

2-6 ELECTRICAL ADJUSTMENT PROCEDURES

2-6-1 ELECTRICAL ADJUSTMENT FOR CAMERA SECTION

TEST EQUIPMENT AND TOOLS

The following equipment is required for adjustment of the CAMERA section.

1. Oscilloscope
Dual Trace, 50MHz, 2mV/DIV.
10:1 Probe
1:1 Probe
2. Digital Volt Meter or VTVM
3. Frequency Counter
4. Vectorscope
5. Light Meter
6. Tripod
7. Colour Video Monitor
8. Lighting
140 foot-candles(1400lux). on the chart surface
3200 degrees K.
9. Reflection Chart
 - * Logarithmic Gray Scale chart
(Part No.:YWV2310RB99)
 - * Colour Chip Chart
(Part No.:YWV2100RB98)
 - * Hunting Chart
(Part No.:VFK0546)
 - * White Chart (Card)
(Part No.:VFK0546)
 - * J Chart & Ball Chart
(Part No.:VFK0580)
 - * B/W Chart
(Part No.:VFK0546)
 - * Gray-White Chart
(Part No.:VFK0546)
 - * Colour Bar Chart
(Part No.:VFK0677)
10. Plastic Tip Driver
11. E.V.R. FIXTURE (Part No.:VFK0644)
 - * ROM1 (Part No.:VFK0701 ROM1)
ROM1 performs the adjustment with manual calculation for NV-G2/G1.

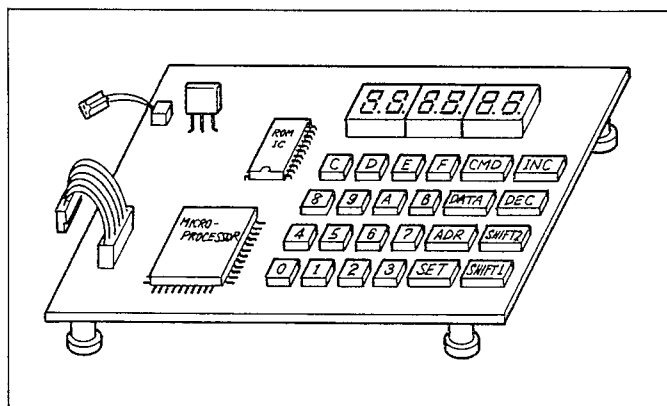


Fig. C1

12. Colour temperature Conversion filter
 - * C16 Filter (Part No.:VFK0324)
 - * C8 Filter (Part No.:VFK0547)

13. Camera Extension Cables

- * Extension Cable (18P) (Part No.:VFK0698)
- * Extension Cable (30P) (Part No.:VFK0667)
- * Extension Cable (13P) (Part No.:VFK0672)
- * 22 PIN E.V.R. CONNECTION CABLE (22P)
(Part No.:VFK0699)

Following Extension Cables can be used for VTR section too.

- * FLAT Cable (18P) (Part No.:VFK0670)
- * Extension Cable (24P) (Part No.:VFK0668)

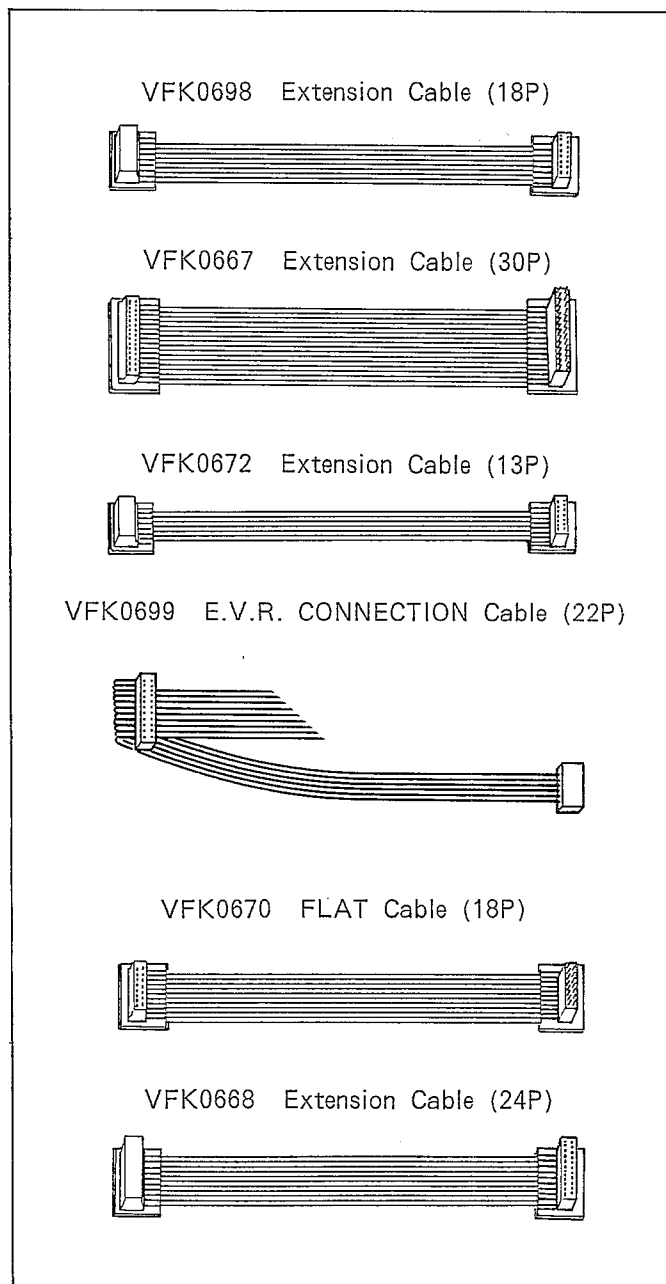


Fig. C2

E.V.R. FIXTURE

Camera Process section employs the remarkable memory IC so called E.E.P.R.O.M. (Electric Erasable Programmable Read Only Memory) that fulfills the role of variable resistor in conventional camera process.

In the conventional camera process, each adjustment points were used to be adjusted by turning variable resistors as shown in Fig.C39.

PREPARATION

- 1) Remove both side case (R) and (L) referring disassembly method.
- 2) Connect the E.V.R. FIXTURE and measuring equipments as shown in Fig.C3.

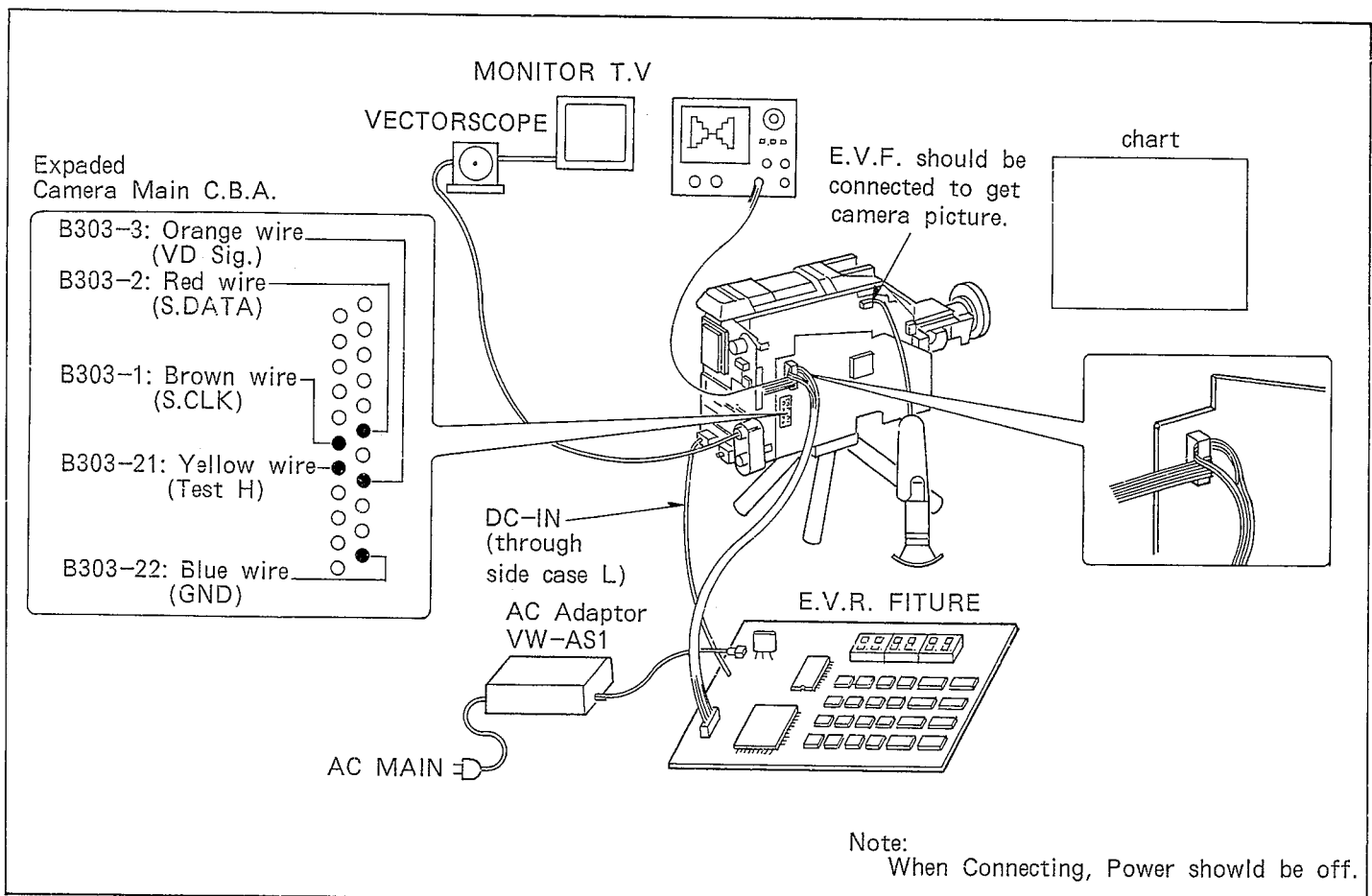


Fig. C3

Initial setting (For getting Picture)

- 1) Select the mode selector on E.V.R. Fixture to "A" side. (Refer to Fig.C41)
- 2) Turn the power SW of E.V.R. fixture on.
- 3) Turn the power SW of Camcorder NV-G2/G200/G1/G100 on.
Then LED Display on E.V.R. Fixture indicates "01 80 00". If display does not indicate this, Push RESET button or confirm the connection cables between EVR and CAMERA.
* In this time, Picture is appeared on TV monitor.
- 4) Push the both buttons of the "SHIFT 1" key and "1 key" together for performing initial setting.
- 5) In the production of camcorder, all EEPROMs in camcorder are set for "Writing inhibit condition".
In this condition, camera adjustment can not be performed.
In order to release this condition, write the data "00" to address "34" with command "02".
In order to set for "Write inhibit" write the data "A3" to address "34" with command "02".

(Adjustment Items required after replacing the individual components.)

When following parts are replaced, check the following adjustment items and adjust these if

NO.	Replaced Parts	Adjustment point or check points which are required			
		ALL ADJ. Points	Colour Reproduction	Focus & Zoom Encoder	Other ADJ.
1	IC303(ROM), IC304(D/A)	○			
2	CCD Unit individual		○	○	
3	Camera Main C.B.A.	○			
4	Sensor C.B.A. without CCD		○	○	
5	Zoom Encoder			○	
6	Lenz Unit			○	
7	IC703			△	
8	IC104		○		HC, carrier Balance
9	IC711			○	ALC, Pedestal

○ markAdjustment may be required.

△ markConfirm adjustment necessity and adjust it, if necessary.

Colour Reproduction.....WB, Colour gain, colour phase adjustments.

Fig. C4

(Standard Setting for Camera Adjustment)

Unless specified, switches are set to following positions.

- 1) White Balance Switch.....Indoor
AF.....Auto
High speed shutter.....OFF
Fade.....OFF
DIGITAL TITLE MEMORY.....OFF
These are set automatically after performing the "Initial setting" with EVR.
- 2) Iris.....ALC condition
- 3) Use 3200 degrees kelvin light source for lighting.
- 4) For trigger the oscilloscope, use video output.
- 5) Service work for camera unit must be performed in a dust free location to maintain the lens cleanliness.

HOW TO READ THE ADJUSTMENT PROCEDURES (FOR USE OF CONVENTIONAL VR)

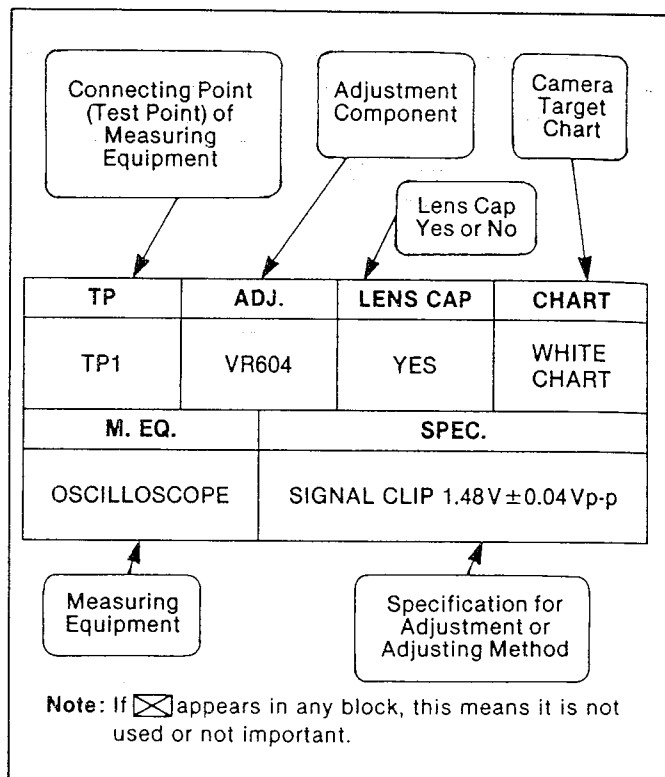
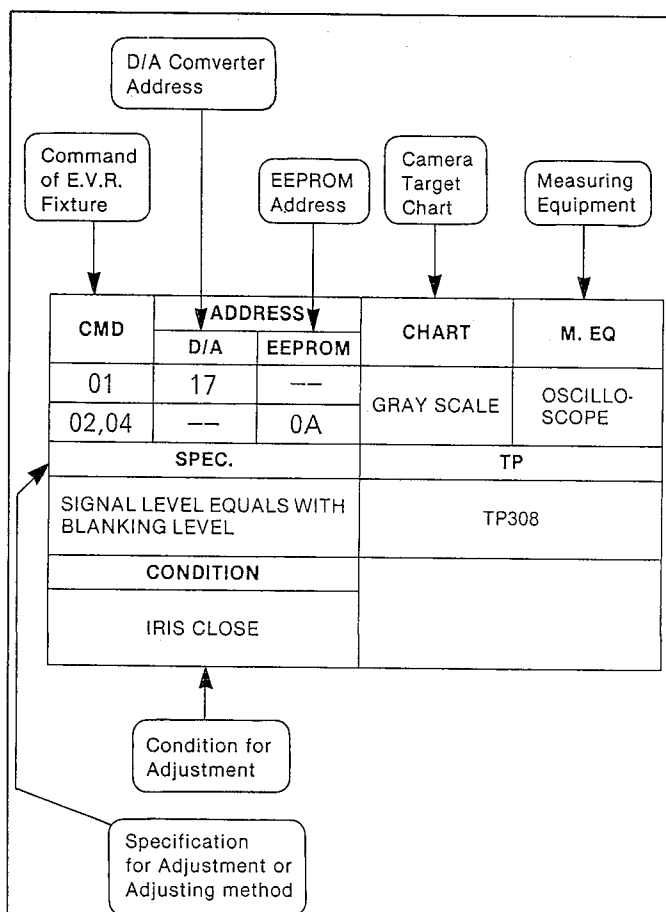


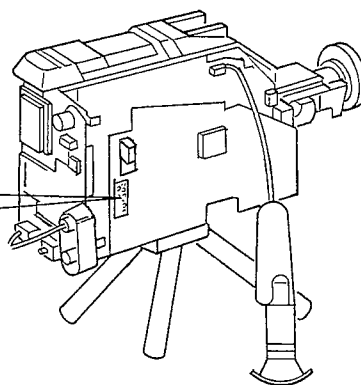
Fig. C5

HOW TO READ THE ADJUSTMENT PROCEDURES (FOR USE OF E.V.R.)



Test Point Array on Camera Main C.B.A.

B303-PIN17 ○	○ B303-PIN18
B303-PIN12 ○	○ B303-PIN5
B303-PIN10 ○	○ B303-PIN11
B303-PIN19 ○	○ B303-PIN4
B303-PIN13 ○	○ B303-PIN20
B303-PIN1 ○	○ B303-PIN2
B303-PIN21 ○	○ B303-PIN8
B303-PIN16 ○	○ B303-PIN3
B303-PIN6 ○	○ B303-PIN9
B303-PIN15 ○	○ B303-PIN7
B303-PIN14 ○	○ B303-PIN22



When connecting E.V.R. FIXTURE without E.V.R. Connection Cable VFK0699, connect the E.V.R. Cable for NV-MS70 at soldering points as shown below.

Fig. C6

1. FCK FREQUENCY ADJUSTMENT

TP	ADJ.	LENS CAP	CHART
TL520	C261		
M. EQ.		SPEC.	
FREQUENCY COUNTER		9.656250 MHz+/-15Hz	

2. AF ZONE ADJUSTMENT

TP	ADJ.	IRIS CAP	CHART
CL6, CL7	C726		
M. EQ.		SPEC.	
OSCILLOSCOPE		A=38USEC+/-1USEC	

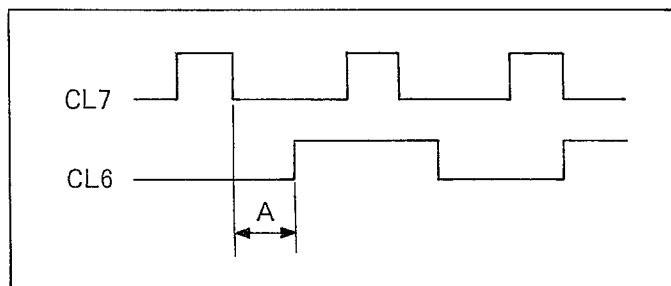


Fig. C7

3. ZOOM ENCODER ADJUSTMENT

CMD	ADDRESS		CHART	M. EQ
	D/A	EEPROM		
01	T:25 W:26	----- -----	For object: 10m	DIGITAL VOLTMETER
02,04	----- -----	T:0F W:10	Near object: 1m	
SPEC.			TP	
TO BE CALCULATED			B303-PIN5(V REF+) B303-PIN18(V REF-)	

NOTE:

- 1) Unless you replaced zoom Encoder, 3rd frame or 4th moving frame unit, do not perform this adjustment. (Because this adjustment is critical)
- 2) Regarding the connection of EVR, refer to preparation. (Fig.C3)

(Simplified adjustment)

- (1) Set the Focus sw to "MANUAL"(SHIFT 1 + C).
- (2) Check the back Focus.
- (3) If back focus is not correct, proceed to (4)
If back focus is correct, skip this adjustment.

