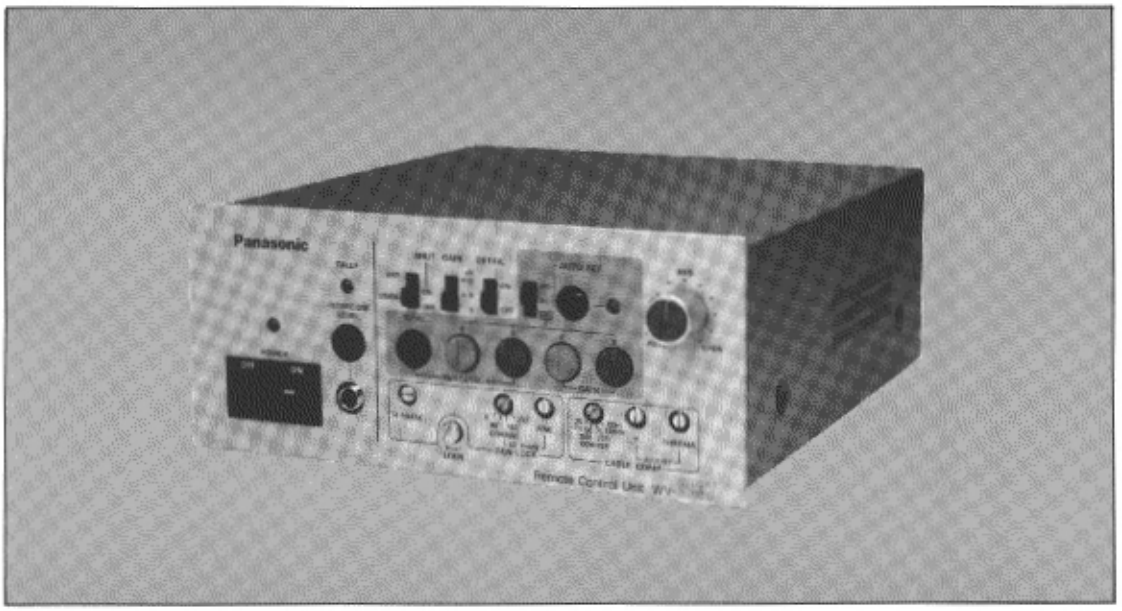
Operating Instructions

Remote Control Unit

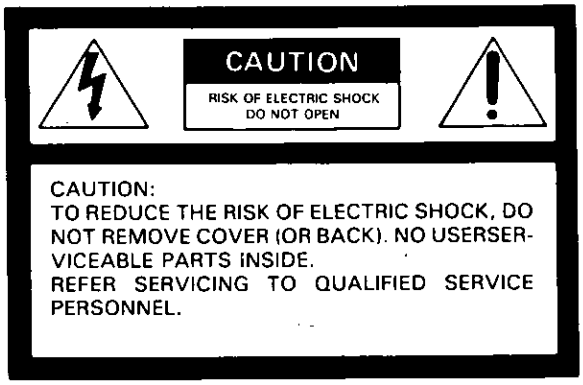
WV-RC37

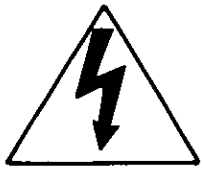


Panasonic

Before attempting to connect or operate this product, please read these instructions completely.

CONTENTS





SA 1965

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

SA 1966

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

For U.S.A

Warning:
This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the instruction manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

For CANADA

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

The serial number of this product may be found on the bottom of the unit.
You should note the serial number of this unit in the space provided and retain this book as a permanent record of your purchase to aid identification in the event of theft.

Model No. _____

Serial No. _____

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

PREFACE

A remote control unit (RCU) WV-RC37 is used to remotely control the WV-F70, WV-F200A and WV-F300 color camera system in studio. Features and functions include white and black balance setting, iris control, R/B gain control, R/B pedestal control,total pedestal control, color bar/camera selection & shutter ON/OFF high gain selection, detail ON/OFF horizontal and subcarrier phase adjustment for gen-lock and intercom level control.

Note:

The WV-RC37 does not provide separate R/G/B video output.

