

**Owner's Manual**

**2.4GHZ WIRELESS CAMERA SYSTEM**

(PORTABLE-WIRELESS CCD CAMERA & WIRELESS-VIEW RECEIVER)

WOOJU COMMUNICATIONS CO.,  
LTD.  
FCC ID: KN3 910C-924C  
EXHIBIT #: 7

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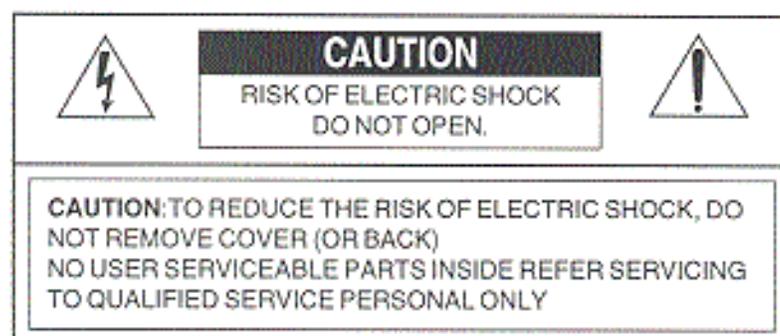
Before operating the unit, please read this manual thoroughly and retain it for future reference.

## WARNING

### WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.  
DO NOT INSERT ANY METALLIC OBJECT THROUGH VENTILATION GRILLS.

### CAUTION



#### Explanation of Graphical Symbols



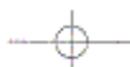
This symbol is intended to alert the user the presence of uninsulated, "dangerous voltage" that may be of sufficient magnitude to constitute a risk of electric shock.



This symbol is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the appliance.

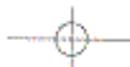
## IMPORTANT SAFEGUARDS

- 1. READ INSTRUCTIONS**-All the safety and operating instructions should be read before the appliance is operated.
- 2. RETAIN INSTRUCTIONS**-The safety and operating instructions should be retained for future reference.
- 3. CLEANING**-Unplug this unit from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
- 4. ATTACHMENTS**-Do not use attachments not recommended by the monitor equipment manufacturer as they may result in the risk of fire, electric shock or injury to persons.
- 5. WATER AND MOISTURE**-Do not use this equipment near water-for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, near a swimming pool, or the like.
- 6. ACCESSORIES**-Do not place this equipment on an unstable cart, stand or table. The equipment may fall, causing serious injury to a child or adult, and serious damage to the equipment. Wall or shell mounting should follow the manufacturer's instructions, and should use a mounting kit approved by the manufacturer.
- 7. A equipment and cart combinations** should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the equipment and cart combination to overturn.
- 8. VENTILATION**-Slots and openings in the cabinet and the back or bottom are provided for ventilation, and to ensure reliable operation of the equipment and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the equipment on a bed, sofa, rug, or other similar surface. This equipment should never be placed near or over adaptor or heat register. This equipment receiver should not be placed in a built-in installation such as a bookcase unless proper ventilation is provided.



## IMPORTANT SAFEGUARDS

9. **POWER SOURCES**-This equipment should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your home. Consult your monitor dealer or local power company. For monitor equipment designed to operate from battery power refer to the operating instructions.
10. **GROUNDING OR POLARIZATION**-This equipment is provided with a polarized alternating-current line plug(a plug having one blade wider than the other). The plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.
- ALTERNATE WARNINGS**-This product is equipped with a three-wire grounding-type plug, a plug having a third (grounding)pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet,contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.
11. **POWER CORDS**-Do not allow anything to rest on the power cord. Do not locate this equipment where the cord will be abused by persons walking on it.
12. **HEED WARNINGS**-Follow all instructions marked on the equipment.
13. **LIGHTNING**-For added protection for this equipment during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the video product due to lightning and power-line surges.
14. **OVERLOADING**-Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.
15. **OBJECT AND LIQUID ENTRY**-Never push objects of any kind into this equipment through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
16. **SERVICING**-Do not attempt to service this equipment yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.





