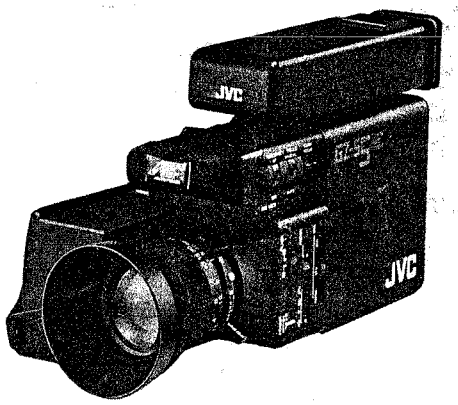
V12034

JVC

SERVICE MANUAL

COMPACT VIDEO CAMERA

GZ-S5U



SPECIFICATIONS

Pickup tube	: 1/2" high-band Static-Magnetic SATICON* single tube
Color system	: Single carrier, frequency separation color system
Scanning system	: 30 frames 525 lines, 2 : 1 interlaced
Video output	: 1 Vp-p 75 ohms, NTSC-type output
Horizontal resolution	: Better than 270 lines
Video S/N ratio	: Better than 45 dB
Sensitivity	: 20 lux (1.9 fc) with sensitivity switch UP
Audio output	: CH-1 and -2, -20 dB/1 k ohm
Provided microphone	: Detachable electret condenser stereo microphone, mono/stereo switchable —68 dB/2.2 k ohms
External microphone input	: CH-1 and -2, —68 dB/Low impedance 3.5 mm mini jack
Lens	: 6 : 1 power zoom lens (8 — 48 mm) f/1.4 with macro and auto shutter
Iris	: Auto iris/E-E lock/Manual control
Focus	: TCL image sensing auto-focus device, defeatable to manual focus; touch focus possible
Color temperature switch	: Indoor (3200K) Outdoor (W12) position
White balance	: Auto white balance/preset with memory
Viewfinder	: 1" electronic viewfinder, detachable
Indicator & alarm	: 11-mode indication in viewfinder (pause, tape run, battery alarm, white balance, under-exposure, sensitivity, filter, tape end, focus behind, correct focus, focus front)
Fader	: Built-in automatic white fader, in about 5 seconds
Power requirement	: DC 12 V
Power consumption	: 7.2 watts
Dimensions	: Camera 120(W) x 110(H) x 249(D) mm (4-3/4" x 4-3/8" x 9-13/16") EVF 60(W) x 35(H) x 159(D) mm (2-3/8" x 1-7/16" x 6-5/16") Camera with EVF & lens hood 120(W) x 153(H) x 258(D) mm (4-3/4" x 6-1/16" x 10-3/16")
Temperature: Operating	: 0°C to 40°C (32°F to 104°F)
Storage	: —10°C to 50°C (14°F to 122°F)
Weight	: 1.4 kg (3.1 lbs)
Accessories	: Camera cable Shoe adapter Electronic viewfinder VF-P3U Lens hood Lens cap
Optional accessories	: CG-P50U Character generator CB-P45U Carrying bag RM-P4U Camera remote control SS-P3U Shooting strap SF-P3U Shoulder frame CB-P5AU System carrying case CB-P6U VCR/Camera combo case

*A registered trademark

Specifications and design are subject to change without notice.

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▒▒) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors

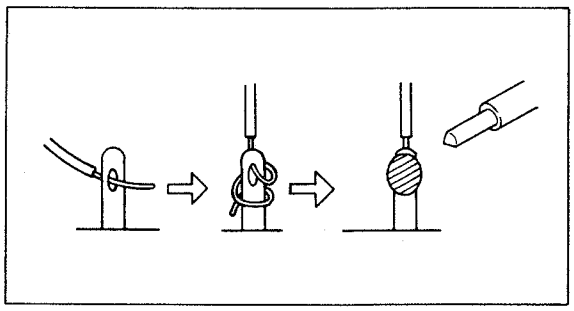


Fig. 1

5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

7. Check that replaced wires do not contact sharp edged or pointed parts.

8. When a power cord has been replaced, check that 10—15 kg of force in any direction will not loosen it.

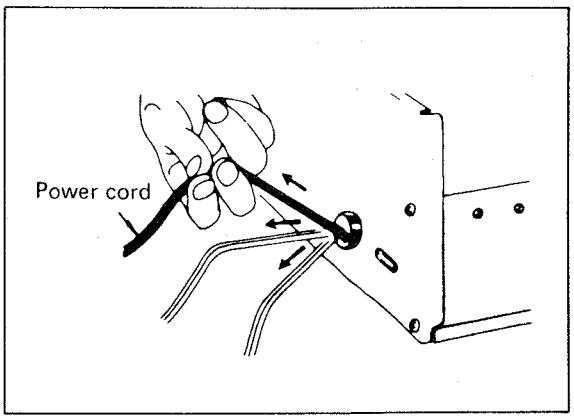


Fig. 2

9. Also check areas surrounding repaired locations.

10. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the parts specified. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

11. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

1. Connector part number : E03830-001
2. Required tool : Connector crimping tool of the proper type which will not damage insulated parts.
3. Replacement procedure

   1) Remove the old connector by cutting the wires at a point close to the connector.
   Important : Do not reuse a connector (discard it).
   2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.
   3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.
   4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.
   5) Check the four points noted in Fig. 7.

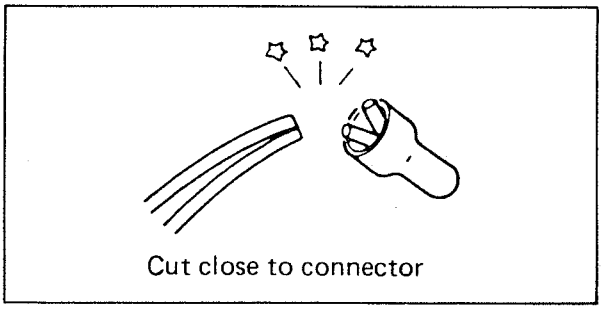


Fig. 3

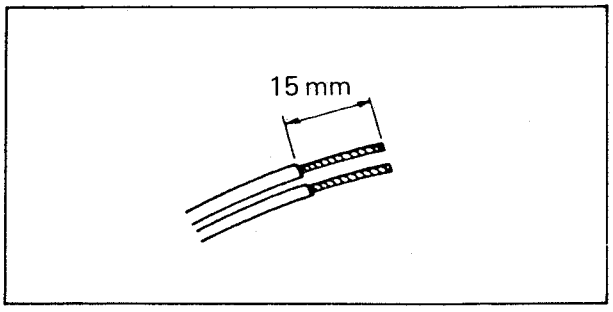


Fig. 4

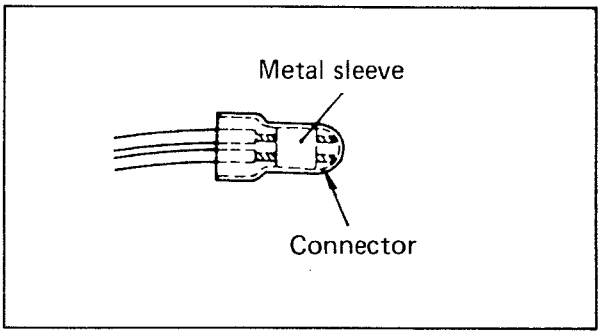


Fig. 5

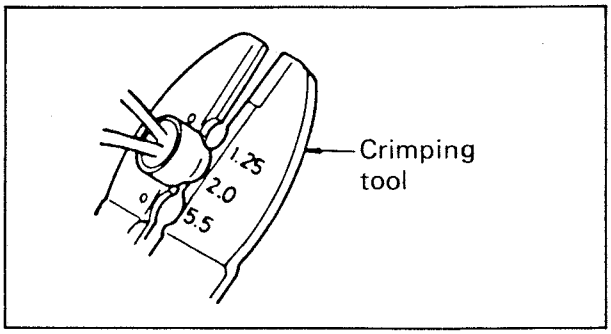


Fig. 6

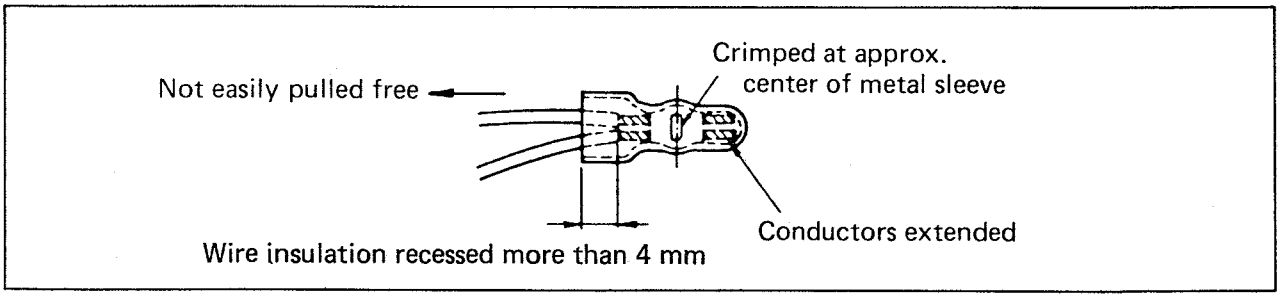


Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table below.

2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.) See table below.

3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d),(d') between soldered terminals, and between terminals and surrounding metallic parts. See table below.

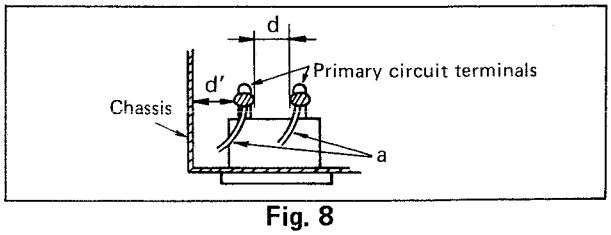


Fig. 8

Table 1: Ratings for selected areas

AC Line Voltage	Region	Insulation Resistance	Dielectric Strength	Clearance Distance(d),(d')
100 V	Japan	≧ 1 MΩ/500 V DC	1 kV 1 minute	≧ 3 mm
110 to 130 V	USA & Canada	– – –	900 V 1 minute	≧ 3.2 mm
* 110 to 130 V 200 to 240 V	Europe Australia	≧ 10 MΩ/500 V DC	4 kV 1 minute	≧ 6 mm (d) ≧ 8 mm (d') (a: Power cord)

* Class II model only.
Note. This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

4. **Leakage current test**
   Confirm specified or lower leakage current between B(earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

   Measuring Method: (Power ON)
   Insert load Z between B(earth ground,power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure and following table.

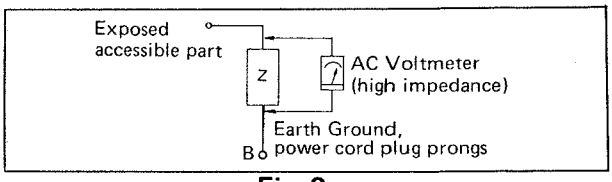


Fig. 9

Table 2: Leakage current ratings for selected areas

AC Line Voltage	Region	Load Z	Leakage Current (i)	Earth Ground (B) to:
100 V	Japan	1 kΩ	i ≦ 1m A rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF, 1.5 kΩ	i ≦ 0.5m A rms	Exposed accessible parts
110 to 130 V 200 to 240 V	Europe Australia	2 kΩ	i ≦ 0.7 m A peak i ≦ 2 m A dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 m A peak i ≦ 2 m A dc	Other terminals

Note. This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

TABLE OF CONTENTS

REPLACING AND MOUNTING OF AF (AUTO-FOCUS) SERVICING PARTS

1. MOUNTING OF ZOOM SENSOR UNIT

(Refer to Section 4.2 "Optical Block Diagram".)

- **Procedures**

1. Set the zoom ring at the position of "48" (Stopper position) as shown in Fig. 1.
2. Loosen encoder setscrew (2) of the zoom sensor unit (see Fig. 2).
3. Mount the zoom sensor unit on the optical block assembly and fix it by tightening and locking a screw (Symbol No. 38, Parts No. PU55550-029 on the Parts List). Through this procedure keep the encoder setscrew (2) in the direction toward the center of the output terminals.
4. Holding the shaft (1) turned fully clockwise (encoder stop position) tighten and lock the encoder setscrew (2).
5. After replacing the zoom sensor unit, turn the zoom ring in all the range (48 ⇆ 8 ⇆ MACRO) repeatedly to confirm that it works normally.

Note: Make sure to set the zoom ring positioning its "48" mark at the indicator ring's appropriate point.

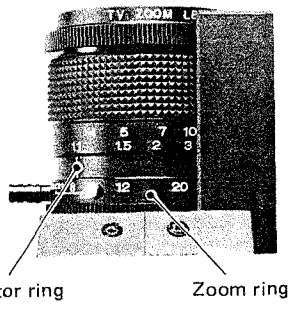


Fig. 1 Zoom lens (top view)

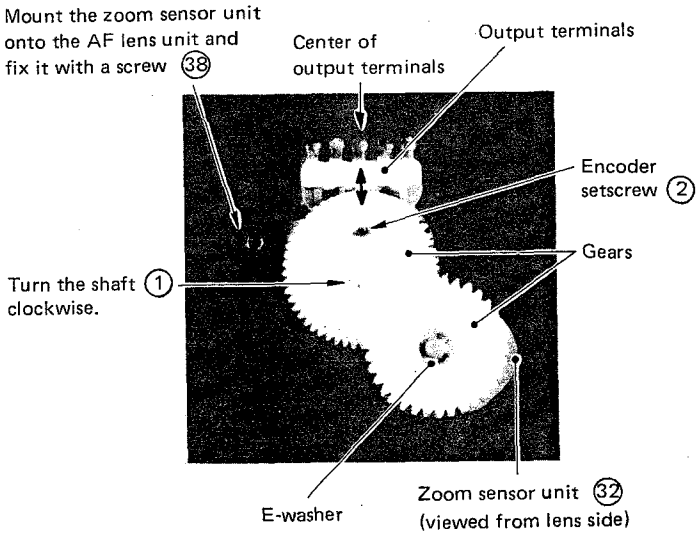


Fig. 2 Zoom sensor unit (viewed from lens side)

2. MOUNTING OF AF MOTOR UNIT

(Refer to Section 4.2 "Optical Block Diagram".)

- **Procedures**

1. Use 3 screws (symbol No. 37) to secure the auto focus motor unit to the optical block assembly.
2. When assembling the auto-focus unit, make a gap of 3/4 −1/2 of tooth height between the gear of the auto-focus unit 27 and the auto-focus ring gear (20).

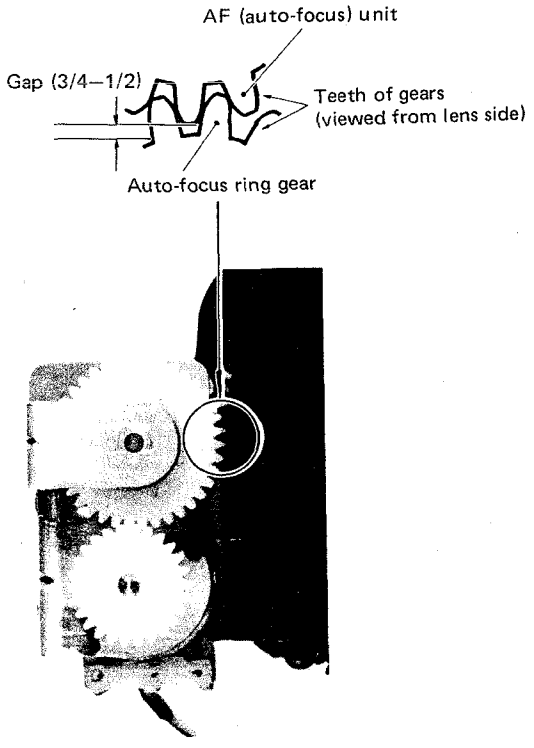


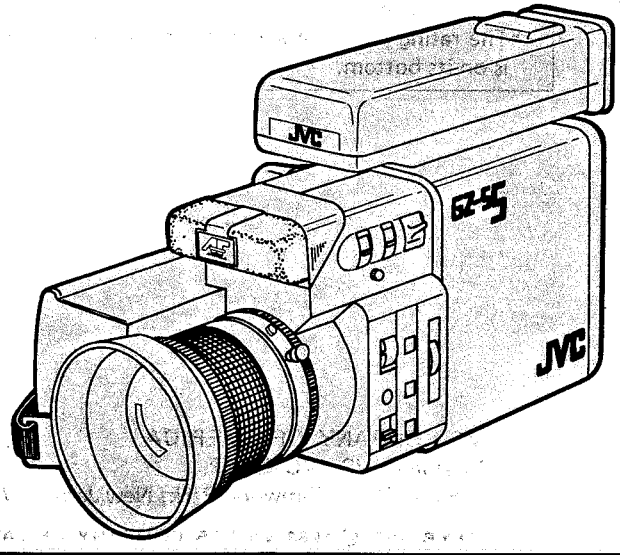
Fig. 3

INSTRUCTIONS

JVC®

GZ-S5 COMPACT VIDEO CAMERA

Specifically for the GZ-S5U



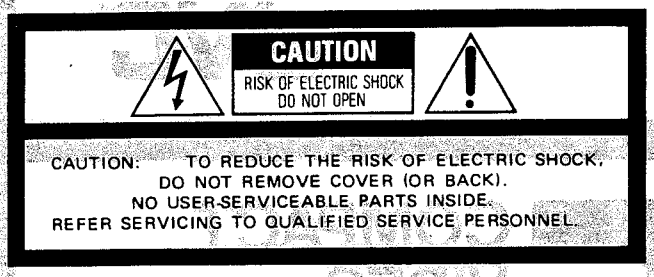
AUTO FOCUS

For Customer Use:
Enter below the Serial No. which is located on the bottom of the camera. Retain this information for future reference.

Model No. GZ-S5U

Serial No. _____

PU30425-593



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.

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.

CAUTION
To prevent electric shock do not use this polarized plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

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

This video camera should be used with DC 12 V ⎓ only.
CAUTION:
To prevent electric shocks and fire hazards, do NOT use any other power source.
The provided viewfinder should be used exclusively with the GZ-S5 camera.

NOTES:
- The rating plate (serial number plate) of the camera is on its bottom.
- The rating plate (serial number plate) of the viewfinder is on its bottom.

JVC COMPANY OF AMERICA
Division of US JVC CORP.
41 Slater Drive, Elmwood Park, New Jersey 07407

Printed in Japan

Thank you for purchasing the JVC GZ-S5 color video camera, a compact camera that's truly portable. Incorporating a Saticon* pickup tube and a highly advanced TCL* auto-focus system, it boasts both superb picture quality and operating convenience, especially with live portable video applications. Its excellent performance makes it an ideal camera for use with any JVC video recorder, including the HR-S3 VHS-C compact video cassette recorder. Combine this camera with a portable recorder, and you will discover a new excitement in making your "portable" video productions.

To take best advantage and gain the most service from your new camera, read this instruction booklet carefully and thoroughly.

*Saticon and TCL are registered trademarks.

Preserving your camera

- Do not aim the camera at the sun or other strong light source when shooting or recording, and even when not shooting or when the power is off. Also, do not aim the camera at fluorescent lights, light bulbs or light-reflecting objects for an extended period of time. This may cause damage to the Saticon* pickup tube and the auto-focus sensor. It is recommended that the lens cap remain on the camera at all times except when actually in use.

CONTENTS

FEATURES

- Newly-developed 1/2" high-band Saticon* pickup tube for superior color reproduction and sharp images with high resolution.
- Low-light sensitivity of 20 lux (1.9 fc) with less susceptibility to lag and burn.
- Ultra-compact, lightweight, high-precision TCL* image sensing auto-focus mechanism.
- Touch Focus for instant auto focusing while in the manual focus mode, or for focus lock while in the auto-focus mode.
- Focus-aid viewfinder indications for focus point in front of, on, or behind the subject.
- Auto-fade with white-colored blank screen.
- Exclusive stereo microphone, switchable to mono, provided for stereo sound recording (on a stereo-capable video recorder).
- Attachable character generator (optional) for date and title recording.
- Remote power on/off switching of HR-C3 compact VHS recorder.
- Automatic white balance control.
- 6X power zoom lens with macro-focusing capability.
- Automatic iris control with EE lock and manual override.
- 1-Inch electronic viewfinder with various shooting indications.
- Mono/stereo external microphone jack provided.
- Shoe adapter provided for flexible viewfinder positioning.
- Lens grip design allowing the camera to be held comfortably for long periods.
- Camera remote control for zooming, tape start/stop and HR-C3 power on/off (optional).

MAINTENANCE

- Apply power and operate the camera at least 1 to 2 hours once every six months. The pickup tube will lose efficiency with age if the camera is not used for a prolonged time.
- The camera is adversely affected by dust and moisture. For storing the camera, select a place not subject to high temperature and/or humidity, or extremely low temperature.
- When the camera is dusty, clean by gently wiping with a soft cloth.
- When the lens is dusty, blow it off or gently wipe it with a soft brush, or a soft cloth slightly dampened with lens cleaner. (Be careful not to scratch the lens.)
- When moisture condenses on the camera, immediately wipe it off using a soft dry rag.
- Wipe the case with a soft dry cloth.
- Avoid the use of strong cleaning agents such as benzine or alcohol as they may damage the case.

PRECAUTIONS

Be careful not to damage the Saticon tube and the auto-focus sensor.

Do not aim the camera lens directly at extremely bright objects such as the sun or other strong light sources.

Do not keep the lens directed at bright lights for long periods.

These careless or incorrect uses could damage the Saticon tube and the auto-focus sensor. Therefore, be sure to keep the lens capped except during shooting.

If the aperture is left open, even while the camera is not being powered, the Saticon tube could be burned. Make it a rule to put the lens cap over the lens after each recording session.

Do not expose the camera to high temperatures over 50°C (122°F) for long periods.

If the camera should be subjected to direct sunlight, or left in a closed car in summer, or placed near a heater, the Saticon tube and the auto-focus sensor may deteriorate and the cabinet may become deformed. Furthermore, this also may cause the transistors and other electronic and mechanical parts to malfunction.

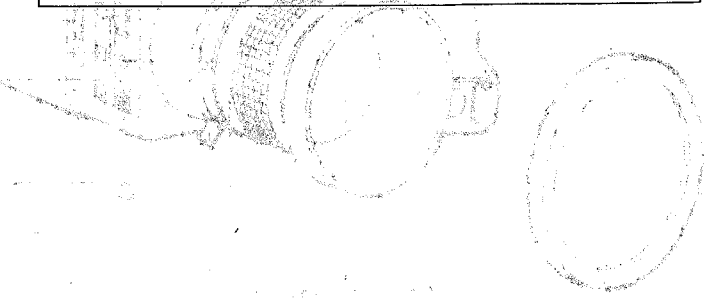
Remember the following:

- Do not leave the camera in places of over 50°C (122°F).
- Do not use the camera in places of over 40°C (104°F).
- Do not store the camera in places of over 30°C (86°F) for long periods.

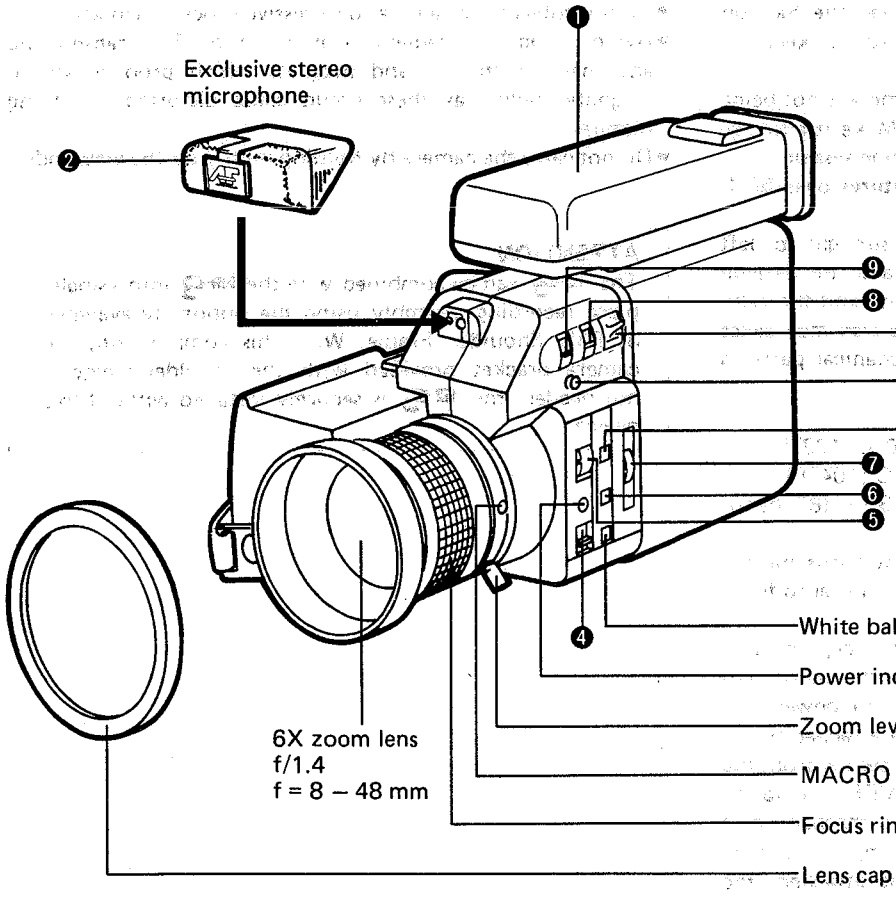
- Do not touch the focus ring while the auto-focus mechanism is in operation as this could damage the auto-focus mechanism.
- Except while actually recording, be sure to keep the lens capped. As long as light enters the lens, the auto-focus mechanism will continue to operate and consume power.
- When a filter or a special-effect lens is to be attached to the end of the lens, be sure to turn power off or switch from the Auto-focus mode to the Manual mode. NEVER attempt to attach a filter or lens while the auto-focus mechanism is operating as this will result in malfunctioning. (If a tele-conversion or wide-angle conversion lens is attached, the auto-focus mode cannot be used.)
- Do not allow flammables, water or metallic objects to get inside the camera, as this can cause damage or malfunctioning.
- Never disassemble any part of the camera. The high voltage developed inside the camera is dangerous.
- Do not subject the camera to excessive shock or vibration.
- Avoid using the camera near radio or TV transmitting antennas, or motors and magnets which produce strong magnetic fields, as these could cause distorted or rolling pictures.
- Do not carry the camera by holding it only by the viewfinder.

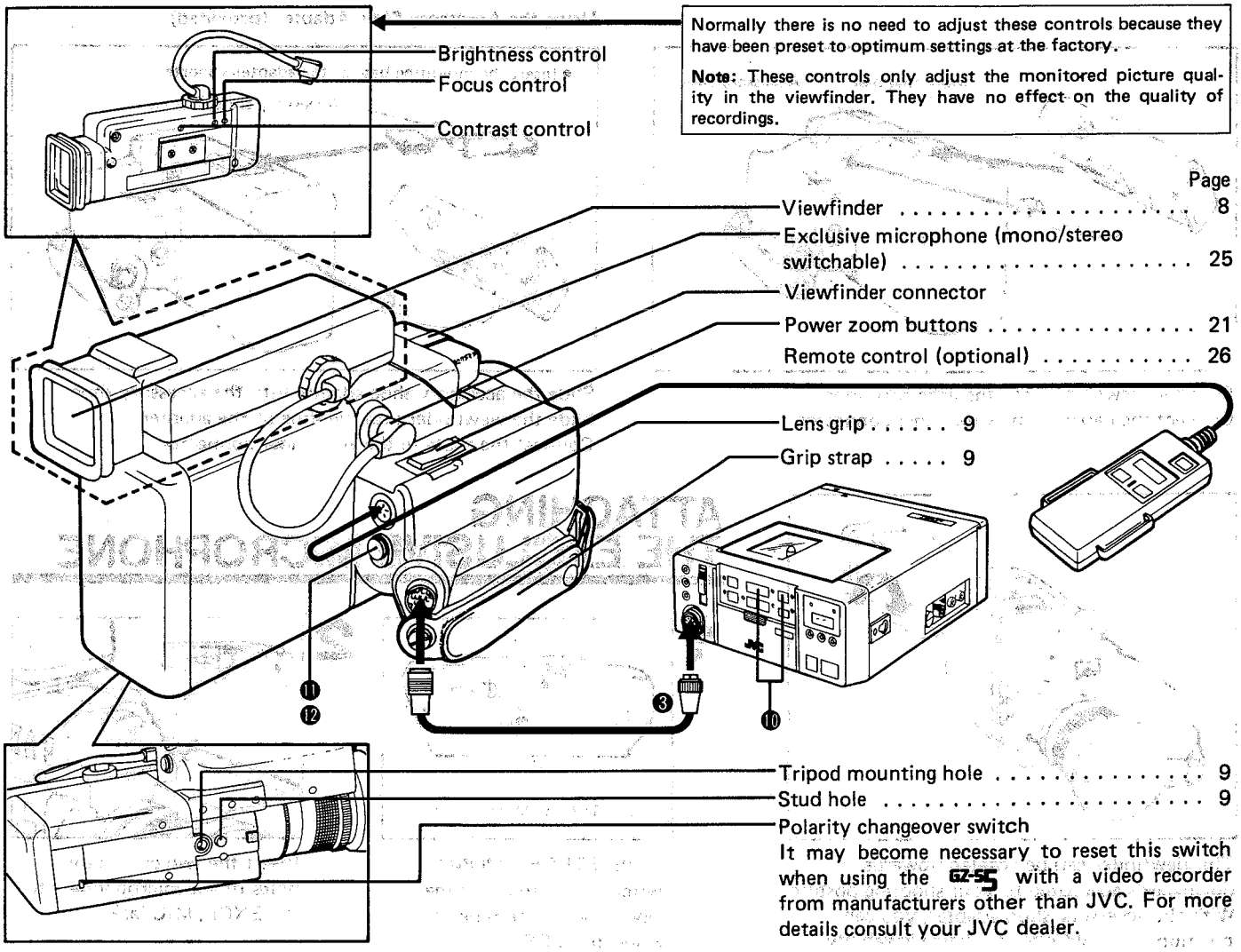
ATTENTION

The GZ-5 can be combined with the HR-C into a single-piece recording assembly using the optionally available SF-P3U Shoulder Frame. With this combination, the camera bracket provided with the shoulder frame is not needed; the GZ-5 is securely installed without this device.

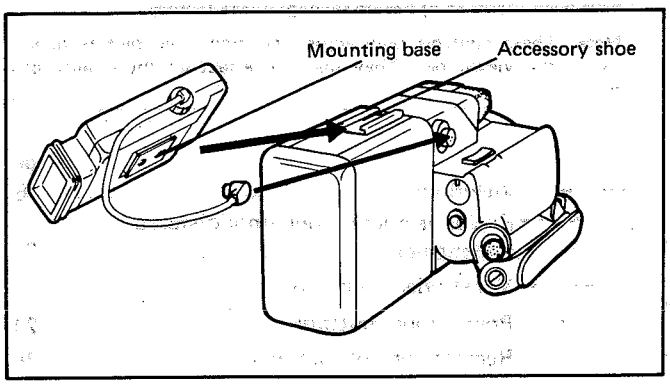


BASIC OPERATION PROCEDURE Shooting under normal daytime conditions



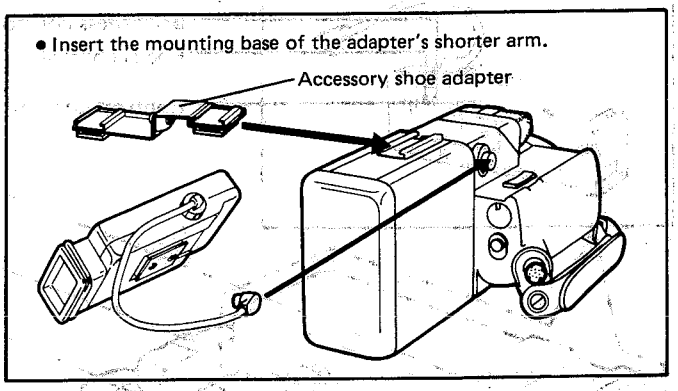

Brightness control
Focus control
Contrast control
Normally there is no need to adjust these controls because they have been preset to optimum settings at the factory.
Note: These controls only adjust the monitored picture quality in the viewfinder. They have no effect on the quality of recordings.
Page
Viewfinder 8
Exclusive microphone (mono/stereo switchable) 25
Viewfinder connector
Power zoom buttons 21
Remote control (optional) 26
Lens grip 9
Grip strap 9
Tripod mounting hole 9
Stud hole 9
Polarity changeover switch
It may become necessary to reset this switch when using the GZ-S5 with a video recorder from manufacturers other than JVC. For more details consult your JVC dealer.

MOUNTING THE VIEWFINDER

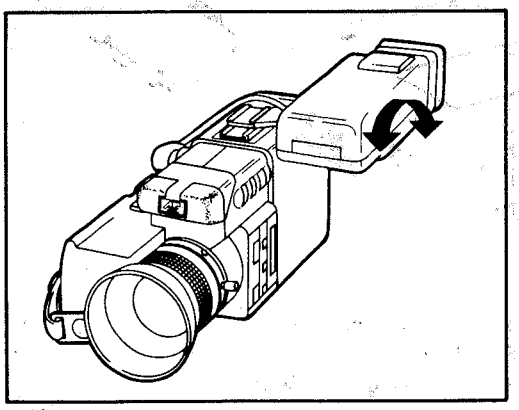


Slide the viewfinder into the accessory shoe.
Connect the cable to the viewfinder connector.

Using the Accessory Shoe Adapter (provided)



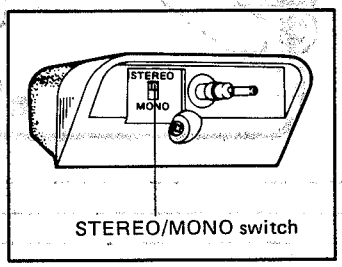
Slide the accessory shoe adapter into the accessory shoe.
Slide the viewfinder into the shoe of the adapter.
Connect the cable to the viewfinder connector.



The viewfinder can be rotated upwards or downwards according to your shooting posture. With the accessory shoe adapter, you can position the viewfinder for best viewability.

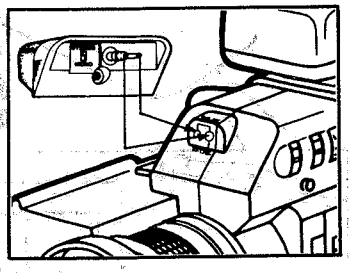
ATTACHING THE EXCLUSIVE MICROPHONE

1



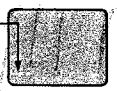
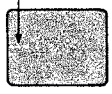
Set the STEREO/MONO switch on the microphone depending on the type of the connected VCR.

2



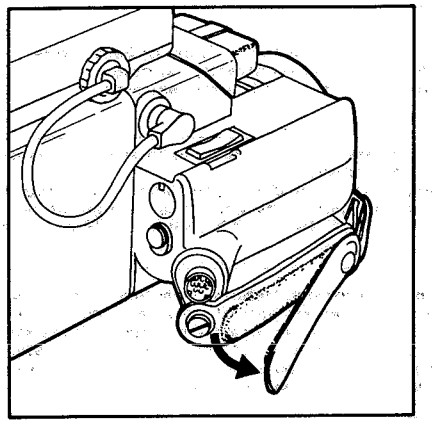
Insert the two connector plugs of the microphone into the EXCL. MIC jacks.

VIEWFINDER INDICATIONS

Recording standby mode	Correct exposure  Under-exposure 	Long white line shows when the recorder is in the Pause or Stop mode. Line at the center: shows that the subject is correctly exposed. Line below the center: shows that the subject is under-exposed.
Recording mode	Correct exposure Flickering  Under-exposure 	When the start/stop switch is pressed, the line reduces in size and flashes to indicate that the tape is running properly. Line at the center: correct exposure. Line below the center: under-exposure While recording, the line moves downwards when the amount of light is insufficient. To correct it, set the SENSITIVITY switch to UP or increase lighting. (See page 17.)
Focus condition	Focus point behind the subject  Correct focus  Focus point in front of the subject 	When the focus point is located behind the subject, a small white square flickers at the upper left part of the screen. When the subject at the center of the frame is correctly focused, a white square appears at the upper center part of the screen and remains lit. When the focus point is located in front of the subject, a small white square flickers at the upper right part of the screen.
Battery warning		The leftmost quarter of the screen becomes white and flickers when the power of the battery inside the recorder becomes insufficient for normal operation.
Tape end	Rapid flickering 	When the remaining tape length reaches one minute or less, flickering speed of the recording mode indicator line is accelerated. (This indication may not be available with some recorders.)
SENSITIVITY switch position		A white square appears at the bottom left corner of the screen when the SENSITIVITY switch is set to UP. See page 24.
White balance adjustment		Press the W. BAL ADJ button for about one second; the white square at the upper left corner flickers. If flickering of the white square changes into a steady, flicker-free light when the button is released, optimum white balance has been obtained. (See page 15.)
FILTER switch position		A red LED lights when the FILTER switch is set to ☀, warning that the conversion filter is not in position when shooting outdoors. See page 15.

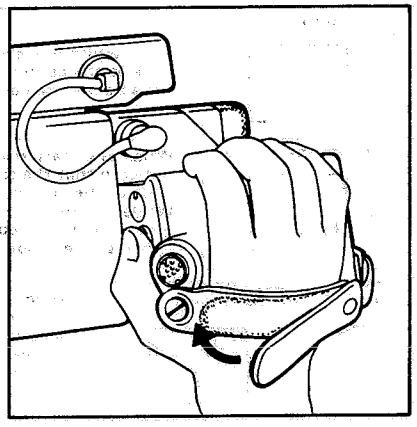
GRIP STRAP

1

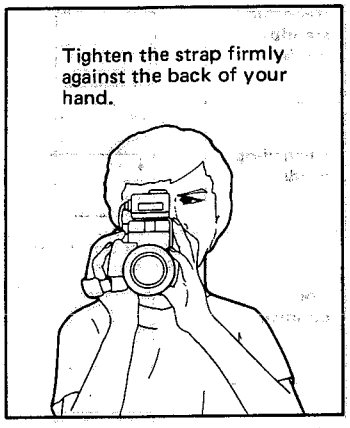


Separate the Velcro strip to expand the loop.

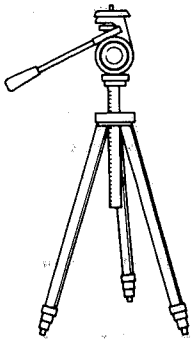
2

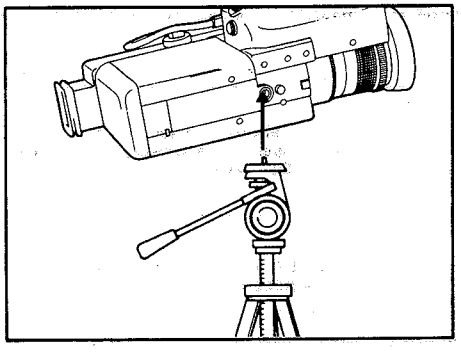


Pass your right hand through the loop and grasp the lens grip. Adjust the length of the strap to suit your hand size and refasten the Velcro strip.



TRIPOD MOUNTING



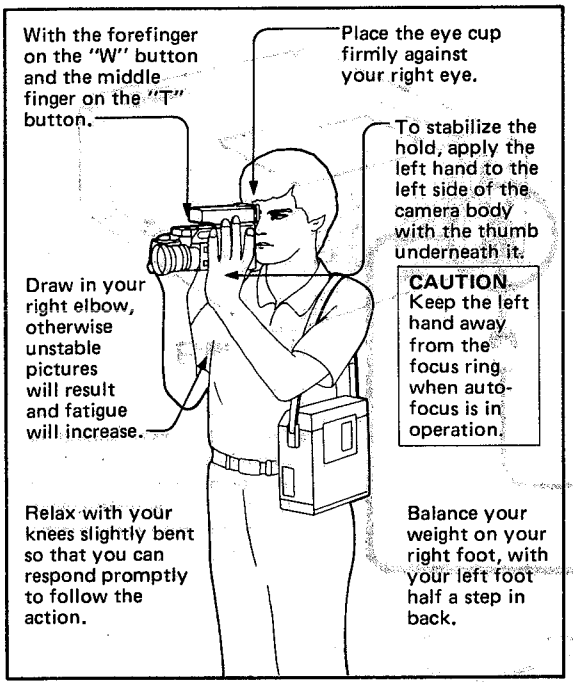


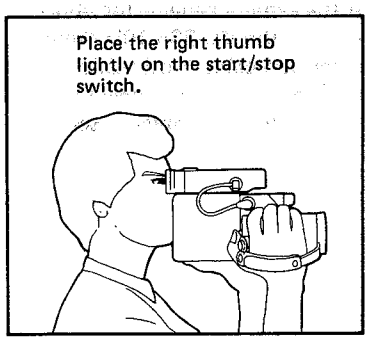
Align the screw and camera direction stud of the tripod with the camera's tripod mounting socket and stud hole, and firmly tighten the screw.

Note:
This video camera may be used only with a SAMSON tripod Model 4-73010-7 (CAM HEAD 4-72300-3). The tripod legs should be fully spread. Use with other tripods may result in instability causing possible injury.

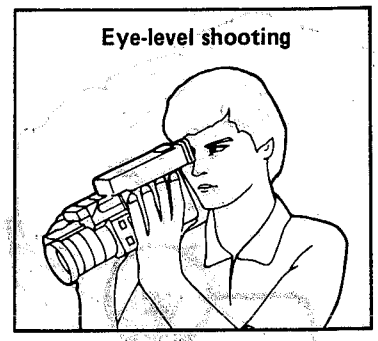
SHOOTING POSTURES

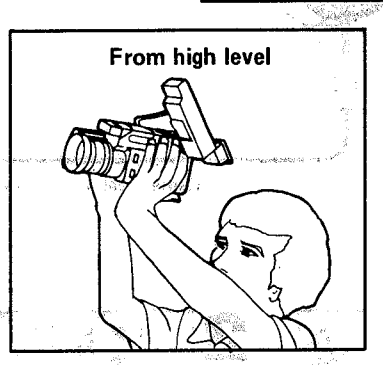
Basic posture

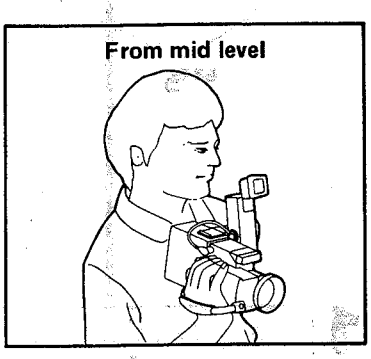


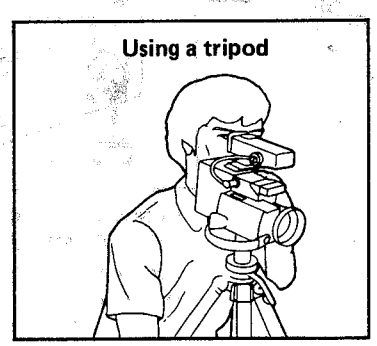


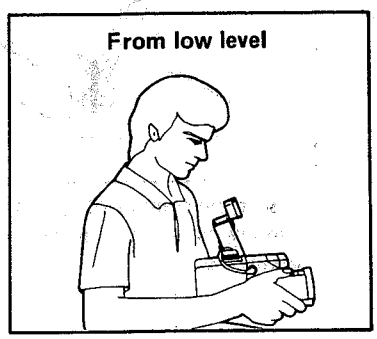
Various postures using the shoe adapter



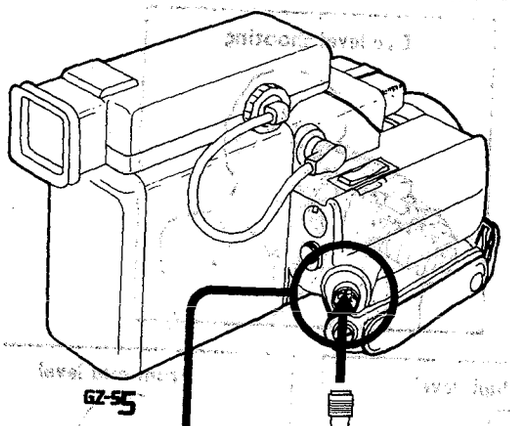


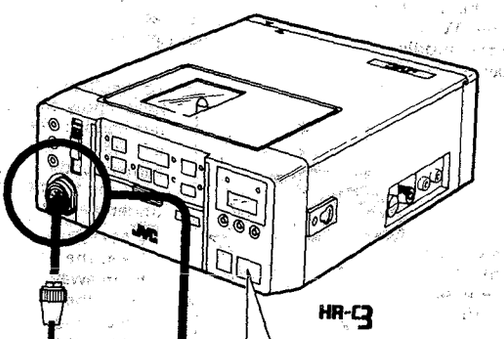






CONNECTIONS Connecting to the HR-C3 recorder

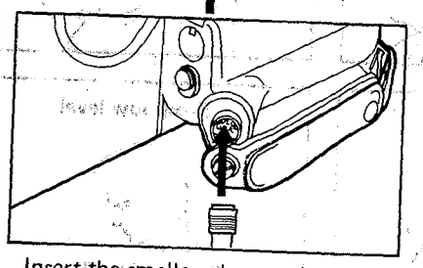




Camera cable (provided)

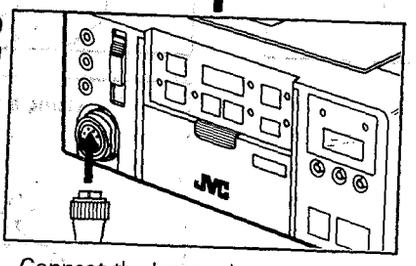
- The VCR power should be turned off when connections are being made, otherwise troubles such as malfunctioning of the auto-focus mechanism could occur.