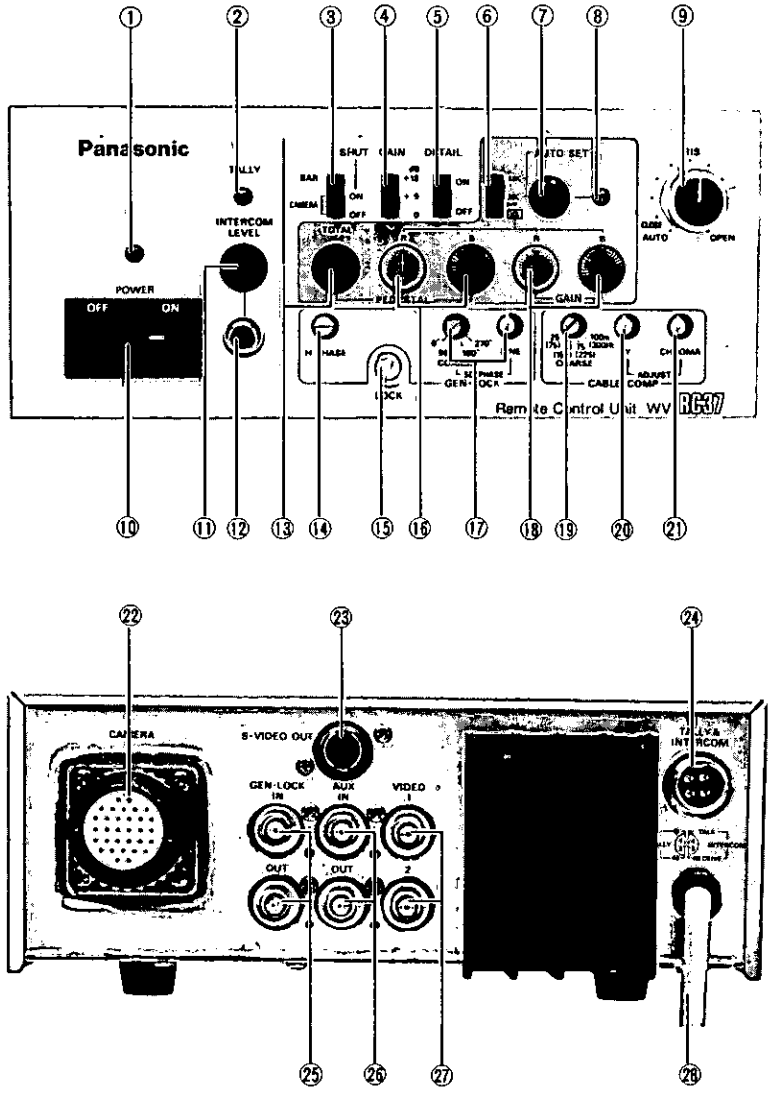
FEATURES

1. With cable length compensation switch and fine control, 32-pin studio cable between the camera and RCU can be extended to maximum 100m (approximately 300ft).
2. With auto/manual selection switch and auto set switch, the white and black balance can be set automatically.
3. Color adjustment can be made by R and B gain and R and B pedestal controls on the RCU.
4. With color bar/camera selection & shutter ON/OFF switch, the electronic shutter operation is remotely controlled from the RCU as well as color bar/camera selection. (The WV-F200A camera does not feature the electronic shutter.)
5. With lens iris control, the auto iris level of zoom lens on the camera can be manually controlled from the RCU.
6. Horizontal and subcarrier phase controls on the RCU can adjust for matching the phase of the gen-lock signal for the system use.
7. 19" EIA rack mountable with the optional rack mount WV-RM37.

PRECAUTIONS

- Do not attempt to disassemble the unit.
  There are no user-serviceable parts inside.
- Do refer any servicing to qualified service personnel.
- Do not abuse the unit. Avoid striking, shading etc.
- Do not use strong or abrasive detergents when cleaning the unit. Do use dry cloth to clean the unit when dirty. In case the dirt is hard to remove, use mild detergent and wipe gently.
- Do not expose the unit to rain or moisture. Do take immediate action if ever the unit do become wet.
  Turn power off and refer servicing to qualified service personnel. Moisture can damage the unit and also create the danger of electric shock.
- Use the unit under the conditions where temperature is within 23°F - 113°F (−5°C - +45°C) and humidity is within 30% - 90%.

MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS



1 **Power Indicator**
This indicator lights up whenever the unit is operated.

2 **Tally Indicator (TALLY)**
When RCU is used in conjunction with a special effects generator, the tally indicator on the RCU informs to the RCU operator and others concerned that the camera system is actually recording the scene.

3 **Color Bar/Camera Selection & Shutter ON/OFF Switch (BAR/CAMERA, ON/OFF)**
When used in a system, this switch can select the camera mode or color bar mode regardless of the Selection Switch on the camera. This switch also switches ON/OFF the shutter operation.

BAR:
The color bar is provided from the Video Output Connectors (28) on the RCU.

CAMERA, ON:
The camera is in operating condition after necessary adjustments and the electronic shutter mode is engaged for blurfree recording of high speed action.

CAMERA, OFF:
The camera is in normal operating condition with standard shutter speeds.

Note:
The WV-F200A camera does not feature the electronic shutter.

4 High Gain Selection Switch (0/+9/+18dB)
Normally set this switch to the 0dB position. Positions +9dB and +18 dB increase the video output amplitude for dark scenes and are equivalent to opening the lens iris 1.5 or 3 F- stops, respectively.

5 Detail ON/OFF Switch (DETAIL ON/ OFF)
When set to ON, the edges of the objects in the picture are enhanced and a sharp picture is reproduced. The sharpness of the picture for WV-F200A and WV-F300 can be set by the Detail Level Selection Switch on the camera.
A softer picture can be obtained by setting this switch to OFF.
Normally this switch should be set to the ON position.

6 Auto/Manual Selection Switch (AWC/ABC/MN)
This switch is used to select the white balance and black balance modes as follows:

AWC:	The white balance can be set automatically by pressing the Auto Set Switch (7).
ABC:	The black balance can be set automatically by pressing the Auto Set Switch (7).
MN:	The white balance and black balance can be adjusted by the Red and Blue Gain Controls (19) and the Red and Blue Pedestal Controls (16).

7 Auto Set Switch (AUTO SET)
This switch sets the white balance or black balance automatically according to the position of the Auto/Manual Selection switch (6).

