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Agent.	Y.P.LEE,MOCK&PARTNERS
Inventor	TANAKA, Toshiyuki
Applicant	Hanwha Aerospace Co.,Ltd.
Rightholder	SAMSUNG ELECTRONICS CO., LTD.

Title of Invention

camera systems and cameras

Title of Invention

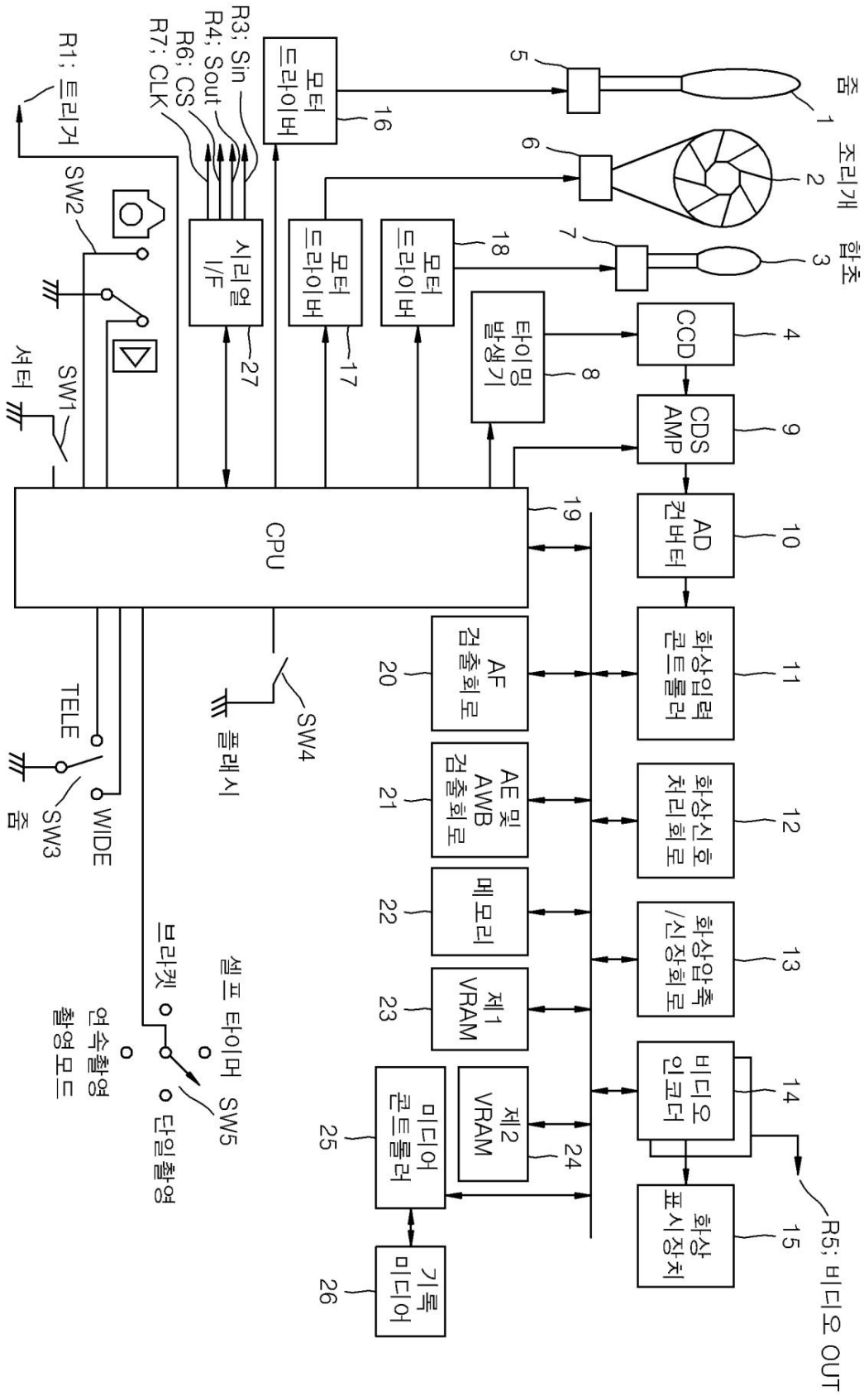
Camera system and camera

summary

Abstract

The camera according to the present invention includes the second VRAM (24), the image, and the video encoder (14) out (24) image data read out from the second VRAM based on image or in which image data is stored, and the CCD (4) generates Putting communication means to the external fl 9 that generates image predetermined character information (CPU 1 4) through the from the second VRAM 24 as the operator ash. As to the data and stores it in the second VRAM 24 , the image data read out image data are store stage d. The image the CCD (4) produces second VRAM 24, video encoder 14 outputting to external flash through data based on the predetermined c video I/F receiving image or the CPU (19) wh The external flash displays ich produces image and stored in the second VRAM (2 based on the image data data through communication means, and image haracter information received by the video I/F) includes an LCD that
4). The external flash includes the video I / F receiving image data through the communication means, and LCD indicating the image based on image data. LCD indicati ng the image based on image data the video I / F recei ves.

Representative drawing



scope of claim

Scope of Claims

Claim **1:**

Claim 1:

Imaging means for capturing an image of a subject and generating an image, and image data The camera system including the external flash which

An image storage unit in which is stored, and an image generated by the imaging unit comprises the imaging device taking a picture of the su to generate image data based on predetermined character information to obtain the image and produces the image, and the image output means outputting image data read image, including the camera the image storage means, the out from the image generating means for storing the image storage means, and outputting the image data read out from the image the outside, and the picture display stage; and a y device storage means a camera including an image storage means to communicatively connected to the camera, and a light emitting indicating the image based on the communicat communication means communication means, connected to the camera and means receiving an instruction from the camera through the image n and the light emitting means, receiving the indication communicatio, and emitting a flash of light; image input means for receiving displaying an image based on the image data received by the data through communication means, and image display means for means A camera system that includes an image input means from the camera through the communication external flash that d emits the flash and the image input means, receiving. image data through the communication means and image data which the image input means accepts, and as to the image storage means, image data are stored; an d the image the imaging device produces or the image generation means which produces image data based on the predetermined character information and stored in the image storage means.

Claim **2:**

Claim 2:

The method of claim 1 , wherein the external flash comprises a power supply for supplying power, and a charging means for supplying power to the light emitting means when the light emitting means emits a flash of light by being charged by the power supplied from the power supply. , The camera system wherein the image display means displays a predetermined image or text when the charging means is being charged.

As for claim 1, the camera system wherein the external flash indicates the predetermined image or the charact er the recharge means the picture display device is the charge the recharge means is included that is charge d ; and supplies electricity to the light emitting means when the light emitting means emits the flash by the p ower source, and the electricity of being supplied from the power source supplying electricity.

Claim **3:**

Claim 3:

The camera system of claim 1 or 2 , wherein the communication means includes a connection terminal electrically and electronically communicatively connecting the camera and the external flash.

As for claim 1 or 2, the camera system in which the communication means includes the connection terminal which enables to communicate connects the camera a nd external flash as the electricity ÿ electronic.

Claim **4:**

Claim 4:

The method of claim 1 or 2 , wherein the communication means is the camera and system includes a wireless communication means for communicably connecting the external flash wirelessly. tion apparatus which enables to communicate wirelessly y connects the camera and external flash.

As for claim 1 or 2, the camera system in which the camera

Claim **5:**

Claim 5:

The camera according to claim 4 , wherein the wireless communication device is a wireless I/F capable of bidirectional communication, and the camera takes an image by receiving a command from a shutter button installed in the external flash through the wireless I/F. system.

As for claim 4, the camera system in which it is the wireless interface in which the bidirectionally the wirele ss communication apparatus is communicable ; and it r eceives the indication from the shutter button installed at the external flash through the wireless interface and the camera takes a picture of the image.

Claim **6:**

Claim 6:

A communication means that is communicatively connected to an external flash and captures the subject generate an image, and the image generated by the image capturing means connected to the external flash and communication, th image or image data is generated based on predetermined character information, and image e imaging device taking A picture of the subject and pr oduces the image, and the image, and the image the i including an image output means output through the communication means d. The maging device produces or the image output means whi ch produces image data based on the predetermined character information and outputted through the commu nication means.