- (4) Connect the EVR to camcorder. (Refer to Preparation Fig.C3)
- (5) Perform the initial setting by pushing "SHIFT 1" key and "1" key together.
- (6) Read the data of Tele side and wide side in EEPROM as follows;
 - * Push "CMD" button and then push "0" and "4". (Setting command 04)
 - * Push "ADR" button and then push "0" and "F". (Setting Address 0F)
 - * Push "SET" button and take memo of number which is indicated on LED Display. (as TELE side data)
 - * As the same way, set the command "04".
 - * Set the address "10".
 - * Push the "SET" button and memo the number which is indicated on LED Display. (as wide side data)
- (7) Set the command(CMD) to "01".
- (8) Set the address(ADR) to "25" for TELE.
- (9) Push "INC" or "DEC" once to increase or decrease the data for one step.
- (10) Confirm the back focus.
Repeat (8) and (9) until back focus becomes best.
- (11) When back focus becomes best, write the data by pushing "SHIFT 1" and "0" together.
- (12) Set the address(ADR) to "26" for WIDE.
- (13) Push "INC" or "DEC" once to increase or decrease the data for one step.
- (14) Confirm the back focus.
Repeat(13) and (14) until back focus becomes best.
- (15) When back focus becomes best, write the data by pushing "SHIFT 1" and "0" together.

(Pre cise Adjustment for Zoom Encoder)

According to number which is mentioned on white sheet of lens unit, calculate the voltage to be supplied the both side of zoom Encoder.
And write the its result into EEPROM as follows:

<Pre -Adjustment>

- (1) Calculate the V.REF(+), V.REF(-) using the following formula.

TELE side

$$\begin{aligned} \text{B303-PIN5: V.REF(+)} &= \text{V.REF3+} \\ &\quad (\text{V.REF3-V.REF1}) * \\ &\quad (5/\text{VT})/(\text{VT-VW}) \end{aligned}$$

WIDE side

$$\begin{aligned} \text{B303-PIN18: V.REF(-)} &= \\ &\quad \text{V.REF1-(V.REF3-V.REF1)*VW/} \\ &\quad (\text{VT-VW}) \end{aligned}$$

V.REF3 = Voltage at B303-PIN19(Please measure it)

V.REF1 = Voltage at B303-PIN20(Please measure it)

VT = which is mentioned on white sheet of top portion of lens unit. (Bigger number)

VW = Which is mentioned on white sheet of top portion of lens unit. (Smaller number)

VA = Voltage of B303-PIN18 at full zoom WIDE position.

VB = Voltage of B303-PIN5 at full zoom TELE position.

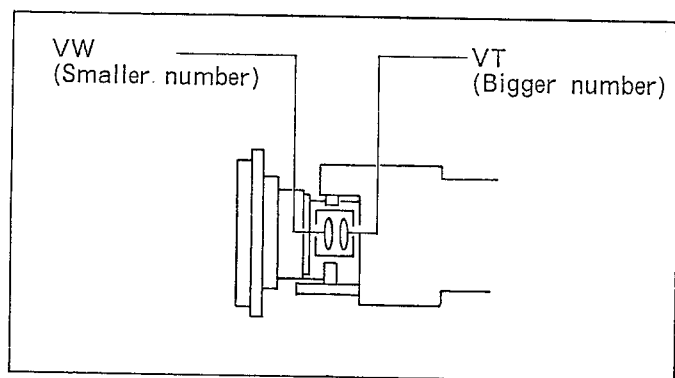


Fig. C8

- (2) Take memo the above result of calculation.
- (3) Set the zoom to fully TELE position.
- (4) Connect the probe of volt meter to B303-PIN5: V.REF(+) (see Fig.C8) and measure the voltage.
- (5) Using E.V.R, change the data of D/A address to "25" with command "01" so that voltage at B303-PIN5: V.REF(+) become same as a result of calculation as follows:
 - * Push "CMD", "0" and "1" keys.
 - * Push "ADR", "2" and "5" keys.
 - * Measure the voltage at B303-PIN5: V.REF(+) (see Fig.C8).
 - * Push "INC" or "DEC" so that voltage at B303-PIN5: V.REF(+) become same as a result of calculation.
 - * Write the data by pushing "SHIFT 1" and "0" keys together.
- (6) As the same way, set the zoom to fully WIDE position.
- (7) Measure the voltage at B303-PIN18: V.REF(-).
- (8) Change the D/A address to "26" (with command "01") and increase or decrease the data by pushing "INC" or "DEC" so that voltage at B303-PIN18: V.REF(-) become same as a result of calculation. Then, push "SHIFT 1" and "0" keys together to write the data.:

<Fine Adjustment>

- (1) Calculate the following formula with measuring the each voltage. And take note the result.

$$VAD = (V.REF3 - V.REF1) * 3 / 255$$

* TELE side

$$B303-PIN5: V.REF(+) = VB + (VB - (VA - VAD)) * (5 - VT) / (VT - VW)$$

* WIDE side

$$B303-PIN18: V.REF(-) = (VA - VAD) - (VB - (VA - VAD)) * VW / (VT - VW)$$

- (2) Set the zoom to fully TELE position.
- (3) While measuring the voltage at B303-PIN5. Change the data of D/A address "25" with command "01" so that voltage at B303-PIN5 become same as a result of calculation and when B303-PIN5 voltage comes same as result of calculation write its data by pushing "SHIFT 1" and "0" keys together.
 - * Push "CMD", "0" and "1" keys.
 - * Push "ADR", "2" and "5" keys.
 - * Measure the voltage at B303-PIN5.
 - * Push "INC" or "DEC" so that voltage at B303-PIN5 become same as a result of calculation.
 - * Push "SHIFT 1" and "0" keys together to write the data.

- (4) Set the zoom to fully wide position.
- (5) While measuring the voltage at B303-PIN18, change the data of D/A address "26" with command "01" so that voltage at B303-PIN18 become same as a result of calculation and write its data by pushing "SHIFT 1" and "0" keys together. The procedure is same as (3), only address is "26".

4. AF HALL AMP OFFSET GAIN ADJUSTMENT

| TP | ADJ. | LENS CAP | CHART |
|-----------|----------------------------|---|-------|
| B303-PIN4 | VR302(BIAS)
VR301(GAIN) | NO | |
| M. EQ. | | SPEC. | |
| D.V.M. | | CLOSE: V.REF3+/-50mV
OPEN : V.REF1+80+/-20mV | |

NOTE:

- 1) Manual Focus mode....SHIFT 1 + C
 - 2) Marking ALC(IRIS) fully close...SHIFT 1 + 3
 - 3) Marking ALC(IRIS) fully open...SHIFT 1 + 2
- (1) Set the unit to Manual Focus mode.
 - (2) Close the IRIS. (SHIFT 1 + 3)
 - (3) Adjust VR302 so that voltage at B303-PIN4 becomes V.REF1+80+/-20mV. V.REF is voltage at B303-PIN20.
 - (4) Open the IRIS. (SHIFT 1 + 2)
 - (5) Adjust VR301 so that voltage at B303-PIN4 becomes V.REF3+/-50mV. V.REF3 is a voltage at B303-PIN19.

5. V-SUB ADJUSTMENT

| TP | ADJ. | LENS CAP | CHART |
|------------|-------|-------------|--------------|
| | VR303 | NO | HALOGEN LAMP |
| M. EQ. | | SPEC. | |
| MONITOR TV | | NO BLOOMING | |

Note:

- (1) Making ALC(IRIS) fully open...SHIFT 1 + 2
- (2) High Speed Shutter "OFF".....
Set the command "06", Data "00" and DA address "40".
- (3) High Speed Shutter "1/250".
Set the command "06", Data "40" and DA address "40".

- (1) Zoom all the way in (Fully tele position) and aim the camera at the Halogen Lamp as shown in Fig.C9

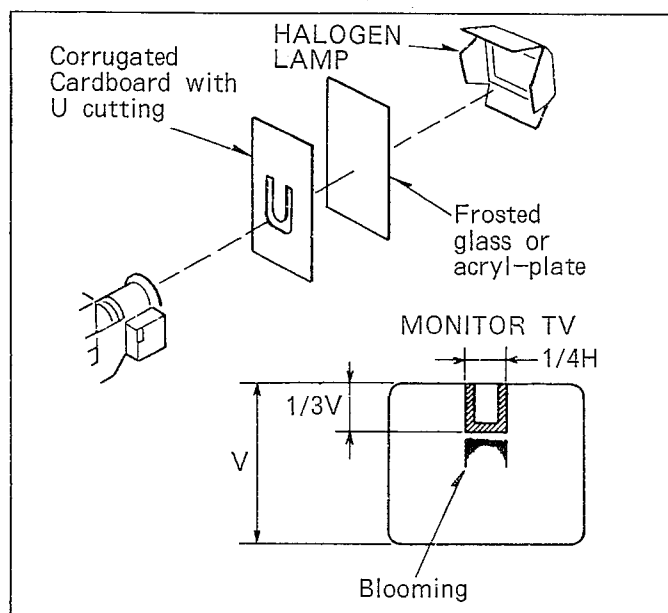


Fig. C9

- (2) Set the High Speed Shutter SW to "OFF" portion.
- (3) Blind the lighting using frosted glass or acryl plate to diffuse incoming light. And also put a corrugated cardboard which inside is Cut "U" shape as shown in Fig.C9.
- (4) Adjust VR303 so that blooming is just disappear. (If blooming is not disappeared completely, adjust until minimum blooming.)
- (5) High Speed Shutter "ON(1/250)" and "OFF" both mode, confirm that the monitored picture dose not contain the Blooming even if the camera moves as shown in Fig.C10

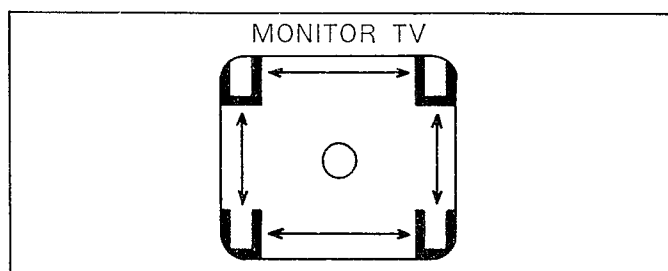



Fig. C10

6. VTR PEDESTAL(R-Y),(B-Y)ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|--------------------------|------------------|------------------|---|--|
| | D/A | EEPROM | | |
| 01 | R-Y:2C
B-Y:2B | -----
----- |  | OSCILLO-
SCOPE or
VECTOR-
SCOPE |
| 02,04 | -----
----- | R-Y:0D
B-Y:0E | | |
| SPEC. | | | TP | |
| WAVEFORM IS
MINIMIZED | | | VIDEO OUT | |
| CONDITION | | | | |
| Fade: ON | | | | |

NOTE:

Refer to preparation for connection of EVR.

- (1) Connect the Video output to vectorscope. (or oscilloscope)
- (2) Place the unit to "FADE" by pushing "SHIFT 1" and "D" keys together.
- (3) Push "CMD", "0" and "1" keys.
- (4) Push "ADR", "2" and "C" keys.
- (5) Push "INC" or "DEC" so that waveform become minimized as shown in Fig.C11. or so that vector comes to centre as shown in Fig.C12.

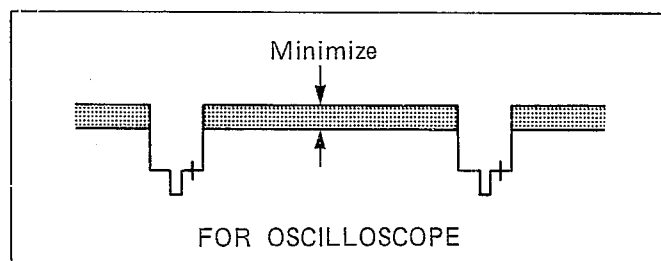


Fig. C11

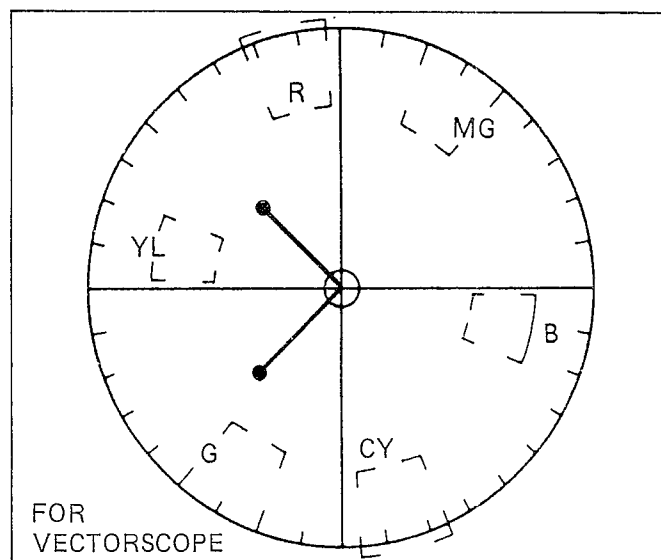


Fig. C12

- (6) Push "SHIFT 1" and "0" keys together to write its data.
- (7) Change "ADR" to "2B" (with command "01").
- (8) Push "INC" or "DEC" so that waveform is minimized. (or Vector comes to centre)
- (9) Push "SHIFT 1" and "0" keys together to write its data.

7. COLOUR 90°, 270° AND BURST PHASE ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|--------------------------|-------------------------------------|-------------------------------------|---------------|-----------------|
| | D/A | EEPROM | | |
| 01 | 27 (PHASE)
28 (90°)
23 (270°) | -----

----- | COLOUR
BAR | VECTOR
SCOPE |
| 02,04 | -----


----- | 17 (PHASE)
18 (90°)
15 (270°) | | |
| SPEC. | | | TP | |
| SHOWN BELOW | | | VIDEO OUT | |
| CONDITION | | | | |
| WHITE BALANCE:
INDOOR | | | | |

NOTE:

Perform this adjustment after finishing the VTR PEDESTAL ADJUSTMENT.

- Connect the jumper wire through capacitor(10V, 47uF) between B303-PIN6 and GND in order to eliminate the R-Y signal.
- Adjust the Burst Phase VR on Vectorscope so that B-Y signal comes to B-Y axis as shown in Fig.C21.
- Disconnect the jumper wire through capacitor between B303-PIN6 and GND.
- Connect the jumper wire through capacitor(10V, 47uF) between B303-PIN7 and GND in order to eliminate the B-Y signal.
- Supply video out signal to vectorscope.
- Aim the camera at colour bar chart.
- Push the "CMD" key, "0" key and "1" key.
- Push the "ADR" key, "2" key and "3" key.
- Push the "INC" key or "DEC" key so that signal comes to R-Y axis(270°) as shown in Fig.C13.
- Push the "CMD" key, "0" key and "2" key.
- Push the "ADR" key, "1" key and "5" key.
- Push the "SET" key in order to write the data to EEPROM.
- Push the "CMD" key, "0" key and "1" key.
- Push the "ADR" key, "2" key and "8" key.
- Push the "INC" key or "DEC" key so that signal comes to R-Y axis(90°) as shown in Fig.C13.
- Push the "CMD" key, "0" key and "2" key.
- Push the "ADR" key, "1" key and "8" key.
- Push the "SET" key in order to write the data to EEPROM.
- Disconnect the jumper wire through capacitor between B303-PIN7 and GND.
- Connect the jumper wire through capacitor(10V,47uF) between B303-PIN6 and GND in order to eliminate the R-Y signal.
- Push the "CMD" key, "0" key and "1" key.
- Push the "ADR" key, "2" key and "7" key.
- Push the "INC" key or "DEC" key so that signal comes to Burst phase in PAL mode of Vector Scope as shown in Fig.C13.
- Push the "CMD" key, "0" key and "2" key.
- Push the "ADR" key, "1" key and "7" key.
- Push the "SET" key, in order to write the data to EEPROM.

8. BURST LEVEL ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|-----------|---------|--------|---|-------------------|
| | D/A | EEPROM | | |
| 01 | 24 | --- |  | OSCILLO-
SCOPE |
| 02,04 | --- | 16 | | |
| SPEC. | | | TP | |
| 300+−10mV | | | VIDEO OUT
(With 75ohm Termination) | |

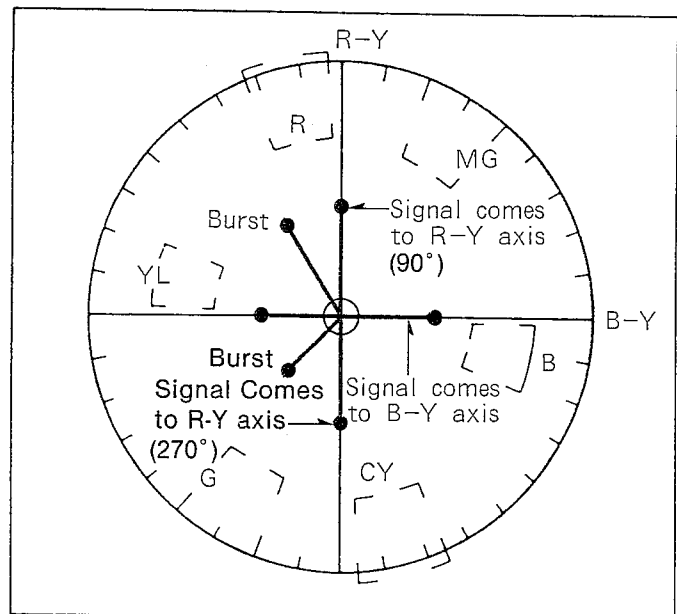


Fig. C13

NOTE:

Refer to preparation for connection of EVR and Initial setting.

- Connect the Video output with 75ohm Termination to oscilloscope.
- Push the "CMD", "0" and "1" keys.
- Push the "ADR", "2" and "4" keys.
- Push the "INC" or "DEC" so that waveform becomes 300+/-10mV.
- Push the "CMD", "0" and "2" keys.
- Push the "ADR", "1" and "6" keys.
- Push the "SET" key in order to write the data to EEPROM.

9. OR BIAS ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|--------------------------|---------|--------|---------|-------------------|
| | D/A | EEPROM | | |
| 01 | 14 | -- | J CHART | OSCILLO-
SCOPE |
| 02,04 | -- | 07 | | |
| SPEC. | | | TP | |
| WAVEFORM is
MAXIMIZED | | | TP201 | |

NOTE:

Regarding connection of EVR, refer to preparation and Initial setting.