8 Auto Warning Indicator (Green)
This indicator blinks while the white balance or black balance is being automatically set. It goes out once the white and black balance have been correctly set.
This indicator lights when the white or black balance is set improperly. In this case, carry out the automatic setting procedure for white and/or black balance.

9 Lens Iris Control (IRIS, AUTO-CLOSE/OPEN)
This control is used to set the lens iris of the auto iris servo control zoom lens.
AUTO:
The iris level of the zoom lens is controlled automatically.
CLOSE/OPEN:
The iris level of the zoom lens can be manually controlled by turning this control.
Note:
1. The Iris Control Selection switch on the lens should be set to the A (Auto) position to enable control of the lens iris from the RCU. If the lens has REM (Remote) position, set the switch to the REM (Remote) position.
2. As the iris level of the zoom lens WV-LZ70/12 can not be remotely controlled, set this control to the AUTO position.

10 Power Switch (POWER ON/OFF)
This switch turns on and off the power to the RCU.

11 Intercom Level Control (INTERCOM LEVEL)
Use this control to freely adjust the volume level in the headset connected to the Intercom Jack (12).

12 Intercom Jack
This jack is used for communication between the camera operator and RCU operator in a system configuration with a Special Effects Generator.

13 Total Pedestal Level Control (TOTAL PEDESTAL)
This control can adjust the pedestal level of the video signal (luminance) for matching the black level between two or more cameras in a system. Turn this control clockwise to increase the pedestal level, and counterclockwise to decrease the level.

14 Horizontal Phase Control for Gen-lock (H PHASE)
The horizontal phase of the camera signal can be adjusted to match the horizontal phase of the signal at the Gen-lock Input connector (25).

15 Lock Screw (LOCK)
When the RCU is mounted onto the Rack Mount WV-RM37, turn this screw to lock the RCU firmly on the frame.

16 Red and Blue Pedestal Controls (R & B PEDESTAL)
The black balance can be set manually by these controls when the Auto/Manual Selection switch (6) is set to the MN (Manual) position. Turn these controls clockwise to increase the Red and Blue pedestal levels, and counterclockwise to decrease the levels.

17 Subcarrier Phase Coarse and Fine Controls (SC PHASE COARSE/FINE)
These controls allow adjustment of the camera signal subcarrier phase from 0° to 360°, to match the phase with that of the burst signal at the Gen-lock Input Connector (25) in a system configuration.
The COARSE control adjusts the subcarrier phase from 0° to 360° in 90° steps, while the FINE control allows continuous fine adjustment over a range of 90°.

18 Red and Blue Gain Controls (R GAIN, B GAIN)
These controls are used to manually adjust the white balance.
These controls only work when the Auto/Manual Selection switch (6) is set to the MN (Manual) position. Turn the controls clockwise to increase the Red and Blue signal levels, and counterclockwise to decrease the levels.

19 Cable Length Compensation Switch (CABLE COMP)
This switch is used to compensate for extensive cable lengths used on the 32-pin studio cable between the camera and RCU.
25m (75 ft): Use for cable lengths of less than 25m (75 ft)
50m (150 ft): Use for cable lengths of 25 - 50m (75 - 150 ft)
75m (225 ft): Use for cable lengths of 50 - 75m (150 - 225 ft)
100m (300 ft): Use for cable lengths of 75 - 100m (225 - 300 ft)

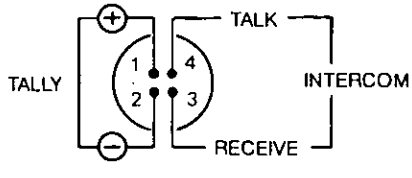
20 Luminance Gain Fine Control (Y ADJUST)
This control allows fine adjustment of the video luminance signal level for matching the levels of all cameras in the system. Adjust this control only after having set the Cable Length Compensation switch (19) to the correct position.

21 Chroma Gain Fine Control (CHROMA ADJUST)
This control allows fine control of the chroma signal level for matching the chroma levels of all cameras in the system. Adjust this control only after having set the Cable Length Compensation switch (19) to the correct position.

22 32-pin Camera Connector (CAMERA)
Connect the 32-pin studio cable from the camera to this connector.

23 S-VHS Video Output Connector (4-Pin connector) (S-VIDEO OUT)
This connector supplies a luminance and chrominance signal to the S-VHS video input connector on the S-VHS VTR or video monitor.

24 Tally and Intercom Input Connector (TALLY & INTERCOM)
Connect the 4-pin cable between this connector and the Tally & Intercom output of the Special Effects Generator.



25 Gen-lock Input Connectors (BNC) (GEN-LOCK IN)
These connectors receive the gen-lock signal (black burst or composite) from the Special Effects Generator for system reference.
Two connectors are provided for either bridging or looping application.
When the gen-lock signal is connected to only an upper (IN) connector, the gen-lock signal is automatically terminated with 75 ohms.
If two BNC connectors are connected for bridging or looping through the gen-lock signal, the gen-lock signal is not terminated with 75 ohms.

26 Auxiliary Input Connectors (BNC) (AUX IN)
These connectors receive the lineview signal from the Special Effects Generator. Two connectors are provided for bridging or looping application.
When the lineview signal is connected to only an upper (IN) connector, the signal is automatically terminated with 75 ohms. If two BNC connectors are connected for bridging or looping through the lineview signal, the lineview signal is not terminated.