The camera including the communication means to

background art

Background Art

The present invention relates to a camera system and camera having an external flash attached to a display.

The invention relates to the camera system and camera comprising the external flash in which the displ ay is adhered.

Conventionally, in order to provide information to the user, information about captured images such as histograms and shooting conditions, camera setting conditions such as aperture, shutter speed, shooting mode, number of pixels, and camera operation methods are displayed on the display provided by the camera body to provide information to the user. A method of displaying such information as superimposed on a photographed image is used.

Conventionally, in order that the information is provided the user with the method for overlapping on photograp hed images and indicating the camera set state of the i nformation, iris, shutter speed, photographic Mode, the pixel number etc about the photographed images, the c amera handling method, including, the information inclu ding the histogram or the photographing condition etc. in the display which the camera body includes is used.

In addition, an external flash connected to a single-lens reflex camera or the like is equipped with a display such as a liquid crystal using segments, and displays information such as the aperture of the camera, zoom information of the flash, and reachable distance.

Moreover, the display including the liquid crystal by the segment etc. is equipped in the external flash connecti ng to the single-lens reflex camera etc. and the inform ation including the iris of the camera, the zoom informa tion of the flash, the access available distance etc. is i ndicated.

Further, as prior art, Japanese Patent Laid-Open Nos. 2005-080042, 2000-050196, 2000-261590, 2004-3280 38 , and the like are known.

Moreover, with JP2005-080042 A, with (2000-050196), with (2000-261590), 2004-328038 moat is known as th e prior art.

However, in the method of providing information using the display provided in the camera body, there is a problem in that the amount of information provided is too large to be displayed at once or the screen becomes complicated.

But there is a problem that there is much amount content provided in the method for providing the inform ation using the display which the camera body includes and it cannot indicate or the screen becomes complica ted.

content of invention

Summary of Invention

Effects of the Invention

Effects of the Invention

Since the camera system of the present invention displays the image data generated by the image generating means of the camera on the image display means of the external flash, it is possible to provide various types of information to the user.

The camera system of the invention provides the user image data which the image generation means of the camera produces are indicated in the picture display device of the external flash with many information.

technical challenge

Technical Task

An object of the present invention is to provide a camera system and a camera equipped with an excellent information providing means.

The camera system and the camera equipped with the information provide method in which the object of the present invention is excellent are to be provided.

Composition and operation of the invention

Structure & Operation of the Invention

A camera system according to the present invention includes imaging means for capturing an image of a subject and generating an image, image storage means for storing image data, image data generated by the imaging means or predetermined character information, and generating image data. A camera including an image generating means for storing in the image storage means and an image output means for outputting image data read from the image storage means to the outside, a communication means communicatively connected to the camera, and a camera through the communication means It includes an external flash including a light emitting means for emitting light in response to instructions from the external flash, an image input means for receiving image data through a communication means, and an image display means for displaying an image based on the image data received by the image input means.

The camera system about the invention includes the external flash including the camera, and the picture dis play device indicating the image based on the communi cation means, connected to the camera and communic ation the light emitting means receiving the indication f rom the camera through the communication means and emits the flash, and the image input means receiving im age data through the communication means and image data including the imaging device taking a picture of th e subject and produces the image, the image storage means in which image data are stored, and the image which the imaging device produces or the image genera tion means which produces image data based on the pr edetermined character information and stored in the im

age storage means, and the image output means outpu tting image data read out from the image storage mean s to the outside. The picture display device indicating t he image based on the communication means, connect ed to the camera and communication the light emitting means receiving the indication from the camera throug h the communication means and emits the flash, and th e image input means receiving image data through the communication means and image data the image input means receives.

A camera according to the present invention includes communication means communicatively connected to an external flash, imaging means for generating an image by capturing an image of a subject, and generating image data based on an image generated by the imaging means or predetermined character information. and an image output means for outputting the solution through the communication means.

The camera about the invention comprises the communication means connected to the external flash and communication, the imaging device taking a picture of the subject and produces the image, the image whic h the imaging device produces, or the image output me ans which produces image data based on the predeter mined character information and outputted through co mmunication means.

In the present invention, the communication means may include a connection means for electrically and electronically communicatively connecting the camera and the external flash. The connecting means may be a contact that transmits a signal in a physically contacted state, such as a hot shoe.

In the present invention, the communication means comprises the camera and the connection method whic h enables to communicate connects the external flash to the electricity ÿ electronic. The connection method can be the contact point delivering the signal to the st ate contacted like the hot shoe.

In the present invention, the communication means wirelessly connects the camera and the external flash.

In the present invention, the communication means may include a communication means comprises the camera and the wireless communication, apparatus which enables to communicate wirelessly co nects the external flash to communicatio wireless I/F such as Bluetooth or UWB (ultra wide bn means, communicate with the camera by wireless communication. That is, in the connection terminal or and) can be used the UWB (ultra wide band), including, physical so-called, the Bluetooth (bluetooth) not only the connection by the the wireless inter face including the hot shoe etc. can use connects the camera and external flash to the communication with the wireless communication.

wireless communication device that communicatively connects. That is, the so-called physical contact by a connection terminal such as a hot shoe

In the present invention, the wireless communication device is a wireless I/F capable of bidirectional communication, and the camera can take an image by receiving a command from a shutter button installed in an external flash through the wireless I/F.

In the present invention, it is the wireless interface in which the bidirectionally the wireless communication ap paratus is communicable and the indication is received from the shutter button installed in the external flash t hrough the wireless interface and the camera can take a picture of the image.

The camera system according to another aspect of the present invention, the camera system about the dissimilar side of the present invention comprises the imaging device which captures a subject and generates an image, and the image generated by the imaging device or a predetermined based on character information and outputting the image data to other roduces the A camera including an image output means for generating image data image it takes a picture of the subject and the image which the imaging device produces or the ca unit, and the camera and mera producing image data based on the predetermined communication means connected communicatively, character information and includes the image output meter from the camera through the communication means, light emitting means that emits flashes upon receiving instructions from the camera, and image data stored means which outputs to the outside, the The camera and the image input means for storing image data received through the image storage means and communication means in the image external flash including the communication means conn storage means, and the image storage means ected to the communication, the light emitting means r. and an external flash including an image receiving the indication from the camera through the co display means for displaying an image based on the output image data. mmunication means and emits the flash, the image store age means, and the picture display device indicating the image based on the image input means storing image data received through the communication means in the image storage means and image data read out from the image storage means. As to the image storage means, i mage data are stored.

The external flash of the camera system according to the present invention supplies power, and the power source, and the recharge means are

is charged by power and the power supplied from the power source, included and the picture display device can indicate th charging water that supplies power to the light emitting means when the light means flashes e predetermined image or the character when the rech arge means is the charge. As to the power source, about the inventio defined image or text when the charging means is being the image display means can display a small external flash of the camera system being supplied from the power source and charged. n supplies electricity. The recharge means is charged with the electricity of supplies electricity to the light emitting means when the light emitting means emits the flash.

The communication means of the camera about the invention includes multiple connection terminals and it i, and among the connection terminals, the direction, in which the connection ter part is placed at the front of the direction connection terminal connected to the image output means is arranged in the connection terminal with th means is normal at a connection terminal other than in which the flash is inserted, and the image output minal connected among the flash most, image data can be output only when communication is feasible. the connection terminal connected to itself e image output means inserts the external connection terminal except the connection terminal in which the image ront and it can output image data only when normally c ommunicating through the output mean s is connected to itself.

The external flash according to the present invention, the external flash about the invention comprises the camera and the picture display device indicating the and receives instructions from the camera through the communication means im age based on the invention that is communicatively connected to the camera, for emitting light, the communication and the light emitting means for receiving and the age based on the communication means, connected to light emitting means and ing the indication from the camera based on the image data received by image data through the communication means, input means for receiving image data, commun may be included. ication means and emits the flash the image input means An image display means for displaying an image through the and the image input means, receiving image data through the communication means and image data which the image input means r eceives.