- Aim the camera at J chart.
- Connect the oscilloscope to TP201.

- (3) Push "CMD", "0" and "1" keys of EVR.
- (4) Push "ADR", "1" and "4" keys.
- (5) Push "INC" or "DEC" so that waveform is maximized as shown in Fig.C22.
- (6) Push "SHIFT 1" and "0" keys together to write its data.

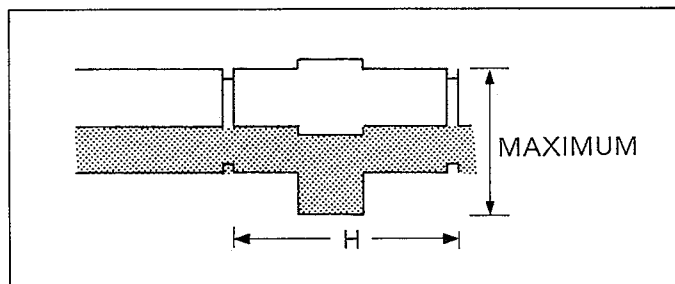


Fig. C14

10. ALC ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|---------------------------------------|------------------|------------------|------------------------|-------------------|
| | D/A | EEPROM | | |
| 01 | 22 (R)
24 (F) | -----
----- | GRAY
SCALE
CHART | OSCILLO-
SCOPE |
| 02,04 | -----
----- | 06 (R)
12 (F) | | |
| SPEC. | | | TP | |
| 300+--50mV(Rough)
300+--10mV(Fine) | | | B303-PIN14 | |

NOTE:
Regarding connection of EVR, refer to preparation and Initial setting.

- (1) Aim the camera at Gray scale chart.
- (2) Connect the oscilloscope to B303-PIN14.
- (3) Push the "CMD" key, "0" key and "1" key of EVR.
- (4) Push the "ADR" key, "2" key and "2" key.
- (5) Push the "INC" key or "DEC" key so that "DATA" becomes "80".
- (6) After setting (3)~(5), perform next procedure.
- (7) Push the "CMD" key, "0" key and "1" key of EVR.
- (8) Push the "ADR" key, "2" key and "1" key.
- (9) Push the "INC" key or "DEC" key so that waveform becomes 300+/-50mV.
- (10) Push "SHIFT 1" key and "0" key together to write its adjusted data into EEPROM.

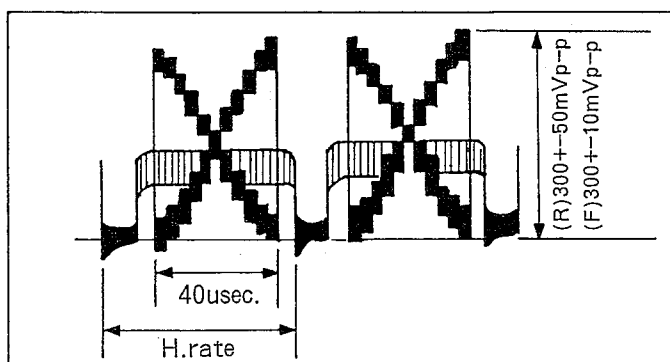


Fig. C15

- (11) Push the "CMD" key, "0" key and "1" key of EVR.
- (12) Push the "ADR" key, "2" key and "2" key.

- (13) Push the "INC" key or "DEC" key so that waveform becomes 300+/-10mVp-p.
- (14) Push the "CMD" key, "0" key and "2" key.
- (15) Push the "ADR" key, "1" key and "2" key.
- (16) Push the "SET" key in order to write the data to EEPROM.

11. CDS GAIN ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|---|---------|--------|---------|-------------------|
| | D/A | EEPROM | | |
| 01 | 15 | --- | J CHART | OSCILLO-
SCOPE |
| 02,04 | --- | 08 | | |
| SPEC. | | | TP | |
| 180+--60mV | | | TP202 | |
| CONDITION | | | | |
| ALC ADJUSTMENT
SHOULD BE 300+--10mV(F) | | | | |

NOTE:
Regarding connection of EVR, refer to preparation and Initial setting.

- (1) Set the ALC adjustment so that waveform is 300+/-10mV. (Refer to ALC ADJUSTMENT)
- (2) Aim the camera to J chart.
- (3) Push the "CMD", "0" and "1" keys of EVR.
- (4) Push the "ADR", "1" and "5" keys.
- (5) Connect the oscilloscope to TP202.
- (6) Push the "INC" or "DEC" key so that waveform is 180+/-60mV.
- (7) Push the "SHIFT 1" and "0" keys together to write its adjusted data in EEPROM

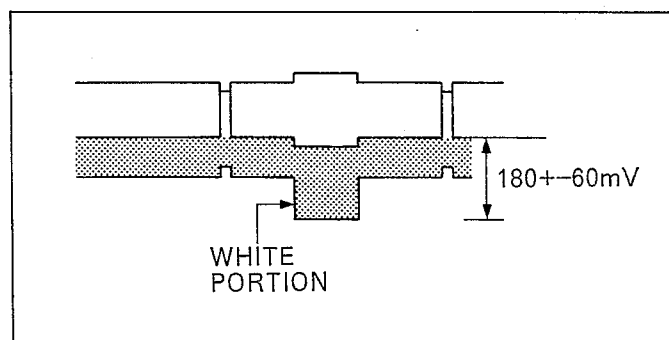



Fig. C16

12. PEDESTAL ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|------------------------|---------|--------|---|-------------------|
| | D/A | EEPROM | | |
| 01 | 17 | -- |  | OSCILLO-
SCOPE |
| 02 04 | -- | 0A | | |
| SPEC. | | | TP | |
| BLK LEVEL+/-5mV | | | B303-PIN9 | |
| CONDITION | | | | |
| IRIS CLOSE OR LENS CAP | | | | |

NOTE:

Regarding the connection of EVR refer to preparation and Initial setting.

- (1) Close the IRIS.
- (2) Connect the oscilloscope to B303-PIN9.
- (3) Push the "CMD" key, "0" key and "1" key of EVR.
- (4) Push the "ADR" key, "1" key "7" key.
- (5) Push the "INC" key or "DEC" key so that waveform becomes BLK level+5mV.
- (6) Push the "SHIFT 1" key and "0" key together to write its adjusted data.

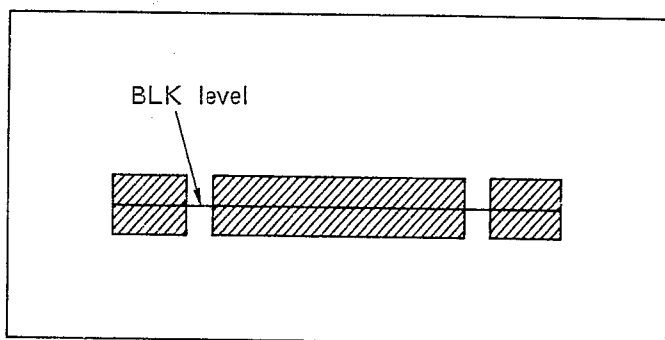


Fig. C17

13. AGC ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|----------------|---------|--------|------------------------|-------------------|
| | D/A | EEPROM | | |
| 01 | 16 | -- | GLAY
SCALE
CHART | OSCILLO-
SCOPE |
| 02,04 | -- | 09 | | |
| SPEC. | | | TP | |
| V/S=2.33+-0.15 | | | B303-PIN16 | |

NOTE:

Regarding the connection of EVR, refer to Preparation and Initial setting.

- (1) Aim the camera at Gray Scale Chart.
- (2) Connect the oscilloscope to B303-PIN16.
- (3) Push the "CMD" key, "0" key and "1" key of EVR.
- (4) Push the "ADR" key, "1" key and "6" key.
- (5) Push the "INC" key or "DEC" key so that ratio of V and S becomes 2.33+/-0.15 as shown in Fig.C26.
- (6) Push the "SHIFT 1" key and "0" key together to write its adjusted data in.

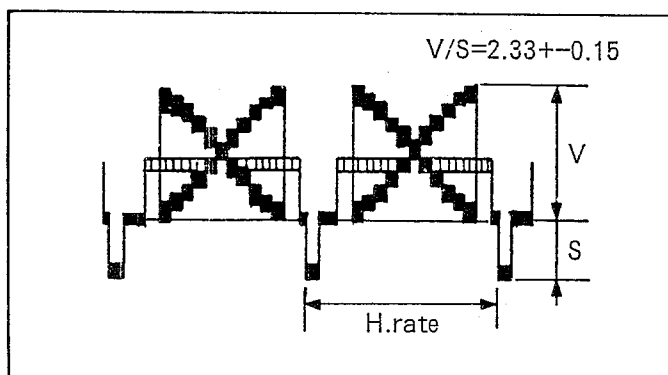


Fig.C18

NOTE:

Regarding the connection of EVR, refer to Preparation and Initial setting.

14. r LEAK ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|-------------------|---------|--------|------------------------|-------------------|
| | D/A | EEPROM | | |
| 01 | 13 | -- | GRAY
SCALE
CHART | OSCILLO-
SCOPE |
| 02,04 | -- | 11 | | |
| SPEC. | | | TP | |
| C =LESS THAN 30mV | | | B303-PIN7,8 | |

- (1) Aim the camera at gray scale chart.
- (2) Connect the oscilloscope to B303-PIN14.
- (3) Set the "CMD" to, "01" by pushing "CMD" key, "0" key and "1" key.
- (4) Set the "ADDRESS" to "21" by pushing the "ADR" key, "2" key and "1" key.
- (5) Push the "INC" key and "DEC" key so that the level of white part of Gray Scale Chart becomes 600+/-50mV.
- (6) Connect the oscilloscope to B303-PIN8.
- (7) Set the command to "01" by pushing the "CMD" key, "0" key and "1" key.
- (8) Set the address to "0B" by pushing the "ADR" key, "0" key and "B" key.
- (9) Push the "INC" key and "DEC" key so that level of a:2R-G becomes less than 10mV as shown in Fig.C19-1. But do not write its data to EEPROM.
- (10) Set the address to "0C" by pushing the "ADR" key, "0" key and "C" key.
- (11) Push the "INC" key and "DEC" key so that level of b:2B-G becomes less than 10mV as shown in Fig.C19-1. But do not write its data to EEPROM.

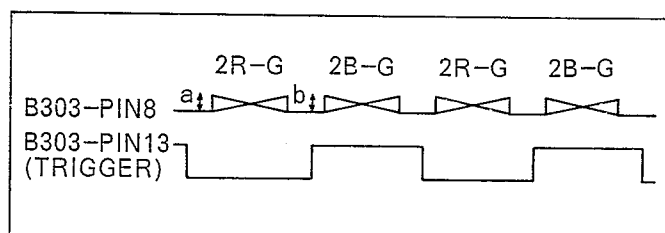


Fig. C 19-1

- (12) Connect the oscilloscope to B303-PIN7.
- (13) Set the command to "01" by pushing the "CMD" key, "0" key and "1" key.
- (14) Set the address to "13" by pushing the "ADR" key, "1" key and "3" key.
- (15) Push the "INC" key and "DEC" key so that level of c:B-Y becomes less than 30mV as shown in Fig.C19-2.
- (16) Push the "SHIFT 1" key and "0" key to write its adjusted data into EEPROM.

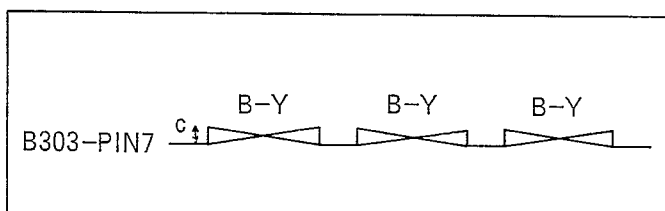
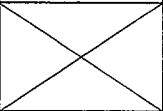


Fig. C19-2

15. FH/2 LEVEL DIFFERENCE ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|---------------------------------|---------|--------|---|-------------------|
| | D/A | EEPROM | | |
| 01 | 06 | — |  | OSCILLO-
SCOPE |
| 02,04 | — | 05 | | |
| SPEC. | | | TP | |
| NO SIGNAL LEVEL
DIFFERENCE | | | B303-PIN15
(TRIGGER: B303-PIN13) | |
| CONDITION | | | | |
| LENS CAP: ON
(OR IRIS CLOSE) | | | | |

NOTE:

Regarding the connection of EVR, refer to preparation and Initial setting.

- (1) Close the IRIS(SHIFT 1+3).
- (2) Connect the oscilloscope to B303-PIN15.
- (3) Push the "CMD" key, "0" key and "1" key of EVR.
- (4) Push the "ADR" key, "0" and "6" key.
- (5) Push the "INC" key or "DEC" key so that level difference of R-Y dark signal and B-Y dark signal become nothing.
(so that R-Y dark level equals to B-Y dark level)
- (6) Push the "SHIFT 1" key and "0" key together to write its adjusted data into EEPROM.

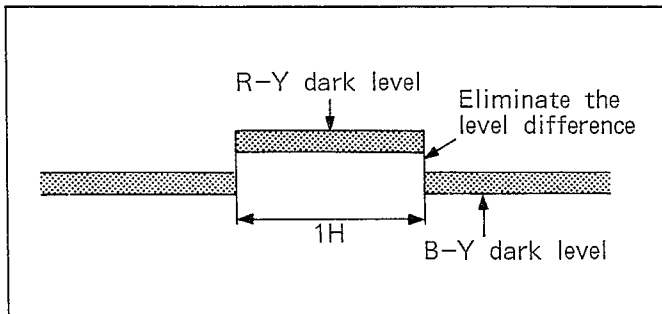
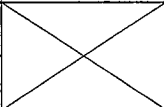


Fig. C20

16. CHROMA PEDESTAL ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|-------------------------------|---------|--------|---|-------------------|
| | D/A | EEPROM | | |
| 01 | 05 | — |  | OSCILLO—
SCOPE |
| 02,04 | — | 04 | | |
| SPEC. | | | TP | |
| NO SIGNAL LEVEL
DIFFERENCE | | | B303—PIN15 | |
| CONDITION | | | | |
| LENS CAP
(OR IRIS CLOSE) | | | | |

NOTE:

Regarding the connection of EVR, refer to preparation and Initial setting.

- (1) Close the Iris(SHIFT 1+3).
- (2) Connect the oscilloscope to B303-PIN15.
- (3) Push the "CMD" key, "0" and "1" key of EVR.
- (4) Push the "ADR" key, "0" key and "5" key.
- (5) Push the "INC" key or "DEC" key so that BLK level equals to dark level.
- (6) Push the "SHIFT 1" key and "0" key together to write its adjusted data.

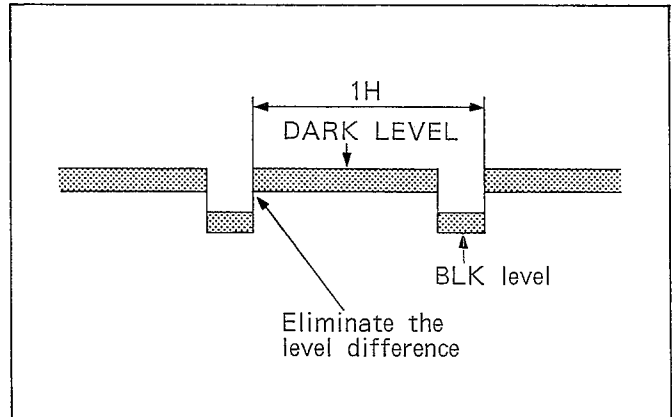
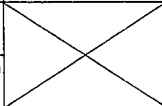


Fig. C21

17. R-Y,B-Y PEDESTAL ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|--|--------------------|--------------------|---|--------------|
| | D/A | EEPROM | | |
| 01 | 03(R-Y)
04(B-Y) | —
— |  | OSCILLOSCOPE |
| 02,04 | —
— | 02(R-Y)
03(B-Y) | | |
| SPEC. | | | TP | |
| BLK LEVEL EQUALS TO DARK LEVEL | | | B303-PIN6(R-Y)
B303-PIN7(B-Y) | |
| CONDITION | | | | |
| IRIS CLOSE
(LENS CAP: ON)
AGC: MINIMUM | | | | |

NOTE:

Regarding the connection of EVR, refer to Preparation and Initial setting.

- (1) Close the IRIS.
- (2) Push the "SHIFT 1" key and "4" key together to minimized the AGC.
- (3) Connect the oscilloscope to B303-PIN6(R-Y).
- (4) Push the "CMD" key, "0" key and "1" key.
- (5) Push the "ADR" key, "0" key and "3" key.
- (6) Push the "INC" key or "DEC" key so that dark level becomes equal to BLK level.
- (7) Push the "SHIFT 1" key and "0" key to write its adjusted data into EEPROM.
- (8) Connect the oscilloscope to B303-PIN7.
- (9) Change the address "ADR" to "04" with command "01".
- (10) Push the "INC" key or "DEC" key so that dark level becomes equal to BLK level.
- (11) Write its adjusted data by pushing the "SHIFT 1" key and "0" key together.

- (12) Return the AGC to normal by pushing "SHIFT 1" key and "1" key.
- (13) Connect the vectorscope to video output.
- (14) Confirm that vector comes to centre while IRIS is closed.
- (15) If vector is not centre, readjust the CHROMA PEDESTAL and FH/2 LEVEL DIFFERENCE ADJUSTMENT so that vector comes to centre.
- (16) Confirm R-Y, B-Y PEDESTAL ADJUSTMENT.

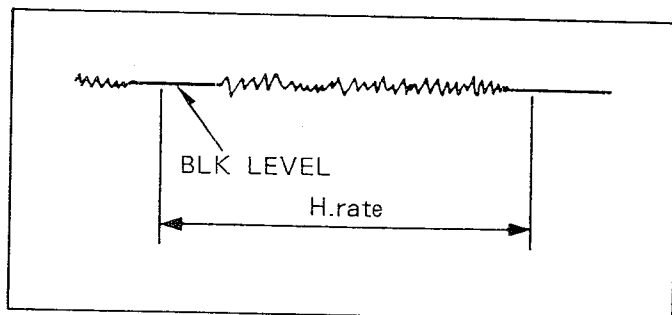


Fig. C22

- (11) Repeat 3. to 10. until vector comes to centre (Vectorscope) or waveform is minimized (Oscilloscope).

