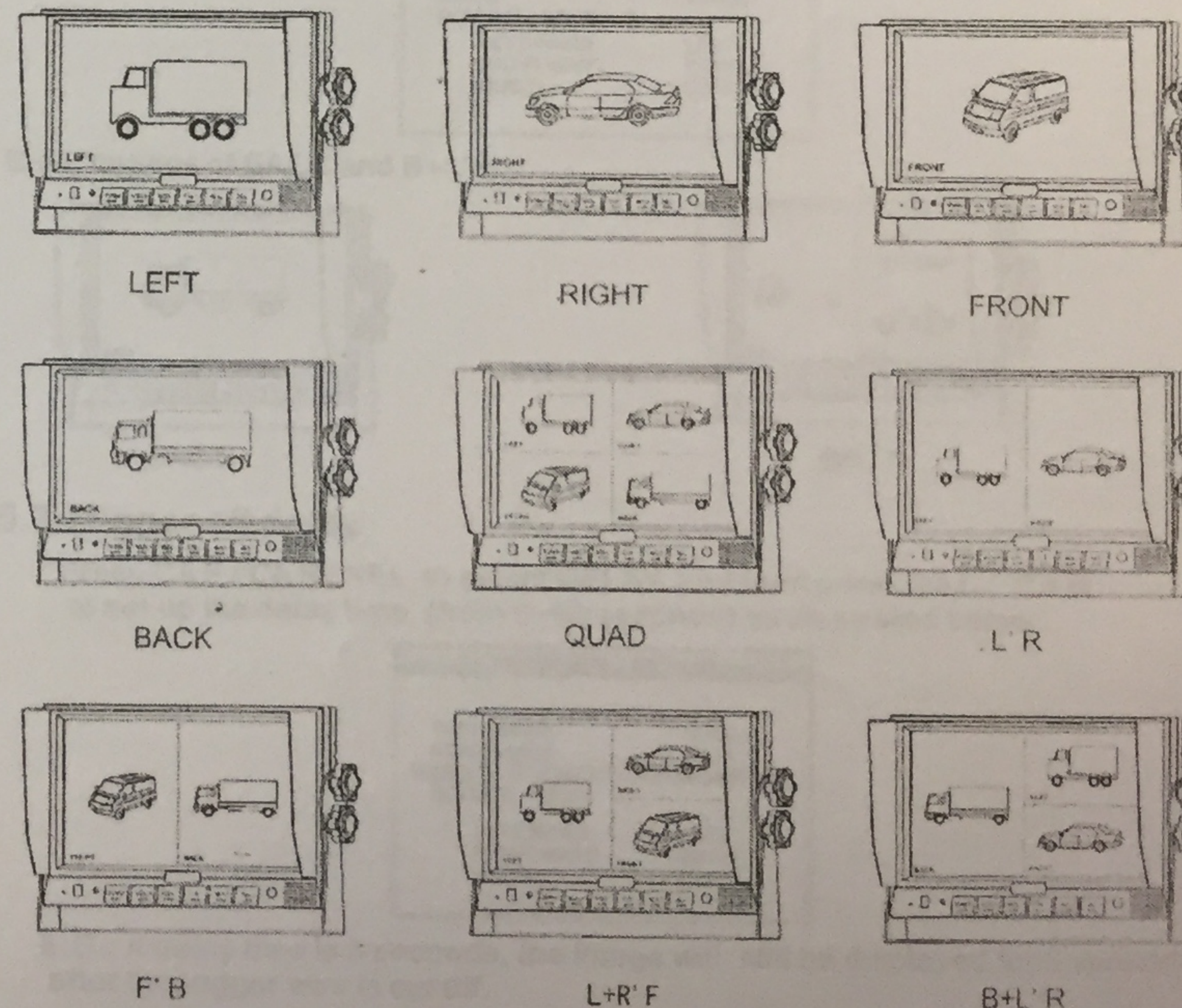
SYSTEM SETUP		
REC-V	OUT	QUAD
SCAN	DELAY	OFF
JUMP	KEY	01_SEC
P-ON	MODE	LEFT
DVD	IMAGE	QUAD
SYSTEM		STA
		PAL

7.4.5 Switch-on mode

Press CAF / CAB / SEL to select P-ON MODE, and then press CAL / CAR to set up display from "LEFT", "RIGHT", "FRONT", "BACK", "QUAD", "L'R", "F'B", "L+R'F", "B+L'R" and AV when monitor is switched on.