27 Video Output Connectors (BNC) (VIDEO 1, 2)
These connectors supply a composite video signal to the Special Effects Generator, the Video Monitor or the VTR.

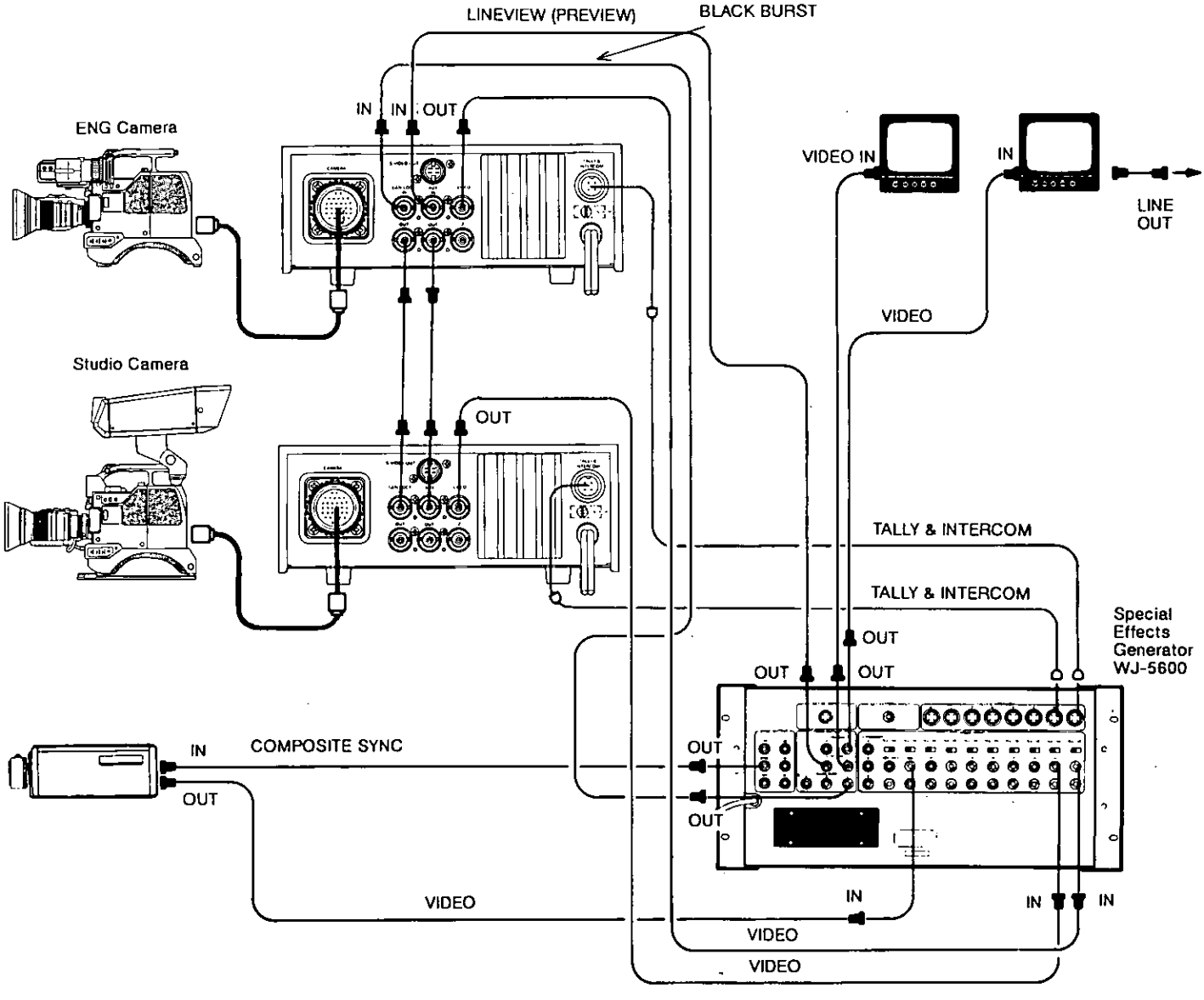
28 AC Power Cord

CONNECTION

- Connect the 32-pin studio cable between the camera and the Remote Control Unit (RCU).
- Connect the coaxial cable for the video output signal between the Video Output connector (27) on the RCU and the video input on the production unit, such as the Special Effects Generator.
- Connect the coaxial cable for the gen-lock signal between the black burst output on the production system and the Gen-lock Input connector (25) on the RCU. (The signal may be bridged or looped through to another RCU.)
- Connect the coaxial cable for the lineview signal between the effect output connector on the production system and the Auxiliary Input connector (26) on the RCU. (The signal may be bridged or looped through to another RCU.)