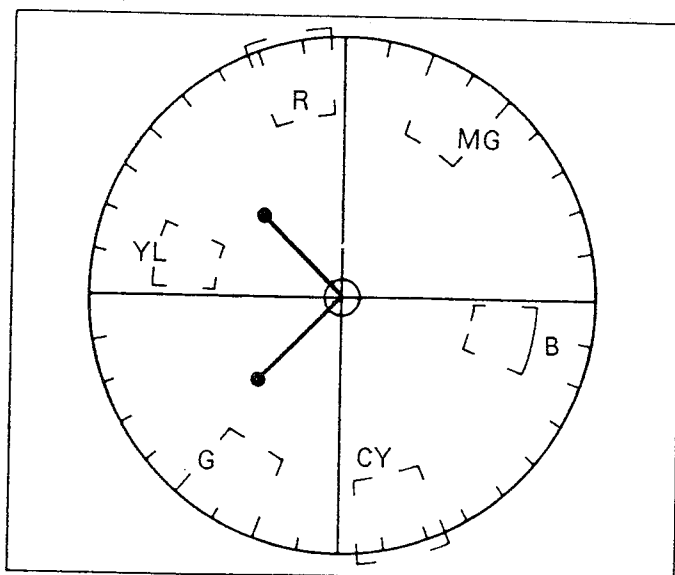


Fig. C23 With Vectorscope

18. INDOOR WHITE BALANCE ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|---|--------------------|--------------------|----------------|--|
| | D/A | EEPROM | | |
| 01 | 0B(R-Y)
0C(B-Y) | —
— | WHITE
CHART | VECTOR-
SCOPE OR
OSCILLO-
SCOPE |
| 02,04 | —
— | 60(R-Y)
63(B-Y) | | |
| SPEC. | | | TP | |
| CENTER OF VECTORSCOPE
OR WAVEFORM IS MINIMIZED
(OSCILLOSCOPE) | | | VIDEO OUT | |
| CONDITION | | | | |
| IRIS VR: CENTRE | | | | |

NOTE:

Regarding the connection of EVR, refer to Preparation and Initial setting.

- (1) Aim the camera at white chart.
- (2) Connect the Video out to Vectorscope or oscilloscope.
- (3) Set the command "01" by pushing "CMD" key, "0" key and "1" key.
- (4) Set the address "0B"(R-Y) by pushing "ADR" key, "0" key and "B" key.
- (5) (In case of vectorscope) Push "INC" key or "DEC" key so that vector approaches to centre as much as possible.
- (6) (In case of oscilloscope) Push "INC" key or "DEC" key so that waveform is minimized.
- (7) When best point comes, Push the "SHIFT 1" key and "0" key together to write its adjusted data into EEPROM.
- (8) Change the address to "0C" by pushing "ADR" key "0" key and "C" key.
- (9) Adjust the data by pushing "INC" key or "DEC" key so that vector approaches to centre (Vectorscope) or so that waveform is minimized.
- (10) When best point comes, Push the "SHIFT 1" key and "0" key together to write its adjusted data into EEPROM.

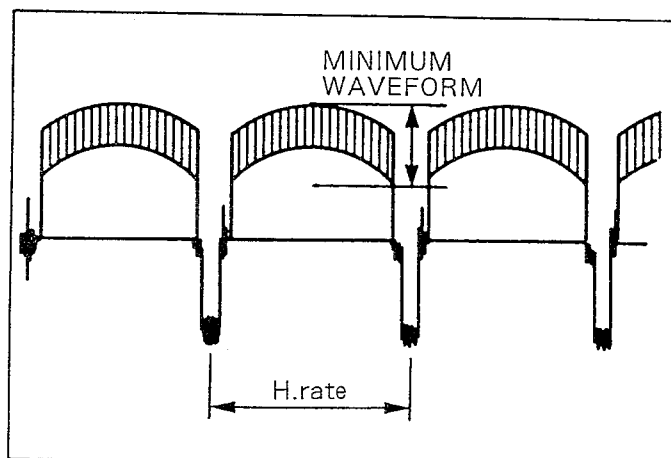


Fig. C24 With Oscilloscope

19. COLOUR PHASE AND GAIN ADJUSTMENT (INDOOR)

| CMD | ADDRESS | | CHART | TP |
|-------------|-------------------------------------|-------------------------------------|---|--------------|
| | D/A | EEPROM | | |
| 01 | 09,07
(PAHSE)
0A,08
(GAIN) | —
— | COLOUR
CHIP
CHART | VIDEO
OUT |
| 02,04 | —
— | 62,65
(PHASE)
61,64
(GAIN) | | |
| M. EQ | | | SPEC. | |
| VECTORSCOPE | | | RED: 106+−3 degree/PHASE
206+−5%/GAIN
YEL: 165+−3 degree/PHASE
65+−5%/GAIN | |

NOTE:

Regarding the connection of EVR, refer to Preparation and Initial setting.

NOTE:

Regarding the connection of EVR, refer to Preparation and Initial setting.

- (1) Aim the camera at colour chip chart.
- (2) Connect the video output to vectorscope.
- (3) Set the command to "01" by pushing the "CMD" key, "0" key and "1" key.
- (4) Set the address to "09"(R-Y Phase) by pushing the "ADR" key, "0" key and "9" key.
- (5) Push the "INC" key or "DEC" key so that phase of Red vector and Yellow vector approach to the spec.
- (6) When best point comes, push "SHIFT 1" key and "0" key together to write its adjusted data to EEPROM.
- (7) Change the address to "07"(B-Y Phase) by pushing the "ADR" key "0" key and "7" key.
- (8) Push the "INC" key or "DEC" key so that phase of Red and Yellow vectors approach to the spec.
- (9) When best point comes, push the "SHIFT 1" key and "0" key together to write its adjusted data.
- (10) Change the address to "0A"(R-Y Gain) by pushing "ADR" key, "0" key and "A" key.
- (11) Push the "INC" key or "DEC" key so that gain of Red and Yellow vectors approach to the spec.
- (12) When best point comes, push the "SHIFT 1" key and "0" key together to write its adjusted data.
- (13) Change the address to "08"(B-Y Gain).
- (14) Push the "INC" or "DEC" key so that gain of Red and Yellow vectors approach to the spec.
- (15) When best point comes, push the "SHIFT 1" key and "0" key together to write its adjusted data.
- (16) Repeat the 3 to 15 until vectors become within spec as shown in Fig.C25.

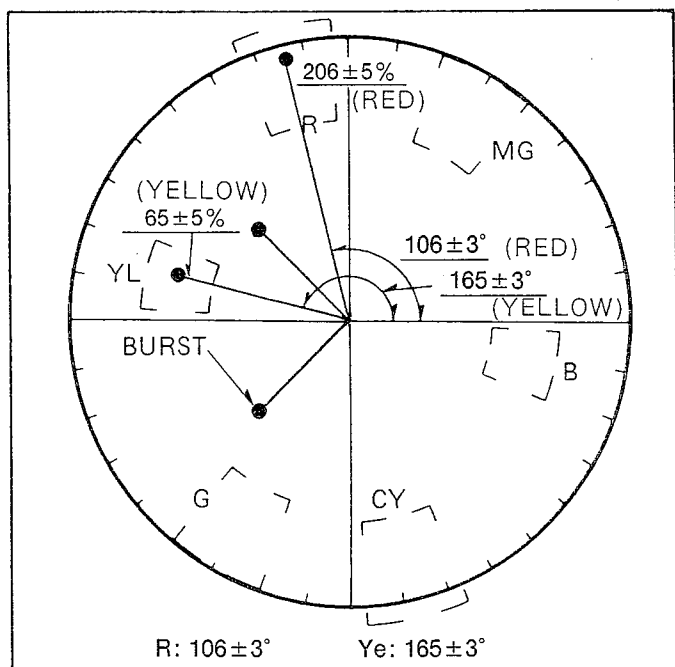


Fig. C25

20. OUTDOOR WHITE BALANCE ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|--|----------------------|----------------------|----------------|--|
| | D/A | EEPROM | | |
| 01 | 0B (R-Y)
0C (B-Y) | ----
---- | WHITE
CHART | VECTOR-
SCOPE
OR OSCILLO-
SCOPE |
| 02,04 | ----
---- | 72 (R-Y)
75 (B-Y) | | |
| SPEC. | | | TP | |
| VECTOR COMES CENTRE OR
WAVEFORM IS MINIMIZED | | | VIDEO
OUT | |
| CONDITION | | | | |
| WHITE BALANCE: OUTDOOR
IRIS VR: CENTRE
COLOUR TEMPERATURE
CONVERSION
FILTER: VFK0324 | | | | |

NOTE:

Regarding the connection of EVR, refer to Preparation and Initial setting.
Do not use "SHIFT 1"+"0" for writing data because this function is not operated for this adjustment.

- (1) Set the white balance switch to "OUT DOOR".
- (2) Aim the camera at white chart.
- (3) Connect the video out to vectorscope or oscilloscope.
- (4) Cover the lens with colour temperature conversion filter VFK0324 to imitate the outdoor lighting.
- (5) Set the command to "01" by pushing "CMD" key, "0" key and "1" key.
- (6) Set the address to "0B" by pushing "ADR" key, "0" key and "B" key.
- (7) (In case of use of vectorscope)
Push the "INC" key or "DEC" key so that vector comes to centre as much as possible.
- (8) (In case of use of oscilloscope)
Push the "INC" key or "DEC" key so that waveform is minimized.
- (9) When the best point comes, change the command to "02" by pushing "CMD" key, "0" key and "2" key, and change the address to "72" by pushing the "ADR" key, "7" key and "2" key. (Do not change the data) Then, push "SET" key to write its adjusted data to EEPROM directly.
- (10) Change the address to "0C". (Command is "01")
- (11) Push the "INC" key and "DEC" key so that vector comes to centre or so that waveform is minimized.
- (12) When the best point comes, change the command to "02" and change to "75" (Do not change the data) then push the "SET" button to write its data to EEPROM directly.
- (13) Repeat 4. to 11. until vector comes centre or waveform is minimized.

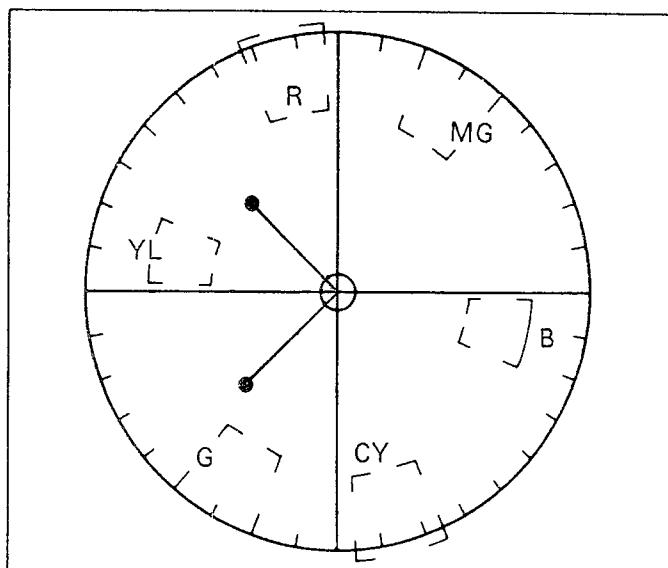


Fig. C26 With Vectorscope

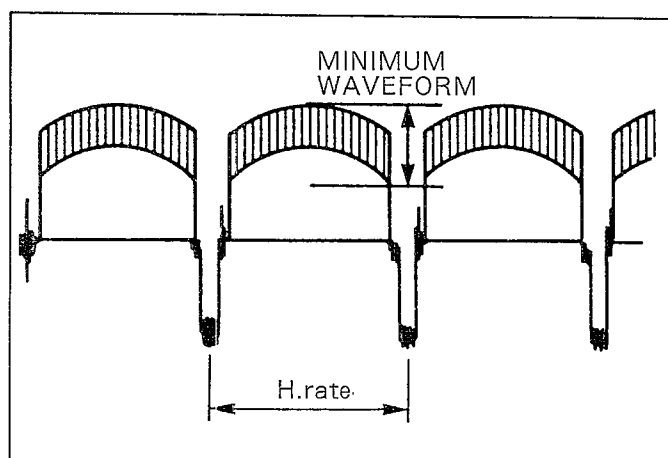


Fig. C27 With Oscilloscope

21. COLOUR PHASE AND GAIN ADJUSTMENT (OUTDOOR)

| CMD | ADDRESS | | CHART | M. EQ |
|-------------|-------------------------------------|-------------------------------------|---|--------------|
| | D/A | EEPROM | | |
| 01 | 09,07
(PHASE)
0A,08
(GAIN) | ----
---- | COLOUR
CHIP
CHART | VIDEO
OUT |
| 02,04 | ----
---- | 74,77
(PHASE)
73,76
(GAIN) | | |
| SPEC. | | | TP | |
| VECTORSCOPE | | | RED: 106+−3 degree/PHASE
290+−5%/GAIN
YEL: 160+−5 degree/PHASE
80+−5%/GAIN | |

NOTE:

Regarding the connection of EVR, refer to Preparation and Initial setting.
Do not use "SHIFT 1"+"0" for writing because this function is not operated correctly for this adjustment.

- (1) Aim the camera at colour chip chart. and cover the lens with colour temperature conversion filter VFK0324.

- (2) Connect the video output to vectorscope.
- (3) Set the command to "01" by pushing the "CMD" key, "0" key and "1" key.
- (4) Set the address to "09"(R-Y Phase) by pushing the "ADR" key, "0" key and "9" key.
- (5) Push the "INC" key or "DEC" key so that phase of Red and Yellow vectors approach to spec.
- (6) When best point comes, change the command to "02" by pushing "CMD" key, "0" key and "2" key and change the address to "74" by pushing the "ADR" key, "7" key and "4" key (Do not change the data) and then push the "SET" key to write its adjusted data into EEPROM directly.
- (7) Change the command to "01" by pushing the "CMD" key, "0" key and "1" key. Change the address to "07" by pushing the "ADR" key, "0" key and "7" key.
- (8) Push the "INC" key or "DEC" key so that phase of Red and Yellow vectors approach to the spec.
- (9) When best point comes, change the command to "02" by pushing the "CMD" key, "0" key and "2" key. (Do not change the data), and change the address to "77" by pushing "ADR" key, "7" key and "7" key. Then, Push the "SET" key to write its adjusted data to EEPROM Directly.
- (10) Change the command to "01" by pushing the "CMD" key, "0" key and "1" key. Change the address to "0A" (R-Y Gain) by pushing "ADR" key, "0" key and "A" key.
- (11) Push the "INC" or "DEC" key so that gain of Red and Yellow vectors approach to the spec.
- (12) When best point comes, change the command to "02" and change the address to "73" while keeping the data. Then, Push the "SET" key to write its adjusted data to EEPROM directly.
- (13) Change the command to "01". Change the address to "08"(B-Y Gain).
- (14) Push the "INC" or "DEC" key so that gain of Red and Yellow vectors approach to the spec.
- (15) When the best point comes, change the command to "02" and change the address to "76" (do not change the data). Then, Push the "SET" key to write adjusted data to EEPROM directly.
- (16) Repeat the 3. to 15. until vectors become within spec as shown in Fig.C28.

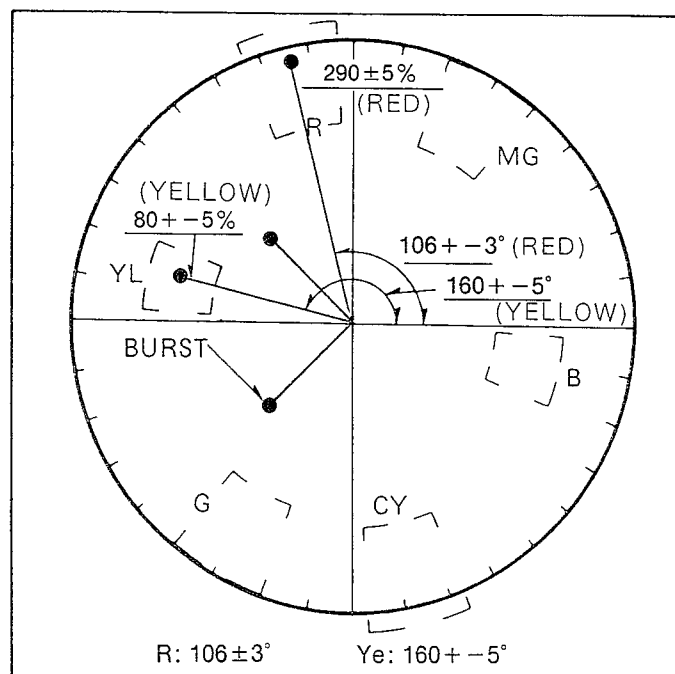


Fig. C28

22. EDGE CORRECTION ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|-------------------------------|---------|--------|-----------------------|--------------|
| | D/A | EEPROM | | |
| 01 | 18 | -- | BLACK AND WHITE CHART | OSCILLOSCOPE |
| 02,04 | -- | 0B | | |
| SPEC. | | | TP | |
| ELIMINATE THE EDGE COMPONENTS | | | TP313 | |
| CONDITION | | | | |
| ALC: 800mV | | | | |

NOTE:

Regarding the connection of EVR, refer to Preparation and Initial setting.

- (1) Readjust the ALC adjustment so that spec become 800mV. (Refer to ALC adjustment). But do not write its data into EEPROM.
- (2) Aim the camera at Black and White chart.
- (3) Connect the oscilloscope to B303-PIN8.
- (4) Set the command to "01".
- (5) Set the address to "18".
- (6) Push the "INC" key or "DEC" key so that Edge signal as shown below is minimized.
- (7) Set the command to "02".
- (8) Return the ALC to 300mV. Set the address to "0B".
- (9) Push the "SET" key in order to write the data to EEPROM.
- (10) Return the ALC to 300mV. Push the "SHIFT 1" key and "1" key together (Initial setting) ALC return to 300mV if you did not change the data

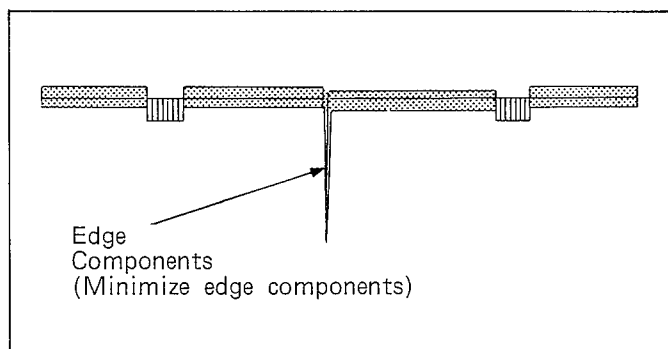


Fig. C29

23. HC(High Cut) ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|--|---------|--------|---------------|-------------------|
| | D/A | EEPROM | | |
| 01 | 19 | --- | GRAY
SCALE | OSCILLO-
SCOPE |
| 02,04 | --- | 0C | | |
| SPEC. | | | TP | |
| AS SHOWN IN FIG. C38 | | | VIDEO
OUT | |
| CONDITION | | | | |
| ALC: 800mV
Colour Temperature
Conversion filter: VFK0547 | | | | |

NOTE:

Regarding the connection of EVR, refer to Preparation (Fig.C6) and Initial setting.