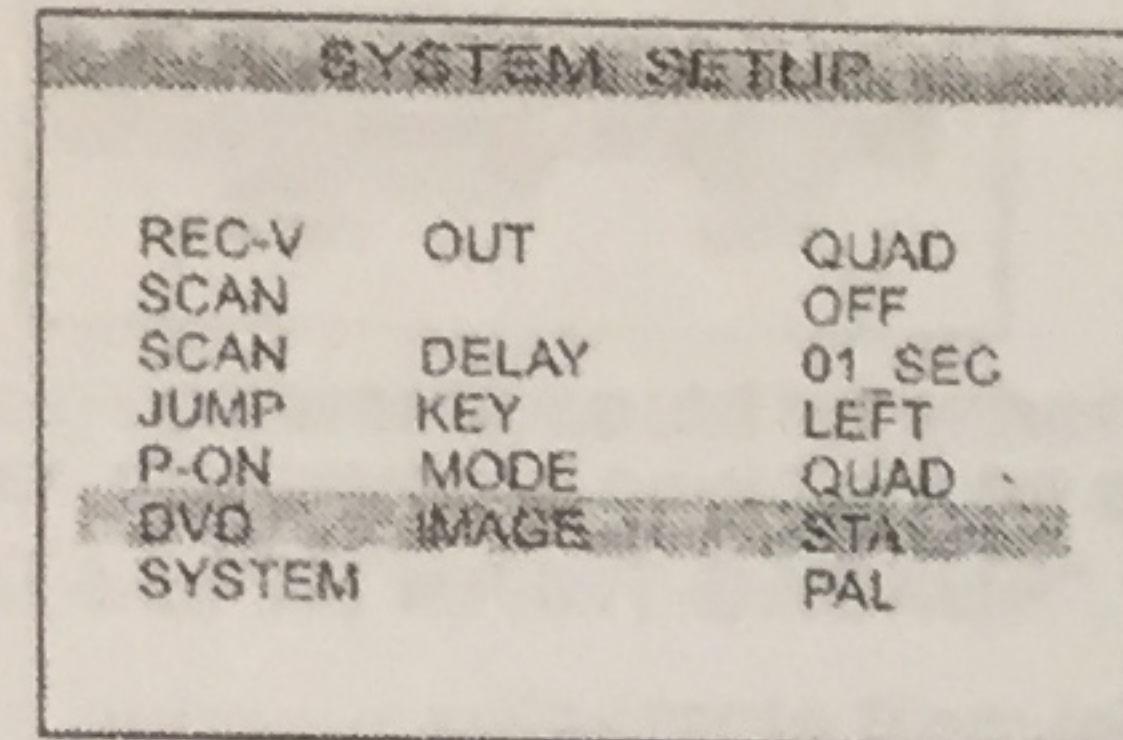
SYSTEM SETUP		
REC-V	OUT	QUAD
SCAN	DELAY	OFF
JUMP	KEY	01_SEC
P-ON	MODE	LEFT
DVD	IMAGE	QUAD
SYSTEM		STA
		PAL

Different display modes are as illustrated below:



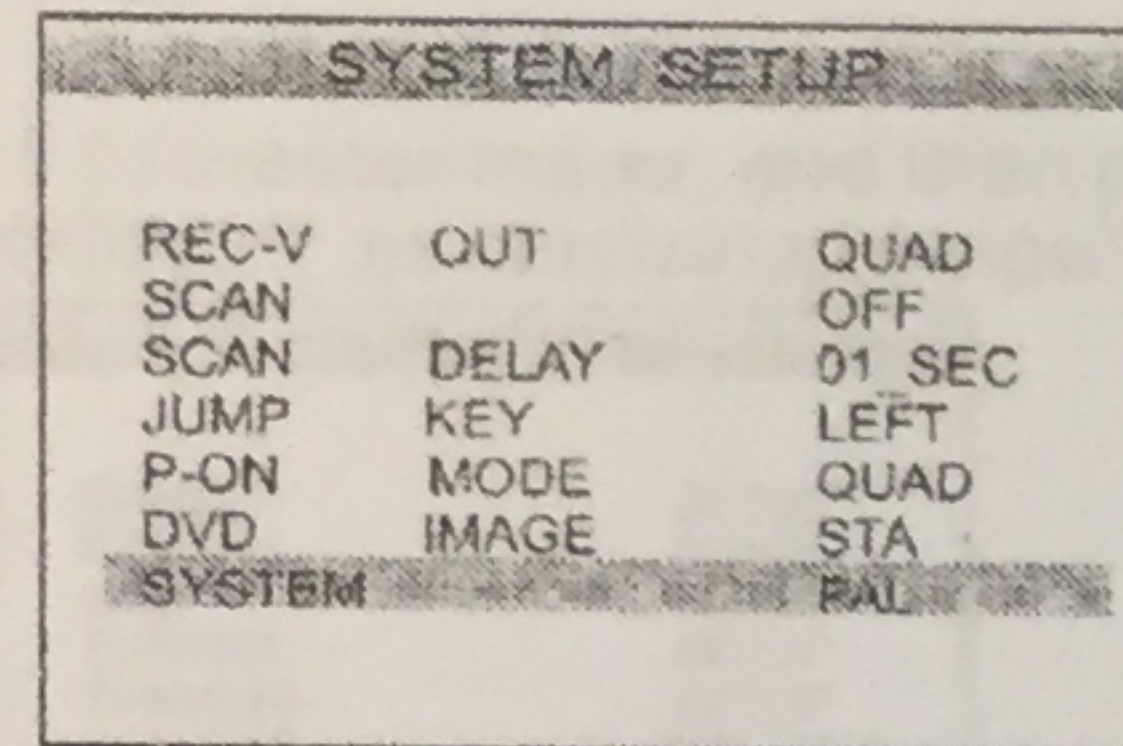
7.4.6 DVD IMAGE

Press CAF / CAB / SEL to select DVD IMAGE, and then press CAL / CAR to select from "STA" (standard), "BRI" (bright) and "SOF" (soft). When the monitor is operated by remote control, on the screen will display "STANDARD", "BRIGHT", or "SOFT".