Note:

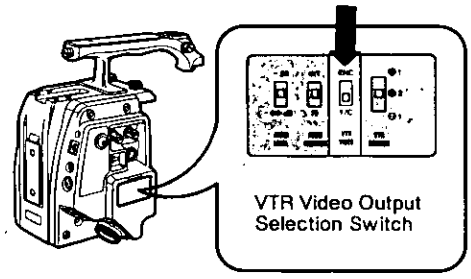
1. The Tally light and intercom between the camera, RCU and Special Effects Generator will function only when the 4-pin cable for the Tally light and intercom is connected between the RCU and Special Effects Generator.
2. The 32-pin studio cable can be extended up to a maximum of 100m (approximately 300 ft). When extending the cable, be sure to set the Cable Length Compensation switch (19) to the position matching the extension length.
3. The Subcarrier Phase Coarse and Fine controls (17) and the Horizontal Phase control (14) on the RCU should be set to match other cameras in the system. Refer to page 7 for details.
4. Refer to the operating instructions of the special effects generator.



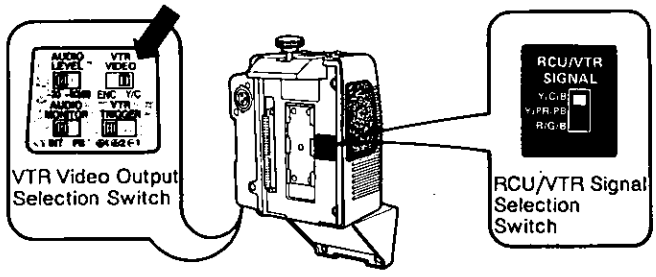
OPERATING PROCEDURE

1) Make all the required connections.
2) Set the VTR Video Output Selection switch and the RCU/VTR Signal Selection switch on the camera as follows.

- For WV-F70
  When using the WV-RC37 with the WV-F70, the VTR Video Output Selection switch on the camera adaptor of WV-F70 should be set to the Y/C position.



- For WV-F200A and WV-F300
  When using the WV-RC37 with the WV-F200A and WV-F300, the VTR Video Output Selection switch and the RCU/VTR Signal Selection switch on the camera adaptor of WV-F200A and WV-F300 should respectively be set to the Y/C and the Y/C/B position.

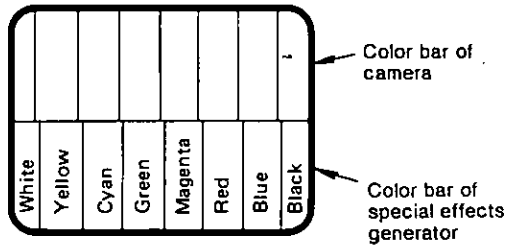


3) Set the switch as follows:

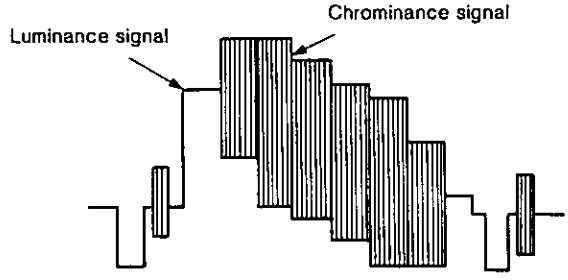
Unit	Switches	Positions
Camera	White Balance Selection switch	AWC A or AWC B
	Lens Iris Selection switch	NOR (Normal)
	Iris Control Selection switch on lens	A (Auto) or REM (Remote)
	Detail Level Selection or Detail ON/OFF switch	HIGH or LOW, or ON
	Power Selection switch	VTR/RCU
	Power switch	ON
RCU	High Gain Selection switch (4)	0dB
	Color Bar/Camera Selection & shutter ON/OFF switch (3)	BAR
	Auto/Manual Selection switch (6)	AUTO
	Lens Iris Control (9)	AUTO
	Power switch (10)	ON

4) Set the Cable Length Compensation switch (19) on the RCU according to the length of studio cable used.
Note: The standard cable length is 10m (30 ft).

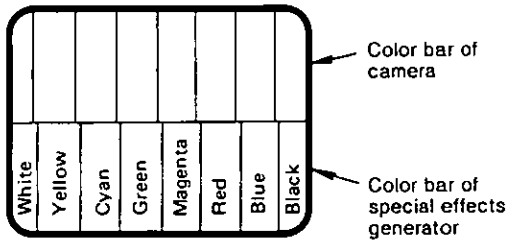
5) Fine-adjust the luminance gain and chroma gains as follows:
   - Set the switches and controls on the Special Effects Generator so that the split color bar picture is observed on the program monitor. Refer to the operating instructions accompanying the Special Effects Generator.



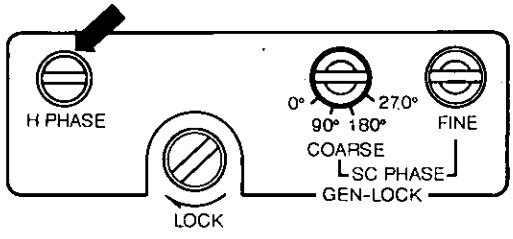
   - Connect an oscilloscope to the Program Output connector of the Special Effects Generator or feed the Program Output signal to a waveform monitor.
     Observe the horizontal period of the Program Output signal.
   - Adjust the Luminance Gain Fine control (20) so that the luminance signal levels of both color bar signals are equal. Adjust the Chroma Gain Fine control (21) so that the chrominance signal levels of both color bar signals are equal.