Hereinafter, the configuration and operation of a camera system and a camera according to the present invention will be described in detail through embodiments of the accompanying drawings.

Hereinafter, the camera system about the invention, and the configuration and action of the camera are par ticularly illustrated through the embodiments of the att ached view.

1 is a block diagram showing the overall configuration of a camera according to an embodiment of the present invention. In this embodiment, a digital camera will be described as an example of a camera related to the present invention.

Figure 1 is a block diagram showing the whole configuration of the camera about a preferred embodim ent of the present invention. In the present preferred e mbodiment, for example, the digital camera is given of t he camera about the invention and it illustrates.

The digital camera according to this embodiment includes a zoom lens 1, an aperture 2, a focus lens 3, an imaging device (CCD) 4, a zoom motor 5, an aperture motor 6, and a focus motor 7.), a timing generator (8), a CDSAMP circuit (9) and a serial I/F (27). Here, the zoom lens 1, the diaphragm 2, the focus lens 3, and the imaging device 4 constitute an imaging means for capturing an image of a subject.

The digital camera about this embodiment comprises the zoom lens (1), the iris (2), the focusing lens (3), th e image pickup device (CCD: 4), the zoom-motor (5), t he iris motor (6), the focus motor (7), the timing gener ator (8), the CDSAMP circuit (9), and the serial I / F (2 7). Here, it is comprised the imaging device in which th e zoom lens (1), the iris (2) , and the focusing lens (3) and image pickup device (4) take a picture of the subje ct.

The diaphragm motor 6 constitutes a diaphragm variable unit that changes the degree of opening of the diaphragm 2 . The timing generator 8 constitutes a shutter speed variable unit that changes the shutter speed. A CDSAMP (correlated double sampling amplifier) circuit 9 constitutes a gain variable unit for varying the amplification degree with respect to the output of the imaging element 4 constituting the output of the imaging means. The diaphragm motor 6, the timing generator 8, the CDSAMP circuit 9, and the flash constitute exposure changing means for changing the exposure state in the imaging means.

It is comprised the iris variant part in which the iris motor (6) changes about opening of the iris (2). It is c omprised the shutter speed variant part in which the ti ming generator (8) changes the shutter speed. It is co mprised the gain variant part in which the CDSAMP (cor related double sampling amplifier) circuit (9) varies the amplification degree about the output of the image pick up device (4) comprised the output of the imaging devi ce. And the exposure change mean in which with the iri s motor (6), with the timing generator (8), with the CD SAMP circuit (9), flash changes the exposure state in t he imaging device is constructed.

The position of the zoom lens 1 is movable by the zoom motor 5. Aperture The position of the zoom lens (1) is movable with the

The degree of opening of (2) is controllable by the diaphragm motor 6. The position of the focus lens 3 is controllable by the focus motor 7. The light of the subject passing through the zoom lens 1, the diaphragm 2, and the focus lens 3 is formed on the light receiving surface of the imaging device 4.

zoom-motor (5). About opening of the iris (2) is is with the iris motor (6). The position of the focusing lens (3) is is with the focus motor (7). The light of the subject passing through the zoom lens (1), and the iris (2) and focusing lens (3) is imaged in the light-receiving surfac e of the image pickup device (4).

The light of the subject in which the image pickup device 4 is imaged in the CCD (charge coupled deja, CMOS (complementary MOS) imaging on the front of the complementary imaging device 4. MOS of color filter R (red), G (green), and B (blue) primary color filters are used pickup magenta), Y device (4), the color filter is arranged. Occasionally, there imaging e complementary color system filter of the case, the C element timing signal from the timing generator (8). do. he Ye (the yellow: yellow) the conf iguration of the color filter array is used. The image pi ckup

light-receiving surface is co. As the imaging element 4, a CCD (charge coupled device) imaging station nverted photoelectrically. The device, etc. are used. vice) image pickup device, the CMOS (color filter is arranged arrangement) image pickup device etc. are used as the image composition, device (4). In the front side of the image pickup, Cy (cyan; cyan), Mg (magenta; are cases in which a complementary color filter of the e (yellow) is used. The (4) obtains y (the cyan: cyan), the Mg (the deep red: magenta), and t by the using R (red), G (green), an d the primary color system filter of B (blue) as device (4) is driven with the timing signal from the timing generator (8).

In addition, the digital camera of this embodiment includes an A/D converter 10, an image input controller 11, an image signal processing circuit 12, an image compression/expanding circuit 13, a video encoder 14, an image display Device 15, motor driver 16, 17, 18, CPU 19, AF detection circuit 20, AE and AWB detection circuit 21, memory 22, first VRAM 23, It includes a second VRAM 24, a media controller 25, a recording medium 26, a serial I/ F 27, and a trigger R1 . In addition, the digital camera of this embodiment includes a shutter switch (SW1), a recording/reproducing switch (SW2), a zoom switch (SW3), a flash mode switch (SW4) and a shooting mode selection switch (SW5).

Moreover, the digital camera of this embodiment comprises the A/D converter (10), the image input con troller (11), the picture signal processing circuit (12), t he image compression / expander circuit (13), the vide o encoder (14), the image display device (15), motor d rivers (16,17,18), the CPU (19), the AF detection circui t (20), AE, and the AWB detection circuit (21), the me mory (22), the first VRAM (23), the second VRAM (24), the media controller (25), the recording media (26), th e serial I / F (27), the trigger (R1). And moreover, the digital camera of this embodiment comprises the shutte r switch (SW1), the register / regenerative switch (SW 2), the zoom-switch (SW3), and the flash mode switch (SW4), and the photographic Mode selection switch (S W5).

The A/D converter 10 digitizes the image signal output from the imaging device 4 and input through the CDSAMP circuit 9. The image input controller 11 supplies the image signal output from the A/D converter 10 to the CPU 19.

The picture signal in which the image pickup device (4) outputs and the A/ D converter (10) is inputted through the CDSAMP circuit (9) is digitized. The image input co ntroller (11) supplies the picture signal which the A/D c onverter (10) outputs to the CPU (19).

The image signal processing circuit 12 performs image processing such as gamma correction, edge enhancement, and white balance on an input image signal. Parameters for performing such image separation are set by the CPU 19.

It image-processes about the picture signal in which the picture signal processing circuit (12) is inputted of the gamma correction, the edge enhancement, the whi te balance etc. The parameter which is for this kind of image processing to do is set up by the CPU (19).

The picture compression/expanding circuit 13 is the picture signal in which the image compression/encodes the input picture signal. As a compression method of image data, for example, JPEG (joint p expander circuit (13) is inputted is compressed code e. For example, JPEG (joint DCT (dis p) is used as the compression mode of image data. It is the photo graphic experts gru hoto graphic experts group) is used. JPEG is compressing image. Moreover, the compr is not. session mode of image standard for JPEG using the DCT (discrete cosine tr) . limited ansform) and data is not restricted to JPEG.

A first VRAM (video RAM) 23 is a memory for storing image data displayed on the image display device 15. The second VRAM 2 4 is a memory for storing image data displayed on the LCD 58 of the external flash and is an image storage means.

It is the memory that the first VRAM (video RAM: 23) stores data of the indicated image in the image display device (15). It is the memory that the second VRAM (2 4) stores data of the indicated image in the LCD (58) o f the external flash and it is the image storage means.

The video encoder 14 is stored in the first VRAM 23 and the second VRAM 24. based o to form a video composite signal, and the image read out from the first the image display device 15, to the second VRAM In (24), the image read out read out to the image display device (15) from the sec means that is output to signal ond VRAM 24 to the video OUT (R5). It is the display such as the liquid video OUT (R5) is an external ystal display) etc. Indicates the image based on flash in which the image display device is a signal output terminal. (15) is interface include s about the external flash.