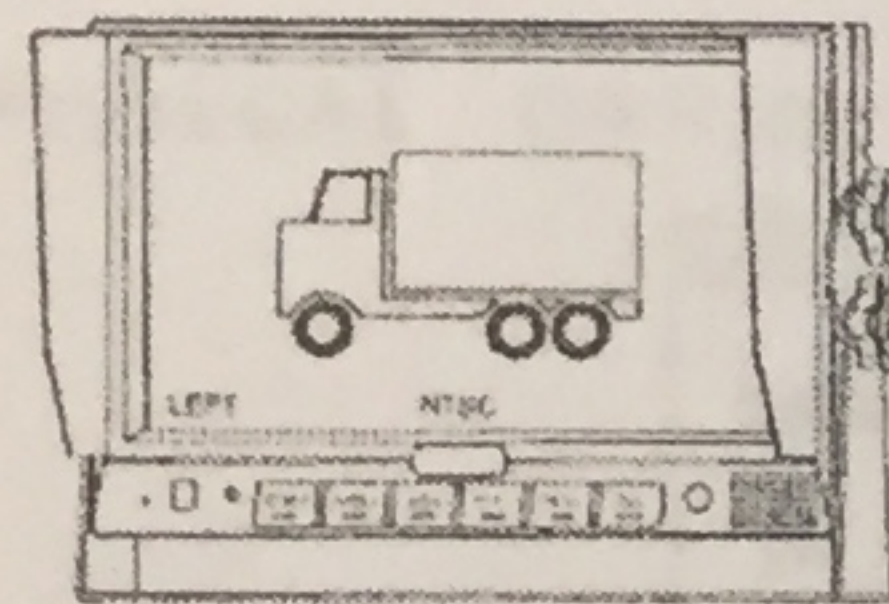


7.4.7 TV system

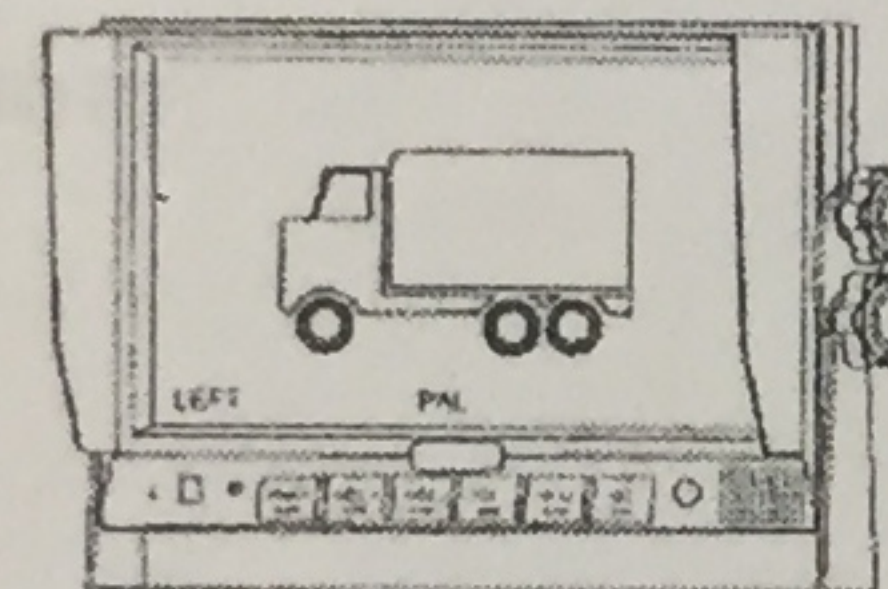
Press CAF / CAB / SEL to select SYSTEM, and then press CAL / CAR to select "NTSC" or "PAL".



E.G.:



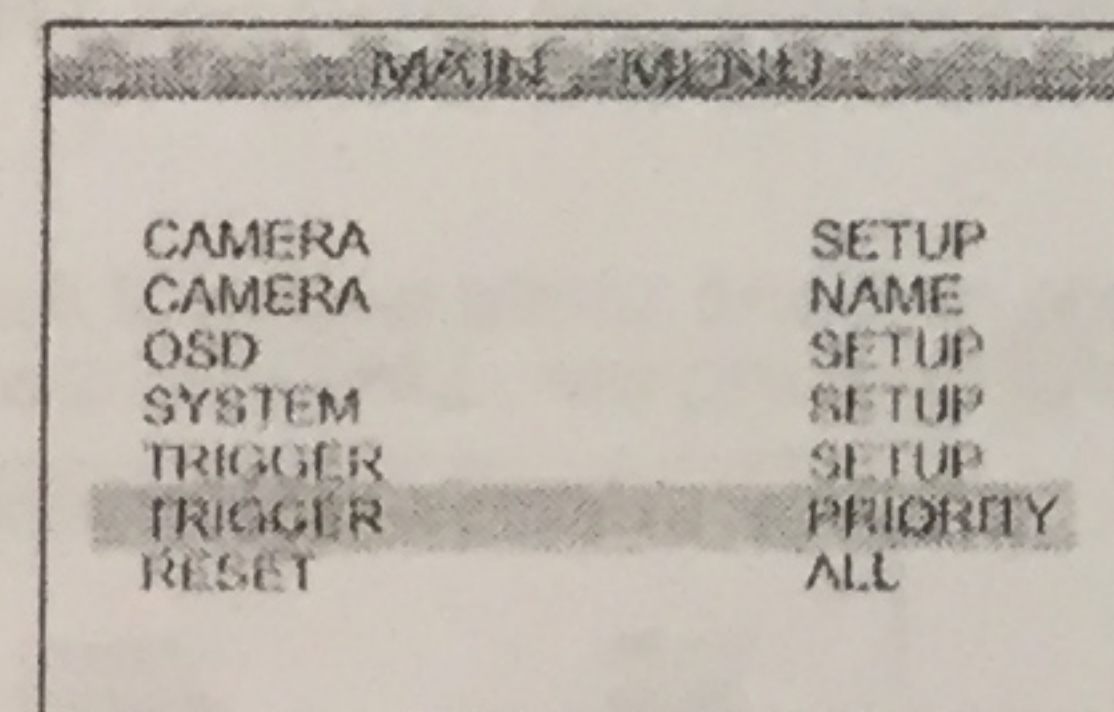
NTSC



PAL

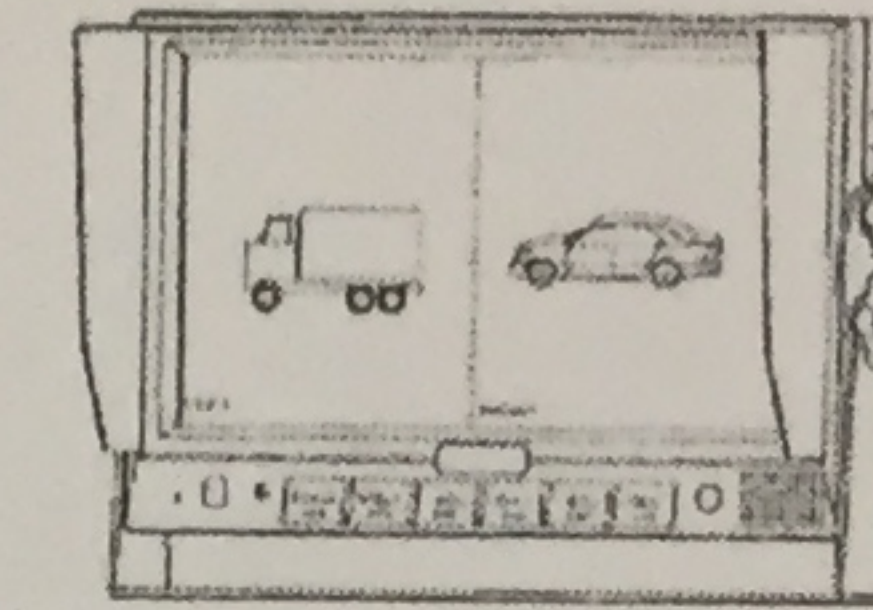
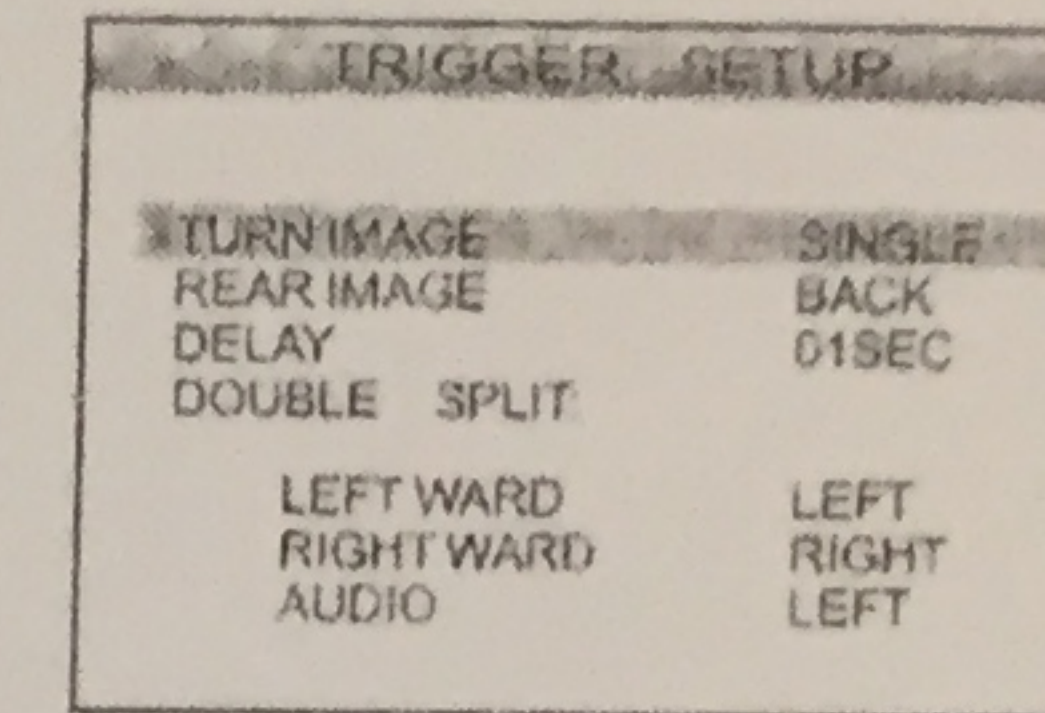
7.5 Trigger wire setup