## IMPORTANT SAFEGUARDS

17. **DAMAGE REQUIRING SERVICE**-Unplug this equipment from the wall outlet and refer servicing to qualified service personnel under the following conditions:
- A. When the power supply cord or the plug has been damaged.
  - B. If liquid has been spilled, or objects have fallen into the video product.
  - C. If the video product has been exposed to rain or water.
  - D. If the video product does not operate normally by following the operating instructions, adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls, may result in damage and will often require extensive work by a qualified technician to restore the video product to its normal operation.
  - E. If the video product has been dropped, or the cabinet damaged.
  - F. When the video product exhibits a distinct change in performance-this indicates a need for service.
18. **REPLACEMENT PARTS**-When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.
19. **SAFETY CHECK**-Upon completion of any service or repairs to this video product, ask the service technician to perform safety checks to determine that the video product is in proper operating condition.

**SAVE THESE INSTRUCTIONS.**



**FCC CLASS B NOTICE**

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ▷ Reorient or relocate the receiving antenna.
- ▷ Increase the separation between the equipment and receiver.
- ▷ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ▷ Consult the dealer or an experienced radio or television technician for help.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.

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## INTRODUCTION

This system will give you added security and comfort for many years. It is easy to install in almost anywhere you need audio/video surveillance. To safely use all the high technical functions of the unit, please read the installation and operating instruction in the manual, and keep it for future reference.

Your new wireless CCD camera is specially engineered for wireless observation system. It features a sensitive microphone thus registering both images and sound via the monitor. Camera sensitivity is automatically regulated by averaging the screen. For this reason, bright lights will cause a loss of shadow detail. This is something to be considered when at night, a hall light may be in the field of view of the camera, causing shadow detail to be lost.

Conversely a large dark area such as a large unit stairwell may cause highlight detail to wash out. Correct camera placement will eliminate some of these problems.

## FEATURES

- Highly reliable stable circuit to assure best quality picture.
- Availability of up to 4 camera connections.
- Easy to install and operate.
- Compact, lightweight and versatile.
- Clear Video/Audio transmission without running cable.
- Audio/Video out jacks to be connected to a monitor or TV set.
- Record and review the image with VCR.
- Low minimum lighting capacity.
- One way Audio system.
- Portable wireless CCD-camera.
- Manual or auto camera selection switch.

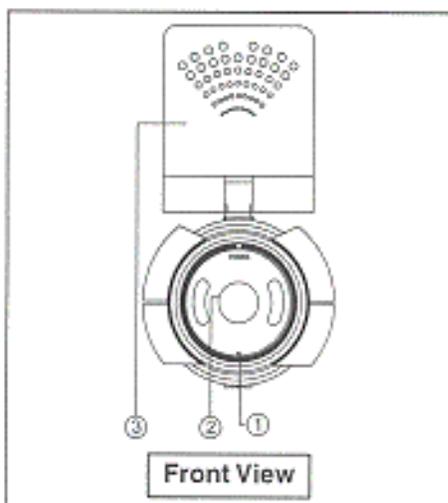
### Read the following precautions before installing or using the system

1. Choose an ideal location for the camera so that the lens won't be exposed to any direct light source. The camera unit must also be protected against moisture and vibration.
2. The monitor should only be operated with the correct power source indicated on the specification.
3. Check the system for operation prior to installing the unit.
4. Be extra careful not to scratch the camera lens.