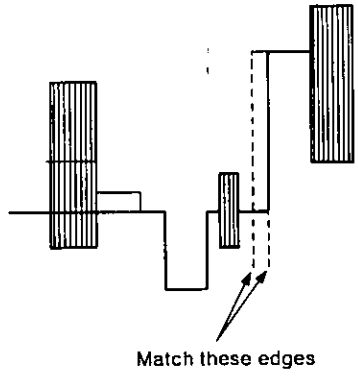


6) Adjust the horizontal phase of the camera as follows:
- Set the switches and controls on the Special Effects Generator so that the split color bar picture is observed on the program monitor. Refer to the operating instructions accompanying the Special Effects Generator.



- Connect an oscilloscope to the Program Output connector of the Special Effects Generator and check the horizontal blanking period of the Program Output signal.
- Adjust the Horizontal Phase control (14) on the RCU so that the phase of the Horizontal blanking of the color bar signal for the camera matches that of the Special Effects Generator.

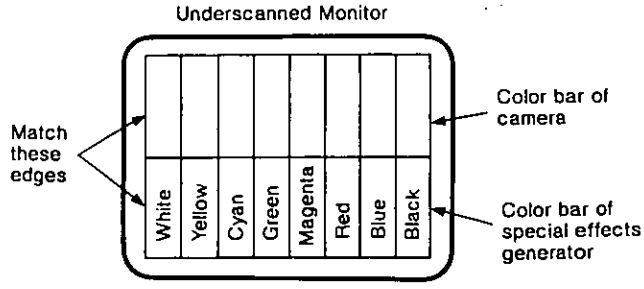




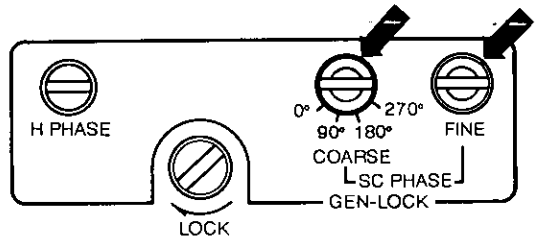
- The horizontal phase of the camera can be roughly adjusted by observing the split color bar picture on the underscanned program monitor after all switches and controls have been correctly set. Adjust the Horizontal Phase control (14) so that the starting edges of the white bar of the camera and Special Effects Generator roughly match each other.

Note:

The horizontal phase as well as the subcarrier phase explained in the next paragraph should be readjusted if the connections of coaxial cable length is changed in the system.



7) Adjust the subcarrier phase of the camera as follows:
- Set the switches and controls on the Special Effects Generator so that the split color bar picture is observed on the program monitor. Refer to the operating instructions accompanying the Special Effects Generator for details.
- Adjust the Subcarrier Phase Coarse and Fine Controls (17) on the RCU so that the colors of the color bars from the camera are similar to the colors of the color bars generated by the Special Effects Generator.



- For precise adjustment, the use of a vectorscope is recommended. In this case, supply the Program Output signal from the Special Effects Generator to the vectorscope. While observing the vectorscope, adjust the Subcarrier Phase Coarse and Fine Controls (17) on the RCU so that the phase of the color bars from the camera matches that of the bars generated by the Special Effects Generator.

8) Reset the Color Bar/Camera Selection & shutter ON/OFF switch (3) on the RCU from the BAR to the CAMERA, OFF position.

9) Set the black balance while referring to "WHITE BALANCE SETTING" on page 8.

10) Set the white balance while referring to "WHITE BALANCE SETTING" on page 9.

BLACK BALANCE SETTING

1. Black Balance

Correct setting of the black balance is required for producing correct colors, especially in low-light situations. Once the black balance has been correctly set, the setting is maintained in a special memory, until the next setting. The setting will not be lost, even though camera power is turned off.

For best results, it is recommended that the black balance adjustment be carried out, however, if the camera has not been used for a long period of time.

2. Automatic Black Balance Setting

- Set the Iris Control Selection switch on the zoom lens and the Lens Iris Control (9) on the Remote Control Unit (RCU) to the A (Auto) or REM (Remote) position, and AUTO position, respectively.

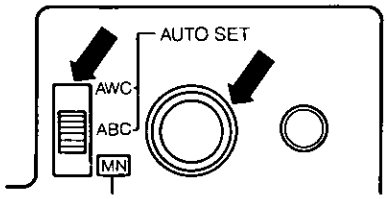
  Note:

  If you need to set the black balance while in the manual iris control mode, the incoming light should be blocked by setting the Filter Wheel to close position or capping the lens.

- Set the Auto/Manual Selection switch (6) on the RCU to the ABC position and press the Auto Set switch (7) momentarily. The lens iris is closed, blocking incoming light, and the black balance is automatically set. When the black balance has been set, the lens iris returns to its previous position.

  The Auto Warning indicator (8) on the RCU blinks while the black balance is being set. The indicator goes out when the black balance has been set.

  If the Auto Warning indicator remain lit, the black balance adjustment should be carried out once more.

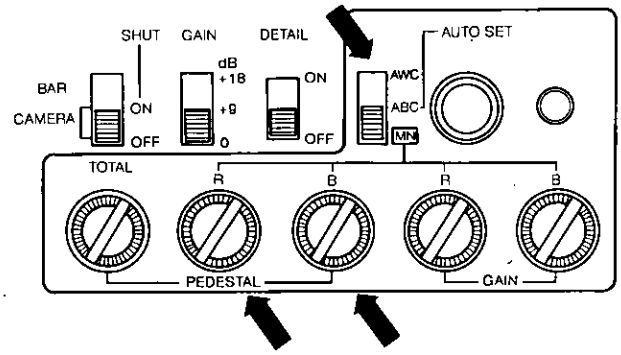


Note:

The black balance setting will be kept in the memory until the next setting even if the power to the camera is turned off. It is recommended, however, the black balance be reset if the camera has not been in use for a long time.