Press MENU to go back to master menu, and then press CAF / CAB / SEL to select TRIGGER SETUP as illustrated below:

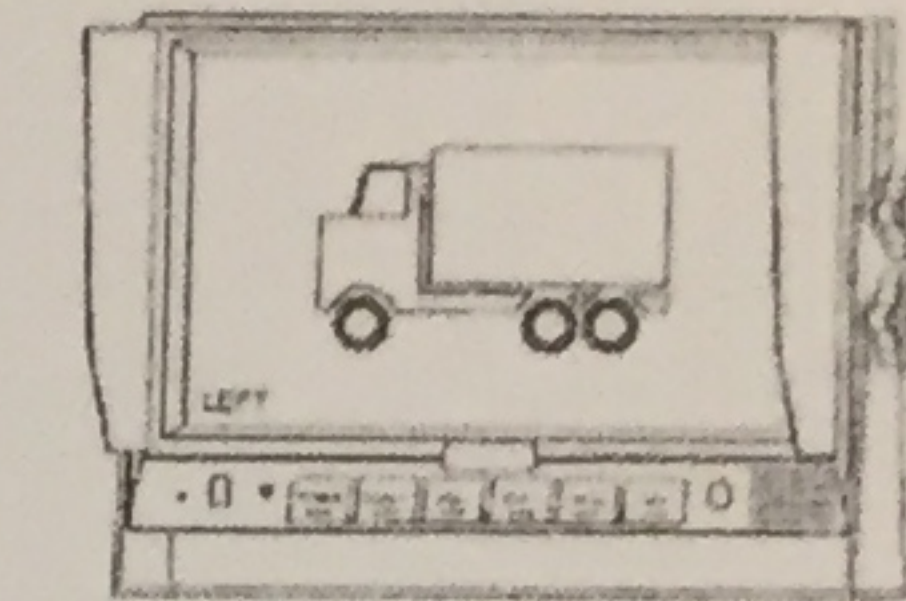


7.5.1 TURN IMAGE

Press CAF / CAB / SEL to select TURN IMAGE, and then press CAL / CAR to select the display mode at turning. When it is set to be DUAL, the images of left and right -side cameras will be displayed; when it is SINGLE, it shows image from either left or right-side camera.