Image data in which the video encoder (14) is stored in the first VRAM (23) and the second VRAM (24) are read out and the video composite signal is formed VRAM 23 n this image data and the image read out from the first is transferred to from the VRAM (23) is the image output means which the image is the image output the video OUT (R5). The picture display device 15 outputs the video composite crystal display (LCD: liquid crystal display) that displays an image based on the the video composite eo composite signal that the connection interface has for the vid inputted. The video OUT (R5) is the video composite signal SSO which the connection

The AF detection circuit 20 is for performing automatic focus adjustment based on the output of the imaging device 4. The AF detection circuit 20 detects the high-frequency component level of the image signal in order to control the focus. That is, at the in-focus, the high-frequency component level of the image signal increases. Therefore, the in-focus state can be determined by detecting the high-frequency component level of the image signal. The high-frequency component level of the image signal is detected by the AF detection circuit 20, and the high-frequency component level of the image signal is integrated over a predetermined focus area to obtain an AF evaluation value. The obtained AF evaluation value is supplied to the CPU 19.

The AF detection circuit (20) is to perform the automatic focus control based on the output of the im age pickup device (4). It is for the focus control to do and the AF detection circuit (20) detects the high freq uency component level of the picture signal. That is, in the in-focus point, the high frequency component level of the picture signal is enlarged. Therefore, in focus co ndition can be determined if the high frequency compo nent level of the picture signal is detected. The high fr equency component level of the picture signal is detec ted by the AF detection circuit (20) and the high frequ ency component level of this picture signal is integrate d for the predetermined focal region and the AF evalua tion value saves. The AF evaluation value saved is sup plied to the CPU (19).

The AE and AWB detection circuit 21 forms an exposure control signal and a white balance control signal in the following order based on the image signal output from the imaging device 4 to perform exposure and white balance, and converts these signals to output to the CPU 19.

So that AE and AWB detection circuit (21) perform the exposure and white balance, the exposure control sign al and white balance control signal are formed into the following order based on the picture signal which the im age pickup device (4) outputs and these signals are ou tputted to the CPU (19).

The exposure control signal refers to a luminance evaluation value representing the brightness of an image. The AE and AWB detection circuit 21 calculates the average value of the luminance of the entire image for the input image signal, and uses this as the luminance evaluation value.

The brightness evaluation value in which the exposure control signal shows the brightness of the image is refe rred to. The average value of the brightness of the ima ge total is produced about the picture signal in which A E and AWB detection circuit (21) are inputted and it ha s this as the brightness evaluation value.

Also, the white balance control signal refers to B gain and R gain. Moreover, component gain and R gain of each pixel in the white balance control. Here, in B gain is the whit-balance control, it is magnification toward the blue component of e control, green mponent of each pixel among the three primary colors of each ach pixel and R gain is magnification toward the red co . Also, in white balance the B gain and R gain among the three primary colors of each pixel in the whi pixel. Moreover, the balance of the three primary colors is controlled by multiplying component (by a factor of 1). do. The lance control controls the blue component ha for the blue component and the red component without changing the green red, blue, and green change (1 times) and the balance of B gain about the r it does not AE and AWB detection circuit 21 calculates the average value of each value of the component by the average value of the blue component ed minutes of the entire image, and B gain is the value obtained by dividing the average component is red ed by. AE and AWB detection circuit (21) produce the value component and three primary colors R gain is multipli , and the average value of the green total, blue, and the green component each average value and it can be said divided by the average value of the r component is called the R gain. ed of the image dividing the average value of the gr een component into the to be the value dividing B gain, and the average value of the green component the value average value of the blue com ponent into the average value of the red component R gain.

The CPU 19 is an operation means for controlling the entire digital camera, and the CPU 19 is the operation means controlling the digital camera whole and it mea. Further, ns producing image data. Moreover, in the CPU (19), th shutter is an image generation means for generating image data on the image generation switch (SW1), record/playback switch (SW2), zoom switch (SW

3), an input signal is given from a flash mode switch (SW4), a shooting mode selection switch (SW5), and the like. Also, from the CPU 19, a zoom driving signal for moving the zoom lens 1, a focus driving signal for moving the focus lens 3, an diaphragm driving signal for opening and closing the diaphragm 2, and a CDSAMP circuit 9), a gain control signal for controlling the gain and a trigger signal for driving an external flash are output. In addition, the CPU 19 performs serial communication with an external flash through the serial I/F 27.

e input signal is given from the shutter switch (SW1), r egister / regenerative switch (SW2), zoom-switch (SW 3), flash mode switch (SW4), the photographic Mode s election switch (SW5) etc. Moreover, the zoom driving signal, for moving the zoom lens (1) from the CPU (19) the focusing drive signal, for moving the focusing lens (3) the aperture driving signal, for opening and closing the iris (2) the gain control signal for controlling the gai n of the CDSAMP circuit (9), and the trigger signal for operating the external flash are outputted. Moreover, t he CPU (19) performs the external flash and serial com munications through the serial I / F (27).

The memory 22 stores a program for operating the CPU 19. The memory 22 is the RAM (random access memory) which is the memory of the used memory .) and CPU 19 (read only memory) which is the nonvolatile access memory), which is a volatile memory used as working memory.

volatility as the ROM ROM (read only memory) which is a non-volatile memory st RAM oring the program for operating the CPU 19 and worki (random ng memory the CPU (19) operates.

The shutter switch SW1 is a switch that takes an image when pressed in the recording mode.

It is the switch in which the shutter switch (SW1) takes a picture of the image if the switch is pressed do wn in the write mode.

The recording/playback switch SW2 is a switch that sets the digital camera to a recording mode for capturing images or a playback mode for displaying captured images on the image display device 15.

It is the switch in which the register / regenerative switch (SW2) sets up the digital camera as the playba ck mode indicating the write mode taking a picture of t he image or the image taken a photograph in the image display device (15).

The zoom switch (SW3) is a switch that moves the zoom lens 1 in recording mode.

It is the switch in which the zoom-switch (SW3) moves the zoom lens (1) in the write mode.

The flash mode switch (SW4) is a switch that sets automatic light emission/ forced light emission/disabled light emission mode of the flash.

The flash mode switch (SW4) is the switch setting up the automatic radiation / force radiation / radiation for bid as the light emitting mode of the flash.

The shooting mode selection switch (SW5) is a switch for selecting one shooting mode according to the shooting situation among self-timer mode, continuous shooting mode, single shooting mode, and bracket mode.

According to the photographic Mode selection switch (SW5) is the photographing status among the self-time r mode, sequence photography mode, single photograp hic Mode, bracket modes, it is the switch which is for o ne photographic Mode to choose.

The media controller 25 functions to read/write data to the recording medium 26.

The media controller (25) functions to do the reading/writing about data in the recording media (26).

The recording medium 26 is a medium on which compression-encoded image signals are recorded as image files, and a card-type removable memory using a flash memory is used, for example. In addition, non-volatile memory, magnetic tape, magnetic disk, optical disk, etc. built in a digital camera may be applied to the recording medium 26.

It is the media in which the picture signal in which the recording media (26) is compression coded is recorded as the graphics file and the detachable memory using f or example, the flash memory of the card-typed is use d. Moreover, in the recording media (26), the nonvolatil e memory, magnetic tape, magnetic disc, the optical di sc etc which the digital camera is installed can be appli ed.

2 is a block diagram showing the configuration of an external flash according to an embodiment of the present invention. The external flash includes a zoom panel (50), a motor driver (51), a light emitter (52), a CPU (53), a charger (54), a power supply (55), a video I/F (56), and an LCD driver (57). , LCD (58), and serial I/F (59).

Figure 2 is a block diagram showing the configuration of the external flash about a preferred embodiment of the present invention. The external flash includes the zoom panel (50), the motor driver (51), the light emitting uni t (52), the CPU (53), the charge unit (54), the power s upply unit (55), the video I / F (56), the liquid crystal d isplay driver (57), the LCD (58), the serial I / F (59).