- (1) Readjust the ALC to 700mV. But do not write the data into EEPROM.(Refer to ALC ADJUSTMENT)
- (2) Aim the camera at Gray Scale Chart.
- (3) Cover the lens with colour Temperature conversion filter(C8:VFK0547).
- (4) Connect the oscilloscope to VIDEO OUT.
- (5) Set the command to "01".
- (6) Set the address to "19".
- (7) Push the "INC" key or "DEC" key so that first step of gray scale chart becomes less than 20mV and 3rd step of gray scale chart becomes more than 40mV as shown in Fig.C30.
- (8) Set the command to "02".
- (9) Set the address to "0C".
- (10) Push the "SET" key in order to unit the data to EEPROM.
- (11) Return the ALC to 300mV. Push the "SHIFT 1" key and "1" key together, ALC will return to original level (300mV) if you did not change ALC.

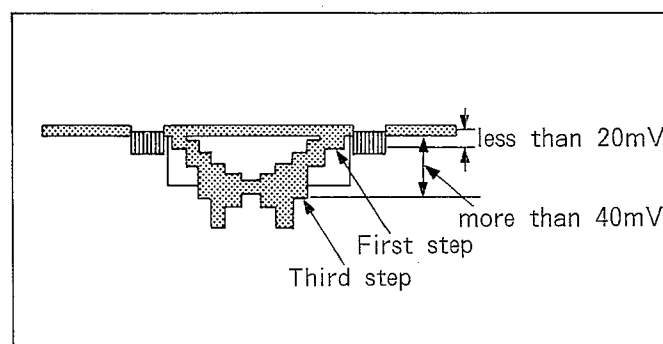


Fig. C30

24. DATA WRITING FOR COLOUR REPRODUCTION

As stated before, each adjustment voltage are memorized in EEPROM as digital data.

Regarding colour reproduction adjustments such as white balance, phase and gain adjustments, only adjustments have been performed at indoor condition (3200 degree kelvin) and outdoor condition (5100 degree kelvin).

EEPROM needs the data at other condition, too such

as data at 2800 degree kelvin 3600 degree levin, 4500 degree kelvin and 6000 degree kelvin. In order to fulfill the entering rest of these data, following calculation have to be done and result must be entered to proper address of EEPROM.

(How to calculate and enter the data)

- 1) Read the data from proper address of EEPROM, which is indicated in following formula column.
- 2) The data which is read out is hexadecimal number, therefore, this must be converted to decimal number. You can do it easily using hexadecimal/decimal conversion table. (Fig.C49).
- 3) Substitute the read out data in to formula and calculate it.
- 4) Convert the result of calculation to hexadecimal value using conversion table.
- 5) Enter the result to EEPROM address. Item shows the contents of adjustment address, for example, R-Y WB 28 means R-Y white Balance at 2800 degree kelvin.

(For Example)

| ITEM | EEPROM ADDRESS | FORMULA |
|-----------|----------------|----------------------------|
| R-Y WB 28 | ADR 5A | $ADR60-0.20*(ADR72-ADR60)$ |

- 1) Read out the data.
ADR60: Set the command to "04".
Set the address to "60".
Push the "SET" button.
Numver which is indicated in "DATA" LED is a data of ADR60(Address "60") for example, if indicated data is "56", substitute "56" to ADR60.
As the same way, read out the data from address "72".
For example, if data which are read out are ADR72="6C", ADR60="56" above formula becomes:
 $R-Y WB 28 = 56-0.20(6C-56)$.
- 2) Convert the hexadecimal data into decimal number using conversion table(Fig.C12). For example, "56" in hexadecimal is "86" in decimal from intersection of 5 and 6. Substitute its to formula.
Therefore,
 $R-Y WB 28 = 86-0.2*(108-86)$
 $= 86-0.2*22$
 $= 81.6$ cut off the fractions.
- 3) Convert the result "82" to hexadecimal using conversion table(Fig.C12).
"82" decimal is "52" in hexadecimal.
Write the "52" into EEPROM address "5A".
* Set the command to "02".
* Set the address to "5A".
* Push the "SET" key.

Calculate all following formula and write these result into proper EEPROM address.

| NO. | ITEM | EEPROM ADDRESS | RESULT OF CALCULATION | FORMULA |
|-----|------------|----------------|-----------------------|-----------------------------------|
| 1 | R-Y WB 28 | 5A | | $ADR60-0.2*(ADR72-ADR60)$ |
| 2 | R-Y WB 36 | 66 | | $ADR60+0.52*(ADR72-ADR60)$ |
| 3 | R-Y WB 45 | 6C | | $ADR60+1.03 \times (ADR72-ADR60)$ |
| 4 | R-Y WB 60 | 78 | | $ADR60+1.17 \times (ADR72-ADR60)$ |
| 5 | R-Y WB HE | 40 | | ADR70 |
| 6 | R-Y GC 28 | 5B | | ADR61 |
| 7 | R-Y GC 36 | 67 | | $ADR61+1.0*(ADR73-ADR61)$ |
| 8 | R-Y GC 45 | 6D | | $ADR61+3.0*(ADR73-ADR61)$ |
| 9 | R-Y GC 60 | 79 | | ADR73 |
| 10 | R-Y GC HE | 41 | | ADR73 |
| 11 | R-Y MAT 28 | 5C | | ADR62 |
| 12 | R-Y MAT 36 | 68 | | ADR62 |
| 13 | R-Y MAT 45 | 6E | | $ADR62-0.88 \times (ADR62-ADR74)$ |
| 14 | R-Y MAT 60 | 7A | | ADR74 |
| 15 | R-Y MAT HE | 42 | | ADR74 |
| 16 | B-Y WB 28 | 5D | | $ADR63-0.12*(ADR75-ADR63)$ |
| 17 | B-Y WB 36 | 69 | | $ADR63+0.1*(ADR75-ADR63)$ |
| 18 | B-Y WB 45 | 6F | | $ADR63+0.9*(ADR75-ADR63)$ |
| 19 | B-Y WB 60 | 7B | | $ADR63+1.24 \times (ADR75-ADR63)$ |
| 20 | B-Y WB HE | 43 | | ADR75 |
| 21 | B-Y GC 28 | 5E | | ADR64 |
| 22 | B-Y GC 36 | 6A | | $ADR64-0.77 \times (ADR64-ADR76)$ |
| 23 | B-Y GC 45 | 70 | | $ADR76-0.30*(ADR64-ADR76)$ |
| 24 | B-Y GC 60 | 7C | | ADR76 |
| 25 | B-Y GC HE | 44 | | ADR76 |
| 26 | B-Y MAT 28 | 5F | | ADR65 |
| 27 | B-Y MAT 36 | 6B | | ADR65 |
| 28 | B-Y MAT 45 | 71 | | ADR77 |
| 29 | B-Y MAT 60 | 7D | | ADR77 |
| 30 | B-Y MAT HE | 45 | | ADR77 |

Fig. C31 Calculation

25. R-Y, B-Y OFFSET SETTING

- * Read out the A/D address data of R-Y, B-Y and write its into EEPROM as follows.

25-1. R-Y OFFSET

- (1) Set the command to "05" by pushing "CMD" key, "0" key and "5" key.
- (2) Set the address to "03" by pushing "ADR" key, "0" key and "3" key.
- (3) Push the "SET" key and memo its data.
- (4) Set the command to "02".
- (5) Set the address to "3A".
- (6) Push the data key and enter the memorized number at 3.
(for example, if its data is "7C" Push "7" key and "C" key)
- (7) Push the "SET" key to write it into EEPROM.

25-2. B-Y OFFSET

- (1) Set the command to "05".
- (2) Set the address to "04".
- (3) Push the "SET" button and memo its data.
- (4) Set the command to "02".
- (5) Set the address to "3B".
- (6) Push the "DATA" key and enter the memorized number at 3.
- (7) Push the "SET" key to write it into EEPROM.

26. AWB DATA SETTING FOR INDOOR

NOTE:

Perform this setting after finishing the R-Y, B-Y PEDESTAL ADJUSTMENT.

| ITEM | AD ADDRESS | READ OUT DATA | |
|-------|------------|----------------------|----------------------|
| | | AT WHITE | AT DARK |
| AWBY | 05 | | |
| | | WRITE TO 53 (EEPROM) | WRITE TO 3F (EEPROM) |
| S/H 1 | 06 | | |
| | | WRITE TO 54 (EEPROM) | WRITE TO 3C (EEPROM) |
| S/H 2 | 16 | | |
| | | WRITE TO 55 (EEPROM) | WRITE TO 3D (EEPROM) |

Fig. C32 Memo 1

26-1. AWBY (DARK)

- (1) Close the IRIS.
- (2) Set the command to "05". (Reading the A/D converted data)
- (3) Set the address to "05".
- (4) Push the "SET" key to read out the A/D data. If data is within "08" to "20", take memo of its data. (to blank column of above table Fig.C32).
If data is not within "08" to "20", change the D/A data with command "01", address "1A" so that A/D data becomes within "08" to "20" as follows.
 - * Set the command to "01".
 - * Set the address to "1A".
 - * Push the "INC" or "DEC" key.
 - * Confirm the A/D data (by doing (2) to (4)).
 - * Repeat these until A/D data becomes within "08" to "20" and take memo of its A/D data. (to blank column Fig.C32)
 - * Set the command to "02".
 - * Set the address to "13".
 - * Push the "SET" key to write its data to EEPROM.

26-2. S/H 1 (DARK)

- (1) Close the IRIS.
- (2) Set the command to "05". (Reading the A/D converted data)
- (3) Set the address to "06".
- (4) Push the "SET" key to read out the A/D data. If data which is read out is within "04" to "20", take memo of its data. (to blank column Fig.C32).
If data is not within "04" to "20", change the D/A data with command "01", address "1C" so that A/D data becomes within "04" to "20" as follows.
 - * Set the command to "01".
 - * Set the address to "1C".
 - * Push the "INC" key or "DEC" key.
 - * Confirm the A/D data (by doing (2) to (4)).
 - * Repeat above (2) to (4) until A/D data becomes "04" to "20" and take memo of its data. (to blank column Fig.C32).
 - * Set the command to "02".
 - * Set the address to "14".
 - * Push the "SET" key to write its data to EEPROM.

26-3. S/H 2 (DARK)

- (1) Close the IRIS.
- (2) Set the command to "05". (Reading the A/D converted data)
- (3) Set the address to "16".
- (4) Push the "SET" key to read out the data. If data which is read out is within "04" to "20" take memo of its data. (to blank column of Fig.C32)

If data is not within "04" to "20", change the D/A data with command "01", address "1C" so that A/D data becomes within "04" to "20" as follows,

- * Set the command to "01".
- * Set the address to "1C".
- * Push the "INC" key or "DEC" key.
- * Confirm the A/D data (by doing (2) to (4)).
- * Repeat above (2) to (4) until A/D data becomes "04" to "20" and take memo of its data. (to blank column Fig.C32)
- * Set the command to "02".
- * Set the address to "14".
- * Push the "SET" key to write its data to EEPROM.

26-4. AWBY (WHITE)

- (1) Aim the camera at white chart.
- (2) Set the command to "05".
- (3) Set the address to "05".
- (4) Push the "SET" key to read out the AD data and take memo of the number which is indicated on DATA LED to blank column of above table. (Fig.C32)

26-5. S/H 1 (WHITE)

- (1) Aim the camera at white chart.
- (2) Set the command to "05".
- (3) Set the address to "06".
- (4) Push the "SET" key to read out the AD data and take memo of its number to blank column. (Fig.C32)

26-6. S/H 2 (WHITE)

- (1) Aim the camera at white chart.
- (2) Set the command to "05".
- (3) Set the address to "16".
- (4) Push the "SET" key to read out the data and take memo of its data into blank column of Fig.C32.

26-7. Writing the data

AWBY (WHITE) to "53"

- (1) Set the command to "02".
- (2) Set the address to "53".
- (3) Push the "DATA" key and enter the data of AWBY (WHITE) which is taken memo at 26-4.
- (4) Push the "SET" key to write its data.

S/H 1 (WHITE) to "54"

- (5) Set the command to "02".
- (6) Set the address to "54".
- (7) Push the "DATA" key and enter the data of S/H 1 (WHITE) which is taken memo at 26-5.
- (8) Push the "SET" key to write its data.

S/H 2 (WHITE) to "55"

- (9) Set the command to "02".
- (10) Set the address to "55".

- (11) Push the "DATA" key and enter the data of S/H 2 (WHITE) which is taken memo at 26-6.
- (12) Push the "SET" key to write its data.

AWBY (DARK) to "3F"

- (13) Set the command "02".
- (14) Set the address to "3F".
- (15) Push the "DATA" key and enter the data of AWBY (DARK) which is taken memo at 26-1.
- (16) Push the "SET" key to write its data.

S/H 1 (DARK) to "3C"

- (17) Set the command to "02".
- (18) Set the address to "3C".
- (19) Push the "DATA" key and enter the data of S/H 1 (DARK) which is taken memo at 26-2.
- (20) Push the "SET" key to write its data.

S/H 2 (DARK) to "3D"

- (21) Set the command to "02".
- (22) Set the address to "3D".
- (23) Push the "DATA" key and enter the data of S/H 2 (DARK) which is taken memo at 26-3.

26-8. Calculation of AWB INDOOR SETTING

Convert the data that you took memo to decimal number using conversion table Fig.C49. And substitute the these data into following formula then, calculate it, And take memo of it.

$$(A) \text{ S/H1 31} = \text{memo} = \frac{\text{S/H 1(WHITE)} - \text{S/H 1(DARK)}}{\text{AWBY(WHITE)} - \text{AWBY(DARK)}} \times 128$$

$$(B) \text{ S/H2 31} = \text{memo} = \frac{\text{S/H 2(WHITE)} - \text{S/H 2(DARK)}}{\text{AWBY(WHITE)} - \text{AWBY(DARK)}} \times 128$$

Fig. C33 Calculation 2 and memo.

27. AWB DATA SETTING FOR OUTDOOR

MEMO

| ITEM | AD ADDRESS | READ OUT DATA | |
|-------|------------|----------------------|-------------|
| | | WHITE | DARK |
| AWBY | 05 | 00 | Same as 24. |
| | | WRITE TO 56 (EEPROM) | |
| S/H 1 | 06 | 00 | Same as 24. |
| | | WRITE TO 57 (EEPROM) | |
| S/H 2 | 16 | 00 | Same as 24. |
| | | WRITE TO 58 (EEPROM) | |

Fig. C34 Memo

Using same way as "26, AWB DATA SETTING FOR INDOOR", read out the data of AD address "05", "06", "16" when lens is covered with VFK0324.

27-1. AWBY (WHITE)

- (1) Aim the camera at white chart.
- (2) Cover the lens with VFK0324
- (3) Set the command to "05".
- (4) Set the address to "05".
- (5) Push the "SET" key to read the data and take memo of its data into blank column of Fig.C34.

27-2. S/H 1(WHITE)

- (1) Aim the Camera at white chart.
- (2) Cover the lens with VFK0324.
- (3) Set the command to "05".
- (4) Set the address to "06".
- (5) Push the "SET" key and take memo of its data into blank column Fig.C34.

27-3 S/H 2(WHITE)

- (1) Aim the camera at white chart.
- (2) Cover the lens with VFK0324.
- (3) Set the command to "05".
- (4) Set the address to "16".
- (5) Push the "SET" key and take memo of its data into blank column of Fig.C34.

27-4. Writing the data

AWBY (WHITE) TO "56"

- (1) Set the command to "02".
- (2) Set the address to "56".
- (3) Push the "DATA" key and enter the data of AWB (WHITE) which is taken memo at 27-1.
- (4) Push the "SET" key to write its data.

S/H 1 (WHITE) to "57"

- (5) Set the command to "02".
- (6) Set the address to "57".
- (7) Push the "DATA" key and enter the data of S/H 1 (WHITE) which is taken memmo at 27-2.
- (8) Push the "SET" key to write its data.

S/H 2 (WHITE) to "58"

- (9) Set the command to "02".
- (10) Set the address to "58".
- (11) Push the "DATA" key and enter the data of S/H 2 (WHITE) which is taken memo at 27-3.
- (12) Push the "SET" key to write ists data.

27-5. Calculation of AWB OUTDOOR SETTING

Convert the data that you took memo of Fig.C35. to decimal number using conversion table Fig.C49. Substitute its data into following formula and calculate it and take memo of result into blank column of Fig.C35.

$$(C) \text{ S/H1 51} = \text{Memo} = \text{S/H 1(WHITE)} - \text{S/H 1(DARK)} / \text{AWBY(WHITE)} - \text{AWBY(DARK)} * 128$$

$$(D) \text{ S/H2 51} = \text{Memo} = \text{S/H 2(WHITE)} - \text{S/H 2(DARK)} / \text{AWBY(WHITE)} - \text{AWBY(DARK)} * 128$$

Fig. C35 Calculation 3 and Memo

28. DATA SETTING FOR COLOUR TEMPERATURE DETECTION AND COLOUR TEMPERATURE COLOUR DETECTION.

- (1) Substitute the decimal data (A,B,C,D) from memo Fig.C33, Fig.C35 into following formula and calculate it.
- (2) Then, convert its result (decimal data) to hexadecimal data using conversion table Fig.C49.
- (3) Write its data into proper EEPROM address with command "02".
- (4) Refer to "FOR EXAMPLE" of next.

| NO. | ITEM | EEPROM ADDRESS | RESULT OF CALCULATION | FORMULA |
|-----|------------|----------------|-----------------------|---------------------------------|
| 1 | S/H2 31→28 | 46 | | $(B) - 0.32 * ((D) - (B))$ |
| 2 | S/H2 28→31 | 47 | | $(B) - 0.32 * ((D) - (B))$ |
| 3 | S/H2 36→31 | 48 | | $(B) + 0.03 * ((D) - (B))$ |
| 4 | S/H2 31→36 | 49 | | $(B) + 0.03 * ((D) - (B)) + 4$ |
| 5 | S/H2 45→36 | 4A | | $(B) + 0.33 - ((D) - (B))$ |
| 6 | S/H2 36→45 | 4B | | $(B) + 0.33 * ((D) - (B)) + 4$ |
| 7 | S/H2 51→45 | 4C | | $(B) + 0.52 * ((D) - (B))$ |
| 8 | S/H2 45→51 | 4D | | $(B) + 0.52 * ((D) - (B)) + 4$ |
| 9 | S/H2 60→51 | 4E | | $(B) + 1.19 * ((D) - (B))$ |
| 10 | S/H2 51→60 | 4F | | $(B) + 1.19 * ((D) - (B)) + 10$ |
| 11 | S/H1 G28 | 20 | | $(A) - 41$ |
| 12 | S/H1 G31 | 21 | | $(A) - 41$ |
| 13 | S/H1 G36 | 22 | | $(A) - 35$ |
| 14 | S/H1 G45 | 23 | | $(A) - 47$ |
| 15 | S/H1 G51 | 24 | | $(A) - 19$ |
| 16 | S/H1 G60 | 25 | | $(A) + 17$ |
| 17 | S/H1 GPD | 26 | | $(A) - 35$ |
| 18 | S/H1 Mg 28 | 28 | | $(A) * 256$ |
| 19 | S/H1 Mg 31 | 29 | | $(A) * 256$ |
| 20 | S/H1 Mg 36 | 2A | | $(A) + 23$ |
| 21 | S/H1 Mg 45 | 2B | | $(A) + 7$ |
| 22 | S/H1 Mg 51 | 2C | | $(A) + 55$ |
| 23 | S/H1 Mg 60 | 2D | | $(A) + 72$ |
| 24 | S/H1 Mg PD | 2E | | $(A) + 39$ |

Fig. C36

((FOR Example))

| Item | EEPROM ADDRESS | FORMULA |
|------------|----------------|--------------------|
| S/H2 45-36 | 4A | (B)+0.46*((D)-(B)) |

- (1) Substitute the decimal data of (B), (D) from Fig.C33, Fig.C35.
 $= 12 + 0.46 * (147 - 12)$
 $= 12 + 0.46 * 135$
 $= 12 + 62.1$
 $= 74.1$
 $= 74 = \text{RESULT OF CALCULATION}$
- (2) Convert the result of hexadecimal.
 decimal 86 = hexadecimal 4A.
- (3) Set the command to "02".
- (4) Set the address to "4A".
- (5) Set the data to "4A" by pushing "DATA" key, "4" key and "A" key.
- (6) Push the "SET" key to write the data.