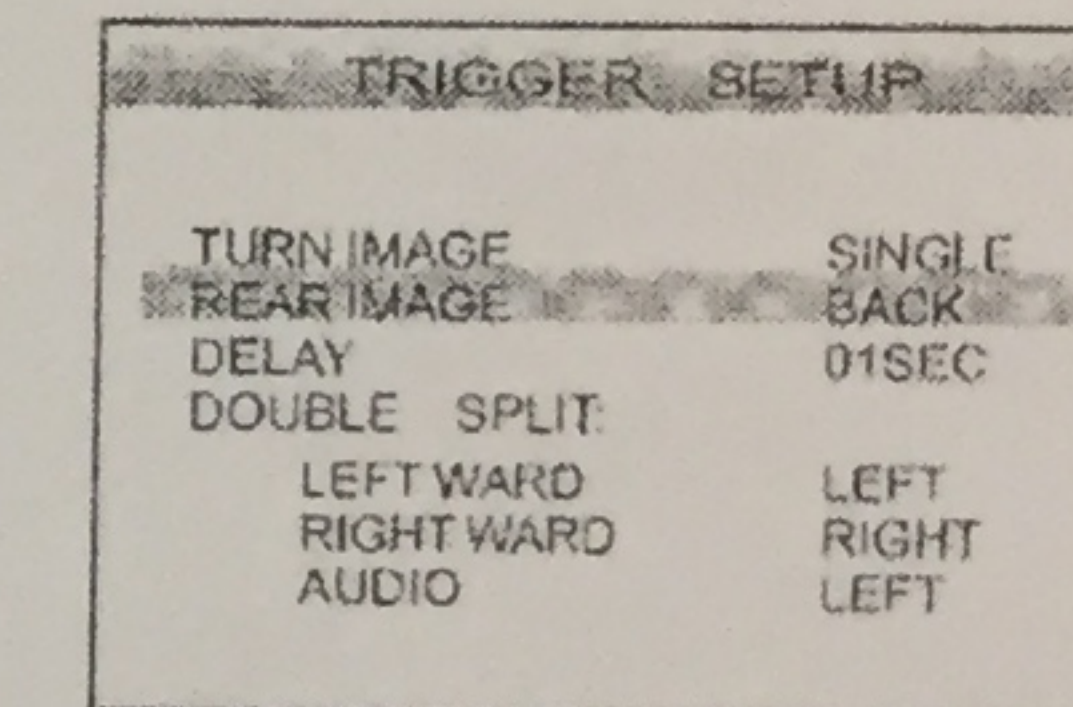
DUAL



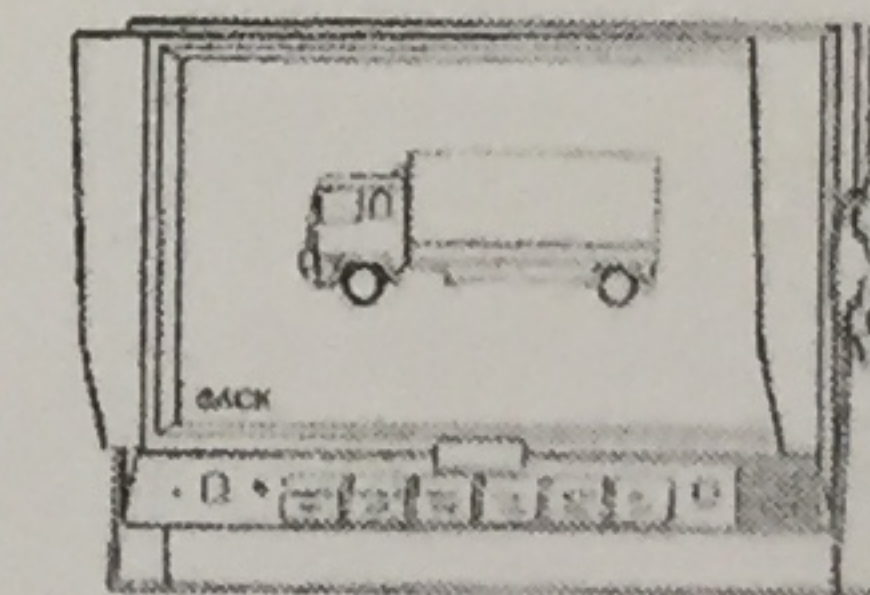
SINGLE

7.5.2 Backup display

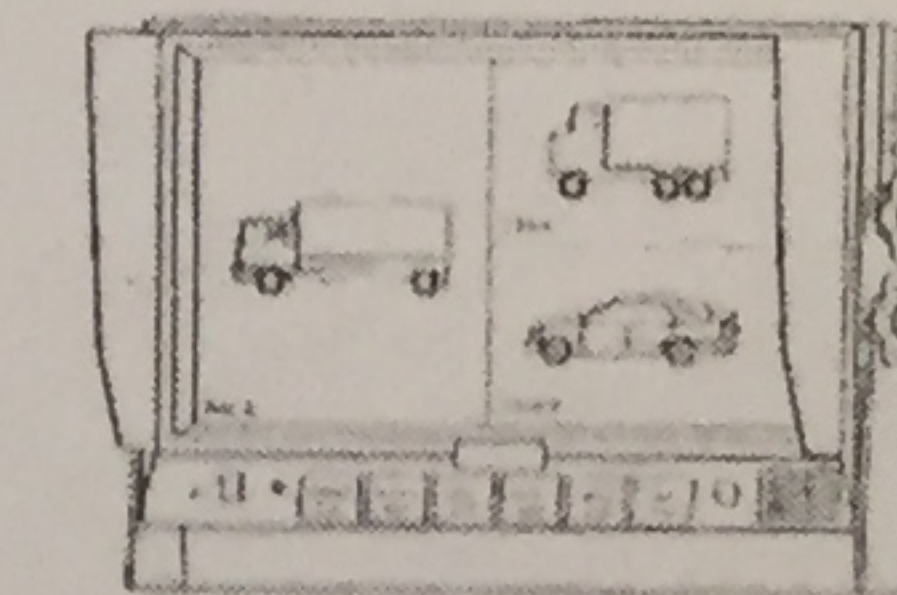
Press CAF / CAB / SEL to select REAR IMAGE, and then press CAL / CAR to select the display mode when backing up. If it is BACK, the monitor shows image from backup camera when reversing trigger is activated; if it is B+L'R, it shows images from back-up, left-side and right-side cameras on one screen when reversing.