The zoom panel 50 is a panel driven by a motor driver 51, and the exopsure angle of the flash which the light

The irradiation angle of the flash light emitted by the light emitting unit 52 is changed. The light emitting unit 52, the emitting unit 52 emits as the panel in which the according to the instruction of the CPU 53. The charging unit 54 has power ed. zoom panel 50 is driven with the motor driver 51 is changed, and emits light accumulated and supplied a large current for the light emitting unit 52 to emit The light emitting unit (52) emits the flash with the indication of the CPU (53) that has that supplies electricity stored in the charging unit 54 and accumulates electricity light. The high current in which th The power supply unit 55 is an electric charge unit 54 and the emitting unit (52) radiates is supplied. It is the battery is a connection and the light. The video IN (P5) is connected to the video OUT (R5) of the camera in which the power supply unit (55) supplies the electri video composite signal. terminal, and the video I/F (56) connected to the video IN (P5) is an image input means LCD (58) by receiving the video composite signal of the video I/F (56) or image LCD dry city of accumulating to the charge unit (54). It is the c buffer (57) drives the LCD(58) is driven by the LCD driver(57) with the video OUT (R5) of the data of the CPU onnection terminal in which the video IN (P5) connects (53) . The display means for displaying an image. Serial I/F (59) is an interface for serial camera and it is the im age input means in which the video I/F (56) connecte is an image sig camera, and Sin(s nal. Image data of the video composite signal of the vi communication between the card to the video IN (P5) receives the video composite received and the liquid d), communication by GND (ground) connection terminal erial in), Sout (serial out), CLK (clock), CS (clear to sen deo I / F (56) or the CPU (53) is he picture display device in which the LCD (58) is drive that transmits the flash do. Trigger(P1) crystal display driver (57) operates the LCD (58). It is t is the signal the image which the liquid crystal display driver (57) receives. In the serial I / F timing notified by the camera. n with the liquid crystal display driver (57) and indicating communicates with the connection terminal of the Sin (serial in), the Sout (59) is the interval with the camera, it is the interface the serial communications an d it the trigger (P1) transmits the emission timing of the flash which the camera (serial out), CLK (clock) , the CS (clear to send), GND (ground). It is the signal wire in which notifies.

3a and 3b are a camera and an external camera according to an embodiment of the present invention

Figures 3a and 3b are drawing showing hot shoes A diagram showing the hot shoes 60 and 61, which are communication means of the flash. Figures 60 and 61 which are the communication means of the camera about a preferred and the hot shoe 60 has a forward and external flash. In the drawing 3a is the embodiment of the present inve 3a is a view of the camera viewed from above, terminals provided by the hot shoe (6 part the camera, it is this drawing. In the upper flash mounted by sliding the hot shoe 61 of the external flash. The connection of the external flash is slid from f Sin(R3), Sout(R4), CS(clear to send; R6), hot shoe (6 0) are for serial communication of the serial I/F (27) 0), the hot shoe (61) trigger output (R1), common graph put of the GND (R2), in which connection CLK(clock; ront and it mounts. It is the video OUT (R5) for the out R7), and trigger for hot shoe (60) includes are the It is common ground (R5). Video OUT (R5) is terminals whi sound, GND (R2), and video for output of video encoder 14 OUT ch the flash of the Sin (R3) for the serial communications, the Sout. 3B shows the arranged ahead of other connection terminals in the insertion direction of the external bottom, and the connection terminals provided by the hot shoe 61 are R7), with external flash as R4, the CS (clear to send: R6), with the CLK (clock: a view from the communication of real I/F(59), onnection terminal of the serial I/F(27) and video the trigger (R1) for the trigger output, each c Sin(P4), Sout(P3), CS(P6) for serial connection terminal. The video OUT (R5) is arranged in the inser ground, GND en CLK (P7), trigger (P1) for trigger input, and common coder (14) of each (P5) of the video I/F (56). ilar connection terminal. In the drawing 3b is the (P2), and the input video IN tion direction front of the external flash than the dissim (P2), in which connection ter minals which the hot shoe (61) includes are the downs ide the external flash, it is this drawing. It is the input video IN (P5) of the GND (P6), with the CLK (P7), with the trigger (P1) for the trigger input, each common ground of the Sin (P4) for the serial communications, the Sout (P3) , the CS connection ter minal of the serial I/F (59) and video I/F (56).

In this way, the connection terminal connected to the image output means is arranged in front of other connection terminals in the direction of inserting the external flash, and image data is output only in a state in which normal communication is possible through the other connection terminal, thereby preventing malfunction of the external flash. can be prevented

In this way, the connection terminal connected to the image output means is arranged to front than the dissi milar connection terminal to the direction inserting the external flash and by outputting image data in the stat e that normally can communicate through the dissimilar connection terminal the malfunction of the external flas h etc. can be prevented.

Next, with reference to FIG. 4, the operation from when the power of the digital camera is turned on will be described, focusing on the operation in conjunction with an external flash. The main power of the digital camera is turned ON/OFF by manipulating a power switch (not shown). When the power is turned on , the digital camera performs initialization of memory, zooming, DSP, and various drivers 16, 17, 18, etc., and then the CPU 19 sends video to the video encoder 14.

Next, it indicates so that the digital camera the CPU (19) stops the signal power about the video OUT (R5) t he initialization of the memory, zooming, DSP, all kinds of the drivers (16,17,18) etc after doing the performan ce to the video encoder (14) if the operation of the tim e in which the power source of the digital camera was

output to OUT(R5). Through this round the connection action with the With this ecomes the main power source of the digital camera, the CPU (19) power switch (not illustrated), and is set to record mode. It is determined g. Through this, the output of the image signal for the external flash is turned on during with reference to fig. 4 is illustrated a Instructs to stop signal external flash it b, the output of the video signal for the external flash is turned OFF (S11). confirms the setting state of the record/playback switch (SW2) th the operation of the whether or not there is (S12). with the ON / OFF the power source is turned on during turned off (S11). Next, the CPU (19) c onfirms the set up status of the register / regenerative switch (SW2) and it determines whether it is set up as the write mode (S12).

Here, the image pickup device 4 regularly accepts the image in the image photographing in the extrinsic if it is set to the recording mode, other than when picture signal is input to the CPU (19) through the CDSAMP circuit (9), phase taking an image, the CDSAMP circuit it is set up as the write mode and the the CPU 19 (the operation at the time of taking an image is described later signal through the A/D converter (10) and the image input controller (11) is input to image signal to the image signal processing circuit 1 (11) (the operation in and the A/D converter 10 and image input controller). The CPU 19 outputs this digital outputs the image from the CPU 19 es later). . The CPU (19) outputs this the image photographing description 2). The image signal processing circuit 12 processing circuit (12). The pictur performs image processing such as white digital image signal, gamma correction, edge enhancement, to the picture signal image-processes about. This image signal is stored in the first VRAM 23 at this balance control, and outputs the resulting image signal e signal processing circuit (12) 19. The video encoder 14 is a first VR enhancement, the whit-balance control picture signal of the gamma correction, the edge e as image data through the CPU e signal is input from the CPU (19) and the picture sign Jit signal is formed, and etc. If the picture data stored in the pictur AM (23) is referred to, the video comper result is outputted. This picture signal is output to value (15). Since the picture this video composite signal is used as a picture display device al which is the CPU 19 as i signal, the picture display unit 15 monitor mage data during display unit 15 displays this video composite stored in the first VRAM 23 through the to image data in which the video encoder (1 4) is stored in the first VRAM (23) shooting. The video composite signal is formed with r image is displayed (S13). eference image display device (15) indicates this video c omposite signal. Therefore the and this video comp osite signal is outputted to the image display device (1 5). The monitor image among ph otography is indicated in the image display device (15)

(S13).

In the meantime, the CPU 19 also inputs the image signal input to the image signal processing circuit 12 to the AE and AWB detection circuit 21, and obtains an exposure control signal and a white balance control signal as a result. Next, the CPU 19 outputs a diaphragm driving signal and a gain setting signal based on the exposure control signal. The aperture driving signal is supplied to the aperture motor 6 through the motor driver 17, and the degree of opening of the aperture 2 is controlled to reach a predetermined signal level. Also, the gain setting signal is supplied to the CDSAMP circuit 9, and the gain of the CDSAMP circuit 9 is controlled to a predetermined signal level. The CPU 19 sets the B gain and R gain to the image signal processing circuit 12 based on the white balance control signal . In this way, exposure and white balance are always controlled in an optimal state so that shooting can be performed at any time in the recording mode.