29. WRITING THE DATA DIRECTLY

NOTE:

Unless you replace the EEPROM IC, this adjustment is not required.

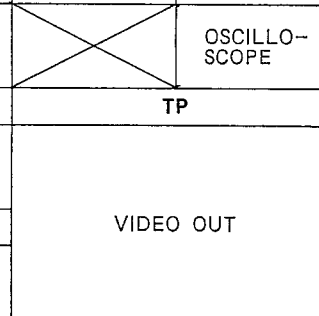
- (1) Write the following data to EEPROM directly with command "02".

| NO. | ITEM | EEPROM ADDRESS | DATA |
|-----|---------------|----------------|------|
| 1 | FADE TIME 1 | 30 | 6A |
| 2 | MEMORY SW1 | 31 | 00 |
| 3 | MEMORY SW2 | 32 | 10 |
| 4 | MEMORY SW3 | 33 | 08 |
| 5 | WRITE PROTECT | 34 | 00 |
| 6 | D.K HOLD L | 35 | 10 |
| 7 | FADE TIME 2 | 36 | 20 |
| 8 | MEMORY SW4 | 37 | 10 |
| 9 | FADE SPEED | 38 | 80 |
| 10 | AWB IN | 1A | 40 |
| 11 | RG IN | 1B | 10 |
| 12 | RMAT IN | 1C | 00 |

| | | | |
|----|---------|----|----|
| 13 | BWB IN | 1D | 20 |
| 14 | RG IN | 1E | 0A |
| 15 | BMAT IN | 1F | 00 |

Fig. C37

30. VITC SIGNAL LEVEL ADJUSTMENT (FOR NV-G2E/B/A/EN)

| CMD | ADDRESS | | CHART | M. EQ |
|-----------|---------|--------|---|--------------|
| | D/A | EEPROM | | |
| 01 | 01 | 00 |  | OSCILLOSCOPE |
| SPEC. | | | | TP |
| 580+-20mV | | | | VIDEO OUT |
| CONDITION | | | | |
| FADE : ON | | | | |

NOTE:

Refer to preparation for connection of E.V.R.

- (1) Connect the Video output to oscilloscope.
- (2) Place the unit to "FADE" by pushing "SHIFT 1" and "D" keys together.
- (3) Insert the plug of VITC Generator Cord into the Character Generator Terminal.
- (4) Push "CMD", "0" and "1" keys.
- (5) Push "ADR", "0" and "1" keys.
- (6) Push "INC" or "DEC" so that waveform become 580+-20mV as shown in Fig.C38.
- (7) Push the "CMD", "0" and "2" keys.
- (8) Push the "ADR", "0" and "0" keys.
- (9) Push the "SET" key in order to write the data to EEPROM.

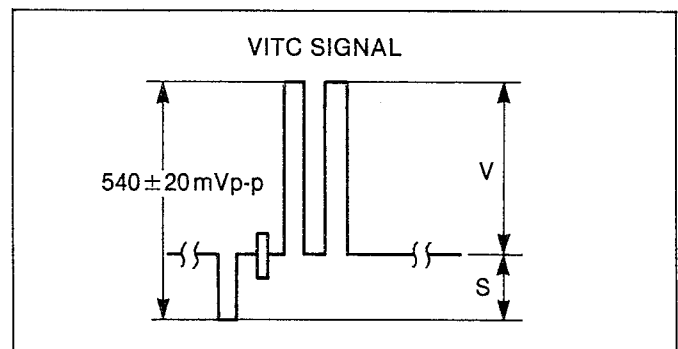
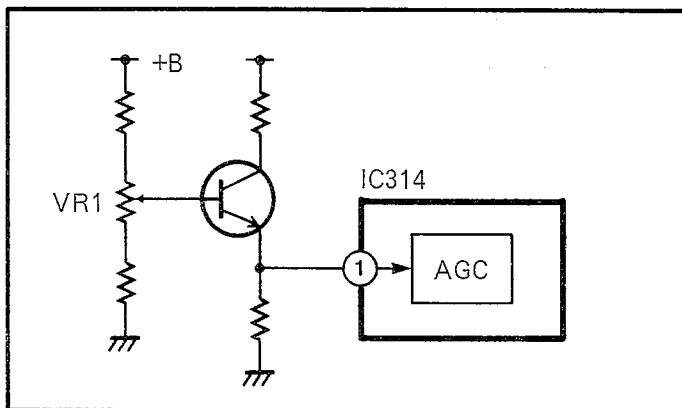


Fig. C38

2-6-2 HOW TO OPERATE E V R FIXTURE

(CONVENTIONAL ADJUSTMENT)

CAMERA PROCESS C.B.A.



Control voltage is decided by variable resistor.

Fig. C39

(NEW ADJUSTMENT BY E.V.R)

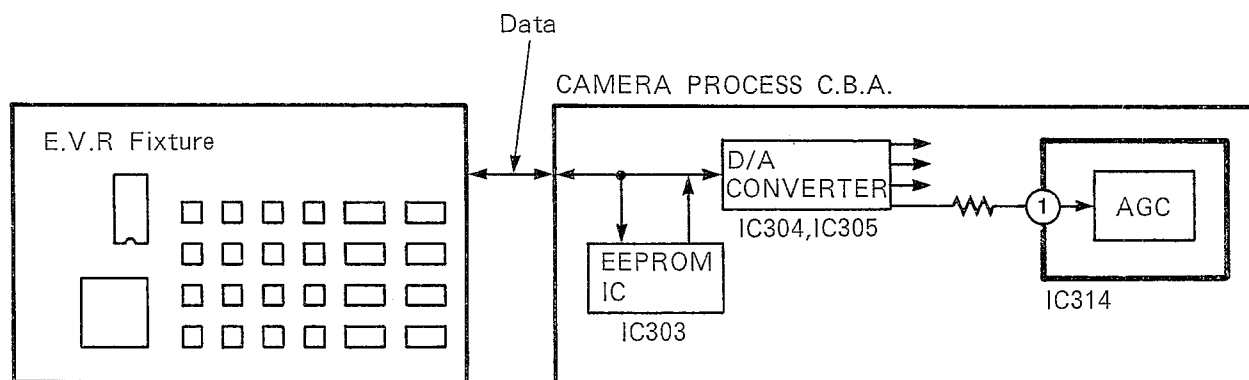


Fig. C40

In case of NV-G2/G200/G1/G100, adjustment voltage is memorized in EEPROM as 8 bit digital data. EEPROM supplies the memorized adjustment voltage to the adjustment point through D/A converter as shown in Fig.C4.

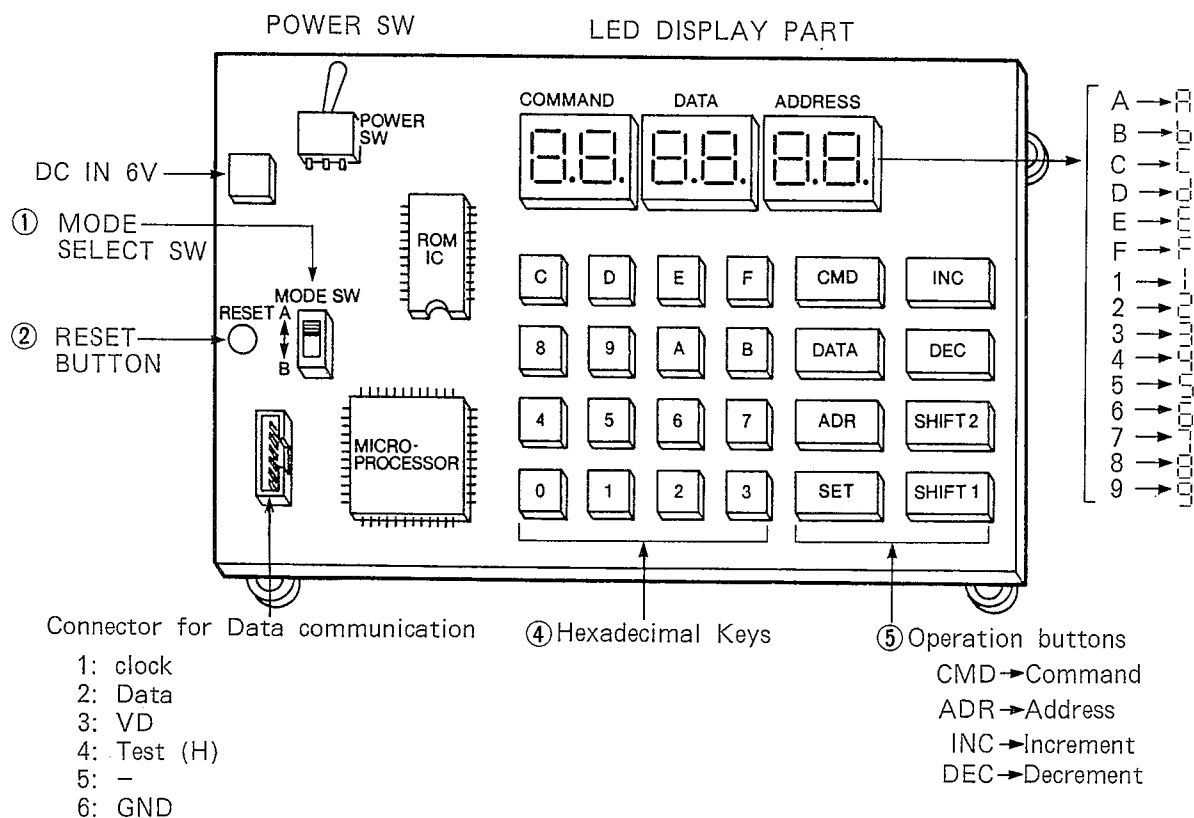
The data in EEPROM can be electrically exchanged freely. E.V.R. (Electric Variable Resistor) has been developed to exchange the 8 bit data of EEPROM in process circuit.

E.V.R can also communicate with D/A converter directly to change the each control voltage.

Normally EEPROM is having voltage data and is sent to D/A converter where digital data is changed into DC voltage (control voltage).

Using E.V.R. you can change the data stored in EEPROM easily, in other words, you can adjust the camera process section. And E.V.R. can also send the data to D/A converter directly for confirming the adjustment.

Name of Key



| NO. | NAME | DESCRIPTION |
|-----|----------------------------------|---|
| ① | MODE SW | MODEL selection switch. In case of NV-G2/G200, turn it to "A" side |
| ② | RESET BUTTON | After Power is on, if operation is not stable, push this SW. |
| ③ | ROM IC | ROM IC of which Programing (to operate E.V.R) is memorized in. In the tuture, to cope with new camcorder servicing, this ROM IC could be replaced to new version. |
| ④ | HEXADECIMAL KEYS | Key buttons of 16 pieces (from "O" to "F"). These are used when "COMMAND", "DATA" or "ADDRESS" is set. |
| ⑤ | OPERATION BUTTONS | The buttons to operate writing, reading or setting the data. |
| | CMD: Command button | This is used to decide the which communication between E.V.R and camcorder (for example, data writing or reading) to perform. |
| | DATA: Data button | To be used for displaying the data. |
| | ADR: Address button | To appont the EEPROM address or D/A converter address. |
| | SET: Set button | To communicate the data which is displaying with camcorder. |
| | INC: Incliment
DEC: Decliment | Increase or decrease the data one by one (+1, -1) |
| | SHIFT 1 button | To carry out macro operation (while pusing with hexadecimal keys) SHIFT 1 button is used. |
| | SHIFT 2 button | Not used. |

Fig. C41

(Before Adjusting, How to use the E.V.R. Fixture)

- 1) How to Read out the Data which is being stored in EEPROM.
Connect the E.V.R. Fixture as shown in Fig.C3 and perform the "initial setting". Pushing "SHIFT 1" key and "1" key together.

Result: Adjustment value of ALC has been set for "4D".

It is convenient to read out the data like this (and take memo) before writing the new data next time) even if something mistake is happened when writing the new data, you can rewrite original data.

| Item | Proceduring Order | | Buttons to be Pushed | LED Indication |
|--|-------------------|---|--|--|
| | 1 | Initial Setting (Refer to Preparation)
It is not necessary to do "Initial Setting" at before every Read out. It is enough to do once before starting the adjustment. | SHIFT 1 + 1

Push both buttons together. | 0 1 8 0 0 0 |
| For Example,
Recording out the data of ALC Adjustment
communication from camcorder to E.V.R
Fixture
Camera → E.V.R | 2 | Set the Command mode to "04" "04" is read out command. (Refer to command description) | CMD 0 4 | LED lights up
04/80 00
Command setting |
| | 3 | Set the Address of EEPROM | ADR 0 6 | 04 4d 06
Address setting of EEPROM LED lights up |
| | 4 | Read out the data | SET

Push this for 2 seconds | 04 4d 06
data for ALC for example |

Fig. C42

2) Writing the New Data.

Note 1:

In order to avoid the mis-writing protection data is stored in Address "34" of EEPROM. This must be released before writing. Releasing the write protection ; Push the "SHIFT 1" key and "7" key together.
*There is 2 procedures to write the new data.

- 1) Write the data after finding the best point (Search and writing procedure)
- 2) Write the data directly (Direct writing Procedure)

(1) Search and write Procedure (For example :ALC Adjustment)

Confirmation: Confirm whether data is written correctly or not.

- Procedure -
1. Set the command to "04"
 2. Set the address to "06"
 3. Push the "SET" button.
 4. The number which is indicated on DATA LED is a data which has been written.

Note 2:

In this procedure, E.V.R. controls the D/A converter directly (Because data of D/A converter is changed, adjustment voltage is changed) and after finding the best point E.V.R. marks D/A converter transfer the data to EEPROM. (Refer to construction system in Fig.C-4) Then, Data is written in EEPROM, Therefore, Address of D/A converter is different from address of EEPROM. For example, in case of ALC adjustment, address of D/A converter is "21" but address of EEPROM is "06". At the first, when command "01" is appointed, D/A converter is controlled directly by E.V.R. Then, when "SHIFT 1" and "0" are pushed together, data in D/A converter is written in EEPROM where address is "06" automatically in spite of without appointing the address of EEPROM. (When "SHIFT 1" and "0" keys are pushed together, data of D/A converter is automatically transferred in to corresponding EEPROM address and is stored automatically.)

Note 3: If LED display "Err" that means Error, check the write protection (refer to Note

| Item | Proceduring Order | Buttons to be Pushed | LED Indication |
|---|---|--|--|
| | 1 Initial Setting (Refer to Preparation)
It is not necessary to do "Initial Setting" at before every writing the data. It is enough to do once before starting the adjustment. | SHIFT 1 + 1
Push both buttons together | 0 1 8 0 0 0 |
| For Example, writing the ALC adjustment data.
E.V.R→Camera | 2 Set the command to "01". | CMD 0 1 | Command for search mode. |
| | 3 Set the Address of D/A converter for "21"
E.VR→D/A (communication from E.V.R to D/A converter)) | ADR 2 1 | LED lights up
0 1 8 0 0 0 |
| | 4 Adjustment
Push "DEC" or "INC" button so that Peak to Peak of waveform at TP307 become 300mV±20mV. (use oscilloscope) | Search with
INC or DEC | 0 1 8 0 2 1
LED lights up |
| | 5 Write in the data after finding the best front. | SHIFT 1 + 0
Push both buttons together. | LED will disappear.
0 1 4 2 / 2 1
Data "4D" has been stoved into EEPROM. |

Fig. C43

(2) Direct Writing Procedure




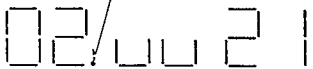







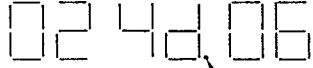

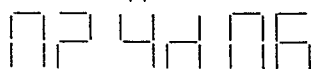
| Item | Proceduring Order | | Buttons to be Pushed | LED Indication |
|--|-------------------|--|---|--|
| | 1 | Initial Setting same as (1) | same as (1) | same as (1) |
| For Example, writing the ALC adjustment data | 2 | Searching the best Point.
same as (1) | same as (1) | same as (1) |
| | 3 | | | |
| | 4 | | | |
| | 5 | Change the command to "02" |    | LED lights up

Command for Direct writing |
| | 6 | Set the address of EEPROM to "06" |    | address of EEPROM

LED lights up |
| | 7 | Set the data of best point "4D" |    | 
LED lights up |
| | 8 | Write the data | 
Push this for 2sec. | LED disappear.
 |

Fig. C44

Confirmation: Confirm whether data is written correctly or not.

- Procedure –
1. Set the Command to "04"
 2. Set the Address to "06"
 3. Push the "SET" button
 4. The number which is indicated on DATA LED is a data which has been written.

Write the data "00" to address "34" of EEPROM so that wrong data is written in by mistake. This procedure is automatically done if "SHIFT 1" and "6" are pushed together with command "01".