E.G.: Images of BACK and B+L'R:



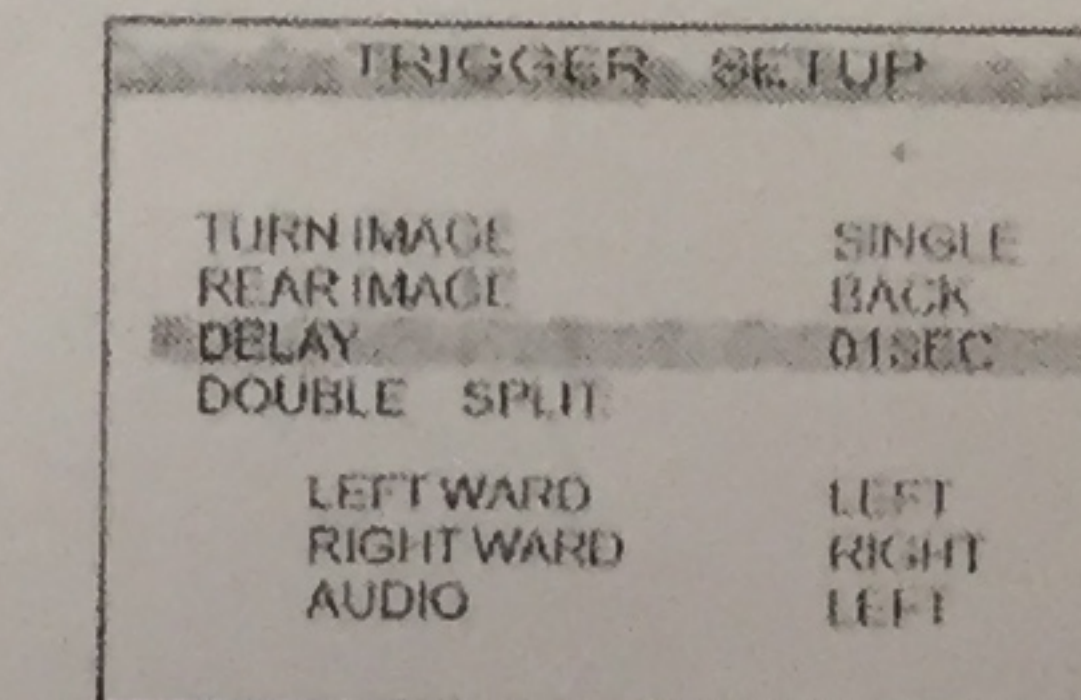
BACK



B+L'R

7.5.3 Trigger off delay

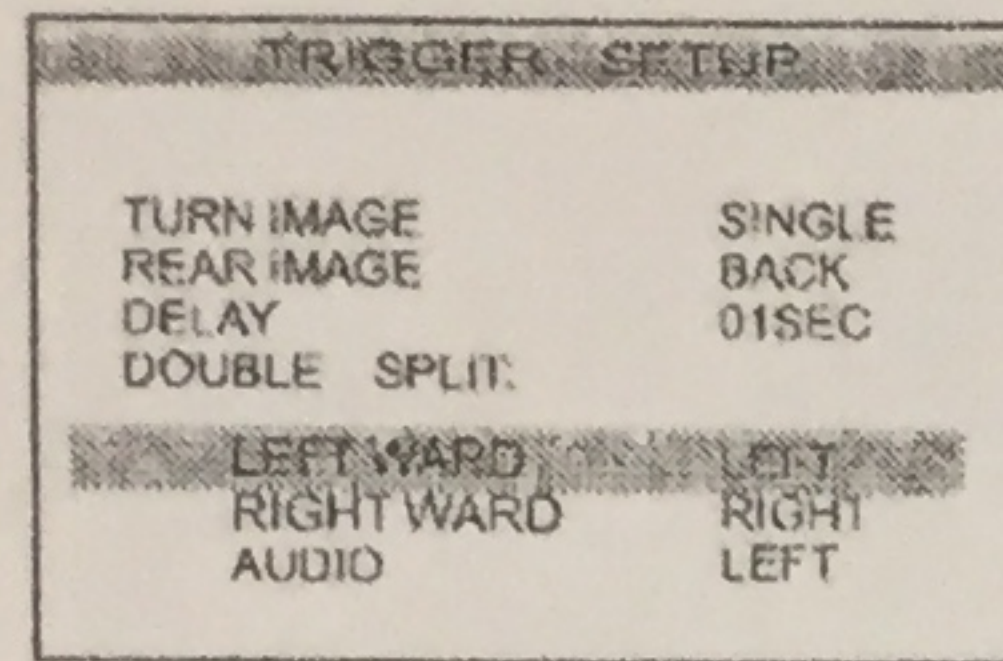
Press CAF / CAB / SEL to select DELAY, and then press CAL / CAR to set up the delay time (from 0~60 seconds) as illustrated below:



E.G.: If delay time is 5 seconds, the image will still be displayed for 5 seconds after the trigger wire is cut off.