Moreover, the picture signal which the CPU (19) inputs for that to the picture signal processing circuit (12) is i nput to AE and AWB detection circuit (21) and conseq uently the exposure control signal and white balance c ontrol signal are acquired. Next, the CPU (19) outputs t he aperture driving signal and gain setting signal based on the exposure control signal. And the aperture drivin g signal is supplied to the iris motor (6) through the mo tor driver (17) and about opening of the iris (2) is contr olled so that the predetermined signal level is. Moreove r, the gain setting signal is supplied to the CDSAMP circ uit (9) and the gain of the CDSAMP circuit (9) is contro lled so that the predetermined signal level is. The CPU (19) is for the establishment of B gain in the picture sig nal processing circuit (12) based on the white balance control signal and R gain. In this way, the exposure an d white balance are always controlled in the write mod e to the optimum behavior in order to enable to take a picture of the anytime.

Further, upon determination in step S12, the recording/reproducing switch SW2 switches to playback. established, it moves to the step S1 he reproduction side it moves to the step S12. In the step S14, the image file of the recording medium 26 is opened

Moreover, since the condition is not concluded when the register / regenerative switch (SW2) is set up as t side, since the condition is not S14 in the de 4 . In step S14, the CPU 19 terminates the media control at the step through the grap roller 25 and

read. The CPU 19 supplies the image data read from the recording stuck out with the CPU 19 through the me. Burn dia controller (25). performs image data decompression processing, and ead out from VRAM 23) is stored in Video, mpression/expander circuit (13). The generates a video on / expander circuit 13 performs the image data and image data of the result i. A reproduced image is (23). The video encoder (14) produces the video composite

hics file of the recording media (26) is opened and data on imag is medium 26 to the image compression/expanding circuit 13. e data are The CPU 19 supplies image data r compression/expanding circuit 13 the recording media 26 to the image co resultant image data in the first image compressi coder 14 refers to the image data of the first VRAM 23, decompression composite signal, and supplies it to the image display device 15. output to the image display device 15 (S14). s stored in the first VRAM signal with reference to i mage data of the first VRAM (23) and this is supplied to the image display device (15). The play image is outputted in the image display device (15) (S14).

Next, the CPU 19 starts communication with the external flash through the serial I/F 27 (S15). The CPU 19 determines whether normal communication with the external flash is established (S16). Here, if the external flash is not yet connected and communication is not established, the process moves to step 22 since the condition of step S16 is not established. In step S22, the CPU 19 instructs the video encoder 14 again following step S11 to stop outputting the signal to the video OUT R5 (S22). Incidentally, the stop signal output here is because the external flash is connected to the camera, the video is output from the video OUT (R5), and then the external flash is removed. Next, as long as the power is not turned off (S23), the process returns to step S12 and repeats the same sequence.

Next, the CPU (19) starts the communication with the external flash through the serial I / F (27) (S15). The C PU (19) determines whether the normal communicating with the external flash is concluded or not (S16). Here, if the external flash is not yet connected and the com municating is not concluded it moves to 22 step since t he condition of the step S16 is not established. In the step S22, the CPU (19) again indicates to the video en coder (14) following the step S11 in order to stop the s ignal power about the video OUT (R5) (S22). Moreover, here, the external flash is connected to the camera to stop the signal power and after which takes the extern al flash after it outputs the image from the video OUT (R5) is considered. Next, the power source returns to t he step S12 which does not have and which the power source do (S23)s and the same sequence is repeated.

If the external flash is connected to the camera while repeating the sequence, the CPU 19 communicates with the external flash in step S15, repeating the sequence, the communicating with the e be able to For this reason, normal communication, which is the determination condition of step S16, is established if xternal flash the CPU 19 is possible in the step S15 if, and the process moves to step S17. In step S17, the CPU 19 inquires the external flash about the charging state through the real I/F 27 since the normality communicating which is the step S17 the CPU (19) asks about the state of cha rge to the referee condition of the step S16 is concluded and it moves to. the (59) When the charging status is acquired from (54), it is notified external flash in the step S17 through the charging state through the serial I/F Since it is es the consulting of the state of charge through the se through erial I/F (27) the CPU (53) of the external flash receiv real I/F (59). the CPU 19 will receive rial I / F (59), the state of charge is acquired that the external flash is connected, if the charging unit 54 is charging here, I/F (27) (S charge unit (54) and it notifies the external flash is con from the Receive notification that charging is in progress through the real charge, here the CPU (19) receives the n otification of the content 17). nected through the serial I / F (59) if the charge unit (54) was the through the serial I / F (27) f or this reason. It is in the charge (S17).

Next, in the judgment condition of step S18, charging of the external flash is required Next, in the referee condition of the step S18, since this condition is met. Since the decision condition of step S18 was the charge of the external flash was this condition was required, so to step S19. The CPU 19 reports &quot ;charge oncluded. Therefore, concluded the referee condition of the step S18 was c, the process moves 24 (19) records image data of the character called “char (S19). Next, it moves to the step S19 the CPU !” is recorded in the second VRAM VRAM 24 (S19). Next, it instructs to start signal output for the OUT the CPU 19 sends the video encoder 14 video ging !” this in the second When the audio encoder (14) receives this instruction, it is stored in (R5) (S21). Non-CPU (19) indicates to the video encoder (14) in order t (R5) (S2 1). If the video encoder (14) receives the enhanced gr the second VRAM (24) o start the signal power about the video OUT charger, image data stored in the second VRAM signal is video composite signal is generated/output. This video composite aphic via video OUT (R5) and video I/F (56) . The LCD driver outputs transmitted to LCD (24) are read out and the video composite signal based driver production /. is received, based on this signal, " This video the video composite signal on this image data is outputted with the shown in FIG. 7 . Next, the crystal display driver via the video OUT composite signal is transmitted to the liquid !" is displayed on the LCD 58 as S12 and repeats the same sequence. (R5) and video (S23) where the power is not turned off returns to step

I / F (56). As shown in Figure 7, it indicates based on t wo signal as the LCD (58) ÿthe charging !ÿ if the liquid crystal display driver receives the video composite sign al. Next, the power source returns to the step S12 whi ch does not have and which the power source do (S2

In this way, the connection terminal video OUT (R5) of the interface for connecting the external flash of the camera is provided ahead of the connection terminal for serial communication or trigger, which is the connection terminal for the existing external flash, in the insertion direction of the external flash. is connected and the output of video OUT (R5) is stopped until serial communication is established. By doing this, when connecting the external flash, even if the video OUT (R5), which is the connection terminal of the video encoder 14, is contacted with the serial communication or trigger d0 connection terminal of the external flash , the external flash does not malfunction or load is not applied. .

3)s and the same sequence is repeated.

In this way, the connection terminal video OUT (R5) of the interface for the external flash connection of the c amera is included than the connection terminal of the s erial communications which is the connection terminal f or the existing external flash or the trigger in the inserti on direction front of the external flash and until the ext ernal flash is connected and the serial communications establishes the output of the video OUT (R5) is stoppe d. In this way, when the external flash is connected as box even if it contacts the d0 connection terminal of the serial communications of the external flash or the t rigger in the video OUT (R5) which is the connection te rminal of the video encoder (14) the external flash malf unctions or the subordinate is not caught.

Moreover, it becomes unsteadily the ground of the external flash inside among the charge of the charge u becomes unstable during charging of the charging unit 54, the ground has the concern in why. Therefore, in this embodiment, the display and even if the image is distorted, the image quality is markedly degraded y, incontent is changed or h the display of the LCD (58) is distorted. Consequentl display is limited, to this, ntents is changed or the limit is put in the display and i. For example, the present preferred embodiment, the marked co is displayed such as "Charging!" In addition 56 is cut off to lower the picture quality even if the image is distorted, and the image display of the LCD 58 t indicates like "charging !" . Alternatively, the output of the video I/F the display of the LCD 58 which changes, and when charging is finished, the marked previously held by the LCD driver 57 or the like is displayed on the LCD 58. d. Besides, displayed. onochrome. Or the output of the video I / F (56) is cut off and the image contents or limited can be marked to the m image input from the video I/F 56 can be and if the charge is terminated, the image inputted from the video I / F (56) can be which the liquid crystal display driver (57) etc. have in advance is indicated in the LCD (58) indicated.