1



Insert the smaller plug on the camera cable into the camera cable connector.

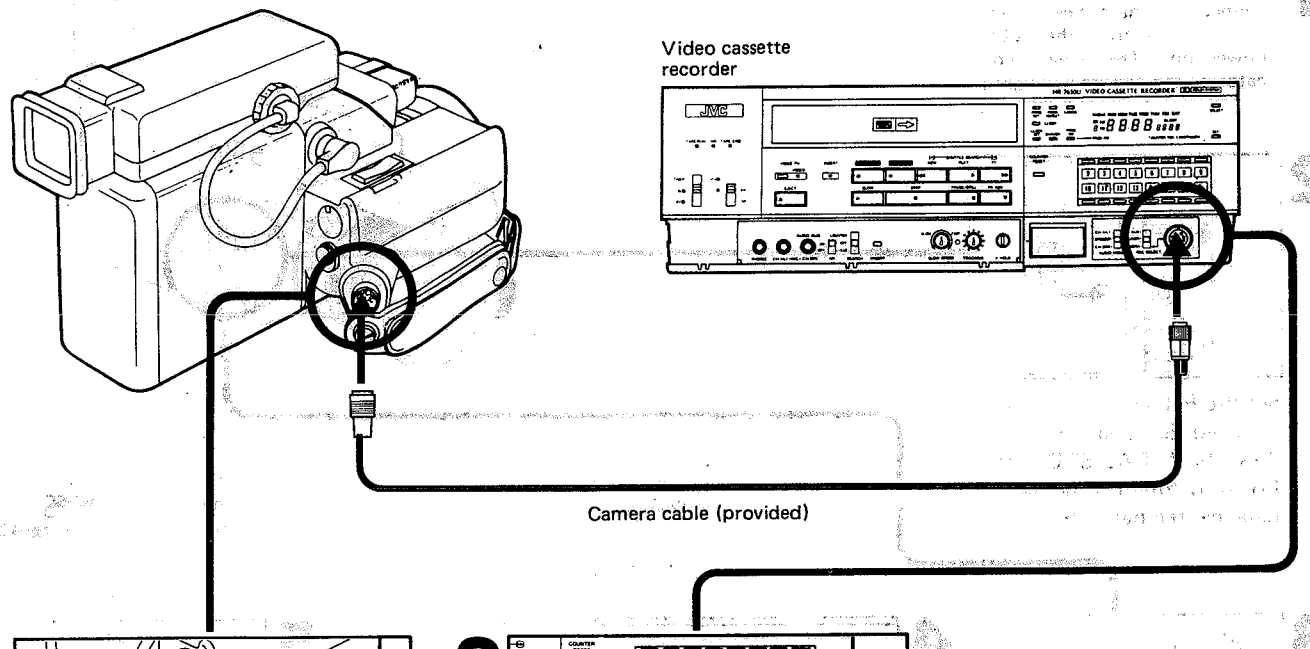
2



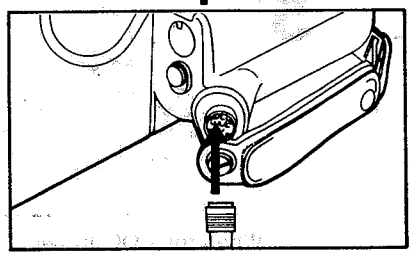
Connect the larger plug to the VCR's CAMERA connector. Secure the connection by turning the fixing ring.

If the camera cable is too short, employ the VC-235-10U camera extension cable (optionally available). Do not connect two or more extension cables in series.

Connecting to a VCR equipped with a camera connector

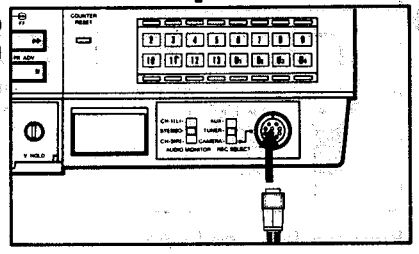


1



Connect the camera cable to the camera cable connector.

2



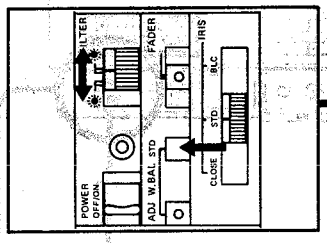
Connect the larger plug on the camera cable to the VCR's CAMERA connector.

Note

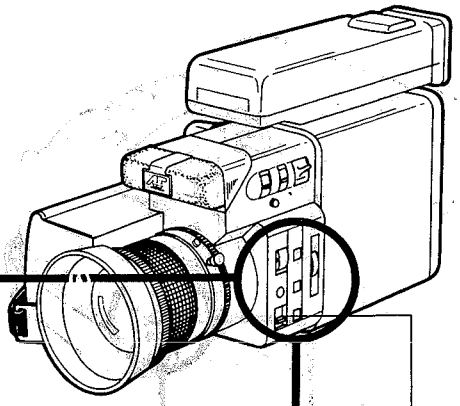
- With VCRs other than the JVC HR-C3, HR-2650U and HR-7650U, some viewfinder indications may not function.

RECORDING OPERATION

1 After making sure that all connections have been made correctly, switch the VCR power on. (The power indicator on the camera will light.)

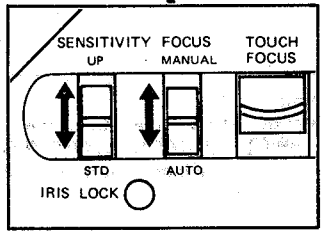


2 Set the FILTER switch as required. See page 15.
Press the W. BAL STD button. For adjustment of white balance, see page 15.

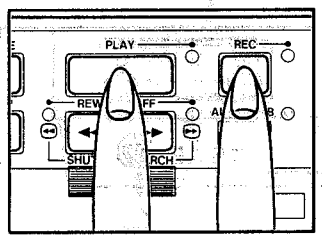


Recording standby mode indication

This power switch functions only when the GZ-S5 is connected with the HR-C3.



3 Set the FOCUS switch as required, see page 19.
Set the SENSITIVITY switch as required, see page 24.

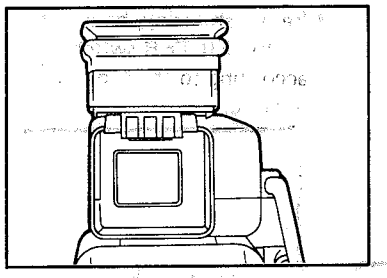


4 Press the REC and PLAY buttons simultaneously. The recorder enters the recording standby mode.

Check the viewfinder indications. See page 8.

5 When the FOCUS switch is set to AUTO, just determine the composition. When the FOCUS switch is set to MANUAL, adjust the focus. For focusing and zooming, see pages 19 – 21.

Note
If the start/stop switch is pressed in the Stop mode of the VCR, the line disappears. (With the HR-2650U, a short white line may appear.) First engage the VCR in the standby mode.



Playback monitoring
- Rewind the tape to a point from which you want to check the recording.
- Put the VCR in the Playback mode, and you can view the playback picture on the viewfinder screen.
- Flip up the viewfinder lens to obtain better viewing.

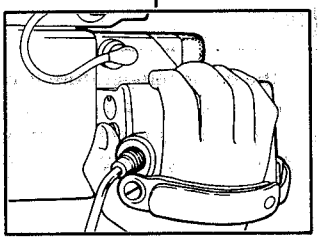
Automatic quick review function
With the HR-C3 or HR-2650U recorder, you can see the last second of the recording on the viewfinder screen when you stop the camera. This allows you to check that satisfactory recording was made.

- Do not aim the camera lens directly at extremely bright objects such as the sun or other strong light source. This may cause damage to the Saticon tube and the auto-focus sensor.

Recording

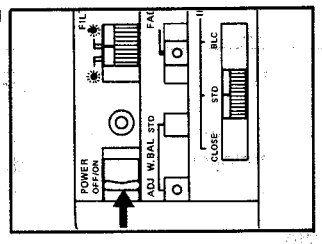
Standby

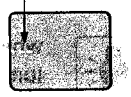
6



Press the start/stop switch.
- This causes the white line on the viewfinder screen to shrink and start flickering, showing that recording is actually taking place.

7

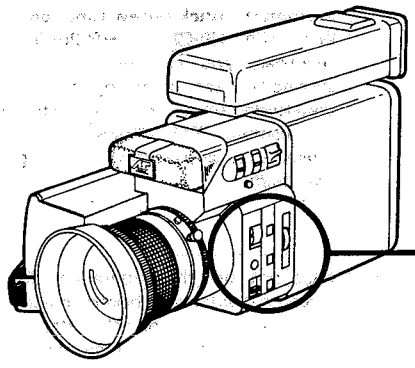




Notes:
- When combined with the HR-C3, the tape-end warning appears about one minute before the end of the tape.
- VCRs without standby lock function cannot produce smooth edits if power is switched off between takes.

To stop recording temporarily, press the start/stop switch once again.
- If you need to remain in the standby mode for longer than 5 minutes, first set the REC LOCK button to ON (if provided on your VCR), and then switch the VCR power off. When combined with the HR-C3, its power can be switched off with the camera's switch.

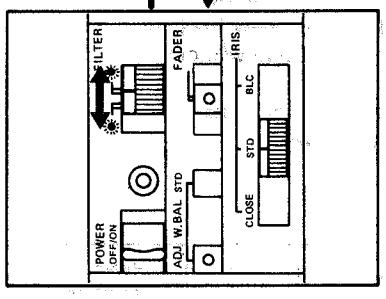
COLOR TEMPERATURE SETTING



For more information on color temperature and white balance, refer to page 27.

●Before shooting, be sure to set the FILTER switch according to the type of lighting.

Lights at ☀



1

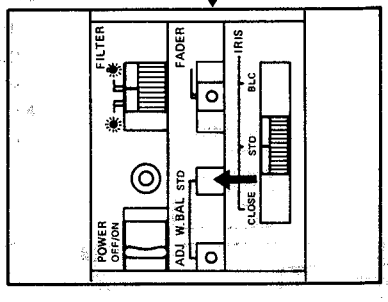
Set the FILTER switch to:

☀ when the subject is illuminated by a halogen or tungsten lamp.

☀ when you shoot in the daytime outdoors.

Under fluorescent lighting, set the FILTER switch to ☀ and adjust white balance in the manner that follows.

●The W. BAL buttons are to select two different functions; shooting at a preset color temperature or at a color temperature exactly corresponding to the shooting situation.



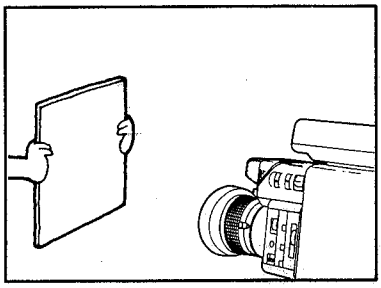
2

If you are going to adjust the white balance, read on.

STD When the color temperature is close to preset values, such as under lighting from a halogen or tungsten lamp or in the daytime outdoors, press the W. BAL STD button.

ADJ When accurate white balance adjustment is needed, or when the color temperature of lighting is unknown, such as under mixed artificial lighting, fluorescent lighting, a cloudy or rainy sky, or in the morning or evening, white balance adjustment is necessary.

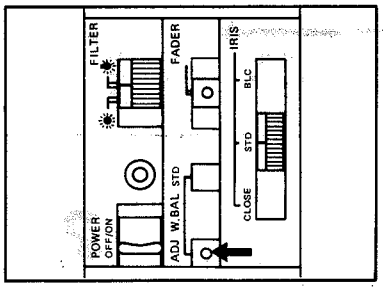
1



Aim the camera at a white or monochrome object (wall or paper) and zoom to telephoto.

2

Flickers while the button is being pressed.



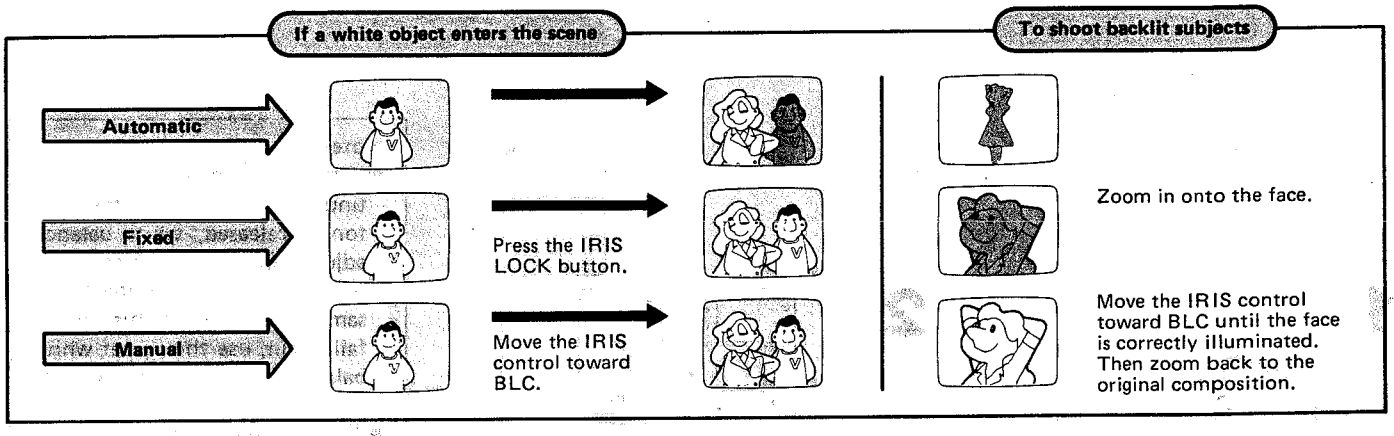
Press the W. BAL ADJ button for about one second.
The white square at the upper left corner of the screen flickers to show that white balance is being adjusted. When the button is released, if white balance has been correctly adjusted, the white square stops flickering and remains steadily lighted.

Notes:

- If the white square should continue to flicker after the button is released, white balance adjustment has not been correctly performed. Repeat the same procedure. If this should fail again, use the preset white balance by pressing the W.BAL STD button.
- White balance setting is kept in memory for about 3 hours.
- If you shoot more than 3 hours after the last white balance adjustment, or when lighting conditions change, re-perform white balance adjustment.
- If the SENSITIVITY switch position is changed, re-perform white balance adjustment.

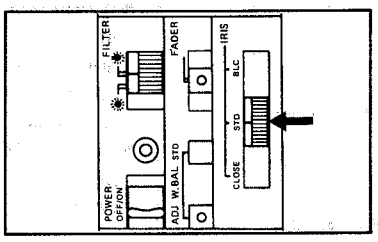
IRIS CONTROL

This camera is provided with an automatic iris control which adjusts the lens aperture according to the amount of light entering the lens so that correct exposure is obtained even when illumination of the subject changes. Fixed iris and manual control are also possible.



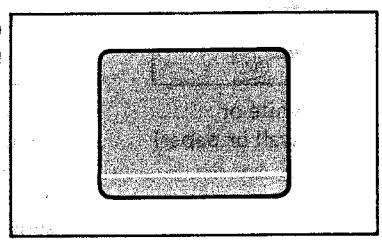
Automatic iris control

1



Set the IRIS control to STD.

2

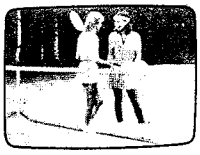


If the line on the viewfinder screen is lower than center, the amount of light is insufficient. Set the SENSITIVITY switch to UP, or increase the lighting.

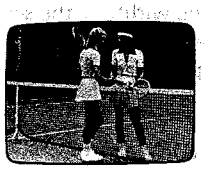
Picture variations with different apertures

Check the viewfinder image when adjusting the iris manually.

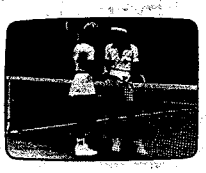
Over-exposure



Correct exposure

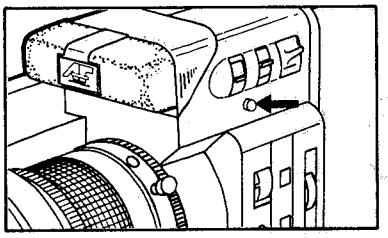


Under-exposure



Move the IRIS control manually for more precise aperture adjustment or special effects.

Fixed iris

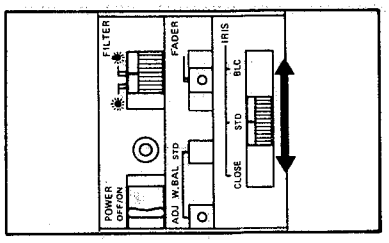


Press the IRIS LOCK button, and the aperture setting adjusted in the STD mode will be locked as long as the button is being pressed even when the brightness of the subject varies.

The fixed iris mode may improve the results:

- when the situation of a subject is changed into being backlit
- when a bright sky enters the frame while zooming out
- when panning from light to dark subjects (or vice versa)
- when a white object moves in and out of the scene

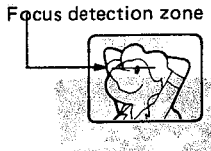
Manual iris control



To reduce aperture, move the IRIS control toward CLOSE (where the aperture is completely closed).
To increase aperture, move the IRIS control toward BLC (where the aperture is about 1 f-stop wider than the setting in the STD mode).

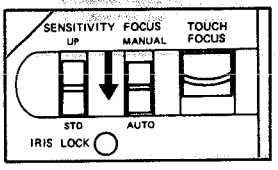
AUTO FOCUS

The GZ-5S incorporates an auto-focus mechanism which enables most subjects to be focused automatically.



- A slender area in the center and extending horizontally for about 1/3 the width of the screen is used to detect focus. (No actual indication provided on the screen.)

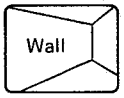
Simply set the FOCUS switch to AUTO.



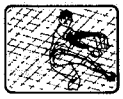
CAUTION

- Do not touch the focus ring while the auto-focus mechanism is in operation.
- Except while actually shooting, keep the lens capped. Whenever light enters the lens, the auto-focus mechanism functions and consumes power.
- Do not attempt to use auto-focus when a teleconversion or wide-angle conversion lens is attached. This could lead to damaging the auto-focus mechanism. Set the FOCUS switch to the MANUAL position with add-on lenses.

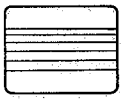
Correct focus may not be obtained in the following situations. In such cases manual focusing should be performed to obtain proper focus.



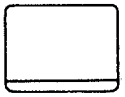
Low-contrast subjects such as a smooth, single-color wall or the blue sky.



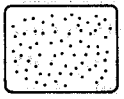
Two subjects at different distances overlap in the same scene.



Horizontal lines only.



Low illumination where the under-exposure indicator appears on the viewfinder screen.

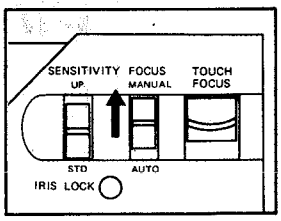


Minute patterns or identical patterns that are regularly repeated.

MANUAL FOCUS

When you use the manual focus mode, be sure to focus the lens in the maximum telephoto position. If you focus in on a certain subject in the wide-angle position, sharply-focused images cannot be obtained when it is zoomed up because the depth of field is reduced at longer focal lengths.

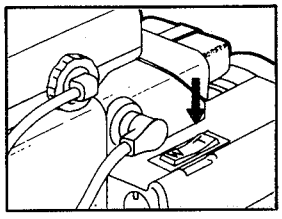
1



Procedure

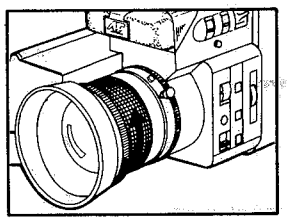
Set the FOCUS switch to MANUAL.

2



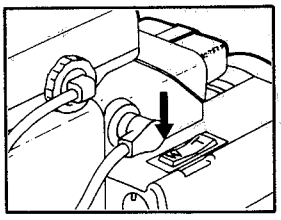
Zoom in on a subject by pressing the "T" button.

3



Focus onto it by turning the focus ring.

4



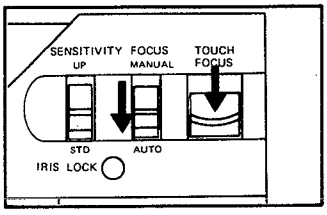
Determine the composition by pressing the "W" button.

TOUCH FOCUS

The TOUCH FOCUS button has two different functions.

A When you want to fix the focus point at a certain distance while in the AUTO mode:

Focus lock in the auto-focus mode



Set the FOCUS switch to AUTO. While shooting, press down the TOUCH FOCUS button where the focus point is to be fixed.

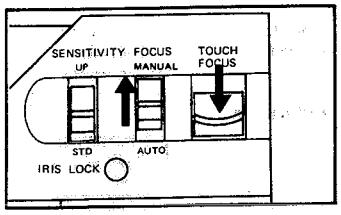
(The same focus point will be maintained while the button is being pressed down. When the button is released, the auto-focus mode is re-entered.)

This focus-lock technique is useful in the following situations:

- The subject itself does not move back and forth, but automobiles or people sometime pass between the subject and the camera. (If the auto-focus mode remains engaged, the subject and moving objects that obstruct it will be focused alternately.)
- Variable-focus effect is to be obtained by starting with out-of-focus and then gradually focusing in on the subject. (First capture an object about 1 m/3 ft away in the auto-focus mode and then fix the focus point by holding the TOUCH FOCUS button pressed down. Aim at a distant subject and, while shooting, release the TOUCH FOCUS button.)
- The in-focused subject is to be situated either at the left or right of the screen. (First capture the subject at the center of the frame in the auto-focus mode and then hold the focus point fixed. Pan the camera to determine the desired composition and shoot with the TOUCH FOCUS button still being pressed down.)
- The subject consists only of horizontal lines. (First capture the subject with the camera tilted horizontally and lock the focus. Then return the camera to its normal upright position for actual shooting in the focus-lock mode.)

B When you want to focus in on a specific subject automatically while you are shooting in the manual focus mode:

Temporary auto-focus in the MANUAL mode



Set the FOCUS switch to MANUAL. While shooting, press the TOUCH FOCUS button when you want to switch to the auto-focus mode temporarily.

(The auto-focus mode is maintained while the button is being pressed down. When the button is released, the manual focus mode is re-entered.)

This instant auto-focus technique is useful in the following situations:

- To suddenly shift the subject from a distant object to a nearer one (or vice versa).
- To change the angle of view from wide-angle to telephoto.

FOCUS INDICATORS

The focus indicators on the viewfinder screen function in both the auto and manual focus modes. Especially in the manual focus mode, these indicators give reference to correct focusing.

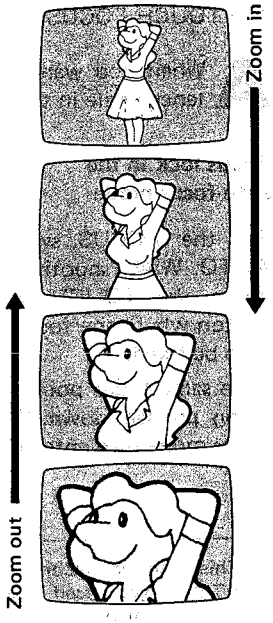
Focus condition	Focus point behind the subject	Correct focus	Focus point in front of the subject
Indication			
	White square flickers at upper left part of screen.	White square appears at the upper center part of screen.	White square flickers at upper right part of screen.
Corrective operation in the manual mode	Turn the focus ring clockwise until the flickering square moves to the center and stops flickering.	Keep the focus ring in the same position.	Turn the focus ring counter-clockwise until the flickering square moves to the center and stops flickering.

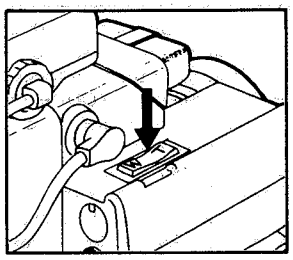
Notes

- Because of the extremely high focus accuracy of the built-in auto-focus system, the sensitive focus indicators respond even to the slightest movement of the camera itself, and appear as though they are moving rapidly from left to right or vice versa. In this case, the subject is correctly in focus. So proceed with shooting.
- All the focus indicators disappear if auto-focus cannot properly function in situations such as those with low-contrast or low-illuminated subjects or subjects composed of only horizontal lines. Use manual focus in such cases.

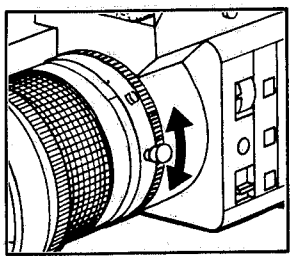
ZOOMING

When the focal length of the lens is varied by turning the zoom ring, the image appears to come nearer to or retreat from the viewer.





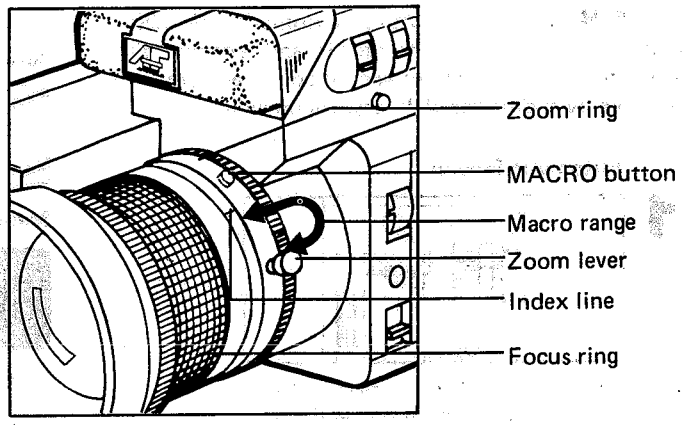
Power zooming
Press "T" for zooming in and "W" for zooming out.



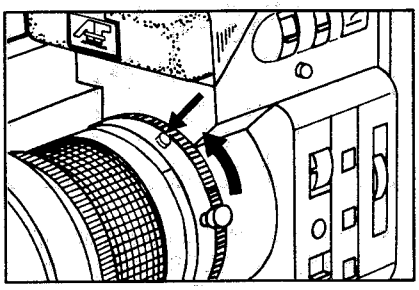
Manual zooming
Rotate the zoom lever upwards for zooming in and downwards for zooming out.

MACRO SHOTS

In the ZOOM range, focusing is possible only for subjects that are more than 1.1 m (3.5 ft) away from the camera. By setting the lens to MACRO, it is possible to focus manually in on any subject located inside that limit, right up to the front of the lens. The MACRO and ZOOM ranges combined give continuous shooting ability from zero to infinity.

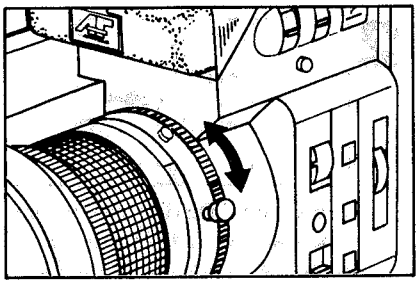


Engage MACRO



While pushing in the MACRO button, turn the zoom ring in the direction of the arrow until the MACRO button passes the index line.

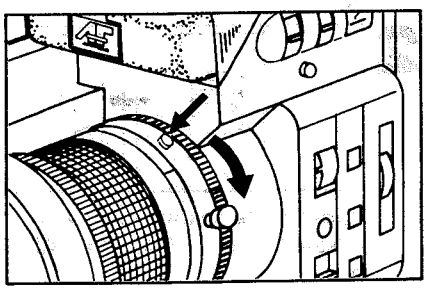
Focus



Focus by turning the zoom ring slowly.

- Use the zoom ring to focus in the MACRO range.
- Turning the focus ring will slightly alter the angle of view of the lens.
- The zoom and auto-focus mechanisms do not function during macro shooting. (The focus indicators are effective.)

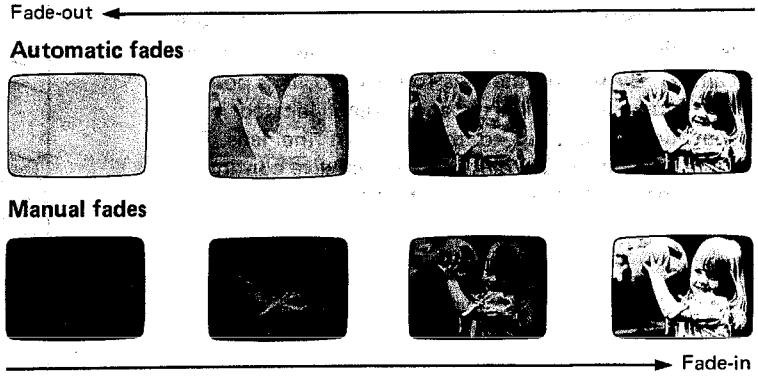
Release MACRO



To release the macro mode, turn the zoom ring in the direction of the arrow with the MACRO button pressed, until it passes the index line.

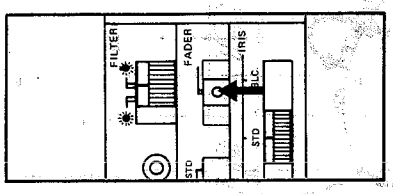
FADE-IN/FADE-OUT

The GZ-5S is equipped with an automatic fade mechanism for allowing smooth fade-in and fade-out with a white-colored blank screen. Black fades are also possible by sliding the IRIS control manually.



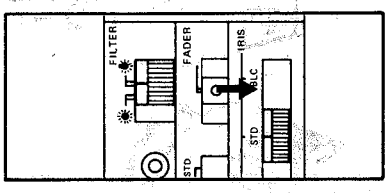
Automatic fade-in

1



Determine the composition in the Recording Standby mode and continue pressing the FADER button. In about 5 seconds, the screen will become white.

2



Press the start/stop switch and release the finger from the FADER button.
Fade-in will start and be completed in about 5 seconds.

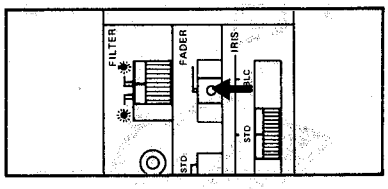
Note

- If you want to delay the start of fade-in, press the start/stop switch with the FADER button still being pressed and release the button after a desired time has elapsed.

Automatic fade-out

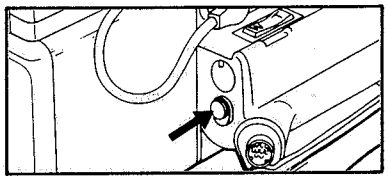
1 Start shooting as usual.

2



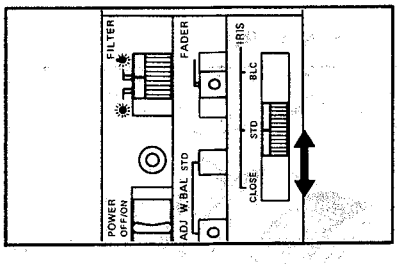
Press the FADER button where you want for fade-out to start and continue to press until the fade-out is completed (in about 5 seconds).

3



Stop shooting by pressing the start/stop switch after fade-out has been completed.

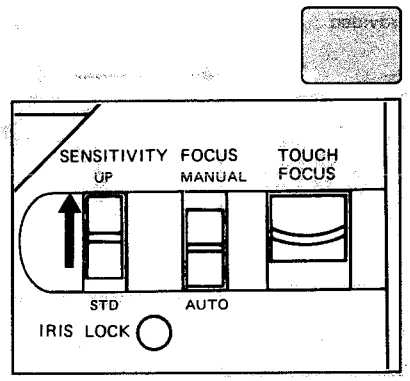
Manual fades



- Sliding the IRIS control gradually from STD to CLOSE will give a fade-out effect. The blank screen color is black in this case.
- Sliding the IRIS control gradually from CLOSE to STD will give a fade-in effect from black to normal picture.

SENSITIVITY SWITCH

The SENSITIVITY switch is to increase sensitivity electrically in low-light situations when the white line remains in the lower portion on the viewfinder screen.



Set the SENSITIVITY switch to UP when illumination is not sufficient.

A white square will appear at the bottom left corner of the viewfinder screen.

Note
There is some loss in picture quality and color reproduction in the UP position. Therefore, wherever possible, increase the lighting and use the STD position.

To express natural changes in brightness, use the STD position even when shooting under low illumination, otherwise naturalness will be lost.

Examples of under-illuminated situations where the STD position may give better results:

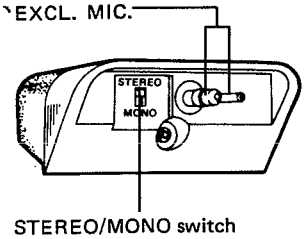
- when shooting a gradually darkening sky
- when you want to present darker settings realistically
- when shooting scenes of fireworks or neon signs

SOUND RECORDING

This camera has two audio channels to make stereo recordings possible when used with a stereo VCR. The provided exclusive microphone is a mono/stereo switchable, high-sensitivity condenser microphone.

Exclusive microphone

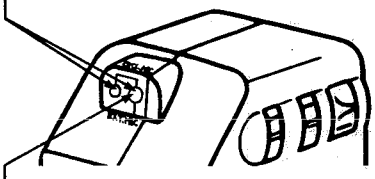
Connector plugs
Insert into the two holes labelled "EXCL. MIC."



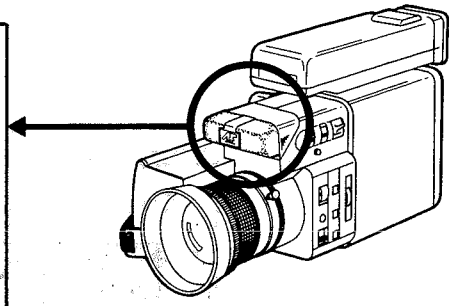
STEREO/MONO switch
Set this switch either to STEREO or MONO depending on the type of the connected VCR.

Microphone jacks

EXCL. MIC jacks
Use to connect the provided microphone.



EXT. MIC jack
3.5 mm dia. stereo mini-jack. Use this jack for connecting a stereo microphone other than the one provided.

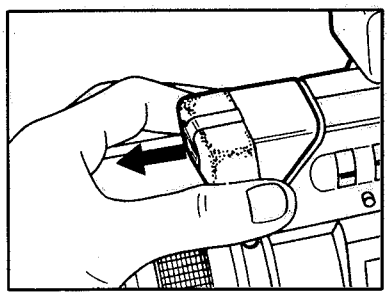


Sound recording possibilities

Recorder / Micro-phone	HR-C3	Stereo VCRs
Provided stereo microphone	Monaural recording. (Set the mike's STEREO/MONO switch to MONO.)	Stereo recording. (The mike's STEREO/MONO switch should be in the STEREO position.)
External monaural mike	Monaural recording.	Recording is made only on the left channel.
External stereo mike	Left channel sound is recorded.	Stereo recording.

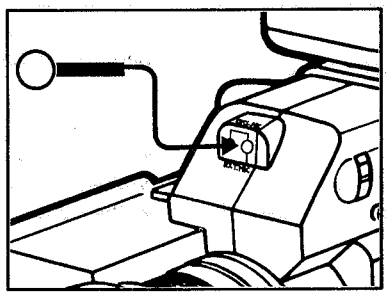
Using an external microphone

1



Remove the provided detachable microphone.
Be sure to hold the microphone the way as illustrated and pull it horizontally. (Do not hold it by the foam rubber windscreen.)

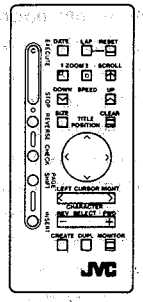
2

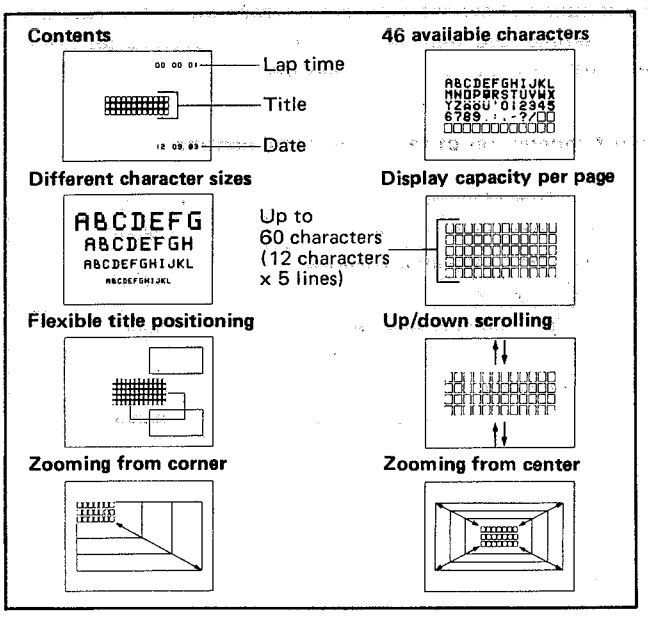


Plug an external microphone into the EXT. MIC jack (the larger one).

CHARACTER GENERATOR — Soon to be released — (optional)

The separately available character generator enables you to superimpose the date, titles and lap time on your recordings. Record dates as a reminder of the exact day a certain memorable event took place. Compose creative titles to give tapes more personality. Superimposing the lap time on some sports or action scenes can add extra drama to their viewing. Various techniques are possible to introduce more variety to your video productions as shown here.



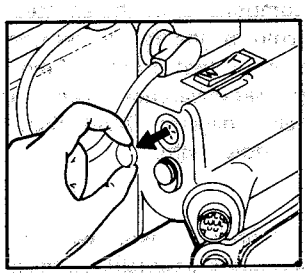


- Twelve different pages are available for titling. (Of them, four can be used for zooming titles.)
- Two scroll pages, each storing up to 37 lines of 12 characters, are also available for titling.
- Titles can be held in memory for about one year.

REMOTE CONTROL UNIT RM-P4U (optional)

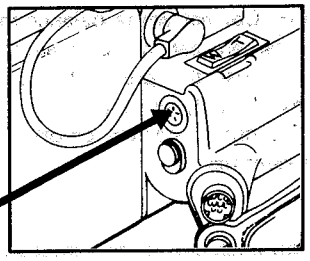
The remote control unit RM-P4U (optional) permits start/stop, zooming and VCR power on/off to be controlled from a distance.

1



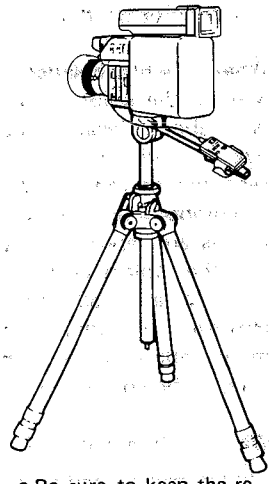
Remove the cap from the remote control jack.

2

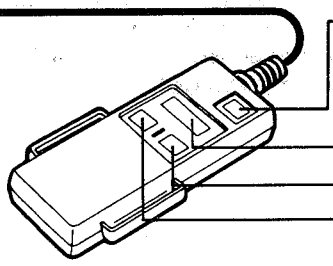


Plug the remote control cable into the remote control connector.

When the camera is tripod-mounted, it is convenient to attach the remote control to the pan handle of the tripod.



- Be sure to keep the remote control jack capped when the remote control unit is not in use.



SUPPLEMENTAL INFORMATION

What is "color temperature"?

Light is composed of various color components in different proportions. A relationship exists between the temperature of a light source and the color components of the emitted light; as the temperature rises, the color of the light varies from red, orange, yellow, white to blue in that order. "Color temperature" is a value that expresses differences in color among light sources, measured in Kelvin degrees. Bluish light has a higher color temperature than reddish light.

What is "white balance"?

Making the colors look natural on TV is what white balance is all about. Because a camera is not as adaptable as the human eye, if a light source is reddish, white subjects in that light are recorded as reddish. White balance adjustment is performed to compensate for color temperature variations of light so that whites are reproduced as white. Correct white balance makes all other colors correct. This camera can perform automatic white balance adjustment with just the press of a button. However, if illumination is insufficient, white balance adjustment cannot be performed. To obtain correct colors, therefore, sufficient illumination is essential.

What is "illuminance"?

"Illuminance" (also called 'luminance') is the intensity or brightness of light, expressed in lux or footcandles (fc). The GZ-S5 is designed to provide best pictures under the conditions of a 700-lux (67 fc) illuminance, although shooting is possible all the way down to 20 lux (1.9 fc) with the SENSITIVITY switch in the UP position. To obtain good pictures in very bright light, the use of an ND (neutral density) filter is recommended. (See chart on next page.)

How to get good color pictures

The simplest way is to provide sufficient lighting (close to the camera's reference illuminance) and accurately adjust the camera to the color temperature of that lighting. If light sources of different color temperatures are used together, accurate white balance adjustment is very difficult. For example, if natural light is mixed with artificial light, which is likely to occur next to windows, correct colors of the subject are difficult to obtain. It is recommended in such cases that curtains in the room be closed to shut out light from outside. Also, when artificial lighting devices are used, they should all have the same color temperature. For example, it is recommended that incandescent or halogen lamps not be used together with fluorescent lighting.

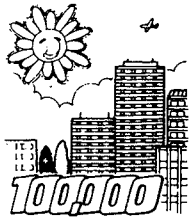
Color temperatures of various artificial lighting

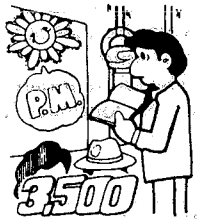
Type of illumination		Color temperature
Tungsten lamp for home use		2800K
Tungsten lamp for photographic use		3200K
Quartz-halogen lamp		
Blue lamp for photographic use		5000K
Fluorescent lamp	Warm white	3500K
	White	4500K
	Daylight type	6500K

Illuminance chart

- The values on this chart are approximated to give you a rough reference.

	Unit: Lux (fc)	
ND filter desired	100,000 (9,300)	• Clear sky, mid-day, under sunlight (100,000/9,300)
Range for practical use		• Clear sky (10:00 a.m.) under sunlight (65,000/6,045)
		• Clear sky (3:00 p.m.) under sunlight (35,000/3,255) • Cloudy sky (mid-day) under sunlight (32,000/2,976) • Cloudy sky (10:00 a.m.) under sunlight (25,000/2,325)
	10,000 (930)	
		• By the window during the afternoon (3,500/324)
	2,000 (190)	• Cloudy sky (one hour after sunrise) (2,000/190)
	1,000 (94)	• Clear sky (one hour before sunset) (1,000/94)
Lighting desired	600 (55)	• Counters at department stores (500 – 700/47 – 66)
	500 (47)	• Bowling center (500/47) • Office under fluorescent light (400 – 500/37 – 47) • Library (400 – 500/37 – 47)
		• Direct light of a flashlight at 1 m (3 ft) distance (250/22.7)
	100 (9)	• Streetlights at night (150 – 200/13.5 – 18)
	80 (7.3)	
Lighting necessary	Minimum lighting for an object	
	20 (1.9)	
		• Cigarette lighter (at a distance of 30 cm/11.8 in) (15/1.4)
	10 (1)	• Candlelight (at a distance of 20 cm/7.9 in) (10 – 15/1 – 1.4)





IN CASE OF DIFFICULTY

What may initially appear to be trouble is not always a real problem. Make sure first . . . . .

Symptoms	Check points
Picture colors greatly differ from actual subject colors.	Have you set the FILTER switch correctly? (See page 15.) Have you moved to a different location after adjusting the white balance? Or are you shooting at some later time in the day with the same white balance adjustment? ●In these cases, it is necessary to re-adjust white balance. (See page 16.) Are you shooting with the standard white balance setting under mixed lighting or a cloudy sky? ●When the color temperature of the lighting is unknown, adjust white balance.
White balance adjustment is impossible. (The white square on the viewfinder screen continues flickering.)	Have you aimed the camera at a white object? With colored objects such as red or green, white balance adjustment is impossible. Have you set the FILTER switch correctly first? Is the viewfinder indicator line lower than the center? ●This shows that the amount of light is insufficient, and white balance adjustment cannot be performed. Increase the lighting.
Normal exposure cannot be obtained, sometimes halation and sometimes black-out occur.	Check whether the IRIS control has accidentally moved out of the STD position. Have you shot with the IRIS LOCK button pressed? ●Use the fixed iris only for special cases. (See page 18.)
Stereo recording is not possible with a stereo recorder.	Is the STEREO/MONO switch on the exclusive microphone set to STEREO? ●If not, set it to STEREO.
Sound cannot be recorded with an external microphone.	Have you switched on the external microphone?
Auto focus does not function properly.	Is the FOCUS switch set to AUTO? ●If not, set it to AUTO. Are you shooting such subjects that are not suitable for automatic focusing? See page 19. Have you connected the camera to the VCR with its power on?
Recording does not start when the camera's start/stop switch is pressed.	Have you pressed the REC and PLAY buttons of the connected VCR?