7.5.4 Duplex split display

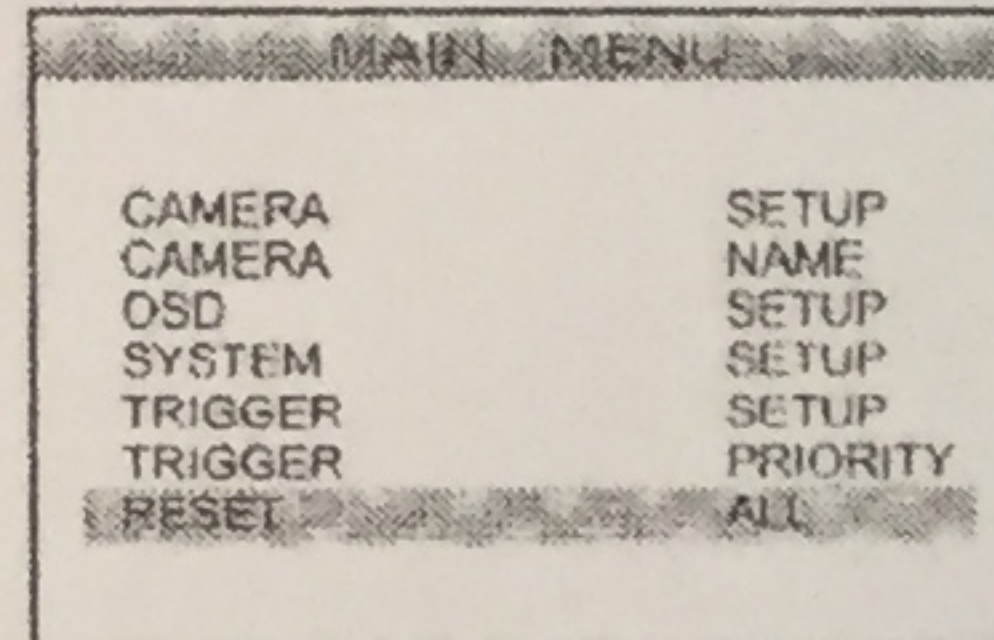
Press CAF / CAB / SEL to select LEFT, and then press CAL / CAR to select the camera to be displayed on the LEFT WARD. So does RIGHT.



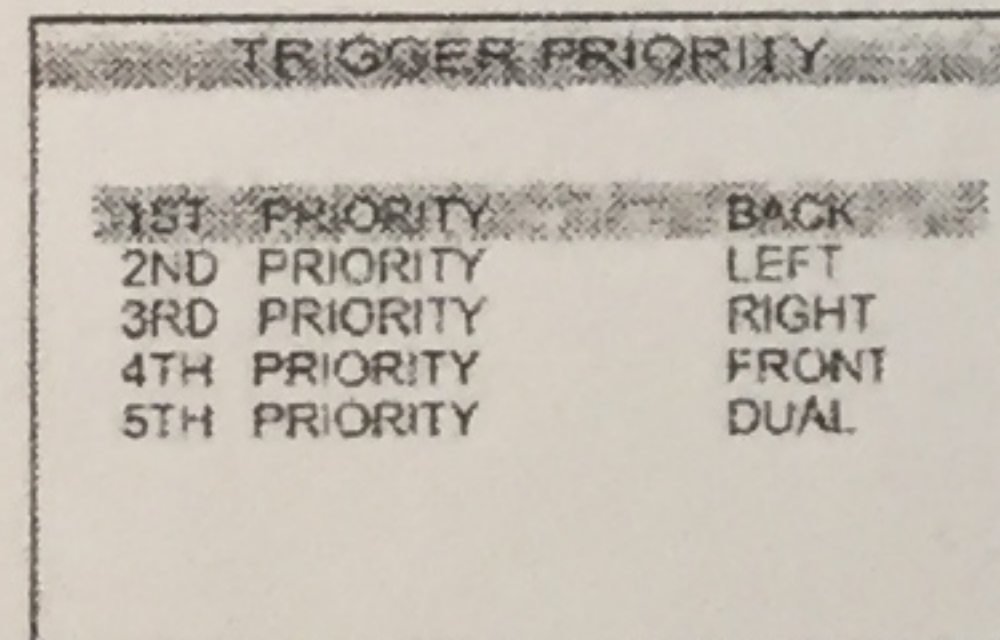
- ① Left, right, front or back-up camera could be either displayed on right ward or left ward on the screen. However, one camera could not be shown on both right ward and left ward. It could be only "RIGHT-LEFT", "RIGHT-BACKUP", "RIGHT-FRONT" etc.
- ② Audio setup. The audio output is selectable from left, right, front and back camera.

7.6 Trigger Priority

Press MENU to go back to master menu, and then press CAF / CAB / SEL to select TRIGGER PRIORITY as illustrated below:



- ① Press CAL / CAR to enter TRIGGER PRIORITY:



- ② Press CAF / CAB / SEL to select 1st TRIGGER PRIORITY, and then press CAL / CAR to set up which camera would be 1st trigger priority. Every priority level can be set up as LEFT, RIGHT, FRONT, BACK or DUAL. Default priority settings are BACK, LEFT, RIGHT, FRONT and DUAL respectively from the first to the fifth.

7.7 Reset

Press MENU to go back to master menu, and then press CAF / CAB / SEL or RES on the remote control to select REST ALL. Any press on CAL / CAR will go back to default setting.