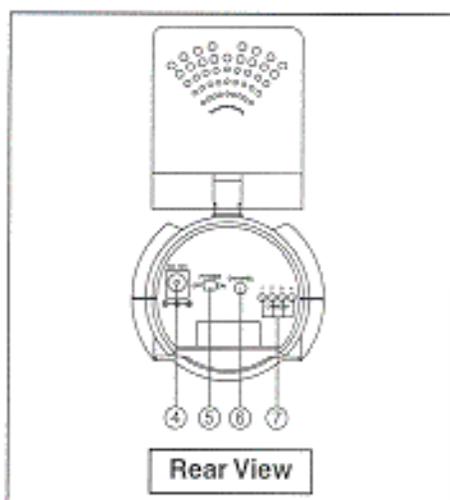


## CONTROLS AND FUNCTIONS

### ● Camera

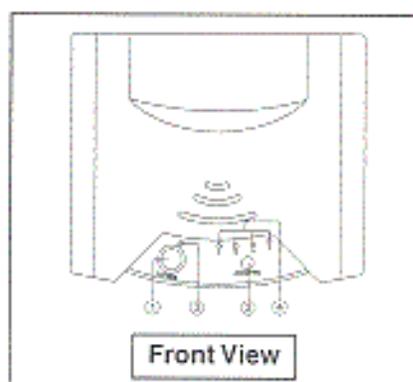


1. **LED-POWER INDICATOR**  
Indicates the camera is turned on.
2. **CCD CAMERA LENS**  
Delivers sharp image to the CCD sensor.
3. **ANT**  
Send an elective wave
4. **DC POWER INPUT JACK**  
Receive the source of electric power through AC adaptor.
5. **POWER ON/OFF S/W**  
Move S/W to right or left for turning power on or off.
6. **S/W FOR CHANGING CHANNEL**  
Press S/W for moving to channel 1,2,3,4
7. **CHANNEL 1,2,3,4 LED**  
It shows channel by light of LED.

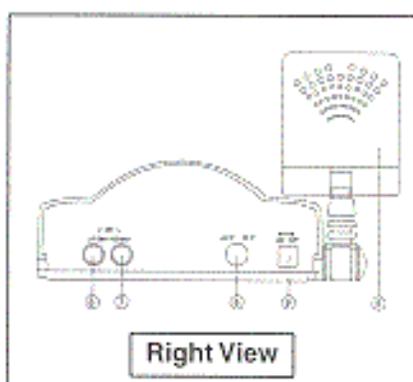


## OPERATING INSTRUCTION

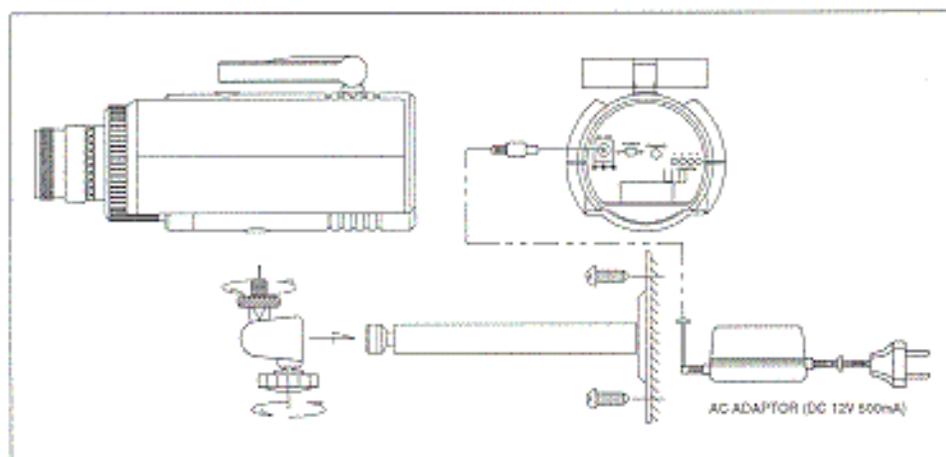
### ● Wireless Receiver



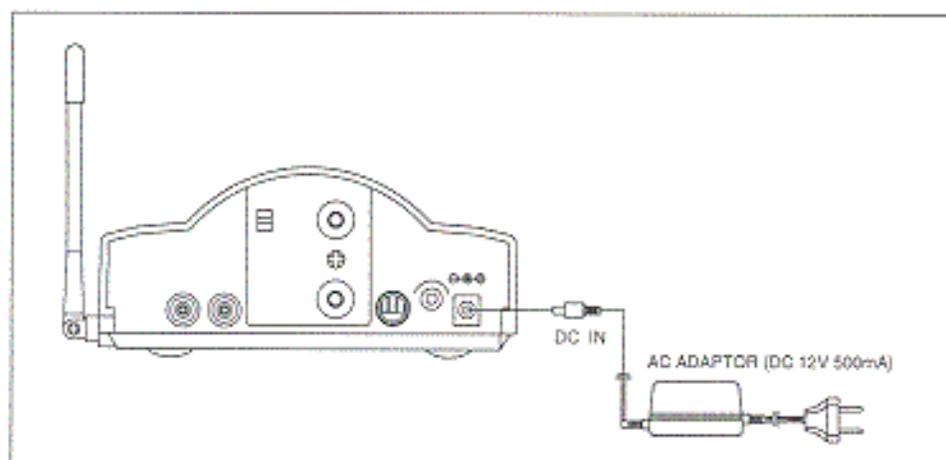
1. **POWER ON / OFF BUTTON**  
Press to turn on the power.
2. **CHANNEL SELECTOR BUTTON**  
Press S/W for moving to channel 1,2,3,4
3. **LED POWER INDICATOR**  
On/off light.
4. **CHANNEL 1,2,3,4 LED**  
It shows channel by light of LED
5. **ANT**  
Receive an elective wave