(Description of Command)

Selecting the communication for what kind of data exchange is performed between EVR Fixture and camcorder.






| Command | Communication | Contents |
|---|-----------------------------|---|
|  | EVR Fixture → D/A converter | Data transmission from EVR to address of D/A converter. |
|  | EVR Fixture → EEPROM | Writing the data to address of EEPROM. |
|  | EEPROM → D/A converter | — |
|  | EEPROM → EVR Fixture | Reading out the data of EEPROM. |
|  | A/D→EVR Fixture | Data transmission of A/D conversion to EVR. |

Fig. C45

(SHIFT1 Command)

The following operations are provided to transfer the data by one touch.

| NO. | Buttons to be pushed | Operation |
|-----|------------------------------------|---|
| 1 | SHIFT 1 + 0
Push these together | Writing the Data of D/A converter, which is indicated on LED Display, into corresponded address of EEPROM.
Condition: right after carrying out the command with "01" |
| 2 | SHIFT 1 + 1 | Setting the all data of EEPROM into D/A converter (Initial Setting). |
| 3 | SHIFT 1 + 2 | Making ALC fully open. |
| 4 | SHIFT 1 + 3 | Making ALC fully close. |
| 5 | SHIFT 1 + 4 | Making AGC Gain minimize. |
| 6 | SHIFT 1 + 5 | Making AGC Gain maximize. |
| 7 | SHIFT 1 + 6 | Writing protection of EEPROM on. (Data writing can not be performed/write inhibit) |
| 8 | SHIFT 1 + 7 | Releasing the writing protection. (Data writing can be performed) |
| 9 | SHIFT 1 + 8 | Releasing the HC (High Cut). |
| 10 | SHIFT 1 + 9 | Zoom comes to "TELE" position. |
| 11 | SHIFT 1 + A | Zoom comes to "WIDE" position. |
| 12 | SHIFT 1 + B | Focus becomes "Auto Focus". |
| 13 | SHIFT 1 + C | Focus becomes "Manual Focus". |
| 14 | SHIFT 1 + D | FADE ON |
| 15 | SHIFT 1 + E | FADE OFF |

Fig. C46

Note: If you want to stop the zoom in between TELE and WIDE, you can control it by using "SHIFT1" + "9" or "SHIFT1" + "A" alternately. For example, when zoom motor is moving to TELE side if you push "SHIFT1" and "A" keys together, zoom motor is stopped.

(Error Indication)

If something error is happening while EVR is working, EVR indicates the error message which are mentioned in Fig.C47 for 2 seconds and then return to previous indication.

| Error NO. | Contents of Error | Simple checking method |
|-----------|--|---|
| 0 | Command of except "01"~"06" is set | |
| 1 | VD signal from camera is not coming. | lead wire of TP may be cut out |
| 2 | Communication with camera is not synchronized. | lead wire of TP may be cut out |
| 3 | Writing error in the EEPROM of camera. | Check with command "01" and.
SHIFT 1 + 7
(Releasing the writing Protection) |

Fig. C47

(Other functions which can be controlled by E.V.R)

| Shutter Speed
key In | Normal | 1/120sec. | 1/250sec. | 1/500sec. | 1/1000sec. | 1/2000sec. | 1/4000sec. |
|-------------------------|--------|-----------|-----------|-----------|------------|------------|------------|
| CMD | 06 | 06 | 06 | 06 | 06 | 06 | 06 |
| DATA | 00 | 20 | 40 | 60 | 80 | A0 | C0 |
| ADR | 40 | 40 | 40 | 40 | 40 | 40 | 40 |

Fig. C49

Camera operation can be controlled by EVR even during adjustment.
For example, in case of high speed shutter 1/120sec. Set the command "06", Data "20" and D/A address "20".
Then push "SET" button, camera becomes 1/120sec. shutter speed.
1) Push "CMD" button then push "0" and "6" buttons.
2) Push "DATA" button then push "2" and "0" buttons.
3) Push "ADR" button then push "4" and "0" buttons.
4) Push "SET" button. Camera becomes 1/120sec. shutter speed.
As the same way, following operation can be done.

For some of adjustment items, calculation of hexadecimal data (indicated on LED of EVR Fixture) is needed to obtain the adjustment data.
In these cases, convert the hexadecimal value to decimal value before calculation and after calculation is finished, reconvert the result to hexadecimal to obtain the adjustment data. Thus, write the adjustment data into EEPROM.
A hexadecimal - Decimal conversion table is shown in Fig.C49.

| Hexadecimal
lower digit | Hexadecimal
upper digit | | | | | | | | | | | | | | | |
|----------------------------|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | b | C | d | E | F |
| 0 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 1 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| 2 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 |
| 3 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 |
| 4 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 |
| 5 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 |
| 6 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 |
| 7 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 |
| 8 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 |
| 9 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 |
| A | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 |
| b | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 |
| C | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 |
| d | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 |
| E | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 |
| F | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 |

For example: If indication of EVR is "A8" (as upper digit is "A" and lower digit is "8"), a decimal value of "168" is obtained from the intersection of ① and ② in the above table.

Fig. C50 Hexadecimal-Decimal Conversion Table

2-6-3. ELECTRICAL ADJUSTMENT
FOR E V F SECTION

The following adjustments are for Electronic Viewfinder.

- (1) Connect the Viewfinder plug to the E.V.F. connector on the unit.
- (2) The camera circuit must be completely sligned before viewfinder adjustments are made.

1. H-OSC ADJUSTMENT

| TP | ADJ. | LENS CAP | CHART |
|-------------------|-------|-----------------|------------|
| Pin 1 of P801 | VR802 | NO | BALL CHART |
| M. EQ. | | SPEC. | |
| FREQUENCY COUNTER | | 15.9KHz+-0.1KHz | |

NOTE:
P801,VR802: E.V.F. C.B.A.

- (1) Connect the Frequency counter Pin 1 of P801, use DC.
- (2) Adjust the H-OSC(VR802) so that the frequency is 15.9+-0.1KHz.

2. CENTERING ADJUSTMENT

- (1) Aim the camera at the registration chart.
- (2) Adjust the Deflection Yoke Centering Magnets by turning them so that the picture on monitor TV is centered.

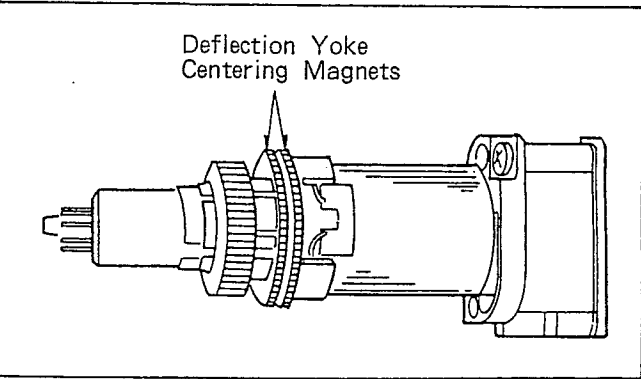


Fig. C51

3. FOCUS ADJUSTMENT

| TP | ADJ. | LENS CAP | CHART |
|------------|-------|-----------------|------------|
| | VR803 | NO | BALL CHART |
| M. EQ. | | SPEC. | |
| VIEWFINDER | | BEST RESOLUTION | |

NOTE:
VR803: E.V.F. C.B.A.

- (1) Aim the camera at the Ball chart.
- (2) Adjust the focus control(VR803) for best resolution in the viewfinder.

4 V.SIZE ADJUSTMENT

| TP | ADJ. | LENS CAP | CHART |
|------------|-------|------------------------|------------------|
| | VR801 | NO | GRAY SCALE CHART |
| M. EQ. | | SPEC. | |
| VIEWFINDER | | VERTICAL SIZE IS FIXED | |

NOTE:
VR801: E.V.F. C.B.A.

- (1) Aim the camera at the gray scale chart.
- (2) Adjust the Vertical Size(VR801) so the Vertical Size is correct and the picture does not roll as shown in Fig.C47.

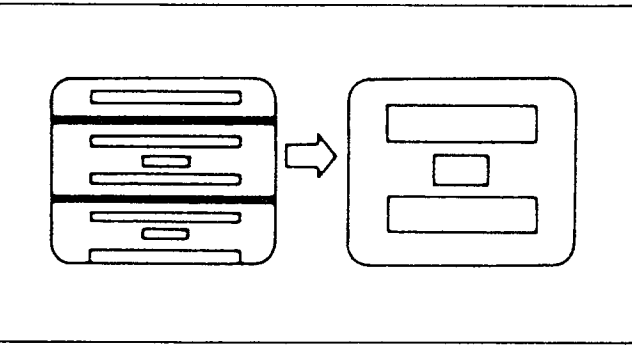


Fig. C52

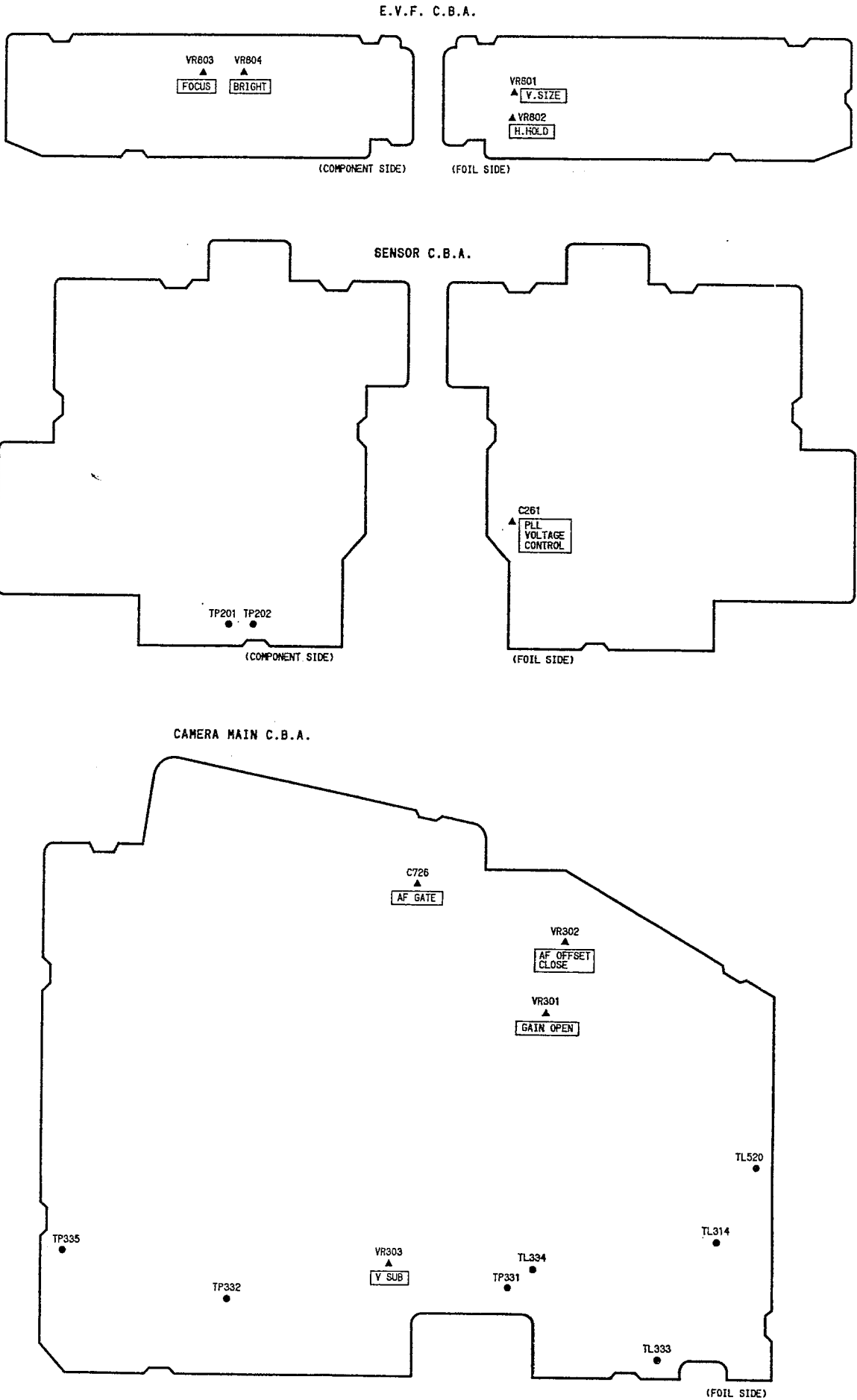
5. BRIGHTNESS ADJUSTMENT

| TP | ADJ. | LENS CAP | CHART |
|------------|-------|-------------------|------------------|
| | VR804 | NO | GRAY SCALE CHART |
| M. EQ. | | SPEC. | |
| VIEWFINDER | | NATURAL GRADATION | |

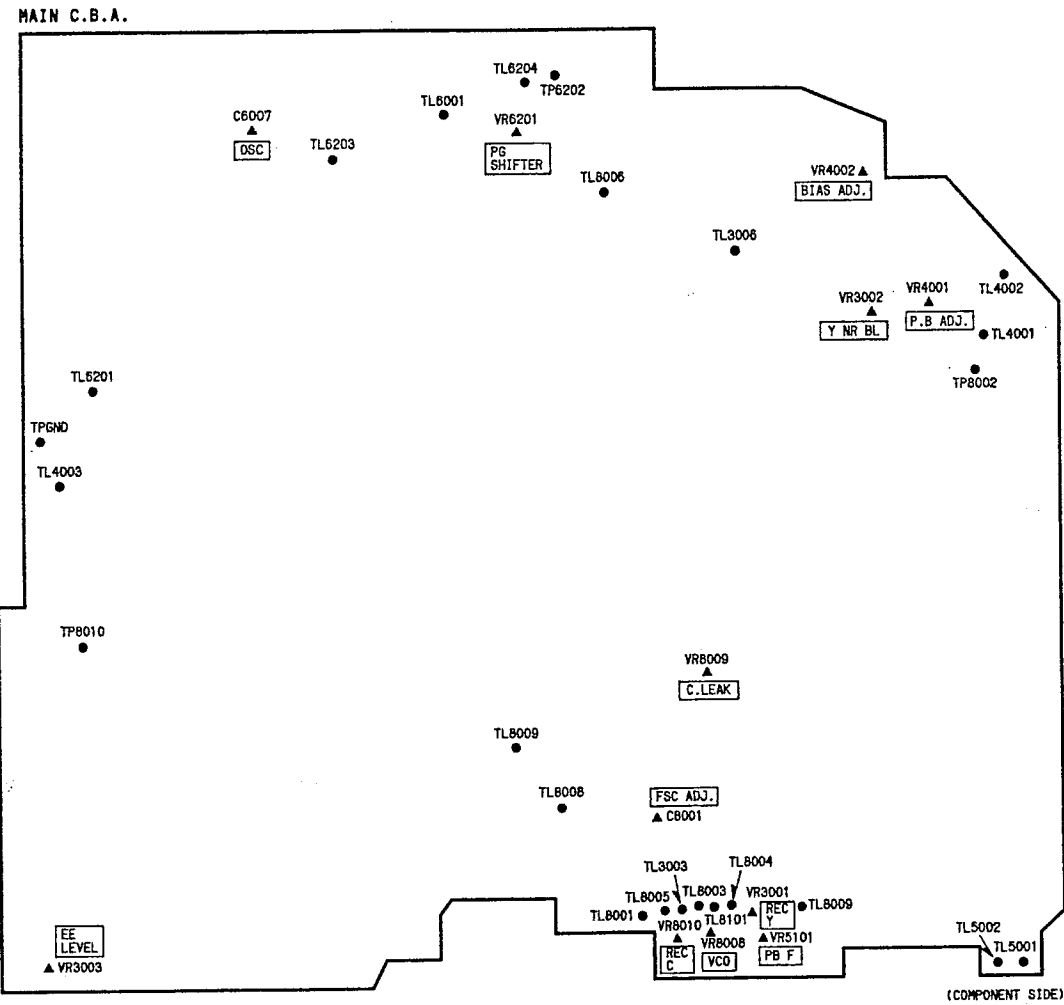
NOTE:
VR804: E.V.F. C.B.A.

- (1) Aim the camera at gray scale chart.
- (2) Adjust the brightness control(VR804) so that the black and white bars in the E.V.F. screen are the same as they are in the monitor TV screen.

LOCATION OF TEST POINTS & CONTROLS (1)



LOCATION OF TEST POINTS & CONTROLS (2)



2-6-4. ELECTRICAL ADJUSTMENT FOR VTR SECTION

TEST EQUIPMENT AND TOOLS

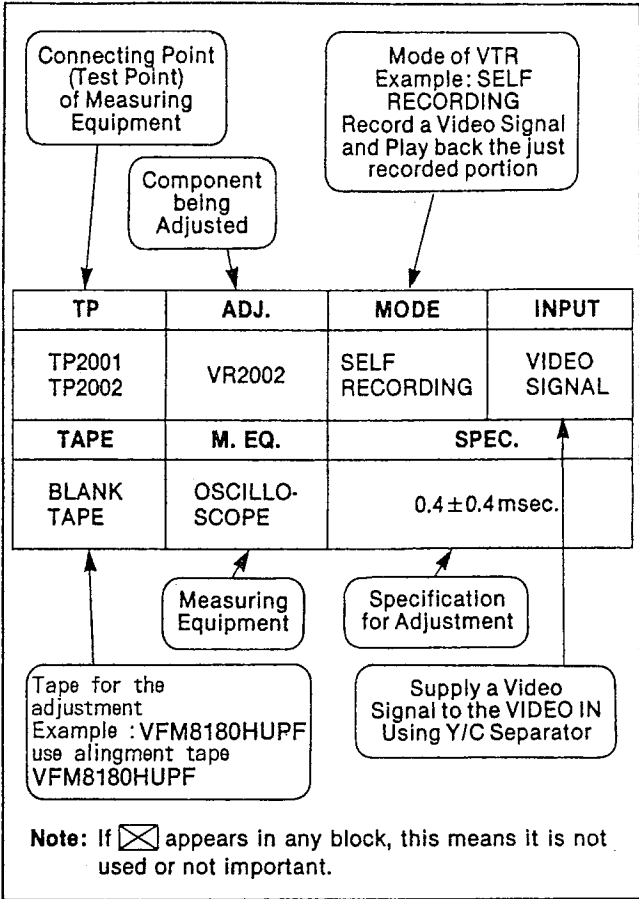
The following equipment is required for adjustment of the VTR section.

1. VTVM (Vacuum Tube Volt Meter)
DVM (Digital Volt Meter)
Voltage Range : 0.01~50V
2. Dual Trace Oscilloscope
Voltage Range : 0.06~50V/div
Frequency Range : 0~50MHz
Probe : 10:1 or 1:1
3. Frequency counter
Frequency Range : 0~10MHz
4. Signal Generator (Sinewave)
Frequency Range : 0~10MHz
5. Video Sweep Generator
Frequency Range : 0~10MHz
6. Colour Monitor TV
7. Plastic Tip Driver
8. VHS-C Alignment Tape (VF8180HUPF)
9. VHS-C Blank Tape
10. Pattern Generator
11. Vectorscope

PREPARATION


1. Remove the casing panels.
(Refer to the disassemble method)
2. Connect the extension cable if necessary.
Refer to Technical Information.