GZ-S5U SPECIFICATIONS

Pickup tube	: 1/2" high-band Static-Magnetic SATICON* single tube
Color system	: Single carrier, frequency separation color system
Scanning system	: 30 frames 525 lines, 2:1 interlaced
Video output	: 1 Vp-p 75 ohms, NTSC-type output
Horizontal resolution	: Better than 270 lines
Video S/N ratio	: Better than 45 dB
Sensitivity	: 20 lux (1.9 fc) with sensitivity switch UP
Audio output	: CH-1 and -2, -20 dB/1 kohm
Provided microphone	: Detachable electret condenser stereo microphone, mono/ stereo switchable -68 dB/2.2 kohms
External microphone input	: CH-1 and -2, -68 dB/Low impedance 3.5 mm mini jack
Lens	: 6:1 power zoom lens (8 – 48 mm) f/1.4 with macro and auto shutter
Iris	: Auto iris/E-E lock/Manual control
Focus	: TCL* image sensing auto-focus device, defeatable to manual focus; touch focus possible
Color temperature switch	: Indoor (3200K)/Outdoor (W12) position
White balance	: Auto white balance/preset with memory
Viewfinder	: 1" electronic viewfinder, detachable
Indicator & alarm	: 11-mode indication in viewfinder (pause, tape run, battery alarm, white balance, under-exposure, sensitivity, filter, tape end, focus behind, correct focus, focus front)
Fader	: Built-in automatic white fader, in about 5 seconds
Power requirement	: DC 12 V ⎓
Power consumption	: 7.2 watts
Dimensions	: Camera 120(W) x 110(H) x 249(D) mm (4-3/4" x 4-3/8" x 9-13/16") EVF 60(W) x 35(H) x 159(D) mm (2-3/8" x 1-7/16" x 6-5/16") Camera with EVF & lens hood 120(W) x 153(H) x 258(D) mm (4-3/4" x 6-1/16" x 10-3/16")
Temperature:	
Operating	: 0°C to 40°C (32°F to 104°F)
Storage	: -10°C to 50°C (14°F to 122°F)
Weight	: 1.4 kg (3.1 lbs)
Accessories	: Camera cable Accessory shoe adapter Electronic viewfinder VF-P3U Lens hood Lens cap
Optional accessories	: CG-P50U Character generator CB-P45U Carrying bag RM-P4U Camera remote control SS-P3U Shooting strap SF-P3U Shoulder frame CB-P5AU System carrying case CB-P6U VCR/Camera combo case

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41 Slater Drive, Elmwood Park, N J 07407

JL3 U Printed in Japan
PU30425-593

SECTION 1
DISASSEMBLY

1.1 PRECAUTIONS AND DISASSEMBLY

1.1.1 Removal of outer panel

Loosen the shoe screw on the top panel and remove the shoe clip. Next, remove three screws ① (two on the bottom and one on the top), and then pull the panel in the direction of the arrow to remove it. (See Fig. 1-1.)

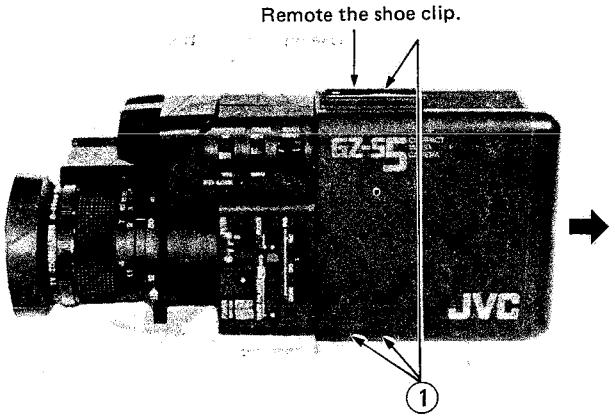


Fig. 1-1 Removal of outer panel

1.1.2 Removal of grip cover

Note: When removing the grip, leave the VIDEO and DEF boards securely fixed.
For removing the grip, it is easier to remove the control panel on the opposite side first.

Remove the two screws ② on the bottom of the grip cover, then take off the cover slowly expanding in the direction of the arrow mark.

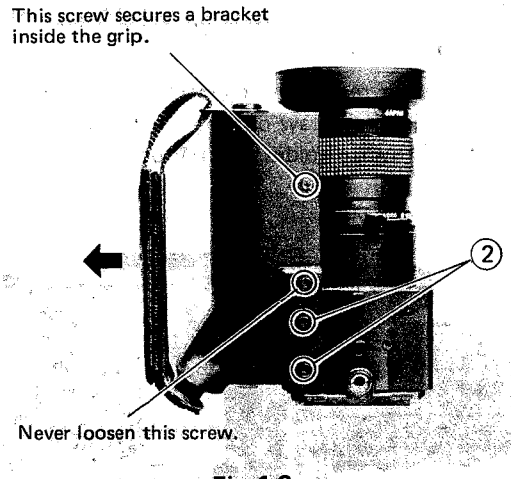


Fig. 1-2

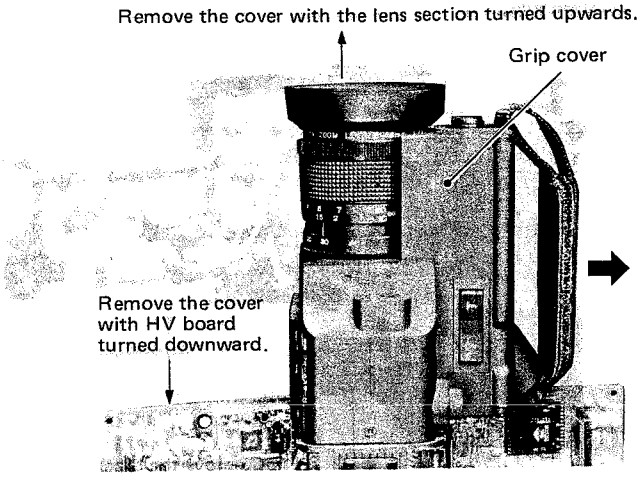


Fig. 1-3 Removal of grip cover

1.1.3 Re-assembling grip cover

Before re-assemble the grip cover, first remove the bracket (refer to the Grip Ass'y parts List — Symbol No. 21).

Note: If the bracket is left fixed, it is impossible to re-assemble the grip cover.

Holding the grip cover with the left hand, put the bottom section Ⓒ in the grip holder's groove Ⓓ. In this state, mount the grip cover in the direction of the arrow. After completion of re-assembling the grip cover, fit the bracket.

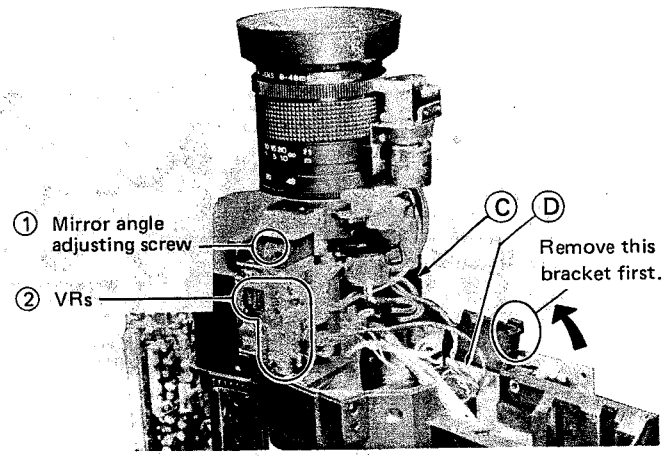


Fig. 1-4 Mounting of grip cover

Note: Never turn the mirror angle adjusting screw and VRs of AF electrical parts. The former is the most important parts to image the same picture on TCL sensor as that to be recorded, and the latter function total adjustments of AF optical system.

1.1.4 Precautions for removing and mounting grip cover

When performing removing and mounting the grip cover, be most careful. If not, the filter unit spring below the power zoom motor and the auto-focus unit gear will be damaged.

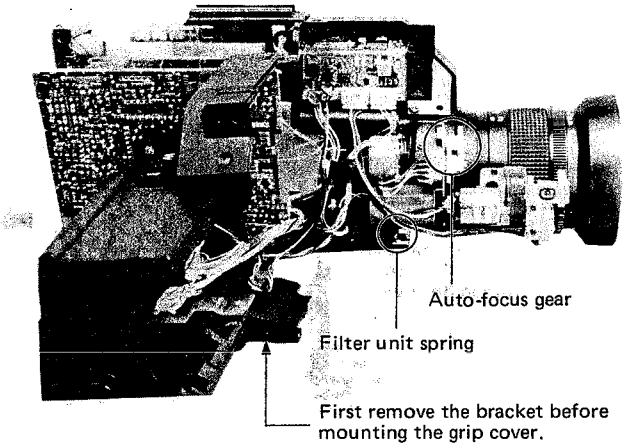


Fig. 1-5

1.1.5 Flexible printed circuit boards

1. As flexible printed circuit boards are formed on soft thin insulation films, be careful to handle them in disassembly, repair or adjustment.
2. As shown in Fig. 1-6 the VIDEO P.W.B. (G) , BOTTOM P.W.B. (H) , and DEFLECTION board (I) compose a CAMERA P.W.B. ass'y together three in one. As the video board is connected with others through flexible printed circuits as shown in Fig. 1-7 (J), carefully handle the boards expecially in opening and closing them.

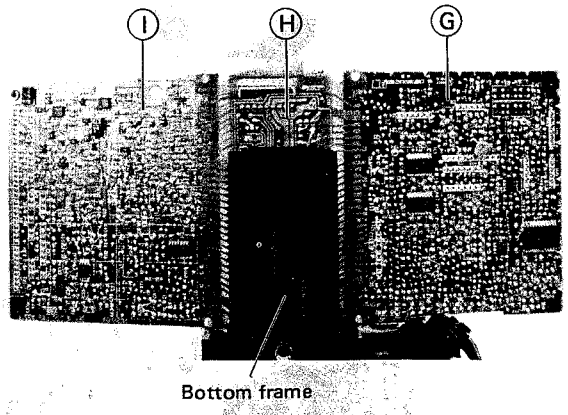


Fig. 1-6 Camera P.W.B. Ass'y

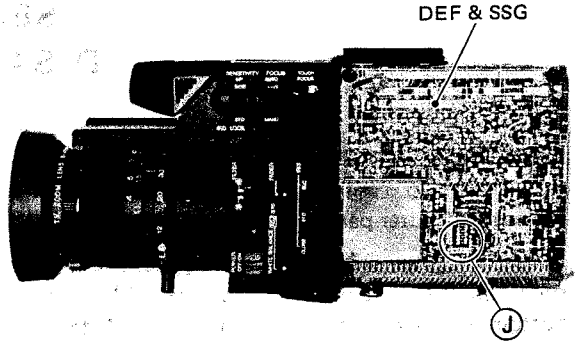


Fig. 1-7 Flexible printed circuits

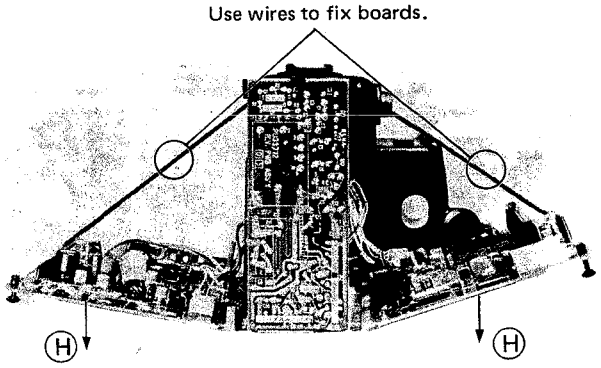


Fig. 1-8 Caution at opening/closing boards

3. Since pushing down flexible boards causes thermocompression bonding section (where fine patterns are printed) to be disconnected or damaged and they will become unusable. To avoid this problem, be sure to use wires to protect boards from lowering when opening or closing the assembly.

1.1.6 Removal of flexible printed circuit boards (Video, Bottom and Deflection boards)

1. Remove 6 nylon rivets on VIDEO and DEF boards as shown in Fig. 1-9.
2. Remove respective connectors of VIDEO and DEF boards, then draw out the HV board in the direction of the arrow by holding the HV board by its underside.

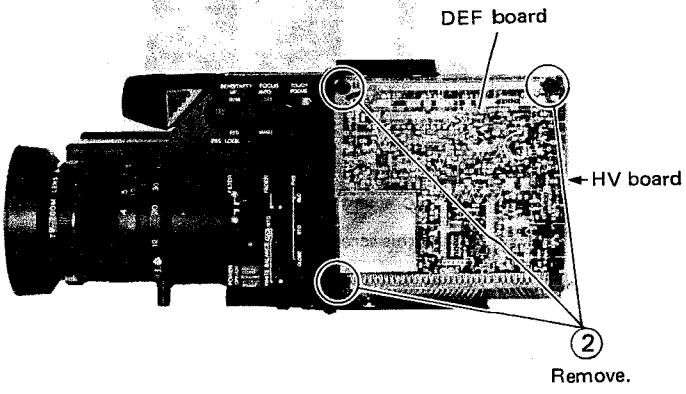


Fig. 1-9 Removal of HV board

3. As shown in Fig. 1-10, the catch (encircled in the figure) of the bottom frame is fixed in the groove of the bottom board. To remove the camera board ass'y, push the catch in the direction of the arrow with thumb and forefinger and remove the bottom board from the groove.

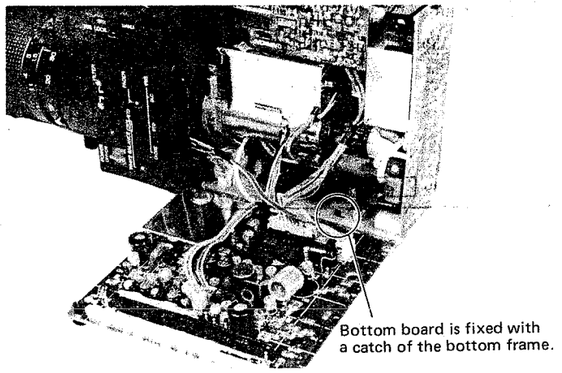


Fig. 1-10 Removal of camera board ass'y

1.1.7 Replacement of pickup tube and deflection yoke

1. Remove a screw on the bottom of the control panel cover, and then take off the cover. (See Fig. 1-11.)
2. Remove two screws (3) of the yoke holder and the white wire soldered to the preamp shield cover on the opposite side, then disconnect the Saticon tube and remove the HV board.
   In this state, push out the pickup tube and deflection yoke in the direction of the arrow.
3. Pushing the stem pin side of the pickup tube, take the pickup tube out of the deflection yoke.

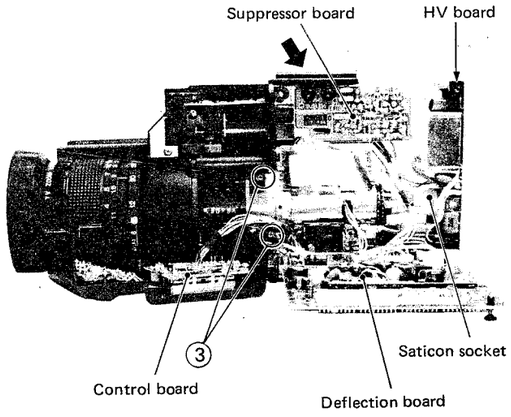


Fig. 1-11 Removal of pickup tube and deflection yoke

4. For taking out the pickup tube by pushing the stem pin side, refer to Fig. 1-12.

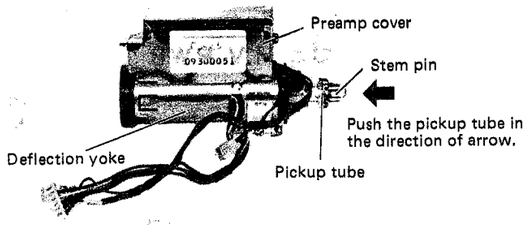


Fig. 1-12

1.1.8 Replacing forering and auto-focus ring gear

The following is replacing procedures of the forering and auto-focus ring gear which were damaged or trand-formed resulting from dropping and strong shock.

1. First remove the rubber ring with a small screw driver.
2. As shown in Fig. 1-13 the forering and focus ring gear are fixed with polyester tape of 15 mm wide around the helicoid.
3. When removing the forering, cut the polyester tape inserting a sharp cutter into the groove. However, be careful not to cut the part of (A) which is joined with the focus ring. (Removal of the focus ring causes disorder of the optical system.)

Fig. 1-13 Optical block assembly (A)

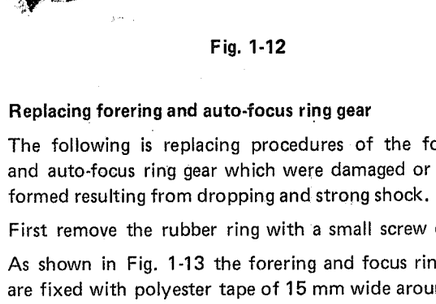
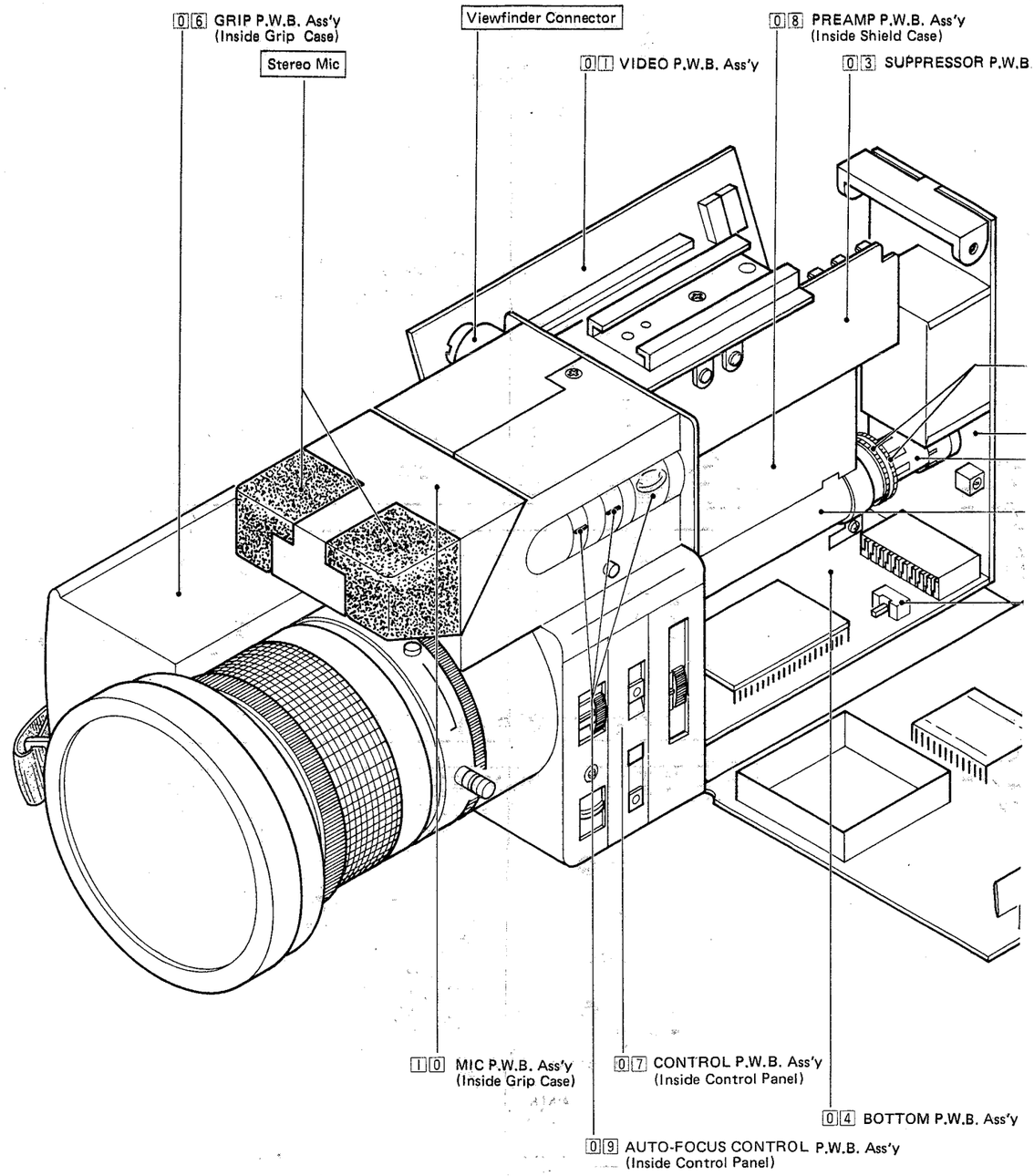


Fig. 1-14 Optical block assembly (B)

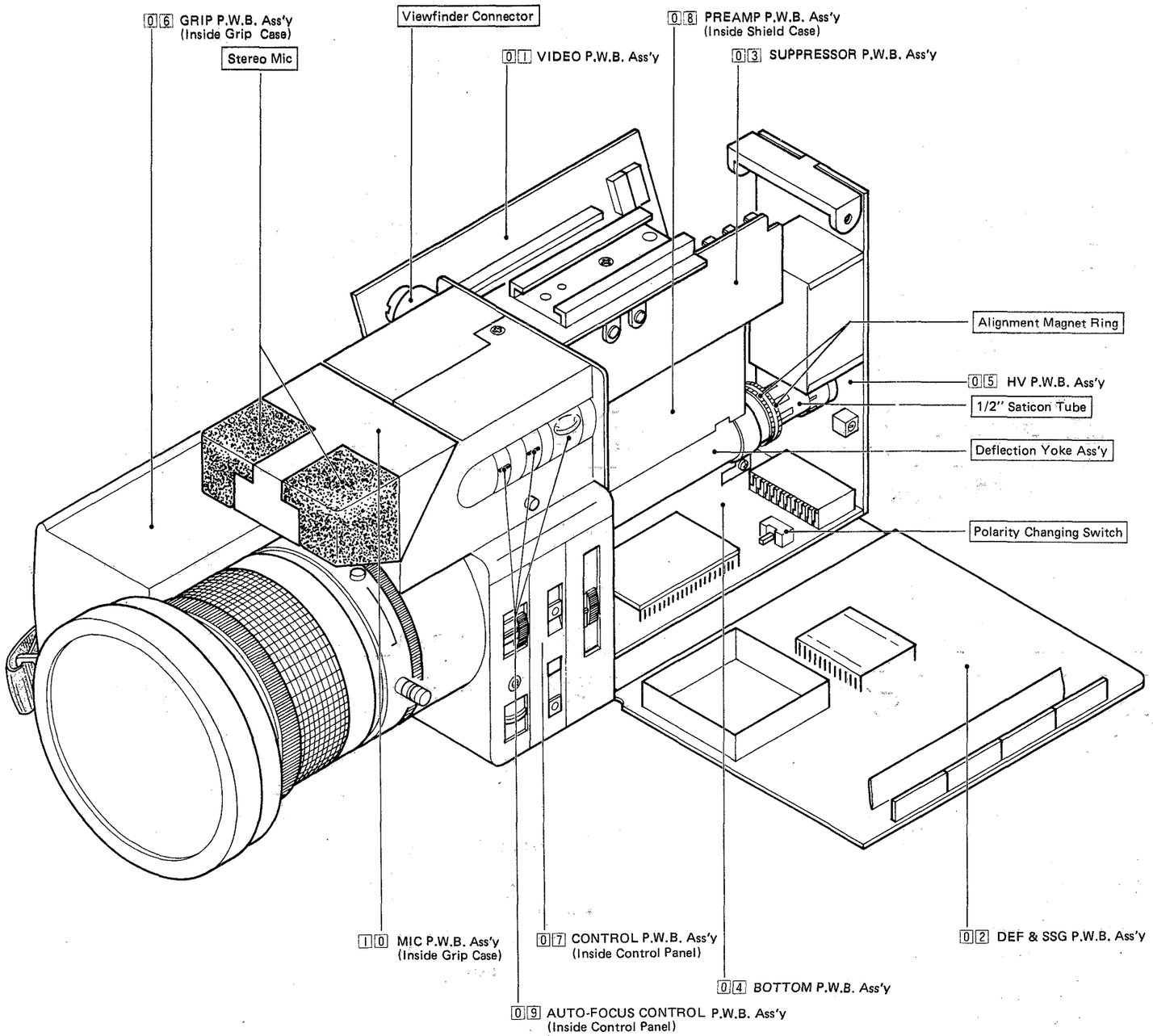
4. When re-assembling or replacing a forering, make sure to use the specified polyester tape. (Refer to the Optical Block Assembly Parts List – Symbol No. 25.)

1.2 NAMES OF MAIN PARTS (GZ-S5U)



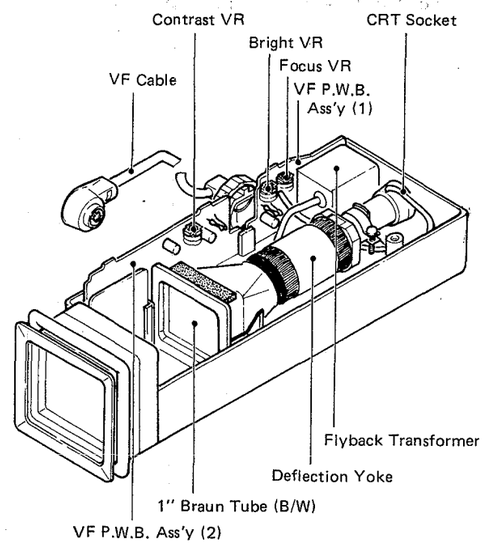
Note: For details about functions of the polarity changing switch, refer to owner's instruction book.

1.2 NAMES OF MAIN PARTS (GZ-S5U)



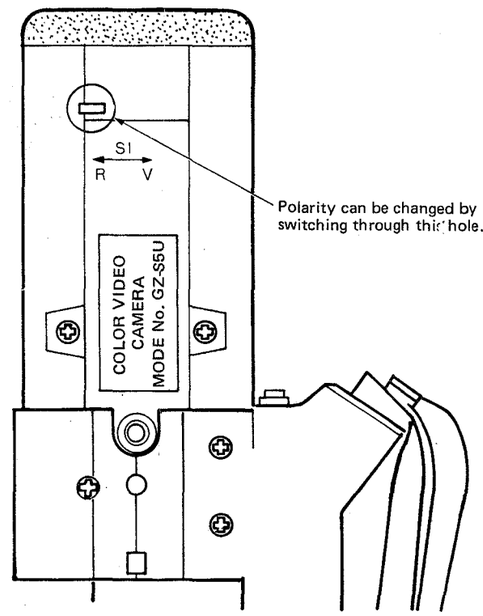
Note: For details about functions of the polarity changing switch, refer to owner's instruction book.

1.3 MAIN PARTS OF ELECTRONIC VIEWFINDER



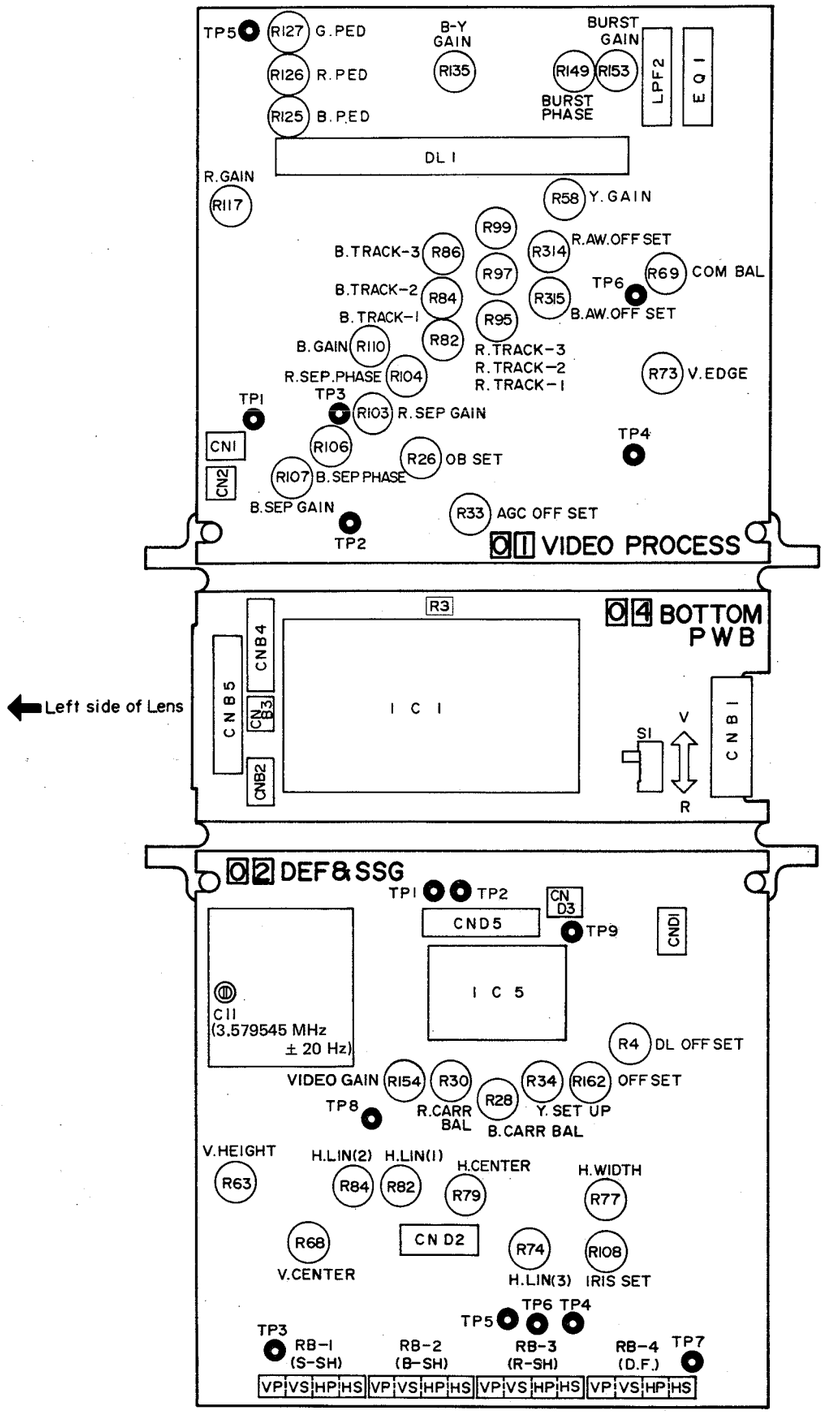
1.4 CHANGE OF POLARITY

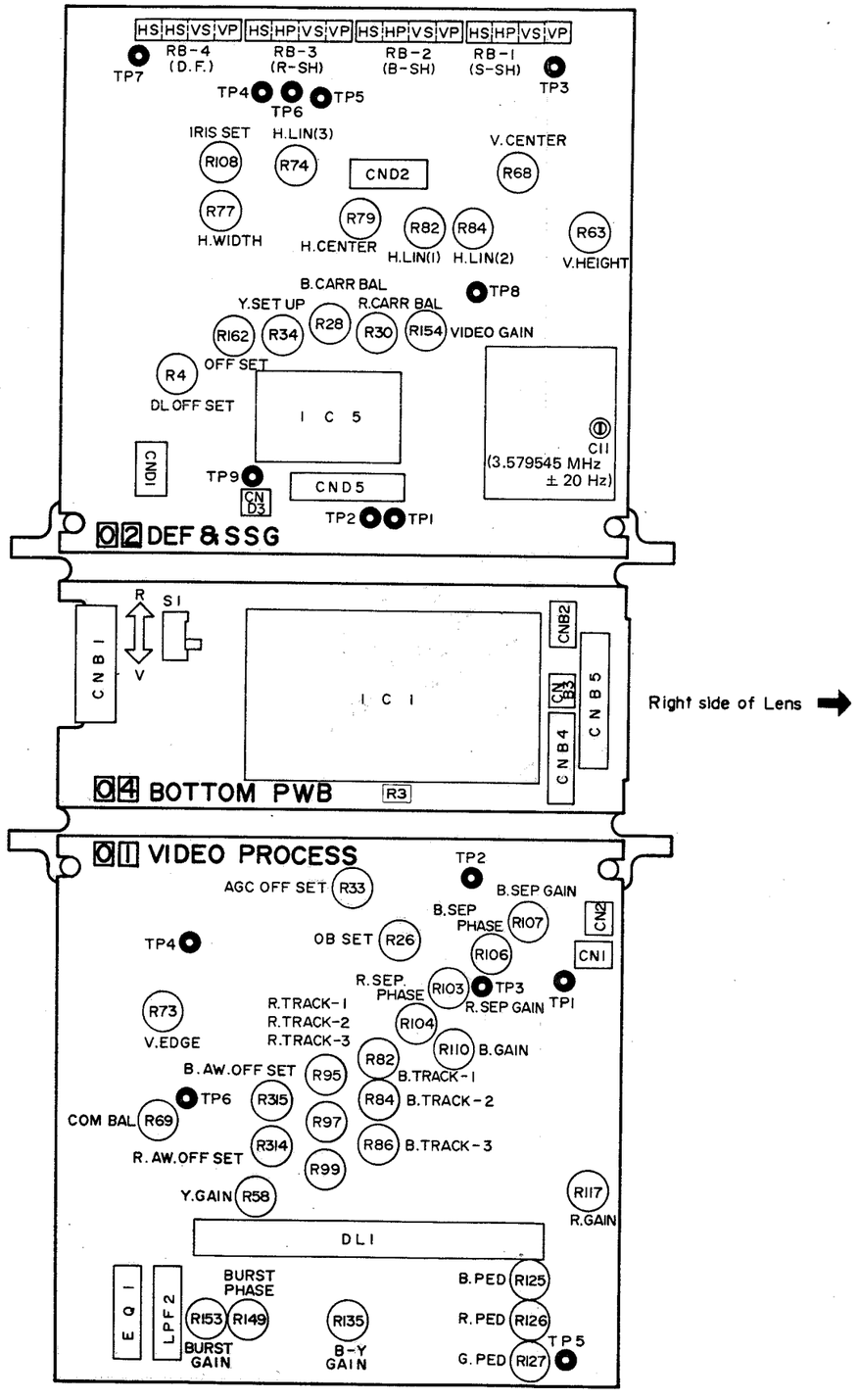
In the model of GZ-S5U is a polarity changing switch of VTS START/STOP (10-P camera connector, pin 6) built in.



1.5 LOCATION OF ADJUSTING VRs

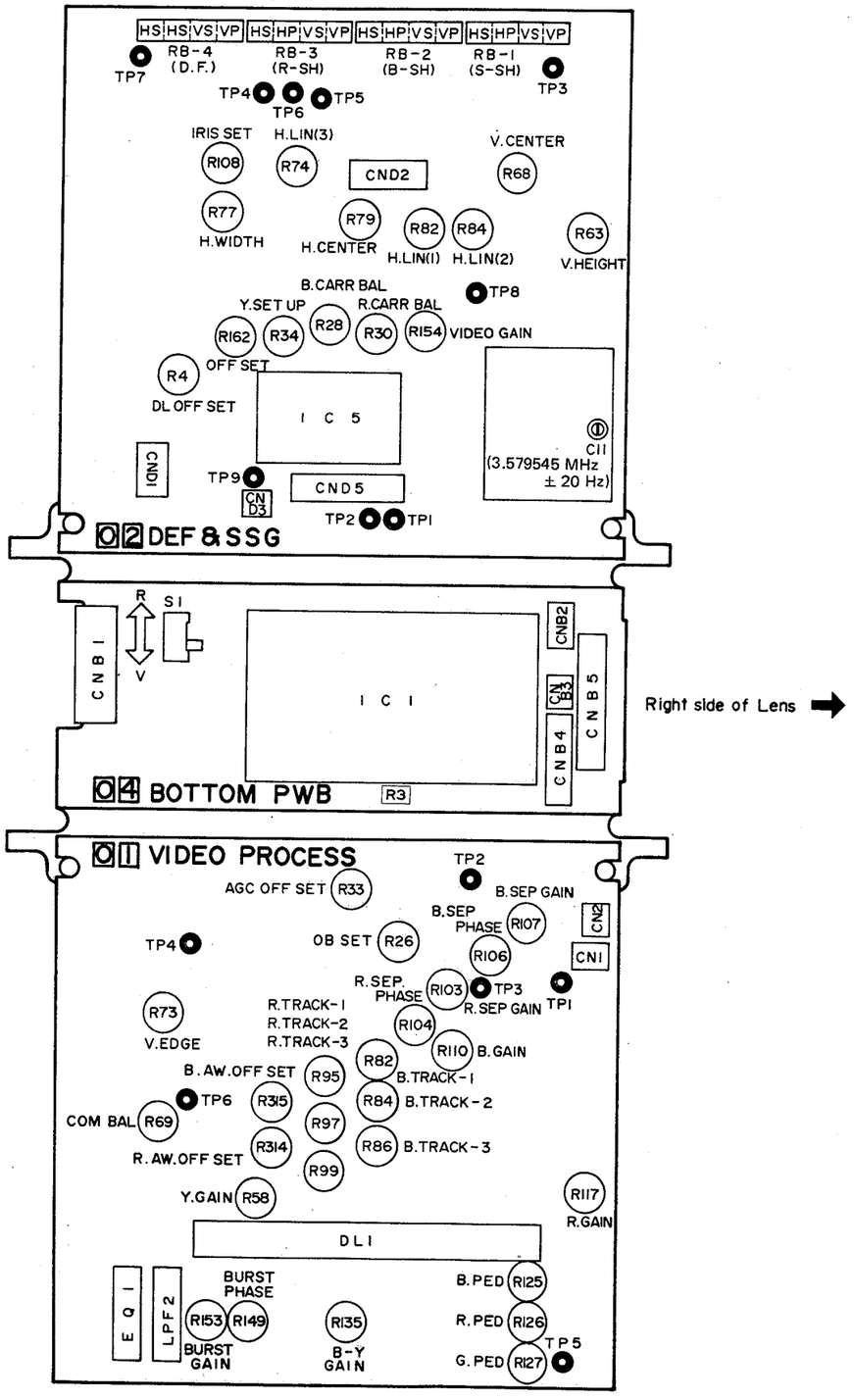
For encoder adjustment by R135, R149 and R153 on VIDEO PROCESS P.W.B. [0][1] , make sure to use vectorscope.



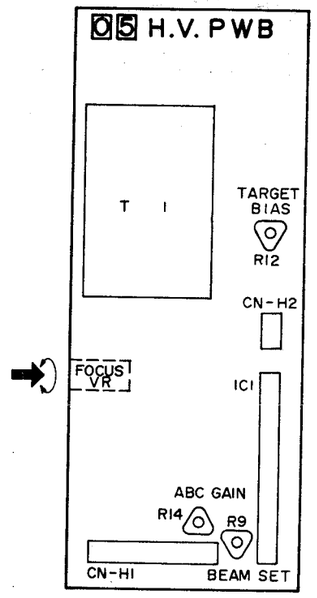


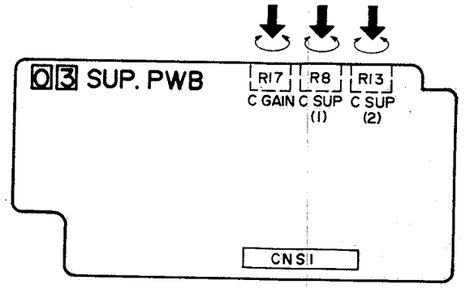
1.6 NAME

P.W.B.
0
0
0 3
0 4
0 5
0 6
0 7
0 8
0 9
1 0
1 1



Right side of Lens





1.6 NAMES OF MAIN P.W.B.'s

P.W.B. No.	Name	Remarks
01	Video Process P.W.B. Ass'y	Camera P.W.B. Ass'y 00
02	DEF & SSG P.W.B. Ass'y	
03	Suppressor P.W.B. Ass'y	
04	Bottom P.W.B. Ass'y	
05	H.V. (High Voltage) P.W.B. Ass'y	
06	Grip P.W.B. Ass'y	
07	Control P.W.B. Ass'y	
08	Pre-amp P.W.B. Ass'y	
09	Auto-focus Control P.W.B. Ass'y	
10	Mic P.W.B. Ass'y	
11	Electronic Viewfinder P.W.B. Ass'y	

1-4

SECTION 2
ADJUSTMENTS

2.1 ADJUSTING JIGS AND MEASURING DEVICES

2.1.1 Jigs and tools for color camera adjustment

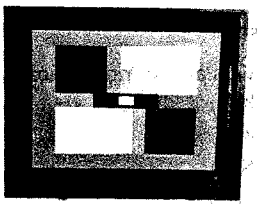
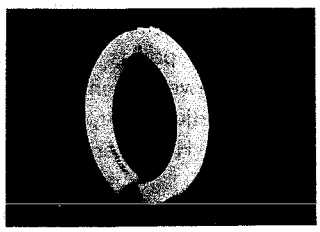
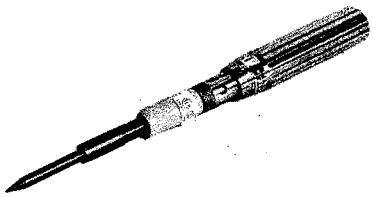
Reflection type greyscale pattern – GS-2A  11 steps, γ = 2.2, H : W = 3 : 4	Lighting equipment  (Halogen light, Color temperature: 3 200°K, Pattern illumination: 4000 lux)	Rotation jig – PUJ43847 
Pinhole caps – PUJ36531  (for V. center and beam adjustments)	Torque driver – PUJ44644  (for tightening pick-up tube)	

Table 2-1

2.1.2 Other necessaries for adjustment

- Lux meter
- Air blower
- Lens cleaning paper, alcohol
- Skin color and white patterns
- Torque driver
- Color temperature conversion filter
- ND filter

2.1.3 Others convenient for adjustment

- Oscilloscope (Delay type is recommended)
  (Probe: 1 : 1, 10 : 1)
- Camera adaptor (CA-P25 or equivalent)
- Color monitor (adequate to this model)
- Frequency counter (precise type)
- DC voltmeter (precise type)
- Vectorscope
  (Required for some adjustments)

2.1.4 Standard setting and connections

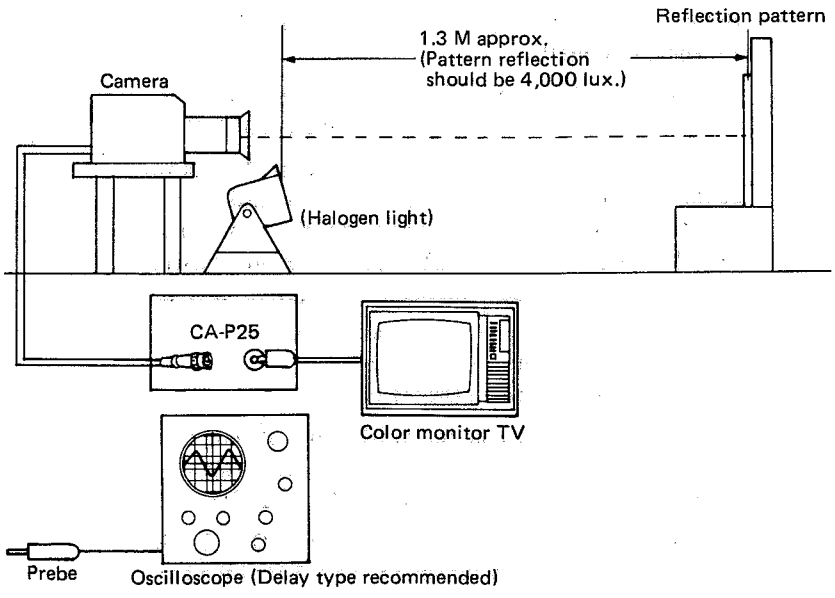


Fig. 2-1

2.2 PREPARATION AND CHECKUP BEFORE ADJUSTMENT.

2.2.1 Preparations and precautions

- This service manual describes for the case that the pickup tube or deflection yoke has been replaced. Therefore, if a servicing is different from this case, here may be some adjusting items unnecessary for the servicing. In practical servicing adjust a set to obtain its highest performance referring to the characteristics of the pickup tube and deflection yoke as well as to the values shown in this manual.
- VRs, test points and descriptions are all explained being viewed from parts side otherwise indicated.
- Before adjustment, do apply vinyl tape and the like onto the HV board to prevent from receiving electric shock.
- All adjusting jigs and measuring devices such as an oscilloscope, frequency counter, DC voltmeter, greyscale, color pattern and so forth should be cleaned and checked up before adjustments. Dirty and disordered devices cause incorrect adjustment.

1. Use 3,200°K light equipment and set it so that the intensity of illumination on the pattern may be 4,000 lux or more and the whole area of the pattern may be lighted equally. (Two or more light sources recommended)
   Poor and bad lighting results in inproper adjustment.
2. Set switches and controls as follows:
   Sensitivity switch — Standard
   Iris — Standard (Auto)
   White balance — Standard
   Filter changer switch — ☀ mode
3. Before adjustment cap the lens for about 10 minutes for aging (preheat).
4. Trigger an oscilloscope from the following test point:
   a) H/V rate . . . . Deflection board TP-9 (VIDEO OUT)
5. If adjustments have mostly differed from the normal condition, perform presetting of the monitor before adjustment. If picture is normal on the monitor or only fine adjustment is required, preset is unnecessary.
6. In the period of aging (preheating), confirm that the output of the switching regulator as follows:
   3 ± 0.1 V at HV board CH-H1 pin 5,
   8.5 ± 0.15 V at HV board CN-H1 pin 7.
7. Connect a frequency counter to IC3 pin 8 of Deflection board and adjust C11 of DEF & SSG board so that subcarrier frequency becomes 3.579545 MHz ± 20 Hz.
8. Remove the shield cover on the back side of DEF & SSG board and adjust L1 to obtain +3 V ± 0.1 V at the both ends of C16 of DEF & SSG board.