6. **AUDIO OUTPUT JACK**  
Send audio signal
7. **VIDEO OUTPUT JACK**  
Send video signal
8. **OUTPUT DIN JACK**  
Send audio, video signal
9. **DC POWER INPUT JACK**  
Receive the source of electric power through AC adaptor

**INSTALLATION****● Mounting the Camera**

1. Attach the stand base to the wall or ceiling where you want to install the camera. Locate a wall stud or ceiling joist and secure bracket using the four supplied head screws.
2. Attach the camera to the stand and firmly tighten the swivel.
3. Attach the camera with the stand to the stand base. Firmly tighten the joint knob on the stand base.
4. Connect the supplied 12V 500mA AC Adaptor to the DC IN jack on the rear of the camera and plug it into AC outlet.  
The red LED on the front of the camera will indicate that the unit is turned on.

**INSTALLATION****● Wireless Receiver**

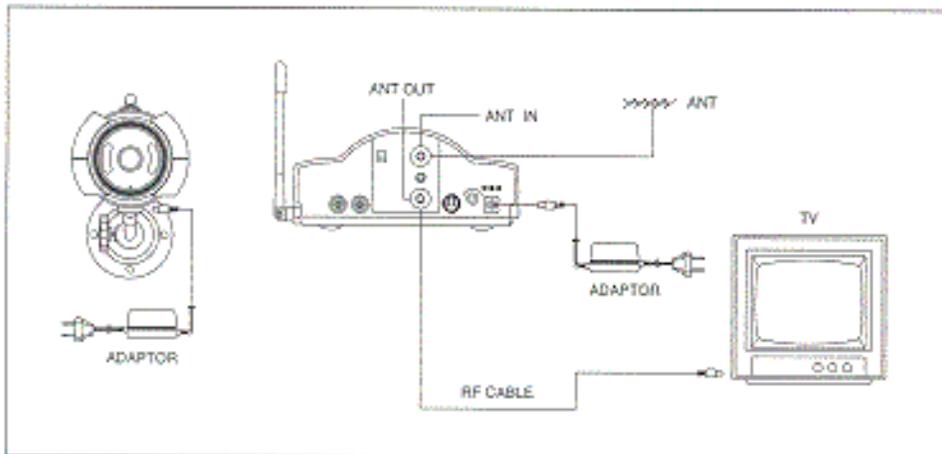
1. Place the wireless receiver unit on or near the TV with audio/video input jacks or monitor where you want to install it.
2. Set the antenna position by rotating it clockwise.
3. Connect the supplied 12V/500mA AC adaptor to the DC IN jack at the rear of the receiver and plug it into AC outlet.
4. Push the power switch. The red LED on the receiver will indicate that the unit is turned on. Be sure the receiving TV or VCR is turned off. Turn on the wireless receiver first.

## WIRELESS OPERATION

Maximum range is 120ft. without loss of any picture/sound quality.

**NOTE:** Each home or office has different reception. Different construction products, such as foil insulation, heating ducts, steel studs, etc, will create different reception conditions. It may be necessary to rotate the antenna or move the wireless camera and wireless receiver to get the best reception. Placing the wireless receiver on a shelf near the TV/monitor or VCR may improve the reception.