HOW TO READ THE ADJUSTMENT PROCEDURES



SERVO SECTION

1. PG SHIFTER ADJUSTMENT

| TP | ADJ. | MODE | INPUT |
|-----------------------------------|-------------------|-----------|---|
| TP6202
VIDEO OUT | VR6201 | PLAY |  |
| TAPE | M. EQ. | SPEC. | |
| ALIGNMENT
TAPE
(VF8180HUPF) | OSCILLO-
SCOPE | 6.5H±0.5H | |

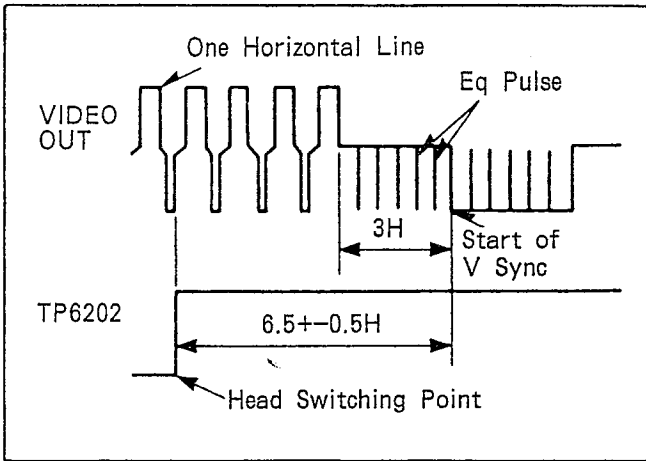


Fig. V2

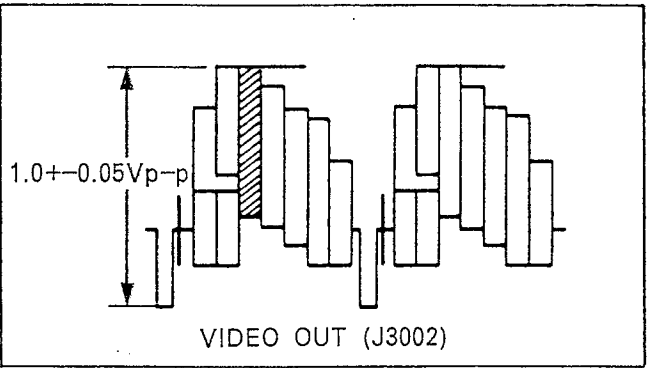



Fig. V3


3. Fsc ADJUSTMENT

| TP | ADJ. | MODE | INPUT |
|---------------|----------------------|--------------|---|
| TP8009 | C8001 | PLAY |  |
| TAPE | M. EQ. | SPEC. | |
| BLANK
TAPE | FREQUENCY
COUNTER | 4433619±50Hz | |

- (1) Connect the frequency counter to TP8009.
- (2) Adjust the C8001 so that frequency becomes 4433619±50Hz.

LUMINANCE & CHROMINANCE SECTION

2. E-E LEVEL ADJUSTMENT

| TP | ADJ. | MODE | INPUT |
|---|-------------------|----------------|---------------|
| VIDEO OUT | VR3003 | STOP | COLOUR
BAR |
| TAPE | M. EQ. | SPEC. | |
|  | OSCILLO-
SCOPE | A=1.0±0.05Vp-p | |

Note:
Video out should be terminated with 75 ohm or should be connected with TV.



(In case of shooting colour bar by camera)

- (1) Aim the camera at colour bar chart.
- (2) Connect the oscilloscope to video output.
- (3) Adjust the VR3003 so that Y output (White portion of colour bar) becomes 1.0±0.05Vp-p.

(In case of use of pattern generator)

- (1) Supply the Y signal of pattern generator to B6007-PIN8.
- (2) Adjust the VR3003 so that level becomes 1.0±0.05Vp-p.

4. VCO FREE-RUN FREQUENCY ADJUSTMENT

| TP | ADJ. | MODE | INPUT |
|---|----------------------|----------|---|
| TP8003 | VR8008 | STOP |  |
| TAPE | M. EQ. | SPEC. | |
|  | FREQUENCY
COUNTER | 613±5KHz | |

- (1) Connect the jumper wire between TP8001, TP8101 and TP8010(5V).
- (2) Connect the frequency counter to TP8003.
- (3) Adjust the VR8008 so that frequency becomes 613±5KHz.

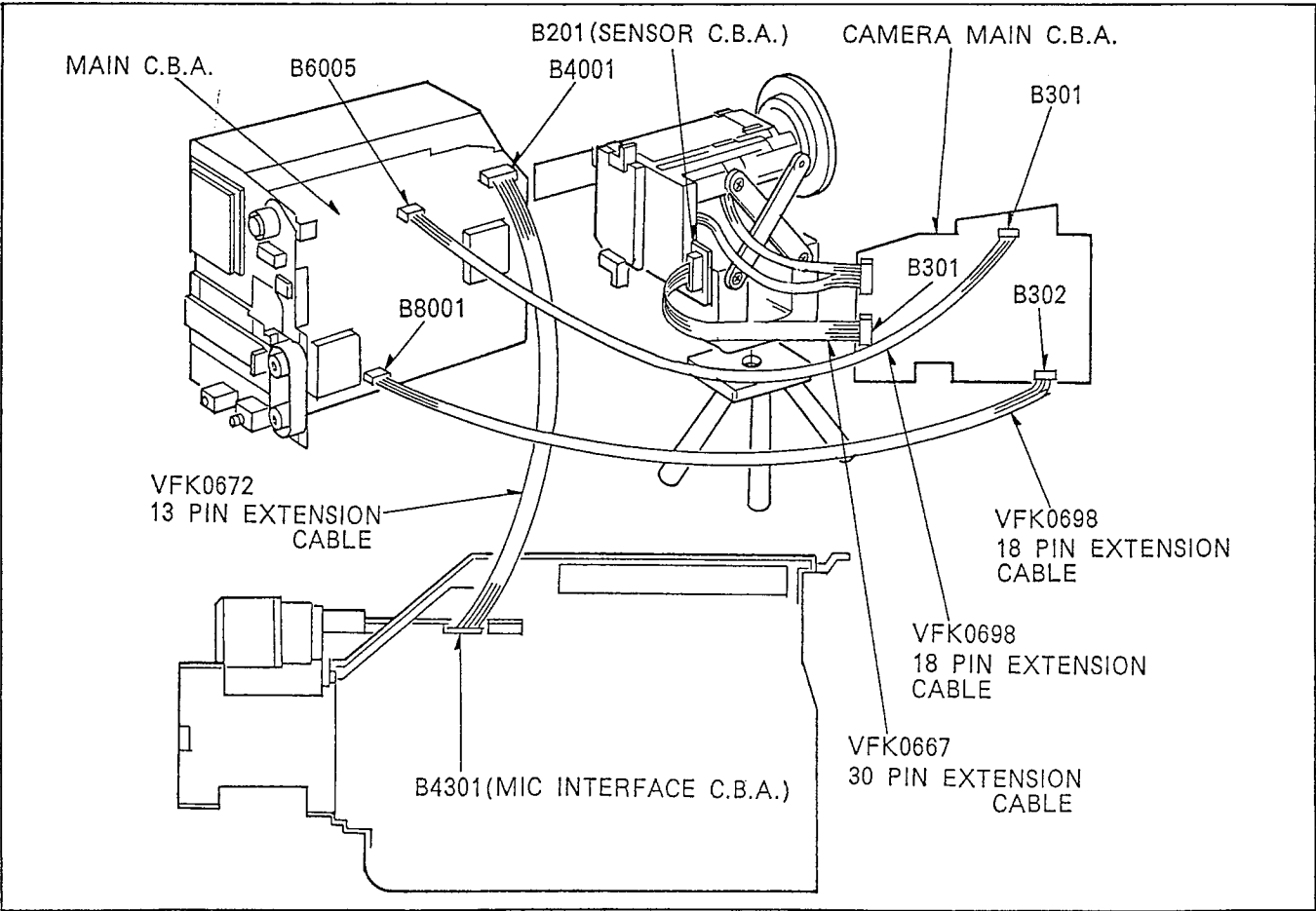


Fig. V1

5. MAIN BM CARRIER LEAK ADJUSTMENT

| TP | ADJ. | MODE | INPUT |
|--------|--------------|------------------|-------|
| TP8008 | VR8009 | STOP | |
| TAPE | M. EQ. | SPEC. | |
| | OSCILLOSCOPE | "A" IS MINIMIZED | |

- (1) Connect the jumper wire between TP8006 and TP8010(5V) in VTR mode.
- (2) Connect the oscilloscope to TP8008.
- (3) Adjust the VR8009 so that "A" is minimized.

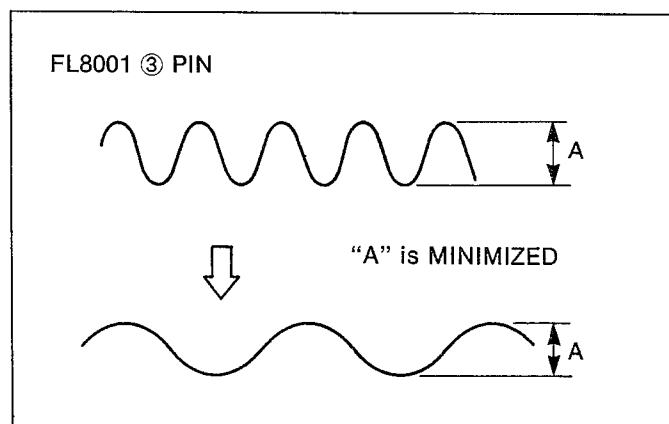


Fig. V4

6. RECORDIGN CURRENT ADJUSTMENT

6-1. REC CHROMA LEVEL ADJUSTMENT

| TP | ADJ. | MODE | INPUT |
|----------------------------|--------------|---------------------------|---------------|
| TP5001(HOT)
TP5002(GND) | VR8010 | S-VHS
REC/PLAY
(SP) | COLOUR
BAR |
| TAPE | M. EQ. | SPEC. | |
| BLANK
TAPE | OSCILLOSCOPE | 12+-5mVp-p | |

NOTE:

Perform this adjustment after finishing the Burst Level adjustment.

- (1) Connect the oscilloscope to TP5001(HOT) and TP5002(GND).
- (2) Connect the jumper wire between TP3003 and TP8010(5V) to eliminate luminance signal.
- (3) Aim the camera at colour bar.
- (4) Make recording in SP mode.
- (5) Adjust the VR8010 so that chroma level becomes 12+-5mVp-p.

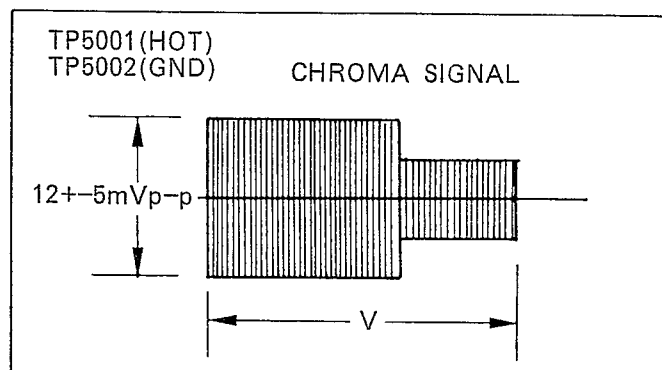


Fig. V5

6-2. LUMINANCE RECORDING CURRENT ADJUSTMENT

| TP | ADJ. | MODE | INPUT |
|----------------------------|--------------|-------------------|---------------|
| TP5001(HOT)
TP5002(GND) | VR3001 | SELF
RECORDING | COLOUR
BAR |
| TAPE | M. EQ. | SPEC. | |
| BLANK
TAPE | OSCILLOSCOPE | 110+-5mVp-p | |

- (1) Connect the oscilloscope to TP5001(HOT) and TP5002(GND).
- (2) Aim the camera at colour bar.
- (3) Make recording in SP mode.
- (4) Adjust the VR3001 so that luminance level becomes 110+-5mVp-p.

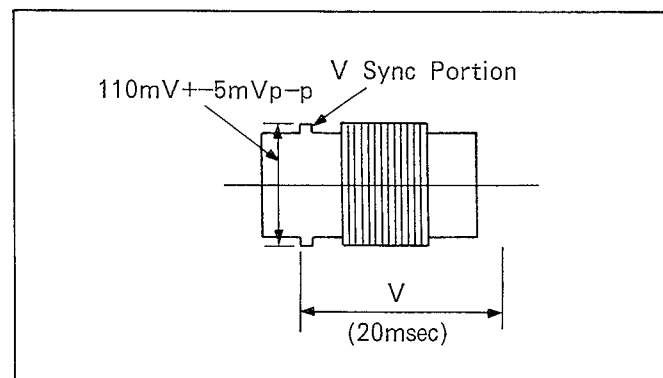


Fig. V6

7. YNR ADJUSTMENT

| TP | ADJ. | MODE | INPUT |
|---------------|--------------|--|---------------|
| TP3006 | VR3002 | SELF
RECORDING | COLOUR
BAR |
| TAPE | M. EQ. | SPEC. | |
| BLANK
TAPE | OSCILLOSCOPE | SIGNAL IS MINIMIZED
(LESS THAN 100mV) | |

- (1) Aim the camera at colour bar chart.
- (2) Record it in SP mode.
- (3) Connect the oscilloscope to TP3006.
- (4) Play back just recorded portion.
- (5) Adjust VR3002 so that signal is minimized.

8. HEAD FREQUENCY RESPONSE ADJUSTMENT FOR VHS MODE

| TP | ADJ. | MODE | INPUT |
|------------|---------------------------|---------------------|--------------------|
| LINE OUT | VR5101 | SELF RECORDING (SP) | VIDEO SWEEP SIGNAL |
| TAPE | M. EQ. | SPEC. | |
| BLANK TAPE | VIDEO SWEEP/ OSCILLOSCOPE | A=0+-1dB(56~71%) | |

- (1) Set the sweep generator output as shown below.

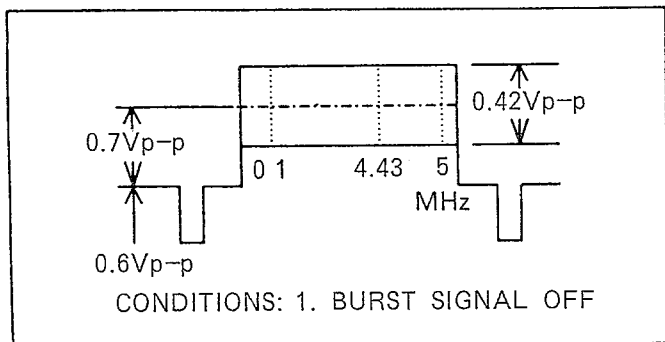


Fig. V7

- (2) Supply sweep signal to B6007-PIN8.
 (3) Record it for a while in SP mode.
 (4) Play back just recorded portion.
 (5) Adjust VR5101 so that level at 2MHz is within spec. as shown in Fig.V7.

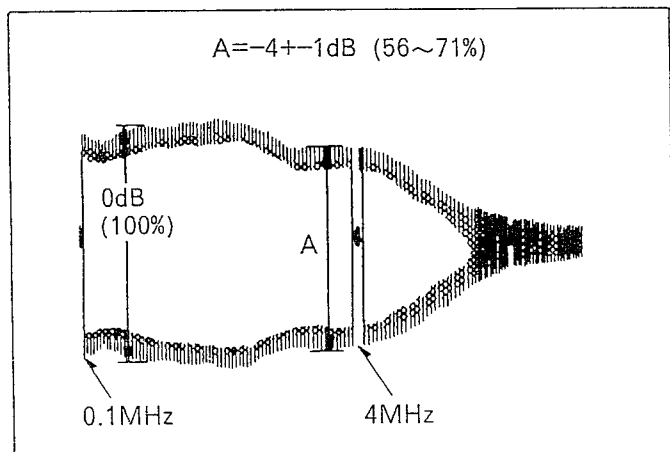


Fig. V8

AUDIO SECTION

9. AUDIO BIAS CURRENT ADJUSTMENT

| TP | ADJ. | MODE | INPUT |
|----------------------------|--------|--------------------|-------|
| TL4001(HOT)
TL4002(GND) | VR4002 | REC/PLAY | |
| TAPE | M. EQ. | SPEC. | |
| BLANK TAPE | D.V.M. | 2.7mVrms+-0.1mVrms | |

10. AUDIO PLAYBACK LEVEL ADJUSTMENT

| TP | ADJ. | MODE | INPUT |
|------------|-------------------------|----------------|--|
| LINE OUT | VR4001 | SELF RECORDING | 1KHz AUDIO
-60dB
SIGNAL
VIDEO
SIGNAL |
| TAPE | M. EQ. | SPEC. | |
| BLANK TAPE | SIGNAL GENERATOR/D.V.M. | -8dBV+-0.5dB | |

NOTE:

Audio select SW should be normal

- (1) Supply the audio signal(1KHz/-60dB sine-wave) to audio circuit through the MIC Input Jack.
 (2) Record it for a while.
 (3) Play back just recorded portion.
 (4) Adjust the VR4001 so that the level in playback mode is -8dBV+-0.5dB.

SYSTEM CONTROL SECTION

11. OSD DISPLAY POSITION ADJUSTMENT (FOR NV-G2E/B/A/EN)

| TP | ADJ. | MODE | INPUT |
|-----------------|------------|-------------|------------|
| MONITOR PICTURE | C6007 | STOP | COLOUR BAR |
| TAPE | M. EQ. | SPEC. | |
| | MONITOR TV | SHOWN BELOW | |

- (1) Connect the E.V.F. unit.
 (2) Aim the camera at colour bar.
 (3) Place the unit at OSD mode.
 (4) Adjust the C6007 so that indication on the monitor is located as shown in Fig.V8.

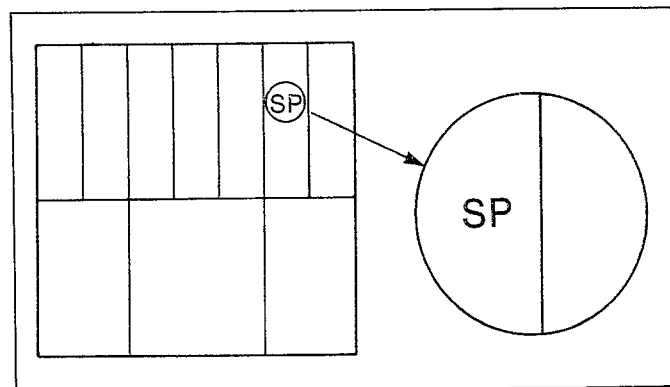


Fig. V9