2.2.2 Preset of deflection system

Set the following VRs at the mechanical center.
R79 (H. CENTER)
R68 (V. CENTER)
R82 (H. LIN-1)
R84 (H. LIN-2)
R74 (H. LIN-3)

2.2.3 Preset of video system

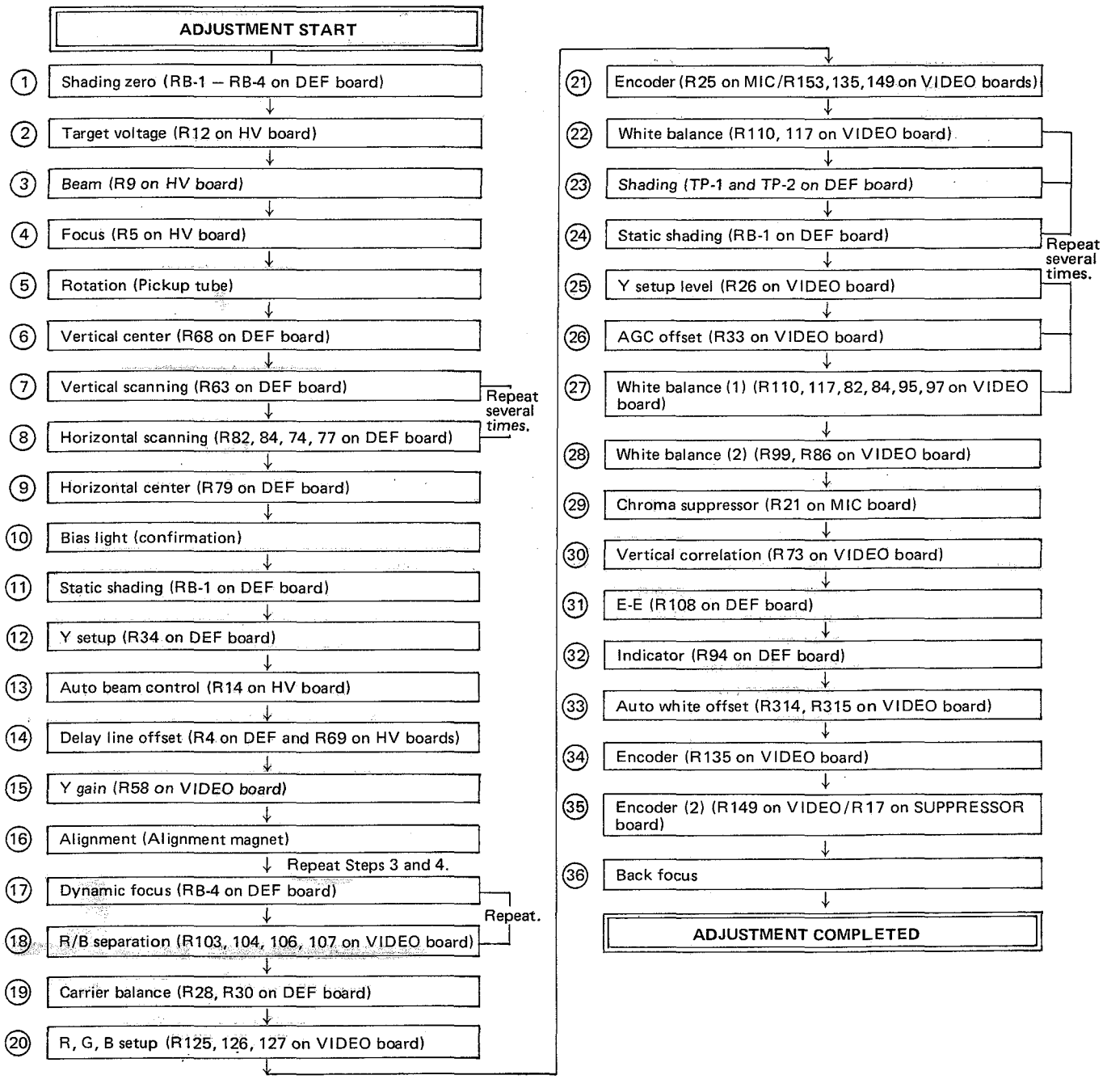
Set the following VRs at the mechanical center.
R82 (B. TRACK-1)
R84 (B. TRACK-2)
R86 (B. TRACK-3)
R95 (R. TRACK-1)
R97 (R. TRACK-2)
R99 (R. TRACK-3)

2.2.4 Preset of suppressor system

Set the following VRs in the direction of coloration (compensation unavailable).
R8 (C. SUP-1) . . . . . Fully clockwise
R13 (C. SUP-2) . . . . . Fully counterclockwise
R17 (C. GAIN) . . . . . Fully counterclockwise

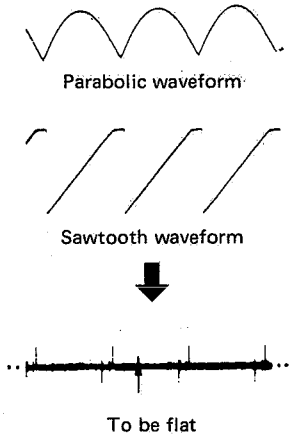
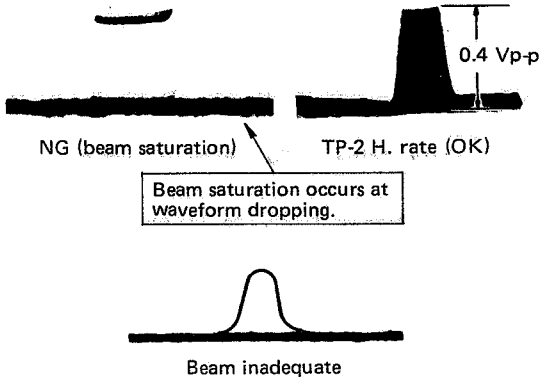
2.3 ADJUSTMENT PROCEDURE

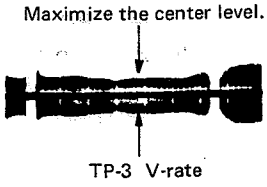
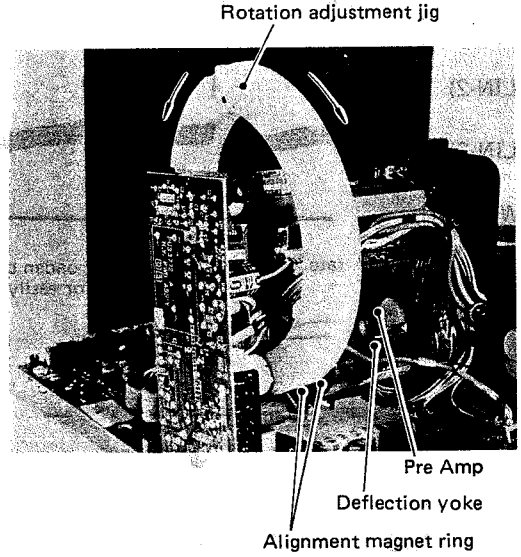
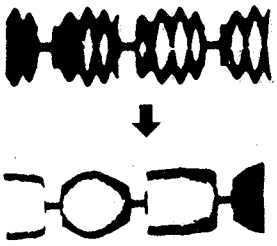
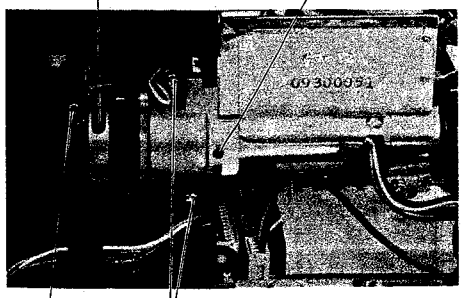
Notes: • The adjustments 1 through 17 are required only when the camera is overhauled or the pickup tube and/or deflection yoke is replaced.
• Adjustment with a greyscale or white pattern should be performed in just scanning mode in principle.

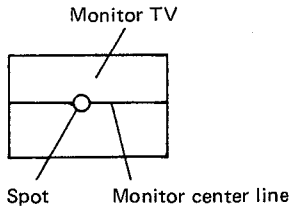
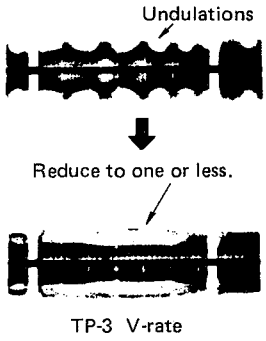
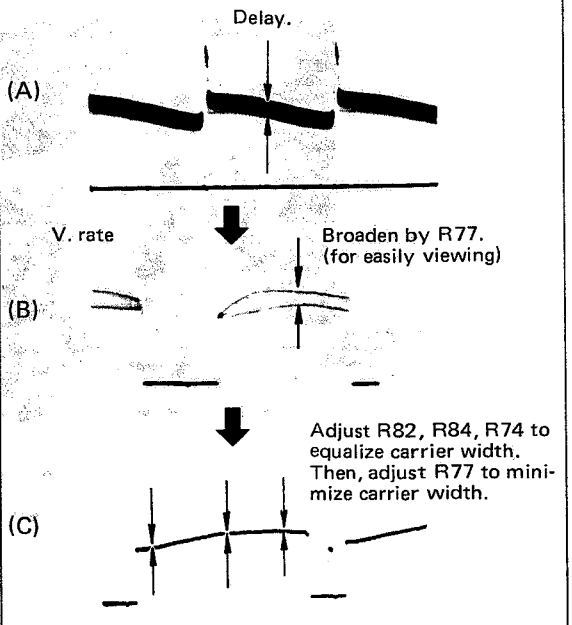


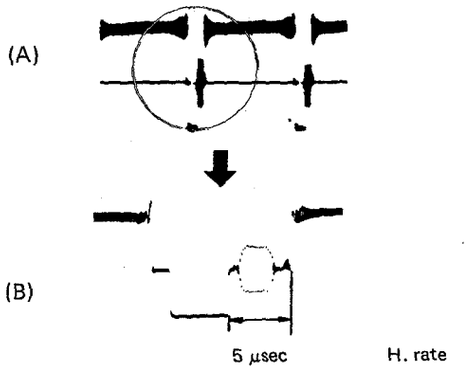
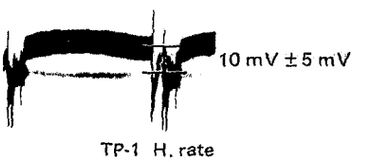
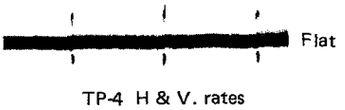
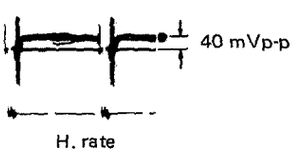
2.4 ELECTRICAL ADJUSTMENT

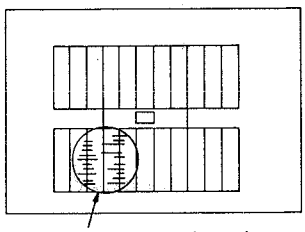
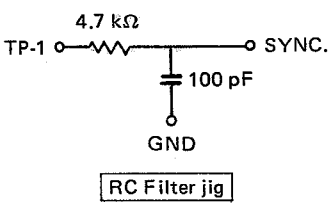
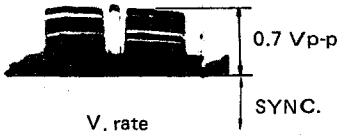
Note: DEF & SSG P.W.B. Ass'y [0][2] test point TP-9 (VIDEO OUT) is not terminated. If measurement is performed at TP-9, set the level of VIDEO OUT double.

No.	Item	Mode	Check point	Adjustment parts	Description and Waveform
1	Shading zero: 1) Static shading 2) Blue shading 3) Red shading 4) Dynamic shading	Iris closed	DEF & SSG board [0][2] TP-3 TP-5 TP-6 TP-4	 RB-1 (S. SH) RB-2 (B. SH) RB-3 (R. SH) RB-4 (D.F.)	After replacing the pick-up tube, adjust H-rate and V-rate so that shading compensation waveforms become flat.  Parabolic waveform Sawtooth waveform To be flat **Fig. 2-2**
2	Target voltage	Iris closed	H.V. board [0][5] CN-H2 pin 1	R12 (TARGET BIAS)	Adjust R12 to obtain 55 $^{+1}_{-3}$ V signal voltage.
3	Beam	• Pick up white pattern. • Set the lens to MACRO. • Place a beam cap (PUJ36531) on the lens.	Video Process board [0][1] (PRE OUT)	H.V. [0][5] TP-1 (BEAM)	**Note:** • Perform adjustment as quickly as possible to avoid damaging the Saticon tube. • Before setting beam adjust the alignment magnets to zero (overlap the notched portions). • Short TP-2 (ABC CTL) to ground. • Set R14 (ABC GAIN) on H.V. board to its mechanical center. 1) Adjust R9 to obtain 0.4 V immediately before beam saturation occurs. 2) After the adjustment, disconnect TP-2 from GND.  0.4 Vp-p NG (beam saturation) TP-2 H. rate (OK) Beam saturation occurs at waveform dropping. Beam inadequate **Fig. 2-3**

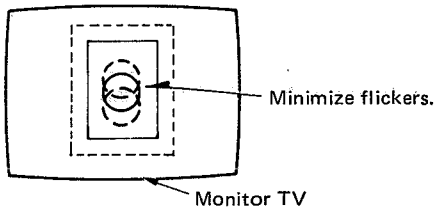
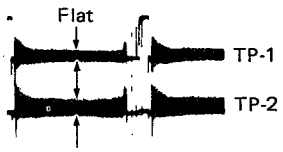
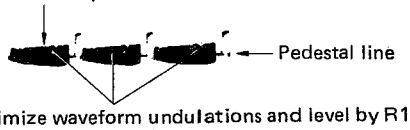
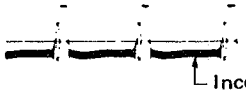
No.	Item	Mode	Check point	Adjustment parts	Description and Waveform
4	Focus coarse	Pick up white pattern.	Video Process board [0][1] TP-3 (CHROMA)	H.V. board [0][5] R5 (FOCUS)	Adjust R5 to maximize the center level of V-rate waveform at TP-3 as illustrated below.  **Fig. 2-4**
5	Rotation	Pick up white pattern.	Video Process board [0][1] TP-3 (CHROMA)	Rotation of pick-up tube	**Note:** • Never turn the Saticon tube by grasping its socket, otherwise the stem pins. • High voltage leads are connected to H.V. board, exercise care to avoid electrical shock. 1) Loosen the pickup tube setscrew. 2) As shown in Fig. A, use delayed sweep and observe the V-rate center. Apply the rotation jig (PUJ43847) to the glass stem of the tube as shown by Fig. C and carefully turn the tube to obtain left to right symmetry. 3) After obtaining waveform symmetry, use the torque driver (PUJ44644) to tighten the set-screw to 0.4 kg. 4) If symmetry cannot be obtained by rotating the tube, on the DEF & SSG board, adjust R82 (H. LINEARITY-1), R84 (H. LINEARITY-2) and R74 (H. LINEARITY-3). Then repeat the tube rotation adjustment. • Rotation Jig Use rotation jig to grasp the pick-up tube as shown and turn it slowly.  **Fig. 2-5 (C)** (A)  (B)  **Fig. 2-5**

No.	Item	Mode	Check point	Adjustment parts	Description and Waveform
6	Vertical center	• Pick up white pattern. • Set the lens to MACRO. • Place a pinhole cap on the lens. (PUJ36531)	Monitor display	DEF & SSG board [0][2] R68 (V. CENTER)	Adjust R68 to position the pinhole cap spot at the vertical center of the monitor display.  **Fig. 2-6**
7	Vertical scanning	Pick up white pattern.	Video Process board [0][1] TP-3 (CHROMA)	DEF & SSG [0][2] R63 (V. HEIGHT)	**Note:** It is required to adjust vertical and horizontal scan and horizontal center several times. Adjust R63 to minimize waveform undulations.  **Fig. 2-7** **Note:** If two or more undulations appear on an oscilloscope, accurate 3.9 MHz waveform cannot be obtained.
8	Horizontal scanning (Do not use underscan type monitor TV for this adjustment.)	Pick up white pattern.	Video Process board [0][1] IC-4 pin 6	DEF & SSG board [0][2] R82 (H. LIN-1) R84 (H. LIN-2) R74 (H. LIN-3) R77 (H. WIDTH)	1) Adjust R82, R84 and R74 to equalize carrier width. 2) Adjust R77 to minimize carrier width.  **Fig. 2-8**

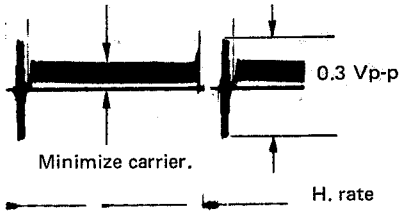
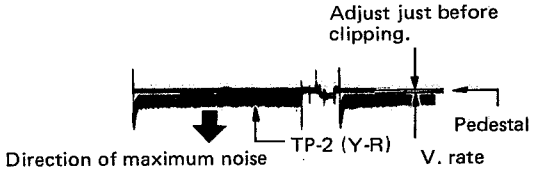
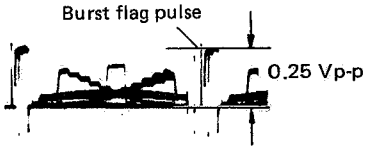
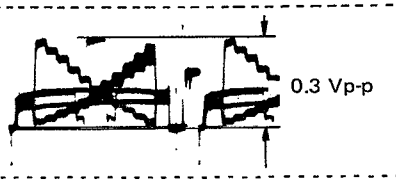
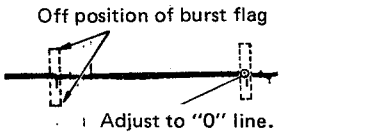
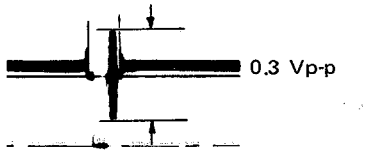
No.	Item	Mode	Check point	Adjustment parts	Description and Waveform
9	Horizontal center	Iris closed	DEF & SSG board [0][2] (VIDEO OUT)	R79 (H. CENTER)	Adjust R79 to obtain a time duration of 6.6 μsec from H. sync back porch to the video rise. See the figure below.  **Fig. 2-9**
10	Bias light	Iris closed	Video Process board [0][1] TP-1 (PRE-OUT)		Confirm that the signal level (between centers of the pedestal and noise) is 10 ± 5 mV as shown in the figure below.  **Fig. 2-10**
11	Static shading coarse	Iris closed	Video Process board [0][1] TP-4 (Y SET)	DEF & SSG board [0][2] RB-1 (S. SH)	Adjust RB-1 to obtain flat waveform both at H. & V. rates as shown in the figure below.  **Fig. 2-11**
12	Y setup	Iris closed	DEF & SSG board [0][2] (VIDEO OUT)	DEF & SSG board [0][2] R34 (Yw SETUP) Video Process board [0][1] R26 (OB SET)	**Note:** Before adjustment turn R17 (C. GAIN) to its minimum level, because of increased carrier components. 1) Turn R26 fully clockwise. Then, adjust R34 for setup level 15 mVp-p. 2) Adjust R26 again to obtain 40 mVp-p setup level.  **Fig. 2-12**

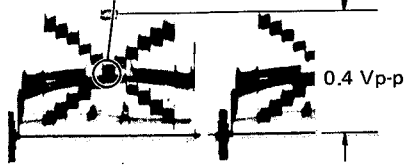
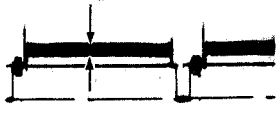
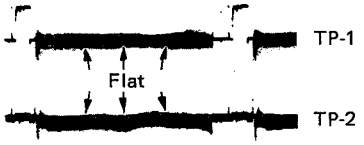
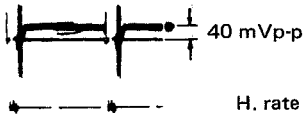
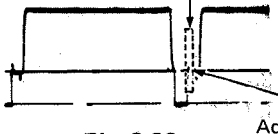
No.	Item	Mode	Check point	Adjustment parts	Description and Waveform
13	ABC gain	• Greyscale • Iris – Manual (BLC)	Monitor display	HV board [0][5] R14 (ABC GAIN)	1) Repeat Beam Adjustment (Item 3). 2) Monitor the display and turn R14 to obtain maximum oscillation (beats). 3) Slowly turn R14 counterclockwise to stop the oscillation on the display. 4) If R14 is turned fully clockwise and no oscillation appears on the display, set R14 to its maximum position. 5) Cap and uncap the lens several times and confirm no beat appearing on the display.  Maximum oscillation (beats) Slowly turn R14 to stop the beats. **Fig. 2-13**
14	Delay line offset	Greyscale	Video Process board [0][1] TP-6 (COMB BAL)	DEF & SSG [0][2] R4 (DL OFFSET) Video Process board [0][1] R69 (COMB BAL)	1) Turn VIDEO board R69 fully counterclockwise. 2) First turn DEF board R4 fully counterclockwise, then turn it slowly to the point just before low level signals compress.  (A) 3) Adjust R69 again so that average signal level becomes zero (flat). (B)  Adjust R69 for flat (zero) average signal level. TP-6 V. rate **Fig. 2-14**
15	Y & Video gain	• Greyscale • Iris – Manual (BLC)	DEF & SSG board [0][2] (VIDEO OUT)	R154 (VIDEO GAIN) R58 (Y GAIN)	1) Confirm that the Y-setup adjustment (item 12) has been completed. 2) Adjust R154 so that the clip level at VIDEO OUT becomes 0.76 Vp-p. 3) Connect an RC filter to TP-1 and adjust the lens iris to obtain 0.14 V. 4) Adjust the lens iris to obtain 0.7 Vp-p. 5) After the adjustments, remove the RC filter.  4.7 kΩ TP-1 SYNC. 100 pF GND RC Filter jig  0.7 Vp-p SYNC. V. rate **Fig. 2-15**

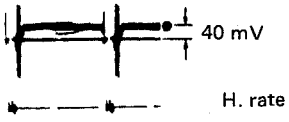
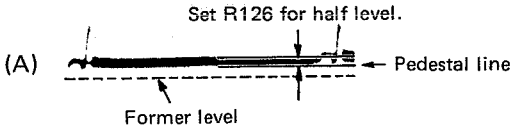
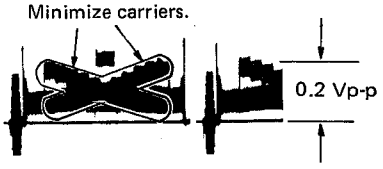
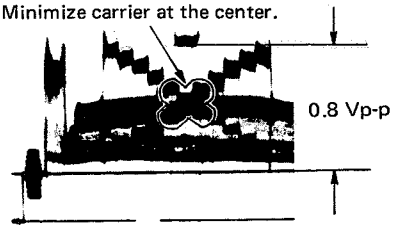
Note: After completion of the adjustments of items 1 through 15, adjust R17 (C. GAIN) of the Suppressor P.C.B. so that burst level becomes 0.3 Vp-p.

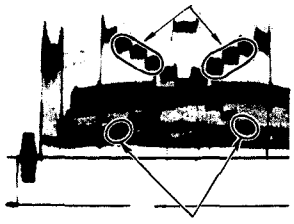
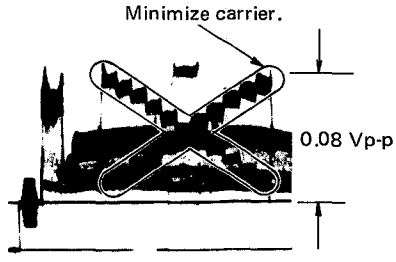
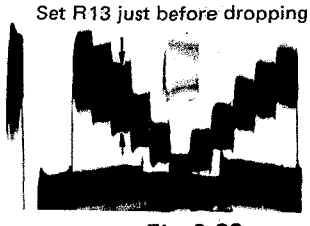
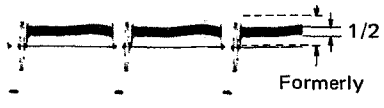
No.	Item	Mode	Check point	Adjustment parts	Description and Waveform
16	Alignment (Wobbling method) If Wobbling Jig is used, set RB-4 (Dynamic Focus) to "0".	• Audio signal generator (for 30 Hz rectanglular waveform) • Wobbling jig	Monitor TV	Alignment magnet	**Note:** When the alignment magnet is rotated, the beam valurs become wrong. In this case, be sure to confirm the value by performing the beam adjustment (item 3) and the focus adjustment (item 4) again. 1) Induce picture wobbling by applying a 30 Hz squarewave to DEF & SSG board TP-7. 2) Alternately adjust the two alignment magnets to eliminate the wobbling from the picture.  **Fig. 2-16**
17	Dynamic Focus (Dual-trace)	Pick up white pattern.	DEF & SSG board 0 2 TP-1 (Y-B) TP-2 (Y-R)	RB-4	1) Adjust RB-4 to obtain flat waveform (both R & B) at TP-1 and TP-2 simultaneously. 2) If flat waveform cannot be obtained by the above, adjust RB-2 (B. SH) and RB-3 (R. SH) to obtain flat waveforms.  **Fig. 2-17**
18	R & B color separation (Dual-trace)	• Iris – Center • Pick up white pattern.	DEF & SSG board 0 2 TP-2 (Y-R) TP-1 (Y-B)	Video Process board 0 1 R103 (R SEP GAIN) R104 (R SEP PHASE) R106 (B SEP PHASE) R107 (B SEP GAIN)	1) Adjust the lens iris to obtain 0.4 Vp-p at VIDEO OUT. 2) If white balance is disturbed, turn R110 and R117 (R & B GAIN) to adjust waveform to the center of the pedestal line, then separate them. 3) Observe waveforms in dual-trace, and adjust R103, R107 (R & B SEP GAIN) and R104, R106 (R & B PHASE) alternately so that waveform undulations and levels become minimized as shown in Fig. (B) below. (A) Adjust waveform to the center of the pedestal by R110 and R117.  Minimize waveform undulations and level by R103, R104, R106 and R107. (B)  **Fig. 2-18**

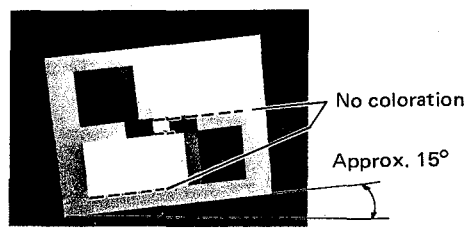
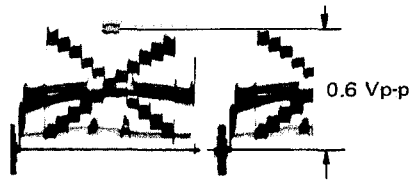
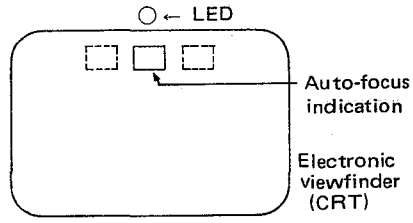
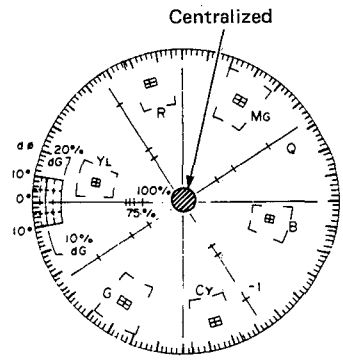
Note:
Repeat adjustments of the items 17 and 18 several times and confirm best results.

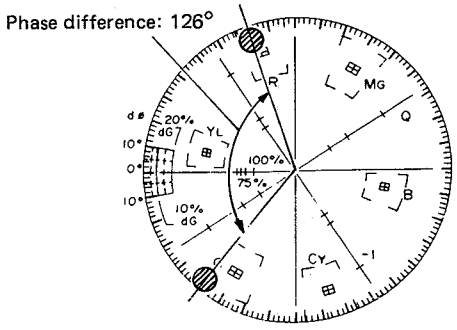
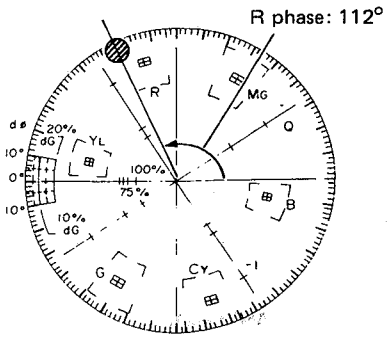
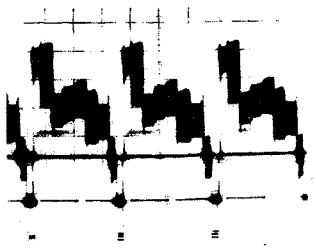
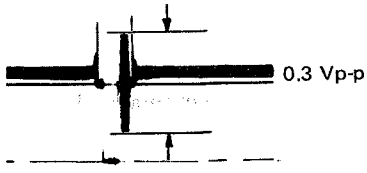
No.	Item	Mode	Check point	Adjustment parts	Description and Waveform
19	Carrier balance	• Iris closed • All VRs set to fully counter-clockwise position	—	Video Process board [0][1] R125 (B. PED.)	1) Turn R17 (C. GAIN) of Suppressor P.C.B. so that burst level becomes 0.3 V. Then, adjust R28 and R30 alternately to obtain the minimum VIDEO OUT carrier.  Fig. 2-19
			—	R126 (R. PED.)	
			—	R127 (G. PED.)	
			DEF & SSG board [0][2] (VIDEO OUT)	DEF & SSG board [0][2] R28, R30 (CARR. BAL)	
20	R, G, B setup	• Iris closed	DEF & SSG board [0][2] TP-2 (Y-R)	Video Process board [0][1] R126 (R. PED.)	1) Turn R126 (R. PED.) in the direction of noise (clockwise). 2) Next, turn R126 slowly counterclockwise to set it to the position just before clipping (see Fig.). 3) Adjust R125 and R127 so that VIDEO OUT carrier becomes minimized in the same manner as the above item 19.  Fig. 2-20
			DEF & SSG board [0][2] (VIDEO OUT)	R125 (B. PED.) R127 (G. PED.)	
21	Encoder (Rough adj.)	• Greyscale	DEF & SSG board [0][2] TP-1 (Y-B)	Video Process board [0][1] R153 (0.25 Vp-p) (BURST LEVEL)	1) Short TP-3 (CHROMA) of Video Process P.C.B. to GND. 2) Connect oscilloscope to Top (Y-R) of the DEF & SSG board. Adjust the lens iris to obtain 0.4 V. 
			TP-1 (Y-B)	R135 0.3 Vp-p (Y-B GAIN)	
		• Lens — Capped	TP-2 (Y-R)	R149 (BURST LEVEL)	
			DEF & SSG board [0][2] (VIDEO OUT)	Suppressor board [0][3] R17 (C. GAIN)	 Fig. 2-21 • After adjustments, disconnect TP-2 (CHROMA) from GND.

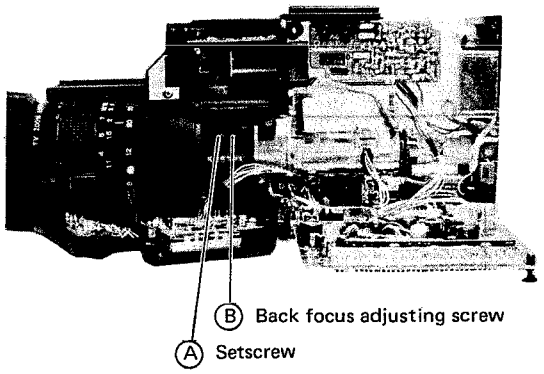
No.	Item	Mode	Check point	Adjustment parts	Description and Waveform
22	White balance (Rough adj.)	• Pick up white pattern. • Greyscale	DEF & SSG board [0][2] (VIDEO OUT)	– Video Process board [0][1] R110 (B. GAIN) R117 (R. GAIN)	1) Adjust the lens iris to obtain 0.4 Vp-p at VIDEO OUT. 2) Adjust R110 and R117 to minimize signal level at the center (see Fig. below). Minimize carrier at the center.  0.4 Vp-p **Fig. 2-22**
23	Static shading	• Pick up white pattern. • Increase sensitivity.	DEF & SSG board [0][2] (VIDEO OUT)	RB-1 (S. SH)	1) Adjust the lens iris to obtain 0.15 Vp-p at VIDEO OUT. 2) Adjust RB-1 so that static shading waveform becomes flat both at H and V rates. 3) After adjustment reset the sensitivity switch to its normal position. Flat  **Fig. 2-23**
24	Shading (Dual-trace)	• Pick up white pattern.	DEF & SSG board [0][2] (VIDEO OUT) TP-1 (Y-B) TP-2 (Y-R)	– DEF & SSG board [0][2] RB-2 RB-3	**Note:** If slanted 8 patterns (∞) overlap the waveforms, first perform R & B separation adjustments. 1) Adjust the lens iris to obtain 0.4 Vp-p at VIDEO OUT. 2) Adjust RB-2 and RB-3 to obtain flat shading compensation wavefoms at TP-1 and TP-2.  TP-1 Flat TP-2 Adjustments for both at H & V rates are required. **Fig. 2-24**
25	Y setup level	• Iris closed	DEF & SSG board [0][2] (VIDEO OUT)	Video Process board [0][1] R26 (OB SET)	• Adjust R26 so that interval between centers of pedestal and waveform becomes 40 mVp-p.  40 mVp-p H. rate **Fig. 2-25**
26	Fader offset	• Iris closed	DEF & SSG board [0][2] (VIDEO OUT)	R162 (OFFSET)	1) First, adjust R17 (C. GAIN) of Suppressor board to turn off burst signal. 2) Depress the control panel fader switch and adjust R162 (OFFSET) so that the pedestal portion becomes flat (see figure). 3) After the above adjustments, adjust R17 so that burst level becomes 0.3 Vp-p. Fader off  Adjust to the pedestal line. **Fig. 2-26**

No.	Item	Mode	Check point	Adjustment parts	Description and Waveform
27	AGC offset	• Iris closed • Sensitivity increased	DEF & SSG board [0][2] (VIDEO OUT)	Video Process board [0][1] (AGC OFFSET)	1) Adjust R33 to obtain 40 mV average setup level. 2) After this adjustment, reset the sensitivity switch to the normal position.  **Fig. 2-27**
28	White balance (1)-1	• Iris closed	DEF & SSG board [0][2] TP-2 (Y-R)	Video Process board [0][1] R126 (R. PED.)	1) Re-adjust item 15 (Y-gain adjustment). 2) Turn R126 (R. PED.) in the direction of noise. 3) Next, turn R126 slowly counterclockwise so that the signal level becomes half.  **Fig. 2-28**
		• Greyscale	DEF & SSG board [0][2] (VIDEO OUT)	Video Process board [0][1] R125 (B. PED.) R127 (G. PED.)	1) Adjust the lens iris to obtain 0.2 Vp-p at VIDEO OUT. 2) Adjust R125 and R127 to minimize overall carriers.  **Fig. 2-29**
				R110 (B. GAIN) R117 (R. GAIN)	1) Adjust the lens iris to obtain 0.8 Vp-p at VIDEO OUT. 2) Adjust R110 and R117 to minimize the carrier at the center (at 6th step of the greyscale).  **Fig. 2-30**
				R84 (B. TRACK-2) R97 (R. TRACK-2) R82 (B. TRACK-1) R95 (R. TRACK-1)	1) Iris is still set for 0.8 Vp-p. 2) Adjust R84 and R97 to minimize the carrier of the second lowest step of stairstep waveform. 3) Repeat the above adjustments of (B) and (C) to adjust white balance. 4) Adjust R82 and R95 to minimize carriers of 7th and 9th steps of stairstep waveform.

No.	Item	Mode	Check point	Adjustment parts	Description and Waveform
28	White balance (1)-1	• Greyscale	DEF & SSG board [0][2] (VIDEO OUT)		Minimize carriers at 7th and 9th steps of stairstep waveform by R82 and R95. (D)  Minimize carrier at the 2nd lowest step of stairstep waveform by R84 and R97. **Fig. 2-31** 5) If satisfactory result cannot be obtained by the above adjustments (A) through (D), repeat adjustments by turning R110, R117, R82 and R95 several times.
29	White balance (2)	• Greyscale • Sensitivity increased	DEF & SSG board [0][2] (VIDEO OUT)	Video Process board [0][1] R86 (B.TRACK-3) R99 (B.TRACK-3)	1) Adjust the lens iris to obtain 0.8 Vp-p at VIDEO OUT. 2) Observe both oscilloscope and monitor TV, adjust R86 and R99 for total white balance.  **Fig. 2-32**
30	Chroma suppressor	• Greyscale • Color temp. SW – Outdoor	DEF & SSG board [0][2] (VIDEO OUT)	Suppressor board [0][3] R13 (CHROMA SPRS 2) R8 (CHROMA SPRS 1)	1) Adjust the lens iris to obtain 0.8 Vp-p at VIDEO OUT. 2) In the above condition turn R13 slowly clockwise and set it at the position that 3rd step of chroma level of VIDEO OUT signal begins dropping as shown in the figure below. Set R13 just before dropping of the level. (A)  **Fig. 2-33** 3) Next, set the iris to CLOSE and the sensitivity select SW to UP, and adjust R8 to decrease chroma noise of VIDEO OUT by half. (B)  **Fig. 2-34**

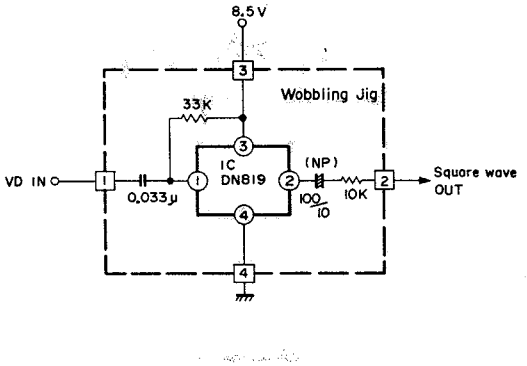
No.	Item	Mode	Check point	Adjustment parts	Description and Waveform
31	Vertical correlation compensation	• Greyscale	Monitor TV	Video Process board [0][1] R73 (V. EDGE)	**Note:** Confirm that white balance. If white balance is disturbed, repeat the adjustment of item 14 (Delay line offset adj.). 1) Tilt the greyscale by about 15° and adjust R73 to eliminate coloration in horizontal line edge portions.  **Fig. 2-35**
32	E-E	• Greyscale	DEF & SSG board [0][2] (VIDEO OUT)	DEF & SSG board [0][2] R108 (IRIS SET)	**Note:** Set the iris at its normal position. 1) Adjust R108 to obtain 0.6 Vp-p VIDEO OUT.  **Fig. 2-36**
33	Indicators	• Isis – Closed	Electronic VF (CRT)	Bottom P.C.B. [0][4] (IND. ADJ.)	• Adjust R3 so that the indication of auto-focus flickering appears just below the LED of CRT.  **Fig. 2-37**
34	Auto-white offset	Pick up white pattern.	Vector scope	Video Process board [0][1] R314 (R. AW. OFFSET) R315 (B. AW. OFFSET)	1) Depressing the auto-white setting button of the control panel, adjust R314 and R315 so that all levels centralize on the vector scope.  **Fig. 2-38**

No.	Item	Mode	Check point	Adjustment parts	Description and Waveform
35	Encoder (1)	• 7-color pattern	DEF & SSG board [0][2] (VIDEO OUT)	Video Process board [0][1] R135 (B-Y GAIN)	1) Adjust the lens iris so that the white component of the video out signal becomes 0.7 Vp-p. 2) Observe the vectorscope and adjust R135 so that phase difference between Red and Green becomes 126°.  Fig. 2-39
	Encoder (2)	• 7-color pattern	DEF & SSG board [0][2] (VIDEO OUT)	Video Process board [0][1] R149 (BURST PHASE)	1) Observe the vectorscope and adjust R149 to obtain Red phase of 112°. 2) After setting R phase, confirm that Green is 238°.  Fig. 2-40
			DEF & SSG board [0][2] (VIDEO OUT)	Suppressor board [0][3] R17 (C. GAIN)	1) Set IRIS to obtain 0.8 Vp-p VIDEO OUT at the white peak portion. 2) Adjust R17 so that R chroma becomes 0.4 Vp-p.  Fig. 2-41
				Video Process board [0][1] R153 (BURST LEVEL)	3) Adjust R135 to obtain 0.3 Vp-p burst level.  Fig. 2-42

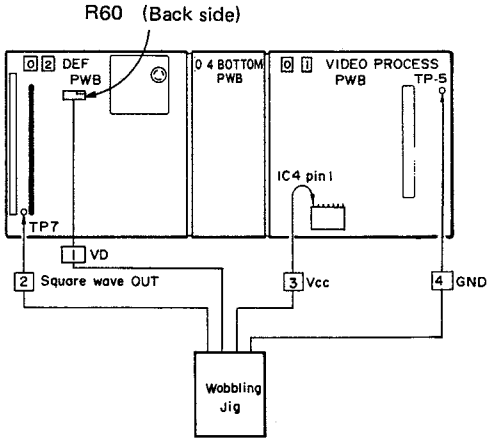
No.	Item	Mode	Check point	Adjustment parts	Description and Waveform
36	Back focus	• Manual focus • Iris – Fully open	Monitor TV	Back focus adjusting screw	**Note:** If picture is saturated, place an ND filter onto the lens. 1) Loosen the setscrew [A] and turn the zoom ring to maximum telephoto position. Observe monitor and adjust focus by carefully turning ff screw [B]. 2) Next, when the distance scale on the lens reads infinity (∞), confirm that a subject is brought in focus on the monitor. 3) Pick up a subject within 3–5 m distant. Operate the zoom and confirm focus at both extremes.  **Fig. 2-43** 4) Tighten the setscrew [A] and lock the back focus adjusting screw [B].

2.5 WOBBLING METHOD

The following schematic and circuit diagrams will be an reference for making a Wobbling jig.



Schematic diagram



Standard circuit board

SECTION 3
DIAGRAMS AND CIRCUIT BOARDS

CONTENTS

3.1 SCHEMATIC DIAGRAM NOTES

3.1.1 Schematic safety precaution

▒▒ parts are safety related parts.
When replacing them, be sure to use the specified parts.

Voltage and waveform measurements.

Voltage: Measured with digital voltmeter in DC range; iris closed.

Waveform:

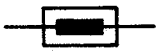
Iris;	Auto (center)
Auto White Mode;	STD
Filter switch;	☼
Sens up switch;	STD

Greyscale illuminated at 4000 lux which completely fills the picture ared.

3.1.2 Unit indications

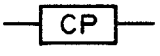
No units: [Ω] No units: [μF] μ/μH: [ΩH]
K: [kΩ] P: [pF] m: [mH]
M: [MΩ] Ⓣ: Tantalum Capacitor

Thermistor



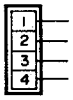
Thermal Fuse

Circuit Protector



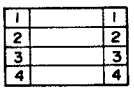
Posistor

3.1.3 Connection symbols

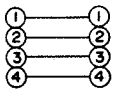


Connecter

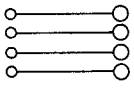
Connector soldered to board (solder)



Connecter (Boards connected directly to each other)

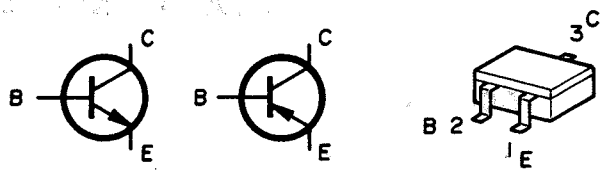


Joined by soldering

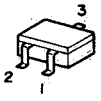


DEF/VIDEO boards and bottom board (flexible board) are joined by hot pressure soldering.

Chip transistor



Chip diode

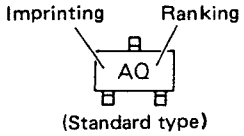


3.1.4 Chip parts

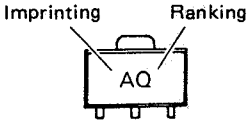
Some resistors, shorting jumpers (0 Ω resistance), ceramic capacitors, transistors, and diodes are chip parts. These chip parts cannot be reused after they were once removed.

3.1.5 Chip transistor and chip diode imprinting

Transistors



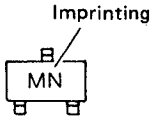
(Standard type)



(Power type)

Type	Imprinting	Type	Imprinting
2SA1022	E	2SD602	W
2SB709	A	2SD1030	1Z
2SC2404	U	2SK209GR	X
2SC2778	K	2SK316	1K
2SD601	Y		

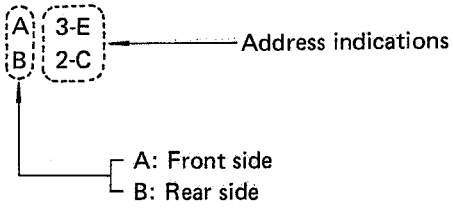
Diodes



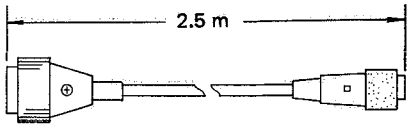
Type	Imprinting
MA28TA	ML
MA28WA	MF
MA151WK	MN
MA151WA	MT

3.1.6 Address indications

In the schematic diagrams of Video Process and DEF & SSG, designations such as A3-E, B2-C etc are addresses of the chip part positions.