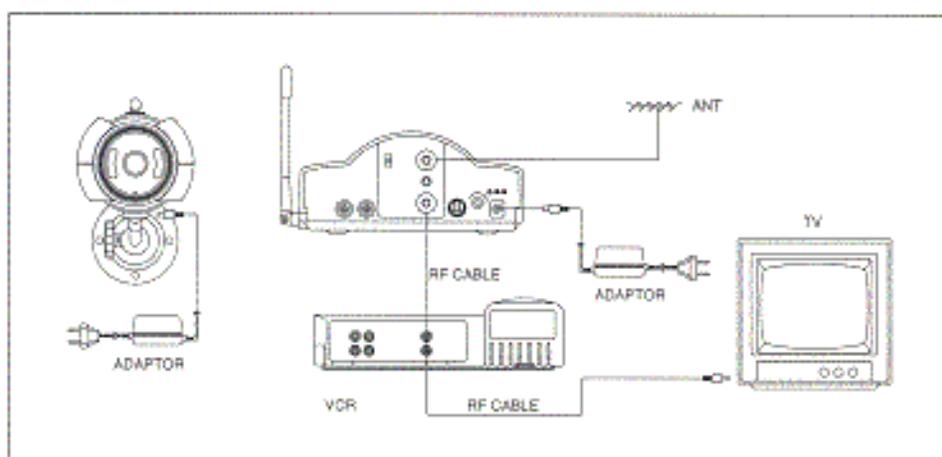
### ● Operation with TV (Optional)



1. Plug one end of the RF cable into the ANT OUT jack at the rear of the receiver.
2. Connect the other end of RF cable to the ANTENNA IN jack on your TV.
3. Plug one end of the coaxial cable (not supplied) into the ANTENNA IN jack at the rear of the receiver unit.  
Connect the other end of the cable to the wall antenna terminal in your home or office.
4. Set the function switch on the wireless receiver to the WIRELESS position (for the regular TV mode, set the function switch to the TV position).
5. Be sure both wireless camera and wireless receiver are turned on.
6. Turn on your TV and adjust the fine tuning control on the wireless receiver.

## WIRELESS OPERATION

### ● Operation with TV & VCR (Optional)

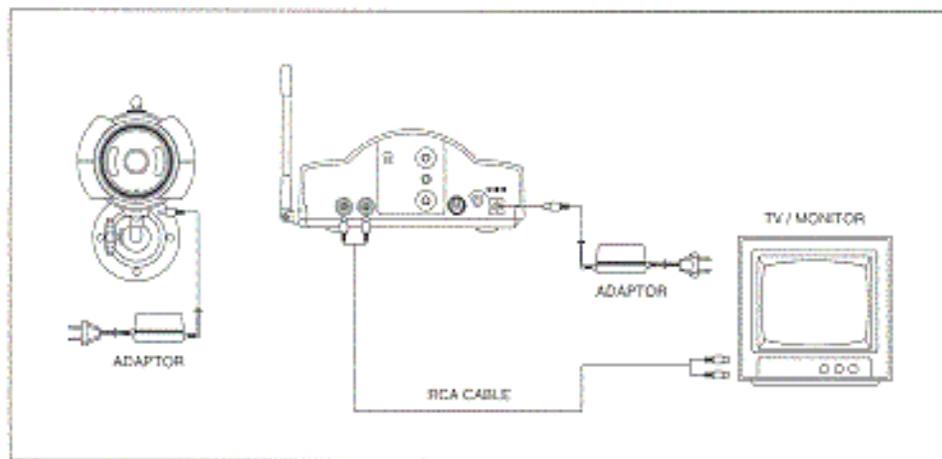


1. Plug one end of the RF cable into the ANT OUT jack at the rear of receiver.
2. Connect the other end of the RF cable to the ANT IN jack on your VCR.
3. Plug one end of RF cable 2 (not supplied) into the ANT OUT jack on your VCR. Connect the other end of cable to the ANTENNA IN jack on your TV.
4. Connect one end of coaxial cable to the ANT IN jack on the receiver and plug it into the wall antenna terminal in your home or office.
5. Set the function switch on the wireless receiver to the WIRELESS position (for the regular TV mode, set the function switch to the TV position).  
Be sure both the wireless camera and the wireless receiver are turned on.
6. Turn on the TV and VCR. Adjust the fine tuning control for the best reception.