3. Manual Black Balance Setting

- Manual adjustment of the black balance is possible by adjusting the Red Pedestal and Blue Pedestal controls (16) on the RCU.
- Set the Auto/Manual Selection switch (6) on the RCU to the MN (Manual) position and close the lens iris by setting the Filter Wheel on the camera to the close position or capping the lens.
- Observe the signal waveform of the video output signal on an oscilloscope or a waveform monitor.
- Adjust the Red Pedestal and Blue Pedestal controls (16) on the RCU so that the carrier wave of the video output signal is at minimum.



Minimize the carrier wave using the Red & Blue Pedestal controls.

- The overall pedestal level can be adjusted by the Total Pedestal control (13) on the RCU.

WHITE BALANCE SETTING

1. White Balance

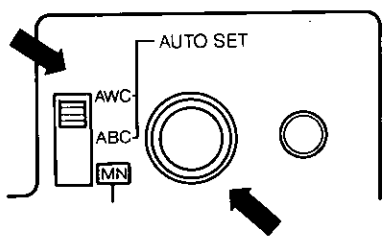
- Light can be measured in terms of its color temperature, stated in degrees Kelvin (°K). Light blue has a higher color temperature than reddish light. Thus, when the camera is aimed at an object illuminated by a light source having a high color temperature, the produced image will be somewhat bluish, while if the color temperature is low, the image will turn reddish.
- In order to correctly reproduce the colors at the scene, the white balance should be set before recording is begun.

2. Automatic White Balance Setting

- Use the Filter Wheel on the camera to select the proper filter according to the color temperature of the light source at the scene.

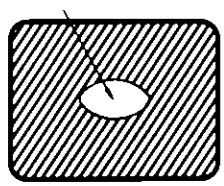
	Object/Scene & Light Source Condition	Color Temperature	Wheel No.
Indoor	Halogen Lamp or Tungsten Lamp (Studio)	3200°K	1
Indoor	Fluorescent Lamp (White)	4500°K	3
Outdoor	Fluorescent Lamp (Daylight)	6500°K	3
Outdoor	Daylight (Sunny)	4500°K	2
Outdoor	Daylight (Fine-Partly Cloudy)	5000° - 6000°K	2
Outdoor	Cloudy	7000° - 7500°K	3

- Set the White Balance Selection switch on the camera to the AWC A or AWC B position, and the Auto/Manual Selection switch (6) on the RCU to the AWC position.



- While aiming the camera at a white object, e. g. white paper or a white wall, adjust the zoom, center on the white image and make sure that at least 10% of the viewfinder screen is occupied by the white image.

White object: more than 10% of viewfinder screen



Viewfinder

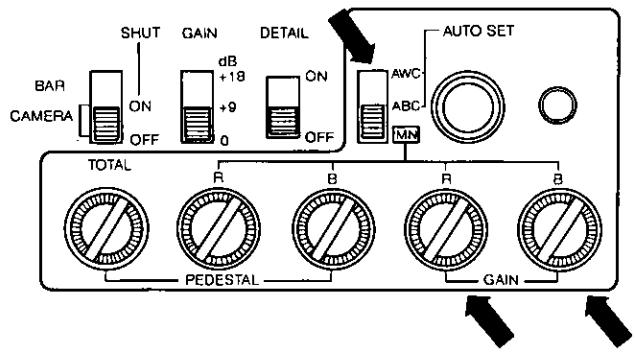
- Press the Auto Set switch (7) on the RCU momentarily. The white balance is automatically set. When the white balance has been set, the Auto Warning indicator (8) on the RCU blinks, and the indicator goes out when the adjustment is complete. If the Auto Warning indicator remains lit, the white balance adjustment should be carried out once more.
  However, before proceeding with the adjustment, make sure the Filter Wheel is set correctly.

Note:

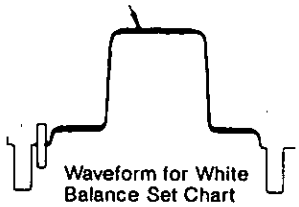
1. The white balance setting (as well as the black balance setting) will be kept in the memory until the next setting, even if the power to the camera is turned off. (The memory back-up battery will supply power for up to ten years.) It is recommended, however, the white balance be reset if the camera has not been in use for a long time.
2. When the white balance is reset, the previous setting in the corresponding memory is reset.
3. When two white balance settings have been stored in the memory, when moving between these two light sources, simply flick the White Balance Selection switch on the camera to the position matching the light source. Recording is not interrupted when the white balance is reset.
4. Allow a few minutes of warm-up time before setting the white balance. This will allow a higher degree of precision when making the adjustment.
5. The white balance may not be correctly set under the following conditions :
   - In low light situations
   - In extremely bright light situations.
6. If recording is to be carried out under sunlight, the white balance setting should be performed against a white surface exposed to the sun to avoid color distortion. Please note that if the white balance has been set in this manner, only a slight color distortion will appear when turning the camera towards shades.