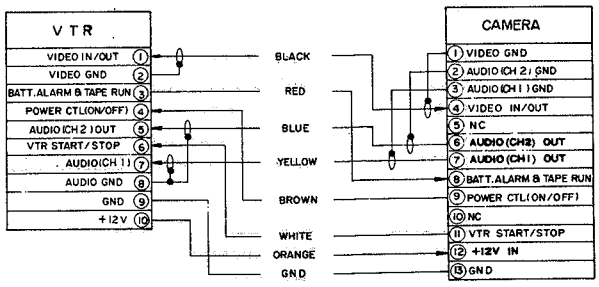


3.1.7 Connection of camera cable ass'y



10 pin
(Video)

13 pin
(Camera)



3.2 KEY TO ABBREVIATIONS

ABC : Automatic Beam Control
AF : Auto Focus
AGC : Automatic Gain Control
ALM : Alarm
AMP : Amplifier

B : Base
BAT.IND : Battery Indicator
B.BLK : Beam Blanking
BEAM DET : Beam Detector
BFP : Burst Flag Pulse
BPF : Band-Pass Filter
BGP : Black Gate Pulse
B. PEAK W BAL :Blue Peak White Balance
B. S. COMPEN :Blue Shading Compensator
B/W : Black and White
B-Y IND : Blue-Luminace Indecator

C : Collector
C(Chroma) : Chrominance
CAR. BAL : Carrier Balance
C. BLK : Composite Blanking
CCD : Charge-Coupled Devices
CC'T : Circuit
CENT : Center
CF : Comb Filter
CH : Channel
CONN : Connector
CP : Clamp Pulse
CRT : Cathode Ray Tube
C. SYNC : Composite Sync.
CTR GEN : Character Generator
CVBS : Chrominance, Video, Burst and Sync

D : Drain
DC BAL : Direct Current Balance
DCC : Dark Current Compensator
DEF : Deflection
D. FOCUS : Dynamic Focus
DL : Delay Line
D. SH : Dynamic Shading

E : Emitter
E. E : Electronic Eye
EF : Emitter Follower
EQ : Equalizer
EVF : Electronic Viewfinder

FB : Feedback
F.B.T. : Flyback Transformer
FLUO : Fluorescent Light

G : Grid
G : Gate
G : Green

H : Horizontal
HBF : Horizontal Burst Flag Pulse
H CENT : Horizontal Center
H. D : Horizontal Drive Pulse
H. LIN : Horizontal Linearity
HP : Horizontal Parabola
HPF : High-pass Filter
HS : Horizontal Sawtooth
HV : High Voltage
H WIDTH : Horizontal Width

INT MIC : Internal Microphone
IRIS IND : Iris Indicator

K : Cathode

LPF : Low-Pass Filter

MANU : Manual
MIC : Microphone
MIX : Mixer
MOD : Modulator
MONO. : Monaural

NOR : Normal

OB : Optical Black
OPT : Optical
OSC : Oscillator

PAR : Parabola
PB DET : Playback detector

REC/PB : Record and Playback
REF : Reference
REG : Regulator
REMOCON : Remote Control
R PEAK W BAL : Red Peak White Balance
RS COMPEN : Red Shading Compensator
R-Y IND : Red-Luminance Indicator

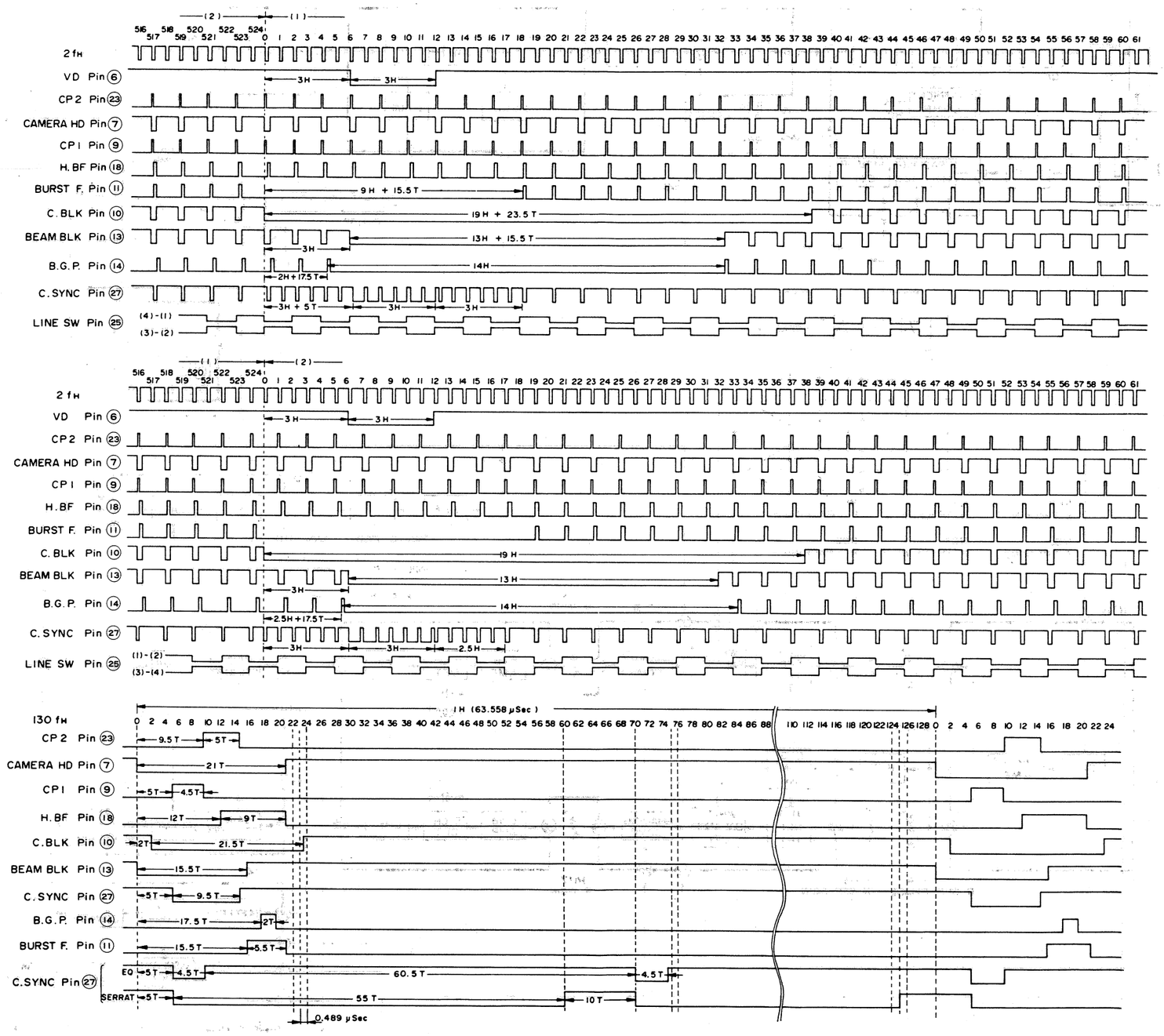
S : Source
SAW : Sawtooth
SC : Sub-Carrier
SENS. CTL : Sensitivity Control
SEP BAL : Separation Balance
SEP PHASE : Separation Phase
SH : Shading
SSG : Synchronization Signal Generator
S SHADING : Static Shading
S SOCKET : Saticon Socket
ST : Stereo
SW : Switch
SW REG : Switching Regulator
SYNC SEP : Sync Separator

V : Vertical
V.D : Vertical Drive
VP : Vertical Parabola
VS : Vertical Sawtooth

W BAL : White Balance

YL : Luminance Low Band
YW : Luminance Wide Band

3.3 SSG TIMING CHART (HD440072F)



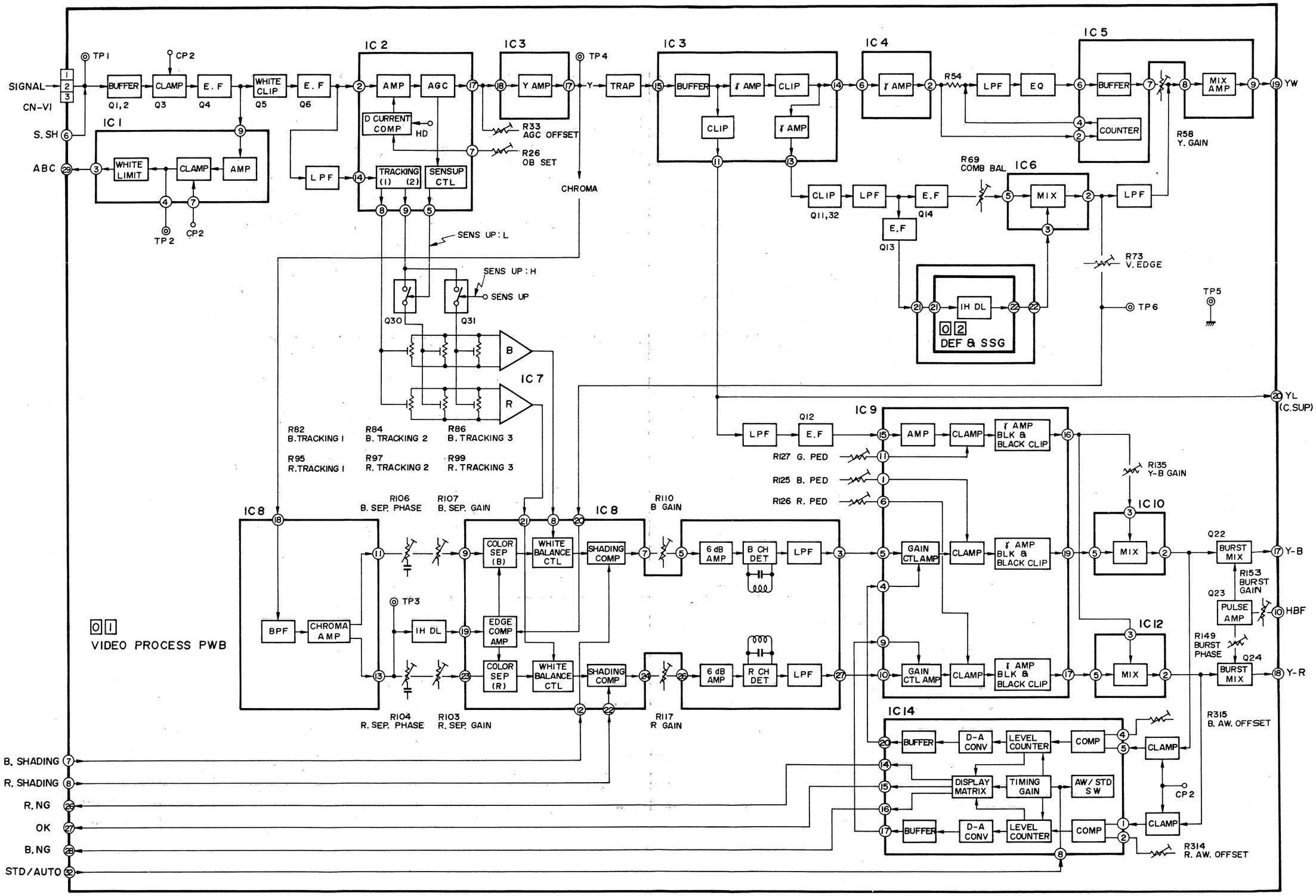
NTSC ;

1H = 63.558 μSec

$1T = \frac{1}{130}H = 0.489\ \mu Sec$

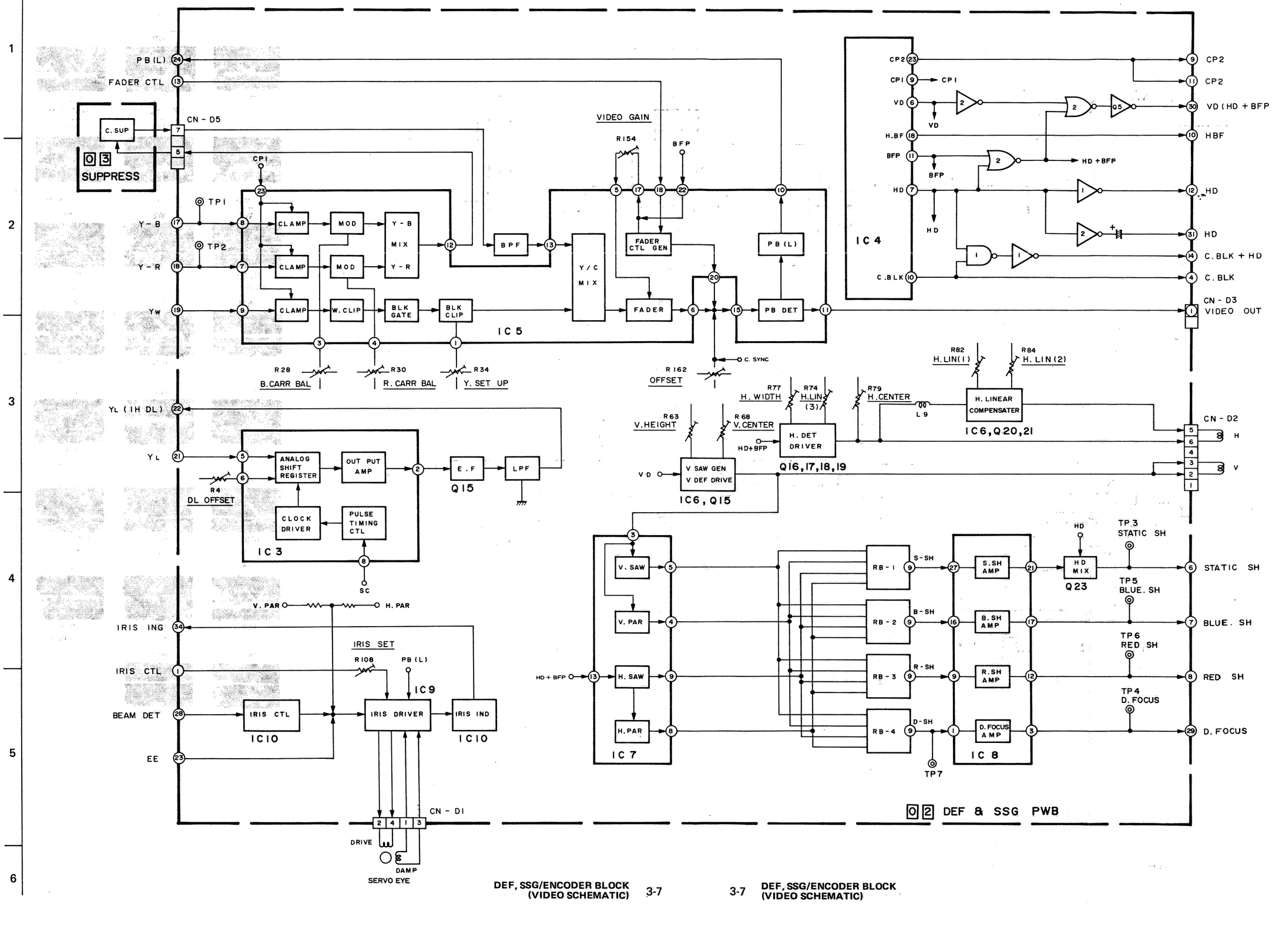
$1V = \frac{525}{2}H = 16.6\ mSec$

3.4 VIDEO PROCESS BLOCK DEAGRAM

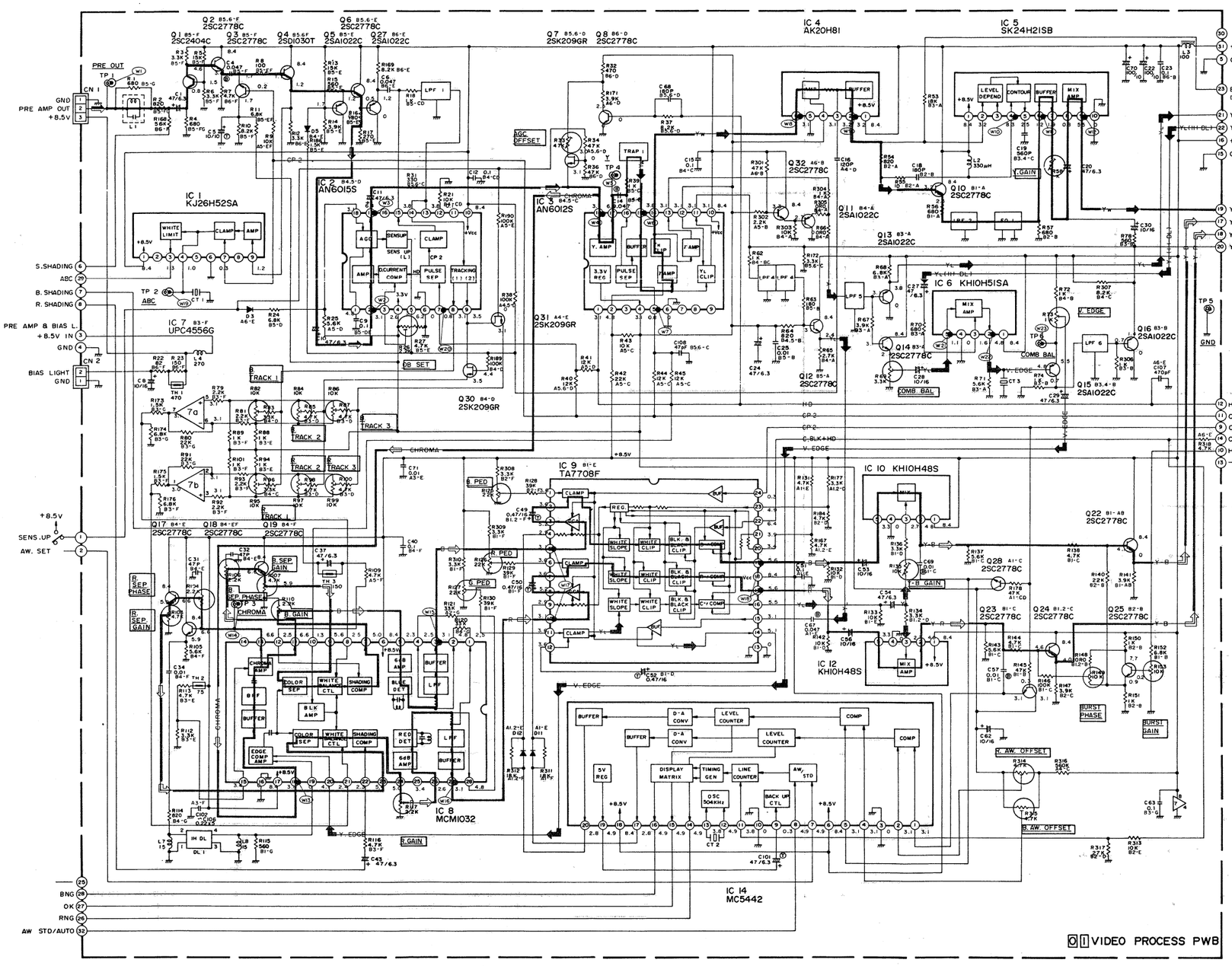


3-6 VIDEO BLOCK (SSG TIMING CHART)

3.5 DEF & SSG/ENCODER BLOCK DIAGRAM



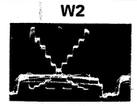
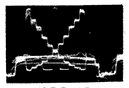
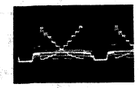
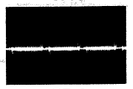
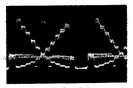
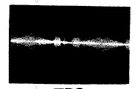
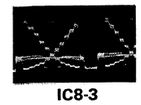
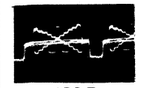
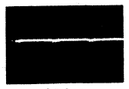
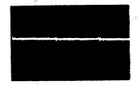
3.6 VIDEO PROCESS SCHEMATIC DIAGRAM



NOTES:

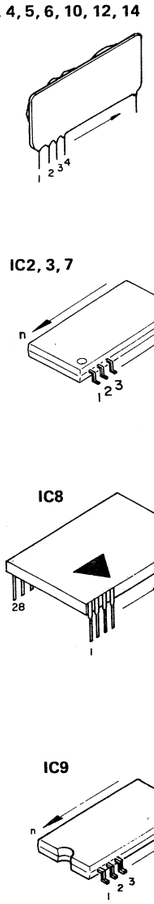
1. ▒▒ parts are importantly related to safety.
   When replacing them, make sure to use specified parts.
2. Voltage and waveform measurements
   Voltage: Measured with digital voltmeter in DC range at iris closed
   Waveform: With greyscale completely filling the picture area at auto-iris

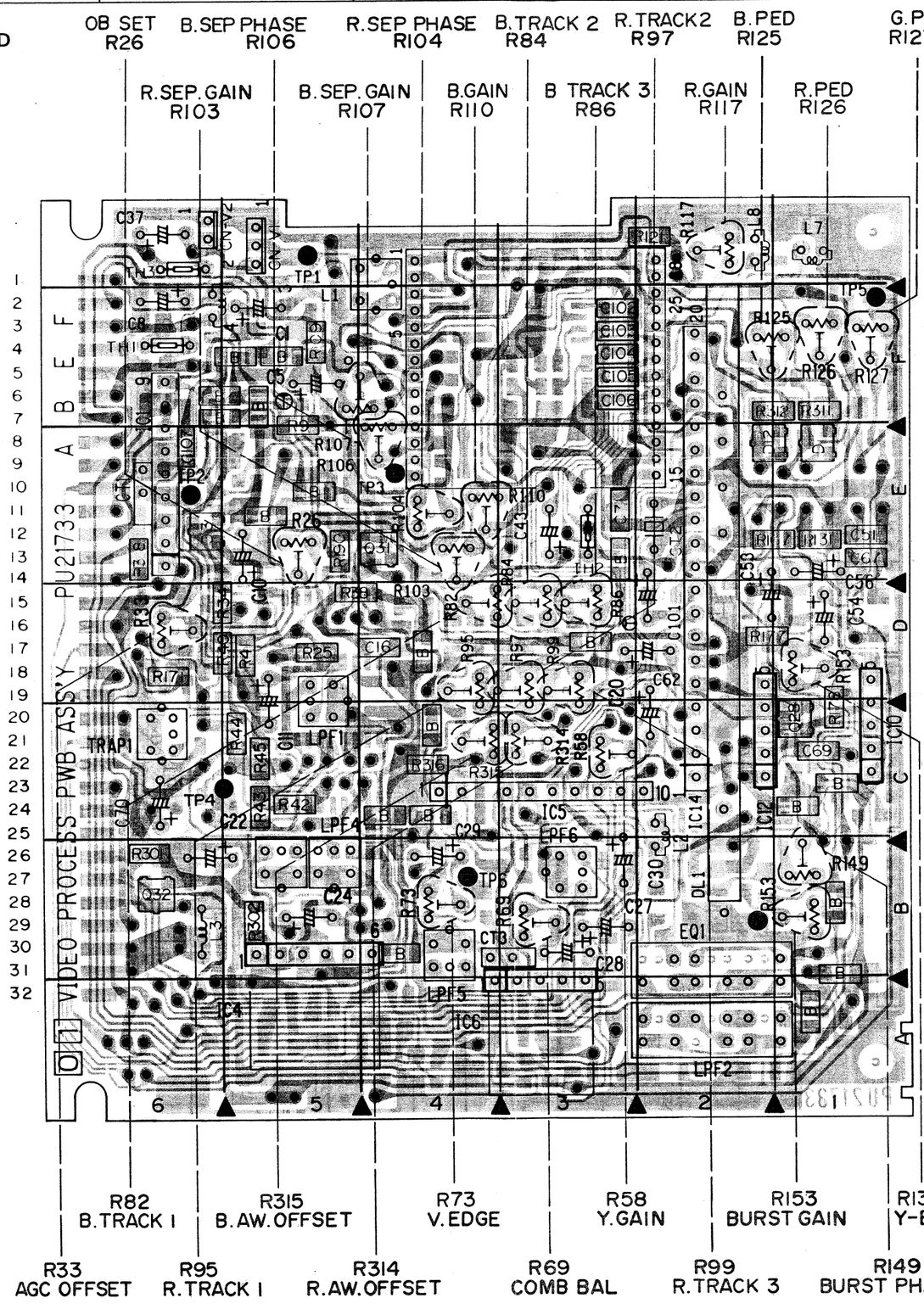
Wave forms of Video Process P.W.B.

W1  **TP1** 0.2 Vp-p (H)	**W2**  **TP2** 0.8 Vp-p (H)	**W3**  **IC2-17** 0.6 Vp-p (H)
W4  **IC3-18** 0.6 Vp-p (H)	**W5**  **TP4** 1.5 Vp-p (H)	**W6**  **IC3-15** 1.3 Vp-p (H)
W7  **IC3-5** 7 Vp-p (H)	**W8**  **IC4-6** 0.5 Vp-p (H)	**W9**  **IC4-2** 1.2 Vp-p (H)
W10  **IC5-4** 0.38 Vp-p (H)	**W11**  **IC5-6** 0.7 Vp-p (H)	**W12**  **IC5-9** 1.6 Vp-p (H)
W13  **IC8-18**	**W14**  **TP3** 0.2 Vp-p(H)	**W15**  **IC8-3** 0.4 Vp-p (H)
W16  **IC8-27** 0.4 Vp-p (H)	**W17**  **IC9-5, 10** 0.4 Vp-p(H)	**W18**  **IC9-17, 19** 0.7 Vp-p (H)
W19  **IC2-2** 0.3 Vp-p (H)	**W20**  **IC2-7** 7 Vp-p (H)	**W21**  **IC6-5** 0.12 Vp-p
W22  **IC6-2**	**W23**  **TP6**	

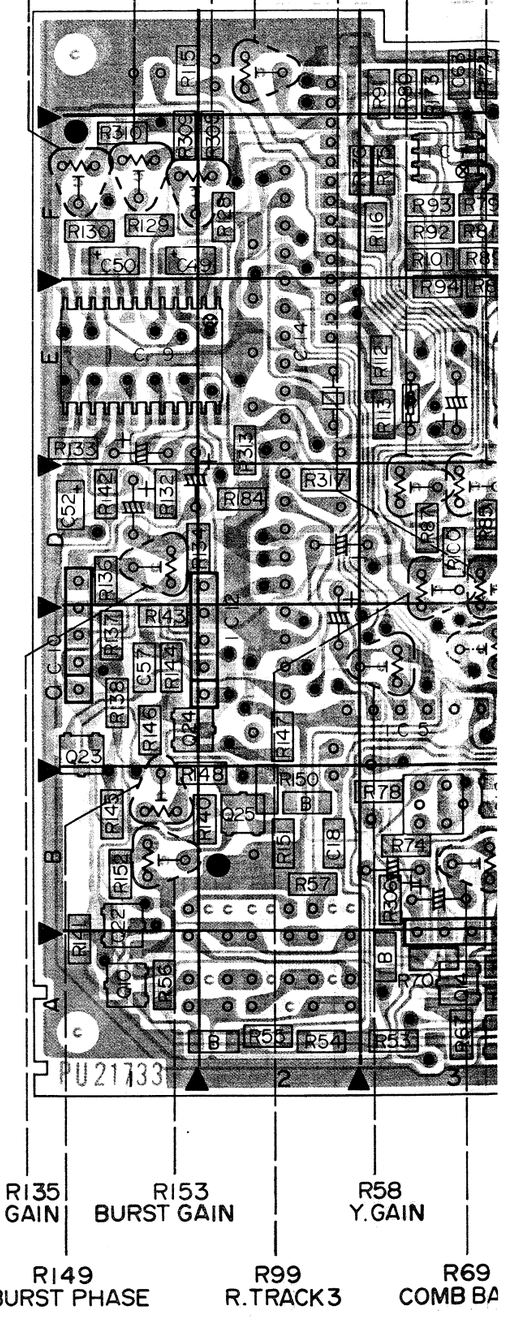
3.7 VIDEO PROCESS CIRCUIT BOARD

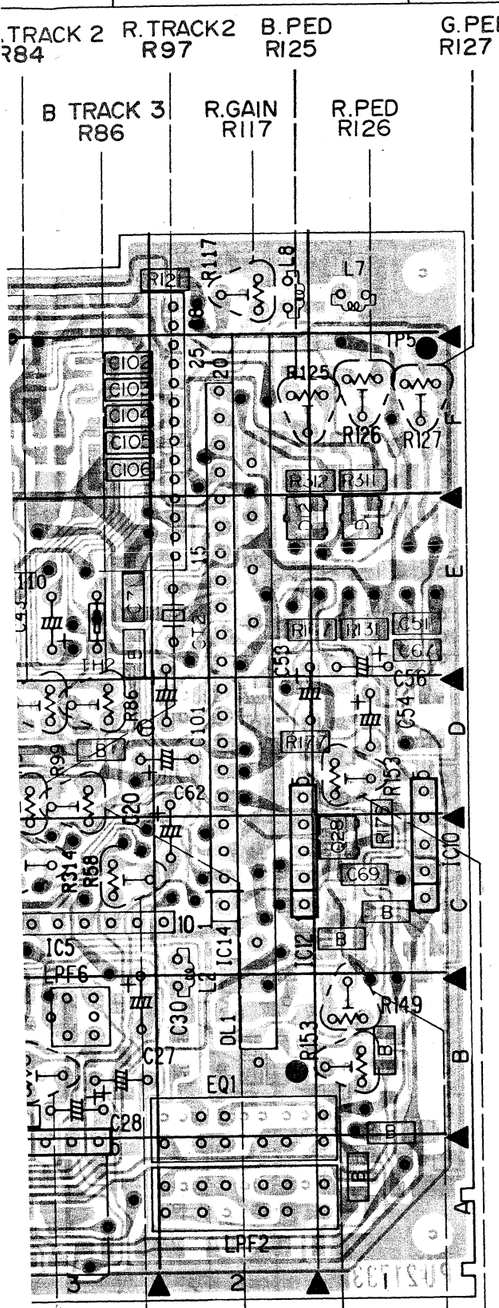
Video Process P.W.B.
— Front side —



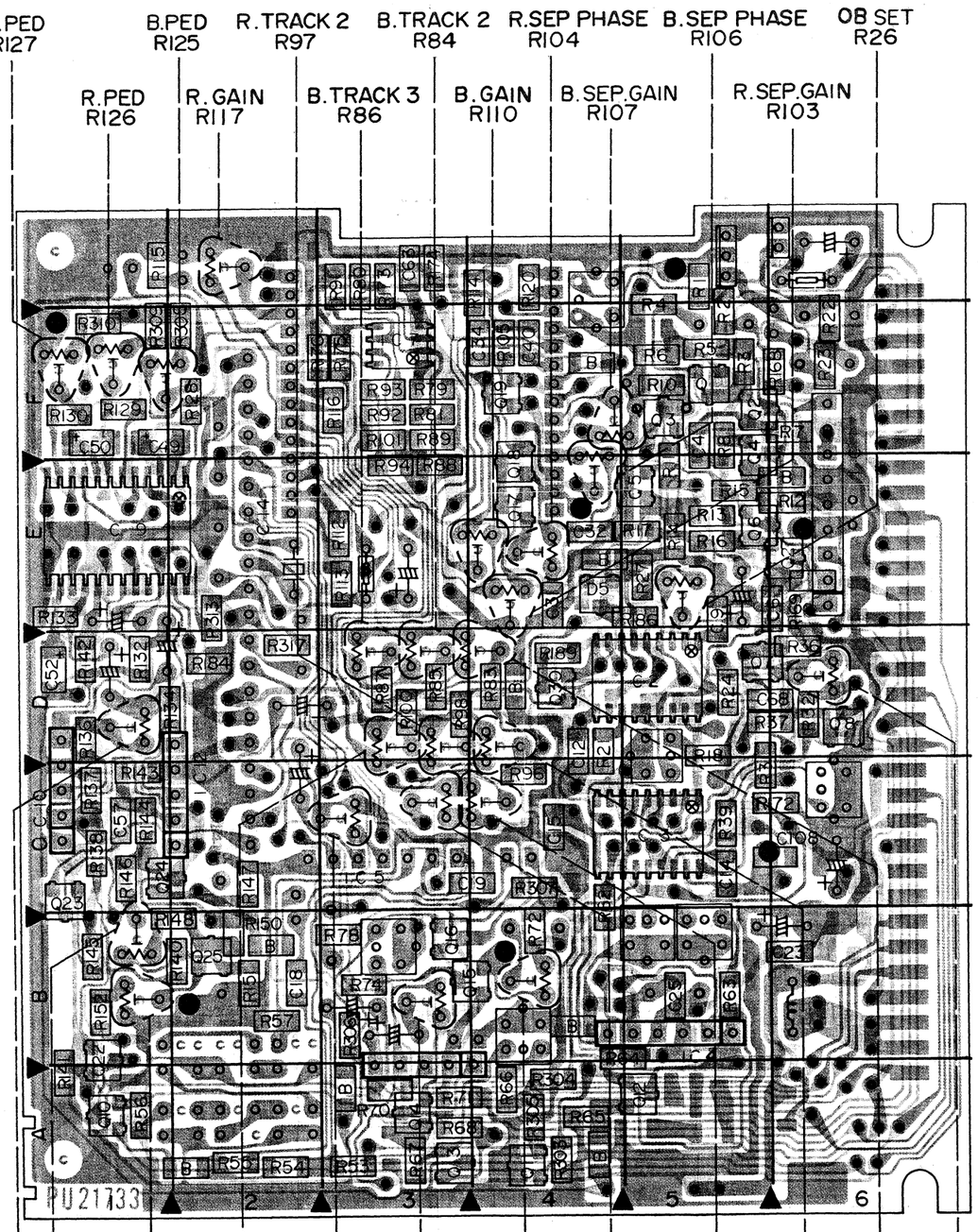


Video Process P.W.B.
— Rear side —



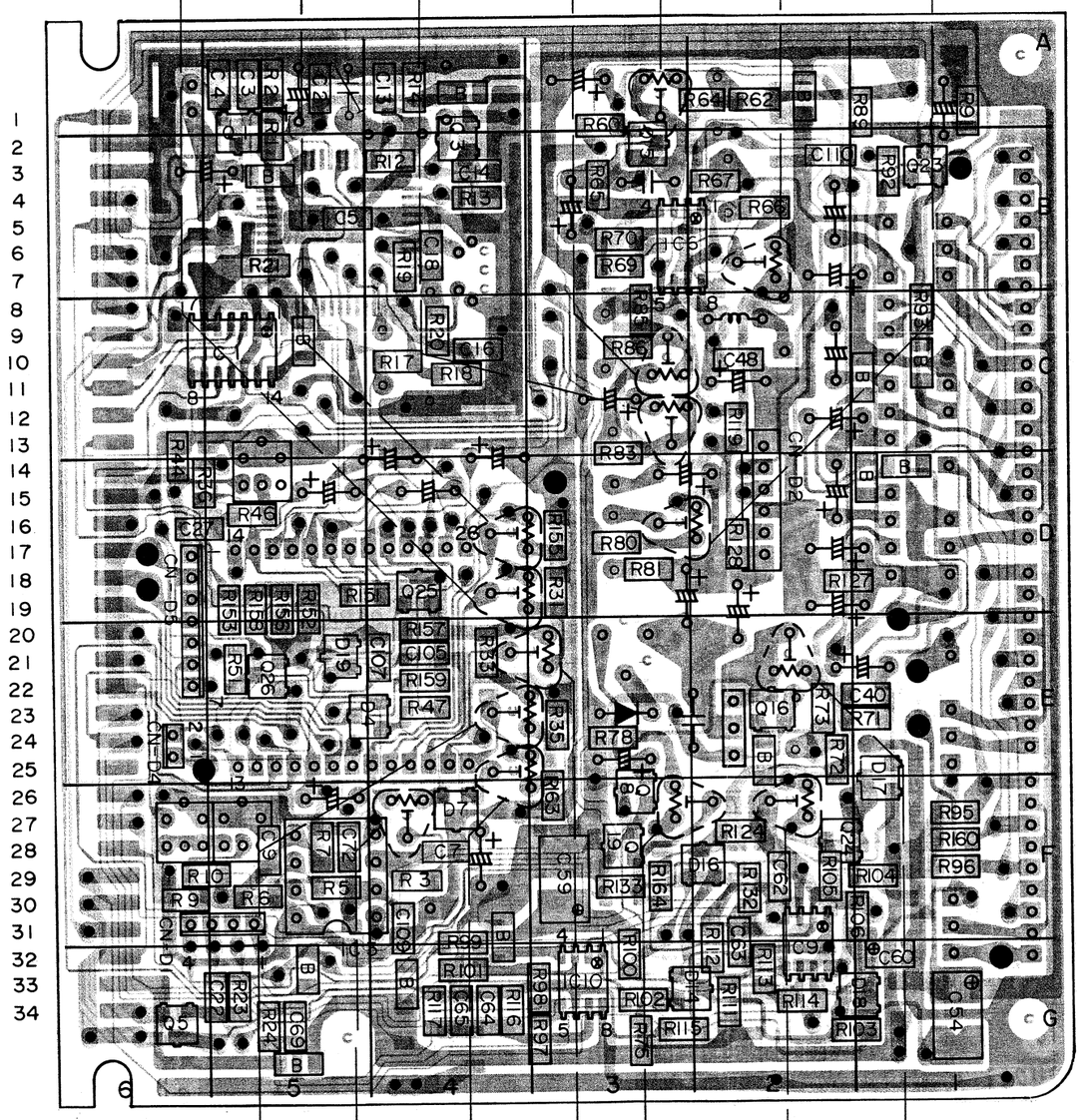


Video Process P.W.B.
— Rear side —

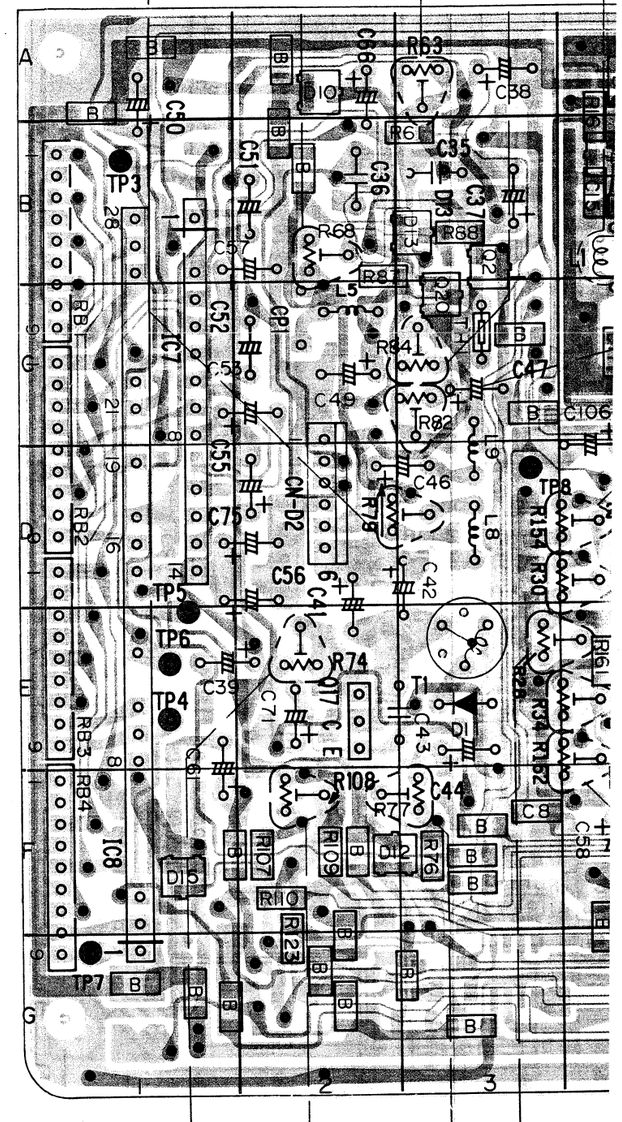


3.8 DEF & SSG CIRCUIT BOARD

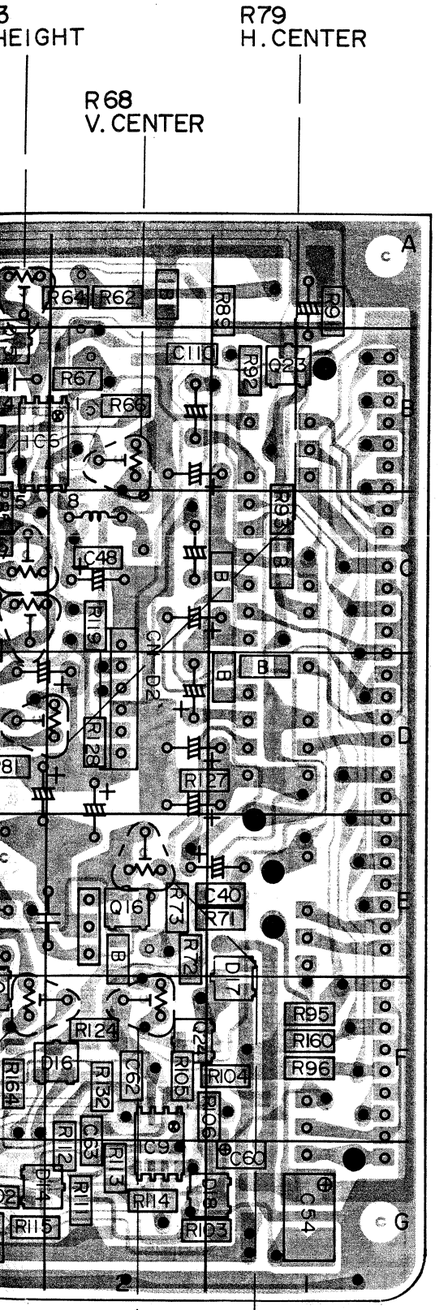
DEF & SSG P.W.B.
— Rear side —

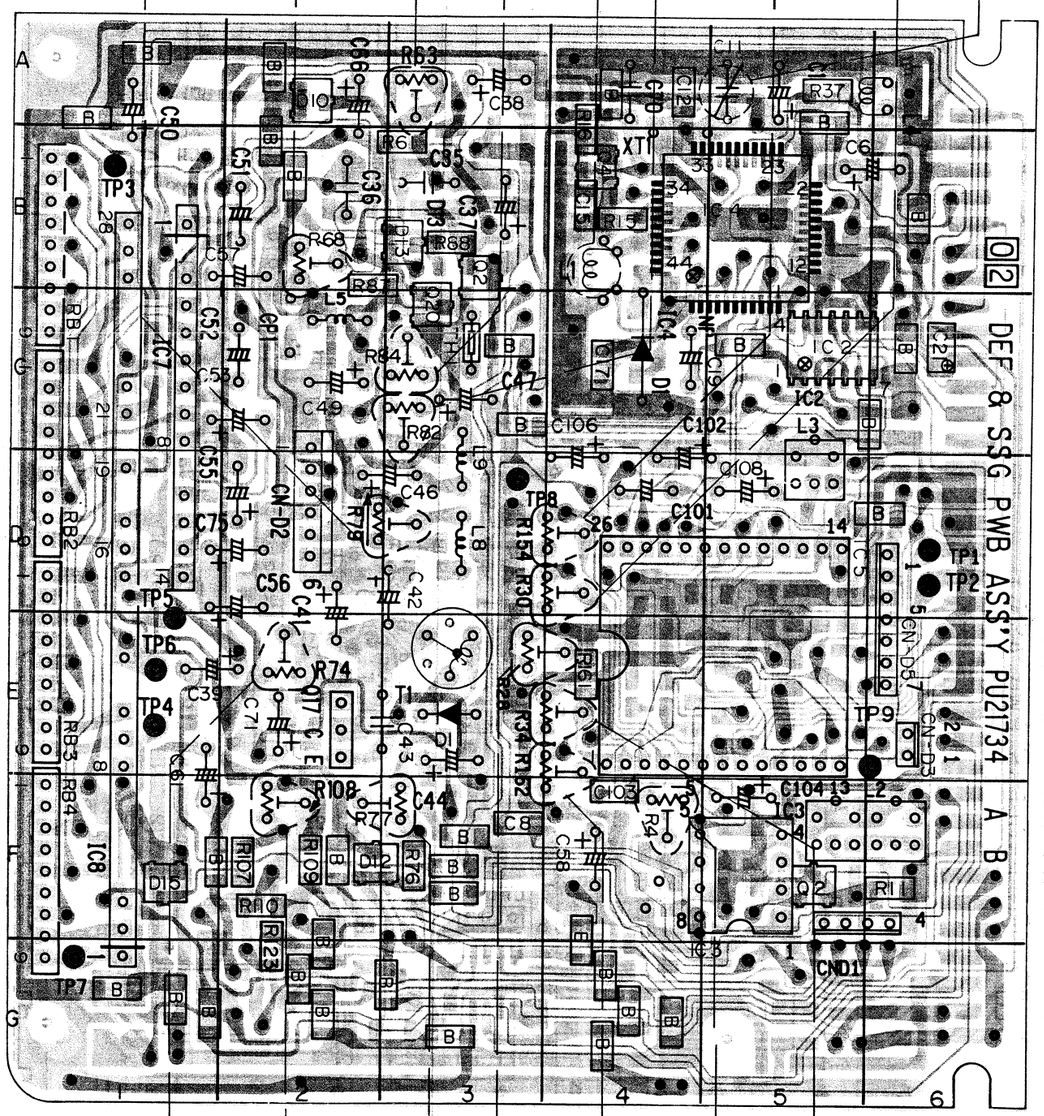


DEF & SSG P.W.B.
— Front side —

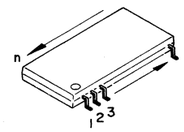


DEF & SSG P.W.B.
— Front side —



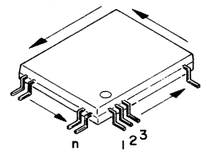


IC1, 2, 6, 9, 10

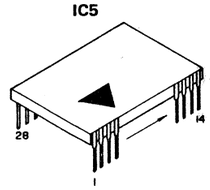


IC3

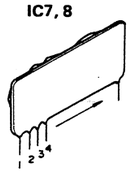
IC4



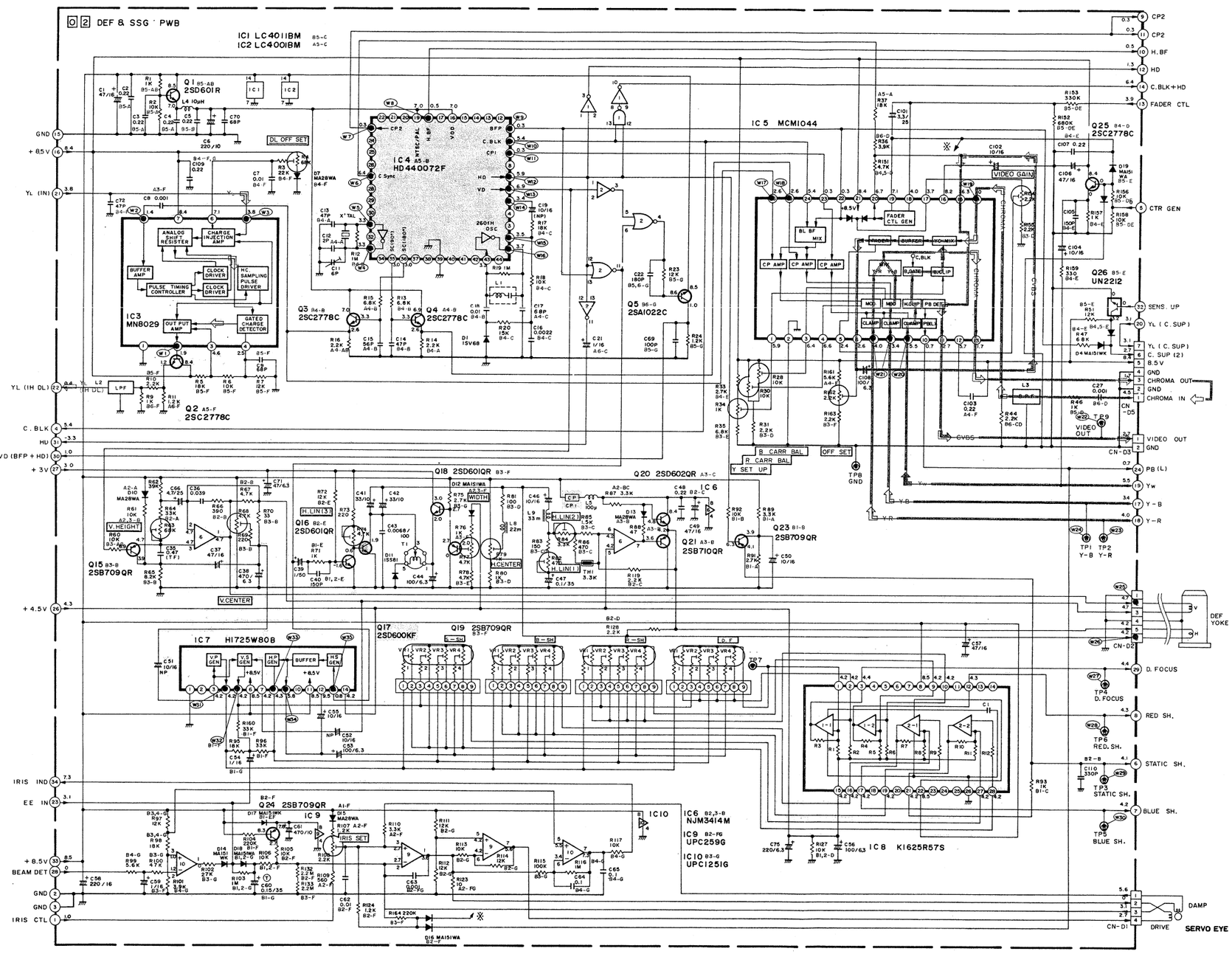
IC5



IC7, 8



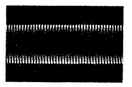
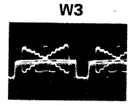
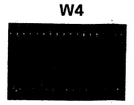
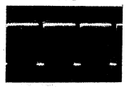
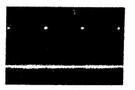
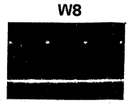
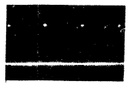
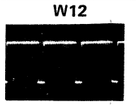
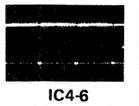
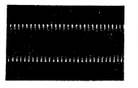
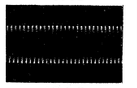
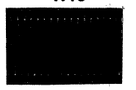
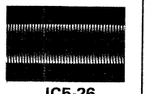
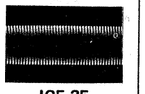
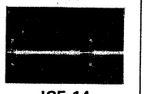
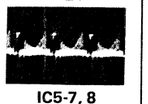
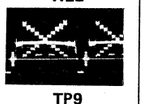
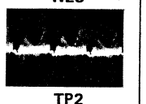
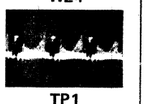
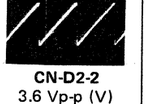
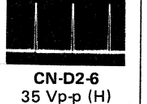
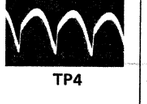
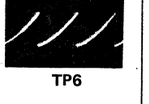
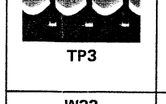
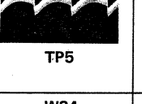
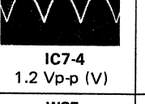
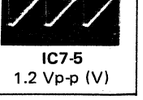
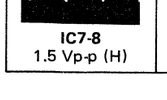
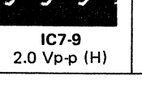
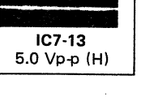
3.9 DEF & SSG/EMCODER SCHEMATIC DIAGRAM