## WIRELESS OPERATION

### ● Operation with Monitor

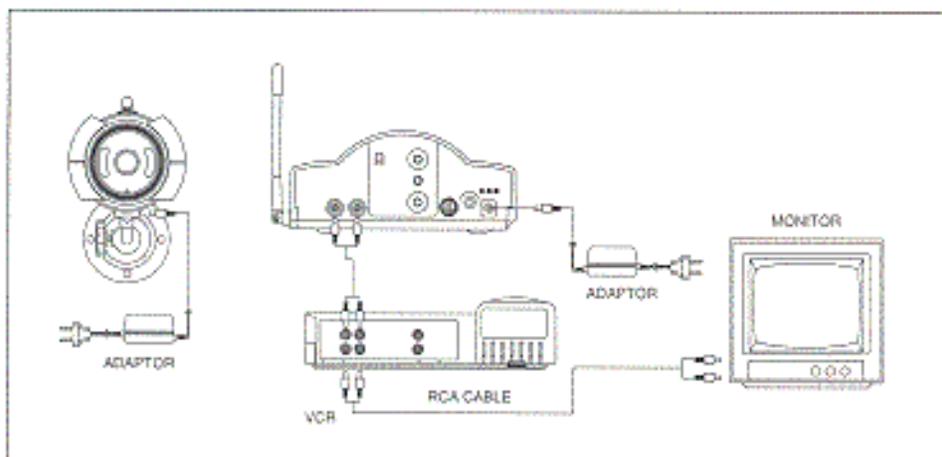
If your TV has Audio/Video input jacks, you may use your TV as a monitor by switching the TV mode to VIDEO function using remote control unit or manually.



1. Connect the shielded RCA cable to the wireless receiver. Plug one white plug into the AUDIO OUT jack and one yellow plug (same side) to the VIDEO OUT jack at the rear of the wireless receiver.
2. Plug the other white and yellow plugs (other side) into the AUDIO IN and VIDEO IN jacks on your observation monitor.
3. Be sure both the wireless camera and receiver are turned on.
4. Turn on your monitor and adjust the fine tuning control on the wireless receiver for the best reception.

## WIRELESS OPERATION

### ● Operation with Monitor & VCR



1. Plug one end of the supplied RF cable into the ANT OUT jack at the rear of the wireless receiver.
2. Connect the other end of RF cable to the ANT IN jack on your VCR.
3. Connect the shielded RCA cable to your VCR.  
Plug one white plug into the AUDIO OUT jack and the yellow plug at the same side to be connected to VIDEO OUT jack on your VCR.
4. Plug the other ends into the AUDIO IN and VIDEO IN jack on your monitor.
5. Be sure both wireless camera and receiver are turned on.
6. Turn on your monitor and VCR.
7. Adjust the fine tuning control on the wireless receiver.



## WIRE OPERATION

When distance is over 120ft, wire mode operation is recommended.

### ● Operation with TV or Monitor

1. Connect the shielded RCA plug to the camera. Plug one white plug into the AUDIO OUT jack and one yellow plug (same side) to the VIDEO OUT jack.
2. Plug the other white and yellow plugs (other side) into the AUDIO IN and VIDEO IN jack on your TV or monitor.
3. Turn on the camera and TV or monitor.

### ● Operation with TV and VCR

1. Connect the shielded RCA plug to the AUDIO OUT and VIDEO OUT jacks at the rear of the camera.  
The white and yellow plugs on the other side should be connected to the AUDIO IN and VIDEO IN jacks on your VCR.
2. Plug one end of the supplied RF cable to the ANT OUT jack on your VCR. Connect the other end to the ANTENNA IN jack on your TV.
3. Turn on the camera, TV and VCR.