In this way, by displaying a predetermined image or text on the image display means when the charging means of the external flash is being charged, it is possible to prevent a significant deterioration in image quality even if the display of the image display means is disturbed.

In this way, the predetermined image or the character is indicated in the picture display device when the rech arge means of the external flash is the charge. In that way it can prevent although the display of the picture display device gets messed up the picture quality from being remarkably lowered.

Furthermore, if time passes and the charge unit (54) charge of the external flash is terminated the CPU (1), the CPU (19) completes in step S17. Serial I/ 9) receives the through the serial I/F (27) It is I / F. Therefore, the judgment conditions of step S18, notification of the recharge complete in F (59) and the step S17 from the CPU (53) established, the process moves to step S20. In step S20, the CPU 19 concluded that charging is necessary, are (59) and serial I / F (27). Therefore, because it is not S18 is it moves to the step S20 shown in FIG. 5A. In the shutter speed, aperture that the charge which is the referee conditi designated information data (eg, on of the step (the photographin 2 recorded in the VRAM 24 (S20). At this time, the video encoder value, etc.) shooting conditions) as image data, and in step S20, it has the information data output has already started in step S21, image data stored in the second V ample, 14 determines g condition including the shutter speed, shown in for ex Since signal PU (19) is designated as image data and it records in t Generates/outputs a video the drawing 5a the iris value etc) in which the C RAM 24 is read from time to time, and this encode Therefore, here, the image of the information data recorded in the second composite signal based on image data. he second VRAM (24) (S20). Then, in the video the video composite signal is generated / output, ed. Therefore image data stored in VRAM 24 r (14) is the step S21, the signal power is already start By reading the phase data, time are read out and transmitted to the video comp. When the LCD driver receives the second VRAM video OUT(R5) and video I/F(56) via the LCD driver (24) from time to with, it displays information data on the LCD 58 based on this signal. the production /. the video composite signal and the osite signal based on this image data is outputted OFF, which is the determination condition of step S23, ation data recorded in the Therefore, here, after image data of inform, until the condition that the power supply is this process. production / and it transmits via the video OUT (R5) an d video I / F second VRAM 24 is read o ut and the video composite signal is outputted with the Repeat video comp osite signal , it indicates in the LCD (58) based on two signal by (56) in the liquid crystal display driver. If t he liquid crystal display driver receives the t information data. Then, until the condition th at the power source which is the referee condition of

he step S23 is turned off is established the e-process i s repeated.

Here, the image that the CPU 19 writes into the second VRAM 24 and displays on the LCD 58 Here, it was done by the photographing condition is set to the shooting condition shown in Fig. 5A, but this showing the image in which the CPU (19) wrote in the second VRAM (24) and indicated in the LCD (58) in the CP drawing 5a. However it can distribution, etc. is gure 5f) of 1 each (Figure 5e) of the photographed ima or in playback become besides 1 each (Fi U (19) interprets and the histogram (Fig. 5b) of the luminance previous or photographed images forward and back (Fig. 5c), or ward in the help mode or recording mode An enlarged image of a part of a photographed image ges mode. Displaying help on how to operate the camera (Fig. 5d), m (Figure 5b), or the button (Figure 5d), about the histogra stored in the memory 22 in the playback mode or recording captured image in playback mode or recording mode The images at the playback mode image (Figure 5c), augmenting a image (Fig . 5e) or part of the photographed before the handling method for storage in the memory (22) in the playback mode or the write may be one before and after the captured image (FIG. 5F). the CPU (19) interprets the photographed images in for example, the playback mode or the write mode or the camera mode or the playback mode or the write mode inc luding the brightness distribution etc. In which or the write mode and obtained.

In addition, the image display device 15 of the camera displays the captured image and histogram, and the external flash LCD 58 displays the shooting conditions (Fig. 6c), and the camera is operated to display the histogram on the external flash. Then, the CPU 19 changes the image stored in the first VRAM 23 and stops displaying the histogram on the image display device 15 (FIG. 6D), so that the image display device 15 and the LCD (58) may be coordinated. For another example, when there are six types of display items: (1) shutter speed, (2) aperture, (3) zoom, (4) exposure compensation, (5) flash mode, and (6) histogram , (When the shutter speed of 1) is displayed on the LCD 58 of the external flash, the rest of (2) to (6) are displayed on the image display device 15 of the camera, and the aperture of (2) is displayed on the LCD of the external flash (58), the remaining (1) and (3) to (6) may be displayed in a toggle manner so that the display items are sequentially linked and changed on the image display device 15 of the camera.

Moreover, it may be acceptable that the image display device (15) of the camera indicates the photographed i mages and histogram and if the camera is manipulated i n the external flash LCD (58) in the state (Figure 6c) in dicating the photographing condition and the histogram is indicated in the external flash in order that it disco ntinue (Figure 6d)s the image in which the CPU (19) is stored in the first VRAM (23) being changed and indicat ing the histogram in the image display device (15) the marked contents of the LCD (58) and image display dev ice (15) is hands with joined. It may be acceptable tha t when it has 6 kind of (1) shutter speed, (2) iris, (3) z oom, (4) exposure correction, (5) flash mode, (6) histo gram as the dissimilar display item the rest (2) ~ (6) i ndicates in the image display device (15) of the camer a when indicating the shutter speed of (1) in the LCD (58) of the external flash and the display item is succe ssively operated with to the toggle style crack in order to indicate the rest (1) and (3) ~ (6) in the image displ ay device (15) of the camera if the iris of (2) be indica ted in the LCD (58) of the external flash, and it change

s.

Next, the operation at the time of image capturing is explained. First, when the shutter switch Next, the operation in the image photographing is (SW1) is pressed, and the CPU 19 detects this, the timing generator illustrated. First, the shutter switch (SW1) is pressed d own and the shutter signal is sent to the timing generator (8) at the same time as send a trigger signal to the external flash through the trigger (29). When the CPU (5 sending the shutter signal to the trigger (8) if the CPU (19) detects this . Simultaneously light emission instruction to the light emitter 52, so ger (29) when radiating the flash. As trigger signal is sent the external flash through the trig 3) receives the trigger signal, it sends a emitting unit 52 if supplied by the power supplied from the charging unit 54. The image the CPU 53 sends, the light emitting unit 52 emits light if the radiation indication to the light received. Therefore the flash is emi, and the received image is output as an analog pickup device 4 receives an image projected by this flash of light, and the trigger signal is are gain controlled by the CDSAMP circuit (9) and 2) is supplied from the charge unit image signal. This is notted with the electricity that the light emitting unit (5 analog picture signals the image pickup device 4 is irradiated in this hair image signal is taken on and the (54). The image in A/D converter 10 converts it into a digital image signal. This digital which the digital picture signal received is the picture signal source o the analog picture image accepted is outputted t to the CPU 19 through the image input controller 11. After that, signal. This analog picture signal is Image processing such as gamma correction, edge emphasis, white balance, YC conversion gain controlled with the CDSAMP circuit (9) and it is tra is performed in the circuit (12), and the image compression / expansion circuit (13) Data formed to the digital image signal with the A/D conveyor is compressed and recorded on the recording medium 26 as an image file. rter (10). This digital image signal enters the CPU (19) through the image input controller (11). Thereafter, as to the accepted digital image signal, the image process ing of the gamma correction, edge enhancement, white balance, the YC conversion etc is performed in the pict ure signal processing circuit (12) and it data compressi on:s is performed with the image compression / expander circuit (13) and it is recorded in the recording media

(26) as the graphics file.