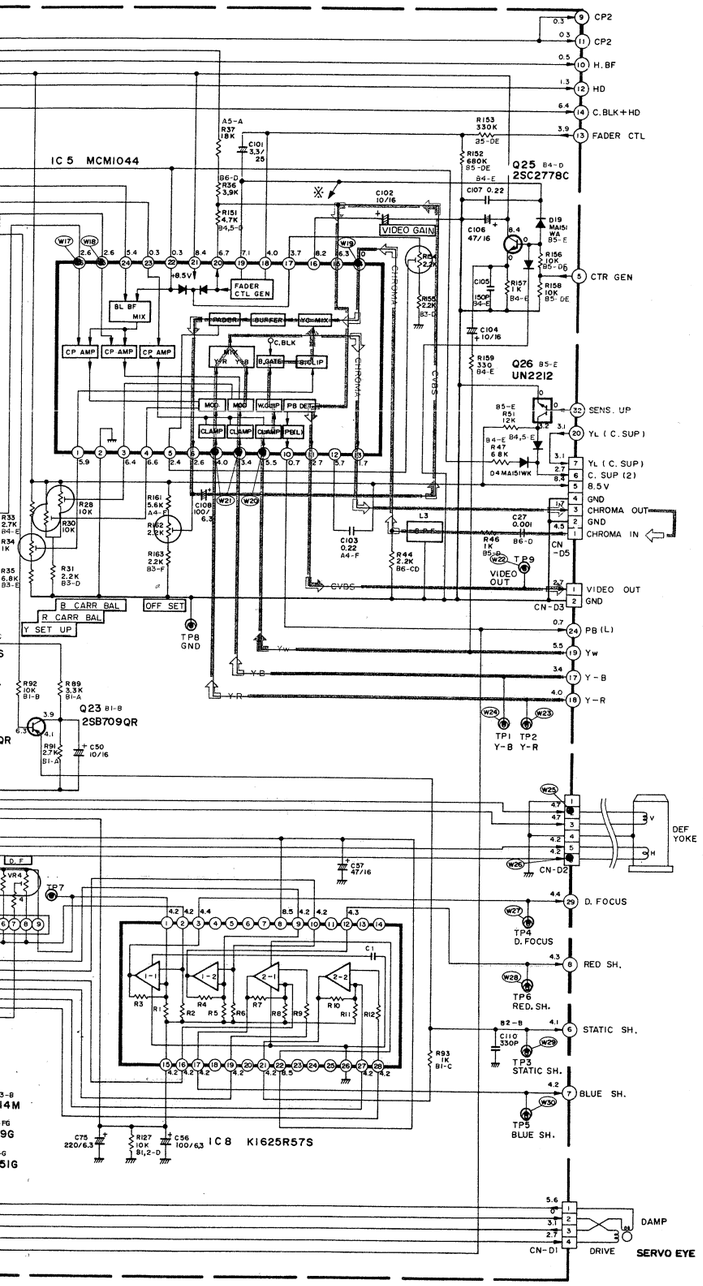
NOTES:

1. ▒▒ parts are importantly related to safety.
   When replacing them, make sure to use specified parts.
2. Voltage and waveform measurements
   Voltage: Measured with digital voltmeter in DC range at iris closed
   Waveform: With greyscale completely filling the picture area at auto-iris

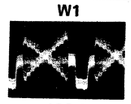
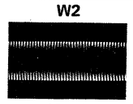
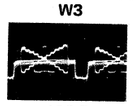
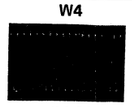
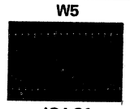
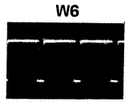
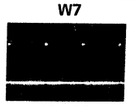
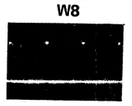
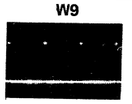
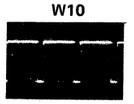
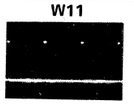
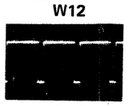
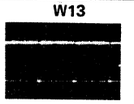
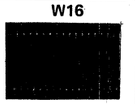
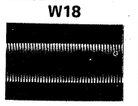
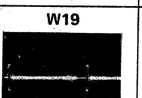
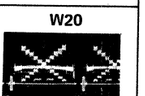
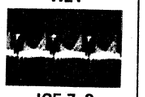
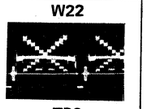
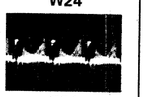
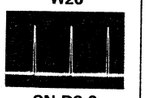
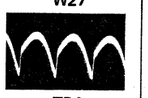
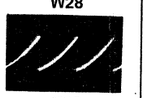
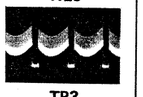
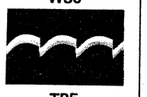
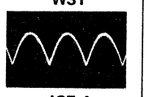
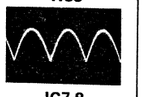
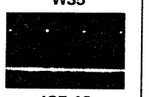
Wave forms of DEF & SSG/ENCODER P.W.B.

W1  **IC3-2** 0.15 Vp-p (H)	**W2**  **IC3-8** 0.68 Vp-p	**W3**  **IC3-5** 0.18 Vp-p (H)	**W4**  **IC4-33** 4.5 Vp-p
W5  **IC4-31** 0.6 Vp-p	**W6**  **IC4-27** 3 Vp-p (H)	**W7**  **IC4-23** 5.0 Vp-p	**W8**  **IC4-18** 6.0 Vp-p (H)
W9  **IC4-11** 6.0 Vp-p (H)	**W10**  **IC4-10** 6.5 Vp-p (H)	**W11**  **IC4-9** 6.5 Vp-p (H)	**W12**  **IC4-7** 6.5 Vp-p (H)
W13  **IC4-6** 3 Vp-p (V)	**W14**  **IC4-5** 50 mV	**W15**  **IC4-2** 0.2 Vp-p	**W16**  **IC4-1** 5 Vp-p (H)
W17  **IC5-26** 1.1 Vp-p	**W18**  **IC5-25** 1.1 Vp-p	**W19**  **IC5-14** 0.2 Vp-p (H)	**W20**  **IC5-9** 1.8 Vp-p (H)
W21  **IC5-7, 8** 0.3 Vp-p (H)	**W22**  **TP9** 2.0 Vp-p(G)	**W23**  **TP2** 0.3 Vp-p (H)	**W24**  **TP1** 0.25 Vp-p (H)
W25  **CN-D2-2** 3.6 Vp-p (V)	**W26**  **CN-D2-6** 35 Vp-p (H)	**W27**  **TP4**	**W28**  **TP6**
W29  **TP3**	**W30**  **TP5**	**W31**  **IC7-4** 1.2 Vp-p (V)	**W32**  **IC7-5** 1.2 Vp-p (V)
W33  **IC7-8** 1.5 Vp-p (H)	**W34**  **IC7-9** 2.0 Vp-p (H)	**W35**  **IC7-13** 5.0 Vp-p (H)	

3-11 DEF, SSG/ENCODER, BOTTOM SCHEMATIC & BOARD
(BOTTOM, H.V. SCHEMATIC & BOARD)

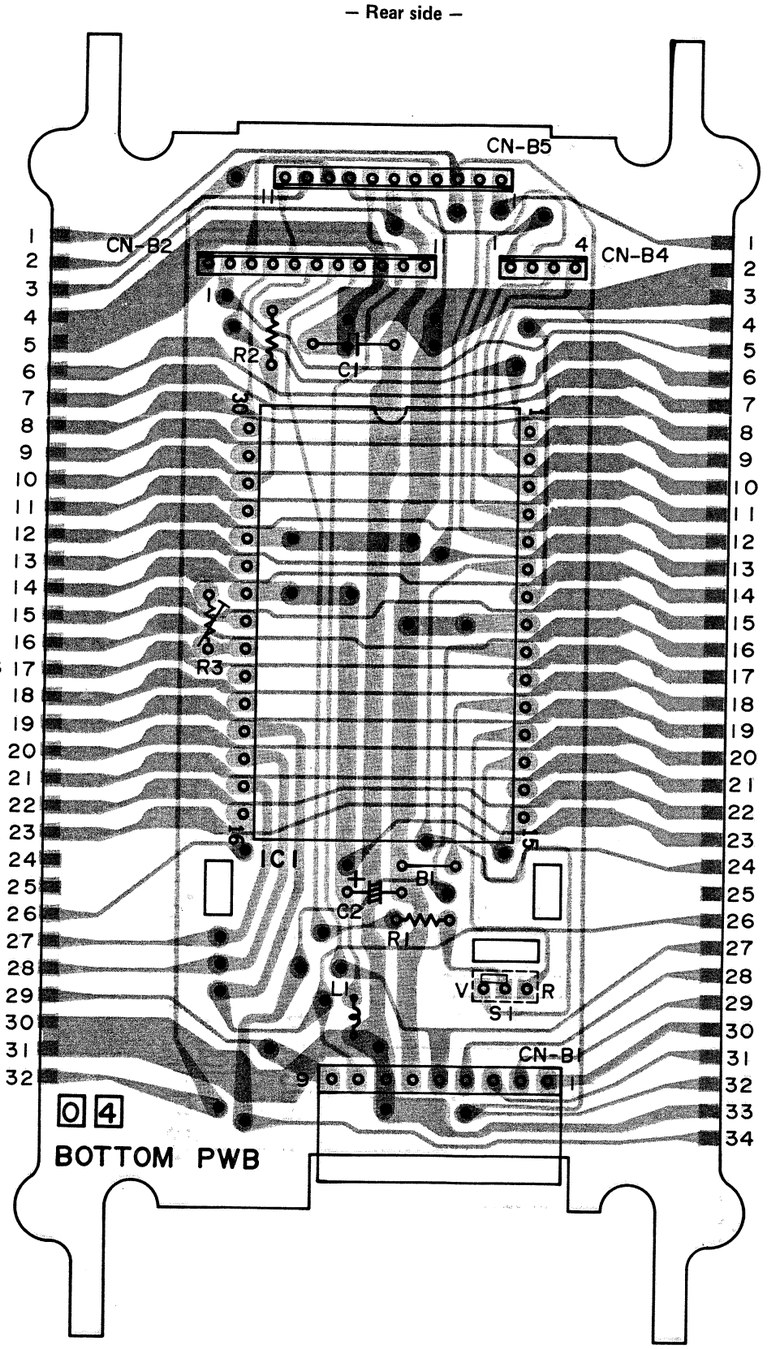


Wave forms of DEF & SSG/ENCODER P.W.B.

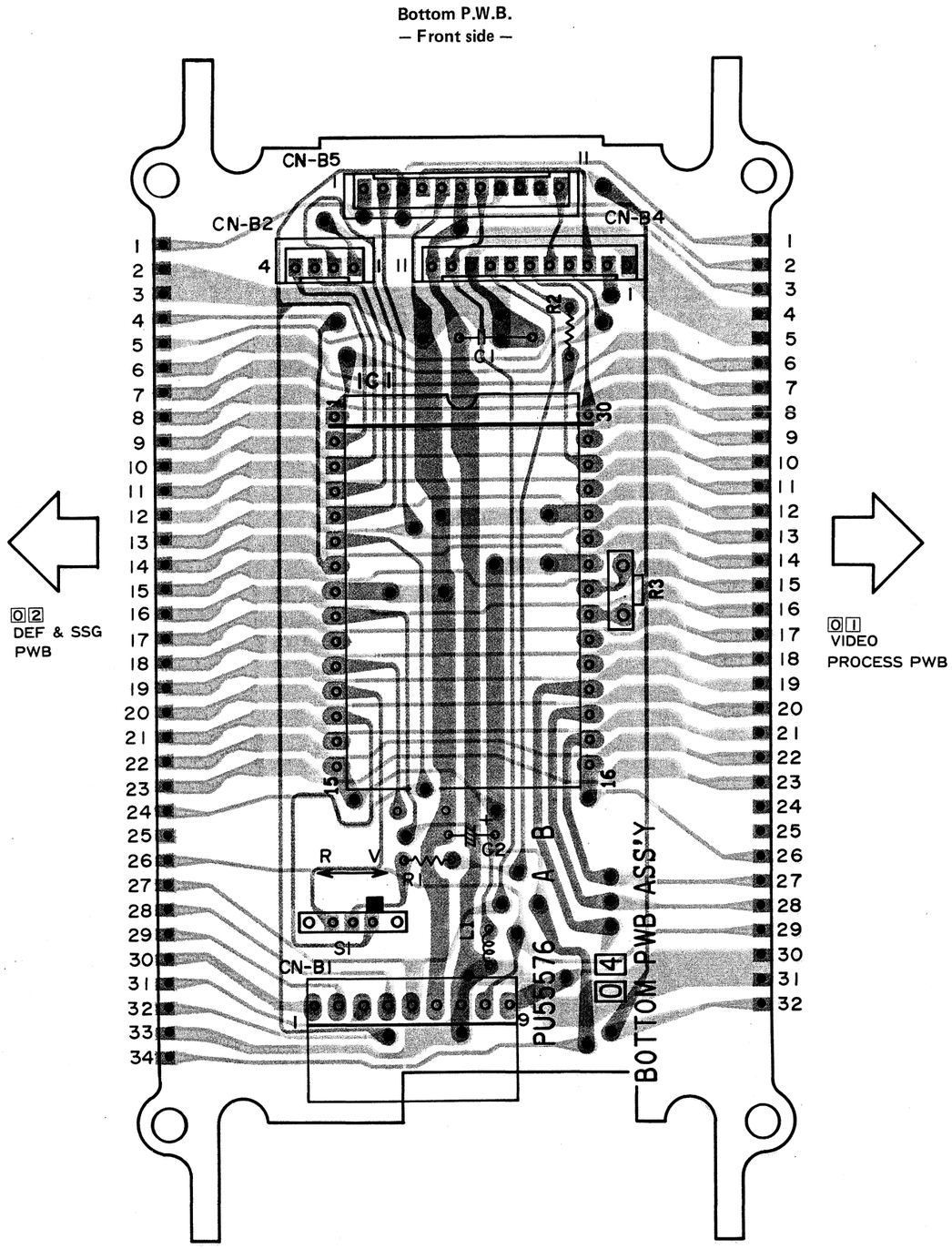
W1  **IC3-2** 0.15 Vp-p (H)	**W2**  **IC3-8** 0.68 Vp-p	**W3**  **IC3-5** 0.18 Vp-p (H)	**W4**  **IC4-33** 4.5 Vp-p
W5  **IC4-31** 0.6 Vp-p	**W6**  **IC4-27** 3 Vp-p (H)	**W7**  **IC4-23** 5.0 Vp-p	**W8**  **IC4-18** 6.0 Vp-p (H)
W9  **IC4-11** 6.0 Vp-p (H)	**W10**  **IC4-10** 6.5 Vp-p (H)	**W11**  **IC4-9** 6.5 Vp-p (H)	**W12**  **IC4-7** 6.5 Vp-p (H)
W13  **IC4-6** 3 Vp-p (V)	**W14**  **IC4-5** 50 mV	**W15**  **IC4-2** 0.2 Vp-p	**W16**  **IC4-1** 5 Vp-p (H)
W17  **IC5-26** 1.1 Vp-p	**W18**  **IC5-25** 1.1 Vp-p	**W19**  **IC5-14** 0.2 Vp-p (H)	**W20**  **IC5-9** 1.8 Vp-p (H)
W21  **IC5-7, 8** 0.3 Vp-p (H)	**W22**  **TP9** 2.0 Vp-p(G)	**W23**  **TP2** 0.3 Vp-p (H)	**W24**  **TP1** 0.25 Vp-p (H)
W25  **CN-D2-2** 3.6 Vp-p (V)	**W26**  **CN-D2-6** 35 Vp-p (H)	**W27**  **TP4**	**W28**  **TP6**
W29  **TP3**	**W30**  **TP5**	**W31**  **IC7-4** 1.2 Vp-p (V)	**W32**  **IC7-5** 1.2 Vp-p (V)
W33  **IC7-8** 1.5 Vp-p (H)	**W34**  **IC7-9** 2.0 Vp-p (H)	**W35**  **IC7-13** 5.0 Vp-p (H)	

3.10 BOTTOM CIRCUIT BOARD (Back side)

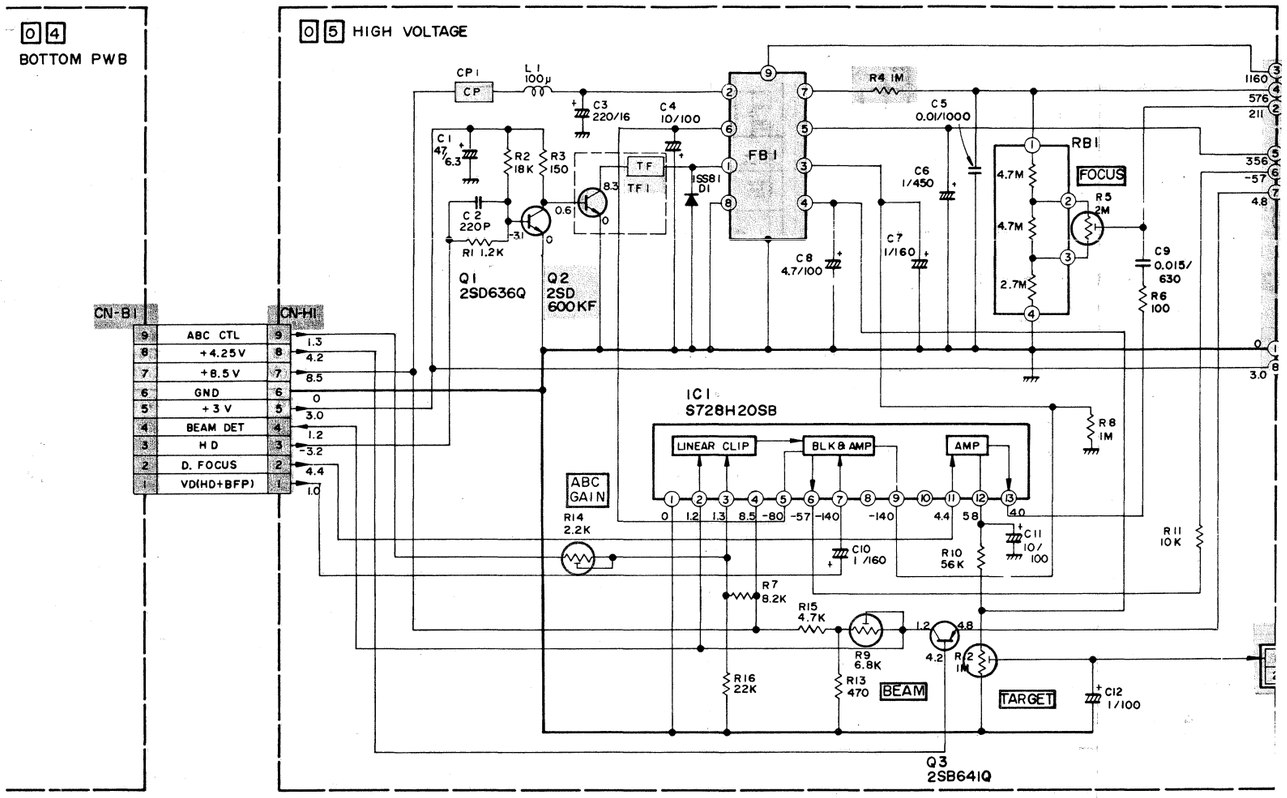
Bottom P.W.B.
— Rear side —



3.11 BOTTOM CIRCUIT BOARD (Front side)



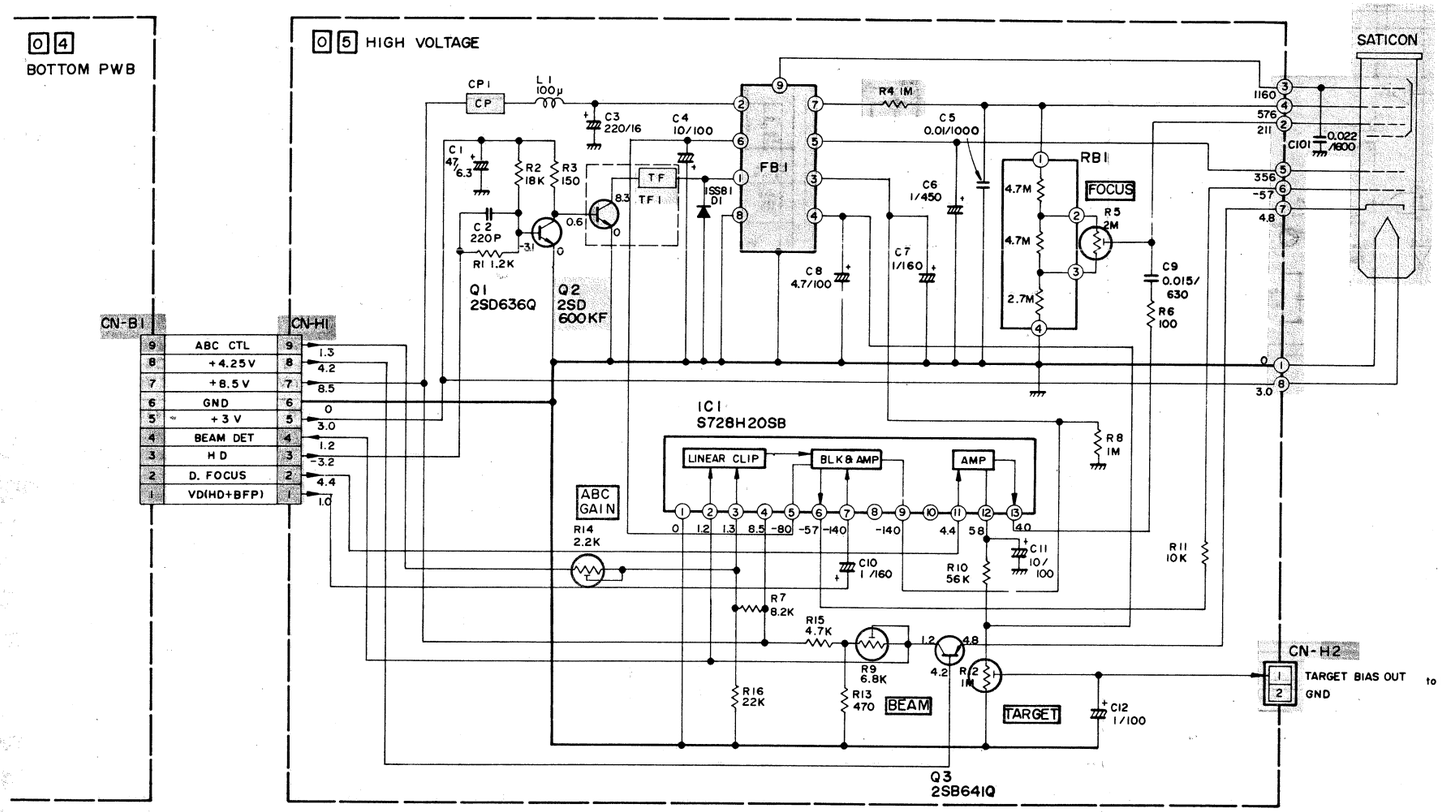
3.12 H.V. BOARD SCHEMATIC DIAGRAM



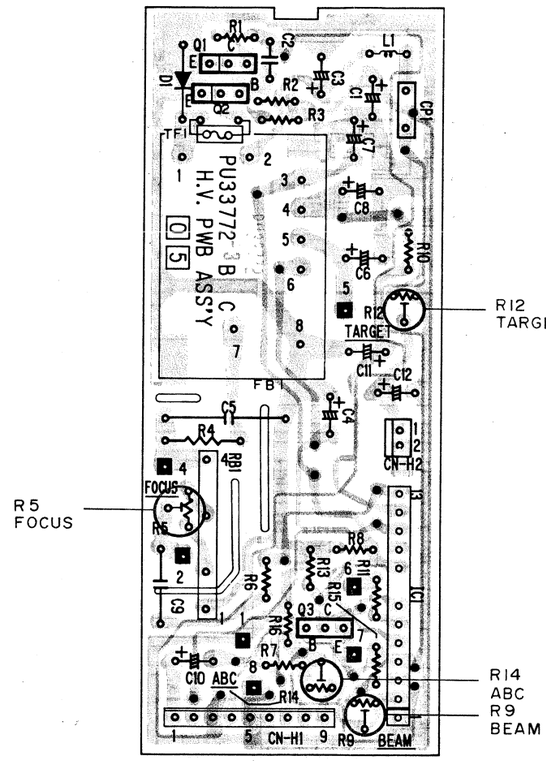
NOTES:
1. parts are importantly related to safety.
   When replacing them, make sure to use specified par
2. Voltages are measured with digital voltmeter in DC r

BOTTOM, H.V. SCHEMATIC & BOARD
(DEF, SSG/ENCODER, BOTTOM SCHEMATIC & BOARD) 3-12

3.12 H.V. BOARD SCHEMATIC DIAGRAM



3.13 H.V. CIRCUIT BOARD



R5 FOCUS

R12 TARGET

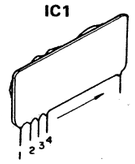
R14 ABC

R9 BEAM

NOTES:

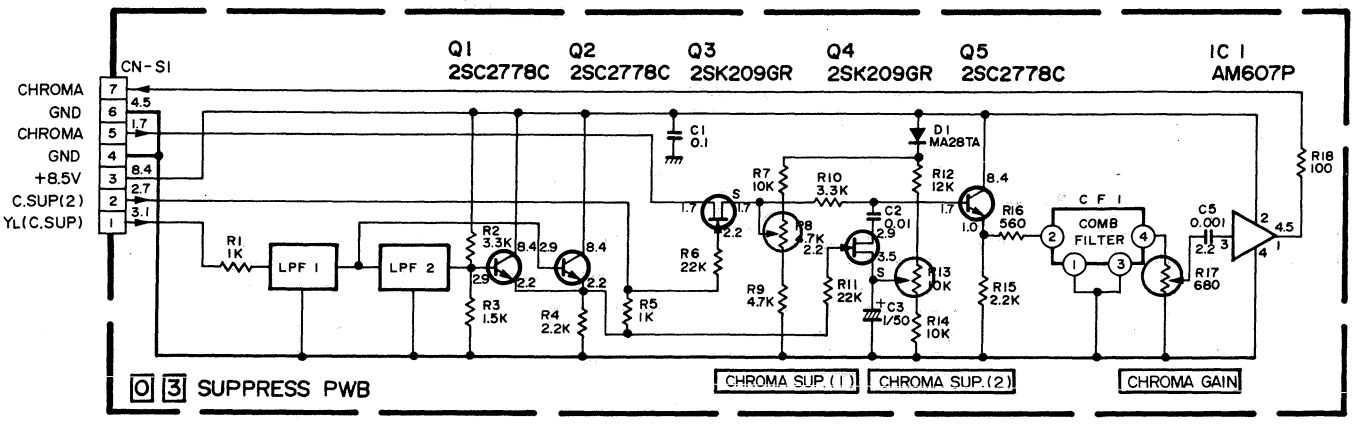
1. ▒▒▒ parts are importantly related to safety.
   When replacing them, make sure to use specified parts.
2. Voltages are measured with digital voltmeter in DC range at iris closed.

IC1



3-12 BOTTOM, H.V. SCHEMATIC & BOARD
(DEF, SSG/ENCODER, BOTTOM SCHEMATIC & BOARD)

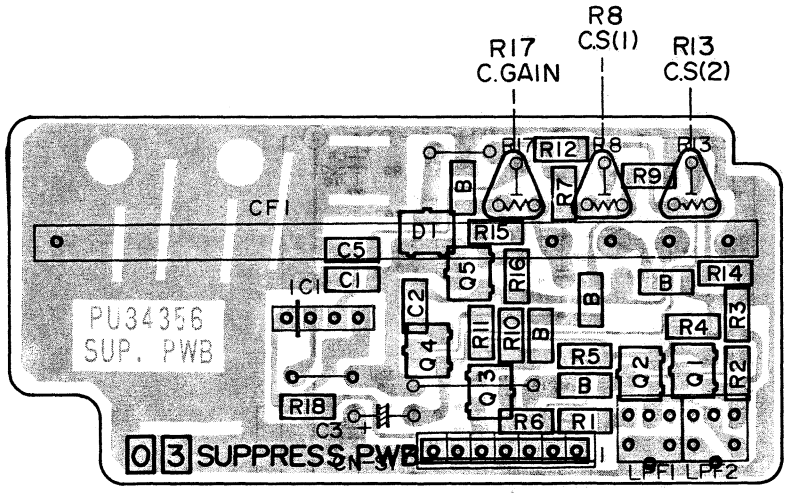
3.14 SUPPRESSOR SCHEMATIC DIAGRAM

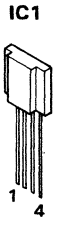


NOTES:

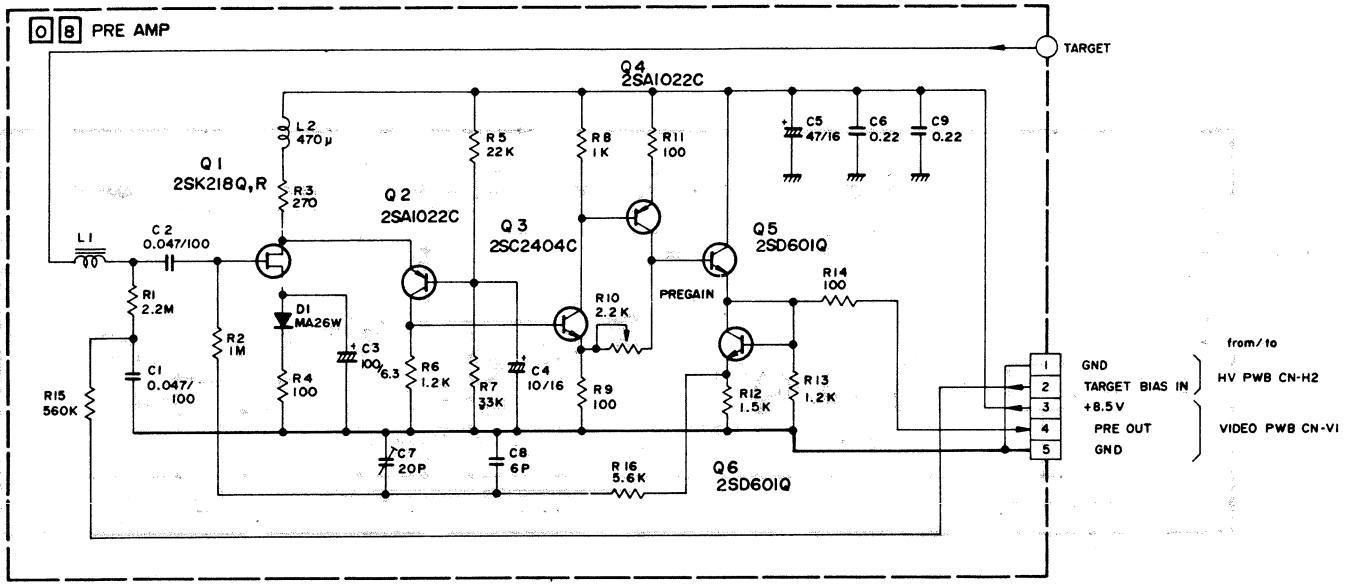
1. ▒▒ parts are importantly related to safety.
   When replacing them, make sure to use specified parts.
2. Voltages are measured with digital voltmeter in DC range at iris closed.

3.15 SUPPRESSOR CIRCUIT BOARD

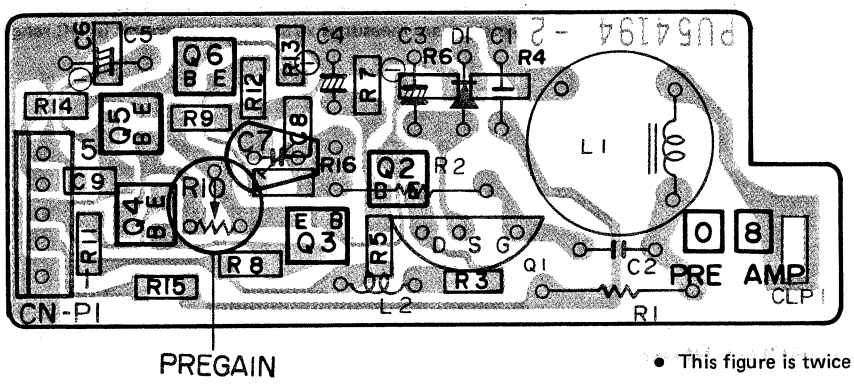




3.16 PRE-AMP SCHEMATIC DIAGRAM

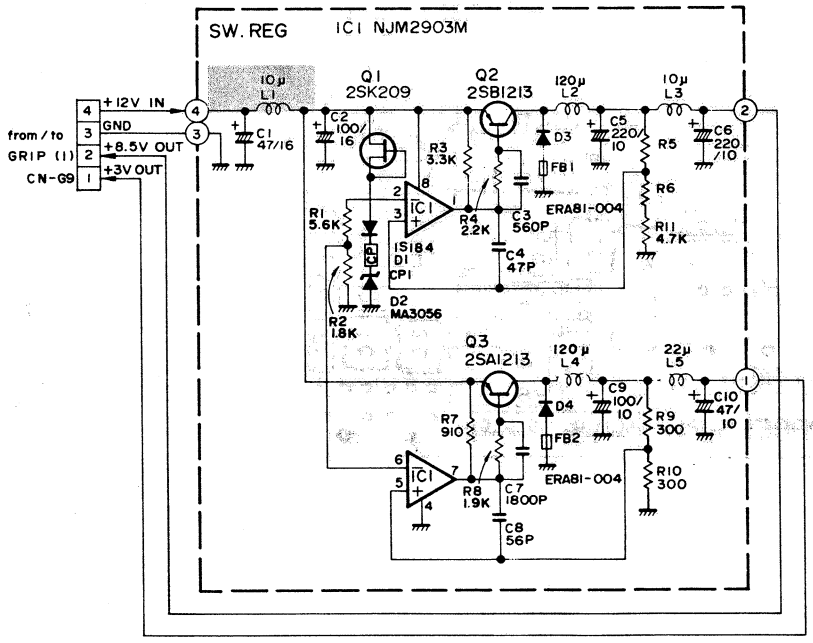


3.17 PRE-AMP CIRCUIT BOARD

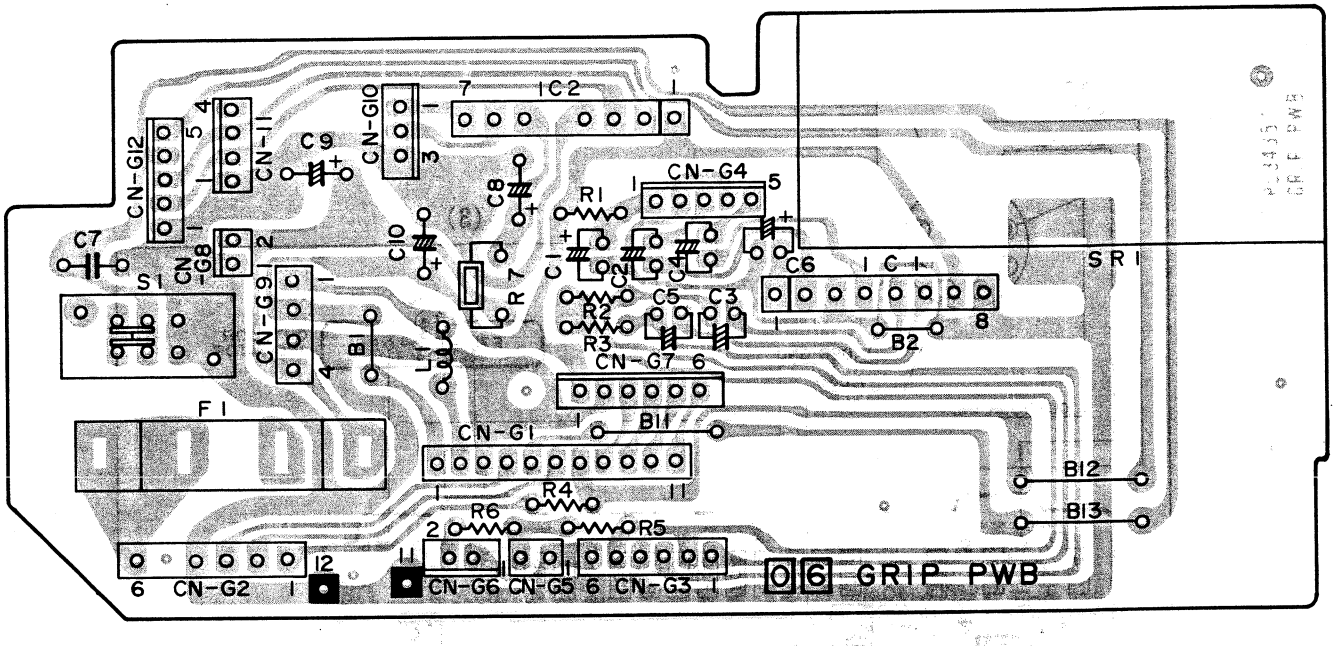


• This figure is twice as large as the life-size.

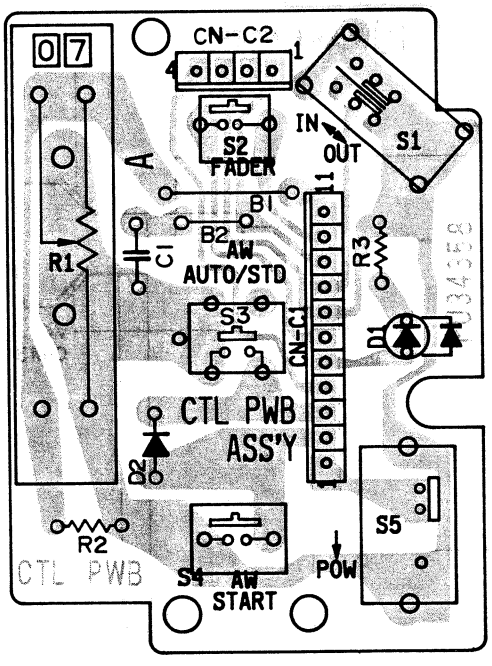
3.18 SWITCHING REGULATOR SCHEMATIC DIAGRAM



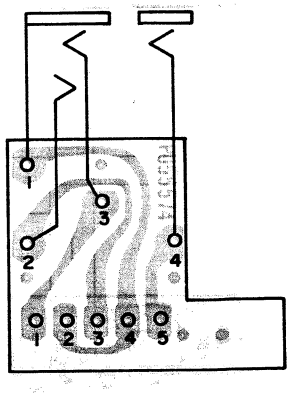
3.19 GRIP CIRCUIT BOARD



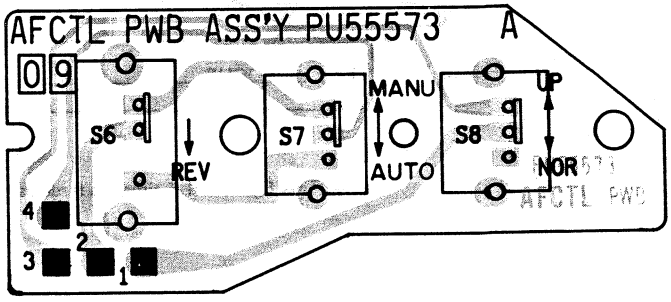
3.20 CONTROL CIRCUIT BOARD



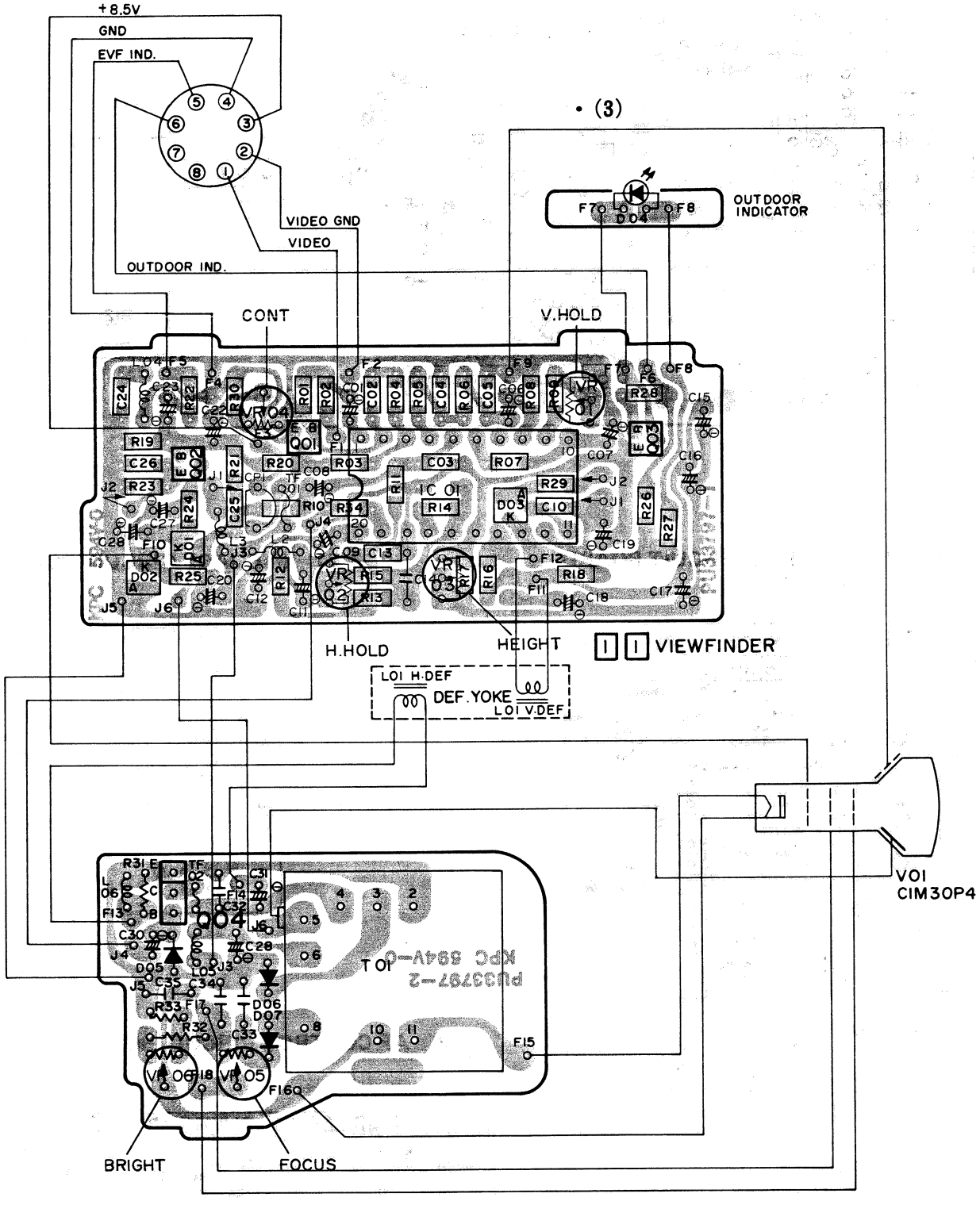
3.21 MIC JACK CIRCUIT BOARD



3.22 AF CONTROL CIRCUIT BOARD



3.23 ELECTRONIC VIEWFINDER CIRCUIT BOARD



• This figure is 1.5 times as large as the life-size.