3. Manual White Balance Setting

- The white balance can be set manually, if so desired, from the RCU.
- Use the Filter Wheel on the camera to select the proper filter according to the color temperature of the light source at the scene. Refer to the table over filter settings on page 9.
- Set the Auto/Manual Selection switch (6) on the RCU to the MN (Manual) position.
- Aim the camera at a white object, e. g. a white paper or white wall.
- Observe the signal waveform of the video output signal on an oscilloscope or a waveform monitor.
- Adjust the Red Gain and Blue Gain controls (18) on the RCU so that the carrier wave of the video output signal is at minimum.



Minimize the carrier wave using the Red & Blue gain controls.



Waveform for White Balance Set Chart

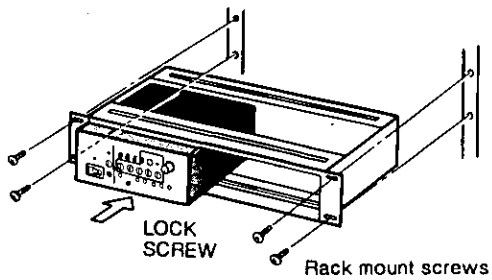
RACK MOUNT INFORMATION

The WV-RC37 can be mounted onto the standard 19" EIA rack by using the rack mount WV-RM37 (option).

1. Mount the rack mount frame onto the standard 19" EIA rack with mounting screws (locally purchased).
2. Remove four rubber feet from the RCU and turn the Lock Screw (15) on the RCU fully counterclockwise.
3. Slide the RCU into the rack mount frame and turn the Lock Screw (15) fully clockwise to hold the RCU in place.
4. After mounting the RCU, mount an attached blank panel onto the rack mount frame to cover the extra mounting space.

Note:

Two sets of the RCU can be mounted onto the rack mount frame.



SPECIFICATIONS

Power Source:	120V AC, 60 Hz, 75W
Video Input:	1.0V p-p composite Y/75 ohms and 0.3V p-p-burst-level chrominance/75 ohms (32-pin camera connector)
Video Output:	1.0V p-p NTSC composite/75 ohms x 2 (BNC connectors)
S-VHS Video Output:	1.0V p-p composite Y/75 ohms and 0.3V p-p-burst-level chrominance/75 ohms (4-pin connector)
Gen-Lock Input:	1.0V p-p NTSC composite or black burst signal/75 ohms or Hi-Z looping through x 1 (BNC connectors)
Subcarrier Phase for Gen-Lock:	Adjustable more than 360°
Horizontal Phase for Gen-Lock:	Adjustable from -0.1μ sec to $+3.0\mu$ sec
Aux (Lineview) Input:	1.0V p-p NTSC composite/75 ohms or Hi-Z looping through x 1 (BNC connectors)
Maximum Studio Cable Length:	100m (300 ft) with cable length compensator
Tally & Intercom:	4-pin connector
Switches:	Power, High Gain Selection, Color Bar/Camera Selection & shutter ON/OFF, Auto/Manual Selection, Auto Set, Detail ON/OFF, Cable Length Compensation, Subcarrier Phase Coarse
Controls:	R and B gain, R and B Pedestal, Total Pedestal, Subcarrier Phase Fine, Horizontal Phase, Luminance Gain Fine, Chroma Gain Fine, Intercom Level, Lens Iris
Ambient Operating Temperature:	23° - 113°F (−5°C - +45°C)
Ambient Operating Humidity:	30% - 90%
Dimensions (including knobs & connectors):	8-1/4" (W) x 3-9/16" (H) x 11-1/16 (D) 209 (W) x 90 (H) x 281 (D) mm
Weight:	9.5 lbs (4.3 kg)

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Panasonic

Communications & Systems Company

Panasonic Communications & Systems Company
Division of Matsushita Electric Corporation of America

PROFESSIONAL/INDUSTRIAL VIDEO

HEADQUARTERS:
50 Meadowland Parkway, Secaucus, New Jersey 07094
EASTERN ZONE:
50 Meadowland Parkway, Secaucus, NJ 07094 (201) 348-7620
CENTRAL ZONE:
425 E. Algonquin Road, Arlington Hts. IL 60005 (312) 981-4826
SOUTHERN ZONE:
Dallas Region: 4500 Amon Carter Blvd., Ft Worth. TX 76155 (817) 685-1117
Atlanta Region: 1854 Shackleford Ct. Suite 115. Norcross. GA 30093 (404) 925-6841
WESTERN ZONE:
Seattle Region: 1200 Westlake Ave. N., Suite 508. Seattle, WA 98109 (206) 285-8883
Los Angeles Region: 6550 Katella Ave., Cypress. CA 90630 (714) 373-7275
MATSUSHITA ELECTRIC OF CANADA LIMITED
5770 Ambler Drive, Mississauga, Ontario, Canada L4W 2T3 (416) 624-5010
PANASONIC SALES COMPANY
DIVISION OF MATSUSHITA ELECTRIC OF PUERTO RICO, INC.
San Gabriel Industrial Park, 65th Infantry, Ave. KM. 9.5 Carolina, Puerto Rico 00630 (809) 750-4300

N0889-0 YWV8QA1895AN Printed in Japan
Ⓝ 1