In addition, in this embodiment, the camera is provided with a second VRAM 24 and, moreover, it may be acceptable that it was in this audio encoder 14, and the camera has a connection terminal video OUT embodiment and the second VRAM 24 and video enco der (14) were included in the camera and flash receives the video composite signal output by the camera d (R5) , but the id that the external flash received the video composite that the external platform signal which the camera outputted to the connection t flash, and the the second VRAM (24) and the video encoder 14 is installed in an external OUT (R5). However, image data which set may be written to the second image data output by the CPU 19 is outputted to the external platform video in the external flash and which the CPU (19) outputs are VRAM 24 provided in the flash. up the second VRAM (24) and video encoder (14) recoded in the second VRAM (24) equipped in the extern al flash.

Furthermore, the wireless communication apparatus can be used to communicate image data or video between a camera and an external flash. Moreover, the wireless communication apparatus can composite signals. That is, be used when communicating image data or the video, as shown in Figure 6a, Bluetooth or UWB (ult composite signal between the camera and external flas h. That is, as shown in Figure 6a, the wireless interfac ra wide band) You can physical connection means such as a connection terminal such as a hot use wireless I/F such as At this time, regardless of whether or not there is a shoe, e including the Bluetooth or the UWB (ultra wide band) etc. can be used. Then, it has no relation to the occur. In addition, when using such a wireless rence of the physical connection method like the conne, and an ction I/F, as shown in FIG. 6B , a bidirectional wireless I/F is used, as shown in the button is provided, and an instruction of the shutter button is notified to the terminal including the hot shoe etc on the external flash side . Moreover, th shutter shutter to cause the camera to take an image. It can also be a button in CPU 19 via this wireless I/F, e.g. using this kind of wireless interface, and the are included and the indication of this shutter button is notified of through the external flash as shown in Figure. 6b, the bidirectional wireless interface is used this wireless interface in the CPU (19) and the camera takes a picture of the image.

Although the present invention has been described with reference to the above-described embodiments, these are only examples, and those skilled in the art will understand that various modifications and other equivalent embodiments are possible therefrom. Therefore, the true technical protection scope of the present invention will be defined by the appended claims.

For your reference, the invention was the above described embodiment illustrated but this is illustrative i t is nothing but and if it experiences and it grows up un der the technical field, it will understand that it change s and the equal other embodiment is possible to be fro m this various. Therefore, it should be determined with the patent claim in which the extent of technical prote ction calming oneself down of the invention is attache d.

Brief description of the drawing

Brief explanation of the drawing Figure 1 is a block

1 is a block diagram showing the overall configuration of a camera according to an embodiment of the present invention.

diagram showing the whole configuration of the camera about a preferred embodim ent of the present invention.

2 is a block diagram showing the configuration of an external flash according to an embodiment of the present invention.

Figure 2 is a block diagram showing the configuration of the external flash about a preferred embodiment of the present invention.

3A is a plan view of a camera for showing a connection interface between a camera and an external flash according to an embodiment of the present invention.

Figure 3a is a plane view of the camera for showing the connection interface of the camera about a preferred e mbodiment of the present invention and external flash.

3B is a bottom view of an upper flash for illustrating a connection interface between a camera and an external flash according to an embodiment of the present invention.

Figure 3b is a bottom view of the abandonment flash for showing the connection interface of the camera ab out a preferred embodiment of the present invention an d external flash.

4 is a flowchart illustrating the operation of a camera according to an embodiment of the present invention.

Figure 4 is a flowchart for illustrating the operation of the camera about a preferred embodiment of the present invention. Figure 5a is an image table of a camera system

according to an embodiment of the present invention Figure 5a is a display example in the image display device of the camera system about a Preferred embodi ment of the present invention and LCD, the photograph is a display example. ing condition including the shutter speed and iris value etc. is indicated.

5B is a display example of displaying a histogram of a luminance distribution and the like in an image display device and LCD of a camera system according to an embodiment of the present invention .

Figure 5b is a display example in the image display device of the camera system about a preferred embodi ment of the present invention and LCD, the histogram i ncluding the brightness distribution etc. is indicated.

5C is a display example of displaying an enlarged image of a part of a captured image in an image display device and LCD of a camera system according to an embodiment of the present invention .

Figure 5c is a display example in the image display device of the camera system about a preferred embodi ment of the present invention and LCD, the photograph ed images partial enlarged image is indicated.

5D is a display example of displaying help for a camera manipulation method in an image display device and LCD of a camera system according to an embodiment of the present invention .

Figure 5d is a display example in the image display device of the camera system about a preferred embodi ment of the present invention and LCD, the help about the camera handling method is indicated.

Fig. 5E is a display example of displaying a previous image of a captured image in the image display device and LCD of the camera system according to the embodiment of the present invention .

Figure 5e is a display example in the image display device of the camera system about a preferred embodi ment of the present invention and LCD, 1 each of the p hotographed images previous is indicated.

5F is a display example of displaying the front and rear images of a captured image on the LCD and the image display device of the camera system according to the embodiment of the present invention .

Figure 5f is a display example in the image display device of the camera system about a preferred embodi ment of the present invention and LCD, forward and ba ckward 1 each of the photographed images are indicat ed.

FIG. 6A is an exemplary view showing that wireless communication is used for communication between a camera and an external flash according to an embodiment of the present invention.

It is the example diagram which shows that the drawing 6a uses the wireless communication in the com munication between the camera about a preferred emb odiment of the present invention and the external flas h. 6b is the example diagram which shows that the example drawing 6b uses the bidirectional wireless interface in the communication between a camera and an external flash according to an embodiment of the present invention. There is also communication between the camera about a preferr. ed embodiment of the present invention and the extern al flash.

6C is an exemplary view showing a state in which a captured image and a histogram are displayed on an image display device of a camera according to an embodiment of the present invention and shooting conditions are displayed on an external flash LCD .

Figure 6c is an example diagram showing state indicates the photographed images and histogram in the image display device of the camera about a preferred embodiment of the present invention and indicating the photographing condition in the external flash LCD. Figure 6d is an example diagram in the drawing 6c, the operating state of the image display device when the RAM is displayed on the external flash by manipulating the camera in Figure 6c. It's a mani try. pulating the camera and indicating the histogram in the external flash is shown.

7 is a display example indicating that the LCD of the camera system according to an embodiment of the present invention is being charged.

Figure 7 is a display example indicating that LCD of the camera system about a preferred embodiment of the pr esent invention is the charging.

* Description of symbols for main parts of drawings

* The description of reference numerals showing the main elements in drawings.

Reference Numerals 1: zoom lens 21: AE and AWB detection circuit 2: aperture 22: memory 3: focus lens 23: first VRAM 4: image pickup device 24: second VRAM 5: zoom motor 25: media controller 6: aperture motor 26: recording medium 7: focus motor 27: serial I/F 8: timing generator 50: zoom panel 9: CDSAMP circuit 51: motor driver DESCRIPTION OF SYMBOLS 10: A/D converter 52: light emitting unit 11: image input controller 53: CPU 12: image signal processing circuit 54: charging unit 13: image compression / expansion circuit 55: power supply unit 14: video encoder 56: video I/F 15: image display device 57: LCD driver 16,17,18: motor driver 58: LCD 19: CPU 59: Serial I/F 20: AF detection circuit 60, 61: hot shoe

1: zoom lens 21: AE and AWB detection circuit. 2: iris 22: memory. 3: focusing lens 23: first VRAM. 4: image pickup device 24: second VRAM. 5: zoom-motor 25: media controller. 6: iris motor 26: recording media. 7: focus motor 27: serial I / F. 8: timing generator 50: zoom panel. 9: CDSAMP circuit 51: motor driver. 10: a/D converter 52: light emitting unit. 11: image input controller 53: CPU. 12: picture signal processing circuit 54: charge unit. 13: image compression / expander circuit 55: power supply unit. 14: video encoder 56: video I / F. 15: image display device 57: liquid crystal display driver. 16,17,18: motor driver 58: LCD. 19: CPU 59: serial I / F. 20: AF detection circuit 60,61: hot shoe.

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