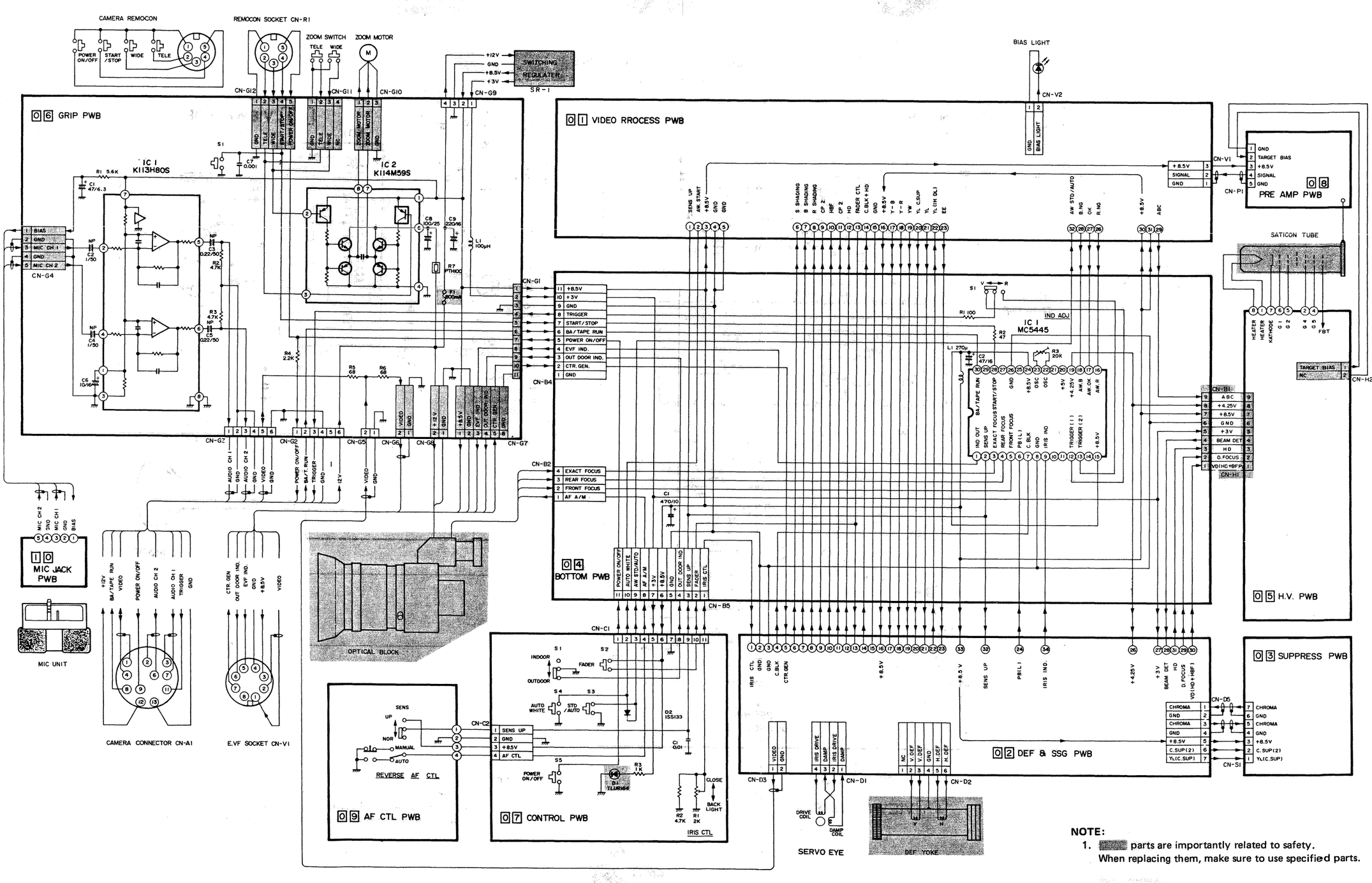
3.24 ELECTRONIC VIEWFINDER SCHEMATIC DIAGRAM

NOTES:

1. ▒▒ parts are importantly related to safety.
   When replacing them, make sure to use specified parts.
2. Voltages are measured with digital voltmeter in DC range at iris closed.

3-17 ELECTRONIC VIEWFINDER SCHEMATIC (OVERALL WIRING)

3.25 OVERALL WIRING



NOTE:

1. ▨ parts are importantly related to safety.
   When replacing them, make sure to use specified parts.

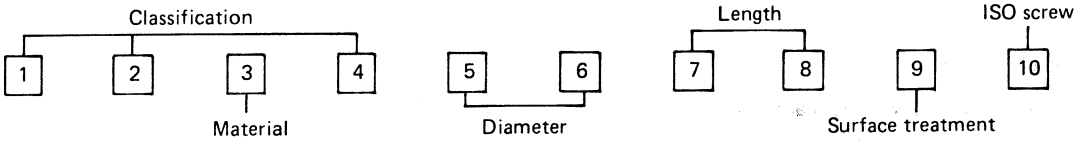
SECTION 4
EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety.
Replace only with specified part numbers.

4.1 STANDARD PART NUMBER CODING

4.1.1 Screw coding



Classification (first digit)

Symbol Letter	Name
S	Normal screw
N	Assembly screw
L	"
D	"
M	Wood screw
F	Feather screw
T	Set screw
Y	"
B	Bolt
N	Nut
W	Washer
R	E-ring
E	Eyelet
P	Spring
G	Washer head screw

Material (third digit)

Symbol Letter	Material
S	Steel
E	Stainless steel
C	Cast iron
U	Bronze
B	Brass
P	Phosphor bronze
N	German silver
Y	Brass
A	Aluminum
Z	Zinc alloy
K	Polycarbonate

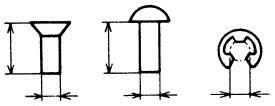
Shape of Screw Head (second digit)

Symbol Letter		Shape of Screw Head
P		Pan head
S		Flat countersunk head
H		Oval countersunk head
D		Binding head
R		Round head
B		Round head
T		Truss head

Type of Screw (fourth digit)

Symbol Letter	Type of Screw
P	Cross-Recessed head screw
A	Tapping screw
B	Special tapping screw
T	Thread rolling tapping screw
E	Special tapping screw
F	Special tapping screw

Diameter and Length of Screw (fifth – eighth digit)



– Example –

S P B P 3 0 0 6 Z S

(Diameter x 10) (Length)

Diameter : 3 mm

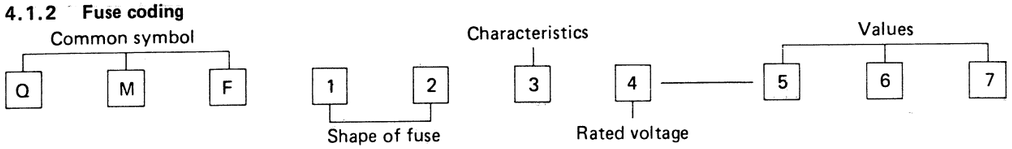
Length : 6 mm

Surface Treatment (ninth digit)

Symbol Letter	Surface Treatment
Z	Galvanization, dichromic acid treatment (MFZn2-C)
N	Nickel plating (MFNi2, MFNil)
R	Chrome plating (MBCr2, MBCr1)
G	Silver plating (SP4)
W	Nichrome platings
P	Phosphite treatment
B	Bronze plating

Symbol letter	Surface treatment
M	Black coloring after galvanization
A	Red coloring after galvanization
C	Blue coloring after galvanization
T	Green coloring after galvanization
V	Violet coloring after galvanization
F	Iron with black coloring

4.1.2 Fuse coding



Shape of Fuse (first and second digit)

Symbol No.	Shape	Remarks
51		ϕ 5.2 x 20
60		ϕ 6.4 x 30
61		ϕ 6.35 x 31.8
63		With 60 Lead Wire
66		With 61 Lead Wire

Rated Voltage (fourth digit)

Symbol No.	Rated Voltage	
1	AC 125 V	
2	AC 250 V	
3	100 mA ≀ 1 A	AC 250 V
	1.25 A ≀ 6.3 A	AC 125 V

Values (fifh-seventh digit)

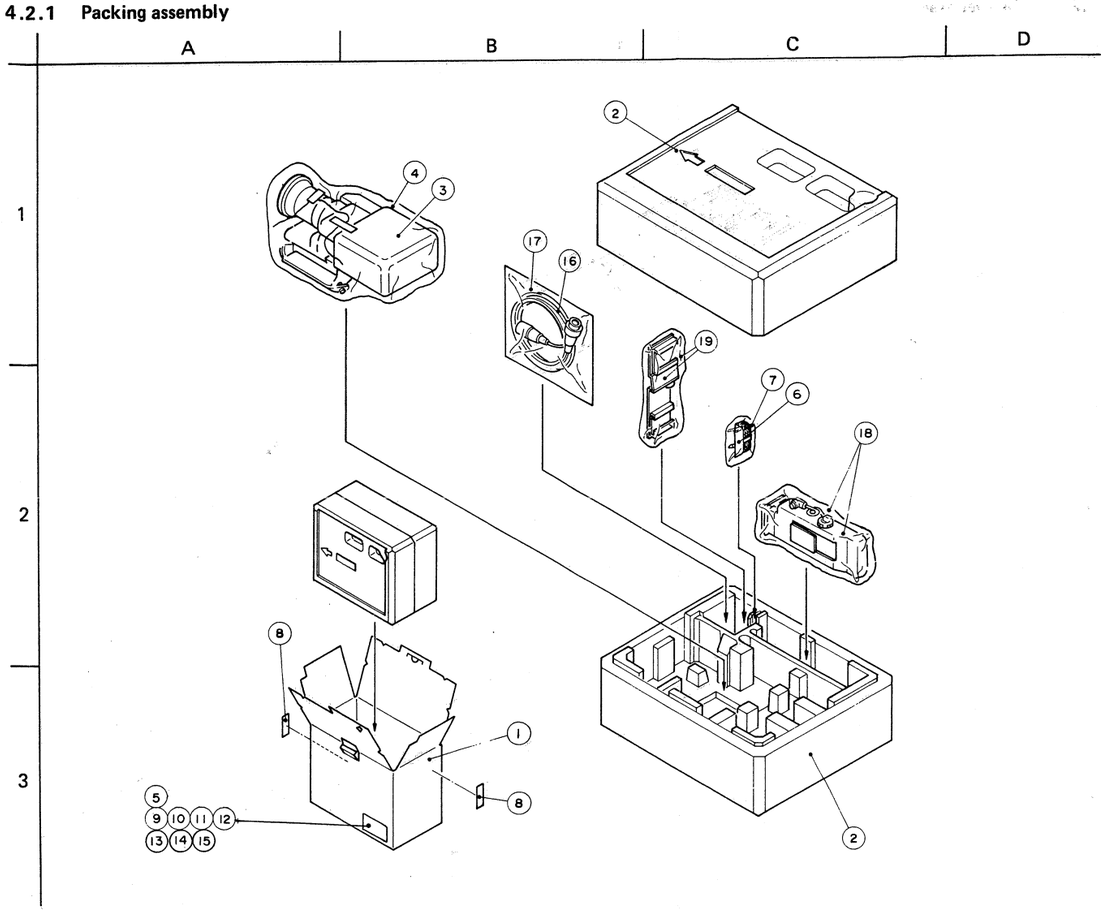
R10	.....	100 mA
R125	.....	125 mA
1R0	.....	1.0 A
1R2	.....	1.2 A
1R25	.....	1.25 A
100	.....	10 A

Characteristics (third digit)

Symbol No.	Fusing Current	Fusing Time	Remarks
S	160%	Within 1 hr.	Anti-rush Type
	200%	" 2 min.	
	700% – 2000%	" 0.01 sec.	
R	160%	" 1 hr.	Regular Fusible Type
	200%	" 2 min.	
M	135%	" 1 hr.	Regular Fusible Type (for UL)
	200%	" 2 min.	
U	135%	" 1 hr.	Anti-rush Type (for UL)
	200%	" 2 min.	
	800% – 2000%	" 0.01 sec.	
A	210%	" 2 min.	Anti-rush Type (for Europe)
	275%	0.5 – 10 sec.	
	400%	0.15 – 2 sec.	
	1000%	0.02 – 0.3 sec.	
B	210%	Within 30 min.	Regular Fusible Type (for SEMKO, Europe)
	275%	0.05 – 2 sec.	
	400%	0.01 – 0.3 sec.	
C	135%	Within 1 hr.	Anti-rush Type (for UL, Japan)
	200%	" 2 min.	

4.2 EXPLODED VIEWS AND PARTS LIST

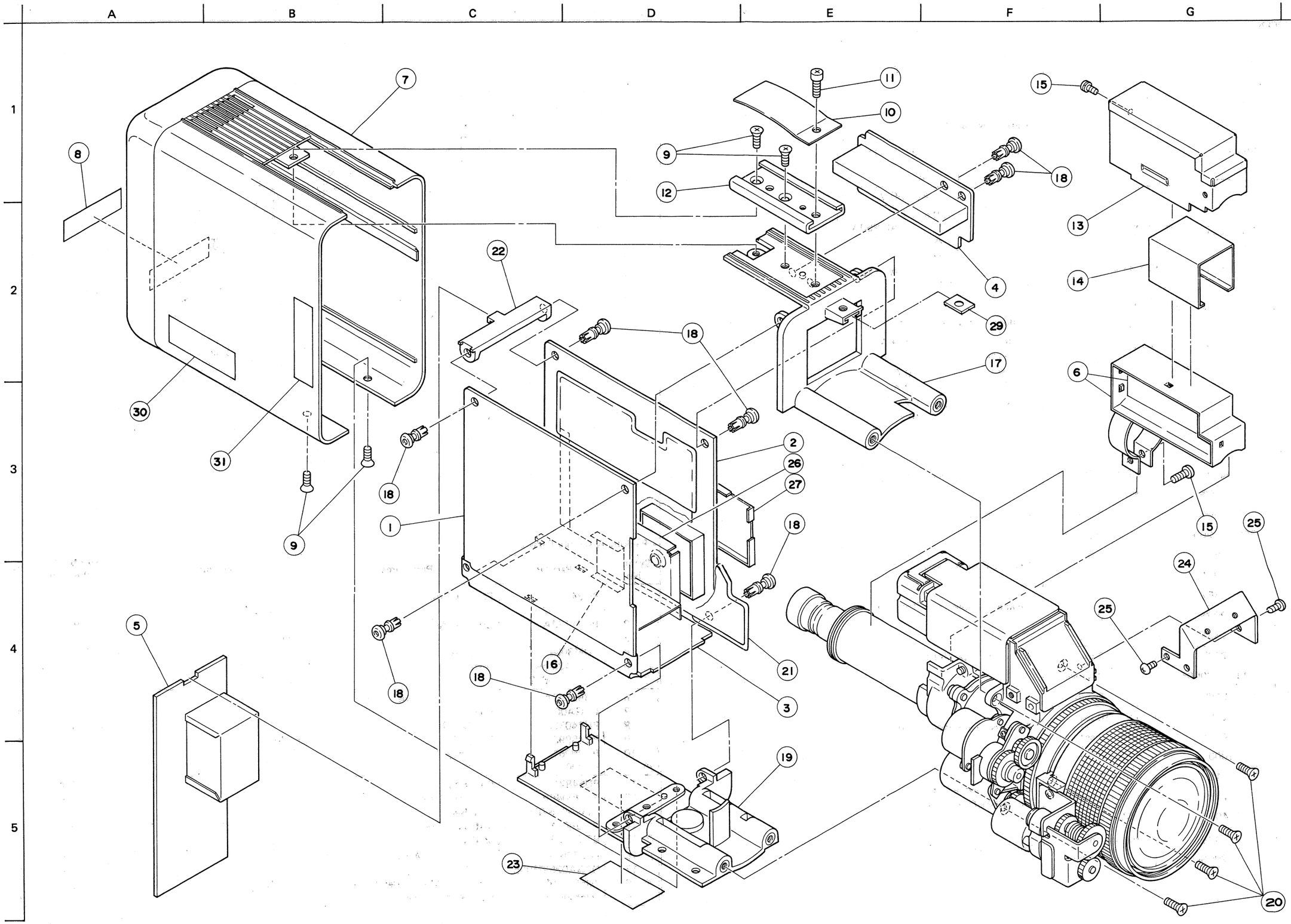
4.2.1 Packing assembly



— Packing Assembly Parts List —

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
1	PU34470	Packing Case		3-B	1
	" -2	"	for CANADA	3-B	
2	PU21732A	Cushion Ass'y		1-B, 3-C	2
3	–	–	GZ-S5U	1-B	1
4	PUM30021-36	Poly Bag		1-B	1
⚠ 5	PU30425-593	Instruction	for USA	1-B	1
⚠	" -612	"	for CANADA	1-B	1
6	PU55577A	Stereo Microphone		2-C	1
7	QPGA007-01003	Poly Bag		2-C	1
8	PUP40329	Ser. No. Sticker		2-A, 3-B	2
⚠ 9	PU45993	Safety Tip	for USA	3-A	1
⚠ 10	BT20061	Warranty Card	for USA	3-A	1
⚠	BT20025F	"	for CANADA	1-B	1
11	PU54821	Poly Bag		3-A	1
12	BT-20046B	Toll Free Card	for USA	3-A	1
13	QPGA025-03505	Poly Bag		3-A	1
⚠ 14	BT-20071	Instruction Guide	for CANADA	3-A	1
⚠ 15	BT-20017D	Safety Tips		3-A	1
⚠ 16	PU33769A-2	Camera Cable Ass'y		1-B	1
17	QPGA025-04005	Poly Bag		1-B	1
⚠ 18	PU53973A-2	Electronic Viewfinder Ass'y	Incl. Poly Bag	2-C	1
19	PU55249A-1	Shoe Adapter Ass'y	"	1-C	1

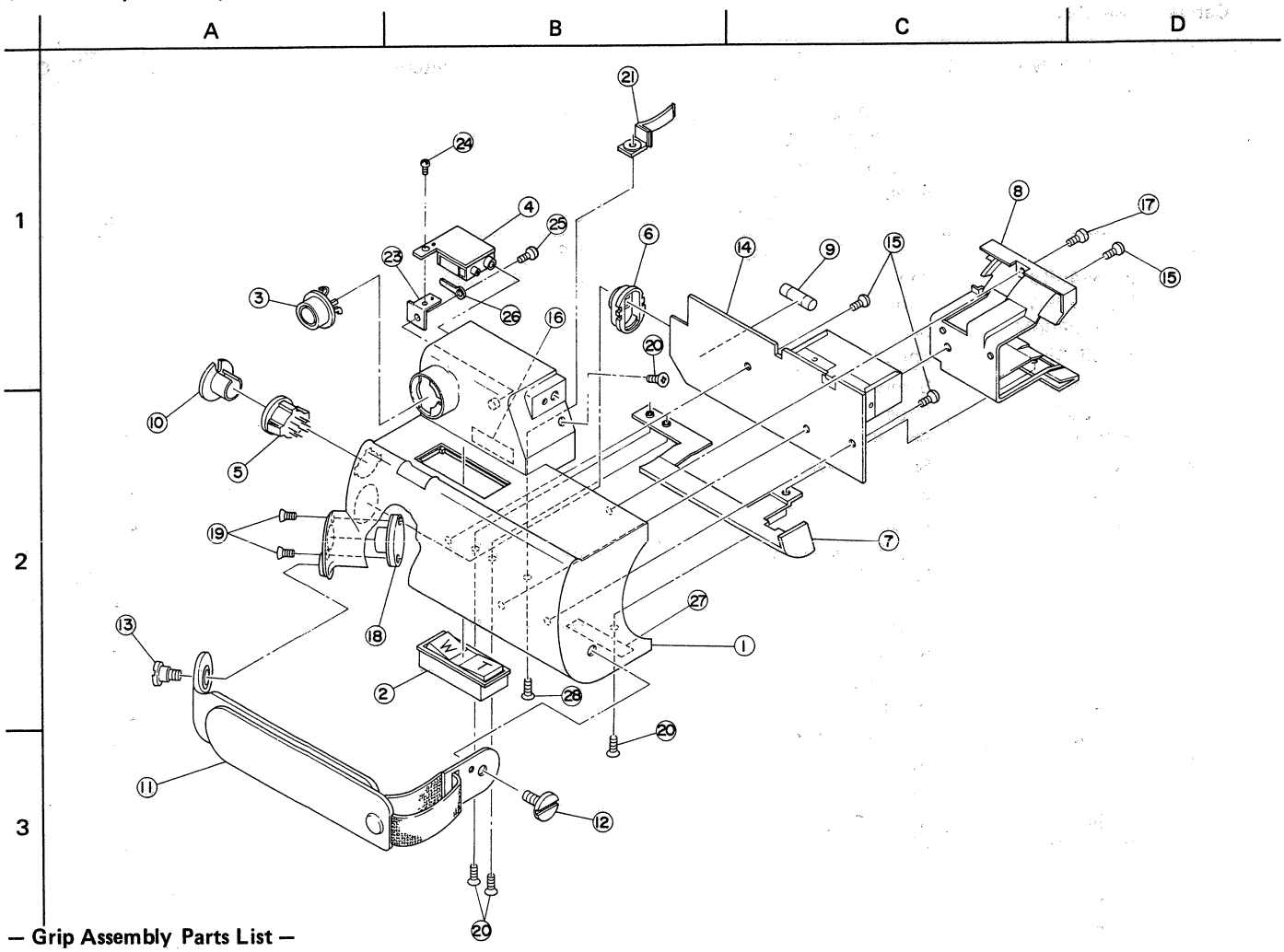
4-3


A
B
C
D
E
F
G
H
1
2
3
4
5
7
8
30
31
9
22
18
1
16
21
3
19
23
5
11
10
12
4
29
17
2
26
27
15
13
14
6
25
24
20

— Cabinet Assembly Parts List —

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
1	—	Video Process P.W.B. Ass'y	REF: 01	3-C	1
2	—	DEF & SSG P.W.B. Ass'y	REF: 02	3-E	1
3	—	Bottom P.W.B. Ass'y	REF: 04	4-E	1
4	—	Suppressor P.W.B. Ass'y	REF: 03	2-F	1
5	—	HV (High Voltage) P.W.B. Ass'y	REF: 05	4-A	1
⚠ 6	—	Pre-amp P.W.B. Ass'y	REF: 08	2-F	1
⚠ 7	PU34468B	Panel Ass'y	Incl. (8), (30), (31)	1-C	1
8	PU54705-2	Label		1-A	1
9	SSBP2606M	Screw		1-D, 3-B	4
10	PU53945	Shoe Clip		1-E	1
11	PU53946	Screw		1-E	1
12	PU53944	Shoe		1-D	1
⚠ 13	PU53971-1-5	Shield Cover		2-F	1
14	PU55394	Shield Sleeve		2-F	1
15	LPSP2606Z	Screw		1-F, 3-G	2
⚠ 16	PU56121	Insulator		4-C	1
⚠ 17	PU21702B	Top Frame Ass'y	Incl. Plate Nut	2-F	1
⚠ 18	PU54378	Nylon Rivet		1-F,2-D,3-C, 3-E, 4-C	8
⚠ 19	PU34350A	Bottom Frame Ass'y	Incl. Plate Nut	5-E	1
20	SSBP2608Z	Screw		5-G	4
⚠ 21	PU55804-1-3	Insulator		4-E	1
⚠ 22	PU53942	Bracket		2-C	1
⚠ 23	PU55558-2	Serial No. Plate		5-C	1
24	PU55557	Bracket		4-G	1
25	SBSE2605Z	Tapping Screw		3-G, 4-G	2
26	PU56122	Shield Case		3-E	1
27	PU53969A	Shield Cover		3-E	1
28	—	—		—	—
29	PU55555	Tap Plate		2-F	1
30	PU54392	Label		3-A	1
31	PU49729-2	"		3-B	1

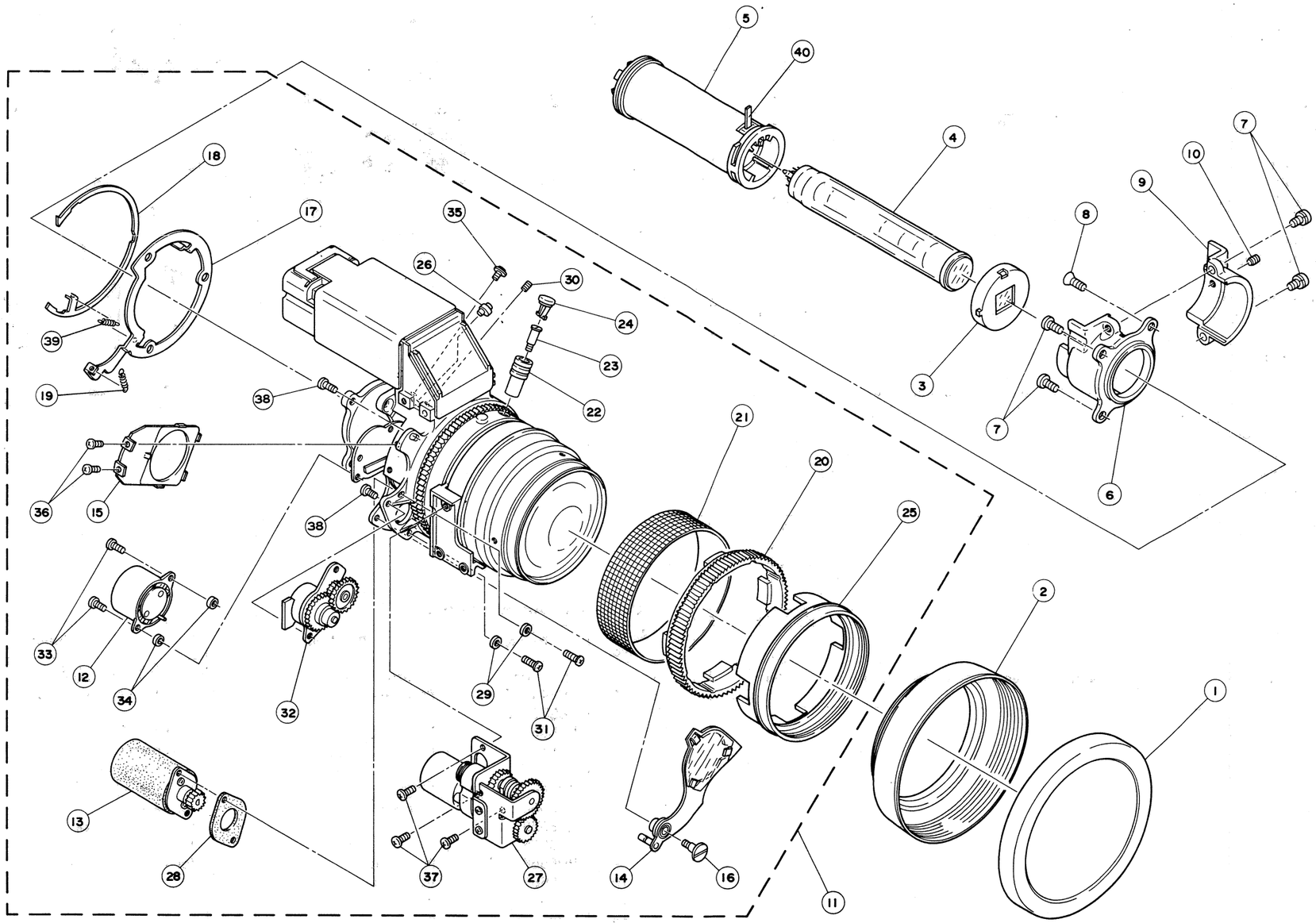
4.2.3 Grip assembly



— Grip Assembly Parts List —

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
	PU21703B	Grip Cover Ass'y	Incl. ①–⑧, ⑭ – ⑳, ㉓ – ㉗		1
⚠ 1	PU21704-2	Grip Cover		2-C	1
2	PU55559	Zoom Switch	Incl. Zoom P.W.B.	2-A	1
⚠ 3	ML-PU2392A	EVF Socket Ass'y	Incl. Connectors CN-G6 & CN-G7	1-A	1
4	—	Mic Jack Ass'y	REF: [1][0]	1-B	1
⚠ 5	ML-PU2394A	Remote Control Socket Ass'y	Incl. Connector CN-G12	2-A	1
⚠ 6	PU55561	Trigger Knob		1-B	1
7	PU34351	Grip Holder		2-C	1
⚠ 8	PU34352	Grip Frame		1-C	1
⚠ 9	QMF51C3-R80	Fuse	F1	1-C	1
10	PU56244	Remote Cap		2-A	1
⚠ 11	PU34353B	Belt Ass'y		3-A	1
12	PU53950-1-1	Belt Screw (A)		3-B	1
13	PU53943	" (B)		2-A	1
14	—	Grip P.W.B. Ass'y	REF: [0][6]	1-C	1
15	SBSE2606Z	Screw		1-C,1-D	4
⚠ 16	PU47030-1-3	Caution Label		1-B	1
17	SBSE2606M	Screw		1-D	1
⚠ 18	ML-PU2400A	Camera Connector Ass'y	Incl. Connectors CN-A1, CN-G2, 3	2-A	1
19	SSBP2608M	Screw		2-A	2
20	SSBP2606M	"		1-B,3-B	4
21	PU55553	Grip Bracket		1-B	1
22	—	—		—	—
23	PU56010	Bracket		1-B	1
24	SPSP2004Z	Screw		1-B	1
25	SBSB2606Z	"		1-B	1
26	PU49485-5	Wire Clamp		1-B	1
27	PU53145-3	Caution Label		2-B	1
28	SSBP2606F	Screw		2-B	1

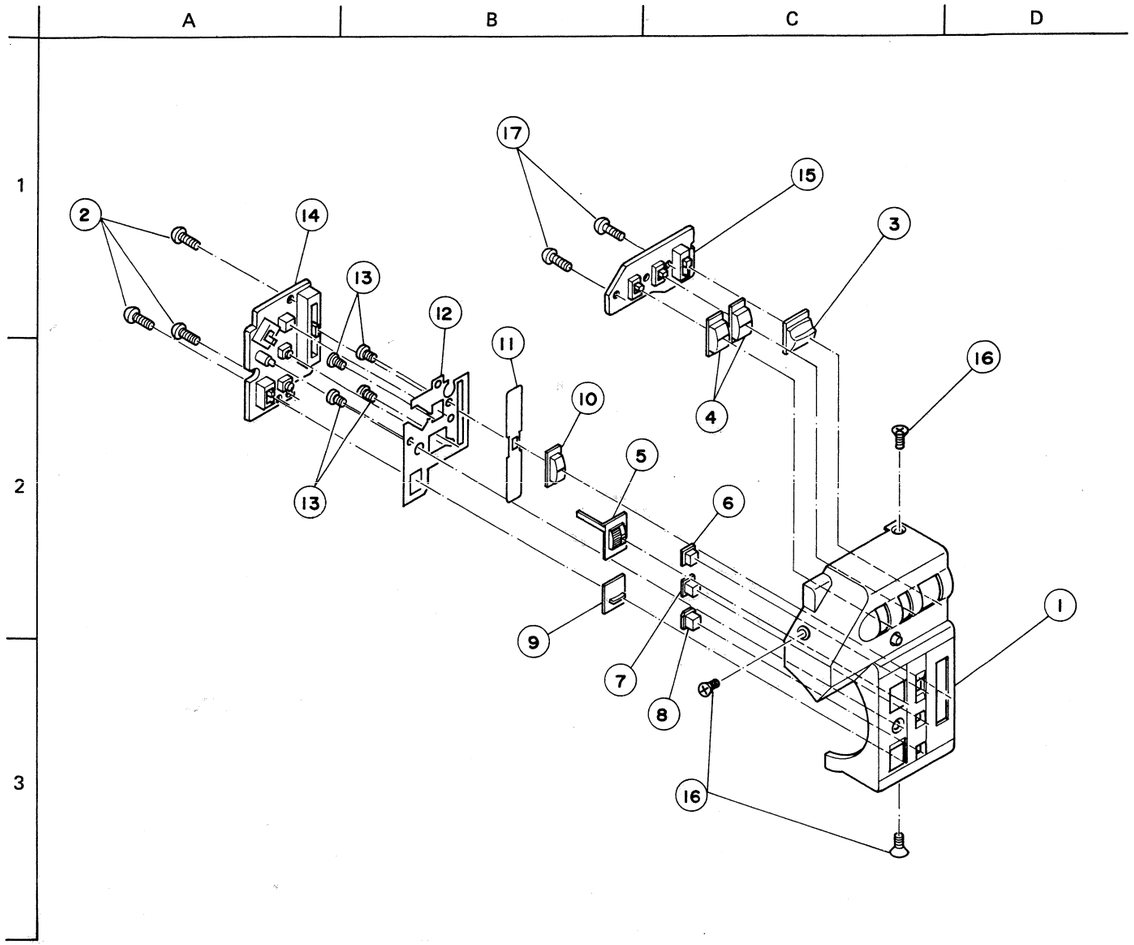
4.2.4 Optical block assembly



— Optical Block Assembly Parts List —

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
1	PU54085	Hood Cap		4-F, 4-G	1
2	PU55552	Hood		3-F	1
3	PU54086A-1	Bias Light Ass'y		3-E	1
⚠ 4	H4180	Saticon Tube		2-E	1
⚠ 5	PU54087B	Deflection Yoke	Incl. (40)	1-E	1
6	PU21459-2-6	Yoke Holder (A)		3-F	1
7	LPSP2608Z	Screw		2-G	2
8	SDBP2608Z	Screw		2-F	3
9	PU33719-1-3	Yoke Holder (B)		2-F	1
10	YFS2603	Setscrew		2-F	1
⚠ 11	PU55550A	Optical Block Ass'y	Incl. (12) – (39)	5-E	1
⚠ 12	PU55550-001	Servo Eye		4-B	1
⚠ 13	" -002	Motor Unit	with Gear Box	4-B	1
14	PU54083-003	Filter Unit		5-D	1
15	PU55550-025	Low-Pass Filter Unit		3-B	1
16	" -005	Filter Axis		5-D	1
17	" -006	Filter Ring		2-C	1
18	" -007	Filter Ring Retainer		2-B	1
19	PU54083-008	Filter Spring		3-B	1
20	PU55550-027	Auto-Focus Ring Gear		3-E	1
21	" -010	Focusing Ring Cover		3-D, 3-E	1
22	" -011	Zoom Lever		3-D	1
23	" -012	Zoom Lever Pin		3-D	1
24	PU54083-013	Zoom Lever Cap		2-D	1
25	PU55550-014	Focusing Ring	Incl. Tape securing Focusing Ring	3-E	1
	" -014-1	"	Excl. " (See Sec. 1.5.)		
26	" -015	Back Focus Adjusting Screw		2-C	1
⚠ 27	" -024	Auto-Focus Unit		5-D	1
28	PU54083-017	Motor Spacer		5-B	1
29	PU55550-018	Motor Collar		4-C	2
30	" -019	Hex. Screw		2-D	1
31	PU54083-020	Screw		4-D	2
32	PU55550-026	Zoom Sensor Unit		4-C	1
33	PU54083-022	Screw		4-B	2
34	" -023	Collar		4-B	2
35	PU55550-016	Screw		2-C	1
36	" -030	"		3-B,3-C,5-C	2
37	" -028	"			3
38	" -029	"		3-C	2
39	" -009	Filter Spring	Note: Different from No. 19 in length	2-B	1
40	XVC-645TA	Taget Pin		1-E	1

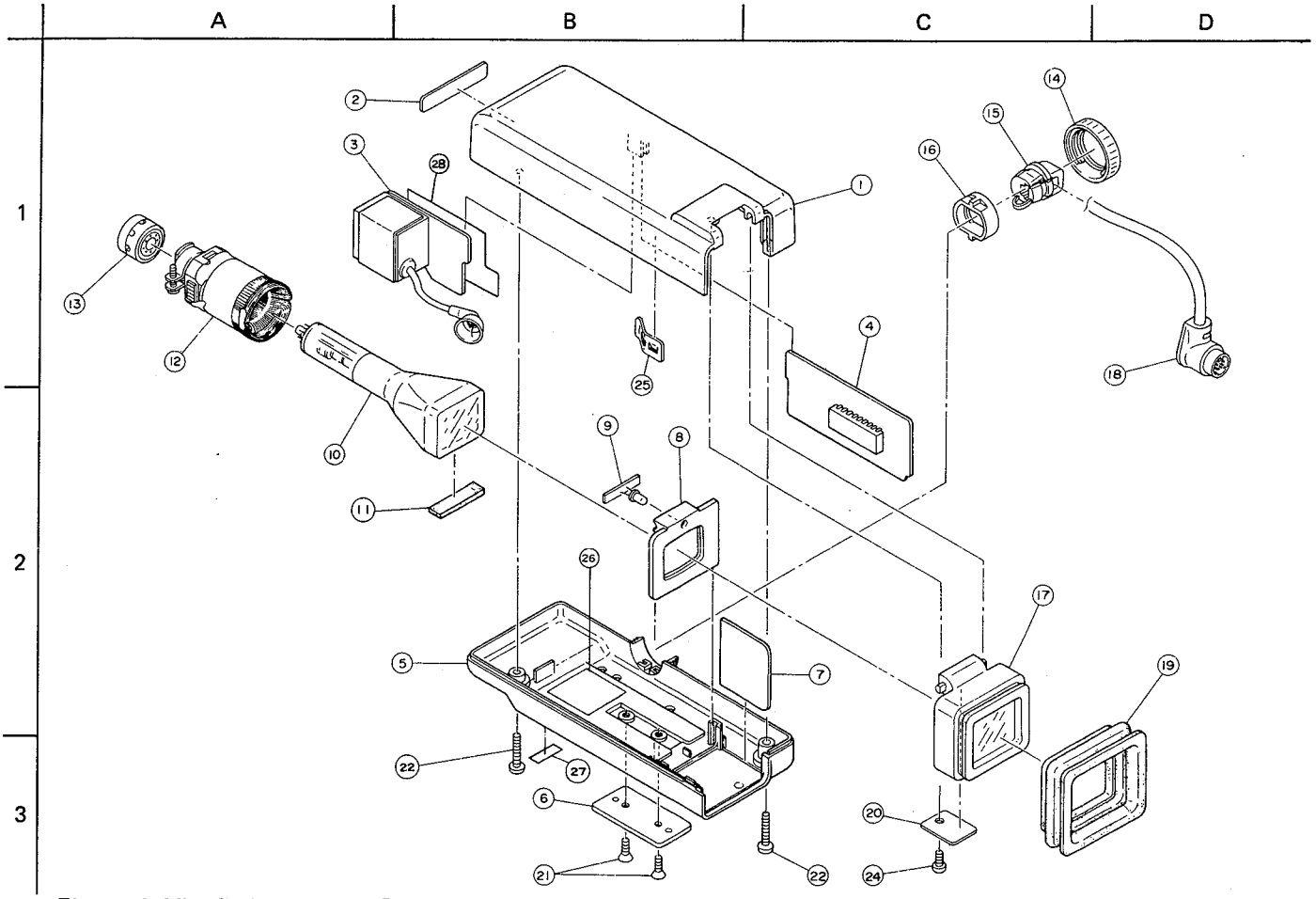
4.2.5 Control panel assembly



— Control Panel Assembly Parts List —

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
	PU21705B	Control Panel Ass'y	Incl. (1) – (15), (17)		1
1	PU34453B	Panel Ass'y	Incl. Iris Locking Knob	2-D	1
2	SBSE2606Z	Screw		1-A, 1-B	3
3	PU55563	Manual Knob	for Focus Switch	1-C	1
4	PU55564	Knob	for Changing Sensitization, Auto/Manual Focus	2-C	2
5	PU55565	Filter Knob	for Filter Change	2-B, 2-C	1
6	PU55566	Push Knob (C)	for Fader	2-C	1
7	PU55567	" (A)	for White Balance	3-B	1
8	PU55568	" (B)	for "	3-C	1
9	PU55569-1-2	Power Knob	for VTR Power Source	2-B, 3-B	1
10	PU55570	Iris Knob		2-B	1
11	PU53967	Plate		2-B	1
12	PU55571	Pressure Plate		1-B	1
13	SBSB2003Z	Screw		1-B, 2-A	4
14	–	Control Panel P.W.B. Ass'y	REF: 07	1-A	1
15	–	AF Control P.W.B Ass'y	REF: 09	1-C	1
16	SSBP2606M	Screw		2-D, 3-C	3
17	SDSA2606Z	"		1-B	2

4.2.6 Electronic viewfinder assembly



– Electronic Viewfinder Assembly Parts List –

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
	PU53973B-2	Electronic Viewfinder Ass'y	Incl. (1) – (28)		1
⚠ 1	PU53973-001	Top Cover		1-C	1
2	" -002	Mark		1-A	1
3	–	Electronic Viewfinder P.C.B. Ass'y	(1) REF: 1 1	1-A	1
4	–	"	(2) REF: 1 1	1-C	1
⚠ 5	PU53973-005	Bottom Cover		2-B	1
6	" -006	Plate		3-B	1
7	" -007	Partition		2-C	1
8	" -008	CRT Masking		2-B	1
9	–	LED P.C.B. Ass'y	REF: 1 1	2-B	1
⚠ 10	PU53973-010	1" CRT	C1M30P4	2-A	1
⚠ 11	" -011	Tape		2-A	1
12	" -012	Deflection Yoke		1-A	1
⚠ 13	" -013	CRT Socket		1-A	1
14	" -014	Ring		1-C	1
⚠ 15	" -015	Strain Relief		1-C	1
16	" -016	Cord Stopper		1-C	1
17	" -017	Lens Holder Ass'y		2-C	1
⚠ 18	" -018	VF Cable		1-D	1
19	" -019	Eye Cap		2-D	1
20	" -020	Spring		3-C	1
21	" -021	Screw		3-B	2
22	" -022	"		3-B, C	2
23	–	–		–	–
24	PU53973-024	Screw		3-C	1
⚠ 25	" -025	Earth Lug		1-B	1
⚠ 26	" -026	Label	HIGH VOLTAGE	2-B	1
27	PU52064	Serial Number Label		3-B	1
⚠ 28	PU53973-077	Insulator		1-B	1

SECTION 5
ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

RESISTORS – All resistance values are in ohms (Ω).

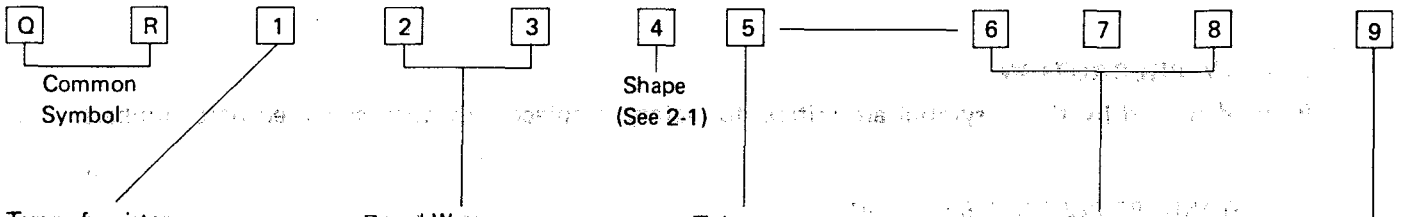
K	:	1 000
M	:	1 000 000
CR	:	Carbon Resistor
Comp. R	:	Composition Resistor
WR	:	Wire Wound Resistor
OMR	:	Oxide Metal Film Resistor
VR	:	Variable Resistor (Potentiometer)
MFR	:	Metal Film Resistor
FR	:	Fusible Resistor
PMR	:	Precision Metal Film Resistor

CAPACITORS – All capacitance values are in μF, unless otherwise indicated.