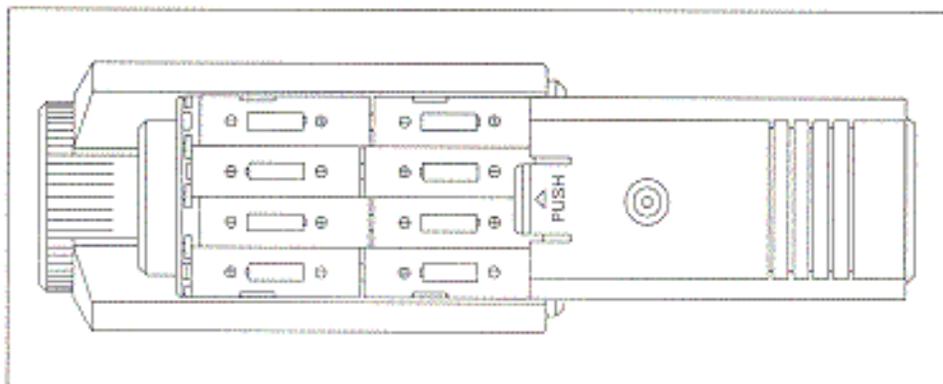
### ● Operation with Monitor and VCR

1. Connect the shielded RCA plug to the AUDIO OUT and VIDEO OUT jacks on the back of the camera.  
The white and yellow plugs on the other side should be connected to the AUDIO IN and VIDEO IN jacks on your VCR.
2. Plug the other shielded RCA plug into the AUDIO OUT and VIDEO OUT jacks on your VCR. Connect the other ends to AUDIO IN and VIDEO IN jacks on your monitor.
3. Turn on the camera, monitor and VCR.



## CAMERA OPERATION WITH BATTERY

### ● Battery Installation



BATTERY OPERATING TIME		
DRY OR ALKALINE BATTERY	9-10 Hrs (Max)	7-8 Hrs (Average)
RECHARGEABLE BATTERY	CHARGING TIME	OPERATING TIME
INITIAL CHARGE	24 Hrs	4 Hrs (Max)
FOR AVERAGE	10-12 Hrs	3 Hrs

Operating time will vary depending on the temperature and moisture in operating environment.

1. Open the battery compartment door on the bottom of the camera by sliding it down as indicated.
2. Following the battery polarity as indicated, insert 8 pieces dry batteries or equivalents (Alkaline or Rechargeable batteries) and close the battery compartment door.
3. Turn on the camera by setting the power/charge selector to the power position.
4. Red on the front will indicate that the camera is turned on.

**CAUTION : DO NOT CHARGE THE DRY OR ALKALINE BATTERY.**

## TROUBLE SHOOTING

If the system does not function properly, check the following points before contact the service center.

Problems	Causes and remedies	
	Receiver	Camera
<b>No power (No picture/sound)</b>	<ul style="list-style-type: none"> <li>· AC adaptor not plugged in</li> <li>· Improper TV/monitor connection</li> </ul>	<ul style="list-style-type: none"> <li>· AC adaptor not plugged in</li> <li>· Improper battery installation</li> <li>· Batteries weak</li> </ul>
<b>Poor reception</b>	<ul style="list-style-type: none"> <li>· Fine tuning incorrect</li> <li>· Improper antenna connection</li> <li>· Improper channel setting</li> </ul>	<ul style="list-style-type: none"> <li>· Antenna direction</li> <li>· Batteries weak</li> </ul>
<b>Picture flickering</b>		<ul style="list-style-type: none"> <li>· Strong spot light in the field of view</li> </ul>
<b>Normal sound, dim picture</b>	<ul style="list-style-type: none"> <li>· Improper brightness control setting on your TV/monitor</li> </ul>	<ul style="list-style-type: none"> <li>· Lighting source in the field of view</li> </ul>
<b>Picture too bright, Picture too dark</b>	<ul style="list-style-type: none"> <li>· Improper brightness control setting on your TV/monitor</li> </ul>	<ul style="list-style-type: none"> <li>· Lighting source in the field of view</li> </ul>
<b>Picture rolls and Jumps Scrambled picture</b>	<ul style="list-style-type: none"> <li>· Improper V-Hold control setting on your TV/monitor</li> <li>· Fine tuning incorrect</li> </ul>	
<b>Picture smaller than screen or volume weak</b>	<ul style="list-style-type: none"> <li>· House current may be too low</li> </ul>	<ul style="list-style-type: none"> <li>· House current may be too low</li> <li>· Batteries weak</li> <li>· Replace or recharge the batteries</li> </ul>

## SPECIFICATIONS

### ● Transmitter

<b>Output level</b>	90dB microvolts/ Meter at 3Meter	90dB microvolts/ Meter at 3Meter
<b>Operating frequency band</b>	2.4 to 2.4835GHz	2.4 to 2.4835GHz
<b>Modulation</b>	FM (Video & Audio)	FM (Video & Audio)
<b>Video output level</b>	1V p-p	1V p-p
<b>Audio output level</b>	1V p-p	1V p-p
<b>Video output impedance</b>	75Ω	75Ω
<b>Audio output impedance</b>	600Ω	600Ω
<b>Image device</b>	1/3" or 1/4" color CCD sensor	1/3" B/W CCD camera
<b>Number of pixels</b>	512(H)X492(V) (NTSC) 512(H)X582(V) (PAL)	512(H)X492(V) (EIA) 512(H)X582(V) (CCIR)
<b>Scanning system</b>	525lines, 60field/sec (NTSC) 625lines, 50field/sec (PAL)	525lines, 60field/sec (EIA) 625lines, 50field/sec (CCIR)
<b>Sync system</b>	Internal sync	Internal sync
<b>Resolution</b>	330(H)X350(V) TVlines (NTSC) 330(H)X380(V) TVlines (PAL)	350(H)X420(V) TVlines (EIA) 350(H)X420(V) TVlines (CCIR)
<b>Usable illumination</b>	1 Lux (F1.4)	0.1 Lux (F1.8)
<b>S/N ratio</b>	More than 45dB	More than 45dB
<b>Gamma characteristics</b>	0.45	0.45
<b>Electronic shutter speed</b>	1/60~1/100,000sec (NTSC) 1/50~1/100,000sec (PAL)	1/60~1/100,000 sec (EIA) 1/50~1/100,000 sec (CCIR)
<b>Lens</b>	92° or 73°	92°
<b>Microphone</b>	Electric condenser	Electric condenser
<b>Power supply</b>	12V DC, 500mA AC Adaptor/ 12V alkaline battery (8 of "AA" size)	12V DC, 500mA AC Adaptor/ 12V alkaline battery (8 of "AA" size)
<b>Weight</b>	310g	300g

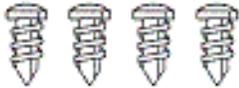
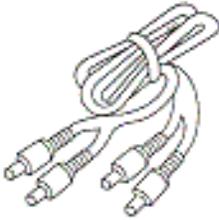
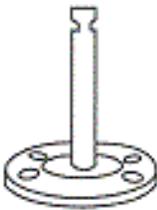
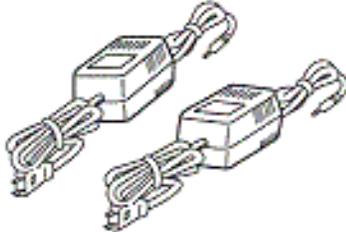
**SPECIFICATIONS**

## ● Receiver

Operating frequency	2.4 to 2.4835 GHz
Video output level	1V p-p
Audio output level	1V p-p
Noise figure	3.5dB
Power supply	12V DC, 500mA AC Adaptor
Dimensions	150(W) X 135(D) X 110(H) mm
Channel	Manual 4CH
RF output channel	NTSC : VHF 3,4 channel PAL : UHF 38 channel

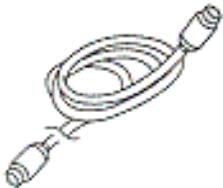
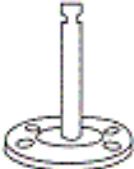
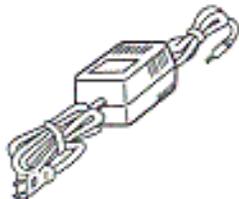
**ACCESSORIES**

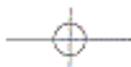
## ● Standard Accessories

Screws	RCA Cable (1.5m)
	
Pipe Stand	Adaptor (2 pcs)
	

**ACCESSORIES**

## ● Optional Accessories

Screws	6P Cable (1.5m)	Pipe Stand
		
Adaptor	4P Cable (1.5m)	RCA Cable (1.5m)
		

**CARE AND MAINTENANCE**

Your video observation system is an example of superior craftsmanship. Following these precautions will give you many years of solid performance and enjoyment.

Keep your monitor & camera dry. If it does get wet, wipe it dry immediately.



Use and store your unit in normal temperature environment. Extreme temperatures can shorten the life of electronic devices.



Handle the monitor carefully. Dropping it can cause serious damage to the unit.



Occasionally, clean the unit with a damp cloth to keep it looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the unit.



Keep the unit away from excessive dirt and dust. These can cause premature wear of parts.

Use only recommended size and type of batteries. Always remove old or weak batteries.

Note: All specifications subject to change without notice. E & OE