P	:	μμF
C Cap	:	Ceramic Capacitor
E Cap	:	Electrolytic Capacitor
FM Cap	:	Film Mica Capacitor
MM Cap	:	Metalized Mylar Capacitor
MP Cap	:	Metalized Paper Capacitor
MY Cap	:	Mylar Capacitor
NP Cap	:	Non-polar Capacitor
PC Cap	:	Polycarbonate Capacitor
PF Cap	:	Plastic Film Capacitor
PP Cap	:	Poly Pro Capacitor
PS Cap	:	Polystyrol Capacitor
T Cap	:	Tantalum Capacitor
TR Cap	:	Trimmer Capacitor

5.1 STANDARD PART NUMBER CODING

5.1.1 Fixed Resistor Coding



Type of resistor

C	Composition Resistor
D	Carbon Resistor
F	Unflammable Resistor
G	Oxide Metal Film Resistor
M	Metal Plate Resistor
X	Metal Film Resistor
W	Wire Wound Resistor
Y	Wire Wound Resistor
V	Metal Film Resistor, High Stability
Z	Special Resistor
S	Chip Resistor

Rated Wattage

Symbol	Rated wattage
16	1/6 (W)
18	1/8 "
14	1/4 "
12	1/2 "
01	1 "
02	2 "
03	3 "
04	4 "
05	5 "
06	6 "
07	7 "
75	7.5 "
08	8 "
10	10 "
15	15 "
20	20 "
30	30 "

Tolerance

Symbol	Tolerance
F	±1 %
G	±2 %
J	±5 %
K	±10 %
M	±20 %

Values

–Example –	
R47	0.47 Ω
4R7	4.7 Ω
470	47×10^0 47 Ω
471	47×10^1 470Ω
472	47×10^2 4.7 KΩ
473	47×10^3 47 KΩ
474	47×10^4 470 KΩ
475	47×10^5 4.7 MΩ
10R2	10.2 Ω
1430	143×10^0 143 Ω
1581	158×10^1 1.58 KΩ

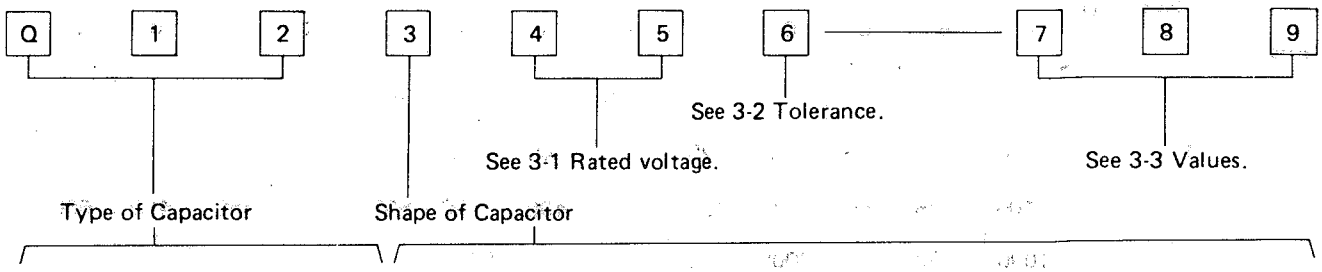
Size

Symbol	Size
A	Small Size
S	Small Size

2-1 Shape of resistor (■ **: Flame retardant resistor)**

Sort	C	D	G	F	M	W	X	Y	V
1									
2									
3									
4									
5						L type			
6						Resin Covered			
7						Enameled			
8									
9									

5.1.2 Fixed Capacitor Coding



Ceramic Capacitors

Symbol	Type of Capacitor	Disk Lead	Kink Lead			
QCC	Ceramic			4	5	
QCF	"	1	3			
QCS	"	1	3			
QCT	Temperature compensation					
QCX	Special			1	3	
QCY	Ceramic	1, 4	3			8
QCZ	Special					

Electrolytic Capacitors

Symbol	Type of Capacitor	Tubular	Mono-direction	Anti-stress	Forming	Snap-in
QEA	Characteristic A	2	4			
QEB	Low Leakage		4	5	6	
QED	Characteristic D	2	4			
QEE	Tantalum		4	5		
QEE	" (small type)		8			
QEK	Characteristic W (subminiature type)		4	5		
QEL	Characteristic L					7
QEN	Non-polar	2	4	5	6	
QET	Characteristic W (small type)	2	4	5	6	
QEW	Characterisitc W	2	4	5	6	7
QEZ	Special					

Paper Film Capacitors

Symbol	Type of Capacitor	Tubular	Normal		Flame retardant	
			Mono-direction	Kink Lead	Mono-direction	Kink Lead
QFF	Film mica		4			
QFH	Metalized mylar	2	4	3	5	6
QFM	Mylar	2	4	3, 7	5	6
QFN	" (small type)		4			
QFP	Polypropylene		4	3		
QFS	Polystyrole	2	4	3		
QFZ	Special					

3-1 Rated voltage (V)

First letter \ 2nd letter	A	B	C	D	E	F	G	H	J	K	V	W	X
0						3.15			6.3				
1	10		16	20	25		40	50	63		35		
2	100	125	160	200	250	315	400	500	630		350	450	600
3	1000	1250		2000				5000					

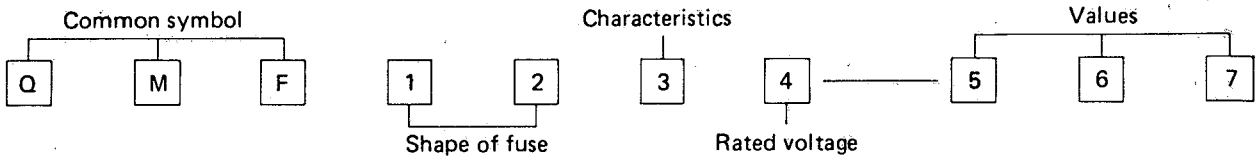
3-2 Tolerance

Symbol	F	G	J	K	M	N	Z	P	A	H	R
(%)	±1	±2	±5	±10	±20	±30	+80 −20	+100 − 0	+100 − 10	+50 −10	+30 −10

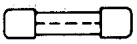
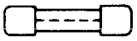
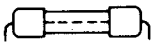
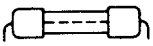
3-3 Values

– Example –	Values are in picofarads.	
101	10×10^1	100 pF
102	10×10^2	1,000 pF = 0.001 μF
103	10×10^3	10,000 pF = 0.01 μF
104	10×10^4	100,000 pF = 0.1 μF
5R0	5.0	5 pF

5.1.3 Fuse Coding



Shape of Fuse (first and second digit)

Symbol No.	Shape	Remarks
51		ϕ 5.2 x 20 mm
60		ϕ 6.4 x 30 mm
61		ϕ 6.35 x 31.8 mm
63		With 60 Lead Wire
66		With 61 Lead Wire

Rated Voltage (fourth digit)

Symbol No.	Rated Voltage	
1	AC 125 V	
2	AC 250 V	
3	100 mA ≀ 1 A	AC 250 V
	1.25 A ≀ 6.3 A	AC125 V

Value (fifth – seventh digit)

– Example –

R10 ..... 100 mA
R125 ..... 125 mA
1R0 ..... 1.0 A
1R2 ..... 1.2 A
1R25 ..... 1.25 A
100 ..... 10 A

Characteristics (third digit)

Symbol No.	Fusing Current	Fusing Time	Remarks
S	160%	Within 1 hr.	Anti-rush Type
	200%	" 2 min.	
	700% – 2000%	" 0.01 sec.	
R	160%	" 1 hr.	Regular Fusible Type
	200%	" 2 min.	
M	135%	" 1 hr.	Regular Fusible Type (for UL)
	200%	" 2 min.	
U	135%	" 1 hr.	Anti-rush Type (for UL)
	200%	" 2 min.	
	800% – 2000%	" 0.01 sec.	
A	210%	" 2 min.	Anti-rush Type (for Europe)
	275%	0.5 – 10 sec.	
	400%	0.15 – 2 sec.	
	1000%	0.02 – 0.3 sec.	
B	210%	Within 30 min.	Regular Fusible Type (for SEMKO, Europe)
	275%	0.05 – 2 sec.	
	400%	0.01 – 0.3 sec.	
C	135%	Within 1hr.	Anti-rush Type (for UL, Japan)
	200%	" 2 min.	

5.2 ELECTRICAL PARTS LIST BY ASSEMBLIES

5.2.1 Camera P.W.B. Ass'y [0][0] PU55556A

Symbol No.	Part No.	Part Name	Description
[0][1]	–	Video Process P.W.B. Ass'y	
[0][2]	–	DEF & SSG P.W.B. Ass'y	
[0][3]	–	Bottom P.W.B. Ass'y	

5.2.2 Video Process P.W.B. Ass'y [0][1]

Symbol No.	Part No.	Part Name	Description
IC 1	KJ26H52SA	Integrated Circuit	
IC 2	AN6015S	"	Flat IC
IC 3	AN6012S	"	"
IC 4	AK20H81	"	
IC 5	SK24H21SB	"	
IC 6	KH10H51SA	"	
IC 7	UPC4556G	"	Flat IC
IC 8	MCM1032	"	
IC 9	TA7708F	"	Flat IC
IC10	KH10H48S	"	
IC11	–	–	
IC12	KH10H48S	Integrated Circuit	
IC13	–	–	
IC14	MC5442	Integrated Circuit	
Q 1	2SC2404C	Chip Transistor	
Q 2	2SC2778C	"	
Q 3	"	"	
Q 4	2SD1030T	"	
Q 5	2SA1022C	"	
Q 6	2SC2778C	"	
Q 7	2SK209GR	Chip F.E.T.	
Q 8	2SC2778C	Chip Transistor	
Q 9	–	–	
Q10	2SC2778C	Chip Transistor	
Q11	2SA1022C	"	
Q12	2SC2778C	"	
Q13	2SA1022C	"	
Q14	2SC2778C	"	
Q15	2SA1022C	"	
Q16	"	"	
Q17	2SC2778C	"	
Q18	"	"	
Q19	"	"	
Q20	–	–	
Q21	–	–	
Q22	2SC2778C	Chip Transistor	
Q23	"	"	
Q24	"	"	
Q25	"	"	
Q26	–	–	
Q27	2SA1022C	Chip Transistor	
Q28	2SC2778C	"	
Q29	–	–	
Q30	2SK209GR	Chip F.E.T.	
Q31	"	"	
Q32	2SC2778C	Chip Transistor	
D 1	–	–	
D 2	–	–	
D 3	MA151WA	Chip Diode	
D 4	–	–	
D 5	MA151WK	Chip Diode	
D 6	–	–	
D 7	–	–	
D 8	–	–	
D 9	–	–	

Symbol No.	Part No.	Part Name	Description
D10	—	—	
D11	MA151WK	Chip Diode	
D12	"	"	
R 1	QRS188J-681YN	Chip R	
R 2	" -821YN	"	
R 3	" -332YN	"	
R 4	" -681YN	"	
R 5	" -153YN	"	
R 6	" -332YN	"	
R 7	" -472YN	"	
R 8	" -101YN	"	
R 9	" -103YN	"	
R10	" -822YN	"	
R11	" -682YN	"	
R12	" -332YN	"	
R13	" -153YN	"	
R14	" -392YN	"	
R15	" -561YN	"	
R16	" -181YN	"	
R17	" -271YN	"	
R18	" -102YN	"	
R19	—	—	
R20	—	—	
R21	QRS188J-103YN	Chip R	
R22	" -820YN	"	
R23	" -151YN	"	
R24	" -682YN	"	
R25	" -562YN	"	
R26	QVZ3531-222	VR	OB SET
R27	QRS188J-472YN	Chip R	
R28	—	—	
R29	—	—	
R30	—	—	
R31	QRS188J-331YN	Chip R	
R32	" -471YN	"	
R33	QVZ3531-473	VR	AGC OFF SET
R34	QRS188J-473YN	Chip R	
R35	—	—	
R36	QRS188J-473YN	Chip R	
R37	" -822YN	"	
R38	" -104YN	"	
R39	" -102YN	"	
R40	" -123YN	"	
R41	" -123YN	"	
R42	" -223YN	"	
R43	" -103YN	"	
R44	" -123YN	"	
R45	" -123YN	"	
R46	—	—	
R47	—	—	
R48	—	—	
R49	—	—	
R50	—	—	
R51	—	—	
R52	—	—	
R53	QRS188J-183YN	Chip R	
R54	" -821YN	"	
R55	" -100YN	"	
R56	" -681YN	"	
R57	" -681YN	"	

Symbol No.	Part No.	Part Name	Description
R58	QVZ3531-102	VR	Y. GAIN
R59	—	—	
R60	—	—	
R61	—	—	
R62	QRS188J-102YN	Chip R	
R63	" -181YN	"	
R64	" -821YN	"	
R65	" -272YN	"	
R66	" -0R0Y	"	
R67	" -392YN	"	
R68	" -682YN	"	
R69	QVZ3531-332	VR	COMB BAL.
R70	QRS188J-681YN	Chip R	
R71	" -562YN	"	
R72	" -102YN	"	
R73	QVZ3531-102	VR	V. EDGE
R74	QRS188J-102YN	Chip R	
R75	—	—	
R76	—	—	
R77	—	—	
R78	QRS188J-561YN	Chip R	
R79	" -222YN	"	
R80	" -223YN	"	
R81	" -222YN	"	
R82	QVZ3531-103	VR	B. TRACK 1
R83	QRS188J-332YN	Chip R	
R84	QVZ3531-103	VR	B. TRACK 2
R85	QRS188J-472YN	Chip R	
R86	QVZ3531-103	VR	B. TRACK 3
R87	QRS188J-472YN	Chip R	
R88	" -102YN	"	
R89	" -102YN	"	
R90	—	—	
R91	QRS188J-223YN	Chip R	
R92	" -222YN	"	
R93	" -222YN	"	
R94	" -102YN	"	
R95	QVZ3531-103	VR	R. TRACK 1
R96	QRS188J-332YN	Chip R	
R97	QVZ3531-103	VR	R. TRACK 2
R98	QRS188J-472YN	Chip R	
R99	QVZ3531-103	VR	R. TRACK 3
R100	QRS188J-472YN	Chip R	
R101	" -102YN	"	
R102	—	—	
R103	QVZ3531-472	VR	R. SEP. GAIN
R104	" -222	"	R. SEP. PHASE
R105	QRS188J-562YN	Chip R	
R106	QVZ3531-222	VR	B. SEP. PHASE
R107	" -472	"	B. SEP. GAIN
R108	—	—	
R109	QRS188J-472YN	Chip R	
R110	QVZ3531-222	VR	B. GAIN
R111	—	—	
R112	QRS188J-332YN	Chip R	
R113	" -472YN	"	
R114	" -561YN	"	
	" -821YN	"	
R115	" -561YN	"	
R116	" -472YN	"	
R117	QVZ3531-222	VR	R. GAIN
R118	—	—	
R119	—	—	
R120	QRS188J-333YN	Chip R	
R121	" -333YN	"	
R122	—	—	

Symbol No.	Part No.	Part Name	Description
R123	–	–	
R124	–	–	
R125	QVZ3531-223	VR	B. PED.
R126	" -223	"	R. PED.
R127	" -223	"	G. PED.
R128	QRS188J-393YN	Chip R	
R129	" -393YN	"	
R130	" -393YN	"	
R131	" -472YN	"	
R132	" -103YN	"	
R133	" -103YN	"	
R134	" -332YN	"	
R135	QVZ3531-103	VR	Y-B BAIN
R136	QRS188J-332YN	Chip R	
R137	" -562YN	"	
R138	" -472YN	"	
R139	–	–	
R140	QRS188J-223YN	Chip R	
R141	" -392YN	"	
R142	" -103YN	"	
R143	" -562YN	"	
R144	" -472YN	"	
R145	" -473YN	"	
R146	" -104YN	"	
R147	" -392YN	"	
R148	" -0R0Y	"	
R149	QVZ3531-103	VR	BURST PHASE
R150	QRS188J-102YN	Chip R	
R151	" -102YN	"	
R152	" -682YN	"	
R153	QVZ3531-103	VR	BURST GAIN
R167	QRS188J-472YN	Chip R	
R168	" -563YN	"	
R169	" -822YN	"	
R170	–	–	
R171	QRS188J-392YN	Chip R	
R172	" -332YN	"	
R173	" -152YN	"	
R174	" -682YN	"	
R175	" -152YN	"	
R176	" -682YN	"	
R177	" -332YN	"	
R178	" -473YN	"	
R179	–	–	
R180	–	–	
R181	–	–	
R182	–	–	
R183	–	–	
R184	QRS188J-472YN	Chip R	
R185	–	–	
R186	QRS188J-152YN	Chip R	
R187	–	–	
R188	–	–	
R189	QRS188J-104YN	Chip R	
R190	" -104YN	"	
R301	QRS188J-473YN	Chip R	
R302	" -222YN	"	
R303	" -103YN	"	
R304	" -102YN	"	
R305	" -0R0Y	"	
R306	" -102YN	"	
R307	" -822YN	"	

Symbol No.	Part No.	Part Name	Description
R308	QRS188J-332YN	Chip R	
R309	" -332YN	"	
R310	" -332YN	"	
R311	" -183YN	"	
R312	" -183YN	"	
R313	" -103YN	"	
R314	QVZ3531-472	VR	R.AW. OFFSET
R315	" -472	"	B.AW. OFFSET
R316	QRS188J-564YN	Chip R	
R317	" -273YN	"	
R318	" -472YN	"	
	QRS188J-0R0Y	Chip R	
C 1	QER50JM-476	E Cap	
C 2	–	–	
C 3	–	–	
C 4	QCY81EK-473ZL	Chip Cap	
C 5	QEE51AM-106M	T Cap	
C 6	QCY81EK-473ZL	Chip Cap	
C 7	–	–	
C 8	QER51CM-106G	E Cap	
C 9	QCF81HZ-104ZL	Chip Cap	
C10	QER50JM-476	E Cap	
C11	" -476	"	
C12	QCF81HZ-104ZL	Chip Cap	
C13	–	–	
C14	QCY81EK-473ZL	Chip Cap	
C15	QCF81HZ-104ZL	"	
C16	QCT81CH-121ZL	"	
C17	–	–	
C18	QCT81CH-181ZL	Chip Cap	
C19	QCS81HK-561ZL	C Cap	
C20	QER50JM-476	E Cap	
C21	–	–	
C22	ECEA1AF101E	E Cap	
C23	QCF81HZ-104ZL	Chip Cap	
C24	QER50JM-476	E Cap	
C25	QCF81HZ-103ZL	Chip Cap	
C26	–	–	
C27	QER50JM-476	E Cap	
C28	QER51CM-106G	"	
C29	QER50JM-476	"	
C30	QER51CM-106G	"	
C31	QCT81CH-470ZL	Chip Cap	
C32	" -470ZL	"	
C33	–	–	
C34	QCY81HK-103ZL	Chip Cap	
C35	–	–	
C36	–	–	
C37	QER50JM-476	E Cap	
C38	–	–	
C39	–	–	
C40	QCF81HZ-104ZL	Chip Cap	
C41	–	–	
C42	–	–	
C43	QER50JM-476	E Cap	
C44	–	–	
C45	–	–	
C46	–	–	
C47	–	–	

Symbol No.	Part No.	Part Name	Description
C48	—	—	
C49	QEF81CM-474W	Chip T Cap	
C50	" -474W	"	
C51	QCF81HZ-104ZL	Chip Cap	
C52	QEF81CM-474X	Chip T Cap	
C53	QER51CM-106G	E Cap	
C54	QER50JM-476	"	
C55	—	—	
C56	QER51CM-106G	E Cap	
C57	QCY81HK-103ZL	Chip Cap	
C58	—	—	
C59	—	—	
C60	—	—	
C61	—	—	
C62	QER51CM-106G	E Cap	
C63	QCY81EK-473ZL	Chip Cap	
C64	—	—	
C65	—	—	
C66	—	—	
C67	QCY81EK-473ZL	Chip Cap	
C68	QCT81CH-181ZL	"	
C69	QCY81HK-103ZL	"	
C70	ECEA1AF101E	E Cap	
C71	QCF81HZ-103ZL	Chip Cap	
C101	QEE50JM-476	T Cap	
C102	QCF81EZ-224ZL	Chip Cap	
C103	" -224ZL	"	
C104	" -224ZL	"	
C105	" -224ZL	"	
C106	" -224ZL	"	
C107	QCS81HK-471ZL	"	
C108	QCT81CH-470ZL	"	
L 1	PU53480-2	T Coil	
L 2	PU54223-331K	Peaking Coil	
L 3	PU54224	Coil	
L 4	PU54223-271K	Peaking Coil	
L 5	—	—	
L 6	—	—	
L 7	PU54223-150K	Peaking Coil	
L 8	" -150K	"	
LPF 1	PU54231	Low Pass Filter	
LPF 2	PU54226	"	
LPF 3	—	—	
LPF 4	PU54523	Low Pass Filter	
LPF 5	PU54225	"	
LPF 6	PU54230	"	
TRAP 1	PU54233	Trap	
EQ 1	PU54234	Equalizer	
CT 1	PU54237	Ceramic Trap	
CT 2	PU55578	"	
CT 3	PU46042-4	"	
DL 1	PU55579	Delay Line	

Symbol No.	Part No.	Part Name	Description
TH 1	ERP-F3A2M471	Thermistor	
TH 2	ERT-D2FGL750S	"	
TH 3	ERT-D2FIL154S	"	
TP1—6	PU54983	Test Pin	
CN-V1	PU54208-3	Connector	
CN-V2	" -2	"	

5.2.3 DEF & SSG P.W.B. Ass'y [0][2]

Symbol No.	Part No.	Part Name	Description
IC 1	LC4011BM	Integrated Circuit	Flat IC
IC 2	LC4001BM	"	"
IC 3	MN8029	"	
⚠IC 4	HD440072F	"	Flat IC
IC 5	MCM1044	"	
IC 6	NJM3414M	"	Flat IC
IC 7	H1725W80B	"	
IC 8	K1625R57SB	"	
IC 9	UPC259G	"	Flat IC
IC10	UPC1251G	"	"
Q 1	2SD601Q,R	Chip Transistor	
Q 2	2SC2778C	"	
Q 3	"	"	
Q 4	"	"	
Q 5	2SA1022C	"	
Q15	2SB709QR	Chip Transistor	
Q16	2SD601Q,R	"	
⚠Q17	2SD600KF	Transistor	
Q18	2SD601Q,R	Chip Transistor	
Q19	2SB709Q,R	"	
Q20	2SD602Q,R	"	
Q21	2SB710Q,R	"	
Q22	—	—	
Q23	2SB709Q,R	Chip Transistor	
Q24	"	"	
Q25	2SC2778C	"	
Q26	UN2212	Digital Transistor	
D 1	1SV68	Diode	
D 2	—	—	
D 3	—	—	
D 4	MA151WK	Chip Diode	
D 5	—	—	
D 6	—	—	
D 7	MA28WA	Chip Diode	
D 8	—	—	
D 9	—	—	
D10	MA28WA	Chip Diode	
D11	1SS81	Diode	
D12	MA151WA	Chip Diode	
D13	MA28WA	"	
D14	MA151WK	"	
D15	MA28WA	"	
D16	MA151WA	"	
D17	MA151WK	"	
D18	MA151WA	"	
D19	MA151WA	"	
R 1	QRS188J-102YN	Chip R	
R 2	" -103YN	"	

Symbol No.	Part No.	Part Name	Description
R 3	QRS188J-223YN	Chip R	
R 4	QVZ3531-683	VR	DL.OFFSET
R 5	QRS188J-183YN	Chip R	
R 6	" -103YN	"	
R 7	" -123YN	"	
R 8	—	—	
R 9	QRS188J-102YN	Chip R	
R10	" -222YN	"	
R11	" -122YN	"	
R12	" -105YN	"	
R13	" -682YN	"	
R14	" -222YN	"	
R15	" -682YN	"	
R16	" -222YN	"	
R17	" -183YN	"	
R18	" -103YN	"	
R19	" -105YN	"	
R20	" -153YN	"	
R21	" -0R0Y	"	
R22	—	—	
R23	QRS188J-123YN	Chip R	
R24	" -122YN	"	
R25	—	—	
R26	—	—	
R27	—	—	
R28	QVZ3531-103	VR	B.CARR.BAL.
R29	—	—	
R30	QVZ3531-103	VR	R.CARR.BAL.
R31	QRS188J-222YN	Chip R	
R32	—	—	
R33	QRS188J-272YN	Chip R	
R34	QVZ3531-102	VR	Y.SETUP
R35	QRS188J-682YN	Chip R	
R36	" -392YN	"	
R37	" -183YN	"	
R38	—	—	
R39	—	—	
R40	—	—	
R41	—	—	
R42	—	—	
R43	—	—	
R44	QRS188J-222YN	Chip R	
R45	—	—	
R46	QRS188J-102YN	Chip R	
R47	" -682YN	"	
R51	QRS188J-123YN	Chip R	
R60	QRS188J-103YN	Chip R	
R61	" -103YN	"	
R62	" -393YN	"	
R63	QVZ3531-683	VR	V.HEIGHT
R64	QRS188J-333YN	Chip R	
R65	" -822YN	"	
R66	" -391YN	"	
R67	" -472YN	"	
R68	QVZ3531-472	VR	V.CENTER
R69	QRS188J-221YN	Chip R	
R70	" -330YN	"	
R71	" -102YN	"	
R72	" -123YN	"	
R73	" -221YN	"	
R74	QVZ3531-471	VR	H.LIN (3)

Symbol No.	Part No.	Part Name	Description
R75	QRS188J-272YN	Chip R	
R76	" -102YN	"	
R77	QVZ3531-472	VR	H. WIDTH
R78	QRS188J-472YN	Chip R	
R79	QVZ3531-102	VR	H. CENTER
R80	QRS188J-102YN	Chip R	
R81	" -101YN	"	
R82	QVZ3531-471	VR	H. LIN (1)
R83	QRS188J-151YN	Chip R	
R84	QVZ3531-332	VR	H. LIN (1)
R85	QRS188J-152YN	Chip R	
R86	" -471YN	"	
R87	" -332YN	"	
R88	" -470YN	"	
R89	" -332YN	"	
R90	—	—	
R91	QRS188J-272YN	Chip R	
R92	" -103YN	"	
R93	" -102YN	"	
R94	—	—	
R95	QRS188J-183YN	Chip R	
R96	" -333YN	"	
R97	" -123YN	"	
R98	" -183YN	"	
R99	" -563YN	"	
R100	" -104YN	"	
R101	" -392YN	"	
R102	" -273YN	"	
R103	" -105YN	"	
R104	" -224YN	"	
R105	" -103YN	"	
R106	" -103YN	"	
R107	" -122YN	"	
R108	QVZ3531-222	VR	IRIS SET
R109	QRS188J-561YN	Chip R	
R110	" -332YN	"	
R111	" -123YN	"	
R112	" -123YN	"	
R113	" -103YN	"	
R114	" -123YN	"	
R115	" -104YN	"	
R116	" -105YN	"	
R117	" -103YN	"	
R118	—	—	
R119	QRS188J-222YN	Chip R	
R120	—	—	
R121	—	—	
R122	—	—	
R123	QRS188J-100YN	Chip R	
R124	" -122YN	"	
R125	—	—	
R126	—	—	
R127	QRS188J-103YN	Chip R	
R128	" -222YN	"	
R129	—	—	
R130	—	—	
R131	—	—	
R132	QRS188J-225YN	Chip R	
R133	" -225YN	"	
R151	QRS188J-472YN	Chip R	
R152	" -684YN	"	
R153	" -334YN	"	
R154	QVZ3531-222	VR	VIDEO GAIN

Symbol No.	Part No.	Part Name	Description
R155	QRS188J-222YN	Chip R	
R156	" -103YN	"	
R157	" -102YN	"	
R158	" -103YN	"	
R159	" -391YN	"	
R160	" -333YN	"	
R161	" -562YN	"	
R162	QVZ3531-222	VR	OFFSET
R163	QRS188J-222YN	Chip R	
R164	" -224YN	"	
B	QRS188J-0R0Y	Chip R	
C 1	QER51CM-476	E Cap	
C 2	QCF81EZ-224ZL	Chip Cap	
C 3	" -224ZL	"	
C 4	" -224ZL	"	
C 5	" -224ZL	"	
C 6	QEU41AM-227	E Cap	
C 7	QCF81HZ-103ZL	Chip Cap	
C 8	QCY81HK-102ZL	"	
C 9	QCT81CH-680ZL	C Cap	
C10	—	—	
C11	QAT3001-022	TR Cap	SC ADJ.
C12	QCT81CH-2R0ZL	C Cap	
C13	" -470ZL	Chip Cap	
C14	" -470ZL	"	
C15	" -560ZL	C Cap	
C16	QCY81HK-222ZL	Chip Cap	
C17	QCT81CH-680ZL	C Cap	
C18	QCF81HZ-103ZL	Chip Cap	
C19	QEP51CM-106	NP. E. Cap	
C20	—	—	
C21	QEF81CM-105W	Chip T Cap	
C22	QCT81CH-181ZL	Chip Cap	
C23	—	—	
C24	—	—	
C25	—	—	
C26	—	—	
C27	QCY81HK-102ZL	Chip Cap	
C35	QFV81HJ-474	MY Cap	
C36	QFN31HJ-393	"	
C37	QER51CM-476	E Cap	
C38	QEU50JM-477	"	
C39	QER51HM-105G	"	
C40	QCT81CH-151ZL	Chip Cap	
C41	QEE41AM-336	T Cap	
C42	QEE51AM-336	"	
C43	QFP32AJ-682M	PP Cap	
C44	QER50JM-107	E Cap	
C45	—	—	
C46	QER51CM-106G	E Cap	
C47	QEE51VM-104	T Cap	
C48	QCF81EZ-224ZL	Chip Cap	
C49	QER51CM-476	E Cap	
C50	" -106G	"	
C51	QEP51CM-106	NP. E. Cap	
C52	" -106	"	

Symbol No.	Part No.	Part Name	Description
C53	QER50JM-107	E Cap	
C54	QEF81CM-105X	Chip T Cap	
C55	QER51CM-106G	E Cap	
C56	QER50JM-107	"	
C57	QER51CM-476	"	
C58	ECEA1CE221S	"	
C59	QEF81CM-105W	Chip T Cap	
C60	QEF81VM-154W	"	
C61	QEU51AM-477	E Cap	
C62	QCF81HZ-103ZL	Chip Cap	
C63	QCY81HK-102ZL	"	
C64	QCF81HZ-104ZL	"	
C65	" -104ZL	"	
C66	QER51EM-475G	E Cap	
C67	—	—	
C68	—	—	
C69	QCT81CH-101ZL	Chip Cap	
C70	QCS31HJ-680	C Cap	
C71	QER50JM-476	E Cap	
C72	QCS81HK-470ZL	Chip Cap	
C73	—	—	
C74	—	—	
C75	PU54990	E Cap	
C101	QEPB1EM-335G	NP. E. Cap	
C102	QER51CM-106G	E Cap	
C103	QCF81EZ-224ZL	Chip Cap	
C104	QER51CM-106G	E Cap	
C105	QCT81CH-151ZL	Chip Cap	
C106	QER51CM-476	E Cap	
C107	QCF81EZ-224ZL	Chip Cap	
C108	QER50JM-107	E Cap	
C109	QCF81EZ-224ZL	Chip Cap	
C110	QCS81HJ-331ZL	"	
C111	QCF81EZ-224ZL	"	
RB 1	PU51498	VR Block	
RB 2	"	"	
RB 3	"	"	
RB 4	"	"	
⚠CP 1	ICP-F10	IC Protector	
⚠XT 1	PU55813	Crystal Unit	
T 1	PU49778	H. DEF. Trans.	
L 1	PU54235	Trap	VDC ADJ.
L 2	PU55580	Low Pass Filter	
L 3	PU54524	Band Pass Filter	
L 4	PU54223-100K	Peaking Coil	
L 5	PU48530-101K	"	
L 6	—	—	
L 7	—	—	
L 8	PU50448-223K	Choke Coil	
L 9	" -333K	"	
TP	PU54983	Test Pin	TP1—9

Symbol No.	Part No.	Part Name	Description
TH 1	ERT-D2ZHL332S	Thermistor	
⚠CN-D1	PU53587-4	Cap. Housing	
⚠CN-D2	PU54208-6	Connector	
⚠CN-D3	PU53587-2	Cap. Housing	
CN-D4	—	—	
⚠CN-D5	PU53587-7	Cap. Housing	
	PU53972	Shield Sash	

5.2.4 Suppressor P.W.B. Ass'y [0][3] . . . PU34356B-C

Symbol No.	Part No.	Part Name	Description
⚠IC 1	AN607P	Integrated Circuit	
Q 1	2SC2778C	Chip Transistor	
Q 2	"	"	
Q 3	2SK209GR	Chip F.E.T.	
Q 4	"	"	
Q 5	2SC2778C	Chip Transistor	
D 1	MA28TA	Chip Diode	
R 1	QRS188J-102YN	Chip R	
R 2	" -332YN	"	
R 3	" -152YN	"	
R 4	" -222YN	"	
R 5	" -102YN	"	
R 6	" -223YN	"	
R 7	" -103YN	"	
R 8	PU54307-472	VR	CHROMA SUP.(1)
R 9	QRS188J-472YN	Chip R	
R10	" -332YN	"	
R11	" -223YN	"	
R12	" -123YN	"	
R13	PU54307-103	VR	CHROMA SUP.(2)
R14	QRS188J-103YN	Chip R	
R15	" -222YN	"	
R16	" -561YN	"	
R17	PU54307-681	VR	CHROMA GAIN
R18	QRS188J-101YN	Chip R	
B	QRS188J-0R0Y	Chip R	
C 1	QCF81HZ-104ZL	Chip Cap	
C 2	QCY81HK-103ZL	"	
C 3	QER51HM-105G	E Cap	
C 4	—	—	
C 5	QCY81HK-102ZL	Chip Cap	
CF 1	PU51984	Comb Filter	
LPF 1	PU54254-2	Low Pass Filter	
LPF 2	PU54255-2	"	

5.2.5 Bottom P.W.B. Ass'y [0][4]

Symbol No.	Part No.	Part Name	Description
IC 1	MC5445	Integrated Circuit	
R 1	QRD167J-101	CR	
R 2	" -470	"	
R 3	PU56113-203	VR	
C 1	QEC41AM-477	E Cap	
C 2	QER51CM-476	"	
S 1	PU54212	Slide Switch	
L 1	PU54223-271K	Peaking Coil	
⚠CN-B1	PU49217-09	Connector	
⚠CN-B2	PU53587-4	"	
CN-B3	—	—	
⚠CN-B4	PU53587-11R	Connector	
⚠CN-B5	PU53587-11	"	

5.2.6 H.V. (High Voltage) P.W.B. Ass'y [0][5] PU33772F

Symbol No.	Part No.	Part Name	Description
IC 1	S728H20SB	Integrated Circuit	
Q 1	2SD636Q	Transistor	
⚠Q 2	2SD600KF	"	
Q 3	2SB641Q	"	
D 1	1SS81	Diode	
R 1	QRD167J-122	CR	
R 2	" -183	"	
R 3	" -151	"	
⚠R 4	QRV121F-1004M	MFR	
R 5	PU50304-205	VR	FOCUS
R 6	QRD167J-101	CR	
R 7	" -822	"	
R 8	" -105	"	
R 9	QVZ3531-682	VR	BEAM
R10	QRD167J-563	CR	
R11	" -103	"	
R12	QVZ3531-105	VR	TARGET BIAS
R13	QRD167J-471	CR	
R14	QVZ3531-472	VR	ABC GAIN
R15	QRD167J-472	CR	
R16	" -223	"	
C 1	QER50JM-476	E Cap	
C 2	QCS11HJ-221	C Cap	
C 3	QEC81CM-227	E Cap	
C 4	QET42AR-106	"	
C 5	QFH52BK-103	MY Cap	
C 6	QET42WR-105	E Cap	
C 7	QET42CR-105	"	
C 8	QET42AR-475	"	
C 9	QFH42JM-153M	MY Cap	
C10	QET42CR-105	E Cap	
C11	QET42AR-106	"	
C12	" -105	"	
L 1	PU54224	Coil	
⚠FB 1	PU54152B	F.B.T. Ass'y	
⚠CP 1	ICP-F10	Circuit Protector	
⚠TF 1	PU48295	Thermo Fuse	
⚠RB 1	PU50269-2	Resistor Block	
⚠C101	PU49961	PP Cap	Included in Saticon Socket
⚠	PU54652A	Saticon Socket	
⚠CN-H1	PU49218-09	Connector	
⚠CN-H2	PU54208-2	"	

5.2.7 Grip P.W.B. Ass'y [0][6] PU34357B

Symbol No.	Part No.	Part Name	Description
IC 1	K113H80S	Integrated Circuit	
IC 2	K114M59S	"	
R 1	QRD167J-562	CR	
R 2	" -472	"	
R 3	" -472	"	
R 4	" -222	"	
R 5	" -680	"	
R 6	" -680	"	
R 7	PU52108-101	Posistor	
C 1	QEE40JM-476	T Cap	
C 2	QEPA1HM-105	NP Cap	
C 3	" -224	"	
C 4	" -105	"	
C 5	" -224	"	
C 6	QER41CM-106	E Cap	
C 7	QFN31HK-102	MY Cap	
C 8	QET61EM-107	E Cap	
C 9	QECA1CM-227	"	
L 1	PU54224	Coil	
CN-G1	—	—	
CN-G2	—	—	
CN-G3	—	—	
⚠CN-G4	PU53587-5	Connector	
CN-G5	—	—	
⚠CN-G6	PU53587-2R	Connector	
⚠CN-G7	" -6	"	
⚠CN-G8	" -2	"	
CN-G9	—	—	
⚠CN-G10	PU53587-3	Connector	
⚠CN-G11	" -4	"	
⚠CN-G12	" -5R	"	
⚠	PU51212	Fuse Holder	
S 1	PU54218	Push Switch	

⚠SR-1 SW Regulator Ass'y PU55581

⚠IC 1	NJM2903M	Integrated Circuit	
Q 1	2SK209Y	Chip Transistor	
Q 2	2SA1213	"	
Q 3	"	"	

Symbol No.	Part No.	Part Name	Description
D 1	1SS184	Diode	
D 2	MA3056L	Zener Diode	
D 3	ERA81-004	Diode	
D 4	" -004	"	
C 1	ECEA1CK470M	E Cap	
C 2	ECEA1CS101M	"	
C 3	CM21SL561K	Chip Cap	
C 4	CM21CH470J	"	
C 5	ECEA1AE221M	E Cap	
C 6	"	"	
C 7	CM21WR182M	Chip Cap	
C 8	CM21CH560J	"	
C 9	ECEA1AE101M	E Cap	
C10	LRE10V470M	"	
L 1	FL7HP100K-40	Coil	
L 2	FP10HL121K-30	"	
L 3	FL7HP100K-40	"	
L 4	FP8HL121K-23	"	
L 5	FLHP220K-30	"	
CP 1	ICP-N10	Circuit Protector	

5.2.8 Mic Jack P.W.B. Ass'y [1][0] PU55574B

Symbol No.	Part No.	Part Name	Description
MJ 1	PU55585	Mic Jack	

5.2.9 Control P.W.B. Ass'y [0][7] PU34358A

Symbol No.	Part No.	Part Name	Description
⚠D 1	TLUR164	L.E.D.	
D 2	1SS133	Diode	
	PU53996	LED Leveller	
R 1	PU54211	Slide VR	
R 2	QRD167J-472	CR	
R 3	" -102	"	
C 1	QFN31HK-103	MY Cap	
S 1	PU54495	Slide Switch	
S 2	PU55788	Tact Switch	
S 3	PU54214	"	
S 4	PU55788	"	
S 5	PU55583	Slide Switch	

AF Control Panel P.W.B. Ass'y [0][9] PU55573A

S 6	PU55583	Slide Switch	
S 7	PU55584	"	
S 8	"	"	

5.2.10 Pre-amp P.W.B. Ass'y [0][8] PU55712A-C

Symbol No.	Part No.	Part Name	Description
Q 1	2SK316Q	Chip F.E.T.	
Q 2	2SA1022C	Chip Transistor	
Q 3	2SC2404C	"	
Q 4	2SA1022C	"	
Q 5	2SD601Q	"	
Q 6	"	"	
D 1	MA26W	Diode	
R 1	QRD187J-225	CR	
R 2	" -105	"	
R 3	QRS188J-271YN	Chip R	
R 4	" -101YN	"	
R 5	" -223YN	"	
R 6	" -122YN	"	
R 7	" -333YN	"	
R 8	" -102YN	"	
R 9	" -101YN	"	
R10	QVZ3531-222	VR	PRE GAIN
R11	QRS188J-101YN	Chip R	
R12	" -152YN	"	
R13	" -122YN	"	
R14	" -101YN	"	
R15	" -564YN	"	
R16	" -562YN	"	
C 1	PU55713	C Cap	
C 2	"	"	
C 3	QER50JM-107	E Cap	
C 4	QER51CM-106G	"	
C 5	" -476	"	
C 6	QCF81EZ-224ZL	Chip Cap	
C 7	QAT3001-011	TR Cap	
C 8	QCT81CH-6R0ZL	Chip Cap	
C 9	QCF81EZ-224ZL	"	
L 1	PU55711	Parcival Coil	
L 2	PU48530-271K	Peaking Coil	
	PU53970-1-3	Shield Case	

5.2.11 Electronic Viewfinder P.W.B. Ass'y [1][1]

Symbol No.	Part No.	Part Name	Description
Electronic Viewfinder P.C.B.(1) Ass'y PU53973-003			H.V.P.W.B. Ass'y
⚠ Q 4	2SD763	Transistor	
D 5	MA150	Diode	
D 6	V06C	"	
⚠ D 7	V11J	"	
R31	QRD187J-332A	CR	
R32	" -275A	"	
R33	" -224A	"	
	" -334A	"	
C29	ECEA1ASS101	E Cap	
C30	ECEA1CK100	"	
C31	ECEA1ASS470	"	
⚠ C32	AMA100K332KZ	FM Cap	
⚠	" 472NZ	"	
⚠	" 562KZ	"	
C33	ECKD3A102KBN	C Cap	
C34	ECKD2H102KB	"	
C35	AMX100K333	FM Cap	
VR 5	H0622A2R2MB	VR	
VR 6	H0622A470KB	"	
L 5	LAL03NA221K	Coil	
L 6	ELH5L90	"	
⚠ TF 2	D-98-3A	Thermo Fuse	
⚠ T 1	KF7311V	Flyback Trans.	
Electronic Viewfinder P.W.B.(2) Ass'y. PU53973-004			**PU33797** (Incl. (P.W.B. -1, 2, 3)
⚠ IC 1	TA7679P	Integrated Circuit	
Q 1	2SD601	Chip Transistor	
Q 2	2SD814	"	
Q 3	2SD601	"	
D 1	MA152K	Diode	
D 2	"	"	
D 3	"	"	

Symbol No.	Part No.	Part Name	Description
R 1	QRS188J-471YN	Chip R	
R 2	" -471YN	"	
R 3	" -394YN	"	
R 4	" -561YN	"	
R 5	" -822YN	"	
R 6	" -822YN	"	
R 7	" -122YN	"	
R 8	" -224YN	"	
R 9	" -154YN	"	
R10	" -472YN	"	
R11	" -332YN	"	
R12	" -332YN	"	
R13	" -333YN	"	
R14	" -332YN	"	
R15	" -153YN	"	
R16	" -472YN	"	
R17	" -8R2YN	"	
	" -120YN	"	
R18	" -102YN	"	
R19	" -103YN	"	
R20	" -153YN	"	
R21	" -183YN	"	
R22	" -153YN	"	
R23	" -152YN	"	
R24	" -153YN	"	
R25	" -105YN	"	
R26	" -334YN	"	
R27	" -562YN	"	
R28	" -103YN	"	
R29	" -391YN	"	
R30	" -152YN	"	
R31	—	—	
R32	—	—	
R33	—	—	
R34	QRS188J-561YN	Chip R	
C 1	ECEA1AK220	E Cap	
C 2	ECU(X)1H103KBM	Chip Cap	
C 3	ECU(X)1H153KBM	"	
C 4	ECU(X)1H682KBM	"	
C 5	"	"	
C 6	ECEA1HKR47	E Cap	
C 7	ECSF1VE105	T Cap	
C 8	ECEA1HKR47	E Cap	
C 9	ECSF1AE226	T Cap	
C10	ECU(X)1H471KM	Chip Cap	
C11	ECEA1HK010	E Cap	
C12	"	"	
C13	ECU(X)1H103KBM	Chip Cap	
C14	ECQP1472JZ	PP Cap	
C15	ECEA0JK101	E Cap	
C16	"	"	
C17	"	"	
C18	ECEA1AK330	"	
C19	ECEA1ASS101	"	
C20	"	"	
C21	—	—	
C22	ECEA1AK220	E Cap	
C23	ECEA1CK100	"	
C24	ECU(X)1H470KM	Chip Cap	
C25	ECU(X)1H333KBM	"	
C26	ECU(X)1H331KM	Chip Cap	
C27	ECEA1HK010	E Cap	
C28	ECEA1HK4R7	"	
VR 1	EVN-B6AA00B15	VR	
VR 2	EVN-B6AA00B14	"	
VR 3	EVM-B6AA00B12	"	
VR 4	H0622A4R7KB	"	
L 1	—	—	
L 2	LAL03NA221K	Coil	
L 3	PU49995-221K	"	
L 4	LAL03NA390K	"	
⚠ CP 1	ICP-N10	Circuit Protector	0.4 A
⚠ TF 1	D-98-3A	Thermo Fuse	
Electronic Viewfinder P.W.B.(3) Ass'y PU53973-009			
D 4	LN28RA	L.E.D.	